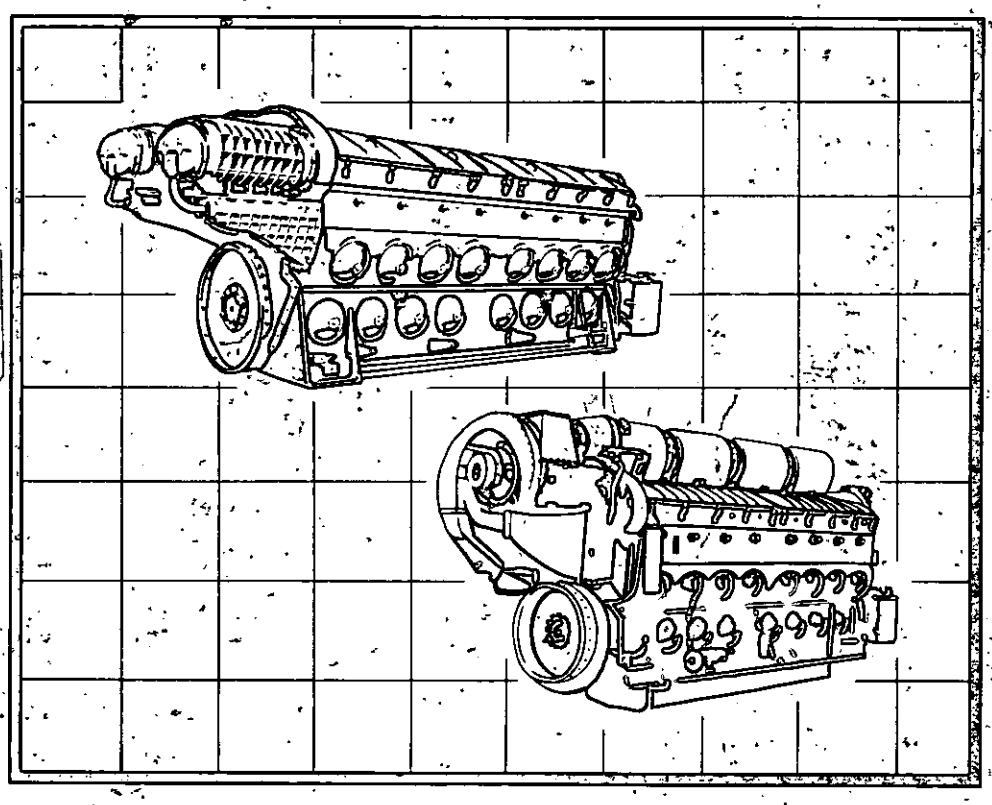
REPLACEMENT PARTS CATALOG No. 300

Diesel Engines – Models 567D and 645

For Domestic and Export Locomotives



SCSQ

ELECTRO-MOTIVE

REPLACEMENT PARTS CATALOG

NO. 300

DIESEL ENGINES - MODELS 567D and 645

SEE P.L. F100 FOR ENGINE MODEL DESIGNATIONS

DOMESTIC and EXPORT LOCOMOTIVES

6th Edition

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REPLACES Catalog No. 350

ELECTRO MOTIVE

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FOREWORD

Replacement Parts Catalog 300 provides parts ordering information for Series 567D and 645 Diesel Engines powering General Motors Domestic and Export locomotives.

The catalog is divided into four major sections – Alphabetical Index, Table of Contents, Parts Lists, and Numerical Index. The proper use of these sections in the correct sequence permits easy identification of the correct replacement part and its ordering reference.

ALPHABETICAL INDEX

This section is an alphabetical listing of the noun description used to identify a replacement part. Each description is referenced to the Parts List number in which it appears. For example:

BEARING .. Connecting Rod	107
BEARING .. Fuel Injector Control Shaft	115
BEARING .. Idler Gear Stubshaft	126
BEARING .. Idler Gear - Upper	126

The applicable Parts List for an Upper Idler Gear Bearing is 126. This Parts List number can now be referenced in the Table of Contents.

TABLE OF CONTENTS

The Table of Contents is a listing of all the Parts Lists in numerical sequence. Under the general headings of each Parts List are detailed subject descriptions, the page on which they appear, and the applicable engine models. For example:

Parts List Number	Subject	Page No.	Engine Application
F126	Camshaft Drive Gear Train		
	Camshaft Drive Gear Train	1-3	8,12,16-645E
	Camshaft Drive Gear Train	4-5	8-645E3B,E3C, F3B
	Idler Gear Stubshaft Assemblies	6-7	
	Upper Idler and Turbocharger Drive Gear Assembly	8	

The camshaft drive gear train is on pages 1-3 for roots blown 8 cylinder engines, and pages 4-5 for turbocharged 8 cylinder engines. The alpha prefix in the parts list number indicates the revision level; "A" being a new Parts List, "B" the first revision, "C" the second revision, etc.

PARTS LISTS

Parts Lists contain the ordering references for serviceable replacement components of the engine assembly. The method of listing items within a Parts List is called the "Indented System." Components of an assembly will have their descriptions indented to the right and directly beneath the assembly. For example:

Ref. No.	Part Number	Qty. Req.	Description
1	9515339	1	GEAR ASSEMBLY .. Spring drive - 19.7:1 ratio
2	9515336	1	GEAR ASSEMBLY .. Upper idler - 58 tooth
3	8407341	2	BEARING .. Hub
4	8261101	1	BEARING .. Gear
5	8448310	1	GEAR .. Turbocharger drive - 70 tooth

The Bearings (Ref. Nos. 3 and 4) are components of the Idler Gear Assembly (Ref. No. 2), which is a component of the Spring Drive Gear Assembly (Ref. No. 1). If the Idler Gear Assembly was ordered, the Bearings would be included. This does not mean that all items of an assembly are cataloged. Items which are not considered serviceable are not listed.

Items not identified by a Part Number in the Parts List may be ordered by specifying the following information on the purchase order – Catalog Number, Parts List Number, Page Number, Reference Number, complete description of the Part and the Assembly Part Number of which this item is a component. For example:

Ref. No.	Part Number	Qty. Req.	Description
1	9528662	1	FILTER ASSEMBLY .. Soakback
2		1	SHELL .. Filter

Order: Quantity 1, Filter Shell, Catalog 300, Parts List F134, Page 20, Reference Number 2, part of 9528662 Soakback Filter Assembly.

Illustrations in the Parts Lists are assigned Plate Numbers. These Plate Numbers use the Parts List number as a base, then are prefixed with a revision letter and suffixed with a serial number. For example, Plate C132-1 is the third revision to the first plate appearing in Parts List 126C. The Plate prefix and Parts List prefix may not always match since it is possible to revise one without revising the other.

These illustrations are intended to be used as a visual guide for locating a replacement part, and they may not always be an exact representation of your particular equipment.

Parts List Headings

REFERENCE NUMBER – Indicates part number location in the text and corresponds to the part identification reference in the illustration.

PART NUMBER – Indicates number to be used for ordering purposes.

QUANTITY REQUIRED – Lists total Quantity Required in that particular application. A dash (-) in this column indicates that the part is not a component of that particular application or assembly, or that optional quantities appear in the Description column. "As Required" or its abbreviation in this column indicates the quantity will vary for each application.

DESCRIPTION – Gives a detailed description of the part. Also used for application information, part number change references, part numbers with optional quantities, or part numbers for oversize and undersize replacements.

Ref. No.	Part Number	Qty. Req. A	Qty. Req.	Description
		A	-	8,12,16-645 engines
		-	B	20-645 engines
1	8069014	1	-	GEAR .. Crankshaft - 79 teeth
1	8360843	-	1	GEAR .. Crankshaft - 79 teeth
2	8031949	1	1	SLINGER .. Oil
3	----	A.R.		SHIM .. Oil slinger
				8035526 .. .010 thick
				8035527 .. .020 thick
				8035528 .. .030 thick

In the example above, only components with a quantity listed in Column A would be applicable to 8,12,16-645 engines. The Oil Slinger Shims (Ref. No. 3) should be ordered in quantity and size As Required. Ref. Nos. 2 and 3 are both applicable to 8,12,16, and 20 cylinder 645 engines.

Parts List Symbols

ASTERISK (*) – Precedes the Reference Number when the part or its location are not shown in the illustration.

OPTION (ϕ) - Precedes the Reference Number when two or more different types of a component have been used in that application. This may be due to design changes, different suppliers, or a part that is applied by customer specification. For example:

Ref. No.	Part Number	Qty. Req.	Description
ϕ10	8534979	2	CORE ASSEMBLY .. Aftercooler (Harrison)
ϕ10	8435460	2	CORE ASSEMBLY .. Aftercooler (Young)
ϕ11	8477713	1	TUBE .. Oil suction - Standard capacity oil pan
ϕ11	8443779	1	TUBE .. Oil suction - Increased capacity oil pan

The Option Symbol for Ref. No. 10 indicates that either Part Number may be ordered, since the only difference is the supplier. The Option Symbol is used for Ref. No. 11 because the customer will have to choose which tube to order based on the type of oil pan on his engine assembly.

NOTE (ƒ) – Precedes the Reference Number when additional information regarding the part is located within the Parts List in the form of an italicized note. For example:

Ref. No.	Part Number	Qty. Req.	Description
2	9515336	1	GEAR ASSEMBLY .. Upper idler
ƒ3	8407341	2	BEARING .. Hub
ƒ4	8261101	1	BEARING .. Gear

ƒ Replacement Bearings must be precision bored after assembly.

PLUS (+) – Precedes the Reference Number when a part listing is not in its primary location, but shown for clarity or reference. For example:

Ref. No.	Part Number	Qty. Req.	Description
+15	9323945	1	DAMPER .. Gear - See Parts List No. 120

The Plus Symbol in this example was used to show that the Gear Damper is shown in Parts List No. 122 for clarity. However, its primary location is in Parts List No. 120.

NUMERICAL INDEX

Located in the back of the Catalog is the Numerical Index. This a listing of every Part Number in the Catalog and is sequenced by Part Number, Parts List, Page, and Reference Number. This index is used to find the Description, Application, or Quantity Required for a Part when only the Part Number is known.

ALPHABETICAL INDEX

CATALOG 300

The Alphabetical Index references the applicable Parts List number to the most commonly referred to items by description. Additional locating and application information may be found by referring to the appropriate Parts List in the Table of Contents.

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DOMESTIC RAIL

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	Engine Equipped Reference Chart	1-2	All engines
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	Air Box Drain Piping	14	16-567D1,D2,D3,D3A
	Crankcase & Oil Pan Assembly	15-18	16-567ED1,ED2,ED3,ED3A
C103	Engine Ramp	1	16-567D1,D2
F104	Handhole Cover and Cylinder Test Valve		
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	Handhole Cover Assembly	2	All engines
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F108	Pistons and Rings (Replaces P.L. E108-S,E114-S & E114)		
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F110	Cylinder Head Crabs (Replaces P.L. E110-S)		
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E112	Injector Control Linkage (Replaced by P.L. A115)		
A113	Exhaust Valve Bridge, Rocker Arms and Oil Lines (Formerly in P.L. E108-S & E108)	1-2	All engines
E114	Piston Assembly, Pistons, Ring Sets and Rings (Replaced by P.L. F108)		
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/ Replacement for Korean 567C engines.
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B133-E	Booster Pump		
	Booster Pump Mounting	1	8,16-645E; 12,16-645E3,E3B; 16-645F3B
	Booster Pump Assembly	2	8,16-645E; 12,16-645E3,E3B; 16-645F3B
F134	Lube Oil System		
	Accessory End Outside Lines	4-7	All engines
	Lube Oil Manifold Assembly	8	All engines
	Manifold Relief Valve	9	All engines
	Piston Cooling, Camshaft Stubshaft and Rocker Arm Lube Oil Lines	10-12	All engines

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Parts List Number	Subject	Page Number	Engine Application
F134	Lube Oil System (Cont.)		
	Rear End Lines Mounting and Piping	15	8,12,16-645E
	Soak Back Filter Assembly - With Flanged Connections	20	12,16-645E3,E3B 16-645E3C,F3B; 20-645E3
	Turbocharger Lube Oil Filter	21	
	Soak Back Lube Oil System - With Flanged Connections	22-24	
	Soak Back Pump and Motor Assembly	25-30	
F136	Lube Oil Strainer	1-4	All engines
F138	Piston Cooling and Pressure Pump	1-5	
F140	Lube Oil Scavenging Pump	1-3	
F142	Lube Oil Separator (Replaces P.L. E142-S)		
	Lube Oil Separator	1	8,12,16-645E
	Lube Oil Separator	2	12,16-645E
	Lube Oil Separator	3	12-645E3; 16-645E3,E3B,E3C; 20-645E3
	Lube Oil Separator, Ejector and Eductor Tube Application	4-5	12-645E3,E3B; 16-645F3,F3B
	Lube Oil Separator	12	20-645E3 (DDM45)
F144	Cooling System		
	Water Manifold Bracket Application	1	16-645E3,E3B,E3C,F3,F3B
	Water Manifold Application	2-3	All engines
	Water Pump Application	4	8-645E
	Water Pump Application - Single Water Pump	5	12,16-645E
	Water Pump Application - Two (2) Water Pumps	6	12,16-645E
	Water Pump Application	7	12-645E3,E3B
	Water Pump Application	8	16-645E3,E3B,E3C,F3,F3B,20-645E3
	Aftercooler Piping	9	12-645E3,E3B; 16-645E3C,F3B; 20-645E3
F146	Water Pump	1-2	All engines
F148	Fuel Oil Piping	1-2	
F150	Fuel Oil Filter		
	Spin on Fuel Oil Filter Assembly	1	All engines
	Fuel Oil Filter	6-7	8,12,16-645E; 12,16,20-645E3
	Viscose to Twin Spin on Filter Kit	8	
E152	Fuel Injector (Replaced by P.L. A111)		
F154	Cylinder Head Cover and Support Frame		
	Current Design Round Top Inside Frame Corners	1-2	8-645E; 12-645E,E3,E3B
	Current Design Round Top Inside Frame Corners	3-4	16-645E,E3,E3B,E3C,F3B; 20-645E3
	Current Design Cover Assembly for Round Top Inside Corner Frame	5-6	All engines
	Cover Latches and Support Assembly	10	
E156	Overspeed Trip Housing and Cover (Replaced by P.L. F132)		

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F159	Engine Crankcase Pressure Switch, Detector and Low Water Safety Shutdown Valve		
	Index	1	
	Pressure Switch, Detector and Valve Applications	2-11	
	Repair Kit Index	21	
	Detector & Valve Assemblies	22-28	
F160	Camshaft Drive Housing and Cover	1-2	
F162	Auxiliary Generator Drive Assembly		
	Auxiliary Generator Drive Assembly	1	8,12,16-645E
	Auxiliary Generator Drive Assembly	2	12,16-645E3,E3B; 16-645E3C, F3B
	Auxiliary Generator Drive Assembly	3	8-645E (G18B)
D165	Governor Assembly - Electro - Hydraulic PG Barometric Rebalancing	1-16	8,12-645E (G18,GA18,G22)
F166	Governor Assembly (Replaces P.L. E166-S)		
	Governor Reference Chart	1-4	8,12,16-645E; 12,16-645E3,E3B; 20-645E3; 16-645E3C,F3B
	Governor Plug and Adapter Kit	4	
	12 Pole Electro-Hydraulic PG Governors	5-23	8,12,16-645E; 12,16,20-645E3
	16 Pole Electro-Hydraulic PGR Governors	24-34	8,12,16-645E
	16 Pole Electro-Hydraulic PGR Governors	35-51	12,16-645E3,E3B; 20-645E3; 16-645E3C, F3B
E168	Governor Drive Gear and Stubshaft (Replaced by P.L. F170)		
F170	Governor Drive and Governor Drive Gear (Replaces P.L. E168)		
	Governor Drive Gear	1	All engines
	Governor Drive Assembly	2-3	
F172	Exhaust Chamber Assembly (Replaces P.L. E172-S)		
	Exhaust Chambers With Straight Leg Manifolds, Heat Shields, and Water Discharge Flange	2-4	12-645E3,E3B
		5-7	16-645E3,E3B,E3C,F3B
		11-13	20-645E3
	Inspection Port Kit	13	12,16,20-645E3; 12,16-645E3B 16-645E3C
	Standard Exhaust Chamber Assembly	20	12-645E
	Standard Exhaust Chamber Assembly	26	16-645E
	Spark Retention Exhaust Chamber Asm.	28	16-645E
	Standard Exhaust Chamber Assembly	33	8,12,16-645E
	Standard Exhaust Chamber Assembly	34	8,12,16-645E
	Standard Exhaust Chamber Assembly	35	12-645E
	Standard Exhaust Chamber Assembly	36	16-645E
F174	Turbocharger Application (Replaces P.L. E174-S)		
	Turbocharger Reference Chart	1-2	All 645 turbocharged engines
	Turbocharger, Aftercooler and Air Duct Mounting	7-10	

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	Oil Bath Panel Type Filter Assemblies	2	12-645E
	Oil Bath Air Intake Filter and Adapter	9-10	16-645E
	Roof Mounted Oil Bath Panel Type Filter Asm.	11	16-645E
	Roof Mounted Oil Bath Panel Type Filter Asm.	12	12-645E
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	Cycoil Oil Bath Air Intake Filter and Mounting	14-15	20-645E3
	Cycoil Oil Bath Air Intake Filter and Mounting	16	16-645E3,E3B
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E181	Paper and Fiberglass Engine Air Filters		
	Paper Element Engine Air Filters and Mounting	6-9	16-645E3
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		12	12-645E3,E3B
		13-14	12-645E3,E3B
	Paper and Fiberglass Element Engine Air Filters and Mounting	15	20-645E3
	Paper Element Engine Air Filters and Mounting	34	16-645E
		35-36	12,16-645E3,E3B
		40	8,16-645E; 12,16,20-645E3; 12,16-645E3B
F182	Exhaust Stacks and Silencers (Replaces P.L. E182-S)		
	Exhaust Stack Assembly	1	20-645E3
	Exhaust Stack Assembly	2	12,16-645E3,E3B
F185	Roots Blower and Blower Support		
	Air Duct, Blind Cover, Blower and Blower Support Mounting Application	1	8-645E
	Roots Blower Application	2	12,16-645E
	Engine Blower Assembly	3-6	8,12,16-645E
F199	Engine Gasket Kits (Replaces P.L. E199-S)		
	Index	1-3	All engines
	Engine Gasket Kits	4-11	
	Numerical Index		

Parts List No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

16-567D1,8,12,16-645E Roots Blown Engines
16-567D2,D3,D3A;8-645E3B,E3C,F3B;12-645E3,E3B,E3C,F3B;
16-645E3,E3A,E3B,E3C,F3,F3B; and 20-645E3,E3B Turbocharged Engines

ENGINE EQUIPPED REFERENCE CHART
DOMESTIC MODEL LOCOMOTIVES

Ref. No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	/ Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
567D ENGINES EQUIPPED						
1	8278119	- - - -	- - - -	8288693	- - - -	16-567D1-GP18 W/low capacity L.O. pump 8084556
				8296332	- - - -	16-567D1-GP18 W/high capacity L.O. pump 8252844
2	8340852	- - - -	- - - -	- - - -	- - - -	16-567D1-GP28
3	8283119	- - - -	- - - -	8444347	- - - -	16-567D1-SD18
4	8345173	- - - -	- - - -	- - - -	- - - -	16-567D1-SD28
5	8289225	- - - -	- - - -	8296314	- - - -	16-567D2-GP20
6	8289223	- - - -	- - - -	8295936	- - - -	16-567D3-SD24 - 2 port aftercoolers
7	8264621	- - - -	8289223		- - - -	16-567D3-SD24 - 4 port aftercoolers
8	8305373	- - - -	- - - -	8296451	- - - -	16-567D3-GP30
9	8333514	- - - -	8376135	8296468	8421873	16-567D3A-GP35-DD35, No. 1 end, DDA35,SD35, and SDP35
10	8336272	- - - -	- - - -	- - - -	- - - -	16-567D3A,DD35, No. 2 end
645 ENGINES EQUIPPED						
11	8375117	- - - -	- - - -	8382199	- - - -	8-645E - SW1000 & SW1001
12	9510723	- - - -	- - - -	- - - -	- - - -	8-645E3B - Proposed
13	9546852	- - - -	- - - -	- - - -	- - - -	8-645E3C - GP15T (Early)
14	9559764	- - - -	- - - -	- - - -	- - - -	8-645E3C - GP15T (Current - with Reversed serration coupling disc)
14A	9548159	- - - -	- - - -	- - - -	- - - -	8-645F3B - Proposed
15	8367383	- - - -	- - - -	8382220	9507106	12-645E - SW1500 W/2 water pumps
16	8454331	- - - -	- - - -	9335392	9507107	12-645E - SW1500 W/1 water pump
17	8493254	- - - -	- - - -	- - - -	- - - -	12-645E - MP15,MP15DC (Early)
18	9530436	- - - -	- - - -	- - - -	- - - -	12-645E - MP15,MP15DC (Current)
19	9089447	- - - -	- - - -	9331065	- - - -	12-645E - MP15AC
20	9317237	- - - -	- - - -	- - - -	- - - -	12-645E - GP15-1
21	8410907	- - - -	- - - -	8419273	8421876	12-645E3 - GP39,SD39,SDL39
22	8448762	- - - -	- - - -	- - - -	- - - -	12-645E3 - GP39AC,SD39
23	- - - -	9087801	- - - -	- - - -	- - - -	12-645E3 - GP39-2
24	- - - -	9510679	- - - -	- - - -	- - - -	12-645E3B - GP39-2
25	- - - -	9546797	- - - -	- - - -	- - - -	12-645E3C - GP39-2,GP49
26	- - - -	9557350	- - - -	- - - -	- - - -	12-645E3C - GP39-2 (Current with reversed serration engine coupling disc)
27	- - - -	9519832	- - - -	- - - -	- - - -	12-645F3 - GP39X,GP49
28	- - - -	9547676	- - - -	- - - -	- - - -	12-645F3B - GP49
29	- - - -	9554106	- - - -	- - - -	- - - -	12-645F3B - GP49 (Current with reversed serration engine coupling disc)
30	8363076	- - - -	- - - -	# 8379664 ## 8442872	# 8421874 ## 8442873	16-645E - GP38 W/2 water pumps
31	8441626	- - - -	- - - -	## 8442872	## 8442873	16-645E - SD38 W/2 water pumps
32	8448763	- - - -	- - - -	- - - -	- - - -	16-645E - GP38AC,GP38-2 W/2 water pumps
33	8448775	- - - -	8448763	- - - -	- - - -	16-645E - SD38AC,SD38-2 W/2 water pumps
34	9097920	- - - -	- - - -	9503190	9517287	16-645E - GP38-2,SD38-2 W/1 water pump

/ Replacement engines for 567 will have 645 crankcase and oil pan assembly with 567 components
Standard lube oil separator ## Low profile lube oil separator

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

ENGINE EQUIPPED REFERENCE CHART (CONTINUED)
Domestic Model Locomotives

Ref. No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
35	9540603	- - - -	- - - -	- - - -	- - - -	16-645E - F40PH-2M
36	9556885	- - - -	- - - -	- - - -	- - - -	16-645E - GP38-2,SD38-2 (Current with reversed serration engine coupling disc)
37	9508093	- - - -	- - - -	- - - -	- - - -	16-645E - FP7,FP7A (Service replacement for 16-567BC)
38	8348001	- - - -	- - - -	8376720	8421877	16-645E3 - GP40,GP40-2,GP40P-2 SD40,SD40-2,SDP40,SDP40F, SD40T-2,SD40B-2
39	9099802	- - - -	- - - -	9526211	9526391	16-645E3 - F40PH
40	- - - -	8420799	- - - -	- - - -	8424965	16-645E3A - DDA40X
41	- - - -	8493991	- - - -	- - - -	- - - -	16-645E3A - F40C,F40PH
42	9510695	- - - -	- - - -	9536362	9536029	16-645E3B - GP40-2,SD40-2
43	9512076	- - - -	- - - -	- - - -	- - - -	16-645E3B - F40PH,F40PH-2
44	9545807	- - - -	- - - -	- - - -	- - - -	16-645E3C - GP40-2,SD40-2, SD40T-2,SDL40-2
45	9546283	- - - -	- - - -	- - - -	- - - -	16-645E3C - F40PH,F40PH-2
46	9556792	- - - -	- - - -	- - - -	- - - -	16-645E3C - F40PH,F40PH-2 (Current with reversed serration engine coupling disc)
47	9557564	- - - -	- - - -	- - - -	- - - -	16-645E3C - GP40-2,SD40-2, SD40T-2,SDL40-2 (Current with reversed serration engine coupling disc)
48	9320547	- - - -	- - - -	- - - -	- - - -	16-645F3 - GP40X,SD40X, GP50,SD50S
49	9522427	- - - -	- - - -	- - - -	- - - -	16-645F3 - SD50
50	9532673	- - - -	- - - -	- - - -	- - - -	16-645F3 - GP50,SD50, SD50S
51	9546286	- - - -	- - - -	- - - -	- - - -	16-645F3B - GP50,GP50T,SD50, SD50T
52	9554103	- - - -	- - - -	- - - -	- - - -	16-645F3B - GP50,GP50T,SD50, SD50S (Current with reversed serration engine coupling disc)
/53	8361060	- - - -	- - - -	8382173	8421878	20-645E3 - SD45,SDP45,F45,FP45
// 54	8433419	- - - -	- - - -	- - - -	- - - -	20-645E3 - SD45,SD45-2, SD45T-2,SD45-2R
55	9511347	- - - -	- - - -	- - - -	- - - -	20-645E3B - SD45-2,SD45T-2

/ *20-645E3 engine with thick (4-43/64 inch) engine flywheel disc*
// *20-645E3 engine with thin (4-23/64 inch) engine flywheel disc*

Normally aspirated engine equipped includes complete engine with flywheel, ring, gear, blowers, air intake filters, starter motors (if applicable), and engine governor.

Turbocharged engine equipped includes complete engine with flywheel, ring gear, starter motors (if applicable), turbocharger, aftercoolers, exhaust chambers, and engine governor.

Engines equipped for GP18 and GP28 locomotives include engine ramps - See Parts List 103.

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

8,12,16-645E Roots Blown Engines
12-645E3,E3B;16-645E3,E3B,E3C,F3B;20-645E3 Turbocharged Engines

ENGINE EQUIPPED REFERENCE CHART

Export Model Locomotives

Ref. No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
1	8397204	- - - -	- - - -	- - - -	- - - -	8-645E-G18,GA18,G18U,G18W
2	- - - -	- - - -	9091536	- - - -	- - - -	8-645E-G8 (Korea - replacement for 8-567C)
3	8453184	- - - -	- - - -	- - - -	- - - -	8-645E - G18B
4	9327563	- - - -	- - - -	- - - -	- - - -	8-645E - GL18M
5	- - - -	- - - -	9339795	- - - -	- - - -	8-645E - GA8 (Replacement for 567C)
6	9523185	- - - -	- - - -	- - - -	- - - -	8-645E - SW1002
7	9533718	- - - -	- - - -	- - - -	- - - -	8-645E - M7
8	9535056	- - - -	- - - -	- - - -	- - - -	8-645E - G18U
9	9540061	- - - -	- - - -	- - - -	- - - -	8-645E - SW1003C
10	9553068	- - - -	- - - -	- - - -	- - - -	8-645E - G8B
11	9559853	- - - -	- - - -	- - - -	- - - -	8-645E - GL18M
12	8382586	- - - -	- - - -	- - - -	- - - -	8-645E - G18B
13	8383612	- - - -	- - - -	- - - -	- - - -	12-645E - G22 W/2 water pumps
14	8454331	- - - -	- - - -	9335392	- - - -	12-645E - SW1504
15	8461852	- - - -	- - - -	- - - -	- - - -	12-645E - G22,G22CW,G22CU,G22U, G22W,GL22C W/1 water pump
16	- - - -	- - - -	9091734	- - - -	- - - -	12-645E - G12 (Korea - replacement for 12-567C)
17	9334262	- - - -	- - - -	- - - -	- - - -	12-645E - GL22C
18	9507381	- - - -	- - - -	- - - -	- - - -	12-645E - GL22CU-2
19	9509488	- - - -	- - - -	- - - -	- - - -	12-645E - G22W
20	9527557	- - - -	- - - -	- - - -	- - - -	12-645E - GL22CU/AC
21	8365041	- - - -	- - - -	- - - -	- - - -	12-645E3 - GT22C,GT22CU, GT22CW,GT22LC
22	8498323	- - - -	- - - -	- - - -	- - - -	12-645E3 - GT22CU
23	9310872	- - - -	- - - -	- - - -	- - - -	12-645E3 - JT22CW
24	9325685	- - - -	- - - -	- - - -	- - - -	12-645E3 - JT22MC
25	9337695	- - - -	- - - -	- - - -	- - - -	12-645E3 - JT22CW-2
26	9511261	- - - -	- - - -	- - - -	- - - -	12-645E3 - GT22HW
27	9528505	- - - -	- - - -	- - - -	- - - -	12-645E3 - JT22CW
28	9556971	- - - -	- - - -	- - - -	- - - -	12-645E3 - JT22CW
29	9518934	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22LC,GT22CU, GT22CW,
30	9518933	- - - -	- - - -	- - - -	- - - -	12-645E3B - JT22CW-2
31	9535085	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22CU
32	9541269	- - - -	- - - -	- - - -	- - - -	12-645E3B - JT22CW
33	9545469	- - - -	- - - -	- - - -	- - - -	12-645E3B - JT22CW-2,JT22MC
34	9545470	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22CW,GT22LC-2, JT22LC-2
35	9554685	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22CW,GT22LC-2, JT22LC-2 (Current with reversed serration engine coupling disc)
36	9554978	- - - -	- - - -	- - - -	- - - -	12-645E3B - JT22CW-2,JT22MC (Current with reversed serration engine coupling disc)
37	9556275	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22HW
38	9556316	- - - -	- - - -	- - - -	- - - -	12-645E3B - GT22HW with Yugoslav oil level gauge

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

ENGINE EQUIPPED REFERENCE CHART (CONTINUED)
EXPORT MODEL LOCOMOTIVES

Ref. No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
39	8433307	- - - -	- - - -	- - - -	- - - -	16-645E - G26C
40	8421659	- - - -	- - - -	- - - -	- - - -	16-645E - G26,G26C,G26CW W/2 water pumps
41	- - - -	- - - -	9091877	- - - -	- - - -	16-645E - SD9 (Korea - replacement for 16-567C)
42	8441626	- - - -	- - - -	8442872	8442873	16-645E - SD38M W/2 water pumps & low profile L.O. separator
43	9097919	- - - -	- - - -	- - - -	- - - -	16-645E - G26C,G26CU,G26CW, GL26C W/1 water pump
44	9322613	- - - -	- - - -	- - - -	- - - -	16-645E - G26CU/AC
45	9362196	- - - -	- - - -	- - - -	- - - -	16-645E - SD38
46	9334156	- - - -	- - - -	- - - -	- - - -	16-645E - G26CU/AC
47	9504275	- - - -	- - - -	- - - -	- - - -	16-645E - GL26CU-2/AC
48	9515890	- - - -	- - - -	- - - -	- - - -	16-645E - J26CW/AC
49	9526447	- - - -	- - - -	- - - -	- - - -	16-645E - J26C
50	9531033	- - - -	- - - -	- - - -	- - - -	16-645E - GL26CU
51	9524054	- - - -	- - - -	- - - -	- - - -	16-645E - AA
52	9536282	- - - -	- - - -	- - - -	- - - -	16-645E - G26HW - With Yugoslav oil level gauge
53	9542008	- - - -	- - - -	- - - -	- - - -	16-645E - G26CW-2
54	9544718	- - - -	- - - -	- - - -	- - - -	16-645E - GL26CU-2 /AC
55	9550298	- - - -	- - - -	- - - -	- - - -	16-645E - GL26C
56	9551967	- - - -	- - - -	- - - -	- - - -	16-645E - GL26CU-2
57	9556071	- - - -	- - - -	- - - -	- - - -	16-645E - G26CW-2 (Current with reverse serration engine coupling disc
58	8442708	- - - -	- - - -	- - - -	- - - -	16-645E3 - GT26C,GT26CW, GT26CU-2,GT26CW-2
59	9331282	- - - -	- - - -	- - - -	- - - -	16-645E3 - GT26CU-2
60	9501761	- - - -	- - - -	- - - -	- - - -	16-645E3 - SD40-2
61	9509480	- - - -	- - - -	- - - -	- - - -	16-645E3 - GT26CW
62	9531448	- - - -	- - - -	- - - -	- - - -	16-645E3 - GT26M2C
63	9510695	- - - -	- - - -	9535362	9536029	16-645E3B - GT26CW,GT26CW-2
64	9514547	- - - -	- - - -	- - - -	- - - -	16-645E3B - SD40-2
65	9516899	- - - -	- - - -	- - - -	- - - -	16-645E3B - AC/AC
66	9518315	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CU-2,GT26CW-2
67	9518576	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CW
68	9537085	- - - -	- - - -	- - - -	- - - -	16-645E3B - JT26C - SS
69	9543806	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CU-2
70	9548395	- - - -	- - - -	- - - -	- - - -	16-645E3B - JT26C-SS with two oil level gauges
71	9558107	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CW,GT26CW-2
72	9559820	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CW,GT26CW-2 (Current with reverse serration engine coupling disc)
73	9559986	- - - -	- - - -	- - - -	- - - -	16-645E3B - GT26CU-2 (Current with reverse serration engine coupling disc)
74	9552822	- - - -	- - - -	- - - -	- - - -	16-645E3C - SD40-2
75	9534193	- - - -	- - - -	- - - -	- - - -	16-645F3 - SD50S
76	9558479	- - - -	- - - -	- - - -	- - - -	16-645F3B - GT36HCW-2
77	8433419	- - - -	- - - -	8382173	8421878	20-645E3 - DDM45

Normally aspirated engine equipped includes complete engine with Flywheel, Ring Gear, Blowers, Air Intake Filters, Starter Motors (if applicable), and Engine Governor.

Turbocharged engine equipped includes complete engine with Flywheel, Ring Gear, Starter Motors (if applicable), Turbocharger, Aftercoolers, Exhaust Chambers and Engine Governor.

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

567D AND 645 ENGINES

CRANKCASE & OIL PAN REFERENCE CHART

Ref No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	†Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
			567D CRANKCASE AND OIL PAN ASSEMBLY			
1	8308070	- - - -	8370849	8296321	- - - -	16-567D1
2	8328602	- - - -	8406424	8285082	- - - -	16-567D2
3	8328601	- - - -	8371182	8421626	- - - -	16-567D3
		- - - -	8371182	8421626	8421879	16-567D3A
			645 CRANKCASE AND OIL PAN ASSEMBLY			
4	# 9320384	- - - -	- - - -	9513474	- - - -	8-645E (Except GL18M,G8,GA8, SW1002,M7,SW1003C
5	# 9320387	- - - -	- - - -	- - - -	- - - -	8-645E (Korea - G8,GA8 replacement - includes water manifolds)
6	##	- - - -	- - - -	- - - -	- - - -	8-645E (GL18M)
7	##	- - - -	- - - -	- - - -	- - - -	8-645 (SW1002,SW1003C)
8	##	- - - -	- - - -	- - - -	- - - -	8-645E3C,F3B (GP15T)
9	8382349	##	- - - -	8382352	8497154	12-645E (Except G12,GP15-1, GL22C,GL22CU-2,GL22CU/AC
10	8382444	- - - -	- - - -	- - - -	- - - -	12-645E (Korea - G12 Replacement - includes water manifolds)
11	##	- - - -	- - - -	- - - -	- - - -	12-645E (GP15-1)
12	##	- - - -	- - - -	- - - -	- - - -	12-645E (GL22C,GL22CU-2,GL22CU/AC)
13	8419272	##	- - - -	8421881	8421885	12-645E3,E3B,E3C (Except JT22CW)
14	- - - -	##	- - - -	- - - -	9536246	12-645F3,F3B (GP39X,GP49)
15	8366130	##	- - - -	8379662	8421880	16-645E (Except SD9,FP7, FP7A,GL26CU-2AC,A-A, SDP38,GL26CU-2)
16	8371183	- - - -	- - - -	- - - -	- - - -	16-645E (Korea - SD9 replacement - includes water manifolds)

†Replacement crankcase and oil pan assembly for 567 will be 645 modified crankcase and oil pan and will include all necessary components to adapt to original application. Refer to Page 15 for component Parts List. The chart on the right identifies the original 567 model designation to the replacement 645 modified crankcase and oil pan assembly.

Model Designation	
Original	Replacement
16-567D1	16-567ED1
16-567D2	16-567ED2
16-567D3	16-567ED3
16-567D3A	16-567ED3A

When replacing an 8 cylinder crankcase manufactured before January, 1976, accessory kit 9319605 is also required.

##Part number will be furnished upon request.

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

CRANKCASE & OIL PAN REFERENCE CHART (CONTINUED)

Ref No.	Original Part Number W/Standard Oil Pan Sump	Original Part Number W/Increased Capacity Oil Pan Sump	Replacement Part Number W/Std. Oil Pan Sump	Unit Exchange Part No. W/Standard Oil Pan Sump	Unit Exchange Part No. W/Increased Capacity Oil Pan Sump	Application
17	##	- - - -	- - - -	- - - -	- - - -	16-645E (FP7,FP7A,GL26CU-2AC, A-A,SDP38,GL26CU-2)
18	8365644	8382442	- - - -	8379663	8421886	16-645E3,E3A,E3B,E3C (Except JT26C-SS,GT26M2C)
19	##	- - - -	- - - -	- - - -	- - - -	16-645E3,E3B (JT26C-55, GT26M2C
20	9525494	9525493	- - - -	9536245	9536244	16-645F3,F3B
21	8382350	##	- - - -	8382353	8421887	20-645E3,E3B

Part number will be furnished upon request.

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY
CRANKCASE AND OIL PAN ASSEMBLY
PLATE F100-1

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines

CRANKCASE ASSEMBLY .. ENGINE - Includes Oil Pan

It is essential that the crankcase and oil pan be maintained the same length to assure proper assembly of end housing parts. Therefore, it is recommended that the crankcase be ordered as an assembly of crankcase and oil pan. Refer to Parts List 154 for applicable cylinder head cover frames. Engines delivered after February, 1972 applied a reduced diameter hardened insert for the water manifold supports located at the crankcase camshaft drive end. This crankcase will only accept the current water manifolds with the reduced diameter flange having an O.D. of 3.370 inches. Therefore, it is recommended that new water manifolds be ordered with the crankcase and oil pan. Refer to Parts List 144 for applicable water manifolds..

1	- - - - -	1	1	1	1	1	1	CRANKCASE ASSEMBLY .. Engine - Includes oil pan - See reference chart on Pages 5 & 6
ϕ 2	8344365	2	2	2	2	2	2	BASE .. Anchor shackle
ϕ*2A	9311575	1	1	1	1	1	1	BASE .. Anchor shackle - "Y" shape - Optional on turbocharged engines only, camshaft drive end
ϕ 3	9096428	As Required						BOLT .. Base mounting - 1-14 x 2 type C flanged 12 point - Formerly 272580 and 9436877 Qty. 8 required with 2-8344365 base Qty. 4 required with 1-8344365 base
ϕ*3A	9096320	4	4	4	4	4	4	BOLT .. Base mounting - 1-14 x 4-1/2 type C flgd. 12 point - Applied with 9311575 base
/ 4	8271449	20	28	36	36	36	44	STUD .. Main bearing - 1-1/4-12 x 15-11/16 in. long

/ *For gauging purposes, optional ground surface stud 8473541 is available for application to center main bearings only.*

4A	- - - - -	5	7	10	10	10	12	CAP .. Main bearing - See Parts List 118 for main bearing cap application and location chart
5	8089200	10	14	20	20	20	24	NUT .. Spline - 3/8-24 - Cylinder head bracket bolt
6	9085894	20	28	40	40	40	48	BOLT .. Cyl. head crab - 1-3/4-12 x 15-5/8 - Repl. 8347885
7	8348556	10	14	20	20	20	24	BOLT .. Bracket - 3/8-24 x 3 in. long
8	8133575	10	14	20	20	20	24	BRACKET .. Crab bolt
9	8213064	20	28	36	36	36	44	NUT .. Main bearing stud - 1-1/4-12 slotted hd. - Upper
10	8213347	-	-	2	2	2	2	RETAINER .. Main bearing stud - Center mains only
#11	8408684	20	28	36	36	36	44	NUT .. Main bearing stud - 1-1/4-12 hex. - Lower - Replaces 8028725
#12	8412532	20	28	36	36	36	44	WASHER .. Hardened - Lower main bearing stud nut

Current production engines apply a hardened washer 8412532 and main bearing nut 8408684 to prevent gouging by the nut. The hardened washer should only be used with the new nut 8408684. The present nut is 1/4 inch shorter and will accommodate the application of the washer. The washer must not be applied with the former castellated nut 8028725 because the nut will extend beyond the end of the stud and not allow engagement of the socket wrench when torquing in the area of the oil pan suction pipe. The hardened washer should not be applied to a main bearing cap that has been gouged by a nut unless these gouges have been milled from the surface of the main bearing cap. Contact our Service Department for machining tolerances.

13	186266	-	-	4	4	4	4	BOLT .. 1/4-20 x 3-1/4 hex. head
13	179808	20	28	32	32	32	40	BOLT .. 1/4-20 x 2-3/4 hex. head
14	8035130	20	28	36	36	36	44	NUT .. Lock - 1/4-20 hex.
15	8268641	8	12	16	16	16	20	INSERT .. Lower liner 9088530 - .060 O.S. except 12,16-645F3,F3B engines
15	9319169	-	12	16	-	-	-	INSERT .. Lower liner - 12,16-645F3,F3B engines
15A	8344765	8	12	16	16	16	20	ELBOW .. Exhaust

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines
-		1	1	1	1	1	1	CRANKCASE ASSEMBLY .. Engine - Includes oil pan

BRACKET .. Manifold - Piston Cooling

Contact our Service Department for information on repairing and/or replacing damaged piston cooling manifolds.

ϕ16	8140865	8	12	16	16	16	20	BRACKET .. Manifold - Piston cooling - Undrilled
ϕ17	8445780	8	12	16	16	16	20	BRACKET .. Manifold - Piston cooling - Two piece, machined and tapped - For installation instructions, See W.S. 10556
18	8032691	2	-	-	-	-	-	TUBE .. Piston cooling
18	8032682	-	2	-	-	-	-	TUBE .. Piston cooling
18	8032693	-	-	2	2	2	-	TUBE .. Piston cooling
18	8360715	-	-	-	-	-	2	TUBE .. Piston cooling
19	8159029	5	7	10	10	10	12	TUBE .. Oil lubricating
20	8346155	4	4	4	4	4	4	TUBE .. Breather
*21	8433263	2	2	2	2	2	2	SLEEVE .. Water manifold - Camshaft drive end - 3.38 I.D. x 3.63 O.D. x 1-5/16 wide
*22	8293393	1	-	-	-	-	-	PLATE .. Name
*22	8293392	-	1	-	-	-	-	PLATE .. Name - 12-645E engine
*22	8376251	-	1	-	-	-	-	PLATE .. Name - 12-645E3,E3B, E3C,F3B engines
*22	8293391	-	-	1	-	1	-	PLATE .. Name - 16-567D1 and 16-645E engines
*22	8290819	-	-	1	1	1	-	PLATE .. Name - 16-567D2,D3,D3A, 16-645E3,E3A,E3B,E3C,F3B engines
*22	8360895	-	-	-	-	-	1	PLATE .. Name
23	8227168	1	1	1	1	1	1	PLATE .. Name - Model and serial number - Formerly 8363465
24	193933	10	10	10	10	10	10	RIVET .. Plate mtg. - 3/32 x 1/2 flat head - Copper

Injector Timing

The following material (Ref. No's. 25 through 45) is applicable only to those 8,12 and 16-645E engines which are replacements for 8,12,16-567C engines.

COVER .. Blind - Water Discharge

*25	8359548	1	1	1	-	-	-	COVER .. Blind - Water discharge - Top deck
*26	8347756	1	1	1	-	-	-	GASKET .. Cover mounting
*27	9096428	4	4	4	-	-	-	BOLT .. Cover mounting - 1-14 x 2 Type C flanged 12 point
*28	8417696	2	2	2	-	-	-	BOLT .. Plug Ins. Lkg. - 3/4-16 x 9/16 hex.
*29	8417139	2	2	2	-	-	-	WASHER .. Plain - 3/4
*30	8080858	1	-	-	-	-	-	FLANGE .. Blind - Water opening - Top deck - Camshaft drive end
*31	8070513	1	-	-	-	-	-	GASKET .. Blind flange
*32	271584	4	-	-	-	-	-	BOLT .. Flange mounting - 5/8-18 x 1-5/8 hex. head
*33	8133334	4	-	-	-	-	-	WASHER .. Lock - 5/8 lock
*34	9417985	1	-	-	-	-	-	SCREW .. Set - 1/2-20 x 1/2 - Hex. socket

MANIFOLD ASSEMBLY .. Water

*35	8461118	1	-	-	-	-	-	MANIFOLD ASSEMBLY .. Water
*36	8461120	-	1	-	-	-	-	MANIFOLD ASSEMBLY .. Water
*37	8441950	-	-	1	-	-	-	MANIFOLD ASSEMBLY .. Water

Right bank

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines
		1	1	1	1	1	1	CRANKCASE ASSEMBLY .. Engine - Includes oil pan

MANIFOLD ASSEMBLY .. Water (Continued)

*38	8461119	1	-	-	-	-	-	MANIFOLD ASSEMBLY .. Water } Left bank
*39	8461121	-	1	-	-	-	-	MANIFOLD ASSEMBLY .. Water } Left bank
*40	8441949	-	-	1	-	-	-	MANIFOLD ASSEMBLY .. Water } Left bank
*41	8173319	2	2	2	-	-	-	PLUG .. Pipe - Water manifold - 1 inch headless
*42	8433272	4	4	4	-	-	-	SEAL .. Water manifold - Camshaft drive end
*43	8347416	2	2	2	-	-	-	GASKET .. Water manifold to crankcase
*44	181429	8	8	8	-	-	-	BOLT .. Manifold mtg. - 1/2-20 x 1-1/4 hex. head } Shipping Only
*45	6101229	8	8	8	-	-	-	WASHER .. Plain - 1/2 } Shipping Only

OIL PAN ASSEMBLY .. Engine

46	- - - -	1	1	1	1	1	1	OIL PAN ASSEMBLY .. Engine
*47	103879	1	1	1	1	1	1	PLUG .. Pipe - 3/8 M.P.T.
ϕ48	103870	1	1	-	-	-	-	PLUG .. Pipe - 1 M.P.T.
ϕ48	106643	-	1	2	2	2	2	PLUG .. Pipe - 1-1/2 M.P.T.
*49	8348620	-	-	1	-	1	1	PLUG .. Pipe - 1/2 M.P.T. - Except 16-645E eng.
50	8081234	21	21	21	21	24	21	NUT .. Spline - 1/2-20 - 8187166 .. Oversize - .885 O.D.
*51	8089200	-	-	-	1	-	-	NUT .. Spline - 3/8-24 - Except 16-567D1 engine
52	8480694	1	-	-	-	-	-	PIPE .. Suction - Formerly 8179200
52	8480356	-	1	-	-	-	-	PIPE .. Suction - Standard capacity oil pan sump - Formerly 8159729
52	8443781	-	1	-	-	-	-	TUBE ASSEMBLY .. Suction - Increased capacity oil pan sump - 12-645E3,E3B,E3C,F3,F3B engines
52	8477713	-	-	1	-	1	-	PIPE .. Suction - Standard capacity oil pan sump - Formerly 8173171
52	8443779	-	-	1	1	1	-	TUBE ASSEMBLY .. Suction - Increased capacity oil pan sump - Formerly 8330827
52	8480357	-	-	-	-	-	1	PIPE .. Suction - Standard capacity oil pan sump - Formerly 8360817
52	8434172	-	-	-	-	-	1	TUBE ASSEMBLY .. Suction - Increased capacity oil pan sump - Formerly 8364293
53	9315261	1	1	1	1	-	1	TUBE .. Drain - Air box - Replaces 8356134
54	9315262	1	1	1	1	-	1	TUBE .. Drain - Air box - Replaces 8356135
*55	8158875	-	-	-	-	2	-	TUBE .. Drain - Air box
*56	8195119	-	-	-	-	1	-	PLATE .. Oil pan - Accessory end
*57	8195120	-	-	-	-	1	-	GASKET .. Plate mounting
*58	103879	-	-	-	-	1	-	PLUG .. Pipe - 3/8 M.P.T.
*59	181433	-	-	-	-	4	-	BOLT .. Plate mtg. - 1/2-20 x 1-3/4 hex. head
*60	103323	-	-	-	-	12	-	WASHER .. Lock - 1/2
*61	8204420	-	-	-	-	2	-	FLANGE .. Oil pan - Used on camshaft drive end
*62	8204419	-	-	-	-	2	-	GASKET .. Flange mounting
*63	181429	-	-	-	-	8	-	BOLT .. Flange mtg. .. 1/2-20 x 1-1/4 hex. head
*64	8050962	-	1	1	-	-	-	FLANGE .. Blind - 3-3/4 in. sq. - 4 holes } Applicable to increased capacity oil pans on normally aspirated engines only
*65	8389165	-	1	1	-	-	-	GASKET .. Blind flange } Applicable to increased capacity oil pans on normally aspirated engines only
*66	181427	-	4	4	-	-	-	BOLT .. Flg. Mtg. -1/2-20 x 1 hex. hd. } Applicable to increased capacity oil pans on normally aspirated engines only
*67	6101229	-	4	4	-	-	-	WASHER .. Plain - 1/2 } Applicable to increased capacity oil pans on normally aspirated engines only
*68	8399163	-	1	1	-	-	-	FLANGE .. Blind - 4x3-5/8 in. - 4 holes @ 7/16 in. dia. } Applicable to increased capacity oil pans on normally aspirated engines only
*69	8390072	-	1	1	-	-	-	GASKET .. Blind flange } Applicable to increased capacity oil pans on normally aspirated engines only
*70	179839	-	4	4	-	-	-	BOLT .. Flg. Mtg. - 3/8-16 x 1 hex. hd. } Applicable to increased capacity oil pans on normally aspirated engines only
*71	6101225	-	4	4	-	-	-	WASHER .. Plain - 3/8 } Applicable to increased capacity oil pans on normally aspirated engines only

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines
		-	-	-	-	-	-	CRANKCASE ASSEMBLY .. Engine - Includes oil pan
*72	9433507	4	4	4	4	-	4	SCREW .. Set - 5/8-18 x 3/4 conical point - Hex. socket head - Camshaft drive end
73	8187007	2	-	-	-	-	-	SEAL .. Silicon - Crankcase to oil pan
73	8187009	-	2	-	-	-	-	SEAL .. Silicon - Crankcase to oil pan
73	8187010	-	-	2	2	2	-	SEAL .. Silicon - Crankcase to oil pan
73	8360920	-	-	-	-	-	2	SEAL .. Silicon - Crankcase to oil pan
74	8198078	2	2	2	2	2	2	"O" RING .. Air box drain
75	272511	18	26	36	36	36	44	BOLT .. Crankcase to oil pan - 1-14 x 2-3/4 hex. hd.
76	272512	4	4	4	4	4	4	BOLT .. Crankcase to oil pan 1-14 x 9 hex. head
77	8032724	22	30	40	40	40	48	NUT .. Lock - 1-14 hex.
78	131019	22	30	40	40	40	48	WASHER .. Plain - 1-1/16 I.D. x 2 O.D.
79	8054189	4	4	4	4	4	4	DOWEL .. Tapered - 1/2-20 x 2 in. long 8126991 .. .010 O.S. 8126992 .. .030 O.S.
80	103343	4	4	4	4	4	4	WASHER .. Plain - 1/2
81	8032719	4	4	4	4	4	4	NUT .. Lock - 1/2-20 hex.
*82	8413156	-	-	1	-	-	1	FLANGE .. Adapter - 3-3/4 in. sq. - 4 holes @ 9/16 dia. - Applied to engines having threaded soak back lube oil systems
*83	8389165	-	-	1	-	-	1	GASKET .. Flange mounting
*84	181430	-	-	4	-	-	4	BOLT .. Flange mounting - 1/2-20 x 1-3/8 hex. hd.
*84A	6101229	-	-	4	-	-	4	WASHER .. Plain - 1/2
*84B	8413159	-	-	1	-	-	1	GASKET .. Soak back filter mounting
*85	8411267	-	-	1	-	-	-	PLATE .. Soak back pump mounting
	GAUGE .. Oil Level							
*86	- - - -	As Required						GAUGE .. Oil level - Dipstick - See chart below
*87	8071849	As Required						SEAL .. Felt - Oil level gauge
*87A	188002	As Required						PLUG .. Button

Oil Level Gauge Part Number	Engine Application
8195721	8-645E;E3C,16-645E (except SW1002,G18U,SW1003C G26HW-2 locomotives)
8285936	8-645E (SW1002,SW1003C)
9318188	8-645E (G18U)
8195722	12-645E
8285976	12-645E3,E3B (except GT22HW); 16-645E3,E3A,E3B,E3C, F3,F3B; 16-567D1,D2,D3,D3A - Standard capacity oil pan
8333323	12-645E3,E3B,E3C,F3,F3B (except GT22HW); 16-645E3,E3A,E3B,E3C,F3, F3B; 16-567D1,D2,D3,D3A; 20-645E3,E3B - Increased capacity oil pan
8468174	12-645E (G22CU,G22CW locomotives) - Readings in Spanish
8476475	12,16-645E3 (JT22CW,GT22HW,GT26CW-2 locomotives) - Readings in Yugoslav
8378325	20-645E3,E3B - Standard capacity oil pan
8429923	12-645E3,E3B,E3C,F3,F3B - Calibrated in gallons - Increased capacity oil pan
8437210	16-645E3A - Calibrated in gallons
8431145	20-645E3,E3B - Calibrated in gallons

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines
FLANGE .. Drain - Air Box								
88	8364299	1	1	1	1	-	1	FLANGE .. Drain - Air box - 3/4 F.P.T.
89	8356239	1	1	1	1	-	1	GASKET .. Flange mounting
90	181429	4	4	4	4	-	4	BOLT .. Flange mounting - 1/2-20 x 1-1/4 hex. head
91	6101229	4	4	4	4	-	4	WASHER .. Plain - 1/2
DRAIN EQUIPMENT .. Air Box								
*92	8178307	-	-	-	-	2	-	COCK .. Cut-out - 1/2 - Air drain - See Page 14
*93	8196675	-	-	-	-	1	-	TUBE ASSEMBLY .. Air box drain - Left bank
*94	8196676	-	-	-	-	1	-	TUBE ASSEMBLY .. Air box drain - Right bank
*95	8081567	-	-	-	-	2	-	GASKET .. Tube - Air box drain
*96	181361	-	-	-	-	4	-	BOLT .. Flange mounting - 3/8-24 x 7/8 hex. head

Ref. No's. 92 thru 96 were applied to engines prior to April, 1960. The following piping was released for application to all GP20, GP28, GP30, GP35, SD24, SD35, SDP35, DD35 and DDA35 locomotives. This system returns to the by-pass position automatically after the air box has been blown down manually, thus preventing continuous excessive drainage which is detrimental in the operation of the D2, D3 and D3A engines.

*97	8289467	-	-	-	-	2	-	VALVE ASSEMBLY .. Air box drain - See Page 14
*98	8034030	-	-	-	-	4	-	GASKET .. Air box drain valve
*99	181444	-	-	-	-	4	-	BOLT .. Drain valve mounting - 1/2-20 x 3-1/2 hex. hd.
*100	103323	-	-	-	-	4	-	WASHER ...Lock - 1/2
*101	8272821	-	-	-	-	2	-	PAD .. Air box drain
*102	8272425	-	-	-	-	2	-	GASKET .. Air box drain pad
*103	8289810	-	-	-	-	2	-	ELBOW .. Drain valve
*104	181364	-	-	-	-	4	-	BOLT .. Pad mounting - 3/8-24 x 1 hex. head
KIT .. Opposed Flow Air Box Drain Restriction Device								
*105	8361613	-	-	-	-	1	-	KIT .. Opposed flow air box drain restriction device - Applied to 567 turbocharged engines - Refer to Pointers Article dated August 18, 1965 and March 21, 1966
*106	8353205	-	-	-	-	1	-	TEE ASSEMBLY .. Flanged
*107	8354304	-	-	-	-	2	-	BLOCK .. Spacer
*108	8029159	-	-	-	-	2	-	GASKET .. Flat - Spacer block to oil pan
*109	8034030	-	-	-	-	2	-	GASKET .. Square - Spacer block to drain pipe elbow
*110	8362363	-	-	-	-	2	-	FLANGE .. Pipe
*111	8087412	-	-	-	-	2	-	GASKET .. Flat - Flanged tee
*112	179843	-	-	-	-	4	-	BOLT .. 3/8-16 x 1-1/2 hex. head
*113	103321	-	-	-	-	4	-	WASHER .. Lock - 3/8
*114	102635	-	-	-	-	4	-	NUT .. 3/8-16 hex.
*115	8108197	-	-	-	-	4	-	CLAMP ASSEMBLY .. Tube mounting
*116	8108221	-	-	-	-	1	-	CLAMP ASSEMBLY .. Pipe
*117	8362882	-	-	-	-	1	-	PIPE ASSEMBLY .. Tee flange to bottom to tank

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required						Description
		A	-	-	-	-	-	8-645E,E3B,E3C,F3B engines
		-	B	-	-	-	-	12-645E,E3B,E3C,F3B engines
		-	-	C	-	-	-	16-645E,E3B,E3C,F3B engines
		-	-	-	D	-	-	16-645E3A engine
		-	-	-	-	E	-	16-567D1,D2,D3 and 16-567D3A engines
		-	-	-	-	-	F	20-645E3,E3B engines
ENGINE MOUNTING HARDWARE								
†*118	- - - -	8	8	8	8	8	8	BOLT .. Engine mounting 271549 - 1-8 x 2-1/2 hex. head 271702 - 1-8 x 3 hex. head
*119	8137697	8	8	8	8	8	8	WASHER .. Lock - 1
†*120	- - - -	4	4	4	4	4	4	DOWEL .. Pin - Engine mounting 8022474 - 1 in. x 3-1/4 in. long - 1-8 threaded end 8341940 - 1 in. x 3-3/4 in. long - 1-8 threaded end
*121	218445	4	4	4	4	4	4	NUT .. 1-8 hex.

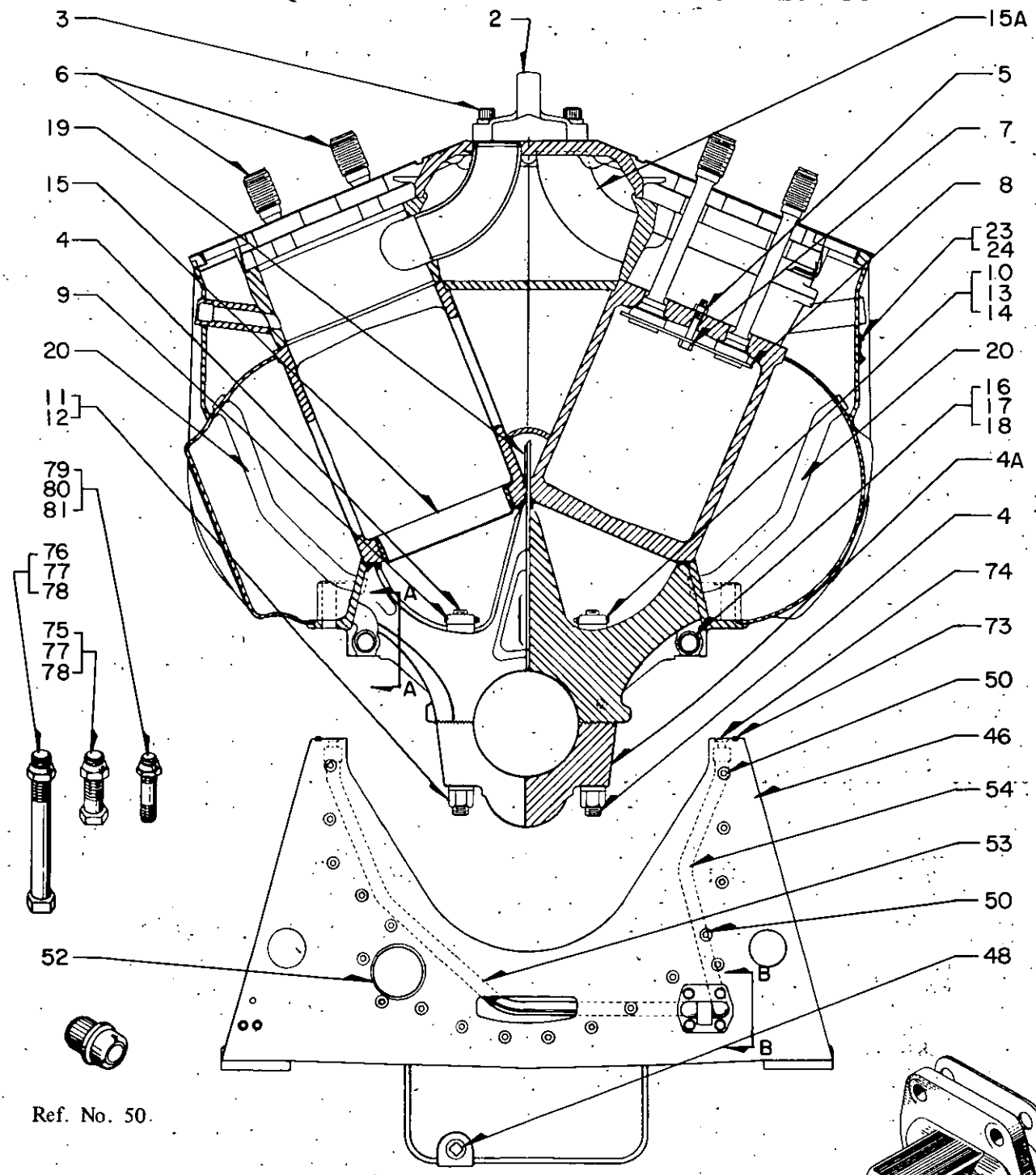
† *Applicable part dependent upon specific installation requirement.*

PAINT .. Engine

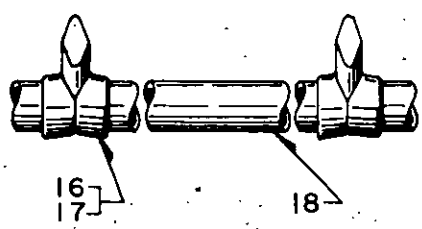
*122	- - - -	As Required	ENAMEL .. Engine - Suede gray 8078289 .. Quart 8122047 .. Gallon 8133054 .. 5 Gallons
*123	8228726	As Required	PRIMER .. Buff oxide - 1 gallon

P.L. No. F100

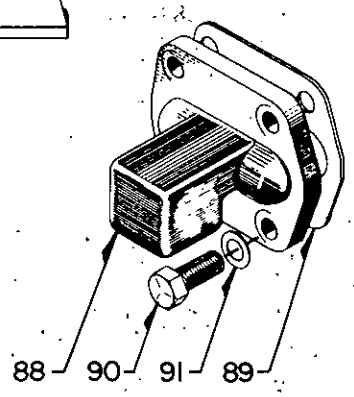
ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY



Ref. No. 50



VIEW A-A



VIEW B-B

Ref. No. 1
PLATE F100-1

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Air Box Drain Piping
16-567D1,D2,D3 and D3A Engines

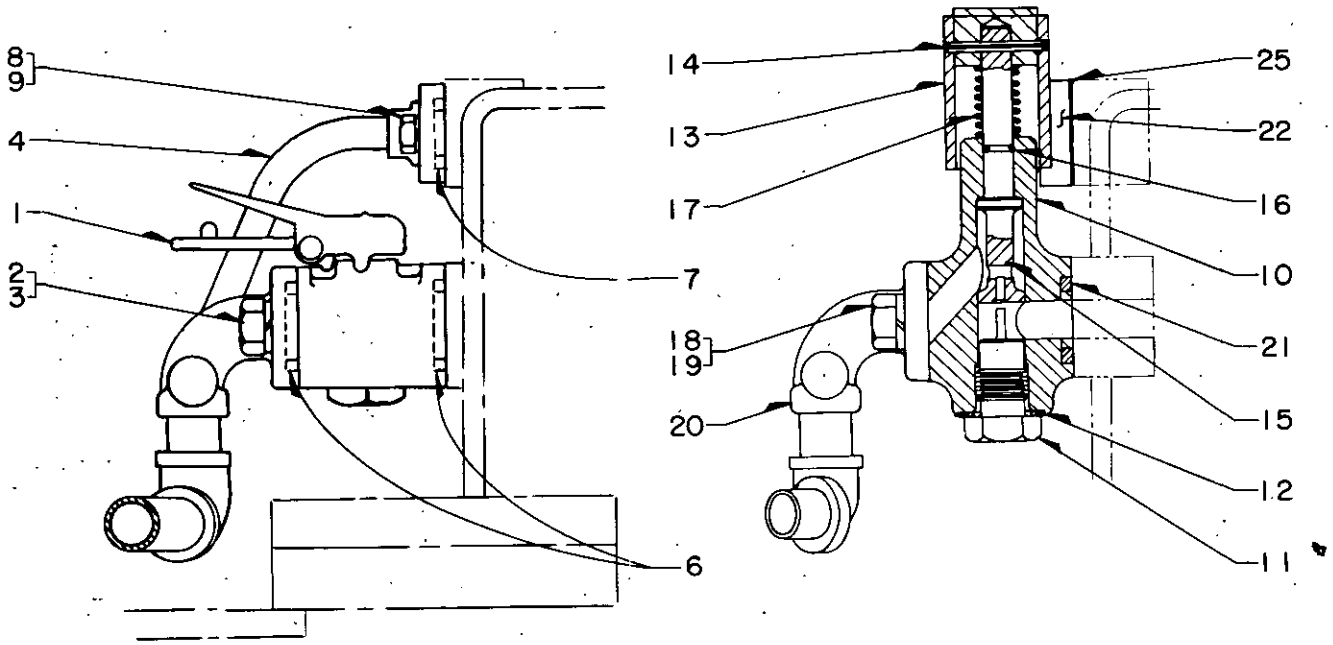


PLATE C100-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	GP18,GP20,SD18 and SD24 (GP20 and SD24 prior to April, 1960) models
		-	B	GP20,GP28,GP30,GP35,SD24,SD35,SDP35,DD35 & DDA35 models after April, 1960
1	8178307	2	-	COCK .. Cut-out - 1/2 - Air box drain
2	181444	4	-	BOLT .. Cut-out cock mounting - 1/2-20 x 3-1/2 hex. head
3	103323	4	-	WASHER .. Lock - 1/2
4	8196675	1	-	TUBE ASSEMBLY .. Air box to cut-out cock - Left bank
* 5	8196676	1	-	TUBE ASSEMBLY .. Air box to cut-out cock - Right bank
6	8034030	4	-	GASKET .. Cut-out cock mounting
7	8081567	2	-	GASKET .. Tube assembly to engine air box
8	181361	4	-	BOLT .. Tube assembly mounting - 3/8-24 x 7/8 hex. head
9	103321	4	-	WASHER .. Lock - 3/8
10	8289467	-	2	VALVE .. Air box drain
11	8289412	-	2	PLUG .. Valve
12	8104175	-	2	WASHER .. Valve plug
13	8289413	-	2	SLEEVE .. Valve
14	455731	-	2	PIN .. Spring
15	8289411	-	2	VALVE
16	8167469	-	2	RING .. "O" - Valve seal
17	8289731	-	2	SPRING .. Valve
18	181444	-	4	BOLT .. Valve mounting - 1/2-20 x 3-1/2 hex. head
19	103323	-	4	WASHER .. Lock - 1/2
20	8289810	-	2	ELBOW .. Flanged
21	8034030	-	4	GASKET .. Valve to flanged elbow and engine air box
22	8272821	-	2	PAD .. Blanking
*23	181364	-	4	BOLT .. Blanking pad mounting - 3/8-24 x 1 hex. head
*24	103321	-	4	WASHER .. Lock - 3/8
25	8272425	-	2	GASKET .. Blanking pad

8196888 8279329 8332262 8335955
8266763 8316530 8198143

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Crankcase and Oil Pan Assembly
PLATE C100-3

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-567ED1 engine
		-	B	-	16-567ED2 engine
		-	-	C	16-567ED3 and 16-567ED3A engines

It is essential that the crankcase and oil pan be maintained the same length to assure proper assembly of end housing parts. Therefore, it is recommended that crankcase be ordered as an assembly of crankcase and oil pan. Refer to Parts List 154 for applicable cylinder head cover frames.

1	- - - - -	1	1	1	CRANKCASE ASSEMBLY .. Engine - Includes oil pan - See Reference Chart on Page 5
ϕ 2	8344365	2	2	2	BASE .. Anchor shackle
ϕ*2A	9311575	-	1	1	BASE .. Anchor shackle - "Y" shape - Optional on turbocharged engines only, camshaft drive end
3	9096428	8	As Req.		BOLT .. Base mounting - 1-14 x 2 Type C flanged 12 point - Formerly 272580 and 9436877 Quantity 8 required with 2-8344365 base Quantity 4 required with 1-8344365 base
ϕ*3A	9096320	-	4	4	BOLT .. Base Mounting - 1-14 x 4-1/2 Type C flanged - 12 point - Applied with 9311575 base
∤ 4	8271449	36	36	36	STUD .. Main bearing - 1-1/4-12 x 15-11/16 in. long

∤ *For gauging purposes, optional ground surface stud 8473541 is available for application to center main bearings only.*

4A	- - - - -	10	10	10	CAP .. Main bearing - See P.L. 118 for application and location chart
5	8089200	20	20	20	NUT .. Spline - 3/8-24 - Cylinder head bracket bolt
6	9085894	40	40	40	BOLT .. Cylinder head - 1-3/4-12 x 15-5/8 in. long - Replaces 8347885
7	8348556	20	20	20	BOLT .. Bracket - 3/8-24 x 3 in. long
8	8133575	20	20	20	BRACKET .. Crab bolt
9	8213064	36	36	36	NUT .. Main bearing stud - 1-1/4-12 slotted head - Upper
10	8213347	2	2	2	RETAINER .. Main bearing stud - Center mains only
# 11	8408684	36	36	36	NUT .. Main bearing stud - 1-1/4-12 hex. - Lower - Replaces 8028725
# 12	8412532	36	36	36	WASHER .. Hardened - Lower main bearing stud nut

\# *Current production engines apply a hardened washer 8412532 and main bearing nut 8408684 to prevent gouging by the nut. The hardened washer should only be used with the new nut 8408684. The present nut is 1/4 inch shorter and will accommodate the application of the washer. The washer must not be applied with the former castellated nut 8028725 because the nut will extend beyond the end of the stud and not allow engagement of the socket wrench when torquing in the area of the oil pan suction pipe. The hardened washer should not be applied to a main bearing cap that has been gouged by a nut unless these gouges have been milled from the surface of the main bearing cap. Contact our Service Department for machining tolerances.*

13	186266	4	4	4	BOLT .. 1/4-20 x 3-1/4 hex. head
13	179808	32	32	32	BOLT .. 1/4-20 x 2-3/4 hex. head
14	8035130	36	36	36	NUT .. Lock - 1/4-20 hex.
15	8268641	16	16	16	INSERT .. Lower liner 9088350 - .060 O.S.
15A	8344765	16	16	16	ELBOW .. Exhaust

BRACKET .. Manifold - Piston Cooling

Contact our Service Department for information on repairing and/or replacing damaged piston cooling manifolds.

ϕ16	8140865	16	16	16	BRACKET .. Manifold - Piston cooling - Undrilled
ϕ17	8445780	16	16	16	BRACKET .. Manifold - Piston cooling - Two piece, machined and tapped - For installation instructions, see W.S. 10556
18	8032693	2	2	2	TUBE .. Piston cooling
19	8159029	10	10	10	TUBE .. Oil lubricating
20	8346155	4	4	4	TUBE .. Breather

P.L. No. F100

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-567ED1 engine
		-	B	-	16-567ED2 engine
		-	-	C	16-567ED3 and 16-567ED3A engines
		1	1	1	CRANKCASE ASSEMBLY .. Engine.
*21	8433263	2	2	2	*SLEEVE .. Water manifold - Camshaft drive end - 3.38 I.D. x 3.63 O.D. x 1-5/16 wide
*22	8293391	1	-	-	PLATE .. Name - Injector timing
*22	8290819	-	1	1	PLATE .. Name - Injector timing
23	8227168	1	1	1	PLATE .. Name - Model and serial number - Formerly 8363465
24	193933	10	10	10	RIVET .. Plate mtg. - 3/32 x 1/2 flat head - Copper
COVER .. Blind - Water Discharge					
*25	8359548	1	1	1	COVER .. Blind - Water discharge - Top deck
*26	8347756	1	1	1	GASKET .. Cover mounting
*27	9096428	4	4	4	BOLT .. Cover mounting - 1-14 x 2 Type C flanged 12 point
*28	8417696	2	2	2	BOLT .. Plug Ins. Lkg. - 3/4-16 x 9/16 hex.
*29	8417139	2	2	2	WASHER .. Plain - 3/4
MANIFOLD ASSEMBLY .. Water					
*30	8441950	1	1	1	MANIFOLD ASY. .. Water - Right bank
*31	8441949	1	1	1	MANIFOLD ASY. .. Water - Left bank
*32	8173319	2	-	-	PLUG .. Pipe - Water manifold - 1 inch headless
*33	8433272	4	4	4	SEAL .. Water manifold - Camshaft drive end - Formerly 8347415
*34	8347416	2	2	2	GASKET .. Water manifold to crankcase
*35	181429	8	8	8	BOLT .. Manifold mounting - 1/2-20 x 1-1/4 hex. head } Shipping
*36	6101229	8	8	8	WASHER .. Plain - 1/2 } Only
OIL PAN ASSEMBLY .. Engine					
37	- - - -	1	1	1	OIL PAN ASSEMBLY .. Engine
*38	103879	1	1	1	PLUG .. Pipe - 3/8 M.P.T.
39	106643	2	2	2	PLUG .. Pipe - 1-1/2 M.P.T.
*40	8348620	-	1	1	PLUG .. Pipe - 1/2 M.P.T.
41	8081234	21	21	21	NUT .. Spline - 1/2-20 8187166 .. Oversize - .885 O.D.
*42	8089200	-	1	1	NUT .. Spline - 3/8-24
*43	144034	-	1	1	BUSHING .. Pipe reducing - 3/4 M.P.T. x 1/2 F.P.T.
44	8477713	1	1	1	PIPE .. Suction - Formerly 8173171
45	9315261	1	1	1	TUBE .. Drain - Air box - Replaces 8356134
46	9315262	1	1	1	TUBE .. Drain - Air box - Replaces 8356135
*47	8413156	-	1	1	FLANGE .. Adapter - 3-3/4 in. sq. - 4 holes @ 9/16 dia. - Applied to engines having threaded soak back lube oil systems
*48	8389165	-	1	1	GASKET .. Flange mounting
*49	181427	-	4	4	BOLT .. Flange mounting - 1/2-20 x 1 hex. head
*50	6101229	-	4	4	WASHER .. Plain - 1/2
*51	8399163	-	1	1	FLANGE .. Blind - 4 x 3-5/8 in. - 4 holes @ 7/16 in. dia.
*52	8390072	-	1	1	GASKET .. Blind flange
*53	179839	-	4	4	BOLT .. Flange mtg. - 3/8-16 x 1 hex. head
*54	6101225	-	4	4	WASHER .. Plain - 3/8
*55	9433507	4	4	4	SCREW .. Set - 5/8-18 x 3/4 conical point - Hex. soc. hd. - Cmshft. dr. end
56	8187010	2	2	2	SEAL .. Silicon - Crankcase to oil pan
57	8198078	2	2	2	"O" RING .. Air box drain
58	272511	36	36	36	BOLT .. Crankcase to oil pan - 1-14 x 2-3/4 hex. head
59	272512	4	4	4	BOLT .. Crankcase to oil pan - 1-14 x 9 hex. head
60	8032724	40	40	40	NUT .. Lock - 1-14 hex.
61	131019	40	40	40	WASHER .. Plain - 1-1/16 I.D. x 2 O.D.
62	8054189	4	4	4	DOWEL .. Tapered - 1/2-20 x 2 in. long 8126991 .. .010 O.S. 8126992 .. .030 O.S.
63	103343	4	4	4	WASHER .. Plain - 1/2
64	8032719	4	4	4	NUT .. Lock - 1/2-20 hex.

ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-567ED1 engine
		-	B	-	16-567ED2 engine
		-	-	C	16-567ED3 and 16-567ED3A engines
		1	1	1	CRANKCASE ASSEMBLY .. Engine

FLANGE .. Drain - Air Box

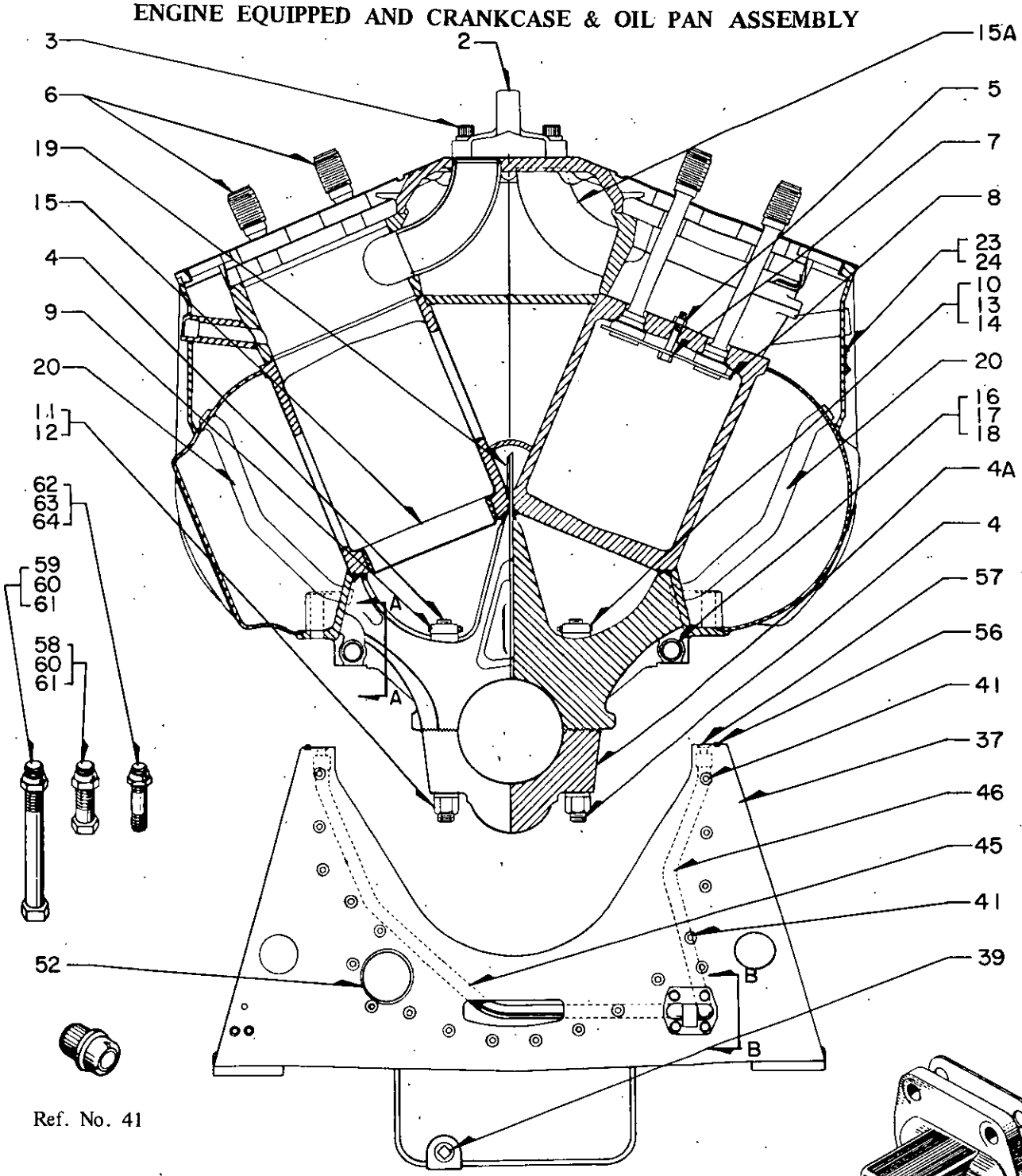
65	8364299	1	1	1	FLANGE .. Drain - Air box - 3/4 F.P.T.
66	8356239	1	1	1	GASKET .. Flange mounting
67	181429	4	4	4	BOLT .. Flange mounting - 1/2-20 x 1-1/4 hex. head
68	6101229	4	4	4	WASHER .. Plain - 1/2
*69	8390477	-	2	2	FLANGE .. Blind
*70	8347396	-	2	2	GASKET .. Flange mounting
*71	181374	-	8	8	BOLT .. Flange mounting - 3/8-24 x 1-1/2 hex. head
*72	6101225	-	8	8	WASHER .. Plain - 3/8

The following is a list of material furnished with replacement 645 modified crankcase and oil pan assemblies for 567 engine application.

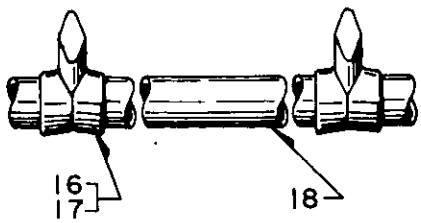
*73	8349063	1	1	1	ELBOW .. Water inlet - Right bank
*74	8349064	1	1	1	ELBOW .. Water inlet - Left bank
*75	8347416	2	2	2	GASKET .. Water inlet elbow to water manifold
*76	181436	8	8	8	BOLT .. Water inlet elbow to water manifold
*77	179887	8	8	8	BOLT .. Water pump to water inlet elbow - 1/2-13 x 1-3/4 hex. head
*78	6101229	16	16	16	WASHER .. Plain - 1/2
*79	9093027	16	16	16	TUBE ASSEMBLY .. Water inlet - Replaces 8347340
*80	8347343	32	32	32	STRAP .. Saddle - Water inlet tube
*81	8032717	64	64	64	NUT .. Lock - 3/8-24 hex. - Saddle strap
*82	8268162	1	1	1	WELL .. Thermometer
*83	8359602	1	1	1	PIPE ASSEMBLY .. Drain - Accessory end
*84	8029469	2	2	2	GASKET .. Drain pipe to water inlet elbow
*85	179843	8	8	8	BOLT .. Drain pipe to water inlet elbow - 3/8-16 x 7/8 hex. head
*86	6101225	8	8	8	WASHER .. Plain - 3/8
*87	8141612	2	2	2	ELBOW .. Water outlet
*88	8347993	1	1	1	TUBE ASSEMBLY .. Fuel supply and drain
*89	8348604	1	-	-	TUBE ASSEMBLY .. Engine detector to water inlet elbow
*90	8477002	-	1	1	HOSE ASSEMBLY .. Engine detector to water inlet elbow - Replaces 8412290 tube assembly - Formerly 8348604
*91	8342588	2	3	3	"O" RING .. Tube mounting
*92	186542	2	2	2	SCREW .. Tube mounting - No. 10-24 x 1/2 hex. socket head
*93	8349424	1	-	-	FLANGE .. Blind - Applied to water inlet elbow when engine detector is not used
*94	8025988	1	-	-	GASKET .. Blind flange
*95	106260	2	-	-	WASHER .. Plain - 1/4
*96	8359523	-	1	1	PIPE ASSEMBLY .. Air box drain - Lower portion
*97	8359524	-	1	1	PIPE ASSEMBLY .. Air box drain - Upper portion
*98	8359525	-	1	1	TUBE ASSEMBLY .. Air box drain
*99	8040345	-	1	1	ELBOW .. 3/4 M.P.T. x 5/8 tube
*100	8040322	-	1	1	CONNECTOR .. 3/4 M.P.T. x 5/8 tube
*101	8108221	-	1	1	CLAMP ASSEMBLY .. Pipe
*102	8108212	-	2	2	CLAMP ASSEMBLY .. Pipe
*103	8147805	-	2	2	PAD .. Blanking - 2 in. square - 16 gauge
*104	8412325	-	1	1	VALVE .. Cutoff - 1 in. ball cock
*105	8347397	-	-	1	PIPE ASSEMBLY .. Manifold to aftercooler - Right bank
*106	8347398	-	-	1	PIPE ASSEMBLY .. Manifold to aftercooler - Left bank

P.L. No. F100

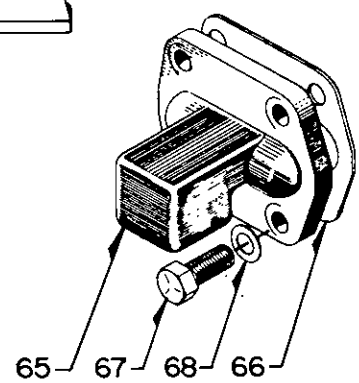
ENGINE EQUIPPED AND CRANKCASE & OIL PAN ASSEMBLY



Ref. No. 41



VIEW A-A



VIEW B-B

Ref. No. 1

PLATE C100-3

ENGINE RAMP

GP18 - 16-567 D1 Engine
GP20 - 16-567 D2 Engine

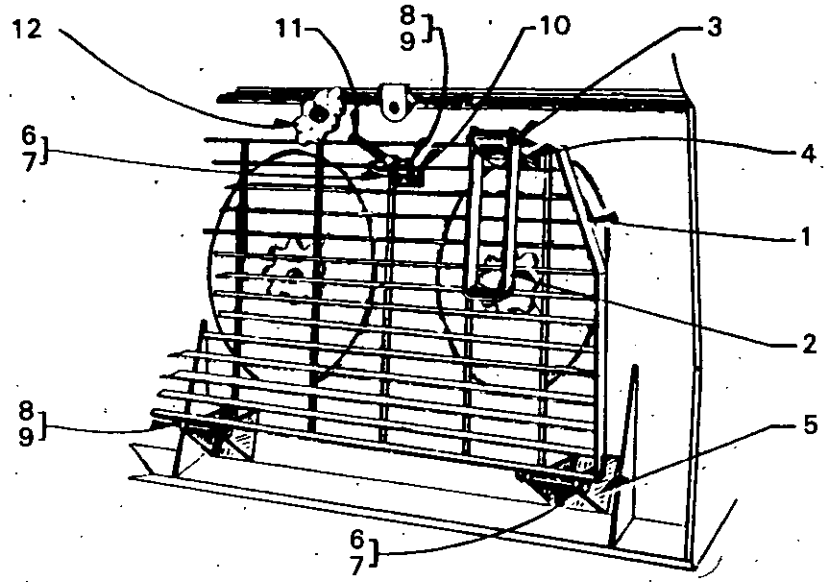


PLATE C103-1

Ref. No.	Part Number	Qty. Req.	Description
1	8148138	4	RAMP ASSEMBLY .. Engine
2	8084063	8	LEG .. Ramp
3	424267	8	PIN .. Ramp leg - 1/2 x 2-3/4 inches long
4	8084794	8	HINGE .. Ramp leg
5	8192353	8	BRACKET .. Ramp to oil pan - Lower
6	181427	24	BOLT .. Hex head 1/2-20 x 1 - Bracket to oil pan
7	103343	36	WASHER .. Plain 1/2 - Formerly 120396
8	8032918	12	PIN .. Hinge
9	108630	12	PIN .. Cotter 1/8 x 7/8 inch long
10	8192351	4	BRACKET .. Ramp to oil pan - Upper
11	8177613	4	BOLT .. Eye - Handwheel - 1/2-13 x 3-1/8
12	8085073	4	WHEEL .. Hand - Ramp lock

Note: For all other Domestic Locomotives with Hood Mounted Ramps, see Catalog 190, Parts List No. 2510.

8278119, 8281096, 8289255

Parts List No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

Handhole Cover Assembly
16-567D1 Engine

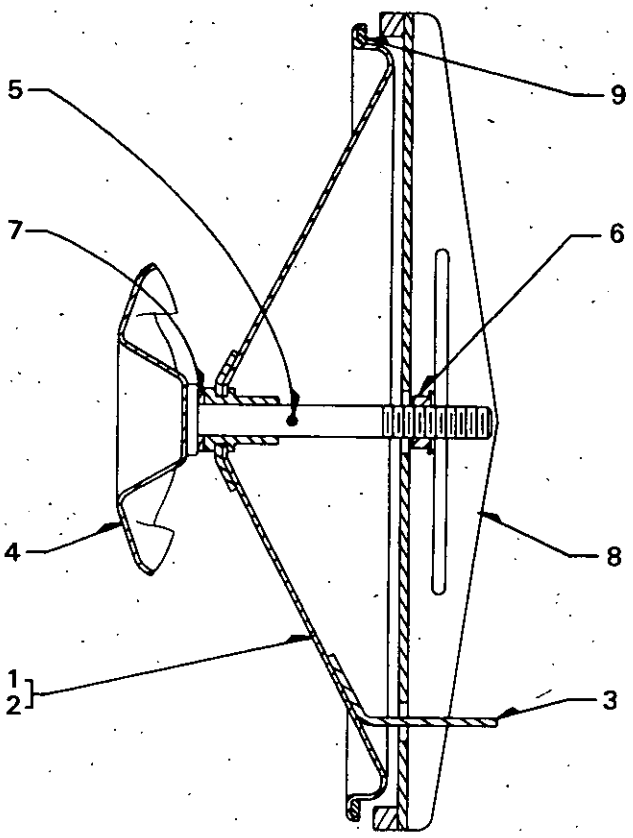


PLATE C104-1

Ref. No.	Part Number	Qty. Req.	Description
COVER ASSEMBLY .. Handhole			
Quantities listed are for one cover assembly. 32 required per engine.			
1	8247074	1	COVER ASSEMBLY .. Handhole - Replaced by 9314870 } See Page 2
2	8247072	1	COVER .. Handhole - Replaced by 9314870
3	8247066	1	GUIDE .. Locator - Welded to cover
†4	8324408	1	HANDWHEEL .. Cover - Includes stem
5	273337	1	PIN .. Retaining - 1/8 diameter - Formerly 455734
6	8159727	1	NUT .. Hex 1/2-20
7	8247063	1	GASKET .. Handwheel - Nylon
†8	8247070	1	CROSSBAR ASSEMBLY .. Cover
9	8291349	1	GASKET .. Handhole cover - Formerly 8158150

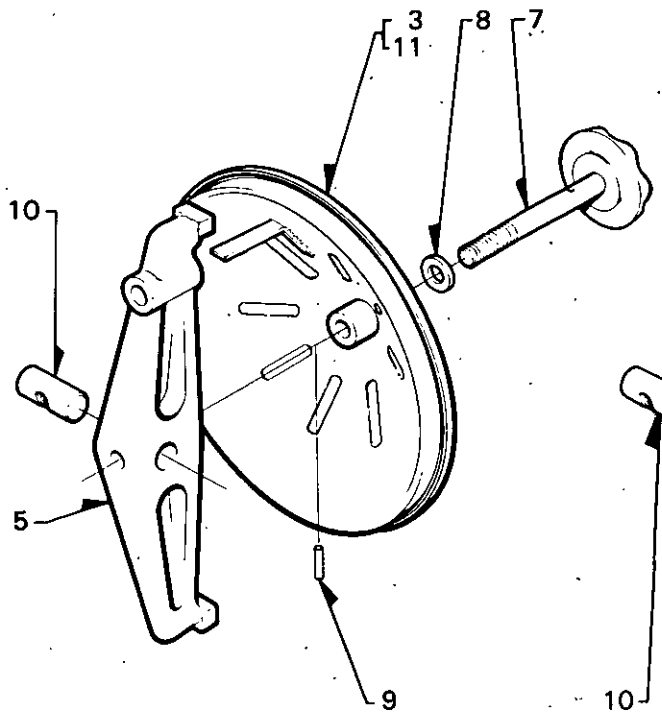
† Handwheel 8324408 and Crossbar 8247070 are no longer available and replaced by the following replacement parts. The handwheel and crossbar previously used are not interchangeable with the replacement handwheel and crossbar.

9314872	1	CROSSBAR ASSEMBLY .. Cover - Replaces 8335841
8262322	1	HANDWHEEL ASSEMBLY .. Cover - Includes stem
8247063	1	GASKET .. Handwheel - Nylon
273337	1	PIN .. Retaining - Formerly 455734
8262316	1	PIN .. Crossbar

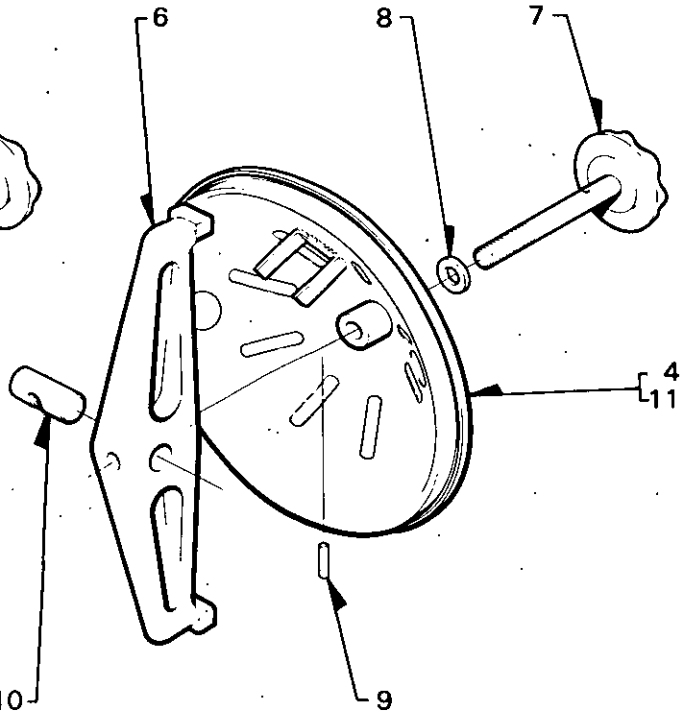
P.L. No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

Handhole Cover Assembly
16-567D1,D2,D3,D3A; 8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C,F3,F3B;
16-645E,E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B Engines



Ref. No. 1



Ref. No. 2

PLATE C104-2

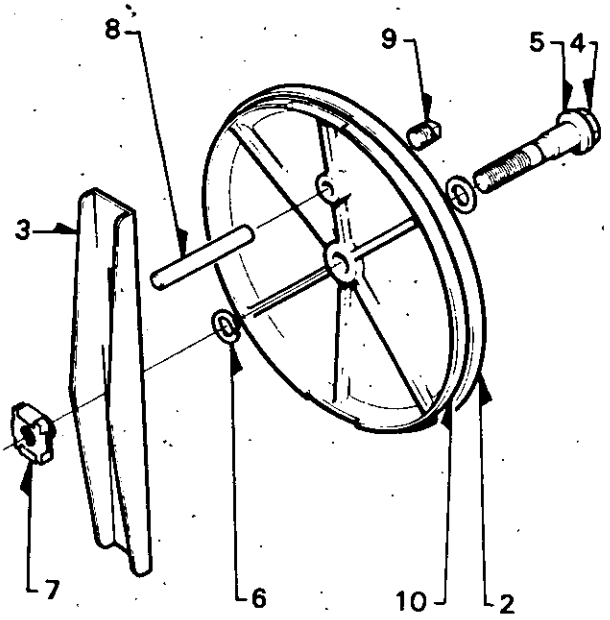
Quantity 16 Required For All 8 Cylinder Engines
Quantity 23 Required For 12 Cylinder Engines With Starter Motors
Quantity 24 Required For 12 Cylinder Engines Without Starter Motors
Quantity 31 Required For 16 Cylinder Engines With Starter Motors
Quantity 32 Required For 16 Cylinder Engines Without Starter Motors
Quantity 39 Required For All 20 Cylinder Engines

Ref. No.	Part Number	Qty. Req.		Description
COVER ASSEMBLY .. Handhole - Plain				
Quantities listed are for one cover assembly.				
1	8335840	1	-	COVER ASSEMBLY .. Handhole - All 8,12,16 and 20-645 engines - Replaced by 9314870
2	9314870	-	1	COVER ASSEMBLY .. Handhole - All 8,12,16 and 20-645 engines Replaces 8335840
3	8274750	1	-	COVER .. Handhole - No longer furnished - Use 9314870 handhole cover assembly for replacement
4	9314871	-	1	COVER .. Handhole
5	8335841	1	-	CROSSBAR ASSEMBLY .. Cover - Replaced by 9314872
6	9314872	-	1	CROSSBAR ASSEMBLY .. Cover - Replaces 8335841
7	8262322	1	1	HANDWHEEL ASSEMBLY .. Cover - Includes stem
8	8247063	1	1	GASKET .. Handwheel - Nylon
9	273337	1	1	PIN .. Retaining - 1/8 diameter x 5/8 inch long - Formerly 455734
10	8262316	1	1	PIN .. Crossbar to handwheel stem
11	8291349	1	1	GASKET .. Handhole cover to crankcase or oil pan

P.L. No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

Handhole Cover At Starter Motor Location
Previous Design
12,16-645E and 12,16,20-645E Engines With Starter Motors



Ref. No. 1

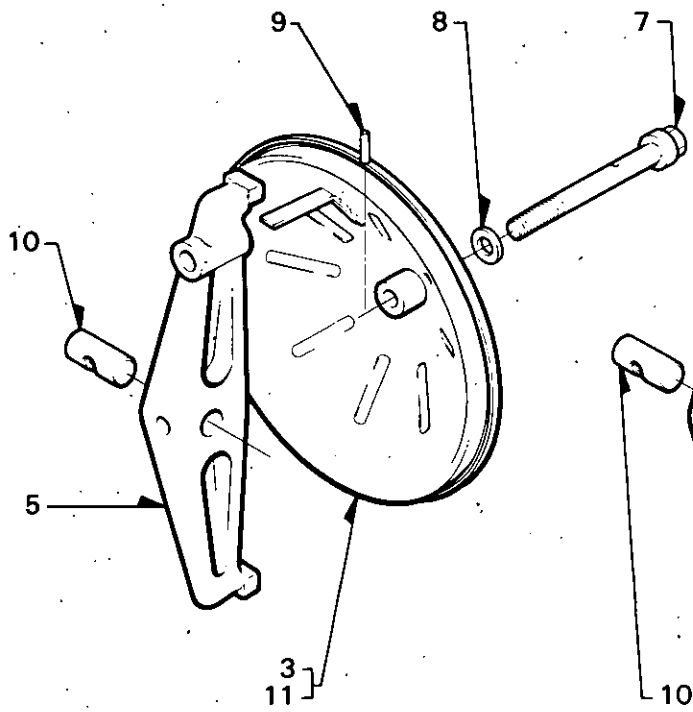
PLATE E104-3

Ref. No.	Part Number	Qty. Req.	Description
COVER ASSEMBLY .. Handhole - At Starter Motor Location - Previous Design			
Quantities listed are for one cover assembly.			
1	8212122	1	COVER ASSEMBLY .. Handhole
2	8211975	1	COVER .. Handhole
3	8141999	1	CROSSBAR .. Cover
4	8211983	1	STUD .. Hex head 1/2-20 x 3 inch - Cover
5	8152423	1	GASKET... Stud
6	8173805	1	RING .. Stud retaining
7	8159727	1	NUT .. Special square 1/2-20 - Includes retainer
8	456885	1	PIN... Locating 1/4 x 1-5/8 inches
9	103877	1	PLUG .. Pipe 1/8
10	8291349	1	GASKET .. Handhole cover

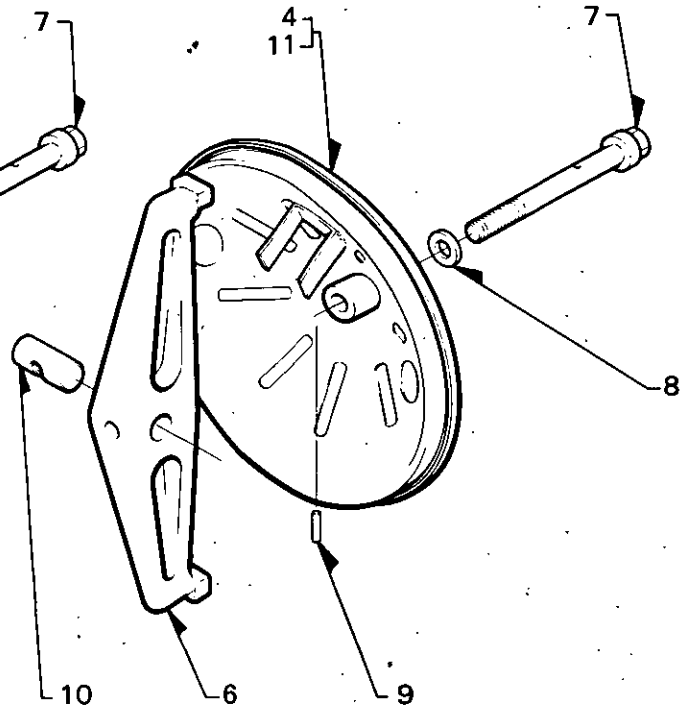
P.L. No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

Handhole Covers At Starter Motor Location
Current Design
12,16-645E,E3,E3B,E3C,F3,F3B; 16-645E3A and 20-645E3,E3B Engines



Ref. No. 1



Ref. No. 2

PLATE E104-4

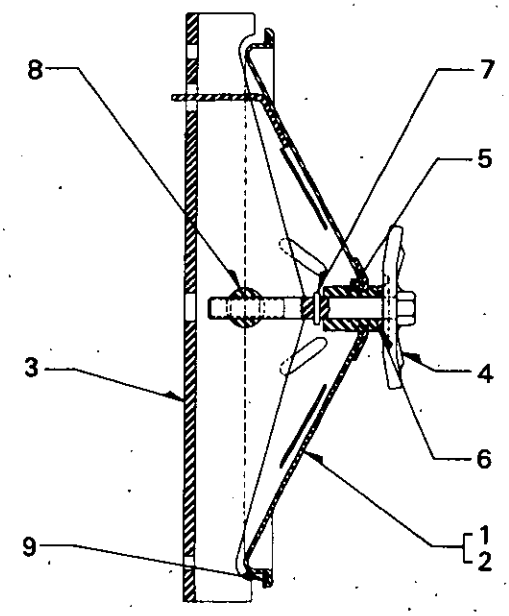
Ref. No.	Part Number	Qty. Req.		Description
COVER ASSEMBLY .. Handhole - At Starter Motor Location - Current Design				
Quantities listed are for one cover assembly.				
1	8391430	1	-	COVER ASSEMBLY .. Handhole - Replaced by 9314869
2	9314869	-	1	COVER ASSEMBLY .. Handhole - Replaces 8391430
3	8274750	1	-	COVER .. Handhole - No longer furnished - Use 9314869 handhole cover assembly for replacement
4	9314871	-	1	COVER .. Handhole
5	8335841	1	-	CROSSBAR ASSEMBLY .. Cover - Replaced by 9314872
6	9314872	-	1	CROSSBAR ASSEMBLY .. Cover - Replaces 8335841
7	8391429	1	1	BOLT ASSEMBLY .. Includes washer
8	8247063	1	1	GASKET .. Bolt - Nylon
9	273337	1	1	PIN .. Retaining - 1/8 diameter x 5/8 inch long - Formerly 455734
10	8262316	1	1	PIN .. Crossbar to bolt assembly
11	8291349	1	1	GASKET .. Handhole cover to oil pan

P.L. No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

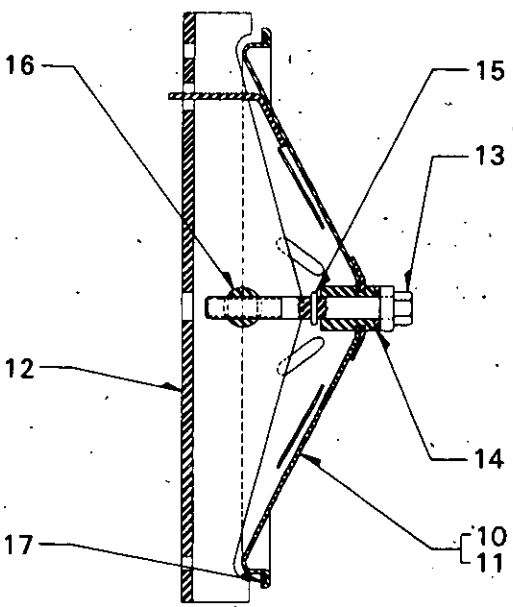
Handhole Cover Assembly
16-645E3A Engine

Note: The following handhole covers were for use on 16-645E3A engines only. They have since been replaced by handhole cover assemblies which are applicable to 567D and ALL 645 engines. See Pages 2 and 4 for these replacement covers.



Quantity 31 Required

Ref. No.	Part Number	Qty. Req.	Description
			COVER ASSEMBLY .. Handhole
			Quantities listed are for one cover assembly.
1	8427704	1	COVER ASM. .. Handhole - Replaced by 9314870
2	8436420	1	COVER .. Handhole - No longer furnished - Use 9314870 for replacement
3	8427659	1	CROSSBAR ASSEMBLY
4	8481903	1	HANDWHEEL ASM. - Replaces 8427653
5	8481901	1	STUD .. Handwheel - Replaces 8427636
6	8247063	1	GASKET .. Handwheel - Nylon
7	273337	1	PIN .. Handwheel - Retaining - 1/8 dia. - Formerly 455734
8	8262316	1	PIN .. Crossbar to handwheel stem
9	8291349	1	GASKET .. Handhole cover



Quantity 1 Required

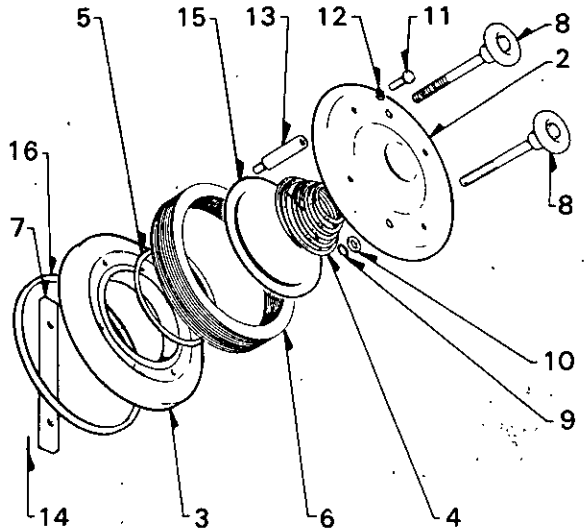
			COVER ASSEMBLY .. Handhole - Located At Starter Motor
			Quantities listed are for one cover assembly.
10	8427788	1	COVER ASM. .. Handhole - Replaced by 9314869
11	8436420	1	COVER .. Handhole - No longer furnished - Use 9314869 for replacement
12	8427659	1	CROSSBAR ASSEMBLY
13	8481902	1	STUD ASSEMBLY .. Includes washer - Replaces 8427781
14	8247063	1	GASKET .. Stud - Nylon
15	273337	1	PIN .. Handwheel - Retaining - 1/8 dia. - Formerly 455734
16	8262316	1	PIN .. Crossbar to stud
17	8291349	1	GASKET .. Handhole cover

PLATE B104-5

P.L. No. F104

HANDHOLE COVER AND CYLINDER TEST VALVE

Safety Handhole Cover Assembly
12,16-645E Engines - Export Only
GL22CU-2 and GL26CU-2 Locomotives



Ref. No. 1

PLATE B104-6

Quantity 3 Required For 12 Cylinder Engine
Quantity 4 Required For 16 Cylinder Engine

Ref. No.	Part Number	Qty. Req.	Description
			COVER ASSEMBLY .. Handhole - Safety
			Quantities listed are for one cover assembly.
1	8499419	1	COVER ASSEMBLY .. Handhole - Safety
2	9558965	1	COVER ASSEMBLY .. Handhole
3	9558966	1	SEAT .. Handhole cover valve
4	9558967	1	SPRING .. Handhole cover
5	9095844	1	SEAL .. O-ring - Valve seat
6	9080829	1	ARRESTOR .. Flame - Handhole cover
7	9558968	1	BAR .. Clamping
8	9558969	2	HANDWHEEL ASSEMBLY .. Includes bolt
9	9095821	2	SEAL .. O-ring - Handwheel
10		2	WASHER
11		4	SCREW .. Hex head
12		4	WASHER .. Lock
13		4	GUIDEBOLT
14		2	PIN .. Cotter
15		1	PLATE .. Valve
16	8291349	1	GASKET .. Handhole cover to oil pan

HANDHOLE COVER AND CYLINDER TEST VALVE

Cylinder Test Valve
All Engines

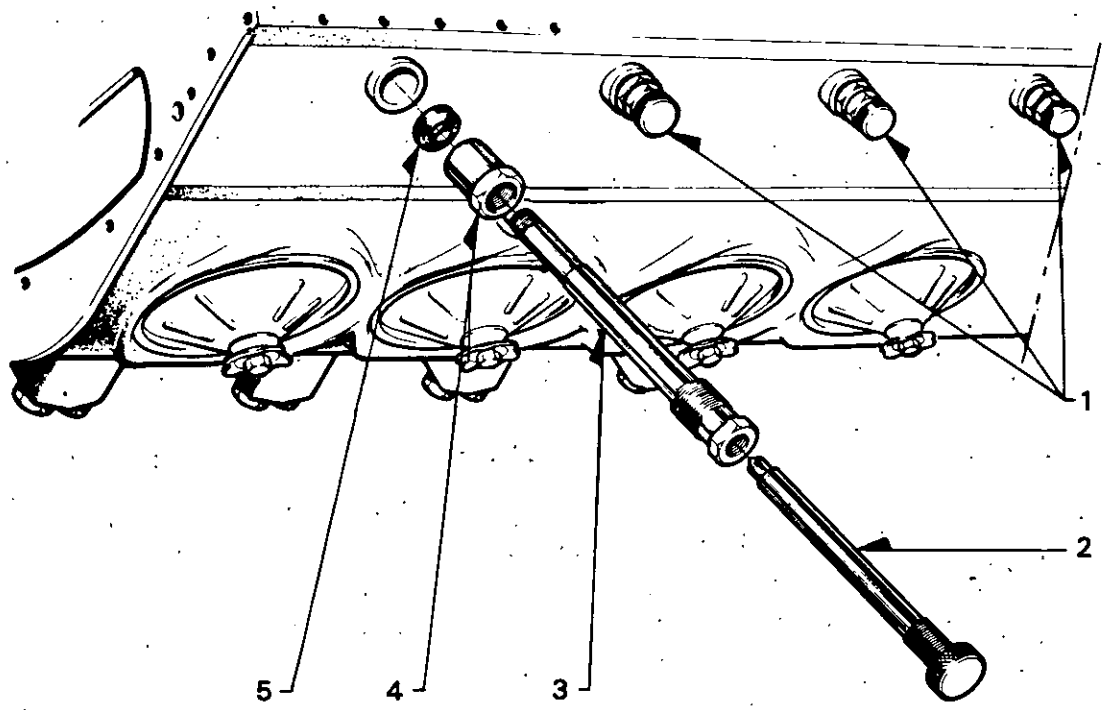
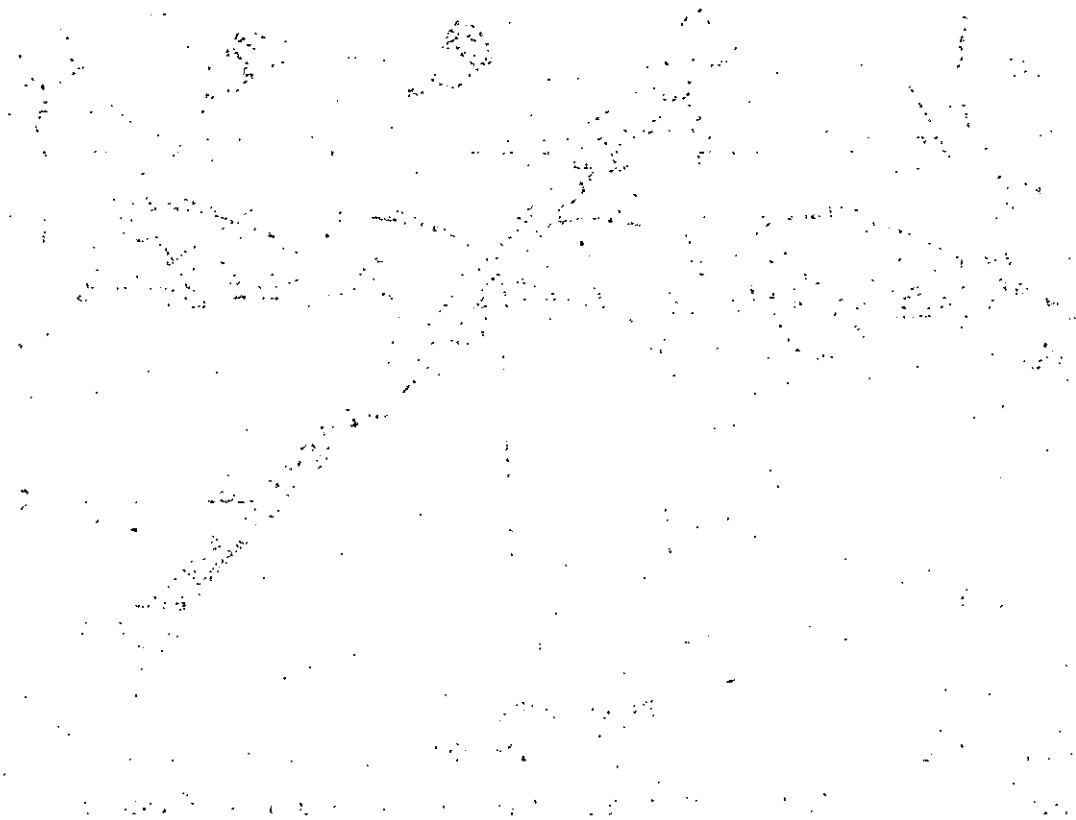


PLATE B104-7

Ref. No.	Part Number	Qty. Req.	Description
1	8048880	1	VALVE ASSEMBLY .. Cylinder test - One required per cylinder
2	8024846	1	VALVE .. Needle
3	8048883	1	BODY .. Valve
4	8048884	1	NUT .. Packing
5	8328687	1	SEAL .. Valve nut



POWER ASSEMBLIES AND ASSOCIATED COMPONENTS

Locating Reference

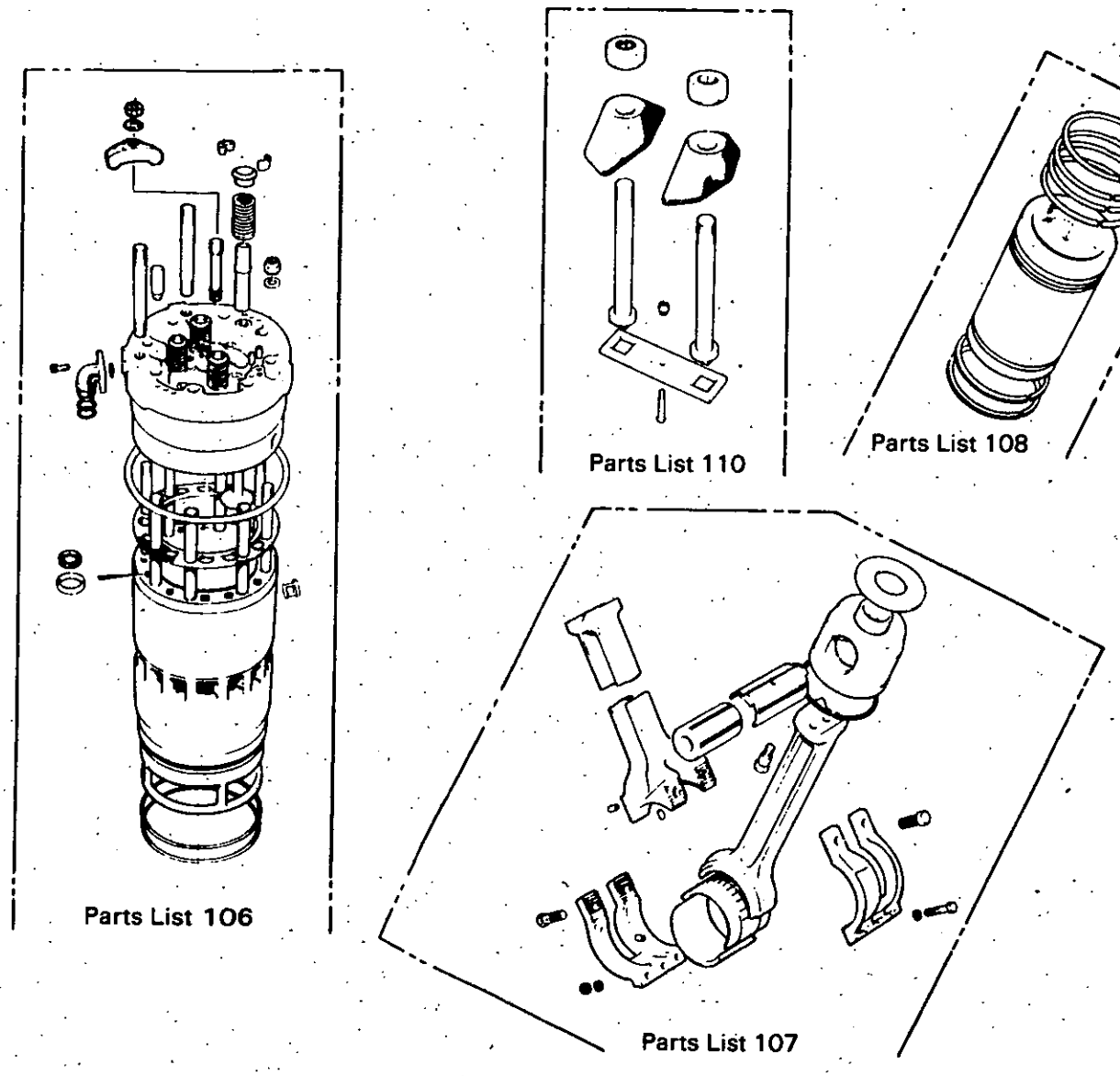
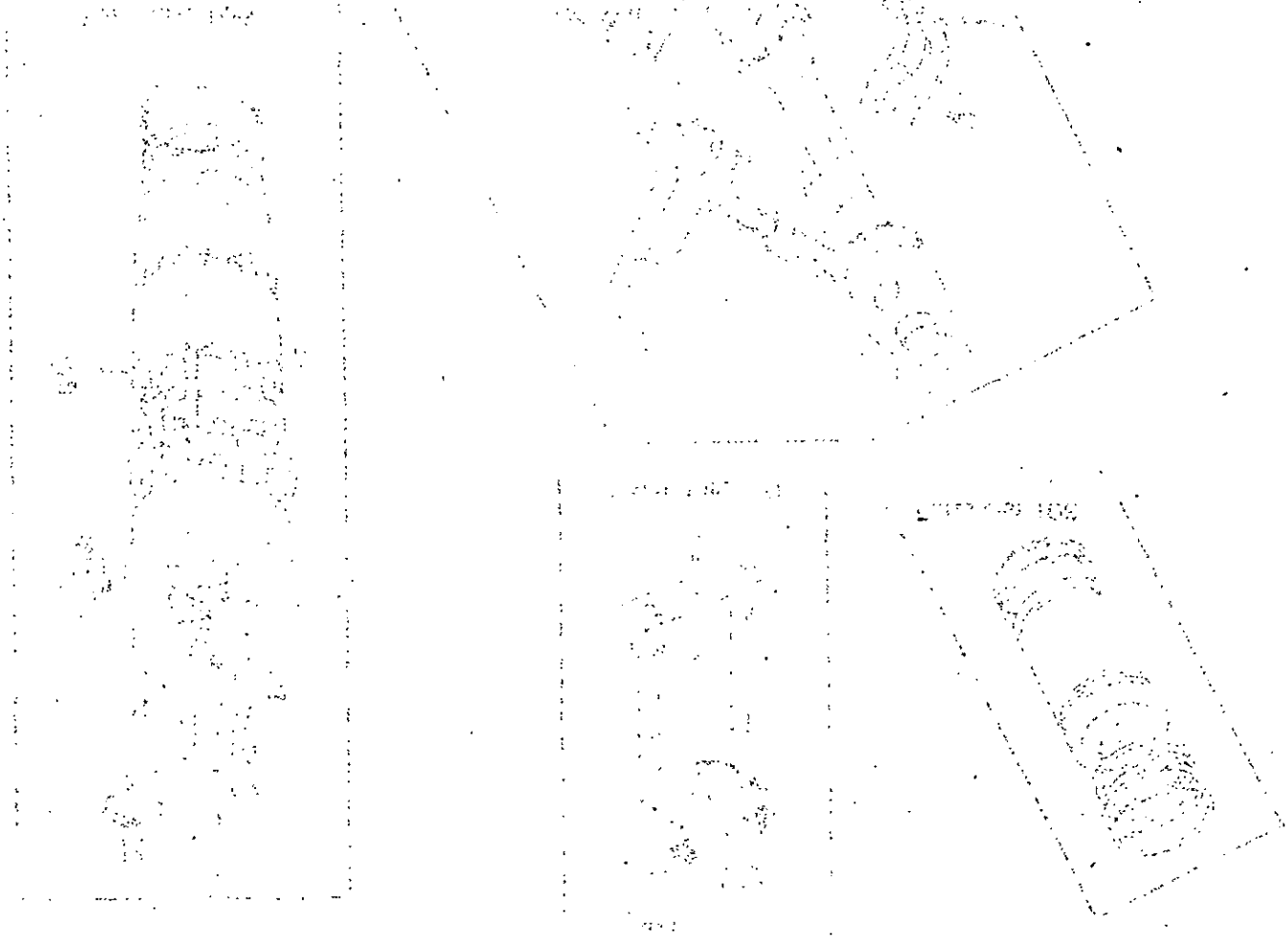


PLATE A105-1

Parts List No.	Parts List Description
106	CYLINDER HEAD AND LINER Includes Seals, Gaskets, Elbows and Exhaust Valves
107	CONNECTING ROD, CARRIER AND PISTON PIN Includes Thrust Washer, Bearings and Dowels
108	PISTONS AND RINGS Includes Ring Sets and Oversize Components
109	POWER PACK ASSEMBLIES Includes Unit Exchange (UTEX) Cross Reference
110	CYLINDER HEAD CRABS Includes Bolts, Nuts and Brackets



CYLINDER HEAD AND LINER

16-567D and 8,12,16,20-645 Engines

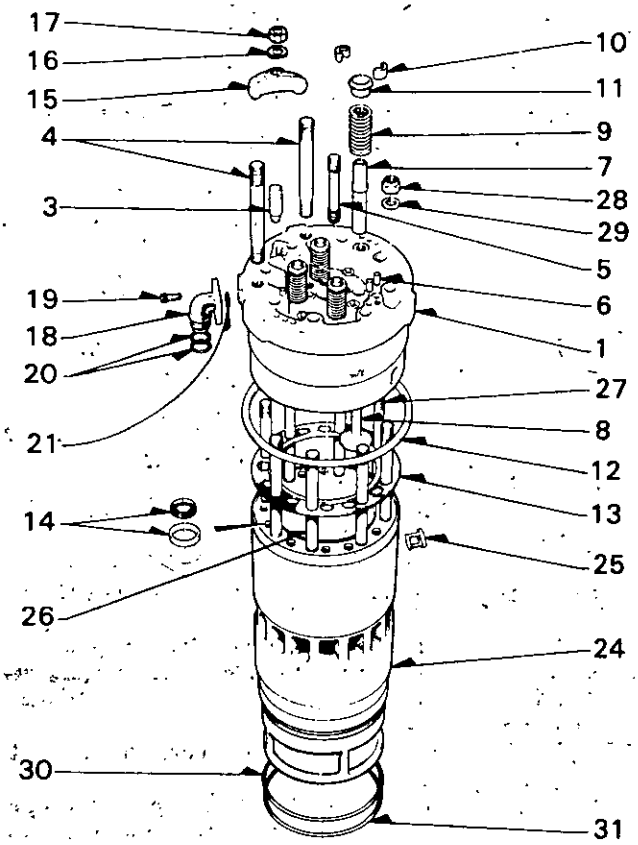


PLATE F106-1

Ref. No.	Part Number	Qty. Req.		Description

Quantities Listed Are For One Cylinder Head And One Cylinder Liner

CYLINDER HEAD ASSEMBLY

1	9319736	1	-	HEAD ASM. .. Cylinder with 9319735 valves - Replaces 9319456 and 8424464 - Applicable to 567D,645E,E3,E3A, and E3B engines
1	9556060	-	1	HEAD ASM. .. Cylinder with 9319735 valves - Applicable to 645E3C,F3, and F3B engines

Current design cylinder heads can be identified by a number five (5) cast 3/4 inch high and raised in a diamond shaped border (◇5◇). Previous design heads had the numbers 2,3,4,5, or 6 enclosed in an 1-1/8 inch diameter circle (② , ③ , ④ , ⑤ , or ⑥) or the numbers 3 or 4 enclosed in a diamond shaped border (◇3◇ or ◇4◇). This identification is located on the top face of the flange at the 7 o'clock position. Heads prior to the type ② should be restricted to 567D1 engines as these heads did not incorporate the changed flow design. Type ② heads should be restricted to 567D1, D2, D3, and D3A engines because these heads do not have the wide flange. The wide flange head, (types ③ , ④ , ⑤ , ⑥ , ◇3◇ , ◇4◇ , and ◇5◇) are applicable to all engines prior to the 645E3B, especially the 645E, E3, and E3A engines. 645E3B engines may use the ◇4◇ or ◇5◇ heads, while the 645E3C, F3, and F3B engines are restricted to ◇5◇ heads with part number 9556060 and 9556059.

2	9319455	1	-	HEAD ASM. .. Cylinder - Without valves - Replaces 8424450
2	9556059	-	1	HEAD ASM. .. Cylinder - Without valves

P.L. No. F106

CYLINDER HEAD AND LINER

Ref. No.	Part Number	Qty. Req.		Description
	9319736	1	-	HEAD ASM. .. Cylinder - With valves
	9556060	-	1	HEAD ASM. .. Cylinder - With Valves
	9319455	1	-	HEAD ASM. .. Cylinder - Without valves
	9556059	-	1	HEAD ASM. .. Cylinder - Without valves
3	8028097	1	1	SUPPORT .. Injector crab
4	8035930	2	2	STUD .. Rocker arm shaft - 1-8 x 1-14 x 7-3/4 long 8079922 .. .002 O.S. 8079924 .. .015 O.S. 8115243 .. .019 O.S. 8079923 .. .004 O.S. 8115242 .. .017 O.S.
5	8028701	1	1	STUD .. Injector crab - 5/8-11 x 5/8-18 x 4-15/16 long 8115143 .. .002 O.S. 8115145 .. .015 O.S. 8115147 .. .019 O.S. 8115144 .. .004 O.S. 8115146 .. .017 O.S.
6	8028366	4	4	PIN .. Dowel - Replaces 8485334
7	8310840	4	4	GUIDE .. Exhaust valve 8327002 .. .0015 O.S. 8338304 .. .015 O.S.
8	9319735	4	4	VALVE .. Exhaust - Heavy head - Inconel
9	8068791	4	4	SPRING .. Exhaust valve
10	8383293	8	8	LOCK .. Valve seat - One half - Single groove
11	8081795	4	4	SEAT .. Spring
12	9509180	1	1	RING .. Seat - Cylinder head - .192 thickness - Replaces 8419438 9516094 .. .018 O.S. 9509803 .. .038 O.S.
ϕ13	8442936	1	-	GASKET .. Head to liner - Copper clad - Replaces 8410829
ϕ13	9556032	-	1	GASKET .. Head to liner - Stainless steel/nickel clad
*ϕ13	8476400	1	-	GASKET .. Head to liner - With integrated grommet seals - Optional to 8442936
*ϕ13	9561067	-	1	GASKET .. Head to liner - With integrated grommet seals - Optional to 9556032
14	8392118	1	1	KIT .. Seal - Water - Consists of (12) heat dam insulators and (12) grommet type seals - Note: Seal and insulator must be applied as an assembly - Not required with 8476400 and 9561067 gaskets
15	9092979	1	1	CRAB .. Fuel injector
16	8044832	1	1	WASHER .. Spherical - Injector crab
17	103030	1	1	NUT .. Spherical - 5/8-18
18	8414444	1	1	ELBOW .. Water outlet - Double groove
19	217911	2	2	SCREW .. Socket head - 3/8-16 x 7/8 - Elbow mounting
20	9317972	2	2	SEAL .. O-ring - Water outlet elbow to crankcase
21	8305815	1	1	SEAL .. O-ring - Elbow to head
*22	----	A.R.		GREASE .. Silicon - Applied to Ref. Nos. 14,20, and 21 8425724 .. 8 oz. tube 8425725 .. 2 lb. can
*ϕ23	8427111	1	-	KIT .. Gasket - Cylinder head - With 8442936 GASKET - Optional to 8479836 kit
*ϕ23	9561069	-	1	KIT .. Gasket - Cylinder head - With 9556032 GASKET - Optional 9561068 kit
*ϕ23	8479836	1	-	KIT .. Gasket - Cylinder head - With 8476400 GASKET - Optional to 8427111 kit
*ϕ23	9561068	-	1	KIT .. Gasket - Cylinder head - With 9561067 GASKET - Optional to 9561069 kit

See Parts List No. 199

CYLINDER HEAD AND LINER

Ref. No.	Part Number	Qty. Req.	Description
CYLINDER LINER ASSEMBLY			
24	8415993	1	LINER ASM. .. Cylinder - Standard cast iron liner bore - 18 port fabricated - 8,12,16-645E; 12,16,20-645E3; 16-645E3A (DDA40X) engines - Optional to 9318831 on 12,16,20-645E3 and 16-645E3A engines
24	9318831	1	LINER ASM. .. Cylinder - Cast iron liner bore - Laser hardened port relief (Mae West) - 18 port fabricated - 12,16,20-645E3,E3B; 16-645E3A (DDA40X); original 12,16-645F3 engines - Optional to 8415993 on 12,16,20-645E3 and 16-645E3A engines - See Pointers No. 7L78, July 17, 1978
24	9318833	1	LINER ASM. .. Cylinder - Cast iron liner bore - Laser hardened port relief and upper bore (Hub) - 18 port fabricated - 16-645E3A (DDA40X) 8,12,16-645E3B, E3C, F3B; 12,16-645F3 engines
24	9500723	1	LINER ASM. .. Cylinder - Cast iron liner bore - Plateau honed and laser hardened port relief (Mae West) - 18 port fabricated - 16-645E (F40PH-2M); 16-645E3, E3B (F40PH, F40PH-2); 16-645E3A (F40PH, F40C) engines
24	9535740	1	LINER ASM. .. Cylinder - Cast iron liner bore - Plateau honed, laser hardened port relief and upper bore (Hub) 18 port fabricated - 16-645E3A (F40PH, F40C); 16-645E3B (F40PH, F40PH-2); 16-645E3C (F40PH, F40PH-2) engines
24	9090233	1	LINER ASM. .. Cylinder - Chrome plated liner bore - 18 port fabricated - 8,12,16-645E; 12,16,20-645E3, E3B; 16-645E3C, F3, F3B engines- Export only
†24	8305512	1	LINER ASM. .. Cylinder - Cast iron liner bore - 15 port fabricated - Double lower and upper pilot seal grooves - 16-567D1,D2,D3,D3A engines - Replaces 20 port liner 8300780

† Normally aspirated 567 engines can intermix 15 and 20 port liners without restriction. Early turbocharged engines with 20 port liners can apply no more than three 15 port liners in an engine. Contact our Service Department for additional information on intermixing 15 and 20 port liners on turbocharged 567 engines.

Ref. Nos. 25 through 36 are applicable to all the above cylinder liner assemblies.

25	8348964	1	DEFLECTOR .. Water inlet - Brass - All 645 liners
25	8163097	1	DEFLECTOR .. Water inlet - Brass - 567D liners
26	8411641	7	STUD .. Liner - 3/4-10 x 3/4-16 x 10-3/4 in. long 8411642 .. .002 O.S. 8413916 .. .015 O.S. 8413918 .. .019 O.S. 8411643 .. .004 O.S. 8413917 .. .017 O.S.
27	8411644	1	STUD .. Liner - Locating - 3/4-10 x 3/4-16 x 10-3/4 in. long 8411645 .. .002 O.S. 8413919 .. .015 O.S. 8413921 .. .019 O.S. 8411646 .. .004 O.S. 8413920 .. .017 O.S.
28	8060089	8	NUT .. Hex - 3/4-16 - Liner to head
29	8140912	8	WASHER .. Hardened and ground - 3/4
ϕ30	8228554	1	SEAL .. Liner - Top groove - Polyacrylic rubber - Except 645E3C,F3,F3B engines
ϕ30	9316850	1	SEAL .. Liner - Top groove - Viton - 645E3C,F3,F3B engines
ϕ31	9316850	1	SEAL .. Liner - Lower groove - Viton - Turbocharged engines
ϕ31	8228554	1	SEAL .. Liner - Lower groove - Polyacrylic rubber - Roots blown engines
*32	8305815	1	SEAL .. Water jumper line to liner
+*33	8025988	1	GASKET .. Piston cooling tube to manifold - See Parts List No. 134
+*34	8142354	1	GASKET .. Jumper line to water manifold - See Parts List No. 144
ϕ*35	9320844	1	KIT .. Liner - Replaces 8284873 - Except 645E3C,F3, and F3B engines } See
ϕ*35	9525089	1	KIT .. Liner - 645E3C,F3,F3B engines } P.L. 199
*36	8494711	A.R.	COMPOUND .. Thread sealing - Liner stud - 250 cc bottle

Parts List No. B107

CONNECTING ROD, BEARINGS, CARRIER AND PISTON PIN

16-567D1,D2,D3,D3A; 8,12,16-645E and 12,16,20-645E3 Engines

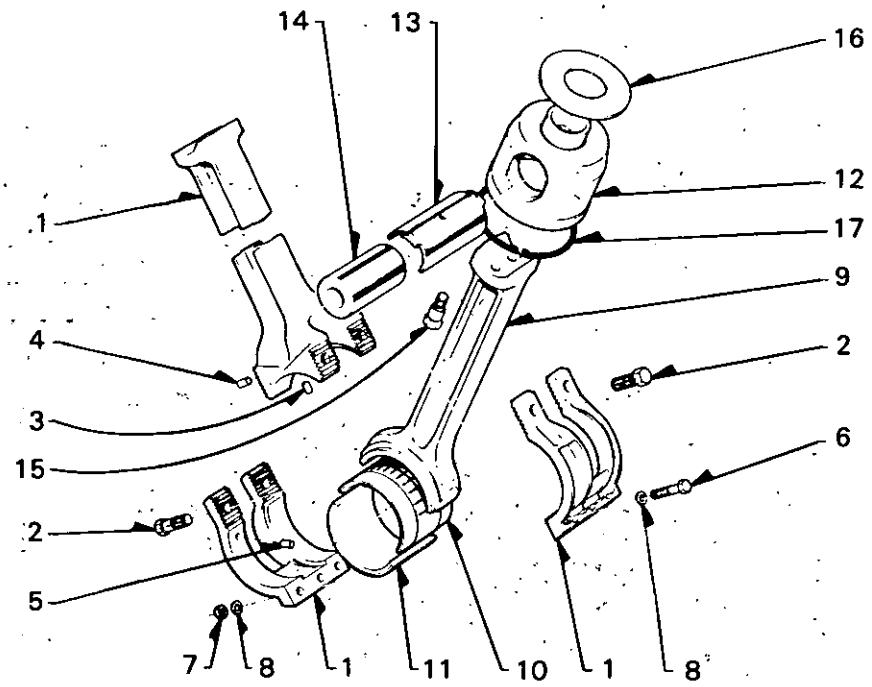


PLATE A107-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E engines
		-	B	-	-	12-645E,E3 engines
		-	-	C	-	16-567D1,D2,D3,D3A and 16-645E,E3 engines
		-	-	-	D	20-645E3 engines
1	8159354	4	6	8	10	ROD ASM. .. Connecting - Fork - Trunnion type - Includes basket
2	8127868	16	24	32	40	BOLT ASM. .. Hex head 5/8-18 x 1-3/4 - Includes washer
3	8025990	8	12	16	20	DOWEL .. Upper bearing .5000 diameter x 3/4 long
						8188833 - .001 oversize 8430709 - .008 oversize
						8188834 - .002 oversize 8188835 - .010 oversize
						8430707 - .004 oversize 8385374 - .020 oversize
						8430708 - .006 oversize 8385375 - .030 oversize
4	8031947	4	6	8	10	DOWEL .. Basket to rod .3125 diameter x 13/16 long
5	8029147	4	6	8	10	DOWEL .. Bearing locating .3125 diameter x 9/16 long
6	8259128	12	18	24	30	BOLT .. Hex head 1/2-20 x 2-3/4
7	8487883	12	18	24	30	NUT .. Hex lock 1/2-20 - Replaces 8195434
8	8260114	24	36	48	60	WASHER .. Special
9	9544257	4	6	8	10	ROD .. Connecting - Blade - Replaces 8159138
10	8354118	4	6	8	10	BEARING .. Upper - Connecting rod
						8354119 - .031 undersize 8354120 - .062 undersize
11	8136114	4	6	8	10	BEARING .. Lower - Connecting rod
						8137807 - .031 undersize 8137808 - .062 undersize
12	8367800	8	12	16	20	CARRIER .. Piston
13	8361565	8	12	16	20	BEARING .. Insert - Carrier - Silver plated - Turbocharged engines
13	8341192	8	12	16	-	BEARING .. Insert - Carrier - Bronze lined - Roots blown engines
14	8269842	8	12	16	20	PIN .. Piston
15	8159340	16	24	32	40	BOLT ASSEMBLY .. Piston pin - Includes spacer
16	8135330	8	12	16	20	WASHER .. Thrust
17	8059699	8	12	16	20	RING .. Snap

P.L. No. B107

CONNECTING ROD, BEARINGS, CARRIER AND PISTON PIN

8,12,16,20-645E3B,E3C; 8,12,16-645F3,F3B and 16-645E3A Engines

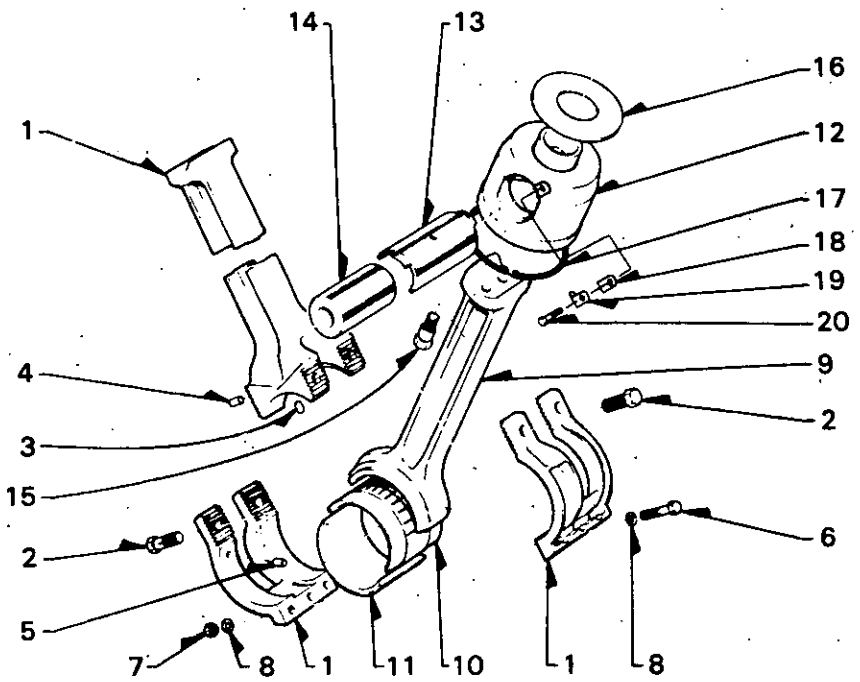


PLATE A107-2

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C,F3B engines
		-	B	-	-	12-645E3B,E3C,F3,F3B engines
		-	-	C	-	16-645E3A,E3B,E3C,F3,F3B engines
		-	-	-	D	20-645E3B engines
1	8159354	4	6	8	10	ROD ASM. .. Connecting - Fork - Trunnion type - Includes basket
2	8127868	16	24	32	40	BOLT ASSEMBLY .. Hex head 5/8-18 x 1-3/4 - Includes washer
3	8025990	8	12	16	20	DOWEL .. Upper bearing .5000 diameter x 3/4 long 8188833 - .001 oversize 8430709 - .008 oversize 8188834 - .002 oversize 8188835 - .010 oversize 8430707 - .004 oversize 8385374 - .020 oversize 8430708 - .006 oversize 8385375 - .040 oversize
4	8031947	4	6	8	10	DOWEL .. Basket to rod .3125 diameter x 13/16 long
5	8029147	4	6	8	10	DOWEL .. Bearing locating .3125 diameter x 9/16 long
6	8259128	12	18	24	30	BOLT .. Hex head 1/2-20 x 2-3/4
7	8487883	12	18	24	30	NUT .. Hex lock 1/2-20 - Replaces 8195434
8	8260114	24	36	48	60	WASHER .. Special
9	9544257	4	6	8	10	ROD .. Connecting - Blade - Replaces 8159138
10	8354118	4	6	8	10	BEARING .. Upper - Connecting rod 8354119 - .031 undersize 8354120 - .062 undersize
11	8136114	4	6	8	10	BEARING .. Lower - Connecting rod 8137807 - .031 undersize 8137808 - .062 undersize
12	8442120	8	12	16	20	CARRIER .. Piston
13	8442226	8	12	16	20	BEARING .. Insert - Carrier - Bronze lined
14	9518958	8	12	16	20	PIN .. Piston - Rocking - Replaces 8417645
15	8159340	16	24	32	40	BOLT ASSEMBLY .. Piston pin - Includes spacer
16	8135330	8	12	16	20	WASHER .. Thrust
17	8059699	8	12	16	20	RING .. Snap
†18	9548905	16	24	32	40	RETAINER .. Bearing - Replaces 8430093
†19	9536664	16	24	32	40	CLIP .. Bolt - With locking tab - Replaces 8430094
†20	9547667	16	24	32	40	BOLT .. Hex head 1/4-20 x 1/2 - Special locking - Formerly 454812

† See Pointers article dated November 22, 1982 for detailed information on these items.

PISTONS AND RINGS
Piston Assembly Reference Chart

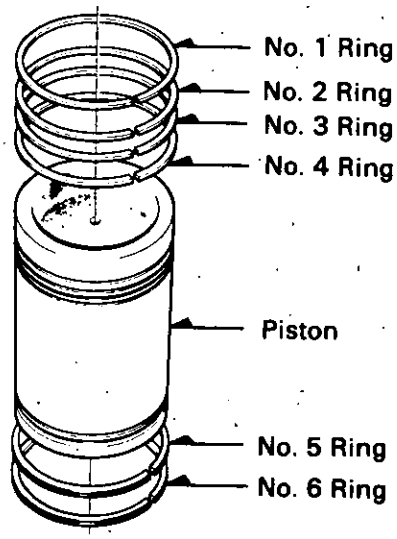


PLATE A108-1

Ref. No.	Part Number	Application							Description	Page No.
		A	-	-	-	-	-	-	567D1 engines	
		-	B	-	-	-	-	-	567D2,D3,D3A engines	
		-	-	C	-	-	-	-	645E engines	
		-	-	-	D	-	-	-	645E3 engines	
		-	-	-	-	E	-	-	645E3A engines	
		-	-	-	-	-	F	-	645E3B and 645F3 engines	
		-	-	-	-	-	-	G	645E3C and 645F3B engines	
For Cast Iron Liner Bores - Standard Diameter - Includes Rings										
1	†8416846	X	-	-	-	-	-	-	PISTON ASM. .. 16:1 compressed ratio	2
2	9336201	-	X	-	-	-	-	-	PISTON ASM. .. 14.5:1 compression ratio	5
3	8481489	-	-	X	-	-	-	-	PISTON ASM. .. Fire ring piston	7
4	9516937	-	-	-	X	-	-	-	PISTON ASM. .. With stainless steel top ring	11
5	8492334	-	-	-	X	-	-	-	PISTON ASM. .. Ductile iron top ring - Fire ring piston	12
6	9533163	-	-	-	X	X	X	-	PISTON ASM. .. Used with "HUB" liner - Fire ring piston	16
7	9550585	-	-	-	-	-	-	X	PISTON ASM. .. 16:1 fire ring piston	18
For Chrome Plated Liner Bores - Standard Diameter - Includes Rings										
8	†8455551	X	-	-	-	-	-	-	PISTON ASM. .. 16:1 compression ratio	4
9	9336200	-	X	-	-	-	-	-	PISTON ASM. .. 14.5:1 compression ratio	6
10	8481488	-	-	X	-	-	-	-	PISTON ASM. .. Fire ring piston	9
11	9336997	-	-	X	-	-	-	-	PISTON ASM. .. Fire ring piston - High side wear and high sulfur fuel	10
12	8467247	-	-	-	X	-	-	-	PISTON ASM. .. With ductile iron top ring	14
13	9336998	-	-	-	X	-	-	-	PISTON ASM. .. High side wear and high sulfur fuel	15
14	9533161	-	-	-	X	X	X	-	PISTON ASM. .. Fire ring piston	16
15	9533162	-	-	-	X	X	X	-	PISTON ASM. .. High side wear and high sulfur fuel - Fire ring piston	17
16	9550584	-	-	-	-	-	-	X	PISTON ASM. .. High side wear and high sulfur fuel - 16:1 fire ring piston	18
17	9555990	-	-	-	-	-	-	X	PISTON ASM. .. 16:1 fire ring piston	19

†567D1 engines were formerly equipped with 20:1 pistons which are no longer available and cannot be intermixed with current 16:1 pistons. When replacement of the 20:1 piston is required, it is recommended that a complete engine set of 16:1 pistons be ordered. See Pages 3 and 4 for ring sets applicable to 20:1 pistons.

P.L. No. F108

PISTONS AND RINGS

567D1 Engines With 16:1 Compression Ratio
and Cast Iron Liner Bores

The 567D1 engines were formerly equipped with 20:1 pistons which are no longer available and cannot be intermixed with current 16:1 pistons. Refer to Page 3 for ring sets applicable to 20:1 pistons.

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	8416846	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8356592
2	8409499	1	PISTON .. Bare - Standard - Replaces 8338200
3	8318770	1	RING SET .. Piston
4	8317533	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .247 thick - No. 1 groove
5	8235299	1	RING .. Comp. - Chrome faced - Cast iron - I.S.C. - .243 thick - No. 2 groove
6	8257707	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 3 groove
7	8028545	1	RING .. Oil control - Double hook scraper - No. 4 groove
8	8257949	1	RING .. Oil control - Spring loaded - No. 5 groove
PISTON ASSEMBLY .. .030 OS Diameter			
9	8416847	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8356593
10	8410130	1	PISTON .. Bare - .030 OS - Replaces 8338253
11	8318997	1	RING SET .. Piston
12	8317534	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .247 thick - No. 1 groove
13	8237072	1	RING .. Comp. - Chrome faced - Cast iron - I.S.C. - .243 thick - No. 2 groove
14	8259514	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 3 groove
15	8040541	1	RING .. Oil control - Double hook scraper - No. 4 groove
16	8271457	1	RING .. Oil control - Spring loaded - No. 5 groove
PISTON ASSEMBLY .. .060 OS Diameter			
17	8416848	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8356594
18	8410131	1	PISTON .. Bare - .060 OS - Replaces 8338254
19	8318998	1	RING SET .. Piston
20	8317535	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .247 thick - No. 1 groove
21	8237073	1	RING .. Comp. - Chrome faced - Cast iron - I.S.C. - .243 thick - No. 2 groove
22	8259515	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 3 groove
23	8040542	1	RING .. Oil control - Double hook scraper - No. 4 groove
24	8271458	1	RING .. Oil control - Spring loaded - No. 5 groove
OVERSIZE WIDTH TOP RINGS			
25	8317536	1	RING .. Comp. - Chrome faced - Ductile iron - Standard diameter x 1/64 OS width
26	8317537	1	RING .. Comp. - Chrome faced - Ductile iron - .030 OS diameter x 1/64 OS width
27	8317538	1	RING .. Comp. - Chrome faced - Ductile iron - .060 OS diameter x 1/64 OS width
28	8317539	1	RING .. Comp. - Chrome faced - Ductile iron - Standard diameter x 1/32 OS width
29	8317540	1	RING .. Comp. - Chrome faced - Ductile iron - .030 OS diameter x 1/32 OS width
30	8317541	1	RING .. Comp. - Chrome faced - Ductile iron - .060 OS diameter x 1/32 OS width

PISTONS AND RINGS

567D1 Engine With 20:1 Comp. Ratio and Cast Iron Liner Bores

The 567D1 engines were formerly equipped with 20:1 pistons which are no longer available and cannot be intermixed with current 16:1 pistons. When replacement of the 20:1 piston is required it is recommended that a complete engine set of pistons be ordered. Refer to Page 2 for ordering reference to 16:1 piston assemblies and ring sets. The following ring sets are applicable to the 20:1 piston assembly only.

Ref. No.	Part Number	Qty. Req.	Description
RING SET .. Standard Diameter			
1	8355869	1	RING SET .. Piston
2	8311623	1	RING .. Compression - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
3	8351048	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
4	8269839	1	RING .. Compression - Tapered faced - Ferrox filled - I.S.C. - .186 thick - No. 4 groove
5	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
6	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
RING SET .. .030 OS Diameter			
7	8356028	1	RING SET .. Piston
8	8311752	1	RING .. Compression - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
9	8355875	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
10	8272724	1	RING .. Compression - Tapered faced - Ferrox filled - I.S.C. - .186 thick - No. 4 groove
11	8040541	1	RING .. Oil control - Double hook scraper - No. 5 groove
12	8271457	1	RING .. Oil control - Spring loaded - No. 6 groove
RING SET .. .060 OS Diameter			
13	8356029	1	RING SET .. Piston
14	8311753	1	RING .. Compression - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
15	8355876	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
16	8272725	1	RING .. Compression - Tapered face - Ferrox filled - I.S.C. - .186 thick - No. 4 groove
17	8040542	1	RING .. Oil control - Double hook scraper - No. 5 groove
18	8271458	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
19	8311754	1	RING .. Compression - Chrome faced - Ductile iron - Standard diameter x 1/64 OS width
20	8311755	1	RING .. Compression - Chrome faced - Ductile iron - .030 OS diameter x 1/64 OS width
21	8311756	1	RING .. Compression - Chrome faced - Ductile iron - .060 OS diameter x 1/64 OS width
22	8311757	1	RING .. Compression - Chrome faced - Ductile iron - Standard diameter x 1/32 OS width
23	8311758	1	RING .. Compression - Chrome faced - Ductile iron - .030 OS diameter x 1/32 OS width
24	8311759	1	RING .. Compression - Chrome faced - Ductile iron - .060 OS diameter x 1/32 OS width

P.L. No. F108

PISTONS AND RINGS

567D1 Engines With Chrome Plated Liner Bores

The 567D1 engines were originally equipped with 20:1 pistons which are no longer available nor can they be intermixed with the current 16:1 pistons. When replacement of the 20:1 piston is required, a complete engine set of 16:1 pistons is recommended. See Ref. No. 9. Refer to Ref. Nos. 1 through 8 for rings and ring sets still available for 20:1 pistons.

Ref. No.	Part Number	Qty. Req.	Description
RING SET .. Piston - Standard Diameter - 567D1 Engine With 20:1 Pistons			
1	8455543	1	RING SET .. Piston - Replaces 8318386
2	8455529	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
3	8318658	2	RING .. Comp. - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 2 and 3 grooves
4	8269839	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
5	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
6	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS - 567D1 Engines With 20:1 Pistons			
7	8455530	1	RING .. Comp. - Barrel face - Ductile iron - Std. diameter x 1/64 OS width
8	8455531	1	RING .. Comp. - Barrel face - Ductile iron - Std. diameter x 1/32 OS width
PISTON ASSEMBLY .. Standard Diameter - 567D1 Engines With 16:1 Pistons			
9	8455551	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8340464
10	8409499	1	PISTON .. Bare - Standard - Replaces 8338200
11	8455540	1	RING SET .. Piston - Replaces 8318772
12	8455532	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .247 thick - No. 1 groove
13	8235401	1	RING .. Comp. - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 2 groove
14	8257707	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 3 groove
15	8028545	1	RING .. Oil control - Double hook scraper - No. 4 groove
16	8257949	1	RING .. Oil control - Spring loaded - No. 5 groove
RING SET .. .030 OS Diameter - 567D1 Engines With 16:1 Pistons			
17	8455541	1	RING SET .. Piston - .030 diameter
18	8455535	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .247 thick - No. 1 groove
19	8236290	1	RING .. Comp. - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 2 groove
20	8259514	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .243 thick - No. 3 groove
21	8040541	1	RING .. Oil control - Double hook scraper - No. 4 groove
22	8271457	1	RING .. Oil control - Spring loaded - No. 5 groove
OVERSIZE WIDTH TOP RINGS - 567D1 Engines With 16:1 Pistons			
23	8455533	1	RING .. Comp. - Barrel face - Ductile iron - Std. diameter x 1/64 OS width
24	8455534	1	RING .. Comp. - Barrel face - Ductile iron - Std. diameter x 1/32 OS width

PISTONS AND RINGS
567D2,D3,D3A Engines
With Cast Iron Liner Bores

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9336201	1	PISTON ASSEMBLY .. Engine - Replaces 8298255, 8319470, 8320393, 8335685, 8340534 and 8356589
2	9327478	1	PISTON .. Bare - Standard - Replaces 8315721, 8320170, 8332255 and 8340447
3	8355869	1	RING SET .. Piston - Replaces 8298254 and 8315577
4	8311623	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
5	8351048	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
6	8269839	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
7	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
PISTON ASSEMBLY .. .030 OS Diameter			
9	9336202	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8303641, 8319471 8320394, 8335686, 8340535 and 8356590
10	9327479	1	PISTON .. Bare - .030 OS - Repl. 8320391, 8332285, 8340477 and 8396765
11	8356028	1	RING SET .. Piston - Replaces 8303643 and 8317560
12	8311752	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
13	8355875	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
14	8272724	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
15	8040541	1	RING .. Oil control - Double hook scraper - No. 5 groove
16	8271457	1	RING .. Oil control - Spring loaded - No. 6 groove
PISTON ASSEMBLY .. .060 OS Diameter			
17	9336203	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8303642, 8319472, 8320395, 8335687, 8340536 and 8356591
18	9327480	1	PISTON .. Bare - .060 OS - Replaces 8272686, 8320392, 8332286 and 8340478
19	8356029	1	RING SET .. Piston - Replaces 8303644 and 8317559
20	8311753	1	RING .. Comp. - Chrome faced - Ductile iron - S.S.C. - .190 thick - No. 1 groove
21	8355876	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .187 thick - No. 2 and 3 grooves
22	8272725	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
23	8040542	1	RING .. Oil control - Double hook scraper - No. 5 groove
24	8271458	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
25	8311754	1	RING .. Comp. - Chrome faced - Ductile iron - Standard dia. x 1/64 OS width - Replaces 8303647
26	8311755	1	RING .. Comp. - Chrome faced - Ductile iron - .030 OS diameter x 1/64 OS width - Replaces 8303648
27	8311756	1	RING .. Comp. - Chrome faced - Ductile iron - .060 OS diameter x 1/64 OS width - Replaces 8303649
28	8311757	1	RING .. Comp. - Chrome faced - Ductile iron - Standard dia. x 1/32 OS width - Replaces 8303650
29	8311758	1	RING .. Comp. - Chrome faced - Ductile iron - .030 OS diameter x 1/32 OS width - Replaces 8303651
30	8311759	1	RING .. Comp. - Chrome faced - Ductile iron - .060 OS diameter x 1/32 OS width - Replaces 8303652

P.L. No. F108

PISTONS AND RINGS

567D2,D3,D3A Engines
With Chrome Plated Liner Bores

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9336200	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8319473, 8320396, 8340537 and 8455554
2	9327478	1	PISTON .. Bare - Standard - Replaces 8320170 and 8340447
3	8455543	1	RING SET .. Piston - Replaces 8318386
4	8455529	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
5	8318658	2	RING .. Comp. - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8269839	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
7	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
9	8455544	1	RING SET .. Piston - Replaces 8338156
10	8455531	1	RING .. Comp. - Barrel face - Ductile iron - Standard dia. x 1/32 OS width - No. 1 groove
11	8318658	2	RING .. Comp. - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8269839	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - .186 thick - No. 4 groove
13	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
RING SET .. Standard Diameter			
15	8455546	1	RING SET .. Piston - Replaces 8371807 - Optional to 8455543
16	8455529	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
17	8371806	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8269839	1	RING .. Comp. - Tapered faced - Ferrox filled - Cast iron - I.S.C. - No. 4 groove
19	8028545	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8257949	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	8455530	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width
22	8455531	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/32 OS width

PISTONS AND RINGS

645E Engines
With Cast Iron Liner Bores - No. 1 Ring Chrome Faced
Stainless Steel With Non Flash Chrome Sides - Fire Ring Piston

Ref. No.	Part Number	Qty. Req.	Description
1	8481489	1	PISTON ASM. .. Engine - Incl. rings - Repl. 8375128, 8377844, 8449855, 8464062, 8466788, 8474221 and 8474215
2	8472778	1	PISTON .. Bare - Standard - Replaces 8362280, 8377246 and 8459705
3	8474214	1	RING SET .. Piston - Replaces 8375127, 8449854, 8464059, 8466787 and 8474220
4	8470090	1	RING .. Comp. - Chrome faced - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8347088, 8427494 and 8418580
5	8418589	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and No. 3 grooves - Replaces 8347097
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
PISTON ASSEMBLY .. .030 OS Diameter			
9	8481494	1	PISTON ASM. .. Engine - Incl. rings - Repl. 8375130, 8377845, 8449857, 8464066, 8466790, 8474223 and 8474217
10	8472779	1	PISTON .. Bare - .030 OS - Replaces 8362296, 8377247 and 8459706
11	8474216	1	RING SET .. Piston - Replaces 8375129, 8449856, 8464060, 8466789 and 8474222
12	8470091	1	RING .. Comp. - Chrome faced - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8347089, 8427555 and 8418581
13	8418590	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves - Replaces 8347098
14	8347101	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
15	8347104	1	RING .. Oil control - Double hook scraper - No. 5 groove
16	8464954	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
PISTON ASSEMBLY .. .060 OS Diameter			
17	8481498	1	PISTON ASSEMBLY .. Engine - Incl. rings - Repl. 8375132, 8377846, 8449859, 8464067, 8466792, 8474225 and 8474219
18	8472780	1	PISTON .. Bare - .060 OS - Replaces 8362297, 8377248 and 8459707
19	8474218	1	RING SET .. Piston - Replaces 8375131, 8449858, 8464061, 8466791 and 8474224
20	8470092	1	RING .. Comp. - Chrome faced - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8347090, 8427556 and 8418582
21	8418591	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves - Replaces 8347099
22	8347102	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
23	8347105	1	RING .. Oil control - Double hook scraper - No. 5 groove
24	8464955	1	RING .. Oil control - No. 6 groove

P.L. No. F108

PISTONS AND RINGS

645E Engines
With Cast Iron Liner Bores - No. 1 Ring Chrome Faced
Stainless Steel With Non Flash Chrome Sides - Fire Ring Piston

Ref. No.	Part Number	Qty. Req.	Description
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
1	9337439	1	RING SET .. Piston - Standard diameter x 1/64 OS width
2	8470093	1	RING .. Compression - Chrome faced - Stainless steel - Standard diameter x 1/64 OS width - No. 1 groove
3	8418589	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and No. 3 grooves
4	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
5	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
6	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
7	9337440	1	RING SET .. Piston - Standard diameter x 1/32 OS width
8	8470096	1	RING .. Compression - Chrome faced - Stainless steel - Standard diameter x 1/32 OS width - No. 1 groove
9	8418589	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
10	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
11	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
12	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
OVERSIZE WIDTH RINGS TOP RINGS			
13	8470093	1	RING .. Comp. - Chrome faced - Stainless steel - Std. diameter x 1/64 OS width - Replaces 8347091, 8427557 and 8418583
14	8470094	1	RING .. Comp. - Chrome faced - Stainless steel - .030 OS diameter x 1/64 OS width - Replaces 8347092, 8427558 and 8418584
15	8470095	1	RING .. Comp. - Chrome faced - Stainless steel - .060 OS diameter x 1/64 OS width - Replaces 8347093, 8427559 and 8418585
16	8470096	1	RING .. Comp. - Chrome faced - Stainless steel - Std. diameter x 1/32 OS width - Replaces 8347094, 8427560 and 8418586
17	8470097	1	RING .. Comp. - Chrome faced - Stainless steel - .030 OS diameter x 1/32 OS width - Replaces 8347095, 8427561 and 8418587
18	8470098	1	RING .. Comp. - Chrome faced - Stainless steel - .060 OS diameter x 1/32 OS width - Replaces 8347096, 8427562 and 8418588

PISTONS AND RINGS

645E Engines
With Chrome Plated Liner Bores - No. 1 Ring Barrel Face Ductile Iron - Fire Ring Piston

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	8481488	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8464072 and 8466794
2	8472778	1	PISTON .. Bare - Standard - Replaces 8459705
3	8466793	1	RING SET .. Piston - Replaces 8455547
4	8455536	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
5	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
9	8467248	1	RING SET .. Piston - Standard diameter x 1/64 OS width
10	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width - No. 1 groove
11	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
15	8467249	1	RING SET .. Piston - Standard diameter x 1/32 OS width
16	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/32 OS width - No. 1 groove
17	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width
22	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/32 OS width

P.L. No. F108

PISTONS AND RINGS

645E Engines
With Chrome Plated Liner Bores - No. 1 Ring Barrel Face Ductile Iron With Thick Chrome Plated Sides and Interrupted Witness Groove On Ring Face - Fire Ring Piston For Use With High Sulfur Fuel and On High Side - Wear Applications

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9336997	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 9336999
2	8472778	1	PISTON .. Bare - Standard - Replaces 8459705
3	9323296	1	RING SET .. Standard diameter - Replaces 9316112
4	9323293	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - S.S.C. - .190 thick - No. 1 groove - Replaces 9316323
5	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
9	9323297	1	RING SET .. Piston - Standard diameter x 1/64 OS width - Replaces 9316113
10	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS Width - No. 1 groove - Replaces 9316110
11	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
15	9323298	1	RING SET .. Piston - Standard diameter x 1/32 OS width - Replaces 9316114
16	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - No. 1 groove - Replaces 9316111
17	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS width - Replaces 9316110
22	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - Replaces 9316111

PISTONS AND RINGS

645E3 Engines
With Cast Iron Liner Bores -
No. 1 Ring Prestressed Stainless Steel With Flash Chrome Sides

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9516937	1	PISTON ASM. .. Engine - Includes rings - Replaces 8431230, 8464068 and 8467251
2	8459702	1	PISTON .. Bare - Standard
3	9516928	1	RING SET .. Piston - Replaces 8434523 and 8467250
4	9338809	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8433002
5	8418589	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
PISTON ASSEMBLY .. .030 OS Diameter			
9	9516940	1	PISTON ASM. .. Engine - Includes rings - Replaces 8431366, 8464069 and 8467253
10	8459703	1	PISTON .. Bare
11	9516929	1	RING SET .. Piston - Replaces 8434524 and 8467252
12	9338810	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8434515
13	8418590	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
14	8347101	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. .186 thick - No. 4 groove
15	8347104	1	RING .. Oil control - Double hook scraper - No. 5 groove
16	8464954	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
PISTON ASSEMBLY .. .060 OS Diameter			
17	9516941	1	PISTON ASM. .. Engine - Includes rings - Replaces 8431367, 8464070 and 8467255
18	8459704	1	PISTON .. Bare - .060 OS
19	9516930	1	RING SET .. Piston - Replaces 8434525 and 8467254
20	9338811	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides -Stainless steel - S.S.C. - .190 thick - No. 1 groove - Replaces 8434516
21	8418591	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
22	8347102	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
23	8347105	1	RING .. Oil control - Double hook scraper - No. 5 groove
24	8464955	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
25	9338812	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/64 OS width - Replaces 8434517
26	9338813	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .030 OS diameter x 1/64 OS width - Replaces 8434518
27	9338814	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .060 OS diameter x 1/64 OS width - Replaces 8434519
28	9338815	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/32 OS width - Replaces 8434520
29	9338816	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .030 OS diameter x 1/32 OS width - Replaces 8434521
30	9338817	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .060 OS diameter x 1/32 OS width - Replaces 8434522

P.L. No. F108

PISTONS AND RINGS

645E3 and 645E3A Engines
With Cast Iron Liner Bores - No. 1 Ring -
Chrome Faced Ductile Iron With Flash Chrome Sides

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter - 645E3 Engines Only			
1	8492334	1	PISTON ASSEMBLY .. Engine - Includes rings
2	8459702	1	PISTON .. Bare - Standard
3	8466787	1	RING SET .. Piston
4	8418580	1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - S.S.C. - 190 thick - No. 1 groove
5	8418589	2	RING .. Compression - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - ..186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Piston - Standard Diameter With 1/64 and 1/32 OS Width Top Rings - 645E3 and 645E3A Engines			
9	8492442	1 -	RING SET .. Piston - Standard diameter x 1/64 OS width top ring
10	8492443	- 1	RING SET .. Piston - Standard diameter x 1/32 OS width top ring
11	8418583	1 -	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - Standard diameter x 1/64 OS width - No. 1 groove
12	8418586	- 1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - Standard diameter x 1/32 OS width - No. 1 groove
13	8418589	2 2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
14	8347100	1 1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
15	8347103	1 1	RING .. Oil control - Double hook scraper - No. 5 groove
16	8464953	1 1	RING .. Oil control - Spring loaded - No. 6 groove
RING SET .. Piston - .030 OS Diameter With 1/64 and 1/32 OS Width Top Rings - 645E3 and 645E3A Engines			
17	8492444	1 -	RING SET .. Piston - .030 OS diameter x 1/64 OS width top ring
18	8492445	- 1	RING SET .. Piston - .030 OS diameter x 1/32 OS width top ring
19	8418584	1 -	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - .030 OS diameter x 1/64 OS width - No. 1 groove
20	8418587	- 1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - .030 OS diameter x 1/32 OS width - No. 1 groove
21	8418590	2 2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
22	8347101	1 1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
23	8347104	1 1	RING .. Oil control - Double hook scraper - No. 5 groove
24	8464953	1 1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
25	8418583	1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - Standard diameter x 1/64 OS width
26	8418584	1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - .030 OS diameter x 1/64 OS width
27	8418586	1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - Standard diameter x 1/32 OS width
28	8418587	1	RING .. Compression - Chrome faced - Flash chrome sides - Ductile iron - .030 OS diameter x 1/32 OS width

PISTONS AND RINGS

645E3,E3A,E3B,E3C,F3,F3B Engines
With Cast Iron Liner Bores - No. 1 Ring Prestressed Stainless Steel With Flash Chrome Sides
Oversize Width Ring Sets

Ref. No.	Part Number	Qty. Req.	Description
RING SET .. Piston - Standard Diameter With 1/64 OS Width Top Ring			
1	9516931	1	RING SET .. Piston - Standard diameter x 1/64 OS width top ring - Replaces 8475173 and 8486611
2	9338812	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/64 OS width - No. 1 groove - Replaces 8434517
3	8418589	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
4	8347100	1	RING .. Compression - Tapered face - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
5	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
6	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove - Replaces 8347106
RING SET .. Piston - Standard Diameter With 1/32 OS Width Top Ring			
7	9516934	1	RING SET .. Piston - Standard diameter x 1/32 OS width top ring - Replaces 8475174 and 8479805
8	9338815	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/32 OS width - No. 1 groove - Replaces 8434520
9	8418589	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
10	8347100	1	RING .. Compression - Tapered face - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
11	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
12	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove - Replaces 8347106
RING SET .. Piston - .030 OS Diameter With 1/64 OS Width Top Ring			
13	9516932	1	RING SET .. PPiston - .030 OS diameter x 1/64 OS width top ring - Replaces 8480631 and 8486613
14	9338813	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides stainless steel - .030 OS diameter x 1/64 OS width - No. 1 groove - Replaces 8434518
15	8418590	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
16	8347101	1	RING .. Compression - Tapered face - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
17	8347104	1	RING .. Oil control - Double hook scraper - No. 5 groove
18	8464954	1	RING .. Oil control - Spring loaded - No. 6 groove - Replaces 8347107

P.L. No. F108

PISTONS AND RINGS

645E3 Engines
With Chrome Plated Liner Bores - No. 1 Ring Barrel Face Ductile Iron

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	8467247	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 8455556 and 8464071
2	8459702	1	PISTON .. Bare - Standard
3	8466793	1	RING SET .. Piston - Replaces 8455547
4	8455536	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
5	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
9	8467248	1	RING SET .. Piston - Standard diameter x 1/64 OS width - Replaces 8455548
10	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width - No. 1 groove
11	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 grooves
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
15	8467249	1	RING SET .. Piston - Standard diameter x 1/32 OS width - Replaces 8455549
16	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard dia. x 1/32 OS width - No. 1 groove
17	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width
22	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/32 OS width

PISTONS AND RINGS

645E3 Engines

With Chrome Plated Liner Bores - No. 1 Ring Barrel Face Ductile Iron With Thick Chrome Plated Sides and Interrupted Witness Groove On Ring Face - For Use With High Sulfur Fuel and On High Side Wear Applications

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9336998	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 9337001
2	8459702	1	PISTON .. Bare - Standard
3	9323296	1	RING SET .. Standard diameter - Replaces 9316112
4	9323293	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - S.S.C. - .190 thick - No. 1 groove - Replaces 9316323
5	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
9	9323297	1	RING SET .. Piston - Standard diameter x 1/64 OS width - Replaces 9316113
10	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Replaces 9316110 Standard diameter x 1/64 OS width - No. 1 groove
11	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
15	9323298	1	RING SET .. Piston - Standard diameter x 1/32 OS width - Replaces 9316114
16	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - No. 1 groove - Replaces 9316111
17	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Comp. tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS width - Replaces 9316110
22	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - Replaces 9316111

P.L. No. F108

PISTONS AND RINGS

645E3,E3A,E3B,F3 Engines
With Cast Iron and Chrome Plated Liner Bores
Fire Ring Piston

Ref. No.	Part Number	Qty. Req.	Description
			Application of piston assembly 9533163 or 9533161 requires the use of the "Rocking" piston pin arrangement (piston pin -8417645 or 9518958, carrier - 8442120 and insert bearing - 8442226).
			PISTON ASSEMBLY .. Standard Diameter - Laser Hardened Upper Bore Cast Iron Liner
1	9533163	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 9516939
2	9523619	1	PISTON .. Bare - Standard - Replaces 8419089
3	9516928	1	RING SET .. Piston
4	9338809	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - S.S.C. - .190 thick - No. 1 groove
5	8418589	2	RING .. Comp. - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick -No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
			OVERSIZE WIDTH TOP RINGS - Cast Iron Liner Bore
9	9338812	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/64 OS width
10	9338813	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .030 OS diameter x 1/64 OS width
11	9338814	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .060 OS diameter x 1/64 OS width
12	9338815	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/32 OS width
13	9338816	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .030 OS diameter x 1/32 OS width
14	9338817	1	RING .. Comp. - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - .060 OS diameter x 1/32 OS width
			PISTON ASSEMBLY .. Standard Diameter - Chrome Plated Liner Bore
15	9533161	1	PISTON ASSEMBLY .. Engine - Includes ring
16	9523619	1	PISTON .. Bare - Standard
17	8466793	1	RING SET .. Piston
18	8455536	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
19	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No 2 and 3 grooves
20	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
21	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
22	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
			OVERSIZE WIDTH TOP RINGS - Chrome Plated Liner Bore
23	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/64 OS width
24	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard diameter x 1/32 OS width

PISTONS AND RINGS

645E3,E3A,E3B,F3 Engines
With Chrome Plated Liner Bores - No. 1 Ring Barrel Faced Ductile Iron With Thick Chrome Plated Sides and Interrupted Witness Groove - Fire Ring Piston - For Use With High Sulfur Fuel and On High Side Wear Applications

Ref. No.	Part Number	Qty. Req.	Description
			Application of piston assembly 9533162 requires the use of the "Rocking" piston pin arrangement (piston pin -8417645 or 9518958, carrier - 8442120 and insert bearing - 8442226).
			PISTON ASSEMBLY .. Standard Diameter
1	9533162	1	PISTON ASSEMBLY .. Engine - Includes rings - Replaces 9533166 and 9337473
2	9523619	1	PISTON .. Bare - Standard - Replaces 8419089
3	8323296	1	RING SET .. Standard diameter - Replaces 9316112
4	9323293	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - S.S.C. - .190 thick - No. 1 groove - Replaces 9316323
5	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
			†RING SET .. Standard Diameter With 1/64 OS Width Top Ring
9	9323297	1	RING SET .. Piston - Standard diameter x 1/64 OS width - Replaces 9316113
10	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS width - No. 1 groove - Replaces 9316110
11	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Comp. - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
			†RING SET .. Standard Diameter With 1/32 OS Width Top Ring
15	9323298	1	RING SET .. Piston - Standard diameter x 1/32 OS width - Replaces 9316114
16	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - No. 1 groove - Replaces 9316111
17	8388418	2	RING .. Comp. - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Comp. tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
			†OVERSIZE WIDTH TOP RINGS
†21	9323294	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS width - Replaces 9316110
†22	9323295	1	RING .. Comp. - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - Replaces 9316111

† These rings and ring sets also applicable to 645E3C and F3B engines.

P.L. No. F108

PISTONS AND RINGS

645E3C,F3B Engines
16:1 Compression Ratio
With Cast Iron and Chrome Plated Liner Bores

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter - Laser Hardened Upper Bore Cast Iron Liner			
1	9550585	1	PISTON ASSEMBLY .. Engine - Includes rings
2	9572817	1	PISTON .. Bare - Standard - 16:1 comp. ratio - Repl. 9545565, 9549581 and 9564583
3	9516928	1	RING SET .. Piston - Replaces 8434523 and 8467250
4	9338809	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - S.S.C. - .190 thick - No. 1 groove - Repl. 8433002
5	8418589	2	RING .. Compression - Chrome faced - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
OVERSIZE WIDTH TOP RINGS - Cast Iron Liner Bore			
†9	9338812	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/64 OS width - Replaces 8434517
†10	9338815	1	RING .. Compression - Prestressed - Chrome faced - Flash chrome sides - Stainless steel - Standard diameter x 1/32 OS width - Replaces 8434520

†See Page 13, Ref. Nos. 1 and 7, for Oversize Width Ring Sets.

PISTON ASSEMBLY .. Standard Diameter - Chrome Plated Liner Bore - For Use With High Sulfur Fuel and On High Side Wear Applications

11	9550584	1	PISTON ASSEMBLY .. Engine - Includes rings
12	9573312	1	PISTON .. Bare - Standard - 16:1 comp. ratio - Repl. 9545565, 9549581 and 9564583
13	9323296	1	RING SET .. Standard diameter - Replaces 9316112
14	9323293	1	RING .. Compression - Barrel face - Ductile iron - Thick chrome plated sides - S.S.C. - .190 thick - No. 1 groove - Replaces 9316323
15	8388418	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
16	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
17	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
18	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
OVERSIZE WIDTH TOP RINGS - Chrome Plated Liner Bore			
††19	9323294	1	RING .. Compression - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/64 OS width - Replaces 9316110
††20	9323295	1	RING .. Compression - Barrel face - Ductile iron - Thick chrome plated sides - Standard diameter x 1/32 OS width - Replaces 9316111

††See Page 17, Ref. Nos. 9 and 15, for Oversize Width Ring Sets.

PISTONS AND RINGS

645E3C,F3B Engines
16:1 Compression Ratio
With Chrome Plated Liner Bores - No. 1 Ring Barrel Face Ductile Iron

Ref. No.	Part Number	Qty. Req.	Description
PISTON ASSEMBLY .. Standard Diameter			
1	9555990	1	PISTON ASSEMBLY .. Engine - Includes rings
2	9573312	1	PISTON .. Bare - Standard - 16:1 comp. ratio - Repl. 9545565, 9549581 and 9564583
3	8466793	1	RING SET .. Piston - Replaces 8455547
4	8455536	1	RING .. Comp. - Barrel face - Ductile iron - S.S.C. - .190 thick - No. 1 groove
5	8388418	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
6	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
7	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
8	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/64 OS Width Top Ring			
9	8467248	1	RING SET .. Piston - Standard diameter x 1/64 OS width - Replaces 8455548
10	8455537	1	RING .. Comp. - Barrel face - Ductile iron - Standard dia. x 1/64 OS width - No. 1 groove
11	8388418	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
12	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
13	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
14	8464953	1	RING .. Oil control - Spring loaded - Slotted lower land - No. 6 groove
RING SET .. Standard Diameter With 1/32 OS Width Top Ring			
15	8467249	1	RING SET .. Piston - Standard diameter x 1/32 OS width - Replaces 8455549
16	8455538	1	RING .. Comp. - Barrel face - Ductile iron - Standard dia. x 1/32 OS width - No. 1 groove
17	8388418	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 2 and 3 grooves
18	8347100	1	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - .186 thick - No. 4 groove
19	8347103	1	RING .. Oil control - Double hook scraper - No. 5 groove
20	8464953	1	RING .. Oil control - Spring loaded - No. 6 groove
OVERSIZE WIDTH TOP RINGS			
21	8455537	1	RING .. Compression - Barrel face - Ductile iron - Standard dia. x 1/64 OS width
22	8455538	1	RING .. Compression - Barrel face - Ductile iron - Standard dia. x 1/32 OS width

POWER PACK ASSEMBLIES

Complete, Mini and Partial Power Pack Assemblies
Not Illustrated

COMPLETE POWER PACK ASSEMBLIES

The complete Power Pack Assembly consists of the Cylinder Head Assembly, Cylinder Liner, Piston Assembly, Carrier Assembly, Connecting Rod Assembly, and all necessary Gaskets and Seals. All components are pre-assembled and packaged in an Expendable or Storage Container. The Cylinder Head Seat Ring (see Parts List No. 106) and Connecting Rod Bearings (see Parts List No. 107) are not included in the Power Pack Assembly.

Ref. No.	Conn. Rod Type	New Power Pack Container Type Storage	Expend.	Unit Exchange Power Pack	Application/Description
CAST IRON LINER BORE					
1	†Fork	8444278	8444280	8444284	567D1 with 16:1 compression ratio - Inconel valves and "D" liner
2	Blade	8444279	8444281	8444285	
3	†Fork	8296489	8434267	8296493	567D2,D3,D3A - No. 1 ring chrome faced ductile iron
4	Blade	8296490	8434268	8296494	
5	†Fork	8449869	9514327	8467605	645E - No. 1 ring chrome faced stainlesssteel - Bronze carrier insert bearing
6	Blade	8449871	9088370	8467606	
7	†Fork	----	9518135	9544883	645E - No. 1 ring chrome faced stainless steel - Laser hardened port relief liner
8	Blade	----	9518136	9544884	
9	†Fork	8467559	8467560	8467607	645E3 (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides
10	Blade	8467561	8467562	8467608	
11	†Fork	9517595	9503109	9523262	645E3 (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief liner
12	Blade	9517596	9503111	9523263	
13	†Fork	----	8491785	8492250	645E3 (Except F40PH) - No. 1 ring chrome faced ductile iron with flash chrome sides
14	Blade	----	8491786	8492249	
15	†Fork	----	9503105	----	645E3 (Except F40PH) - No. 1 ring chrome faced ductile iron with flash chrome sides - Laser hardened port relief liner
16	Blade	----	9503107	----	
17	†Fork	----	9321414	9322130	645E3 (F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Plateau honed and laser hardened port relief liner
18	Blade	----	9321416	9322129	
19	†Fork	----	9527310	9551460	645E3A,E3B (F40C,F40PH,F40PH-2) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Plateau honed, laser hardened port relief and upper bore - Fire ring piston
20	Blade	----	9527311	9551461	
21	†Fork	9527312	9527313	9541019	645E3A,E3B (Except F40PH), F3 - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief and upper bore - Fire ring piston
22	Blade	9527314	9527315	9541020	
23	†Fork	----	9550610	----	645E3C (F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Plateau honed, laser hardened port relief and upper bore - 16:1 fire ring piston
24	Blade	----	9550609	----	

† *One (1) Connecting Rod Hardware Kit (8409745) is included with each Fork Rod Power Pack Assembly.*

P.L. No. A109

POWER PACK ASSEMBLIES

COMPLETE POWER PACK ASSEMBLIES

Ref. No.	Conn. Rod Type	New Power Pack Container Type Storage	Expend.	Unit Exchange Power Pack	Application/Description
CAST IRON LINER BORE - Continued					
25 26	†Fork Blade	9549816 9549818	9549817 9549819	9551463 9551462	645E3C (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief and upper bore - 16:1 fire ring piston
27 28	†Fork Blade	9559296 9559294	9559297 9559295	9561589 9561588	645F3B - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief and upper bore - 16:1 fire ring piston - With 9556060 head assembly (9556059 head)
CHROME PLATED LINER BORE - For Export Locomotives Using High Sulfur Fuel					
29 30	†Fork Blade	9332672 9332674	9332673 9332675	9339405 9339406	645E - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined carrier insert bearing
31 32	†Fork Blade	9328183 9328185	9328184 9328186	9339407 9339408	645E3 - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Silver plated carrier insert bearing
33 34	†Fork Blade	9527316 9527318	9527317 9527319	9546357 9546358	645E3B - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined carrier insert bearing - Fire ring piston
35 36	†Fork blade	9551207 9551208	9550606 9550605	---- ----	645E3C - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined carrier insert bearing - 16:1 fire ring piston
37 38	†Fork Blade	9561804 9561803	9561150 9561148	---- ----	645F3B - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined carrier insert bearing - 16:1 fire ring piston - With 9556060 head assembly (9556059 head)

† One (1) Connecting Rod Hardware Kit (8409745) is included with each Fork Rod Power Pack Assembly.

POWER PACK ASSEMBLIES

MINI AND PARTIAL POWER PACK ASSEMBLIES

A Mini Power Pack is the same as a Complete Power Pack less the connecting rod.

A Partial Power Pack is the same as a Mini Power Pack less the carrier, insert bearing, piston pin and bolt assembly, thrust washer, and snap ring.

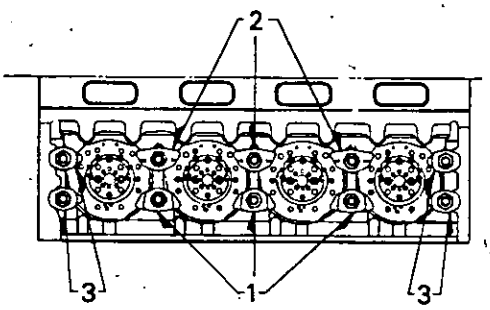
Mini and Partial Power Packs are not offered on a unit exchange basis.

Ref. No.	Conn. Rod Type	New Power Pack Container Type Storage	Expend.	Application/Description
CAST IRON LINER BORE				
1	Partial	- - - -	9338598	567D1 with 16:1 compression ratio - Inconel valves - "D" liner
2	Mini	- - - -	9319972	645E - No. 1 ring stainless steel with chrome face - Bronze lined carrier insert bearing
3	Partial	- - - -	9332388	
4	Mini	9556097	9319973	645E3 (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides
5	Partial	- - - -	9326099	
6	Mini	- - - -	9519207	645E3 (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief liner
7	Partial	- - - -	9518041	
8	Mini	- - - -	9320986	645E3 (Except F40PH) - No. 1 ring ductile iron with chrome face and flash chrome sides
9	Partial	- - - -	9326098	
10	Mini	- - - -	9527320	645E3A,E3B (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief and upper bore - Fire ring piston
11	Partial	- - - -	9527321	
12	Mini	- - - -	9551062	645E3A,E3B (F40C,F40PH,F40PH-2) - No. 1 ring prestressed stainless steel with chrome face and sides - Plateau honed, laser hardened port relief liner - Fire ring piston
13	Partial	- - - -	9551064	
14	Mini	- - - -	9550599	645E3C (Except F40PH) - No. 1 ring prestressed stainless steel with chrome face and flash chrome sides - Laser hardened port relief and upper bore - 16:1 fire ring piston
15	Partial	- - - -	9550600	
16	Mini	- - - -	9559298	645F3B - No. 1 ring prestressed stainless steel with chrome face and sides - Laser hardened port relief and upper bore - 16:1 fire ring piston - 9556060 head assembly (9556059 head)
17	Partial	- - - -	9559299	
CHROME PLATED LINER BORE - For Export Locomotives Using High Sulfur Fuel				
18	Mini	9332684	9332685	645E - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined insert bearing
19	Partial	9332670	9332671	
20	Mini	9332682	9332683	645E3 - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Silver plated insert bearing
21	Partial	- - - -	9331782	
22	Mini	9332686	9332687	645E3,E3B - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Rocking piston pin arrangement - Bronze lined insert bearing
23	Partial	9519209	9519208	
24	Mini	9527326	9527327	645E3B - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined insert bearing - Fire ring piston
25	Partial	9527324	9527325	
26	Mini	- - - -	9550608	645E3C - No. 1 ring barrel faced ductile iron with thick chrome plated sides and interrupted witness groove - Bronze lined insert bearing - 16:1 fire ring piston
27	Partial	- - - -	9550607	

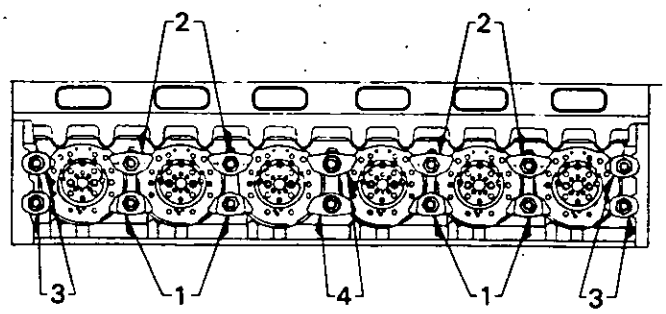
CYLINDER HEAD CRABS

Original Design Crabs

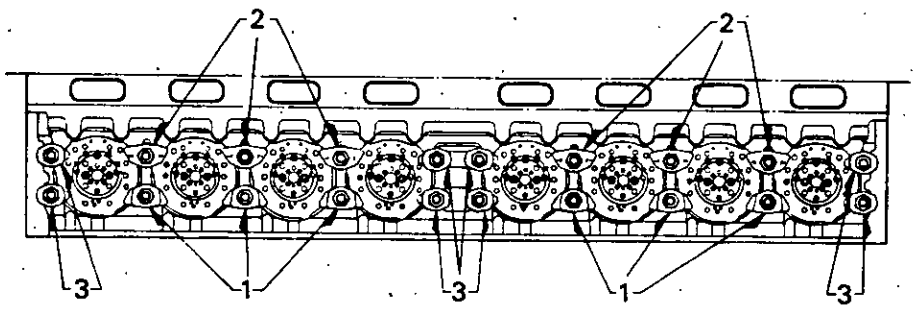
16-567D1,D2,D3,D3A; 8-645E; 12-645E,E3,E3B; 16-645E,E3,E3A,E3B and 20-645E3,E3B Engines



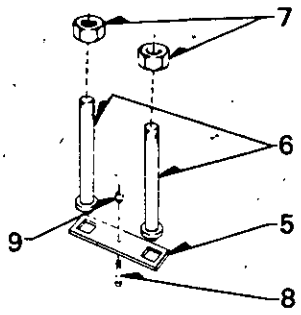
8 Cylinder Engine

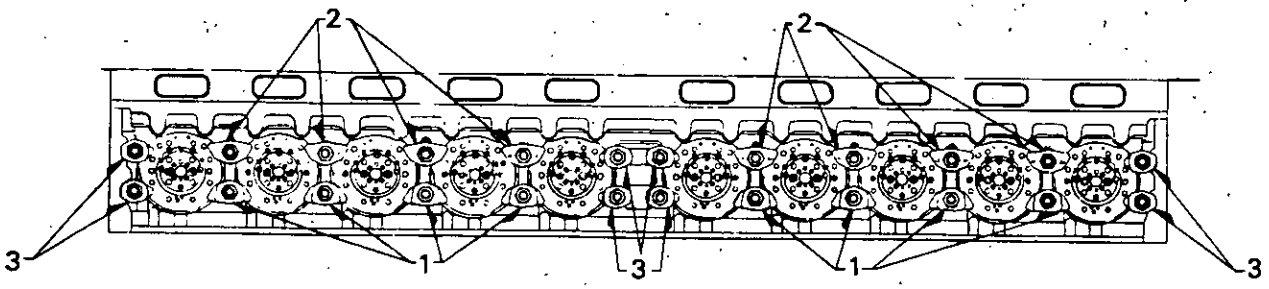


12 Cylinder Engine



16 Cylinder Engine





20 Cylinder Engine

PLATE F110-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8 cylinder engines } *Quantities Shown Are For*
		-	B	-	-	12 cylinder engines } *One Engine Assembly*
		-	-	C	-	16 cylinder engines } *One Engine Assembly*
		-	-	-	D	20 cylinder engines } *One Engine Assembly*
1	8133941	6	8	12	16	CRAB .. Cylinder head - Intermediate - Outboard
2	9324690	6	8	12	16	CRAB .. Cylinder head - Intermediate - Inboard - Formerly 8133941
3	8133939	8	8	16	16	CRAB .. Cylinder head - End - Center on 16 and 20 cylinder only
4	8174620	-	4	-	-	CRAB .. Cylinder head - Center - 12 cylinder only
5	8133575	10	14	20	24	BRACKET .. Crab bolt
6	9085894	20	28	40	48	BOLT .. Crab - 1-3/4-12 x 15-5/8 long - Replaces 8422387 and 8347885
7	8155104	20	28	40	48	NUT .. Hex crab - 1-3/4-12 - Spherical seat
8	8348556	10	14	20	24	BOLT .. Hex head 3/8-24 x 3 - Bracket mounting
9	8089200	10	14	20	24	NUT .. Spline - 3/8-24

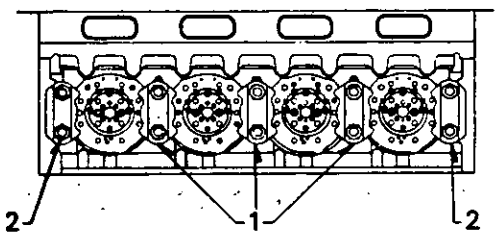
See Page 2 for Plate Crabs and Plate Crab Kits.

P.L. No. F110

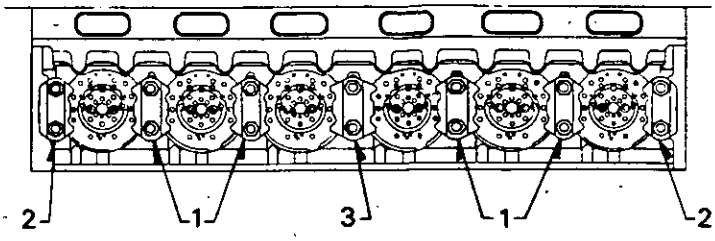
CYLINDER HEAD CRABS

Plate-Type Crabs

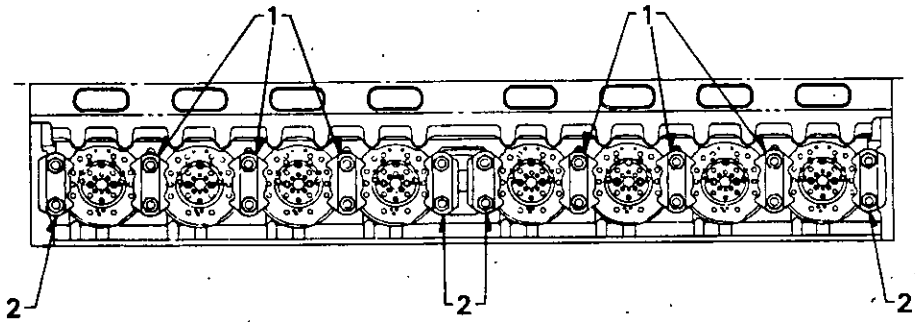
8-645E3B,E3C,F3B; 12-645E3B,E3C,F3,F3B; 16-645E3B,E3C,F3,F3B; 20-645E3B Engines



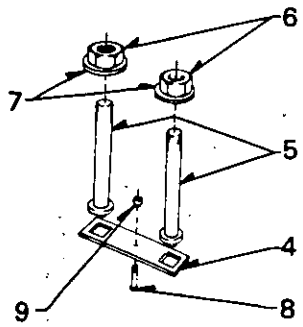
8 Cylinder Engine

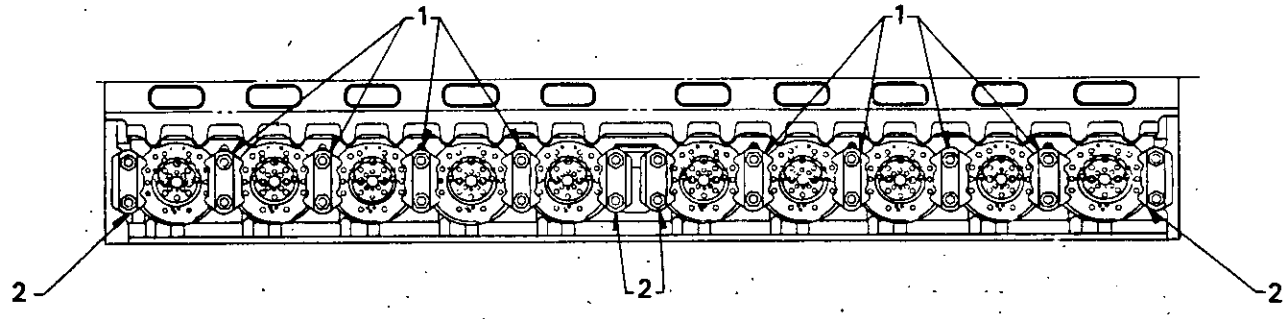


12 Cylinder Engine



16 Cylinder Engine





20 Cylinder Engine

PLATE A110-2

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8 cylinder engines } *Quantities Shown Are For*
		-	B	-	-	12 cylinder engines } *One Engine Assembly*
		-	-	C	-	16 cylinder engines } *One Engine Assembly*
		-	-	-	D	20 cylinder engines } *One Engine Assembly*
1	9319170	8	8	12	16	CRAB .. Cylinder head - Intermediate
2	9523067	4	4	8	8	CRAB .. Cylinder head - End - Center on 16 and 20 cyl. only
3	9332871	-	2	-	-	CRAB .. Cylinder head - Center on 12 cyl. only
4	8133575	10	14	20	24	BRACKET .. Crab bolt
5	9085894	20	28	40	48	BOLT .. Crab
6	8040808	20	28	40	48	NUT .. Crab bolt
7	9319172	20	28	40	48	WASHER .. Special - Hardened and ground
8	8348556	10	14	20	24	BOLT .. Hex head 3/8-24 x 3 - Bracket mounting
9	8089200	10	14	20	24	NUT .. Spline 3/8-24
†10	9558451	1	-	-	-	KIT .. Crab - Service } Each kit contains Ref. No.s 1,2,3 (for 12 cyl. engines), 5,6, and 7 in the quantities shown for each engine assembly.
†11	9558545	-	1	-	-	KIT .. Crab - Service } Each kit contains Ref. No.s 1,2,3 (for 12 cyl. engines), 5,6, and 7 in the quantities shown for each engine assembly.
†12	9552014	-	-	1	-	KIT .. Crab - Service } Each kit contains Ref. No.s 1,2,3 (for 12 cyl. engines), 5,6, and 7 in the quantities shown for each engine assembly.
†13	9335056	-	-	-	1	KIT .. Crab - Service } Each kit contains Ref. No.s 1,2,3 (for 12 cyl. engines), 5,6, and 7 in the quantities shown for each engine assembly.

†*Note: Plate Crab Kits can be applied to all turbocharged engines.*

Parts List No. A111

FUEL INJECTORS

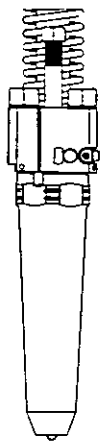


PLATE A111-1

FUEL INJECTOR REFERENCE CHART

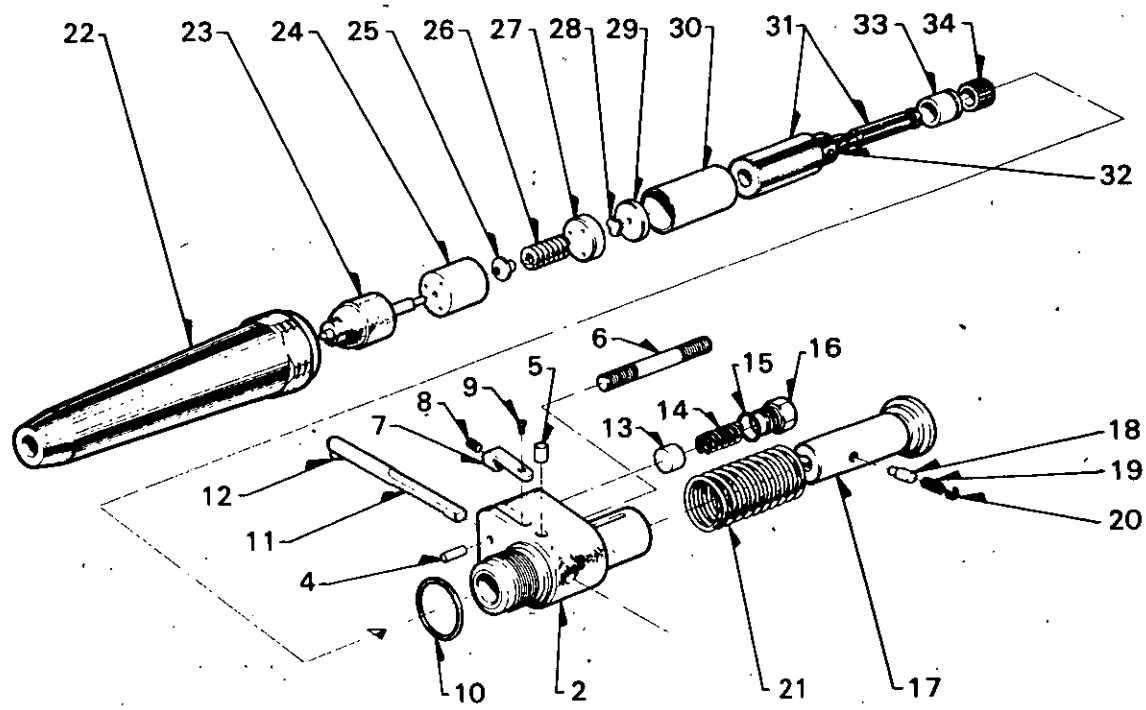
Ref. No.	Injector Part No.	Replaces	Replaced By	UTEX Part No.	Low Smoke	Application
1	5228830	- - - -	5229200	8478045	No	8,12,16-645E engines
†2	5229200	5228830	- - - -	8478045	Yes	8,12,16-645E engines
3	5228895	- - - -	5229250	8478046	No	12,16,20-645E3 engines
†4	5229250	5228895	- - - -	8478046	Yes	12,16,20-645E3 engines
5	5228800	- - - -	5229290	8478048	No	16-567D1 engines
†6	5229290	††5228540 5228800	- - - -	8478048	Yes	16567D1 and 8,12,16-645E (High altitude)
7	5228750	- - - -	5229310	8478051	No	16-567D2,D3,D3A engines
8	5229285	- - - -	5229310	8478051	Yes	16-567D2,D3,D3A engines
†9	5229310	††5228605 5228750 5229285	- - - -	8478051	Yes	16-567D2,D3,D3A engines
10	5229000	- - - -	5229320	8478053	No	16-645E3A engines
†11	5229320	5229000	- - - -	8478053	Yes	8-645E3B; 16-645E3,E3A; 20-645E3B engines
†12	5229500	- - - -	- - - -	9081163	Yes	16-645E engines with 15 port liners
†13	5229510	- - - -	- - - -	9081164	Yes	8,12,16-645E engines rated at 835 RPM
†14	5229710	- - - -	- - - -	9333858	Yes	16-645E3A (F40PH); 8-645F3B; 12,16-645F3,F3B engines
†15	5229335	- - - -	- - - -	8478055	Yes	8-645E3C; 12-645E3B,E3C; 16-645E3B,E3C engines
†16	5226210	- - - -	- - - -	9561950	Yes	16-645F3B engines

† All replacement and current fuel injectors are low smoke with Low-Sac spray tips. Components of the current and previous design injectors differ only in the type of spray tips. All replacement spray tips for the previous style injectors will be of the current Low-Sac design.

†† For injectors without calibration slide - see Pages 5-7.

P.L. No. A111

FUEL INJECTORS



Ref. No. 1

PLATE A111-2

Ref. No.	Part Number	Quantity Required										Description
		A	B	C	D	E	F	G	H	J	K	
1	5228830	1	-	-	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229200
1	5229200	1	-	-	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5228895	-	1	-	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229250
1	5229250	-	1	-	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5228800	-	-	1	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229290
1	5229290	-	-	1	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5228750	-	-	-	1	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229310
1	5229285	-	-	-	1	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229310
1	5229310	-	-	-	1	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5229000	-	-	-	-	1	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229320
1	5229320	-	-	-	-	1	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5229500	-	-	-	-	-	1	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5229510	-	-	-	-	-	-	1	-	-	-	INJECTOR ASSEMBLY .. Fuel
1	5229710	-	-	-	-	-	-	-	1	-	-	INJECTOR ASSEMBLY .. Fuel
1	5229335	-	-	-	-	-	-	-	-	1	-	INJECTOR ASSEMBLY .. Fuel
1	5226210	-	-	-	-	-	-	-	-	-	1	INJECTOR ASSEMBLY .. Fuel
2	5228798	1	-	1	-	-	-	1	-	-	-	BODY ASSEMBLY .. Injector - Replaces 5228761
2	5228888	-	1	-	-	-	-	-	-	-	-	BODY ASSEMBLY .. Injector - Replaces 5228887
2	5228754	-	-	-	1	-	-	-	-	-	-	BODY ASSEMBLY .. Injector - Replaces 5228755
2	5229039	-	-	-	-	1	-	-	-	1	-	BODY ASSEMBLY .. Injector - Replaces 5229037
2	5228797	-	-	-	-	-	1	-	-	-	-	BODY ASSEMBLY .. Injector - Replaces 5228759
2	5229709	-	-	-	-	-	-	-	1	-	1	BODY ASSEMBLY .. Injector - Replaces 5229708
*3	5226912	2	-	2	-	-	2	2	-	-	-	PLUG .. Body
*3	5228462	-	2	-	2	2	-	-	2	2	2	PLUG .. Body
4	5226482	1	1	1	1	1	1	1	1	1	1	DOWEL .. Injector locating
5	5226727	1	1	1	1	1	1	1	1	1	1	PIN .. Rack guide
6	5226484	1	1	1	1	1	1	1	1	1	1	STUD .. Fuel connection
7	5228745	1	1	1	1	1	1	1	1	1	1	ADAPTOR .. Calibration slide
8	5228758	1	1	1	1	1	1	1	1	1	1	SCREW .. Set 8-32 x .220 - Nylock
9	9421614	1	1	1	1	1	1	1	1	1	1	SCREW .. Socket head cap 8-32 x 3/8
10	5226571	1	1	1	1	1	1	1	1	1	1	SEAL .. Body to nut

FUEL INJECTORS

Ref. No.	Part Number	Quantity Required										Description
		A	B	C	D	E	F	G	H	J	K	
		-	-	-	-	-	-	-	-	-	-	INJECTOR ASSEMBLY .. Fuel
11	5226496	1	-	1	1	-	1	1	-	-	-	RACK .. Injector
11	5228890	-	1	-	-	-	-	-	-	-	-	RACK .. Injector
11	5229045	-	-	-	-	1	-	-	1	1	1	RACK .. Injector
12	5227401	1	1	1	1	-	1	1	-	-	-	PIN .. Rack
12	5227688	-	-	-	-	1	-	-	1	1	1	PIN .. Rack
13	5228013	2	2	2	2	2	2	2	2	2	2	ELEMENT .. Filter - Stainless steel mesh
14	5226415	2	2	2	2	2	2	2	2	2	2	SPRING .. Filter
15	5226186	2	2	2	2	2	2	2	2	2	2	GASKET .. Cap
16	5226512	2	2	2	2	2	2	2	2	2	2	CAP .. Fuel filter
17	5228139	1	1	1	1	1	1	1	1	1	1	FOLLOWER .. Injector
18	5227914	1	1	1	1	1	1	1	1	1	1	PIN .. Stop
19	5227904	1	1	1	1	1	1	1	1	1	1	SPRING .. Stop pin
20	5228184	1	1	1	1	1	1	1	1	1	1	RETAINER .. Stop pin and spring
21	5226491	1	1	1	1	1	1	1	1	1	1	SPRING .. Plunger
22	5228545	1	1	1	1	1	1	1	1	1	1	NUT .. Injector
23	5229195	1	-	-	1	-	-	-	-	-	-	TIP ASM. .. 5 hole - Low-Sac - Includes needle valve
23	5229230	-	1	-	-	-	-	-	-	-	-	TIP ASM. .. 6 hole - Low-Sac - Includes needle valve
23	5229235	-	-	1	-	-	-	-	-	-	-	TIP ASM. .. 6 hole - Low-Sac - Includes needle valve
23	5229265	-	-	-	-	1	-	-	-	-	-	TIP ASM. .. 7 hole - Low-Sac - Includes needle valve
23	5229260	-	-	-	-	-	1	1	-	-	-	TIP ASM. .. 6 hole - Low-Sac - Includes needle valve
23	5229275	-	-	-	-	-	-	-	1	1	1	TIP ASM. .. 6 hole - Low-Sac - Includes needle valve
24	5228538	1	1	1	1	1	1	1	1	1	1	CAGE .. Needle valve spring
25	5228541	1	1	1	1	1	1	1	1	1	1	SEAT .. Valve spring
26	5228539	1	1	1	1	1	1	1	1	1	1	SPRING .. Valve
27	5228571	1	1	1	1	1	1	1	1	1	1	CAGE .. Check valve
28	5226950	1	1	1	1	1	1	1	1	1	1	VALVE .. Check
29	5228572	1	1	1	1	1	1	1	1	1	1	SPACER .. Check valve
30	5226574	1	1	1	1	1	1	1	1	1	1	DEFLECTOR .. Injector spill
31	5228236	1	-	1	-	-	-	1	-	-	-	PLUNGER ASSEMBLY .. Includes bushing
31	5228894	-	1	-	-	-	-	-	-	-	-	PLUNGER ASSEMBLY .. Includes bushing
31	5228574	-	-	-	1	-	-	-	-	-	-	PLUNGER ASSEMBLY .. Includes bushing
31	5229011	-	-	-	-	1	-	-	-	1	-	PLUNGER ASSEMBLY .. Includes bushing
31	5227853	-	-	-	-	-	1	-	-	-	-	PLUNGER ASSEMBLY .. Includes bushing
31	5229705	-	-	-	-	-	-	-	1	-	-	PLUNGER ASSEMBLY .. Includes bushing
31	5226464	-	-	-	-	-	-	-	-	-	1	PLUNGER ASSEMBLY .. Includes bushing
32	5228343	1	-	1	-	-	-	1	-	-	-	PIN .. Guide
32	5227923	-	1	-	-	1	-	-	1	1	1	PIN .. Guide
32	5226450	-	-	-	1	-	1	-	-	-	-	PIN .. Guide
33	5226499	1	-	1	1	-	1	1	-	-	-	RETAINER .. Gear
33	5228893	-	1	-	-	-	-	-	-	-	-	RETAINER .. Gear
33	5229052	-	-	-	-	1	-	-	1	1	1	RETAINER .. Gear
34	5226498	1	-	1	1	-	1	1	-	-	-	GEAR .. Rack
34	5228892	-	1	-	-	-	-	-	-	-	-	GEAR .. Rack
34	5228408	-	-	-	-	1	-	-	1	1	1	GEAR .. Rack
*35	5226714	2	2	2	2	2	2	2	2	2	2	CAP .. Protective - Used on Ref. 16 for storage
+*36	8032718	1	1	1	1	1	1	1	1	1	1	NUT .. Lock - Fuel line to injector - See Parts List No. 148

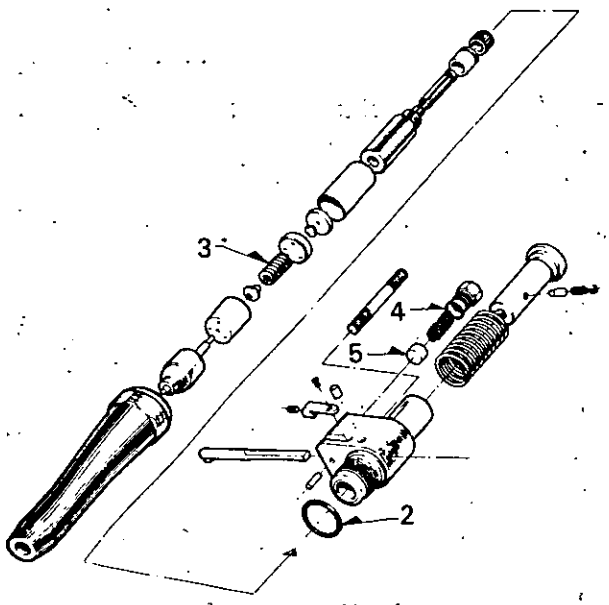
For Injector Repair Kits - See Pages 4 and 5.

P.L. No. A111

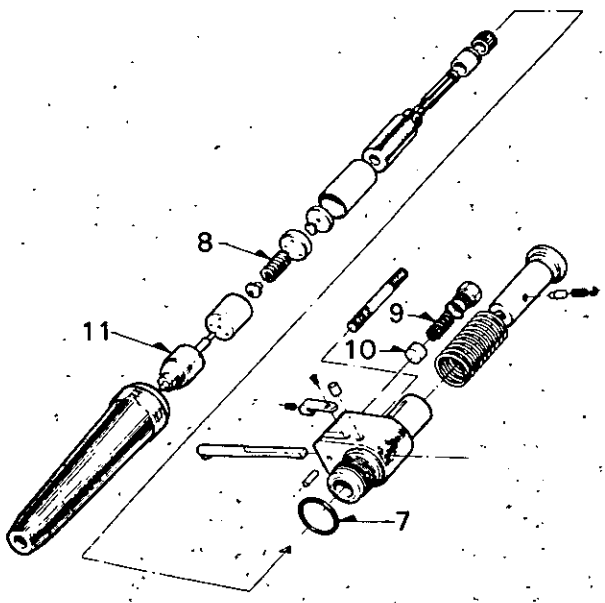
FUEL INJECTORS
Repair Kits
PLATE A111-3

Ref. No.	Part Number	Quantity Required										Description
		A	-	-	-	-	-	-	-	-	-	5228830 and 5229200 fuel injectors
		-	B	-	-	-	-	-	-	-	-	5228895 and 5229250 fuel injectors
		-	-	C	-	-	-	-	-	-	-	5228800 and 5229290 fuel injectors
		-	-	-	D	-	-	-	-	-	-	5228750, 5229285 and 5229310 fuel injectors
		-	-	-	-	E	-	-	-	-	-	5229000 and 5229320 fuel injectors
		-	-	-	-	-	F	-	-	-	-	5229500 fuel injector
		-	-	-	-	-	-	G	-	-	-	5229510 fuel injector
		-	-	-	-	-	-	-	H	-	-	5229710 fuel injector
		-	-	-	-	-	-	-	-	J	-	5229335 fuel injector
		-	-	-	-	-	-	-	-	-	K	5226210 fuel injector
1	5228836	1	1	1	1	1	1	1	1	1	1	KIT .. Basic repair
2	5226571	1	1	1	1	1	1	1	1	1	1	SEAL .. Injector nut to body
3	5228539	1	1	1	1	1	1	1	1	1	1	SPRING .. Needle valve
4	5226186	2	2	2	2	2	2	2	2	2	2	GASKET .. Filter cap to body
5	5228013	2	2	2	2	2	2	2	2	2	2	ELEMENT .. Filter - Stainless steel mesh
6	5229238	1	-	-	1	-	-	-	-	-	-	KIT .. Basic repair with Low-Sac tip assembly
6	5229258	-	1	-	-	-	-	-	-	-	-	KIT .. Basic repair with Low-Sac tip assembly
6	5229288	-	-	1	-	-	-	-	-	-	-	KIT .. Basic repair with Low-Sac tip assembly
6	5229321	-	-	-	-	1	-	-	-	-	-	KIT .. Basic repair with Low-Sac tip assembly
6	5229704	-	-	-	-	-	1	1	-	-	-	KIT .. Basic repair with Low-Sac tip assembly
6	5229336	-	-	-	-	-	-	-	1	1	1	KIT .. Basic repair with Low-Sac tip assembly
7	5226571	1	1	1	1	1	1	1	1	1	1	SEAL .. Injector nut to body
8	5228539	1	1	1	1	1	1	1	1	1	1	SPRING .. Needle valve
9	5226186	2	2	2	2	2	2	2	2	2	2	GASKET .. Filter cap to body
10	5228013	2	2	2	2	2	2	2	2	2	2	ELEMENT .. Filter - Stainless steel mesh
11	----	1	1	1	1	1	1	1	1	1	1	TIP ASSEMBLY .. Low-Sac - See Ref. No. 23 on Page 3
12	5229239	1	-	-	-	-	-	-	-	-	-	KIT .. Repair - Injector service
12	5229259	-	1	-	-	-	-	-	-	-	-	KIT .. Repair - Injector service
12	5229291	-	-	1	-	-	-	-	-	-	-	KIT .. Repair - Injector service
12	5229843	-	-	-	-	1	-	-	-	-	-	KIT .. Repair - Injector service
12	5229461	-	-	-	-	-	-	-	1	-	-	KIT .. Repair - Injector service
12	5229945	-	-	-	-	-	-	-	-	1	-	KIT .. Repair - Injector service
13	5226571	1	1	1	-	1	-	-	1	1	-	SEAL .. Injector nut to body
14	5228539	1	1	1	-	1	-	-	1	1	-	SPRING .. Needle valve
15	5226186	2	2	2	-	2	-	-	2	2	-	GASKET .. Filter cap to body
16	5228013	2	2	2	-	2	-	-	2	2	-	ELEMENT .. Filter - Stainless steel mesh
17	----	1	1	1	-	1	-	-	1	1	-	PLUNGER .. Includes bushing - See Ref. No. 31 on Page 3
18	5228572	1	1	1	-	1	-	-	1	1	-	SPACER .. Check valve
19	5226950	1	1	1	-	1	-	-	1	1	-	VALVE .. Check
20	5228541	1	1	1	-	1	-	-	1	1	-	SEAT .. Valve spring
21	5228571	1	1	1	-	1	-	-	1	1	-	CAGE .. Check valve
22	5228538	1	1	1	-	1	-	-	1	1	-	CAGE .. Needle valve spring
23	----	1	1	1	-	1	-	-	1	1	-	TIP ASM. .. Low-Sac - See Ref. No. 23 on Page 3
24	5229779	1	1	1	1	1	1	1	1	1	1	KIT .. Injector repair - Included in Ref. No. 31
25	5228571	1	1	1	1	1	1	1	1	1	1	CAGE .. Check valve
26	5228572	1	1	1	1	1	1	1	1	1	1	SPACER .. Check valve
27	5226950	1	1	1	1	1	1	1	1	1	1	VALVE .. Check
28	5228539	1	1	1	1	1	1	1	1	1	1	SPRING .. Needle valve
29	5228538	1	1	1	1	1	1	1	1	1	1	CAGE .. Needle valve spring
30	5228541	1	1	1	1	1	1	1	1	1	1	SEAT .. Valve spring
31	5229246	1	-	-	1	-	-	-	-	-	-	KIT .. Injector repair
31	5229248	-	-	1	-	-	-	-	-	-	-	KIT .. Injector repair
*32	5229779	1	-	1	1	-	-	-	-	-	-	KIT .. Injector repair
33	5229195	1	-	-	1	-	-	-	-	-	-	TIP ASM. .. 5 hole - Low-Sac - Includes needle valve
33	5229235	-	-	1	-	-	-	-	-	-	-	TIP ASM. .. 6 hole - Low-Sac - Includes needle valve

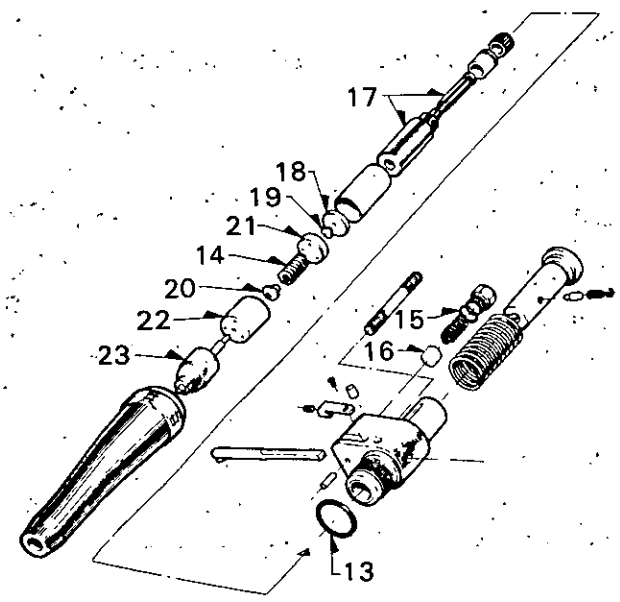
FUEL INJECTORS



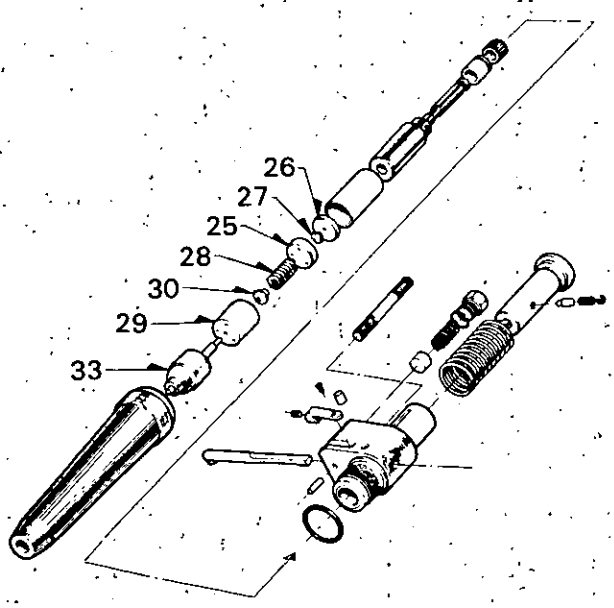
Kit - Ref. No. 1



Kit - Ref. No. 6



Kit - Ref. No. 12



Kit - Ref. Nos. 24 and 31

PLATE A111-3

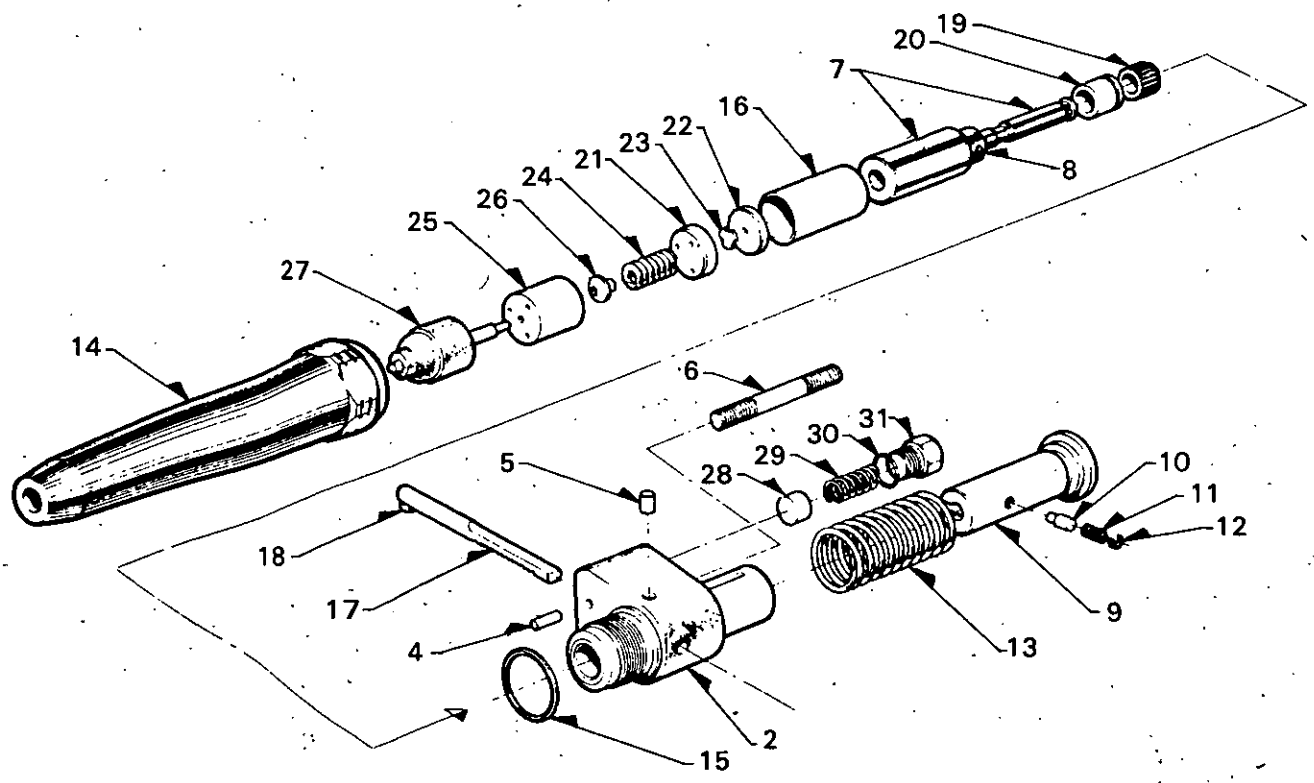
P.L. No. A111

FUEL INJECTOR

Without Calibration Slide
16-567D1,D2,D3,D3A Engines
PLATE A111-4

Ref. No.	Part Number	Qty. Req.		Description
1	5228605	1	-	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229310 - UTEX 8478051
1	5228540	-	1	INJECTOR ASSEMBLY .. Fuel - Replaced by 5229290 - UTEX 8477971
2	5228503	1	-	BODY ASSEMBLY .. Injector - Replaces 5228504
2	5228244	-	1	BODY ASSEMBLY .. Injector - Replaces 5228245
*3	5226912	2	2	PLUG .. Body
4	5226482	1	1	DOWEL .. Injector locating
5	5226727	1	1	PIN .. Rack guide
6	5226484	1	1	STUD .. Fuel connection
7	5228574	1	-	PLUNGER ASSEMBLY .. Includes bushing
7	5228236	-	1	PLUNGER ASSEMBLY .. Includes bushing
8	5226450	1	-	PIN .. Guide
8	5228343	-	1	PIN .. Guide
9	5228139	1	1	FOLLOWER .. Injector
10	5227914	1	1	PIN .. Stop
11	5227904	1	1	SPRING .. Stop pin
12	5228184	1	1	RETAINER .. Stop pin
13	5226491	1	1	SPRING .. Plunger
14	5228545	1	1	NUT .. Injector
15	5226571	1	1	SEAL .. Body to nut
16	5226574	1	1	DEFLECTOR .. Injector spill
17	5226496	1	1	RACK ASSEMBLY .. Injector
18	5227401	1	1	PIN .. Rack
19	5226498	1	1	GEAR .. Rack
20	5226499	1	1	RETAINER .. Gear
21	5228571	1	1	CAGE .. Check valve
22	5228572	1	1	SPACER .. Check valve
23	5226950	1	1	VALVE .. Check
24	5228539	1	1	SPRING .. Needle valve
25	5228538	1	1	CAGE .. Needle valve spring
26	5228541	1	1	SEAT .. Needle valve spring
27	5229235	1	1	TIP ASSEMBLY .. Low-Sac - Replaces 5229242, 5229243 and 5229244
28	5228013	2	2	ELEMENT .. Filter - Stainless steel mesh
29	5226415	2	2	SPRING .. Filter
30	5226186	2	2	GASKET .. Filter cap
31	5226512	2	2	CAP .. Filter
*32	5226714	2	2	CAP .. Protective - Used on Ref. No. 31 for shipping and storage
*33	8032178	2	2	NUT .. Lock - Fuel line to injector
*34	5228836	1	1	KIT .. Basic repair - See Ref. No. 1 on Page 4 for components
*35	5229779	1	1	KIT .. Injector - See Ref. No. 24 on Page 4 for components
*36	5229288	1	1	KIT .. Repair - Replaces 5229287 and 5229289
*37	5229235	1	1	TIP ASSEMBLY .. Low-Sac - Replaces 5229242, 5229243 and 5229244
*38	5226571	1	1	SEAL .. Injector nut to body
*39	5228539	1	1	SPRING .. Needle valve
*40	5226186	2	2	GASKET .. Filter cap to body
*41	5228013	2	2	ELEMENT .. Filter - Stainless steel mesh
*42	5229248	1	1	KIT .. Repair - Replaces 5229247 and 5229249
*43	5229235	1	1	TIP ASSEMBLY .. Low-Sac - Replaces 5229242, 5229243 and 5229244
*44	5228571	1	1	CAGE .. Check valve
*45	5228572	1	1	SPACER .. Check valve
*46	5226950	1	1	VALVE .. Check
*47	5228539	1	1	SPRING .. Needle valve
*48	5228538	1	1	CAGE .. Needle valve spring
*49	5228541	1	1	SEAT .. Valve spring

FUEL INJECTORS



Ref. No. 1

PLATE A111-4

Parts List No. A113

EXHAUST VALVE BRIDGE, ROCKER ARMS AND OIL LINES

All Engines

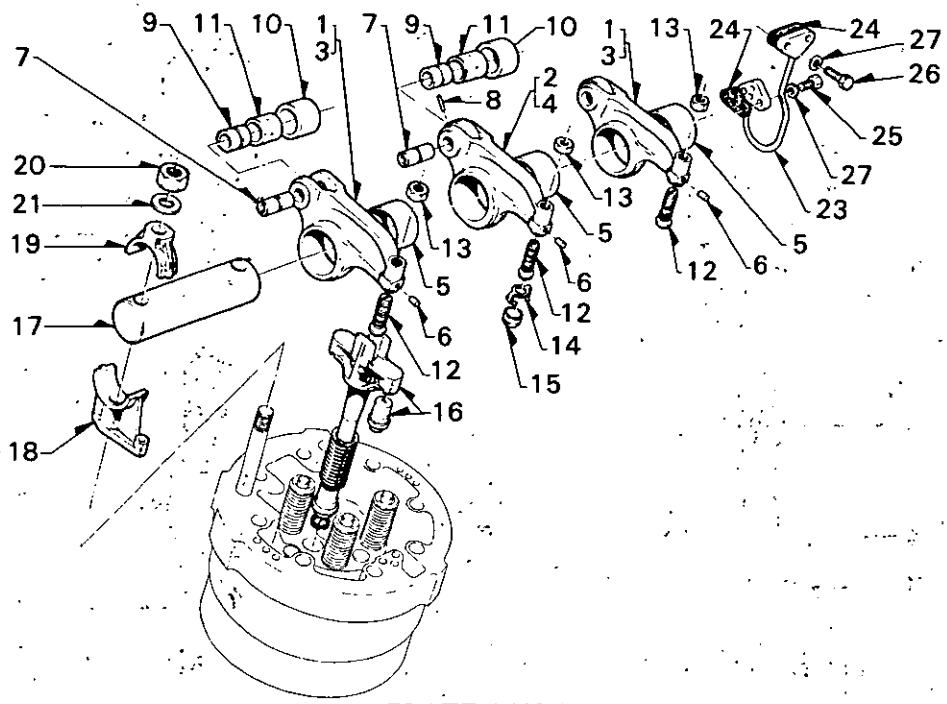


PLATE A113-1

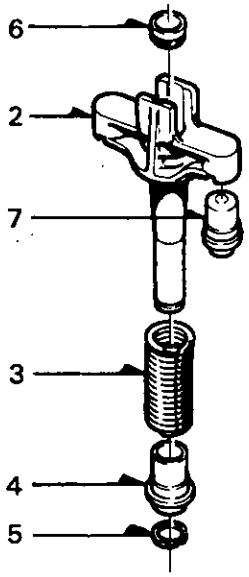
Ref. No.	Part Number	Quantity Required A		Quantity Required B		Description
		A		B		567D1,D2,D3,D3A and 645E,E3,E3A engines } *Quantities Shown Are For* 645E3B,E3C,F3,F3B engines } *One Cylinder Head Asm.*
1	8328694	2	-	-	-	ARM ASSEMBLY .. Rocker - Exhaust valve
1	9319505	-	-	2	-	ARM ASSEMBLY .. Rocker - Exhaust valve
2	8456128	-	1	-	-	ARM ASSEMBLY .. Rocker - Injector
2	9319504	-	-	-	1	ARM ASSEMBLY .. Rocker - Injector
3	8328695	2	-	2	-	ARM .. Rocker - Exhaust valve
4	8456127	-	1	-	1	ARM .. Rocker - Injector
5	8055322	2	1	2	1	BUSHING .. Rocker arm
6	141126	2	1	2	1	PIN .. Dowel 5/32 x 1/4 inch long
7	8146111	2	1	2	1	PIN .. Cam follower
8	442919	2	1	2	1	PIN .. Groove 1/8 x 7/8 inch long
9	8135970	2	1	2	1	RACE .. Inner
10	8051006	2	1	-	-	ROLLER .. Cam follower
10	9319503	-	-	2	1	ROLLER .. Cam follower - Crowned
11	8135971	2	1	2	1	BUSHING .. Floating
12	8052327	2	1	2	1	SCREW .. Adjusting
13	8028723	2	1	2	1	NUT .. Lock 5/8-18
14	8031925	-	1	-	1	SPRING .. Button retaining
15	8052307	-	1	-	1	BUTTON .. Injector
16	8085260	2		2		BRIDGE .. Exhaust valve - See Page 2
17	8028460	1		1		SHAFT .. Rocker arm
†18	9090607	2		2		SUPPORT .. Rocker arm shaft
†19	9090608	2		2		CAP .. Support - Replaces 8405773 } Formerly 8028459
20	8487866	2		2		NUT .. Hex 1-14
21	8421965	2		2		WASHER .. Hardened - Special } See Ref. No. 22
*22	8307731	A.R.		A.R.		LUBRICANT .. Thread - Applied to Ref. Nos. 20 and 21 - For more information, see Pointers of September 17, 1973.
+23	8039842	1		1		LINE ASSEMBLY .. Lube oil - Rocker arm shaft
+24	8029167	2		2		GASKET .. Lube oil line to camshaft block
+25	181311	2		2		BOLT .. Hex head 1/4-28 x 5/8 - Oil line to rocker arm shaft
+26	179795	2		2		BOLT .. Hex head 1/4-20 x 3/4 - Oil line to camshaft bearing block
+27	103319	4		4		WASHER .. Lock - 1/4

† *Illustration shows former style Support and Cap Assembly - 8028459.*

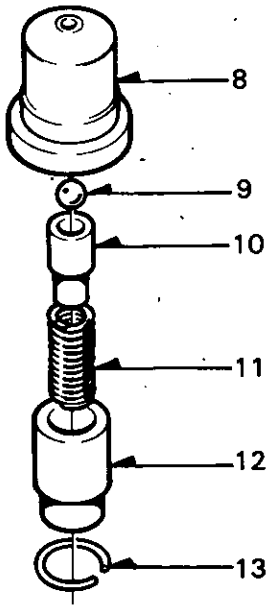
P.L. No. A113

EXHAUST VALVE BRIDGE, ROCKER ARMS AND OIL LINES

Exhaust Valve Bridge And Lash Adjuster



Ref. No. 1



Ref. No. 7

PLATE A113-2

Ref. No.	Part Number	Qty. Req.	Description
1	8085260	1	BRIDGE ASSEMBLY .. Exhaust valve
2	8054088	1	BRIDGE .. Exhaust valve
3	8068791	1	SPRING .. Bridge
4	8028126	1	SEAT .. Spring
5	8028136	1	RING .. Locking
6	8052307	1	BUTTON .. Bridge
7	8085254	2	ADJUSTER ASSEMBLY .. Lash - UTEX Part No. 8326078
8	8081806	2	BODY .. Lash adjuster
9	145636	2	BALL .. Check
10	8052331	2	RETAINER .. Ball
11	8052319	2	SPRING .. Lash adjuster
12	8081808	2	PLUNGER .. Lash adjuster
13	8052320	2	RING .. Locking

Part List No. A115

INJECTOR CONTROL LINKAGE

Standard Type Adjusting Link
16-567D1,D2,D3,D3A; 8-645E,E3B,E3C,F3B; 12,16-645E,E3,E3B,E3C,F3,F3B;
16-645E3A and 20-645E3,E3B Engines

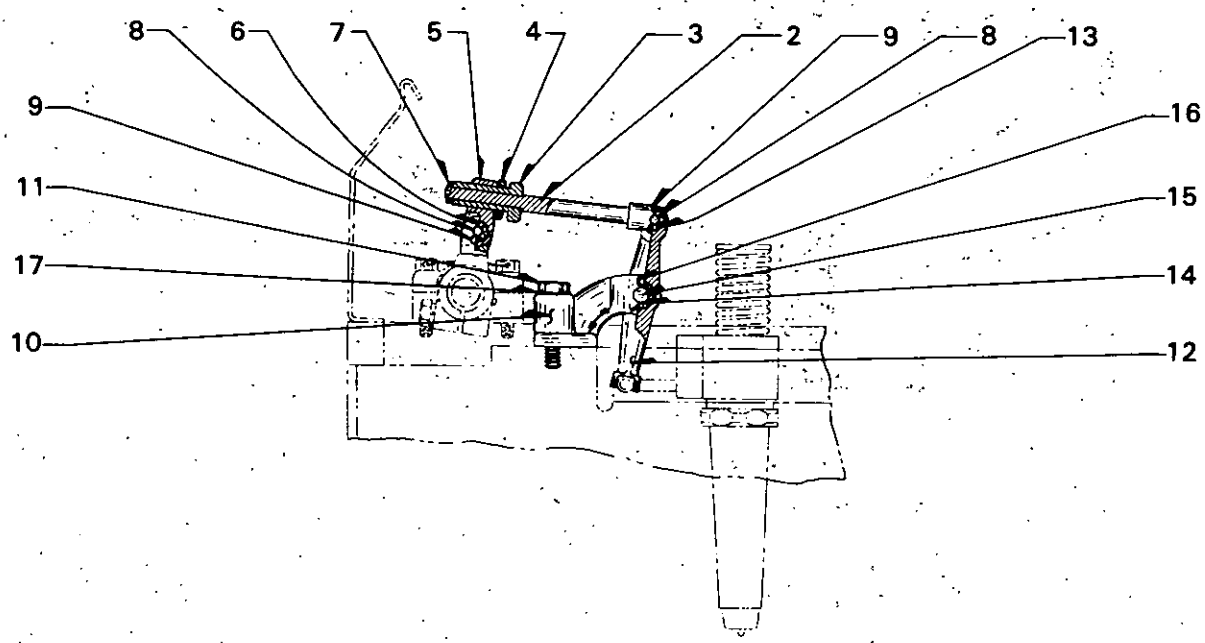


PLATE A115-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8 cylinder engines
		-	B	-	-	12 cylinder engines
		-	-	C	-	16 cylinder engines
		-	-	-	D	20 cylinder engines
Quantities listed are for one engine.						
*1	8070027	8	12	16	20	LINK ASSEMBLY .. Adjusting - Standard type
2	8069697	8	12	16	20	SHAFT .. Link
3	8034849	8	12	16	20	COLLAR .. Shaft
4	8034846	8	12	16	20	NUT .. Hex collar 5/8-24
5	8359417	8	12	16	20	LINK .. Adjusting
6	148401	8	12	16	20	BEARING .. Needle
7	8034847	8	12	16	20	WASHER .. Peened to shaft
8	8028103	16	24	32	40	PIN .. Clevis - 1/4 x 1-1/8 inches long
9	148147	16	24	32	40	RETAINER .. Spring - 3/16 diameter groove
10	9541016	8	12	16	20	BRACKET .. Control lever - Replaces 8418278
11	179890	8	12	16	20	BOLT .. Hex head 1/2-13 x 2-1/4
12	9522625	8	12	16	20	LEVER ASSEMBLY .. Injector control - Formerly 8215506
13	148401	8	12	16	20	BEARING .. Needle
14	148402	8	12	16	20	BEARING .. Needle
15	8028098	8	12	16	20	PIN .. Clevis - 1/2 x 1-3/32 inches long
16	148151	8	12	16	20	RETAINER .. Spring - 7/16 diameter groove
17	6101229	8	12	16	20	WASHER .. Flat 1/2 - Formerly 103323 lockwasher

P.L. No. A115

INJECTOR CONTROL LINKAGE

Spring-Loaded Adjusting Link
16-645E3A,E3C Engines – Models F40PH and F40PH-2 Locomotives

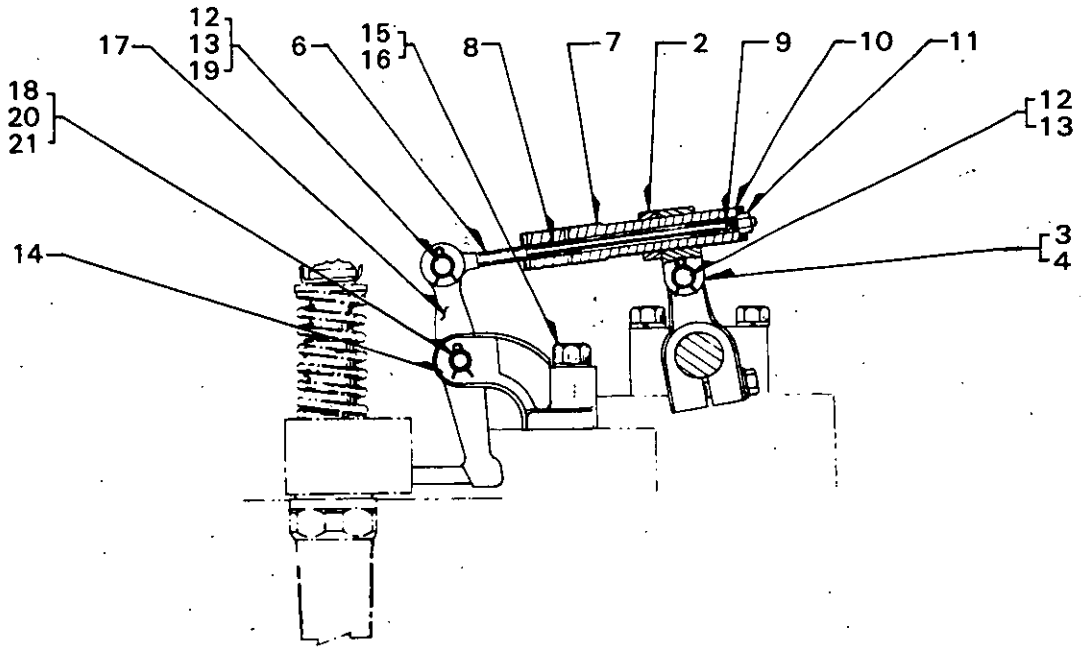


PLATE A115-2

Ref. No.	Part Number	Qty. Req.	Description
Quantities listed are for one engine.			
*1	8305892	16	LINK ASSEMBLY .. Adjusting - Injector control - Spring loaded
2	8034846	16	NUT .. Hex 5/8-24
3	8359417	16	LINK .. Adjusting
4	148401	16	BEARING .. Needle
*5	3328369	16	SLIP JOINT ASSEMBLY .. Injector control
6	3328360	16	ROD .. Clevis
7	3328361	16	SLEEVE .. Slip joint
8	3250496	16	SPRING .. Tension
9	3247166	32	COLLAR .. Spring holding
10	3345099	32	RING .. Snap
11	3328504	32	NUT .. Special
12	8028103	32	PIN .. Clevis - Link attaching - 1/4 x 1-1/8 inches
13	148147	32	RETAINER .. Spring - Clevis pin - 3/16 diameter groove
14	9541016	16	BRACKET .. Control lever - Replaces 8418278
15	179890	16	BOLT .. Hex head 1/2-13 x 2-1/4 - Bracket mounting
16	6101229	16	WASHER .. Plain 1/2
17	9522625	16	LEVER ASSEMBLY .. Injector control - Formerly 8215506
18	148402	16	BEARING .. Needle
19	148401	16	BEARING .. Needle
20	8028098	16	PIN .. Clevis 1/2 x 1-1/16 inches - Lever to bracket
21	148151	16	RETAINER .. Spring - Clevis pin - 7/16 diameter groove

35605, 42881

P.L. No. A115

INJECTOR CONTROL LINKAGE

Control Shaft, Support Bracket and Bearings
All Engines

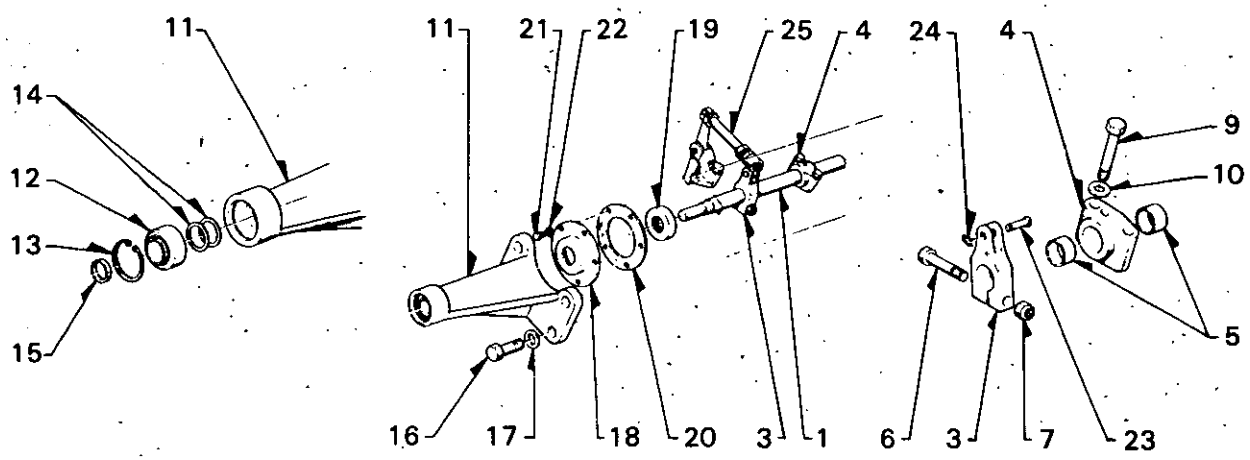


PLATE A115-3

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engines } *Quantities Shown Are For One Engine Assembly*
		-	B	-	-	12-645 engines
		-	-	C	-	16-645 engines
		-	-	-	D	20-645 engines
1	8196851	1	-	-	-	SHAFT ASM. .. Injector control - Left bank
1	8196853	-	1	-	-	SHAFT ASM. .. Injector control - Left bank
1	8196855	-	-	1	-	SHAFT ASM. .. Injector control - Left bank } *See Page 4 For Optional Two-Piece Service Kits*
1	8360853	-	-	-	1	SHAFT ASM. .. Injector control - Left bank
*2	8196852	1	-	-	-	SHAFT ASM. .. Injector control - Right bank
*2	8196854	-	1	-	-	SHAFT ASM. .. Injector control - Right bank
*2	8196856	-	-	1	-	SHAFT ASM. .. Injector control - Right bank } *See Page 4 For Optional Two-Piece Service Kits*
*2	8360850	-	-	-	1	SHAFT ASM. .. Injector control - Right bank
3	8360051	8	12	16	20	LEVER .. Injector control shaft
4	8443643	8	12	16	20	BEARING AND SUPPORT ASSEMBLY .. Replaces 8360052
5	8443644	16	24	32	40	BUSHING .. Support
6	181379	8	12	16	20	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
7	8032717	8	12	16	20	NUT .. Hex lock 3/8-24
*8	9411615	8	12	16	20	PIN .. Spring 7/32 x 1-1/2 inches long - Lever to shaft
ϕ9	181379	16	24	32	40	BOLT .. Hex head 3/8-24 x 2 - Applied to former bearing 8360052 only
ϕ9	181381	16	24	32	40	BOLT .. Hex head 3/8-24 x 2-1/2 - Applied to current bearing 8443643 only
10	6101225	16	24	32	40	WASHER .. Flat 1/4
11	8451755	2	2	2	2	BRACKET ASSEMBLY .. Support - Formerly 8069712
12	908085	2	2	2	2	BEARING .. Ball - Formerly 954157
13	8054053	2	2	2	2	RING .. Snap - Bearing retaining
*13A	8487996	2	2	2	2	SHIM .. Support bracket - .014 inch thick - Applied with 8069712 support bracket on shortened crankcases
14	8061581	As Required				SHIM .. Bearing to bracket - .015 thick
15	8054047	2	2	2	2	SPACER .. Control lever - 5/32
ϕ16	181428	8	8	8	8	BOLT .. Hex head 1/2-20 x 1-1/8
17	6101229	8	8	8	8	WASHER .. Aircraft type - 1/2
18	8070619	2	2	2	2	RETAINER ASSEMBLY .. Oil seal
19	8028752	2	2	2	2	SEAL .. Oil
20	8070521	2	2	2	2	GASKET .. Retainer
21	181313	10	10	10	10	BOLT .. Hex head 1/4-28 x 3/4 - Retainer mounting
22	9414320	10	10	10	10	WASHER .. Flat 1/4 - Formerly 108578 and 8407353
23	8028103	8	12	16	20	PIN .. Clevis - Control lever to adjusting link
24	148147	8	12	16	20	RETAINER .. Clevis pin - Spring type
25	- - - -	-	-	-	-	LINK ASM. .. Adjusting - See Pages 1 and 2

P.L. No. A115

INJECTOR CONTROL LINKAGE

Two-Piece Control Shaft Kits
For 16,20-645 Engines
Not Illustrated

As a service option to the one-piece injector control shafts shown on Page 3, two-piece control shaft kits are available for 16 and 20-cylinder engines. These kits eliminate the need for removal of the cylinder head cover support frames when replacement is required.

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-645 engines
		-	B	20-645 engines
1	9084412	1	-	KIT .. Control shaft - Left bank - Service option for 8196855
1	9084402	-	1	KIT .. Control shaft - Left bank - Service option for 8360853
†2	9084413	1	-	SHAFT ASSEMBLY .. Left bank - Rear
†2	9084404	-	1	SHAFT ASSEMBLY .. Left bank - Rear
†3	9084414	1	-	SHAFT ASSEMBLY .. Left bank - Front
†3	9084403	-	1	SHAFT ASSEMBLY .. Left bank - Front
4	181379	2	2	BOLT .. Hex head 3/8-24 x 2 - Front shaft to rear shaft connecting
5	8032717	2	2	NUT .. Hex lock 3/8-24
6	9084409	1	-	KIT .. Control shaft - Right bank - Service option for 8196856
6	9084399	-	1	KIT .. Control shaft - Right bank - Service option for 8360850
†7	9084410	1	-	SHAFT ASSEMBLY .. Right bank - Rear
†7	9084400	-	1	SHAFT ASSEMBLY .. Right bank - Rear
†8	9084411	1	-	SHAFT ASSEMBLY .. Right bank - Front
†8	9084401	-	1	SHAFT ASSEMBLY .. Right bank - Front
9	181379	2	2	BOLT .. Hex head 3/8-24 x 2 - Front shaft to rear shaft connecting
10	8032717	2	2	NUT .. Hex lock 3/8-24

† Each shaft assembly includes the following components in the quantities indicated.

11	8360051	4	4	LEVER .. Injector control shaft
12	8443643	4	4	BEARING AND SUPPORT ASSEMBLY .. Includes bushings
13	181379	4	4	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
14	8032717	4	4	NUT .. Hex lock 3/8-24
15	9411615	4	4	PIN .. Spring 7/32 x 1-1/2 inches long - Lever to shaft

INJECTOR CONTROL LINKAGE

Lever and Control Rod
All Engines

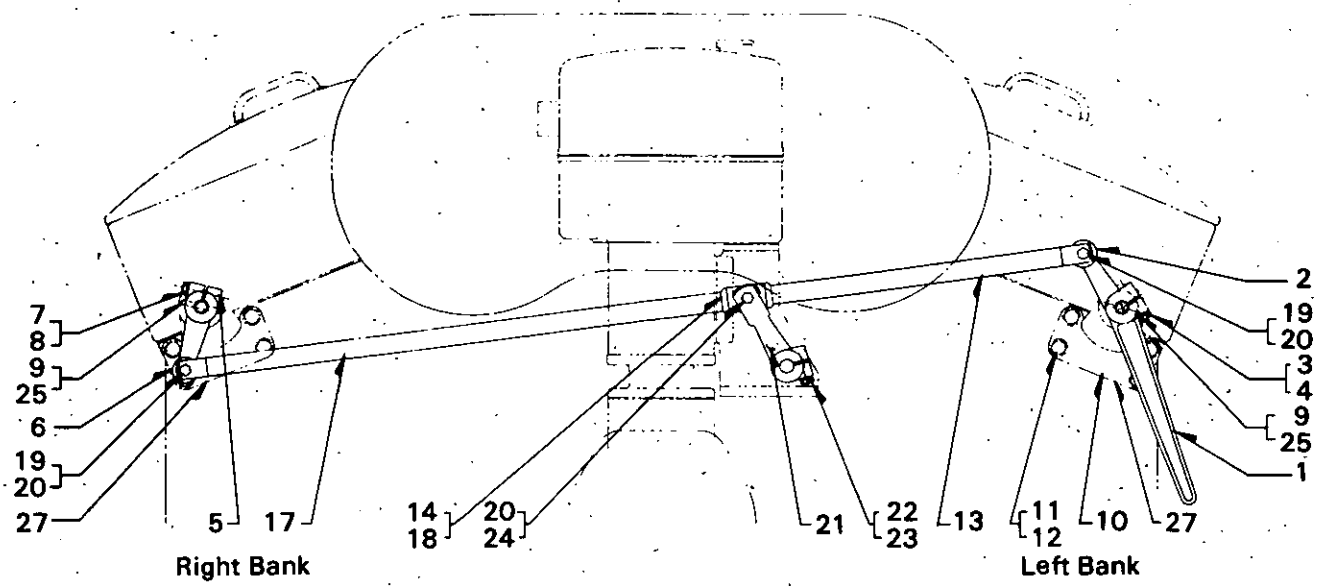


PLATE A115-4

Ref. No.	Part Number	Qty. Req.	Description
			Quantities listed are for one engine and are applicable to both 567D and 645 engines unless otherwise specified in the description column.
1	8451739	1	LEVER ASM. .. Manual control - Injector control shaft - Left bank - 16-567D1; 8,12, 16-645E,E3B,E3C,F3B; 12,16-645E3,F3; 16-645E3A and 20-645E3,E3B - Form. 8194651
*1A	8452059	1	LEVER ASM. .. Manual control - Injector control shaft - Left bank - 16-567D2,D3, D3A and 16-567D1 when pressure switch 8297986 is applied - Form. 8237277
2	954285	1	BEARING .. Ball
3	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4 - Injector control shaft - Formerly 181378
4	6101225	1	WASHER .. Plain 3/8 - Formerly 103321 lockwasher
			Items 2, 3 and 4 are applicable to both items 1 and 1A.
5	8451749	1	LEVER ASM. .. Manual control - Injector control shaft - Right bank - Form. 8194652
6	954285	1	BEARING .. Ball
7	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4 - Injector control shaft - Formerly 181378
8	6101225	1	WASHER .. Plain 3/8 - Formerly 103321 lockwasher
9	103608	2	PIN .. Taper - No. 4 x 2 inches long
+10	8451755	2	BRACKET ASSEMBLY .. Support - Outer end bearing - See Page 3
11	181428	8	BOLT .. Hex head 1/2-20 x 1-1/8 - Bracket to crankcase
12	6101229	8	WASHER .. Plain 1/2
13	8451757	1	LINK ASSEMBLY .. Control - Left bank - Replaces 8194653 and 8329598
14	954285	1	BEARING .. Ball
*15	103028	1	NUT .. Hex 1/2-20 - Control link } Applicable to 8194653 only,
*16	8196848	1	CLEVIS .. Adjustable - Control rod } see Ref. No. 13
17	8451756	1	LINK ASSEMBLY .. Control - Right bank - Formerly 8194649
18	954285	1	BEARING .. Ball
19	8080078	2	BOLT .. Hex head 5/16-24 x 1-17/32 - Control lever to link
20	8032716	3	NUT .. Hex lock 5/16-24 - Control lever to link
21	8215509	1	LEVER .. Governor to control rod - 16-567D1; 8,12,16-645E; 12,16,20-645E3 and 16,20-645E3A
*21A	8275674	1	LEVER .. Governor to control rod - 16-567D2,D3,D3A
22	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4 - Lever clamping - Formerly 181378
23	6101225	1	WASHER .. Plain 3/8 - Formerly 103321 lockwasher
24	8194650	1	BOLT .. Hex head 5/16-24 x 2 - Control link to lever
25	8054047	2	SPACER .. Control lever
*26	124548	1	KEY .. Woodruff - No. 8 - Applied to control rod lever with keyed shaft
27	8487996	2	SHIM .. Support bracket - Refer to Pointers Article, July 16, 1973

Parts List No. F118

CRANKSHAFT, MAIN BEARINGS AND MAIN BEARING CAPS

Crankshaft and Main Bearings 8-645 Engines

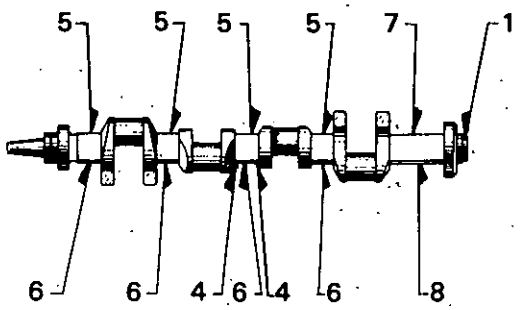


PLATE D118-1

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	9546459	1	CRANKSHAFT .. Engine - Standard - Replaces 8235623, 8235793 or 8434197
†ϕ*1	9323404	1	CRANKSHAFT .. Engine - Stubless
*2	426318	4	PLUG .. Pipe - 3/8 - Hex socket
*3	8348618	1	PLUG .. Pipe - 1/4 - Square socket
4	8028006	2	COLLAR .. Thrust - Standard thickness - Consists of two halves
			8081195 .. .015 OS 8141702 .. .030 OS
5	8455862	4	BEARING .. Main - Front and intermediate - Upper - Standard I.D.
			8455863 .. .031 US 8455865 .. .093 US
			8455864 .. .062 US 8455866 .. .125 US
6	8455666	4	BEARING .. Main - Front and intermediate - Lower - Standard I.D.
			8455683 .. .031 US 8455685 .. .093 US
			8455684 .. .062 US 8455686 .. .125 US
7	8455844	1	BEARING .. Main - Rear - Upper - Standard I.D.
			8455845 .. .031 US 8455847 .. .093 US
			8455846 .. .062 US 8455848 .. .125 US
8	8455665	1	BEARING .. Main - Rear - Lower - Standard I.D.
			8455679 .. .031 US 8455681 .. .093 US
			8455680 .. .062 US 8455682 .. .125 US
*9	8491160	1	KIT .. Upper main bearing - Standard I.D. - Consists of all the upper main bearings (Ref. Nos. 5 and 7) in the quantities listed above
*10	8491161	1	KIT .. Lower main bearing - Standard I.D. - Consists of all the lower main bearings (Ref. Nos. 6 and 8) in the quantities listed above

† For applicable stubshaft, see Parts List No. 122.

P.L. No. F118

CRANKSHAFT, MAIN BEARINGS AND MAIN BEARING CAPS

Crankshaft and Main Bearings 12-645 Engines

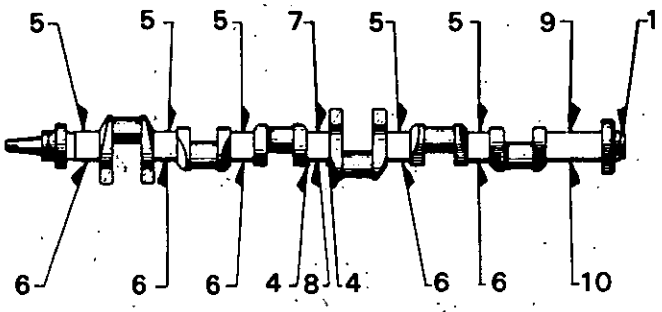


PLATE B118-2

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	9547357	1	CRANKSHAFT .. Engine - Standard - Replaces 8034709 or 8434198
ƒϕ*1	8481829	1	CRANKSHAFT .. Engine - Stubless
*2	426318	6	PLUG .. Pipe - 3/8 - Hex socket
*3	8348618	1	PLUG .. Pipe - 1/4 - Square Socket
4	8028419	2	COLLAR .. Thrust - Standard thickness - Consists of two halves 8081194 .. .015 oversize 8146108 .. .030 oversize
5	8455862	5	BEARING .. Main - Front and intermediate - Upper - Standard I.D. 8455863 .. .031 US 8455865 .. .093 US 8455864 .. .062 US 8455866 .. .125 US
6	8455666	5	BEARING .. Main - Front and intermediate - Lower - Standard I.D. 8455683 .. .031 US 8455685 .. .093 US 8455684 .. .062 US 8455686 .. .125 US
7	8455850	1	BEARING .. Main - Center - Upper - Standard I.D. 8455851 .. .031 US 8455853 .. .093 US 8455852 .. .062 US 8455854 .. .125 US
8	8455667	1	BEARING .. Main - Center - Lower - Standard I.D. 8455687 .. .031 US 8455689 .. .093 US 8455688 .. .062 US 8455690 .. .125 US
9	8455844	1	BEARING .. Main - Rear - Upper - Standard I.D. 8455845 .. .031 US 8455847 .. .093 US 8455846 .. .062 US 8455848 .. .125 US
10	8455665	1	BEARING .. Main - Rear - Lower - Standard I.D. 8455679 .. .031 US 8455681 .. .093 US 8455680 .. .062 US 8455682 .. .125 US
*11	8455081	1	KIT .. Upper main bearing - Standard I.D. - Contains all the upper main bearings (Ref. Nos. 5,7 and 9) in the quantities listed above
*12	8455083	1	KIT .. Lower main bearing - Standard I.D. - Contains all the lower main bearings (Ref. Nos. 6,8 and 10) in the quantities listed above

ƒ For applicable stubshaft, See Parts List No. 122.

P.L. No. F118

CRANKSHAFT, MAIN BEARINGS AND MAIN BEARING CAPS

Crankshaft and Main Bearings 16-567D and 16-645 Engines

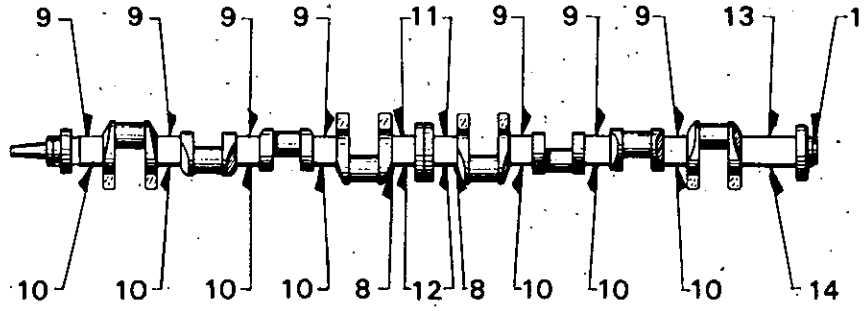


PLATE B118-3

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	8034708	1	CRANKSHAFT .. Engine - Standard - Replaces 8375901
†ϕ*1	8482822	1	CRANKSHAFT .. Engine - Stubless - Except F40C,F40PH and F40PH-2 Locomotives
†ϕ*1	8492275	1	CRANKSHAFT .. Engine - Stubless - F40C,F40PH and F40PH-2 Locomotives
*2	426318	8	PLUG .. Pipe - 3/8 - Hex socket
*3	8365851	6	PLATE .. Lock
*4	223784	6	BOLT .. Hex head 1-14 x 2-3/4 - Crankshaft connecting
*5	8028398	3	DOWEL .. Tapered - With 1-1/2 - 12 threaded end - 1.800 end diameter 8148445 .. .015 OS 8148444 .. .030 OS 8167261 .. .020 OS 8298210 .. .040 OS 8298209 .. .025 OS 8298211 .. .050 OS
*6	8028399	3	NUT .. Hex 1-1/2-12
*7	8348618	1	PLUG .. Pipe - 1/4 - Square socket
8	8028006	2	COLLAR .. Thrust - Standard thickness - Consists of two halves 8081195 .. .015 OS 8141702 .. .030 OS
9	8455862	7	BEARING .. Main - Front and intermediate - Upper - Standard I.D. 8455863 .. .031 US 8455865 .. .093 US 8455864 .. .062 US 8455866 .. .125 US
10	8455666	7	BEARING .. Main - Front and intermediate - Lower - Standard I.D. 8455683 .. .031 US 8455685 .. .093 US 8455684 .. .062 US 8455686 .. .125 US
11	8455856	2	BEARING .. Main - Center - Upper - Standard I.D. 8455857 .. .031 US 8455859 .. .093 US 8455858 .. .062 US 8455860 .. .125 US
12	8455668	2	BEARING .. Main - Center - Lower - Standard I.D. 8455691 .. .031 US 8455693 .. .093 US 8455692 .. .062 US 8455694 .. .125 US
13	8455844	1	BEARING .. Main - Repair - Upper - Standard I.D. 8455845 .. .031 US 8455847 .. .093 US 8455846 .. .062 US 8455848 .. .125 US
14	8455665	1	BEARING .. Main - Rear - Lower - Standard I.D. 8455679 .. .031 US 8455681 .. .093 US 8455680 .. .062 US 8455682 .. .125 US
*15	8452186	1	KIT .. Upper main bearing - Standard I.D. - Contains all the upper main bearings (Ref. Nos. 9,11 and 13) in the quantities listed above
*16	8452210	1	KIT .. Lower main bearing - Standard I.D. - Contains all the lower main bearings (Ref. Nos. 10,12 and 14) in the quantities listed above

† For applicable stubshaft, see Parts List No. 122.

P.L. No. F118

CRANKSHAFT, MAIN BEARINGS AND MAIN BEARING CAPS

Crankshaft and Main Bearings 20-645 Engines

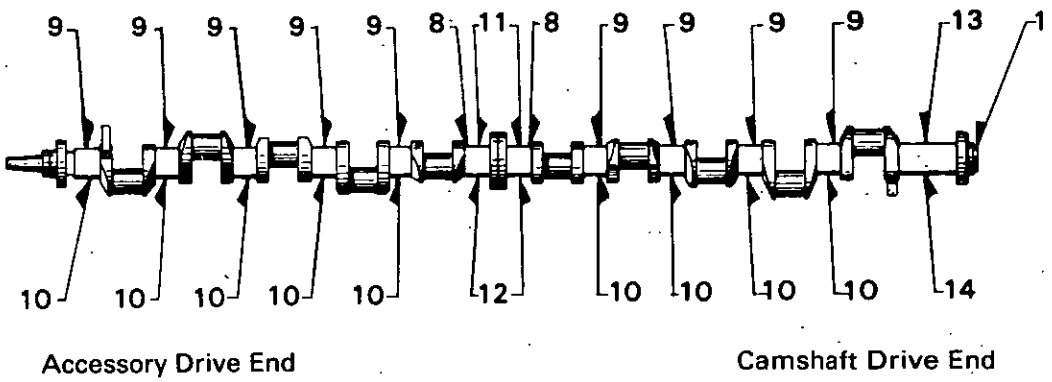


PLATE A118-4

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	8360783	1	CRANKSHAFT .. Engine - Standard - Replaces 8376124
†ϕ*1	8480803	1	CRANKSHAFT .. Engine - Stubless
*2	426318	10	PLUG .. Pipe - 3/8 - Hex socket
3	8365851	6	PLATE .. Lock
4	223784	6	BOLT .. Hex head 1-14 x 2-3/4 - Crankshaft connecting
5	8028398	3	DOWEL .. Tapered - With 1-1/2-12 threaded end - 1.800 end diameter 8148445 .. .015 OS 8148444 .. .030 OS 8167261 .. .020 OS 8298210 .. .040 OS 8298209 .. .025 OS 8298211 .. .050 OS
6	8028399	3	NUT .. Hex 1-1/2-12
7	8348618	1	PLUG .. Pipe - 1/4 - Square socket
8	8028006	2	COLLAR .. Thrust - Standard thickness 8081195 .. .015 OS 8141702 .. .030 OS
9	8455862	9	BEARING .. Main - Front and intermediate - Upper - Standard I.D. 8455863 .. .031 US 8455865 .. .093 US 8455864 .. .062 US 8455866 .. .125 US
10	8455666	9	BEARING .. Main - Front and intermediate - Lower - Standard I.D. 8455683 .. .031 US 8455685 .. .093 US 8455684 .. .062 US 8455686 .. .125 US
11	8455856	2	BEARING .. Main - Center - Upper - Standard I.D. 8455857 .. .031 US 8455859 .. .093 US 8455858 .. .062 US 8455860 .. .125 US
12	8455668	2	BEARING .. Main - Center - Lower - Standard I.D. 8455691 .. .031 US 8455693 .. .093 US 8455692 .. .062 US 8455694 .. .125 US
13	8455844	1	BEARING .. Main - Rear - Upper - Standard I.D. 8455845 .. .031 US 8455847 .. .093 US 8455846 .. .062 US 8455848 .. .125 US
14	8455665	1	BEARING .. Main - Rear - Lower - Standard I.D. 8455679 .. .031 US 8455681 .. .093 US 8455680 .. .062 US 8455682 .. .125 US
*15	9536454	1	KIT .. Upper main bearing - Standard I.D. - Contains all the upper main bearings (Ref. Nos. 9,11 and 13) in the quantities listed above
*16	8459837	1	KIT .. Lower main bearing - Standard I.D. - Contains all the lower main bearings (Ref. Nos. 10,12 and 14) in the quantities listed above

†For applicable stubshaft, See Parts List No. 122.

CRANKSHAFT, MAIN BEARINGS AND MAIN BEARING CAPS

Main Bearing Caps - All Engines



8 Cylinder Engines



12 Cylinder Engines



16 Cylinder Engines



20 Cylinder Engines

Accessory Drive End

Camshaft Drive End

PLATE A118-5

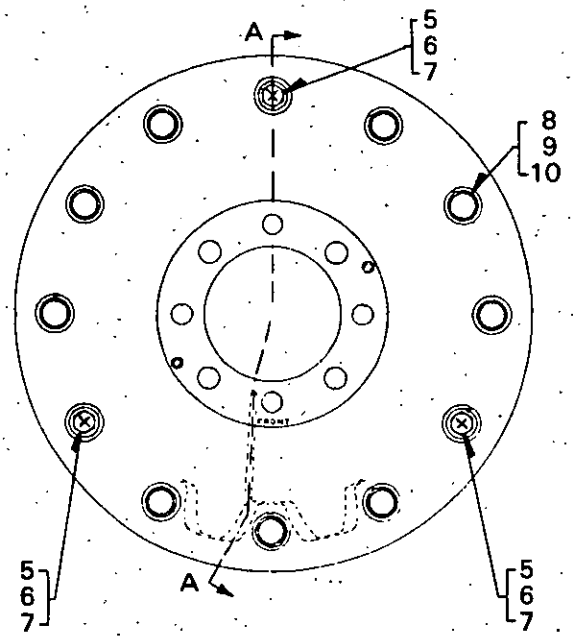
NOTE: Bearing caps have a rough bore and must be line-bored at assembly.

Main Bearing Journal Location	Main Bearing Cap Part Number			
	8 Cyl. Engines	12 Cyl. Engines	16 Cyl. Engines	20 Cyl. Engines
1	8476509	8476509	8476509	8476509
2	8476509	8476509	8476509	8476509
3	8476511	8476509	8476509	8476509
4	8476509	8476508	8476509	8476509
5	8476510	8476509	8476507	8476509
6	–	8476509	8476507	8476507
7	–	8476510	8476509	8476507
8	–	–	8476509	8476509
9	–	–	8476509	8476509
10	–	–	8476510	8476509
11	–	–	–	8476509
12	–	–	–	8476510

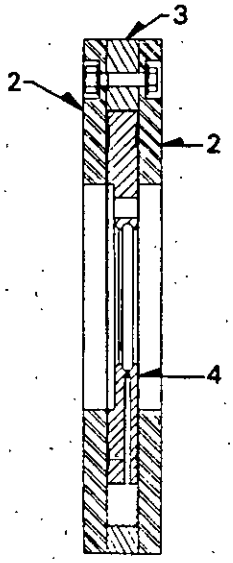
Parts List No. F120

HARMONIC BALANCER AND GEAR DAMPER ASSEMBLIES

Gear Damper
645E3,E3A,E3B,E3C,F3,F3B Engines



Ref. No. 1



SECTION A-A

PLATE E120-1

Ref. No.	Part Number	Qty. Req.	Description
†1	9323945	1	DAMPER ASM. .. Gear - Replaces 8452042 and 8404560 viscous dampers
2	9323944	2	RING .. Outer
3	9323943	1	RING .. Intermediate
4	9323942	1	SPIDER .. Gear damper
5	9338722	3	BOLT .. Hex head 5/8-11 x 2.938
6	9319830	6	WASHER .. Flat 5/8
7	102639	3	NUT .. Hex 5/8-11
8	271615	9	BOLT .. Hex head 3/4-10 x 3
9	9319829	18	WASHER .. Flat 3/4
10	220081	9	NUT .. Hex 3/4-10
*11	8168822	AR	COATING .. 1 quart - Used on all internal rubbing surfaces

GEAR DAMPER MOUNTING

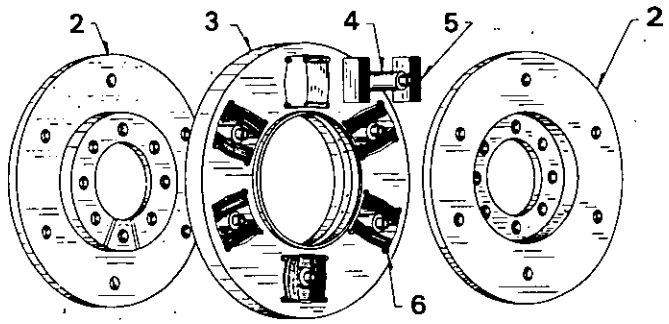
	A	-	Previous Design - Crankshafts with Four Dowel Holes and Four Tapped Holes
	-	B	Current Design - Crankshafts with Eight Tapped Holes
*12	8028241	1 -	RETAINER .. Dowel
*13	8028307	4 -	DOWEL .. 1.000 diameter x 2-1/4 inches long 8082449 .. .005 OS 8082447 .. .015 OS 8158468 .. .030 OS 8082450 .. .010 OS 8158467 .. .020 OS
*14	8028318	4 -	BOLT .. Hex head 1/2-20 x 7/8 - Dowel retainer mounting
*15	8028317	4 -	BOLT .. Hex head 7/8-14 x 2-1/2 - Drilled head
*16	8438865	- 8	BOLT .. Hex head 7/8-14 x 2-1/2 - Except F40C,F40PH and F40PH-2 models
*16	223771	- 8	BOLT .. Hex head 7/8-14 x 3-1/4 - F40C,F40PH and F40PH-2 models
*17	8174659	4 8	WASHER .. Flat 7/8
*18	8116738	AR -	WIRE .. Lock 3/64 diameter x 500 feet

† The 9323945 damper can also be applied to those 645 Roots Blown Engines used in locomotives not having a mechanical cooling fan drive and to all 567D1,D2,D3 and D3A engines.

P.L. No. F120

HARMONIC BALANCER AND GEAR DAMPER ASSEMBLIES

Harmonic Balancer
16-567D1,D2,D3,D3A and 8,12,16-645E Engines



Ref. No. 1

PLATE B120-2

Ref. No.	Part Number	Qty. Req.	Description
†1	8194330	1	BALANCER ASM. .. Harmonic - "Six Pack" type - Formerly 8340877 - See note below
2	8251608	2	COUPLING .. Balancer
3	8251607	1	HOUSING .. Spring
4	8028240	6	PIN .. Push - 1.500 diameter x 1.003 diameter x 3-19/32 inches long 8373928 .. .005 OS (1.008)
5	8028783	1008	SPRING .. Drive - 2.375 x 4 x .020
6	8194085	24	PIN .. Spring - .5015 diameter x 2.385 inches long 8247359 .. .0025 OS 8437104 .. .0075 OS 8194086 .. .0050 OS 8194087 .. .0100 OS

HARMONIC BALANCER MOUNTING

		A	-	Previous Design - Crankshafts with Four Dowel Holes and Four Tapped Holes
		-	B	Current Design - Crankshafts with Eight Taped Holes
*7	8028241	1	-	RETAINER .. Dowel
*8	8028307	4	-	DOWEL .. 1.000 diameter x 2-1/4 inches long 8082449 .. .005 OS 8082447 .. .015 OS 8158468 .. .030 OS 8082450 .. .010 OS 8158467 .. .020 OS
*9	8028318	4	-	BOLT .. Hex head 1/2-20 x 7/8 - Dowel retainer mounting
*10	8028317	4	-	BOLT .. Hex head 7/8-14 x 2-1/2 - Drilled head
*11	8438865	-	8	BOLT .. Hex head 7/8-14 x 2-1/2
*12	8174659	4	8	WASHER .. Flat 7/8
*13	8116738	AR	-	WIRE .. Lock 3/64 diameter x 500 feet

† When repair or replacement is required of a "Three-Pack" type balancer, it is recommended to convert to the "Six-Pack" type - 8194330 balancer. See Page 1 for 9323945 gear damper which can be applied to 567D1, D2, D3 and D3A engines and to 645 Roots Blown Engines used in locomotives not having a mechanical cooling fan drive.

Parts List No. F122

ACCESSORY DRIVE GEAR ASSEMBLY

Accessory Drive Gear Assembly Applied To Crankshafts With Integral Stubshafts
Four-Spring Type Gear
16-567D1,D2,D3,D3A; 8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C and 16-645E Engines

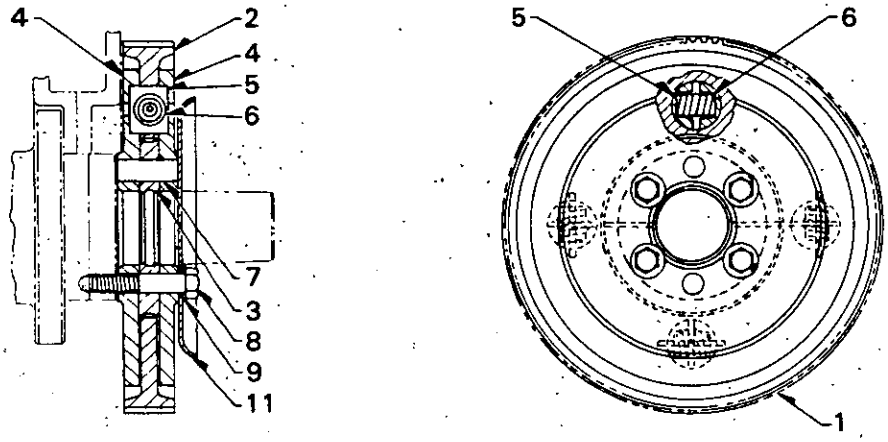


PLATE C122-1

Ref. No.	Part Number	Qty. Req.	Description
1	8250286	1	GEAR ASSEMBLY .. Accessory drive - Four-spring type
2	8141909	1	GEAR .. Drive - Spur
3	8141907	1	HUB .. Drive gear
4	8141908	2	DISC .. Front and rear - Rear replaces 8240518
5	9091462	8	SEGMENT .. Spring - Replaces 8141910
6	8158783	4	SPRING .. Coil
7	8031883	2	DOWEL .. Alignment - .876 diameter x 2-7/16 inches long
			8082445 .. .005 OS
			8082446 .. .010 OS
			8052996 .. .015 OS
8	223759	4	BOLT .. Hex head 3/4-16 x 3-3/4 - Formerly 8031884 drilled head
9	8140912	4	WASHER .. Hardened 3/4
*10	218197	4	NUT .. Hex 3/4-16 - Used to keep assembly together during shipping
11	8084763	1	SLINGER .. Oil

P.L. No. F122

ACCESSORY DRIVE GEAR ASSEMBLY

Accessory Drive Gear Assembly Applied To Crankshafts With Integral Stubshafts
Eight-Spring Type Gear
8-645E (Export); 12-645F3,F3B; 16-645E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B Engines
Except F40C, F40PH and F40PH-2 Locomotives

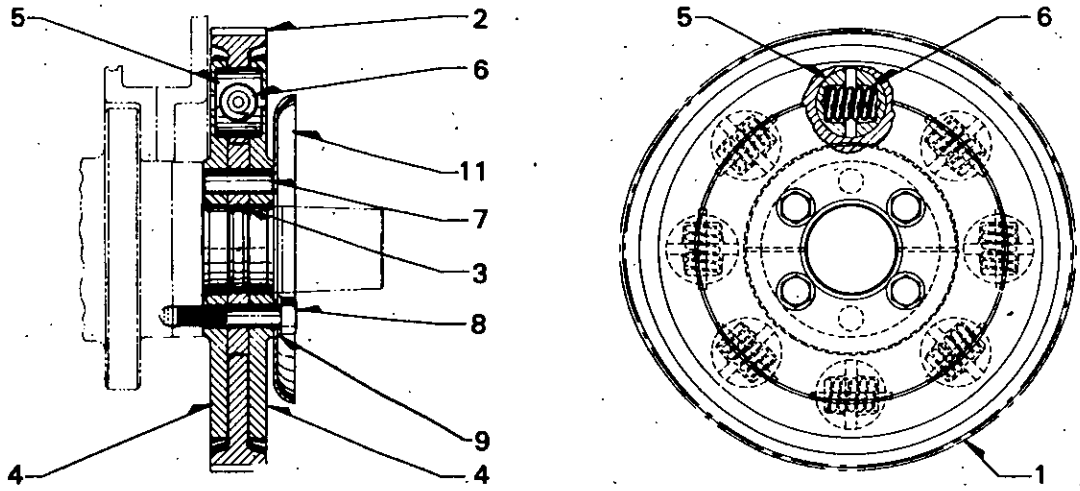


PLATE D122-2

Ref. No.	Part Number	Qty. Req.	Description
1	8365300	1	GEAR ASSEMBLY .. Accessory drive - Eight-spring type
2	8360839	1	GEAR .. Drive - Spur
3	8141907	1	HUB .. Drive gear
4	8360838	2	DISC .. Front and rear - Rear replaces 8360835
5	9091463	16	SEGMENT .. Spring
6	8360837	8	SPRING .. Coil
7	8031883	2	DOWEL .. Alignment - .876 diameter x 2-7/16 inches long
			8082445 .. .005 OS
			8082446 .. .010 OS
			8052996 .. .015 OS
8	223759	4	BOLT .. Hex head 3/4-16 x 3-3/4 - Formerly 8031884 drilled head
9	8140912	4	WASHER .. Hardened 3/4
*10	218197	4	NUT .. Hex 3/4-16 - Used to keep assembly together during shipping
11	8084763	1	SLINGER .. Oil

P.L. No. F122

ACCESSORY DRIVE GEAR ASSEMBLY

Accessory Drive Gear Applied To Bolt-On Stubshaft
8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C,F3; 16-645E,E3,E3B,E3C,F3,F3B
and 20-645E3,E3B Engines
Except F40C, F40PH and F40PH-2 Locomotives

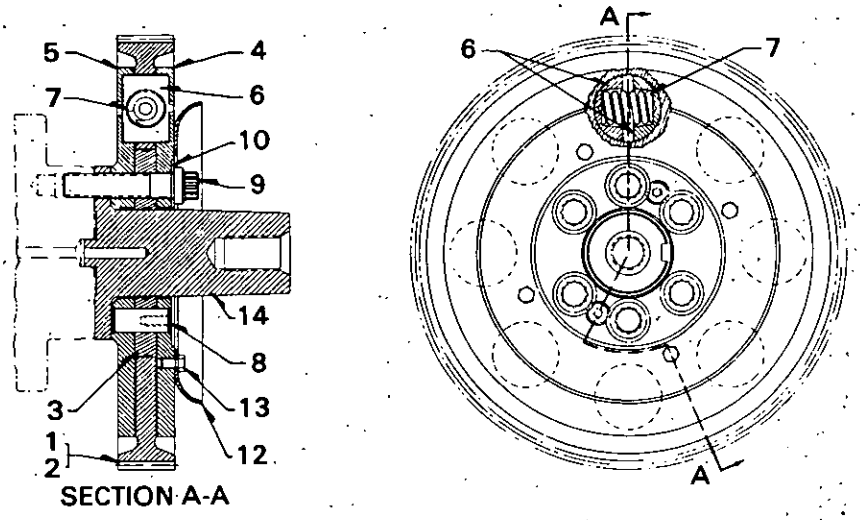


PLATE A122-3

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	-	8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C and 16-645E engines
		-	B	12-645F3; 16-645E3,E3B,E3C,F3,F3B and 20-645E3,E3B engines
*1	8485723	1	-	GEAR ASSEMBLY .. Accessory drive
1	8485722	-	1	GEAR ASSEMBLY .. Accessory drive
*2	8141909	1	-	GEAR .. Drive - Spur
2	8360839	-	1	GEAR .. Drive - Spur
3	8472990	1	1	HUB .. Accessory drive gear
*4	8481995	1	-	DISC .. Accessory drive gear - Outer
4	8481449	-	1	DISC .. Accessory drive gear - Outer
*5	8481994	1	-	DISC .. Accessory drive gear - Inner
5	8481450	-	1	DISC .. Accessory drive gear - Inner
*6	9091462	8	-	SEGMENT .. Spring - Replaces 8141910
6	9091463	-	16	SEGMENT .. Spring - Replaces 8360836
*7	8158783	4	-	SPRING .. Coil
7	8360837	-	8	SPRING .. Coil
8	8459971	2	2	DOWEL .. 7/8 x 2 inches long 8459972 .. .005 OS 8459973 .. .010 OS 8459974 .. .015 OS
9	9434217	6	6	BOLT .. Type C spline head - 7/8-9 x 4 inches long
10	8489072	6	6	WASHER .. Hardened - 57/64 I.D. x 1-5/8 O.D.
*11	220082	6	6	NUT .. Hex 7/8-9 - Used in shipping only
12	8481417	1	1	SLINGER .. Oil
13	9434218	4	4	BOLT .. Hex head 3/8-16 x 5/8 - Slinger to disc
†14	8481374	1	1	STUBSHAFT .. Tapered - Accessory drive coupling
*15	179881	2	2	BOLT .. Hex head 1/2-13 x 1 - Stubshaft to crankshaft - Applied after July, 1977

† When applying 8481374 stubshaft as a repair to the tapered end of a standard crankshaft, the crankshaft must be re-worked and additional material should be purchased. Contact our Service Department for details.

28181, 28424, 30323, 34187, 39379, 42433, 44406
28279, 29435, 32567, 38286, 39697, 44397

P.L. No. F122

ACCESSORY DRIVE GEAR ASSEMBLY

Accessory Drive Gear Assembly Applied To Crankshafts With Bolt-On Stubshafts
16-645E3,E3A,E3B,E3C Engines
F40C, F40PH and F40PH-2 Locomotives

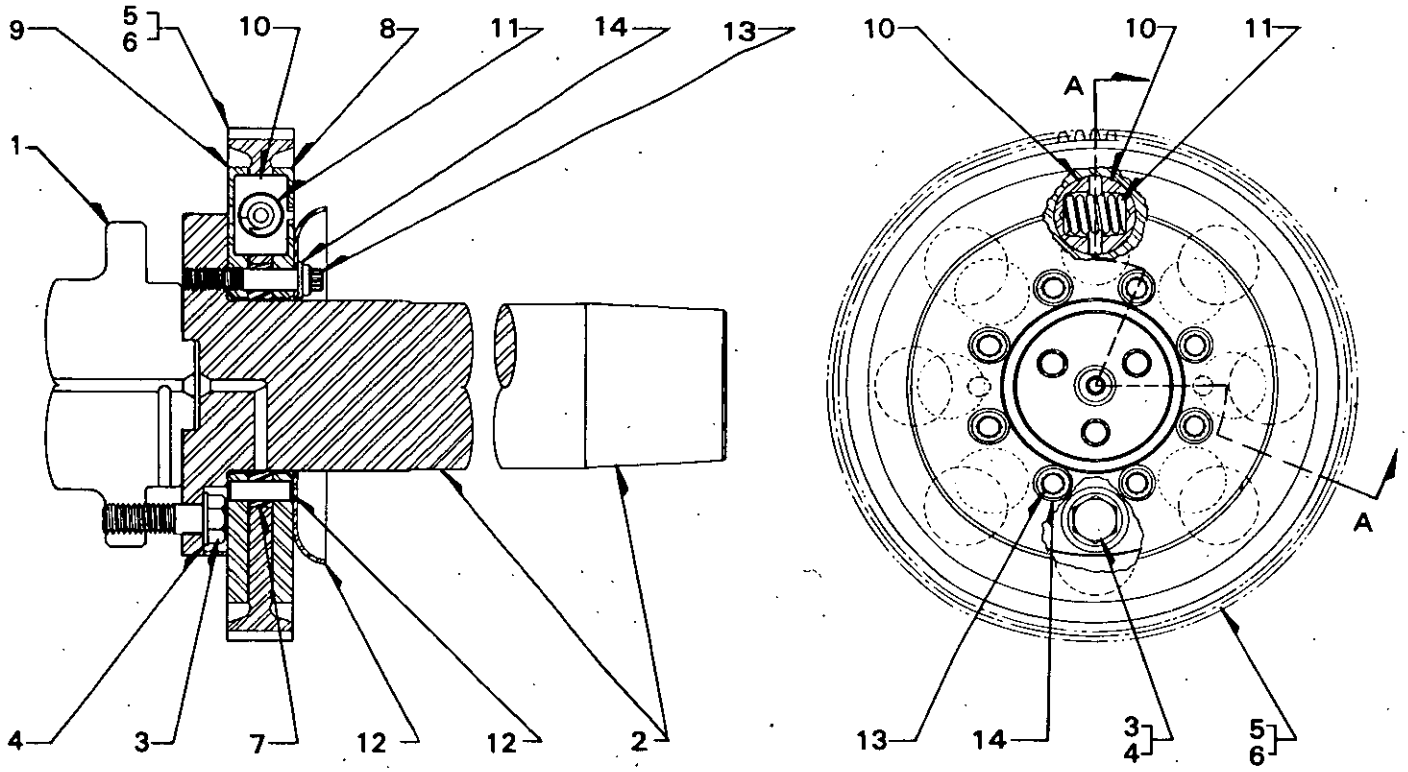


PLATE B122-4

Ref. No.	Part Number	Qty. Req.	Description
+1	8492275	1	CRANKSHAFT .. Engine - Stubless with male pilot - See Parts List No. 118
2	8482954	1	STUBSHAFT .. Tapered - 27 - 3/8 inch long
3	223771	8	BOLT .. Hex head 7/8-14 x 3-1/4 - Stubshaft to crankshaft
4	8174659	8	WASHER .. Hardened 7/8
5	9320634	1	GEAR ASSEMBLY .. Accessory drive
6	8360839	1	GEAR .. Drive - Spur
7	8483064	1	HUB .. Drive gear
8	8483014	1	DISC .. Front
9	8483014	1	DISC .. Rear - Formerly 8483015
10	9094163	16	SEGMENT .. Spring
11	8360837	8	SPRING .. Coil
12	8483097	2	DOWEL .. Alignment .626 diameter x 1-15/16 inches long
			8483098 .. .005 OS
			8483099 .. .010 OS
			8483100 .. .015 OS
13	9434253	8	BOLT .. Spline head 5/8-11 x 3-1/4 - Twelve point
14	8483090	8	WASHER .. Hardened 5/8
*15	102639	8	NUT .. Hex 5/8-11 - Used to hold assembly together during shipping
16	8483087	1	SLINGER .. Oil

8490837B, 8493255A

Parts List No. F124

CRANKSHAFT COUPLINGS

Engine and Generator Coupling Disc With Flywheel Application
8,12,16-645E,E3C; 12,16-645E3,E3B,F3,F3B; 16-645E3A and 20-645E3,E3B Engines

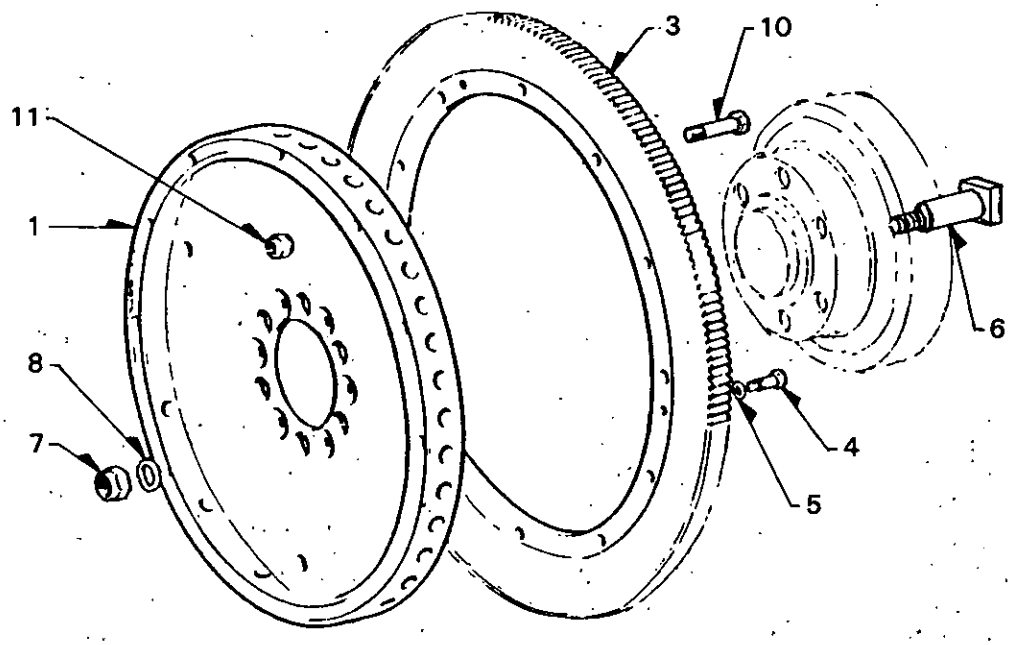


PLATE D124-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8,12,16-645 engines without indicator bracket
		-	B	-	-	8,12,16-645 engines with indicator bracket
		-	-	C	-	20-645 engines without indicator bracket
		-	-	-	D	20-645 engines with indicator bracket
1	----	-	-	-	-	DISC .. Engine coupling - See chart on Pages 2 and 3
*2	----	-	-	-	-	DISC .. Generator coupling - See chart on Pages 2 and 3
3	8416930	1	1	1	1	GEAR .. Ring - Starter motor - Formerly 8356275
4	181370	3	3	3	3	BOLT .. Hex head 3/8-24 x 1-1/4 inches - Ring gear to disc - Formerly 181377 } Not Applicable To Locomotives With DC Main Generators
5	103321	3	3	3	3	WASHER .. Lock 3/8 } Not Applicable To Locomotives With DC Main Generators
6	8245294	6	6	-	-	BOLT .. Coupling disc to crankshaft - 1-1/2-12 x 4-9/16 inches long - 1.735 inch shoulder - Square head - 45° chamfer on one side
*6	8360844	-	-	12	12	BOLT .. Coupling disc to crankshaft - 1-1/4-12 x 4-13/32 inches long - 1.735 inch shoulder - Square head - 45° chamfer on one side
7	8334366	6	6	-	-	NUT .. Hex lock 1-1/2-12
*7	8360845	-	-	12	12	NUT .. Hex lock 1-1/4-12
8	8336210	6	2	-	-	WASHER .. Plain - 2-7/16 O.D. x 1-17/32 I.D.
*8	8360846	-	-	12	8	WASHER .. Plain - 2-7/16 O.D. x 1-9/32 I.D.
9	9551557	-	2	-	-	BRACKET .. Indicator - Generator alignment
*9	8414611	-	-	-	2	BRACKET .. Indicator - Generator alignment
10	273023	12	12	-	-	BOLT .. Hex head 3/4-16 x 5-1/4 - Disc mounting - Engines with ring gear
ϕ*10	271644	12	12	-	-	BOLT .. Hex head 3/4-16 x 4-1/2 - Disc mounting - Engines without ring gear - Formerly 271646
ϕ*10	272422	-	-	12	12	BOLT .. Hex head 3/4-16 x 7 - Disc mounting - Formerly 273028
11	8060089	12	12	12	12	NUT .. Hex lock 3/4-16
*12	8292850	1	1	-	-	INDICATOR .. Flywheel - Engines without ring gear
*13	8354872	1	1	1	1	INDICATOR .. Flywheel - Engines with ring gear

P.L. No. F124

CRANKSHAFT COUPLINGS

Engine To Main Generator Coupling Disc Reference Chart
Domestic and Export Locomotives
8,12,16-645E,E3C; 12,16-645E3,E3B,F3,F3B; 16-645E3A and 20-645E3,E3B Engines

Ref. No.	Locomotive Model	Engine Model	Engine End Coupling Disc	Generator/ Alternator Model	Gen./Alt. Coupling Disc
1	SW1000,1001	8-645E	8186962	D25-C	8185986
2	SW1000	8-645E	8186962	D32-R	†8185986
3	G18,G18U,G18W	8-645E	8186962	D25-R	†8185986
4	GA18	8-645E	8186962	D25-S	†8185986
5	GL18M	8-645E	8211680	AR6-D14	†8185986
6	GL18M	8-645E	9552504	AR6NAD-D18	9552506
7	G8,GA8 (Replacement Engine)	8-645E	8186962	D15E	8185986
8	GP15T	8-645E3C	9552504	AR10JBA-D18	9552506
9	SW1500,MP15DC	12-645E	8186962	D32-P	††8185986
10	MP15DC	12-645E	8186962	D32-U	†8185986
11	MP15DC	12-645E	9557007	D32-U	†8185986
12	MP15AC	12-645E	8211680	AR10E1-D14	8185986
13	MP15AC	12-645E	9552504	AR10JAD-D18	9552506
14	GP15-1	12-645E	8186962	D32B2-D14	†8185986
15	GP15-2	12-645E	9552504	AR6NAD-D18	9552506
16	SW1504	12-645E	8186962	D32-P	††8185986
17	G22,G22CW,G22CU, G22U,G22W,GL22C	12-645E	8186962	D25-P,D32-T	†8185986
18	G12 (Replacement Engine)	12-645E	8186962	D22-F	†8185986
19	GP39,SD39,SDL39	12-645E3	8410893	D32E-D14	†8185986
20	GP39AC,SD39	12-645E3	8211680	AR10A4-D14	†8185986
21	GP39-2	12-645E3,E3B,E3C	8211680	AR10A6-D14	†8185986
22	GP39-2	12-645E3C	9552504	AR10JBA-D18	9552506
23	SD39	12-645E3	8410893	D32D-D14	†8185986
24	GT22C,GT22CU,GT22CW, GT22LC,JT22CW	12-645E3,E3B	8211680	AR10F1-D14	†8185986
25	GT22CW	12-645E3B	9552504	AR10F1-D14	9552506
26	GT22LC-2	12-645E3B	9552504	AR6NBD-D18	9552506
27	JT22LC-2	12-645E3B	9552504	AR6NFD-D18	9552506
28	JT22CW-2	12-645E3B	9552504	AR6NFD-D18	9552506
29	JT22MC	12-645E3B	9552504	AR6NFD-D18	9552506
30	GP49	12-645F3B	9552504	AR15JBB-D18	9552506
31	GP38,SD38	16-645E	8164605	D32E1-D14	†8185986
32	GP38,SD38,SDP38,SD38M	16-645E	8164605	D32B-D14	†8185986
33	GP38	16-645E	8164605	AR10E-D14	†8185986
34	GP38-2,GP38AC,SD38-2 SD38AC	16-645E	8365588	AR10E1-D14	†8185986
35	GP38-2,SD38-2	16-645E	8365588	AR10E2-D14	†8185986
36	GP38-2	16-645E	9552505	AR10E1-D18	9552506
37	SD38-2	16-645E	9552505	AR10JAD-D18	9552506
38	SD9 (Replacement Engine)	16-645E	8164605	D12C-D14	†8185986
39	G26,G26C,G26CW, G26CU,GL26C	16-645E	8164605	D32-T	†8185986
40	G26CW-2	16-645E	9552505	AR6NAD-D18	9552506
41	GP40,SD40,SDP40	16-645E3	8365588	AR10A-D14	†8185986
42	SD40,SDP40	16-645E3	8365588	AR10A1-D14	†8185986
43	GP40,GP40P	16-645E3	8365588	AR10A2-D14	†8185986
44	SD40	16-645E3	8365588	AR10A3-D14	†8185986
45	SD40	16-645E3	8365588	AR10A3M-D14	†8185986
46	GP40-2,GP40P-2	16-645E3,E3B,E3C	8365588	AR10A6-D14	†8185986

† *Part Number 8185986 replaces 8164682.*
†† *Part Number 8185986 replaces 8480732.*

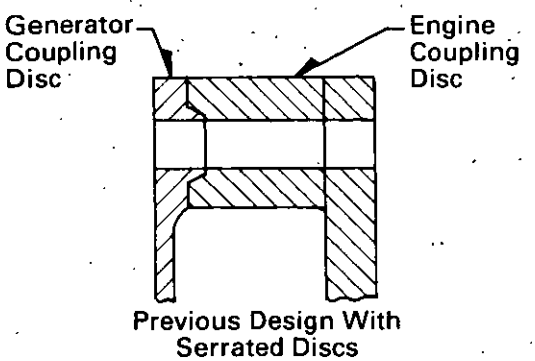
CRANKSHAFT COUPLINGS

Engine To Main Generator Coupling Disc Reference Chart
Domestic and Export Locomotives
8,12,16-645E,E3C; 12,16-645E3,E3B,F3,F3B; 16-645E3A and 20-645E3,E3B Engines

Ref. No.	Locomotive Model	Engine Model	Engine End Coupling Disc	Generator/ Alternator Model	Gen./Alt. Coupling Disc
47	GP40-2	16-645E3C	9552505	AR10JBA-D18	9552506
48	SD40-2,SDP40F SD40B-2,SD40T-2	16-645E3,E3C	8365588	AR10A7-D14	ǂ8185986
49	SD40-2,SD40T-2 SDL40-2	16-645E3C	9552505	AR10JBA-D18	9552506
50	F40PH,F40PH-2	16-645E3,E3B,E3C	8365588	AR10A7B-D14	ǂ8185986
51	F40PH,F40PH-2	16-645E3C	9552505	AR10A9-D18	9552506
52	SD40	16-645E3	8365588	AR10A8-D14	ǂ8185986
53	GT26,GT26CW	16-645E3,E3B	8365588	AR10A5-D14	ǂ8185986
54	GT26CW	16-645E3B	9552505	AR10A5-D14	9552506
55	GT26CW,GT26CU-2	16-645E3,E3B	8365588	AR10F-D14	ǂ8185986
56	GT26CW-2,GT26CU-2	16-645E3B	9552505	AR10F-D18	9552506
57	GT26CW-2	16-645E3,E3B	8365588	AR10F1-D14	ǂ8185986
58	DDA40X	16-645E3A	8365588	AR12-D14	ǂ8185986
59	F40PH,F40C	16-645E3A	8365588	AR10A9-D14	ǂ8185986
60	GP50,GP50T	16-645F3B	9552505	AR15JBB-D18	9552506
61	SD50,SD50S	16-645F3B	9552505	AR11JBA-D18	9552506
ǂǂǂ62	SD45,SDP45	20-645E3	8360898	AR10B-D14	8363127
ǂǂǂ63	SD45,SDP45,F45,FP45	20-645E3	8360898	AR10B2-D14	8363127
ǂǂǂǂ64	SD45	20-645E3	8414284	AR10B3-D14	8414247
ǂǂǂǂ65	SD45,SD45-2,SD45T-2,F45	20-645E3,E3B	8414284	AR10B4-D14	8414247
ǂǂǂǂ66	DDM45	20-645E3	8414284	AR10B3-D14	8414247

ǂ Part Number 8185986 replaces 8164682.
ǂǂ Part Number 8185986 replaces 8480732
ǂǂǂ Engine coupling disc - 4-43/64 inches thick
ǂǂǂǂ Engine coupling disc - 4-23/64 inches thick

In early 1984, Electro-Motive began applying a redesigned engine and generator coupling disc arrangement with reverse serrations. Contact Service Department for further details.



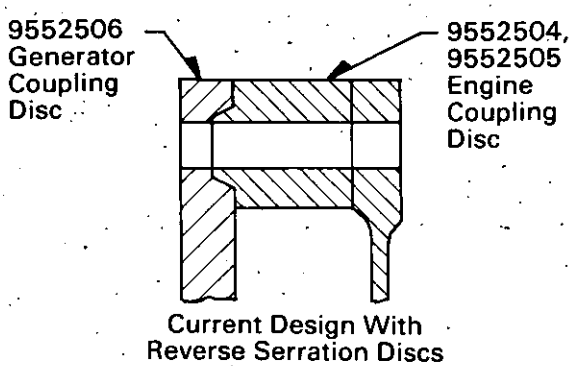


PLATE F124-2

P.L. No. F124

CRANKSHAFT COUPLINGS

Engine To Main Generator Coupling and Accessory Drive Flange
16-567D1,D2,D3,D3A Engines
PLATE C124-3

Ref. No.	Part Number	Qty. Req.	Description
1	8164605	1	DISC .. Coupling - Serrated - Engine end
2	8185986	1	DISC .. Coupling - Serrated - Generator end - Replaces 8164682

† It is recommended to replace all 8032727 nuts and use 8334366 nut Ref. No. 4 and 8336210 washer Ref. No. 5 when replacement is required.

3	8245294	6	BOLT .. Coupling disc to crankshaft - 1-1/2-12 x 4-9/16 inches long - 1.735 inch shoulder - Square head - 45° chamfer on one side
†4	8334366	6	NUT .. Hex lock 1-1/2-12
†5	8336210	6	WASHER .. Plain - 2-7/16 O.D. x 1-17/32 I.D.
6	271644	12	BOLT .. Hex head 3/4-16 x 4-1/2 - Disc to disc
7	8060089	12	NUT .. Hex 3/4-16 - Disc to disc bolt

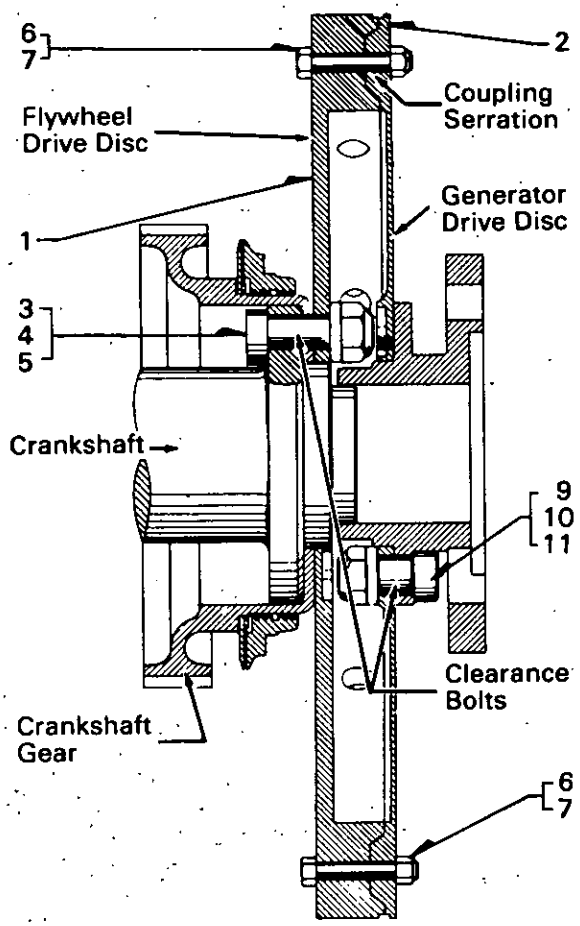
†† Previous design D14 alternator rotor assembly having a 7-3/8 inch outside diameter hub can only use 8032727 nut Ref. No. 8. New mounting arrangement Ref. Nos. 10 and 11 can be applied only if the outside diameter of the rotor hub is machined from 7-3/8 to 7 inches. For additional information refer to M.I. 3302.

††*8	8032727	6	NUT .. Hex 1-1/2-12 - Generator disc bolt
9	8336209	6	BOLT .. Generator disc to generator - 1-1/2-12 x 4-1/16 inches long - 1.700 inch shoulder - Offset head - Formerly 1.740 inch shoulder
10	8334366	6	NUT .. Hex lock 1-1/2-12
11	8336210	6	WASHER .. Plain - 2-7/16 O.D. x 1-17/32 I.D.
12	8115196	1	FLANGE .. Accessory drive - Tapered - Previously applied
13	8323180	1	COUPLING ASSEMBLY .. Accessory drive - Tapered - Currently applied
14	8234958	10	JOINT .. Center bonded
†††15	8029538	1	KEY .. Drive flange .390 x .6265 x 2-1/2 inches long

††† The vertical height of key 8029538 was reduced from 1/2 inch to .390 when the key way depth in mounting flange 8115196 was reduced from .252 to .187. The length was reduced from 3 inches to 2-1/2 inches long. Current low key is furnished for both key way depths. Caution should be taken not to attempt to force former high key into shallow key ways.

16	8029555	1	WASHER .. Flange retaining - 1-9/32 I.D. x 3-11/32 O.D.
17	8029567	1	BOLT .. Hex head 1-1/4-12 x 2-3/4 - Flange retaining
18	8029569	1	SPRING .. Lock
19	181427	1	BOLT .. Hex head 1/2-20 x 1 - Flange to crankshaft
20	103323	1	WASHER .. Lock 1/2
21	8041658	1	COVER .. Accessory drive
22	8084863	1	COVER .. Blind - Applied only when accessory drive coupling is not used
23	8028763	1	GASKET .. Cover
24	8055158	1	SEAL .. Oil - Accessory drive
25	8041657	1	RETAINER .. Oil seal
26	8049954	2	DOWEL .. Alignment
27	8084871	8	STUD .. Cover retaining - 1/2-13-20 x 2-7/16 inches long
28	8032719	8	NUT .. Hex 1/2-20
29	6101229	8	WASHER .. Plain 1/2
30	179839	6	BOLT .. Hex head 3/8-16 x 1 - Retainer
31	103321	6	WASHER .. Lock 3/8

CRANKSHAFT COUPLINGS



Engine To Main Generator
Coupling Arrangement

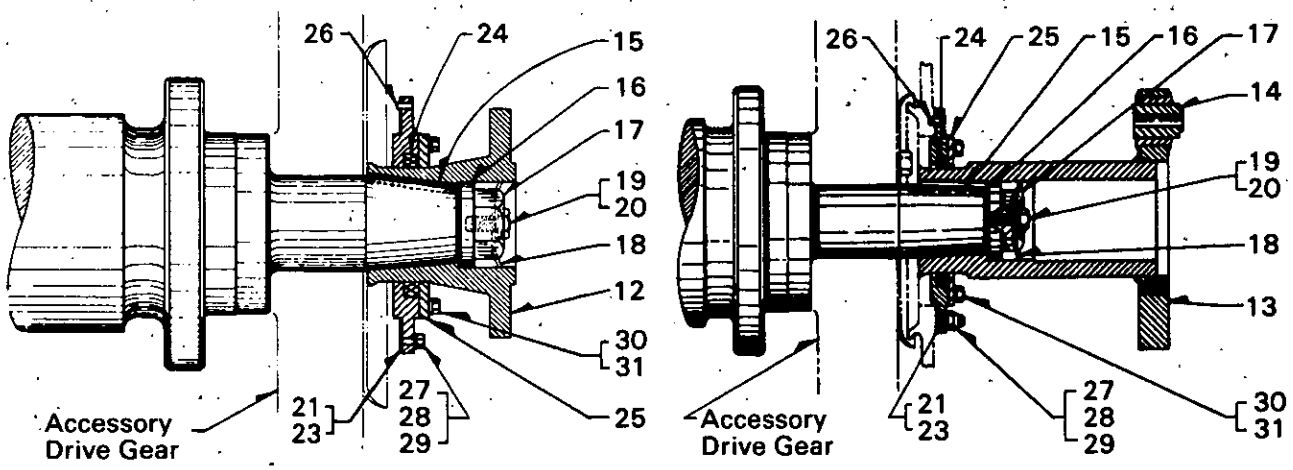


PLATE C124-3

P.L. No. F124

CRANKSHAFT COUPLINGS

Accessory Drive Coupling and Accessory Drive Blind Cover
All 645 Engines
Except F40C, F40PH and F40PH-2 Locomotives

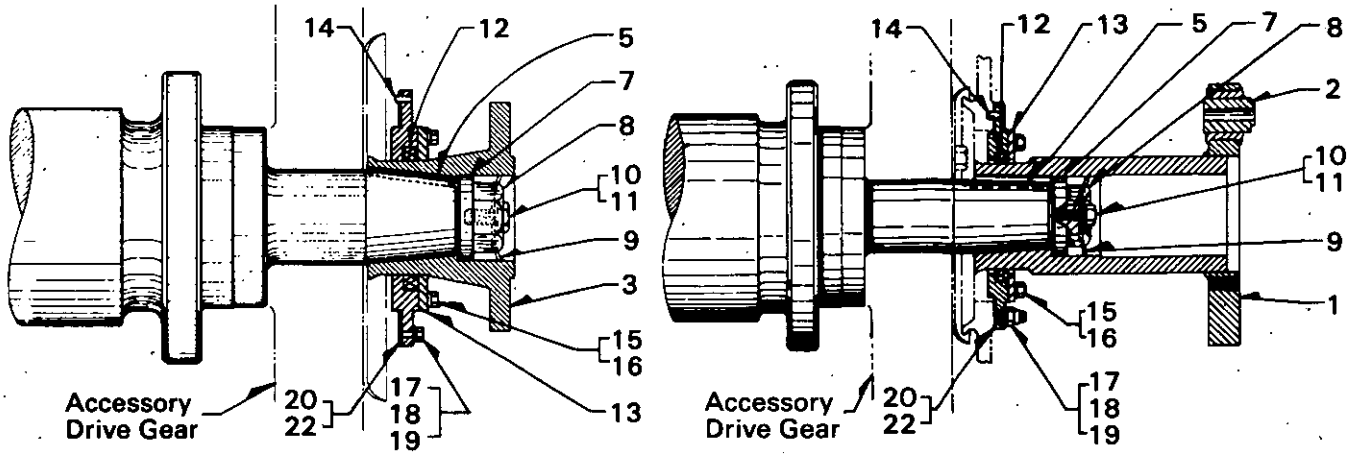


PLATE B124-4

Ref. No.	Part Number	Quantity Required			Description
1	8323180	1	-	-	COUPLING ASSEMBLY .. Accessory drive - All engines except 8,12,16-645E export engines and locomotive models F40C,F40PH and F40PH-2
2	8234958	10	-	-	JOINT .. Center bonded - Rubber bushing
3	8115196	-	1	-	FLANGE .. Accessory drive - Tapered - 8,12,16-645E replacement engines for G8,G12 and SD9 export locomotives
*4	8383159	-	-	1	COUPLING ASSEMBLY .. Accessory drive - 2 hole - Tapered - 12,16-645E export engines - Formerly 8283159
ϕ5	8029538		1		KEY .. Accessory drive coupling - .390 x .6265 x 2-1/2 inches long (length of key was reduced from 3 inches to 2-1/2 inches) except engine crankshafts with bolt on accessory drive stubshaft
ϕ5	8481392		1		KEY .. Accessory drive coupling - .390 x .6265 x 2-1/2 inches long - Drilled - Engine crankshaft with bolt on accessory drive stubshaft
*6	191209		1		SCREW .. Cap - No. 10-24 x 3/8 hex socket head - Used with 8481392 key only
7	8029555		1		WASHER .. Coupling retaining - 1-9/32 I.D. x 3-11/32 O.D.
8	8029567		1		BOLT .. Hex head 1-1/4-12 x 2-3/4 - Coupling retaining
9	8029569		1		SPRING .. Lock
10	181427		1		BOLT .. Hex head 1/2-20 x 1 - Spring retainer
11	103323		1		WASHER .. Lock 1/2
12	8055158		1		SEAL .. Oil - Accessory drive
13	8041657		1		RETAINER .. Oil seal
14	8049954		2		DOWEL .. Alignment
15	179839		6		BOLT .. Hex head 3/8-16 x 1 - Retainer mounting
16	6101225		6		WASHER .. Plain 3/8
*16	103321		6		WASHER .. Lock 3/8
+17	8084871		8		STUD .. Cover retaining - 1/2-13-20 x 2-7/16 inches long
18	6101229		8		WASHER .. Plain 1/2
19	8032719		8		NUT .. Hex lock 1/2-20 - Cover retaining
20	8041658		1		COVER .. Accessory drive
*21	8084863		1		COVER .. Blind - Applied only when accessory drive coupling is not used
22	8028763		1		GASKET .. Cover mounting - Applicable to both Ref. Nos. 20 and 21

CRANKSHAFT COUPLINGS

Accessory Drive Coupling For Crankshafts
With Bolt On Stubshaft
16-645E3,E3A,E3B,E3C Engines
F40C, F40PH and F40PH-2 Locomotives

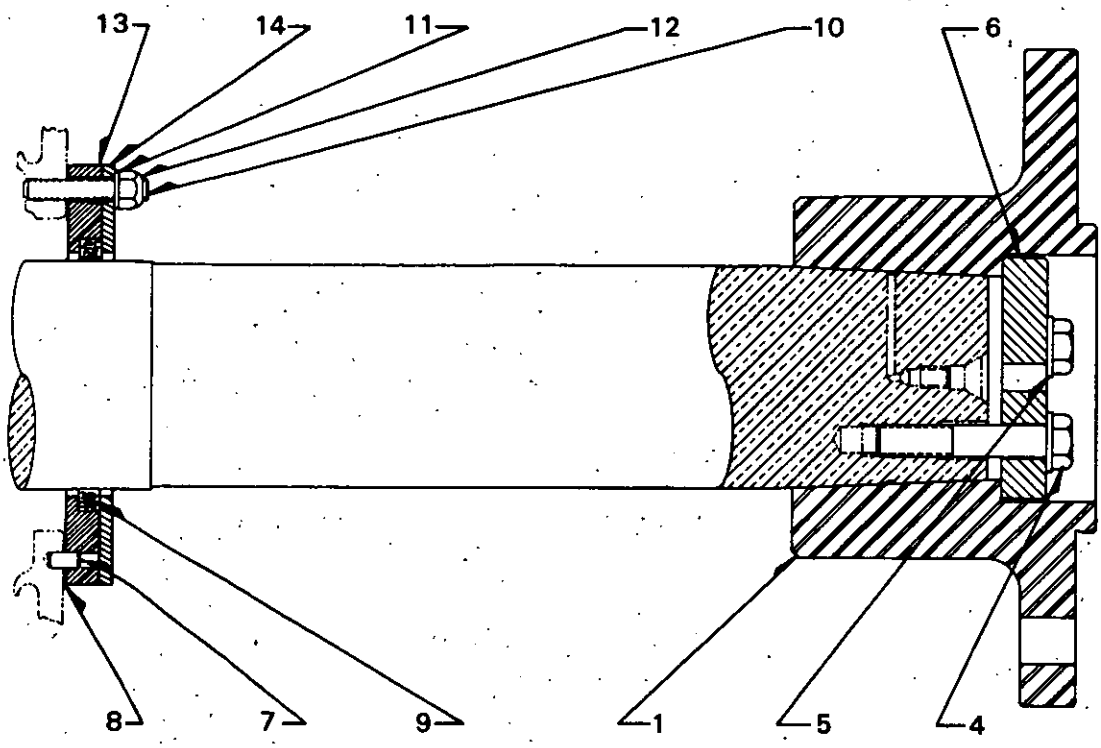


PLATE B124-5

Ref. No.	Part Number	Qty. Req.	Description
1	8482982	1	COUPLING .. Accessory drive - Without dowel pin
*1	9333212	1	COUPLING ASSEMBLY .. Accessory drive - With dowel pin
*2	9333199	1	COUPLING .. Accessory drive
*3	141285	1	PIN .. Dowel 1/2 x 1-1/4
4	223458	3	BOLT .. Hex head 3/4-10 x 4 - Flange mounting
5	8140912	3	WASHER .. 3/4 hardened
6	8483013	1	RETAINER .. Flange mounting
7	8049954	2	DOWEL .. Accessory drive cover alignment
8	8028763	1	GASKET .. Accessory drive cover
9	8483088	1	SEAL .. Accessory drive cover
+10	8084871	8	STUD .. 1/2-13-20 x 2-7/16 inches long
11	6101229	8	WASHER .. Flat 1/2
12	8032719	8	NUT .. Hex lock 1/2-20
13	8483089	1	COVER .. Accessory drive - Flush mounting
14	8483091	1	RETAINER .. Seal

8483150, 38340, 38773, 41894, 42880

P.L. No. F124

CRANKSHAFT COUPLINGS

Engine Turning Jack Assembly
16-567D1,D2,D3,D3A; 8,12,16-645E; 12,16,20-645E3;
12,16-645E3B,E3C and 16-645E3A Engines

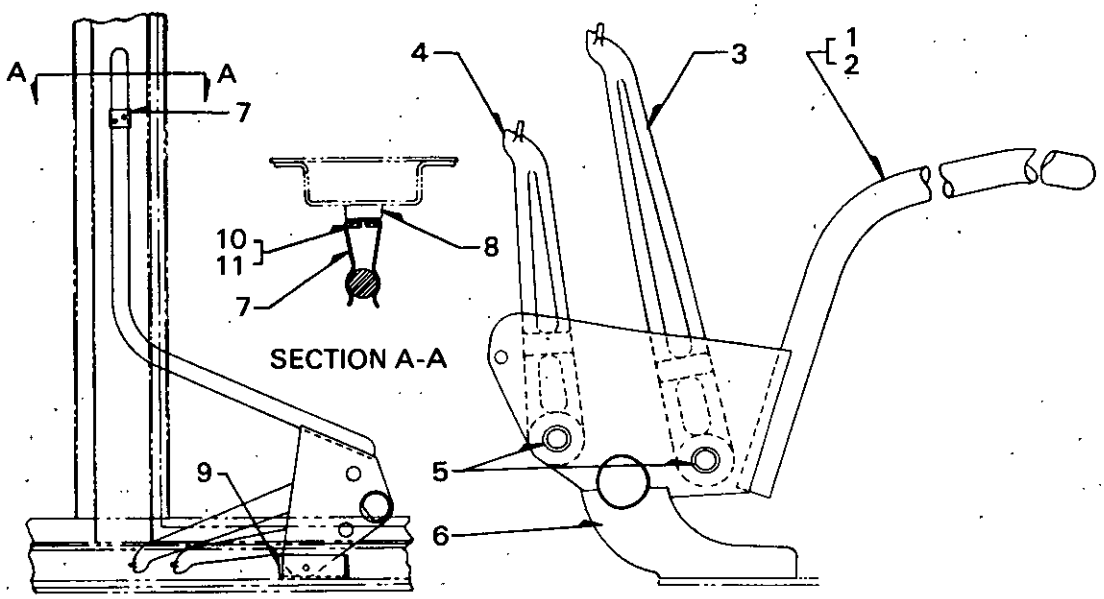


PLATE A124-6

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-567D1,D2,D3,D3A; 12,16,20-645E3; 12,16-645E3B,E3C and 16-645E3A engines
		-	B	-	8,12-645E engines
		-	-	C	8,12,16-645E engines - Export only
1	8320802	1	1	1	JACK ASSEMBLY .. Engine turning
2	8320803	1	1	1	HANDLE ASSEMBLY .. Jack
3	8084761	1	1	1	PAWL .. Long
4	8084759	1	1	1	PAWL .. Short
5	8194542	2	2	2	PIN .. Pawl mounting
6	8084760	1	2	2	BASE .. Engine turning jack mounting - SW1500,MP15DC,MP15AC, GL26C and G26CW
ϕ7	8176086	1	-	1	CLIP .. Mounting
ϕ*7	9327396	1	-	-	CLIP ASSEMBLY .. Mounting - MP15AC only
8	8176119	1	-	1	BRACKET .. Tapping - Except SD18,SD24 and SD45X locomotives - Used on JT22CW export
8	8183377	1	-	-	BRACKET .. Tapping - SD18 and SD24 locomotives only
ϕ9	8176112	1	-	1	BOX ASSEMBLY .. Jack mounting
ϕ*9	9327394	1	-	-	BOX ASSEMBLY .. Jack mounting - MP15AC only
10	179791	2	-	2	BOLT .. Hex head 1/4-20 x 1/2 - Clip mounting
10	179789	-	-	2	BOLT .. Hex head 1/4-20 x 3/8 - Clip mounting - GL26C and G26CW only
10	179793	-	-	2	BOLT .. Hex head 1/4-20 x 5/8 - Clip mounting - JT22LC-2 only
11	103319	2	-	2	WASHER .. Lock 1/4
*12	109084	-	-	2	NUT .. 1/4-20 - JT22LC-2 locomotive only
*13	8206488	-	-	1	PAD .. Tapping - GL26C and G26CW locomotives only
*14	9523188	-	-	1	PAD .. Tapping - GL26C locomotive only
*14	9314633	-	-	1	CHANNEL .. 1-7/8 x 3 inches long - JT22CW locomotive only
*15	9533085	-	-	1	ANGLE .. 2 x 4-1/2 - JT22LC-2 locomotive only
*16	8083943	-	1	-	BAR .. Engine turning
*16	8017395	-	-	1	BAR .. Engine turning
*17	8170360	-	2	-	SUPPORT .. Bar
*18	8401691	-	1	-	BRACKET .. Base supporting - SW1500,MP15DC and MP15AC only

10985, 21119, 32739, 34767, 41081

Parts List No. F125

ELECTRIC STARTER MOTORS

Starter Motor Mounting
8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C,F3,F3B
16-645E,E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B Engines
PLATE C125-1

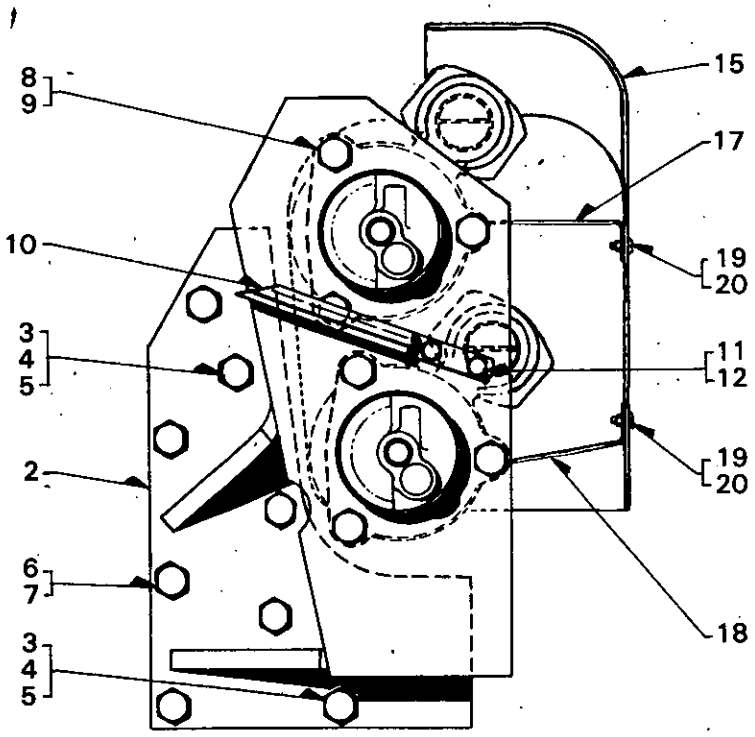
Ref. No.	Part Number	Quantity Required									Description
		A	-	-	-	-	-	-	-	-	12,16-645E; 12,16-645E3 (Domestic); 16-645E3A (F40C,F40PH) and 20-645E3 (Prior to September, 1968) engines
		-	B	-	-	-	-	-	-	-	12-645E,E3,E3B,E3C,F3,F3B and 16-645E,E3,E3B,E3C, F3,F3B engines
		-	-	C	-	-	-	-	-	-	16-645E3C (F40PH,F40PH-2); 16-645F3B (GP50,SD50) engines
		-	-	-	D	-	-	-	-	-	8-645E (GL18M) engine
		-	-	-	-	E	-	-	-	-	12,16-645E3 (Export); 16-645E3A (DDA40X); 20-645E3 engines (After September, 1968)
		-	-	-	-	-	F	-	-	-	8-645E engine
		-	-	-	-	-	-	G	-	-	12-645E3,E3B,E3C; 16-645E,E3,E3B,E3C and 20-645E3,E3B engines
		-	-	-	-	-	-	-	H	-	8-645E,E3B,E3C,F3B engines
		-	-	-	-	-	-	-	-	J	16-645F3B
1	1109999	2	-	-	-	-	-	-	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaced by 1109280
1	1109280	-	2	-	-	-	-	-	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaced by 1990333
1	1990333	-	-	2	-	-	-	-	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaces 1109999 and 1109280 UTEX No. 8384834 - See Page 3
1	1109629	-	-	-	1	2	-	-	-	-	MOTOR ASM. .. Starter - 64 VDC - Replaced by 1109284
1	1109284	-	-	-	-	-	1	2	-	-	MOTOR ASM. .. Starter - 64 VDC - Replaced by 1993740
1	1993740	-	-	-	-	-	-	-	1	2	MOTOR ASM. .. Starter - 64 VDC - Replaces 1109629 and 1109284 UTEX No. 8428605 - See Page 3
2	8358874	1	1	-	1	1	1	1	1	1	BRACKET ASSEMBLY .. Starter motor
2	9550362	-	-	1	-	-	-	-	-	-	BRACKET ASSEMBLY .. Starter motor
3	8249889	2	2	2	2	2	2	2	2	2	BOLT .. Hex head 3/4-16 x 2-5/8 - Bracket to oil pan
4	8140912	2	2	2	2	2	2	2	2	2	WASHER .. Plain 3/4
5	8060089	2	2	2	2	2	2	2	2	2	NUT .. Hex lock 3/4-16
6	271585	6	6	6	6	6	6	6	6	6	BOLT .. Hex head 5/8-18 x 1-3/4 - Bracket to oil pan
7	103325	6	6	6	6	6	6	6	6	6	WASHER .. Lock 5/8
8	271589	6	6	6	3	6	3	6	3	6	BOLT .. Hex head 5/8-18 x 2-1/2 - Bracket to motor
9	8032721	6	6	6	3	6	3	6	3	6	NUT .. Hex lock 5/8-18
10	8354872	1	1	1	1	1	1	1	1	1	INDICATOR .. Flywheel
11	179793	2	2	2	2	2	2	2	2	2	BOLT .. Hex head 1/4-20 x 5/8 - Indicator mounting
12	103319	2	2	2	2	2	2	2	2	2	WASHER .. Lock 1/4
+*13	- - - -	1	1	1	1	1	1	1	1	1	COVER ASSEMBLY .. Handhole - See Parts List No. 104
*14	8348788	1	1	1	-	-	-	-	-	-	CONNECTOR ASSEMBLY .. Braided shunt - Series connected
15	8387359	1	1	-	-	1	-	1	-	1	SHIELD .. Cable protector - Rear
15	9550364	-	-	1	-	-	-	-	-	-	SHIELD .. Cable protector - Rear
*15	9331013	-	-	-	1	-	1	-	1	-	SHIELD .. Cable protector
16	9550363	-	-	1	-	-	-	-	-	-	SHIELD .. Cable protector - Front
17	8387360	1	1	1	1	1	1	1	1	1	BRACKET .. Shield support - Upper
18	8387361	1	1	1	-	1	-	1	-	1	BRACKET .. Shield support - Lower
19	120910	2	2	2	1	2	1	2	1	2	SCREW .. Round head slotted 10-24 x 3/4 - Shield to bracket
20	8035123	2	2	2	1	2	1	2	1	2	NUT .. Hex lock 10-24
21	9440209	-	-	3	-	-	-	-	-	-	SCREW .. Pan head slotted 3/8-16 x 3/4 - Shield to shield
22	120382	-	-	3	-	-	-	-	-	-	WASHER .. Lock 3/8
23	9501273	-	-	3	-	-	-	-	-	-	NUT .. Retainer 3/8-16
24	453049	-	-	3	-	-	-	-	-	-	SCREW .. Pan head slotted 1/4-20 x 3/4 - Shield to bracket
25	120380	-	-	3	-	-	-	-	-	-	WASHER .. Lock 1/4

The following items Ref. Nos. 14 through 25 are not included in the engine equipped.

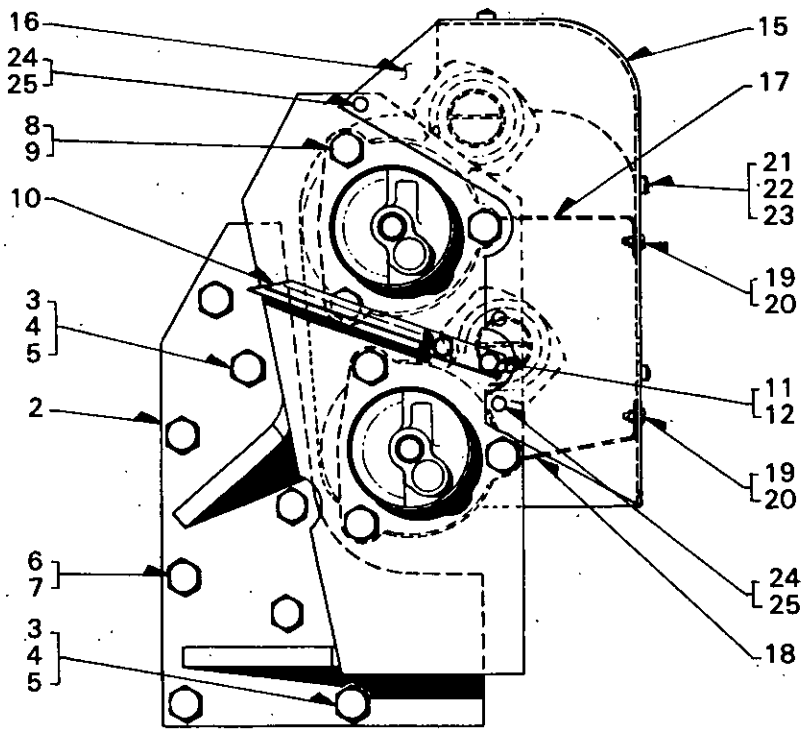
8362067H, 8417334D, 8427792A, 42884, 9327561B

P.L. No. F125

ELECTRIC STARTER MOTOR



Ref. No. 1
Columns A, B, E, G and J



Ref. No. 1
Column C

PLATE C125-1

ELECTRIC STARTER MOTOR

Starter Motor Assembly
PLATES C125-2,3 and A125-4

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
1	1109999	1	-	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaced by 1109280
1	1109280	-	1	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaced by 1990333
1	1990333	-	1	-	-	MOTOR ASM. .. Starter - 32 VDC - Replaces 1109999 and 1109280
1	1109629	-	-	1	-	MOTOR ASM. .. Starter - 64 VDC - Replaced by 1109284
1	1109284	-	-	-	1	MOTOR ASM. .. Starter - 64 VDC - Replaced by 1993740
1	1993740	-	-	-	1	MOTOR ASM. .. Starter - 64 VDC - Replaces 1109629 and 1109284
2	1967349	1	1	1	1	ARMATURE ASSEMBLY .. Starter motor
3	1967345	1	1	-	-	COIL ASSEMBLY .. Filed - 6 coils
3	1970247	-	-	1	1	COIL ASSEMBLY .. Field - 6 coils
4	1950561	1	1	1	1	STUD .. Terminal
5	9414418	2	-	2	-	NUT .. Terminal stud
5	9439624	-	2	-	2	NUT .. Terminal stud
6	1979451	-	1	-	1	NUT ASSEMBLY .. Field terminal stud
6	9421427	1	-	1	-	WASHER .. Lock - Terminal stud
7	811912	1	-	1	-	WASHER .. Plain - Terminal stud
7	1914647	-	1	-	1	WASHER .. Plain - Terminal stud
8	1922457	2	2	2	2	WASHER .. Insulating - Terminal stud
9	1967356	1	1	1	1	INSULATOR .. Terminal stud - Square
10	1965472	1	1	1	1	BUSHING ASSEMBLY .. Terminal stud - Service package - Includes 1 - Insulator support and 1 - Insulator washer
11	1945356	3	3	3	3	PLUG .. Inspection - Commutator end
12	1964857	3	3	3	3	GASKET .. Inspection plug
13	1955989	1	1	1	1	INSULATOR .. Field coil - C.E. - Replaces 1967357 and 1945897
14	1869747	6	6	6	6	SHOE .. Pole
ϕ15	1970469	12	-	-	-	SCREW .. Pole shoe mounting - Replaces 1913100
ϕ15	1968396	12	12	12	12	SCREW .. Pole shoe mounting
16	1967355	3	-	3	2	INSULATOR .. Field coil - Triangular
16	1914873	-	3	-	3	INSULATOR .. Field coil - D.E. - Triangular
17	1953237	1	1	1	1	WASHER .. Thrust - Commutator end
18	1945847	1	-	1	-	FRAME ASM. .. Commutator end - Replaced by 1945848
18	1945848	-	1	-	1	FRAME ASM. .. Commutator end - Replaces 1945847
†19	1894638	1	1	1	1	BUSHING .. Frame - C.E. - Replaces 1869755
20	1916439	1	-	1	-	WICK .. Oil
20	1978754	-	1	-	-	WICK .. Oil - 2-1/4 inches long
20	1972977	-	-	-	1	WICK .. Oil - 1-29/32 inches long
21	1955303	1	-	1	-	PLUG .. Felt
21	1978756	-	1	-	1	PLUG .. Oil reservoir
22	9427882	1	-	1	-	PLUG .. Pipe - Replaces 453465
*23	9417501	1	-	1	-	PLUG .. Retaining - Oil reservoir
*24	1933111	1	-	1	-	GASKET .. Plug retaining
25	1916272	1	1	1	1	SEAL .. O-ring - Frame mounting - Replaces 1945860
26	181568	6	6	6	6	SCREW .. Hex head 1/4-28 x 1 - C.E. frame - Replaces 1914869
27	120380	6	6	6	6	WASHER .. Lock 1/4 - Replaces 9421423
28	1967354	1	1	1	1	PLATE ASSEMBLY .. Brush - Less Brushes
29	1945851	1	1	1	1	PLATE .. Terminal - Includes stud
30	1945850	1	1	1	1	PLATE .. Insulating
31	1979388	3	3	3	3	PLATE .. Spacer - Brush holder - 2 hole for grounded brush - Replaces 1861781
32	1962048	3	3	3	3	PIN .. Brush holder - Short - Grounded brush - Replaces 1928500 and 1861787
33	453435	3	3	3	3	WASHER .. Lock - Brush holder pin - Formerly 6 required
34	1869760	1	1	1	1	PLATE .. Support - Brush holder
35	1913080	6	6	6	6	BUSHING .. Insulating - Brush holder pin - Formerly 12 required
ϕ36	1865925	3	-	3	-	PLATE .. Insulating - 2 hole - Units built prior to October, 1980
ϕ36	1979389	-	3	-	3	PLATE .. Insulating - 2 hole - Units built after October, 1980
37	1962047	3	3	3	3	PIN .. Brush holder - Long - Insulated brush - Replaces 1861786 and 1904982

† *Bushing is to be press fitted and line reamed.*

P.L. No. F125

ELECTRIC STARTER MOTOR

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
-	1109999	1	-	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaced by 1109280
-	1109280	-	1	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaced by 1990333
-	1990333	-	1	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaces 1109999 and 1109280
-	1109629	-	-	1	-	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaced by 1109284
-	1109284	-	-	-	1	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaced by 1993740
-	1993740	-	-	-	1	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaces 1109629 and 1109284
-	1967354	1	1	1	1	PLATE ASSEMBLY .. Brush - Less brushes
38	453435	3	3	3	3	WASHER .. Lock - Brush holder pin - Formerly 6 required
39	1965093	1	1	1	1	INSULATION .. Insulated brush
40	1905043	6	6	6	6	HOLDER .. Brush - Replaces 1861784
41	1861785	12	12	12	12	SPRING .. Brush
42	1984213	3	3	3	3	SCREW ASSEMBLY .. Grounded brush mounting - Includes washer - Replaces 1944656 and 1914580 - Formerly 453468
43	1984212	3	3	3	3	SCREW ASSEMBLY .. Insulated brush mounting - Includes washer - Replaces 1912728 and 1968656 - Formerly 1914642
44	1964516	1	1	1	1	INSULATOR .. Brush plate - .015 inch thick glass cloth
45	1906989	12	12	12	12	BRUSH ASSEMBLY .. Motor - Includes leads - Replaces 1946487 and 1906986
45	1852886	-	12	-	12	BRUSH ASSEMBLY .. Motor - Includes leads - Appl. to 1990333 and 1993740 motors
46	121749	12	12	12	12	SCREW .. Brush lead mounting - 8-32 x 5/16 round head slotted - Replaces 453418
47	132760	3	-	3	-	SCREW .. Brush plate mounting
47	1847807	-	3	-	3	SCREW .. Brush plate mounting
48	453844	3	-	3	-	WASHER .. Lock - Brush plate
49	810794	3	-	3	-	WASHER .. Plain - Brush plate
50	1861791	2	2	2	2	WASHER .. Insulating - Terminal stud
51	120378	1	-	1	-	NUT .. Hex 1/2-13 - Terminal stud
51	1979451	-	1	-	1	NUT .. Terminal stud
*52	1942969	1	-	1	-	BUSHING .. Terminal stud - Rubber
53	9421427	2	1	2	1	WASHER .. Lock - Terminal stud
54	9414418	1	1	1	1	NUT .. Terminal stud
55	811912	1	-	1	-	WASHER .. Plain - Terminal stud
55	1914647	-	1	-	1	WASHER .. Plain - Terminal stud
56	1851632	1	1	1	1	INSULATOR KIT .. Terminal end - Replaces 1918687 and 1918690
						Commutator End
57	1971024	1	-	1	-	HOUSING ASM. .. Drive - Replaces 1957847 and 1949606 -Replaced by 1971025
57	1971025	-	1	-	1	HOUSING ASSEMBLY .. Drive - Replaces 1971024
58	1916439	1	-	1	-	WICK .. Felt - Oil reservoir
58	1978754	-	1	-	1	WICK .. Felt - Oil
59	9427882	1	-	1	-	PLUG .. Pipe - 1/8 N.P.T.F. - Hex socket head - Replaces 453465
60	1978756	-	1	-	1	CUP .. Wick retainer
61	9417501	1	-	1	-	PLUG .. Expansion - Oil reservoir
62	1933111	1	-	1	-	GASKET .. Plug
63	1955303	1	-	1	-	PLUG .. Felt
64	1949619	6	-	6	-	PLUG .. Rubber - Drive housing mounting holes
†65	1894635	1	1	1	1	BUSHING .. Drive housing
66	1971026	1	1	1	1	PIN .. Bushing retaining
67	1948536	5	5	5	5	SCREW .. Hex socket head 5/16-18 x 1-1/2 - Drive housing mounting
68	1947537	1	1	1	1	SCREW .. Hex socket head 5/16-18 x 55/64 - Drive housing mounting
69	1976884	1	1	1	1	CLUTCH ASSEMBLY .. Drive - Starter motor - Replaces 800066 and 1894211
70	1945476	1	1	1	1	GASKET .. Stator housing to drive housing
72	1945857	1	-	1	-	HOUSING ASSEMBLY .. Lever - Replaced by 1979870
72	1979870	-	1	-	1	HOUSING ASSEMBLY .. Lever - Replaces 1945857
73	1916439	1	-	1	-	WICK .. Felt
73	1978754	-	1	-	1	WICK .. Felt
74	1894637	1	1	1	1	BUSHING .. Lever housing - Replaces 1923484
75	9427882	1	-	1	-	PLUG .. Pipe - 1/8 N.P.T.F. - Hex socket head - Replaces 453465

† Bushing is to be press fitted and line reamed.

P.L. No. F125

ELECTRIC STARTER MOTOR

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
-	1109999	1	-	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaced by 1109280
-	1109280	-	1	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaced by 1990333
-	1990333	-	1	-	-	MOTOR ASSEMBLY .. Starter - 32 VDC - Replaces 1109999 and 1109280
-	1109629	-	-	1	-	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaced by 1109284
-	1109284	-	-	-	1	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaced by 1993740
-	1993740	-	-	-	1	MOTOR ASSEMBLY .. Starter - 64 VDC - Replaces 1109629 and 1109284
-	1945857	1	-	1	-	HOUSING ASSEMBLY .. Lever - Replaced by 1979870
-	1979870	-	1	-	1	HOUSING ASSEMBLY .. Lever - Replaces 1945857
76	1918047	1	1	1	1	SEAL .. Oil
77	1978756	-	1	-	1	CUP .. Wick retainer
78	9417501	1	-	1	-	PLUG .. Expansion 0 Oil reservoir
79	1964402	-	1	-	1	PLUG .. Lever housing mounting hole
80	1933111	1	-	1	-	GASKET .. Plug
81	1955303	1	-	1	-	PLUG .. Felt
82	1911644	1	1	1	1	WASHER .. Brake
83	1916272	1	1	1	1	SEAL .. Field frame - Lever housing - Replaces 1945860
84	181568	7	7	7	7	SCREW .. Hex head 1/4-28 x 1 - Lever housing mounting - Replaces 1914869
85	120380	7	7	7	7	WASHER .. Lock - Replaces 9421423
86	1936466	1	1	1	1	WASHER .. Spacer - Lever housing to armature
87	1945356	1	1	1	1	PLUG .. Lever housing
88	1964857	1	1	1	1	GASKET .. Plug - Lever housing
89	1945484	1	1	1	1	LEVER ASSEMBLY .. Shift
90	1948529	1	1	1	1	SHAFT .. Lever - Replaces 1945472
91	1894643	1	1	1	1	SEAL .. O-ring - Shift lever - 1/2 inch diameter - Replaces 1921805
92	1894642	1	1	1	1	SEAL .. O-ring - Shift lever - 15/64 inch diameter - Replaces 1914373
ϕ93	9415235	1	1	1	1	RING .. Snap - Shift lever shaft
ϕ93	9416374	-	1	-	1	RING .. Snap - Shift lever shaft - Applies to 1990333 and 1993740
94	1115567	1	1	1	1	SWITCH ASSEMBLY .. Solenoid - 32 volt } See Page 9 Replaces 1115515, 1115536 and 1115539 }
95	1948522	1	1	1	1	PLUNGER ASSEMBLY .. Switch - Replaces 1945480
96	1948519	1	1	1	1	WASHER .. Spring return - Replaces 1945474
97	801077	1	1	1	1	BOOT .. Plunger - Replaces 1949618 and 1942257
98	1948520	1	1	1	1	RETAINER .. Spring - Shift lever - Replaces 1942256
99	1948521	1	1	1	1	SPRING .. Shift lever return - Replaces 1942260
100	1948526	1	1	1	1	RETAINER .. Spring - Shift lever - Replaces 1942282
ϕ101	9415235	1	1	1	1	RING .. Snap - Shift lever spring retainer
ϕ101	9416374	-	1	-	1	RING .. Snap - Shift lever spring retainer - Applies to 1990333 and 1993740
102	9412305	1	1	1	1	NUT .. Plunger rod guide adjusting
103	1930611	4	4	4	4	SCREW ASSEMBLY .. Solenoid mounting - Includes lockwasher
104	1953236	1	-	1	-	LEAD .. Terminal
104	1979464	-	1	-	1	TERMINAL AND LEAD .. Field terminal to solenoid switch terminal
105	1970188	-	1	-	1	INSULATOR .. Field coil - D.E.
*106	1945843	1	-	1	-	FRAME .. Stator - Less coils

P.L. No. F125

ELECTRIC STARTER MOTOR

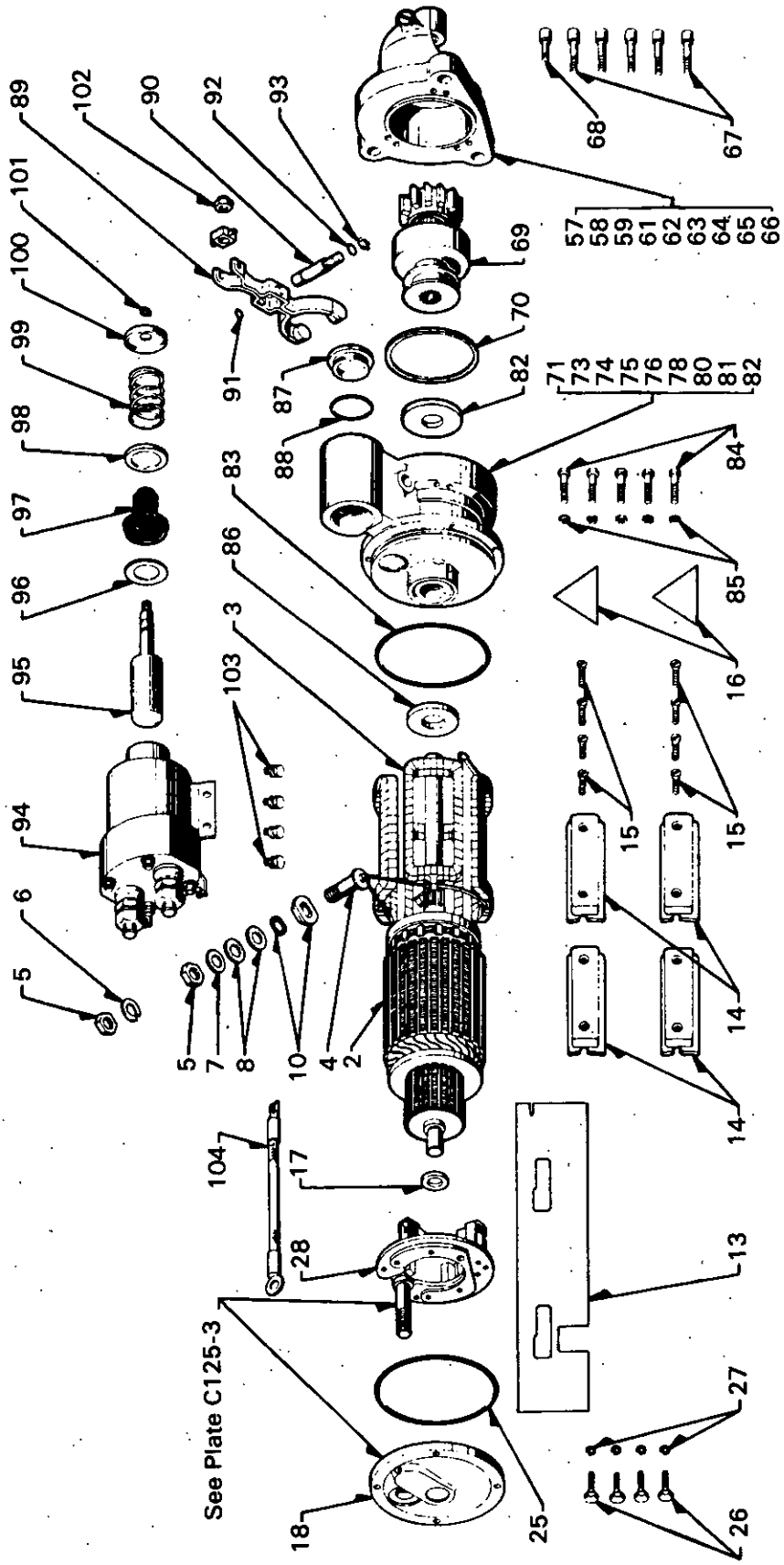


PLATE C125-2

ELECTRIC STARTER MOTOR

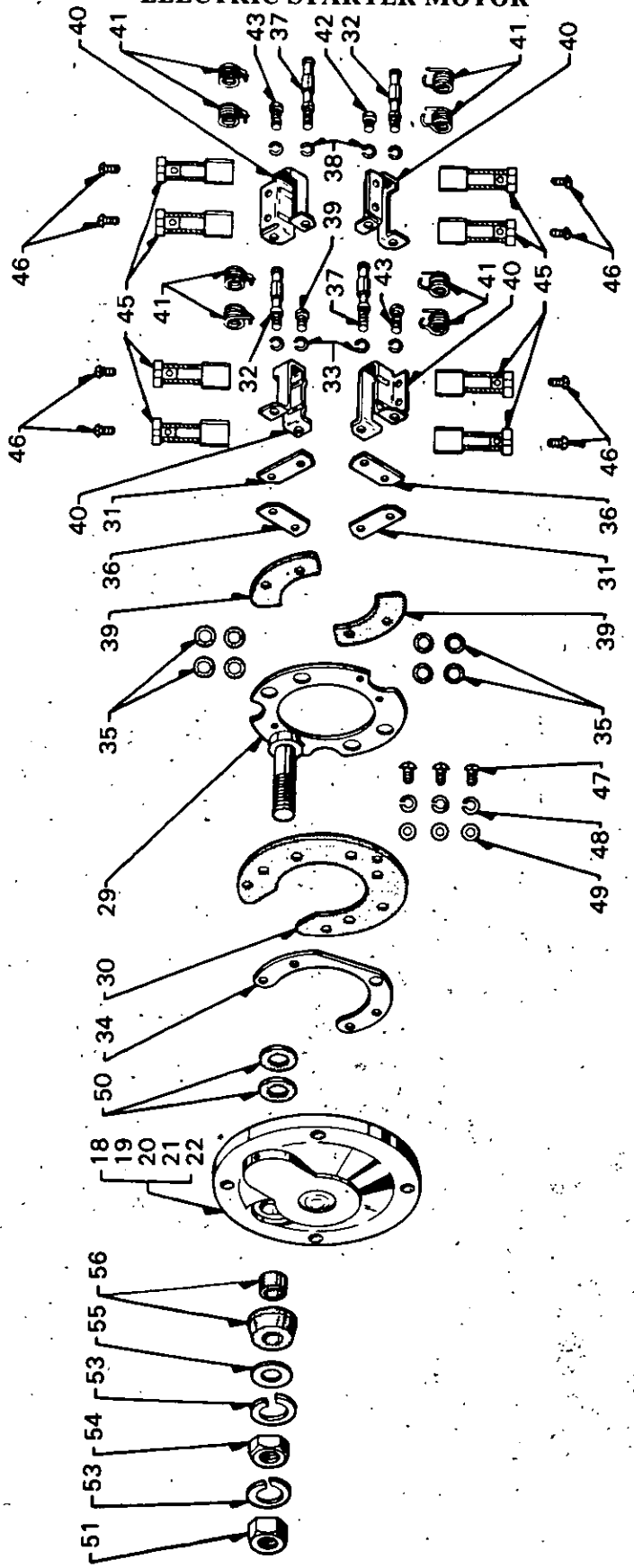


PLATE C125-3

P.L. No. F125

ELECTRIC STARTER MOTOR

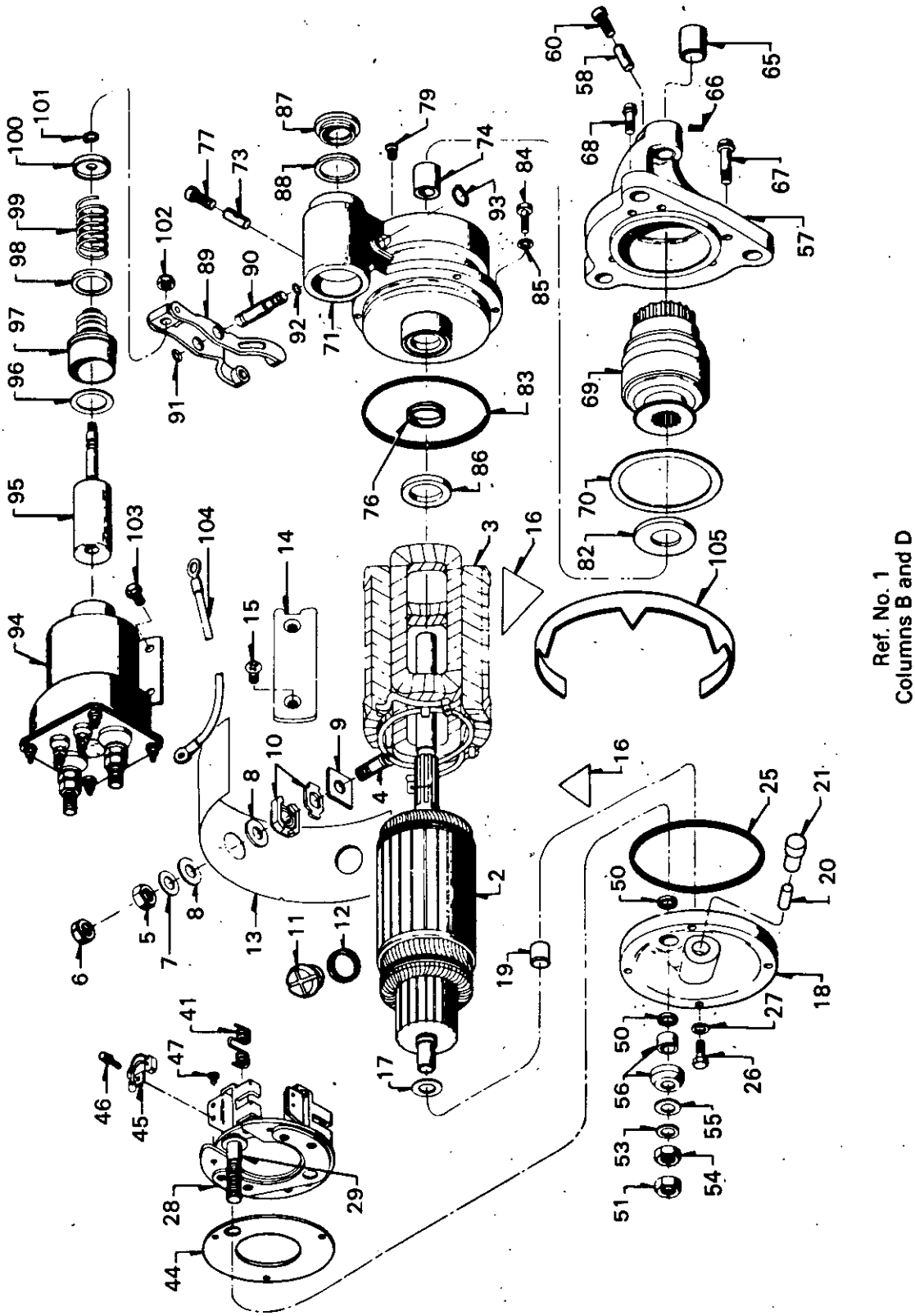


PLATE C125-4

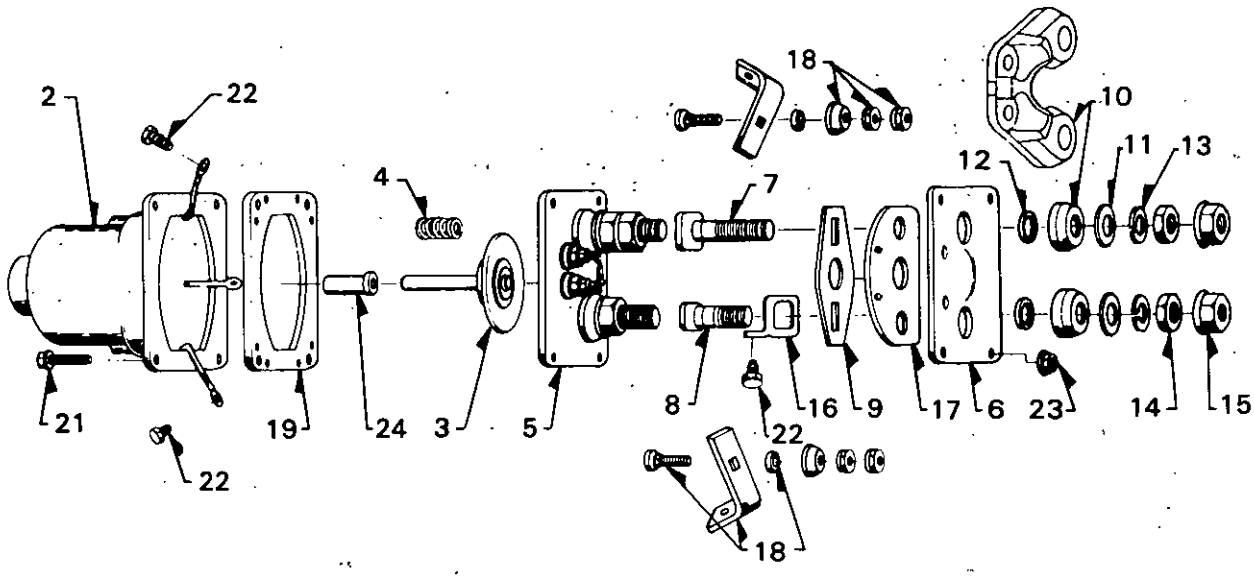
ELECTRIC STARTER MOTOR

Solenoid Switch Assembly
PLATE A125-5

Ref. No.	Part Number	Quantity Required				Description
		A	B	C	D	
*1	1115515	1	-	-	-	SWITCH ASSEMBLY .. Solenoid - Replaced by 1115567
*1	1115536	-	1	-	-	SWITCH ASSEMBLY .. Solenoid - Replaced by 1115567
*1	1115539	-	-	1	-	SWITCH ASSEMBLY .. Solenoid - Replaced by 1115567
1	1115567	-	-	-	1	SWITCH ASSEMBLY .. Solenoid - Replaces 1115515, 1115536 and 1115539
*2	1967338	1	-	-	-	CASE ASSEMBLY .. Switch - Includes coil - Replaced by 1876949
*2	1875622	-	1	-	-	CASE ASSEMBLY .. Switch - Includes coil
*2	1876949	-	-	1	-	CASE ASSEMBLY .. Switch - Includes coil - Replaces 1967338
2		-	-	-	1	CASE ASSEMBLY .. Switch - Includes coil
3	1967335	1	1	1	1	CONTACT ASSEMBLY .. Disc - Formerly 9167335
4	1945402	1	1	1	1	SPRING .. Contact return - Push rod
*5	1967330	1	1	1	-	TERMINAL AND PLATE ASSEMBLY .. Switch
5	1979832	-	-	-	1	TERMINAL AND PLATE ASSEMBLY .. Switch
*6	1945409	1	1	1	-	PLATE .. Terminal
6	1979367	-	-	-	1	PLATE .. Terminal
7	1953244	1	1	1	1	STUD .. Terminal battery - formerly 1906047
8	1906049	1	1	1	1	STUD .. Terminal motor
*9	1931673	1	1	1	-	INSULATION .. Strip - Terminal stud
9	1979369	-	-	-	1	INSULATION .. Strip - Terminal stud
ϕ10	1944836	2	2	2	2	INSULATOR .. Bushing - Terminal stud
ϕ10	1984705	-	-	-	2	INSULATOR .. Bushing - Terminal stud - 4 holes
*11	811912	2	2	2	-	WASHER .. Plain - Terminal stud
11	1914647	-	-	-	2	WASHER .. Plain - Terminal stud
12	1942969	2	2	2	2	BUSHING .. Insulating - Terminal stud
13	9421427	4	4	4	2	WASHER .. Lock - Terminal stud
14	9414418	2	2	2	2	NUT .. Terminal stud - 1/2-13 x 5/16 thick
*15	9413509	2	2	2	-	NUT .. Terminal stud - 1/2-13 x 7/16 thick
15	1979451	-	-	-	2	NUT ASSEMBLY .. Terminal stud - 7/16 thick - Includes washer
16	1906051	1	1	1	1	CLIP .. Support - Terminal
17	1979368	-	-	-	1	INSULATOR .. Terminal stud - 5 holes
18	1979776	-	-	-	2	TERMINAL PACKAGE .. Switch and ground
*19	1950111	1	1	1	-	GASKET .. Terminal plate
19	1979384	-	-	-	1	GASKET .. Terminal plate
*20	1948656	4	-	-	-	NUT .. Sealing - Terminal plate
*21	1971106	-	4	4	-	SCREW ASSEMBLY .. Terminal plate - Cover - Attaching
21	1979385	-	-	-	4	SCREW ASSEMBLY .. Terminal plate - Cover - Attaching
22	1840633	1	1	1	3	SCREW .. Coil lead attaching
23	1979365	-	-	-	4	NUT ASSEMBLY .. Terminal plate - Cover - Attaching - Includes washer
24	1972716	-	-	-	1	BUSHING .. Rod plunger guide
*25	1933749	1	1	-	-	LEAD ASSEMBLY .. Ground connector - Replaces 1909829
*26	1914800	2	-	-	-	SCREW .. Terminal
*27	1915717	-	2	2	-	SCREW .. Terminal
*28	1915718	2	2	2	-	CLIP .. Terminal

P.L. No. F125

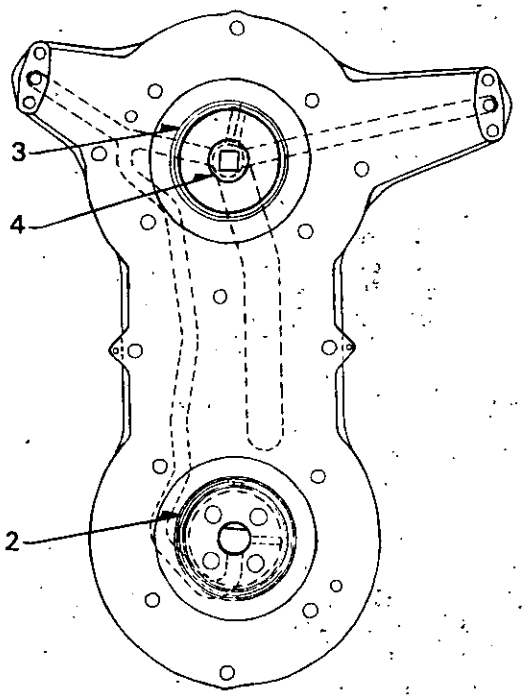
ELECTRIC STARTER MOTOR



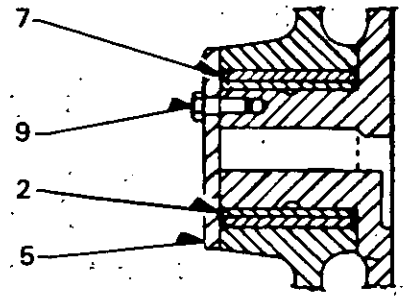
Ref. No. 1
PLATE A125-5

CAMSHAFT DRIVE GEAR TRAIN

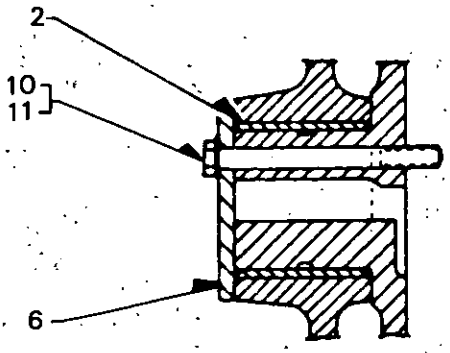
Idler Gear Stubshaft Arrangement
16-567D1 and 8,12,16-645E Engines



Ref. No. 1
Column B



Previous Design



Current Design
Lower Stubshaft
Sectioned Through

PLATE E126-1

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	-	Previous Application
		-	B	Current Application
†1	8163034	1	-	STUBSHAFT ASSEMBLY .. Idler gear - No longer furnished
1	8484128	-	1	STUBSHAFT ASSEMBLY .. Idler gear - Through bolt design
2	8081396	1	-	BEARING .. Lower stubshaft
2	8418334	-	1	BEARING .. Lower stubshaft
3	8081393	1	-	BEARING .. Upper stubshaft
3	8484103	-	1	BEARING .. Upper stubshaft
4	106644	1	1	PLUG .. Pipe - 1-1/4 N.P.T.
5	8081394	1	-	PLATE .. Thrust - Lower idler
6	8418364	-	1	PLATE .. Thrust - Lower idler
7	8069155	1	-	BUSHING .. Lower idler - 4.617 O.D. 8229678 .. 4.677 O.D. 8267496 .. 4.647 O.D.
*8	8081391	1	-	BUSHING .. Upper idler - 4.617 O.D. 8229677 .. 4.677 O.D. 8267497 .. 4.647 O.D.
9	8048764	4	-	BOLT .. Drilled hex head 1/2-13 x 1-1/4 - Thrust plate
10	8418363	-	4	BOLT .. Drilled hex head 5/8-18 x 6-1/2 - Thrust plate
11	8282178	-	4	WASHER .. Hardened 5/8
*12	8028329	15	-	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Stubshaft mounting
*12	8028302	-	15	BOLT .. Drilled hex head 1/2-20 x 1-1/2 - Stubshaft mounting
*13	8260114	-	15	WASHER .. Hardened 1/2

See Page 2

†Stubshaft assembly 8163034 is no longer available and has been replaced by current design stubshaft 8484128. When converting to this latest design, new mounting hardware (Ref. Nos. 6,10,11,12 and 13) is also required. Ref. Nos. 7 and 8 are only required on the earlier design stubshafts. Refer to M.I. 9587, Rev. A for details.

P.L. No. F126

CAMSHAFT DRIVE GEAR TRAIN

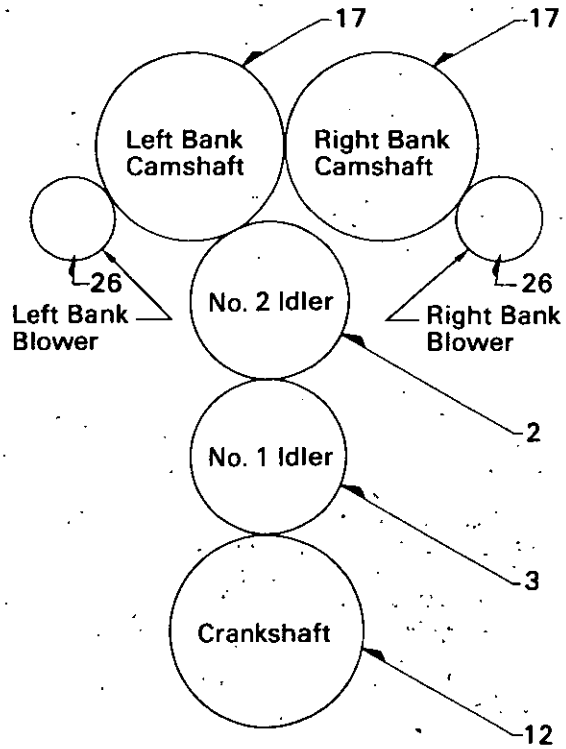
16-567D1 and 8,12,16-645E Engines
PLATE D126-2

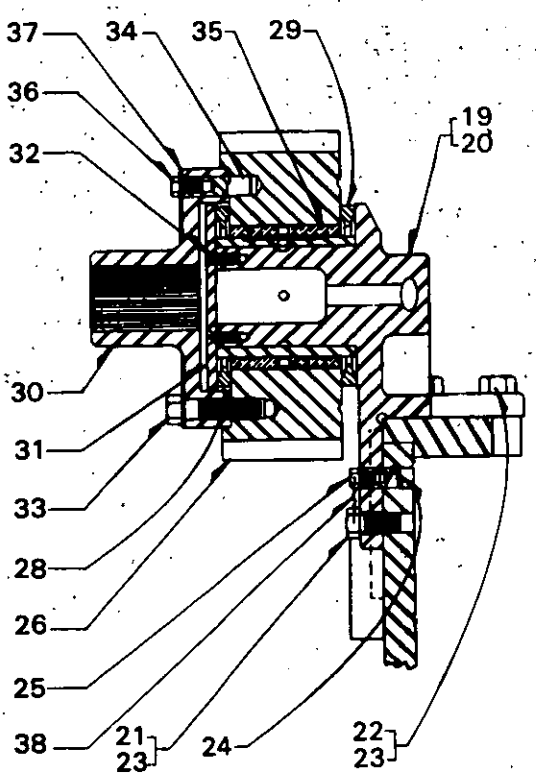
Ref. No.	Part Number	Quantity Required			Description
		A	-	-	8-645E engines
		-	B	-	12-645E engines
		-	-	C	16-567D1 and 16-645E engines
1	----	1	1	1	STUBSHAFT .. Idler gear - See Page 1
2	8483945	1	1	1	GEAR .. Idler - Upper - Replaces 8082766
3	8483944	1	1	1	GEAR .. Idler - Lower - Replaces 8069030
4	----	15	15	15	BOLT .. Stubshaft mounting - See Page 1
5	8260114	15	15	15	WASHER .. Hardened 1/2 - Current design stubshaft only
6	8028327	2	2	2	BOLT .. Drilled hex head dowel 5/16-24 x 1/2
7	8306807	2	2	2	DOWEL .. Locating .5000 diameter x 1-3/16 with 5/16-24 thread 8306808 - .5050 diameter 8306810 - .5150 diameter 8306809 - .5100 diameter
8	8418363	4	4	4	BOLT .. Drilled hex head - 5/8-18 x 6-1/2 - Lower idler gear
9	8282178	4	4	4	WASHER .. Hardened 5/8
10	8418364	1	1	1	PLATE .. Thrust - Lower idler gear
11	8081392	1	1	1	COLLAR .. Thrust - Upper idler gear
12	8069014	1	1	1	GEAR .. Crankshaft
13	8031949	1	1	1	SLINGER .. Oil
14	----	As Req.			SHIM .. Oil slinger 8035526 - .010 8035527 - .021 8035528 - .030
15	8028288	8	8	8	BOLT .. Hex head 5/16-24 x 3/4 - Oil slinger
16	----	-	-	-	BOLT .. Coupling disc. - See Parts List No. 124
17	8069019	2	2	2	GEAR .. Camshaft drive - Left and right bank
18	8266426	8	-	-	BOLT .. Hex head 1/2-20 x 2-1/4 - Gear mounting } See Parts List No. 128
18	8028335	-	8	8	BOLT .. Hex head 1/2-20 x 2-1/8 - Gear mounting } See Parts List No. 128
19	8081390	1	-	1	STUBSHAFT .. Right bank blower drive gear
19	8098077	-	1	-	STUBSHAFT .. Right bank blower drive gear
20	8098078	-	1	-	STUBSHAFT .. Left bank blower drive gear
20	8081389	-	-	1	STUBSHAFT .. Left bank blower drive gear
21	8028329	3	6	6	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Stubshaft mounting
22	455013	5	10	10	BOLT .. Hex head 1/2-20 x 1-3/8 - Stubshaft mounting - Formerly 8028291
23	8260114	8	16	16	WASHER .. Hardened 1/2
24	8028736	1	2	2	DOWEL .. Locating .5000 diameter x 1-1/16 with 5/16-24 thread 8082371 - .5050 diameter 8082369 - .5150 diameter 8082370 - .5100 diameter 8298523 - .5200 diameter
25	8028327	1	2	2	BOLT .. Drilled hex head dowel 5/16-24 x 1/2
26	8483947	1	-	2	GEAR .. Blower drive - 29 tooth - Except 16-567D1 engine - Replaces 8362081
26	8483946	-	2	-	GEAR .. Blower drive - 39 tooth - Replaces 8362082
26	8483942	-	-	2	GEAR .. Blower drive - 30 tooth - 16-567D1 engine - Replaces 8130889
28	8069139	1	2	2	WASHER .. Thrust - Bronze - Outboard
29	8166495	1	2	2	WASHER .. Thrust - Cast iron - Inboard
30	8069495	1	2	2	HUB .. Blower drive
31	8069480	1	2	2	PLATE .. Thrust
32	113229	6	12	12	SCREW .. Slotted flat head 1/4-28 x 3/4 inch - Thrust plate
33	8069557	3	6	6	BOLT .. Hex head 1/2-20 x 2 - Hub mounting
34	8069556	3	6	6	DOWEL .. Locating .5000 diameter x 1-3/4 with 5/16-24 thread 8115083 - .5050 dia. 8115081 - .5100 dia. 8115082 - .5150 dia.
35	8069157	1	2	2	BUSHING .. Drive gear - Floating
36	8028327	3	6	6	BOLT .. Drilled hex head dowel 5/16-24 x 1/2
37	8069558	1	2	2	PLATE .. Retainer
38	8116738	As Req.			WIRE .. Lock - 500 foot length
39	8175731	1	1	1	RETAINER ASSEMBLY .. Oil seal - Replaces 8175730
40	8175858	1	1	1	GASKET .. Oil retainer
41	181370	24	24	24	BOLT .. Hex head 3/8-24 x 1-1/4 - Oil retainer to housing
42	6101225	24	24	24	WASHER .. Plain 3/8

8475600, 8475602, 8475604

P.L. No. F126

CAMSHAFT DRIVE GEAR TRAIN





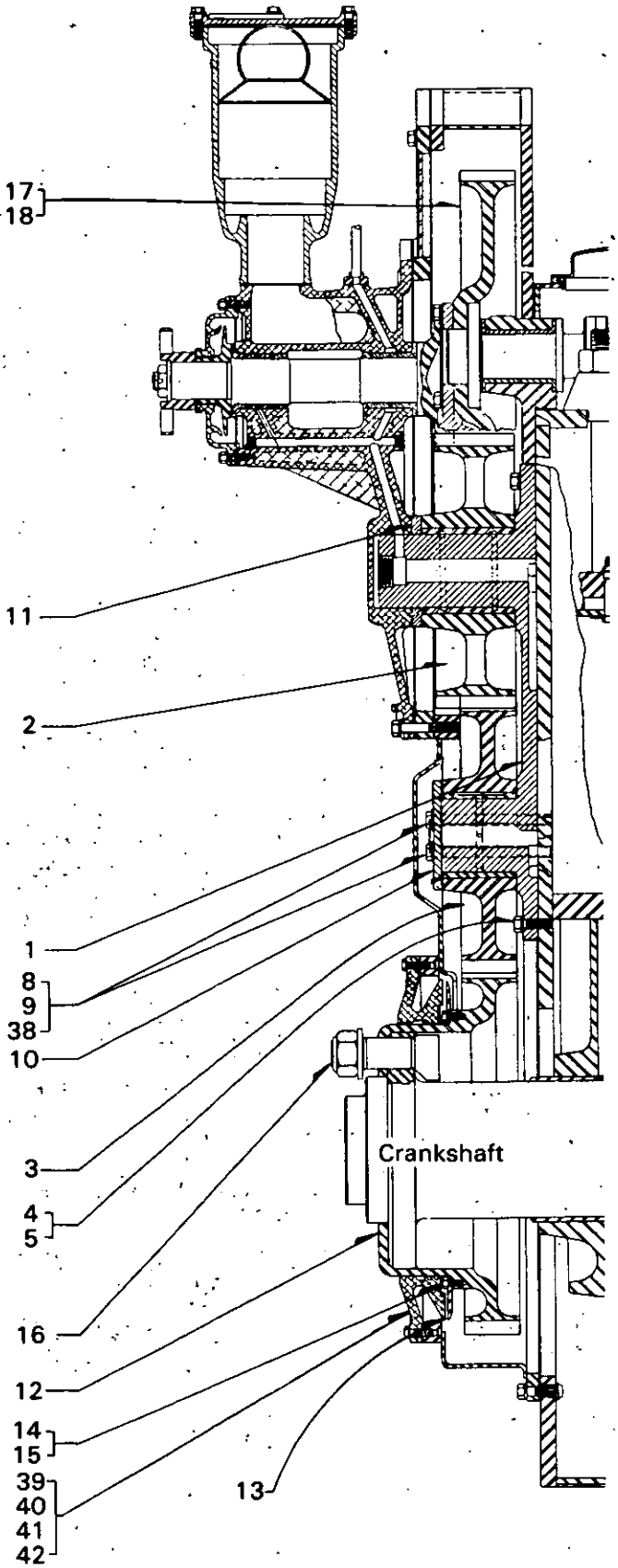


PLATE D126-2

P.L. No. F126

CAMSHAFT DRIVE GEAR TRAIN

16-567D2,D3,D3A; 8,12,16-645E3B,E3C,F3B;
12,16-645E3,F3; 16-645E3A and 20-645E3,E3B Engines
PLATE C126-3

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	16-567D2,D3 engines
		-	B	-	-	-	-	-	16-567D3,D3A engines
		-	-	C	-	-	-	-	8-645E3B,E3C,F3B engines
		-	-	-	D	-	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	-	-	16-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	-	F	-	16-645E3A engine
		-	-	-	-	-	-	G	20-645E3,E3B engines
1	8069014	1	1	1	1	1	1	-	GEAR .. Crankshaft - 79 teeth
1	8360843	-	-	-	-	-	-	1	GEAR .. Crankshaft - 79 teeth
2	8031949	1	1	1	1	1	1	1	SLINGER .. Oil
*3	8028288	8	8	8	8	8	8	8	BOLT .. Hex head 5/16-24 x 3/4 - Slinger to gear
*4	----	As Required							SHIM .. Slinger 8035526 - .010 8035527 - .020 8035528 - .030
5	----	6	6	6	6	6	6	-	BOLT .. Coupling disc to crankshaft - 1-1/2-12 x 4-9/16 inches long - 1.735 inch shoulder - Square head - 45° chamfer on one side - See Parts List No. 124
*5	8360844	-	-	-	-	-	-	12	BOLT .. Coupling disc to crankshaft - 1-1/4-12 x 4-13/32 inches long - 1.735 inch shoulder - Square head - 45° chamfer on one side
6	8483944	1	1	1	1	1	1	1	GEAR .. Lower idler - 58 teeth - Replaces 8069030
7	----	4	4	4	4	4	4	4	BOLT .. Gear mounting - See Page 6
8	----	1	1	1	1	1	1	1	PLATE .. Thrust - See Page 6
†*9	9515332	1	-	-	-	-	-	-	GEAR ASM. .. Spring drive - Replaces 8449075 - See Page 8
†ϕ*9	9515331	-	1	-	1	1	1	-	GEAR ASM. .. Spring drive - Replaces 8449231 - See Page 8 (Columns D,E and F - 12 and 16-645 engines with 16.8:1 or 17.9 gear ratio turbochargers)
†*9	9515339	-	-	1	-	-	-	-	GEAR ASM. .. Spring drive - Replaces 8448324 - See Page 8
†ϕ*9	9515338	-	-	-	1	1	1	1	GEAR ASM. .. Spring drive - Replaces 8419151 - See Page 8 (Columns D,E and F - 12 and 16-645 engines with 18:1 gear ratio turbochargers)
10	----	1	1	1	1	1	1	1	STUBSHAFT ASSEMBLY .. Idler gear - See Page 6 for stubshaft and mounting hardware
11	8069019	2	2	2	2	2	2	2	GEAR .. Camshaft drive - 79 teeth - Left and right bank
*12	455014	-	-	8	-	-	-	-	BOLT .. Drilled hex head 1/2-20 x 1-1/2 - Gear mounting - Formerly 8028302
*12	8028335	8	8	-	8	8	8	8	BOLT .. Drilled hex head 1/2-20 x 2-1/8 - Gear mounting
*13	8266455	2	2	2	2	2	2	2	PLATE .. Dowel retainer
*14	8286669	4	4	4	4	4	4	4	BOLT .. Drilled hex head 5/16-24 x 5/8 - Retainer dowel

† *The Solid Type upper idler and turbocharger drive gear assembly is no longer applied to rail engines. The Spring Type drive gear assembly is recommended for replacement.*

15	8175731	1	1	1	1	1	1	1	RETAINER .. Oil seal - Replaces 8175730
16	8175858	1	1	1	1	1	1	1	GASKET .. Oil retainer
17	181370	24	24	24	24	24	24	24	BOLT .. Hex head 3/8-24 x 1-1/4 - Oil retainer to housing
18	6101225	24	24	24	24	24	24	24	WASHER .. Plain 3/8

CAMSHAFT DRIVE GEAR TRAIN

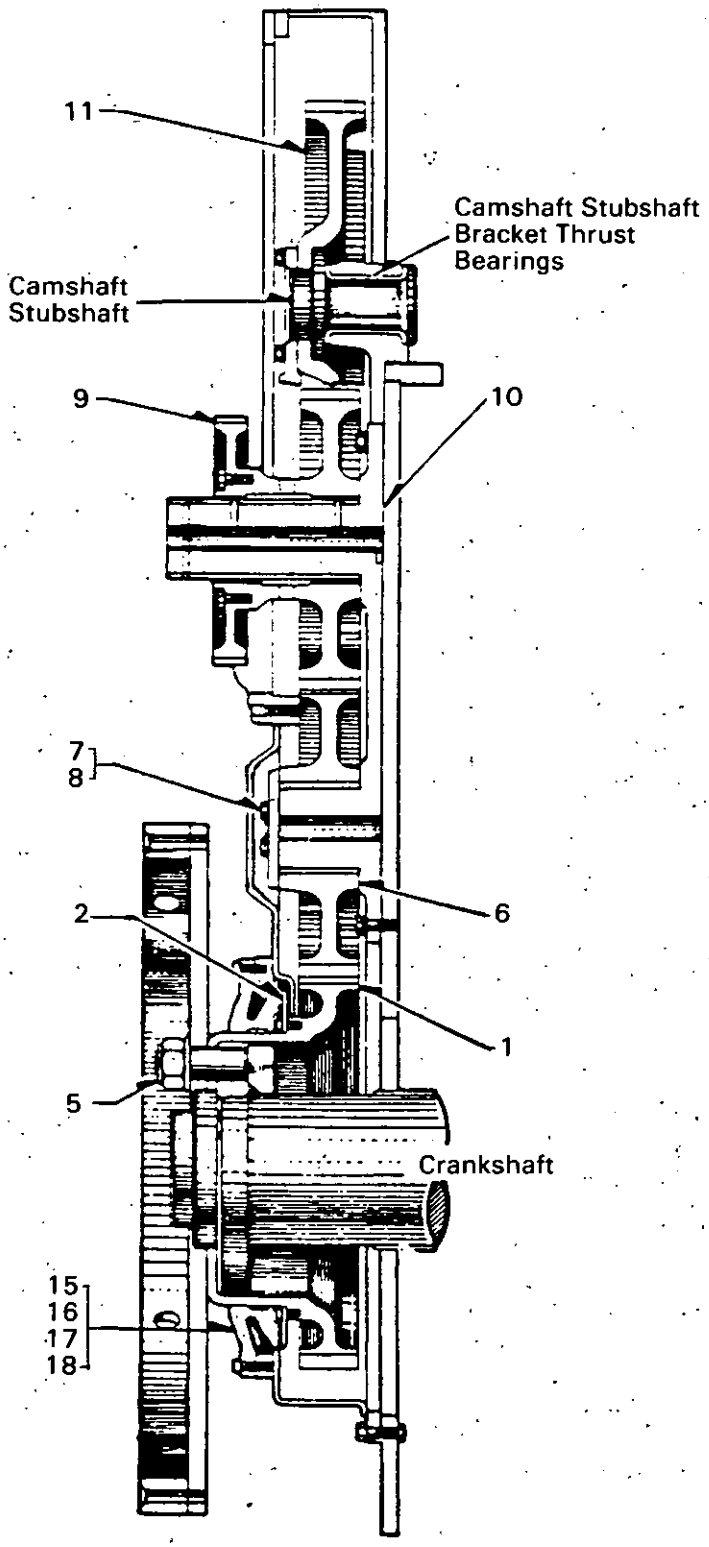


PLATE C126-3

P.L. No. F126

CAMSHAFT DRIVE GEAR TRAIN

Idler Gear Stubshaft Assembly and Mounting
16-567D2,D3,D3A; 8,12,16-645E3B,E3C,F3B;
12,16-645E3,F3; 16-645E3A and 20-645E3,E3B Engines
PLATE B126-4

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	16-567D2,D3 engines
		-	B	-	-	-	-	-	16-567D3,D3A engines
		-	-	C	-	-	-	-	8-645E3B,E3C,F3B engines
		-	-	-	D	-	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	-	-	16-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	-	F	-	16-645E3A engine
		-	-	-	-	-	-	G	20-645E3,E3B engines
*1	8261204	1	-	-	-	-	-	-	STUBSHAFT .. Idler - One piece - Applied to engines with external turbocharger lube oil piping - GP20, SD24 locomotives
†2	8288760	1	1	1	1	1	-	1	STUBSHAFT .. Idler - One piece - Applied to engines with internal turbocharger lube oil piping - No longer furnished - See Ref. Nos. 11 thru 20 for replacement
†*3	8387372	-	-	-	-	-	1	-	STUBSHAFT .. Idler - One piece - Model DDA40X only - No longer furnished - See Ref. Nos. 11 thru 20 for replacement
†††4	8081396	1	1	1	1	1	1	1	SLEEVE .. Lower stubshaft
†††5	8261195	1	1	1	1	1	1	1	SLEEVE .. Upper stubshaft
6	141238	1	1	1	1	1	1	1	PIN .. Dowel - Stubshaft
7	8069155	1	1	1	1	1	1	1	BUSHING .. Idler gear - Floating 8267496 .. .030 OS 8229678 .. .060 OS
8	8081394	1	1	1	1	1	1	1	PLATE .. Thrust - Lower idler gear
9	8048764	4	4	4	4	4	4	4	BOLT .. Drilled hex head 1/2-13 x 1-1/4 - Plate mounting
*10	8028329	15	15	15	15	15	15	15	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Stubshaft mounting
11	8442661	1	1	1	1	1	1	1	STUBSHAFT .. Idler - One piece - Bolt through design - With original oil passages - Replaces 8288760 and 8387372 (Column F - Model DDA40X only)
††12	8470154	1	1	1	1	1	1	1	STUBSHAFT .. Idler - One piece - Bolt through design - With improved oil passages (applied since July, 1974) - Optional to 8442661 stubshaft
†††13	8418334	1	1	1	1	1	1	1	BEARING .. Lower stubshaft
14	8261195	1	1	1	1	1	1	1	SLEEVE .. Upper stubshaft
15	141238	1	1	1	1	1	1	1	PIN .. Dowel - Stubshaft
16	8418364	1	1	1	1	1	1	1	PLATE .. Thrust - Lower idler gear
17	8418363	4	4	4	4	4	4	4	BOLT .. Drilled hex head 5/8-18 x 6-1/2
18	8282178	4	4	4	4	4	4	4	WASHER .. Hardened 5/8
*19	8028302	18	18	18	18	18	18	18	BOLT .. Drilled hex head 1/2-20 x 1-1/2 - Stubshaft mounting
*20	8260114	18	18	18	18	18	18	18	WASHER .. Hardened - 17/32 I.D. x 1-1/16 O.D. x .105 inch thick

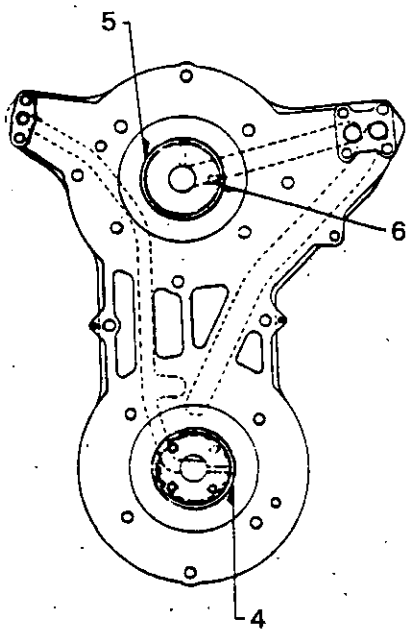
† Stubshafts 8288760 and 8387372 are no longer available. If a replacement is necessary, a conversion to the current stubshaft, 8470154 is suggested. This conversion will require drilling and tapping additional mounting holes and the application of the newer design thrust plate and mounting hardware. Refer to M.I. 9587, Rev. A.

†† Installation of 8470154 stubshaft requires that 3 GPM soak back pump 8492180 also be applied. See Parts List No. 134. Refer to M.I. 9587, Rev. A for details.

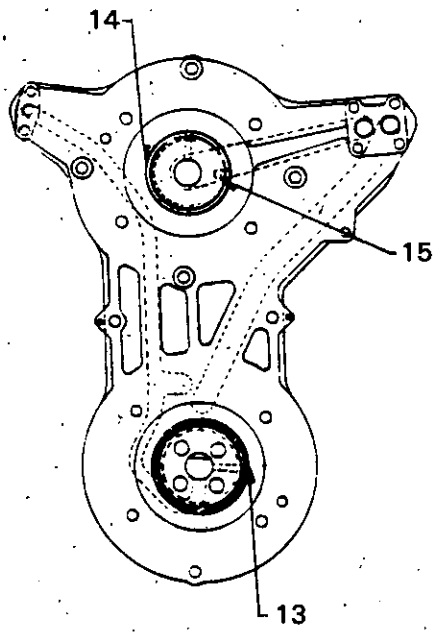
††† Replacement bearings must be applied with a heat shrink press fit.

P.L. No. F126

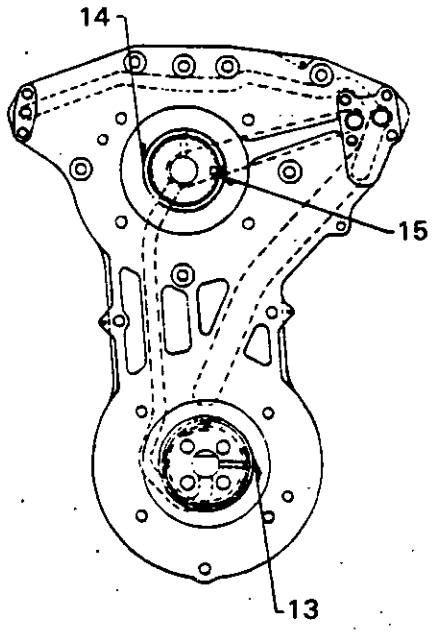
CAMSHAFT DRIVE GEAR TRAIN



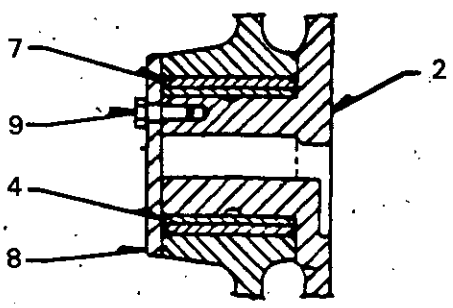
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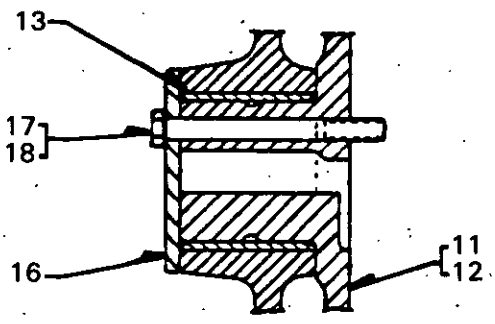
Ref. No. 11



Ref. No. 12



Previous Design



Current Design

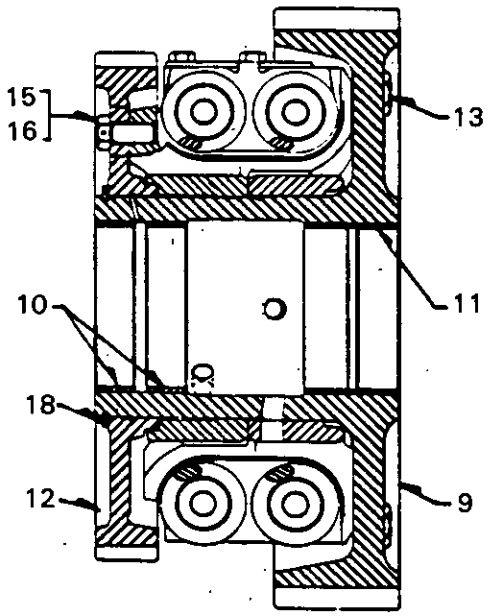
Lower Stubshaft Sectioned Through

PLATE B126-4

P.L. No. F126

CAMSHAFT DRIVE GEAR TRAIN

Upper Idler and Turbocharger Spring Drive Gear Assembly
16-567D2,D3,D3A and 8,12,16,20-645 Turbocharged Engines



Ref. Nos. 1 Through 8

PLATE A126-5

Ref. No.	Part Number	Quantity Required								Description
		A	B	C	D	E	F	G	H	
1	8449075	1	-	-	-	-	-	-	-	GEAR ASSEMBLY .. Spring drive - Replaced by 9515332
2	8449231	-	1	-	-	-	-	-	-	GEAR ASSEMBLY .. Spring drive - Replaced by 9515331
3	8419151	-	-	1	-	-	-	-	-	GEAR ASSEMBLY .. Spring drive - Replaced by 9515338
4	8448324	-	-	-	1	-	-	-	-	GEAR ASSEMBLY .. Spring drive - Replaced by 9515339
5	9515332	-	-	-	-	1	-	-	-	GEAR ASSEMBLY .. Spring drive - 20:1 ratio
6	9515331	-	-	-	-	-	1	-	-	GEAR ASSEMBLY .. Spring drive - 16.8:1 and 17.9 ratios
7	9515338	-	-	-	-	-	-	1	-	GEAR ASSEMBLY .. Spring drive - 18:1 ratio
8	9515339	-	-	-	-	-	-	-	1	GEAR ASSEMBLY .. Spring drive - 19.7:1 ratio
9	8418926	1	1	1	1	-	-	-	-	GEAR ASSEMBLY .. Upper idler - 58 teeth
9	9515336	-	-	-	-	1	1	1	1	GEAR ASSEMBLY .. Upper idler - 58 teeth
†10	8407341	2	2	2	2	2	2	2	2	BEARING .. Hub - 1 inch long
†11	8261101	1	1	1	1	1	1	1	1	BEARING .. Gear - 2.271 inches long
12	8449076	1	-	-	-	1	-	-	-	GEAR .. Turbo drive - 82 teeth
12	8449232	-	1	-	-	-	1	-	-	GEAR .. Turbo drive - 87 teeth
12	8419054	-	-	1	-	-	-	1	-	GEAR .. Turbo drive - 74 teeth
12	8448310	-	-	-	1	-	-	-	1	GEAR .. Turbo drive - 70 teeth
13	9091626	4	4	4	4	-	-	-	-	BOLT .. Hex head 5/8-11 x 1-3/8 - Idler gear - Repl. 426448
†††13	9513657	-	-	-	-	4	4	4	4	BOLT .. Special drilled hex head 3/4-16 x 4 - Idler gear
††*14	8070243	2	2	2	2	2	2	2	2	DOWEL .. Locating .5000 diameter x 1 with 1/4-28 thread 8115096 .. .005 OS 8115097 .. .010 OS 8115098 .. .015 OS
††15	8314057	8	8	8	8	8	8	8	8	BOLT .. Drilled hex head 1/2-13 x 1-1/4 - Turbocharger drive gear mounting } Replaces 8419063
††16	8260114	8	8	8	8	8	8	8	8	WASHER .. Hardened - 17/32 I.D. x 1-1/16 O.D. x .105 inch thick } Replaces 8419063
*17	8116738	As Required								WIRE .. Lock - 3/64 diameter - 500 foot length
18	9414864	1	1	1	1	1	1	1	1	RING .. Snap - Drive gear retaining
*19	9523254	-	-	-	-	2	2	2	2	BOLT .. Drilled hex head 1/2-20 x 2 - Idler gear
*20	9513922	-	-	-	-	4	4	4	4	DAMPER .. Bolt - Applied with 9513657 bolt
*21	102593	-	-	-	-	4	4	4	4	SCREW .. Hex socket hd. 3/8-16 x 1/2 in. - Idler gear bolt

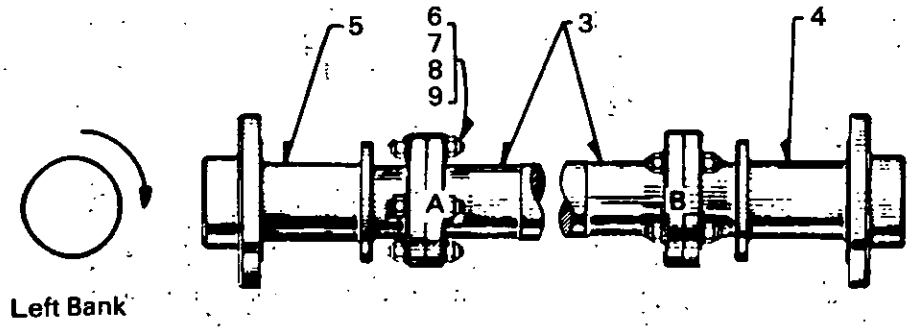
† Bearings must be precision bored.

†† Applied to units shipped after May 1, 1977 and required for modification to spring drive assemblies built prior to May, 1977. See Pointers No. 6L-75, June 23, 1975 for details.

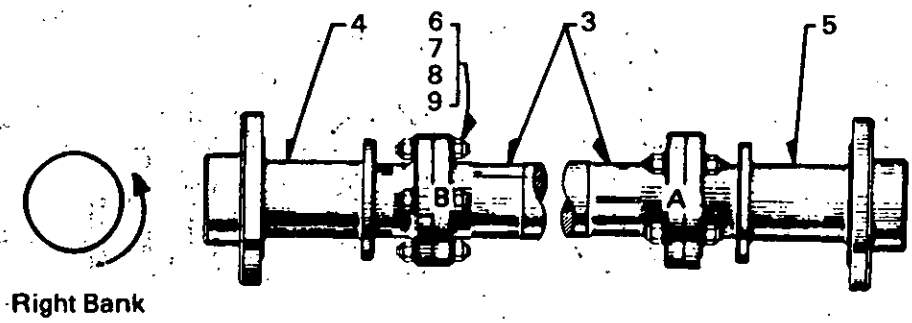
††† See Pointers No. 3L-83, March 7, 1983 for details.

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

Camshaft Assembly
8-645 Engines



Ref. No. 1



Ref. No. 2

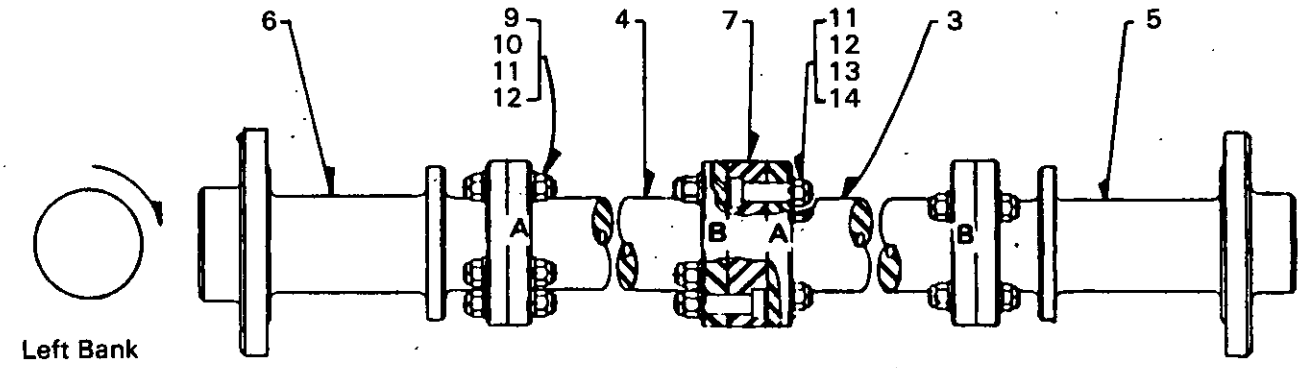
PLATE E128-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	B	8-645E engine 8-645E3B,E3C,F3B engines
1	8274792	1	-	-	-	CAMSHAFT ASSEMBLY .. Left bank
1	8491992	-	-	1	-	CAMSHAFT ASSEMBLY .. Left bank
2	8274793	-	1	-	-	CAMSHAFT ASSEMBLY .. Right bank
2	8491993	-	-	-	1	CAMSHAFT ASSEMBLY .. Right bank
3	8261194	1	1	-	-	SEGMENT .. Camshaft - Left and right banks - Replaces 9502032 and 9503557
3	8419849	-	-	1	1	SEGMENT .. Camshaft - Left and right banks
4	8070749	1	1	1	1	STUBSHAFT .. Camshaft - Left bank accessory drive end - Right bank camshaft drive end
5	8028361	1	1	1	1	STUBSHAFT .. Camshaft - Left bank camshaft drive end - Right bank accessory drive end
6	8034672	2	2	2	2	STUD .. Locating 3/8-24 x 2-3/8 - 7/16 inch shoulder
7	8034673	6	6	6	6	STUD .. Segment 3/8-24 x 2-3/8 - 1/2 inch shoulder
8	8035950	16	16	16	16	WASHER .. Plain 3/8
9	8032717	16	16	16	16	NUT .. Hex lock 3/8-24

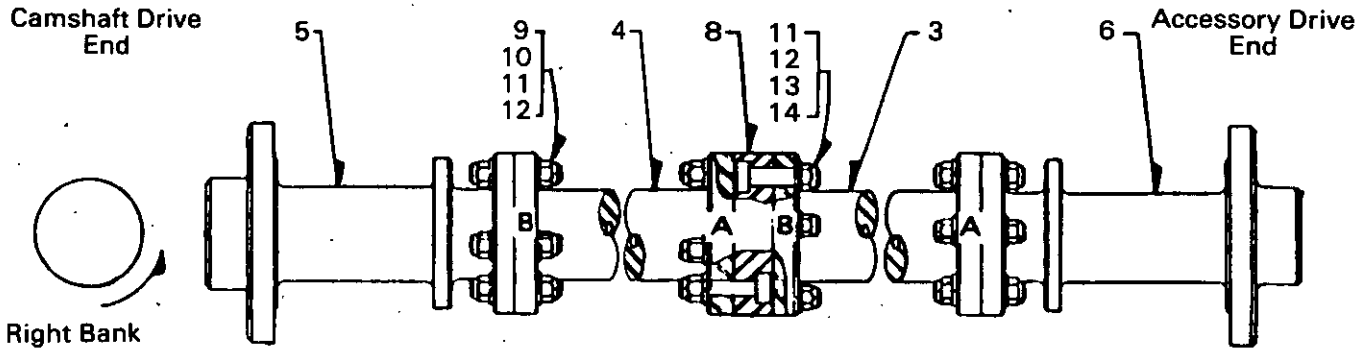
P.L. No. F128

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

Camshaft Assembly
12-645 Engines



Ref. No. 1



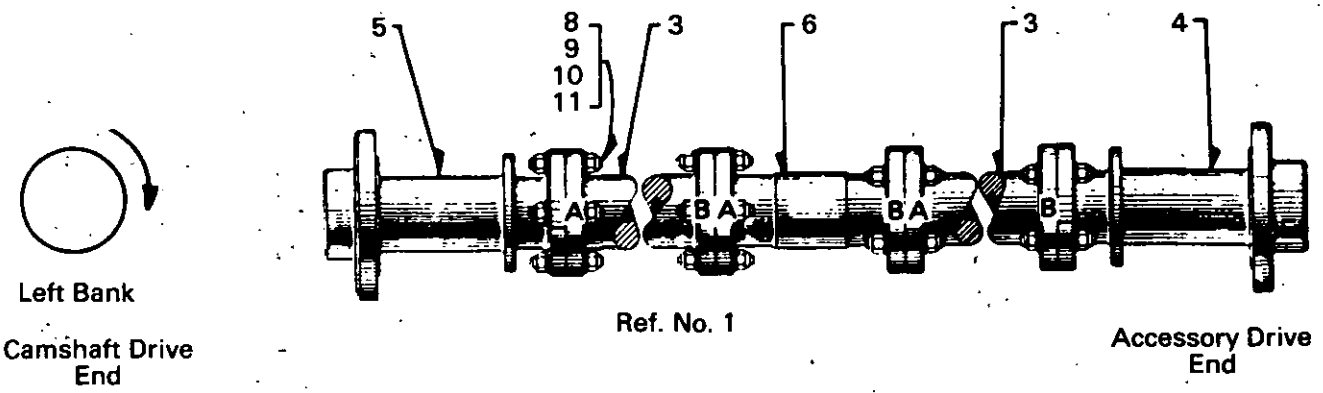
Ref. No. 2

PLATE E128-2

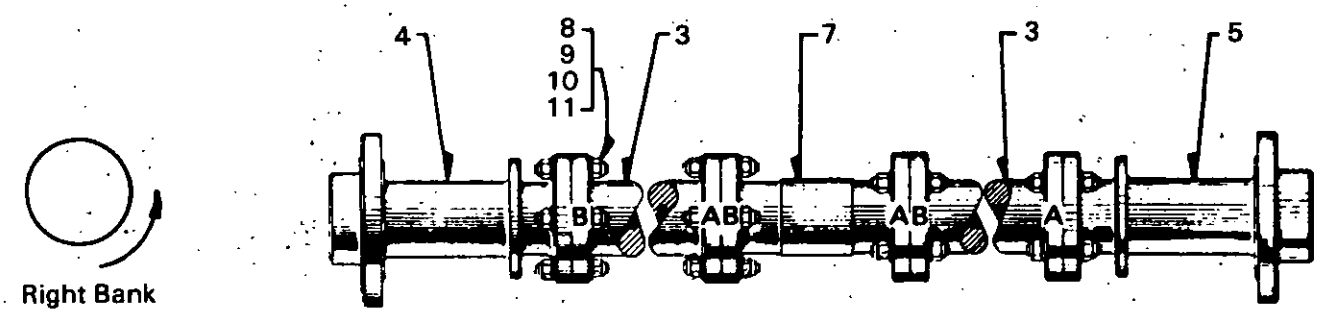
Ref. No.	Part Number	Quantity Required				Description
		A	-	-	B	12-645E,E3 engines 12-645E3B,E3C,F3,F3B engines
1	8274796	1	-	-	-	CAMSHAFT ASSEMBLY .. Left bank
1	9318997	-	-	1	-	CAMSHAFT ASSEMBLY .. Left bank
2	8274797	-	1	-	-	CAMSHAFT ASSEMBLY .. Right bank
2	9318996	-	-	-	1	CAMSHAFT ASSEMBLY .. Right bank
3	8261442	1	1	-	-	SEGMENT .. Camshaft - Left and right banks - Replaces 9502035 and 9503558
3	9318994	-	-	1	1	SEGMENT .. Camshaft - Left and right banks
4	8261443	1	1	-	-	SEGMENT .. Camshaft - Left and right banks - Replaces 9502036 and 9503559
4	9318995	-	-	1	1	SEGMENT .. Camshaft - Left and right banks
5	8028610	1	1	1	1	STUBSHAFT .. Camshaft - Left bank accessory drive end - Right bank camshaft drive end
6	8028482	1	1	1	1	STUBSHAFT .. Camshaft - Left bank camshaft drive end - Right bank accessory drive end
7	8028481	1	1	-	-	SPACER .. Camshaft - Left bank
8	8028975	-	-	1	1	SPACER .. Camshaft - Right bank
9	8034672	2	2	2	2	STUD .. Locating 3/8-24 x 2-3/8 - 7/16 inch shoulder
10	8034673	6	6	6	6	STUD .. Segment 3/8-24 x 2-3/8 - 1/2 inch shoulder
11	8034692	6	6	6	6	BOLT .. Eccentric 3/8-24 x 2-1/8 - 1/2 inch shoulder
12	8034693	2	2	2	2	BOLT .. Eccentric 3/8-24 x 2-1/2 - 7/16 inch shoulder
13	8035950	24	24	24	24	WASHER .. Plain 3/8
14	8032717	24	24	24	24	NUT .. Hex lock 3/8-24

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

Camshaft Assembly
16-645 Engines



Ref. No. 1



Ref. No. 2

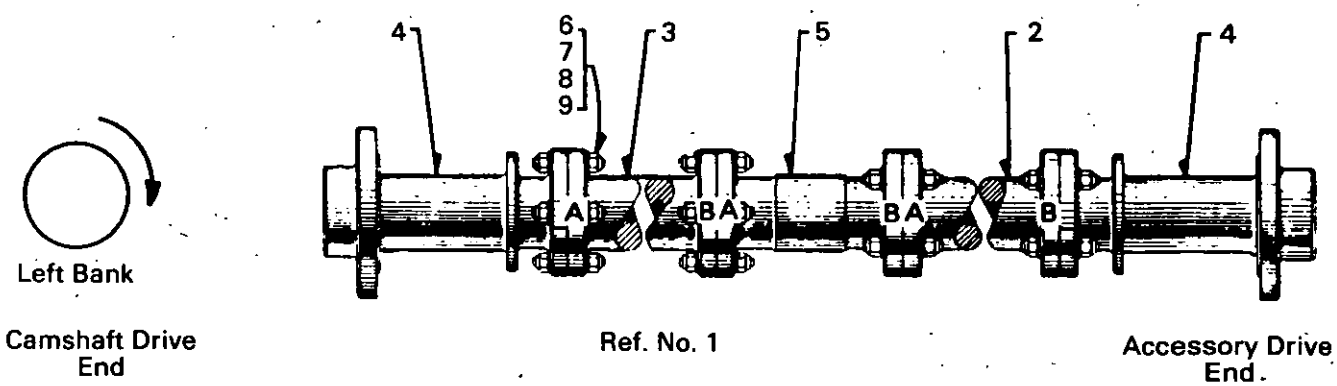
PLATE C128-3

Ref. No.	Part Number	Quantity Required A	-	-	B	Description
		A		-	B	16-567D1,D2,D3,D3A and 16-645E,E3 engines 16-645E3A,E3B,E3C,F3,F3B engines
1	8274790	1	-	-	-	CAMSHAFT ASSEMBLY .. Left bank
1	8419910	-	-	1	-	CAMSHAFT ASSEMBLY .. Left bank
2	8274791	-	1	-	-	CAMSHAFT ASSEMBLY .. Right bank
2	8419911	-	-	-	1	CAMSHAFT ASSEMBLY .. Right bank
3	8261194	2	2	-	-	SEGMENT .. Camshaft - Left and right banks - Replaces 9503557 and 9502032
3	8419849	-	-	2	2	SEGMENT .. Camshaft - Left and right banks
4	8070749	1	1	1	1	STUBSHAFT .. Camshaft - Left bank accessory drive end - Right bank camshaft drive end
5	8028361	1	1	1	1	STUBSHAFT .. Camshaft - Left bank camshaft drive end - Right bank accessory drive end
6	8028638	1	1	-	-	SPACER .. Camshaft - Left bank
7	8028637	-	-	1	1	SPACER .. Camshaft - Right bank
8	8034672	4	4	4	4	STUD .. Locating 3/8-24 x 2-3/8 - 7/16 inch shoulder
9	8034673	12	12	12	12	STUD .. Segment 3/8-24 x 2-3/8 - 1/2 inch shoulder
10	8035950	32	32	32	32	WASHER .. Plain 3/8
11	8032717	32	32	32	32	NUT .. Hex lock 3/8-24

P.L. No. F128

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

Camshaft Assembly
20-645 Engines



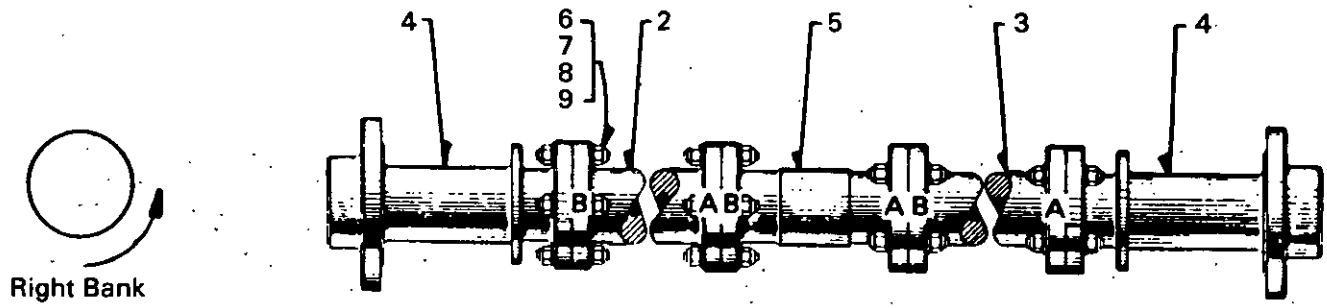


PLATE A128-4

Ref. No.	Part Number	Qty. Req.		Description
		A	-	20-645E3,E3B engines
		-	B	20-645E3 engine
1	8433603	2	-	CAMSHAFT ASSEMBLY .. Left and right banks - Replaces 8361017
1	8361017	-	2	CAMSHAFT ASSEMBLY .. Left and right banks - Replaced by 8433603
†2	8433602	2	-	SEGMENT .. Camshaft - Left and right banks
2	8361013	-	2	SEGMENT .. Camshaft - Left and right banks
††3	8433618	2	-	SEGMENT .. Camshaft - Left and right banks
3	8361012	-	2	SEGMENT .. Camshaft - Left and right banks
4	8028482	2	2	STUBSHAFT .. Camshaft - Left and right banks - Camshaft and accessory drive ends
5	8028637	1	1	SPACER .. Camshaft - Left and right banks
6	8034672	4	4	STUD .. Locating 3/8-24 x 2-3/8 - 7/16 inch shoulder
7	8034673	12	12	STUD .. Segment 3/8-24 x 2-3/8 - 1/2 inch shoulder
8	8035950	32	32	WASHER .. Plain 3/8
9	8032717	32	32	NUT .. Hex lock 3/8-24

† Camshaft segment 8433602 can be substituted for 8361013. Reverse substitution cannot be made.

†† Camshaft segment 8433618 can be substituted for 8361012. Reverse substitution cannot be made.

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

Camshaft Counterweights
16-567D1,D2,D3,D3A; 8,12,16-645E,EB,EC,F3B; 12,16-645E3,F3;
16-645E3A; and 20-645E3,E3B Engines
PLATE A128-5

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	8-645E,E3B,E3C,F3B engines prior to January, 1985
		-	B	-	-	-	-	-	8-645E,E3B,E3C,F3B engines after January, 1985
		-	-	C	-	-	-	-	12-645E,E3,E3B,E3C engines
		-	-	-	D	-	-	-	12-645F3,F3B engines
		-	-	-	-	E	-	-	16-567D1,D2,D3,D3A engines
		-	-	-	-	-	F	-	16-645E,E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	-	-	G	20-645E3,E3B engines
ϕ1	8371518	1	-	-	-	-	-	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 220.50 inch pounds unbalanced moment
ϕ1	9571251	-	1	-	-	-	-	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 221.90 inch pounds unbalanced moment
2	8383745	-	-	1	-	-	-	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 38.65 inch pounds unbalanced moment
3	9556031	-	-	-	1	-	-	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 38.65 inch pounds unbalanced moment - Replaces 8494301
4	8163181	-	-	-	-	1	-	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 42.50 inch pounds unbalanced moment
5	8350518	-	-	-	-	-	1	-	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 45.92 inch pounds unbalanced moment
6	8389517	-	-	-	-	-	-	1	TRIP ASSEMBLY .. Overspeed - Incl. counterweight - Heavy design - Right bank accessory drive end - 27.61 inch pounds unbalanced moment - Replaces 8361014
7	8059630	1	1	1	1	1	1	1	WEIGHT .. Throw out - Overspeed trip
8	8059642	1	1	1	1	1	1	1	GUIDE .. Spring
9	8324000	1	1	1	1	1	1	1	SPRING .. Compression
10	114498	2	2	2	2	2	2	2	NUT .. Hex lock 5/8-18 - Spring adjusting
11	116097	1	1	1	1	1	1	1	WASHER .. Flat 5/8
12	8059643	2	2	2	2	2	2	2	BOLT .. Hex shoulder 1/4-28 x 1-5/8 - Weight to guide
13	8032715	2	2	2	2	2	2	2	NUT .. Hex lock 1/4-28
*14	8283377	1	1	-	-	-	-	-	PLATE .. Cover
*15	8058363	5	5	-	-	-	-	-	BOLT .. Hex head 1/4-20 x 3/4 - Plate to counterweight
*16	8116738	As Req.		-	-	-	-	-	WIRE .. Lock - 3/64 diameter - 500 feet long
ϕ17	8371519	1	-	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 220.50 inch pounds unbalanced moment
ϕ17	9571261	-	1	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 221.90 inch pounds unbalanced moment
18	8367949	-	-	1	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 38.65 inch pounds unbalanced moment
19	9555877	-	-	-	1	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 38.65 inch pounds unbalanced moment
20	8163185	-	-	-	-	1	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 42.50 inch pounds unbalanced moment
21	8350516	-	-	-	-	-	1	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 45.92 inch pounds unbalanced moment
22	8361015	-	-	-	-	-	-	1	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 27.61 inch pounds unbalanced moment - 20-645E3 engines only

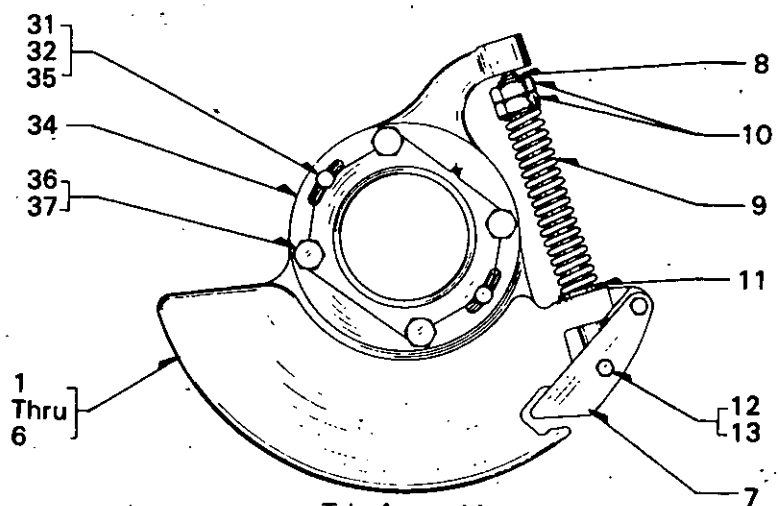
P.L. No. F128

CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS

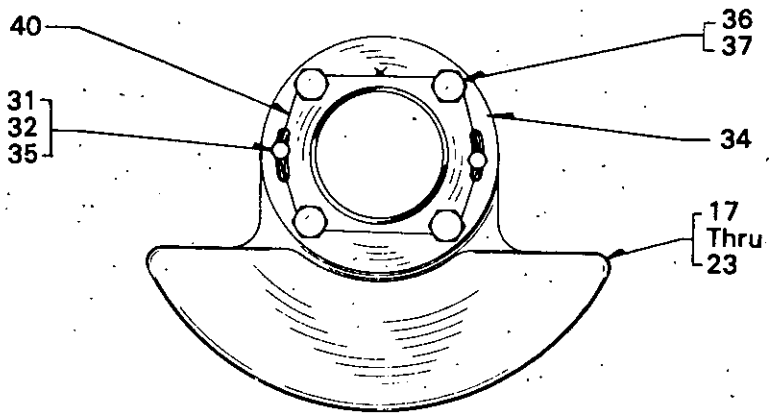
Camshaft Counterweights

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	8-645E,E3B,E3C,F3B engines prior to January, 1985
		-	B	-	-	-	-	-	8-645E,E3B,E3C,F3B engines after January, 1985
		-	-	C	-	-	-	-	12-645E,E3,E3B,E3C engines
		-	-	-	D	-	-	-	12-645F3,F3B engines
		-	-	-	-	E	-	-	16-567D1,D2,D3,D3A engines
		-	-	-	-	-	F	-	16-645E,E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	-	-	G	20-645E3,E3B engines
23	8474389	-	-	-	-	-	-	1	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank accessory drive end - 27.61 inch pounds unbalanced moment - Replaces 8426313 - 20-645E3B engines only
ϕ24	8371521	1	-	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Right bank camshaft drive end - 220.50 inch pounds unbalanced moment
ϕ24	9571259	-	1	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Right bank camshaft drive end - 221.90 inch pounds unbalanced moment
25	8367950	-	-	1	1	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Right bank camshaft drive end - 38.65 inch pounds unbalanced moment
26	8163184	-	-	-	-	2	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Right and left bank camshaft drive end - 42.50 inch pounds unbalanced moment
27	8350517	-	-	-	-	-	2	-	COUNTERWEIGHT .. Camshaft - Heavy design - Right and left bank camshaft drive end - 45.92 inch pounds unbalanced moment
28	8361016	-	-	-	-	-	-	2	COUNTERWEIGHT .. Camshaft - Heavy design - Right and left bank camshaft drive end - 27.61 inch pounds unbalanced moment
ϕ29	8371520	1	-	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank camshaft drive end - 220.50 inch pounds unbalanced moment
ϕ29	9571260	-	1	-	-	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank camshaft drive end - 221.90 inch pounds unbalanced moment
30	8367951	-	-	1	1	-	-	-	COUNTERWEIGHT .. Camshaft - Heavy design - Left bank camshaft drive end - 38.65 inch pounds unbalanced moment
31	8236001	4	4	-	-	-	-	-	DOWEL .. Counterweight - Accessory drive end - 1/2 x 1-9/16 in. long 8236005 .. .005 OS 8236006 .. .010 OS 8236007 .. .015 OS
32	8028739	-	-	4	4	4	4	4	DOWEL .. Counterweight - Accessory drive end - 1/2 x 1-5/16 in. long 8082389 .. .005 OS 8082388 .. .010 OS 8082381 .. .015 OS
33	8028738	4	4	4	4	4	4	4	DOWEL .. Counterweight - Camshaft drive end - 1/2 x 2-1/16 in. long 8082379 .. .005 OS 8082380 .. .010 OS 8045884 .. .015 OS
34	8266455	4	4	4	4	4	4	4	PLATE .. Retainer
35	8286669	4	4	4	4	4	4	4	BOLT .. Drilled hex head dowel 5/16-24 x 5/8
36	455014	8	8	-	-	-	-	-	BOLT .. Hex head 1/2-20 x 1-1/2 - Counterweight - Accessory drive end - Formerly 8028302
37	181430	-	-	8	8	8	8	8	BOLT .. Hex head 1/2-20 x 1-3/8 - Counterweight - Accessory drive end - Formerly 8028287
38	8266426	8	8	-	-	-	-	-	BOLT .. Hex head 1/2-20 x 2-1/4 - Counterweight - Camshaft drive end
39	8028335	-	-	8	8	8	8	8	BOLT .. Hex head 1/2-20 x 2-1/8 - Counterweight - Camshaft drive end
40	8116738	As Required							WIRE .. Lock - 3/64 diameter - 500 feet long

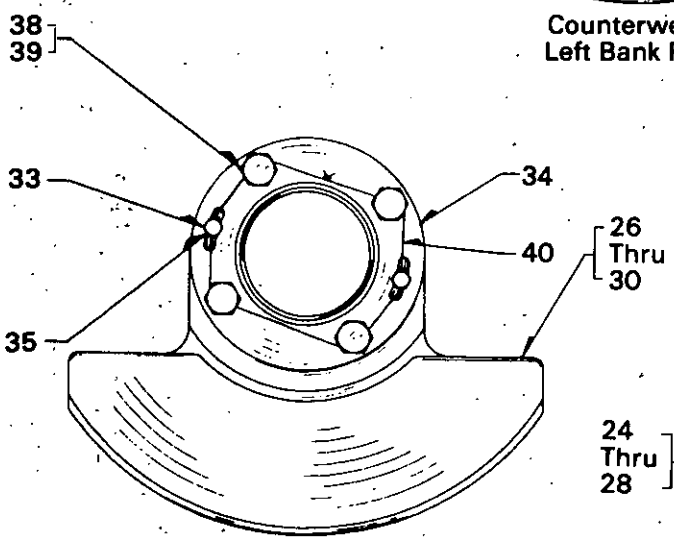
CAMSHAFT AND CAMSHAFT COUNTERWEIGHTS



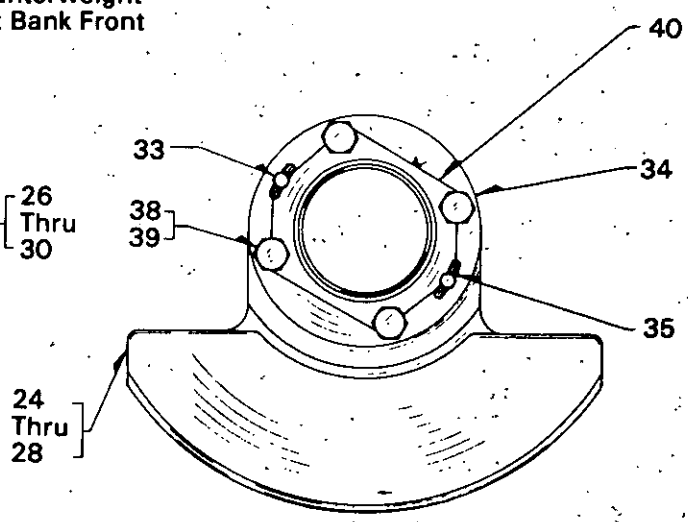
Trip Assembly
Counterweight
Right Bank Front



Counterweight
Left Bank Front

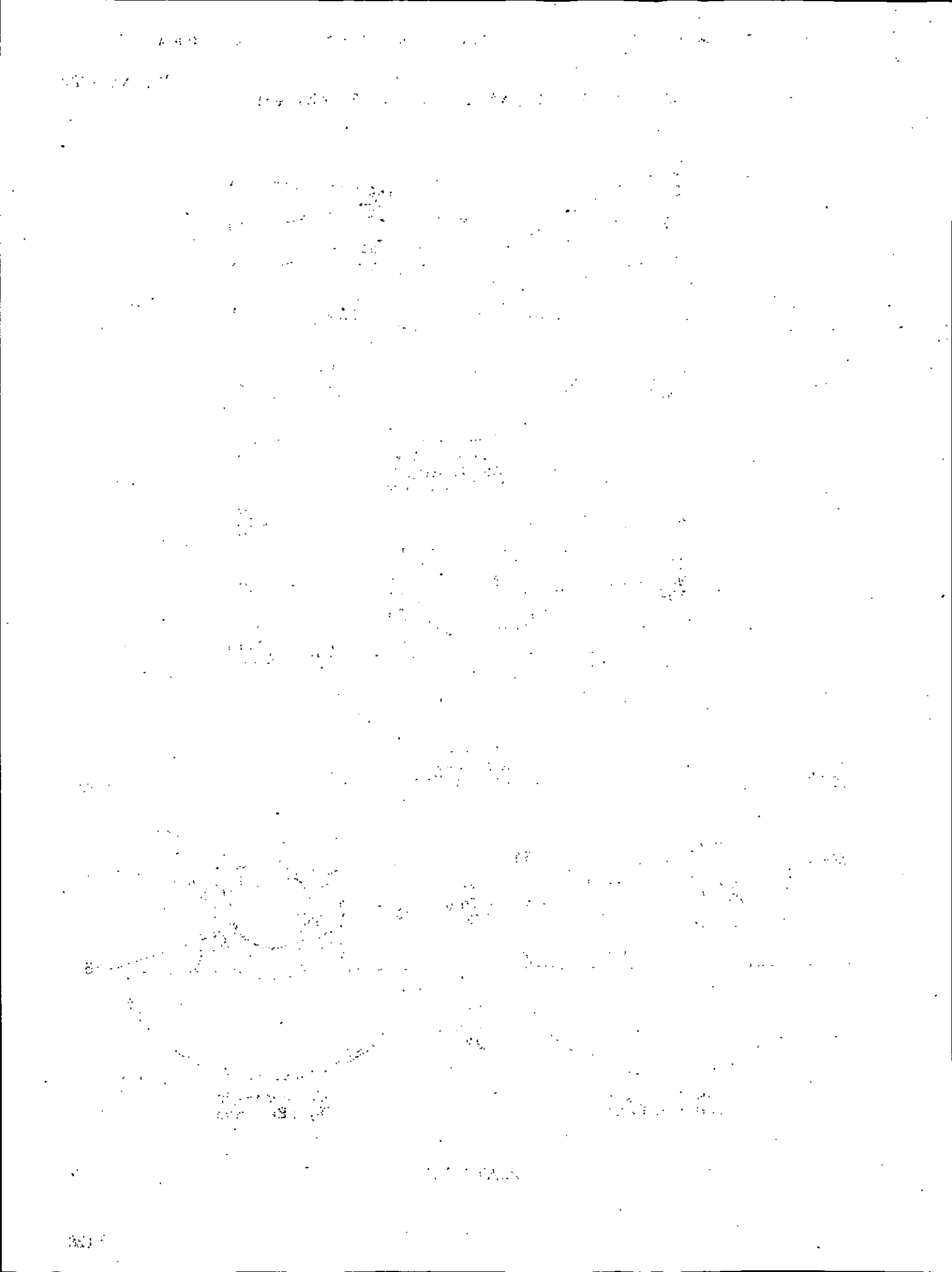


Counterweight
Left Bank Rear



Counterweight
Right Bank Rear

PLATE A128-5



Parts List No. F130

CAMSHAFT BEARING BRACKETS

12,16,20-645 and 16-567D1,D2,D3,D3A Engines

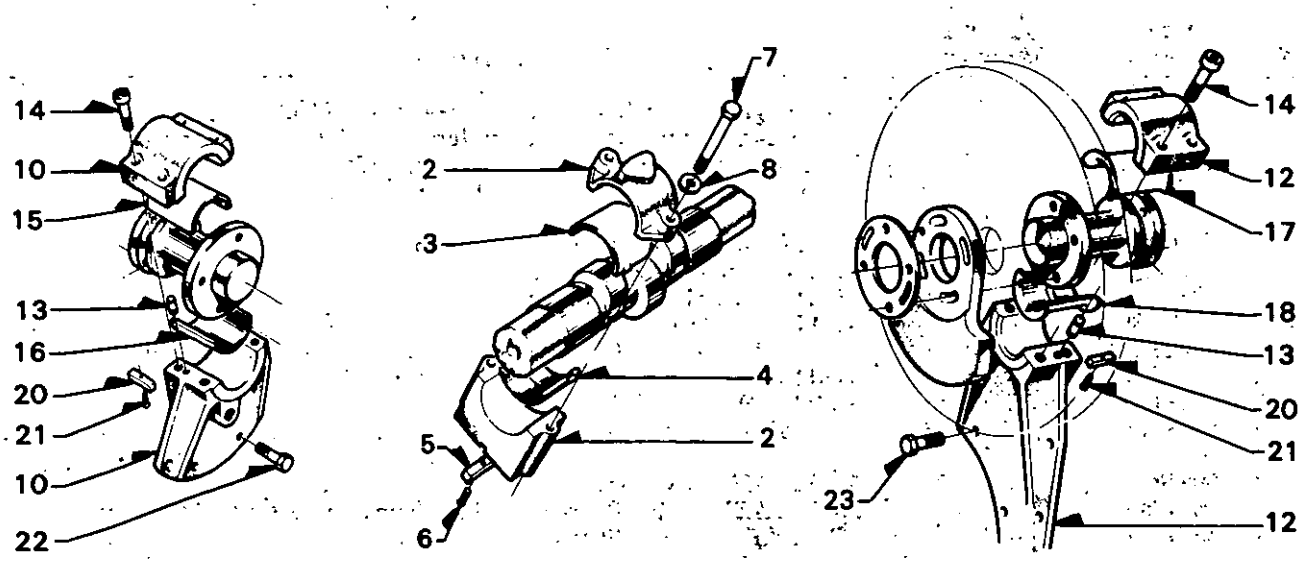


PLATE D130-1

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	12-645 engines
		-	B	-	16-645 and 16-567D1,D2,D3, D3A engines
		-	-	C	20-645 engines
*1	8320994	12	16	20	BLOCK ASSEMBLY .. Bearing - Drilled cap
2	8320995	12	16	20	BLOCK ASSEMBLY .. Bearing - Plain cap
3	8071176	24	32	40	BEARING .. Shell - Upper half
4	8071176	24	32	40	BEARING .. Shell - Lower half
ƒ5	8045976	24	32	40	KEY .. Block to crankcase - .5000 x .5000 x 2-1/4 long
6	110534	24	32	40	SCREW .. Flat head 10-24 x 7/8 inches - Slotted
7	188146	48	64	80	BOLT .. Hex head 3/8-24 x 4-5/8
8	8373316	48	64	80	WASHER .. Special - Formerly 103321
*9	8253146	1	1	1	BRACKET ASSEMBLY .. Bearing - Left bank } Accessory Drive End
10	8253152	1	1	1	BRACKET ASSEMBLY .. Bearing - Right bank } Accessory Drive End
*11	8253259	1	1	1	BRACKET ASSEMBLY .. Bearing - Left bank } Camshaft Drive End
12	8253250	1	1	1	BRACKET ASSEMBLY .. Bearing - Right bank } Camshaft Drive End
13	8029147	8	8	8	DOWEL .. Locating - .3125 x 9/16 long
14	138294	8	8	8	SCREW .. Socket head cap 1/2-13 x 2 inches - Formerly 8253973
15	8237900	2	2	2	BEARING .. Shell - Upper half } Accessory Drive End
16	8237900	2	2	2	BEARING .. Shell - Lower half } Accessory Drive End
17	8253825	2	2	2	BEARING .. Shell - Upper half } Camshaft Drive End
18	8253825	2	2	2	BEARING .. Shell - Lower half } Camshaft Drive End
*19	187697	8	8	8	SCREW .. Socket head cap 1/2-20 x 4-3/4 inches - Bracket to crankcase
ƒƒ20	8044728	4	4	4	KEY .. Bracket to crankcase - .5000 x .5000 x 1-3/4 long
21	110534	4	4	4	SCREW .. Flat head 10-24 x 7/8 inches - Slotted
22	455012	6	6	6	BOLT .. Not drilled hex head 1/2-20 x 1-1/4 - Formerly 8028329
23	8028329	6	6	6	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - For mounting Ref. Nos. 11 and 12
*24	8028312	6	6	6	BOLT .. Drilled hex head 3/8-24 x 1 - For mounting Ref. Nos. 11 and 12
*25	8116738	As Req.			WIRE .. Lock - 500 feet - Currently applied to camshaft drive end only

ƒ For Oversize Crankcase Keyway, use Stepdown Key 8136773 - .5000 to .5625 step - 2-1/4 long.

ƒƒ For Oversize Crankcase Keyway, use Stepdown Key 8166324 - .5000 to .5625 step - 1-1/4 long.

P.L. No. F130

CAMSHAFT BEARING BRACKETS

8-645 Engines
PLATE D130-2

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engines manufactured since September, 1982
		-	B	-	-	8-645 engines manufactured from January, 1976 to August, 1982
		-	-	C	-	8-645 engines manufactured in 1974 and 1975
		-	-	-	D	8-645 engines manufactured in 1973 and before
1	8320994	8	8	8	8	BLOCK ASM. .. Bearing - Drilled cap
2	8320995	8	8	8	8	BLOCK ASM. .. Bearing - Plain cap
3	8071176	16	16	16	16	BEARING .. Shell - Upper half
4	8071176	16	16	16	16	BEARING .. Shell - Lower half
†5	8045976	16	16	16	16	KEY .. Block assembly to crankcase .5000 x .5000 x 2-1/4 long
6	110534	16	16	16	16	SCREW .. Flat head 10-24 x 7/8 in. - Slotted
7	188146	32	32	32	32	BOLT .. Hex head 3/8-24 x 4-5/8
8	8373316	32	32	32	32	WASHER .. Hardened
*9	9095828	1	1	-	-	BRACKET ASM. .. Bearing
*10	8494043	-	-	1	-	BRACKET ASM. .. Bearing } Left Bank - Accessory Drive End
*11	8371597	-	-	-	1	BRACKET ASM. .. Bearing
12	9095834	1	1	-	-	BRACKET ASM. .. Bearing
13	8494041	-	-	1	-	BRACKET ASM. .. Bearing } Right Bank - Accessory Drive End
14	8371596	-	-	-	1	BRACKET ASM. .. Bearing
15	9095832	1	1	-	-	BRACKET ASM. .. Bearing
16	8494044	-	-	1	-	BRACKET ASM. .. Bearing } Left Bank - Camshaft Drive End
17	8371595	-	-	-	1	BRACKET ASM. .. Bearing
*18	9095830	1	1	-	-	BRACKET ASM. .. Bearing
*19	8494042	-	-	1	-	BRACKET ASM. .. Bearing } Right Bank - Camshaft Drive End
*20	8371594	-	-	-	1	BRACKET ASM. .. Bearing
21	8029147	8	8	8	8	DOWEL .. Locating .3125 x 9/16
22	8266361	16	16	16	16	BOLT .. Hex head 5/8-18 x 3
23	8497575	16	16	16	-	WASHER .. Hardened 5/8
24	8237900	2	2	2	2	BEARING .. Shell - Upper half } Accessory Drive End
25	8237900	2	2	2	2	BEARING .. Shell - Lower half
26	8253825	2	2	2	2	BEARING .. Shell - Upper half } Camshaft Drive End
27	8253825	2	2	2	2	BEARING .. Shell - Lower half
*28	8266424	8	8	8	8	BOLT .. Drilled hex head 5/8-18 x 5-1/2 - Bracket to crankcase
29	8497575	8	8	8	-	WASHER .. Hardened 5/8
‡30	8044728	4	4	4	4	KEY .. Bracket assembly to crankcase .5000 x .5000 x 1-3/4 long
31	110534	4	4	4	4	SCREW .. Flat head 10-24 x 7/8 inch - Slotted
32	8499216	2	4	10	-	BOLT .. Drilled hex head 5/8-18 x 3 - Brackets to crankcase
33	223737	6	-	-	-	BOLT .. Hex head 5/8-18 x 1-3/4 - Brackets to crankcase
34	223742	2	-	-	-	BOLT .. Hex head 5/8-18 x 3 - Brackets to crankcase
35	181356	2	-	-	-	BOLT .. Hex head 3/8-24 x 5/8 - Brackets to crankcase
36	8028329	4	4	-	-	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Brackets to crankcase
37	8028312	2	2	6	6	BOLT .. Drilled hex head 3/8-24 x 1 - Brackets to crankcase
38	8499156	4	10	4	-	BOLT .. Drilled hex head 5/8-18 x 1-3/4 - Brackets to crankcase
39	8050937	2	4	4	-	BOLT .. Drilled hex head 3/8-24 x 5/8 - Brackets to crankcase
40	8028302	-	-	-	14	BOLT .. Drillex hex head 1/2-20 x 1-1/2 - Brackets to crankcase
41	9095913	4	4	-	-	DOWEL .. Locating .8750 diameter x 2-1/2 inches long
42	8388954	-	-	4	-	DOWEL .. Locating .7500 diameter x 1-1/2 inches long
43	8497575	14	14	14	-	WASHER .. Hardened 5/8
44	8116738	A.R.		A.R.		WIRE .. Lock - 3/64 diameter x 500 feet

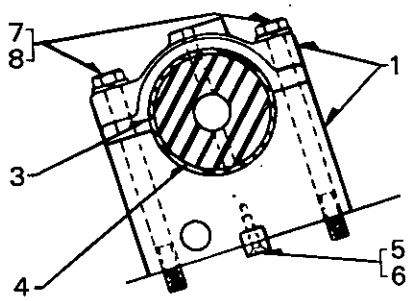
† For Oversize Crankcase Keyway, use Stepdown Key 8136773 - .5000 x .5625 step - 2-1/4 inches long.

‡ For Oversize Crankcase Keyway, use Stepdown Key 8166324 - .5000 x .5625 step - 1-1/4 inches long.

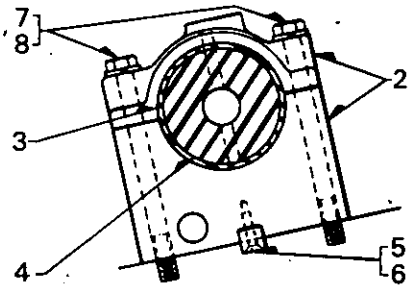
P.L. No. F130

CAMSHAFT BEARING BRACKETS

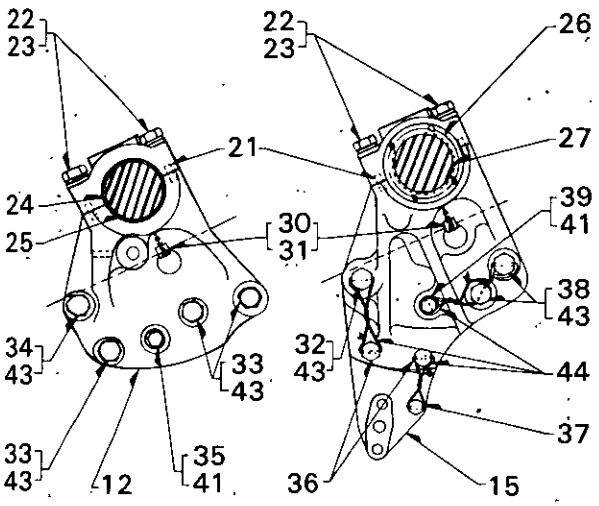
8-645 Engines



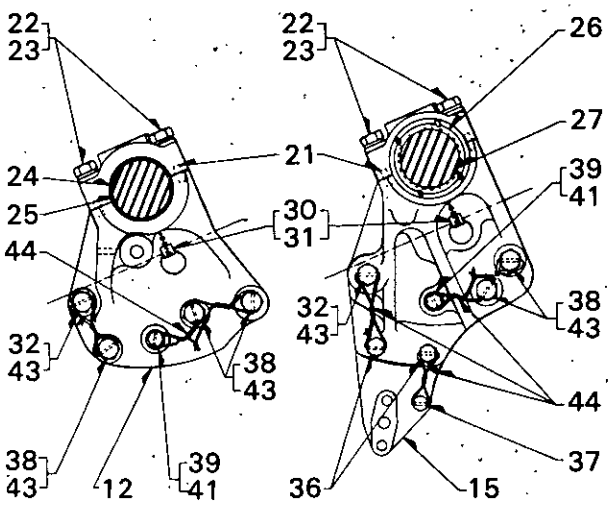
Drilled Cap
Columns A, B, C and D



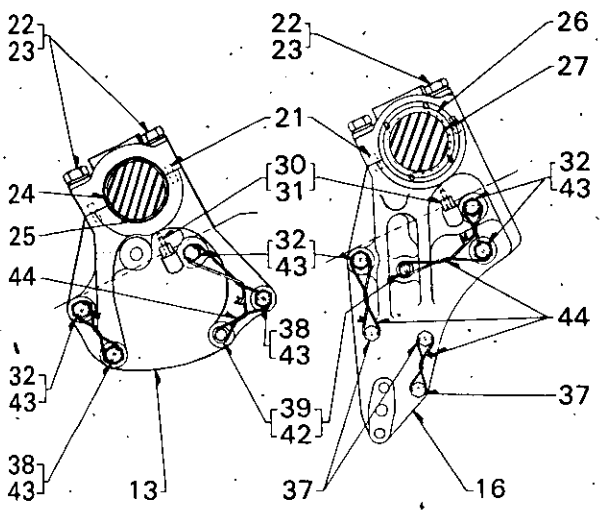
Plain Cap
Columns A, B, C and D



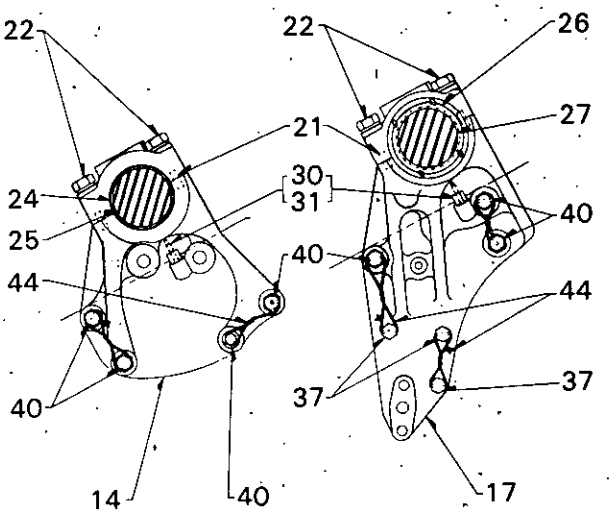
Column A



Column B



Column C



Column D

PLATE D130-2

Parts List No. F132

CAMSHAFT OVERSPEED TRIP LINKAGE

Overspeed Pawl Camshaft and Trip Assemblies
All 645 and 16-567D1,D2,D3,D3A Engines

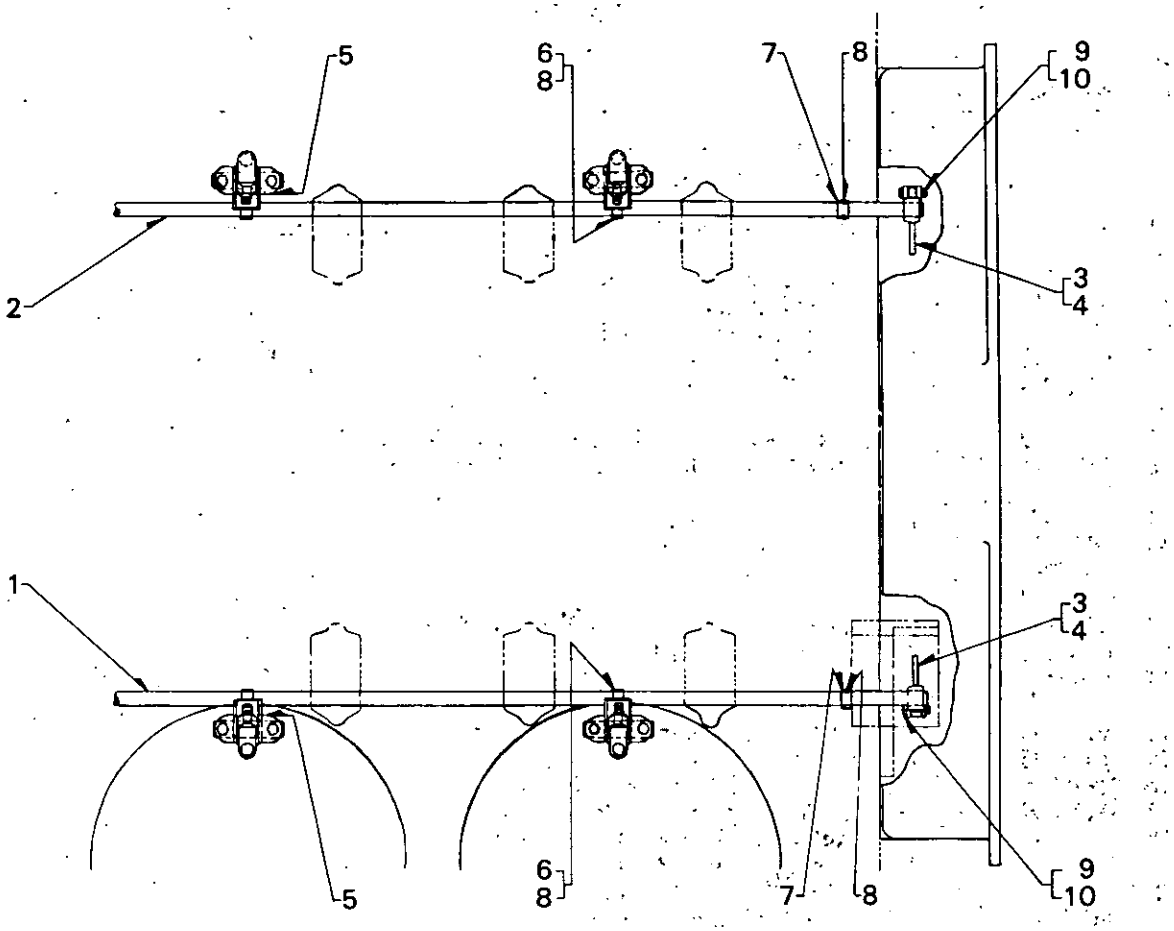


PLATE C132-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engines
		-	B	-	-	12-645 engines
		-	-	C	-	16-645 and 16-567 engines
		-	-	-	D	20-645 engines
1	8320746	1	-	-	-	CAMSHAFT ASSEMBLY .. Pawl - Right bank
1	8320748	-	1	-	-	CAMSHAFT ASSEMBLY .. Pawl- Right bank
1	8320750	-	-	1	-	CAMSHAFT ASSEMBLY .. Pawl - Right bank - Replaces 8054296
1	8360923	-	-	-	1	CAMSHAFT ASSEMBLY .. Pawl - Right bank
2	8320747	1	-	-	-	CAMSHAFT ASSEMBLY .. Pawl - Left bank
2	8320749	-	1	-	-	CAMSHAFT ASSEMBLY .. Pawl - Left bank
2	8320751	-	-	1	-	CAMSHAFT ASSEMBLY .. Pawl - Left bank - Replaces 8054297
2	8360922	-	-	-	1	CAMSHAFT ASSEMBLY .. Pawl - Left bank
3	8028790	2	2	2	2	LEVER .. Trip shaft - Accessory end only
4	103605	2	2	2	2	PIN .. Taper - No. 4 x 1-1/4
5	8028487	8	12	16	20	TRIP ASSEMBLY .. Overspeed - Includes mounting bolts - See Page 7
6	8320742	8	12	16	20	CAM .. Pawl camshaft
7	8320743	2	2	2	2	COLLAR .. Pawl camshaft
8	456652	8	12	16	20	PIN .. Spring 3/16 x 7/8 - Cam to shaft - Formerly collar to shaft also
8	455106	2	2	2	2	PIN .. Spring 3/16 x 13/16 - Collar to shaft (Applied since December, 1983)
9	114785	2	2	2	2	PIN .. Clevis 3/8 x 1-3/32 - Lever to linkage
10	107762	2	2	2	2	PIN .. Cotter 3/32 x 5/8

8118977, 9522709

P.L. No. F132

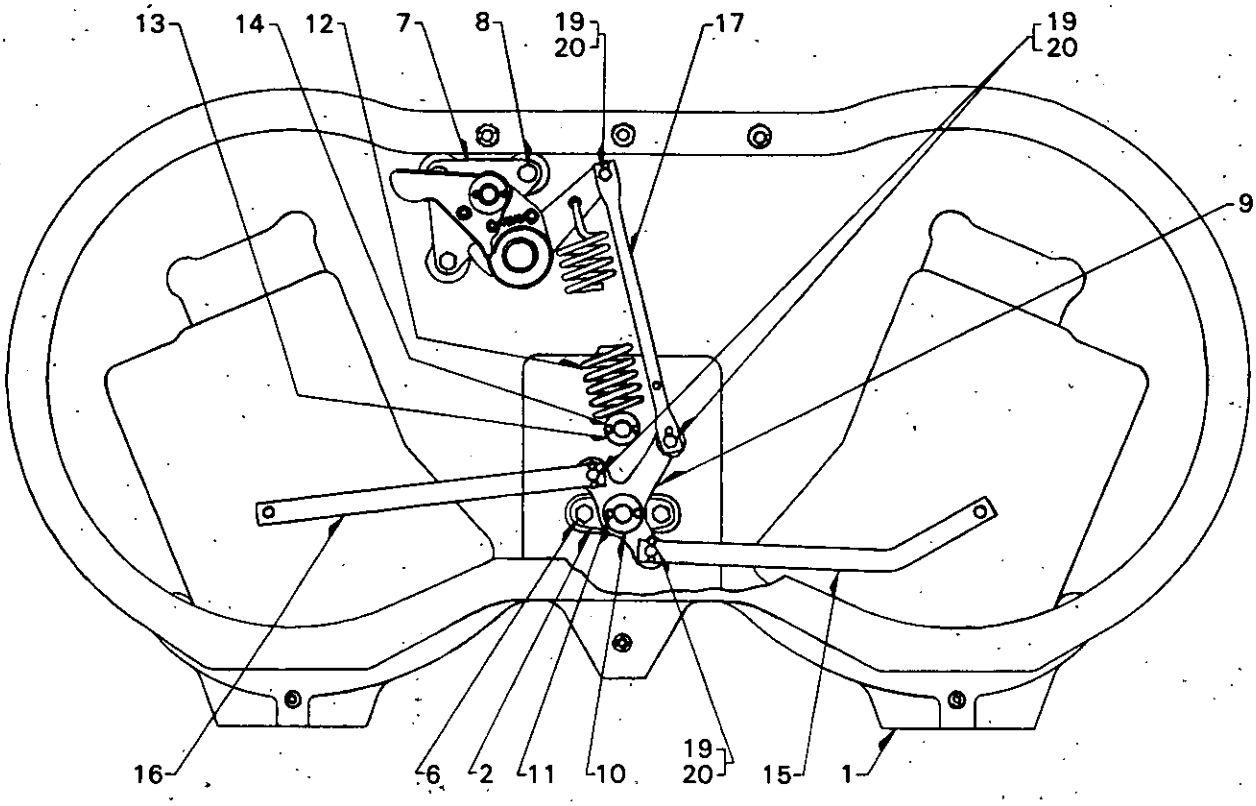
CAMSHAFT OVERSPEED TRIP LINKAGE

Trip Linkage Application
All 645 and 16-567D1,D2,D3,D3A Engines
PLATE B132-2

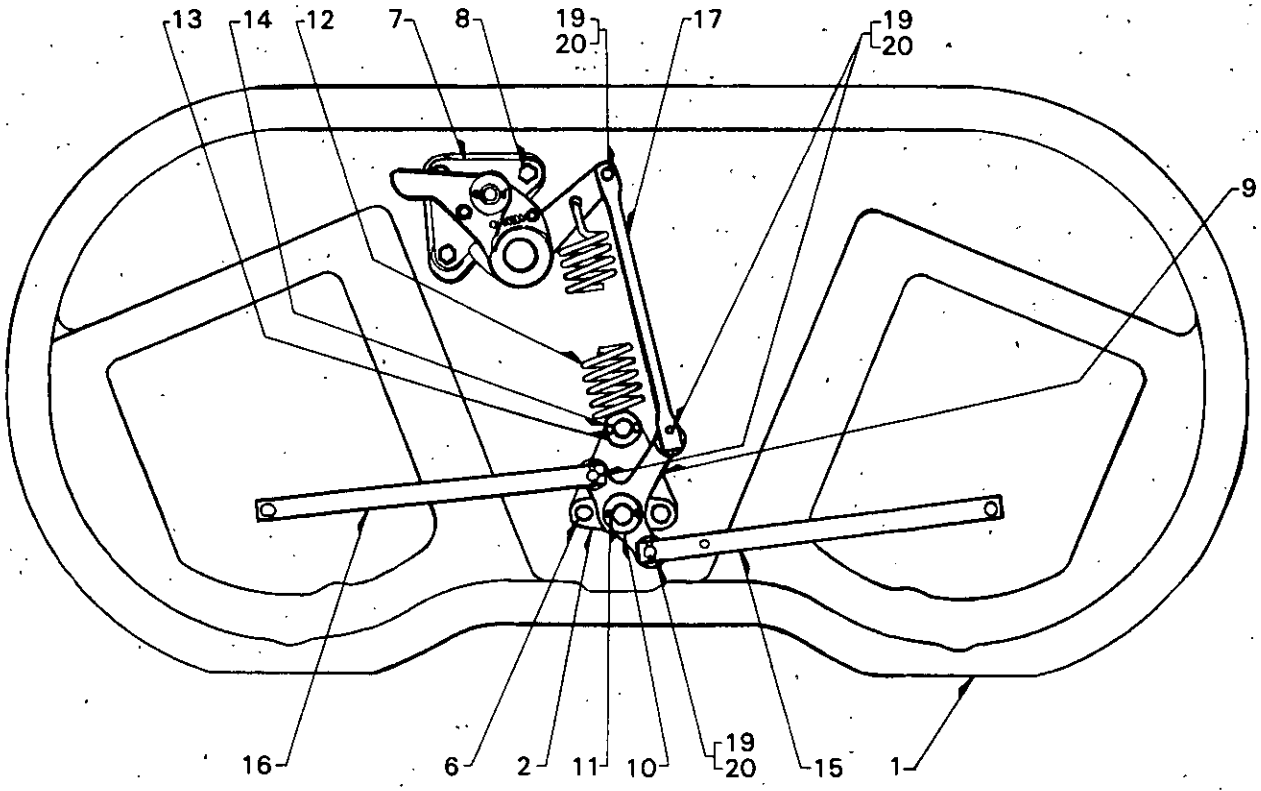
Ref. No.	Part Number	Qty. Req.		Description
		A	-	8-645 engines
		-	B	12,16,20-645 and 16-567 engines
1	----	1	1	HOUSING ASSEMBLY .. Overspeed trip linkage - See Pages 12 and 13
2	8028204	1	1	BRACKET ASSEMBLY .. Toggle lever
*3	8028210	1	1	BRACKET .. Shaft
*4	8028216	1	1	SHAFT .. Toggle lever
*5	112053	1	1	PIN .. Dowel 3/16 x 1-1/4 - Shaft to bracket
6	181364	2	2	BOLT .. Hex head 3/8-24 x 1
7	8074711	1	1	BRACKET ASSEMBLY .. Trip pawl - See Page 8
8	181365	3	3	BOLT .. Hex head 3/8-24 x 1-1/8
9	8028495	1	1	LEVER .. Toggle
10	8028732	1	1	WASHER .. Flat 5/8
11	103385	1	1	PIN .. Cotter 1/8 x 1
12	9097192	1	1	SPRING .. Actuating - Replaces 8311814
13	6101229	1	1	WASHER .. Flat 1/2
14	108629	1	1	PIN .. Cotter 3/32 x 7/8
15	8297815	1	-	LINK .. Left bank
15	8028205	-	1	LINK .. Left bank
16	8028206	1	1	LINK .. Right bank
17	8028207	1	1	LINK .. Upper
18	----	-	-	Reference Number Not Used
19	114785	4	4	PIN .. Clevis 3/8 x 1-3/32
20	107762	4	4	PIN .. Cotter 3/32 x 5/8
+21	8085119	1	1	ANCHOR .. Spring - See Page 4

8452889, 8452906, 8452909, 9522707

CAMSHAFT OVERSPEED TRIP LINKAGE



Column A



Column B

PLATE B132-2

P.L. No. F132

CAMSHAFT OVERSPEED TRIP LINKAGE

Trip Linkage Housing
PLATE C132-3

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	8-645 engines
		-	B	-	12,16,20-645 and 16-567 engines with bottom oil drain holes
		-	-	C	12,16,20-645 engines with rear oil drain holes - Applied since July, 1981
1	8235620	1	-	-	HOUSING ASSEMBLY .. Overspeed trip linkage - With bottom oil drains
2	8159741	-	1	-	HOUSING ASSEMBLY .. Overspeed trip linkage - With bottom oil drains
3	9529804	-	-	1	HOUSING ASSEMBLY .. Overspeed trip linkage - With rear oil drains
4	8084755	23	19	19	NUT .. Spline 3/8-24 x 7/32 spline length
5	8084754	20	16	2	NUT .. Spline 3/8-24 x 3/8 spline length
6	8085119	1	1	1	ANCHOR .. Spring
7	8035440	3	3	-	STUD .. 3/8-16 x 3/8-24 x 1-7/8 long - For oversize pitch dia. - See below 8123048 .. .002 OS 8126933 .. .017 OS 8123049 .. .004 OS 8126934 .. .019 OS 8126932 .. .015 OS
*8	8235617	2	-	-	GASKET .. Housing to crankcase
*8	8044742	-	2	-	GASKET .. Housing to crankcase
*8	9529800	-	-	2	GASKET .. Housing to crankcase
9	8044725	2	2	-	BRACKET .. Support
*10	8035329	4	4	-	BOLT .. Drilled hex head 3/8-16 x 1-1/8
*11	181370	4	4	-	BOLT .. Hex head 3/8-24 x 1-1/4
*12	8116738	As Req.			WIRE .. Lock - 3/64 diameter x 500 feet
13	8143441	2	2	-	SLEEVE .. Oil drain - Trip housing to accessory drive housing
14	8143446	2	2	-	SEAL .. Oil - Bottom groove
15	9095686	2	2	-	SEAL .. Oil - Top groove - Formerly 8143446
*16	8239648	2	-	-	RETAINER .. Oil drain sleeve
*16	8143444	-	2	-	RETAINER .. Oil drain sleeve
17	9529807	-	-	2	SEAL .. Oil - Rear drain to crankcase
18	181428	6	6	-	BOLT .. Hex head 1/2-20 x 1-1/8 - Housing to crankcase
18	181430	-	-	8	BOLT .. Hex head 1/2-20 x 1-3/8 - Housing to crankcase
19	6101229	6	6	8	WASHER .. Flat 1/2
*20	8235619	1	-	-	COVER ASSEMBLY .. Overspeed trip housing } See Page 6
*20	8264373	-	1	-	COVER ASSEMBLY .. Overspeed trip housing } See Page 6
*20	9517381	-	-	1	COVER ASSEMBLY .. Overspeed trip housing } See Page 6
*21	8235618	1	-	-	GASKET .. Cover to housing
*21	8049496	-	1	-	GASKET .. Cover to housing
*21	9529801	-	-	1	GASKET .. Cover to housing

CAMSHAFT OVERSPEED TRIP LINKAGE

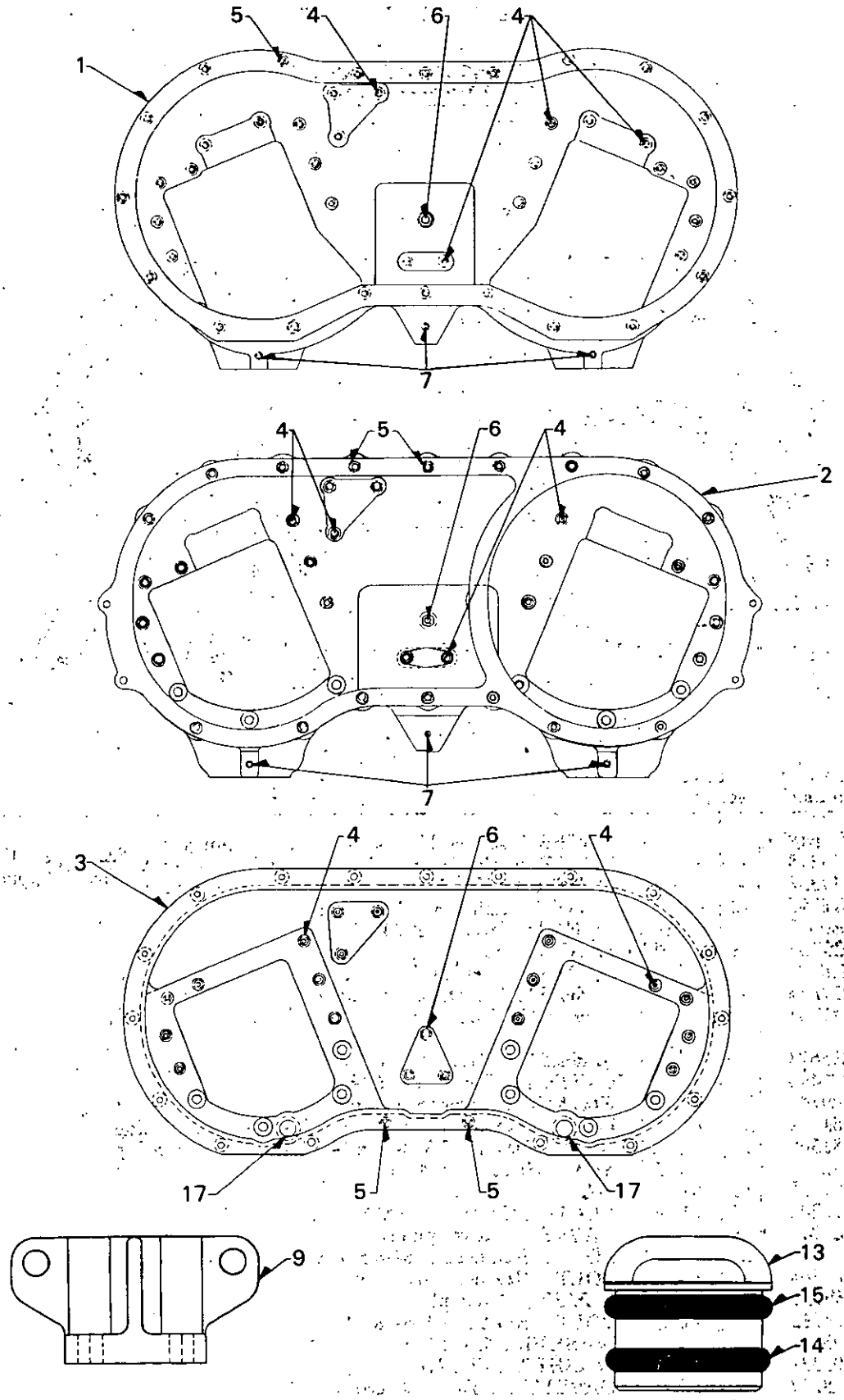
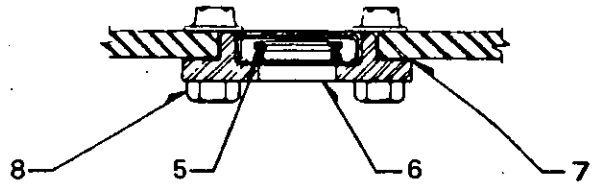


PLATE C132-3

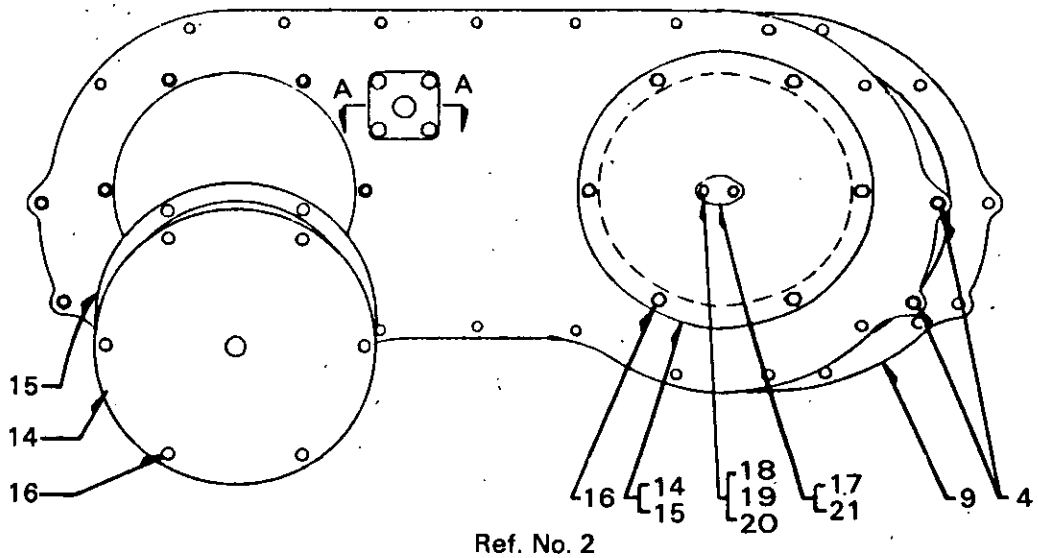
P.L. No. F132

CAMSHAFT OVERSPEED TRIP LINKAGE

Trip Housing Cover
All 645 and 16-567D1,D2,D3,D3A Engines



SECTION A-A



Ref. No. 2

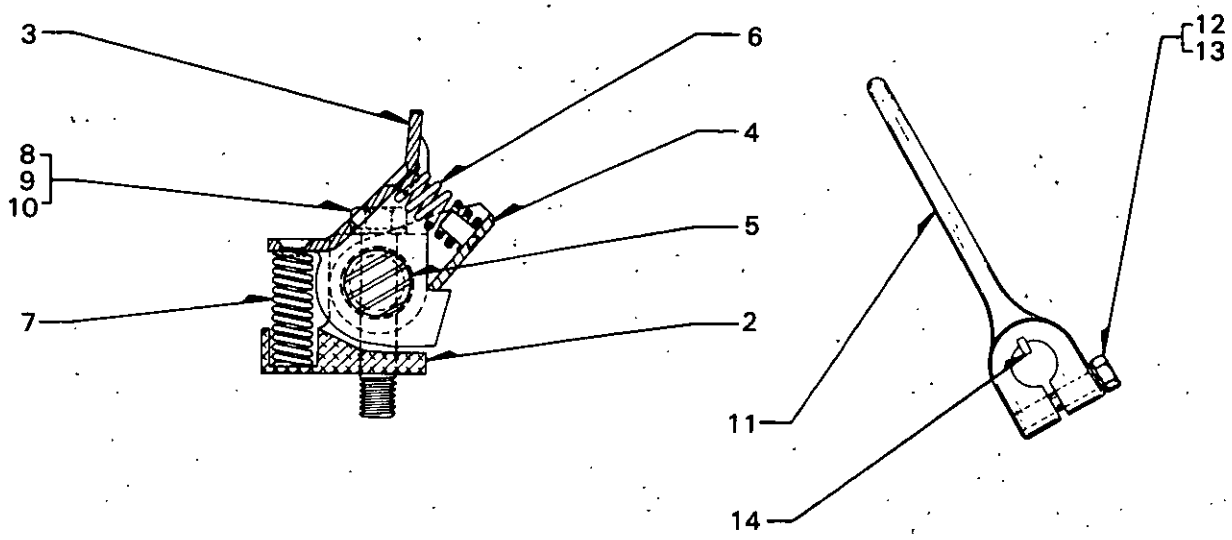
PLATE D132-4

Ref. No.	Part Number	Quantity Required			Description	
*1	8235619	1	-	-	COVER ASSEMBLY .. Overspeed trip housing	See Page 4 For Engine Model Application
2	8264373	-	1	-	COVER ASSEMBLY .. Overspeed trip housing	
*3	9517381	-	-	1	COVER ASSEMBLY .. Overspeed trip housing	
4	8084755	12	-	-	NUT .. Spline 3/8-24 x 7/32	
4	8280665	-	20	10	NUT .. Spline 3/8-24 x 1/4	
5	8028754	1	1	1	SEAL .. Oil	
6	8028220	-	1	1	RETAINER .. Oil seal	
7	8028766	-	1	1	GASKET .. Oil seal retainer	
8	181361	-	4	4	BOLT .. Hex head 3/8-24 x 7/8	
*9	8235618	1	-	-	GASKET .. Cover to housing	
9	8049496	-	1	-	GASKET .. Cover to housing	
*9	9529801	-	-	1	GASKET .. Cover to housing	
*10	181374	20	20	17	BOLT .. Hex head 3/8-24 x 1-1/2 - Cover to housing	
*11	181365	-	-	2	BOLT .. Hex head 3/8-24 x 1-1/8 - Cover to housing	
*12	8032717	-	-	17	NUT .. Hex lock 3/8-24	
*13	6101225	20	20	36	WASHER .. Flat 3/8	
14	8028222	2	2	1	PLATE .. Cover - Access	
15	8028765	2	2	1	GASKET .. Cover plate	
*16	181361	12	-	-	BOLT .. Hex head 3/8-24 x 7/8	
16	181364	-	12	6	BOLT .. Hex head 3/8-24 x 1	
17	8058255	2	2	1	COVER .. Cover plate	
18	181311	4	4	2	BOLT .. Hex head 1/4-28 x 5/8	
19	103319	4	4	2	WASHER .. Lock 1/4	
20	103339	2	2	1	WASHER .. Flat 1/4	
21	8058257	2	2	1	GASKET .. Cover plate cover	

P.L. No. F132

CAMSHAFT OVERSPEED TRIP LINKAGE

Overspeed Trip and Reset Lever
All 645 and 16-567D1,D2,D3,D3A Engines



Ref. No. 1

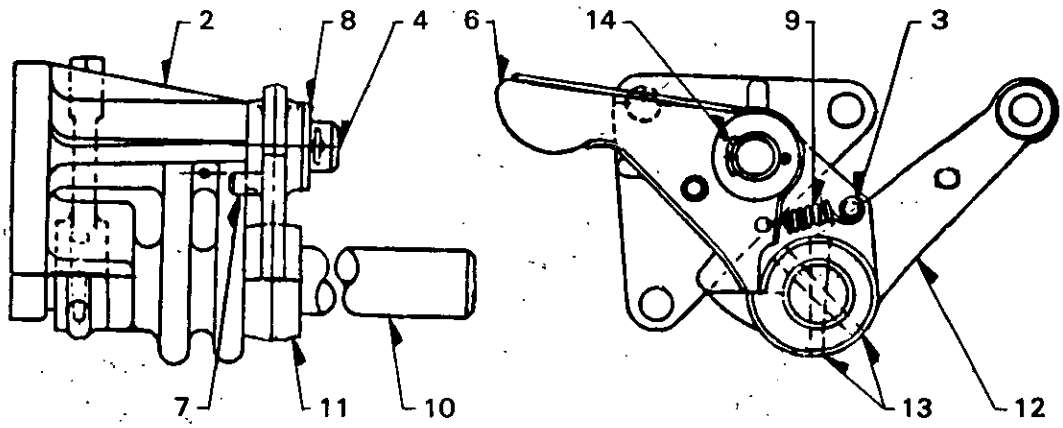
PLATE A132-5

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engines
		-	B	-	-	12-645 engines
		-	-	C	-	16-567 and 16-645 engines
		-	-	-	D	20-645 engines
TRIP ASSEMBLY						
1	8028487	8	12	16	20	TRIP ASSEMBLY .. Cylinder head mechanical overspeed
2	8402557	8	12	16	20	BRACKET .. Trip - Replaces 8028230
3	9326198	8	12	16	20	PAWL .. Trip - Replaces 8028498
4	8028200	8	12	16	20	REST .. Spring
5	8028234	8	12	16	20	SHAFT .. Trip
6	8028787	8	12	16	20	SPRING .. Rest to lever
7	8028788	8	12	16	20	SPRING .. Lever to bracket
8	179848	16	24	32	40	BOLT .. Drilled hex head 3/8-16 x 2-1/4
9	103321	16	24	32	40	WASHER .. Lock 3/8
10	9414322	16	24	32	40	WASHER .. Plain 3/8
LEVER .. Overspeed Trip Reset						
11	8029623	1	1	1	1	LEVER .. Overspeed trip reset
12	181377	1	1	1	1	BOLT .. Lever hex head 3/8-24 x 1-3/4
13	103321	1	1	1	1	WASHER .. Lock 3/8
14	124548	1	1	1	1	KEY .. Woodruff 5/32 x 3/4

P.L. No. F132

CAMSHAFT OVERSPEED TRIP LINKAGE

Overspeed Trip Pawl Bracket Assembly
All 645 and 16-567D1,D2,D3,D3A Engines



Ref. No. 1

PLATE A132-6

Ref. No.	Part Number	Qty. Req.	Description
1	8074711	1	BRACKET ASSEMBLY .. Trip pawl
2	8028201	1	BRACKET .. Mounting
3	8028212	1	ANCHOR .. Spring
4	8028219	1	SHAFT .. Pawl pivot
*5	103696	1	PIN .. Dowel 1/8 x 1-1/4 - Shaft to bracket
6	8069264	1	PAWL .. Overspeed trip
7	8028223	1	PIN .. Stop - Pawl
8	8028732	1	WASHER .. Pawl shaft
9	8028791	1	SPRING .. Trip pawl
10	8069264	1	SHAFT .. Lock
11	8028214	1	LOCK .. Overspeed trip
12	8028213	1	LEVER .. Stop
13	103596	2	PIN .. No. 3 taper - Lock and stop lever to shaft
14	103385	1	PIN .. Cotter 1/8 x 1
*15	181365	3	BOLT .. Hex head 3/8-24 x 1-1/8 - Bracket mounting

Parts List No. C133-E

ELECTRIC OPERATED ENGINE SHUTDOWN

Single Motor-Driven Booster Pump Application
8,16-645E; 12,16-645E3,E3B and 16-645F3B Engines
M7, JT22CW, JT22CW-2, GT26CW, GT26CW-2, GT36HCW-2
and SDL40-2 Locomotives

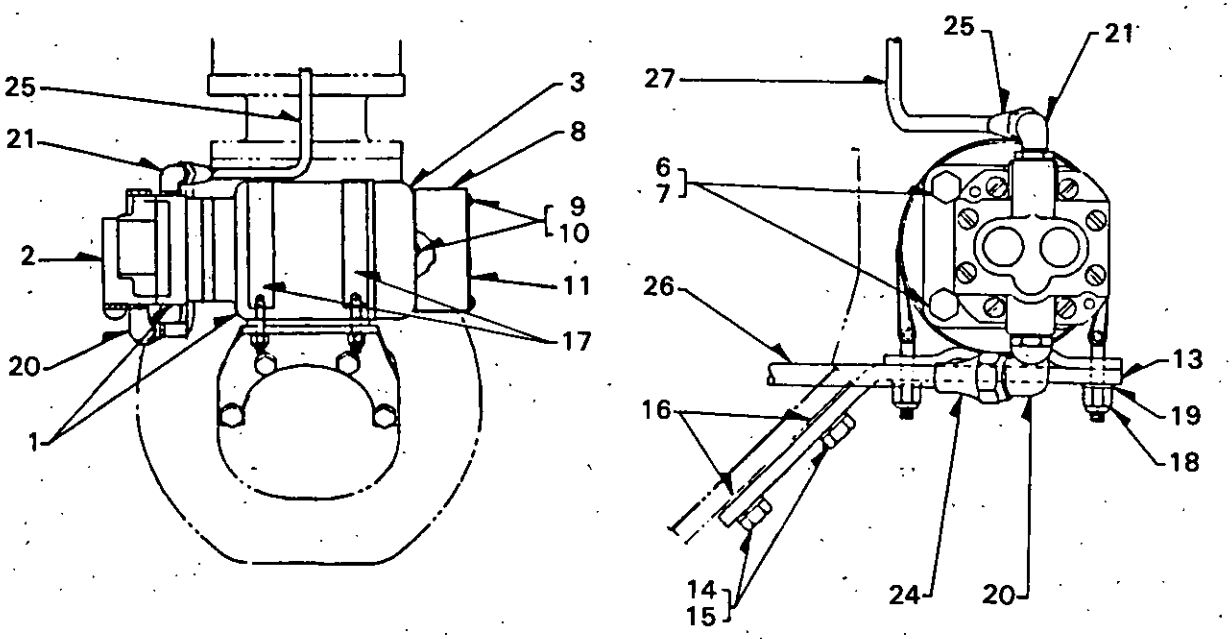


PLATE B133-E-1

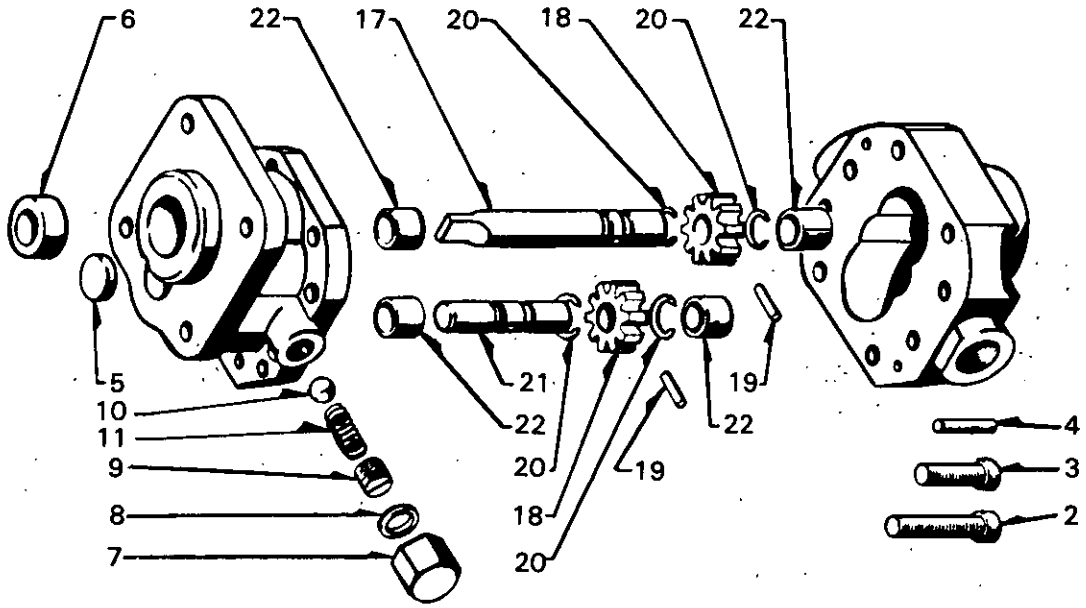
Ref. No.	Part Number	Qty. Req.	Description
1	8280353	1	PUMP ASSEMBLY .. Booster - Motor driven
2	8286931	1	PUMP .. Booster - See Page 2
†3	8286934	1	MOTOR .. Pump - Not furnished - See Note
*4	8286932	1	COUPLING .. Motor to pump
*5	8286933	1	GASKET .. Motor to pump
6	180077	4	BOLT .. Hex head 5/16-18 x 3/4 - Motor to pump
7	120214	4	WASHER .. Lock 5/16
8	8409899	1	BOX .. Junction - With access hole on bottom
9	122159	6	SCREW .. Machine 8-32 x 1/4 - Junction box mounting and cover
10	138530	6	WASHER .. Lock 8
11	8281200	1	COVER .. Junction box
*12	9556646	1	NAMEPLATE .. Cover - "Motor Voltages . . ."
13	8280356	1	BRACKET .. Mounting
14	179841	4	BOLT .. Hex head 3/8-16 x 1-1/4 - Mounting bracket
15	103319	4	WASHER .. Lock 3/8
16	6101225	4	WASHER .. Flat 3/8
17	8301769	2	STRAP .. Mounting - Pump to bracket - Includes T-bolts
18	8032715	4	NUT .. Hex lock 1/4-28
19	103339	4	WASHER .. Plain 1/4
20	118755	1	ELBOW .. 3/8 tube x 1/4 PT - Pump inlet port
21	116453	1	ELBOW .. 1/4 tube x 1/4 PT - Pump outlet port
*22	8040337	1	ELBOW .. 3/8 tube x 1/8 PT - Governor outlet port
*23	118753	1	ELBOW .. 1/4 tube x 1/8 PT - Governor inlet port
24	118539	2	NUT .. Tube 3/8 - Flared fitting
25	118537	2	NUT .. Tube 1/4 - Flared fitting
26	8098594	A.R.	TUBING .. Steel - Copper brazed - 3/8 O.D. x .028 wall x 20 feet
27	8098593	A.R.	TUBING .. Steel - Copper brazed - 1/4 O.D. x .028 wall x 20 feet

† Motor 8286934 and its components are not available. If replacement is required, an entire Pump Assembly, 8280353, must be ordered.

P.L. No. C133-E

ELECTRIC OPERATED ENGINE SHUTDOWN

Booster Pump Assembly



Ref. No. 1

PLATE B133-E-2

Ref. No.	Part Number	Qty. Req.	Description
†1	8286931	1	PUMP ASSEMBLY .. Booster
2		4	SCREW .. 12 point - 1/4-20 x 1-3/8 - Housing to stator
3		4	SCREW .. 12 point - 1/4-20 x 1 - Housing to stator
4	9414289	2	PIN .. Dowel - Housing to stator alignment
5	172530	1	PLUG .. Expansion - 11/16
6	8286941	1	SEAL .. Oil
7		1	CAPNUT .. Hex 1/2-20
8	8286946	1	GASKET .. Copper - 1/2 I.D.
9	8286944	1	SCREW .. Adjusting 1/2-20 x 9/16
10		1	BALL .. Pressure
11		1	SPRING .. Coil
*12	8286940	1	CAP .. Hex 9/16-18
*13		1	GASKET .. Copper - 5/8 I.D.
*14		1	BALL .. Pressure
*15		1	SPRING .. Coil - 1/2 inch free length
*16	8156967	1	SEAL .. O-ring - 1/4 I.D. x 3/8 O.D.
†17	8286938	1	SHAFT .. Drive
†18		2	GEAR .. Idler and drive
19	8334753	2	PIN .. Drive
20	9415584	4	RING .. Snap - Gear
†21		1	SHAFT .. Idler
22	457176	4	BEARING .. Needle

† Pump 8286931 incurred a design change in September 1967. The internal rotating parts of the old style pump are not available; a current design pump - 8286931 - will have to be ordered if the previous design rotating parts need replacement.

LUBE OIL SYSTEM

Accessory End Outside Lines
16-567D1,D2,D3,D3A Engines
PLATE C134-1

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D1 engine
		-	B	16-567D2,D3,D3A engines
STRAINER ASSEMBLY .. Lube Oil				
1	8269263	1	1	STRAINER .. Lube oil - See Parts List No. 136
2	8080850	1	1	GASKET .. Strainer to accessory cover
3	181433	12	12	BOLT .. Hex head 1/2-20 x 1-3/4
4	8032719	2	2	NUT .. Hex lock 1/2-20
5	6101229	14	14	WASHER .. Flat 1/2
6	8082674	1	-	PIPE .. Strainer to scavenging pump
6	8251745	-	1	PIPE .. Strainer to scavenging pump
7	8074661	1	1	GASKET .. Pipe to strainer
8	8032719	4	4	NUT .. Hex lock 1/2-20
9	6101229	4	4	WASHER .. Flat 1/2
10	8029467	2	-	GASKET .. Pipe to scavenging pump
10	8251951	-	1	GASKET .. Pipe to scavenging pump
11	179885	6	8	BOLT .. Hex head 1/2-13 x 1-1/2
12	190256	1	2	BOLT .. Hex head 1/2-13 x 4-1/2
13	6101229	7	10	WASHER .. Flat 1/2
14	8080166	1	-	ELBOW .. Strainer to P.C. and M.B. oil pump
14	8251965	-	1	ELBOW .. Strainer to P.C. and M.B. oil pump
15	8074661	1	1	GASKET .. Elbow to strainer
16	8032719	4	4	NUT .. Hex lock 1/2-20
17	6101229	4	4	WASHER .. Flat 1/2
18	8029470	1	-	GASKET .. Elbow to pressure pump
18	8029150	-	1	GASKET .. Elbow to pressure pump
18	8029467	1	-	GASKET .. Elbow to pressure pump
18	8251950	-	1	GASKET .. Elbow to pressure pump
19	179885	8	8	BOLT .. Hex head 1/2-13 x 1-1/2
20	6101229	8	8	WASHER .. Flat 1/2
21	8082532	1	-	ELBOW .. Piston cooling
21	8251654	-	1	ELBOW .. Piston cooling
22	8444177	1	-	ELBOW ASSEMBLY .. Supply - Replaces 8082451 and 8456681
22	8430437	-	1	ELBOW ASSEMBLY .. Supply - Replaces 8296896 and 8456682
23	8020772	2	2	STUD .. 3/8-16-24 x 2 in. lg. 8123064 .. .002 OS 8123065 .. .004 OS 8126917 .. .015 OS
24	8084872	2	-	STUD .. 5/16-18-24 x 1-1/2 in. lg. 8123044 .. .002 OS 8123045 .. .004 OS 8126982 .. .015 OS
25	8456531	1	1	FLANGE .. Blind
26	8430611	1	1	GASKET .. Flange to elbow
27	6101223	2	2	WASHER .. Flat 5/16
28	8032716	2	-	NUT .. Hex lock 5/16-24
*29	179817	-	2	BOLT .. Hex head 5/16-18 x 7/8
30	113177	1	1	PLUG .. Pipe - 3/4 MPT square head
31	8029470	1	-	GASKET .. Piston cooling and supply elbow to pump
31	8029150	-	1	GASKET .. Piston cooling and supply elbow to pump
32	8029467	1	-	GASKET .. Supply elbow to pump
32	8251950	-	1	GASKET .. Supply elbow to pump
33	8082964	1	1	GASKET .. Piston cooling elbow to cover
34	8082586	1	1	SEAL .. Piston cooling elbow to cover
35	8082965	1	1	GASKET .. Supply elbow to cover
36	8082587	1	1	SEAL .. Supply elbow to cover
37	179885	8	8	BOLT .. Hex head 1/2-13 x 1-1/2
38	181433	7	7	BOLT .. Hex head 1/2-20 x 1-3/4
39	6101229	15	15	WASHER .. Flat 1/2
40	8085838	1	1	OIL LINE .. P.C. oil pump outlet to strainer
41	8085799	2	2	CLAMP .. Tube
*42	116452	2	2	NUT .. 1/4 tube

P.L. No. F134

LUBE OIL SYSTEM

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D1 engine
		-	B	16-567D2,D3,D3A engines
43	118748	1	1	CONNECTOR .. 1/4 tube x 1/8 MPT
44	118753	1	1	ELBOW .. 1/4 tube x 1/8 MPT
45	8079912	1	1	OIL LINE .. Governor drive
46	8029154	2	2	GASKET .. Oil line mounting
47	8032717	2	2	NUT .. Hex lock 3/8-24
48	179845	2	2	BOLT .. Hex head 3/8-16 x 1-3/4
49	103321	2	2	WASHER .. Lock 3/8
50	9319341	1	1	HOSE ASSEMBLY .. Governor oil drain - Repl. 8195034, 8337551 and 8460824
51	9319342	1	1	HOSE ASSEMBLY .. Governor oil supply - Repl. 8195033 and 8460825
52	8428099	1	1	CABLE TIE .. Governor oil hoses
ƒ53	8198335	1	1	TUBE ASSEMBLY .. Lube oil pump suction
ƒ54	8167195	1	-	TUBE ASSEMBLY .. Low oil pressure
ƒ54	8290301	-	1	TUBE ASSEMBLY .. Low oil pressure - Except D3A engine
ƒ55	8118841	1	1	CLIP .. Tube - Low oil pressure line
ƒ56	8109746	1	1	CLIP .. Tube - Oil pump suction line
ƒ57	118755	1	1	ELBOW .. 3/8 tube x 1/4 MPT
58	118752	2	2	CONNECTOR .. 1/2 tube x 3/8 MPT
PUMP ASSEMBLY .. Main Bearing Pressure and Piston Cooling				
59	8084556	1	-	PUMP ASSEMBLY .. Main bearing pressure and piston cooling - See Parts List No. 138
59	8252844	-	1	PUMP ASSEMBLY .. Replaced by 9330012 - See Parts List No. 138
60	8028264	1	1	GASKET .. Pump mounting
61	181432	10	10	BOLT .. Hex head 1/2-20 x 1-5/8
62	6101229	10	10	WASHER .. Flat 1/2
PUMP ASSEMBLY .. Scavenging Oil				
63	8042375	1	-	PUMP ASSEMBLY .. Scavenging oil - See Parts List No. 140
63	8262903	-	1	PUMP ASSEMBLY .. Scavenging oil - See Parts List No. 140
64	8028264	1	1	GASKET .. Pump mounting
65	181432	10	10	BOLT .. Hex head 1/2-20 x 1-5/8
66	6101229	10	10	WASHER .. Flat 1/2

ƒ Not required on current design lube oil systems.

P.L. No. F134

LUBE OIL SYSTEM

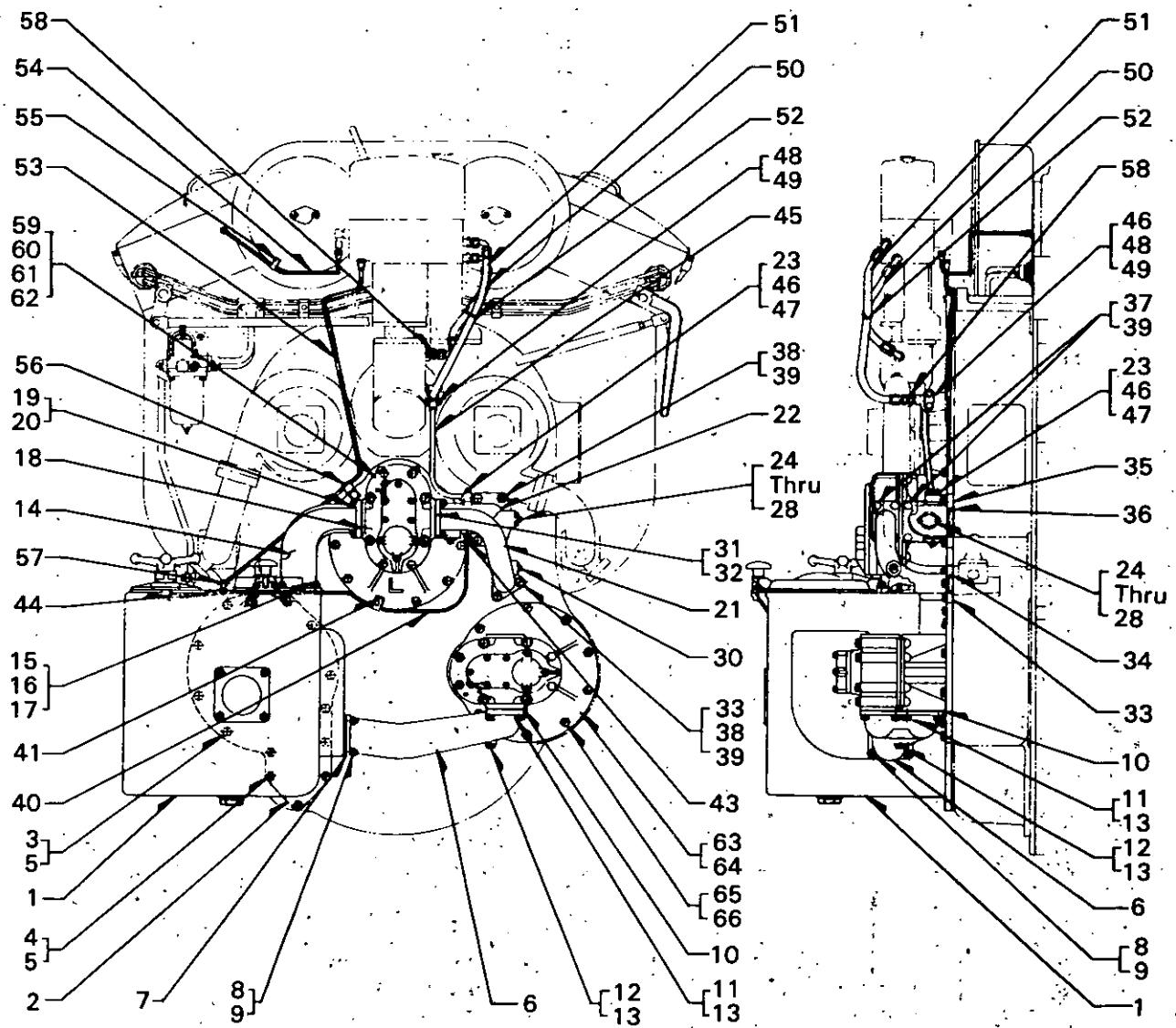


PLATE C134-1

P.L. No. F134

LUBE OIL SYSTEM

Accessory End Outside Lines
8,12,16-645E; 8-645E3B,E3C,F3B; 12,16-645E3,E3B,E3C,F3,F3B;
16-645E3A and 20-645E3,E3B Engines
PLATE D134-2

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	8-645E engine
		-	B	-	-	-	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	C	-	-	-	-	16-645E engine
		-	-	-	D	-	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	-	-	16-645E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	-	F	-	16-645E3A engine - DDA40X only
		-	-	-	-	-	-	G	20-645E3,E3B engines
ϕ1	8186776	1	1	1	-	-	-	-	STRAINER ASSEMBLY .. Lube oil - Except GP15-1, GP15-2, GP15T, GL22CU and some models of G26 and GL26 locomotives - See Parts List No. 136
ϕ1	8269263	-	1	1	1	1	1	1	STRAINER ASSEMBLY .. Lube oil - See Parts List No. 136
2	8080850	1	1	1	1	1	1	1	GASKET .. Strainer to accessory cover
3	181433	12	12	12	12	12	12	12	BOLT .. Hex head 1/20 x 1-3/4
4	8032719	2	2	2	2	2	2	2	NUT .. Hex lock 1/2-20
5	6101229	14	14	14	14	14	14	14	WASHER .. Flat 1/2
6	8118274	1	-	-	-	-	-	-	PIPE .. Strainer to scavenging pump
6	8097348	-	1	-	-	-	-	-	PIPE .. Strainer to scavenging pump
6	8082674	-	-	1	1	-	-	-	PIPE .. Strainer to scavenging pump
6	8251745	-	-	-	-	1	1	1	PIPE .. Strainer to scavenging pump
7	8074661	1	1	1	1	1	1	1	GASKET .. Pipe to strainer
8	8032719	4	4	4	4	4	4	4	NUT .. Hex lock 1/2-20
9	6101229	4	4	4	4	4	4	4	WASHER .. Flat 1/2
10	8029467	1	-	2	2	-	-	-	GASKET .. Pipe to scavenging pump
10	8029150	-	2	-	-	-	-	-	GASKET .. Pipe to scavenging pump
10	8251951	-	-	-	-	1	1	1	GASKET .. Pipe to scavenging pump
11	179885	2	4	6	6	8	8	8	BOLT .. Hex head 1/2-13 x 1-1/2
12	190270	2	-	-	-	-	-	-	BOLT .. Hex head 1/2-13 x 4-1/4
*13	179897	-	2	-	-	-	-	-	BOLT .. Hex head 1/2-13 x 4
14	190256	-	1	1	1	2	2	2	BOLT .. 1/2-13 x 4-1/2
15	187201	-	-	-	-	-	-	1	BOLT .. Hex head 1/2-13 x 4-3/4
16	6101229	4	7	7	7	10	10	10	WASHER .. Flat 1/2
17	8118248	1	-	-	-	-	-	-	ELBOW .. Strainer to P.C. and M.B. oil pump
17	8097345	-	1	-	-	-	-	-	ELBOW .. Strainer to P.C. and M.B. oil pump
17	8080166	-	-	1	1	-	-	-	ELBOW .. Strainer to P.C. and M.B. oil pump
17	8251965	-	-	-	-	1	1	-	ELBOW .. Strainer to P.C. and M.B. oil pump
17	8360557	-	-	-	-	-	-	1	ELBOW .. Strainer to P.C. and M.B. oil pump
18	8074661	1	1	1	1	1	1	1	GASKET .. Elbow to strainer
19	8032719	4	4	4	4	4	4	4	NUT .. Hex lock 1/2-20
20	6101229	4	4	4	4	4	4	4	WASHER .. Flat 1/2
21	8029470	1	-	1	1	-	-	-	GASKET .. Elbow to pressure pump
21	8029482	1	-	-	-	-	-	-	GASKET .. Elbow to pressure pump
21	8029150	-	1	-	-	1	1	-	GASKET .. Elbow to pressure pump
21	8029151	-	1	-	-	-	-	-	GASKET .. Elbow to pressure pump
21	8029467	-	-	1	1	-	-	-	GASKET .. Elbow to pressure pump
21	8251950	-	-	-	-	1	1	-	GASKET .. Elbow to pressure pump
21	8360530	-	-	-	-	-	-	1	GASKET .. Elbow to pressure pump
22	179885	6	8	8	8	8	8	8	BOLT .. Hex head 1/2-13 x 1-1/2
23	6101229	6	8	8	8	8	8	8	WASHER .. Flat 1/2
24	8117467	1	-	-	-	-	-	-	ELBOW .. Piston cooling
24	8097346	-	1	-	-	-	-	-	ELBOW .. Piston cooling
24	8082532	-	-	1	1	-	-	-	ELBOW .. Piston cooling
24	8251654	-	-	-	-	1	1	-	ELBOW .. Piston cooling
24	8360555	-	-	-	-	-	-	1	ELBOW .. Piston cooling

8361204, 8408480, 8382789, 8361205, 9317118, 8361206,
9322701, 8410922, 9087225, 8347898, 8360560, 8492089

LUBE OIL SYSTEM

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	8-645E engine
		-	B	-	-	-	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	C	-	-	-	-	16-645 engine
		-	-	-	D	-	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	-	-	16-645E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	-	F	-	16-645E3A engine - DDA40X only
		-	-	-	-	-	-	G	20-645E3,E3B engines
25	8453906	1	-	-	-	-	-	-	ELBOW ASSEMBLY .. Supply
25	8453905	-	1	-	-	-	-	-	ELBOW ASSEMBLY ..Supply
25	8444177	-	-	1	1	-	-	-	ELBOW ASSEMBLY .. Supply
25	8430437	-	-	-	-	1	1	-	ELBOW ASSEMBLY .. Supply
25	8436704	-	-	-	-	-	-	1	ELBOW ASSEMBLY .. Supply
26	8020772	2	2	2	2	2	2	2	STUD .. 3/8-16-24 x 2 inches long - 8123064 .. .002 OS 8123065 .. .004 OS 8126917 .. .015 OS
27	8084872	-	2	2	2	-	-	-	STUD .. 5/16-18-24 x 1-1/2 inches long - 8123044 .. .002 OS 8123045 .. .004 OS 8126982 .. .015 OS
†28	8456531	-	1	1	1	1	-	1	FLANGE .. Blind
†29	8430611	-	1	1	1	1	-	1	GASKET .. Flange to elbow
†30	6101223	-	2	2	2	2	-	2	WASHER .. Flat 5/16
†31	8032716	-	2	2	2	-	-	-	NUT .. Hex lock 5/16-24
†32	179817	-	-	-	-	2	-	2	BOLT .. Hex head 5/16-18 x 7/8
33	113177	2	2	2	2	2	2	2	PLUG .. Pipe - 3/4 MPT
34	8029482	1	-	-	-	-	-	-	GASKET .. Piston cooling elbow to pump
34	8029151	-	1	-	-	-	-	-	GASKET .. Piston cooling elbow to pump
34	8029470	1	-	1	1	-	-	-	GASKET .. Supply and P.C. elbows to pump
34	8029150	-	1	-	-	1	1	-	GASKET .. Supply and P.C. elbows to pump
34	8360530	-	-	-	-	-	-	1	GASKET .. Supply and P.C. elbows to pump
34	8029467	-	-	1	-	-	-	-	GASKET .. Supply elbow to pump
34	8251950	-	-	-	-	1	1	-	GASKET .. Supply elbow to pump
35	8082964	1	1	1	1	1	1	1	GASKET .. Piston cooling elbow to cover
36	8082586	1	1	1	1	1	1	1	SEAL .. Piston cooling elbow to cover
37	8082965	1	1	1	1	1	1	1	GASKET .. Supply elbow to cover
38	8082587	1	1	1	1	1	1	1	SEAL .. Supply elbow to cover
39	179885	6	8	8	8	8	8	8	BOLT .. Hex head 1/2-13 x 1-1/2
40	181433	7	7	7	7	7	7	7	BOLT .. Hex head 1/2-20 x 1-3/4
41	6101229	13	15	15	15	15	15	15	WASHER .. Flat 1/2
42	8085838	1	1	1	1	1	1	1	LINE .. Oil - P.C. oil pump outlet to strainer
43	8085799	2	2	2	2	2	2	2	CLAMP .. Tube
*44	116452	2	2	2	2	2	2	2	NUT .. 1/4 tube
45	118748	1	1	1	1	1	1	1	CONNECTOR .. 1/4 tube x 1/8 MPT
46	118753	1	1	1	1	1	1	1	ELBOW .. 1/4 tube x 1/8 MPT
47	8079912	1	1	1	1	1	-	-	LINE .. Oil - Governor drive
47	8360558	-	-	-	-	-	-	1	LINE .. Oil - Governor drive
47	8436749	-	-	-	-	-	1	-	LINE .. Oil - Governor drive - Formerly 8360558
47	103877	-	-	-	-	-	1	-	PLUG .. Pipe - 1/8 MPT
48	8029154	2	2	2	2	2	2	2	GASKET .. Oil line mounting
49	8032717	2	2	2	2	2	2	2	NUT .. Hex lock 3/8-24
50	179845	2	2	2	2	2	2	2	BOLT .. Hex head 3/8-16 x 1-3/4
51	103321	2	2	2	-	-	-	-	WASHER .. Lock 3/8
51	6101225	-	-	-	2	2	2	2	WASHER .. Flat 3/8
52	9319341	1	1	1	1	1	1	1	HOSE ASSEMBLY .. 90° x 90° x 14-1/2 inches long
ϕ52	9531700	-	-	1	1	1	-	-	HOSE ASSEMBLY .. Straight x 45° x 16-3/8 inches long
53	9319342	1	1	1	1	1	1	1	HOSE ASSEMBLY .. Straight x 90° x 21-1/2 inches long
ϕ53	9531701	-	-	1	1	1	-	-	HOSE ASSEMBLY .. 90° x 45° x 21-3/8 inches long

† Applied when hot oil shutdown (Parts List No. 159) is not used.

P.L. No. F134

LUBE OIL SYSTEM

Ref. No.	Part Number	Quantity Required							Description
		A	-	-	-	-	-	-	8-645E engine
		-	B	-	-	-	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	C	-	-	-	-	16-645 engine
		-	-	-	D	-	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	-	-	16-645E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	-	F	-	16-645E3A engine - DDA40X only
		-	-	-	-	-	-	G	20-645E3,E3B engines
54	8428099	1	1	1	1	1	1	1	CABLE TIE .. Governor oil hoses
††*55	8198335	1	1	1	1	1	-	1	TUBE ASSEMBLY .. Lube oil pump suction
*56	8167195	1	-	-	-	-	-	-	TUBE ASSEMBLY .. Lube oil pressure - Except GL18M locomotives
††*56	8290301	-	1	-	-	-	-	-	TUBE ASSEMBLY .. Low oil pressure
*57	8118841	1	1	-	-	-	-	-	CLIP .. Tube - Low oil pressure line - Not required on current 12-645E lube oil systems
††*58	8109746	1	1	1	1	1	-	1	CLIP .. Tube - Oil pump suction line
††*59	118755	1	1	1	1	1	-	1	ELBOW .. 3/8 tube x 1/4 MPT
†††59	103878	1	1	1	1	1	1	1	PLUG .. Pipe - 1/4 MPT
60	118752	-	-	-	-	-	-	-	CONNECTOR .. 1/2 tube x 3/8 MPT Two (2) required if 144299 tee is <u>not</u> used One (1) required if 144299 tee is used - See Ref. No. 61
†††61	144299	1	1	1	1	1	1	1	TEE .. 1/2 tube x 3/8 MPT
PUMP ASSEMBLY .. Main Bearing and Piston Cooling									
62	8221309	1	-	-	-	-	-	-	PUMP .. M.B. pressure and P.C. - Export only
62	8176033	1	-	-	-	-	-	-	PUMP .. M.B. pressure and P.C.
62	8106919	-	1	-	-	-	-	-	PUMP .. M.B. pressure and P.C.
62	8084556	-	-	1	1	-	-	-	PUMP .. M.B. pressure and P.C.
62	9330012	-	-	-	-	1	1	-	PUMP .. M.B. pressure and P.C. - Replaces 8252844
62	9330013	-	-	-	-	-	-	1	PUMP .. M.B. pressure and P.C. - Replaces 8360554
									} See Parts List No. 138
63	8028264	1	1	1	1	1	1	1	GASKET .. Pump mounting
64	181432	10	10	10	10	10	10	10	BOLT .. Hex head 1/2-20 x 1-5/8
65	6101229	10	10	10	10	10	10	10	WASHER .. Flat 1/2
PUMP ASSEMBLY .. Scavenging Oil									
66	8042376	1	-	-	-	-	-	-	PUMP .. Scavenging oil
66	8041928	-	1	-	-	-	-	-	PUMP .. Scavenging oil
66	8042375	-	-	1	1	-	-	-	PUMP .. Scavenging oil
66	8262903	-	-	-	-	1	1	1	PUMP .. Scavenging oil
									} See Parts List No. 140
67	8028264	1	1	1	1	1	1	1	GASKET .. Pump mounting
68	181432	10	10	10	10	10	10	10	BOLT .. Hex head 1/2-20 x 1-5/8
69	6101229	10	10	10	10	10	10	10	WASHER .. Flat 1/2

†† Not required on current design Lube Oil Systems.

††† Applied to current design Lube Oil Systems.

P.L. No. F134

LUBE OIL SYSTEM

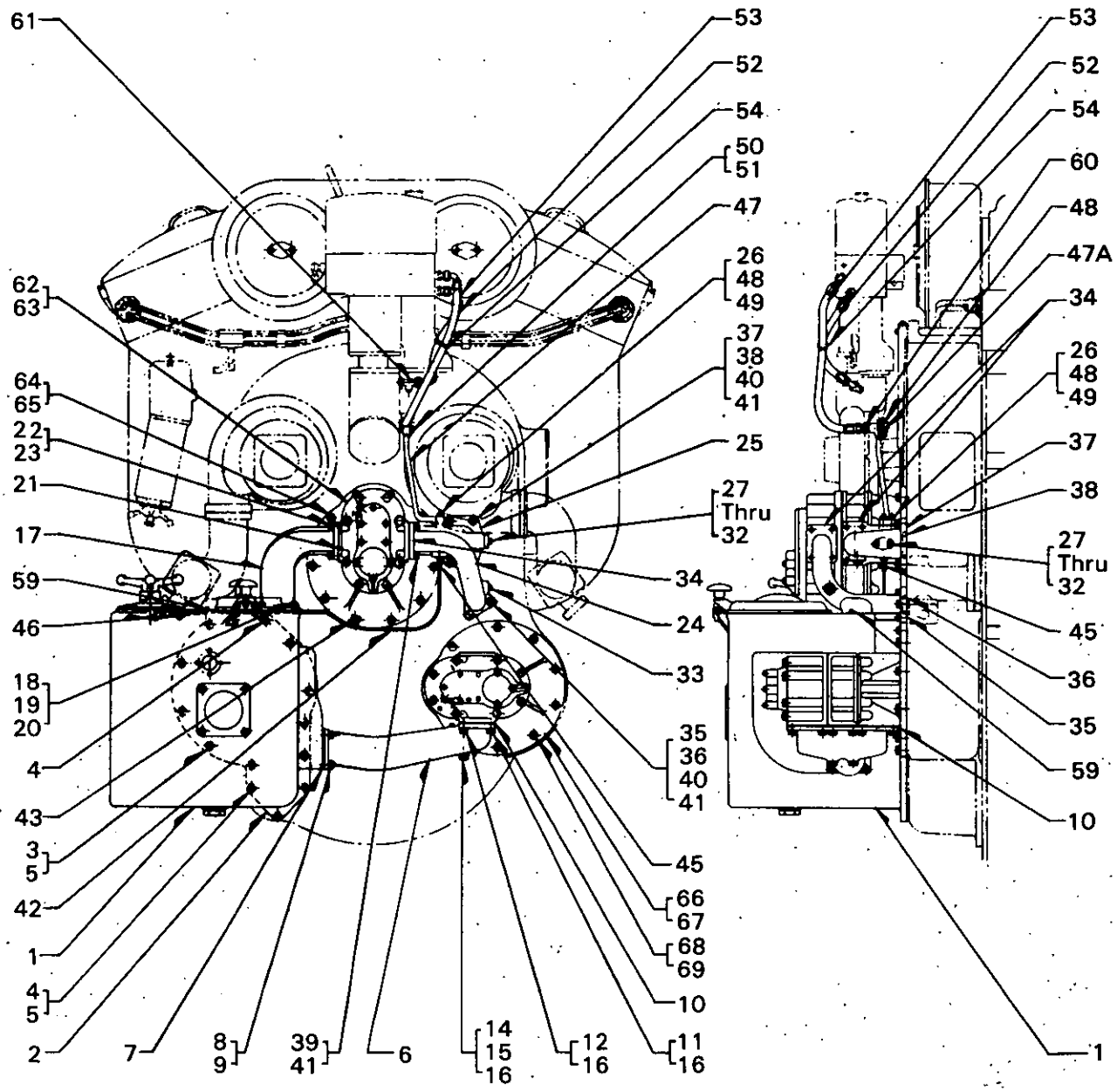


PLATE D134-2

P.L. No. F134

LUBE OIL SYSTEM

Lube Oil Manifold Assembly
All 567D and 645 Engines

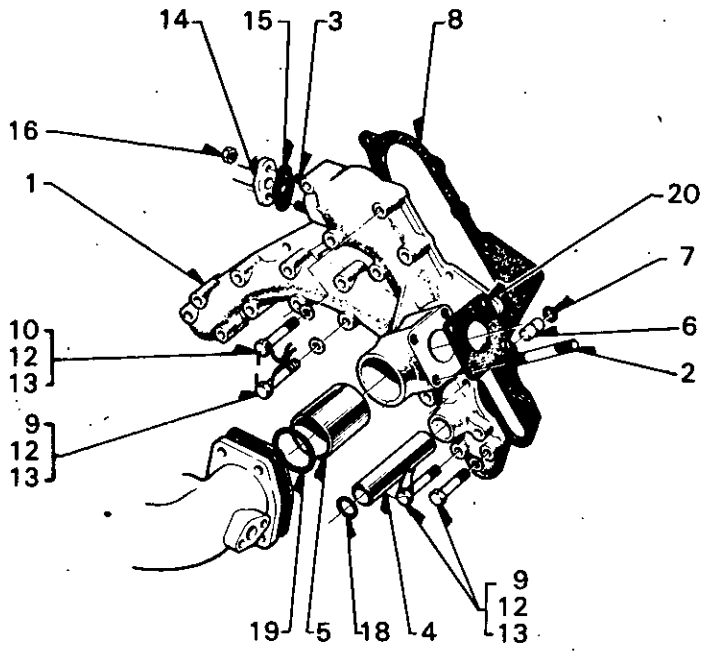
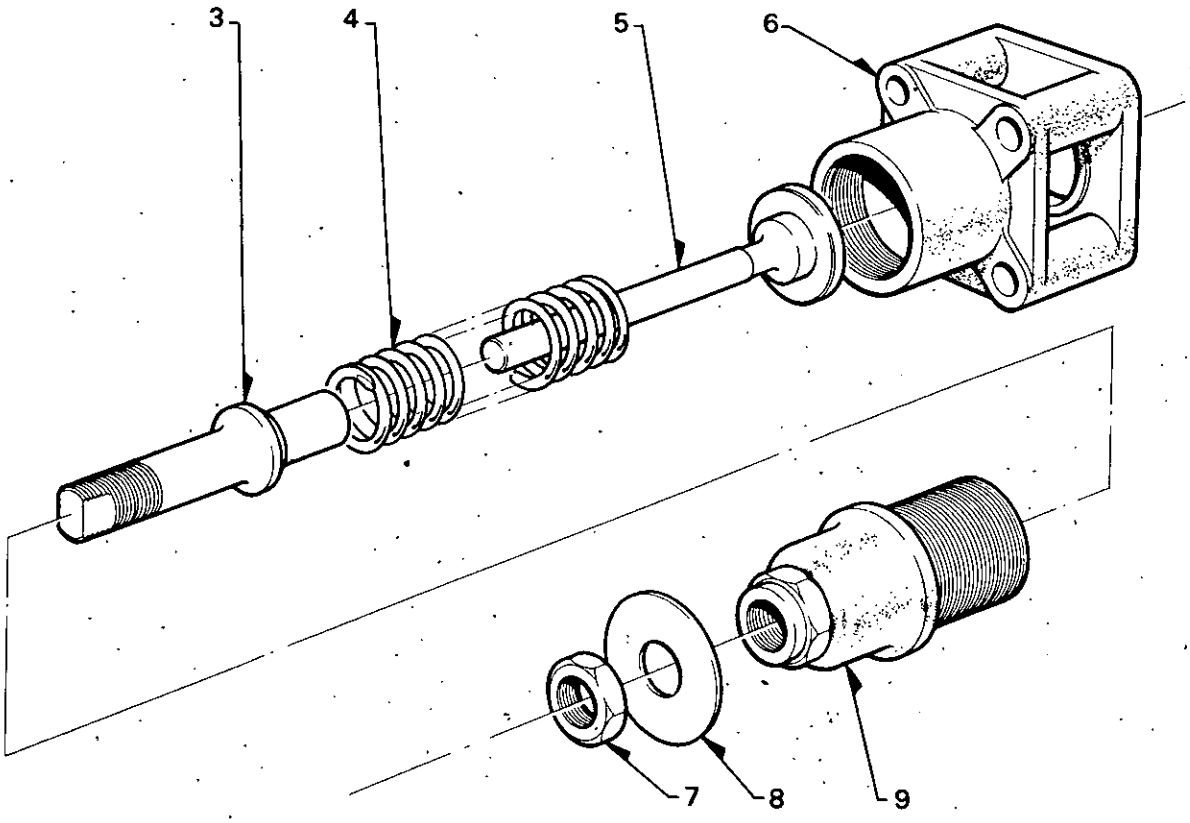


PLATE D134-3

Ref. No.	Part Number	Qty. Req.	Description
1	8160289	1	MANIFOLD ASSEMBLY .. Lube oil
2	8028714	4	STUD .. Relief valve - 1/2-13 x 1/2-20 x 4-1/4 inches long 8123070 .. .002 OS 8126920 .. .015 OS 8126922 .. .019 OS 8123071 .. .004 OS 8126921 .. .017 OS
3	8029137	2	STUD .. Oil line - 3/8-16 x 3/8-24 x 1-3/4 inches long 8115306 .. .002 OS 8115308 .. .015 OS 8115310 .. .019 OS 8115307 .. .004 OS 8115309 .. .017 OS
4	8082557	1	TUBE .. Piston cooling oil - 1.740 O.D. x 6-3/4 inches long
5	8082558	1	TUBE .. Main bearing oil - 2.865 O.D. x 3-1/2 inches long
6	8085062	2	DOWEL .. Special - Manifold locating
7	8085063	2	RING .. Snap - Dowel
8	8167060	1	GASKET .. Manifold to crankcase
9	8088763	14	BOLT .. Drilled hex head 1/2-20 x 2-1/4
10	8088764	6	BOLT .. Drilled hex head 1/2-20 x 3-1/4
*11	8028329	3	BOLT .. Drilled hex head 1/2-20 x 1-1/4
12	6101229	23	WASHER .. Flat 1/2
13	8116738	A.R.	WIRE .. Lock - 3/64 diameter x 500 feet
14	8166331	1	LINE .. Oil - Manifold to governor drive gear stubshaft
15	8029165	2	GASKET .. Oil line
16	8032717	2	NUT .. Hex lock 3/8-24
*17	8028312	2	BOLT .. Drilled hex head 3/8-24 x 1 - Oil line to stubshaft
18	8082586	1	SEAL .. O-ring
19	8082587	1	SEAL .. O-ring
20	8069445	1	GASKET .. Relief valve - For relief valve assembly - See Page 9

LUBE OIL SYSTEM

Manifold Relief Valve
All 567D and 645 Engines



Ref. No. 2

PLATE E134-4

Ref. No.	Part Number	Qty. Req.		Description
*1	8077201	1	-	VALVE ASSEMBLY .. Relief - Roots blown engines
2	8292205	-	1	VALVE ASSEMBLY .. Relief - Turbocharged engines
3	8335222	1	-	GUIDE .. Valve
3	8335224	-	1	GUIDE .. Valve
4	8028785	1	-	SPRING .. Valve
4	8291928	-	1	SPRING .. Valve
5	8028512	1	-	VALVE .. Relief
5	8292090	-	1	VALVE .. Relief
6	8077202	1	1	BODY .. Valve
7	273200	1	1	NUT .. Hex 1-12
8	8335226	-	1	PLATE .. Safety
9	8335223	1	-	HOLDER .. Valve
9	8335225	-	1	HOLDER .. Valve
*10	8069445	1	1	GASKET .. Relief valve mounting } See Page 8
*11	8032719	4	4	NUT .. Hex lock 1/2-20

P.L. No. F134

LUBE OIL SYSTEM

Piston Cooling, Camshaft Stubshaft and Rocker Arm
Lubricating Oil Lines
16-567D1 and 8,12,16-645E Engines

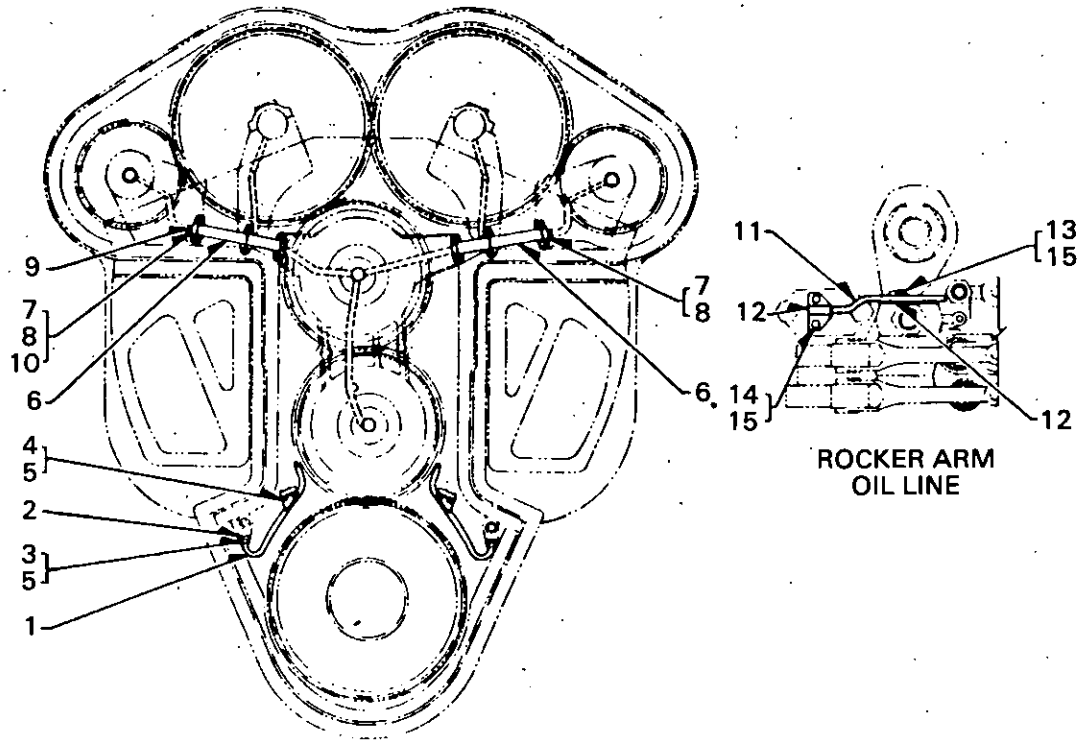


PLATE E134-5

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E engine
		-	B	-	-	12-645E engine
		-	-	C	-	16-645E engine
		-	-	-	D	16-567D1 engine
1	9549578	8	12	16	-	TUBE .. Oil - Piston cooling - Replaces 8405427 and 8453422
1	9549577	-	-	-	16	TUBE .. Oil - Piston cooling - Replaces 8373214 and 8405428
2	8025988	8	12	16	16	GASKET .. Tube to manifold
3	181339	16	24	32	32	BOLT .. Hex head 5/16-24 x 1 - Flange to manifold - Formerly 181338
4	179819	16	24	32	32	BOLT .. Hex head 5/16-18 x 1-1/8 - Tube to liner
5	103320	32	48	64	64	WASHER .. Lock 5/16
6	8081503	1	2	2	2	LINE .. Oil - Camshaft stubshaft - 8 cylinder right bank - 12 and 16 cylinder right or left bank
6	8117605	1	-	-	-	LINE .. Oil - Camshaft stubshaft - Left bank
7	8081594	5	6	6	6	GASKET .. Oil line mounting
8	8167141	10	12	12	12	BOLT .. Hex head 3/8-24 x 1-5/8 - Oil line mounting
9	103878	2	2	2	2	PLUG .. Pipe - 1/4 MPT - Square head
10	8116738	As Required				WIRE .. Lock - 3/64 diameter - Available 500 foot length
11	8039842	8	12	16	16	LINE .. Oil - Rocker arm
12	8029167	16	24	32	32	GASKET .. Oil line to camshaft block
13	181311	16	24	32	32	BOLT .. Hex head 1/4-28 x 5/8 - Oil line to rocker arm shaft
14	179795	16	24	32	32	BOLT .. Hex head 1/4-20 x 3/4 - Oil line to camshaft bearing block
15	103319	32	48	64	64	WASHER .. Lock 1/4

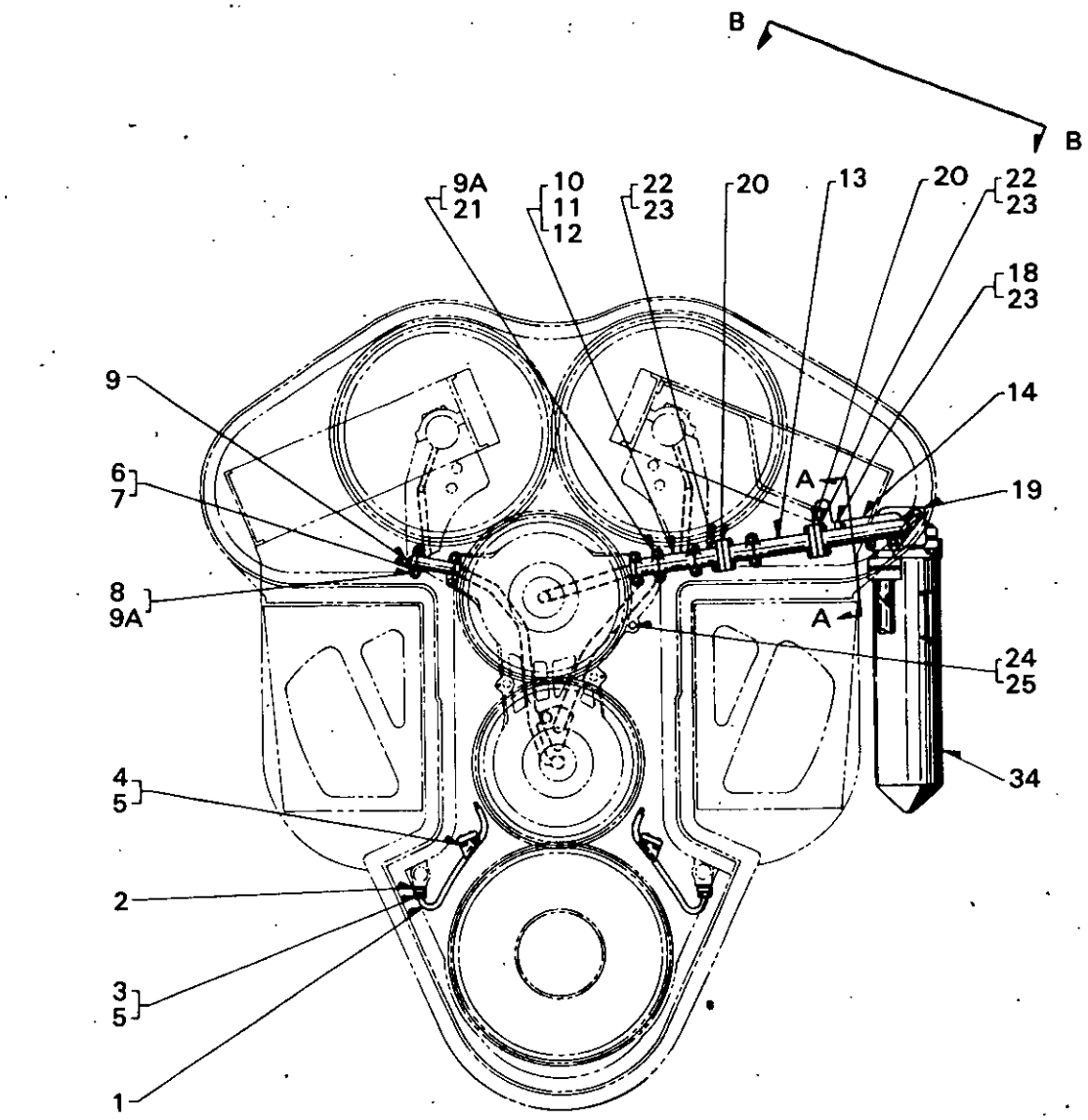
LUBE OIL SYSTEM

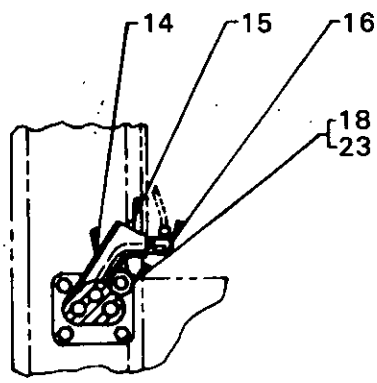
Piston Cooling, Camshaft Stubshaft, Rocker Arm
Lubricating Oil Lines and Turbocharger Filter
All 645 Engines
PLATE D134-6

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C,F3B engines
		-	B	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	C	-	16-645E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	D	20-645E3,E3B engines
1	9549578	8	12	16	20	TUBE .. Oil - Piston cooling - Replaces 8453422 and 8405427
2	8025988	8	12	16	20	GASKET .. Tube to manifold
3	181339	16	24	32	40	BOLT .. Hex head 5/16-24 x 1 - Flange to manifold - Formerly 181338
4	179819	16	24	32	40	BOLT .. Hex head 5/16-18 x 1-1/8 - Tube to liner
5	103320	32	48	64	80	WASHER .. Lock 5/16
6	8117605	1	1	1	1	OIL LINE .. Stubshaft - Left bank
7	8081594	2	2	2	2	GASKET .. Oil line mounting
8	8167141	4	4	4	4	BOLT .. Hex head 3/8-24 x 1-5/8 - Oil line mounting
9	103878	1	1	1	1	PLUG .. Pipe - 1/4 MPT - Square head
9A	8116738	As Required				WIRE .. Lock - 3/64 diameter - Available 500 foot length
10	8288093	1	1	1	1	MANIFOLD .. Oil line - End - Right bank
11	8288139	1	1	1	1	GASKET .. Manifold mounting
12	8081594	1	1	1	1	GASKET .. Manifold mounting - Replaces 8288231
13	8288094	1	1	1	1	MANIFOLD .. Oil line - Center - Right bank
14	8366329	1	1	1	1	MANIFOLD ASSEMBLY. .. Adapter - From center manifold to filter
15	103878	1	1	1	1	PLUG .. Pipe - 1/4 MPT
16	116453	1	1	1	1	ELBOW .. 90° - 1/4 tube x 1/4 MPT
*17	8310841	2	2	2	2	STUD .. 3/8-16-24 x 2-3/8 inches long
*17A	8366379	2	2	2	2	STUD .. 3/8-16-24 x 2-7/8 inches long
18	181384	1	1	1	1	BOLT .. Hex head 3/8-24 x 2-3/4 - Manifold to manifold
19	8366331	1	1	1	1	GASKET .. Manifold to camshaft drive housing
20	8366330	2	2	2	2	GASKET .. Manifold - Used between sections
21	8288257	8	8	8	8	BOLT .. Drilled hex head 3/8-24 x 3-1/2 - Manifold mounting
22	181376	7	7	7	7	BOLT .. Hex head 3/8-24 x 1-5/8 - Manifold to manifold
23	8032717	8	8	8	8	NUT .. Hex lock 3/8-24
24	8288784	1	1	1	1	BOLT .. Drilled hex head 3/8-24 x 1-1/8
25	6101225	1	1	1	1	WASHER .. Flat 3/8
*26	8159199	2	2	2	2	FLANGE .. Manifold - Piston cooling
*27	8159200	2	2	2	2	GASKET .. Flange mounting
*28	8028314	4	4	4	4	BOLT .. Drilled hex head 3/8-24 x 7/8 - Flange mounting
29	8039842	8	12	16	20	LINE .. Oil rocker arm
30	8029167	16	24	32	40	GASKET .. Oil line to camshaft block
31	181311	16	24	32	40	BOLT .. Hex head 1/4-28 x 5/8 - Oil line to rocker arm shaft
32	179795	16	24	32	40	BOLT .. Hex head 1/4-20 x 3/4 - Oil line to camshaft bearing
33	103319	32	48	64	80	WASHER .. Lock 1/4
FILTER ASSEMBLY .. Oil - Turbocharger						
34	8366743	1	1	1	1	FILTER ASSEMBLY .. Oil - Turbocharger - For mounting parts see Pages 22 and 23 - For service components see Page 21

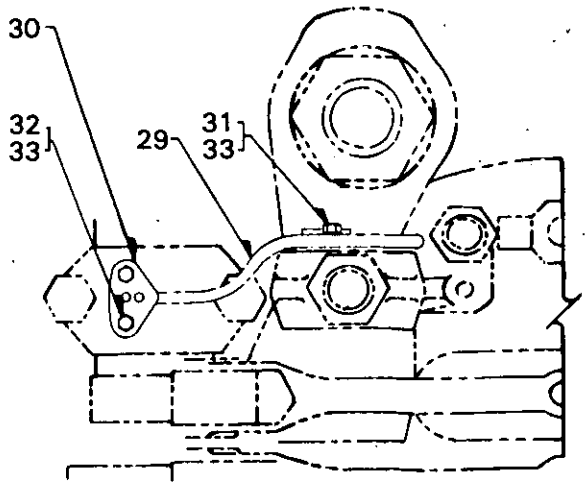
P.L. No. F134

LUBE OIL SYSTEM





SECTION A-A



VIEW B-B

PLATE D134-6

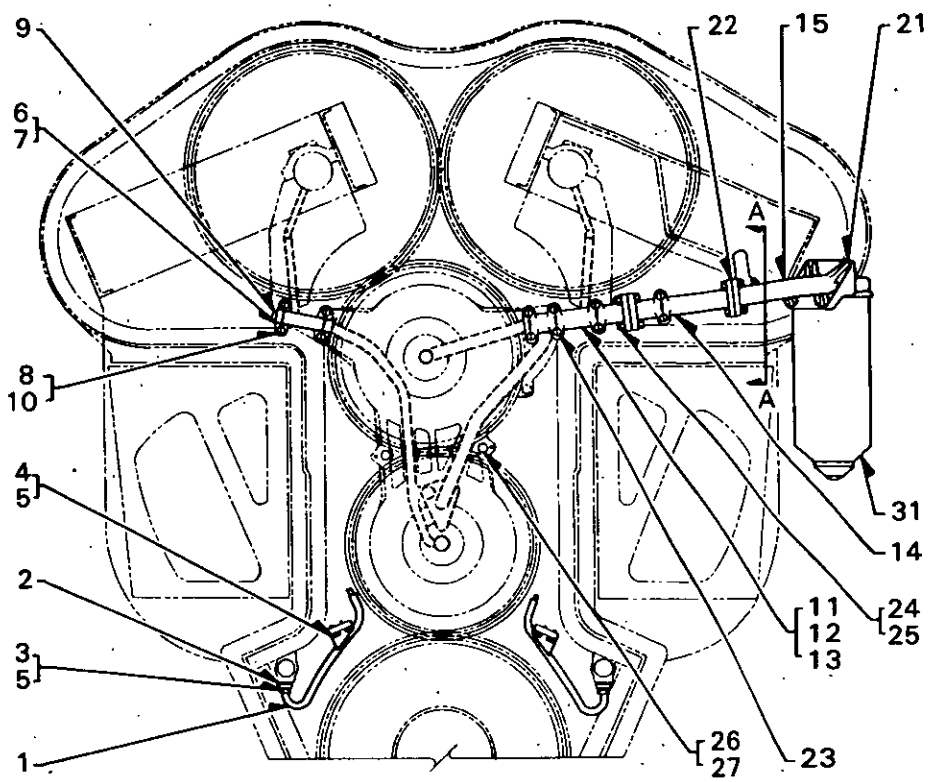
LUBE OIL SYSTEM

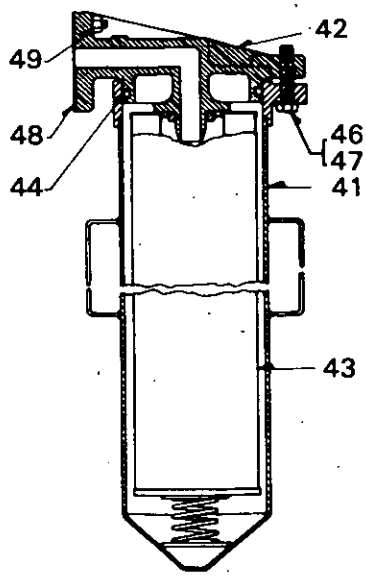
Piston Cooling, Camshaft Stubshaft, Rocker Arm
Lubricating Oil Lines and Turbocharger Filter
16-567D2,D3,D3A Engines
PLATE E134-7

Ref. No.	Part Number	Qty. Req.	Description
For external turbocharger lube oil lines refer to Page 31			
1	9549577	16	TUBE .. Piston cooling oil - Replaces 8373214 and 8405428
2	8025988	16	GASKET .. Tube to manifold
3	181338	32	BOLT .. Hex head 5/16-24 x 7/8 - Flange to manifold
4	179819	32	BOLT .. Hex head 5/16-18 x 1-1/8 - Tube to liner
5	103320	64	WAHSER .. Lock 5/16
6	8117605	1	LINE .. Oil - Stubshaft - Left bank
7	8081594	2	GASKET .. Oil line
8	8167141	4	BOLT .. Hex head 3/8-24 x 1-5/8 - Oil line mounting
9	103878	1	PLUG .. Pipe - 1/4 MPT
10	8116738	A.R.	WIRE .. Lock - 3/64 diameter - Available 500 foot length
11	8288093	1	MANIFOLD .. Oil line - End - Right bank
12	8288139	1	GASKET .. Manifold mounting
13	8081594	1	GASKET .. Manifold mounting - Replaces 8288231
14	8288094	1	MANIFOLD .. Oil line - Center - Right bank
15	8288120	1	MANIFOLD ASSEMBLY .. Filter - D2,D3 engines only - Not furnished Use 8332063 manifold for replacement - Modification required
16	8332063	1	MANIFOLD ASSEMBLY .. Adapter - From center manifold to filter - D3A engines only
17	103878	1	PLUG .. Pipe - 1/4 MPT
18	116453	1	ELBOW .. 90° - 1/4 tube x 1/4 MPT
19	8310841	4	STUD .. Hex head 3/8-16-24 x 2-3/8
20	181384	1	BOLT .. Hex head 3/8-24 x 2-3/4 - 16-567D3A - Manifold to manifold
21	8366331	1	GASKET .. Filter cover to manifold - Replaces 8288140
22	8366330	2	GASKET .. Manifold - Used between sections - Replaces 8288155
23	8288257	8	BOLT .. Drilled hex head 3/8-24 x 3-1/2 - Manifold mounting
24	181376	-	BOLT .. Hex head 3/8-24 x 1-5/8 - Manifold to manifold 8 required with 8288120 manifold - Ref. No. 15 7 required with 8332063 manifold - Ref. No. 16
25	8032717	8	NUT .. Hex lock 3/8-24
26	8288784	1	Drilled hex head 3/8-24 x 1-1/8
27	6101225	1	WASHER .. Flat 3/8
*28	8159199	2	FLANGE .. Manifold - Piston cooling
*29	8159200	2	GASKET .. Flange mounting
*30	8028314	4	BOLT .. Drilled hex head 3/8-24 x 7/8 - Flange mounting
FILTER ASSEMBLY .. Oil - Previous Design			
† Ref. Nos. 31, 32 and 33 are no longer available. For replacement, recommend using 8326029 filter assembly, Ref. No. 40, which is interchangeable with previous design filter assembly 8288259, Ref. No. 31.			
†31	8288259	1	FILTER ASM. .. Oil - Turbocharger - Mounted on camshaft drive housing - Prev. design
†32	8288131	1	COVER .. Filter
†33	8288459	1	BODY ASSEMBLY .. Includes stud
34	8311878	1	SPRING .. Filter
35	8292804	1	CARTRIDGE ASSEMBLY .. Wire screen - Replaced by 8321295
36	8300574	1	GROMMET .. Applied to low end of cartridge
37	8300575	1	GASKET .. Applied to top end of cartridge
38	8288955	1	SEAL .. Cartridge
*39	8321295	1	CARTRIDGE .. Pleated paper - 4-1/2 in. O.D. x 8-11/16 in. long - Repl. Ref. No. 35
FILTER ASSEMBLY .. Oil - Current Design			
†40	8326029	1	FILTER ASM. .. Oil - Turbocharged - Mounted on camshaft drive housing - Current design
41	8327347	1	SHELL ASSEMBLY .. Filter
42	8327348	1	COVER .. Filter
43	8322064	1	CARTRIDGE .. Pleated paper - 4-1/2 inches O.D. x 20 inches long
44	8288955	1	O-RING .. Cover
*45	103877	1	PLUG .. Pipe - 1/8 MPT
46	8350942	2	BOLT .. Hex head 7/16-14 x 2-1/4 - Shell to cover
47	8388011	2	WASHER .. Special - Cover mounting
48	8366331	1	GASKET .. Filter to crankcase - Replaces 8288140
49	8032717	4	NUT .. Hex lock 3/8-24
50	8039842	16	LINE .. Oil - Rocker arm
51	8029167	32	GASKET .. Oil line to camshaft block
52	181311	32	BOLT .. Hex head 1/4-28 x 5/8 - Oil line to rocker arm shaft
53	103319	64	WASHER .. Lock 1/4
54	179795	32	BOLT .. Hex head 1/4-20 x 3/4 - Oil line to camshaft bearing

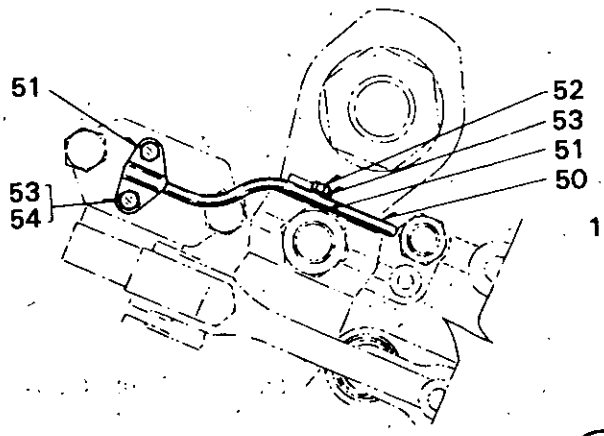
P.L. No. F134

LUBE OIL SYSTEM

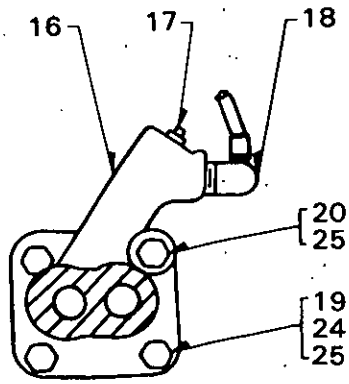




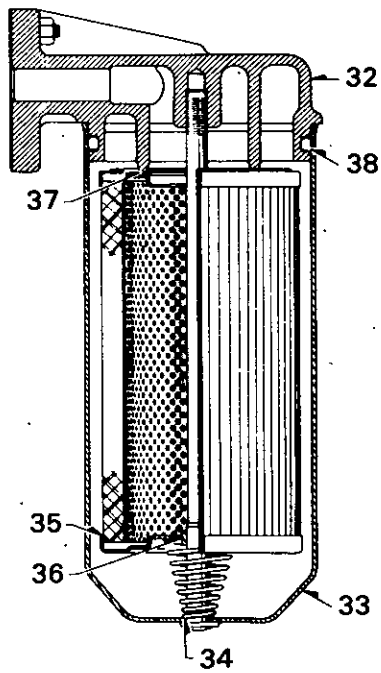
Current Design
Ref. No. 40



Rocker Arm Oil Line



Current Design
SECTION A-A



Previous Design
Ref. No. 31

PLATE E134-7

LUBE OIL SYSTEM

Rear End Lines Mounting and Piping
16-567D1 and 8,12,16-645E Engines

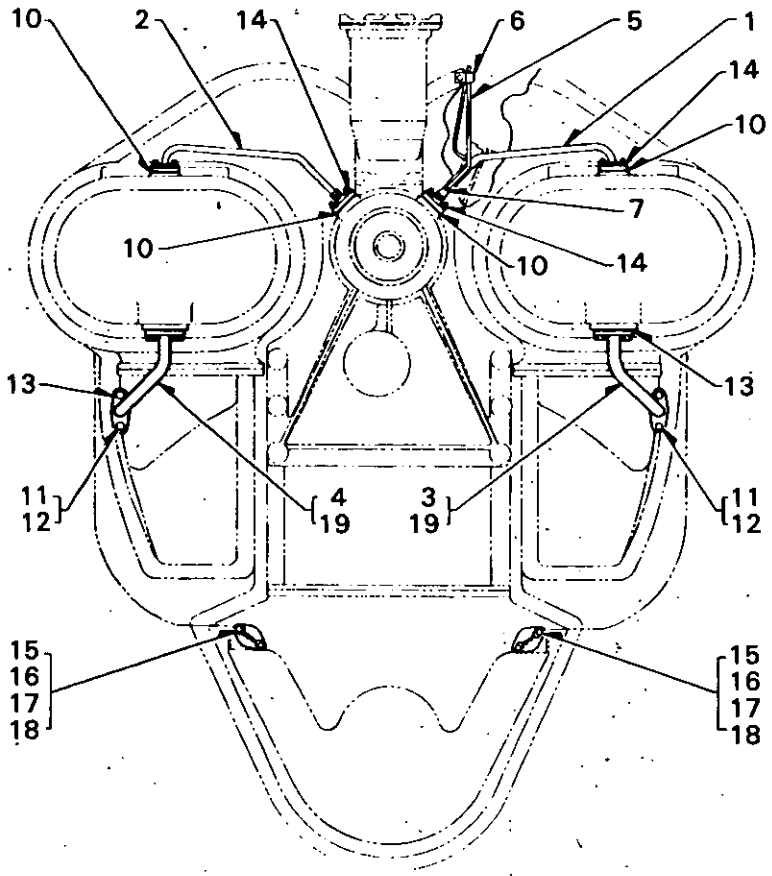


PLATE E134-8

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E engine
		-	B	-	-	12-645E engine
		-	-	C	-	16-645E engine
		-	-	-	D	16-567D1 engine
1	8224549	1	-	1	1	LINE .. Oil - Blower supply - Right-bank
1	8224551	-	1	-	-	LINE .. Oil - Blower supply - Right-bank
2	8224552	-	1	-	-	LINE .. Oil - Blower supply - Left-bank
2	8224550	-	-	1	1	LINE .. Oil - Blower supply - Left-bank
3	8369720	1	-	1	-	LINE .. Oil - Blower drain - Right-bank
3	8369724	-	1	-	-	LINE .. Oil - Blower drain - Right-bank
3	8081577	-	-	-	1	LINE .. Oil - Blower drain - Right-bank
4	8369723	-	1	-	-	LINE .. Oil - Blower drain - Left-bank
4	8369719	-	-	1	-	LINE .. Oil - Blower drain - Left-bank
4	8081575	-	-	-	1	LINE .. Oil - Blower drain - Left-bank
5	8224548	1	1	1	1	TUBE ASSEMBLY .. Low oil pressure - Right-bank
6	8085799	1	1	1	1	CLAMP .. Oil pressure line
7	118748	1	1	1	1	CONNECTOR .. 1/4 tube x 1/8 MPT
*8	103878	-	1	1	1	PLUG .. Pipe - 1/4 MPT
*9	8029169	1	-	-	-	FLANGE .. Blind
10	8029153	3	4	4	4	GASKET .. Blower supply line flange
11	181427	4	8	8	8	BOLT .. Hex head 1/2-20 x 1
12	6101229	4	8	8	8	WASHER .. Flat 1/2
13	8029159	2	4	4	4	GASKET .. Blower drain line flange
14	8032717	6	8	8	8	NUT .. Hex lock 3/8-24
15	8159199	2	2	2	2	FLANGE .. Lube oil manifold - Camshaft drive end
16	8159200	2	2	2	2	GASKET .. Flange to crankcase
17	8028314	4	4	4	4	BOLT .. Flange mounting
18	8116738	As Required				WIRE .. Lock - 3/64 diameter - Available 500 foot length
19	9085710	As Required				TAPE .. Glass insulation - 100 feet - Replaces 8122246 (ASBESTOS)

P.L. No. F134

LUBE OIL SYSTEM

Soakback Lube Oil System
(With Threaded Connections)
16,20-645E3 Engines
PLATE F134-9

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-645E3 engine
		-	B	20-645E3 engine
1	8152343	1	1	PUMP ASSEMBLY .. Soakback - See Page 25
2	8302622	1	-	PLATE .. Pump mounting
2	8360556	-	1	PLATE .. Pump mounting
3	179841	8	4	BOLT .. Hex head 3/8-16 x 1-1/4 - Pump mounting
4	103341	4	4	WASHER .. Plain 3/8
5	103321	8	4	WASHER .. Lock 3/8
6	8366652	1	1	TUBE ASSEMBLY .. Union to turbocharger filter
7	8133421	A.R.		TUBING .. Steel - 1 in. O.D. x .083 in. wall thickness - 20 ft. length
8	8366346	1	1	FLANGE .. Tube
9	8366728	1	-	TUBE .. Soakback filter pipe assembly to union
9	8366730	-	1	TUBE .. Soakback filter pipe assembly to union
10	8347798	1	1	TUBE ASSEMBLY .. Soakback pump to soak back filter
11	8133013	A.R.		TUBING .. Copper - 1.050 O.D. x .072 in. wall thickness - 20 ft. length
12	8089226	1	1	NIPPLE .. Pipe - 1/2 MPT x 4-1/2 inches long
13	144034	1	1	BUSHING .. Pipe reducing - 3/4 MPT x 1/2 FPT
14	8050474	1	1	ELBOW .. Union - 3/4 solder x 3/4 FPT - 90°
15	8062394	1	1	ELBOW .. Pipe - 3/16 solder - 90°
16	8085633	1	1	ELBOW .. Union - 3/4 solder x 3/4 MPT - 90°
17	8347799	1	1	TUBE ASSEMBLY .. Oil pan to soakback pump
18	8133013	A.R.		TUBING .. Copper - 1.050 O.D. x .072 in. wall thickness - 20 ft. length
*19	8088722	1	1	NIPPLE .. Pipe - 1/2 MPT x 2 inches long
*20	144034	1	1	BUSHING .. Pipe reducing - 3/4 MPT x 1/2 FPT
21	8045936	1	1	ELBOW .. Union - 3/4 solder x 3/4 FPT - 90°
22	8085633	1	1	ELBOW .. Union - 3/4 solder x 3/4 MPT - 90°
23	8108212	1	1	CLAMP .. Pipe
24	8350459	1	1	FILTER ASSEMBLY .. Soakback - Replaces 8343379 - See Page 19
25	179838	3	3	BOLT .. Hex head 3/8-16 x 7/8 - Filter mounting
26	103321	3	3	WASHER .. Lock 3/8
27	8342999	1	1	PIPE ASSEMBLY .. Filter to sump
28	8044936	1	1	TEE .. Union - 3/4 MPT x 3/4 FPT x 3/4 FPT
29	8060974	1	1	NIPPLE .. Short pipe - 3/4 MPT
30	192651	1	1	ELBOW .. Pipe reducing - 3/4 FPT x 1/2 FPT
31	8366704	1	1	VALVE .. Relief - 50 PSI - 1/2 MPT inlet x 1/2 FPT outlet
32	8060973	1	1	NIPPLE .. Short pipe - 1/2 MPT
33	8052082	1	1	ELBOW .. Union - 1/2 FPT x 1/2 MPT - 90°
34	8366345	1	1	GASKET .. Tube to filter
35	179841	2	2	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange to filter
36	6101225	2	2	WASHER .. Flat 3/8
37	9422178	1	1	CONNECTOR .. 1 inch tube x 3/4 MPT
38	9410406	1	1	UNION .. Tube 1 inch
39	274228	3	3	FERRULE .. 1 inch tube
40	9410617	3	3	NUT .. Tube 1 inch
41	8342993	3	4	CLAMP .. Tube
42	179880	2	3	BOLT .. Hex head 1/2-13 x 7/8
43	103323	2	3	WASHER .. Lock 1/2
44	179837	1	1	BOLT .. Hex head 3/8-16 x 3/4
45	103321	1	1	WASHER .. Lock 3/8
46	8366533	1	1	VALVE .. Check - Soakback filter
47	8366436	1	1	SEAL .. Check valve
48	8366577	1	1	VALVE .. Check - Turbocharger filter
49	8280352	1	1	SEAL .. Check
50	9413378	1	1	RING .. Retainer

LUBE OIL SYSTEM

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-645E3 engine
		-	B.	20-645E3 engine
51	8366743	1	1	FILTER ASSEMBLY .. Oil - Turbocharger - See Page 21
52	8366424	1	1	GASKET .. Filter mounting
53	8366331	1	1	GASKET .. Manifold to camshaft drive housing
54	8032717	4	4	NUT .. Hex lock 3/8-24
55	6101225	4	4	WASHER .. Flat 3/8
+56	8310841	2	2	STUD .. 3/8-16-24 x 2-3/8 inches long
+57	8366379	2	2	STUD .. 3/8-16-24 x 2-7/8 inches long

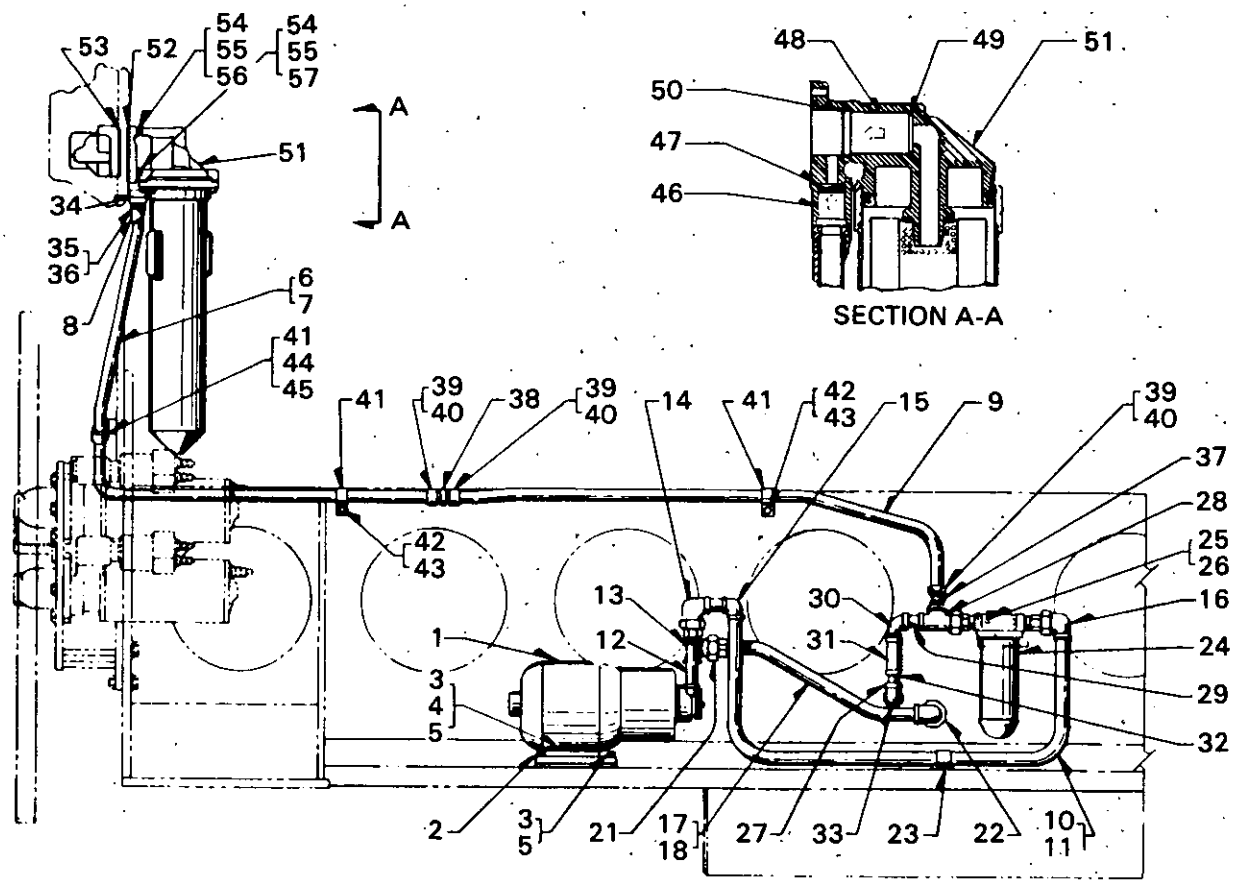
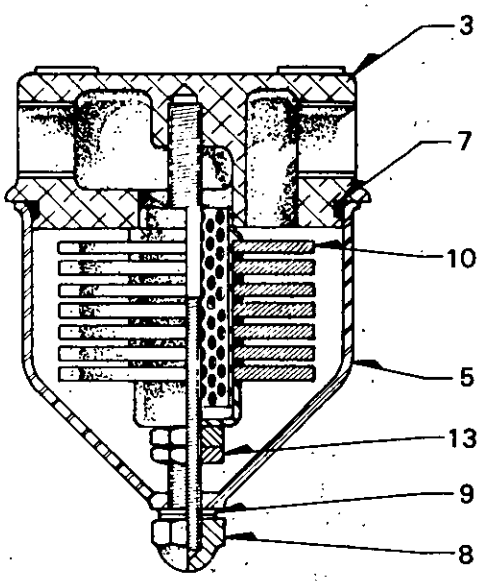


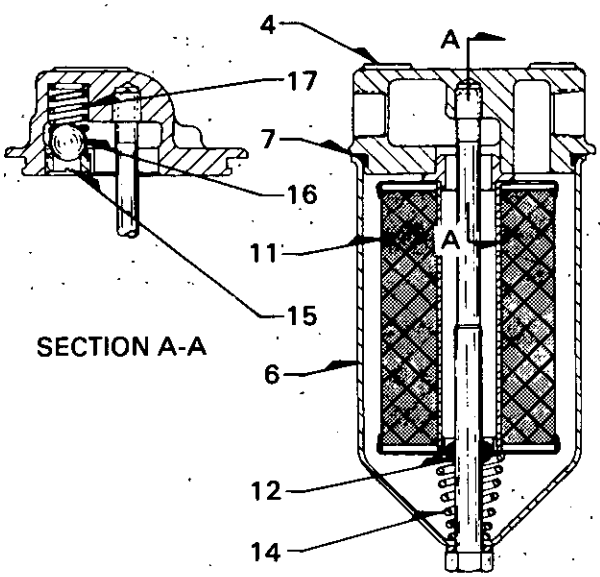
PLATE F134-9

P.L. No. F134

LUBE OIL SYSTEM
Soakback Filter Assembly
16-567D2,D3,D3A Engines



Ref. No. 1



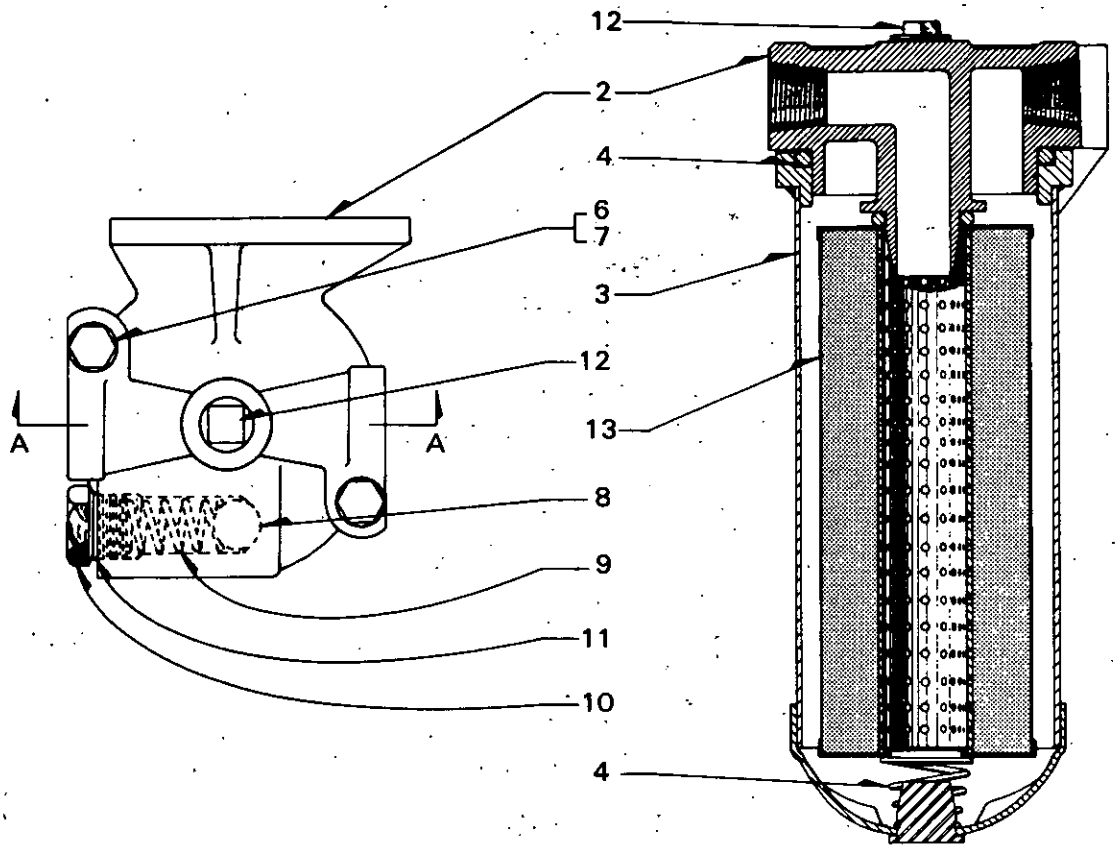
Ref. No. 2

PLATE E134-10

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D2,D3 engines
		-	B	16-567D2,D3,D3A engines
1	8280390	1	-	FILTER ASSEMBLY .. Soakback - Replaced by 8316075
2	8316075	-	1	FILTER ASSEMBLY .. Soakback - Replaces 8280390
3	8284339	1	-	HEAD .. Oil filter
4	8319324	-	1	HEAD .. Oil filter - Includes insert
5	8284333	1	-	BOWL .. Oil filter
6	8317532	-	1	BOWL .. Oil filter
7	8284338	1	1	RING .. "O" - Bowl to head
8	131421	1	-	NUT .. Low crown 5/16-18
9	8284337	1	-	GASKET .. Crown nut to bowl
10	8284340	1	-	CARTRIDGE ASSEMBLY .. Filter
11	8317531	-	1	ELEMENT ASSEMBLY .. Filter 66 pleats - Stainless steel
12	8319313	-	1	GROMMET
13	125119	2	-	NUT .. Hex 5/16-18 - Slotted
14	8319314	-	1	SPRING
15	8284334	1	1	SEAT .. Relief valve
16	8284335	1	1	BALL .. Relief valve
17	8310480	1	1	SPRING .. Compression - Relief valve

LUBE OIL FILTER

Soakback Filter Assembly
(With Threaded Connections)
16-567D2,D3,D3A and 16,20-645E3 Engines



SECTION A-A

Ref. No. 1

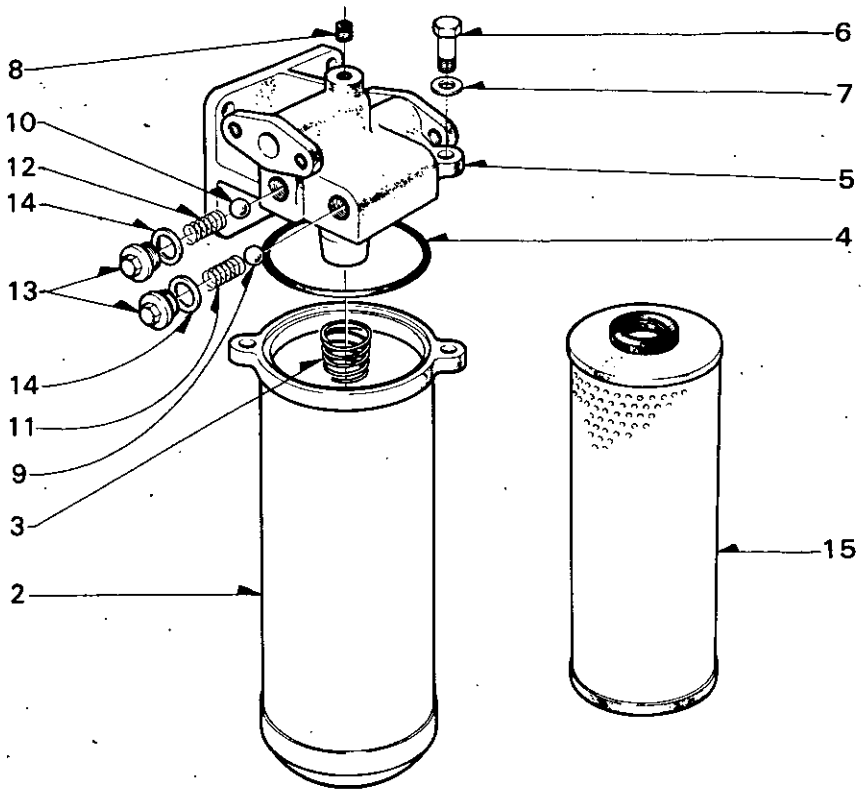
PLATE E134-11

Ref. No.	Part Number	Quantity Required			Description
FILTER ASSEMBLY .. Soakback					
1	8338906	1	-	-	FILTER ASSEMBLY .. Soakback - 16-567D2,D3,D3A engines
1	8350459	-	1	-	FILTER ASSEMBLY .. Soakback - Replaces 8343379 - 16,20-645E3 engines
1	8343379	-	-	1	FILTER ASSEMBLY .. Soakback - Replaced by 8350459 - 16,20-645E3 engines
2	8343158	1	-	-	COVER .. Filter
2		-	1	-	COVER .. Filter - Formerly 8346496
2	8346496	-	-	1	COVER .. Filter
3	8343159	1	1	1	SHELL ASSEMBLY .. Filter
4	8408735	1	1	1	SPRING .. Compression
5	8343161	1	1	1	SEAL .. O-ring - Cover to shell
6	179847	2	2	2	BOLT .. Hex head 3/8-16 x 2 - Cover to shell
7	446363	2	2	2	WASHER .. Plain - 3/8 I.D. x 7/8 O.D. x .089 inch thick
8	104925	1	1	1	BALL .. 11/16 diameter - By-pass valve
9	8343677	1	1	1	SPRING .. By-pass valve
10	8343162	1	1	1	PLUG .. By-pass valve
11	8411918	1	1	-	GASKET .. Plug to cover - Formerly 8434160
11	8434160	-	-	1	GASKET .. Plug to cover
12	103879	-	1	-	PLUG .. Pipe - 3/8 MPT square head
13	8340000	1	1	1	ELEMENT .. Filter - Pleated paper - 7-1/2 inches long

P.L. No. F134

LUBE OIL SYSTEM

Soakback Filter Assembly - With Flanged Connections
All 645 Turbocharged Engines



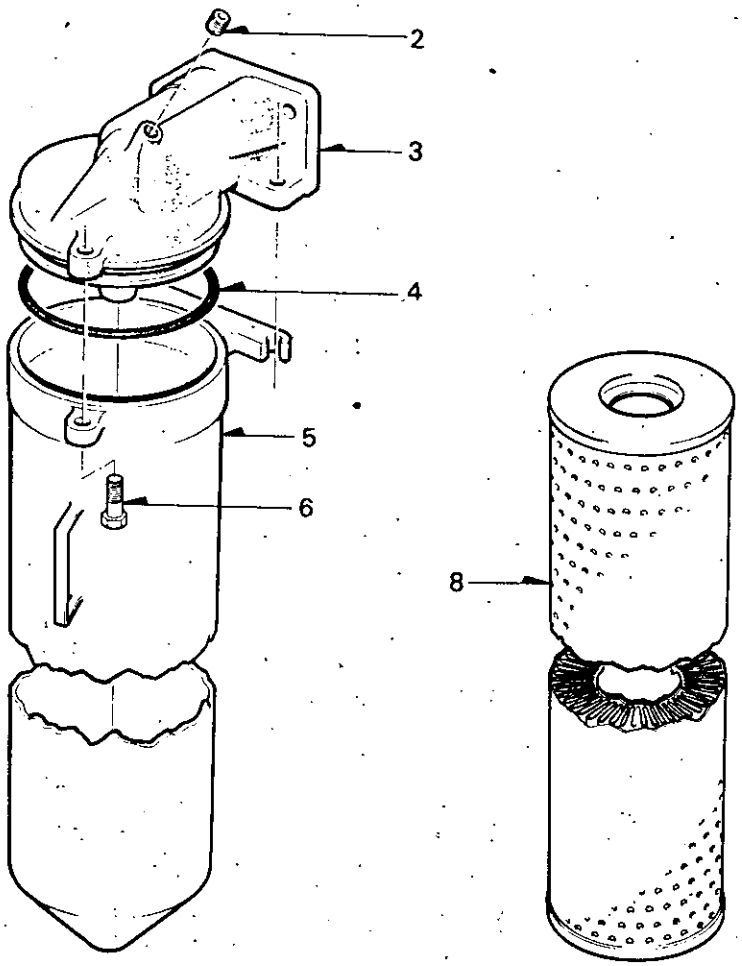
Ref. No. 1

PLATE D134-12

Ref. No.	Part Number	Qty. Req.		Description
1	8397431	1	-	FILTER ASSEMBLY .. Soakback - Replaced by 9528662
1	9528662	-	1	FILTER ASSEMBLY .. Soakback - Replaces 8397431
2	8343159	1	-	SHELL .. Filter
2		-	1	SHELL .. Filter
3	8408735	1	1	SPRING .. Element seating
4	8343161	1	1	SEAL .. O-ring - Shell to cover
5	9086742	1	1	COVER .. Filter
6	179847	2	2	BOLT .. Hex head 3/8-16 x 2
7	446363	2	2	WASHER .. 3/8
8	103877	1	1	PLUG .. Pipe - 1/8
9	104925	1	1	BALL .. 11/16 diameter - By-pass
10	104922	1	-	BALL .. 1/2 diameter - By-pass
10	104924	-	1	BALL .. 5/8 diameter - By-pass
11	8343677	1	1	SPRING .. By-pass valve
12	8494098	1	-	SPRING .. By-pass valve
12		-	1	SPRING .. By-pass valve
13	8343162	2	2	PLUG .. Hex head - By-pass valve
14	8411918	2	2	GASKET .. Valve plug
15	8340000	1	1	ELEMENT .. Filter - Pleated paper - 7-1/2 inches long
*16	8390072	1	1	GASKET .. Mounting

LUBE OIL SYSTEM

Turbocharger Lube Oil Filter
All 645 Turbocharged Engines



Ref. No. 1

PLATE C134-13

Ref. No.	Part Number	Qty. Req.	Description
1	8366743	1	FILTER ASSEMBLY .. Lube Oil - Turbocharger
2	8348617	1	PLUG .. Pipe - 1/8 MPT - Formerly 103877
3	8366231	1	COVER .. Filter
4	8288955	1	SEAL .. O-ring
5	8327347	1	SHELL .. Filter
6	8350942	2	BOLT .. Hex head 7/16-14 x 2-1/4
*7	103342	2	WASHER .. Plain 7/16
8	8322064	1	ELEMENT .. Filter
*9	8366424	1	GASKET .. Mounting - Filter to manifold

P.L. No. F134

LUBE OIL SYSTEM

Soakback Lube Oil System
With Flanged Connections
8-645E3B,E3C,F3B; 12,16-645E3,E3C,F3,F3B; 16-645E3A and 20-645E3,E3B Engines
PLATE D134-14

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C,F3B engines
		-	B	-	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	C	-	16-645E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	D	20-645E3,E3B engines
1	8411403	-	1	1	1	PUMP ASSEMBLY .. Soakback - 1/4 H.P., 64 VDC, 1.7 GPM @ 1200 RPM applied to units built prior to August, 1974 - See Page 25
†1	8492180	1	1	1	1	PUMP ASSEMBLY .. Soakback - 1/4 H.P., 74 VDC, 3 GPM @ 1200 RPM applied to units built since August, 1974
2	8366345	5	5	5	5	GASKET .. Tube assemblies to filters and pump
*3	8492156	1	-	-	-	PLATE .. Pump mounting
3	8411267	-	1	1	-	PLATE .. Pump mounting - Except GP39-2 and DDA40X
3	8360556	-	1	1	1	PLATE .. Pump mounting - GP39-2, DDA40X and 20-645 engines only
4	179841	4	4	4	4	BOLT .. Hex head 3/8-16 x 1-1/4 - Pump to mounting plate
*5	179883	4	-	-	-	BOLT .. Hex head 1/2-13 x 1-1/4 - Mounting plate to oil pan
*6	179881	1	-	-	-	BOLT .. Hex head 1/2-13 x 1 - Mounting plate to oil pan
7	6101225	4	4	4	4	WASHER .. Flat 3/8
*8	6101229	5	-	-	-	WASHER .. Flat 1/2
9	8366652	1	1	1	1	TUBE ASSEMBLY .. Turbocharger filter inlet
10	8366346	1	1	1	1	FLANGE .. 1 inch tube
*11	8480198	1	-	-	-	TUBE ASSEMBLY .. Soakback filter outlet
11	8397314	-	1	-	-	TUBE ASSEMBLY .. Soakback filter outlet
11	8404234	-	-	1	-	TUBE ASSEMBLY .. Soakback filter outlet
11	8412068	-	-	-	1	TUBE ASSEMBLY .. Soakback filter outlet
12	8398611	1	1	1	1	ELBOW .. Flanged - 1 inch tube
13	8492162	1	-	-	-	TUBE ASSEMBLY .. Pump outlet to filter inlet
13	8411266	-	1	-	-	TUBE ASSEMBLY .. Pump outlet to filter inlet
†13	9085367	-	1	-	-	TUBE ASSEMBLY .. Pump outlet to filter inlet
13	8411750	-	-	1	1	TUBE ASSEMBLY .. Pump outlet to filter inlet
†13	9085403	-	-	1	1	TUBE ASSEMBLY .. Pump outlet to filter inlet
14	8366346	1	1	1	1	FLANGE .. 1 inch tube
15	8397313	1	1	1	1	ELBOW .. Flanged - 1 inch tube
16	8492161	1	-	-	-	TUBE ASSEMBLY .. Oil pan to pump inlet
16	8411264	-	1	-	-	TUBE ASSEMBLY .. Oil pan to pump inlet
†16	9085365	-	1	-	-	TUBE ASSEMBLY .. Oil pan to pump inlet
16	8411752	-	-	1	1	TUBE ASSEMBLY .. Oil pan to pump inlet
†16	9085401	-	-	1	1	TUBE ASSEMBLY .. Oil pan to pump inlet
17	8366346	1	1	1	1	FLANGE .. 1 inch tube
18	8411351	1	1	1	1	FLANGE .. 3-3/4 inch square
19	8389165	1	1	1	1	GASKET .. Flange to oil pan
20	9528662	1	1	1	1	FILTER .. Soakback - Replaced 8397431 - See Page 20
21	8366743	1	1	1	1	FILTER .. Turbocharger lube oil - See Page 21
22	8366533	1	1	1	1	VALVE .. Check - Soakback filter
23	8366436	1	1	1	1	SEAL .. O-ring
24	8366577	1	1	1	1	VALVE .. Check - Turbocharger filter
25	8280352	1	1	1	1	SEAL .. O-ring
26	9413378	1	1	1	1	RING .. Retainer - Check valve
27	9410406	1	1	1	1	UNION .. 1 inch tube
28	274228	2	2	2	2	FERRULE .. 1 inch tube
29	9410617	2	2	2	2	NUT .. 1 inch tube

† Tube assemblies indicated by the symbol (†) are applicable to 8492180 pumps only.

LUBE OIL SYSTEM

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
30	8390072	1	1	1	1	GASKET .. Mounting - Soakback filter
31	8366424	1	1	1	1	GASKET .. Mounting - Turbocharger filter
32	8032717	4	4	4	4	NUT .. Hex lock 3/8-24
33	6101225	20	20	20	20	WASHER .. Flat 3/8
34	6101229	6	6	6	6	WASHER .. Flat 1/2
35	179841	10	10	10	10	BOLT .. Hex head 3/8-16 x 1-1/4
36	181430	4	4	4	4	BOLT .. Hex head 1/2-20 x 1-3/8
37	179837	2	2	2	2	BOLT .. Hex head 3/8-16 x 3/4
38	179880	1	2	2	3	BOLT .. Hex head 1/2-13 x 7/8
39	179839	4	4	4	4	BOLT .. Hex head 3/8-16 x 1
40	8342993	3	4	4	5	CLAMP .. Tube
ϕ41	8367086	1	1	1	-	PAD .. Tapping - 3/4 inch square x 5/8 inch thick
ϕ41	8411808	-	1	1	1	PAD .. Tapping - 7/8 inch square x 3/4 inch thick
+42	8310841	2	2	2	2	STUD .. Filter mounting 3/8-16 x 3/8-24 x 2-3/8 - See Page 11
+43	8366379	2	2	2	2	STUD .. Filter mounting 3/8-16 x 3/8-24 x 2-7/8 - See Page 11
ϕ44	8133421	As Required				TUBING .. Steel - 1 inch O.D. x .083 inch wall x 20 feet long

P.L. No. F134

LUBE OIL SYSTEM

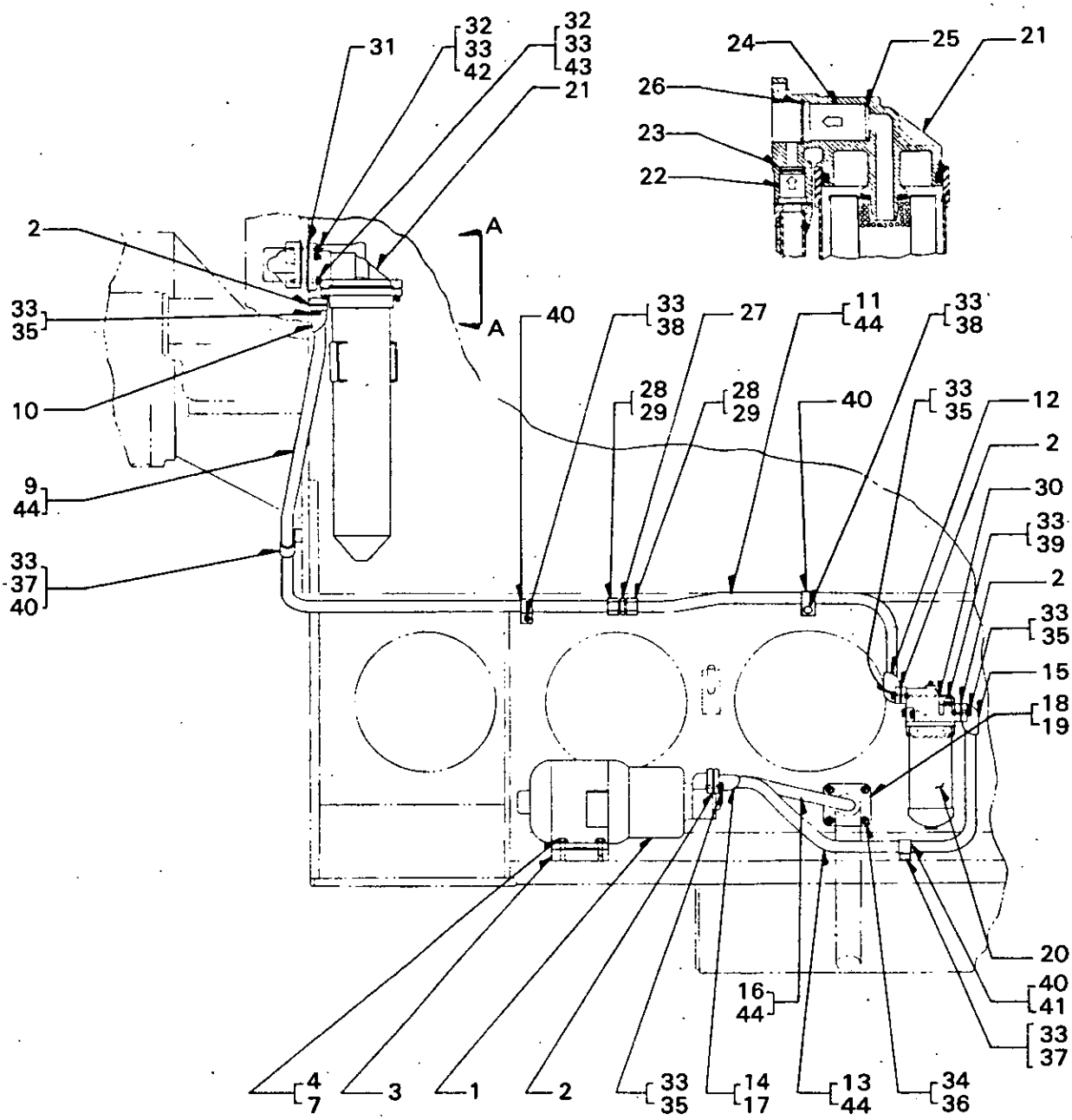
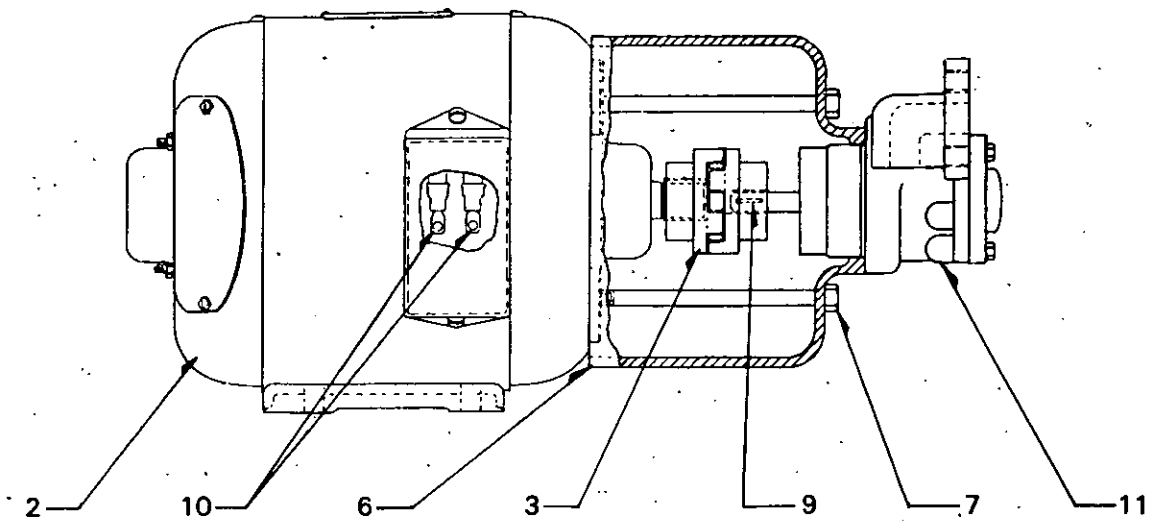


PLATE D134-14

LUBE OIL SYSTEM

Soakback Pump Assembly
All 567D and 645 Engines



Ref. No. 1

PLATE D134-15

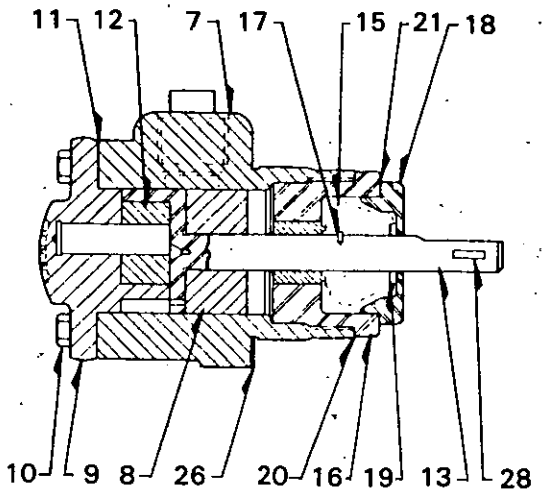
Ref. No.	Part Number	Quantity Required			Description
*1	8152343	1	-	-	PUMP ASSEMBLY .. Soakback - 1/4 H.P., 64 VDC, 1.7 GPM @ 1200 RPM
1	8411403	-	1	-	PUMP ASSEMBLY .. Soakback - 1/4 H.P., 64 VDC, 1.7 GPM @ 1200 RPM
1	8492180	-	-	1	PUMP ASSEMBLY .. Soakback - 3/4 H.P., 74 VDC, 3 GPM @ 1200 RPM
2	5540387	1	1	-	MOTOR .. Pump - 1/4 H.P. - 64 VDC - 1200 RPM - See Page 28
2	4947308	-	-	1	MOTOR .. Pump - 3/4 H.P. - 74 VDC - 1200 RPM - See Page 28
3	8077938	1	1	1	COUPLING .. Flexible
*4	8084884	1	1	1	SPIDER .. Rubber
*5	102570	2	2	2	SCREW .. Set 1/4-20 x 3/8
6	8020247	1	1	1	BRACKET .. Pump mounting
7	186274	4	4	4	BOLT .. Hex head 5/16-18 x 5 - Bracket to motor
*8	179860	2	2	2	BOLT .. Hex head 7/16-14 x 1-1/4 - Pump to bracket
9	106958	1	1	1	KEY .. Woodruff - No. 1
10	8123281	2	2	2	LUG .. Terminal - No. 10
11	8498154	1	-	-	PUMP .. Soakback - 1.7 GPM @ 1200 RPM - Threaded connections - Replaces 8020257 - See Page 26
11	8498155	-	1	-	PUMP .. Soakback - 1.7 GPM @ 1200 RPM - Flanged connections - Replaces 8411540 - See Page 26
11	8498156	-	-	1	PUMP .. Soakback - 3 GPM @ 1200 RPM - Flanged connections - Replaces 8436302 - See Page 26
*12	8442046	1	1	1	SHIM .. Pump to bracket - No. 14 gauge

P.L. No. F134

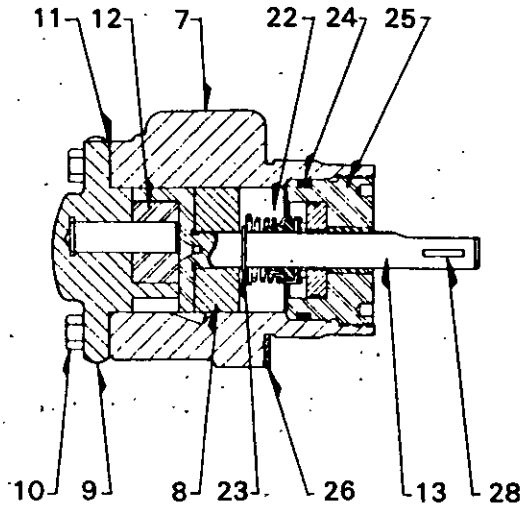
LUBE OIL SYSTEM
Soakback Pump
All 567D and 645 Engines
PLATE D134-16

Ref. No.	Part Number	Quantity Required						Description
		A	'B	C	D	E	F	
1	8020257	1	-	-	-	-	-	PUMP .. Soakback - With threaded connections - Model 1LX75 1.7 GPM @ 1200 RPM - Replaced by 8498154
2	8498154	-	1	-	-	-	-	PUMP .. Soakback - With threaded connections - Model 1LAX75 1.7 GPM @ 1200 RPM
3	8411540	-	-	1	-	-	-	PUMP .. Soakback - With flanged connections - Model 1L6281 1.7 GPM @ 1200 RPM - Replaced by 8498155
4	8498155	-	-	-	1	-	-	PUMP .. Soakback - With flanged connections - Model 1LA6281 1.7 GPM @ 1200 RPM
5	8436302	-	-	-	-	1	-	PUMP .. Soakback - With flanged connections - Model 2L6958 2.9 GPM @ 1200 RPM - Replaced by 8498156
6	8498156	-	-	-	-	-	1	PUMP .. Soakback - With flanged connections - Model 2LA6958 2.9 GPM @ 1200 RPM
7	8116541	1	-	-	-	-	-	HOUSING .. Pump
7		-	1	-	-	-	-	HOUSING .. Pump
7		-	-	1	-	-	-	HOUSING .. Pump
7	9574039	-	-	-	1	-	-	HOUSING .. Pump
7		-	-	-	-	1	-	HOUSING .. Pump
7		-	-	-	-	-	1	HOUSING .. Pump
8	8017806	1	-	1	-	-	-	BUSHING .. Rotor
8		-	1	-	1	-	-	BUSHING .. Rotor
8		-	-	-	-	1	-	BUSHING .. Rotor
8	9534390	-	-	-	-	-	1	BUSHING .. Rotor
9	8017801	1	1	1	1	-	-	COVER .. Includes idler pin
9		-	-	-	-	1	-	COVER .. Includes idler pin
9	9568585	-	-	-	-	-	1	COVER .. Includes idler pin
10	179795	8	8	8	8	6	6	BOLT .. Hex head 1/4-20 x 3/4
11	----	A.R.		A.R.		-	-	GASKET .. Cover to housing 9086800 - .003 8027570 - .004 8027571 - .005
11	9516586	-	-	-	-	A.R.		GASKET .. Cover to housing
12	8017804	1	1	1	1	-	-	GEAR .. Idler
12	9518775	-	-	-	-	1	1	GEAR .. Idler
13	8017805	1	-	1	-	-	-	ROTOR .. Includes drive shaft
13	9516822	-	1	-	1	-	-	ROTOR .. Includes drive shaft
13	9520693	-	-	-	-	1	1	ROTOR .. Includes drive shaft
*14	8062016	1	-	1	-	1	-	SEAL ASSEMBLY .. Oil
15	8033798	1	-	1	-	1	-	SEAL .. Oil - Rotating
16	8062018	1	-	1	-	1	-	SEAL .. Oil - Stationary
17	8017817	1	-	1	-	1	-	PIN .. Seal to shaft
18	8017822	1	-	1	-	1	-	NUT .. Cap
19	8017818	1	-	1	-	1	-	WASHER .. Felt
20	8017809	1	-	1	-	1	-	GASKET .. Seal to housing
21	8017823	1	-	1	-	1	-	GASKET .. Seal to cap nut
22	9089606	-	1	-	1	-	1	SEAL ASSEMBLY .. Oil
23	9514144	-	1	-	1	-	-	RING .. Retaining
24	9514143	-	1	-	1	-	-	SEAL .. O-ring
24	9511532	-	-	-	-	-	1	SEAL .. O-ring
25	9514142	-	1	-	1	-	-	PLUG .. Oil seal
25	9505522	-	-	-	-	-	1	PLUG .. Oil seal
26	8442046	1	1	1	1	1	1	SHIM .. Pump to mounting bracket
*27	179860	2	2	2	2	2	2	BOLT .. Hex head 7/16-14 x 1-1/4
28	106958	1	1	1	1	1	1	KEY .. Woodruff - 1/16 x 1/2

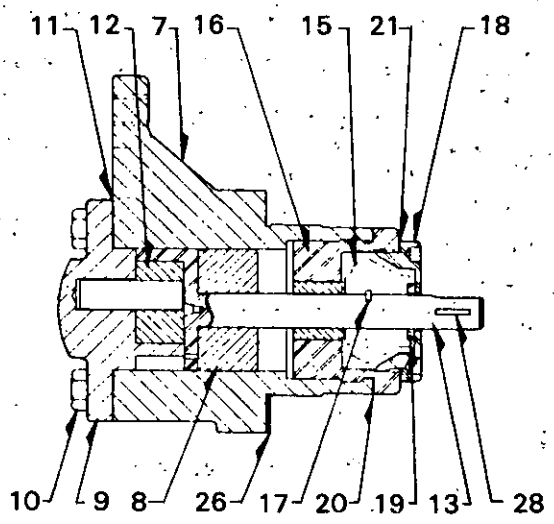
LUBE OIL SYSTEM



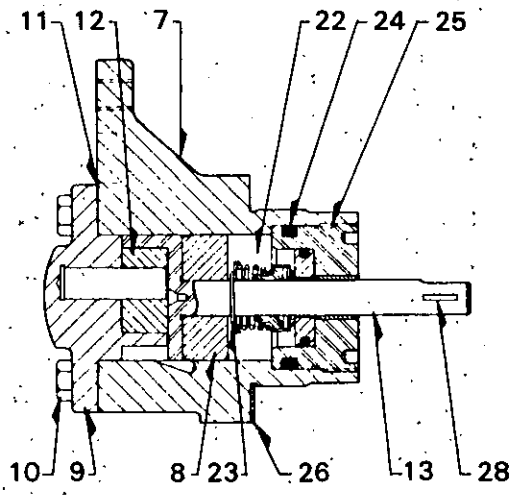
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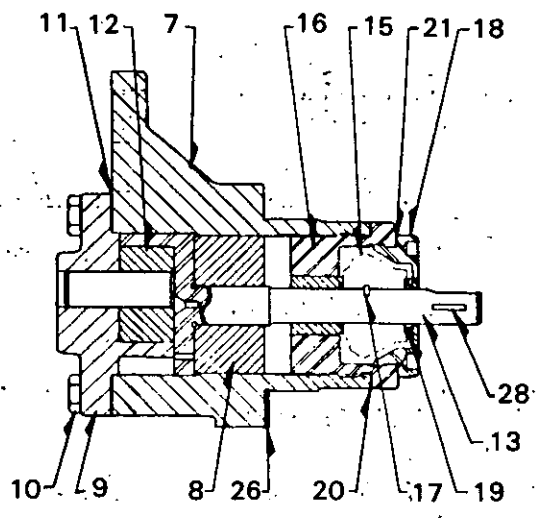
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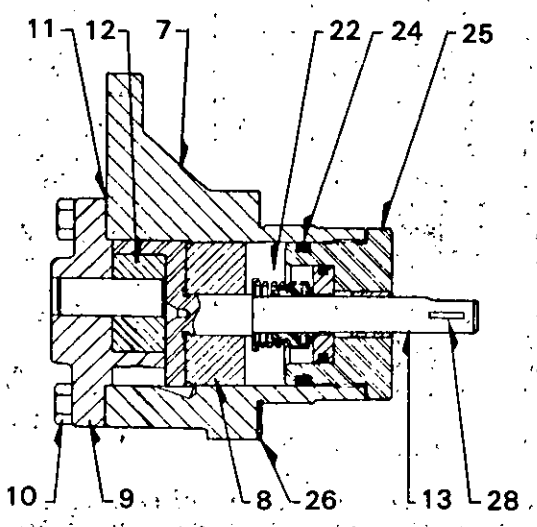
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Ref. No. 4



Ref. No. 5



Ref. No. 6

PLATE D134-16

P.L. No. F134

LUBE OIL SYSTEM
Soakback Pump Motor
All 567D and 645 Engines
PLATE E134-17

Soakback Pump Motor Reference List

Ref. No.	Part Number	Model	H.P.	Volts DC	RPM	Replaced By
1	5360289	A-9385	1/4	64	1100	5540387
2	5358462	A-9385A1	1/4	64	1100	5540387
3	5540387	C-974A2, A3,A4	1/4	64	1200	- - - -
4	4947308	C-994,A1,A2	3/4	74	1200	- - - -

Ref. No.	Part Number	Quantity Required			Description
†1	5360289	A	-	-	MOTOR ASSEMBLY .. Soakback pump - Model A-9385 - Replaced by 5540387
†2	5358462	B	-	-	MOTOR ASSEMBLY .. Soakback pump - Model A-9385A1 - Replaced by 5540387
3	5540387	-	C	-	MOTOR ASSEMBLY .. Soakback pump - Model C-974A2, C-974A3, C-974A4
4	4947308	-	-	D	MOTOR ASSEMBLY .. Soakback pump - Model C-994, C-994A1, C-994A2
†5	5546081	1	-	-	ARMATURE .. Not furnished - See note
6	4971237	-	1	-	ARMATURE .. Includes (2) bearings - Ref. No. 62
7	2801374	-	-	1	ARMATURE .. Includes (2) bearings - Ref. No. 63 - Replaces 4947750
8	5533215	1	-	-	SHAFT ASSEMBLY .. Armature - Includes iron
9	4971219	-	1	-	SHAFT ASSEMBLY .. Armature - Includes iron
10	2801371	-	-	1	SHAFT ASSEMBLY .. Armature - Includes iron - Replaces 4947752
11	1058717	1	-	-	COMMUTATOR .. Armature
12	038972	-	1	-	COMMUTATOR .. Armature
13	2802906	-	-	1	COMMUTATOR .. Armature - Replaces 4947865
14	043635	-	1	1	FAN .. Armature
*15	5319079	-	1	1	DISC .. Balancing
*16	038194	-	A.R.		WEIGHT .. Balancing
*17	5356433	-	A.R.		WEIGHT .. Balancing - Replaces 038195
18	106751	1	1	1	KEY .. Shaft - No. 9 Woodruff
†19	5321765	1	-	-	FRAME ASSEMBLY .. Motor - Not furnished - See note
20	5321497	-	1	-	FRAME ASSEMBLY .. Motor
21	4947746	-	-	1	FRAME ASSEMBLY .. Motor
22	5321770	1	1	-	COIL ASSEMBLY .. Field
23	4947748	-	-	1	COIL ASSEMBLY .. Field
24	041809	2	2	-	POLE PIECE .. Field coil
25	5395851	-	-	2	POLE PIECE .. Field coil
26	036776	4	4	4	SCREW .. Field coil mounting
*27	041808	2	-	-	GROMMET .. Rubber - Lead insulating
*28	4953084	-	1	1	GROMMET .. Rubber - Lead insulating
29	038182	2	2	2	DOWEL .. End frame aligning
30	1071962	1	-	-	BASE .. Motor
31	8239442	4	-	-	BOLT .. Hex head lock 5/16-18 x 5/8 - Base mounting - Formerly 9417634
32	1071962	-	1	1	BASE .. Motor
33	8239442	-	4	4	BOLT .. Hex head lock 5/16-18 x 5/8 - Base mounting - Formerly 9417634
†34	5348549	1	-	-	BRACKET ASSEMBLY .. Brush - Not furnished - See note
35	5320539	-	1	1	FRAME ASSEMBLY .. Comm. end - Includes brush bracket
36	042655	-	1	1	BRACKET .. Brush
37	037972	-	2	2	SCREW .. Bracket retaining
38	453296	-	2	2	WASHER .. Lock - No. 10 - Formerly 106497
39	049681	-	2	2	NUT .. Bracket retaining

† Items marked with the symbol (†) are no longer available. When these items require replacement, it is recommended to order replacement motor 5540387.

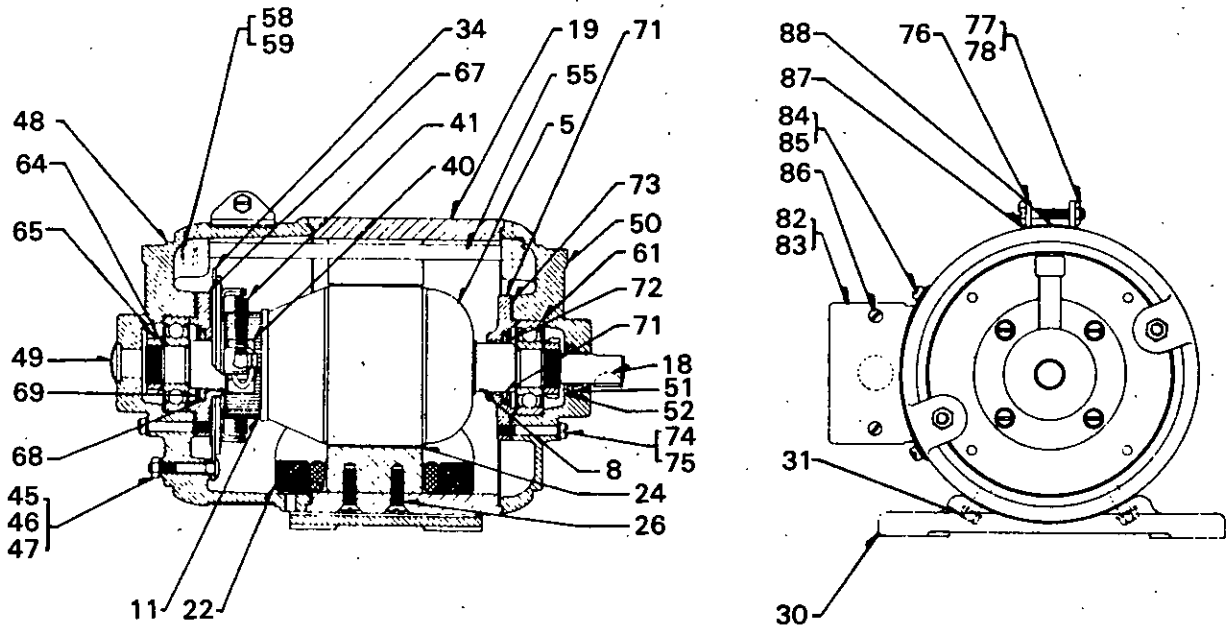
LUBE OIL SYSTEM

Ref. No.	Part Number	Quantity Required			Description
	5360289	A	-	-	MOTOR ASSEMBLY .. Model A-9385
	5358462	B	-	-	MOTOR ASSEMBLY .. Model A-9385A1
	5540387	-	C	-	MOTOR ASSEMBLY .. Model C-974A2, C-974A3
	4947308	-	-	D	MOTOR ASSEMBLY .. Model C-994
	5348549	1	-	-	BRACKET ASSEMBLY .. Brush
	5320539	-	1	1	FRAME ASSEMBLY .. Commutator end - Includes brush bracket
40	8078488	2	2	2	BRUSH .. Carbon - Includes lead and hook
41	038636	2	2	2	SPRING .. Brush
42	5224564	2	2	2	SCREW .. Brush lead - Replaces 038581
43	453299	2	2	2	WASHER .. Lock - Formerly 106496
44	5387289	2	2	2	WASHER .. Brush lead
45	126339	2	-	-	BOLT .. Carriage - Bracket mounting - 1/4-20 x 1-3/4 round head
46	103319	2	-	-	WASHER .. Lock 1/4
47	118613	2	-	-	NUT .. Hex 1/4-20
†48	5360288	1	-	-	FRAME ASSEMBLY .. Commutator end - Not furnished - See note
49	049306	1	-	-	PLUG .. Expansion
50	5315778	1	-	-	FRAME ASSEMBLY .. Pump end
51	1079131	1	-	-	SEAL .. Felt
52	1070516	1	-	-	PLUG .. Expansion
53	4953130	-	1	1	FRAME .. Pump end - Formerly 5322176
*54	5353882	-	1	1	SEAL .. Oil
55	5311232	2	-	-	BOLT .. Thru - End frame mounting
56	1069250	-	2	-	BOLT .. Thru - End frame mounting
57	5346749	-	-	2	BOLT .. Thru - End frame mounting
58	103321	2	-	-	WASHER .. Lock 3/8
59	1071817	2	-	-	NUT .. Thru bolt
60	454407	-	4	4	NUT .. Thru bolt - Formerly 042455
61	954826	2	-	-	BEARING .. Ball
62	907597	-	2	-	BEARING .. Ball - Included with armature 4971237
63	2945828	-	-	2	BEARING .. Ball - Included with armature 2801374 - Formerly 954157
64	127708	2	-	-	NUT .. Lock - Bearing
65	127685	2	-	-	WASHER .. Lock - Bearing
66	5310015	-	2	2	WASHER .. Spring - Bearing
67	5321510	1	-	-	COVER ASSEMBLY .. Bearing - Commutator end
68	1070534	1	-	-	SEAL .. Felt
69	1070511	1	-	-	PLUG .. Expansion
70	5321509	1	-	-	COVER ASSEMBLY .. Bearing - Pump end
71	1070534	1	-	-	SEAL .. Felt
72	1070511	1	-	-	PLUG .. Expansion
73	5311231	2	-	-	GASKET .. Bearing cover
74	132282	8	-	-	SCREW .. Fillister head 1/4-20 x 1-1/2 - Bearing cover
75	103319	8	-	-	WASHER .. Lock 1/4
76	1058639	1	-	-	BAND ASSEMBLY .. Cover
77	177365	1	-	-	SCREW .. Slotted hex head 1/4-28 x 1-1/2 - Cover band
78	1058702	1	-	-	NUT .. Hex 1/4-28
79	049643	-	2	2	PLATE .. Cover - Commutator end - Formerly 1064969
80	049644	-	2	2	GASKET .. Cover plate
81	9418657	-	4	4	SCREW .. Cover plate - Formerly 9420382
82	1078061	1	1	1	BOX .. Conduit
83	1078060	1	1	1	COVER .. Conduit box
84	453294	2	2	2	SCREW .. Fil. head 1/4-20 x 5/16 - Conduit box mtg. - Formerly 142424
85	103319	2	2	2	WASHER .. Lock 1/4
86	436746	2	2	2	SCREW .. Pan head 10-32 x 1/4 - Cover mounting
87	1056802	1	1	1	PLATE .. Name
88	5553979	2	2	2	SCREW .. Drive - Name plate - Formerly 5327153
89	131954	-	2	2	SCREW .. Fillister head 8-32 x 1/4 - Lead terminal - Formerly 5327153
90	453299	-	2	2	WASHER .. Lock - No. 8 - Formerly 106496

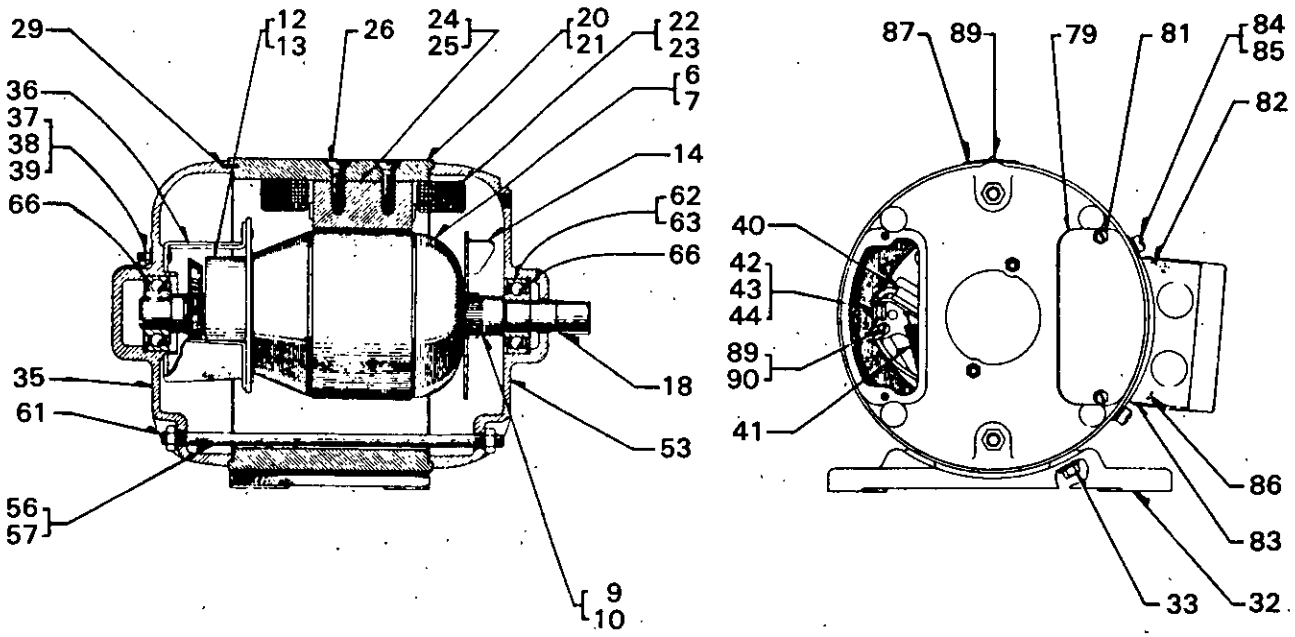
† Items marked with the symbol (†) are no longer available. When these items require replacement, it is recommended to order replacement motor 5540387.

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LUBE OIL SYSTEM



Ref. Nos. 1 And 2



Ref. Nos. 3 And 4

PLATE E134-17

LUBE OIL SYSTEM

Turbocharger Lube Oil Piping
16-567D2 and 'D3 Turbocharged Engines
PLATE D134-18

Please specify Engine Serial Number when ordering from this list.

This parts list applies to turbocharged engines with external lubricating oil lines. For current design turbocharged engines with internal lube oil manifolds refer to Page 13. To convert your present lube oil filter to a 20 inch lube oil filter refer to Maintenance Instruction 9536.

Ref. No.	Part Number	Qty. Req.	Description
FILTER ASM. .. Lube Oil			
+1	8288259	1	FILTER ASSEMBLY .. Lube oil - Turbocharger - No longer furnished - See Pg. 13
2	8289856	1	BRACKET .. Filter mounting
3	8366331	1	GASKET... Filter mounting - Replaces 8288140
4	181374	3	BOLT .. Hex head 3/8-24 x 1-1/2 - Bracket to crankcase
5	181377	4	BOLT .. Hex head 3/8-24 x 1-3/4 - Filter to bracket
6	8032717	4	NUT .. Hex lock 3/8-24
HOSE ASSEMBLY .. Filter To Elbow			
7	8281289	1	HOSE ASSEMBLY .. Filter to elbow - 39-1/4 inches long
8	8281288	1	HOSE ASSEMBLY .. Filter to elbow - 42-1/4 inches long
9	9402711	2	CONNECTOR .. Hose to filter - 3/4 MPT x 3/4 tube
10	8280008	1	ELBOW .. Hose connecting
11	8279958	1	GASKET .. Elbow mounting
12	8280352	1	SEAL .. Elbow
13	179841	4	BOLT .. Hex head 3/8-16 x 1-1/4 - Elbow mounting
14	179848	2	BOLT .. Hex head 3/8-16 x 2-1/4 - Elbow mounting
15	103321	6	WASHER .. Lock 3/8
16	8281280	1	HANGER .. Clamp
17	8281353	1	CLAMP .. Hose
18	179801	1	BOLT .. Hex head 1/4-20 x 1-1/2 - Clamp mounting
19	8035130	1	NUT .. Hex lock 1/4-20
FILTER ASSEMBLY .. Lube Oil			
+20	8316075	1	FILTER ASSEMBLY .. Lube oil - See Page 18
21	8280641	1	BRACKET ASSEMBLY .. Filter mounting
22	181370	1	BOLT .. Hex head 3/8-24 x 1-1/4 - Bracket to oil pan
23	179814	2	BOLT .. Hex head 5/16-18 x 5/8 - Bracket to filter
24	181364	2	BOLT .. Hex head 3/8-24 x 1 - Bracket to oil pan
25	103320	2	WASHER .. Lock 5/16
26	103321	2	WASHER .. Lock 3/8
27	8281287	1	HOSE ASSEMBLY .. Filter to check valve - 46-3/8 inches long
28	144043	1	BUSHING .. Reducing - 3/8 MPT x 1/4 FPT
29	9409910	1	CONNECTOR .. 1/4 MPT x 5/16 tube
30	8280868	1	VALVE .. Check - 1/4 FPT x 1/4 MPT
31	8281329	3	CLAMP .. Hose mounting
32	143997	1	PLUG .. Pipe - 1/4 MPT square socket

P.L. No. F134

LUBE OIL SYSTEM

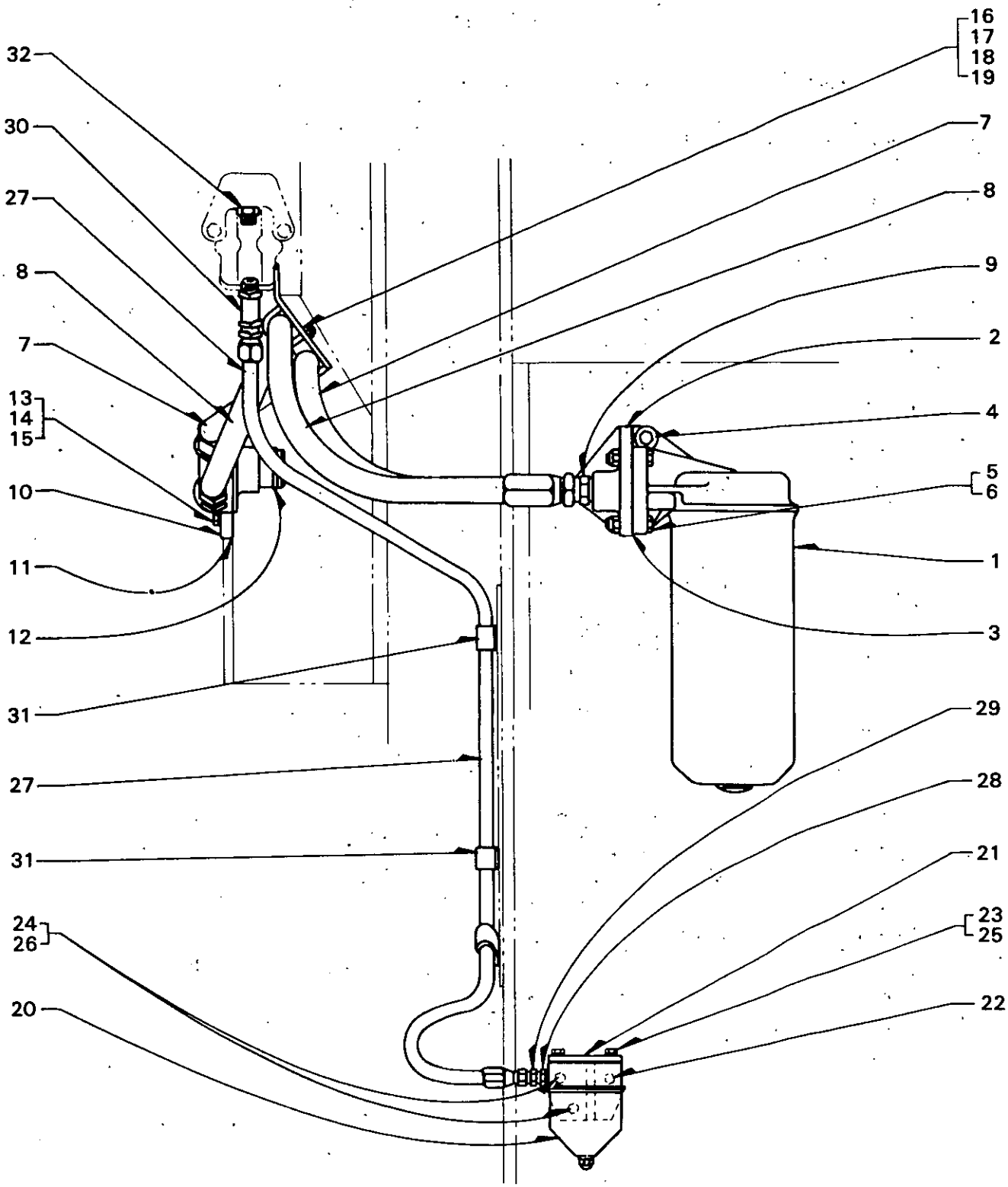


PLATE D134-18

LUBE OIL SYSTEM

Soakback Lube Oil Lines
16-567D2,D3,D3A Engines
PLATE D134-19

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	SOAKBACK APPLICATION - GP20 locomotive
		-	B	-	-	SOAKBACK APPLICATION - SD24 locomotive
		-	-	C	-	SOAKBACK APPLICATION - GP30 locomotive
		-	-	-	D	SOAKBACK APPLICATION - GP35,DD35,DDA35,SD35 and SDP35 locomotives
PUMP ASSEMBLY .. Soakback						
1	8152343	1	1	1	1	PUMP ASSEMBLY .. Soakback - See Page 25
2	8274056	2	-	-	-	PAD .. Tapping - Pump mounting
3	179840	4	-	-	-	BOLT .. Hex head 3/8-16 x 1-1/8 - Pump to tapping pad
4	103321	4	-	-	-	WASHER .. Lock 3/8
5	103341	4	-	-	-	WASHER .. Plain 3/8
6	8302622	-	1	1	1	PLATE .. Pump mounting
7	179841	-	8	8	8	BOLT .. Hex head 3/8-16 x 1-1/4 - Pump to plate mounting
8	103321	-	4	4	4	WASHER .. Lock 3/8
9	103341	-	4	4	4	WASHER .. Plain 3/8
TUBE ASSEMBLY .. Pump Outlet Turbocharger						
† When using filter 8316075 Ref. No. 57, relief valve 8297294 is used for SD24 and GP39 locomotives.						
10	8280913	1	-	-	-	TUBE ASSEMBLY .. Pump outlet to turbocharger
11	8116858	AR	-	-	-	TUBING .. .840 O.D. x .072 wall copper 20 ft.
12	8045917	1	-	-	-	UNION .. Pipe - 1/2 solder x 1/2 MPT
*13	8062374	1	-	-	-	ELBOW .. Pipe - 1/2 solder - 90°
14	8045929	1	-	-	-	ELBOW .. Union - 1/2 solder - 90°
*15	8112112	1	-	-	-	NIPPLE .. Pipe - 1/2 MPT x 3-1/2 inches - Brass
16	8302606	-	1	1	1	TUBE ASSEMBLY .. Pump outlet to turbocharger
17	8116858	-		AR		TUBING .. .840 O.D. x .072 wall copper 20 ft.
18	8116871	-		AR		PIPE .. 1/2 inch standard brass 12 ft.
†19	8340582	-	1	1	1	VALVE .. Relief - 125 PSI - 1/2 MPT inlet x 1/2 FPT outlet
20	8062646	-	1	1	1	TEE .. Pipe - 1/2 FPT x 1/2 solder x 1/2 FPT
21	8062374	-	1	1	1	ELBOW .. Pipe - 1/2 solder - 90°
22	8045929	-	1	1	1	ELBOW .. Union - 1/2 solder - 90°
23	8152981	-	1	1	1	NIPPLE .. Pipe - 1/2 MPT x 3 inches long - Brass
24	8045917	-	1	1	1	UNION .. Pipe - 1/2 solder x 1/2 MPT
24A	8062402	-	1	1	1	ELBOW .. Pipe - 1/2 solder x 1/2 FPT - 90°
TUBE ASSEMBLY .. Oil Pan Sump To Pump						
25	8280912	1	-	-	-	TUBE ASSEMBLY .. Oil pan sump to pump
26	8116858	AR	-	-	-	TUBING .. .840 O.D. x .072 wall copper 20 ft.
27	8045929	1	-	-	-	ELBOW .. Union - 1/2 solder - 90°
28	8074703	1	-	-	-	ELBOW .. Union - 1/2 FPT x 1/2 MPT - 45°
29	8062374	1	-	-	-	ELBOW .. Pipe - 1/2 solder - 90°
30	8131933	1	-	-	-	NIPPLE .. Short pipe - 1/2 MPT - Brass
31	8302607	-	1	1	1	TUBE ASSEMBLY .. Oil pan sump to pump
32	8116858	-		AR		TUBING .. .840 O.D. x .072 wall copper 20 ft.
33	8045929	-	1	1	1	ELBOW .. Union - 1/2 solder - 90°
34	8131933	-	1	1	1	NIPPLE .. Short pipe - 1/2 MPT - Brass
35	8045942	-	1	1	1	ELBOW .. Union - 1/2 solder x 1/2 MPT - 90°

8281185C, 8302496C, 8332064K, 8289896N

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LUBE OIL SYSTEM

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
						SOAKBACK PUMP APPLICATION
36	8281098	1	-	-	-	TUBE ASSEMBLY .. Pump to relief valve and filter
37	8116871	AR	-	-	-	PIPE .. 1/2 in. standard brass - 12 ft.
38	8116858	AR	-	-	-	TUBING .. .840 O.D. x .072 wall copper 20 ft.
39	8045929	1	-	-	-	ELBOW .. 90° union - 1/2 solder
40	8297294	1	-	-	-	VALVE .. Relief - 90 PSI - 1/2 MPT inlet x 1/2 FPT outlet
41	8062402	1	-	-	-	ELBOW .. Pipe - 1/2 solder x 1/2 FPT - 90°
42	8095789	1	-	-	-	TEE .. Pipe - 1/2 solder x 1/2 solder x 1/2 FPT
43	8045910	1	-	-	-	UNION .. Pipe - 1/2 FPT x 1/2 solder
44	144046	1	-	-	-	BUSHING .. Pipe reducing - 3/8 FPT x 1/2 MPT
45	8060972	1	-	-	-	NIPPLE .. Short pipe - 3/8 MPT - Steel
*46	8091580	1	-	-	-	NIPPLE .. Pipe - 1/2 MPT x 5 inches - Brass
47	8302608	-	1	1	1	TUBE ASSEMBLY .. Filter inlet to turbocharger
48	8116858	-	As Req.			TUBING .. .840 O.D. x .072 wall copper 20 ft.
49	8060964	-	1	1	1	NIPPLE .. Close pipe - 3/8 MPT - Steel
50	144046	-	1	1	1	BUSHING .. Pipe reducing - 3/8 FPT x 1/2 MPT
51	8045910	-	1	1	1	UNION .. Pipe - 1/2 FPT x 1/2 solder
52	8045929	-	1	1	1	ELBOW .. Union - 1/2 solder - 90°
52A	8112594	-	1	1	1	NIPPLE .. Pipe - 1/2 solder x 1/2 MPT x 2-1/2 inches - Brass
53	8108115	-	2	2	2	CLAMP ASSEMBLY .. Pipe
54	8108196	5	-	-	-	CLAMP ASSEMBLY .. Pipe
55	8108197	1	-	-	-	CLAMP ASSEMBLY .. Pipe
FILTER ASSEMBLY .. Soakback						
56	8280390	1	1	-	-	FILTER ASSEMBLY .. Soakback - Replaced by 8316075 - See Page 18
57	8316075	1	1	1	1	FILTER ASSEMBLY .. Soakback - Replaces 8280390 - See Page 18
57	8338906	1	1	1	1	FILTER ASSEMBLY .. Soakback - Previous design - See Page 19
58	8280641	1	1	1	1	BRACKET .. Filter mounting - Not required with 8338906 filter
59	181364	2	2	2	2	BOLT .. Hex head 3/8-24 x 1 - Bracket mounting
59	181361	-	-	2	2	BOLT .. Hex head 3/8-24 x 7/8 - Bracket mounting - Appl. with 8338906 filter
60	181370	1	1	1	1	BOLT .. Hex head 3/8-24 x 1-1/4 - Bracket mounting
61	103321	2	2	2	2	WASHER .. Lock 3/8
62	179814	2	2	2	2	BOLT .. Hex head 5/16-18 x 5/8 - Filter to bracket - Not required with 8338906 filter
63	103320	2	2	2	2	WASHER .. Lock 5/16 - Not required with 8338906 filter
64	8291837	1	1	1	1	HOSE ASSEMBLY .. Filter to turbocharger
65	8291690	3	3	2	2	CLAMP .. Hose
66	118752	1	1	1	1	CONNECTOR .. 1/2 tube x 3/8 MPT
67	8291680	1	1	1	1	VALVE .. Check - 3/8 MPT outlet - 3/8 FPT inlet
68	8295498	1	1	-	-	TUBE ASSEMBLY .. Turbocharger to connector block
69	8310898	-	-	1	-	TUBE ASSEMBLY .. Turbocharger to connector block
70	8295499	1	1	2	-	CLIP .. Tube
71	179880	1	1	2	-	BOLT .. Hex head 1/2-13 x 7/8 - Clip mounting
72	103323	1	1	2	-	WASHER .. Lock 1/2
73	103343	1	1	-	-	WASHER .. Plain 1/2
74	444001	-	-	1	-	ADAPTER
75	8295500	-	-	2	-	ELBOW .. 1/4 tube x 1/4 MPT
76	8277143	1	1	1	-	BLOCK .. Connector
77	179887	2	2	2	-	BOLT .. Hex head 1/2-13 x 1-3/4 - Block mounting
78	103323	2	2	2	-	WASHER .. Lock 1/2
79	8277111	1	1	1	-	TUBE ASSEMBLY
*80	116453	-	-	1	-	ELBOW .. 1/4 tube x 1/4 MPT
81	8318396	1	1	1	1	BRACKET ASSEMBLY .. Hose support
82	179837	1	1	1	1	BOLT .. Hex head 3/8-16 x 3/4 - Clamp to bracket
83	102635	1	1	1	1	NUT .. Hex 3/8-16
84	103321	1	1	1	1	WASHER .. Lock 3/8
85	6101229	1	1	1	1	WASHER .. Plain 1/2

P.L. No. F134

LUBE OIL SYSTEM

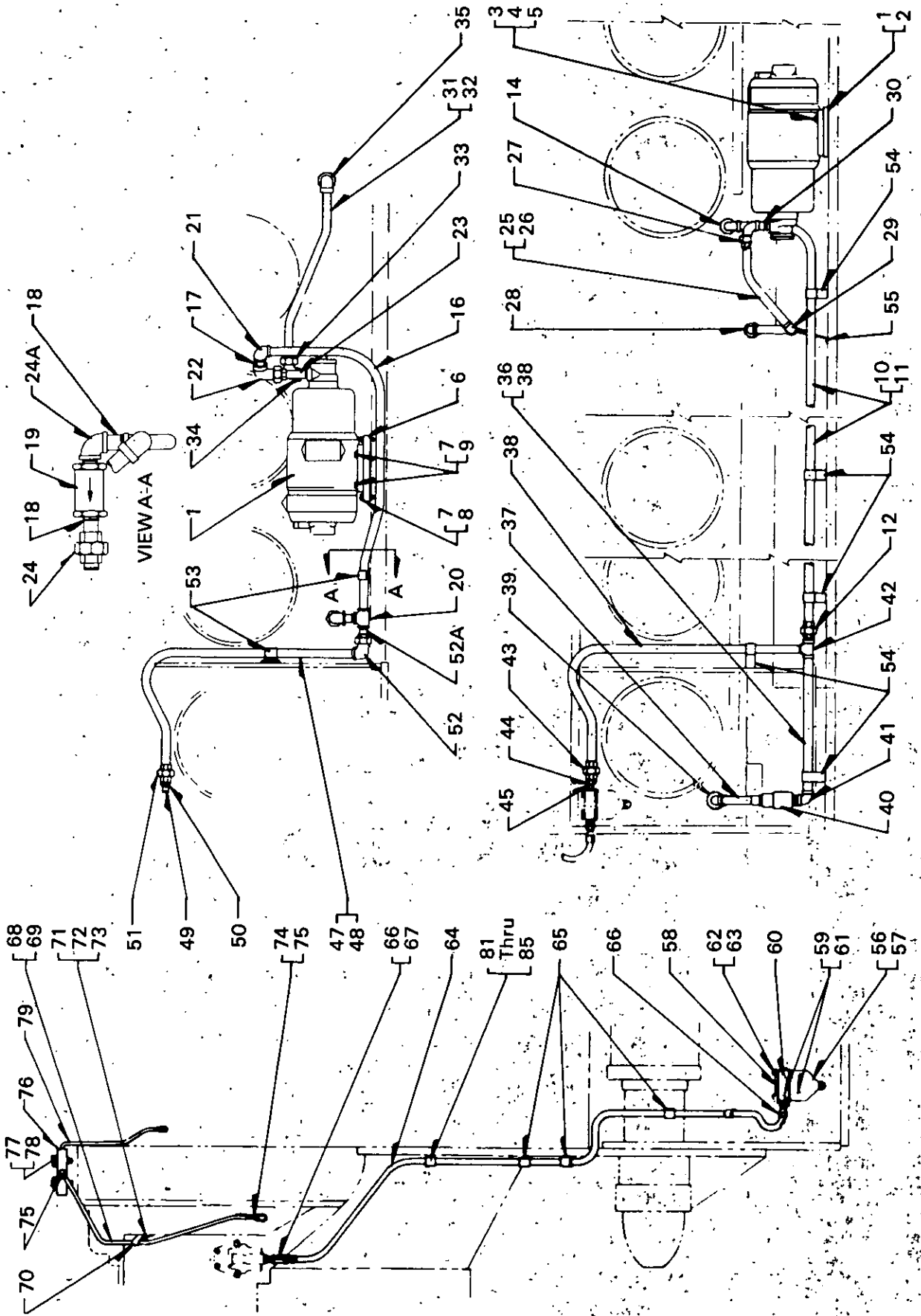


PLATE D134-19

P.L. No. F134

LUBE OIL SYSTEM
Soakback Lube Oil Lines
16-567D3 Engine

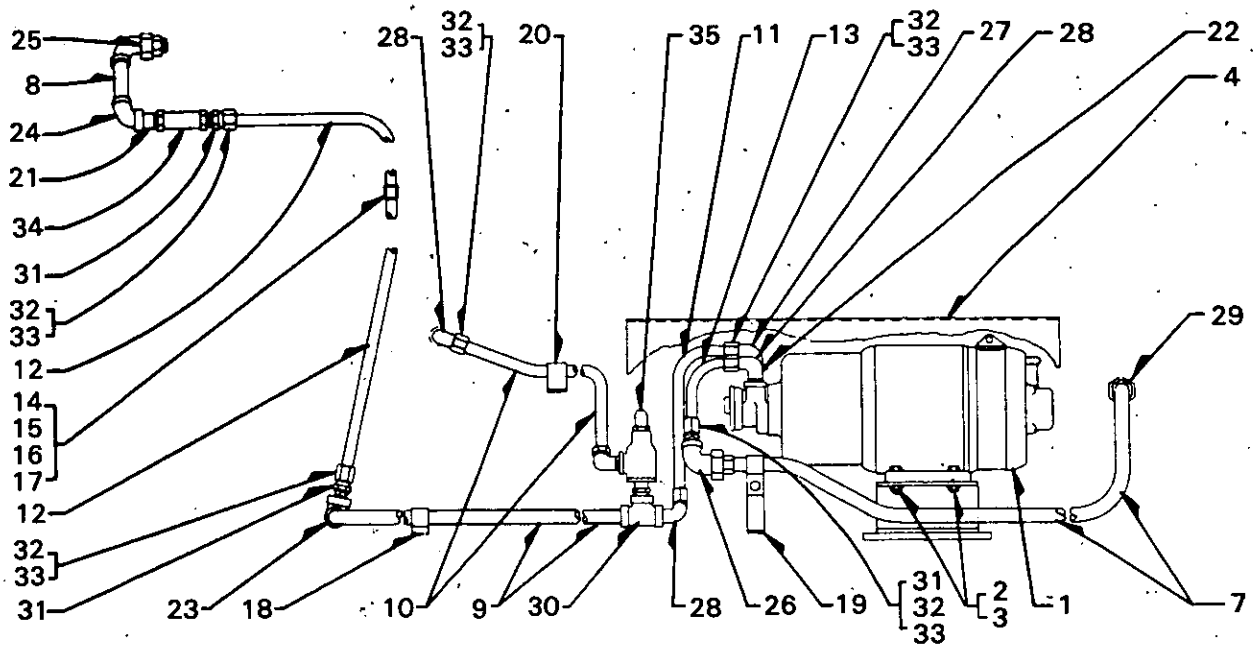


PLATE D134-20

Ref. No.	Part Number	Qty. Req.	Description

The following soakback pump application is applied to turbocharger with high pressure lube oil systems for SD24 locomotive. For current design soakback system, refer to Pages 33 thru 35.

1	8152343	1	PUMP ASSEMBLY .. Soakback - See Page 25
2	179843	4	BOLT .. Hex head 3/8-16 x 1-1/2 - Pump mounting
3	8032743	4	NUT .. Hex lock 3/8-16
4	8265246	1	GUARD .. Soakback pump
*5	179883	4	BOLT .. Hex head 3/8-16 x 1/2 - Guard mounting
*6	103321	4	WASHER .. Lock 3/8
7	8116751	AR	PIPE .. 1/2 inch wrought steel 20 feet
8	8116885	AR	PIPE .. 1/2 inch extra strong brass 12 feet
9	8116858	AR	TUBING .. .840 O.D. x .072 wall copper 20 feet
10	8122034	AR	TUBING .. 5/8 inch O.D. seamless steel 20 feet
11	8265131	1	TUBE... Curved
12	8275087	1	TUBE .. Curved
13	8265130	1	TUBE .. Curved
14	8168450	2	CLAMP ASSEMBLY .. 3/8 tubing
15	8265245	2	CLIP .. Clamp mounting
16	179795	2	BOLT .. Hex head 1/4-20 x 3/4 - Clamp mounting
17	8035130	2	NUT .. Hex lock 1/4-20
18	8108196	2	CLAMP ASSEMBLY .. 1/2 inch pipe
19	8108197	1	CLAMP ASSEMBLY .. 1/2 inch pipe
20	8108209	1	CLAMP ASSEMBLY .. 5/8 tubing
21	8131933	1	NIPPLE .. Short pipe - 1/2 MPT - Brass
22	8060973	1	NIPPLE .. Short pipe - 1/2 MPT - Steel
23	8095640	1	ELBOW .. Pipe - 1/2 FPT x 1/2 solder - 90°
24	8095165	1	ELBOW .. Pipe - 1/2 solder - 90°
25	8045942	1	ELBOW .. Union - 1/2 solder x 1/2 MPT - 90°
26	8044168	1	ELBOW .. Union - 1/2 FPT - 90°
27	9410442	1	ELBOW .. 5/8 tube x 1/2 FPT
28	9410429	4	ELBOW .. 5/8 tube x 1/2 MPT
29	8044160	1	UNION .. Pipe - 1/2 FPT x 1/2 MPT
30	8050475	1	TEE .. Pipe - 1/2 FPT x 1/2 solder x 1/2 FPT
31	9410377	3	CONNECTOR .. 5/8 tube x 1/2 MPT
32	9410614	8	NUT .. 5/8 tube
33	274225	8	FERRULE .. 5/8 tubing
34	8270931	1	VALVE .. Check - 1/2 FPT
35	8269314	1	VALVE .. Relief - 1/2 FPT - Includes spring 8310468

8265244

LUBE OIL SYSTEM

Soakback Lube Oil Lines
16-567D2,D3 Engines
PLATE C134-21

Ref. No.	Part Number	Qty. Req.		Description
		A	-	SOAKBACK PUMP APPLICATION - GP20 locomotive - 16-567D2
		-	B	SOAKBACK PUMP APPLICATION - SD24 locomotive - 16-567D3

The following soakback pump application is applied to turbochargers with low oil pressure lube oil systems. For current soakback system refer to Pages 33 thru 35.

PUMP AND FILTER ASSEMBLY

1	8152343	1	1	PUMP ASSEMBLY .. Soakback - See Page 25
2	8280390	1	1	FILTER ASSEMBLY .. Lube oil - Replaced by 8316075 - See Page 18
3	8261532	-	1	SUPPORT .. Pump mounting
4	8261533	-	1	SUPPORT .. Pump mounting
5	8274056	2	-	PAD .. Tapping - Pump mounting
6	179843	-	4	BOLT .. Hex head 3/8-16 x 1-1/2 - Pump mounting
7	8032743	-	4	NUT .. Hex lock 3/8-16
8	179840	4	-	BOLT .. Hex head 3/8-16 x 1-1/8 - Pump mounting
9	103321	4	-	WASHER .. Lock 3/8
10	103341	4	-	WASHER .. Plain 3/8
11	8280641	1	1	BRACKET .. Filter mounting
12	179814	2	2	BOLT .. Hex head 5/16-18 x 5/8 - Filter to bracket
13	103320	2	2	WASHER .. Lock 5/16
14	181364	2	2	BOLT .. Hex head 3/8-24 x 1 - Bracket mounting
15	103321	2	2	WASHER .. Lock 3/8
16	181370	1	1	BOLT .. Hex head 3/8-24 x 1-1/4 - Bracket mounting

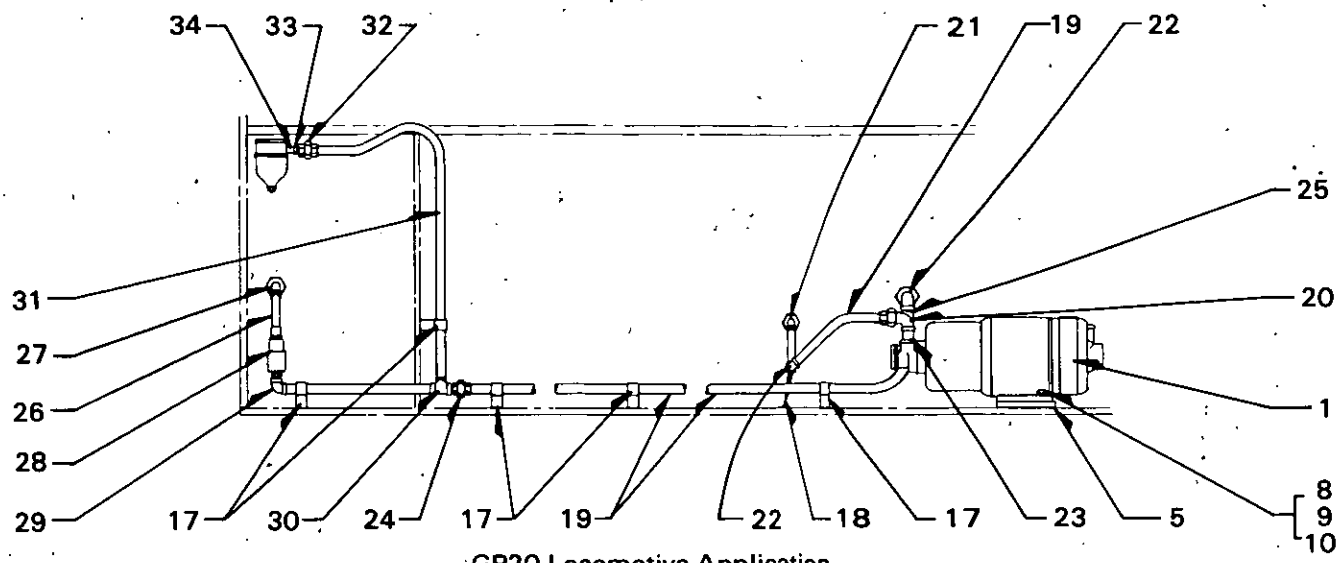
PIPING .. Soakback Pump

17	8108196	5	5	CLAMP ASSEMBLY .. Pipe
18	8108197	1	-	CLAMP ASSEMBLY .. Pipe
19	8116858	-	-	TUBING .. .840 O.D. x .072 wall copper 20 feet long
20	8045929	2	2	ELBOW .. Union - 1/2 solder - 90°
21	8074703	1	-	ELBOW .. Union - 1/2 FPT x 1/2 MPT - 45° - Bronze
22	8062374	2	2	ELBOW .. Pipe - 1/2 solder - 90°
23	8131933	1	1	NIPPLE .. Short pipe - 1/2 MPT - Brass
24	8045917	1	2	UNION .. Pipe - 1/2 solder x 1/2 MPT
25	8112112	1	1	NIPPLE .. Pipe - 1/2 MPT x 3-1/2 inches long - Brass
26	8116751	-	-	PIPE .. 1/2 inch wrought steel - 20 feet - 20 feet long
27	8044782	1	1	ELBOW .. Union - 1/2 FPT x 1/2 MPT - 45°
28	8269314	1	1	VALVE .. Relief - 1/2 FPT - Includes spring 8310468
29	8062402	1	1	ELBOW .. Pipe - 1/2 solder x 1/2 FPT - 90°
30	8095789	1	1	TEE .. Pipe - 1/2 solder x 1/2 solder x 1/2 FPT
31	8281097	1	1	TUBE .. Lube oil
32	8045910	1	1	UNION .. Pipe - 1/2 FPT x 1/2 solder
33	114046	1	1	BUSHING .. Pipe reducing - 3/8 FPT x 1/2 MPT
34	8060972	1	1	NIPPLE .. Short pipe - 3/8 MPT - Steel
35	8277111	1	1	TUBE ASSEMBLY .. Connection block to low oil pressure line
36	8289263	1	1	HOSE ASSEMBLY .. Tee to connector block
37	8281287	1	1	HOSE ASSEMBLY .. Filter to relief valve
38	9409910	1	1	CONNECTION .. 1/4 MPT x 1/4 tube
39	8277143	1	1	BLOCK .. Connector
40	179887	2	2	BOLT .. Hex head 1/2-13 x 1-3/4 - Connector block mounting
41	103323	3	3	WASHER .. Lock 1/2
42	116453	2	2	ELBOW .. 1/4 tube x 1/4 MPT
43	144043	3	3	BUSHING .. Pipe reducing - 1/4 FPT x 3/8 MPT
44	120702	1	1	ELBOW .. Street - 3/8 FPT x 3/8 MPT - 45°
45	8280868	1	1	VALVE .. Check - 1/4 FPT
46	8042833	1	1	TEE .. Pipe - 3/8 FPT
47	8078165	1	1	NIPPLE .. Pipe - 3/8 MPT x 2 inches long - Steel
48	179880	1	1	BOLT .. Hex head 1/2-13 x 7/8 - Clamp
49	103343	1	1	WASHER .. Plain 1/2
50	8281328	1	1	CLAMP .. Tube
51	8281329	3	3	CLAMP .. Tube

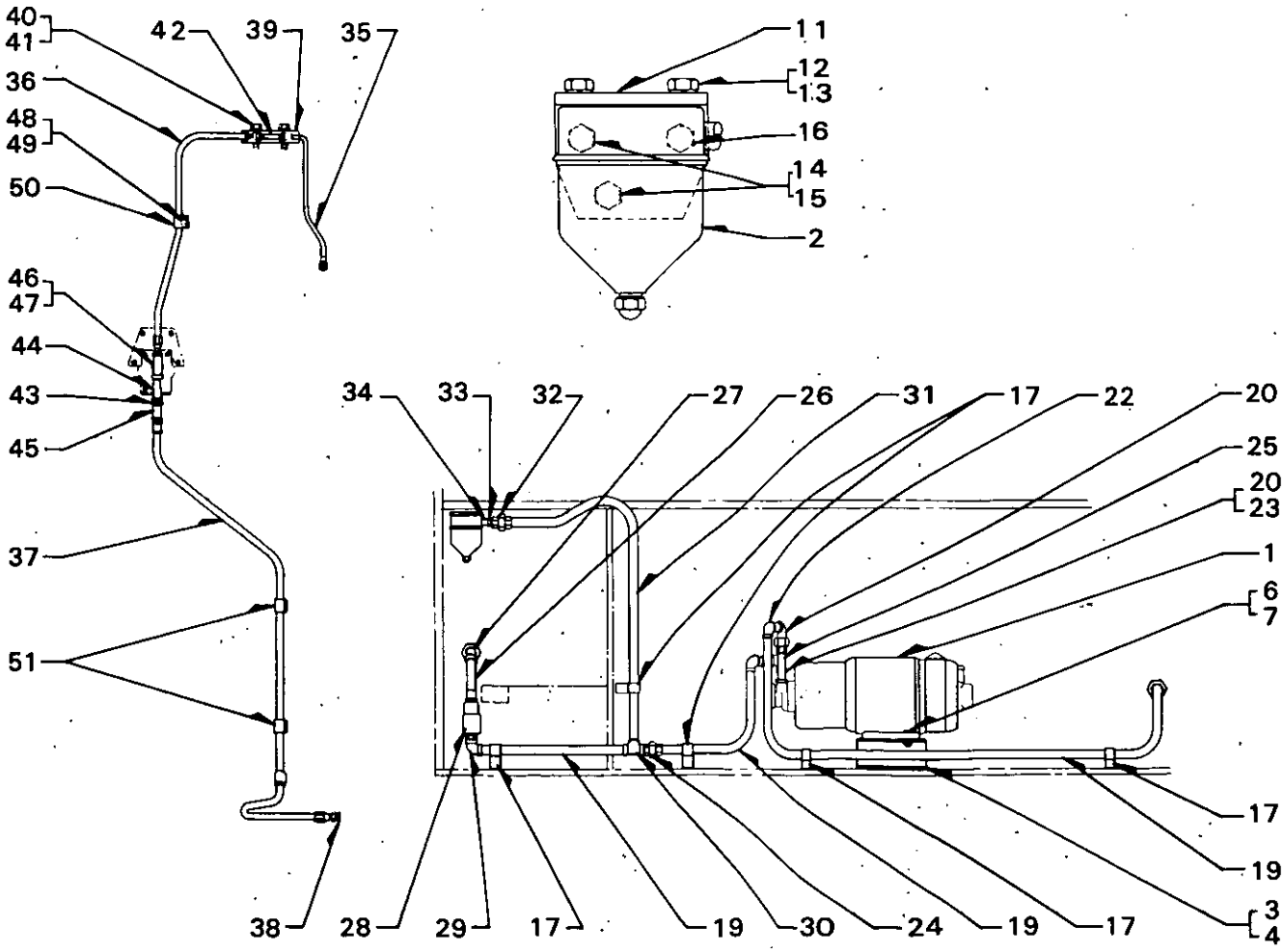
8281185, 8280946

P.L. No. F134

LUBE OIL SYSTEM



GP20 Locomotive Application



SD24 Locomotive Application

PLATE C134-21

LUBE OIL SYSTEM

Lube Oil Sampling Valve
8,12,16-645E; 16-645E3,E3B,E3C,F3,F3B and 20-645E3,E3B Engines

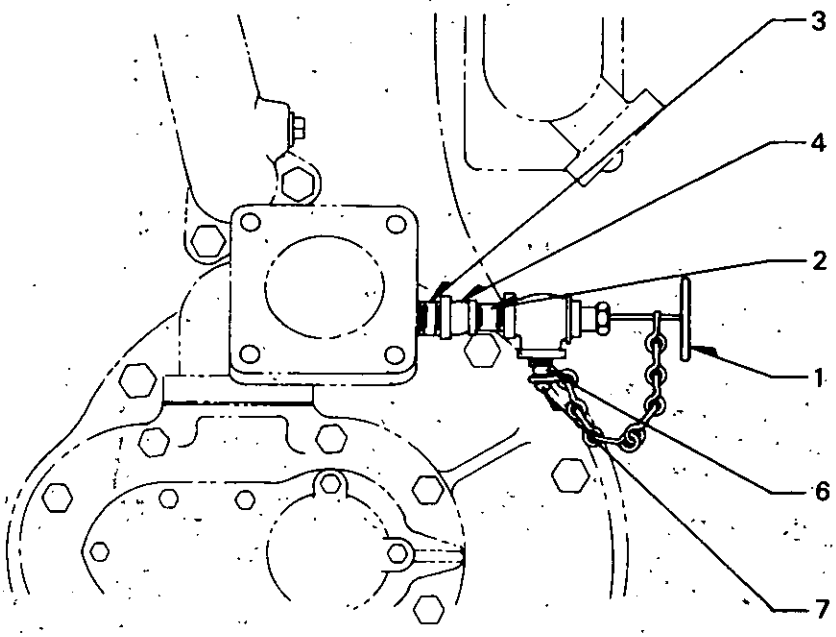


PLATE A134-22

Ref. No.	Part Number	Qty. Req.	Description
VALVE .. Oil Sampling			
1	8061551	1	VALVE .. Angle - 3/8 FPT
2	8060972	1	NIPPLE .. Short - 3/8 MPT
ϕ3	8060973	1	NIPPLE .. Short - 1/2 MPT
ϕ4	142834	1	COUPLING .. Reducing - 1/2 FPT x 3/8 FPT
*ϕ5	189061	1	BUSHING .. Reducing - 3/4 MPT x 3/8 FPT
6	8320002	1	PLUG .. Pipe - 3/8 - Drilled
7	104081	1	RIVET .. 1/4 x 3/8 inch long
*8	8489939	1	VALVE .. Ball - 1/2 inch } Applied To SD40-2 Only
*9	8489960	1	TAG .. Name } Applied To SD40-2 Only

19075, 12132, 29169,
8395219, 8320017, 8489967

P.L. No. F134

LUBE OIL SYSTEM
Engine Pre-Lube Piping
12-645E and 16-645E3,E3B Engines

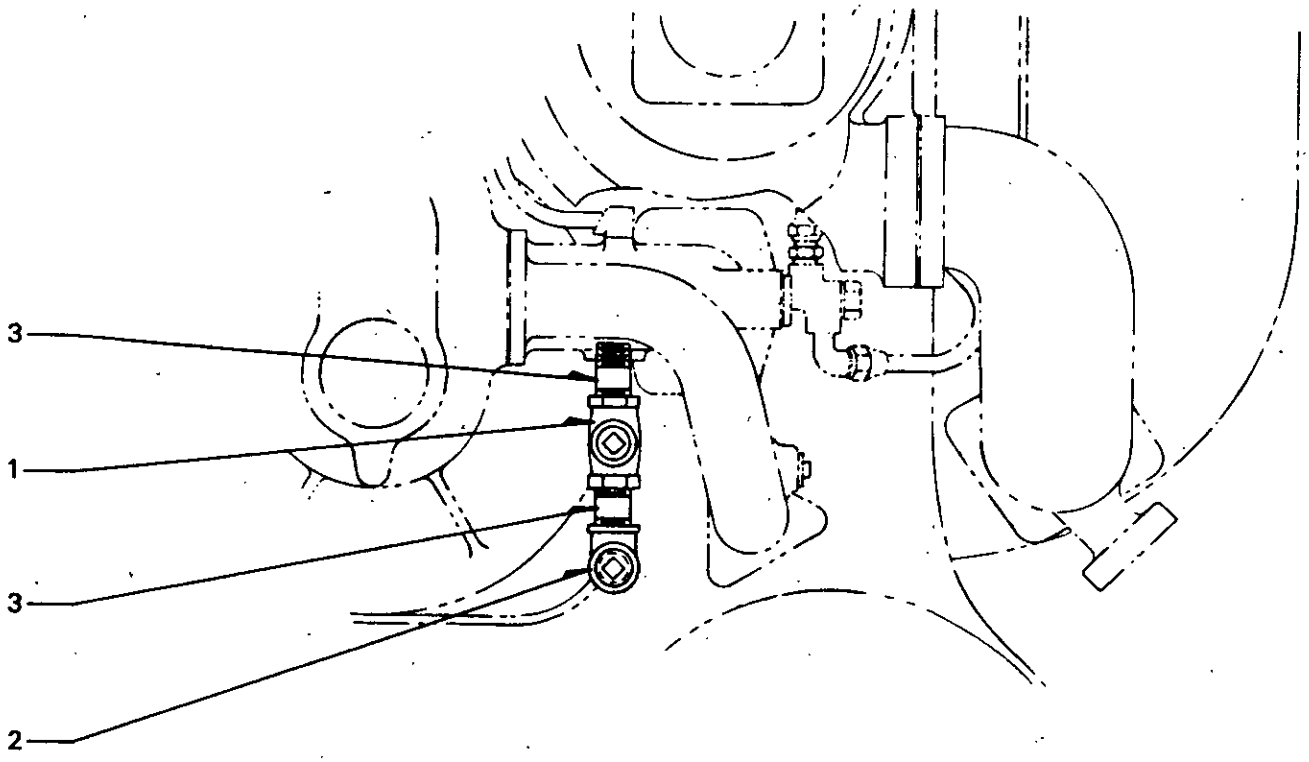


PLATE A134-23

Ref. No.	Part Number	Qty. Req.	Description
1	8445680	1	COCK .. Cut-off - 3/4 FPT
2	119099	1	ELBOW .. 3/4 FPT x 90°
3	8060974	2	NIPPLE .. Short - 3/4 MPT
*ϕ3	8095035	1	NIPPLE .. Long - 3/4 MPT x 5 inches long
*4	103869	1	PLUG .. Pipe - 3/4 MPT

8454216, 9525961

Parts List No. F136

LUBE OIL STRAINER

16-645D1,D2,D3,D3A; 8,12,16-645E; 8-645E3B,E3C,F3B;
12,16-645E3,E3B,E3C,F3,F3B; 16-645E3A and 20-645E3,E3B
PLATE E136-1

Ref. No.	Part Number	Quantity Required				Description
		A	B	-	-	8,12,16-645E engines
		-	-	C	-	16-567D1,D2,D3 engines
		-	-	-	D	16-567D3A; 8-645E3B,E3C,F3B; 12,16-645E,E3,E3B,E3C,F3,F3B and 16-645E3A and 20-645E3,E3B engines
*1	8186776	1	-	-	-	STRAINER ASSEMBLY .. Lube oil - Less valve body, pipe and stop gate - Original design
*2	8186776	-	1	-	-	STRAINER ASSEMBLY .. Lube oil - Less valve body, pipe and stop gate - Latest design with improved housing drain
3	8269263	-	-	1	-	STRAINER ASSEMBLY .. Lube oil - With valve body, pipe and stop gate - Original design
4	8269263	-	-	-	1	STRAINER ASSEMBLY .. Lube oil - With valve body, pipe and stop gate - Latest design
*5	8186761	1	1	-	-	HOUSING ASSEMBLY .. Strainer
5	8269261	-	-	1	1	HOUSING ASSEMBLY .. Strainer
6	8084871	11	11	11	11	STUD .. 1/2-13-20 x 2-7/17 inches long
7	8080447	1	1	1	1	STUD .. 1-8 x 3/4-10 x 6-1/32 inches long
8	8084560	4	4	4	4	INSERT .. Stud 1/2-20 x 15/16 inch long
9	141067	4	4	4	4	PIN .. Dowel 3/32 x 1/2 inch long
10	9314923	-	4	-	4	STUD .. Valve seat - 3/8-16-24 x 2-5/8 inches long
*11	8080434	-	-	2	-	STRAINER ASSEMBLY .. Piston cooling and main bearing oil - Replaced by 8320144 - See Ref. No. 17
*12	8080182	-	-	2	-	SCREEN .. Side - Inner - No. 14 mesh
*13	8080184	-	-	2	-	SCREEN .. Side - Outer - No. 40 mesh
*14	8080208	-	-	2	-	SCREEN .. Bottom inner - No. 14 mesh
*15	8080209	-	-	2	-	SCREEN .. Bottom outer - No. 40 mesh
*16	8080851	-	-	2	-	RETAINER .. Bottom screen
17	8320144	2	2	2	2	STRAINER ASSEMBLY .. Piston cooling and main bearing oil - Replaces 8080434 Ref. No. 11
18	8320143	2	2	2	2	SCREEN ASSEMBLY .. Strainer
19	8317396	2	2	2	2	SCREEN .. Strainer - Pleated 40 mesh
20	8327306	2	2	2	2	COVER ASSEMBLY .. Strainer - Perforated metal
21	8317393	2	2	2	2	CYLINDER .. Cover
22	8327307	2	2	2	2	STUD ASSEMBLY .. Cover
23	8317395	2	2	2	2	STUD .. 3/8-16-24 x 18-3/16 inches long
24	114494	2	2	2	2	NUT .. Hex lock 3/8-24
25	8032717	2	2	2	2	NUT .. Hex lock 3/8-24
*26	8080376	-	-	1	-	STRAINER ASSEMBLY .. Scavenging oil - Replaced by 8308586 - See Ref. No. 30
*27	8080207	-	-	1	-	SCREEN .. Side - No. 6 mesh
*28	8080205	-	-	1	-	SCREEN .. Bottom - No. 6 mesh
*29	8080206	-	-	1	-	RING .. Bottom screen
30	8308586	1	1	1	1	STRAINER ASSEMBLY .. Scavenging oil - Replaces 8080376 - Ref. No. 26
31	8308587	1	1	1	1	SCREEN .. Strainer - Perforated metal
*32	8339583	1	1	1	1	DISC .. Bottom
33	8310841	1	1	1	1	STUD .. 3/8-16 x 3/8-24 x 2-3/8 - Formerly 8479008
34	9550329	-	-	1	1	SPACER .. Applied when longer stud (8310841) is used
35	8085182	2	2	2	2	SEAL .. Piston cooling and main bearing strainer
36	8080445	1	1	1	1	CRAB .. Strainer
37	8085246	1	1	1	1	WHEEL .. Hand

P.L. No. F136

LUBE OIL STRAINER

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
	8186776	1	1	-	-	STRAINER ASSEMBLY .. Lube oil
	8269263	-	-	1	1	STRAINER ASSEMBLY .. Lube oil
38	8080852	1	1	1	1	GASKET .. Scavenging oil strainer
39	8478924	1	1	1	1	SEAL .. Ring - Scavenging oil strainer
40	8478893	1	1	1	1	PLATE .. Strainer - Basket - Replaces 8186925 and 8269287
41	8032717	1	5	1	5	NUT .. Hex lock 3/8-24
42	8032719	3	3	3	3	NUT .. Hex lock 1/2-20
43	8085693	1	1	1	1	COVER ASSEMBLY .. Strainer
44	8085692	1	1	1	1	COVER .. Strainer
45	8085226	2	2	2	2	GUIDE .. Long
46	8085227	2	2	2	2	GUIDE .. Short
47	8085253	1	1	1	1	GASKET .. Cover
48	179816	8	8	8	8	BOLT .. Hex head 5/16-18 x 3/4 - Cover
49	6101223	8	8	8	8	WASHER .. Flat 5/16 - Formerly 103320
50	8085507	2	2	2	2	BOLT ASSEMBLY .. Swivel
51	8020891	2	2	2	2	BOLT .. Swivel 3/8-16 x 1-1/4 inches long
52	8085149	2	2	2	2	CLEVIS .. Flanged
53	142520	2	2	2	2	PIN .. Taper groove 1/4 x 1 inch long
54	179818	4	4	4	4	BOLT .. Clevis hex head 5/16-18 x 1
55	6101223	4	4	4	4	WASHER .. Flat 5/16
56	8020893	2	2	2	2	HANDWHEEL .. 3/8-16
57	8174207	1	-	1	-	PLUG .. Drain
58	9314919	-	1	-	1	SEAT .. Valve
59	8174208	1	-	1	-	GASKET .. Drain plug - Rod
60	9314918	-	1	-	1	GASKET .. Valve seat mounting
61	8174213	1	-	1	-	ROD ASSEMBLY .. Drain
*62	9314922	-	1	-	1	ROD ASSEMBLY .. Drain
*63	453669	1	1	1	1	PIN .. Roll 1/4 x 3 inches long
*64	454565	1	1	1	1	PIN .. Roll 1/4 x 1-1/4 inches long
*65	9335408	-	1	-	1	SEAL .. Plug - Replaces 9314920
*66	9315446	-	1	-	1	SEAL .. Rod assembly plug
67	103758	1	1	1	1	PIN .. Straight 5/16 x 1-1/2 inches long
68	8174209	2	2	2	2	RETAINER .. Rod
69	8175063	1	1	1	1	SPRING .. Retainer
*70	8269124	-	-	1	-	BODY .. Valve - No longer available - Replaced by Ref. Nos. 71 thru 75
71	9321252	-	-	-	1	BODY .. Valve
*72	8269418	-	-	1	1	PIPE ASSEMBLY .. Strainer valve body } Replaces 8269124 Valve Body
73	8269125	-	-	1	1	COVER .. Valve body } Replaces 8269124 Valve Body
*74	9314757	-	-	-	1	SPRING .. Valve retainer } Replaces 8269124 Valve Body
*75	9314756	-	-	-	1	RETAINER .. Valve } Replaces 8269124 Valve Body
76	8269415	-	-	1	1	GASKET .. Valve mounting
77	8269308	-	-	1	1	GATE ASSEMBLY .. Includes stop
*78	8269150	-	-	1	1	GATE .. Stop
*79	8269143	-	-	1	1	STOP .. Gate
*80	454512	-	-	2	2	PIN .. Spring 3/16 x 3/4 inch long
*81	8269288	-	-	1	1	CLAMP .. Pipe
*82	8032743	-	-	1	1	NUT .. Hex 3/8-16
83	179851	-	-	2	2	BOLT .. Hex head 3/8-16 x 3 - Valve mounting
84	179839	-	-	3	3	BOLT .. Hex head 3/8-16 x 1 - Valve mounting
85	6101225	-	-	4	8	WASHER .. Flat 3/8
+86	8366785	1	1	1	1	GASKET .. Main lube oil inlet
+87	8080850	1	1	1	1	GASKET .. Strainer to housing cover
+88	8074661	2	2	2	2	GASKET .. Scavenging and main lube oil outlet
+*89	8496989	1	1	1	1	GASKET KIT .. Lube oil strainer element - See Parts List No. 199
+*90	8496990	1	1	1	1	GASKET KIT .. Lube oil suction strainer - See Parts List No. 199

LUBE OIL STRAINER

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
	8186776	1	1	-	-	STRAINER ASSEMBLY .. Lube oil
	8269263	-	-	1	1	STRAINER ASSEMBLY .. Lube oil

The following components are required to convert from the original design to the current design lube oil strainer. See M.I. 9618 or contact our Service Department for details.

*91	9321252	-	-	1	-	BODY .. Valve	Required For Conversion Of Gate Valve
*92	8269418	-	-	1	-	PIPE ASSEMBLY .. Strainer	
*93	9314757	-	-	1	-	SPRING .. Valve retainer	
*94	9314756	-	-	1	-	RETAINER .. Valve	
*95	9314896	1	-	1	-	PLATE ASSEMBLY .. Adapter	Required For Conversion Of Strainer Housing Drain
*96	9314898	4	-	4	-	STUD .. Adapter plate to valve seat - 3/8-16-24 x 2-1/16 inches long	
*97	9314899	1	-	1	-	GASKET .. Adapter plate to housing	
*98	110532	8	-	8	-	SCREW .. Slotted flat head 10-24 x 5/8 - Adapter plate to housing	
*99	9314919	1	-	1	-	SEAT .. Valve	
*100	9314918	1	-	1	-	GASKET .. Valve seat mounting	
*101	9314922	1	-	1	-	ROD ASSEMBLY .. Drain	
*102	9315446	1	-	1	-	SEAL .. Rod assembly plug	
*103	8032717	4	-	4	-	NUT .. Hex lock 3/8-24	
*104	6101225	4	-	4	-	WASHER .. Flat 3/8	
*105	9505374	-	-	1	-	KIT .. Modification - Lube oil strainer - Contains Ref. Nos. 91 through 104	

P.L. No. F136

LUBE OIL STRAINER

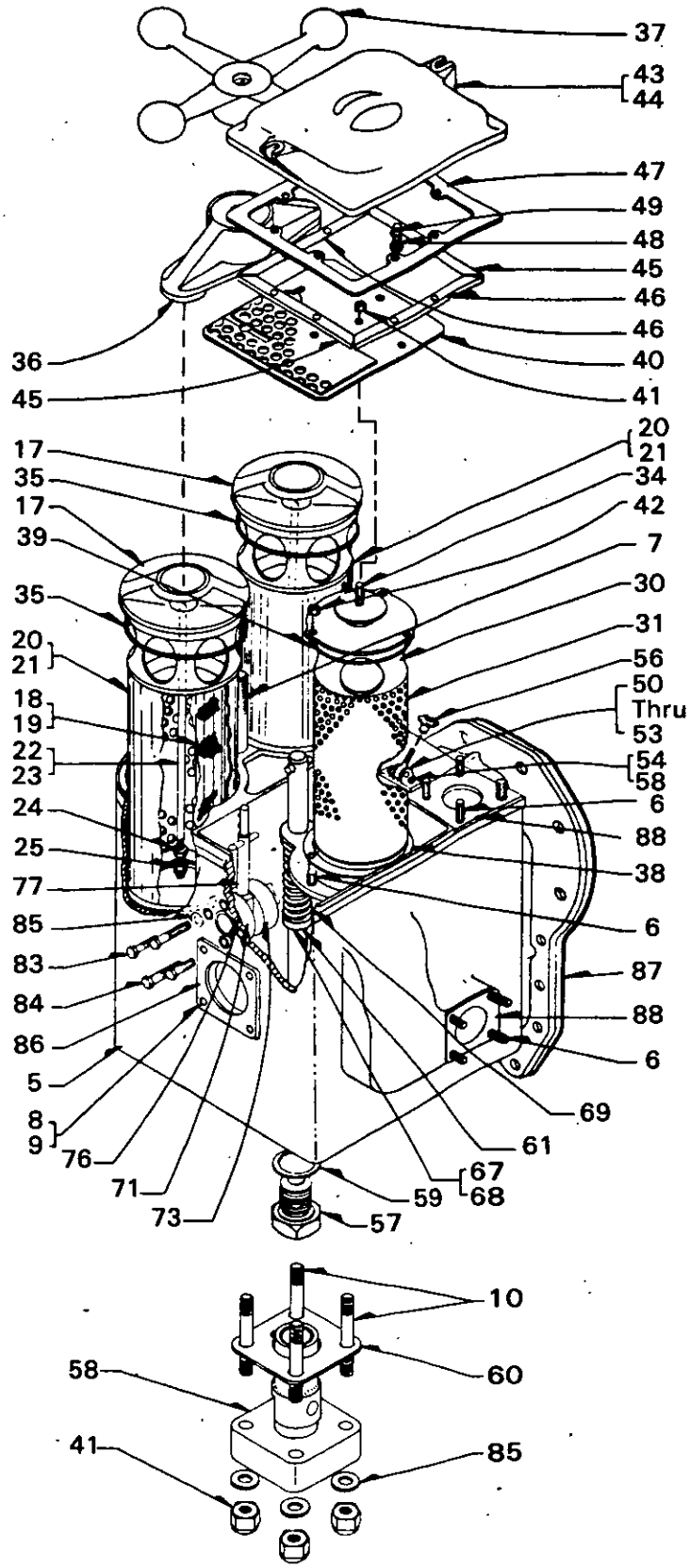


PLATE E136-1

PISTON COOLING AND PRESSURE PUMP

All 567D and 645 Engines
PLATE F138-1

Ref. No.	Part Number	Quantity Required								Description
		A	-	-	-	-	-	-	-	8-645E engines - Export
		-	B	-	-	-	-	-	-	8-645E engines - Domestic
		-	-	C	-	-	-	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	-	D	-	-	-	-	12-645E3,E3B,E3C,F3,F3B; 16-567D1 and 16-645E engines
		-	-	-	-	E	-	-	-	16-567D2,D3,D3A and 16-645E3,E3A engines
		-	-	-	-	-	F	-	-	16-567D2,D3,D3A and 16-645E3,E3A,E3B,E3C,F3 and F3B engines
		-	-	-	-	-	-	G	-	20-645E3 engines
		-	-	-	-	-	-	-	H	20-645E3,E3B engines
1	8221309	1	-	-	-	-	-	-	-	PUMP ASSEMBLY .. Piston cooling and pressure
*2	8176033	-	1	-	-	-	-	-	-	PUMP ASSEMBLY .. Piston cooling and pressure
*3	8106919	-	-	1	-	-	-	-	-	PUMP ASSEMBLY .. Piston cooling and pressure - UTEX 8122947
*4	8084556	-	-	-	1	-	-	-	-	PUMP ASSEMBLY .. Piston cooling and pressure - UTEX 8122949
†5	8252844	-	-	-	-	1	-	-	-	PUMP ASSEMBLY .. Piston cooling and pressure - Replaced by 9330012 - UTEX Part No. 8296366
*6	9330012	-	-	-	-	-	1	-	-	PUMP ASSEMBLY .. Piston cooling and pressure - Replaces 8252844 - UTEX Part No. 8296366
*†7	8360554	-	-	-	-	-	-	1	-	PUMP ASSEMBLY .. Piston cooling and pressure - Replaced by 9330013 - UTEX Part No. 8427270
*8	9330013	-	-	-	-	-	-	-	1	PUMP ASSEMBLY .. Piston cooling and pressure - Replaces 8360544 - UTEX Part No. 8427270
9	8221310	1	-	-	-	-	-	-	-	BODY .. Pump - Rear
*9	8176026	-	1	-	-	-	-	-	-	BODY .. Pump - Rear
*9	8106920	-	-	1	-	-	-	-	-	BODY .. Pump - Rear
*9	8084561	-	-	-	1	-	-	-	-	BODY .. Pump - Rear
9	8029458	-	-	-	-	1	1	-	-	BODY .. Pump - Rear
*9	8360533	-	-	-	-	-	-	1	1	BODY .. Pump - Rear
10	8221312	1	-	-	-	-	-	-	-	BUSHING .. Rear body
*10	8039667	-	1	1	1	1	1	-	-	BUSHING .. Rear body
*10	8360532	-	-	-	-	-	-	1	1	BUSHING .. Rear body
11	8221316	1	-	-	-	-	-	-	-	BODY .. Pump - Front
*11	8029464	-	1	-	-	-	-	-	-	BODY .. Pump - Front
*11	8029457	-	-	1	-	-	-	-	-	BODY .. Pump - Front
*11	8029514	-	-	-	1	-	-	-	-	BODY .. Pump - Front
11	8029459	-	-	-	-	1	1	-	-	BODY .. Pump - Front
*11	8360536	-	-	-	-	-	-	1	1	BODY .. Pump - Front
12	8221318	1	-	-	-	-	-	-	-	BUSHING .. Front body
12	8039669	-	1	1	1	1	1	-	-	BUSHING .. Front body
*12	8360535	-	-	-	-	-	-	1	1	BUSHING .. Front body
13	8251622	-	-	-	-	1	1	-	-	BODY .. Pump - Center
14	8029144	2	2	2	2	2	2	2	2	PIN .. Dowel - 3/8 x 1-1/4
15	8028366	-	-	-	-	2	2	-	-	PIN .. Dowel - 3/8 x 7/8
16	8221320	1	-	-	-	-	-	-	-	COVER .. Pump - Formerly 8221300
16	8029562	-	1	1	1	1	1	-	-	COVER .. Pump
*16	8360537	-	-	-	-	-	-	1	1	COVER .. Pump

† The center drive gear on lube oil pressure pumps 8252844 and 8360554 was formerly keyed to the drive shaft. Due to a change in design, the center drive gear is now attached to the rear drive gear by the use of two slotted spring pins. In addition, the center gear keyway on the drive shaft has been removed. If this new driveshaft (part numbers 9330010 for 16 cylinder pump and 9330011 for 20 cylinder pump) is to be used with the earlier design rear and center drive gears, these gears will have to be drilled to accept the required pins. Contact our Service Department for details regarding this modification. 8252844 and 8360544 pumps sent in on a unit exchange basis will be remanufactured to include the new design components.

P.L. No. F138

PISTON COOLING AND PRESSURE PUMP

Ref. No.	Part Number	Quantity Required								Description
		A	B	C	D	E	F	G	H	PUMP ASSEMBLY .. Piston cooling and pressure
17	8221319	1	-	-	-	-	-	-	-	GASKET .. Pump cover mounting
17	8029498	-	1	1	1	1	1	-	-	GASKET .. Pump cover mounting
*17	8360543	-	-	-	-	-	-	1	1	GASKET .. Pump cover mounting
18	8221314	1	-	-	-	-	-	-	-	SPACER .. Pump body
ϕ18	8029521	-	1	1	1	1	-	-	-	SPACER .. Pump body - With 2-9/16 diameter hole for collar
ϕ18	9330008	-	-	-	-	1	1	-	-	SPACER .. Pump body - With 3-1/16 diameter hole for collar
18	9330009	-	-	-	-	-	-	1	1	SPACER .. Pump body - Replaces 8360538 - Can be used with either 8360551 collar or 9330007 collar
19	8221315	1	-	-	-	-	-	-	-	COLLAR .. Gear spacing
ϕ19	8028884	-	1	1	1	1	-	-	-	COLLAR .. Gear spacing - 2-1/2 in. O.D.
ϕ19	9330006	-	-	-	-	1	1	-	-	COLLAR .. Gear spacing - 3 in. O.D.
*ϕ19	8360551	-	-	-	-	-	-	1	-	COLLAR .. Gear spacing - 2-3/4 in. O.D.
*ϕ19	9330007	-	-	-	-	-	-	1	1	COLLAR .. Gear spacing - 3 in. O.D.
20	8029034	2	2	2	2	3	3	-	-	GASKET .. Body and spacer
*20	8360539	-	-	-	-	-	-	2	2	GASKET .. Body and spacer
21	8221313	1	-	-	-	-	-	-	-	SHAFT .. Drive
*21	8176031	-	1	-	-	-	-	-	-	SHAFT .. Drive
*21	8106705	-	-	1	-	-	-	-	-	SHAFT .. Drive
*21	8084517	-	-	-	1	-	-	-	-	SHAFT .. Drive
21	8251661	-	-	-	-	1	-	-	-	SHAFT .. Drive - No longer available - Use 9330010 and (2) 456713 pins - See Note on Page 1
*21	9330010	-	-	-	-	-	1	-	-	SHAFT .. Drive
*21	8360540	-	-	-	-	-	-	1	-	SHAFT .. Drive - No longer available - Use 9330011 and (2) 456713 pins - See Note on Page 1
*21	9330011	-	-	-	-	-	-	-	1	SHAFT .. Drive
22	8029503	1	1	-	-	-	-	-	-	SHAFT .. Idler
*22	8029497	-	-	1	-	-	-	-	-	SHAFT .. Idler
*22	8084500	-	-	-	1	-	-	-	-	SHAFT .. Idler
22	8251623	-	-	-	-	1	1	-	-	SHAFT .. Idler
*22	8360541	-	-	-	-	-	-	1	1	SHAFT .. Idler
23	8176028	1	1	-	-	-	-	-	-	GEAR ASSEMBLY .. Driven - Rear
*23	8106724	-	-	1	-	-	-	-	-	GEAR ASSEMBLY .. Driven - Rear
*23	8084508	-	-	-	1	-	-	-	-	GEAR ASSEMBLY .. Driven - Rear
23	8320057	-	-	-	-	1	1	-	-	GEAR ASSEMBLY .. Driven - Rear
*23	8360547	-	-	-	-	-	-	1	1	GEAR ASSEMBLY .. Driven - Rear
24	8176030	1	1	-	-	-	-	-	-	BUSHING .. Gear - Formerly 8176032
*24	8106723	-	-	1	-	-	-	-	-	BUSHING .. Gear
*24	8084503	-	-	-	1	-	-	-	-	BUSHING .. Gear
24	8318232	-	-	-	-	1	1	-	-	BUSHING .. Gear
*24	8360546	-	-	-	-	-	-	1	1	BUSHING .. Gear
25	8029463	1	1	-	-	-	-	-	-	GEAR ASSEMBLY .. Driven - Front
*25	8028869	-	-	1	-	-	-	-	-	GEAR ASSEMBLY .. Driven - Front
*25	8029492	-	-	-	1	-	-	-	-	GEAR ASSEMBLY .. Driven - Front - Formerly 8028492
25	8252365	-	-	-	-	1	1	-	-	GEAR ASSEMBLY .. Driven - Front
*25	8360549	-	-	-	-	-	-	1	1	GEAR ASSEMBLY .. Driven - Front
26	8029504	1	1	-	-	-	-	-	-	BUSHING .. Gear
*26	8028885	-	-	1	-	-	-	-	-	BUSHING .. Gear
*26	8029491	-	-	-	1	-	-	-	-	BUSHING .. Gear
26	8318232	-	-	-	-	1	1	-	-	BUSHING .. Gear
*26	8360546	-	-	-	-	-	-	1	1	BUSHING .. Gear

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PISTON COOLING AND PRESSURE PUMP

Ref. No.	Part Number	Quantity Required								Description
		A	B	C	D	E	F	G	H	PUMP .. Piston cooling and pressure
27	8320058	-	-	-	-	1	1	-	-	GEAR ASSEMBLY .. Driven - Center
*27	8360549	-	-	-	-	-	-	1	1	GEAR ASSEMBLY .. Driven - Center
28	8318232	-	-	-	-	1	1	-	-	BUSHING .. Gear
*28	8360546	-	-	-	-	-	-	1	1	BUSHING .. Gear
29	8176032	1	1	-	-	-	-	-	-	GEAR .. Drive - Rear
*29	8106721	-	-	1	-	-	-	-	-	GEAR .. Drive - Rear
*29	8084510	-	-	-	1	-	-	-	-	GEAR .. Drive - Rear
†29	8029522	-	-	-	-	1	-	-	-	GEAR .. Drive - Rear - Not available - Use 8485963
*29	8485963	-	-	-	-	-	1	-	-	GEAR .. Drive - Rear
*†29	8360544	-	-	-	-	-	-	1	-	GEAR .. Drive - Rear - Not available - Use 8485960
*29	8485960	-	-	-	-	-	-	-	1	GEAR .. Drive - Rear
30	8029531	1	1	-	-	-	-	-	-	GEAR .. Drive - Front
*30	8029037	-	-	1	-	-	-	-	-	GEAR .. Drive - Front
*30	8029533	-	-	-	1	-	-	-	-	GEAR .. Drive - Front
30	8252364	-	-	-	-	1	1	-	-	GEAR .. Drive - Front
*30	8360550	-	-	-	-	-	-	1	1	GEAR .. Drive - Front
†31	8029523	-	-	-	-	1	-	-	-	GEAR .. Drive - Center - Replaced by 9518047
*31	9518047	-	-	-	-	-	1	-	-	GEAR .. Drive - Center - Replaces 8485964 and 8029523
*†31	8360550	-	-	-	-	-	-	1	-	GEAR .. Drive - Center - For modified pump use 8485961
*31	8485961	-	-	-	-	-	-	-	1	GEAR .. Drive - Center - Formerly 8485962 gear assembly
32	117982	1	1	2	2	3	2	3	2	KEY .. Woodruff 3/8 x 1-1/4
33	112139	1	1	-	-	-	-	-	-	KEY .. Woodruff 1/4 x 7/8
*34	456713	-	-	-	-	-	2	-	2	PIN .. Slotted spring 3/8 x 1 inch long
35	8035625	1	1	1	1	1	1	1	1	GEAR .. Spur - 80 tooth - Pump drive
36	8028329	4	4	4	4	4	4	4	4	BOLT .. Drilled hex head 1/2-20 x 1-1/4
37	8458530	1	-	-	-	-	-	-	-	SLEEVE .. Driveshaft - Formerly required (2) - 8028880
37	8028880	-	1	1	1	1	1	-	-	SLEEVE .. Driveshaft
*37	8360542	-	-	-	-	-	-	1	1	SLEEVE .. Driveshaft
38	8081368	1	-	-	-	-	-	-	-	WASHER .. Special - 1-1/32 I.D. x 2-3/16 O.D. x 3/16
38	8384839	-	1	1	1	1	1	-	-	WASHER .. Special - 1-1/32 I.D. x 2-3/8 O.D. x 3/8
*38	8384840	-	-	-	-	-	-	1	1	WASHER .. Special - 1-5/32 I.D. x 2-15/32 O.D. x 3/8
39	8134735	1	1	1	1	1	1	-	-	NUT .. Hex lock 1-14
*39	8358553	-	-	-	-	-	-	1	1	NUT .. Hex lock 1-1/8-12
40	8081367	1	-	-	-	-	-	-	-	FLANGE .. Coupling
41	8081366	1	-	-	-	-	-	-	-	SHIELD .. Dust
42	9093702	1	-	-	-	-	-	-	-	SEAL .. O-ring
43	8221321	1	-	-	-	-	-	-	-	SEAL .. Oil
44	8029495	1	1	1	1	1	1	1	1	BOLT .. Special hex head 1/2-13 x 1-1/8 - Idler shaft locking
45	8029494	1	1	1	1	1	1	1	1	WASHER .. Copper 1/2
46	8116738	As Required								WIRE .. Lock - 3/64 diameter x 500 feet
47	8028313	1	1	1	1	1	1	-	-	BOLT .. Drilled hex head 3/8-16 x 1
*47	8041206	-	-	-	-	-	-	1	1	BOLT .. Drilled hex head 3/8-16 x 1-1/2
48	179839	2	4	4	4	4	4	-	-	BOLT .. Hex head 3/8-16 x 1
*48	179843	-	-	-	-	-	-	4	4	BOLT .. Hex head 3/8-16 x 1-1/2
49	179845	5	-	-	-	-	-	-	-	BOLT .. Hex head 3/8-16 x 1-3/4
49	179847	-	3	3	3	3	3	-	-	BOLT .. Hex head 3/8-16 x 2
*49	179848	-	-	-	-	-	-	3	3	BOLT .. Hex head 3/8-16 x 2-1/4

†See Note on Page 1.

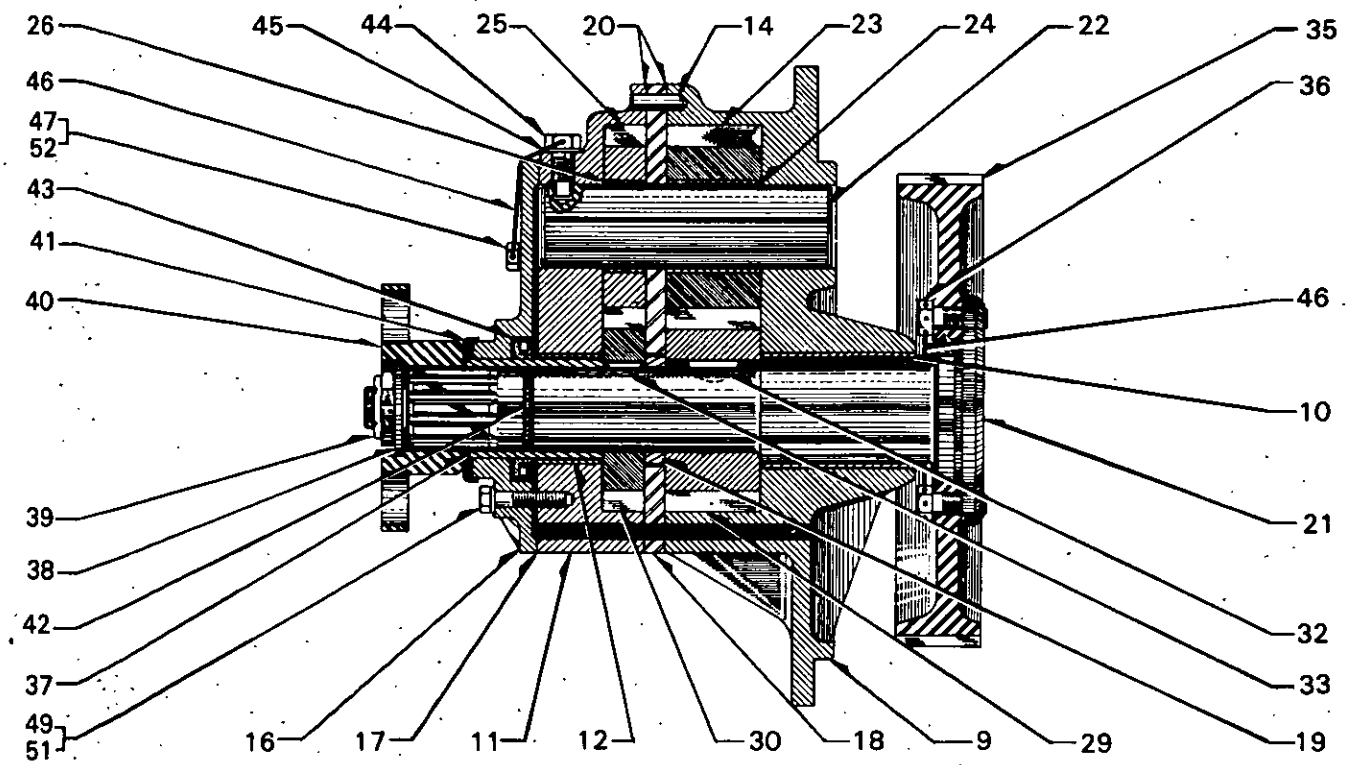
P.L. No. F138

PISTON COOLING AND PRESSURE PUMP

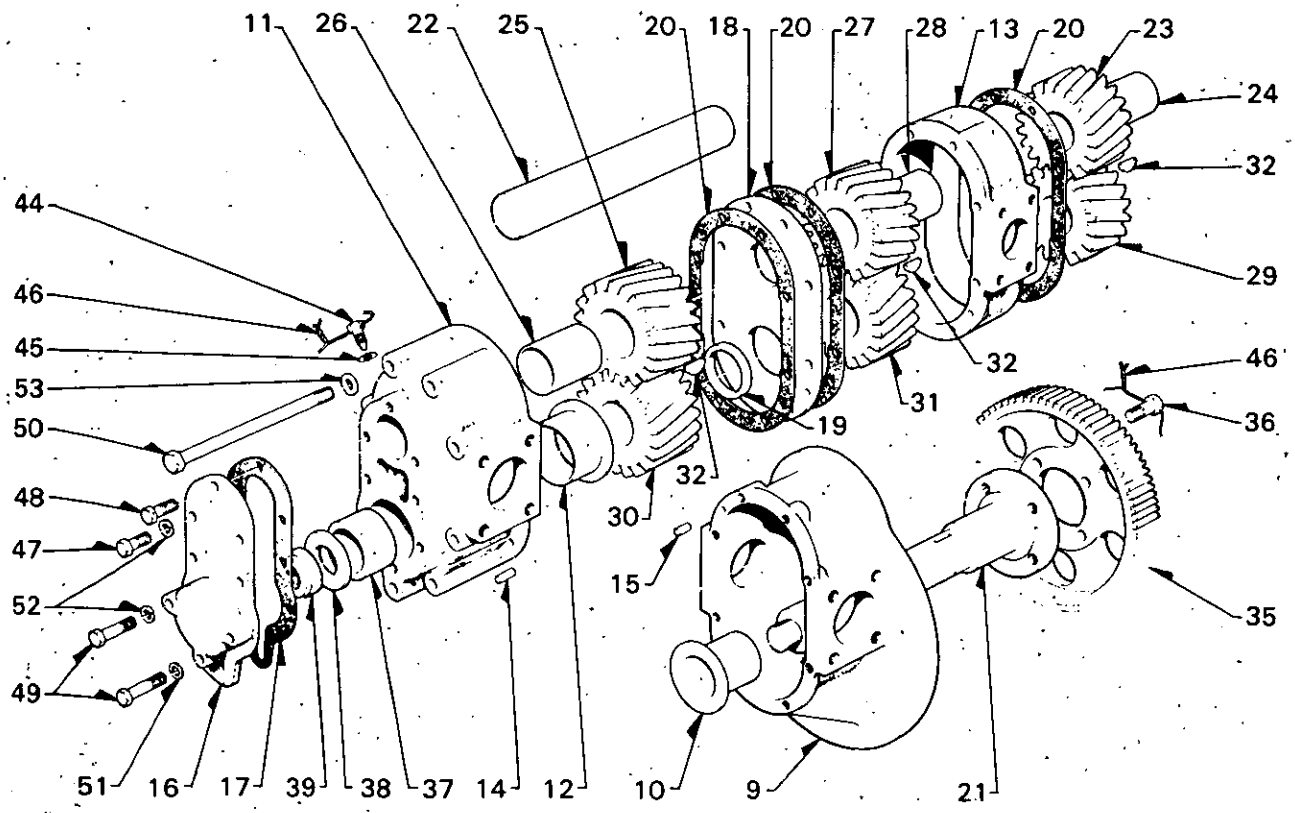
Ref. No.	Part Number	Quantity Required								Description
		A	B	C	D	E	F	G	H	PUMP ASSEMBLY .. Piston cooling and pressure
50	9412048	8	8	-	-	-	-	-	-	BOLT .. Hex head 1/2-13 x 2-7/8
*50	9412049	-	-	4	-	-	-	-	-	BOLT .. Hex head 1/2-13 x 3-1/8
*50	8028958	-	-	4	-	-	-	-	-	BOLT .. Hex head 1/2-13 x 3-7/8
*50	179896	-	-	-	4	-	-	-	-	BOLT .. Hex head 1/2-13 x 3-3/4
*50	179897	-	-	-	4	-	-	-	-	BOLT .. Hex head 1/2-13 x 4
50	8294379	-	-	-	-	8	8	-	-	BOLT .. Hex head 1/2-13 x 7-1/4
*50	190270	-	-	-	-	-	-	8	8	BOLT .. Hex head 1/2-13 x 4-1/4
51	8029142	1	1	1	1	1	1	1	1	WASHER .. Copper 3/8
52	103321	7	7	6	7	-	-	-	-	WASHER .. Lock 3/8
52	6101225	-	-	-	-	7	7	7	7	WASHER .. Flat 3/8 - Ground
53	6101229	8	8	8	8	-	-	8	8	WASHER .. Flat 1/2 - Ground
53	8349503	-	-	-	-	8	8	-	-	WASHER .. Flat 1/2 - Cadmium plated
*54	8028264	1	1	1	1	1	1	1	1	GASKET .. Pump mounting
*55	181432	10	10	10	10	10	10	10	10	BOLT .. Hex head 1/2-20 x 1-5/8 - Pump mounting
*55	6101229	10	10	10	10	10	10	10	10	WASHER .. Flat 1/2 - Ground
*57	8261166	1	1	-	1	-	-	-	-	KIT .. Gasket change out - See Parts List No. 199
*57	8210023	-	-	1	-	-	-	-	-	KIT .. Gasket change out - See Parts List No. 199
*57	8306356	-	-	-	-	1	1	-	-	KIT .. Gasket change out - See Parts List No. 199
*57	8375381	-	-	-	-	-	-	1	1	KIT .. Gasket change out - See Parts List No. 199

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PISTON COOLING AND PRESSURE PUMP



Ref. No. 1



Ref. No. 5

PLATE F138-1

Parts List No. F140

LUBE OIL SCAVENGING PUMP

Lube Oil Scavenging Pump Assembly
All 567D and 645 Engines
PLATE B140-1

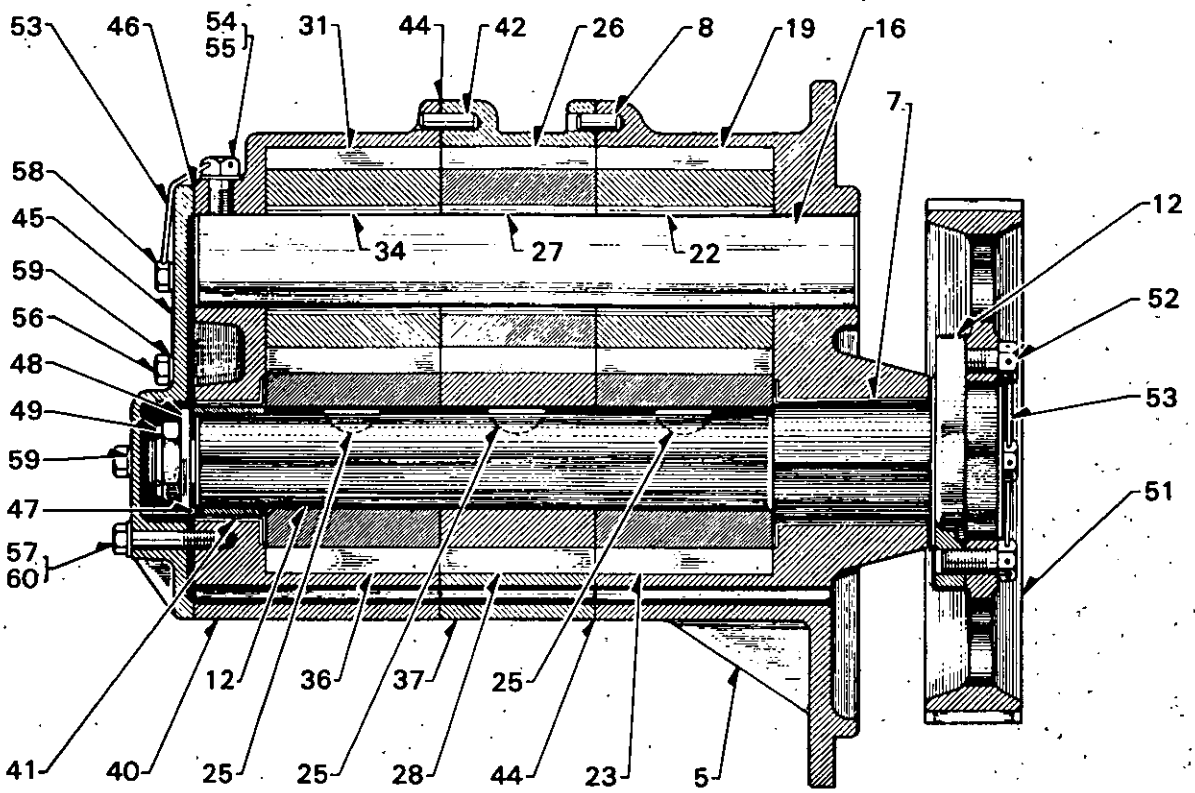
Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E engine
		-	B	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	C	-	12-645E3,E3B,E3C,F3,F3B; 16-567D1 and 16-645E engines
		-	-	-	D	16-567D2,D3,D3A; 16-645E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B engines
*1	8042376	1	-	-	-	PUMP ASSEMBLY .. Lube oil scavenging - UTEX Part No. 8122883
*2	8041928	-	1	-	-	PUMP ASSEMBLY .. Lube oil scavenging - UTEX Part No. 8122885
*3	8042375	-	-	1	-	PUMP ASSEMBLY .. Lube oil scavenging - UTEX Part No. 8122886
4	8262903	-	-	-	1	PUMP ASSEMBLY .. Lube oil scavenging - UTEX Part No. 8296459
5	8029460	1	-	1	1	BODY ASSEMBLY .. Pump - Rear
*6	8029458	-	1	-	-	BODY ASSEMBLY .. Pump - Rear
7	8039667	1	1	1	1	BUSHING .. Oil pump housing
8	8028366	2	2	2	2	PIN .. Dowel 3/8 x 7/8 inch long - Column "D" - Quantity of 4 required - After August, 1968
*9	8029556	1	-	-	-	SHAFT .. Pump drive
*10	8029553	-	1	-	-	SHAFT .. Pump drive
*11	8029566	-	-	1	-	SHAFT .. Pump drive
12	8251762	-	-	-	1	SHAFT .. Pump drive
*13	8029503	1	-	-	-	SHAFT .. Pump idler
*14	8029496	-	1	-	-	SHAFT .. Pump idler
*15	8029511	-	-	1	-	SHAFT .. Pump idler
16	8251763	-	-	-	1	SHAFT .. Pump idler
*17	8029462	1	-	1	-	GEAR ASSEMBLY .. Driven - Rear
*18	8028868	-	1	-	-	GEAR ASSEMBLY .. Driven - Rear
19	8341918	-	-	-	1	GEAR ASSEMBLY .. Driven - Rear
*20	8029461	1	-	1	-	BUSHING .. Driven gear
*21	8028883	-	1	-	-	BUSHING .. Driven gear
22	8340485	-	-	-	1	BUSHING .. Driven gear
23	8029529	1	-	1	1	GEAR .. Drive - Rear
*24	8029522	-	1	-	-	GEAR .. Drive - Rear
25	117982	1	2	2	3	KEY .. Woodruff 3/8 x 1-1/4
26	8341917	-	-	-	1	GEAR ASSEMBLY .. Driven - Center
27	8340484	-	-	-	1	BUSHING .. Driven gear
28	8106721	-	-	-	1	GEAR .. Drive - Center
*29	8028972	-	1	-	-	GEAR ASSEMBLY .. Driven - Front
*30	8029513	-	-	1	-	GEAR ASSEMBLY .. Driven - Front
31	8341916	-	-	-	1	GEAR ASSEMBLY .. Driven - Front
*32	8028883	-	1	-	-	BUSHING .. Driven gear
*33	8029461	-	-	1	-	BUSHING .. Driven gear
34	8340485	-	-	-	1	BUSHING .. Driven gear
*35	9518047	-	1	-	-	GEAR .. Drive - Front - Replaces 8029523
36	8029547	-	-	1	1	GEAR .. Drive - Front
37	8251625	-	-	-	1	BODY ASSEMBLY .. Pump - Center
*38	8029527	1	-	-	-	BODY ASSEMBLY .. Pump - Front
*39	8029459	-	1	-	-	BODY ASSEMBLY .. Pump - Front
ϕ40	8029512	-	-	1	1	BODY ASSEMBLY .. Pump - Front
ϕ40	9533173	-	-	-	1	BODY ASSEMBLY .. Pump - Front - After April, 1982
41	8039669	1	1	1	1	BUSHING .. Pump - Front body
42	8029144	-	-	-	2	PIN .. Dowel 3/8 x 1-1/4 inches long - Not applied after August, 1968
*43	8029034	1	1	1	-	GASKET .. Front body mounting
44	8262754	-	-	-	2	GASKET .. Front and rear body mounting
45	8029562	1	1	1	1	COVER .. Oil pump - Front
46	8029498	1	1	1	1	GASKET .. Cover
47	8028880	1	1	1	1	SLEEVE .. Drive shaft
48	8384839	1	1	1	1	WASHER .. Plain - 1-1/32 I.D. x 2-3/8 O.D. x 3/8 thick - Formerly 8029141
49	8134735	1	1	1	1	NUT .. Hex lock 1-14 - Formerly 8029139
*50	103388	1	1	1	1	PIN .. Cotter 1/8 x 1-3/4 inches long - Formerly used when 8029139 nut was applied - No longer required with lock nut 8134735 Ref. No. 49
51	8035625	1	1	1	1	GEAR .. Pump drive - Spur - 80 tooth

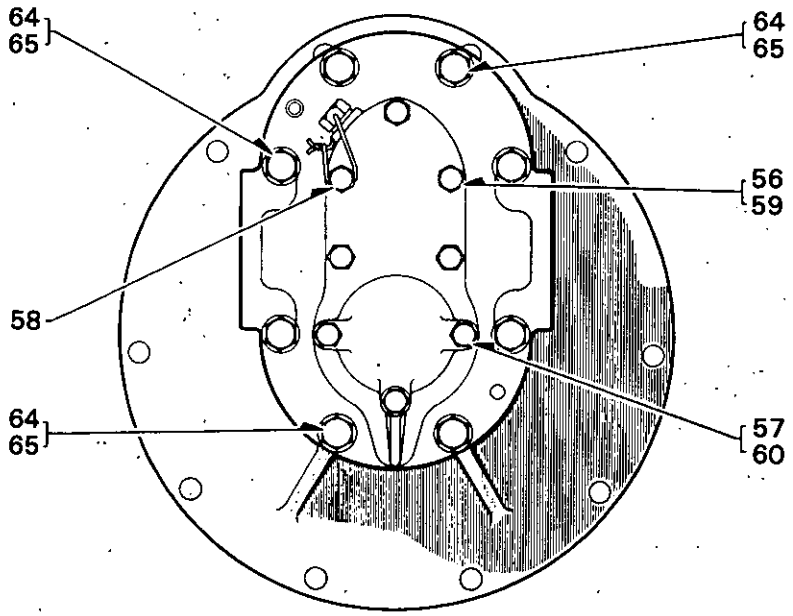
P.L. No. F140

LUBE OIL SCAVENGING PUMP

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engine
		-	B	-	-	8-645E3B,E3C,F3B and 12-645E engines
		-	-	C	-	12-645E3,E3B,E3C,F3,F3B; 16-567D1 and 16-645E engines
		-	-	-	D	16-567D2,D3,D3A; 16-645E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B engines
	8042376	1	-	-	-	PUMP ASSEMBLY .. Lube oil scavenging
	8041928	-	1	-	-	PUMP ASSEMBLY .. Lube oil scavenging
	8042375	-	-	1	-	PUMP ASSEMBLY .. Lube oil scavenging
	8262903	-	-	-	1	PUMP ASSEMBLY .. Lube oil scavenging
52	8028329	4	4	4	4	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Gear to shaft
53	8116738	As Required				WIRE .. Lock 3/64 diameter - Available 500 foot length
54	8029495	1	1	1	1	SCREW .. Drilled hex head set 1/2-13 x 1-1/8
55	8029494	1	1	1	1	WASHER .. Plain 17/32 I.D. x 13/16 O.D. x 1/16 thick - Copper
56	179839	4	4	4	4	BOLT .. Hex head 3/8-16 x 1
57	179847	3	3	3	3	BOLT .. Hex head 3/8-16 x 2
58	8028313	1	1	1	1	BOLT .. Drilled hex head 3/8-16 x 1
59	103321	7	7	7	7	WASHER .. Lock 3/8
60	8029142	1	1	1	1	WASHER .. Plain 3/8
*61	179884	8	-	-	-	BOLT .. Hex head 1/2-13 x 1-3/8
*62	8028956	-	8	-	-	BOLT .. Hex head 1/2-13 x 4-1/8
*63	187152	-	-	8	-	BOLT .. Hex head 1/2-13 x 5
64	9424959	-	-	-	8	BOLT .. Hex head 1/2-13 x 8-3/8
65	6101229	8	8	8	8	WASHER .. Plain 1/2
*65A	9533276	-	-	-	8	RING .. Star tolerance - After April, 1982
*66	8028264	1	1	1	1	GASKET .. Pump mounting
*67	181432	10	10	10	10	BOLT .. Hex head 1/2-20 x 1-5/8
*68	6101229	10	10	10	10	WASHER .. Plain 1/2

LUBE OIL SCAVENGING PUMP



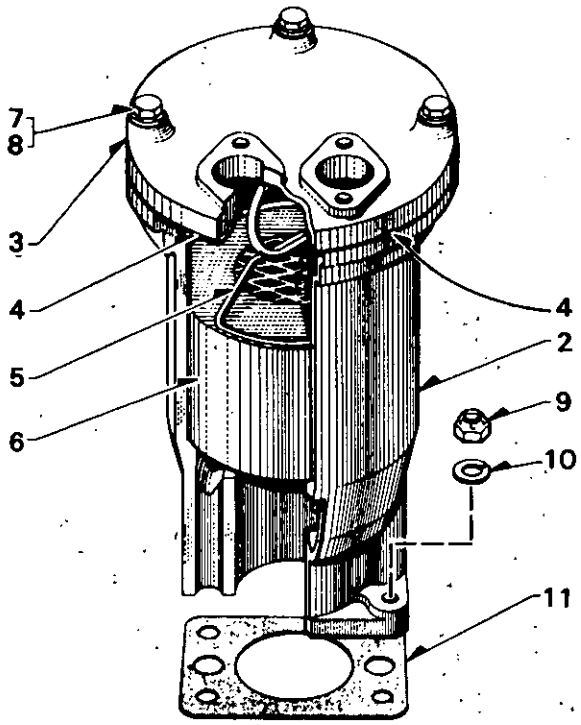


Ref. No. 4

PLATE B140-1

LUBE OIL SEPARATOR

16-567D1 and 8,12,16-645E Engines



Ref. No. 1

PLATE E142-1

Ref. No.	Part Number	Qty. Req.	Description
1	8173846	1	SEPARATOR ASSEMBLY .. Lube Oil
2	8173847	1	HOUSING .. Oil separator
3	8173849	1	COVER .. Oil separator
4	8173851	1	GASKET .. Housing cover
5	8173848	1	SPRING .. Filter holder
6	8173850	1	FILTER .. Oil
7	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4
8	115551	4	WASHER .. Lock 1/2
9	8032719	4	NUT .. Hex lock 1/2-20
10	6101229	4	WASHER .. Plain 1/2
11	8084670	1	GASKET .. Separator mounting

P.L. No. F142

LUBE OIL SEPARATOR

Low Profile Lube Oil Separator
8,12,16-645E Engines

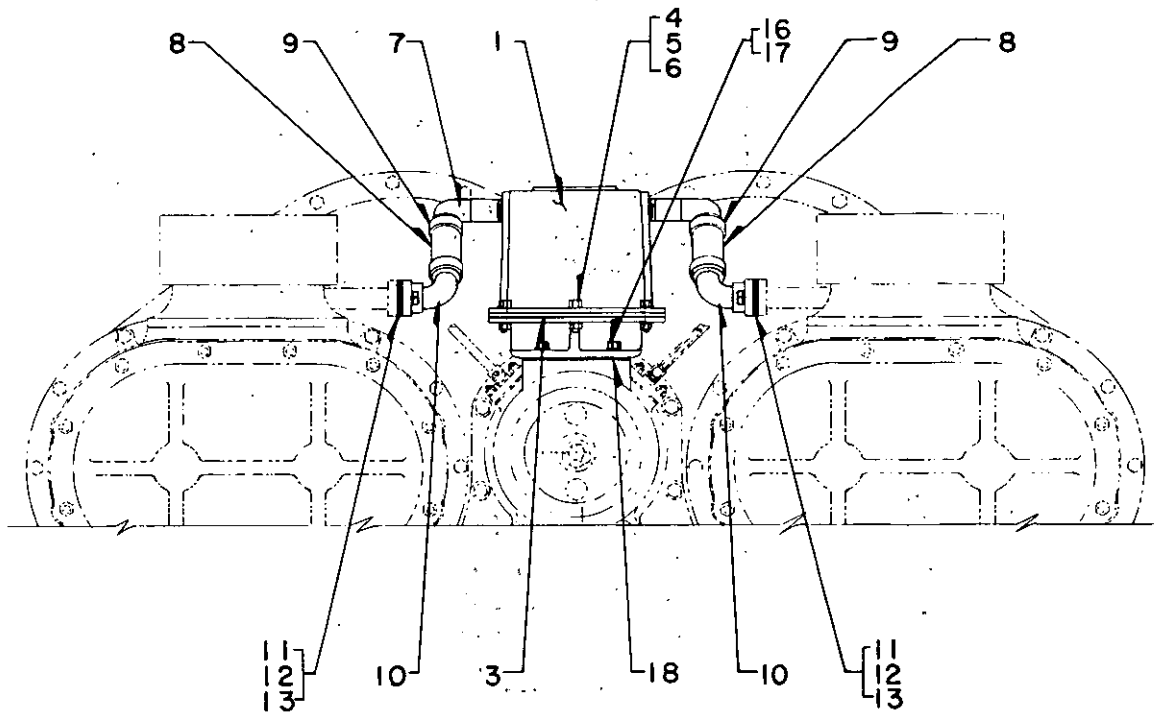


PLATE E142-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	8-645E engines
		-	B	12 and 16-645E engines
1	8431499	1	1	SEPARATOR ASSEMBLY .. Oil - low profile
*2	8498877	1	1	ELIMINATOR .. Oil - element
3	8498876	2	2	GASKET .. Cover
4	120918	6	6	BOLT .. Hex head 3/8-16 x 1-1/2 - Cover mounting
5	273589	6	6	WASHER .. Lock 3/8
6	193228	6	6	NUT .. Hex 3/8-16
7	9316974	1	-	ELBOW .. Oil separator
7	8432170	-	2	ELBOW .. Oil separator
8	8040171	A.R.		HOSE .. Rubber - 36 inch long - Cut to size - Replaces 8432322
9	8048967	2	4	CLAMP .. Hose
10	8432171	1	2	ELBOW .. Swivel flange
11	9571659	-	4	GASKET .. Orifice plate
12	8407198	-	2	ORIFICE PLATE .. 11/16 dia. hole - Formerly 8436986 - 5/8 dia. hole
13	8306502	1	2	GASKET .. Elbow to orifice plate and filter pipe flange - 1.57 I.D. x 1.938 O.D.
14	179885	2	-	BOLT .. Hex head 1/2-13 x 1-1/2 - Elbow mounting
14	181431	-	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Elbow mounting
15	6101229	2	4	WASHER .. Flat 1/2
16	8032719	4	4	NUT .. Hex lock 1/2-20
17	610229	4	4	WASHER .. Flat 1/2
18	8084670	1	1	GASKET .. Separator mounting

P.L. No. F142

LUBE OIL SEPARATOR

12,16,20-645E3,E3B and 16-645E3A,E3C,F3,F3B Engines

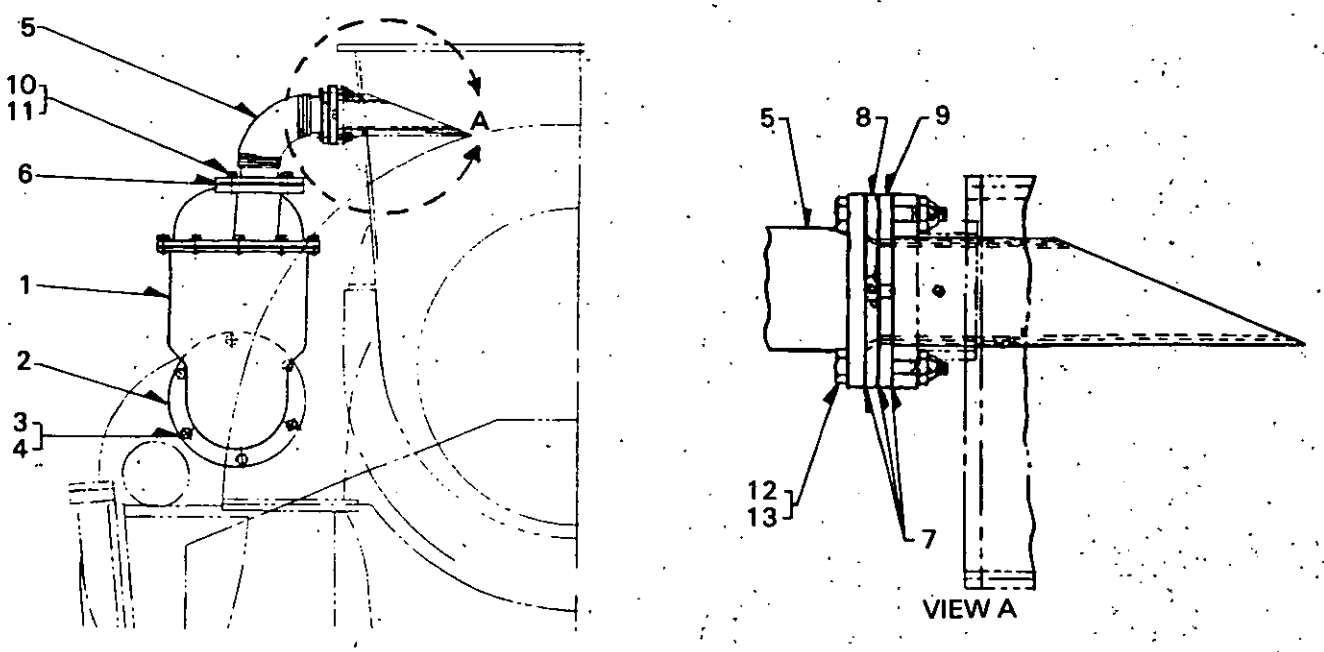


PLATE C142-3

Ref. No.	Part Number	Qty. Req.	Description
			The following lube oil separator application includes the two piece eductor tube arrangement. Prior applications, which featured oil separator 8332584, can be converted to this current design with kit 8453258. refer to M.I. 9576.
1	8448163	1	SEPARATOR ASM. .. Oil - Replaces 8332584 - See Page 12 for service parts
2	8028760	1	GASKET .. Separator mounting
3	179885	6	BOLT .. Hex head 1/2-13 x 1-1/2
4	6101229	6	WASHER .. Flat 1/2
5	8295836	1	ELBOW .. Flexible
6	8306958	1	GASKET .. Elbow to separator
7	8271729	3	GASKET .. Eductor tube
8	9502412	1	TUBE .. Eductor - Inner } Replaces 8448342 - Tube Asm.
9	9502409	1	TUBE .. Eductor - Outer
10	179839	4	BOLT .. Hex head 3/8-16 x 1
11	6101225	4	WASHER .. Flat 3/8
12	181380	4	BOLT .. Hex head 3/8-24 x 2 - Formerly 181379
13	8289127	4	NUT .. Hex lock 3/8-24

9502408

P.L. No. F142

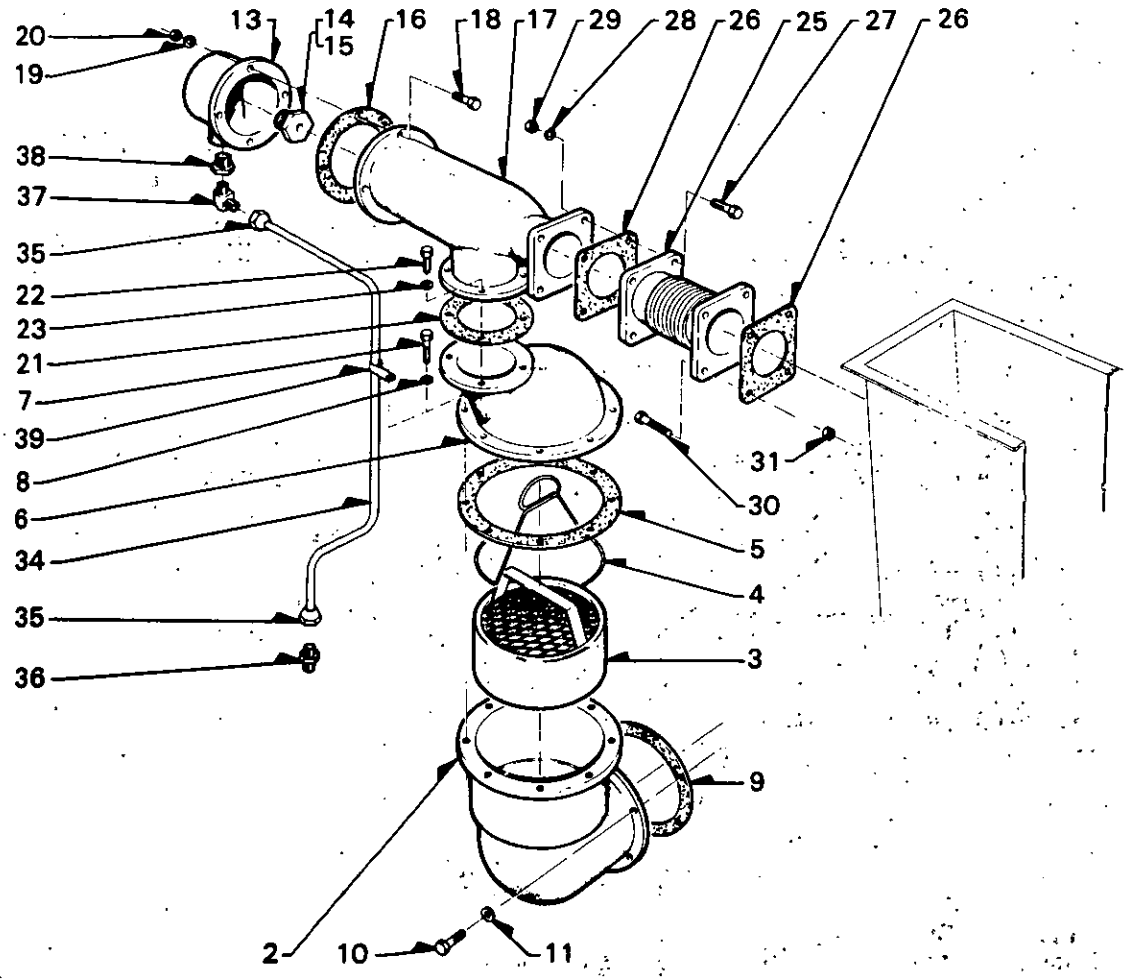
LUBE OIL SEPARATOR

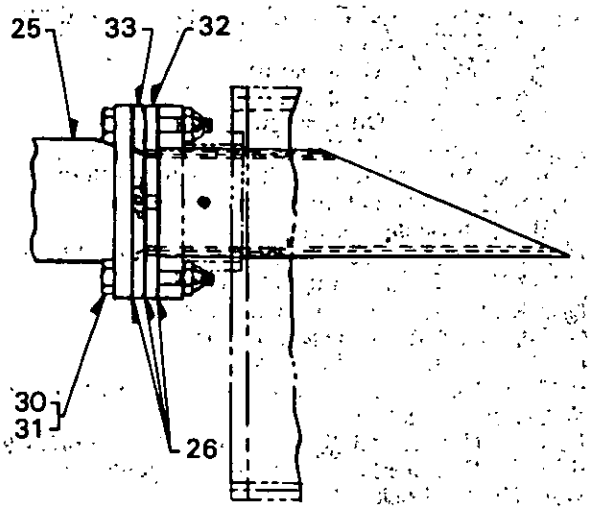
Lube Oil Separator, Ejector, and Eductor Tube Application
8-645E3B,E3C,F3B; 12-645E3,E3B,E3C,F3,F3B and 16-645E3,E3A,E3B,E3C,F3,F3B Engines
PLATE C142-4

Ref. No.	Part Number	Qty. Req.	Description
1	8448163	1	SEPARATOR ASSEMBLY .. Lube oil - Replaces 8332584
2	8335768	1	HOUSING .. Separator
3	8448162	1	ELEMENT .. Separator
4	8453237	1	SPRING .. Element securing
5	8335770	1	GASKET .. Cover
6	8448164	1	COVER .. Separator
7	9415838	8	BOLT .. Hex head 3/8-16 x 1
8	120382	8	WASHER .. Lock 3/8
9	8028760	1	GASKET .. Separator mounting
10	179885	6	BOLT .. Hex head 1/2-13 x 1-1/2
11	6101229	6	WASHER .. Flat 1/2
12	8341909	1	EJECTOR ASSEMBLY .. Lube oil
13	8349293	1	END .. Ejector
14	8349291	1	NOZZLE .. Ejector
15	138517	1	WASHER .. Lock - Nozzle
16	8348835	1	GASKET .. End to chamber
17	8349292	1	CHAMBER .. Ejector
18	9415840	4	BOLT .. Hex head 3/8-16 x 1-1/4
19	120382	4	WASHER .. Lock 3/8
20	120377	4	NUT .. Hex 3/8-16
21	8306958	1	GASKET .. Ejector mounting
22	179841	4	BOLT .. Hex head 3/8-16 x 1-1/4 - For ejectors mounted perpendicular to Exhaust duct
22	179843	4	BOLT .. Hex head 3/8-16 x 1-1/2 - For ejectors mounted parallel to Exhaust duct
23	6101225	4	WASHER .. Flat 3/8
*24	9081771	1	PIPE ASM. .. Flanged - 90° - Applied between ejector and flexible Connection (parallel mounted ejectors only)
25	9085573	1	CONNECTION .. Flexible - 4.62 inches long
26	8271729	5	GASKET .. Flexible connection and eductor tubes
27	179841	4	BOLT .. Hex head 3/8-16 x 1-1/4 (perpendicular ejectors)
27	198842	8	BOLT .. Hex head 3/8-16 x 1-1/2 (parallel ejectors)
28	6101225	A.R.	WASHER .. Flat 3/8
29	102365	A.R.	NUT .. Hex 3/8-16
30	181380	4	BOLT .. Hex 3/8-24 x 2-1/4
31	8289127	4	NUT .. Lock 3/8-24
32	9502409	1	TUBE ASSEMBLY .. Eductor - Outer
33	9502412	1	TUBE ASSEMBLY .. Eductor - Inner
ϕ34	8098595	A.R.	TUBING .. Steel - Copper brazed - 1/2 O.D. x 20 ft. (8 and 12 cylinder engs.)
ϕ34	9515831	A.R.	TUBING .. Steel - Copper brazed 5/8 O.D. - Sold by the foot (16 cyl. engs.)
ϕ35	120141	2	NUT .. Tube 1/2
ϕ35	144308	2	NUT .. Tube 5/8
ϕ36	8078165	1	NIPPLE .. 3/8 x 2
ϕ36	8088722	1	NIPPLE .. 1/2 x 2
ϕ36	8040321	1	CONNECTOR .. 5/8 tube x 3/8 MPT
ϕ37	120142	1	ELBOW .. 90° - 1/2 tube x 3/8 FPT
ϕ37	118757	1	ELBOW .. 90° - 1/2 tube x 3/8 MPT
ϕ37	144283	1	ELBOW .. 90° - 5/8 tube x 1/2 FPT
ϕ37	109429	1	ELBOW .. 90° - 5/8 tube x 1/2 MPT
ϕ37	8027437	1	ELBOW .. 90° - 1/2 tube x 1/2 MPT
ϕ38	189064	2	BUSHING .. Reducing - 1 MPT x 3/8 FPT
ϕ38	189065	2	BUSHING .. Reducing - 1 MPT x 1/2 FPT
39	8449628	1	CLIP .. Tube

9081891, 9320094, 9530339, 9097821, 9530232, 9559688

LUBE OIL SEPARATOR





(Perpendicular Mounted Lube Oil Ejector)

PLATE C142-4

P.L. No. F142

LUBE OIL SEPARATOR
16-567D2,D3 Engines

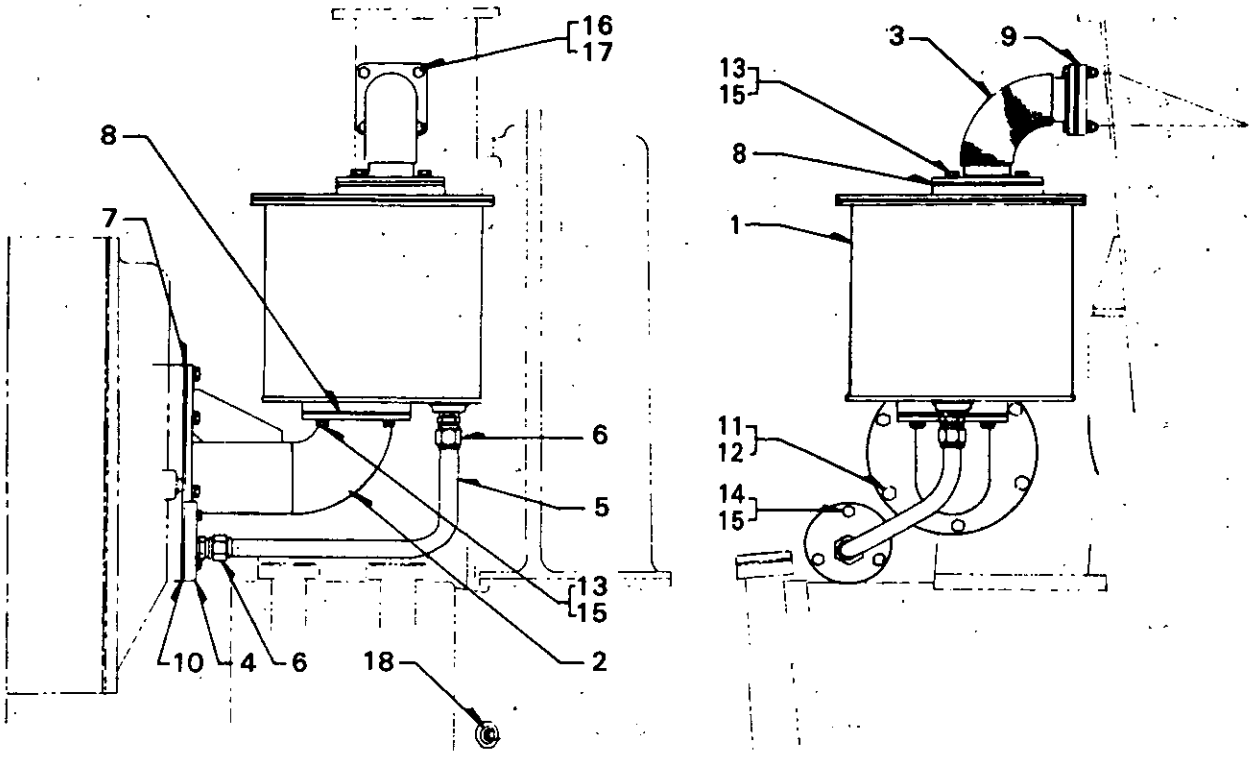


PLATE C142-5

Ref. No.	Part Number	Qty. Req.	Description

The following separator application was discontinued in May, 1963. Please check engine before ordering service parts.

1	8287892	1	SEPARATOR ASSEMBLY .. Oil - Replaced by 8448163 - See Page 4
*1A	8306146	2	GASKET .. Cover
*1B	8285537	1	ELEMENT .. Oil separator
*1C	8306812	1	COVER .. Oil separator
*1D	8291562	1	HOUSING .. Oil separator
2	8272325	1	ELBOW ASSEMBLY .. Oil separator inlet
3	8295836	1	ELBOW ASSEMBLY .. Oil separator outlet to ejector tube
4	8262485	1	FLANGE .. Drain elbow
5	8272334	1	TUBE .. Oil separator drain
6	8271104	2	UNION .. 1 inch tube x 1 inch MPT - Flexible
7	8028760	1	GASKET .. Flange - Inlet elbow
8	8306958	2	GASKET .. Elbow to oil separator
9	8271729	1	GASKET .. Elbow to ejector tube
10	8262488	1	GASKET .. Drain tube flange
11	179885	5	BOLT .. Hex head 1/2-13 x 1-1/2 - Elbow mounting
12	6101229	5	WASHER .. Flat 1/2
13	181361	8	BOLT .. Hex head 3/8-24 x 7/8 - Elbow to oil separator
14	179841	3	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange
15	103321	11	WASHER .. Lock 3/8
16	181374	4	BOLT .. Hex head 3/8-24 x 1-1/2 - Flange to ejector tube
17	8289127	4	NUT .. Hex lock 3/8-24
18	103868	1	PLUG .. Pipe 1/2
*19	138291	1	BOLT .. Hex head 1/2-13 x 1-1/2 - Elbow mounting

8289503C

LUBE OIL SEPARATOR

16-567D2 and D3 Engines
PLATE B142-6

Ref. No.	Part Number	Qty. Req.		Description
		A	-	OIL SEPARATOR APPLICATION - 16-567D2 engine
		-	B	OIL SEPARATOR APPLICATION - 16-567D3 engine

The following separator application was discontinued in February, 1960. Please check engine before ordering service parts.

SEPARATOR ASSEMBLY

1	8269563	1	1	SEPARATOR ASSEMBLY .. Lube oil - Replaced by 8448163
*1A	8285539	1	1	HOUSING .. Oil separator
*1B	8285537	1	1	FILTER .. Oil separator
*1C	8306146	1	1	GASKET .. Cover
*1D	8306813	1	1	COVER .. Oil separator

TUBE ASSEMBLY .. Ejector

2	8261274	1	1	TUBE ASSEMBLY .. Ejector

TUBE ASSEMBLY .. Nozzle

3	8261268	1	1	TUBE ASSEMBLY .. Nozzle
4	8261273	1	1	NOZZLE .. Ejector

ELBOW ASSEMBLY

5	8272325	1	1	ELBOW ASSEMBLY .. Oil separator inlet
6	8272326	1	1	ELBOW ASSEMBLY .. Oil separator outlet to ejector tube

FLANGE .. Ejector Tube

7	8263629	1	1	FLANGE .. Ejector tube
8	8272317	1	1	PLATE .. Cover
9	8262485	1	1	FLANGE .. Drain elbow

GASKET

10	8306958	3	3	GASKET .. Flange - Replaces 8261277
11	8271729	1	1	GASKET .. Cover plate
12	8028760	1	1	GASKET .. Flange - Inlet elbow
13	8262488	1	1	GASKET .. Drain tube
14	8261276	1	1	GASKET .. Flange

TUBE ASSEMBLY .. Drain

15	8272334	1	1	TUBE ASSEMBLY .. Oil separator drain
16	8027437	1	1	ELBOW .. 1/2 tube x 1/2 MPT
17	8040341	1	1	ELBOW .. 1/2 tube x 1/4 MPT
18	8271104	2	2	UNION .. Flexible - 1 tube x 1 MPT - Incl. 8284874 rubber seal
19	8131053	-	1	CLAMP .. Tube
*19	8274601	1	-	CLAMP .. Tube
20	8272327	-	1	TUBE ASSEMBLY .. Oil separator - Can be made from 47-1/4 inches of 8098595 tubing and (2) 118541 tube nuts
*20	8273837	1	-	TUBE ASSEMBLY .. Oil separator - Can be made from 50 inches of 8098595 tubing and (2) 118541 tube nuts

8272324, 8281279

P.L. No. F142

LUBE OIL SEPARATOR

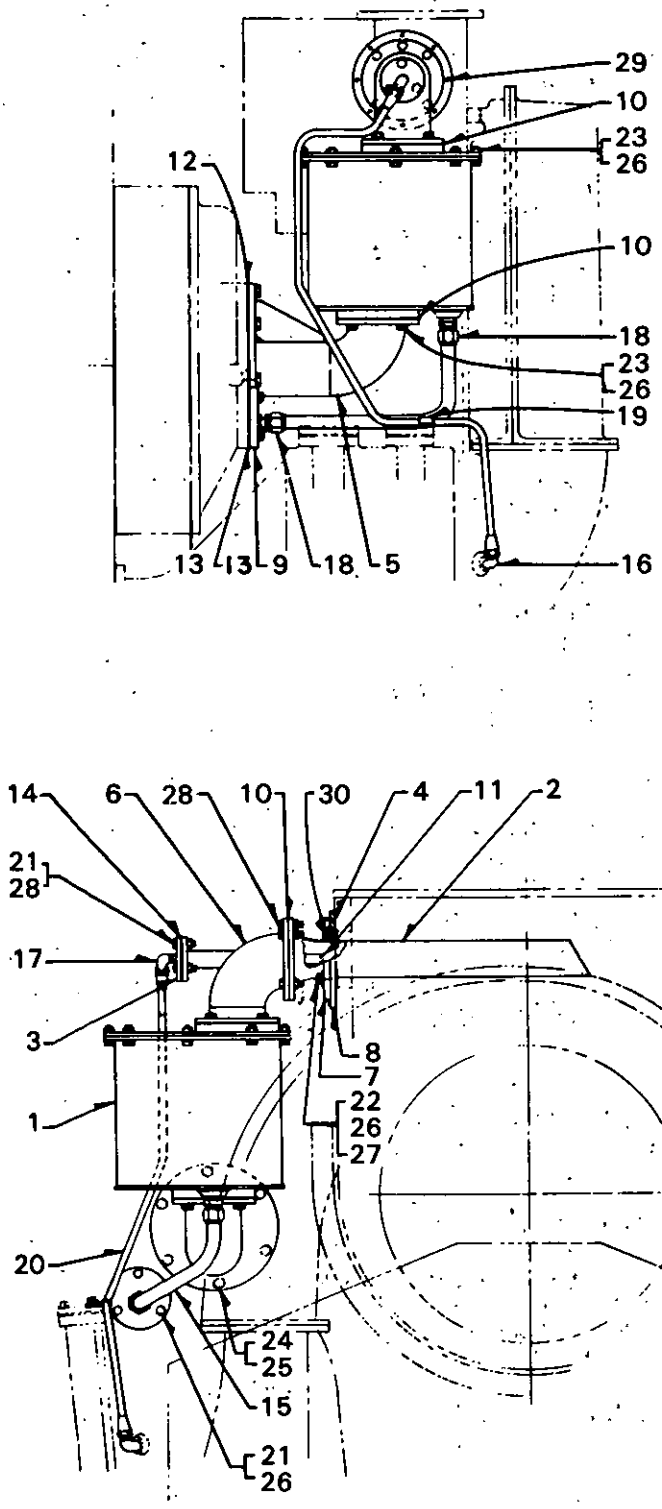
Ref. No.	Part Number	Qty. Req.		Description
		A	-	OIL SEPARATOR APPLICATION - 16-567D2 engine
		-	B	OIL SEPARATOR APPLICATION - 16-567D3 engine
21	179841	11	11	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange
22	181374	4	4	BOLT .. Hex head 3/8-24 x 1-1/2 - Flange
23	181361	8	8	BOLT .. Hex head 3/8-24 x 7/8 - Inlet elbow
24	179885	6	6	BOLT .. Hex head 1/2-13 x 1-1/2 - Flange
25	103321	6	6	WASHER .. Lock 1/2
26	103321	15	15	WASHER .. Lock 3/8
27	8270912	4	4	WASHER .. Special
28	442813	8	8	NUT .. Hex 3/8-16
29	171356	8	8	SCREW .. 8-32 self-tapping
30	8133641	A.R.		ROPE .. Asbestos - 1/4 braided - 10 inches required - Available 10 lb. spool
31	179795	1	-	BOLT .. Hex head 1/4-20 x 3/4
32	109084	1	-	NUT .. Hex 1/4-20
33	103319	1	-	WASHER .. Lock 1/4

The ejector tube was redesigned on GP20 and SD24 locomotives built after October, 1959. Consequently the following items are eliminated providing Ref. No. 2 ejector tube has been replaced with 8288803, ejector tube assembly and exhaust stack 8280863 has been replaced by 8289178 stack assembly.

Ref. No. 3 Tube Assembly - 8261268
Ref. No. 4 Nozzle .. Ejector - 8261273
Ref. No. 16 Elbow - 8027437
Ref. No. 17 Elbow - 8040341
Ref. No. 19 Clamp - 8131053 - 16-567D3 engine
Ref. No. 20 Tube Assembly - 8272327 - 16-567D3 engine
Ref. No. 20 Tube Assembly - 8273837 - 16-567D2 engine

P.L. No. F142

LUBE OIL SEPARATOR



Lube Oil Separator

PLATE B142-6

P.L. No. F142

LUBE OIL SEPARATOR
16-567D3 Engine
PLATE B 142-7

Ref. No.	Part Number	Qty. Req.	Description

NOTE: Some early model SD24 locomotives were equipped with the following oil separator application. Check engine before ordering replacement parts.

SEPARATOR ASSEMBLY

1	8262079	1	SEPARATOR ASSEMBLY .. Oil
2	8306958	1	GASKET .. Oil separator flange - Replaces 8262177
3	8263628	1	GASKET .. Oil separator flange
4	179838	4	BOLT .. Hex head 3/8-16 x 7/8 - Flange
5	103321	4	WASHER .. Lock 3/8

BRACKET ASSEMBLY

6	8262159	1	BRACKET ASSEMBLY .. Oil separator
7	179883	3	BOLT .. Hex head 1/2-13 x 1-1/4 - Bracket
8	103323	3	WASHER .. Lock 1/2
9	179841	4	BOLT .. Hex head 3/8-16 x 1-1/4 - Separator to bracket
10	442813	4	NUT .. Hex 3/8-16

TUBE ASSEMBLY .. Ejector

11	8261274	1	TUBE ASSEMBLY .. Ejector
12	8261273	1	NOZZLE .. Ejector
13	8261268	1	NOZZLE .. Tube assembly
14	179841	8	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange
15	442813	8	NUT .. Hex 3/8-16

FLANGE .. Ejector Tube Mounting

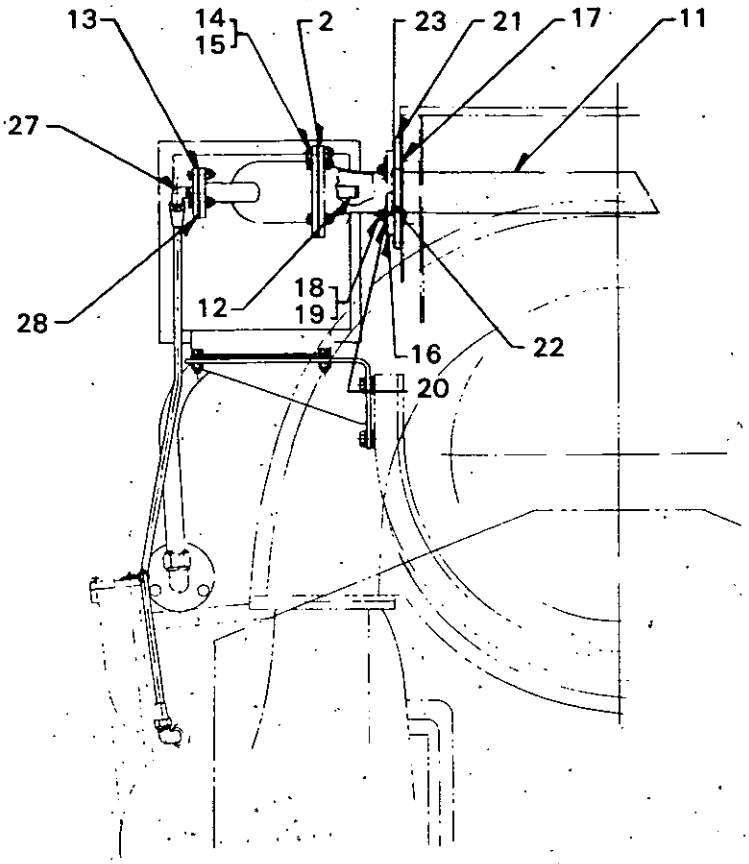
16	8263629	1	FLANGE .. Ejector tube mounting
17	8271729	1	GASKET .. Flange
18	181374	4	BOLT .. Hex head 3/8-24 x 1-1/2 - Flange
19	103321	4	WASHER .. Lock 3/8
20	8270912	4	WASHER .. Special - Formerly 8070912
21	8272317	1	PLATE .. Ejector nozzle
22	8283423	1	ROPE .. Asbestos - 1/4 braided - 9-1/4 inches required
23	171356	8	SCREW .. 8-32 self-tapping

TUBE ASSEMBLY

24	8263634	1	TUBE ASSEMBLY .. Oil separator
25	8027437	1	ELBOW .. 1/2 tube x 1/2 P.T.
26	8131053	1	CLAMP .. Tube
27	8040341	1	ELBOW .. 1/2 tube x 1/4 P.T.
28	8261276	1	GASKET .. Flange
29	8263631	1	TUBE .. Drain
30	8262879	2	ELBOW .. Drain tube to turbocharger
31	8262485	1	FLANGE .. Drain elbow
32	8262488	1	GASKET .. Flange
33	103869	1	PLUG .. Pipe 3/4
34	179841	3	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange
35	103321	3	WASHER .. Lock 3/8

8272318

LUBE OIL SEPARATOR



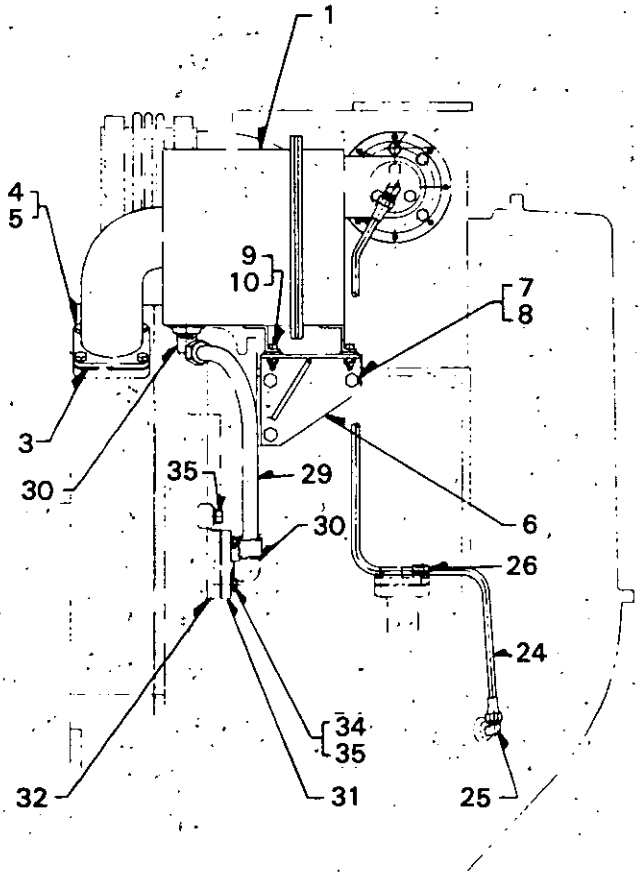


PLATE B142-7

P.L. No. F142

LUBE OIL SEPARATOR

16-567D2,D3,D3A; 12,16,20-645E3 and 16-645E3A Engines

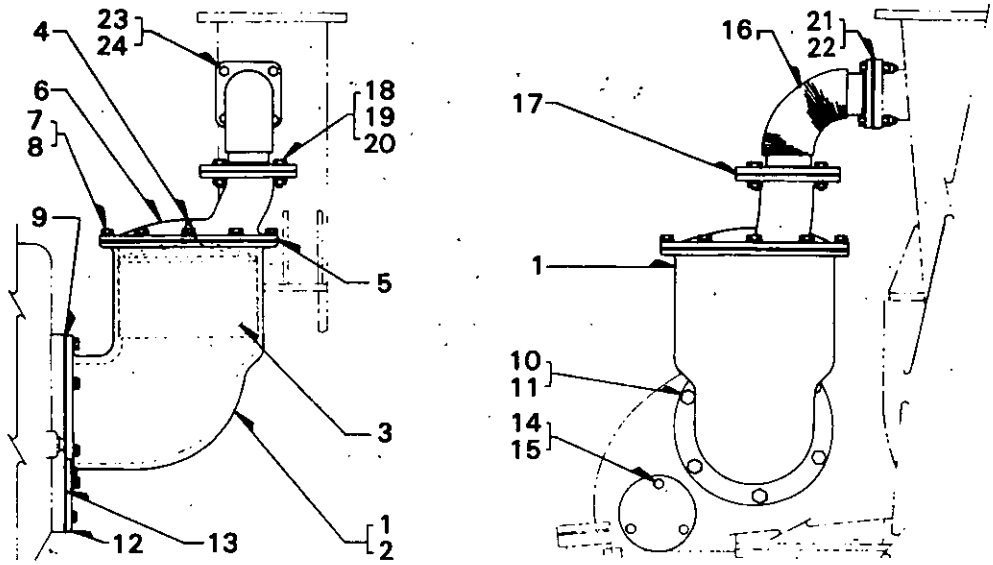


PLATE B142-8

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D2,D3,D3A; 12,16,16-645E3 and 16-645E3A engines
		-	B	20-645E3 engine

The following oil separator application was applied to previous production engines with the ejector tube as an integral part of the exhaust duct assembly. This system can be upgraded to the latest improved oil separator and two piece eductor tube by applying conversion kit 8453258. Refer to M.I. 9576 for specified details.

1	8332584	1	1	SEPARATOR ASSEMBLY .. Oil - Replaced by 8448163 - See Page 3
2	8335768	1	1	HOUSING .. Oil separator
3	8335767	1	1	ELEMENT .. Oil separator
4	8335766	1	1	SPRING .. Element
5	8335770	1	1	GASKET .. Cover
6	8335765	1	1	COVER .. Oil separator
7	9415838	8	8	BOLT .. Hex head 3/8-16 x 1 - Cover mounting
8	120382	8	8	WASHER .. Lock 3/8
9	8028760	1	1	GASKET .. Separator mounting
10	6101229	6	6	WASHER .. Flat 1/2
11	179885	6	6	BOLT .. Hex head 1/2-13 x 1-1/2 - Separator mounting
Reference numbers 12 thru 15 are not applicable after September, 1967.				
12	8271726	1	1	PLATE .. Cover
13	8262488	1	1	GASKET .. Cover plate mounting
14	179839	3	3	BOLT .. Hex head 3/8-16 x 1 - Cover plate mounting
15	103321	3	3	WASHER .. Lock 3/8
16	8295836	1	1	ELBOW ASSEMBLY .. Oil separator outlet to ejector tube
17	8306958	1	1	GASKET .. Oil separator to elbow
18	179843	4	4	BOLT .. Hex head 3/8-16 x 1-1/2 - Elbow to separator
19	103321	4	4	WASHER .. Lock 3/8
19	6101225	-	4	WASHER .. Flat 3/8 - Used in place of 103321 after February, 1968
20	102635	4	4	NUT .. Hex 3/8-16
21	8271729	1	2	GASKET .. Elbow to ejector tube - 2 req'd. with 8409003 orifice plate
22	8409003	-	1	PLATE .. Orifice - Applied after February, 1968
23	181374	4	4	BOLT .. Hex head 3/8-24 x 1-1/2 - Elbow to ejector tube
24	8289127	4	4	NUT .. Hex 3/8-24 - Lock
*25	103868	1	1	PLUG .. Pipe - 1/2 MPT - Not applied to 20 cyl. eng. after Feb., 1968

COOLING SYSTEM

Water Manifold Bracket Application
16-645E3,E3A,E3B,E3C,F3,F3B Engines

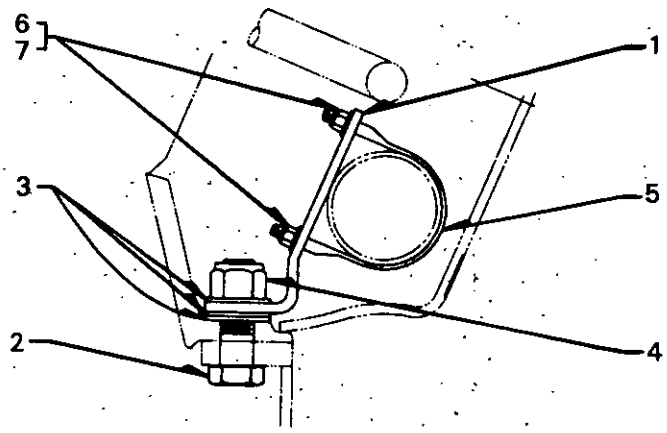


PLATE E144-1

Ref. No.	Part Number	Qty. Req.	Description
			This additional bracket support arrangement has been applied to 16-645 turbocharged engines since Februrary, 1977. The items listed below are also available as a kit for application to 16-645 turbocharged engines manufactured without this arrangement. Contact our Service Department for complete details. Quantities shown are for one engine assembly.
1	9312008	2	BRACKET .. Support - Water manifold
2	273045	2	BOLT .. Hex. head - 1-14 x 3-1/4
3	131019	6	WASHER .. Plain 1 inch
4	8032724	2	NUT .. Hex lock 1-14
5	8347343	2	STRAP .. Saddle
6	8032717	4	NUT .. Hex lock 3/8-24
7	103341	4	WASHER .. Plain 3/8
*8	9326240	1	KIT .. Water manifold support - Contains Ref. Nos. 1 thru 7 in the quantities shown - See Note above

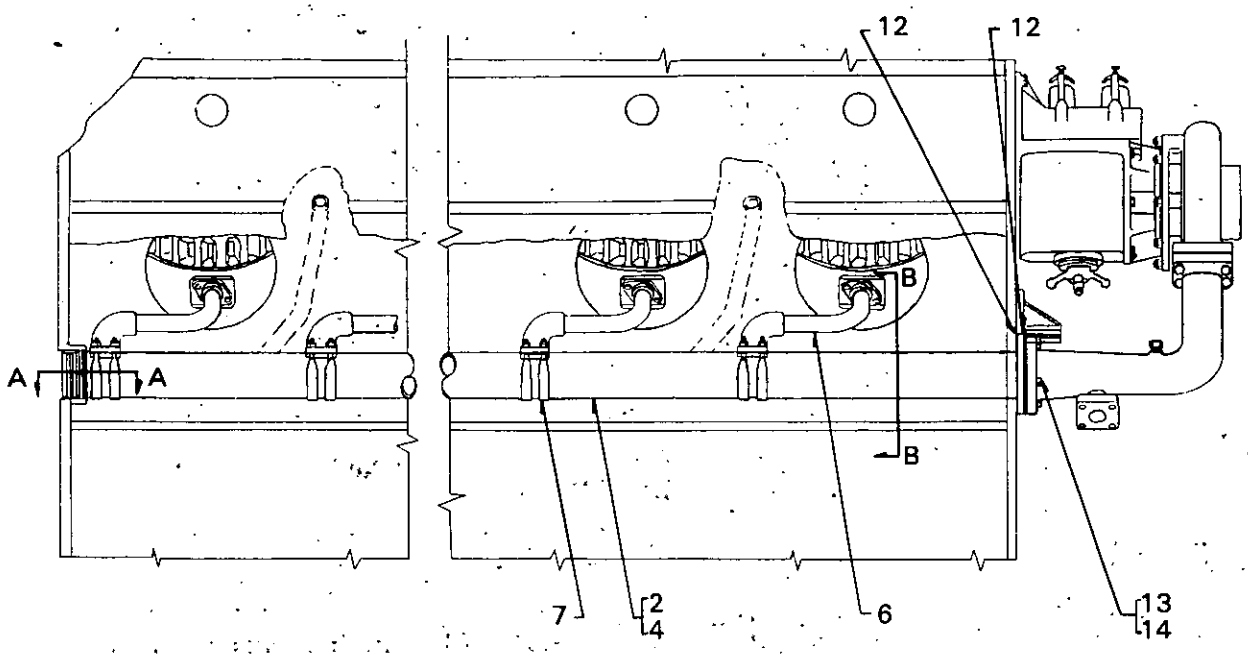
P.L. No. F144

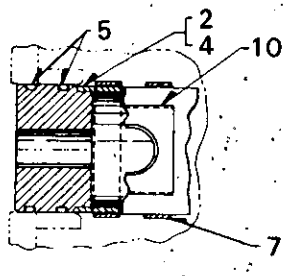
COOLING SYSTEM
Water Manifold Application
All 645 Engines
PLATE F144-2

Ref. No.	Part Number	Quantity Required					Description
		A	-	-	-	-	8-645E engines
		-	B	-	-	-	8-645E3B,E3C,F3B engines
		-	-	C	-	-	12-645E,E3,E3B,E3C,F3,F3B engines
		-	-	-	D	-	16-645E,E3,E3A,E3B,E3C,F3,F3B engines
		-	-	-	-	E	20-645E3,E3B engines
Current Design Manifold - With 3.370 In. Reduced Diameter Insert (Since June, 1971)							
*1	8461119	1	1	-	-	-	MANIFOLD .. Water
*1	8461121	-	-	1	-	-	MANIFOLD .. Water } Left Bank
*1	8441949	-	-	-	1	-	MANIFOLD .. Water
*1	8433303	-	-	-	-	1	MANIFOLD .. Water
2	8461118	1	1	-	-	-	MANIFOLD .. Water
2	8461120	-	-	1	-	-	MANIFOLD .. Water } Right Bank
2	8441950	-	-	-	1	-	MANIFOLD .. Water
2	8433304	-	-	-	-	1	MANIFOLD .. Water
Previous Design Manifold - With 3.557 In. Diameter Insert							
*3	8405965	1	-	-	-	-	MANIFOLD .. Water
*3	8368309	-	1	1	-	-	MANIFOLD .. Water } Left Bank
*3	8347147	-	-	-	1	-	MANIFOLD .. Water
*3	8360563	-	-	-	-	1	MANIFOLD .. Water
4	8405966	1	-	-	-	-	MANIFOLD .. Water
4	8368308	-	1	1	-	-	MANIFOLD .. Water } Right Bank
4	8347146	-	-	-	1	-	MANIFOLD .. Water
4	8360562	-	-	-	-	1	MANIFOLD .. Water
5	8433272	4	4	4	4	4	SEAL .. Water - Applied to 3.370 in. dia. manifold insert
5	8347415	4	4	4	4	4	SEAL .. Water - Applied to 3.557 in. dia. manifold insert
6	9093027	8	8	12	16	20	TUBE ASM. .. Water inlet - Replaces 8347340
†7	8347343	16	16	24	32	40	STRAP .. Saddle - (16 cyl. engines see Page 1 also)
8	8032717	32	32	48	64	80	NUT .. Hex lock 3/8-24
9	8226964	16	16	24	32	40	BOLT ASM. .. Includes lockwasher - 3/8-16 x 1-1/8
10	8142354	8	8	12	16	20	GASKET .. Manifold to water inlet tube
11	8305815	8	8	12	16	20	SEAL .. Cylinder liner to water inlet tube
12	8347416	4	4	4	4	4	GASKET .. Manifold to crankcase and inlet elbow
13	181436	8	8	8	8	8	BOLT .. Hex. head 1/2-20 x 2-1/4
14	6101229	8	8	8	8	8	WASHER .. Flat 1/2
*15	----	-	-	-	-	-	ELBOW .. Water outlet - See Parts List 106

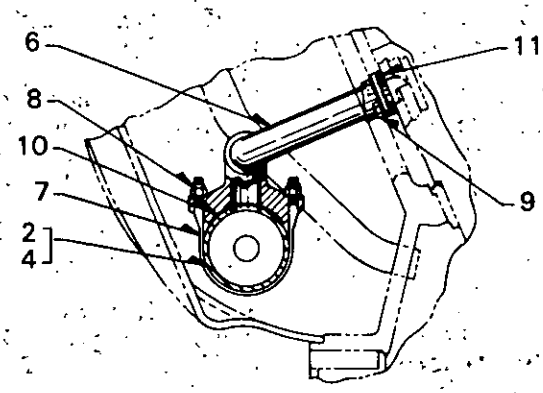
†16-645 turbocharged engines currently have additional manifold support applications - See Page 1.

COOLING SYSTEM





SECTION A-A



SECTION B-B

PLATE F144-2

P.L. No. F144

COOLING SYSTEM

Water Pump Application
8-645E Engines

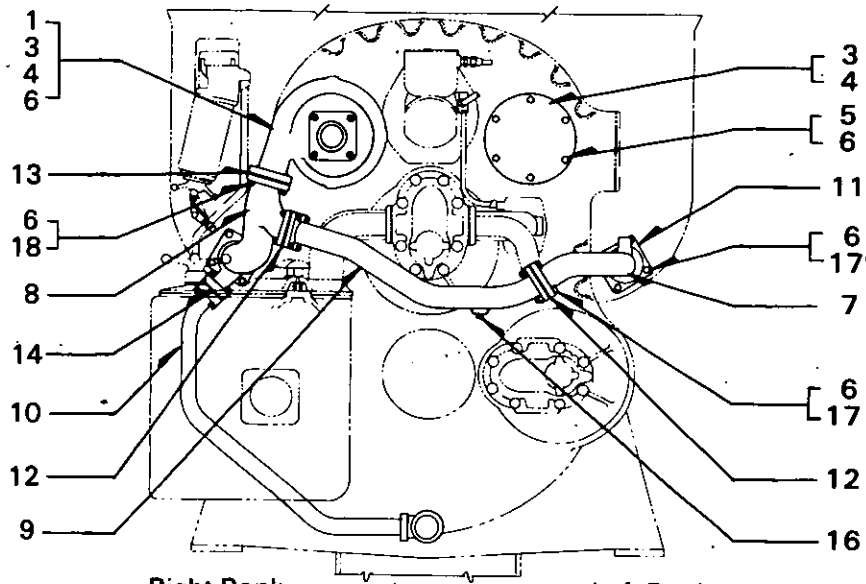


PLATE D144-3

Ref. No.	Part Number	Qty. Req.	Description
†1	8058625	1	PUMP ASSEMBLY .. Water
†1	9516120	1	PUMP ASSEMBLY .. Water - Engines with differential pressure engine protectors
2	8028338	1	COVER .. Blind
3	8028760	2	GASKET .. Pump and blind cover
4	181432	6	BOLT .. Hex head 1/2-20 x 1-5/8
5	181433	6	BOLT .. Hex head 1/2-20 x 1-3/4
6	6101229	32	WASHER .. Flat 1/2
7	8360474	1	ELBOW .. Water inlet - Left bank
7	8371301	1	ELBOW .. Water inlet - Left bank - Applied to units with an engine protector
8	8360379	1	ELBOW .. Water inlet - Right bank
9	8118419	1	PIPE .. Intermediate
10	8374053	1	PIPE .. Drain
11	8347416	2	GASKET .. Water inlet elbows to manifolds
12	8029163	2	GASKET .. Elbows to intermediate pipe
13	8029149	1	GASKET .. Elbow to pump
14	8029469	1	GASKET .. Drain pipe to elbow
*15	8268162	1	WELL .. Thermometer - Applied to Ref. No. 8
16	103868	1	PLUG .. Pipe - 1/2 MPT
17	181436	16	BOLT .. Hex head 1/2-20 x 2-1/4
18	179887	4	BOLT .. Hex head 1/2-13 x 1-3/4
19	8032719	8	NUT .. Hex lock 1/2-20
*20	8366787	1	GASKET .. Pump inlet

†*See Parts List No. 146 for water pump service parts.*

COOLING SYSTEM

Water Pump Application
8-645E3B,E3C,F3B Engines and
12,16-645E Engines With One Water Pump

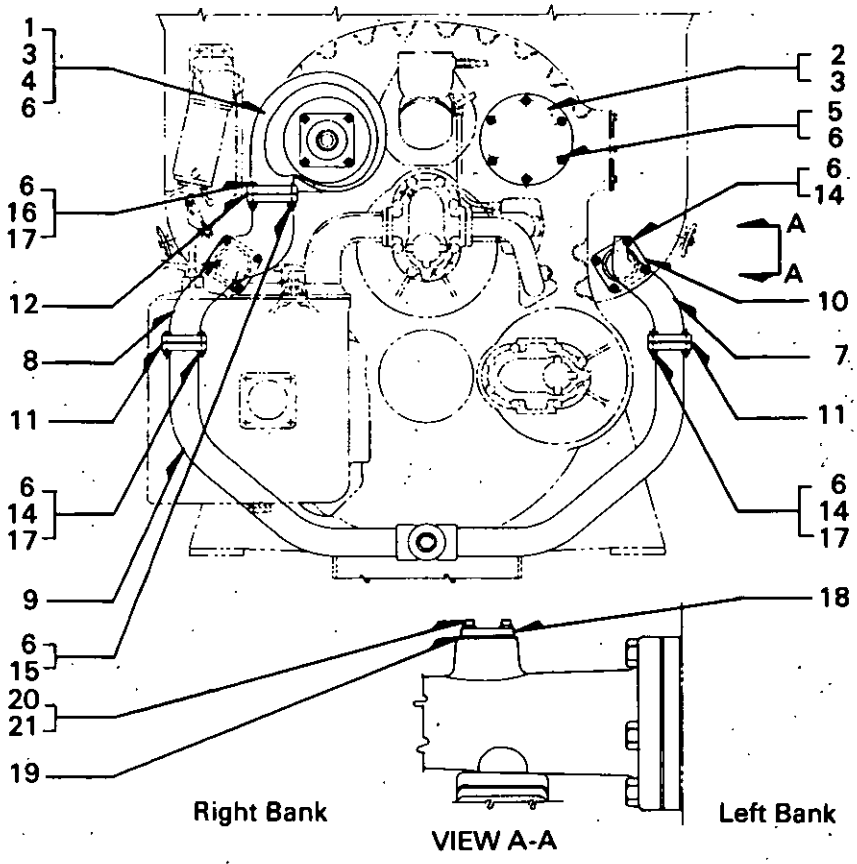


PLATE C144-4

Ref. No.	Part Number	Qty. Req.	Description
1	9530406	1	PUMP ASSEMBLY .. Water - Engines without differential pressure engine protectors - Replaces 8249002 - See P.L. No. 146
*1	9501979	1	PUMP ASSEMBLY .. Water - Engines with differential pressure engine protectors - See Parts List No. 146
2	8028338	1	COVER .. Blind
3	8028760	2	GASKET .. Pump and blind cover
4	181432	6	BOLT .. Hex head 1/2-20 x 1-5/8
5	181433	6	BOLT .. Hex head 1/2-20 x 1-3/4
6	6101229	32	WASHER .. Flat 1/2
7	8453936	1	ELBOW .. Water inlet - Left bank
8	8453995	1	ELBOW .. Water inlet - Right bank
9	8454328	1	PIPE .. Intermediate and water drain
10	8347416	2	GASKET .. Water inlet elbows to manifolds
11	8454337	2	GASKET .. Elbows to pipe
12	8347417	1	GASKET .. Elbow to pump
*13	8268162	1	WELL .. Thermometer
14	181436	16	BOLT .. Hex head 1/2-20 x 2-1/4
15	179887	2	BOLT .. Hex head 1/2-13 x 1-3/4
16	181440	2	BOLT .. Hex head 1/2-20 x 2-1/2
17	8032719	10	NUT .. Hex lock 1/2-20
18	8349424	1	FLANGE .. Blind - Units without an engine protector
19	8025988	1	GASKET .. Blind flange
20	186542	2	SCREW .. Cap 10-24 x 1/2
21	106260	2	WASHER .. Flat - No. 10
*22	8366~~787~~ 785	1	GASKET .. Water pump inlet

P.L. No. F144

COOLING SYSTEM
Water Pump Application
12, 16-645E Engines
With Two Water Pumps

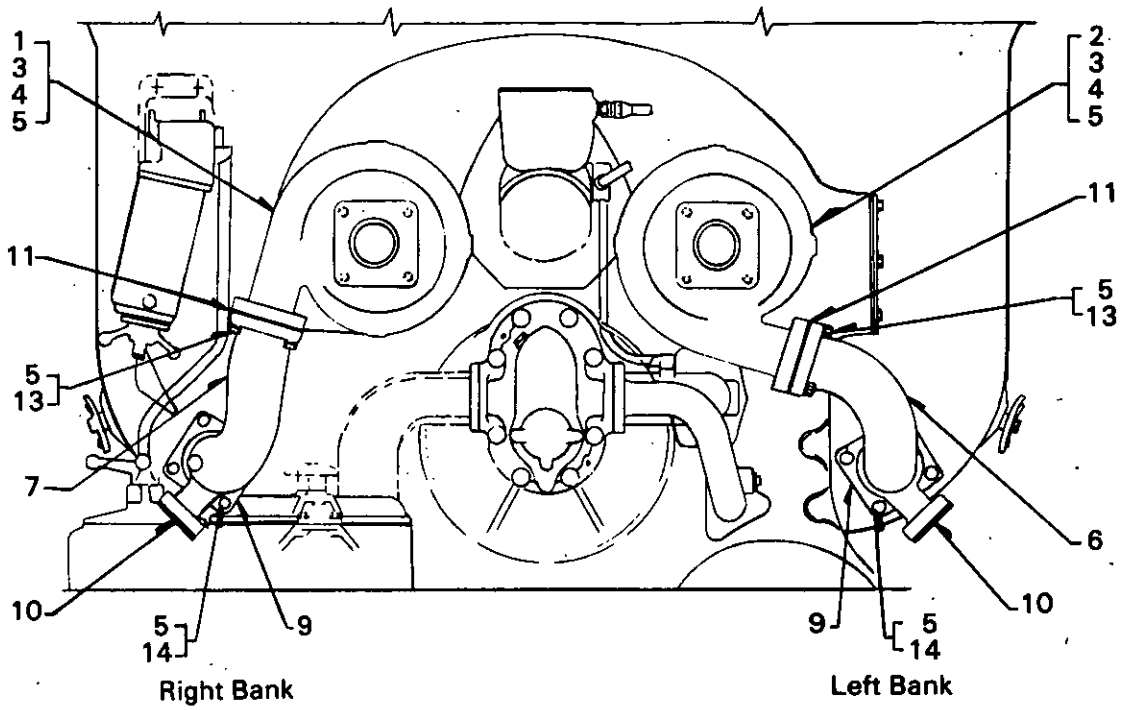


PLATE C144-5

Ref. No.	Part Number	Qty. Req.	Description	
1	8058625	1	PUMP ASSEMBLY .. Water - Right bank	See P.L. 146
2	8058624	1	PUMP ASSEMBLY .. Water - Left bank - Except export 16-645	
*2	9516119	1	PUMP ASSEMBLY .. Water - Left bank - Export 16-645 only	
3	8028760	2	GASKET .. Pump mounting	
4	181432	12	BOLT .. Hex head 1/2-20 x 1-5/8	
5	6101229	28	WASHER .. Flat 1/2	
6	8349064	1	ELBOW .. Water inlet - Left bank	
7	8349063	1	ELBOW .. Water inlet - Right bank	
*8	8366039	1	PIPE .. Drain - Elbow to elbow	
9	8347416	2	GASKET .. Elbows to water manifolds	
10	8029469	2	GASKET .. Elbows to drain pipe	
11	8029149	2	GASKET .. Elbows to pumps	
*12	8268162	1	WELL .. Thermometer	
13	179887	8	BOLT .. Hex head 1/2-13 x 1-3/4	
14	181436	8	BOLT .. Hex head 1/2-20 x 2-1/4	
*15	8366787	2	GASKET .. Pump inlet	

COOLING SYSTEM

Water Pump Application
12-645E3,E3B,E3C,F3,F3B Engines

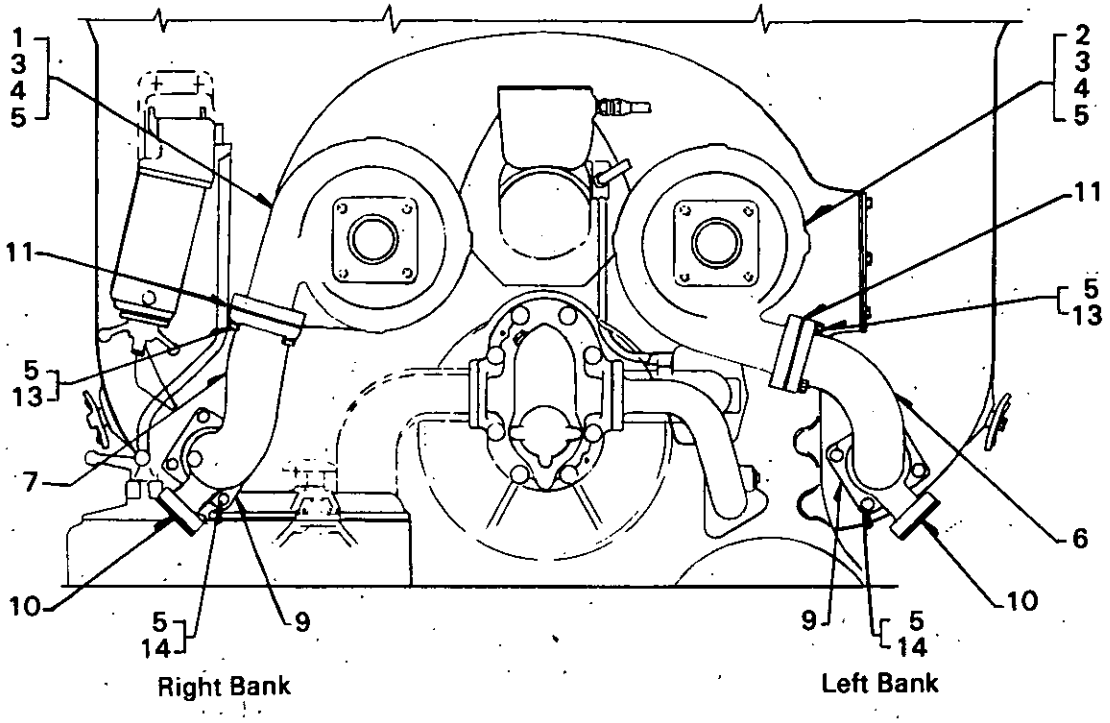


PLATE C144-6

Ref. No.	Part Number	Qty. Req.	Description	
†1	8269644	1	PUMP ASSEMBLY .. Water - Right bank	See P.L. 146
†2	8269638	1	PUMP ASSEMBLY .. Left bank - Engines without differential pressure engine protector	
†*2	9336390	1	PUMP ASSEMBLY .. Water - Left bank - Engines with differential pressure engine protector	
3	8028760	2	GASKET .. Pump mounting	
4	181432	12	BOLT .. Hex head 1/2-20 x 1-5/8	
5	6101229	30	WASHER .. Flat 1/2	
6	8349064	1	ELBOW .. Water inlet - Left bank	
7	8349063	1	ELBOW .. Water inlet - Right bank	
*8	8366039	1	PIPE .. Water drain	
9	8347416	2	GASKET .. Elbows to water manifolds	
10	8029469	2	GASKET .. Elbows to drain pipe	
11	8029149	2	GASKET .. Elbows to pumps	
*12	8268162	1	WELL .. Thermometer	
13	179887	8	BOLT .. Hex head 1/2-13 x 1-3/4	
14	181436	8	BOLT .. Hex head 1/2-20 x 2-1/4	
*15	8366787	2	GASKET .. Pump inlet	

† *See Parts List No. 146 for water pump service parts*

P.L. No. F144

COOLING SYSTEM

Water Pump Application
16-645E3,E3A,E3B,E3C,F3,F3B and
20-645E3,E3B Engines

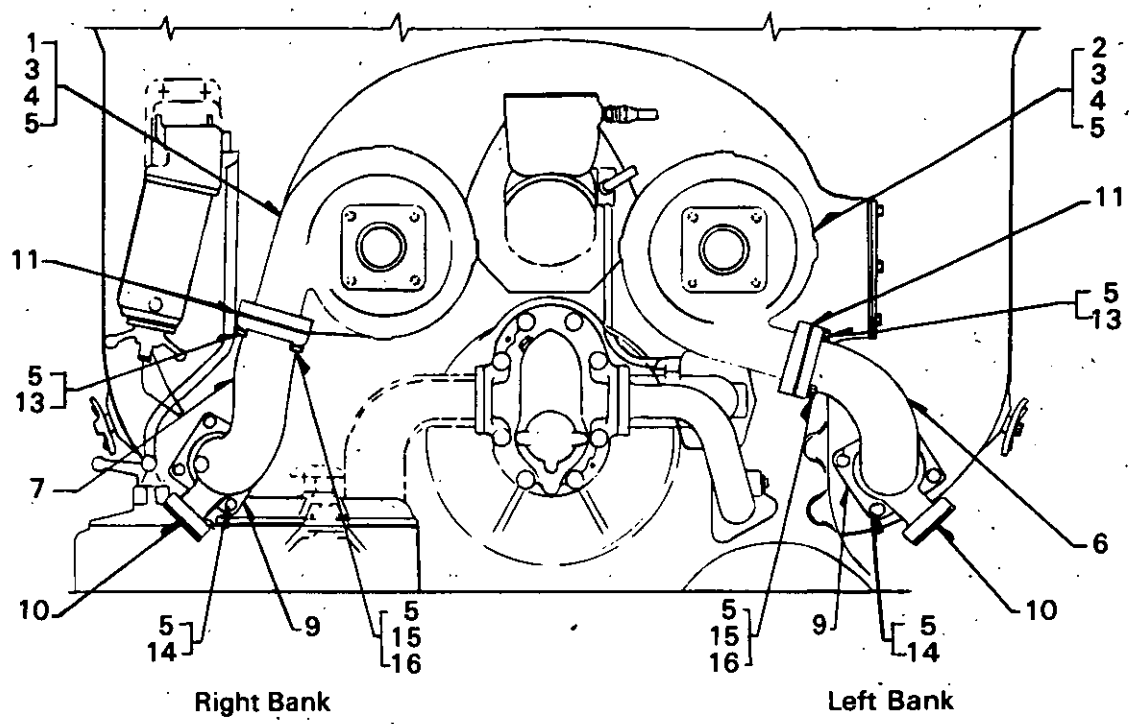


PLATE C144-7

Ref. No.	Part Number	Qty. Req.	Description	
†1	9530406	1	PUMP ASSEMBLY .. Water - Right bank - Replaces 8249002	See P.L. 146
†2	9530407	1	PUMP ASSEMBLY .. Water -Left bank - Engines with differential pressure engine protector - Replaces 9320244	
†2	8347607	1	PUMP ASSEMBLY .. Water - Left bank - Engines without differential pressure engine protector	
3	8028760	2	GASKET .. Pump mounting	
4	181432	12	BOLT .. Hex head 1/2-20 x 1-5/8	
5	6101229	30	WASHER .. Flat 1/2	
6	8346691	1	ELBOW .. Water inlet - Left bank	
7	8346547	1	ELBOW .. Water inlet - Right bank	
*8	8366039	1	PIPE .. Water drain	
9	8347416	2	GASKET .. Elbows to water manifolds	
10	8029469	2	GASKET .. Elbows to drain pipe	
11	8347417	2	GASKET .. Elbows to pumps	
*12	8268162	1	WELL .. Thermometer	
13	179887	4	BOLT .. Hex head 1/2-13 x 1-3/4	
14	181436	8	BOLT .. Hex head 1/2-20 x 2-1/4	
15	181440	4	BOLT .. Hex head 1/2-20 x 2-1/2	
16	8032719	4	NUT .. Hex lock 1/2-20	
*17	8366785	2	GASKET .. Pump inlet	

†See Parts List No. 146 for water pump service parts.

COOLING SYSTEM
Aftercooler Piping
645 Turbocharged Engines

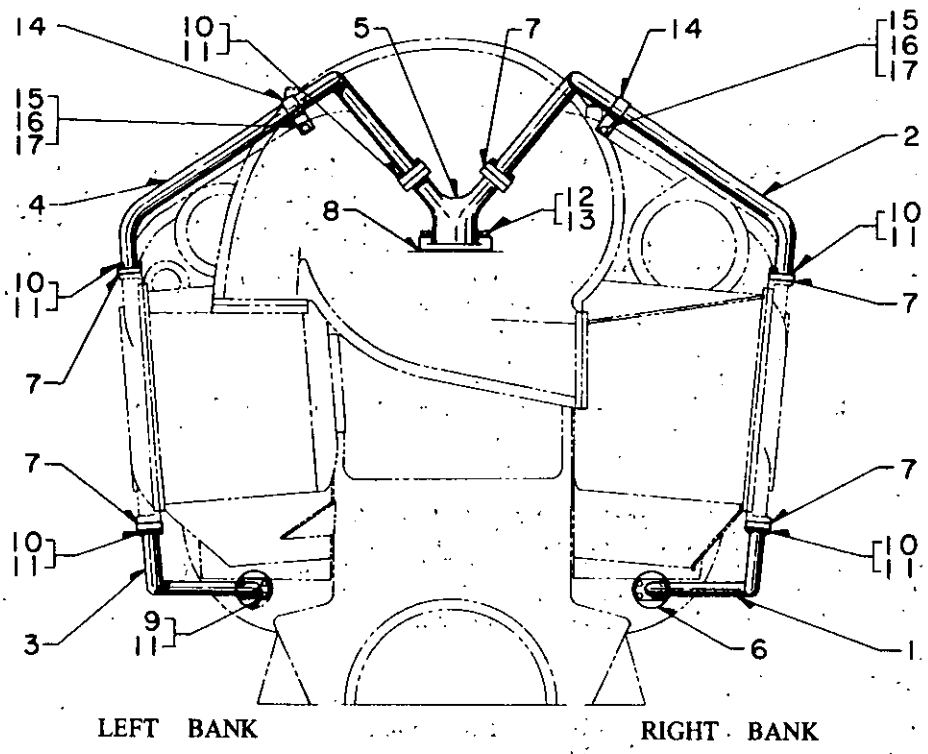


PLATE C144-8

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description	
		A	-	8,12-645 turbocharged engines	
		-	B	16,20-645 turbocharged engines	
1	8347397	1	-	PIPE ASM. .. Water inlet	
1	8352554	-	1	PIPE ASM. .. Water inlet	Right Bank
2	8326019	1	-	PIPE ASM. .. Water discharge	Right Bank
2	8352552	-	1	PIPE ASM. .. Water discharge	Right Bank
3	8347398	1	-	PIPE ASM. .. Water inlet	
3	8352553	-	1	PIPE ASM. .. Water inlet	Left Bank
4	8326020	1	-	PIPE ASM. .. Water discharge	Left Bank
4	8352551	-	1	PIPE ASM. .. Water discharge	Left Bank

The following items Ref. Nos. 5 thru 18 are applicable to Columns A and B.

5	8289021	1	FLANGE .. "Y" Water discharge
6	8347396	2	GASKET .. Manifold to water inlet pipe
7	8289171	6	GASKET .. Water inlet and discharge pipe to aftercooler
8	8070513	1	GASKET .. "Y" flange mounting
9	181374	8	BOLT .. Hex head 3/8-24 x 1-1/2
10	179843	24	BOLT .. Hex head 3/8-16 x 1-1/2
11	6101225	32	WASHER .. Flat 3/8
12	271749	4	BOLT .. Hex head 5/8-18 x 2-1/4
13	6101233	4	WASHER .. Plain 5/8
14	9082050	2	CLAMP .. Pipe - Water discharge pipe - Formerly 8289492
15	6101229	2	WASHER .. Flat 1/2
16	8032719	2	NUT .. Hex lock 1/2-20 - Formerly applied
17	181431	2	BOLT .. Hex head 1/2-20 x 1-1/2
*18	8260114	2	WASHER .. 1/2

P.L. No. F144

COOLING SYSTEM
Engine Cooling Lines
16-567D1,D2,D3, D3A Engines
PLATE A144-9

Ref. No.	Part Number	Qty. Req.	Description
PUMP ASSEMBLY .. Water			
+1	8269664	1	PUMP ASM. .. Water - R.H. - 16-567D3 and D3A engine only - See P.L. 146
*+1A	8058625	1	PUMP ASM. .. Water - R.H. - 16-567D1 and D2 engine only - See P.L. 146
+2	8269638	1	PUMP ASM. .. Water - L.H. - 16-567D3 and D3A engine only - See P.L. 146
*+2A	8058624	1	PUMP ASM. .. Water - L.H. - 16-567D1 and D2 engine only - See P.L. 146
+3	8028760	2	GASKET .. Water pump and blind cover mounting
*+4	181432	12	BOLT .. Hex head 1/2-20 x 1-5/8 - Water
5	8029149	2	GASKET .. Water pump to outlet elbow
6	103323	8	WASHER .. Lock 1/2
7	179887	8	BOLT .. Hex head 1/2-13 x 1-3/4 - Pump to outlet elbow
ELBOW .. Water Outlet			
8	8231842	1	ELBOW .. Water outlet - Right bank
9	8231843	1	ELBOW .. Water outlet - Left bank
10	181436	8	BOLT .. Hex head 1/2-20 x 2-1/4 - Elbow to crankcase
11	6101229	8	WASHER .. Plain 1/2
12	8231838	4	GASKET .. Flange - Water elbow
MANIFOLD .. Water			
13	8231819	1	MANIFOLD .. Water - Right bank
*14	8231820	1	MANIFOLD .. Water - Left bank
15	8231839	2	SUPPORT .. Rear
TUBE ASSEMBLY .. Water Inlet			
16	8206804	16	TUBE ASSEMBLY .. Water inlet - Jumper line
STRAP .. Saddle			
17	8054536	32	STRAP .. Saddle - Water jumper line
18	8032717	64	NUT .. Hex lock 3/8-24
19	8142354	16	GASKET .. Jumper line to water manifold
20	8226964	32	BOLT .. Hex head 3/8-16 x 1-1/8 - Jumper line to liner - Includes lockwasher
21	8305815	16	SEAL .. Jumper line to liner
ELBOW .. Water Outlet			
22	8141612	14	ELBOW .. Water outlet - Cylinder head
23	8190364	2	ELBOW .. Water outlet - Siphon
24	217911	32	SCREW .. Elbow to head - 3/8-16 x 7/8 socket head
25	8305815	16	SEAL .. Cylinder head water outlet elbows
25A	9317972	16	SEAL .. Water outlet elbow to crankcase - Replaces 8413892
26	112578	1	PLUG .. Pipe - 1/4 MPT - Left bank water outlet elbow
+27	8366787	2	GASKET .. Water pump outlet - Replaces 8126649
+28	8029469	2	GASKET .. Drain line to pump
29	8268162	1	WELL .. Thermometer

8165735P, 8289493B

COOLING SYSTEM

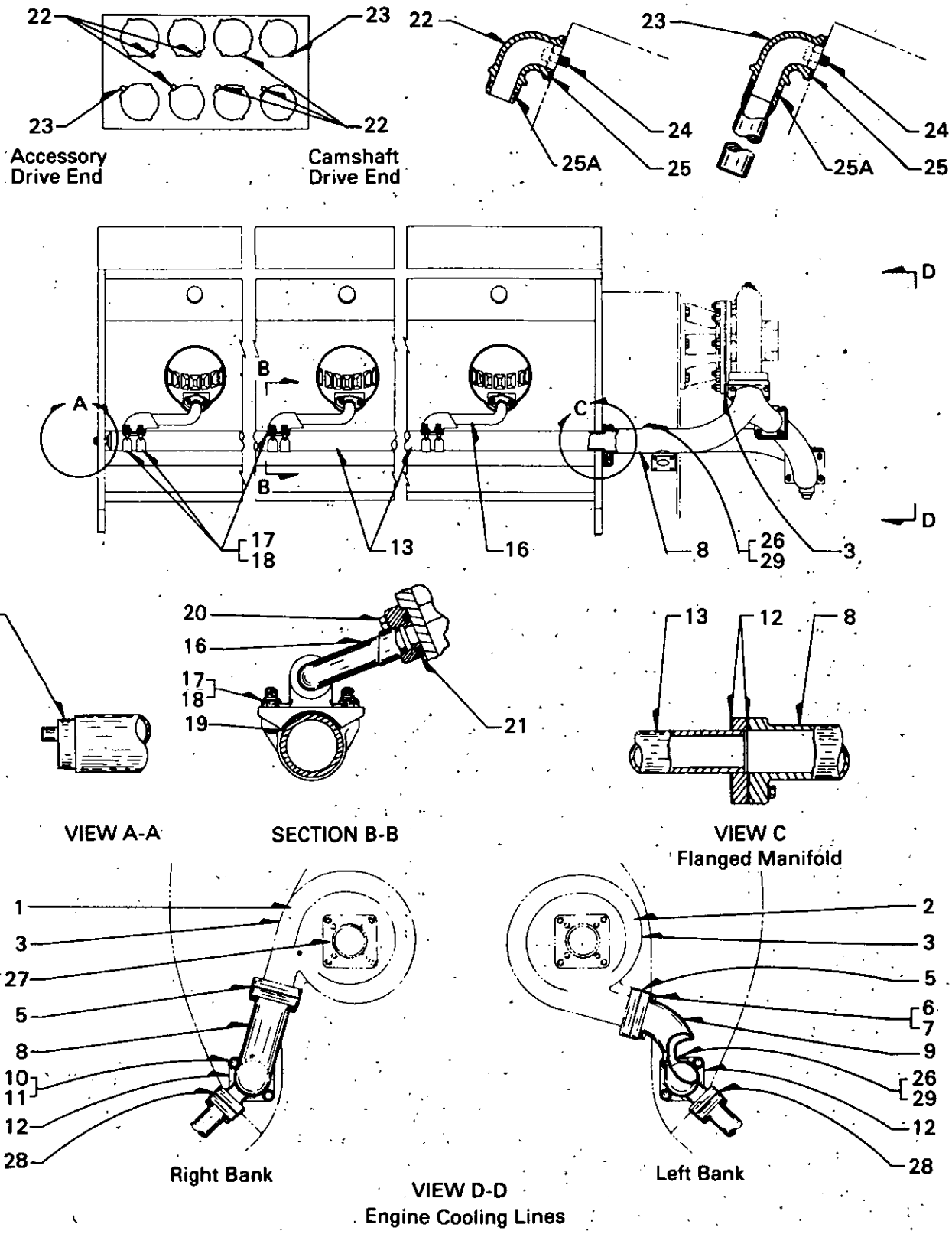


PLATE A144-9

P.L. No. F144

COOLING SYSTEM

Parallel Flow Turbocharger Aftercooler Piping
With 2 Flange, Dowel Mount, Round Tube Type Aftercooler
16-567D3 and D3A Engines
PLATE A144-10

Please specify Engine Serial Number when ordering parts from this list.

Ref. No.	Part Number	Qty. Req.		Description
		A	-	AFTERCOOLER PIPING .. Threaded pipe fitting connections
		-	B	AFTERCOOLER PIPING .. Welded flanged pipe connections (Current)
1	8283781	1	-	PIPE ASSEMBLY .. Engine drain
1A	8325903	-	1	PIPE ASSEMBLY .. Engine drain
2	8116938	A.R.		PIPE .. 1-1/4 in. wrought steel 20 ft. - Approximately 7 ft. required
2A	8116747	-	AR	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 2 ft. 1 in. required
2B	8116748	-	AR	PIPE .. 2 in. wrought steel 20 ft. - Approximately 2-5/8 in. required
3	8132699	1	1	TEE .. Pipe - 1-1/4 weld x 1-1/4 weld x 1-1/4 FPT
4	8330334	2	2	FLANGE .. Pipe - 1-1/4 weld - Replaces 8189314
4A	8326113	-	1	FLANGE .. Pipe - 1-1/2 weld
5	8271452	1	-	TEE .. Pipe - 1-1/4 weld x 2 FPT x 1-1/4 weld
5A	8316774	-	1	TEE .. Pipe 1-1/4 weld x 2 weld x 1-1/4 weld
6	8060937	1	-	NIPPLE .. Close pipe - 2 MPT
7	218641	1	-	TEE .. Pipe - 2 FPT x 1-1/4 FPT x 1-1/2 FPT
7A	8326650	-	1	TEE .. Pipe - 2 weld x 1-1/4 FPT x 1-1/2 weld
7B	8132958	-	1	ELBOW .. Pipe - 1-1/2 butt weld - 90°
8	8029469	2	2	GASKET .. Flange to water pump elbow
9	179843	8	8	BOLT .. Hex head 3/8-16 x 7/8 - Flange mounting
10	103321	8	-	WASHER .. Lock 3/8
10A	6101225	-	8	WASHER .. Plain 3/8
11	106642	1	1	PLUG .. Pipe - 1-1/4 MPT - Square head
PIPE ASSEMBLY .. Aftercooler Supply				
12	8289382	1	-	PIPE ASSEMBLY .. Aftercooler supply
12A	8325904	-	1	PIPE ASSEMBLY .. Aftercooler supply
13	8116747	A.R.		PIPE .. 1-1/2 in. wrought steel 20 ft. - Approximately 15 ft. required
14	8062563	1	-	ELBOW .. Union pipe - 1-1/2 FPT x 90°
14A	8326113	-	2	FLANGE .. Pipe - 1-1/2 weld
14B	8132958	-	1	ELBOW .. Pipe - 1-1/2 butt weld - 90°
PIPE ASSEMBLY .. Supply Line To Crossover Line				
15	8289719	1	-	PIPE ASSEMBLY .. Supply line to crossover line
16	8116747	AR	-	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 1 ft. 7 in. required
17	8062563	1	-	ELBOW .. Union pipe - 1-1/2 FPT x 90°
18	8287970	1	-	UNION .. Pipe - 1-1/2 FPT x 1-1/2 MPT
PIPE ASSEMBLY .. Crossover				
19	8289721	1	-	PIPE ASSEMBLY .. Crossover
19A	8325959	-	1	PIPE ASSEMBLY .. Crossover
20	8116938	A.R.		PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 7 ft. 1 in. required
20A	8116747	-	AR	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 2-1/8 in. required
21	8289337	1	-	TEE .. Pipe - 1-1/4 weld x 1-1/2 FPT x 1-1/4 weld
21A	8326552	-	1	TEE .. Pipe - 1-1/4 weld x 1-1/2 weld x 1-1/4 weld
22	8289172	1	-	FLANGE .. Pipe
22A	8326113	-	1	FLANGE .. Pipe - 1-1/2 weld
22B	8326033	-	2	FLANGE .. Pipe - 1-1/4 weld
23	8210686	1	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°

8325683B

COOLING SYSTEM

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	AFTERCOOLER PIPING
PIPE ASSEMBLY .. Crossover				
24	8289720	1	-	PIPE ASSEMBLY .. Crossover
25	8116938	AR	-	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approximately 2 ft. required
26	8289172	1	-	FLANGE .. Pipe
27	8259377	1	-	COUPLING .. Pipe - 1-1/4 FPT
28	8108119	4	4	CLAMP ASSEMBLY .. Pipe
29	8289171	6	6	GASKET .. Aftercooler and engine inlet pipe flange
29A	8326114	-	2	GASKET .. Aftercooler supply pipe flange
30	179841	8	-	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange mounting
31	179843	16	24	BOLT .. Hex head 3/8-16 x 1-1/2 - Flange mounting
31A	103321	24	-	WASHER .. Lock 3/8
31B	6101225	-	24	WASHER .. Plain 3/8
PIPE ASSEMBLY .. L.B. Aftercooler To Engine Inlet				
32	8289547	1	-	PIPE ASSEMBLY .. L.B. aftercooler to engine inlet
32A	8326020	-	1	PIPE ASSEMBLY .. L.B. aftercooler to engine inlet
33	8116938	A.R.		PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 6 ft. 7 in. required
34	8289172	2	-	FLANGE .. Pipe
34A	8326033	-	2	FLANGE .. Pipe - 1-1/4 weld
PIPE ASSEMBLY .. R.B. Aftercooler To Engine Inlet				
35	8289546	1	-	PIPE ASSEMBLY .. R.B. aftercooler to engine inlet
35A	8326019	-	1	PIPE ASSEMBLY .. R.B. aftercooler to engine inlet
36	8116938	A.R.		PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 6 ft. 7 in. required
37	8289172	2	-	FLANGE .. Pipe
37A	8326033	-	2	FLANGE .. Pipe - 1-1/4 weld
PIPE ASSEMBLY .. Engine Inlet				
38	8289021	1	1	"Y" FLANGED
39	8070513	2	2	GASKET .. Flange
40	271749	8	8	BOLT .. Hex head 5/8-18 x 2-1/4 - "Y" flanged mounting
41	103325	8	-	WASHER .. Lock 5/8
41A	6101233	-	8	WASHER .. Plain 5/8
*42	9082050	2	-	CLAMP ASSEMBLY .. Pipe - Formerly 8289482
*42A	181431	2	-	BOLT .. Hex head 1/2-20 x 1-1/2
*43	8260114	2	-	WASHER .. Plain 1/2
43A	181440	-	8	BOLT .. Hex head 1/2-20 x 2-1/2 - Flange mounting
43B	6101229	-	8	WASHER .. Plain 1/2
43C	8032719	-	8	NUT .. Hex lock 1/2-20
ELBOW .. Water Discharge				
44	8334783	1	1	ELBOW .. Water discharge
45	8289285	1	1	PIPE ASSEMBLY .. Water discharge
46	9082050	-	2	CLAMP ASSEMBLY .. Pipe - Formerly 8289492
47	181431	-	2	BOLT .. Hex head 1/2-20 x 1-1/2
48	8260114	-	2	WASHER .. Plain 1/2
+49	8354611	1	1	GASKET .. Pipe to flanged tee - Replaces 8204326

P.L. No. F144

COOLING SYSTEM

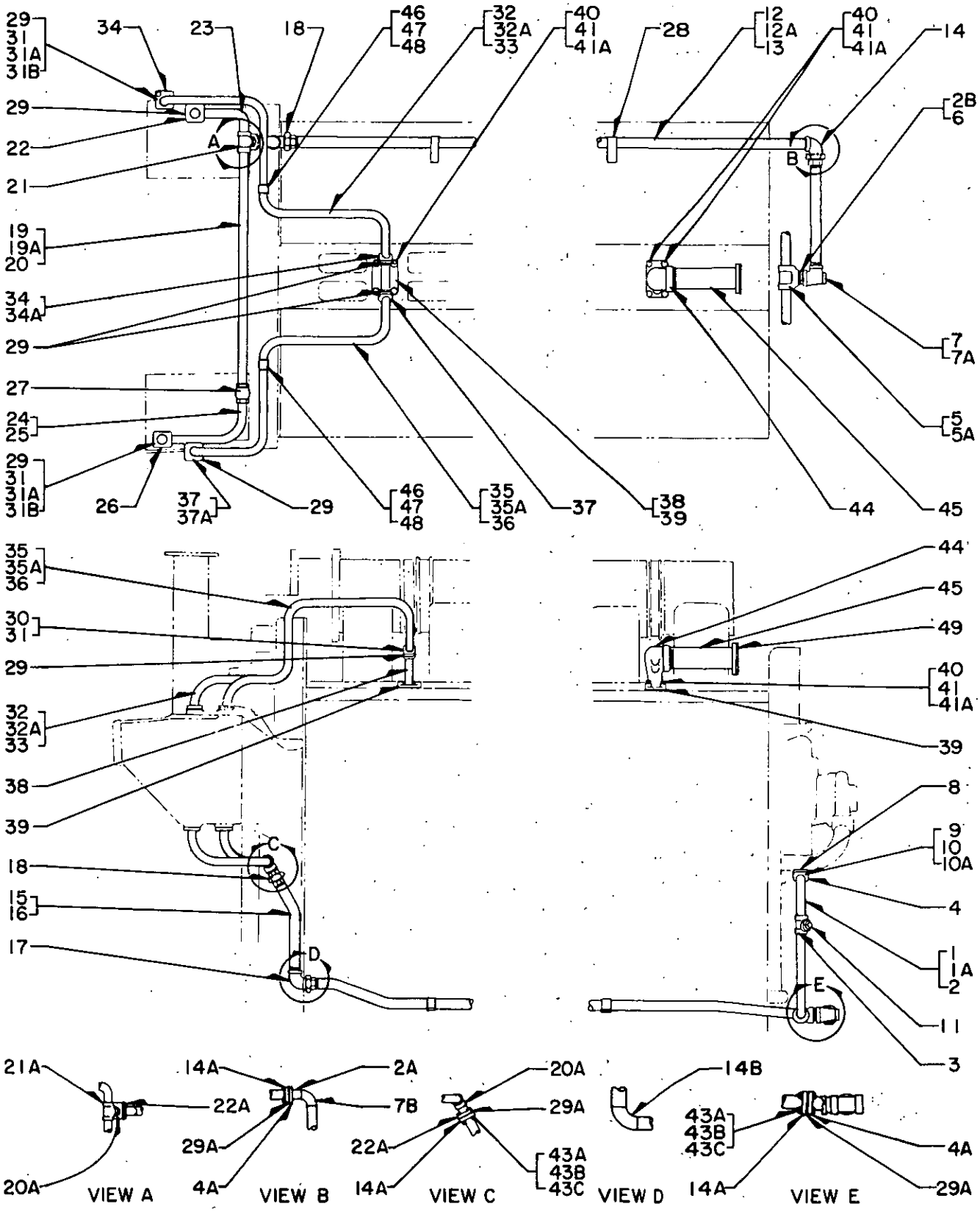


PLATE A144-10

COOLING SYSTEM

Parallel Flow Turbocharger Aftercooler Piping
With 4 Flange, Dowel Mount, Round Tube Type Aftercooler
16-567D3 Engine
PLATE A144-11

NOTE: Please specify Engine Serial Number when ordering parts from this list.

Ref. No.	Part Number	Qty. Req.	Description
PIPE ASSEMBLY .. Engine Drain			
1	8283781	1	PIPE ASSEMBLY .. Engine drain
2	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approximately 7 ft. required
3	8132699	1	TEE .. Pipe - 1-1/4 weld x 1-1/4 weld x 1-1/4 FPT
4	8330334	2	FLANGE .. Pipe - 1-1/4 weld - Replaces 8189314
5	8271452	1	TEE .. Pipe - 1-1/4 weld x 2 FPT x 1-1/4 weld
6	8060937	1	NIPPLE .. Close pipe - 2 MPT
7	218641	1	TEE .. Pipe - 2 FPT x 1-1/4 FPT x 1-1/2 FPT
8	8029469	2	GASKET .. Flange to water pump elbow
9	179838	8	BOLT .. Hex head 3/8-16 x 7/8 - Flange
10	103321	8	WASHER .. Lock 1/2
11	106642	1	PLUG .. Pipe - 1-1/4 MPT - Square head
PIPE ASSEMBLY .. Aftercooler Supply			
12	8289382	1	PIPE ASSEMBLY .. Aftercooler supply
13	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approximately 15 ft. required
14	8062563	1	ELBOW .. Union pipe - 1-1/2 FPT - 90°
PIPE ASSEMBLY .. Supply Line To Crossover Line			
15	8289719	1	PIPE ASSEMBLY .. Supply line to crossover line
16	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 1 ft. 7 in. required
17	8062563	1	ELBOW .. Union pipe - 1-1/2 FPT - 90°
18	8287970	1	UNION .. Pipe - 1-1/2 FPT x 1-1/2 MPT
PIPE ASSEMBLY .. Crossover			
19	8289693	1	PIPE ASSEMBLY .. Crossover
20	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 5 ft. 2 in. required
21	8289173	1	FLANGE .. Pipe
22	8210686	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°
23	8289337	1	TEE .. Pipe - 1-1/4 weld x 1-1/4 weld x 1-1/2 FPT
PIPE ASSEMBLY .. Crossover			
24	8289692	1	PIPE ASSEMBLY .. Crossover
25	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 1 ft. 4 in. required
26	8289277	1	FLANGE .. Pipe
27	8054610	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°

W.S. 10620, 8289506

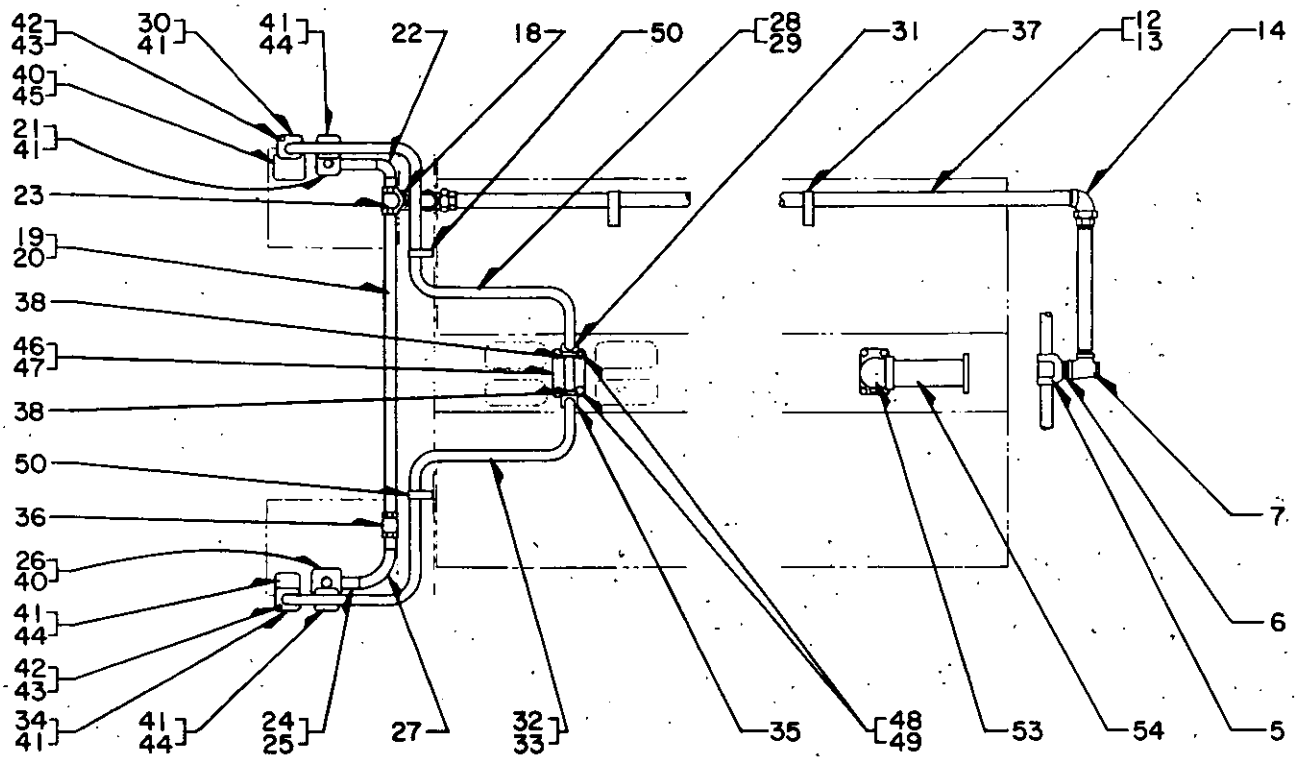
P.L. No. F144

COOLING SYSTEM

Ref. No.	Part Number	Qty. Req.	Description
PIPE ASSEMBLY .. L.B. Aftercooler To Engine Inlet			
28	8289175	1	PIPE ASSEMBLY .. L.B. aftercooler to engine inlet
29	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 6 ft. 7 in. required
30	8289172	1	FLANGE .. Pipe
31	8289173	1	FLANGE .. Pipe
PIPE ASSEMBLY .. R.B. Aftercooler To Engine Inlet			
32	8289174	1	PIPE ASSEMBLY .. R.B. aftercooler to engine inlet
33	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 6 ft. 7 in. required
34	8289172	1	FLANGE .. Pipe
35	8289173	1	FLANGE .. Pipe
36	8259377	1	COUPLING ASSEMBLY .. 1-1/4 I.P.S. x 3-1/4 in. long
37	8108119	4	CLAMP .. Pipe
38	9570757	2	GASKET .. Engine inlet pipe flange - Replaces 8289171
39	179841	8	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange
40	8262705	2	GASKET .. Flange
41	8262821	6	GASKET .. Flange
42	179885	32	BOLT .. Hex head 1/2-13 x 1-1/2 - Flange
43	103323	32	WASHER .. Lock 1/2
44	8262822	3	FLANGE .. Blind
45	8289381	1	FLANGE .. Blind
PIPE ASSEMBLY .. Water Inlet			
46	8289021	1	"Y" FLANGED
47	8070513	1	GASKET .. Flange
48	271749	8	BOLT .. Hex head 5/8-18 x 2-1/4 - Engine water inlet and outlet flange
49	103325	8	WASHER .. Lock 5/8
50	9082050	2	CLAMP ASSEMBLY .. Pipe - Formerly 8289492
*51	181431	2	BOLT .. Hex head 1/2-20 x 1-1/2
*52	8260114	2	WASHER .. Plain 1/2
ELBOW .. Water Discharge			
53	8289286	1	ELBOW .. Water discharge
54	8289285	1	PIPE ASSEMBLY .. Water discharge
*55	103323	2	WASHER .. Lock 1/2
56	8070513	1	GASKET .. Water discharge

P.L. No. F144

COOLING SYSTEM



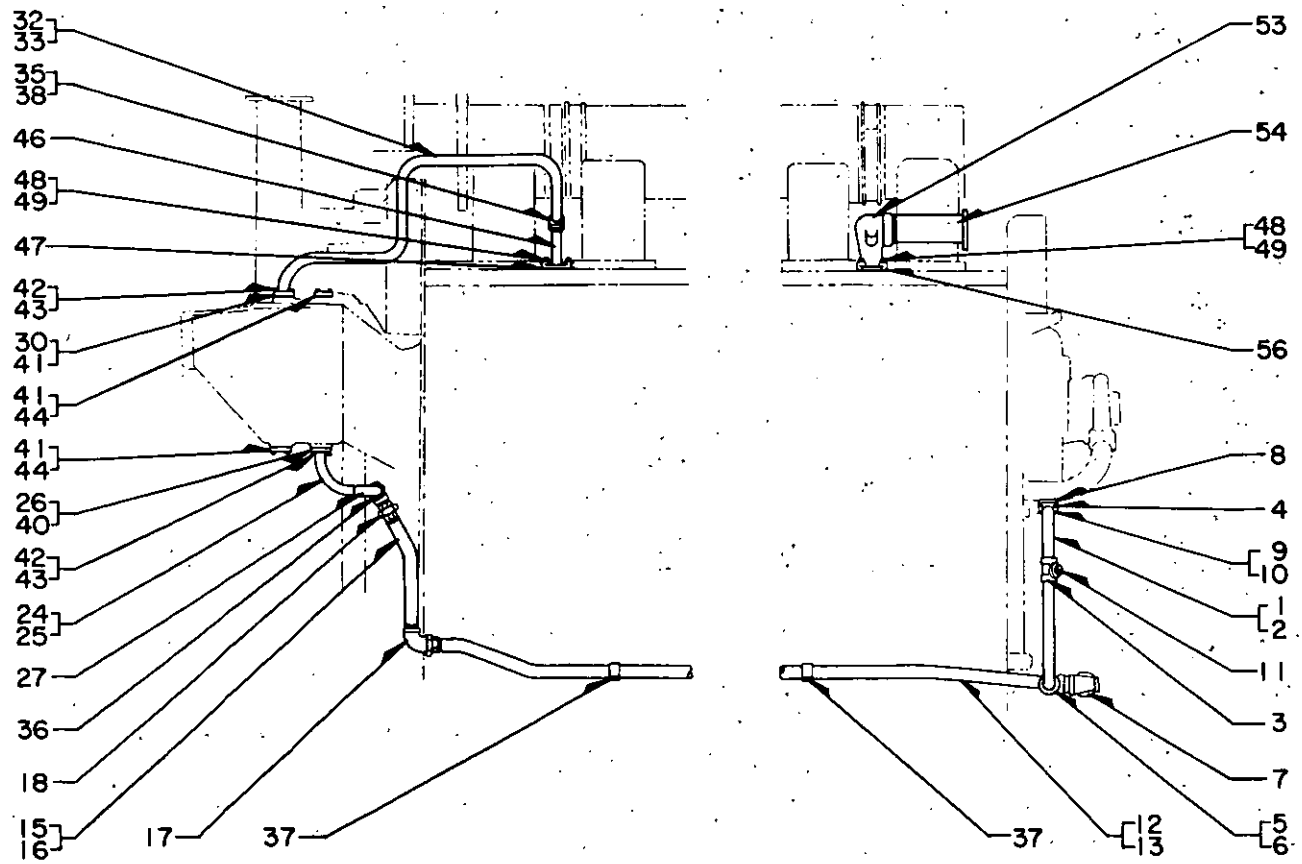


PLATE A144-11

P.L. No. F144

COOLING SYSTEM

Series Flow Turbocharger Aftercooler Piping
With 4 Flange, Bracket Mounted, Flat Tube Type Aftercooler
16-567D3 Engine
PLATE A144-12

NOTE: Please specify Engine Serial Number when ordering parts from this list.

Ref. No.	Part Number	Qty. Req.	Description
PIPE ASSEMBLY .. Engine Drain			
1	8270006	1	PIPE ASSEMBLY .. Engine drain
2	8116938	A.R.	PIPE .. 1-1/4 in. wrought steel 20 ft. - Approx. 3 ft. 6-1/4 in. required
3	8271452	1	TEE .. Pipe - 1-1/4 weld x 1-1/4 weld x 2 FPT
4	8060937	1	NIPPLE .. Close pipe - 2 MPT
5	8050393	1	TEE .. Pipe - 2 FPT x 2 FPT x 2 FPT union
6	8330334	2	FLANGE .. Pipe - 1-1/4 weld - Replaces 8189314
PIPE ASSEMBLY .. Engine Drain To Rear Engine			
7	8272122	1	PIPE ASSEMBLY .. Engine drain to rear of engine
8	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 14 ft. 2-5/8 in. required
9	219508	1	NIPPLE .. Pipe - 2 MPT x 3 in. long
10	218638	1	TEE .. Pipe - 1-1/2 FPT x 2 FPT x 1-1/2 FPT
PIPE ASSEMBLY .. L.B. Aftercooler Inlet - Turbocharger			
11	8271255	1	PIPE ASSEMBLY .. Aftercooler inlet
12	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 3 ft. 6 in. required
13	8132958	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°
14	8062563	1	ELBOW .. Union pipe - 1-1/2 FPT - 90°
*15	8217708	1	OUTLET .. Pipe - 1/2 FPT
16	8263635	1	FLANGE .. Pipe
PIPE ASSEMBLY .. Aftercooler Crossover - Right To Left Bank			
17	8272538	1	PIPE ASSEMBLY .. Aftercooler crossover
18	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 5 ft. 11 in. required
19	8132958	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°
20	8062515	1	UNION .. Pipe - 1-1/2 FPT
21	8263636	1	FLANGE .. Pipe
PIPE ASSEMBLY .. Crossover Line To Right Bank Aftercooler			
22	8272437	1	PIPE ASSEMBLY .. Aftercooler inlet
23	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 3 ft. 11 in. required
24	8153158	1	NIPPLE .. Pipe - 1-1/2 MPT one end only - 2-1/2 in. long
*25	8132958	1	ELBOW .. Pipe - 1-1/4 butt weld - 90°
26	8273093	1	ELBOW .. Pipe - 1-1/4 weld - 90°
27	8273092	1	TEE .. Pipe - 1-1/4 weld x 1-1/2 weld x 1-1/2 weld
28	8263635	1	FLANGE .. Pipe
PIPE ASSEMBLY .. Aftercooler Outlet To Engine			
29	8273305	1	PIPE ASSEMBLY .. Aftercooler to engine
30	8116747	A.R.	PIPE .. 1-1/2 in. wrought steel 20 ft. - Approx. 5 ft. 11 in. required
31	8263636	1	FLANGE .. Pipe
32	8273304	1	FLANGE .. Pipe

8273441, 8272436

COOLING SYSTEM

Ref. No.	Part Number	Qty. Req.	Description
GASKET .. Engine			
33	8070513	1	GASKET .. Water pipe to engine crankcase
34	271583	4	BOLT .. Hex head 5/8-18 x 1-1/2 - Pipe flange to engine
35	8133334	4	WASHER .. Lock 5/8
GASKET .. Aftercooler			
36	8262821	6	GASKET .. Aftercooler flange
37	179885	32	BOLT .. Hex head 1/2-13 x 1-1/2 - Flange to aftercooler
38	103323	34	WASHER .. Lock 1/2
39	8262705	2	GASKET .. Aftercooler flange
40	8262822	4	FLANGE .. Blind - Aftercooler
CLAMP ASSEMBLY			
41	8108119	4	CLAMP ASSEMBLY .. Pipe
42	8272440	1	CLAMP ASSEMBLY .. Pipe
GASKET .. Drain Line			
43	8029469	2	GASKET .. Drain line to engine
44	179841	8	BOLT .. Hex head 3/8-16 x 1-1/4 - Flange to engine
45	103321	8	WASHER .. Lock 3/8
46	181374	1	BOLT .. Hex head 3/8-24 x 1-1/2 - Clamp mounting
47	103868	1	PLUG .. Pipe - 1/2 MPT - Square head
48	8273236	1	CLAMP ASSEMBLY .. Pipe
49	179881	2	BOLT .. Hex head 1/2-13 x 1 - Clamp mounting
50	103343	2	WASHER .. Plain 1/2

P.L. No. F144

COOLING SYSTEM

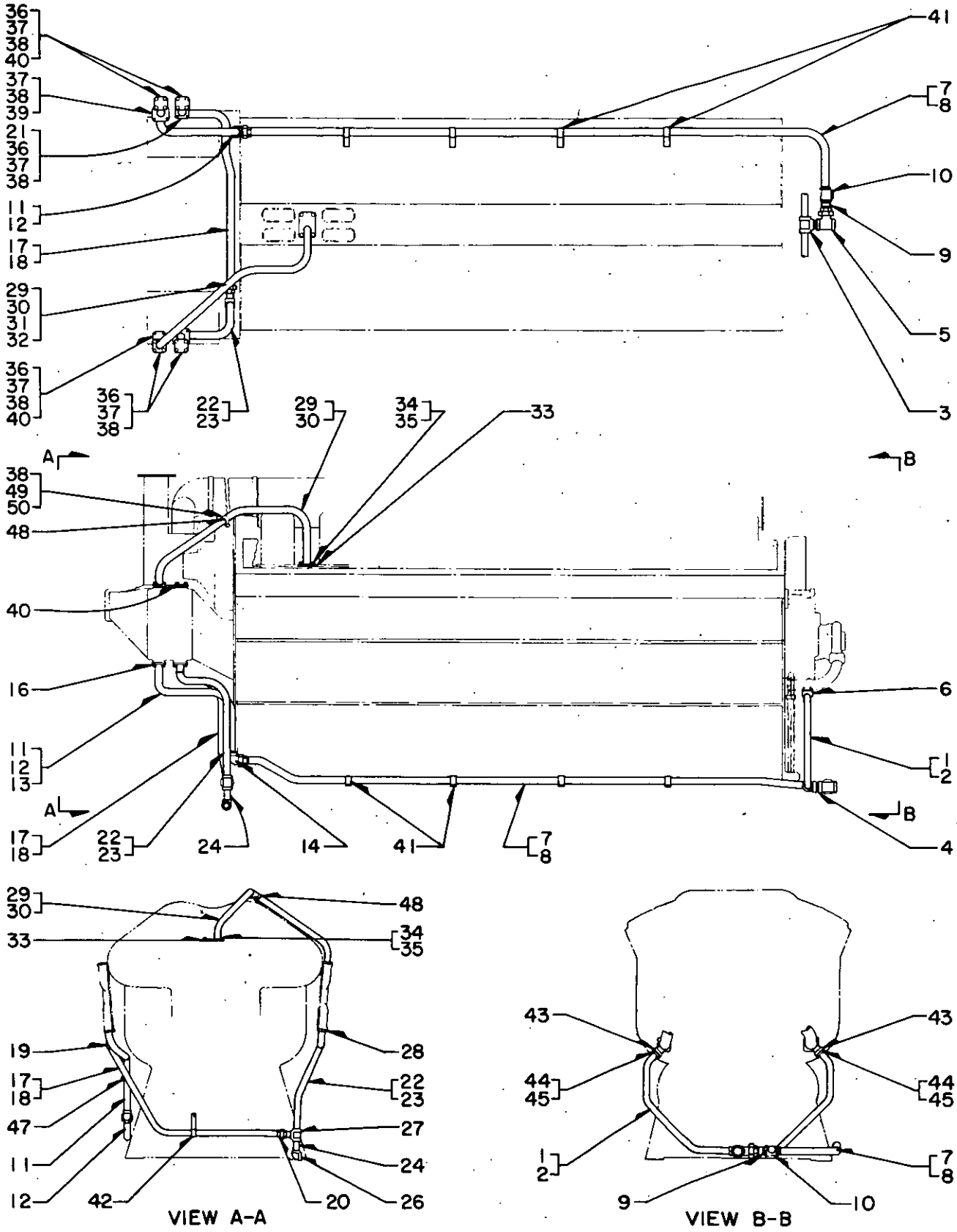


PLATE A144-12

WATER PUMPS

Water Pump Assemblies
Reference Chart
PLATE E146-1

Note: See Parts List No. 144 for specific engine model applications.

Ref. No.	Water Pump Part No.	Engine Location	UTEX Part No.	Replaced By	Ref. 14 Housing Part No.	Ref. 16 Impeller Part No.	Ref. 50 Name Plate Part No.
1	8058624	Left Bank	8122874	----	8354382	8060008	8288613
2	8058625	Right Bank	8122879	----	8354382	8060008	8288612
3	8269638	Left Bank	8296347	----	8276222	8269566	8288611
4	8269664	Right Bank	8296348	----	8276222	8269566	8288610
5	8347607	Left Bank	8379237	----	8250143	8248248	8347719
6	8249002	Right Bank	8379236	9530406	8250143	8248248	8347718
7	ƒ9320244	Left Bank	9332825	9530407	9320243	8248248	9321310
8	ƒ9336390	Left Bank	9503461	----	9336389	8269566	9336410
9	ƒ9501979	Right Bank	9510677	----	ƒƒ9320243	8248248	9501978
10	9516119	Left Bank	9516925	----	9516109	8060008	9516110
11	ƒ9516120	Right Bank	9516924	----	9516109	8060008	9516111
12	ƒ9530407	Left Bank	9332825	----	9320243	8248248	9536187
13	9530406	Right Bank	8379236	----	8250143	8248248	9536186

ƒ These pumps applied to engines with a differential pressure engine protector.

ƒƒ Formerly 9501977 - housing assembly.

The following Components are applicable to all the Water Pumps listed above unless specifically noted in the Description Column.

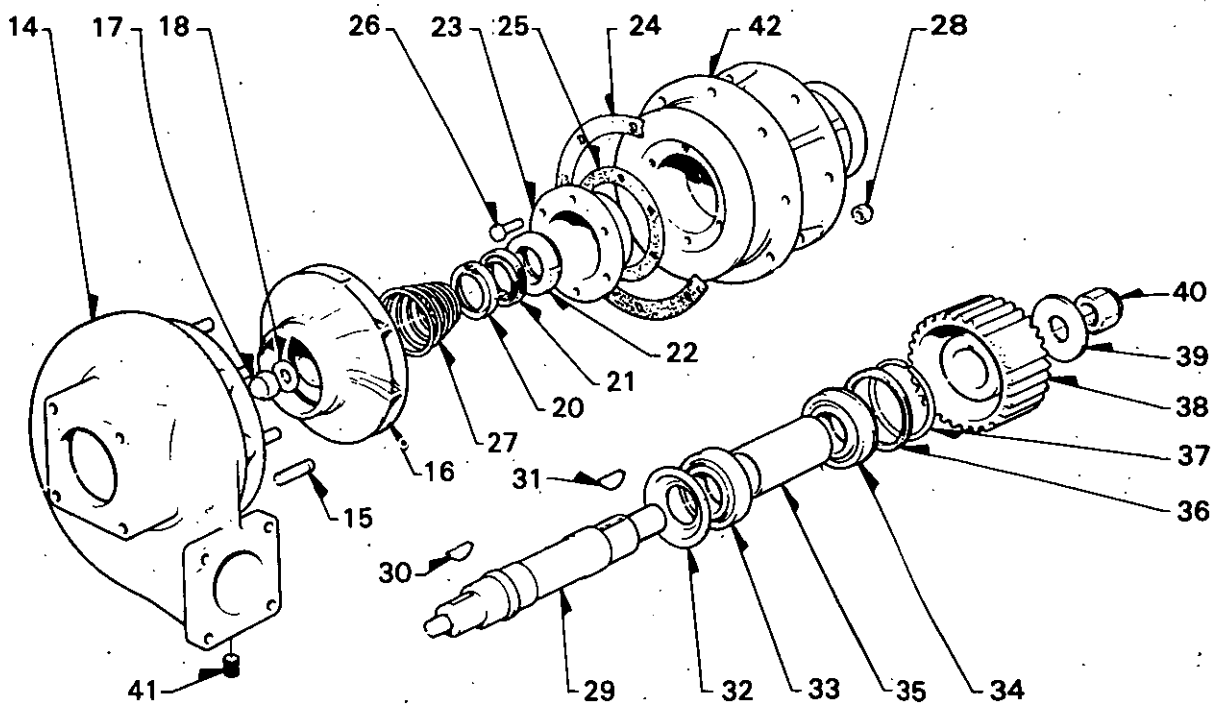
Ref. No.	Part Number	Qty. Req.	Description
-	----	1	PUMP ASSEMBLY .. Water - See chart above
14	----	1	HOUSING ASSEMBLY .. Pump - See chart above
15	8035102	8	STUD .. Housing 1/2-13 x 1/2-20 x 2-1/8 in. long - Standard pitch dia. 8115301 .. .002 OS 8115303 .. .015 OS 8115305 .. .019 OS 8115302 .. .004 OS 8115304 .. .017 OS
16	----	1	IMPELLER .. Pump - See chart above
17	8028724	1	NUT .. Hex lock 5/8-18
18	8028730	1	WASHER .. Flat 5/8
*19	9544892	1	KIT .. Seal - Replaces 8404507
20	9529473	1	RETAINER .. Seal - Replaces 8342485
21	9526863	1	SEAL .. Outer - Replaces 9083462
22	9529199	1	SEAL .. Inner - Replaces 8398612
23	8052224	1	BUSHING .. Stationary
24	8209776	1	GASKET .. Housing to support
25	8370885	1	GASKET .. Support to bushing
26	9543448	6	BOLT .. Special hex head 5/16-18 x 7/8 - With nylon insert - Repl. 9417962

P.L. No. F146

WATER PUMPS

Ref. No.	Part Number	Qty. Req.	Description
-	----	1	PUMP ASSEMBLY .. Water
27	8055346	1	SPRING .. Seal retainer
28	8032719	8	NUT .. Hex lock 1/2-20
29	8052246	1	SHAFT .. Pump
30	103909	1	KEY .. Woodruff - Shaft to impeller
31	108627	1	KEY .. Woodruff - Shaft to gear
32	8042969	1	SLINGER .. Water
///33	908415	1	BEARING .. Ball - Impeller end - Replaces 908377, 908168 and 954240 } *See Note*
///34	908410	1	BEARING .. Ball - Gear end - Replaces 908378, 908169 and 954241 } *See Note*
35	9532762	1	SPACER .. Bearing - Replaces 8042970
36	8042973	1	RING .. Retaining
37	8370886	1	RING .. Snap
38	8042976	1	GEAR .. Drive - 37 tooth
39	8042977	1	WASHER .. Special - 1 inch
40	8032724	1	NUT .. Hex lock 1-14 - Replaces 8449544
41	8348618	A.R.	PLUG .. Pipe 1/4 MPT - Not applied to all pumps
42	8329900	1	SUPPORT ASM. .. Housing - Replaces 8042963 - See Ref. Nos. 45, 46 and 47
*43	9312705	1	SPRING .. Housing
*44	273703	1	PIN .. Roll 1/8 x 1-3/8
*45	8042971	1	FELT .. Lubricator - Used on 8042963 support only
*46	8353988	1	PAD .. Lubricator - Used on 8042963 support only
*47	8004889	1	CUP .. Oil - Used on 8042963 support only
*48	8048482	1	RING .. Wear - Formerly used on housings 8354741 and 8354382
*49	114358	4	SCREW .. Wear ring 1/4-20 x 1-1/8
*50	----	1	NAME PLATE .. Pump - Lists EMD pump part number - See chart
*51	9547683	1	KIT.. Pump repair - Contains seal kit (Ref. No. 19) and bearings (Ref. Nos. 33 and 34)

///It is strongly recommended to replace both bearings when replacing either of the previous style bearings.



Ref. Nos. 1 thru 13
PLATE E146-1

FUEL OIL PIPING

Fuel Oil Manifold and Injector Fuel Oil Lines
All 567D and 645 Engines

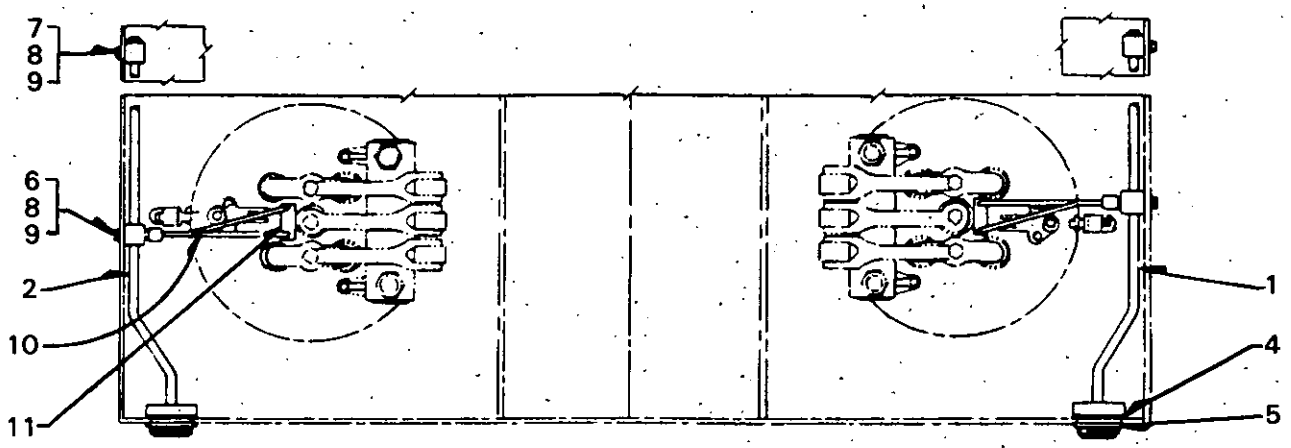


PLATE E148-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645 engines
		-	B	-	-	12-645 engines
		-	-	C	-	16-645 and 16-567D engines
		-	-	-	D	20-645 engines
1	8194740	1	-	-	-	MANIFOLD ASM. .. Fuel line (Left Bank) (Supply and Drain)
1	8194742	-	1	-	-	MANIFOLD ASM. .. Fuel line (Left Bank) (Supply and Drain)
1	8163892	-	-	1	-	MANIFOLD ASM. .. Fuel line (Left Bank) (Supply and Drain)
1	8360876	-	-	-	1	MANIFOLD ASM. .. Fuel line (Left Bank) (Supply and Drain)
2	8194741	1	-	-	-	MANIFOLD ASM. .. Fuel line (Right Bank) (Supply and Drain)
2	8194743	-	1	-	-	MANIFOLD ASM. .. Fuel line (Right Bank) (Supply and Drain)
2	8163891	-	-	1	-	MANIFOLD ASM. .. Fuel line (Right Bank) (Supply and Drain)
2	8360877	-	-	-	1	MANIFOLD ASM. .. Fuel line (Right Bank) (Supply and Drain)
*3	143980	4	4	4	4	PLUG .. Pipe - 3/8 M.P.T. square head
4	8165276	2	2	2	2	GASKET .. Manifold mounting
5	8165289	2	2	2	2	NUT .. Hex 2-1/2 - Manifold mounting
6	181407	8	12	16	20	BOLT .. Hex head 7/16-20 x 2-1/4 - Manifold mounting
7	181395	2	2	2	2	BOLT .. Hex head 7/16-20 x 1 - Manifold mounting
8	116104	10	14	18	22	WASHER .. Plain 7/16 - Copper - Applied between frame and Ref. No. 9
9	103342	10	14	18	22	WASHER .. Plain 7/16 - Steel
10	8160209	8	12	16	20	LINE ASSEMBLY .. Fuel oil - Manifold to injector
11	8032718	8	12	16	20	NUT .. Hex lock 7/16-20

P.L. No. F148

FUEL OIL PIPING

Twin Spin-On Fuel Oil Piping (Formerly Viscose)
All 567D and 645 Engines
PLATE A148-2

Ref. No.	Part Number	Qty. Req.	Description
1	8160140	1	MANIFOLD ASSEMBLY .. Fuel oil
2	9538460	2	BRACKET .. Manifold mounting
3	8032717	4	NUT .. Hex lock 3/8-24
4	6101225	8	WASHER .. Flat 3/8
5	8029197	2	CLIP .. Mounting
6	181377	2	BOLT .. Hex head 3/8-24 x 1-3/4
7	181385	2	BOLT .. Hex head 3/8-24 x 3
			Former applications only used quantity 3 each of Reference Nos. 3 and 5 on existing studs
8	8215900	1	TUBE ASSEMBLY .. Return - Manifold to filter
9	8215901	1	TUBE ASSEMBLY .. Supply - Filter to manifold
10	8104300	2	GASKET .. Tube to manifold
11	186309	2	BOLT .. Tube to manifold 3/8-24 x 3-1/4
12	8032717	2	NUT .. Hex lock 3/8-24
13	----	1	FILTER ASSEMBLY .. Fuel - Twin spin-on - Replaces Viscose element fuel filters - See Parts List No. 150
14	181428	2	BOLT .. Hex head 1/2-20 x 1-1/8 - Filter mounting
15	103323	2	WASHER .. Lock 1/2
ϕ16	8371707	1	TUBE ASSEMBLY .. Fuel oil supply and drain - 8-645 export engines only
ϕ16	8215906	1	TUBE ASSEMBLY .. Fuel oil supply and drain - 16-567D engines only
ϕ16	8347993	1	TUBE ASSEMBLY .. Fuel oil supply and drain - All engines except 8-645E export and 16-567D engines
17	8104455	1	BRACKET .. Tube
18	8104456	1	CLAMP .. Bracket
19	181338	2	BOLT .. Hex head 5/16-24 x 7/8 - Bracket mounting
20	6101223	2	WASHER .. Flat 5/16
21	181341	5	BOLT .. Hex head 5/16-24 x 1-1/4 - (Quantity 4 on 8-645 export engines)
22	103320	5	WASHER .. Lock 5/16 - (Quantity 8 on 8-645E export engines)
23	103340	4	WASHER .. Plain 5/16 - (Quantity 2 on 8-645E export engines)
24	8104292	1	GASKET .. Ref. No. 16 to filter assembly
25	8104276	2	GASKET .. Ref. Nos. 8 and 9 to filter assembly
26	179840	8	BOLT .. Hex head 3/8-16 x 1-1/8
27	103341	8	WASHER .. Plain 3/8
28	103321	12	WASHER .. Lock 3/8
29	181361	4	BOLT .. Hex head 3/8-24 x 7/8
30	8160114	2	GASKET .. Manifold
31	8165289	2	NUT .. Hex 2-12 - Special
32	8165276	2	GASKET .. Inside frame
			See Page 1
33	8261793	1	BRACKET .. Tube - Fuel supply and drain
34	181339	5	BOLT .. Hex head 5/16-24 x 1 - Bracket mounting
35	181343	1	BOLT .. Hex head 5/16-24 x 1-1/2
36	103025	1	NUT .. Hex 5/16-24
37	8308784	1	PAD .. Mounting - Upper bracket

P.L. No. F148

FUEL OIL PIPING

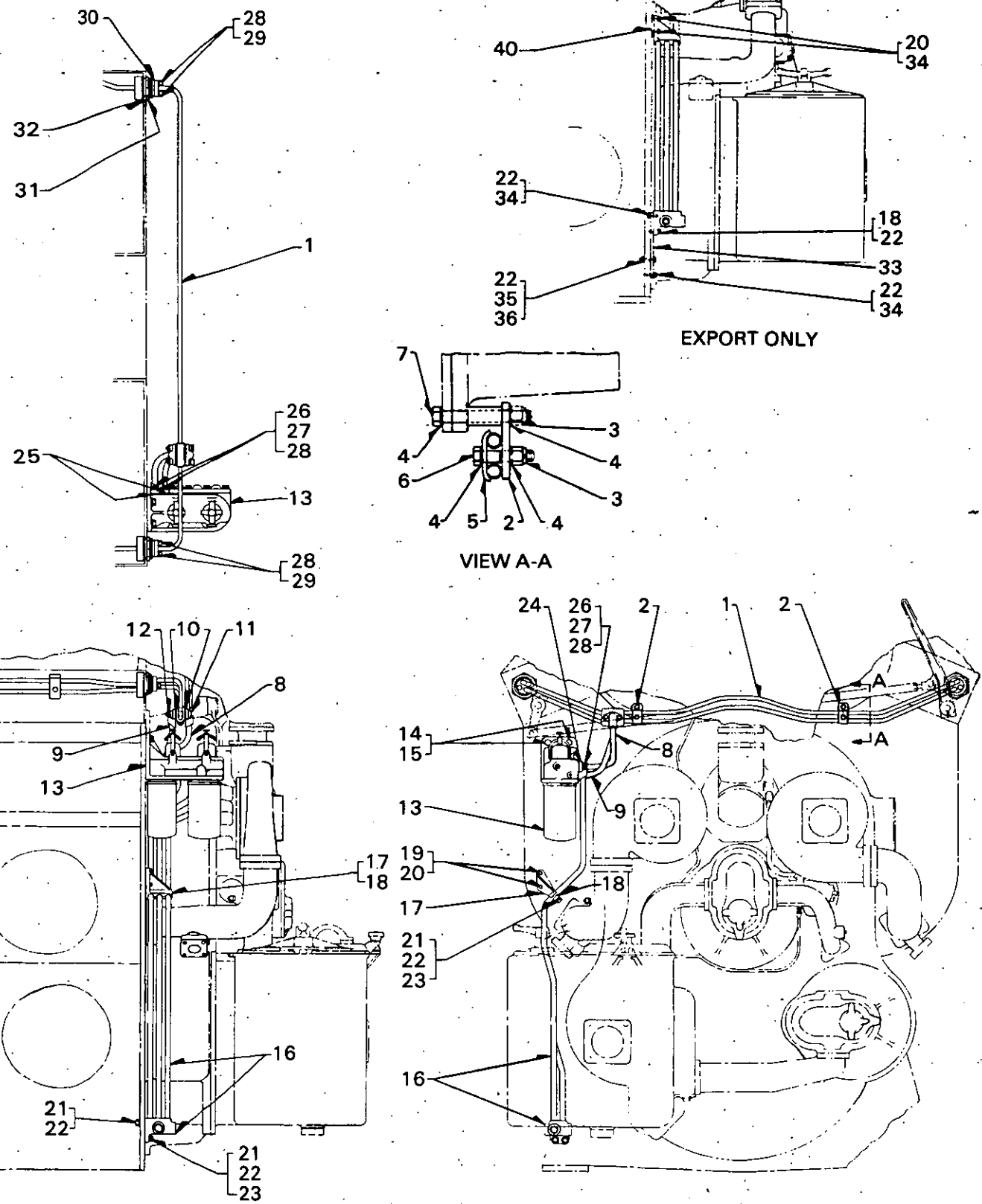


PLATE A148-2

FUEL OIL FILTER

Spin-On Fuel Oil Filter Assembly
All 567D and 645 Engines

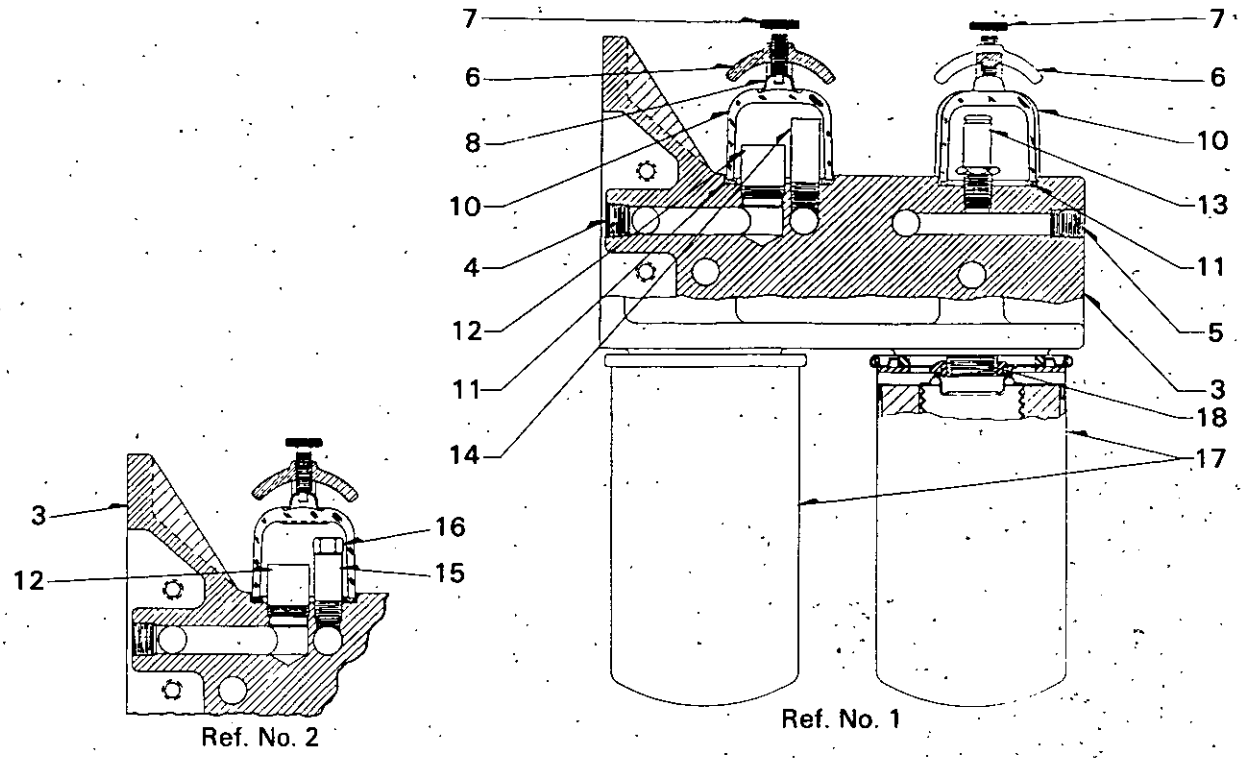


PLATE D150-1

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D1,D2,D3,D3A; 8-645E (domestic and export); 16-645E; 12,16,20-645E3; 16-645E3A; 8,12,16,20-645E3B; 8,12,16-645E3C and 12,16-645F3,F3B engines
		-	B	8-645E (export) and 12-645E engines
1	8479355	1	-	FILTER ASSEMBLY .. Fuel oil - Spin-on - Replaces 8427284, 8311184 and 8215908
2	8497551	-	1	FILTER ASSEMBLY .. Fuel oil - Spin-on - Replaces 8452887 and 8317501
3	8479301	1	1	BODY .. Fuel filter
4	8348619	4	4	PLUG .. Pipe - 3/8 MPT square socket - Headless
5	8348618	1	1	PLUG .. Pipe - 1/4 MPT square socket - Headless
6	8104667	2	2	CLEVIS ASSEMBLY .. Filter bowl
7	8104170	2	2	SCREW .. Thumb
8	854005	2	2	SEAT .. Thumb screw
*9	102828	4	4	SCREW .. Set - Clevis to filter body - 5/16-18 x 1/2 - Slotted
10	8361381	2	2	BOWL .. Glass - Oil sight
11	8104055	2	2	GASKET .. Bowl to filter
12	8427318	1	1	VALVE .. Relief - 5 PSI
13	8297957	1	1	VALVE .. Relief - 60 PSI
14	8104057	1	-	PIPE .. Stand
15	8120418	-	1	PIPE .. Stand
16	8120417	-	1	ORIFICE .. Stand pipe
17	8423132	2	2	ELEMENT .. Fuel filter - Spin-on
ϕ18	8488653	2	2	CONNECTOR .. Fuel filter element - 1-12-UNF-2A threaded both ends - Applied as a repair to filter bodies manufactured prior to 1978. See W.S. 19456 for details on filter body rework
ϕ18	9502226	2	2	CONNECTOR .. Fuel filter element - 1-12-UNF-2A threaded one end and 7/8-14-UNF-2A threaded one end - Applicable to filter bodies manufactured since January, 1978

P.L. No. F150

FUEL OIL FILTER

16-567D1,D2,D3 Engines
PLATES C150-2,3,4

Ref. No.	Part Number	Qty. Req.		Description
FILTER ASSEMBLY .. Fuel				
1	8215908	A	-	FILTER ASSEMBLY .. Fuel - Relief valve in body - Replaced by 8479355 - Refer to Pages 7 and 8
2	8215908	-	B	FILTER ASSEMBLY .. Fuel - Relief valve under sight glass - Replaced by 8479355 - Refer to Pages 7 and 8

Filter with relief valve in body can be converted to filter with relief valve under sight glass with use of Ref. Nos. 23 and 24 column "B". Refer to M.I. 9529 for application of parts.

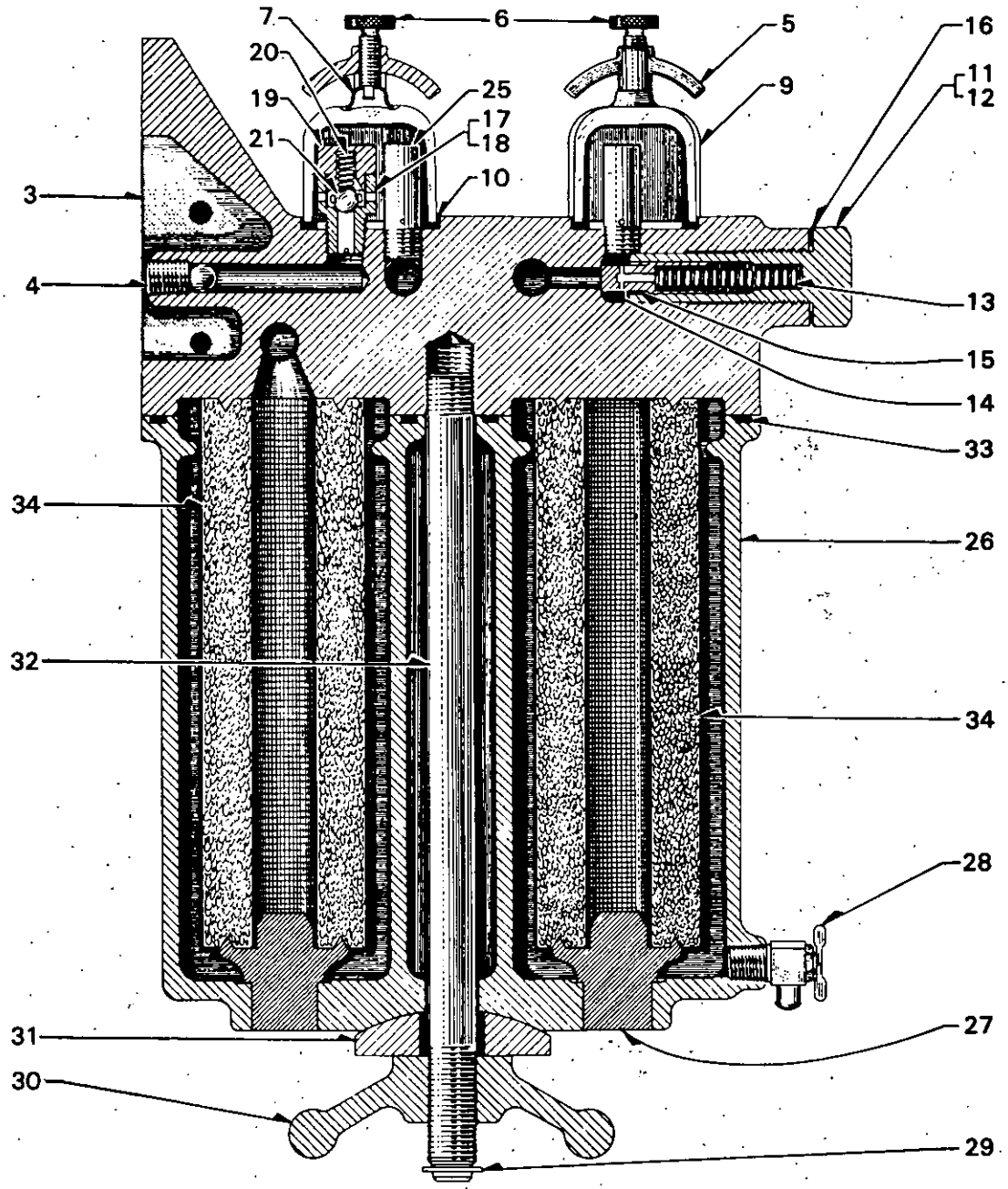
BODY .. Fuel Filter				
ƒ3	8299059	1	1	BODY .. Fuel filter
4	8348618	1	2	PLUG .. Pipe - 1/4 MPT square socket - Headless - Replaces 143997
CLEVIS AND BOWL				
5	8104467	2	2	CLEVIS ASSEMBLY
6	8104170	2	2	SCREW .. Thumb
7	854005	2	2	SEAT .. Thumb screw
*8	102828	4	4	SCREW .. Set - Clevis to body - 5/16-18 x 1/2 slotted - Headless
9	8361381	2	2	BOWL .. Glass - Oil sight - Replaces 1522092
10	8104055	2	2	GASKET .. Bowl to filter body
VALVE .. Relief				
11	8215896	1	-	VALVE .. Relief
12	8215895	1	-	BODY .. Valve
13	8214355	1	-	SPRING .. Plunger
14	8215894	1	-	PLUNGER .. Valve
15	8215893	1	-	RING .. Snap
16	8187186	1	-	GASKET .. Valve to body (One [1] required on 8215908 filters converted to relief valve under sight glass)
17	8222846	1	-	VALVE .. Relief
18	8222847	1	-	BODY .. Valve
19	8222848	1	-	RETAINER .. Spring
20	8222849	1	-	SPRING .. Relief valve
21	145633	1	-	BALL .. 3/8 inch diameter
*22	8215893	1	-	RING .. Snap
23	8322623	-	1	VALVE .. Relief - 10 pounds
24	8297957	-	1	VALVE .. Relief - 60 pounds
25	8104057	2	1	PIPE .. Fuel filter
HOUSING AND ELEMENT				
ƒƒ26	8214346	1	1	HOUSING .. Fuel filter
ƒƒ27	8214347	2	2	SUPPORT HOUSING .. Filter element
28	125688	1	1	COCK .. Drain - 1/4 MPT
29	8124184	1	1	RING .. Snap - Handwheel lock
30	8214352	1	1	HANDWHEEL
31	8214342	1	1	WASHER .. Spherical
32	8214344	1	1	STUD .. Housing to body - 3/4-10-16 x 13-1/8 inches long
33	8177030	2	2	SEAL .. Housing to body
ƒƒƒ34	8302889	2	2	ELEMENT .. Filter - 8-1/2 inches long - Viscose

ƒ Fuel Filter Body 8299059 is no longer available. When replacement is required, recommend ordering 1-8479301 Body, 2-8423132 Element and 1-8427318 Relief Valve.

ƒƒ Housing 8214346, Ref. No. 26, and support 8214347, Ref. No. 27, are no longer available. When replacement is required, recommend ordering 8488617 kit to convert filter from viscose to twin spin-on type. See Page 8.

ƒƒƒ Filters can be converted to use 8299457 - 8 inch long viscose filter element with use of Adapters 8310474. Refer to Plate C150-4 for application

FUEL OIL FILTER

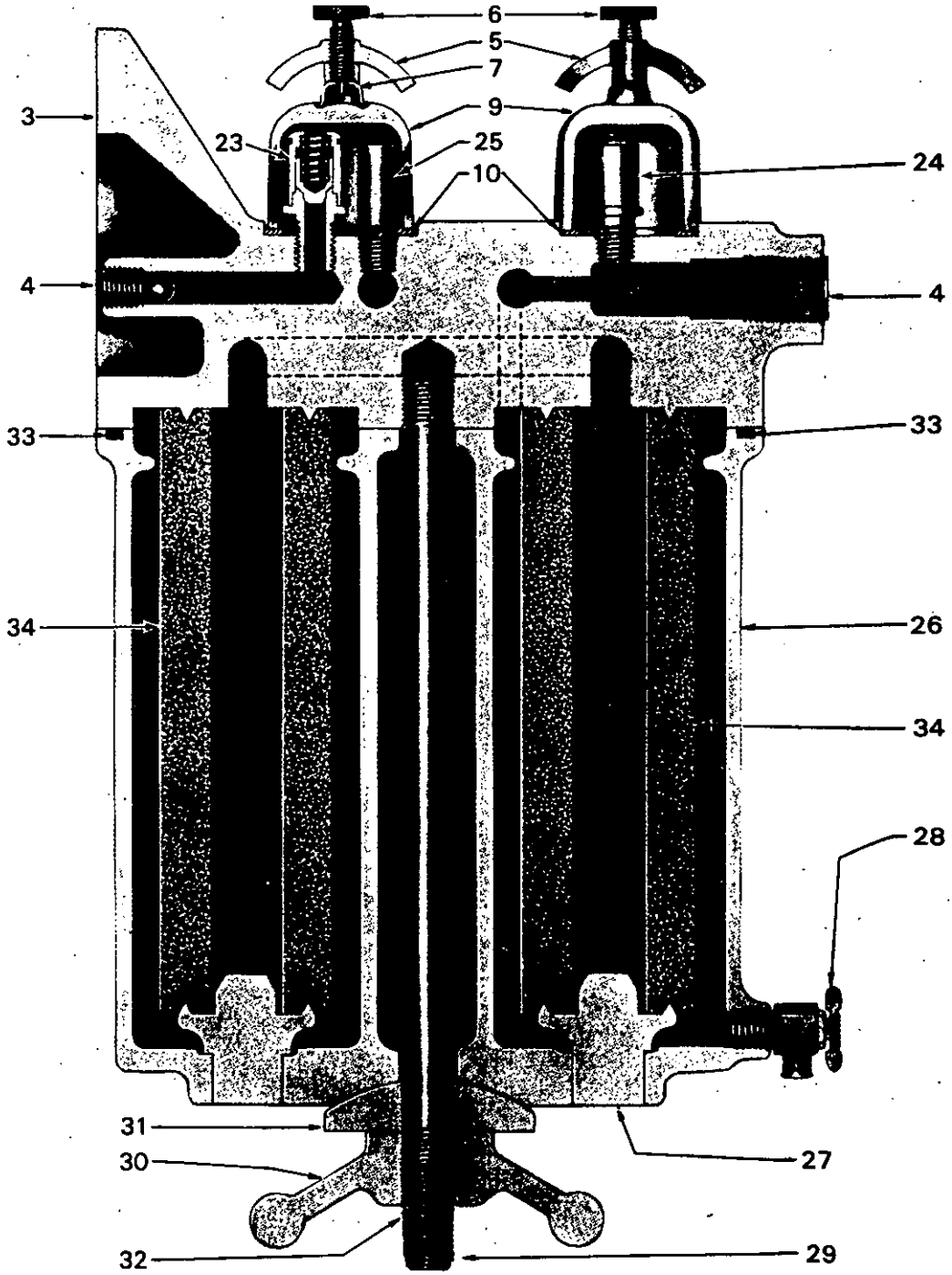


Ref. No. 1

PLATE C150-2

P.L. No. F150

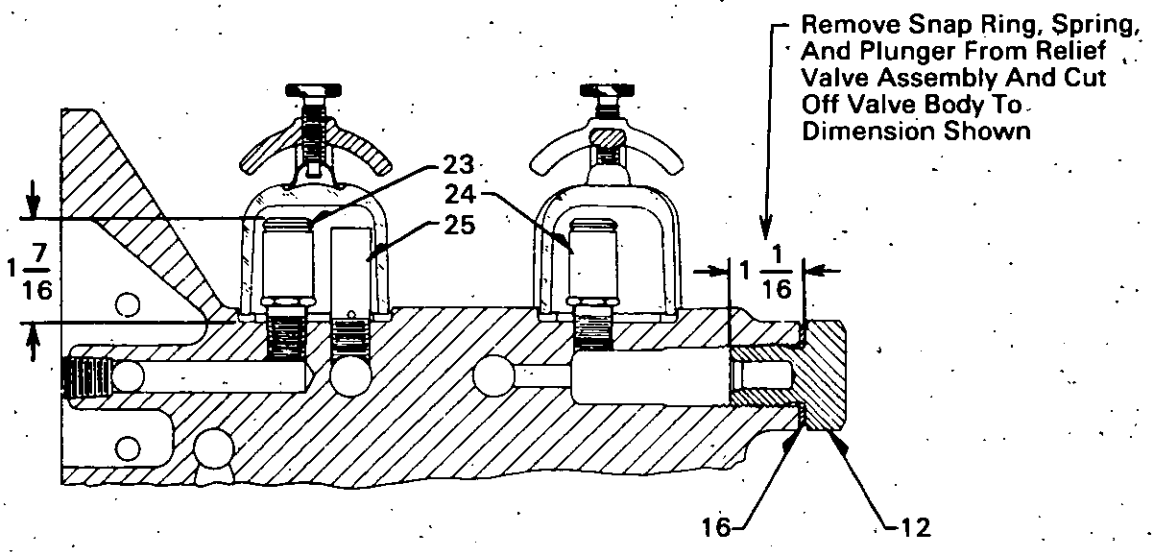
FUEL OIL FILTER



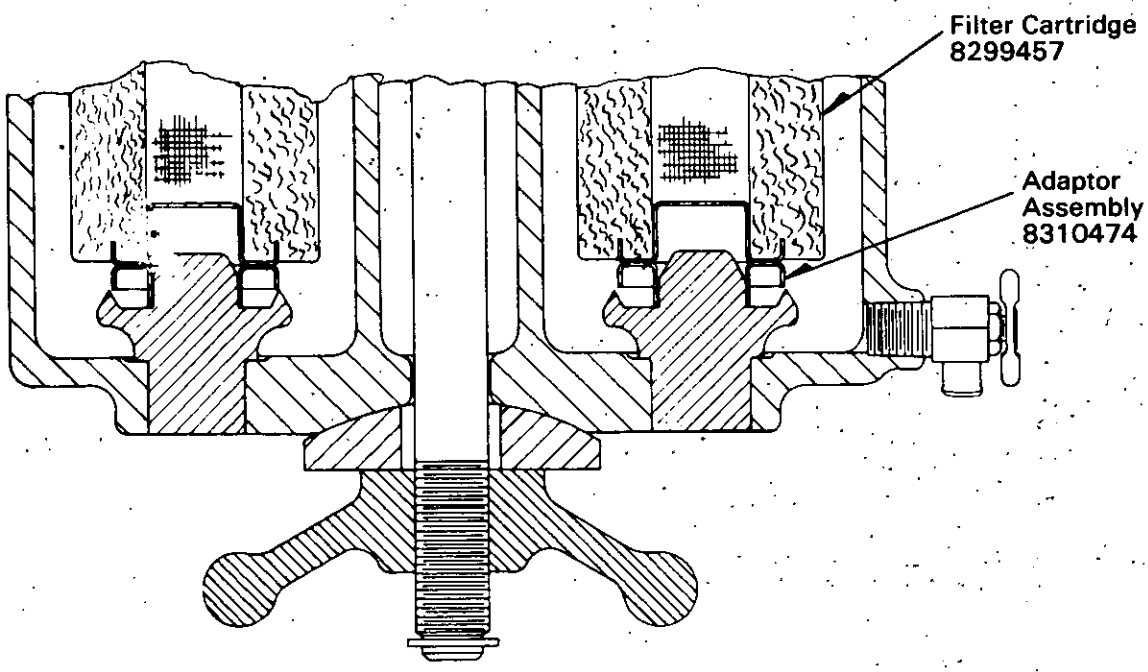
Ref. No. 2

PLATE C150-3

FUEL OIL FILTER



Relief Valve Application
On Converted 8215908 Filter



8 Inch Fuel Filter Element Application

PLATE C150-4

P.L. No. F150

FUEL OIL FILTER

16-567D1,D2,D3,D3A; 8,12,16-645E; 12,16,20-645E and 16-645E3A Engines
PLATE B150-5

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	16-567D1,D2,D3,D3A; 8-645E (domestic and export); 16-645E and 12,16,20-645E engines
		-	B	-	-	8-645E (export) and 12-645E engines
		-	-	C	-	16-567D1,D2,D3,D3A; 8-645E (domestic and export); 16-645E; 12,16,20-645E3 and 16-645E3A engines
		-	-	-	D	8-645 (export) and 12-645E engines
1	8311184	1	-	-	-	FILTER ASSEMBLY .. Fuel oil - Replaces 8215908 - Replaced by 8479355 - See Page 1
*2	8317501	-	1	-	-	FILTER ASSEMBLY .. Fuel oil - Replaced by 8497551 - See Page 1
*3	8427284	-	-	1	-	FILTER ASSEMBLY .. Fuel oil - Replaces 8215908 and 8311184 - Replaced by 8479355 - See Page 1
*4	8452887	-	-	-	1	FILTER ASSEMBLY .. Fuel oil - Replaces 8317501 - Replaced by - 8497551 - See Page 1

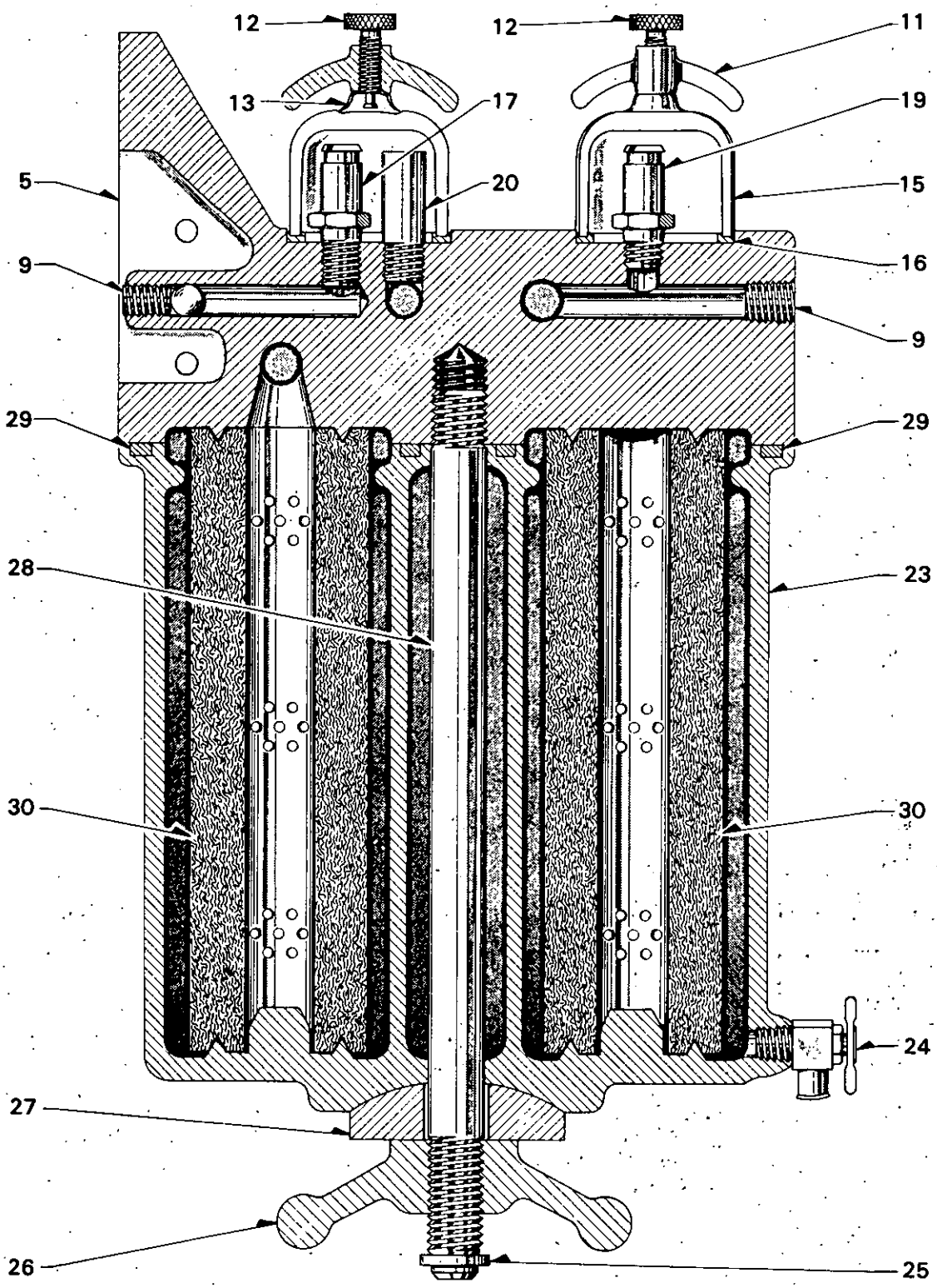
† Fuel filter bodies 8299059 and 8427285 are no longer available. When replacement of 8299059 body is required, recommend ordering 1-8479301 body, 2-8423132 element, and 1-8427318 relief valve. When replacement of 8427285 body is required, recommend ordering 1-8479301 body and 2-8423132 element.

†5	8299059	1	1	-	-	BODY .. Fuel filter - No longer available - See above note
†*6	8427285	-	-	1	1	BODY .. Fuel filter - No longer available - See above note
*7	126045	2	2	-	-	PLUG .. Pipe - 3/8 MPT square socket - Headless
*8	8348619	-	-	3	3	PLUG .. Pipe - 3/8 MPT square socket head
9	143997	2	2	-	-	PLUG .. Pipe - 1/4 MPT square socket - Headless
*10	8348618	-	-	1	1	PLUG .. Pipe - 1/2 MPT square socket head
11	8104467	2	2	2	2	CLEVIS ASSEMBLY .. Filter bowl
12	8104170	2	2	2	2	SCREW .. Thumb
13	854005	2	2	2	2	SEAT .. Thumb screw
*14	102828	4	4	4	4	SCREW .. Set - Clevis to filter - 5/16-18 x 1/2 slotted - Headless
15	8361381	2	2	2	2	BOWL .. Glass - Oil sight
16	8104055	2	2	2	2	GASKET .. Bowl to filter body
17	8322623	1	1	-	-	VALVE .. Relief - 10 PSIG cracking pressure
†*18	8427318	-	-	1	1	VALVE .. Relief - 5 PSIG cracking pressure - Formerly 10 PSIG
19	8297957	1	1	1	1	VALVE .. Relief - 60 PSIG cracking pressure
20	8104057	1	-	1	-	PIPE .. Stand
*21	8120418	-	1	-	1	PIPE .. Stand
*22	8120417	-	1	-	1	ORIFICE .. Stand pipe
††23	8311121	1	1	1	1	HOUSING .. Fuel filter
24	125688	1	1	1	1	COCK .. Drain - 1/4 MPT
25	8124184	1	1	1	1	RING .. Snap - Handwheel lock
26	8214352	1	1	1	1	HANDWHEEL
27	8214342	1	1	1	1	WASHER .. Spherical
28	8311120	1	1	1	1	STUD .. Housing to body - 3/4-10-16 x 12-3/16 inches long
29	8177030	2	2	2	2	SEAL .. Housing to body
30	8299457	2	2	2	2	CARTRIDGE .. Fuel filter - 8 inches long - Viscose

†† Housing 8311121, Ref. No. 23, is no longer available. When replacement is required, recommend ordering 8488617 kit to convert filter from viscose to twin spin-on type. See Page 8.

P.L. No. F150

FUEL OIL FILTER



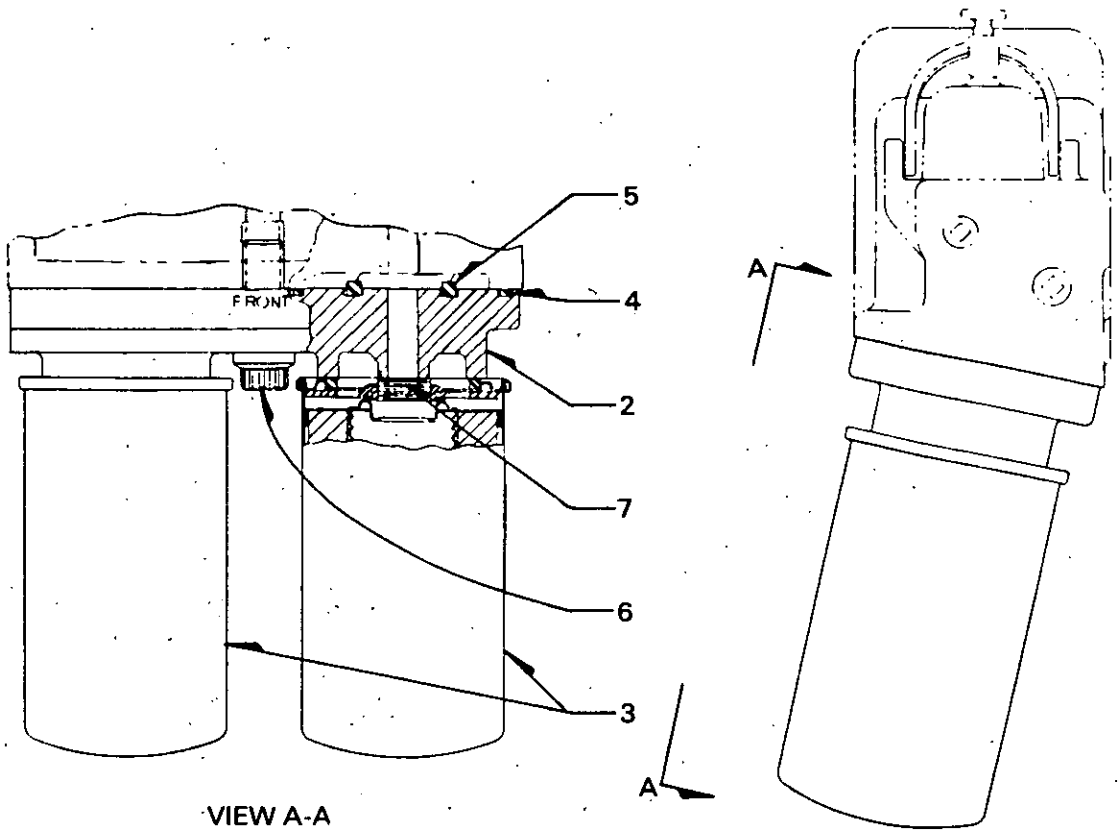
Ref. No. 1

PLATE B150-5

P:L. No. F150

FUEL OIL FILTER

Viscose To Twin Spin-On Filter Conversion Kit
16-567D1,D2,D3,D3A; 8,12,16-645E; 12,16,20-645E3 and 16-645E3A Engines



Ref. No. 1

PLATE B150-6

Ref. No.	Part Number	Quantity Required	Description
			FILTER CONVERSION KIT .. Viscose To Twin Spin-On Filters
			Filter conversion applicable to 8215908, 8311184, 8427284, 8317501 and 8452887 filter assemblies.
1	8488617	1	KIT .. Filter conversion
2	8488615	1	ADAPTER .. Fuel filter
3	8423132	2	FILTER .. Fuel - Spin-on
4	8177030	2	SEAL .. Adapter to body - Outer
5	8488622	2	SEAL .. Adapter to body - Inner
6	9436065	1	BOLT .. Adapter to body - 3/4-10 x 2 - Type C flanged - 12 point
7	8488653	2	CONNECTOR .. Fuel filter element - 1-12-UNF-2A threaded both ends - Applied as a repair to adapter - See W.S. 19456 for details on adapter rework

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

Current Design Round Top Inside Frame Corners
8-645E,E3B,E3C,F3B and 12-645E,E3,E3B,E3C,F3,F3B Engines
PLATE E154-1

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E engine
		-	B	-	-	8-645E3B,E3C,F3B engines
		-	-	C	-	12-645E engine
		-	-	-	D	12-645E3,E3B,E3C,F3,F3B engines
1	8391516	1	1	-	-	FRAME ASSEMBLY .. Cover and support - Repl. 8208775 and 9318547. } Left Bank
*1	8389114	-	-	1	-	FRAME ASM. .. Cover and support - Repl. 8208501 } Left Bank
*1	8388422	-	-	-	1	FRAME ASM. .. Cover and support
2	8391517	1	-	-	-	FRAME ASM. .. Cover and support - Repl. 8208776 } Right Bank
2	8407420	-	1	-	-	FRAME ASM. .. Cover and support
*2	8389113	-	-	1	-	FRAME ASM. .. Cover and support - Repl. 8208502 } Right Bank
*2	8388423	-	-	-	1	FRAME ASM. .. Cover and support
*3	6532324	6	6	6	6	NUT .. Spline 1/4-28 - Replaces 8130176
4	8168871	10	9	16	15	LATCH ASM. .. Cover - Clamp } See Page 10
5	8168872	9	8	16	14	LATCH ASM. .. Cover - Hinge } See Page 10
6	9094557	1	2	-	2	LATCH ASM. .. Cover - Hinge } See Page 10
7	8366616	-	1	-	1	LATCH ASM. .. Cover - Clamp } See Page 10
8	436591	40	40	64	64	SCREW .. Latch mtg. - No. 10-32 x 7/8 pan hd. - Repl. 100767
9	446186	40	40	64	64	WASHER .. Plain - No. 10
10	8032813	40	40	64	64	NUT .. Hex lock No. 10-32
11	8202278	2	2	4	4	SUPPORT ASM. .. Cover - Spring loaded - See Page 10
12	181360	4	4	8	8	BOLT .. Hex head 3/8-24 x 3/4 - Support mounting
13	116103	4	4	8	8	WASHER .. Plain 3/8
*14	8388600	-	-	2	2	SUPPORT .. Cover
*15	8388273	-	-	4	4	GASKET .. Support mounting
*16	138201	-	-	4	4	SCREW .. Hex socket hd. cap 1/4-20 x 3/4 - Support mounting
*17	138203	-	-	4	4	SCREW .. Hex socket hd. cap 1/4-20 x 1-1/4 - Support mtg.
*18	6101221	-	-	8	8	WASHER .. Flat - 1/4
19	8098593	As Req.				TUBING .. 1/4 inch O.D. x .029 copper brazed steel - 20 feet } Right Bank Frame Only
20	116452	2	2	2	2	NUT .. Tube - 1/4 - Replaces 118537 } Right Bank Frame Only
21	8160443	2	1	2	1	ELBOW .. 90°-1/4 - Bulkhead } Right Bank Frame Only
22	272131	2	1	2	1	NUT .. Hex jam 7/16-20 } Right Bank Frame Only
23	8173802	4	5	5	6	CLAMP .. Tube 1/4 } Right Bank Frame Only
24	8194923	As Req.				SPACER .. Shim - .0625 thick - Used with Ref. No. 5
25	8470793	2	2	-	-	GASKET .. Frame to crankcase - Repl. 8275291 } OUTER
*25	8470795	-	-	2	2	GASKET .. Frame to crankcase - Repl. 8275296 } OUTER
26	8470794	2	2	-	-	GASKET .. Frame to crankcase - Repl. 8275295 } INNER
*26	8470796	-	-	2	2	GASKET .. Frame to crankcase - Repl. 8275290 } INNER
*27	181370	14	14	14	14	BOLT .. Hex head 3/8-24 x 1-1/4 - Frame to accessory drive hsg.
28	181365	22	22	22	22	BOLT .. Hex head 3/8-24 x 1-1/8 - Frame to camshaft drive hsg.
29	454911	78	78	110	110	BOLT .. Hex head 3/8-24 x 3/4 - Frame to crankcase Formerly 8218332
30	9509486	114	114	146	146	WASHER .. Hardened 3/8 x 1/8 in. thick - Formerly 8373316, 103341, 103321
*31	8332127	-	1	-	1	CLAMP .. Tube - 1/4 - Oil line - Camshaft drive end - 7/16 dia. mtg. hole
32	8487945	2	2	-	-	COVER ASM. .. Cylinder head } See Page 5
*32	8487963	-	-	4	4	COVER ASM. .. Cylinder head } See Page 5
*33	9087944	1	1	-	-	KIT .. Gasket and cover seal - Repl. 8395611 } See Parts List 199
*33	9087945	-	-	1	1	KIT .. Gasket and cover seal - Repl. 8395610 } See Parts List 199
*34	8425724	As Req.				GREASE .. Silicon - Cover seal to frame - 8 oz. tube - Replaces 8425725 and 8425726
†*35	9507085	2	2	2	2	GASKET .. Cylinder head frame to camshaft drive housing - Optional to 8081380 gasket when only the head frame portion is to be replaced - See Parts List No. 160
†*36	8366747	As Req.				SEALING COMPOUND .. Silicon rubber - 12 oz. cartridge - Applied to headframe to crankcase joint - See Parts List No. 160

8391666D, 8407421E, 8389117D, 8388620D

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

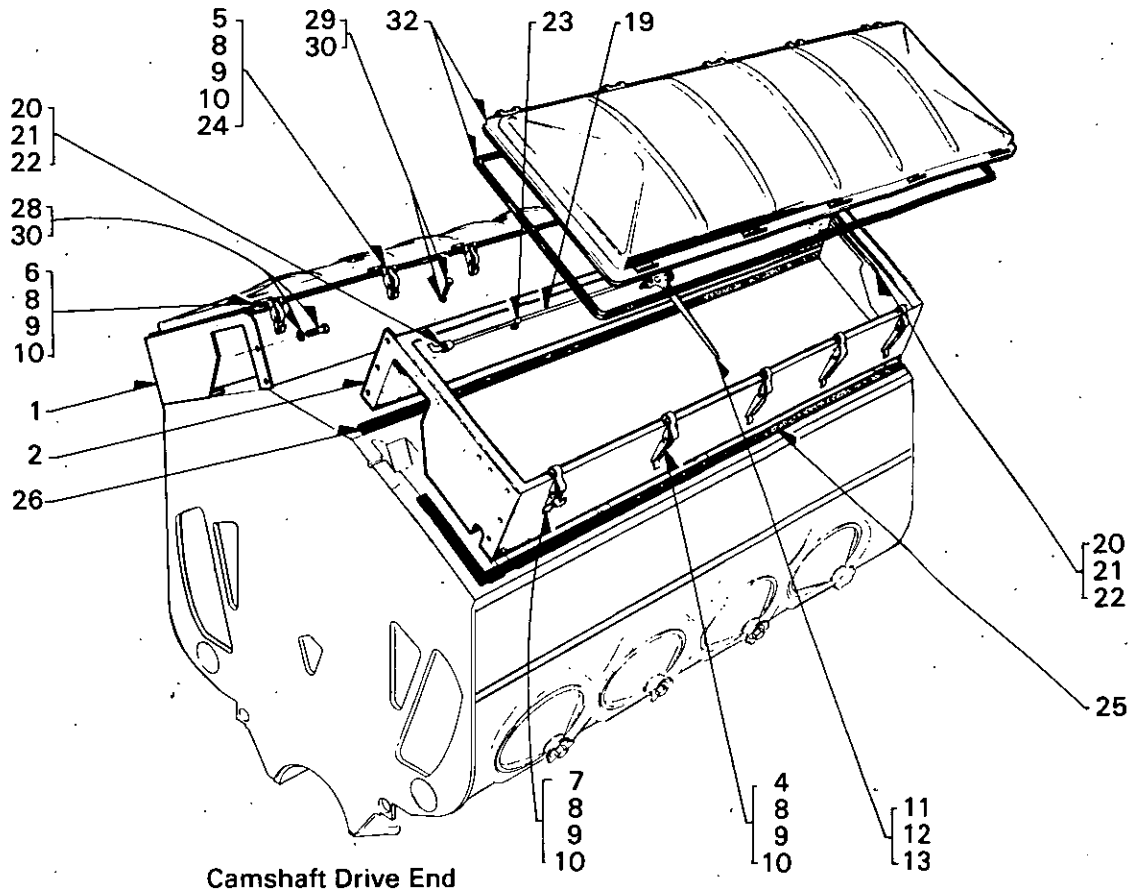


PLATE E154-1

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

Current Design Round Top Inside Frame Corners
16-567D1,D2,D3A; 16-645E,E3,E3A,E3B,E3C,F3,F3B and
20-645E3,E3B Engines
PLATE D154-2

Ref. No.	Part Number	Quantity Req. Per Engine					Description
		A	-	-	-	-	16-645E and 16-567D1 engines
		-	B	-	-	-	16-645E engine - Export GL26CU-2/AC locomotives
		-	-	C	-	-	16-567D2,D3 engines
		-	-	-	D	-	16-645E3,E3A,E3B,E3C,F3,F3B and 16-567D3A engines
		-	-	-	-	E	20-645E3,E3B engines
1	8391035	1	-	-	-	-	FRAME ASM. .. Cover and support - Repl. 8208162 } Left Bank
†1	9080780	-	1	-	-	-	FRAME ASM. .. Cover and support } Left Bank
1	8377675	-	-	1	1	-	FRAME ASM. .. Cover and support - Repl. 8304284 } Left Bank
*1	8374137	-	-	-	-	1	FRAME ASM. .. Cover and support
2	8391034	1	-	-	-	-	FRAME ASM. .. Cover and support - Repl. 8208163 } Right Bank
†2	9080781	-	1	-	-	-	FRAME ASM. .. Cover and support } Right Bank
2	8405068	-	-	1	-	-	FRAME ASM. .. Cover and support - Repl. 8304285 } Right Bank
2	8377674	-	-	-	1	-	FRAME ASM. .. Cover and support - Repl. 8331618 } Right Bank
*2	8374138	-	-	-	-	1	FRAME ASM. .. Cover and support
*3	6532324	6	6	6	6	6	NUT .. Spline 1/4-28 - Replaces 8130176
4	8168871	20	-	19	19	23	LATCH ASM. .. Cover - Clamp } See Page 10
*4	8498896	-	20	-	-	-	LATCH ASM. .. Cover - Clamp } See Page 10
5	8168872	20	-	19	18	22	LATCH ASM. .. Cover - Hinge } See Page 10
*5	8498895	-	18	-	-	-	LATCH ASM. .. Cover - Hinge } See Page 10
*6	8498829	-	18	-	-	-	PAD .. Latch } See Page 10
*7	8366616	-	-	-	1	1	LATCH ASM. .. Cover - Clamp - R.B. } See Page 10
8	9094557	-	2	1	2	2	LATCH ASM. .. Cover - Hinge } See Page 10
*8	8311343	-	-	1	-	-	LATCH ASM. .. Cover - Hinge } See Page 10
*9	8168865	-	18	-	-	-	BRACKET .. Latch
10	436591	80	40	80	80	96	SCREW .. Latch mounting - No. 10-32 x 7/8 pan hd - Replaces 100767
*11	181313	-	40	-	-	-	BOLT .. Hex head 1/4-28 x 3/4 - Latch mounting
*12	181317	-	36	-	-	-	BOLT .. Hex head 1/4-28 x 1-1/4 - Latch and pad mounting
13	446186	80	40	80	80	96	WASHER .. Plain - No. 10
*14	116102	-	76	-	-	-	WASHER .. Plain - 1/4
15	8032813	80	40	80	80	96	NUT .. Hex lock No. 10-32
*16	8032715	-	76	-	-	-	NUT .. Hex lock 1/4-28
17	8202278	4	4	4	4	4	SUPPORT ASM. .. Cover - Spring loaded - See Page 10
18	181360	8	8	8	8	8	BOLT .. Hex head 3/8-24 x 3/4 - Support mounting
19	116103	8	8	8	8	8	WASHER .. Plain 3/8
20	8098593	As Req.					TUBING .. 1/4 inch O.D. x .029 copper brazed steel - 20 feet
21	116452	2	2	2	2	2	NUT .. Tube - 1/4 - Replaces 118537 } Right Bank Frame Only
*22	8160443	2	2	2	1	1	ELBOW .. 90°-1/4 - Bulkhead } Right Bank Frame Only
*23	272131	2	2	2	1	1	NUT .. Hex jam 7/16-20 } Right Bank Frame Only
24	8173802	7	7	7	8	11	CLAMP .. Tube 1/4 } Right Bank Frame Only
25	8194923	As Req.					SPACER .. Shim - .0625 thick - Used with Ref. No. 5
26	8470797	2	2	2	2	-	GASKET .. Frame to crankcase - Repl. 8275294 } Outer
*26	8470799	-	-	-	-	2	GASKET .. Frame to crankcase - Repl. 8360956 } Outer
27	8470798	2	2	2	2	-	GASKET .. Frame to crankcase - Repl. 8275292 } Inner
*27	8470800	-	-	-	-	2	GASKET .. Frame to crankcase - Repl. 8360955 } Inner
*28	181370	14	14	14	14	14	BOLT .. Hex head 3/8-24 x 1-1/4 - Frame to accessory drive hsg.
29	181365	22	22	22	22	22	BOLT .. Hex head 3/8-24 x 1-1/8 - Frame to camshaft drive hsg.
30	454911	150	150	150	150	182	BOLT .. Hex head 3/8-24 x 3/4 - Frame to crankcase formerly 8218332
31	9509486	186	186	186	186	218	WASHER .. Hardened 3/8 x 1/8 in. thick - Formerly 8373316,103341,103321
*32	8332127	-	-	-	1	1	CLAMP .. Tube - 1/4 - Oil line - Camshaft drive end - 7/16 dia. mtg. hole

8391049D, 9080784A, 8262925B, 8378367D, 8433720, 8374281E

† *Application of these top deck frames requires that flame arrestor hand hold cover 8499419 be installed on engine. - See Parts List No. 104.*

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

Ref. No.	Part Number	Quantity Req. Per Engine					Description
		A	-	-	-	-	16-645E and 16-567D1 engines
		-	B	-	-	-	16-645E engine - Export GL26CU-2/AC locomotives
		-	-	C	-	-	16-567D2,D3 engines
		-	-	-	D	-	16-645E3,E3A,E3B,E3C,F3,F3B and 16-567D3A engines
		-	-	-	-	E	20-645E,E3B engine
33	8487945	4	-	4	4	-	COVER ASM. .. Cylinder head }
33	9087069	-	4	-	-	-	COVER ASM. .. Cylinder head } See Page 5
33	8487961	-	-	-	-	4	COVER ASM. .. Cylinder head }
*34	9087946	1	1	1	1	-	KIT .. Gasket and cover seal - Repl. 8386814 } See Parts
*34	9087947	-	-	-	-	1	KIT .. Gasket and cover seal - Repl. 8377469 } List 199
*35	8425724	As Req.					GREASE .. Silicon - Cover seal to frame - 8 ounce tube - Replaces 8425725 and 8425726
†*36	9507085	2	2	2	2	2	GASKET .. Cylinder head frame to camshaft drive housing - Optional to 8081380 gasket when only the head frame portion is to be replaced - See Parts List No. 160
†*37	8366747	As Req.					SEALING COMPOUND .. Silicon rubber - 12 ounce cartridge - Applied to headframe to crankcase joint - See Parts List No. 160

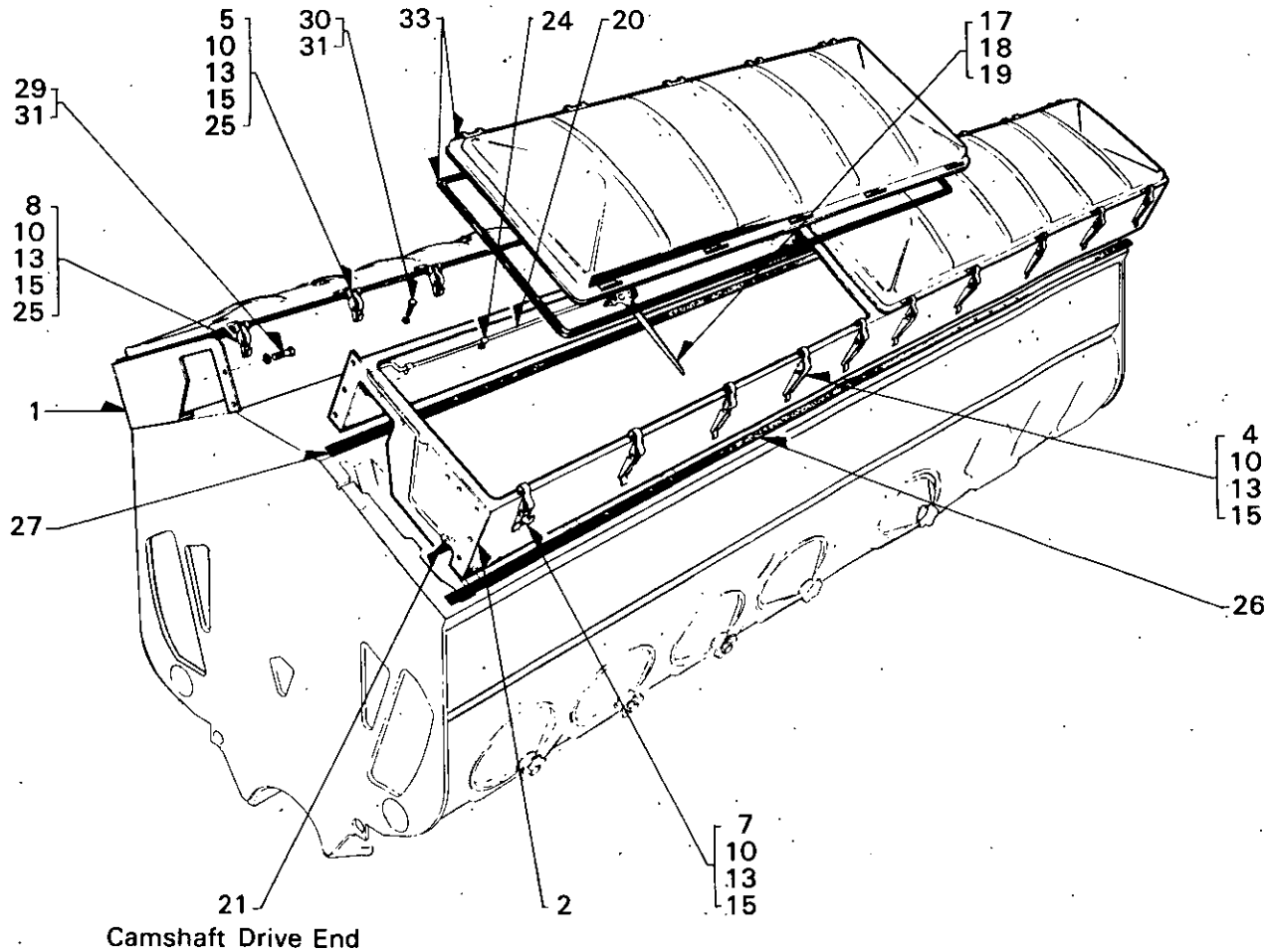


PLATE D154-2

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

Current Design Cover Assembly
For Round Inside Corner Frame Assembly
PLATE A154-3

In early 1982, the cover material was changed from aluminum to coated steel. The aluminum covers are no longer available, but are listed below for service parts reference.

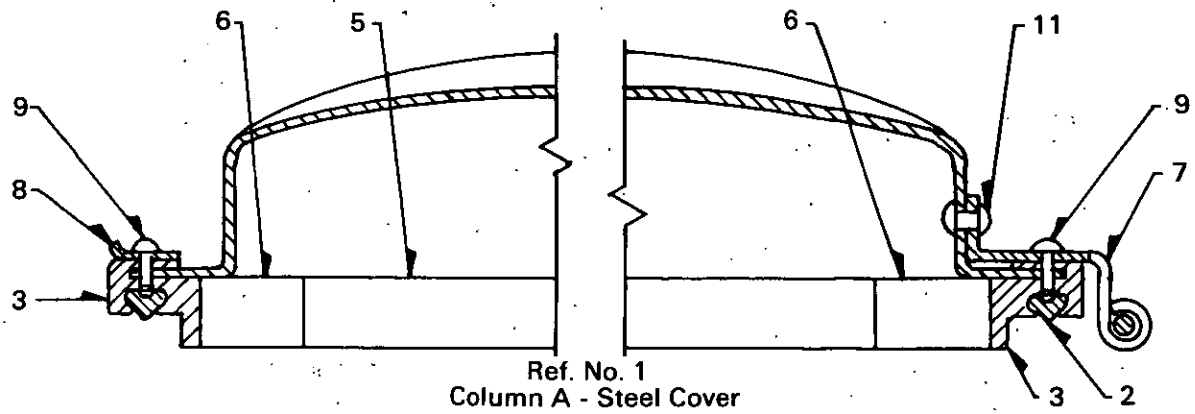
Ref. No.	Part Number	Quantity Required								Description	Replaces
		Steel				Aluminum					
		A	B	C	D	E	F	G	H		
1	8487945	1	-	-	-	1	-	-	-	COVER ASM. .. Cylinder head	8389584
*1	8487963	-	1	-	-	-	1	-	-	COVER ASM. .. Cylinder head	8395609
†1	9087069	-	-	1	-	-	-	1	-	COVER ASM. .. Cylinder head	
*1	8487961	-	-	-	1	-	-	-	1	COVER ASM. .. Cylinder head	8377648

† *Application of this top deck cover requires that flame arrestor hand hold cover 8499419 be installed on engine. - See Parts List No. 104.*

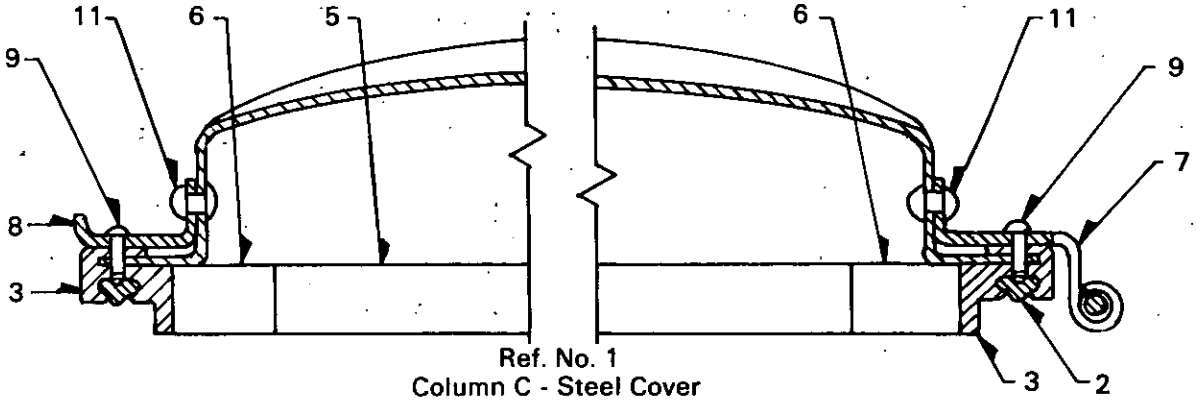
2	9087073	1	-	1	-	1	-	1	-	KIT .. Seal cover - Repl. 8473321, 8380486	
2	9087074	-	1	-	-	-	1	-	-	KIT .. Seal cover - Repl. 8473322, 8399083	
2	9087072	-	-	-	1	-	-	-	1	KIT .. Seal cover - Repl. 8473320, 8373628	
3	9544760	2	-	2	-	-	-	-	-	RETAINER .. Seal	
3	8377496	-	-	-	-	2	-	1	-	RETAINER .. Seal	
*3	9548214	-	2	-	-	-	-	-	-	RETAINER .. Seal	
*3	8388280	-	-	-	-	-	2	-	-	RETAINER .. Seal	SIDE
*3	9547406	-	-	-	2	-	-	-	-	RETAINER .. Seal	
*3	8373043	-	-	-	-	-	-	-	2	RETAINER .. Seal	
4	8498933	-	-	-	-	-	-	1	-	RETAINER .. Seal	
5	9535490	2	2	2	2	-	-	-	-	RETAINER .. Seal	END
5	8373627	-	-	-	-	2	2	2	2	RETAINER .. Seal	
6	9535491	4	4	4	4	-	-	-	-	RETAINER .. Seal	CORNER
6	8373137	-	-	-	-	4	4	4	4	RETAINER .. Seal	
7	9535492	5	4	5	6	-	-	-	-	HINGE ASM. .. Cover	
7	8373440	-	-	-	-	5	4	5	6	HINGE ASM. .. Cover	
8	9535570	5	4	-	6	-	-	-	-	HOOK .. Clamp	
8	8373603	-	-	-	-	5	4	-	6	HOOK .. Clamp	
8	9537842	-	-	5	-	-	-	-	-	HOOK .. Clamp	
8	8498932	-	-	-	-	-	-	5	-	HOOK .. Clamp	
9	9440188	20	16	20	24	-	-	-	-	RIVET .. Hinge and hook to retainer - 1/8 x 5/8 flat head	
10	9402383	-	-	-	-	10	8	20	12	RIVET .. Hinge to retainer - 1/8 x 9/16 cntr. sunk hd.	
11	101890	10	8	8	12	-	-	-	-	RIVET .. Hinge to cover - 3/16 x 3/8 round head	
11	101843	-	-	-	-	10	8	20	12	RIVET .. Hinge to cover - 3/16 x 7/16 round head	
12	9402382	-	-	-	-	10	8	-	12	RIVET .. Hook to retainer - 1/8 x 1/2 cntr. sunk head	
*13	9440189	24	22	26	26	-	-	-	-	RIVET .. Cover to retainer - 1/8 x 1/2 flat head	
*13	9402381	-	-	-	-	44	38	46	48	RIVET .. Cover to retainer - 1/8 x 7/16 cntr. sunk head	
*14	8291069	-	-	-	-	2	2	2	2	HANDLE .. Cover - No longer available	
*15	101843	-	-	-	-	8	8	8	8	RIVET .. Handle to cover - 3/16 x 7/16 round head	
*16	9531766	As Req.				-	-	-	-	SEALER .. Cover to retainer - 10.5 ounce tube	
*16	8210618	-	1	-	1	-	As Req.			SEALER .. Cover to retainer - 1 quart can	
*17	8425724	As Req.				As Req.				GREASE .. Silicon - Cover seal to frame - 8 ounce tube Replaces 8425725 and 8425726	

P.L. No. F154

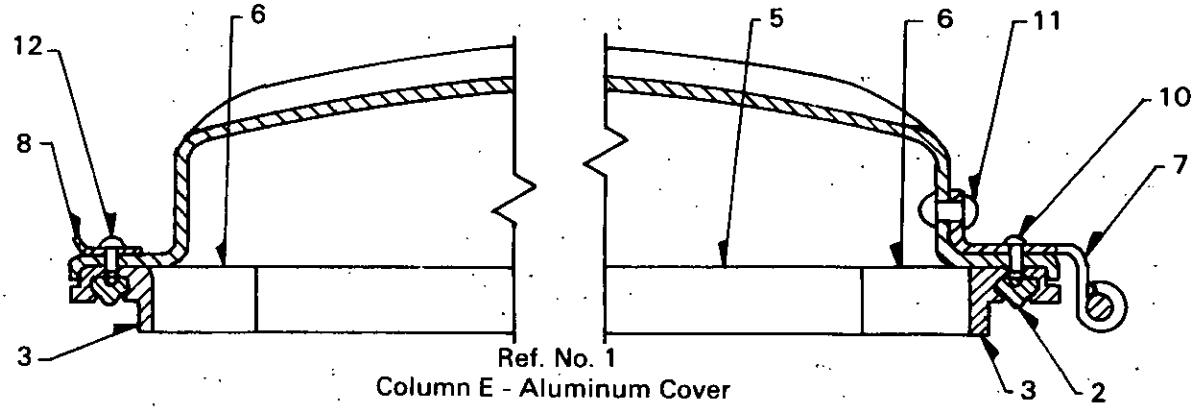
CYLINDER HEAD COVER AND SUPPORT FRAME



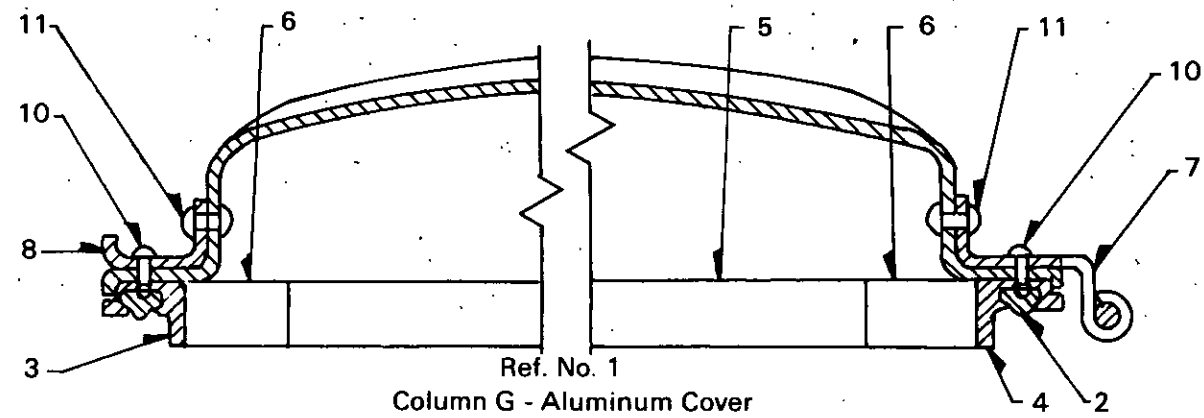
Ref. No. 1
Column A - Steel Cover



Ref. No. 1
Column C - Steel Cover



Ref. No. 1
Column E - Aluminum Cover



Ref. No. 1
Column G - Aluminum Cover

PLATE A154-3

CYLINDER HEAD COVER AND SUPPORT FRAME

Previous Design Square Top Inside Frame Corners
16-567D1,D2,D3,D3A; 8,12,16-645E and 16-645E3 Engines
PLATE A154-4

Ref. No.	Part Number	Quantity Req. Per Engine					Description
		A	-	-	-	-	8-645E engine
		-	B	-	-	-	12-645E engine
		-	-	C	-	-	16-567D2,D3 engines
		-	-	-	-	E	16-645E3 and 16-567D3A engines

Previous design frames with square top inside corners are no longer available. When replacement frames are required the current design frames with round top inside corners and covers are recommended as a replacement. Covers applied to either design frames are not interchangeable. - See chart at right.

Ref. No.	Part Number	Quantity Req. Per Engine					Description	
*1	8208775	1	-	-	-	-	FRAME ASM. .. Cover	Left Bank
*1	8208501	-	1	-	-	-	FRAME ASM. .. Cover	Left Bank
1	8304284	-	-	1	-	-	FRAME ASM. .. Cover	Left Bank
1	8208162	-	-	-	1	-	FRAME ASM. .. Cover	Left Bank
1	8304284	-	-	-	-	1	FRAME ASM. .. Cover	Left Bank
2	8208776	1	-	-	-	-	FRAME ASM. .. Cover	Right Bank
2	8208502	-	1	-	-	-	FRAME ASM. .. Cover	Right Bank
2	8304285	-	-	1	-	-	FRAME ASM. .. Cover	Right Bank
2	8208163	-	-	-	1	-	FRAME ASM. .. Cover	Right Bank
2	8331618	-	-	-	-	1	FRAME ASM. .. Cover	Right Bank
3	8244709	2	-	4	4	4	COVER ASM. .. Cylinder head	See Page 9
3	8244708	-	4	-	-	-	COVER ASM. .. Cylinder head	See Page 9
4	8168871	10	16	19	20	19	LATCH ASM. .. Cover-clip	
5	8168872	10	16	20	20	20	LATCH ASM. .. Cover-hinge	See Page 10
6	8311343	-	-	1	-	-	LATCH ASM. .. Cover-clip	See Page 10
7	8366616	-	-	-	-	1	LATCH ASM. .. Cover-clip	See Page 10
8	8194923	As Req.					SPACER .. Shim - .0625 thick-used with Ref. No. 5	
9	436591	40	64	80	80	80	SCREW .. Latch mtg. - No. 10-32 x 7/8 pan hd. - Replace 100767 formerly 100766	
10	446186	40	64	80	80	80	WASHER .. Plain - No. 10	
11	8032813	40	64	80	80	80	NUT .. Hex lock - No. 10-32	
12	8202278	2	4	4	4	4	SUPPORT ASM. .. Cover - Spring loaded - See Page 10	
13	181360	4	8	8	8	8	BOLT .. Hex head 3/8-24 x 3/4 - Support mounting	
14	116103	4	8	8	8	8	WASHER .. Plain 3/8	
15	8177564	-	2	-	-	-	CHANNEL ASM. .. Support - Cover	
16	8177567	-	4	-	-	-	GASKET .. Channel mtg.	
17	138213	-	8	-	-	-	SCREW .. Channel to frame - 1/4-28 x 1-1/4 socket head	
18	6532324	-	8	-	-	-	NUT .. Spline - 1/4-28 - Replaces 8130176	
19	8470793	2	-	-	-	-	GASKET .. Frame to c/case - Repl. 8275291	Outer
19	8470795	-	2	-	-	-	GASKET .. Frame to c/case - Repl. 8275296	Outer
19	8470797	-	-	2	2	2	GASKET .. Frame to c/case - Repl. 8275294	Outer
20	8470794	2	-	-	-	-	GASKET .. Frame to c/case - Repl. 8275295	Inner
20	8470796	-	2	-	-	-	GASKET .. Frame to c/case - Repl. 8275290	Inner
20	8470798	-	-	2	2	2	GASKET .. Frame to c/case - Repl. 8275292	Inner
*21	181370	14	14	14	14	14	BOLT .. Hex head 3/8-24 x 1-1/4 - Frame to acc. drive housing	
22	181365	22	22	22	22	22	BOLT .. Hex head 3/8-24 x 1-1/8 - Frame to cam shaft drive housing	
23	454911	78	110	150	150	150	BOLT .. Hex head 3/8-24 x 3/4 - Frame to c/case - Formerly 8218832	
24	9509486	114	146	186	186	186	WASHER .. Hardened 3/8 x 1/8 in. thick - Formerly 8373316 1/16 in. thick 103341 and 103321	
*25	6532324	6	6	6	6	6	NUT .. Spline - 1/4-28 - Replaces 8130176	Right Bank Frame Only
26	8098593	As Req.					TUBING .. 1/4 inch O.D. x .029 copper brazed steel - 20 feet	Right Bank Frame Only
27	116452	2	2	2	2	2	NUT .. Tube - 1/4 - Replaces 118537	Right Bank Frame Only
*28	8160443	2	2	2	2	1	ELBOW .. 1/4-90° - Bulkhead	Right Bank Frame Only
*29	272131	2	2	2	2	1	NUT .. Hex jam 7/16-20	Right Bank Frame Only
30	8173802	4	5	7	7	8	CLAMP .. Tube - 1/4 - 1/4 in. dia. mtg. hole	Right Bank Frame Only
31	8332127	-	-	-	-	1	CLAMP .. Tube - 1/4 - 7/16 in. dia. mtg. hole	Right Bank Frame Only

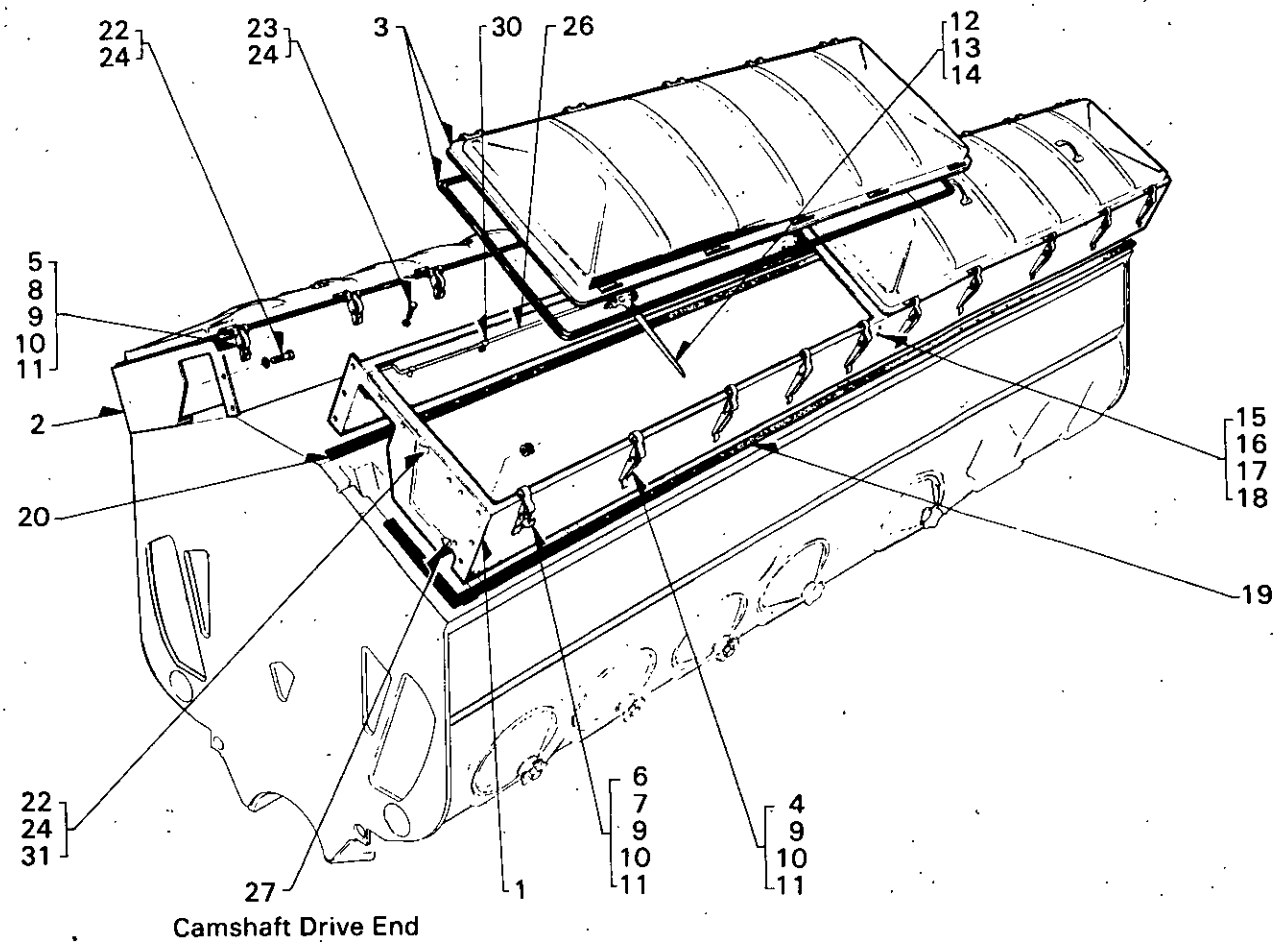
Replacement		
Frame		Cover
See Page		See Pg. 5
8391516	1	8487945
8389114	1	8487963
8377675	3	8487945
8391035	3	8487945
8377675	3	8487945
8391517	1	8487945
8389113	1	8487963
8405068	3	8487945
8391034	3	8487945
8377674	3	8487945

8178157G, 8262925B, 8332065, 8177527G, 8160727M

P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

Ref. No.	Part Number	Quantity Req. Per Engine					Description
		A	-	-	-	-	8-645E engine
		-	B	-	-	-	12-645E engine
		-	-	C	-	-	16-567D2, D3 engine
		-	-	-	D	-	16-645E and 16-567D1 engine
		-	-	-	-	E	16-645E3 and 16-567D3A engines
*32	8271650	1	-	-	-	-	KIT .. Gasket and cover seal }
*32	8271651	-	1	-	-	-	KIT .. Gasket and cover seal } See Parts List No. 199
*32	8271649	-	-	1	1	1	KIT .. Gasket and cover seal }
*33	8425724	As Required					GREASE .. Silicon - Cover seal to frame - 8 ounce tube - Replaces 8425725 and 8425726
†*34	9507085	2	2	2	2	2	GASKET .. Cylinder head frame to camshaft drive housing - Optional to 8081380 gasket when only the head frame portion is to be replaced - See Parts List No. 160
†*35	8366747	As Required					SEALING COMPOUND .. Silicon rubber - 12 ounces cartridge - Applied to headframe to crankcase joint - See Parts List No. 160



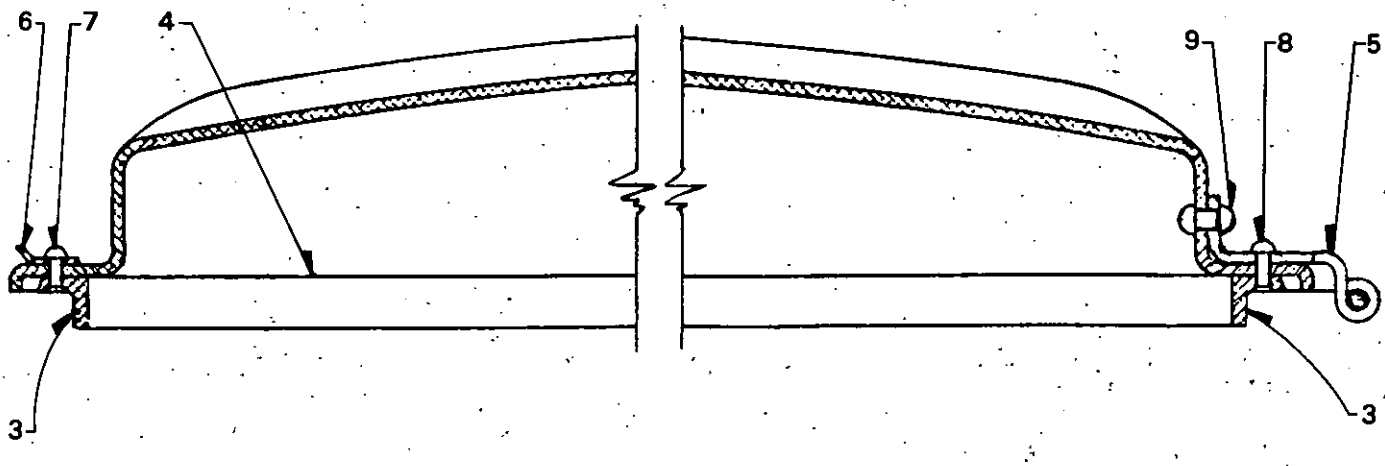
Camshaft Drive End

PLATE A154-4

P.L. No. F154

CYLINDER HEAD COVERS AND SUPPORT FRAMES

Previous Design Cover Assembly
For Square Inside Corner Frame Assembly
16-567D1,D2,D3,D3A; 8,12,16-645E and 16-645E3 Engines



Ref. No. 1 - Cross Section

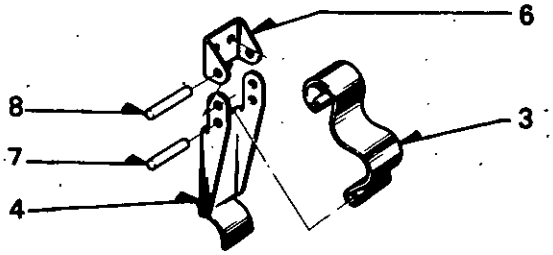
PLATE A154-5

Ref. No.	Part Number	Qty. Req.		Description
1	8244709	1	-	COVER ASSEMBLY .. Cylinder head 8,16-645E, 16-645E3 and 16-567D1,D2,D3,D3A engines
1	8244708	-	1	COVER ASSEMBLY .. Cylinder head
*2	8271623	1	-	SEAL .. Cover - 16 feet long
*2	8271624	-	1	SEAL .. Cover - 13 feet long
3	8208158	2	-	RETAINER .. Cover seal - Side
3	8208484	-	2	RETAINER .. Cover seal - Side
4	8208159	2	2	RETAINER .. Cover seal - End
5	8208157	5	4	HINGE ASSEMBLY .. Cover
6	8208156	5	4	HOOK .. Clamp
7	9402383	10	8	RIVET .. Countersunk head - 1/8 x 9/16 - Hook clamp to cover and retainer
8	9402384	10	8	RIVET .. Countersunk head - 1/8 x 5/8 - Hinge to cover and retainer
9	101843	10	8	RIVET .. Round head - 3/16 x 7/16 - Hinge to cover
*10	9402382	42	36	RIVET .. Countersunk head - 1/8 x 1/2 - Cover to retainers
*11	8031902	2	2	HANDLE .. No longer applied - Not available
*12	101843	8	8	RIVET .. Round head - 3/16 x 7/16 - Handle to cover
*13	8210618	A.R.		SEALER .. Cover to retainer - 1 quart can
*14	8425724	A.R.		GREASE .. Silicon - Cover seal to frame - 8 ounce tube - Replaces 8425725 10 pound can - 8425726 50 pound can

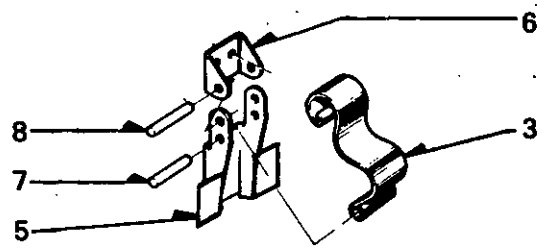
P.L. No. F154

CYLINDER HEAD COVER AND SUPPORT FRAME

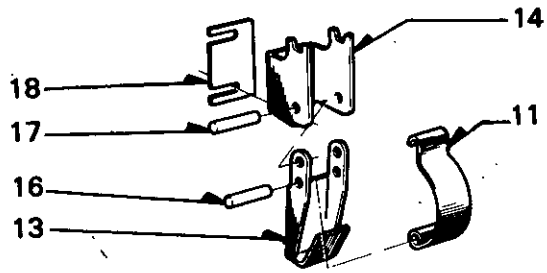
Cover Latches and Support Assembly



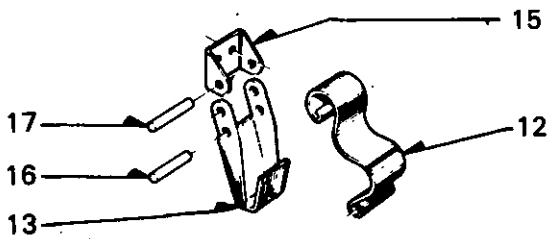
Ref. No. 1



Ref. No. 2

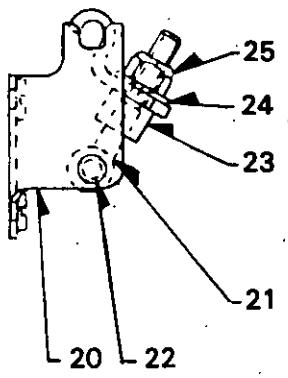


Ref. No. 9

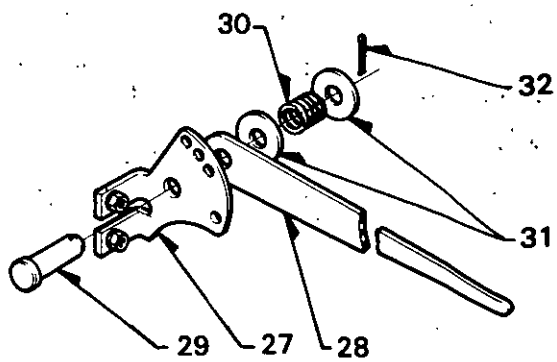


Ref. No. 10

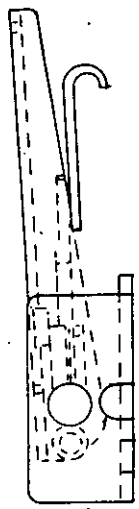
Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
1	8168871	1	-	LATCH ASM. .. Clamp
2	8366616	-	1	LATCH ASM. .. Clamp
3	8168866	1	1	SPRING .. Clamping
4	8168864	1	-	ARM .. Latch
5	8366615	-	1	ARM .. Latch
6	8168867	1	1	BRACKET .. Mounting
7	8172823	1	1	PIN .. 7/32 x 1.160
8	8172822	1	1	PIN .. 7/32 x 1.430
9	8168872	1	-	LATCH ASM. .. Hinge
10	8311343	-	1	LATCH ASM. .. Hinge
11	8168868	1	-	SPRING .. Clamping
12	8168866	-	1	SPRING .. Clamping
13	8222016	1	1	ARM .. Latch
14	8168865	1	-	BRACKET .. Mounting
15	8168867	-	1	BRACKET .. Mounting
16	8172823	1	1	PIN .. 7/32 x 1.160
17	8172822	1	1	PIN .. 7/32 x 1.430
†18	8194923	A.R.		SPACER .. Shim - .0625 thick
19	9094557	1		LATCH ASM. .. Hinge
20	8168865	1		BRACKET .. Mounting
21	9094559	1		HINGE .. Latch
22	8172822	1		PIN .. 7/32 x 1.430
23	9094541	1		LATCH .. Clamping
24	103339	1		WASHER .. Plain - 1/4
25	9416509	1		NUT .. Hex lock 1/4-20
26	8202278	1		SUPPORT ASM. .. Cover
27	8202277	1		BRACKET .. Mounting
28	8202275	1		ARM .. Support
29	114788	1		PIN .. Clevis
30	8202272	1		SPRING .. Torsion
31	103345	2		WASHER .. Plain 5/8
32	103385	1		PIN .. Cotter 1/8 x 1 inch long
33	8498896	1		LATCH ASM. .. Clamp
34	8498895	1		LATCH ASM. .. Hinge



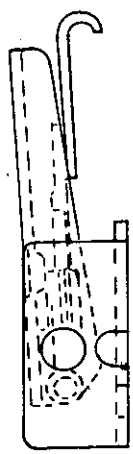
Ref. No. 19



Ref No. 26



Ref. No. 33



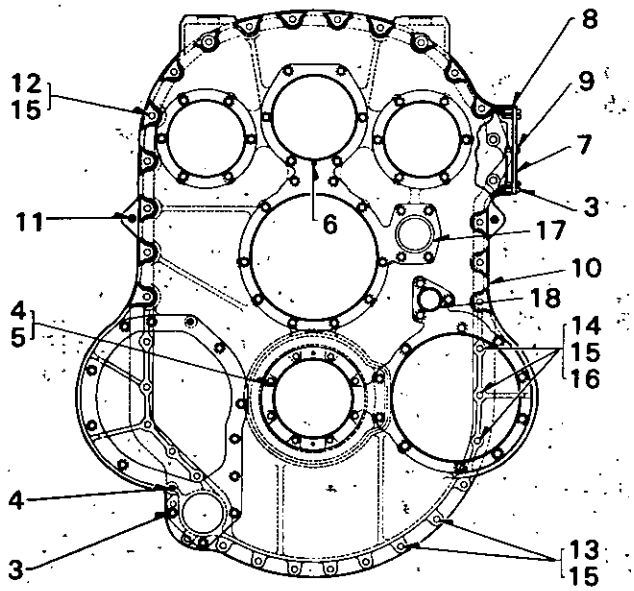
Ref. No. 34

PLATE A154-6

Parts List No. F158

ACCESSORY DRIVE HOUSING

Applied To Engines With Bottom Drain Overspeed Trip Housings



Ref. No. 1

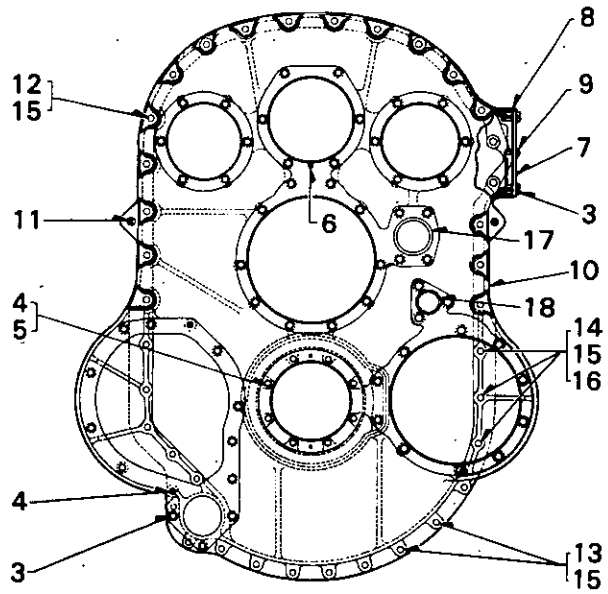
PLATE D158-1

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D1,D2,D3,D3A; 8,12,16-645E; 12,16,20-645E3 (Except F40PH - 16-645E3,E3A); 16-645E3A (DDA40X); 8,12,16,20-645E3B (Except F40PH and F40PH-2); 8-645E3C and 12,16-645F3 engines
		-	B	16-645E3,E3A,E3B (F40PH,F40PH-2 and F40C)
1	8159742	1	-	HOUSING ASSEMBLY .. Accessory drive - With pedestal drain
1	8496050	-	1	HOUSING ASSEMBLY .. Accessory drive - With pedestal drain
2	8081581	57	57	NUT .. Spline 1/2-20
3	8084872	8	8	STUD .. 5/16-18-24 x 1-1/2 inches long - Standard pitch diameter 8123044 ... .002 OS 8126982 ... .015 OS 8126984 .. .019 OS 8123045 .. .004 OS 8126983 .... .017 OS
4	8084871	10	2	STUD .. 1/2-13-20 x 2-7/16 inches long - Standard pitch diameter 8123046 ... .002 OS 8126979 .. .015 OS 8126981 .. .019 OS 8123047 .. .004 OS 8126980 .. .017 OS
5	8473375	-	8	STUD .. 1/2-13-20 x 2-7/8 inches long 8473376 .. .002 OS 8473378 .. .015 OS 8473380 .. .019 OS 8473377 .... .004 OS 8473379 .. .017 OS
6	8028366	1	1	PIN .. Dowel - Governor drive locating - 3/8 x 7/8 inch long
7	8084661	1	1	COVER .. Lube oil relief valve - Not applied to engines with low water and crankcase pressure detector or low water safety shutdown assembly
8	8084685	1	1	GASKET .. Cover or detector to drive housing - See Parts List No. 159
9	8032716	8	8	NUT .. Hex lock 5/16-24
10	8084665	1	1	GASKET .. Housing to crankcase
11	8028740	2	2	DOWEL .. Locating 3/4 inch diameter x 1-1/2 inches long 8168835 .. .005 OS 8168836 .. .010 OS 8168837 .. .015 OS
12	181446	17	17	BOLT .. Hex head 1/2-20 x 4
13	181435	10	10	BOLT .. Hex head 1/2-20 x 2 } Accessory Drive Housing To Crankcase
14	181433	10	10	BOLT .. Hex head 1/2-20 x 1-3/4
15	6101229	37	37	WASHER .. Plain 1/2
16	8116738	A.R.		WIRE .. Lock - 3/64 diameter - Available 500 foot length
+17	8082587	1	1	SEAL .. Supply elbow to housing } See Parts List No. 134
+18	8082586	1	1	SEAL .. Piston cooling elbow to housing

P.L. No. F158

ACCESSORY DRIVE HOUSING

Applied To Engines With Rear Drain Overspeed Trip Housings



Ref. No. 1

PLATE A158-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645E,E3,E3B,E3C,F3,F3B; 16-645E,E3,E3A,E3B,E3C,F3B (Except F40PH,F40PH-2,F40C and export GT36HCW-2 locomotives); and 20-645E3,E3B engines
		-	B	16-645E3,E3A,E3B,E3C,F3B (F40PH,F40PH-2,F40C and export GT36HCW-2 locomotives) engines
1	9531364	1	-	HOUSING ASSEMBLY .. Accessory drive - Without pedestal drain
1	9531367	-	1	HOUSING ASSEMBLY .. Accessory drive - Without pedestal drain
2	8081581	57	57	NUT .. Spline 1/2-20
3	8084872	8	8	STUD .. 5/16-18-24 x 1-1/2 inches long - Standard pitch diameter 8123044 .. .002 OS 8126982 .. .015 OS 8126984 .. .019 OS 8123045 .. .004 OS 8126983 .. .017 OS
4	8084871	10	2	STUD .. 1/2-13-20 x 2-7/16 inches long - Standard pitch diameter 8123046 .. .002 OS 8126979 .. .015 OS 8126981 .. .019 OS 8123047 .. .004 OS 8126980 .. .017 OS
5	8473375	-	8	STUD .. 1/2-13-20 x 2-7/8 inches long - Standard pitch diameter 8473376 .. .002 OS 8473378 .. .015 OS 8473380 .. .019 OS 8473377 .. .004 OS 8473379 .. .017 OS
6	8028366	1	1	PIN .. Dowel - Governor drive locating - 3/8 x 7/8 inch long
7	8084661	1	1	COVER .. Lube oil relief valve - Not applied to engines with low water and crankcase pressure detector or low water safety shutdown assembly
8	8084685	1	1	GASKET .. Cover or detector to drive housing - See Parts List No. 159
9	8032716	8	8	NUT .. Hex lock 5/16-24
10	8084665	1	1	GASKET .. Housing to crankcase
11	8028740	2	2	DOWEL .. Locating 3/4 inch diameter x 1-1/2 inches long 8168835 ..005 OS 8168836 .. .010 OS 8168837 .. .015 OS
12	181446	17	17	BOLT .. Hex head 1/2-20 x 4 } Accessory Drive Housing To Crankcase
13	181435	10	10	BOLT .. Hex head 1/2-20 x 2 } Accessory Drive Housing To Crankcase
14	181433	10	10	BOLT .. 1/2-20 x 1-3/4 } Accessory Drive Housing To Crankcase
15	6101229	37	37	WASHER .. Plain 1/2
16	8116738	A.R.		WIRE .. Lock - 3/64 diameter - Available 500 foot length
+17	8082587	1	1	SEAL .. Supply elbow to housing } See Parts List No. 134
+18	8082586	1	1	SEAL .. Piston cooling elbow to housing } See Parts List No. 134

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

INDEX

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P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Hot Oil and Differential Pressure Detector
With Low Water Cut-Off
8,12,16-645E, 8-645E3B,E3C,F3B, 12,16-645E3,E3B,E3C,F3,F3B, 16-645E3A, 20-645E3,E3B Engines
PLATE E159-1

Ref. No.	Part Number	Quantity Required					Description
		A	-	-	-	-	8-645E engines
		-	B	-	-	-	12,16-645E engines
		-	-	C	-	-	8-645E3B,E3C,F3B engines
		-	-	-	D	-	12-645E3,E3B,E3C,F3,F3B engines
		-	-	-	-	E	16-645E3,E3A,E3B,E3C,F3,F3B and 20-645E3, E3B engines
1	9505867	1	1	-	-	-	DETECTOR ASM. .. Differential pressure - See Page 22
1	9320130	-	-	1	1	1	DETECTOR ASM. .. Differential pressure - See Page 22
2	8084685	1	1	1	1	1	GASKET .. Detector mounting
3	8032716	8	8	8	8	8	NUT .. Hex lock 5/16-24
4	9320121	1	1	1	1	1	HOSE ASM. .. Detector to water cut-off valve
5	9320122	1	1	1	1	1	HOSE ASM. .. Detector to crankcase
6	9553070	1	-	-	-	-	TUBE ASM. .. Detector to water pump
6	9502974	-	1	1	-	-	TUBE ASM. .. Detector to water pump (16-645E with 1 water pump)
6	9320120	-	1	-	1	1	HOSE ASM. .. Detector to water pump (16-645E with 2 water pumps)
7	9320124	1	-	1	-	-	TUBE ASM. .. Detector to oil pressure line
7	9524660	-	1	-	1	1	TUBE ASM. .. Detector to oil pressure line - Formerly 9320124
8	8454131	1	-	1	-	-	TUBE ASM. .. Oil pressure
8	9524657	-	1	-	1	1	TUBE ASM. .. Oil pressure - Formerly 8427017
9	8385173	1	-	1	-	-	TUBE ASM. .. Oil pressure line to cover frame
9	9524852	-	1	-	1	1	TUBE ASM. .. Oil pressure line to cover frame - Formerly 8320154
10	8385172	1	-	1	-	-	TUBE ASM. .. Oil pressure line to governor
10	9524851	-	1	-	1	1	TUBE ASM. .. Oil pressure line to governor - Formerly 8320153
11	8461609	-	1	1	1	-	TUBE ASM. .. Oil pressure line to thermostatic valve
11	8427938	-	-	-	-	1	TUBE ASM. .. Oil pressure line to thermostatic valve
12	8461610	-	1	1	1	-	TUBE ASM. .. Thermostatic valve high pressure line
12	8443799	-	-	-	-	1	TUBE ASM. .. Thermostatic valve high pressure line
13	8412324	1	1	1	1	1	VALVE ASM. .. Cut-off - See Page 28
14	8342588	6	6	6	6	6	SEAL .. O-ring - Valve and flange mounting
15	147115	2	2	2	2	2	SCREW .. Cap - No. 10-24 x 1-1/2 socket head
16	8427032	-	1	1	1	1	VALVE .. Thermostatic - 255°
17	8430611	-	1	1	1	1	GASKET .. Thermostatic valve
18	6101223	-	2	2	2	2	WASHER .. Flat 5/16
19	8032716	8	10	10	10	8	NUT .. Hex lock 5/16-24
20	9421623	-	-	-	-	2	SCREW .. Cap 5/16-18 x 7/8 socket head
21	186542	8	8	8	8	8	SCREW .. Cap No. 10-24 x 1/2
*22	8296013	1	-	-	-	-	CLIP .. Tube - For Ref. 6
*23	3306485	-	1	-	-	-	CLIP .. Tube - For Ref. 6
24	3204128	2	2	2	2	2	CLIP .. Tube
25	8118841	1	1	1	1	1	CLIP .. Tube
26	8475991	-	1	1	1	1	CLAMP ASM. .. Tube - Includes bolt, nut, and washer
27	6101229	2	2	2	2	2	WASHER .. Flat 1/2 - Clamp and clip mounting
28	118807	1	1	1	1	1	TEE .. 3/8 tube x 3/8 MPT x 3/8 MPT
29	8040370	1	1	1	1	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
30	118750	1	1	1	1	1	CONNECTOR .. 3/8 tube x 1/4 MPT
31	8040313	1	1	1	1	1	CONNECTOR .. 3/8 tube x 3/8 MPT
32	118755	-	1	1	1	1	ELBOW .. 90° - 3/8 tube x 1/4 MPT
33	8040341	-	1	1	1	1	ELBOW .. 90° - 1/2 tube x 1/4 MPT
34	116436	-	-	1	1	1	CONNECTOR .. 1/4 tube x 1/4 MPT
35	120279	-	-	1	1	1	TEE .. 3/8 FPT x 3/8 FPT x 3/8 FPT
36	8060964	-	-	1	1	1	NIPPLE .. Close 3/8 MPT

The Following Components May Be Used To Fabricate Or Repair The Tube Assemblies Listed Above

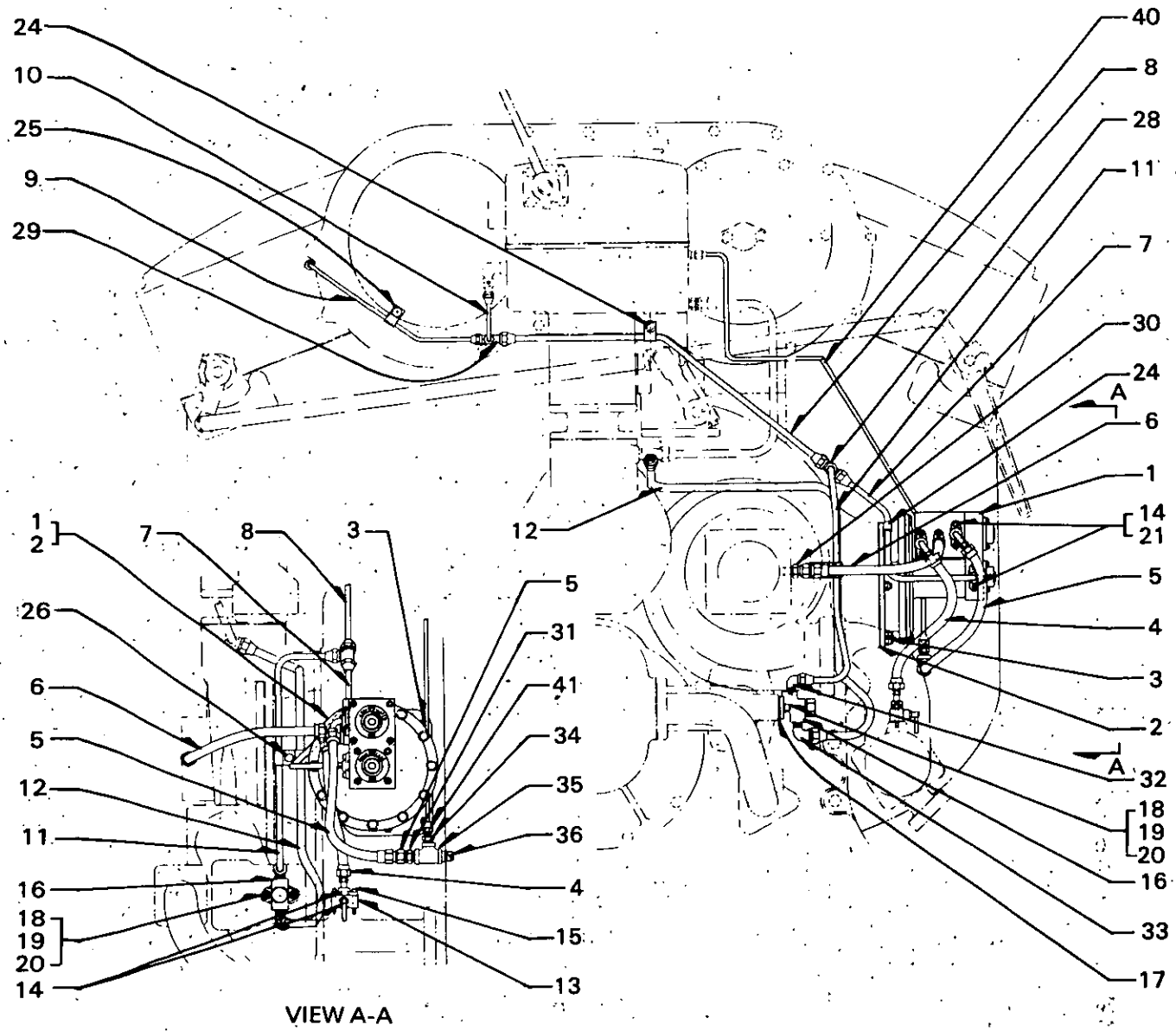
*37	8098593	As Required	TUBING .. 1/4 O.D. x 20 Ft. - Use with 116452 - Tube nut
*38	8098594	As Required	TUBING .. 3/8 O.D. x 20 Ft. - Use with 121758 - Tube nut or 8333798 - Flange
*39	8116730	As Required	TUBING .. 1/2 O.D. x 50 Ft. - Use with 120141 - Tube nut

9553067, 9505741, 9501980, 9336028, 9320125

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	ENGINE APPLICATION - See Page 2
40	8289111	-	-	-	1	1	TUBE ASSEMBLY .. Air box tee to governor
41	116452	-	-	-	1	1	NUT .. 1/4 tube - Replaces 118537



VIEW A-A

PLATE E159-1

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water and Crankcase Pressure
Detector With Low Water Cutoff Application
16-567D1,D3A, 8,12,16-645E, 12,16,20-645E3 Engines
PLATE E159-2

Ref. No.	Part Number	Quantity Required					Description
		A	-	-	-	-	8-645E engines
		-	B	-	-	-	12,16-645E engines
		-	-	C	-	-	12,16, 20-645E3 engines
		-	-	-	D	-	16-567D3A engine
		-	-	-	-	E	16-567D1 engine
1	8464678	1	1	-	-	1	DETECTOR ASM. .. Low water and crankcase pressure - Formerly 8428395 and 8358538 - See Page 24
1	8428395	-	-	1	1	-	DETECTOR ASM. .. Low water and crnakcase pressure - Replaces 8358538 - See Page 24
2	8084685	1	1	1	1	1	GASKET .. Detector to accessory drive housing
3	8032716	8	8	8	8	8	NUT .. Hex lock 5/16-24
†4	8477002	1	1	1	1	1	HOSE ASM. .. Detector to water cutoff valve - Includes flanges - Replaces 8412290 and 8425855

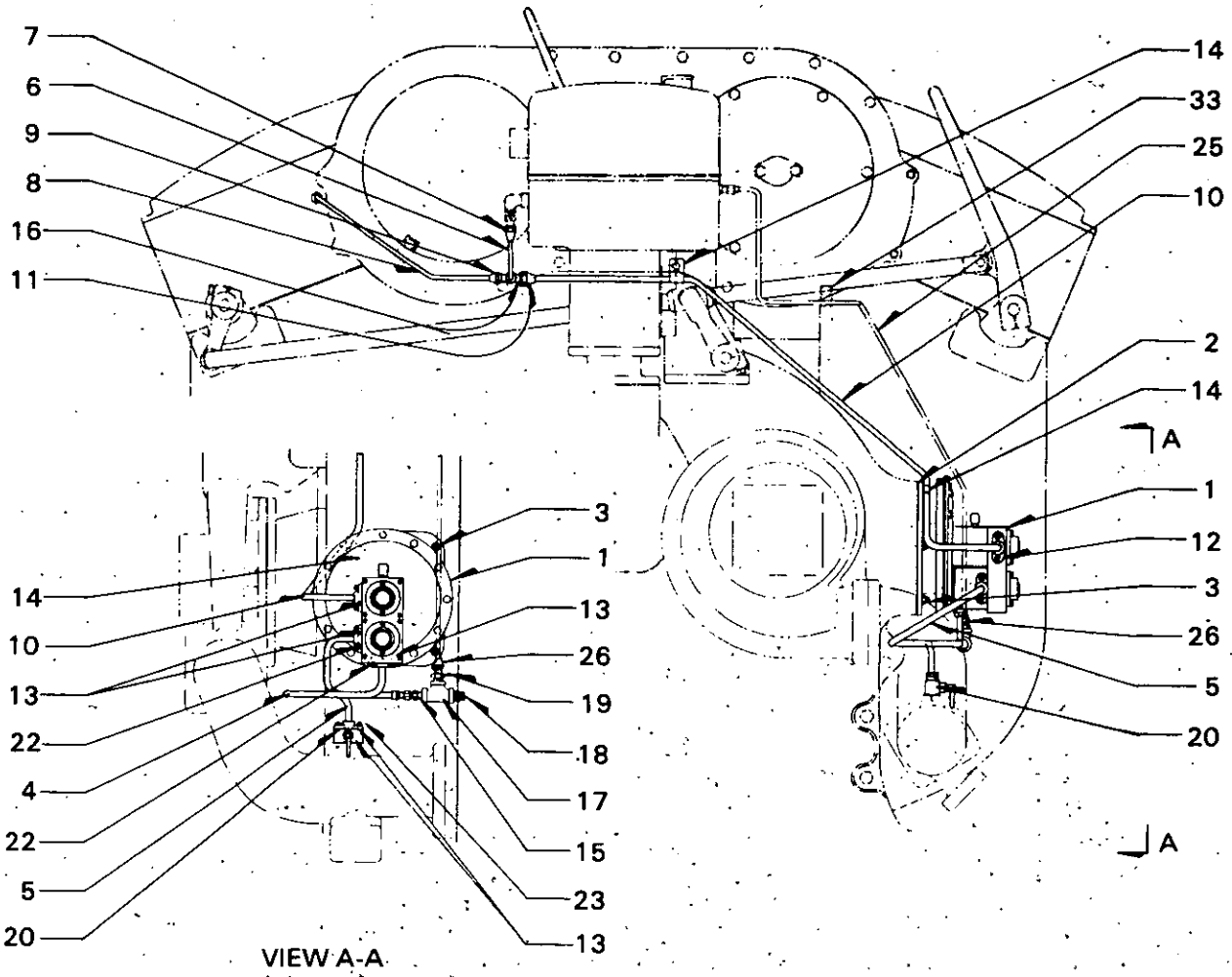
† Previously the 567 engines applied 8425855 tube assembly, 8337318 valve assembly and 8344265 flange for the low water portion. These components are no longer applied or available. It is recommended when replacement is required for either of the above items the following are to be used: 1-8477002 hose, 1-8412324 valve and 1-9093556 flange.

5	8491460	1	1	1	1	1	HOSE ASM. .. Detector to accessory end of crankcase - Includes flange and connecting nut
6	8385172	1	-	-	-	-	TUBE ASM. .. Governor to oil pressure line
6	9524851	-	1	1	1	1	TUBE ASM. .. Governor to oil pressure line - Formerly 8320153
7	116452	2	2	2	2	2	NUT .. 1/4 tube - Replaces 118537
8	8385173	1	-	-	-	-	TUBE ASM. .. Oil line to cover frame
8	9524852	-	1	1	1	1	TUBE ASM. .. Oil line to cover frame - Formerly 8320154
9	116452	2	2	2	2	2	NUT .. 1/4 tube - Replaces 118537
10	8385171	1	-	-	-	-	TUBE ASM. .. Oil pressure line to detector
10	9524785	-	1	1	1	1	TUBE ASM. .. Oil pressure line to detector - Formerly 8337942
11	121758	1	1	1	1	1	NUT .. 3/8 tube
12	8333798	1	1	1	1	1	FLANGE .. Tube mounting
13	8342588	5	5	5	5	5	SEAL .. O-ring - Flange and valve mounting
14	3204128	2	2	2	2	2	CLIP .. Tube mounting
15	8040313	1	1	1	1	1	CONNECTOR .. 3/8 MPT x 3/8 O.D. tube - Formerly 8039169 elbow
16	8040370	1	1	1	1	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
17	120279	-	-	1	1	-	TEE .. 3/8 FPT x 3/8 FPT x 1/4 FPT
18	8060964	-	-	1	1	-	NIPPLE .. Close pipe - 3/8 MPT
19	116436	-	-	1	1	-	CONNECTOR .. 1/4 tube x 1/4 MPT
†20	8412324	1	1	1	1	1	VALVE ASM. .. Cutoff - Formerly 8337318 - See Page 28
†21	9093556	-	-	-	1	1	FLANGE .. Adapter - Valve mounting - Formerly 8344265
22	186542	6	6	6	6	6	SCREW .. Hex socket head 10-24 x 1/2 - Tube mounting
23	147115	2	2	2	-	-	SCREW .. Hex socket head 10-24 x 1-1/2 - Valve mounting
23	147116	-	-	-	2	2	SCREW .. Hex socket head 10-24 x 1-3/4 - Valve mounting
24	8032814	-	-	-	2	2	NUT .. Hex lock 10-24
25	8289111	-	-	1	1	-	TUBE ASM. .. Air box tee to governor
26	116452	-	-	1	1	-	NUT .. 1/4 tube - Replaces 118537
27	8118841	-	-	1	1	-	CLIP .. Tube mounting

8385288, 8338016, 8348793, 8368196, 8340584

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



VIEW A-A

645 Engine Application

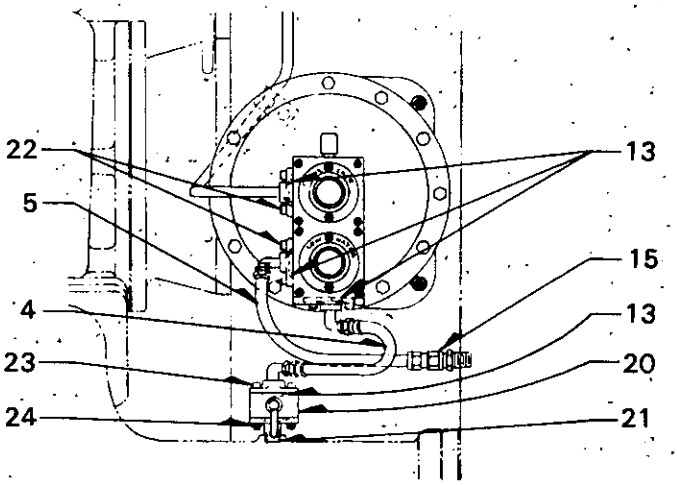


PLATE E159-2

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Hot Oil, Low Water and Crankcase Pressure Detector
With Low Water CutOff Application
12,16-645E, 12,16,20-645E3, 16-645E3A Engines
PLATE D159-3

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	12-645E, 16-645E engines
		-	B	-	12-645E3 (Sept. 1971 thru May, 1977)
		-	-	C	12-645E3 (Prior to September, 1971) 16,20-645E3, 16-645E3A engines
1	8464678	1	-	-	DETECTOR ASSEMBLY .. Low water and crankcase pressure - Formerly 8428395 and 8358538 - See Page 24
1	8428395	-	1	1	DETECTOR ASSEMBLY .. Low water and crankcase pressure - Replaces 8358538 - See Page 24
2	8084685	1	1	1	GASKET .. Detector to accessory drive housing
3	8032716	10	10	8	NUT .. Hex lock 5/16-24
4	7466992	1	1	1	HOSE ASSEMBLY .. Detector to water cutoff valve - Includes flanges - Replaces 8412290
5	8491460	1	1	1	HOSE ASSEMBLY .. Detector to accessory end of crankcase - Includes flange and connecting nut - Replaces 8340583 and 8337883
6	9524851	1	1	1	TUBE ASSEMBLY .. Governor to oil pressure line - Formerly 8320153
7	116452	2	2	2	NUT .. 1/4 tube - Replaces 118537
8	9524852	1	1	1	TUBE ASSEMBLY .. Oil line to cover frame - Formerly 8320154
9	116452	2	2	2	NUT .. 1/4 tube - Replaces 118537
10	8369366	1	1	1	TUBE ASSEMBLY .. Oil pressure line to detector
11	8333798	1	1	1	FLANGE .. Tube mounting
12	121758	1	1	1	NUT .. 3/8 tube
13	9524657	1	1	1	TUBE ASSEMBLY .. Oil pressure line
14	121758	2	2	2	NUT .. 3/8 tube
15	8342588	5	5	5	SEAL .. O-ring - Flange and valve mounting
16	3204128	2	2	2	CLIP .. Tube mounting
17	8040313	1	1	1	CONNECTOR .. 3/8 MPT x 3/8 O.D. tube - Formerly 8039169 elbow
18	8040370	1	1	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
19	120279	-	1	1	TEE .. 3/8 FPT x 3/8 FPT x 1/4 FPT
20	8060964	-	1	1	NIPPLE .. Close pipe - 3/8 MPT
21	116436	-	1	1	CONNECTOR .. 1/4 tube x 1/4 MPT
22	8412324	1	-	-	VALVE ASSEMBLY .. Cutoff - See Page 28
23	186542	6	6	6	SCREW .. Hex socket head No. 10-24 x 1/2 - Tube mounting
24	147115	2	2	2	SCREW .. Hex socket head No. 10-24 x 1-1/2 - Valve mounting
25	8289111	-	1	1	TUBE ASSEMBLY .. Air box tee to governor
26	116452	-	1	1	NUT .. 1/4 tube - Replaces 118537
*27	8427937	-	-	1	TUBE ASSEMBLY .. Thermostatic valve to lube oil strainer - Earlier design only
*28	121758	-	-	2	NUT .. 3/8 tube
29	8461610	1	1	-	TUBE ASSEMBLY .. Thermostatic valve high pressure line
29	8443799	-	-	1	TUBE ASSEMBLY .. Thermostatic valve high pressure line
30	120141	2	2	2	NUT .. 1/2 tube
31	8461609	1	1	-	TUBE ASSEMBLY .. Oil pressure line to thermostatic valve
31	8427938	-	-	1	TUBE ASSEMBLY .. Oil pressure line to thermostatic valve
32	121758	2	2	2	NUT .. 3/8 tube
33	8427032	1	1	1	VALVE ASSEMBLY .. Themostatic - 255°
34	8430611	1	1	1	GASKET .. Valve mounting
*35	3224539	-	-	1	CLIP .. Lube oil strainer tube mounting - Earlier design only
36	118755	1	1	1	ELBOW .. 3/8 tube x 1/4 MPT
*38	118755	-	-	1	ELBOW .. 3/8 tube x 1/4 MPT - L.O. strainer tube mounting - Earlier design only
*38	118750	1	-	2	CONNECTOR .. 3/8 tube x 1/4 MPT - Earlier design only
39	9421623	-	-	2	SCREW .. Hex socket head 5/16-18 x 7/8 - Cap - Formerly 179817
40	610223	2	2	2	WASHER .. Flat 5/16

8454989, 8428104, 8461611

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Ref. No.	Part Number	Quantity Required A	B	C	Description
41	118807	1	1	1	TEE .. 3/8 tube x 3/8 MPT x 3/8 MPT
42	8040341	1	1	1	ELBOW .. 1/2 tube x 1/4 MPT
43	8457991	1	1	1	CLAMP ASSEMBLY .. Themostatic valve tube
44	8457990	1	1	1	BRACKET .. Clamp assembly
45	179796	1	1	1	BOLT .. Hex head 1/4-20 x 7/8
46	103319	1	1	1	WASHER .. 1/4 lock
47	109084	1	1	1	NUT .. Hex 1/4-20
48	6101229	1	1	1	WASHER .. 1/2 plain

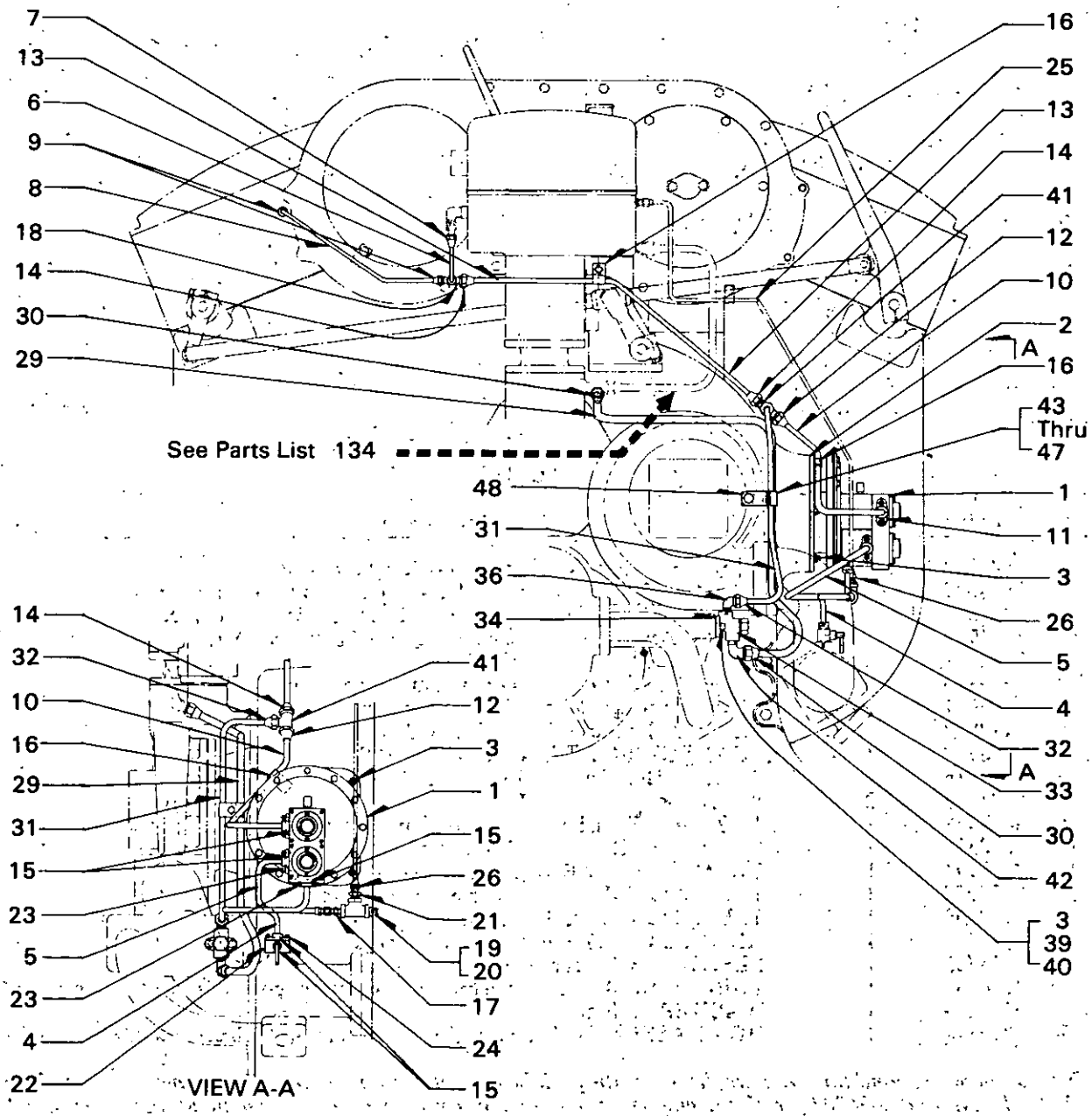


PLATE D159-3

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Hot Oil Shutdown Kit For Units With Engine Detectors
16-567D3,D3A, 12,16,20-645E3 Engines

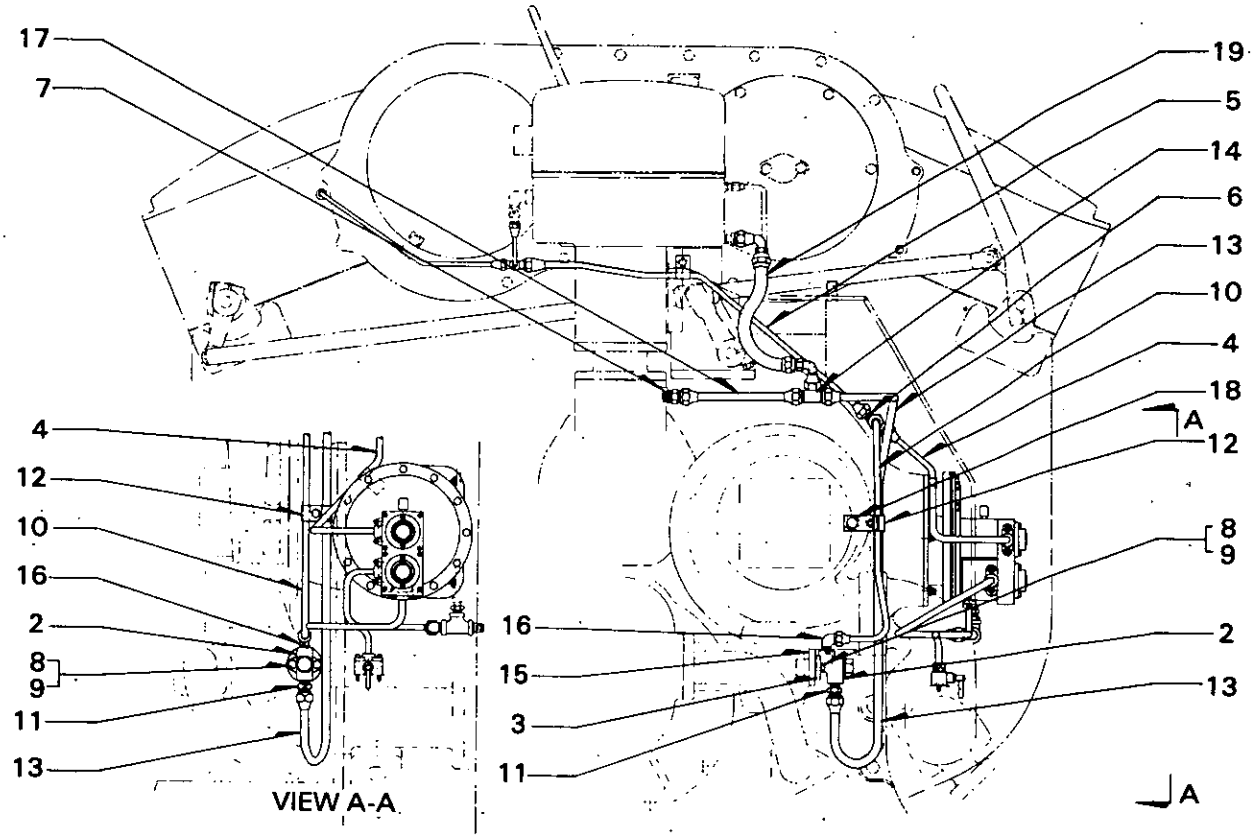


PLATE D159-4

Ref. No.	Part Number	Qty. Req.		Description
1	8447738	1	-	KIT .. Hot oil shutdown with 255 degree thermovalve
*1	8475049	-	1	KIT .. With 275 degree thermovalve - Replaced by component parts
2	8427032	1	-	VALVE ASSEMBLY .. Hex cap - Themostatic - 255 degree
*2	8474984	-	1	VALVE ASSEMBLY .. Themostatic - 275 degree - Square cap
3	8430611	1		GASKET .. Valve mounting
4	8369366	1		TUBE ASSEMBLY .. Oil pressure line to detector
5	8427017	1		TUBE ASSEMBLY .. Oil pressure line
6	118807	1		TEE .. 3/8 tube x 3/8 MPT x 3/8 MPT
7	118752	1		CONNECTOR .. 1/2 tube x 3/8 MPT
8	179816	2		BOLT .. Hex head 5/16-18 x 3/4
9	6101223	2		WASHER .. Flat 5/16
10	8427938	1		TUBE ASSEMBLY .. Oil pressure line to thermostatic valve
11	8040317	1		CONNECTOR .. Flared - 1/2 tube x 1/4 MPT
12	8457991	1		CLAMP ASSEMBLY .. Tube assembly support
13	8457772	1		TUBE ASSEMBLY .. Thermostatic valve lube oil outlet
14	118809	1		TEE .. 1/2 tube x 1/2 tube x 1/2 tube
15	8447923	1		ADAPTER .. Thermostatic valve mounting
16	118755	1		ELBOW .. 3/8 tube x 1/4 MPT
17	8216782	1		TUBE ASSEMBLY .. Themostatic valve to governor drive - Form. 8476476
18	6101229	1		WASHER .. Flat 1/2
19	9319341	1		HOSE ASSEMBLY .. Governor oil drain - Replaces 8460824 - See P.L. 134

Should operating conditions require the use of the prelube port of the lube supply elbow, a new elbow 8430437 for 12 and 16 cyl. and 8436704 for 20 cyl. engines is required. When the new elbow is applied, thermovalve adapter 8447923 (Ref. No. 15) is not required.

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Hot Oil Shutdown Kit For Units Without Engine Detectors
16-567D2, D3 Engines

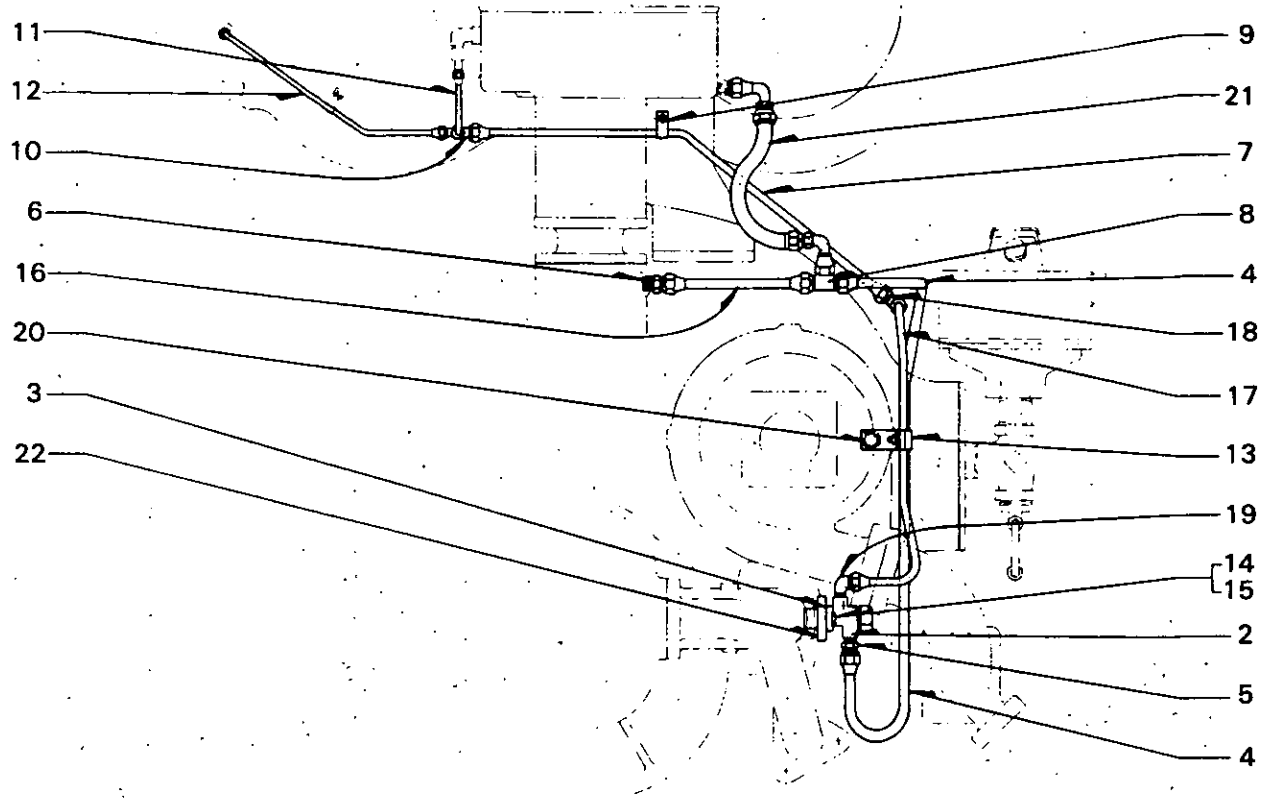


PLATE D159-5

Ref. No.	Part Number	Qty. Req.	Description
1	8448368	1	KIT .. Hot oil shutdown - Replaced by component parts
2	8427032	1	VALVE ASSEMBLY .. Thermostatic - 255 degrees
3	8430611	1	GASKET .. Valve mounting
4	8457772	1	TUBE ASSEMBLY .. Thermostatic valve lube oil outlet
5	8040317	1	CONNECTOR .. Flared - 1/2 tube x 1/4 MPT
6	118752	1	CONNECTOR .. 1/2 tube x 3/8 MPT
7	8427017	1	TUBE ASSEMBLY .. Oil pressure line to thermostatic valve
8	118809	1	TEE .. 1/2 tube x 1/2 tube x 1/2 tube
9	3204128	1	CLIP .. Tube mounting
10	8040370	1	TEE .. 3/8 MPT x 3/8 tube x 3/8 tube
11	8320153	1	TUBE ASSEMBLY .. Governor to oil pressure line
12	8320154	1	TUBE ASSEMBLY .. Oil pressure line to governor
13	8457991	1	CLAMP ASSEMBLY .. Tube mounting
14	179816	2	BOLT .. Hex head 5/16-18 x 3/4
15	6101223	2	WASHER .. Plain 5/16
16	8216782	1	TUBE ASSEMBLY .. Thermostatic valve to governor drive - Formerly 8476476
17	8427938	1	TUBE ASSEMBLY .. Thermostatic valve lube oil inlet
18	118812	1	ELBOW .. 3/8 tube
19	118755	1	ELBOW .. 3/8 tube x 1/4 MPT
20	6101229	1	WASHER .. 1/2 Plain
21	9319341	1	HOSE ASSEMBLY .. Governor oil drain - Replaces 8460824 - See P.L. 134
22	8447923	1	ADAPTER .. Thermostatic valve mounting

Should operating conditions require the use of the prelube port of the lube supply elbow, a new elbow, a new elbow, part number 8430437, is required. When the new elbow is applied, thermovalve adapter 8447923 (Ref. No. 22) is not required.

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Hot Oil Shutdown Application
12-645E and 16-645E Engines

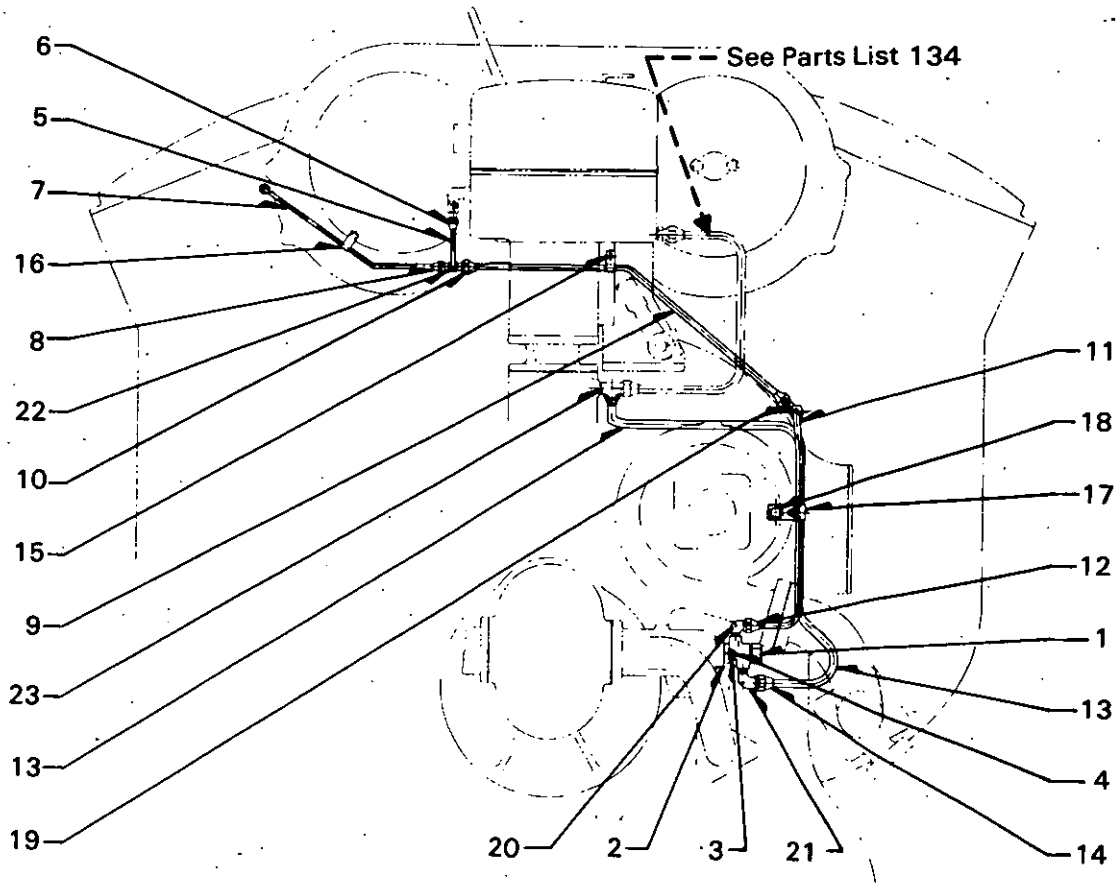


PLATE D159-6

Ref. No.	Part Number	Qty. Req.	Description
1	8427032	1	VALVE ASSEMBLY .. Thermostatic - 255°
2	8430611	1	GASKET .. Valve mounting
3	6101223	2	WASHER .. Plain 5/16
4	8032716	2	NUT .. Hex lock 5/16-24
5	9524851	1	TUBE ASSEMBLY .. Governor to oil pressure line - Formerly 8320153
6	116452	2	NUT .. 1/4 tube - Replaces 118537
7	9524852	1	TUBE ASSEMBLY .. Oil pressure line to governor - Formerly 8320154
8	116452	2	NUT .. 1/4 tube - Replaces 118537
9	9524657	1	TUBE ASSEMBLY .. Oil pressure line - Formerly 8427017
10	121758	2	NUT .. 3/8 tube
11	8461609	1	TUBE ASSEMBLY .. Thermostatic valve lube oil inlet
12	121758	2	NUT .. 3/8 tube
13	8461610	1	TUBE ASSEMBLY .. Thermostatic valve lube oil outlet
14	120141	2	NUT .. 1/2 tube
15	3204128	1	CLIP .. Tube mounting
16	8118841	1	CLIP .. Tube mounting
17	8457991	1	CLAMP ASSEMBLY .. Tube mounting
18	6101229	1	WASHER .. Flat 1/2
19	118812	1	ELBOW .. 3/8 tube
20	118755	1	ELBOW .. 3/8 tube x 1/4 MPT
21	8040341	1	ELBOW .. 1/2 tube x 1/4 MPT
22	8040370	1	TEE .. 3/8 x 1/4 x 1/4 tube
+23	144299	1	TEE .. 3/8 MPT x 3/8 tube x 3/8 tube

8452800

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Detector Application
8,12,16-645E Engines

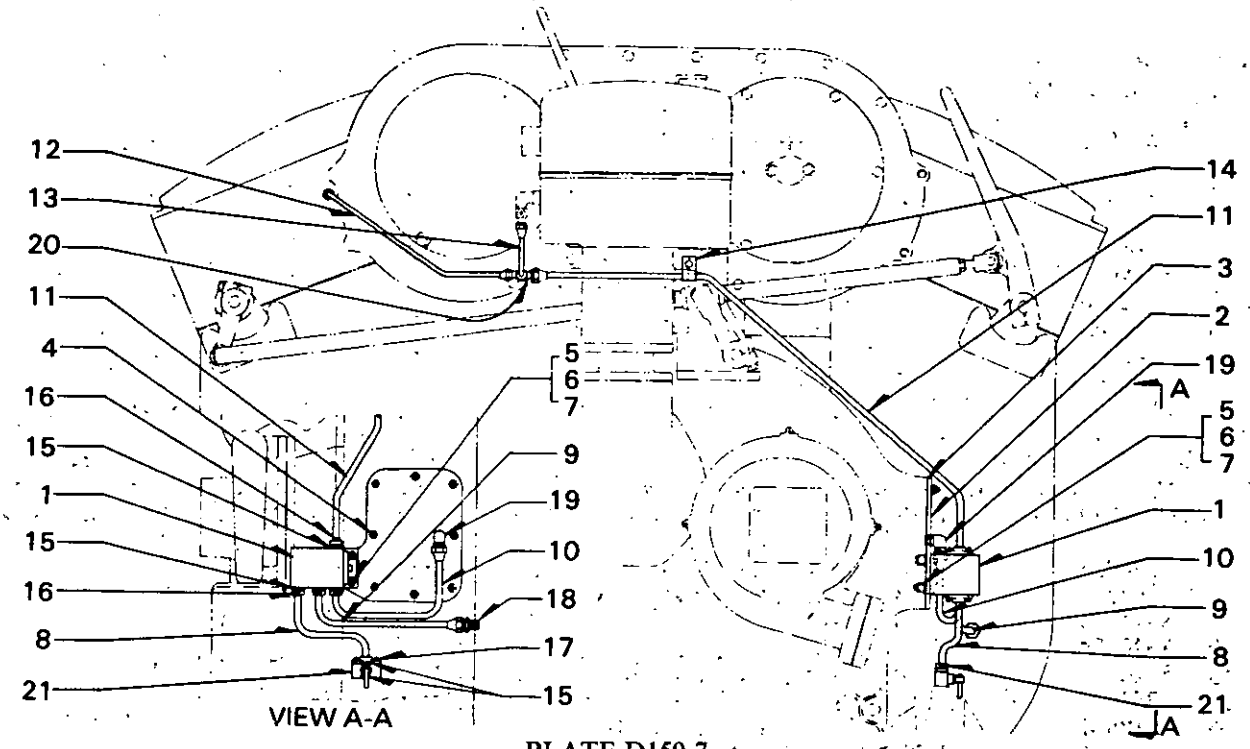


PLATE D159-7

Ref. No.	Part Number	Qty. Req.		Description
		A	-	8,12-645E engines
		-	B	16-645E engine
1	8469592	1	1	VALVE ASM. .. Low water safety shutdown - Formerly 8447342 - See Page 27
2	8344750	1	1	COVER .. Valve mounting
3	8084685	1	1	GASKET .. Cover to accessory drive housing
4	8032716	8	8	NUT .. Hex lock 5/16-24
5	179841	2	2	BOLT .. Hex head 3/8-16 x 1-1/4 - Valve mounting
6	103341	2	2	WASHER .. Plain 3/8
7	8032743	2	2	NUT .. Hex lock 3/8-16
8	8437816	1	1	TUBE ASM. .. Safety valve to water outlet - Includes flanges
9	8355242	1	1	TUBE ASM. .. Safety valve to accessory end of crankcase - Includes flange and connecting nut
10	8344752	1	1	TUBE ASM. .. Safety valve to cover - Includes flange and connecting nut
11	9524786	1	-	TUBE ASM. .. Oil pressure line to safety valve - Includes flange and connecting nut - Formerly 8344754
11	8457498	-	1	TUBE ASM. .. Oil pressure line to safety valve - Includes flange and connecting nut
*11	8427017	-	1	TUBE ASM .. Oil pressure line to governor line - Includes connecting nuts
12	9524852	1	1	TUBE ASM. .. Oil pressure line to governor and safety valve - Includes connecting nuts - Formerly 8320154
13	9524851	1	1	TUBE ASM. .. Gov. to oil pressure line - Incl. connecting nuts - Form. 8320153
14	3204128	1	1	CLIP .. Tube mounting
15	8342588	6	6	SEAL .. O-ring - Flange and valve mounting
16	186542	8	8	SCREW .. Hex socket head No. 10-24 x 1/2 - Flange mounting
17	147115	2	2	SCREW .. Hex socket head No. 10-24 x 1-1/2
18	8040313	1	1	CONNECTOR .. 3/8 MPT x 3/8 O.D. tube
19	118755	1	1	ELBOW .. 3/8 tube x 1/4 MPT
20	8040370	1	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
20	118807	-	1	TEE .. 3/8 tube
21	8412324	1	1	VALVE ASM. .. Shutoff - See Page 28

26201, 27447, 24309, 8365337, 8457496

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Safety Shutdown Valve Application
16-567D1 and D3A Engines
PLATE E159-8

Ref. No.	Part Number	Qty. Req.	Description
1	8469592	1	VALVE ASSEMBLY .. Low water safety shutdown - Norm. aspirated eng. only - 16-567D1 - Formerly 8447342 - See Page 27
1	8447342	1	VALVE ASSEMBLY .. Low water safety shutdown - Turbocharged engine only - 16-567D3A - See Page 26
2	8344750	1	COVER .. Valve mounting
3	8084685	1	GASKET .. Cover to accessory drive housing
4	8032716	8	NUT .. Hex lock 5/16-24
5	179841	2	BOLT .. Hex head 3/8-16 x 1-1/4 - Valve mounting
6	103341	2	WASHER .. Plain 3/8
7	8032743	2	NUT .. Hex lock 3/8-16
†8	8477002	1	HOSE ASM. .. Safety valve to water outlet - Formerly 8344751 tube asm.

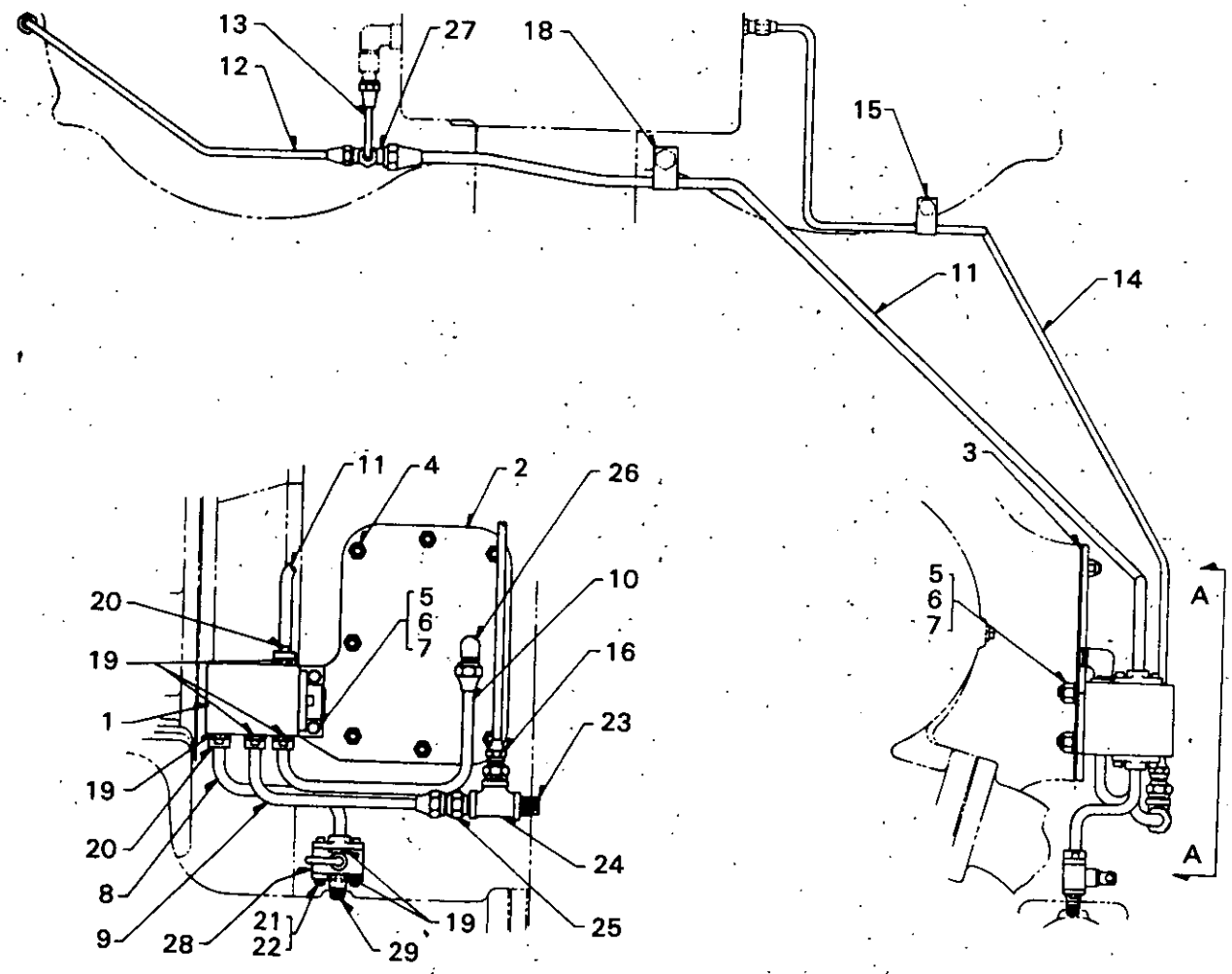
† *Tube assembly 8344751, valve assembly 8337318 and 8344265 flange assembly were applied to the low water safety valve. The components are no longer available. It is recommended when replacement is required for either of the above items the following are to be used: 1-8477002 hose, 1-8412324 valve and 1-9093556 flange.*

9	8344753	1	TUBE ASM. .. Safety valve to accessory end of crankcase
10	8344752	1	TUBE ASM. .. Safety valve to cover
11	8344754	1	TUBE ASM. .. Oil pressure line to safety valve
12	8320154	1	TUBE ASM. .. Oil pressure line to cover frame
13	8320153	1	TUBE ASM. .. Governor to oil pressure line
14	8289111	1	TUBE ASM. .. Tee to governor - D3A engine only
15	8118841	1	CLIP .. Tube mounting - D3A engine only
16	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT - D3A engine only
*17	103878	1	PLUG .. Pipe - 1/4 MPT square head - D1 engine only
18	3204128	1	CLIP .. Tube mounting
19	8342588	6	SEAL .. O-ring - Flange and valve mounting
20	186542	8	SCREW .. Hex socket head No. 10-24 x 1/2 - Flange mounting
21	147116	2	SCREW .. Hex socket head No. 10-24 x 1-3/4 - Tube to valve
22	8032814	2	NUT .. Hex lock No. 10-24
23	8060964	1	NIPPLE .. Close pipe - 3/8 MPT
24	120279	1	TEE .. 3/8 FPT x 3/8 FPT x 1/4 FPT
25	8040313	1	CONNECTOR .. 3/8 tube x 3/8 MPT
26	118755	1	ELBOW .. 3/8 tube x 1/4 MPT
27	8040370	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
†28	8412324	1	VALVE ASM. .. Cutoff - Formerly 8337318 - See Page 28
†29	9093556	1	FLANGE .. Adapter - Valve mounting - Formerly 8344265

8344755

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



VIEW A-A

PLATE E159-8

P.L. No. F159

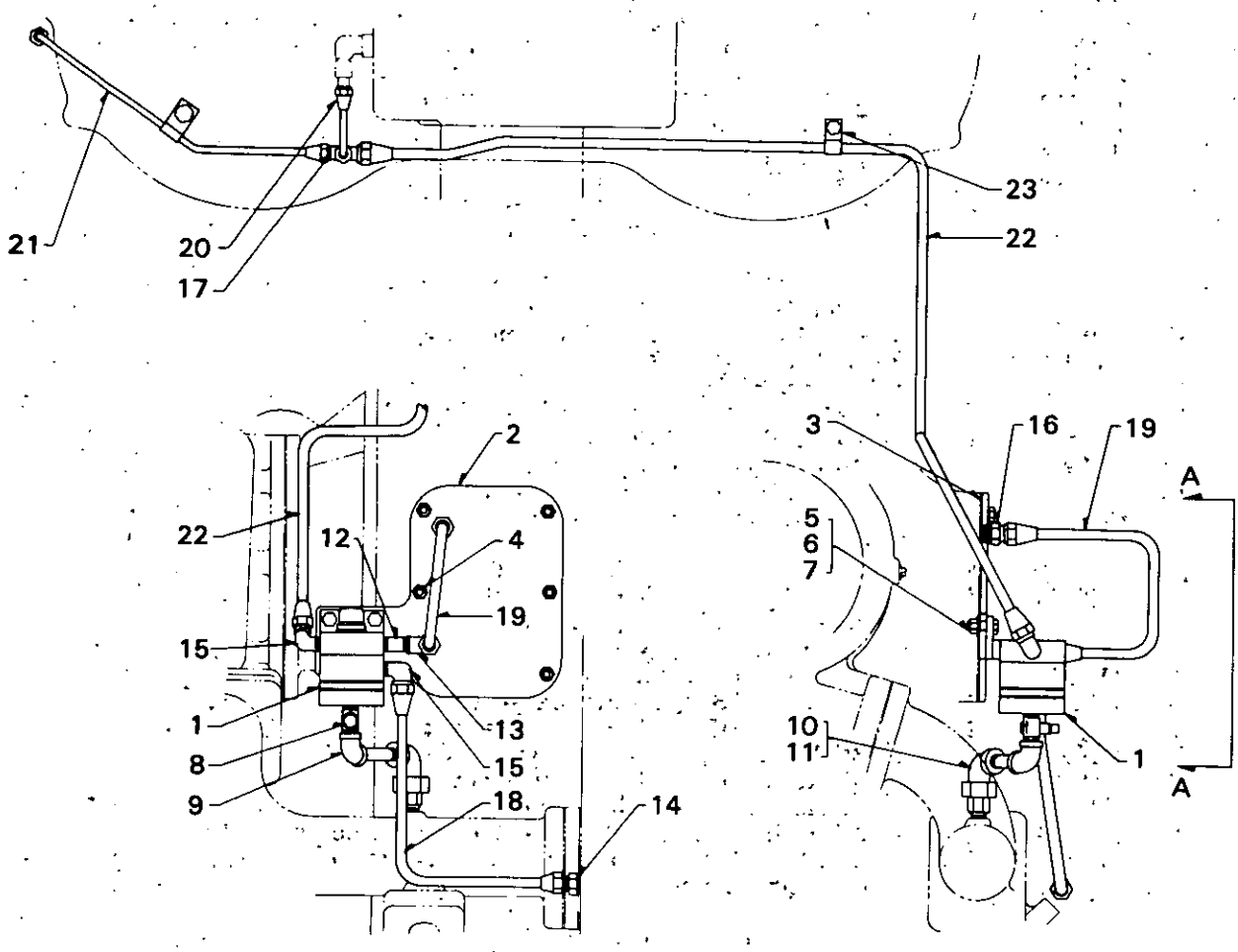
ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Safety Shutdown Valve Application
16-567D3A Engines
PLATE D159-9

Ref. No.	Part Number	Qty. Req.	Description
1	8446593	1	VALVE ASM. .. Low water safety shutdown - See Page 26
2	8339100	1	COVER ASM. .. Valve mounting
3	8084685	1	GASKET .. Cover to accessory drive housing
4	8032716	8	NUT .. Hex lock 5/16-24
5	179839	2	BOLT .. Hex head 3/8-16 x 1 - Valve mounting
6	103341	2	WASHER .. Plain 3/8
7	102635	2	NUT .. Hex 3/8-16
+8	8319665	1	VALVE ASM. .. Cut-off - See Page 28
9	105413	1	ELBOW .. Pipe - 1/4 FPT x 90°
10	119920	1	NIPPLE .. Pipe - 1/4 MPT x 2 in. long
11	8044172	1	ELBOW .. Union - 1/4 FPT x 1/4 MPT
12	8060971	1	NIPPLE .. Short pipe - 1/4 MPT
13	118576	1	ELBOW .. 1/4 FPT x 3/8 tube x 90°
14	8040313	1	CONNECTOR .. 3/8 tube x 3/8 MPT
15	118755	2	ELBOW .. 1/4 MPT x 3/8 tube
16	118750	1	CONNECTOR .. 1/4 MPT x 3/8 tube
17	8040370	1	TEE .. 1/4 tube x 3/8 tube
18	8339099	1	TUBE ASM. .. Crankcase to valve
19	8319912	1	TUBE ASM. .. Cover to valve
20	8320153	1	TUBE ASM. .. Oil pressure line to governor
21	8320154	1	TUBE ASM. .. Oil pressure line to governor and valve
22	8319913	1	TUBE ASM. .. Oil pressure line to valve
23	3104128	1	CLIP .. Tube mounting
*24	103879	1	PLUG .. Pipe - 3/8 MPT square head
*25	120279	1	TEE .. 3/8 FPT x 3/8 FPT x 1/4 FPT
*26	8060964	1	NIPPLE .. Close pipe - 3/8 MPT
*27	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT
*28	8289111	1	TUBE ASM. .. Tee to governor
*29	8118841	1	CLIP .. Tube mounting

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



VIEW A-A

PLATE D159-9

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Crankcase Pressure Switch and
Low Water Safety Valve Application
16-567D3, D3A Engines
PLATE C159-10

Ref. No.	Part Number	Qty. Req.	Description
1	8287986	1	SWITCH ASSEMBLY .. Crankcase pressure
*2	8324706	1	DIAPHRAGM .. Switch
*3	8305804	1	CONNECTOR ASM. .. 6 pole female - Incl. elbow, ferrule and nut
*3A	8222023	1	LAMP .. Double contact - Bayonet base - Watt - 80 volts
4	8319896	1	COVER ASSEMBLY .. Switch and valve mounting
5	8084685	1	GASKET .. Cover to accessory drive housing
6	8032716	8	NUT .. Hex lock 5/16-24
7	8060976	1	NIPPLE .. Short pipe - 1-1/4 MPT
8	8112766	1	COCK .. 3 way - 1-1/4 FPT
9	144062	1	BUSHING .. Pipe reducing - 1-1/4 MPT x 3/8 FPT
10	8040313	1	CONNECTOR .. 3/8 tube x 3/8 MPT
11	8446593	1	VALVE ASSEMBLY .. Low water safety shutdown - Replaces 8349491 and 8358536 - See Page 26
12	179839	2	BOLT .. Hex head 3/8-16 - Valve mounting
13	103341	2	WASHER .. Plain 3/8
14	102635	2	NUT .. Hex 3/8-16
15	8319665	1	VALVE ASSEMBLY .. Cut-off - See Page 28
16	105413	1	ELBOW .. Pipe - 1/4 FPT x 90°
17	119920	1	NIPPLE .. Pipe - 1/4 MPT x 2 in. long
18	8044172	1	ELBOW .. Union - 1/4 FPT x 1/4 MPT
19	8060971	1	NIPPLE .. Short pipe - 1/4 MPT
20	118576	1	ELBOW .. 1/4 FPT x 3/8 tube x 90°
21	118755	2	ELBOW .. 1/4 MPT x 3/8 tube x 90°
22	8040386	1	TEE .. 3/8 tube x 3/8 MPT x 3/8 tube
†23	8040335	1	ELBOW .. 3/8 MPT x 1/4 tube x 90°
24	118750	1	CONNECTOR .. 1/4 MPT x 3/8 tube
25	8040370	1	TEE .. 1/4 tube x 3/8 tube x 3/8 tube
26	8319910	1	TUBE ASSEMBLY .. Valve to crankcase
27	8319911	1	TUBE ASSEMBLY .. Pressure switch to crankcase
28	8319912	1	TUBE ASSEMBLY .. Cover to valve
†29	8319899	1	TUBE ASSEMBLY .. Crankcase to governor
30	8319913	1	TUBE ASSEMBLY .. Oil pressure line to valve
31	8320154	1	TUBE ASSEMBLY .. Oil pressure line to governor and valve
32	8320153	1	TUBE ASSEMBLY .. Governor to oil pressure line
33	3204128	1	CLIP .. Tube mounting

† Parts indicated may vary depending upon specific application.

8288844, 8319909, 8339782, 12103, 14556

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

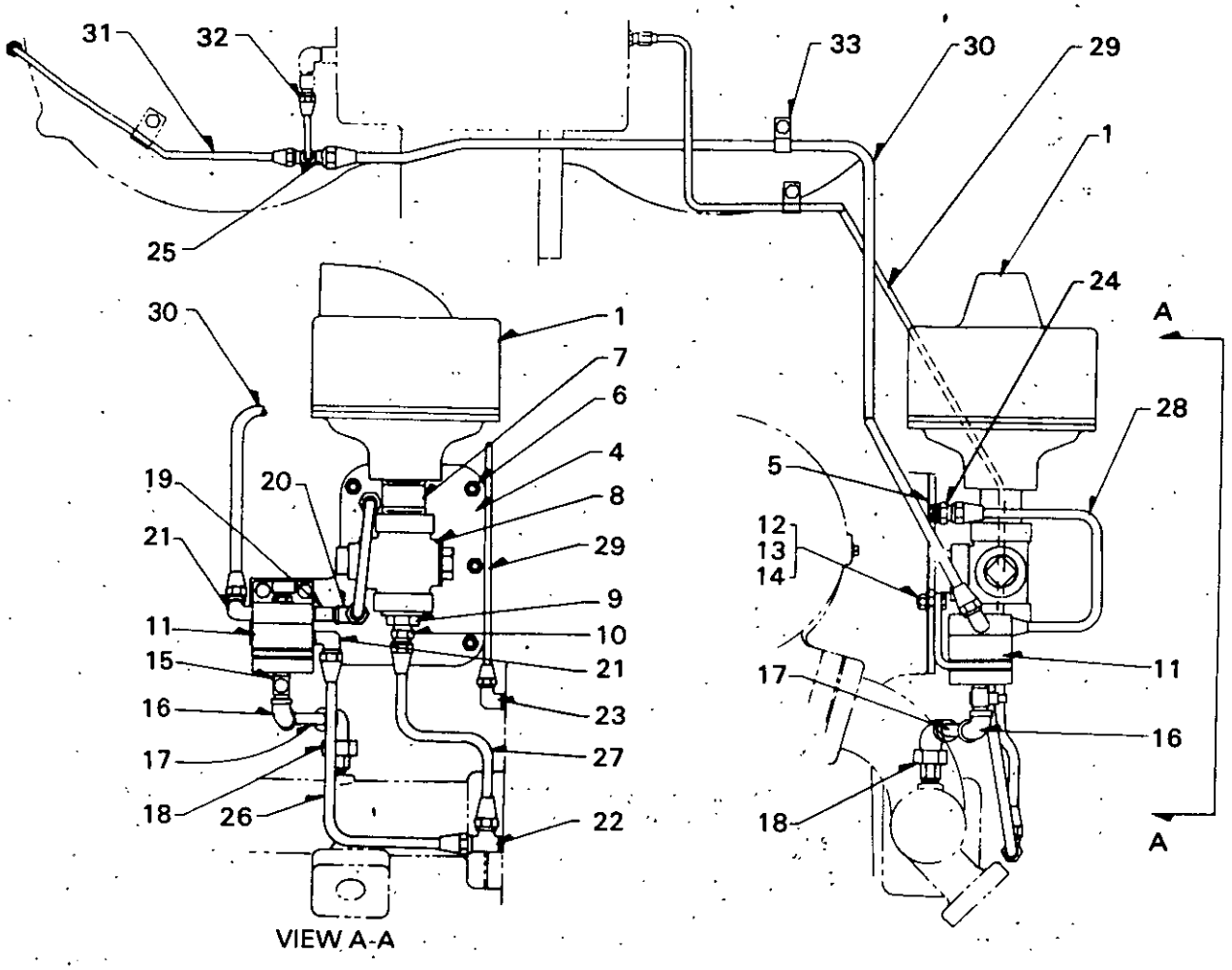


PLATE C159-10

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Pressure Switch and Low Water Safety Valve Application
16-567D1, D3A Engines
PLATE C159-11

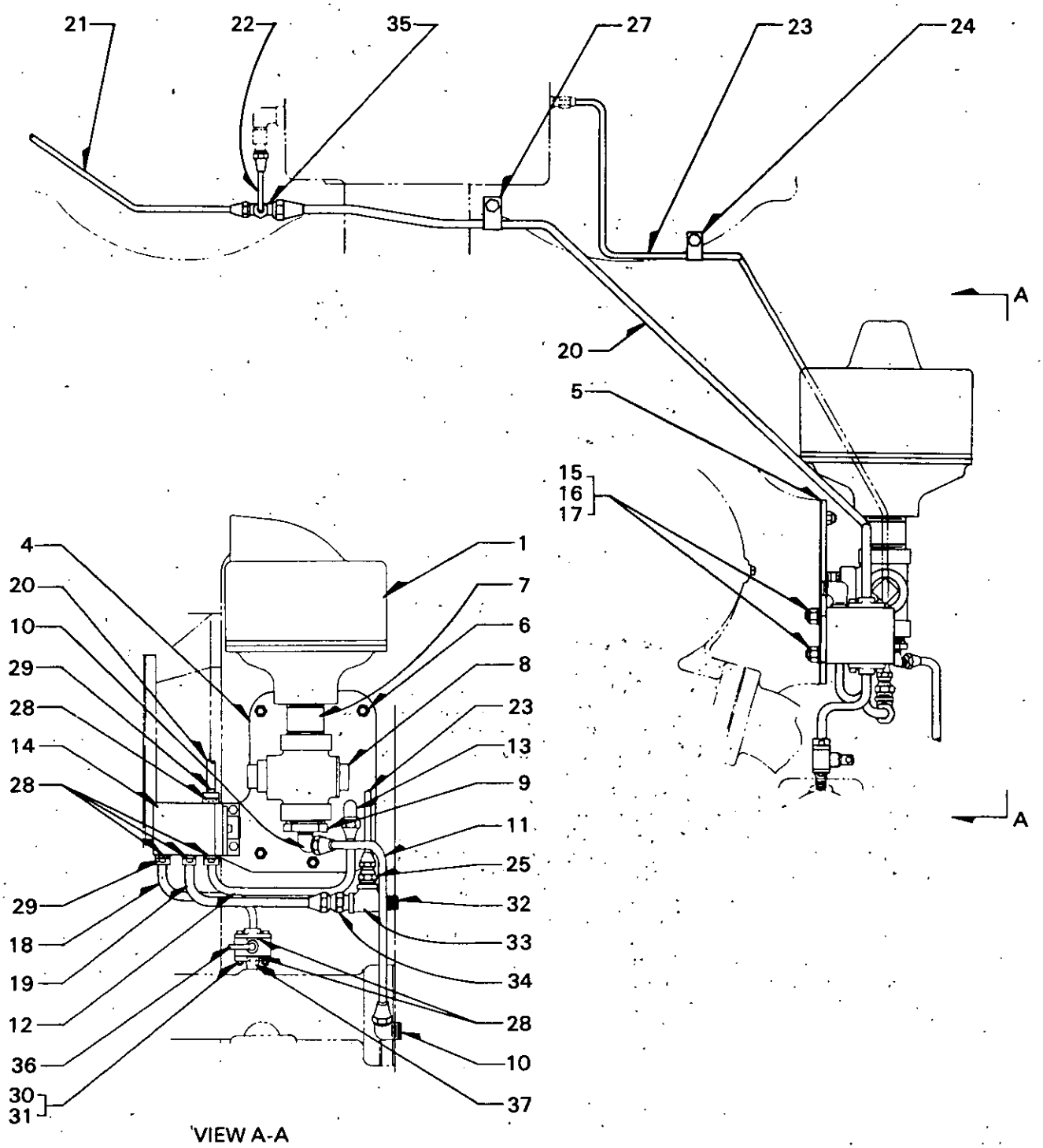
Ref. No.	Part Number	Qty. Req.	Description
1	8287986	1	SWITCH ASM. .. Pressure
*2	8324706	1	DIAPHRAGM .. Switch
*3	8305804	1	CONNECTOR ASM. .. 6 pole female - Incl. elbow, ferrule and nut
*3A	8090357	1	LAMP .. Double contact - Bayonet base - 6 Watt - 110 Volts
4	8347420	1	COVER ASM. .. Switch and valve mounting
5	8084685	1	GASKET .. Cover to accessory drive housing
6	8032716	8	NUT .. Hex lock 5/16-24
7	8060976	1	NIPPLE .. Short pipe - 1-1/4 MPT
8	8112766	1	COCK .. 3 way - 1-1/4 FPT
9	144062	1	BUSHING .. Pipe reducing - 1-1/4 MPT x 3/8 FPT
10	8039169	2	ELBOW .. 3/8 tube x 3/8 MPT x 90°
11	8347400	1	TUBE ASM. .. Switch to crankcase
12	8347399	1	TUBE ASM. .. Cover to valve
13	118755	1	ELBOW .. 3/8 tube x 1/4 MPT
14	----	1	VALVE ASM. .. Low water safety shutdown 8469592 .. 16-567D1 - See Page 27 8447342 .. 16-567D3A - See Page 26
15	179841	2	BOLT .. Hex head 3/8-16 x 1-1/4 - Valve mounting
16	103341	2	WASHER .. Plain 3/8
17	8032743	2	NUT .. Hex head 3/8-16 - Lock
†18	8477002	1	HOSE ASM. .. Safety valve to water outlet - Includes flanges - Formerly 8344751 tube asm.

† Previously system applied 8344751 tube assembly, 8337318 valve assembly and 8344265 flange for the low water portion. These components are no longer applied or available. It is recommended when replacement is required for either of the above items the following are to be used: 1-8477002 hose, 1-8412324 valve and 1-9093556 flange.

19	8344753	1	TUBE ASM. .. Safety valve to crankcase
20	8344754	1	TUBE ASM. .. Oil pressure line to safety valve
21	8320154	1	TUBE ASM. .. Oil pressure line to cover frame
22	8320153	1	TUBE ASM. .. Governor to oil pressure line
23	8289111	1	TUBE ASM. .. Tee to governor - D3A engine only
24	8118841	1	CLIP .. Tube mounting - D3A engine only
25	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT - D3A engine only
*26	103878	1	PLUG .. Pipe - 1/4 MPT square head - D1 engine only
27	3204128	1	CLIP .. Tube mounting
28	8342588	6	SEAL .. O-ring - Flange and valve mounting
29	186542	8	SCREW .. Hex socket head No. 10-24 x 1/2 - Flange mounting
30	147116	2	SCREW .. Hex socket head No. 10-24 x 1-3/4 - Tube to valve
31	8032814	2	NUT .. Hex lock No. 10-24
32	8060964	1	NIPPLE .. Close pipe - 3/8 MPT
33	120279	1	TEE .. 3/8 FPT x 3/8 FPT x 1/4 FPT
34	8040313	1	CONNECTOR .. 3/8 tube x 3/8 MPT
35	8040370	1	TEE .. 3/8 tube x 1/4 tube x 1/4 tube
36	8412324	1	VALVE ASM. .. Cut-off - See Page 28
37	9093556	1	FLANGE .. Valve mounting

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



VIEW A-A

PLATE C159-11

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Crankcase Pressure Switch Application
16-567D2, D3 Engines

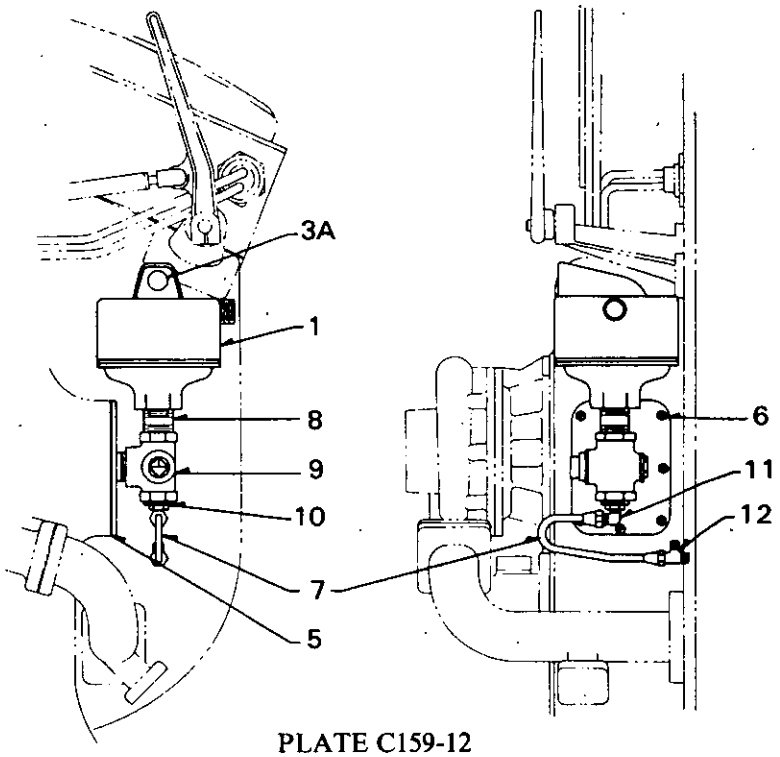


PLATE C159-12

Ref. No.	Part Number	Qty. Req.	Description
1	8287986	1	SWITCH ASSEMBLY .. Crankcase pressure
*2	8324706	1	DIAPHRAGM .. Switch
*3	8305804	1	CONNECTOR ASM. .. 6 pole female - Incl. elbow, ferrule and nut
3A	8222023	1	LAMP .. Double contact - Bayonet base - 6 Watt - 80 volts
4	8288843	1	COVER ASSEMBLY .. Switch mounting plate
5	8084685	1	GASKET .. Cover to accessory drive housing
6	8032716	8	NUT .. Hex lock 5/16-24
7	8320535	1	TUBE ASSEMBLY .. Switch to accessory end of crankcase
8	8060976	1	NIPPLE .. Short - 1-1/4 MPT
9	8112766	1	COCK .. 3 way - 1-1/4 FPT
10	144062	1	BUSHING .. Pipe reducing - 1-1/4 MPT x 3/8 FPT
11	8039169	1	ELBOW .. 3/8 tube x 3/8 MPT x 90°
12	8040386	1	TEE .. 3/8 tube x 3/8 MPT x 3/8 tube
*13	8289111	1	TUBE ASSEMBLY .. Tee to governor
*14	8040406	1	REDUCER Tube - 3/8 tube x 1/4 tube
*15	8040342	1	GASKET .. Flared tube
*16	8118841	1	CLIP .. Tube mounting

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

SERVICE AND CONVERSION KITS

REF. NO.	PART NUMBER	DESCRIPTION
1	8467306	KIT .. Services Detector 8428395 Complete - Can Also Be Used To Convert 8358538 To 8428395
2	8469591	KIT .. Converts The Low Water Portion Of Detectors 8358538 And 8428395 To The 3:1 Ratio Required For Roots Blown Engines
3	8469590	KIT .. Services The Low Water Portion Of Detector 8464678 - Or Services Low Water Valve 8469592 Complete
4	8430364	KIT .. Services Low Water Valves 8446593 And 8447342 - Can Also Be Used To Convert 8358536 To 8446593 Or To Convert 8358537 To 8447342 - Replaces 8467305
5	8379503	KIT .. Services The Crankcase Portion Of Detectors 8358538, 8428395, 8464678, 9320130 And 9505867
6	9339065	KIT .. Services The Low Water Portion Of Detector 9320130
7	9505990	KIT .. Services The Low Water Portion Of Detector 9505867
8	9535868	KIT .. Services Detector 8464678 Complete
9	9535869	KIT .. Services Detector - 9320130 Complete
10	9535870	KIT .. Services Detector - 9505867 Complete

NOTE: The above kits contain all necessary diaphragms, gaskets, seals, balls, springs, and spacers.

P.L. No. F159

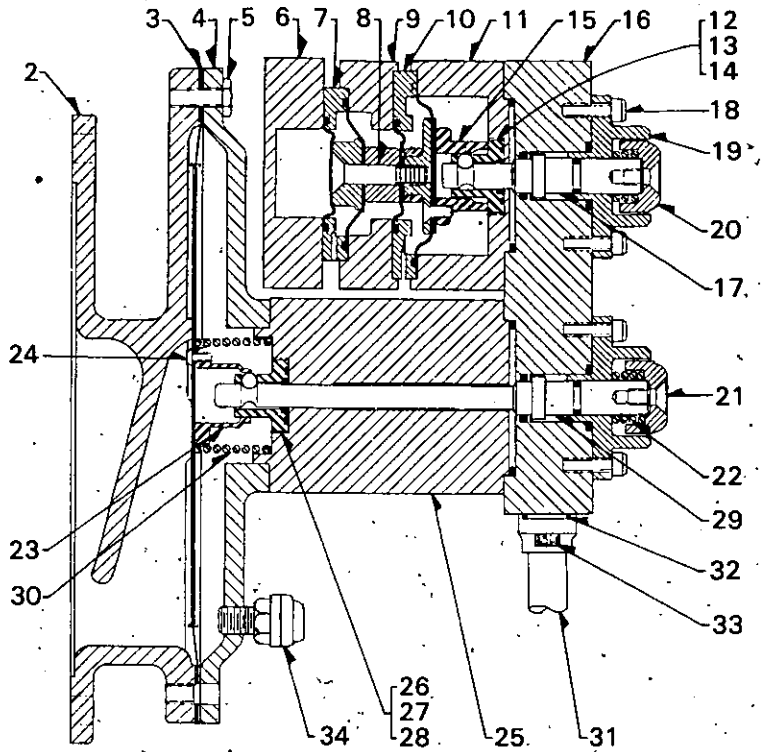
ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Differential Pressure Detector Assembly
PLATE C159-13

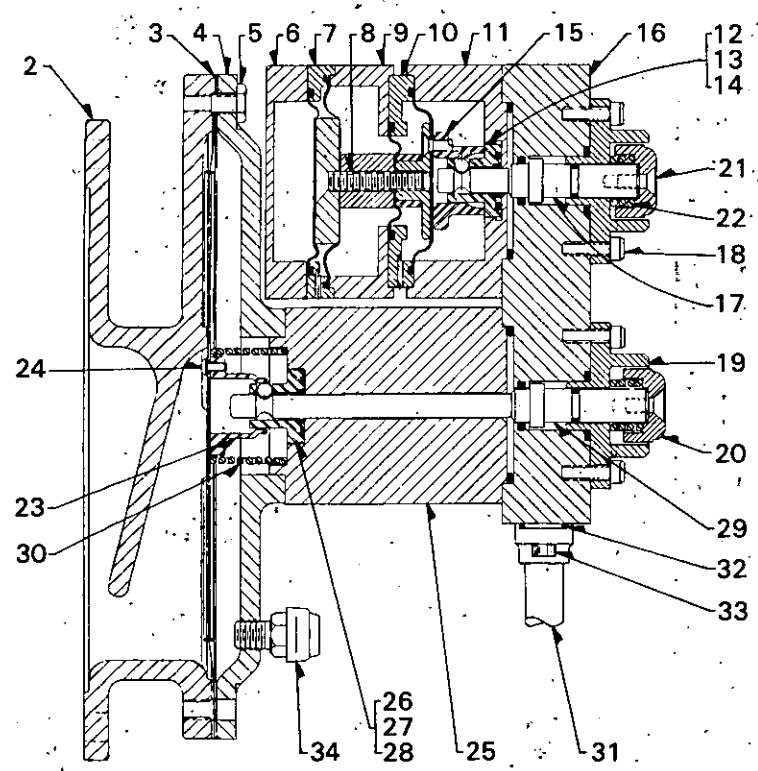
Ref. No.	Part Number	Qty. Req.		Description
		A	-	8,12,16-645E engines
		-	B	8-645E3B,E3C,F3B, 12,16-645E3,E3B,E3C,F3,F3B, 16-645E3A and 20-645E3, E3B engines
1	9505867	1	-	DETECTOR ASM. .. Differential pressure - Roots blown engines
1	9320130	-	1	DETECTOR ASM. .. Differential pressure - Turbocharged engines
2	8338736	1	1	HOUSING .. Mounting
3	9560511	1	1	DIAPHRAGM .. Detector - Crankcase pressure
4	9552498	1	1	COVER .. Diaphragm
5	9552483	12	12	BOLT .. Hex head 1/4-20 x 3/4
6	9552491	1	-	HOUSING .. High pressure
6	9549029	-	1	HOUSING .. High pressure
7	9552493	1	-	SPACER .. Diaphragm
7	9545982	-	1	SPACER .. Diaphragm
8	9552486	1	-	SCREW .. Flat head 1/4-20 x 1-1/4
8	9552485	-	1	SCREW .. Flat head 1/4-20 x 1-3/8
9	9552492	1	-	HOUSING .. Low pressure
9	9549028	-	1	HOUSING .. Low pressure
10	9549027	1	1	SPACER .. Diaphragm
11	9552496	1	1	HOUSING ASM. .. Air
12	8333991	1	1	RETAINER .. Ball
13	8340349	1	1	SEAL .. O-ring - Retainer to reset stem
14	8338711	1	1	SEAL .. O-ring - Retainer to housing
15	8338725	1	1	CAP .. Ball
16	9552490	1	1	HOUSING ASM. .. Oil
17	8347071	1	1	STEM .. Reset - Low water
18	189132	4	4	SCREW .. Cap 10-24 x 5/8 - Socket head
19	8338721	2	2	FLANGE .. Guide
20	8338722	2	2	BUTTON .. Reset
21	8370605	2	2	SCREW .. Flat head - No. 10-32 x 1/2
22	8372528	2	2	SPRING .. Reset button
23	8338719	1	1	CAGE .. Ball
24	8344789	3	3	SCREW .. Button head - No. 6-32 x 1/4
25	9552494	1	-	HOUSING ASM. .. Crankcase
25	9552495	-	1	HOUSING ASM. .. Crankcase
26	8333991	1	1	RETAINER .. Ball
27	8340349	1	1	SEAL .. O-ring - Retainer to reset stem
28	8338711	1	1	SEAL .. O-ring - Retainer to housing
29	9548151	1	1	STEM .. Reset - Crankcase pressure
30	9511416	1	1	SPRING .. Coil
31	9548153	1	1	TUBE ASM. .. Flanged
32	9552488	2	2	SEAL .. O-ring
33	186542	4	4	SCREW .. Cap - No. 10-24 x 1/2 - Socket head
34	8338723	1	1	FITTING .. Vent
*35	8388375	1	1	TAB .. Identification - "LOW WATER"
*36	8388376	1	1	TAG .. Identification - "CRANKCASE"
*37	9552489	1	-	PLATE .. Name
*37	9552497	-	1	PLATE .. Name
*38	9552487	2	2	SCREW .. Drive - No. 2 x 1/4
*39	9549026	4	4	SCREW .. Cap - 1/4-20 x 4-1/4 - Socket head
*40	9552484	4	-	SCREW .. Cap - 1/4-20 x 2 - Socket head
*40	138207	-	4	SCREW .. Cap - 1/4-20 x 2-1/4 - Socket head
*41	138203	4	4	SCREW .. Cap -1/4-20 x 1-1/4 - Socket head
*42	8388377	2	2	CAP .. Dust - Fits over Ref. Nos. 19 and 20
*43	8379503	1	1	KIT .. Repair - Crankcase - Includes Ref. Nos. 3 and 30, plus balls and seals
*44	9505990	1	-	KIT .. Repair - Low water - Includes seals, balls, diaphragms, spring and spacers
*44	9339065	-	1	KIT .. Repair - Low water - Includes seals, balls, diaphragms, spring and spacers
*45	9535870	1	-	KIT .. Repair - Complete - Includes crankcase and low water kits
*45	9535869	-	1	KIT .. Repair - Complete - Includes crankcase and low water kits

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



Detector 9505867 – For Roots Blown Engines



Detector 9320130 – For Turbocharged Engines

PLATE C159-13

P.L. No. F159

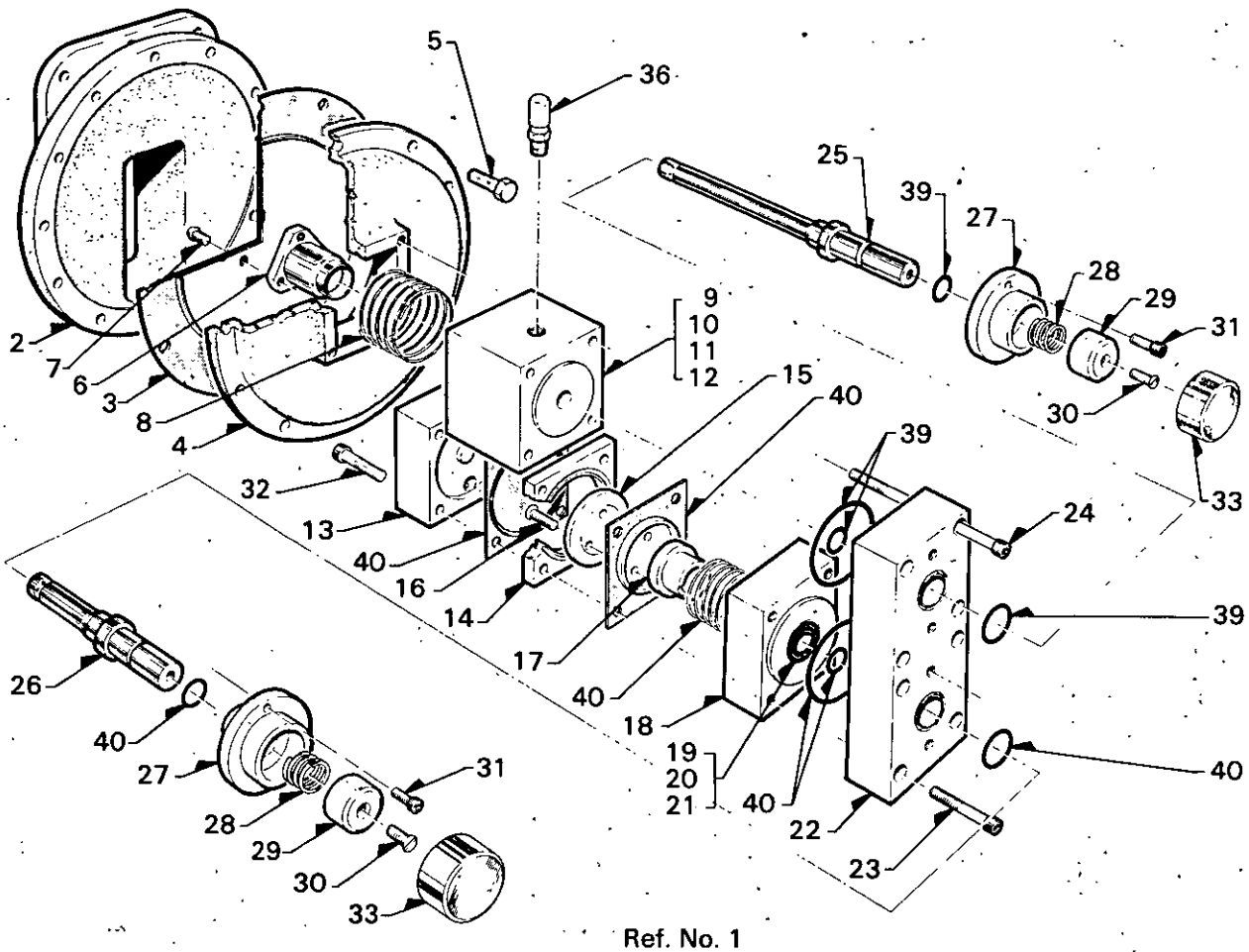
ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water and Crankcase Pressure Detector Assembly
PLATE C159-14

Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	16-567D1,D3A; 8,12,16-645E and 12,16,20-645E3 engines
		-	B	-	16-567D1 and 8,12,16-645E engines
		-	-	C	16-567D3A; 12,16,20-645E3 and 16-645E3A engines •
1	8358538	1	-	-	DETECTOR ASM. .. Low water and crankcase pressure - No longer available - Use 8464678 for Roots Blown engines or 8428395 for turbocharged engines
1	8464678	-	1	-	DETECTOR ASM. .. Low water and crankcase pressure
1	8428395	-	-	1	DETECTOR ASM. .. Low water and crankcase pressure
2	8338736	1	1	1	HOUSING .. Mounting
3	9560511	1	1	1	DIAPHRAGM .. Detector - Crankcase pressure
4	8475817	1	1	1	COVER .. Diaphragm
5	179796	12	12	12	BOLT .. Hex head 1/4-20 x 7/8
6	8338719	1	1	1	CAGE .. Ball
7	8344789	3	3	3	SCREW .. Button head - No. 6-32 x 1/4
8	9511416	1	1	1	SPRING .. Coil
9		1	1	1	HOUSING ASM. .. Crankcase
10	8333991	1	1	1	RETAINER .. Ball
11	8340349	1	1	1	SEAL .. O-ring - Retainer to stem
12	8338711	1	1	1	SEAL .. O-ring - Retainer to housing
13	8388510	1	-	1	PLATE .. Bottom
13	8478181	-	1	-	PLATE .. Bottom
14	8431176	1	-	1	SPACER .. Diaphragm
14	8475250	-	1	-	SPACER .. Diaphragm
14	8431223	-	-	1	SPACER .. Diaphragm
15	8333993	1	-	1	SPACER .. Disc
15		-	1	-	SPACER .. Disc
16	8355601	3	-	-	SCREW .. Flat head - No. 8-32 x 1/2
16		-	3	3	SCREW .. Flat head - No. 8-32 x 1/2 (Nylon)
17	8338725	1	1	1	CAP .. Ball
18		1	-	-	HOUSING ASM. .. Low water - Formerly 8431121
19	8333991	1	1	1	RETAINER .. Ball
20	8340349	1	1	1	SEAL .. O-ring - Retainer to stem
21	8338711	1	1	1	SEAL .. O-ring - Retainer to front housing
22	8392325	1	1	1	HOUSING .. Front
23	138203	4	4	4	SCREW .. Cap 1/4-20 x 1-1/4 - Socket head
24	9424029	4	4	4	SCREW .. Cap 1/4-20 x 3-1/4 - Socket head
25	8355600	1	1	1	STEM .. Reset - Crankcase pressure
26	8347071	1	1	1	STEM .. Reset - Low Water
27	8338721	2	2	2	FLANGE .. Guide
28	8372528	2	2	2	SPRING .. Reset button
29	8338722	2	2	2	BUTTON .. Reset
30	8370605	2	2	2	SCREW .. Flat head - No. 10-32 x 1/2
31	189132	4	4	4	SCREW .. Cap - No. 10-24 x 5/8 - Socket head
32	138202	4	4	4	SCREW .. Cap - 1/4-20 x 1 - Socket head
33	8388377	2	2	2	CAP .. Dust
*34	8388375	1	1	1	TAG .. Identification - "LOW WATER"
*35	8388376	1	1	1	TAG .. Identification - "CRANKCASE"
36	8338723	1	1	1	FITTING .. Vent
*37	8338734	1	1	1	TUBE ASM. .. Flanged
*38	8342588	2	2	2	SEAL .. O-ring - Tube assembly to detector
39	8379503	1	1	1	KIT .. Repair - Crankcase - Includes Ref. Nos. 3 and 8, plus balls and seals
40	8469591	1	-	1	KIT .. Repair - Low water - Includes seals, balls, diaphragms, spring, and spacers
40	8469590	-	1	-	KIT .. Repair - Low water - Includes seals, balls, diaphragms, spring, and spacers
*41	8467306	1	-	1	KIT .. Repair - Complete - Includes crankcase and low water repair kits
*41	9535868	-	1	-	KIT .. Repair - Complete - Includes crankcase and low water repair kits

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE



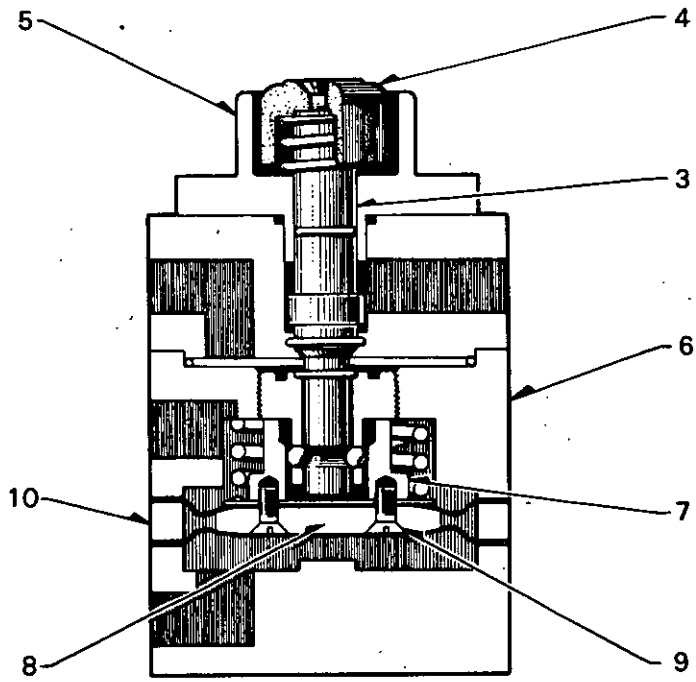
Ref. No. 1

PLATE E159-14

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Safety Shutdown Valve Assembly
1:1 Ratio
16-567D3, D3A Engines



Ref. No. 1

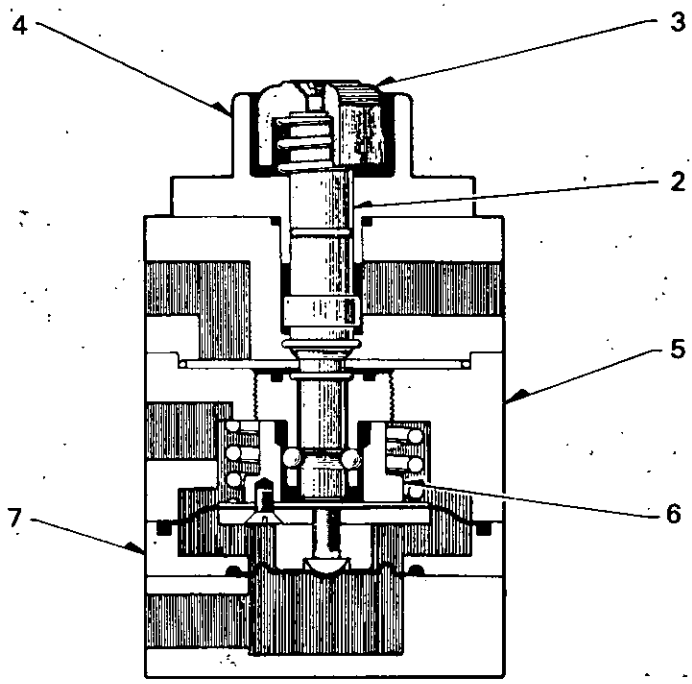
PLATE B159-15

Ref. No.	Part Number	Qty. Req.		Description
1	8447342	1	-	VALVE ASM. .. Low water safety shutdown - Flanged connections - Replaces 8358537
*2	8446593	-	1	VALVE ASM. .. Low water safety shutdown - Threaded connections - Replaces 8358536
3	8347071	1	1	STEM .. Reset
4	8338722	1	1	BUTTON .. Reset
5	8338721	1	1	GUIDE .. Flange
6	8431123	1	-	HOUSING ASM. .. Ball retainer - Includes retainer and two (2) O-rings
*6	8431122	-	1	HOUSING ASM. .. Ball retainer - Includes retainer and two (2) O-rings
7	8338725	1	1	CAP .. Ball
8	8333933	1	1	SPACER .. Diaphragm
9	8355601	3	3	SCREW .. Spacer mounting
10	8431223	1	1	SPACER .. Housing
*11	189132	2	2	SCREW .. Hex socket head 10-20 x 1 - Guide mounting
*12	138202	8	8	SCREW .. Hex socket head 1/4-20 x 1
*13	8370605	1	1	SCREW .. Hex socket head 10-32 x 1/2 - Cap
*14	8430364	1	1	KIT .. Repair - Contains all necessary diaphragms, gaskets, seals, balls, springs, and spacers

P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Safety Shutdown Valve Assembly
3:1 Ratio
16-567D1, 8,12,16-645E Engines



Ref. No. 1

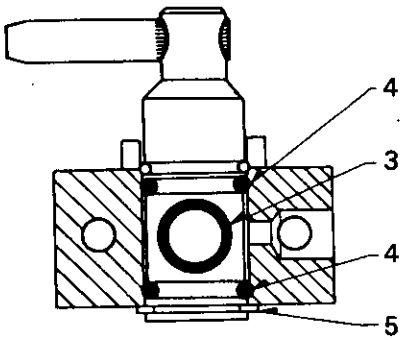
PLATE B159-16

Ref. No.	Part Number	Qty. Req.	Description
1	8469592	1	VALVE ASSEMBLY .. Low water safety shutdown
2	8347071	1	STEM .. Reset
3	8338722	1	BUTTON .. Reset
4	8338721	1	GUIDE .. Flange
5	8431123	1	HOUSING ASSEMBLY .. Ball retainer - Includes retainer and two (2) O-rings
6	8338725	1	CAP .. Ball
7	8475250	1	SPACER .. Diaphragm
*8	189132	2	SCREW .. Hex socket head - 10-24 x 5/8 - Guide mounting
*9	138202	8	SCREW .. Hex socket head - 1/4-20 x 1
*10	8370605	1	SCREW .. Hex socket head - 10-32 x 1/2
*11	8469590	1	KIT .. Repair - Contains all necessary diaphragms, gaskets, seals, balls, springs, and spacers

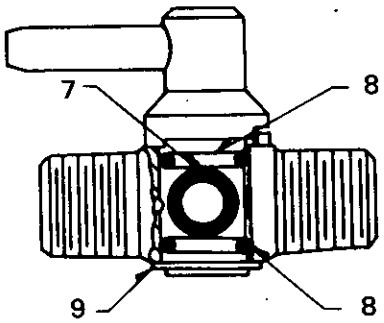
P.L. No. F159

ENGINE CRANKCASE PRESSURE SWITCH, DETECTOR AND LOW WATER SAFETY SHUTDOWN VALVE

Low Water Cut-off Valve Assembly



Ref. No. 1



Ref. No. 6

PLATE B159-17

Ref. No.	Part Number	Qty. Req.		Description
1	8412324	1	-	VALVE .. Low water cut-off - Flange mounting
2	8337318	-	1	VALVE .. Low water cut-off - Flange mounting - No longer available - For replacement information - See Page 12
3	8341538	1	1	SEAL .. O-ring
4	8341539	2	2	SEAL .. O-ring
5	9422422	1	1	RING .. Retaining

LOW WATER CUT-OFF VALVE - 1/4 MPT - Applied to 16-567D1,D3,D3A Engines

6	8319665	1	VALVE .. Low water - Cut-off - Threaded mounting
7	8342220	1	SEAL .. O-ring
8	8342221	2	SEAL .. O-ring
9	9422154	1	RING .. Retaining

Parts List No: F160

CAMSHAFT DRIVE HOUSING AND COVER

16-567D1,D2,D3,D3A; 8,12,16-645E,E3C; 12,16,20-645E3;
16-645E3A; 8,12,16,20-645E3B; 12,16-645F3,F3B and 8-645F3B Engines
PLATE E160-1

Ref. No.	Part Number	Quantity Required					Description
		A	-	-	-	-	8,16-645E and 16-567D1 engines
		-	B	-	-	-	8-645E engine (SW1003C)
		-	-	C	-	-	12-645E engine
		-	-	-	D	-	16-567D2,D3,D3A engines
		-	-	-	-	E	12,16,20-645E3; 16-645E3A; 8,12,16,20-645E3B; 8,12,16-645E3C; 12,16-645F3,F3B and 8-645F3B engines
1	8174616	1	-	-	-	-	HOUSING ASSEMBLY .. Camshaft drive
*2	9523810	-	1	-	-	-	HOUSING ASSEMBLY .. Camshaft drive
*3	8174751	-	-	1	-	-	HOUSING ASSEMBLY .. Camshaft drive
*4	8288709	-	-	-	1	-	HOUSING ASSEMBLY .. Camshaft drive - Applied to engines with external low oil pressure lines
*5	8341635	-	-	-	1	-	HOUSING ASSEMBLY .. Camshaft drive - Applied to D3A engines with internal low oil pressure lines
6	8366877	-	-	-	-	1	HOUSING ASSEMBLY .. Camshaft drive
†7	8081380	1	1	1	1	1	GASKET .. Housing to crankcase - See Ref. No. 29
*8	8407428	-	9	-	-	-	BOLT .. Drilled hex head 1/2-20 x 1 - Housing to crankcase
9	8028329	11	2	11	11	11	BOLT .. Drilled hex head 1/2-20 x 1-1/4 - Housing to crankcase
10	181433	11	11	11	11	11	BOLT .. Hex head 1/2-20 x 1-3/4 - Housing to crankcase
11	8116738	As Required					WIRE .. Lock - 3/64 diameter (500 ft.)
12	8028369	2	2	2	2	2	DOWEL .. 1/2 x 1-1/8 inches long
13	181429	24	24	24	24	24	BOLT .. Hex head 1/2-20 x 1-1/4 - Housing to crankcase
14	8175446	1	1	-	-	-	COVER ASSEMBLY .. Upper
15	8175436	-	-	1	-	-	COVER ASSEMBLY .. Upper
16	181431	12	-	12	-	-	BOLT .. Hex head 1/2-20 x 1-1/2 - Cover to housing
*17	186690	-	12	-	-	-	BOLT .. Hex head 1/2-20 x 1-3/4 - Cover to housing
18	8185923	1	1	-	-	-	GASKET .. Cover to housing - Upper
*19	8451659	-	-	1	-	-	GASKET .. Cover to housing - Upper - Replaces 8185583
††20	8175731	1	1	1	1	1	RETAINER .. Oil seal - Replaces 8175730
21	8175858	1	1	1	1	1	GASKET .. Retainer - Oil seal
22	181370	24	24	24	24	24	BOLT .. Hex head 3/8-24 x 1-1/4 - Retainer to housing
23	6101225	24	24	24	24	24	WASHER .. Plain 3/8
24	8292850	1	1	1	1	1	INDICATOR ...Flywheel - Engines without starter motors
+*25	8354872	1	-	-	-	1	INDICATOR .. Flywheel - Engines with starter motors - See Parts List No. 125
26	454828	2	2	2	2	2	BOLT .. Hex head 1/4-28 x 5/8 - Indicator mounting
*27	179793	2	-	-	-	2	BOLT .. Hex head 1/4-20 x 5/8 - Indicator mounting
28	103319	2	2	2	2	2	WASHER .. Lock 1/4
†29	9507085	2	2	2	2	2	GASKET .. Cylinder head frame to camshaft housing - Optional to 8081380 gasket when only the head frame portion is to be replaced
*30	8366747	As Required					SEALING COMPOUND .. Silicon rubber - 12 oz. cartridge - Applied to headframe to crankcase joint

††8048965 Retainer. Dowels previously furnished in 8175730 Retainer Assembly are no longer required. Use 8175731 Retainer only.

P.L. No. F160

CAMSHAFT DRIVE HOUSING AND COVER

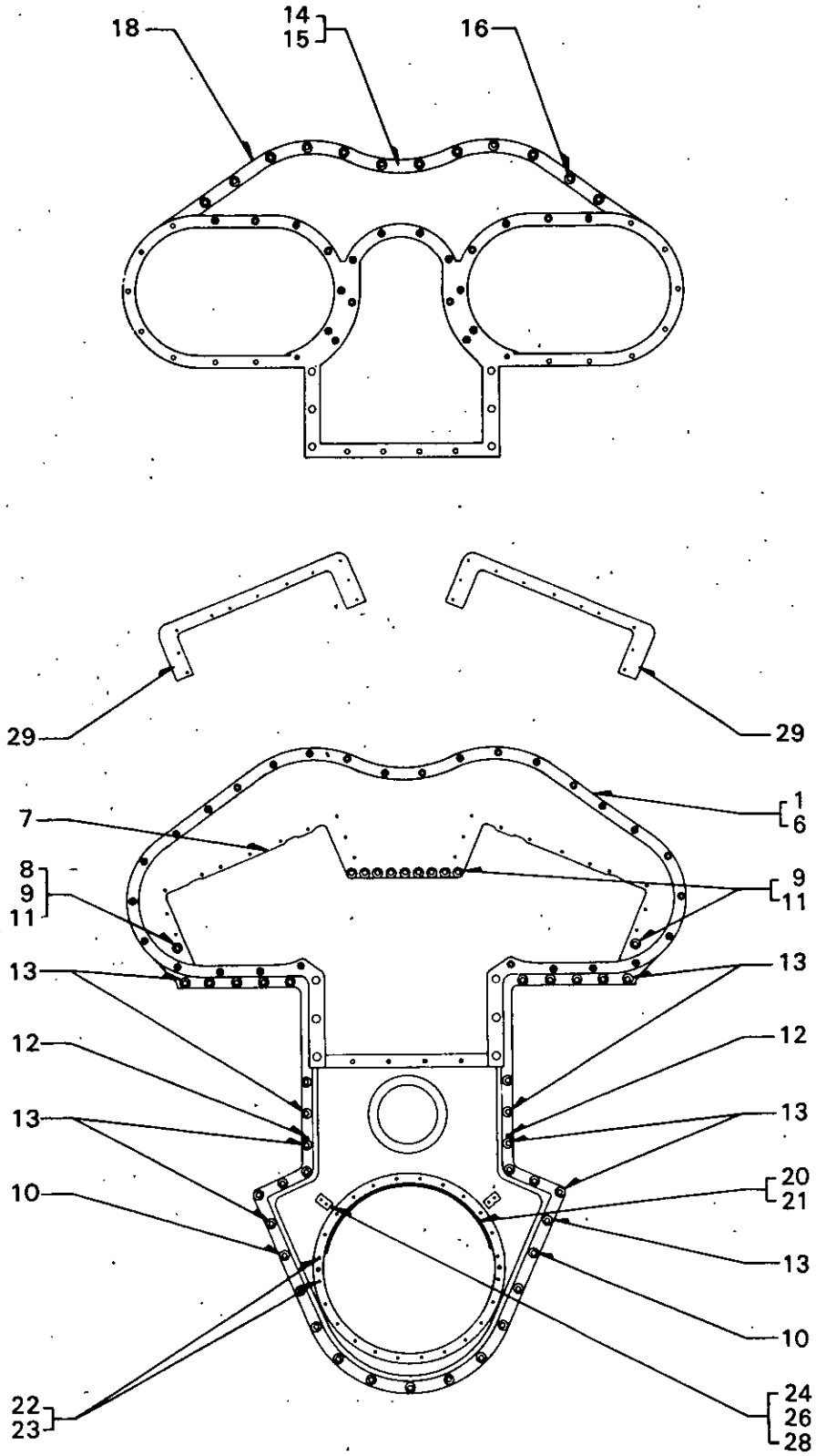


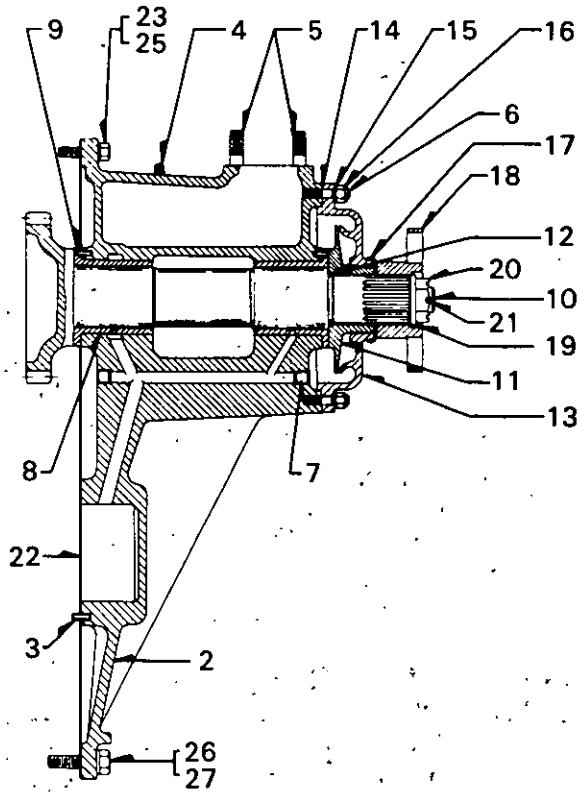
PLATE E160-1

Parts List No. F162

AUXILIARY GENERATOR DRIVE ASSEMBLY

All 567D and 645 Roots Blown Engines

Ref. No.	Part Number	Qty. Req.	Description
1	8084664	1	DRIVE ASM. ...Auxiliary
†2	8081399	1	HOUSING ASM. .. Drive
3	8028304	2	DOWEL .. 1/4 x 5/8 in. lg.
4	8029137	4	STUD .. 3/8-16-24 x 1-3/4 inches long
			8115306 .. .002 OS
			8115307 .. .004 OS
			8115308 .. .015 OS
			8115309 .. .017 OS
			8115310 .. .019 OS
5	8084871	4	STUD .. 1/2-13-20 x 2-7/16 in. long
			8123046 .. .002 OS
			8123047 .. .004 OS
			8126979 .. .015 OS
			8126980 .. .017 OS
			8126981 .. .019 OS
6	8035440	8	STUD .. 3/8-16-24 x 1-7/8 in. long
			8123048 .. .002 OS
			8123049 .. .004 OS
			8126932 .. .015 OS
			8126933 .. .017 OS
			8126934 .. .019 OS
7	8348618	2	PLUG .. Pipe - 1/4 MPT
†8	8392348	2	BUSHING .. Thrust - Stamped to read "Roots" replaces 8081361
			8443829 .. .005 OS
			8443830 .. .010 OS
†9	8392166	2	DOWEL .. 1/8 x 5/8 in. lg.



Ref. No. 1

PLATE D162-1

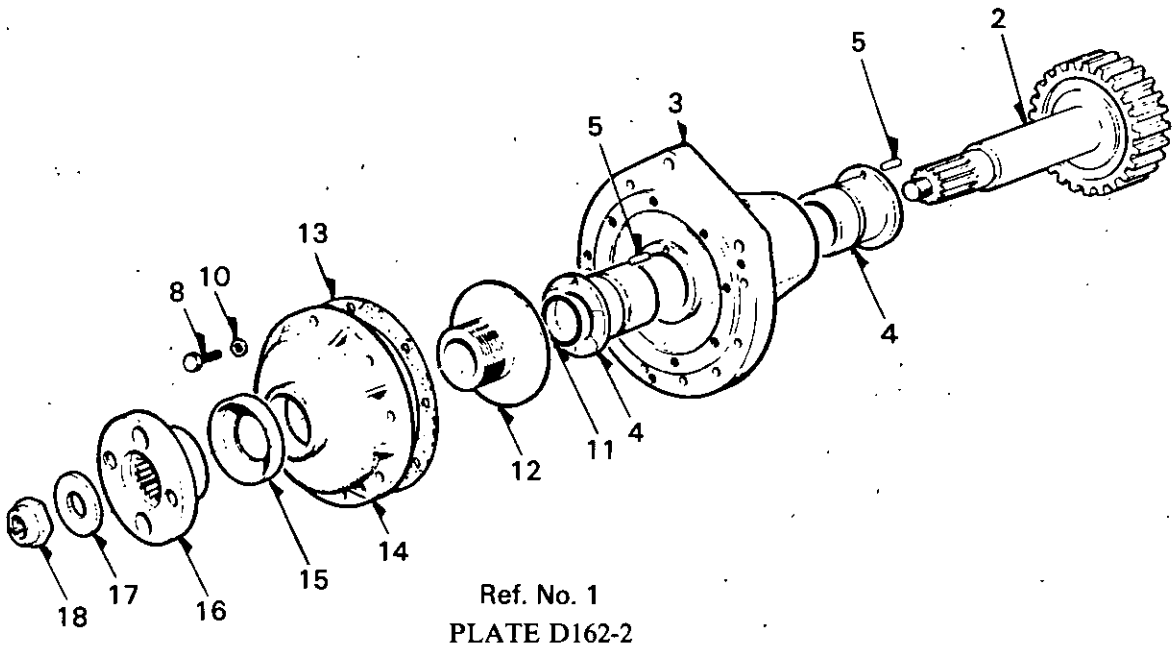
† When replacing 8081361 bearing with the 8392348 bearing, the drive housing 8081399 must be reworked. Remove the 1/4 inch dowel at the 12:00 o'clock position and ream a .1235 hole in the 9:00 o'clock position for the front bearing and the 3:00 o'clock position for the rear bearing. Install bearing and secure with dowel 8392166. Line ream bearing after installation in housing.

10	8081362	1	SHAFT .. Drive - Includes 26T gear
11	8081363	1	SLINGER .. Oil
12	8308292	1	SEAL .. Oil slinger
13	8081027	1	COVER .. Rear
14	8081365	1	GASKET .. Cover
15	6101225	8	WASHER .. Plain 3/8
16	8032717	8	NUT .. Hex lock 3/8-24
17	8081366	1	SHIELD .. Dust
18	8081367	1	FLANGE .. Coupling
19	8081368	1	WASHER .. 1-1/32 I.D. x 2-3/16 O.D.
20	8081369	1	NUT .. Hex 1-14 slotted
21	119209	1	PIN .. Cotter - 1/8 x 1-5/8 in. long
22	8081398	1	GASKET .. Drive to camshaft drive cover
23	181433	8	BOLT .. Hex head 1/20-20 x 1-3/4
*24	181440	4	BOLT .. Hex head 1/2-20 x 2-1/2
25	6101229	12	WASHER .. Plain 1/2
26	8165628	6	BOLT .. Hex head 3/4-16 x 8-1/2
27	8028733	6	WASHER .. Plain 3/4

P.L. No. F162

AUXILIARY GENERATOR DRIVE ASSEMBLY

All 567D and 645 Turbocharger Engines



Ref. No. 1

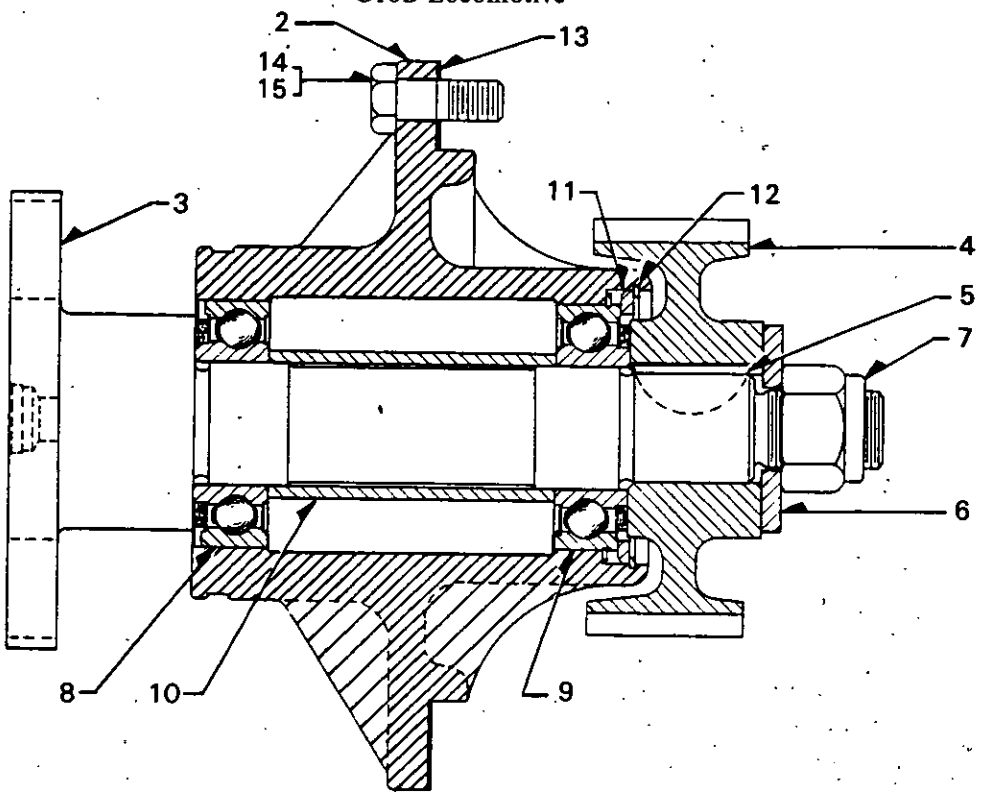
PLATE D162-2

Ref. No.	Part Number	Qty. Req.		Description
1	8460738	1	-	DRIVE ASM. .. Auxiliary generator - Replaces 8261196
1	8261196	-	1	DRIVE ASM. .. Auxiliary generator - Replaced by 8460738
2	8460533	1	-	SHAFT .. Drive - Includes gear
2	8260651	-	1	SHAFT .. Drive - Includes gear
3	8261201	1	1	HOUSING ASM. .. Support
†4	8379914	2	2	BUSHING .. Thrust - Stamped "Turbo" - Unfinished I.D. x 3.001 O.D. - Replaces 8081361 8443827 .. 3.006 O.D. 8443828 .. 3.011 O.D.
5	8028304	2	2	DOWEL .. Pin 1/4 x 5/8 in. lg.
6	444687	2	2	PLUG .. Pipe - 1/8 MPT
*7	8273101	8	8	STUD .. Cover - No longer applied - See Ref. No. 8
*8	179839	8	8	BOLT .. Hex head 3/8-16 x 1 in. lg. Replaces previous stud and nut arrangement.
*9	8032717	8	8	NUT .. Hex lock 3/8-24 - No longer applied - See Ref. No. 8
10	6101225	8	8	WASHER .. Flat 3/8
11	8308292	1	1	SEAL .. Oil
12	8081363	1	1	SLINGER .. Oil
13	8081365	1	1	GASKET .. Cover
14	8460317	1	-	COVER .. Drive
14	8081027	-	1	COVER .. Drive
15	8081366	1	1	SHIELD .. Dust
16	8460316	1	-	FLANGE .. Coupling
16	8081367	-	1	FLANGE .. Coupling
17	8081368	1	1	WASHER .. Hardened
18	8134735	1	-	NUT .. Hex lock 1-14
18	8081369	-	1	NUT .. Hex 1-14
*19	103389	-	1	PIN .. Cotter 1/8 x 2 in. lg.
*20	8261200	1	1	GASKET .. Drive mounting
*21	186339	2	2	BOLT .. Hex head 1/2 - 20 x 5-1/4 in. lg.
*22	6101229	2	2	WASHER .. Flat 1/2
*23	179845	9	9	BOLT .. Hex head 3/8-16 x 1-3/4 in. lg.
*24	6101225	9	9	WASHER .. Flat 3/8

† *Note: Thrust bushing must be line bored to finished size I.D. after installing in housing.*

AUXILIARY GENERATOR DRIVE ASSEMBLY

No. 1 Traction Motor Blower Drive Assembly
8-645E Engine
G18B Locomotive



Ref. No. 1

PLATE A162-3

Ref. No.	Part Number	Qty. Req.	Description
1	8286259	1	DRIVE ASSEMBLY .. No. 1 traction motor blower
2	8286280	1	HOUSING .. Drive shaft
3	8286281	1	SHAFT .. Drive - Includes flange
4	8042976	1	GEAR .. Drive - Spur - 37T
5	108627	1	KEY .. Gear to shaft - 5/16 x 1-1/2 in. long
6	8042977	1	WASHER .. Retaining - 1-1/32 I.D.
7	8032724	1	NUT .. Hex lock 1-14
8	908415	1	BEARING .. Ball - Outer
9	908410	1	BEARING .. Ball - Inner
10	9532762	1	SPACER .. Bearing
11	8042973	1	RING .. Retainer
12	8370886	1	RING .. Snap
13	8028760	1	GASKET .. Drive mounting
14	181432	6	BOLT .. Hex head 1/2-20 x 1-5/8 - Drive mounting
15	6101229	6	WASHER .. Plain 1/2

Parts List No. D165

GOVERNOR ASSEMBLY

Electro-Hydraulic PG Barometric Rebalancing Governor
G18, GA18 and G22 Locomotives
8,12-645E Engines
PLATES B165-1 thru 7

Ref. No.	Part Number	Qty. Req.		Description
*1	8409098	A	-	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance - Replaced by 8424297
*2	8424297	-	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance - Replaces 8409098 - Replaced by 9532035 - Component list available upon request

The following components are applicable to Ref. Nos. 1 and 2 unless otherwise specified in the Description column

3				Reference number not used
4	8149658	1		BASE .. Governor
5	8149696	1		SHAFT .. Drive - Serrated
6	8062007	1		RETAINER .. Bearing
7	8149695	1		SEAL .. Oil
8	8149697	1		RETAINER .. Oil seal
9		1		BEARING .. Ball - Drive shaft - Formerly 954298
10		1		RING .. Snap - Formerly 8149677
11	8113929	3		BOLT .. Drilled hex head 1/4-28 x 5/8 - Bearing retainer to base
12	8288663	A.R.		WIRE .. Lock - .026 diameter - Available 500 foot length - Formerly 8122250
13	8149679	1		GASKET .. Retainer to base
14	8152068	1		SEAL .. Oil - Case to base
15		12		WASHER .. Lock 5/16 - Formerly 120379
16		8		BOLT .. Hex head 5/16-18 x 1 - Case to base - Formerly 179818
17		2		PIN .. Dowel - Case to base - No. 5 x 3/4 inches long - Formerly 103613
18	8149426	1	-	CASE ASSEMBLY .. Power
*18A	8429420	-	1	CASE ASSEMBLY .. Power - Used with external accumulator
19	8149470	1	1	STUD .. Idler
20	8201045	2	2	PLUG .. Drive - Ball check
21		4	4	RING .. Snap - Accumulator - Replaces 8149472 - Formerly 9413465
22	8149469	2	2	PISTON .. Accumulator
23	8149471	2	2	SPRING .. Accumulator - Outer
24	8057784	2	2	SPRING .. Accumulator - Inner
25	8149474	2	2	SEAT .. Spring - Accumulator
26	8113672	2	2	PIN .. Grooved - Dowel case to column - 1/4 x 3/4 inch long
27	8118445	1		COCK .. Drain - 1/8 MPT
28	8152071	1		SEAT .. Inner buffer spring
29	8152072	2		SPRING .. Buffer
30	8152073	1		PISTON .. Buffer
31	8152074	1		PLUG .. Buffer spring - 1-5/16 inches diameter
31A	8478711	1		O-RING .. Plug - Replaces 8223699
31B		1		RING .. Snap - Buffer plug - Formerly 9413448
32	8113998	1	-	GAUGE ASSEMBLY .. Oil level - Replaces 8442288 } Replaced by
*32A	8442288	-	1	GAUGE ASSEMBLY .. Oil level - Replaced by 8113998 } 9328197
33	8444618	2	2	SEAL .. O-ring - Replaces 8319674
ϕ34	8350082	2	2	GASKET .. .312 I.D. x .535 O.D. x .078 inch thick
ϕ*34A	8174780	3	3	GASKET .. .312 I.D. x .500 O.D. x .062 inch thick - Formerly applied
35	8131381	1	-	GLASS .. Sight
*35A	8451831	-	1	GLASS .. Sight - No longer furnished } Use 9328197 Gauge Assembly
36	8319675	1	1	CAP .. Gauge - No longer furnished }
*36A	9328197	1	1	GAUGE ASSEMBLY .. Oil lever - Replaces 8442288 and 8113998
37	8113999	1	1	ELBOW .. Oil gauge
38	8152070	1	1	GEAR .. Idler
39	8152069	1	1	GEAR .. Drive
40	8134425	1	-	PLUG .. Pipe - 1/16 MPT hex socket
*40A		-	1	PLUG .. Pipe - 1/16 MPT hex socket - Formerly 9409954
41		9	9	PLUG .. Pipe - 1/8 MPT hex socket - Formerly 444687
42	8383167	1	1	SPRING .. Speeder

P.L. No. D165

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
*43	8238927	1	1	SLEEVE ASSEMBLY .. Rotating - Replaced by 9327175
*43A	9327175	1	1	SLEEVE ASSEMBLY .. Rotating - Replaces 8238927
44	8160610	1	1	GEAR ASSEMBLY .. Ball head - Includes sleeve
45	8149343	1	1	PLUNGER .. Pilot valve
46	8149341	1	1	BUSHING .. Compensating
47		1	1	RING .. Snap - Bushing - Pilot valve body - Repl. 8149344 - Form. 274416
48	8353912	1	1	BALL HEAD ASSEMBLY
49	8149340	2	2	ARM ASSEMBLY .. Ball
50		4	4	BEARING .. Needle - 1/4 inch shaft - Formerly 148401
51	8228384	1	1	COUPLING ASSEMBLY .. Spring drive
52		8	8	PIN .. Cotter 1/16 x 1/2 inch long - Formerly 103361
53	8149338	4	4	PIN .. Ball arm
56	8353910	1	1	BALL HEAD .. Governor
*56A	8353911	1	1	RETAINER .. Ball head
57A		1	1	SCREW .. Slotted round head 6-32 x 5/16 - Spring drive coupling - Form. 121839
57B		1	1	WASHER .. Lock - No. 6 - Formerly 131181
58	8152338	1	1	SPRING .. Adjusting - Pilot valve
59	8068098	1	1	WASHER .. Plain 5/16
60	8149345	1	1	BEARING .. Thrust
61	8149346	1	1	SEAT .. Speeder spring
62	8350083	1	1	ROD ASSEMBLY .. Shutdown - 7.0 inches long - Ref. No. 43 only
*62A	8350086	1	1	ROD ASSEMBLY .. Shutdown - 7.812 inches long - Ref. No. 43A only
*62B		1	1	SPRING .. Shutdown rod - Ref. No. 43A only
63	8017599	1	1	NUT .. Plunger - Pilot valve - Ref. No. 43 only
63A	8291770	1	1	NUT .. Plunger - Pilot valve - Ref. No. 43A only
64		1	1	PIN .. Cotter 1/16 x 5/8 inch long - Formerly 107761
65	8160641	1	1	BEARING .. Ball
*65A	8284037	2	2	NUT .. Hex 8-32 - Shutdown rod - Formerly 120622
66	8201617	1	-	COLUMN ASSEMBLY .. Governor - Replaces 8201607
*66A	9514006	-	1	COLUMN ASSEMBLY .. Governor - Formerly 8429433
67	8327394	2	2	INSERT .. Thread - Formerly 8137572
68	8113823	1	1	STUD .. Bearing - Pilot valve drive gear
69		6	6	PLUG .. Pipe - 1/8 MPT hex socket - Formerly 444687
70	8113848	1	1	GEAR .. Drive - Pilot valve bushing
71	8113839	1	1	SPRING .. Pilot valve bushing
72	8275539	1	1	BUSHING .. Speed adjusting pilot valve
73	8113815	1	1	BUSHING .. Regulating
74	8113835	2	3	SPRING .. Pilot valve plunger
75	8284087	1	1	PLUNGER .. Pilot valve
76	8113830	1	1	BEARING .. Thrust - Rotating bushing
77	8113833	1	-	PIN .. Straight - 1/8 x 3/4 inch long - Drilled head
*77A	8433220	-	1	PIN .. Straight - 1.156 inches long x .1242 inch diameter
*77B	8433222	-	1	PIN .. Straight - .656 inch long x .1865 inch diameter
78	8113831	1	1	PIN .. Pilot valve - 1/8 x 9/16 inch long
79		3	5	PIN .. Cotter - 1/16 x 3/8 inch long - Formerly 119981
80	9333520	1	1	LEVER .. Lower floating - Repl. 8383169 { Must Be Applied With Ref. No. 303 - 9333521 Plate
*81	8433771	1	1	WASHER .. Lube oil diaphragm
*82	8433224	-	1	BRACKET .. Clamp
83	8113816	1	1	RETAINER .. Regulating bushing
84	6101223	1	1	WASHER .. Plain 5/8 - Bushing retainer
85	8113845	1	1	SPRING .. Bushing retainer
86	8113817	1	1	COLLAR .. Spring retainer
87		1	1	BOLT .. Hex head 1/4-28 x 3/4 - Retainer - Formerly 181566
88	8113991	3	3	WASHER .. Plain 1/4 - Bushing retainer
89	8113822	1	1	SCREW .. Retainer - Special - 1/4-28
*90	8235782	1		VALVE ASSEMBLY .. By-pass
91	8235784	1		PLUNGER ASSEMBLY .. By-pass valve
92	8444617	1		O-RING .. Valve body - Replaces 8223697
93		1		PIN .. Straight - 1/16 x 3/8 inch long - Formerly 3291742 and 456342
94	8235785	1		NUT .. Seal retainer
95	8235786	1		RETAINER .. Sleeve
96	8235787	1		SEAT .. By-pass valve spring
97	8235788	1		SPRING .. Seal retainer

P.L. No. D165

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	- - - -	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
	8235782	1		VALVE ASSEMBLY .. By-pass
98	8235789	1		SPRING .. By-pass valve
99	9318632	1		WASHER .. Seal - Replaces 8235790
100	8235783	1		BODY .. By-pass valve
101	8113840	1		SPRING .. Solenoid counter balance
102	8131473	1		SPRING .. Pilot valve bushing
103	8240842	1		BUSHING .. Pilot valve - Load control
104		1		RING .. Retaining - Load control pilot valve bushing - Formerly 9413362
105	8240841	1		PLUNGER .. Pilot valve - Load control
106	8113849	1		GASKET .. Oil seal - Load control
107	8047553	1		SEAL .. Oil - Load control plunger
109	8240843	1		PISTON .. Overriding
110	8113806	1		COLLAR .. Spring
111	8129778	2		NUT .. Hex lock 5/16-24
112	8113843	1		SPRING .. Valve - Outer
113	8126520	1		SPRING .. Valve - Inner
114	8188850	1		RETAINER .. Spring
115	8113827	1		RING .. Snap - Retainer
116	8132087	1		WASHER .. Indicator
*116A	8426759	1		LIMITER ASSEMBLY .. Fuel
117	8293770	1		INDICATOR .. Load control
118		1		SCREW .. Round head 10-32 x 1/4 - Cross recess - Formerly 155173
120	8307375	1		VALVE ASSEMBLY .. Check
121	8284044	1		SCREEN ASSEMBLY .. Fuel limiter - Includes plug
122	8283109	1		SENSOR ASSEMBLY .. Bellows - Absolute pressure
126	8444618	3		O-RING .. .371 I.D. x .504 O.D. x .073 inch thick - Replaces 8223698
127	8479338	1		O-RING .. .475 I.D. x .624 O.D. x .081 inch thick - Replaces 8284046
128	8137729	1		PIN .. Headed
129	8284047	1		PIN .. Lever - Fulcrum - .186 inch diameter
130	8456970	1		PIN .. Lever - Straight - 7/16 inch long x 1/8 inch diameter - Formerly 8192136
131		1		PIN .. Cotter - 1/16 x 3/8 inch long - Formerly 119981
132	8284048	2		WASHER .. Special - .188 I.D. x .360 O.D. x .062 inch thick
134		8		WASHER .. Lock - No. 10 - Formerly 120217
135	8315022	1		PIN .. Flat head
136		1		BOLT .. Hex head 1/4-28 x 3/4 - Formerly 181566
*137		1		SCREW .. Cap - 10-32 x 5/8 hex socket head - Formerly 431487
138		1		RING .. Snap - Formerly 9413463
140	8308192	1		WASHER .. Special - 9/64 I.D. x 3/8 O.D. x 1/32 inch thick
141	8284050	1		SPRING .. Oil seal
142	8284051	1		WASHER .. Spring
143	8343715	1		SPRING .. Loading
*143A	8343719	1		SEAT .. Loading spring
*144	8343716	1		STRUT .. Connecting - .062 diameter x 1-7/8 inches long
145	8284054	33		GASKET .. .250 I.D. x .360 O.D. x .031 inch thick
*148		1		RING .. Snap - Formerly 9413448
149	8284060	1		WASHER .. O-ring
153	8284063	32		PLATE .. Orifice
154	8343718	1		PISTON .. Fuel limiter - Formerly 8343178
155	8284065	1		SLEEVE .. Piston
156	8284066	1		CASE .. Orifice
157	8284067	1		SEAT .. Spring
158	8343717	1		PLUNGER .. Valve
159	8456971	1		PLUG .. Lever support - Formerly 8284070
*161	8329980	2		WASHER .. Anchor screw - .203 I.D. x .375 O.D. x .031 inch thick
162	8358315	1		BODY ASSEMBLY .. Fuel limiter
162A	8113808	1		HEAD .. Cylinder
162B	8017584	2		SCREW .. Taper
162C		1		PLUG .. Pipe - 1/16 MPT hex socket head - Formerly 9409966
162D	8284062	1		SEAT .. Poppet valve

P.L. No. D165

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY... Electro-Hydraulic PG barometric rebalance
	8426759	1		LIMITER ASSEMBLY .. Fuel
*163	8343720	1		CAP .. Limiting servo
165	8284076	1		BODY .. Banjo fitting - Formerly 8384076
166	8284077	1		SCREW .. Fuel limiter body - Formerly 8280477
167	8283110	1		NUT .. Lock - Bellows
172		1		RING .. Snap - Formerly 9415901
173	8426761	1		RING .. Snap - Formerly 9415903
174	8284350	1		BLOCK .. Lever support
175		1		SCREW .. Cap - 6-32 x 1/2 hex socket head - Formerly 9413469
176		2		WASHER .. Lock - No. 6 - Formerly 131181
*177		2		SCREW .. Cap - 10-32 x 1/2 hex socket head - Formerly 187828
*178		1		WASHER .. Lock - No. 8 - Formerly 106496
*179		1		SCREW .. 8-32 x 3/8 hex socket head - Formerly 9421614
180	8305137	1		SPRING .. Piston
*181	8160165	1		NUT .. Tube
*182	8159471	1		SLEEVE .. Tube
186		2		WASHER .. Plain - .125 I.D. x .312 O.D. x .032 inch thick - Formerly 221416
189		1		SCREW .. Cap - 10-32 x 1-1/4 hex socket head - Formerly 443802
191	8284037	2		NUT .. Hex 8-32 - Shutdown
*192	8426760	1		WASHER .. Plain - .178 I.D. x .340 O.D. x .046 inch thick
*193	8426762	1		STOP .. Rocker arm
*195	8426763	1		BRACKET .. Cam guide
196	8293771	1		SCREW .. Lock - 6-32 x 1/2 hex socket head
*197	8326429	2		WASHER .. 7/16 I.D. x 3/4 O.D. x 1/16 - Steel - 8409098 governor only
*198	8343714	1		ARM ASSEMBLY .. Rocker
199		1		BEARING .. Needle - .1247 inch shaft diameter - Formerly 9413498
200	8343721	1	-	LEVER ASSEMBLY .. Pick-up
201	8284090	1	-	SCREW .. Set
202	8284091	1	-	INSERT .. Helicoil
203	8433212	-	1	LEVER ASSEMBLY .. Pick-up - Includes stop block
*204		-	1	PIN .. Cotter 1/16 x 3/8 inch long - Formerly 119981
212	8292129	1		FILTER ASSEMBLY .. Oil
213	8297955	1		FILTER .. Oil - Includes plug
214	9093493	1		O-RING .. Filter - Replaces 8330683
215	8286156	1		CASE .. Filter cartridge
216	3292039	1		PLUG .. Filter drain - Formerly 3282039
217	5156913	1		GASKET .. Copper
217A	9098533	1		O-RING .. .674 I.D. x .777 O.D. x .103 inch - Formerly 8156971
218	8444617	2		SEAL .. O-ring - Replaces 8292130
220	8113800	3		WASHER .. Lock 1/4
221		3		SCREW .. Cap - 1/4-28 x 2-3/4 hex socket head - Formerly 138219
231	8201590	1		PISTON .. Power - Compensating
232	8113656	1		RING .. Seal - Spring guard
233	8113657	1		ROD .. Tail - Power piston
234	8113658	1		NUT .. Lift - Tail rod - 3/8-24
236	8201591	1		BEARING .. Needle - Terminal shaft
237		1		BEARING... Needle - Terminal shaft - Formerly 456382
238	8061742	1		SEAL .. Oil - 1.379 O.D. x 13/16 I.D. x 13/32 inch diameter
239	8211818	1		SEAL .. Oil .. 1.379 O.D. x 11/16 I.D. x 13/32 inch diameter
240	8444617	1		O-RING .. Needle valve - .296 I.D. x .438 O.D. - Formerly 8223697
241	8223700	1		O-RING .. Spring guard - 2.093 I.D. x 2.500 O.D.
242		1		PIN .. Taper - No. 2 x 3/4 inch long - Formerly 111840
243		1		PLUG .. Pipe - 1/8 MPT hex socket head - Formely 444687
244		4		WASHER .. Lock - Spring guard - 1/4 - Internal teeth - Formerly 120423
245	8057114	2		WASHER .. Lock - Power lever - 5/16
246		1		WASHER .. Lock 3/8 - Internal teeth - Formerly 115549
247		2		SCREW .. Drive - Scale - No. 2 x 3/16 round head - Formerly 145368
248		1		SCREW .. Rack lever - No. 10-24 x 5/8 fil. head slotted - Formerly 132046

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
249		2		SCREW .. Cap - 5/16-18 x 7/8 hex socket head - Formerly 217908
250	8113800	8		WASHER .. Lock 1/4
252		2		RING .. Snap - Rod pin - Formerly 9413435
253	8152079	2		WASHER .. Lock - Pointer - No. 8 - Formerly 106496
254	8113663	1		NUT .. Hex lock 3/8-24 - Tail rod
255		8		SCREW .. Cap - 1/4-28 x 3/4 hex socket head - Formerly 138211
256	8134427	4		BOLT .. Hex socket head 1/4-28 x 1/2 - Spring guard
257		1		WASHER .. Lock - No. 10 - Formerly 106497
258		2		SCREW .. Cap - 8-32 x 3/8 hex socket head - Formerly 9421614
259	8201593	1		NUT .. Hex lock 7/16-20 - Piston rod
260		2		RING .. Retaining - .338 I.D. - Formerly 9411494
261	8113664	1		SPRING .. Guard seal
262	8149111	1		SPRING .. Servo
263	8152339	1		GASKET .. Guard to power cylinder
264	8201595	1		GASKET .. Cover to power cylinder
266	8201594	1		SCALE .. Terminal shaft
267	8149113	1		VALVE .. Needle
268	8326406	1		GUARD ASSEMBLY .. Spring - Formerly 8149115
*268A		1		INSERT .. Helicoil - Formerly 452652
269	8201598	1		COVER .. Power cylinder
270	8201600	2		LINK .. Power piston
271	8201601	1		PIN .. Power lever
272	8201604	1		PIN .. Piston rod
273	8201596	1		LEVER .. Rack dial
274	8346334	1		POINTER .. Rack scale
*274A	8132447	2		PIN .. Drive lock - Pointer
275	8201599	1		LEVER .. Power - Serrated
277	8460057	1		SHAFT .. Terminal - Formerly 8201602
278	8346333	1		CYLINDER ASSEMBLY .. Power
*279		1		NUT .. Hex lock 1/4-28 - Formerly 120613
*279A	8326407	1		SCREW .. Stop
*280	8284078	1		SERVO ASSEMBLY .. Speeder spring
281	8217606	1		PISTON ASSEMBLY .. Power
282	8113963	1		CYLINDER .. Power
283	8284088	1		FULCRUM ASSEMBLY .. Power piston
284	8145336	1		LEVER ASSEMBLY .. Power piston - Consists of two mated pieces
285	8113971	1		SCREW .. Special - Adjusting fulcrum
286	8113764	1		PIN .. Adjustable fulcrum
287	8452881	1		LINK .. Pivot pin - Replaces 8113972
288	8113973	1		LINK .. Floating lever
289		3		PIN .. Cotter 1/16 x 3/8 inch long - Formerly 119981
*290	8134415	1		PIN .. Straight 3/16 x 3/4 inch long
291	8113832	2		PIN .. Headed 3/16 x 25/32 inch long
292	8113974	1		PIN .. Straight 1/8 x 1 inch long
293	8284089	1		STUD .. Speed setting
294	8113976	4		SPACER .. Link
295	8113662	3		WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 inch thick
296		1		NUT .. Hex 10-32 - Formerly 120614
297		1		SCREW .. Round head 10-32 x 3/8 - Formerly 148028
298	8113977	1		NUT .. Hex lock 10-32
299		1		SCREW .. SCREW .. Set - Piston stop - 10-32 x 1-1/4 hex socket - Form. 222384
300	8113772	1		SPRING .. Link - Adjusting
301	8149306	1		SCALE .. Speed indicator
302	8160339	1		CUP ASSEMBLY .. "D" solenoid
303	9333521	1		PLATE ASSEMBLY .. Triangular - Repl. 8383168 & 8459855 - Must Be Applied With Ref. No. 80 - 9333520 Lever
*305	8113773	1		PLUNGER ASSEMBLY .. Shutdown
306	8113775	1		PLUNGER .. Shutdown
307	8113779	1		TUBING .. Plunger
308	8444618	1		SEAL .. O-ring - Replaces 8223698
309	3292030	1		SPRING .. Relief valve

P.L. No. D165

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
	8113773	1		PLUNGER ASSEMBLY .. Shutdown
310	8113778	1		PIN .. Sping 5/32 x 3/4 inch long
311		1		BALL .. 1/4 inch diameter - Formerly 104918
312	8113774	1		PIN .. Plunger
313	8113776	1		SEAT .. Ball valve
315	8362298	1	-	LEVER ASSEMBLY .. Adjusting floating
*315A	8433775	-	1	LEVER ASSEMBLY .. Adjusting floating
*316	8306003	1	1	SPRING .. Adjusting link
*317	8113767	1	1	KNOB .. Adjusting screw
*318	8113768	1	1	PIN .. Adjusting screw
319	8113770	1	-	ECCENTRIC
*319A	8433218	-	1	ECCENTRIC
320	8433219	1	1	BLOCK .. Adjusting - Formerly 8113771
321		1	-	SCREW .. Cap - 1/4-28 x 3/4 hex socket head - Formerly 138211
*321A		-	1	SCREW .. Cap - 8-32 x 7/8 inch long - Formerly 442039
322		2	4	PIN .. Cotter 1/16 x 3/8 inch long - Formerly 119981
323	8214389	-	1	PIN .. Power lever - .880 inch long x .2493 inch diameter
324	8433225	-	1	PIN .. .812 inch long x .1865 inch diameter
*325	8433217	-	1	PIN .. Movable fulcrum
*326	8433215	-	2	LINK .. Pilot valve
327	8433216	-	1	STRAP .. Pilot valve
328	8446359	-	1	LINK .. Pilot valve
329	3304054	-	2	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 inch thick
330	8214389	1	-	PIN .. Power lever - .880 inch long x .2493 inch diameter
331	8113833	1	-	PIN .. Cam arm
332	3304054	2	2	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 inch thick
333	8284085	1	-	LINK .. Pilot valve
334	8413349	2	2	STRAP .. Pilot valve
335	8113780	1	1	BUSHING .. Oil failure valve
*336	8201608	1	-	VALVE ASSEMBLY .. Lube oil
337	8113790	1	-	NUT .. Valve
338		1	-	BALL .. Valve - Formerly 104916
339	8201615	1	-	SEAT .. Ball
†340	8201616	1	-	BODY .. Valve
*341	8259474	1	1	WASHER .. .210 I.D. x .340 O.D. x .25 thick
342	8284081	2	2	WASHER .. .203 I.D. x .380 O.D. x .05 thick
*343		1	1	PLUG .. Pipe - 1/8 MPT hex socket - Formerly 444687
344		1	1	ELBOW .. Street - 1/4 MPT - 90° - Formerly 444040
345	8040382	1	1	TEE .. 1/4 MPT x 1/4 tube x 1/4 tube
*346		1	1	WASHER .. Lock - No. 10 - Formerly 120217
*347		1	1	SCREW .. Set - 1/4-28 x 1/4 hex socket - Formerly 139009
*348	8147713	2	2	SCREW .. Cap - 1/4-28 x 2-3/8 socket head - Formerly 8137713
349	8330235	1	1	SPRING .. Speeder spring servo
350	8113811	1	1	PISTON .. Oil failure
351	8231570	1	1	PLUNGER .. Pilot valve - Overriding
352	8113819	1	1	WASHER .. Diaphragm
353	8113788	1	-	DIAPHRAGM .. Vacuum
354	8113790	2	-	NUT .. Diaphragm
355	8113791	1	-	HOLDER .. Vacuum diaphragm
356	8061137	1	-	WASHER .. Copper - Vacuum diaphragm
357		1	-	CONNECTOR .. Half - Lube vacuum - 3/8 O.D. x 1/4 MPT - Formerly 118750
358	8113794	1	-	SPRING .. Vacuum diaphragm
359	8201612	1	-	CAP .. Diaphragm
360	8201613	1	-	SCREW .. Diaphragm stop
*361	8429435	-	1	CAP .. Diaphragm - Lube oil
†*362	8436325	-	1	GASKET
*363		-	1	PLUG .. Pipe - 1/4 MPT socket head - Formerly 444691
†*364	8429434	-	1	PLUG .. Low vacuum hole

† Gasket 8436325 is not required when Plug 8429434 is applied in place of valve body 8201616 Ref. No. 340.

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
365	8158716	1	1	DIAPHRAGM .. Lube oil
*366	9087347	2	2	SEAL .. O-ring - .239 I.D. - Replaces 8223696
367	9093702	3	2	SEAL .. O-ring - 1.734 I.D. - Replaces 8223701
368		4	4	CONNECTOR .. Half - Load control - 1/2 O.D. x 3/8 MPT - Formerly 118752
369	5939163	1	1	NUT .. Hex 10-32 - Diaphragm
370	8113800	19	19	WASHER .. Lock 1/4
*371		1	1	BOLT .. Hex head 1/4-28 x 1-1/8 - Overriding cylinder - Formerly 181316
372	8134416	2	2	SCREW .. Servo - 1/4-28 x 1-3/8 hex head
373		1	1	SCREW .. Cap - Bushing retainer - 1/4-28 x 3/8 hex socket head - Formerly 217940
374	8147713	1	1	SCREW .. Cap - Solenoid bracket - 1/4-28 x 2-3/8 socket head
375	8163437	1	1	WASHER .. Plain 1/4
376		4	4	SCREW .. Diaphragm cap - 1/4-28 x 2 hex socket head - Formerly 138216
377		3	3	SCREW .. Side plate - 1/4-28 x 1-1/2 hex socket head - Formerly 138214
377A		7	7	SCREW .. Cap - Side plate - 1/4-28 x 3/4 hex socket head - Formerly 138211
378	8113832	1	1	PIN .. Headed - 3/16 x 25/32 inch long
379	8113836	1	1	SPRING .. Pilot valve plunger - Overriding
380	8113846	1	1	SPRING .. Shutdown plunger
381	8113837	1	1	SPRING .. Diaphragm
382	8113844	1	1	SPRING .. Link - Floating lever
383	8113838	1	1	SPRING .. Oil failure piston
384	8113850	1	1	GASKET .. Oil failure bushing
385	8201610	1	1	GASKET .. Side plate
386	8193508	1	1	PLUNGER .. Oil failure
387	8286155	1	1	PLATE .. Side - Drilled for oil filter
*388	8422389	1	1	WASHER .. .130 I.D. x .438 O.D. x .032 inch thick
*389	8284080	1	1	POWER PACK .. Electrical equipment
390	8113683	5	5	PLUNGER ASSEMBLY .. Solenoid
391	8163953	5	5	GUIDE ASSEMBLY .. Solenoid
392	8113743	5	5	PIN .. Locating
393	8133719	10	10	BUSHING .. Plunger guide
394	8284092	1	1	CONNECTOR ASSEMBLY .. Male - 12 point - Inc. wire and lugs
*395	8329355	A.R.		WIRE .. Teflon - Black
*396	8329356	A.R.		WIRE .. Teflon - Red
*397	8329357	A.R.		WIRE .. Teflon - Blue
*398	8329358	A.R.		WIRE .. Teflon - White } 25 foot length
*399	8329359	A.R.		WIRE .. Teflon - Yellow
*400	8329360	A.R.		WIRE .. Teflon - Green
*401	8329361	A.R.		WIRE .. Teflon - Pink
*402	8097414	1	1	HOUSING .. Connector - Flanged - Formerly 8079414
*403	8200229	4	4	LUG .. Terminal - No. 6 stud - Non-insulated
*404	8481010	A.R.		TUBING .. Plastic - Clear - Formerly 8326434
*405	8203174	1	1	PLUG .. Connector
406	8284093	1	-	BRACKET ASSEMBLY .. Switch
*406A	8192136	1	-	PIN .. Bracket
407	8113681	5	5	CASE .. Solenoid
408	8113684	5	5	ROD .. Solenoid plunger
409	8113761	5	5	WASHER .. Solenoid plunger
410	8113738	5	5	PLUG .. Plunger stop
411	8113739	5	5	NUT .. Hex lock 3/4-32
412	8113989	5	5	SPRING .. Load
413	8113740	1	1	COVER .. Wiring
414	8113742	1	1	PLATE .. Connector clamp
415	8113672	2	2	PIN .. Drive lock
416	8113744	10	10	WASHER .. Soldering shield - 1/2 O.D.
417		2	2	WASHER .. Lock - No. 10 - Spring lock - Formerly 120217
418		5	5	SCREW .. Set - 10-32 x 1/4 hex socket - Cup point - Formerly 140880
419	8113745	5	5	RING .. Snap - .187 O.D.
420	8113746	3	3	NUT .. Speed
421		3	3	SCREW .. Tapping - 8-18 x 1-1/4 round head - Formerly 145154
422	8152184	10	10	TUBING .. Varnished - .337 I.D.
423		4	4	SCREW .. Machine - 10-32 x 3/8 flat head - Cross recess - Formerly 155998

P.L. No. D165

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
	8284080	1	1	POWER PACK .. Electrical equipment
†*424		2	2	SCREW .. Switch bracket - No. 10-32 x 2-1/4 hex socket head - Formerly 455581
425	8113755	1	1	SWITCH .. Lube oil signal
426	8113756	5	5	COIL .. Solenoid - 700 ohms
427	8129082	5	5	PAPER .. Insulating
428	8113760	1	1	GASKET .. Connector plate
429	8191876	1	1	BRACKET .. Solenoid
430	8202849	1	1	BRACKET .. Switch mounting
431	8202850	1	1	PLATE .. Switch bracket clamp
*432	8116931	A.R.		CEMENT .. Gasket - 1 pint
433	8377913	2	2	SCREW .. Switch bracket - 10-32 x 2-5/16 fil. head - Cross recess
*434	8113662	3	3	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 inch thick
435	8217607	1	1	PLUG ASSEMBLY .. Spring check
436		1	1	PIN .. Stop - Formerly 456350
440	8367213	1	1	COVER ASSEMBLY .. Governor - Replaces 8201585
441	8131835	2	2	BUSHING .. Cover doweling
443	8017559	1	1	CUP .. Oil filler
445	8140550	1	1	GASKET .. Cover
446	8365140	2	2	BOLT .. Drilled hex head 5/16-24 x 7-1/4 - Cover
*446A	8068098	6	6	WASHER .. Plain 5/16
457	8429419	-	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Square body - Replaced by 8482432 - See Ref. No. 472
458	8113811	-	1	PISTON .. Oil failure
459		-	4	NUT .. No. 10-32 hex - Formerly 120614
460		-	4	WASHER .. Lock - No. 10 - Formerly 120217
461	8327416	-	4	WASHER .. .255 I.D. x .400 O.D. x .031 inch thick
462	8393771	-	2	ELBOW .. 1/4 tube x 1/8 MPT
463		-	4	SCREW .. Slotted fillister head 10-32 - Formerly 117608
464		-	4	SCREW .. Slotted fillister head 1/4-28 x 2-1/4 - Formerly 225585
465	8429426	-	1	SPRING .. Accumulator
466	8429427	-	2	GASKET .. Accumulator cover
*467	8429428	-	1	GASKET .. Accumulator body to case
468	8429429	-	1	COVER .. Accumulator } No Longer Available - Contact EMD Parts
469	8429430	-	1	COVER .. Accumulator } Center For Replacement Information.
470	8429431	-	1	TUBE .. Accumulator }
471	8429432	-	1	BODY .. Accumulator
472	8482432	-	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Round body
473	8113811	-	1	PISTON .. Oil failure
474	8327416	-	4	WASHER .. .255 I.D. x .400 O.D. x .031 inch thick
475		-	4	SCREW .. Slotted fillister head 1/4-28 x 1 - Formerly 190741
476	8393771	-	2	ELBOW .. 1/4 tube x 1/8 MPT
477	8429426	-	1	SPRING .. Accumulator
478	8482434	-	1	GASKET .. Accumulator body to case
479	8488280	-	1	BODY .. Accumulator
480	8488281	-	1	TUBE .. Accumulator
481	8113925	1	-	NUT .. Power piston - For adjustment only
*482	9332176	1	1	LABEL .. Piping - Set of 10 decals - Formerly 8113865
483		1	1	PIN .. Cotter - Tail rod - 1/16 x 3/8 inch long - Formerly 119981
484	8113832	1	1	PIN .. Headed - Tail rod - 3/16 x 25/32 inch long
485		4	4	SCREW .. Cap - Power cyl. to power case - 3/8-16 x 1 hex socket head - Form. 138242
*486	9327637	2	2	SCREW .. Name plate insert - No. 5-40 x 1/4 - Replaces 432267
487		4	4	SCREW .. Column name plate - 8-32 x 1/4 pan head - Cross recess - Formerly 159572
488	8152079	4	4	WASHER .. Lock 3/8
489		1	1	SCREW .. Socket head set 8-32 x 5/8 - Formerly 443871
490	8201587	4	4	BOLT .. Hex head 5/16-24 x 4-3/4 - Column to case
491	8152077	2	2	PLATE .. Name - Bleed hole

† *Not required for current design governors.*

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
	----	A	B	GOVERNOR ASSEMBLY .. Electro-Hydraulic PG barometric rebalance
*492	8356333	1	1	INSERT .. Name plate - Blank - Includes setting - .625 x 2.188 inches long
493	8356332	1	1	PLATE .. Name - Column
494	8113869	1	1	GASKET .. Column to case - Transfer hole
495	8113870	1	1	GASKET .. Case to column
496	8483071	1	1	GASKET .. Power cylinder case - Replaces 8152078
497		6	6	SCREW .. Drive - Bleed hole name plate - No. 10 - Formerly 220342
*498	8132974	2	2	CAP .. Plastic - 7/16-20 } Shipping Purposes Only
*499	8132975	1	1	CAP .. Plastic - 5/8-18 } Shipping Purposes Only
*500	8132976	4	4	CAP .. Plastic - 3/4-16 } Shipping Purposes Only
*501	8419697	1	1	DECAL .. Caution - Not furnished separately - Included in Ref. No. 482
*502	8482447	-	1	CAM .. Fuel limit
*503	8240528	1	1	RECEPTACLE .. Female - 12 point

P.L. No. D165

GOVERNOR ASSEMBLY

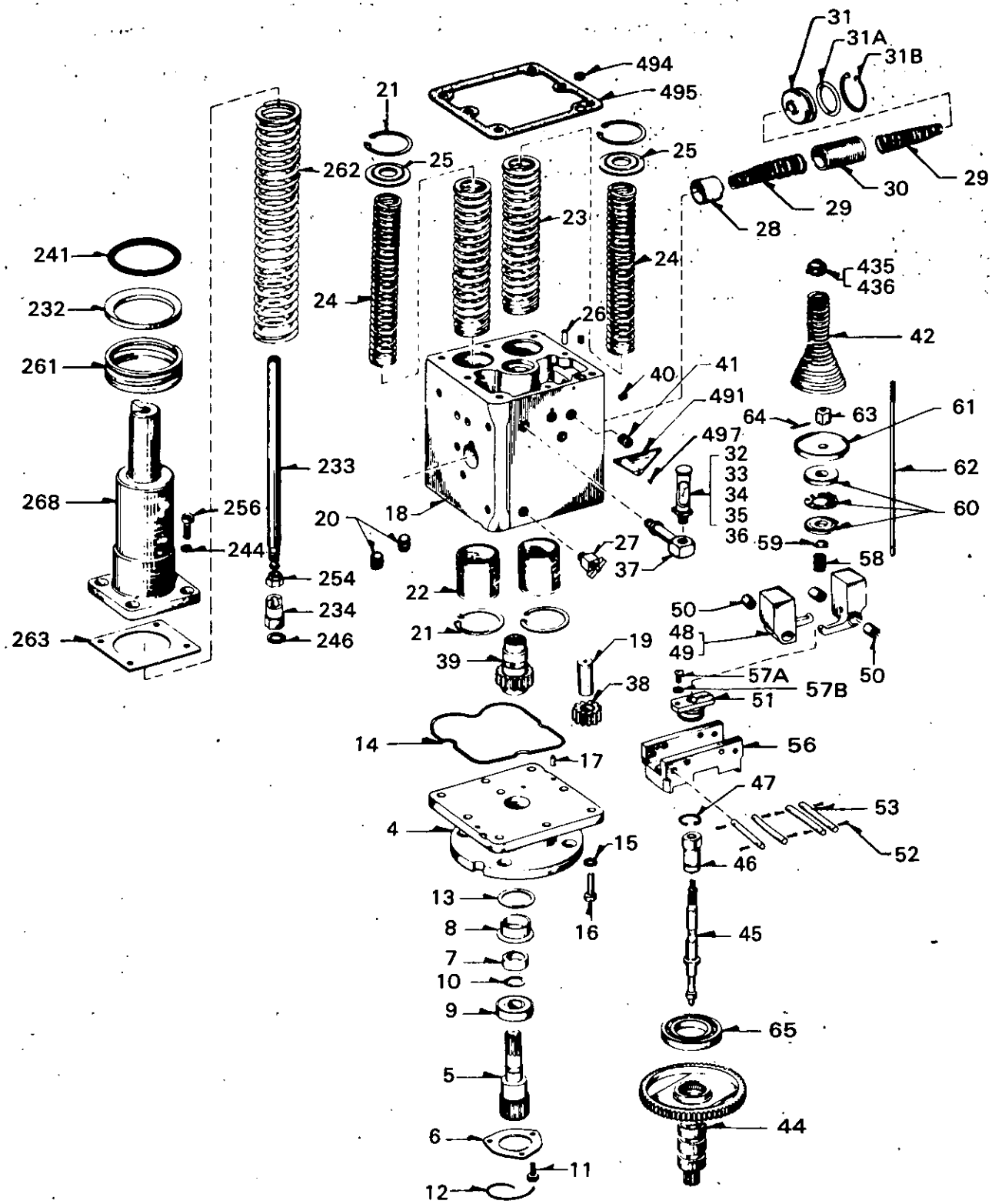


PLATE B165-1

P.L. No. D165

GOVERNOR ASSEMBLY

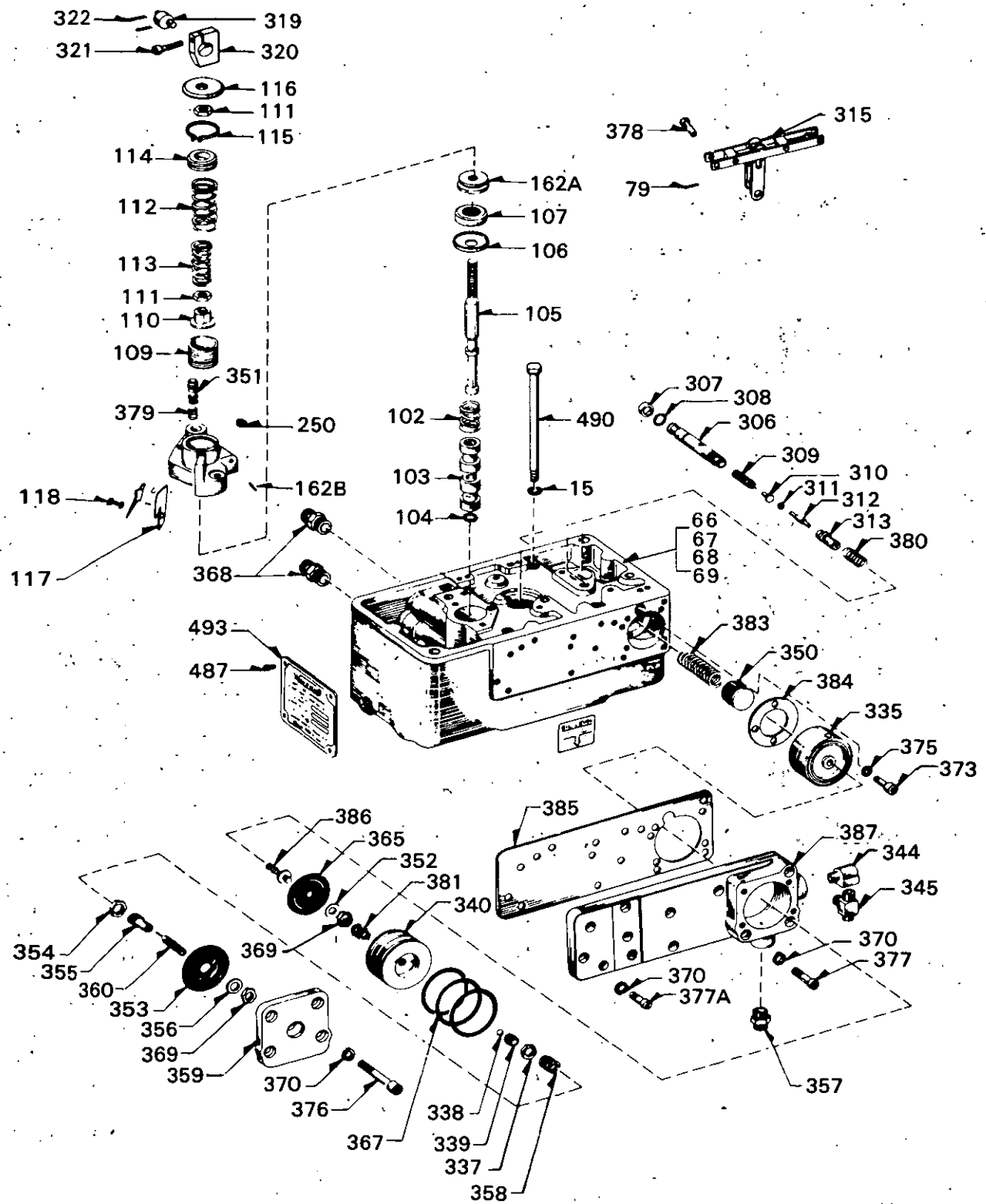


PLATE B165-2

P.L. No. D165

GOVERNOR ASSEMBLY

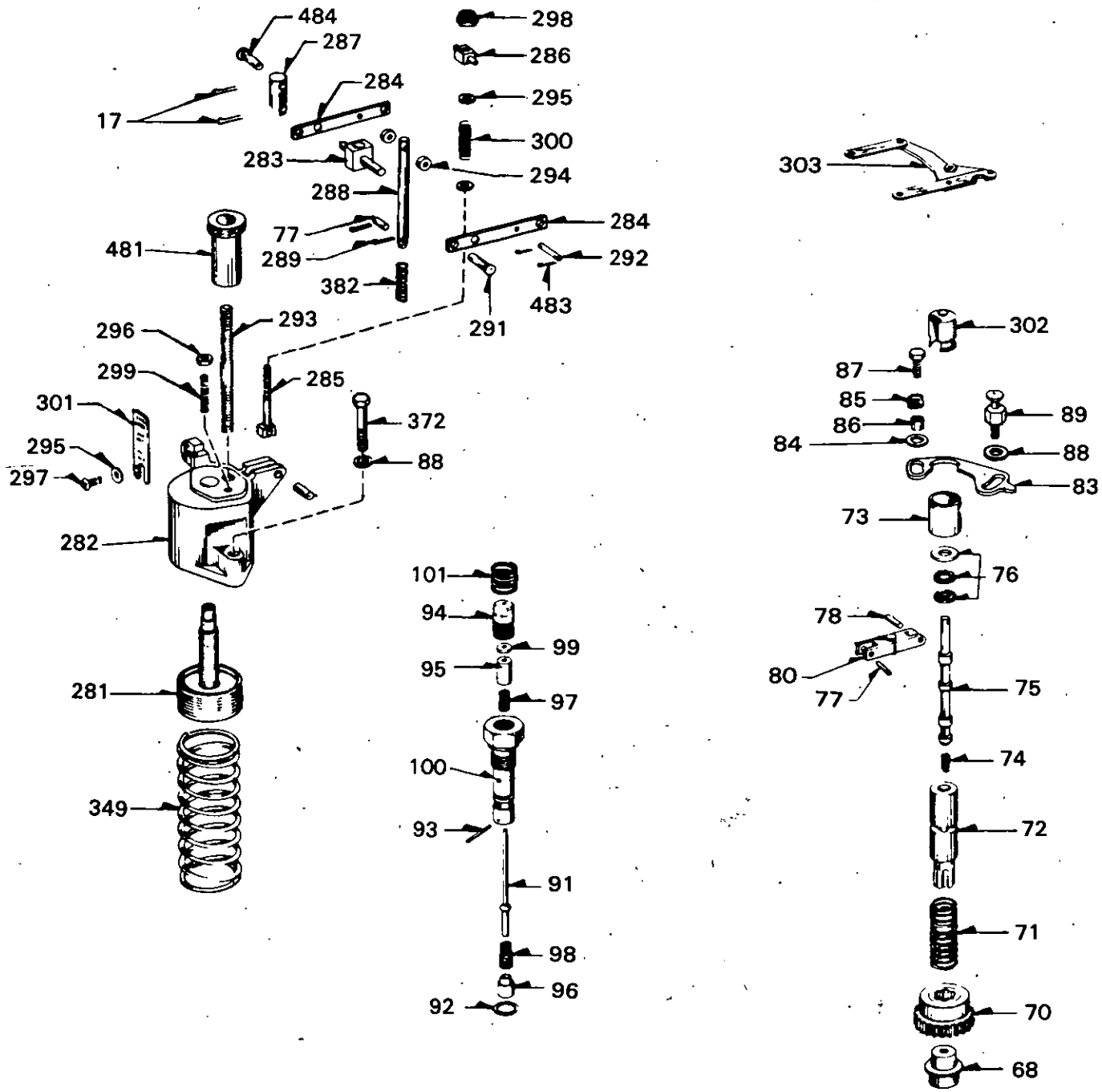


PLATE B165-3

P.L. No. D165

GOVERNOR ASSEMBLY

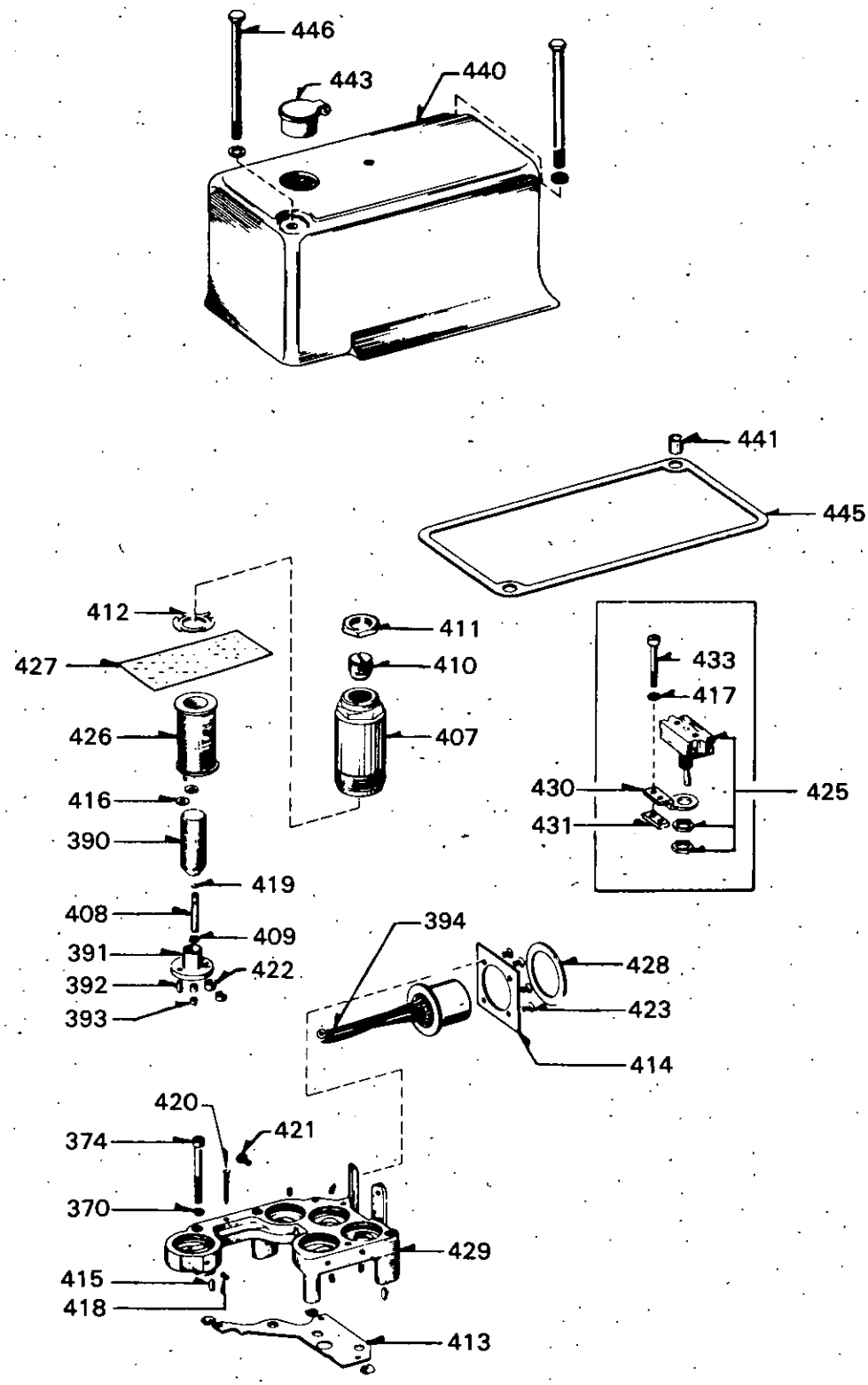
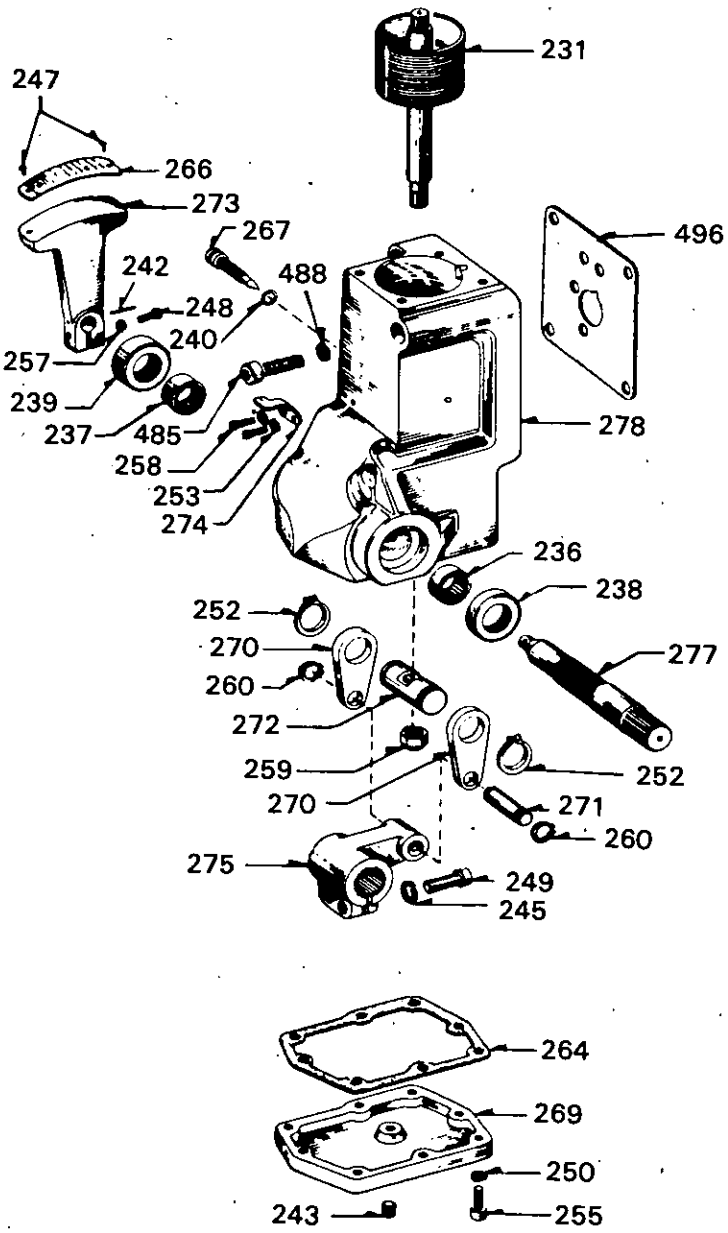
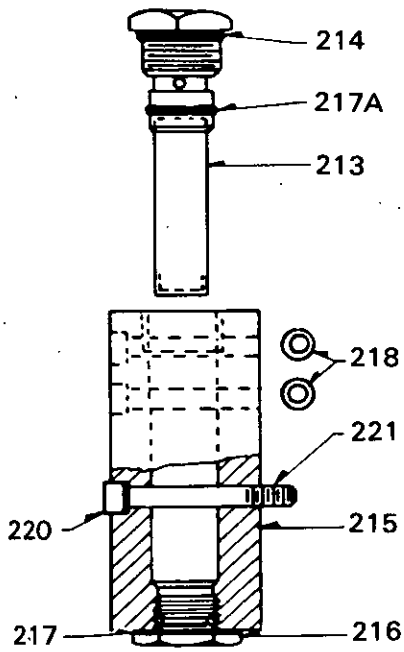


PLATE B165-4

P.L. No. D165

GOVERNOR ASSEMBLY





Ref. No. 212

PLATE B165-5

P.L. No. D165

GOVERNOR ASSEMBLY

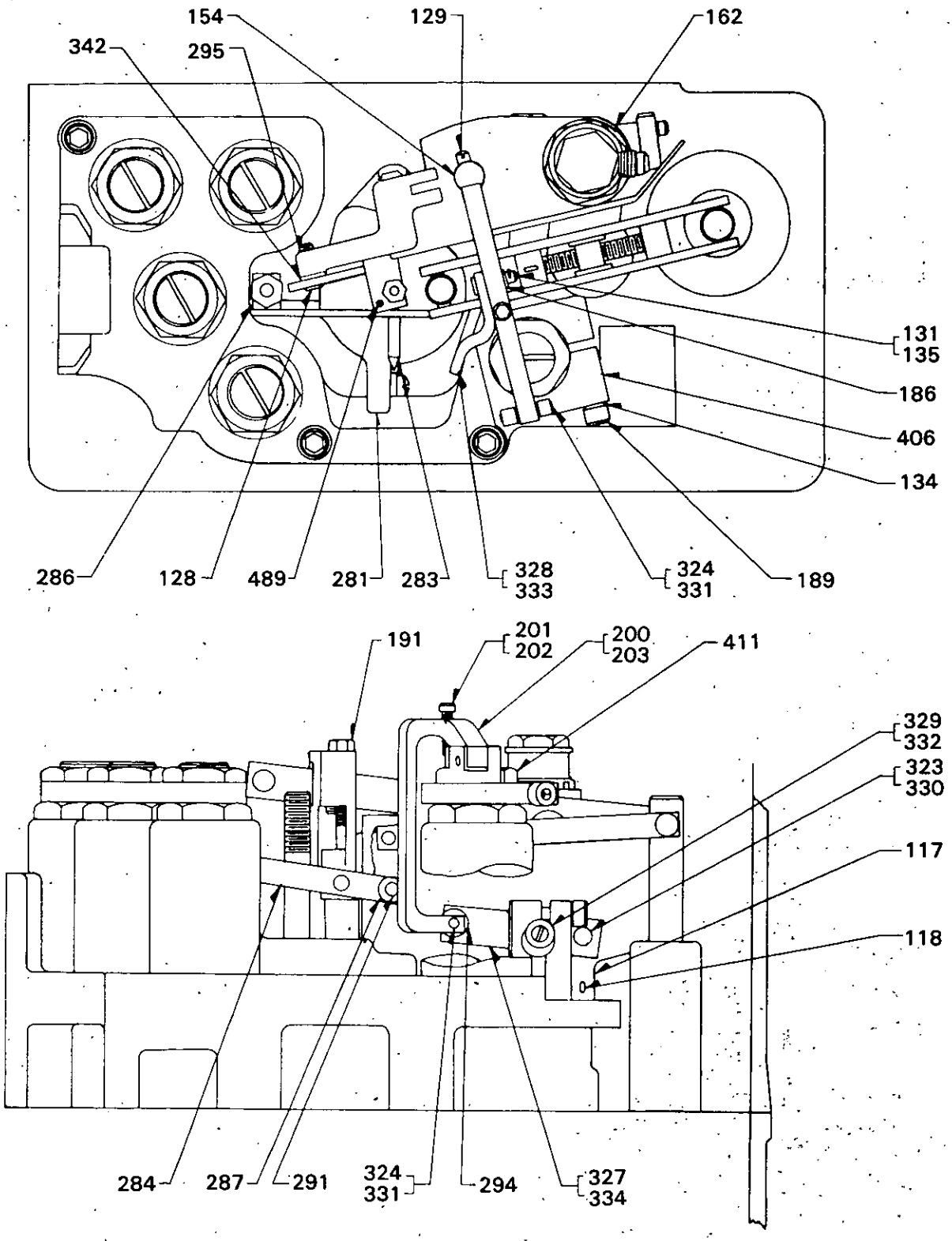
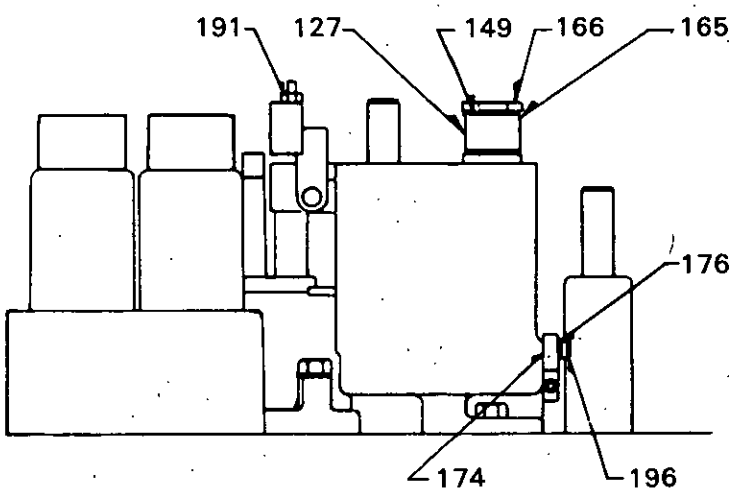
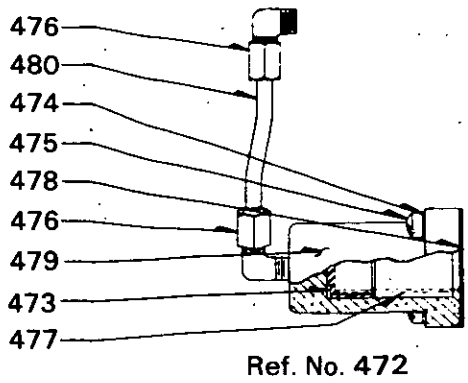


PLATE B165-6

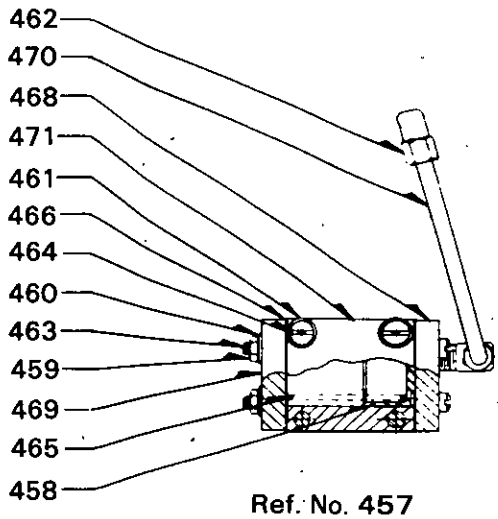
P.L. No. D165

GOVERNOR ASSEMBLY

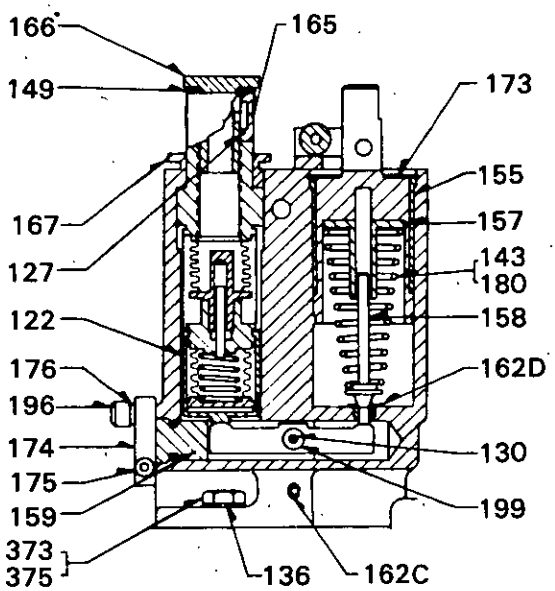




Ref. No. 472



Ref. No. 457



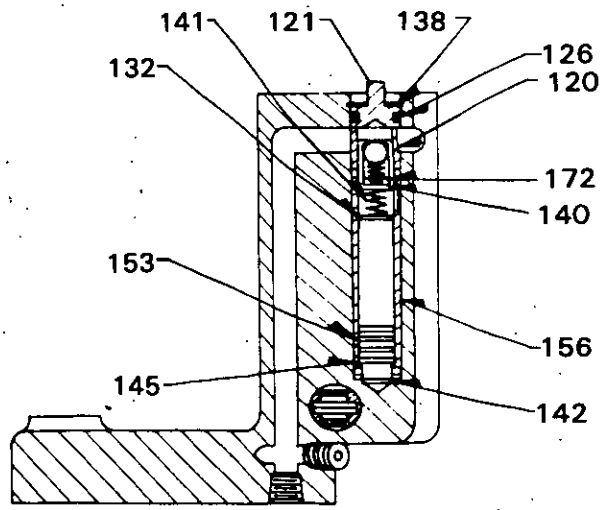


PLATE B165-7

P.L. No. F166

GOVERNOR ASSEMBLY

Electro-Hydraulic PG Governors
16-567D1; 8,12,16-645E,E3B;E3C,F3B; 12,16,20-645E3; 12,16-645F3;
16-645E3A; and 20-645E3B Engines

GOVERNOR REFERENCE CHART

Ref. No.	Part Number Number	Replaced By	Unit Exch. Part No.	Page No.	Locomotive Application
NOTE: When ordering Governors, specify Locomotive Model and Engine Serial Number					
12 Pole Governors					
1	8356392	8424078	8367794	5	GP39,GP40,GP40-2,SD39,SDL39,SD40, SD40-2,SDP40,SDP40F,GT22C,GT22CW, GT26,GT26CW,GT26CW-2
2	8378131	8424078	8367794	5	
3	8424078	----	8367794	5	
4	8367420	8450911	8369043	5	GP39,GP40,GP40-2,SD39,SDL39,SD40,SD40-2, SDP40,SDP40F,FP40,SD45,SD45-2,SD45T-2, SDP45,F45,FP45,DDM45
5	8384254	8424080	8369043	5	
6	8424080	----	8369043	5	
7	8364689	8450911	8450991	5	SD45,SD45-2,SD45T-2,SDP45,F45, FP45,DDM45
8	8378132	8450911	8450991	5	
9	8378133	8450911	8450991	5	
10	8450911	----	8450991	5	
11	8376477	8424079	8377252	5	SD45,FP45
12	8378134	8424079	8377252	5	
13	8424079	----	8377252	5	
14	8437963	----	8438249	5	DDA40X
15	8438887	----	----	5	
16	8436281	9507274	8424300	5	GP38,GP38AC,GP38-2,G18,GA18,G22C, G26,G26C
17	8424298	9507274	8424300	5	
18	9507274	----	8424300	5	
19	8393219	8424218	8393374	5	SD38,SD38M,SD38AC,SD38-2,SDP38,G18, GA18,G22,G22C,G26,G26C
20	8424218	----	8393374	5	
21	8384223	8424222	8384225	5	G22
22	8424222	----	----	5	
23	8384064	8424221	----	5	G22W,GL22
24	8424221	----	----	5	
25	8384063	8424220	8384224	5	SW1500,SW1504,MP15
26	8424220	----	8384224	5	
27	8445798	----	----	5	SW1500
28	8436283	8424299	8424301	5	SW1000,SW1001
29	8424299	----	8424301	5	
30	8377253	8424325	8382485	5	SW1000,SW1001 with D32 Generator
31	8378137	8424325	8382485	5	
32	8424325	----	8382485	5	
33	8378135	9507275	8296480	5	GP18,GP28
34	9091532	----	----	5	G8
35	9091533	9091532	----	5	AA
36	9091534	----	----	5	G12
37	8378136	9091535	8296481	5	SD18,SD28
38	9091535	----	8122811	5	GA8,SD9,SD18,SD28
39	9508105	----	----	5	FP7,FP7A
40	9517563	----	----	5	SDP38

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GOVERNOR ASSEMBLY

GOVERNOR REFERENCE CHART

Ref. No.	Part Number Number	Replaced By	Unit Exch. Part No.	Page No.	Locomotive Application
16 Pole Governors					
41	8453930	8466101	8466183	24	GP38
42	8453928	8466101	8466183	24	SD38,SD38M,G18,GA18,G22
43	8466101	----	8466183	24	GP38,SD38,SD38AC,SD38-2,G18,G22,G18B
†44	8482396	----	8482413	24	GP38,GP38AC,GP38-2,SD38,SD38AC,SD38-2, SDL38-2,G12,G18,G18U,G18W,GA18,GL18M, G22C,G22CU,G22CW,G22U,G22W,GL22, GL22C,GL22CU-2,GL22CU-2/AC,G26C, G26CW,G26CU,G26CU-2,G26,G26CU/AC, GL26C,JT26CW/AC,M7,G8B
†45	9084020	8482396	8482413	24	GP15-1,GP38-2,G22,SW1001
46	8453389	----	8454268	24	SW1500,SW1504
†47	8469802	----	8469803	24	SW1500,SW1504,MP15,MP15AC
†48	9097320	----	9318853	24	SW1500,SW1504,MP15DC,MP15,MP15AC
49	8470396	----	----	24	SW1500
50	8453388	----	8454267	24	SW100,SW1001,SW1002
†51	8482394	----	8482411	24	SW1000,SW1001
52	8460536	----	8460542	24	SW1000 with D32 Generator
†53	8482395	----	8482412	24	SW1000,SW1001 with D32 Generator
54	9311979	----	----	24	G18,G22C
†55	9521597	----	9521598	24	GP15-1,GP15-2
†56	9530435	----	----	24	GP38-2
†57	9549938	----	9549939	24	
†58	9539282	----	----	24	SW1003-C
†59	9540062	----	9540065	24	MP15,MP15AC,MP15DC
†60	9540063	----	9540064	24	GP15-1,GP15-2,GL22CU/AC,GL26CU-2, GL26CU-2/AC
†61	9540602	----	----	24	F40PH-2M
†62	9545909	----	----	24	SW1001
†63	9545910	----	----	24	G26CW-2
64	8453921	8483536	8466179	35	GP39,GP40,GP40-2,SD39,SDL39,SD40,SD40-2,
65	8466096	8483536	8466179	35	SDP40,SDP40F,GT22C,GT22LC,GT26,GT26CW
66	9084021	8483536	8466179	35	GP39-2,GP40-2,SD40-2,JT22CW
67	8483536	----	8466179	35	GP39,GP39AC,GP39-2,GP40,GP40-2,SD39, SDL39,SD40,SD40-2,SD40T-2,SDP40, SDP40F,GT22C,GT22CW,GT22LC,GT22CU GT22HW,GT26,GT26CW,GT26CW-2 GT26C,GT26CU-2,J22CW,JT22MC, JT22CW,JT22CW-2
68	8453922	9334836	8474938	35	SD45,SD45T-2,FP45
69	8474937	9334836	8474938	35	
70	8466099	9334836	8466180	35	SD45-2,SD45T-2
71	9334836	----	8474938	35	SD45,SD45-2,SD45T-2,FP45

†Restricts Governor Application to Roots Blown Engines having Fire Ring Pistons

GOVERNOR ASSEMBLY

GOVERNOR REFERENCE CHART

Ref. No.	Part Number Number	Replaced By	Unit Exch. Part No.	Page No.	Locomotive Application
72	8453923	9334835	8466181	35	GP39,GP40,GP40-2,SD39,SDL39,SD40,SD40-2 SD45,SDP40,SDP40F,FP45
73	8466097	9334835	8466181	35	GP39,GP39-2,GP40,GP40-2,SD39,SDL39,SD40 SD40-2,SD40T-2,SD45,SDP40,SDP40F,F45, GT26M2C
74	9334835	----	8466181		
75	8453924	9322619	8466182	35	SD45,SD45-2,SD45T-2,SDP45,F45,FP45, DDM45,SD45-2R
76	8466098	9322619	8466182		
77	9322619	----	8466182		
78	9090955	9334838	9531316	35	SD40-2,SD40T-2
79	9329963	9334838	9531316	35	SD40-2,SD40T-2
80	9334838	----	9531316	35	GP40-2,SD40-2,GP15T,GT26CW,GT26CW-2, GT26CU-2,JT22CW
81	8494889	9334837	9552694	35	F40C
82	9334837	----	9552694	35	F40C
83	9098143	9335714	9321630	35	F40PH
84	9335714	9335713	9321630	35	F40PH
85	9332869	9335713	9332870	35	F40PH
86	9335713	----	9332870	35	F40PH,F40PH-2
87	9328422	----	9336695	35	F40PH
88	8469954	8489288	----	35	GT22CU
89	8489288	----	----		
90	8453648	9337153	----	35	GT26CU
91	9337153	----	----	35	GT26CU;GT26CU-2
92	9512178	----	9524451	35	SD40-2
93	9512180	----	9526375	35	F40PH,F40PH-2
94	9516898	----	----	35	SD40-2
95	9531867	----	9531868	35	GP40X,GP50,SD40X,SD50,SD50S,SDL50
96	9532462	----	9532860	35	GP39X,GP49,GP50,SD50,SD50S
97	9532792	----	9535631	35	GP39-2,GP15T,GT22CU,GT22CW,GT22CW-2, GT22HW,GT22LC,GT22LC-2,JT22CW-2, JT22LC-2,JT22MC
98	9536860	----	9537472	35	GP40-2
99	9537086	----	----	35	JT26C-SS
100	9544681	----	9544682	35	GP49
101	9545952	----	9545953	35	GP50,GP50T,SD50,SD50T,SD50S,SDL50
102	9546048	----	9546049	35	GP40-2,GP49,SD40-2
103	9546810	----	9546811	35	GP15T
104	9549691	----	9549692	35	GP40-2,SD40-2
105	9549693	----	9549694	35	GP39-2,GP49

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GOVERNOR ASSEMBLY

GOVERNOR REFERENCE CHART

Ref. No.	Part Number Number	Replaced By	Unit Exch. Part No.	Page No.	Locomotive Application
106	9549965	----	9549966	35	F40PH-2
107	9552511	----	9553547	35	GT22LC-2
108	9553548	----	9553549	35	JT22MC
109	9553572	----	9553573	35	GP50,SD50A
110	9556512	----	9556513	35	GP49
111	9559088	----	----	35	GT36HCW-2

GOVERNOR PLUG ASSEMBLY

The following governor plug assemblies are required when changing the locomotive circuitry to accommodate a 16 pole governor on locomotives built with a 12 pole locomotive governor plug assembly. Refer to M.I. 9591 for details and specific model applications.

Part Number	Qty. Req.	Description
8456454	1	PLUG ASSEMBLY .. Governor
or		
8456455	1	PLUG ASSEMBLY .. Governor
or		
8462256	1	PLUG ASSEMBLY .. Governor

GOVERNOR ADAPTER KIT

If modification to locomotive circuitry is not desired, and it is required that a governor having a 16 pole connector be used with a 12 pole locomotive governor plug assembly, use adapter kit 8469433.

Adapter kit 8469432 is available for application of a governor with a 12 pole connector to a locomotive having a 16 pole governor plug assembly. This adapter can be used on all switches, and on those road locomotives with 16 pole plug assemblies which were delivered prior to 1972. Refer to Pointers Article dated May 15, 1972 for details. Components of the above adapter kits are as follows:

Part Number	Qty. Req.		Description
8469433	1	-	KIT .. Governor adapter
8469432	-	1	KIT .. Governor adapter
8469431	1	-	ADAPTER .. Governor
8469430	-	1	ADAPTER .. Governor
8469436	1	1	CLAMP .. Hanger
181370	1	1	BOLT .. 3/8-24 x 1-1/4 hex. head

GOVERNOR ASSEMBLY

12 Pole Electro-Hydraulic PG Governor
16-567D1; 8,12,16-645E; and 12, 16, 20-645E3 Engines
Plates C166-1 and B166-2 thru 7

GOVERNOR REFERENCE CHART

Ref. No. Governor Part No.	Eng. Application - Description	RPM	Rack	Col
8356392, 8378131, 8424078	645E3 - Rebalanced Low idle setting	900	.83	A
8367420, 8384254, 8424080	645E3 - Rebalanced Low idle setting	900	.87	A
8364689, 8378132, 8378133, 8450911	645E3 - Low idle setting	900	.87	A
8376477, 8378134, 8424079	645E3 - Rebalanced Low idle setting	900	.90	A
8437963	645E3A - Low idle setting	950	.74	A
8438887	645E3A - Low idle setting	950	.77	A
8436281, 8424298, 9507274, 8393219, 8424218	645E - Low idle setting	900	.83	B
8384223, 8424222	645E - Export	900	.83	B
8384064, 8424221	645E - Export	835	.92	B
8384063, 8424220, 8445798, 8436283, 8424299	645E	900	.83	B
8377253, 8378137, 8424325	645E - Low idle setting	900	.83	B
8378135	567D1	835	.96	B
9091532	645E - Export	835	.88	B
9091533	645E - Export	835	.92	B
9091534	645E - Export	835	.88	B
8378136	567DI	835	.96	B
9091535	567DI, 645E	835	.92	B
9508105	645E	800	.87	B
9517563	645E	900	.85	B

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
* 1	- - - -	A	B	GOVERNOR ASM. .. Engine - See above chart and Page 1
2	8149658	1	1	BASE .. Governor
3	8149696	1	1	SHAFT .. Drive - Serrated
4	8062007	1	1	RETAINER .. Bearing
5	8149695	1	1	SEAL .. Pin
6	8149697	1	1	RETAINER .. Oil seal
7		1	1	BEARING .. Ball - Drive shaft - Formerly 954298
8		1	1	RING .. Snap - Formerly 8149677
9	8113929	3	3	BOLT .. Bearing retainer to base - 1/4-28 x 5/8 hex. head drilled
10	8288663	A.R.		WIRE .. Lock - .026 in. dia. - Available 500 ft. length
11	8149679	1	1	GASKET .. Retainer to base
12	8152068	1	1	SEAL .. Oil - Case to base
13		8	8	WASHER .. Lock - 5/16 - Formerly 120379
14		8	8	BOLT .. Case to base - 5/16-18 x 1 hex. head - Formerly 179818
15		2	2	PIN .. Dowel - Case to base - No. 5 x 3/4 in. long - Formerly 103613
16	8429420	1	1	CASE ASM. .. Power - Governors 8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325, 8437963, 8439887, 8450911, 9091532, 9091533, 9508105, and 9517563
16A	8149426	1	1	CASE ASM. .. All governors except those listed in Ref. No. 16.
17	8149470	1	1	STUD .. Idler
18	8201045	2	2	PLUG .. Drive - Ball check
19		4	4	RING .. Snap - Accumulator - Formerly 9413465
20	8149469	2	2	PISTON .. Accumulator

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
				CASE ASM. .. Power
21	8149471	2	2	SPRING .. Accumulator - Outer
22	8057784	2	2	SPRING .. Accumulator .. Inner
23	8149474	2	2	SEAT .. Spring - Accumulator
24	8113672	2	2	PIN .. Grooved - Dowel case to column
25		13	13	PLUG .. Pipe - 1/8 M.P.T. hex. socket - Formerly 444687
26		1	1	PLUG .. Pipe - 1/16 M.P.T. hex. socket - Formerly 9409954
27	8118445	1	1	COCK .. Drain - 1/8 M.P.T.
28	8152071	1	1	SEAT .. Buffer Spring
29	8152072	2	2	SPRING .. Buffer
30	8152073	1	1	PISTON .. Buffer
31	8152074	1	1	PLUG .. Buffer Spring - 1-5/16 in. diameter
32	8478711	1	1	"O" RING .. Seal - Replaces 8223699
33		1	1	RING .. Snap-Buffer plug - Formerly 9413448
*34	8113998	1	1	GAUGE ASSEMBLY .. Oil level - Replaces 8442288 - See Ref. No. 40
*35	8444618	2	2	"O" RING .. Seal - Replaces 8319674
*36	8174780	3	3	GASKET .. .312 I.D. x .500 O.D. x .062 in. thick - Formerly applied
*37	8350082	5	5	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
*38	8131381	1	1	GLASS .. Sight - No longer available
*39	8319675	1	1	CAP .. Gauge - No longer available
40	8442288	1	1	GAUGE ASSEMBLY .. Oil level - Repl. by 8113998 - Formerly applied
41	8444618	2	2	"O" RING .. Seal - Replaces 8319674
42	8174780	3	3	GASKET .. .312 I.D. x .500 O.D. x .062 in. thick - Formerly applied
43	8350082	5	5	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
44	8451831	1	1	GLASS .. Sight - No longer available
45	8319675	1	1	CAP .. Gauge - No longer available
*45A	9328197	1	1	GAUGE ASSEMBLY .. Oil level - Currently applied
46	8113999	1	1	ELBOW .. Oil gauge
47	8152070	1	1	GEAR .. Idler
48	8152069	1	1	GEAR .. Drive
49	8383167	1	1	SPRING .. Speeder
*50	8269694	1	-	SLEEVE ASSEMBLY .. Rotating - Replaced by 9327175 - See Page 36
*50A	8238927	-	1	SLEEVE ASSEMBLY .. Rotating - Replaced by 9327175 - See Page 36
51	8160610	1	1	GEAR ASSEMBLY .. Ball head - Includes sleeve
52	8149343	1	1	PLUNGER .. Pilot valve
53	8149341	1	1	BUSHING .. Compensating
54		1	1	RING .. Snap-Bushing - Pilot valve body - Formerly 274416
55	8353912	1	1	BALL HEAD ASSEMBLY
56	8149340	2	2	ARM ASSEMBLY .. Ball
57		4	4	BEARING .. Needle - 1/4 in. shaft - Formerly 148401
58	8228384	1	1	COUPLING ASSEMBLY - Spring drive
59		8	8	PIN .. Cotter - 1/16 x 1/2 in. long - Formerly 103361
60	8149338	4	4	PIN .. Ball arm
61	8353911	1	1	RETAINER .. Ball head
62	8353910	1	1	BALL HEAD .. Governor
63		1	1	SCREW .. 6-32 x 5/16 round head - Formerly 121839
64		1	1	WASHER .. Lock - No. 6 - Formerly 131181
65	8152338	1	1	SPRING .. Adjusting - Pilot valve
66	8068098	1	1	WASHER .. Plain 5/16
67	8149345	1	1	BEARING .. Thrust
68	8149346	1	1	SEAT .. Speeder spring
63A	8291771	1	-	SPRING .. Rotating sleeve
68B	8291770	1	-	NUT .. Plunger - Pilot valve
69	8350084	1	-	ROD ASSEMBLY .. Shutdown
*68A	8350083	-	1	ROD ASSEMBLY .. Shutdown
70	8017599	-	1	NUT .. Plunger - Pilot valve
71		1	1	PIN .. Cotter - 1/16 x 5/8 in. long - Formerly 107761
72	8160641	1	1	BEARING .. Ball
*73	8284037	2	2	NUT .. Shutdown rod - 8-32 hex. - Formerly 120622

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
74	8269701	1	-	COLUMN ASM. .. Governor - 8356932, 8364689, 8367420, 8376477, 8378131, 8378132, 8378133, 8378134 and 8384254 Governors only - Replaces 8269699
74	8429433	1	-	COLUMN ASM. .. Governor - 8424078, 8424079, 8424080, 8437963, 8438887, and 8450911 Governors only
74	8201617	-	1	COLUMN ASM. .. Governor - 8337897, 8337898, 8377253, 8378135, 8378136, 8378137, 8384063, 8384064, 8384223, 8393219. 8436281, 8436283, and 8445798 Governors only - Replaces 8201607
74	8447875	-	1	COLUMN ASM. .. Governor - 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, and 8424325 Governors only
74		-	1	COLUMN ASM. .. Governor - 9091532, 9091533, 9091534, 9091535, 9507274, 9508105, and 9517563 Governors only
75	8327394	2	2	INSERT .. Thread
76	8113823	1	1	STUD .. Bearing - Pilot valve drive gear
77		6	6	PLUG .. Pipe - 1/8 M.P.T. hex. socket - Formerly 444687
78	8113848	1	1	GEAR .. Drive - Pilot valve bushing
79	8113839	1	1	SPRING .. Pilot valve bushing
80	8275539	1	1	BUSHING .. Speed adjusting pilot valve - 8356392, 8364689, 8367420, 8367477, 8378131, 8378132, 8378133, 8378134, 8384254, 8393219, 8424078, 8424079, 8424080, 8424218, 8437963, 8438887, and 8450911 Governors
80	8167317	-	1	BUSHING .. Speed adjusting pilot valve - 8378135, 8378136, 8378137, 8424298, 8424299, 8424325, 8436281, 843283, 8445798, 9091532, 9091533, 9508105, and 9517563 Governors
80	8377907	-	1	BUSHING .. Speed adjusting pilot valve - 8377253, 8384063, 8384064, 8384033, 8424220, 8424221, and 8424222 Governors
81	8113815	1	1	BUSHING .. Regulating
82	8113835	2	1	SPRING .. Pilot valve plunger
83	8284087	1	-	PLUNGER .. Pilot valve
83	8113825	-	1	PLUNGER .. Pilot valve - 8377253, 8378135, 8378136, 8378137, 8424298, 8424299, 8424325, 8436281, 8436283, 8445798, 9091532, 9091533, 9508105, and 9517563 Governors
83	8390349	-	1	PLUNGER .. Pilot valve - 8384063, 8384064, 8384223, 8393219, 8424218, 8424220, 8424221, and 8424222 Governors
84	8113830	1	1	BEARING .. Thrust - Rotating bushing
85	8113833	3	1	PIN .. Straight - 1/8 x 3/4 in. long - Drilled head
86	8113831	1	1	PIN .. Pilot valve - 1/8 x 9/16 in. long
87		5	3	PIN .. Cotter - 1/16 x 3/8 in. long - Formerly 119981
88	9333520	1	1	LEVER .. Lower floating - Replaces 8383169 - Must be applied with Ref. No. 301 - 9333521 Plate
*89	8433220	1	-	PIN .. Straight - 1.56 in. long x .1242 in. diameter
*90	8433222	1	-	PIN .. Straight - .656 in. long x .1865 in. diameter
*91	8433771	1	1	WASHER .. Lube oil diaphragm
*92	8433224	1	-	BRACKET .. Clamp
93	8113816	1	1	RETAINER .. Regulating bushing
94	6101223	1	1	WASHER .. Plain - Bushing retainer - 5/8
95	8113845	1	1	SPRING .. Bushing retainer
96	8113817	1	1	COLLAR .. Spring retainer
97		1	1	BOLT .. Retainer - 1/4-28 x 3/4 hex. head - Formerly 181566
98	8113991	3	3	WASHER .. Plain - Bushing retainer - 1/4
99	8113822	1	1	SCREW .. Retainer - Special - 1/4-28
100	8113840	1	1	SPRING .. Solenoid counter balance
*101	8235782	1	1	VALVE ASSEMBLY .. By-Pass
102	8235784	1	1	PLUNGER ASSEMBLY .. By-Pass valve
103	8444617	1	1	SEAL .. O Ring - Valve body - Replaces 8223697
104	456342	1	1	PIN .. Straight - 1/16 x 3/8 in. long - Formerly 3291742
105	8235785	1	1	NUT .. Seal retainer
106	8235786	1	1	RETAINER .. Sleeve
107	8235787	1	1	SEAT .. By-Pass valve spring

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
				VALVE ASSEMBLY .. By-Pass
108	8235788	1	1	SPRING .. Seal retainer
109	8235789	1	1	SPRING .. By-Pass valve
110	9318632	1	1	WASHER .. Seal - Replaces 8235790
111	8235783	1	1	BODY .. By-Pass valve
112	8131473	1	1	SPRING .. Pilot valve bushing
113	8146495	1	1	BUSHING .. Pilot valve - Load control - All governors except those listed in Reference Nos. 115 and 117
114		1	1	RING .. Retaining - Load control pilot valve bushing - Formerly 9413362
*115	8227009	-	1	BUSHING .. Pilot valve - Load control - 8337898, 8378136, 8378137, 8424299, 8424325, 8436283, and 8445798 Governors only
*116		-	1	RING .. Retaining - Load control pilot valve bushing - Formerly 9413362
*117	8383170	-	1	BUSHING .. Pilot valve - Load control - 8377253, 8384063, 8384064, 8384223, 8424220, 8424221, and 8424222 Governors only
*118		-	1	RING .. Retaining - Load control pilot valve bushing - Formerly 9413362
119	8113805	1	1	PLUNGER .. Pilot valve - Load control - All governors except those listed in Reference No. 119A
*119A	8188851	-	1	PLUNGER .. Pilot valve - Load control - 8337898, 8378136, 8378137, 8424299, 8424325, 8436283, 8445798 Governors only
120	8113849	1	1	GASKET .. Oil seal - Load control
121	8047553	1	1	SEAL .. Oil - Load control plunger
122	8113807	1	1	PISTON .. Overriding - All governors except those listed in Reference No. 122A
122A	8240843	-	1	PISTON .. Overriding - 8384063, 8384064, 8384223, 8393219, 8424218, 8424220, 8424221, and 8424222 Governors only
123	8113806	1	1	COLLAR .. Spring
124	8129778	2	2	NUT .. Lock - 5/16-24 hex
125	8113843	1	1	SPRING .. Value - Outer
126	8126520	1	1	SPRING .. Valve - Inner
127	8188850	1	1	RETAINER .. Spring
128	8113827	1	1	RING .. Snap - Retainer
129	8132087	1	1	WASHER .. Indicator
130	8113810	-	1	CYLINDER .. Overriding
131	8293770	-	1	INDICATOR .. Load control - Formerly 8113847
132	8113808	-	1	HEAD .. Cylinder
133	8017584	-	2	SCREW .. Taper
134	159997	-	1	SCREW .. No. 10-32 x 1/4 round head - Cross recess
135	8113662	-	1	WASHER .. Lock - 3/16
†*136	9514114	1	-	LIMITER ASSEMBLY .. Fuel - Current model governors 8424078, 8424079, 8424080, 8437963, and 8438887 only
†*136	8367363	1	-	LIMITER ASSEMBLY .. Fuel - Except governors listed above

† Components of 8367363 and 9514114 limiters are identical except as noted below :

137	8349466	1	-	BODY ASSEMBLY .. Fuel limiter
138	8113808	1	-	HEAD .. Cylinder
139	8017584	2	-	SCREW .. Taper
140	9409966	1	-	PLUG .. Pipe - 1/16 M.P.T. - Hex socket head
141	8284062	1	-	SEAT .. Poppet valve
142	8293770	1	-	INDICATOR .. Load control - Limiter 8367363 only
143	159997	1	-	SCREW .. No. 10-32 x 1/4 round head - Cross recess
144	8113662	1	-	WASHER .. Lock - 3/16 - Limiter 8367363 only
145	8307375	1	-	VALVE ASSEMBLY .. Check
146	8284044	1	-	SCREEN ASSEMBLY .. Fuel
147	8283109	1	-	SENSOR ASSEMBLY .. Bellows - Absolute pressure

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
		1	-	LIMITER ASSEMBLY .. Fuel
148	9413499	1	-	BEARING .. Sleeve - Fuel limiter 8367363 only
149	8354117	2	-	WASHER .. Spacer - Spring anchor
150	8444618	3	-	SEAL .. O-ring - .371 I.D. x .504 O.D. x .073 in. thick - Formerly 8223698
151	8479338	1	-	SEAL .. O-ring - .475 I.D. x .624 O.D. x .081 in. thick - Replaces 8284046
152	8351415	1	-	PIN .. Connecting beam
153	8284047	1	-	PIN .. Lever - Fulcrum - .186 in. diameter
154	8456970	1	-	PIN .. Lever - Straight - 7/16 in. long x 1/8 in. dia. - Formerly 8192136
155	119981	1	-	PIN .. Cotter - 1/16 x 3/8 in. long
156	8284048	2	-	WASHER .. Special - .188 I.D. x .360 O.D. x .062 in. thick
157	120217	6	-	WASHER .. Lock - No. 10
158	181313	1	-	BOLT .. Hex head 1/4-28 x 3/4
*159	431487	1	-	SCREW .. Cap - 10-32 x 5/8 hex. socket head
160	9413463	1	-	RING .. Snap
161	8308192	1	-	WASHER .. Special - 9/64 I.D. x 3/8 O.D. x 1/32 in. thick
162	8284050	1	-	SPRING .. Oil seal
163	8284051	1	-	WASHER .. Spring
164	8305137	1	-	SPRING .. Piston
165	8429101	2	-	SPRING .. Tension - Formerly 8284053
166	8284054	33	-	GASKET .. .250 I.D. x .360 O.D. x .031 in. thick
*167	8284057	1	-	PIN .. .249 in. dia. x 1-1/8 in. long
168	8354116	1	-	PIN .. Spring anchor
169	8284060	1	-	WASHER .. "O" ring
170	8284063	32	-	PLATE .. Orifice
171	8284064	1	-	PISTON .. Fuel limiter
172	8284065	1	-	SLEEVE .. Piston
173	8284066	1	-	CASE .. Orifice
174	8284067	1	-	SEAT .. Spring
175	8284068	1	-	PLUNGER .. Valve
†ϕ176	8284070	1	-	GUIDE .. Lever - No longer furnished - See Note
ϕ176A	8458520	1	-	GUIDE .. Lever
177	8284072	1	-	ARM .. Cam follower
178	8367364	1	-	CAM .. 1.464 in. long x 1/8 in. thick
179	8284074	2	-	SCREW .. Spring anchor
*180	8329980	2	-	WASHER .. Anchor screw - .203 I.D. x .375 O.D. x .031 in. thick
181	8284076	1	-	BODY .. Banjo fitting
182	8284077	1	-	SCREW .. Fuel limiter body
183	8283110	1	-	NUT .. Lock - Bellows
184	9415901	1	-	RING .. Snap
185	8426761	1	-	RING .. Snap - Formerly 9415903
186	8284350	1	-	BLOCK .. Lever support
187	9413469	1	-	SCREW .. Cap - 6-32 x 1/2 hex. socket head
188	131181	1	-	WASHER .. Lock - No. 6
189	8293771	1	-	SCREW .. Lock - 6-32 x 1/2 hex. socket head
†ϕ*190	8285454	1	-	ARM ASSEMBLY .. Rocker - No longer furnished - See Note
†ϕ191	8284069	1	-	LEVER .. Rocker arm - No longer furnished - See Note
191A	9413498	1	-	BEARING .. Needle - .1247 in. shaft diameter
ϕ*192	8458519	1	-	ARM ASSEMBLY .. Rocker
ϕ192A	8458521	1	-	LEVER .. Rocker arm
192B	9413498	1	-	BEARING .. Needle - .1247 in. shaft diameter

† For governors requiring replacement of earlier design 8285454 Rocker Arm Assembly, 8284070 Guide, or 8284069 Lever, use 8458518 Kit which contains current design 8458519 Rocker Arm Assembly, 8458520 Support Guide and 8456970 Pin.

*193	8436004	1	-	BRACKET ASSEMBLY .. Cam guide
194	8284055	1	-	PIN .. Roller - .375 in. long x .122 in. diameter
*195	8433773	1	-	SCREW .. Stop
*196	8284037	1	-	NUT .. Lock - 8-32 hex.
197	954330	1	-	BEARING .. Ball
198	8433221	1	-	BRACKET .. Cam guide - Formerly 8284071
199	8284061	1	-	SHIM .. Shaft - Switch

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
200	8284059	1	-	UNION ASSEMBLY .. Bulkhead - Formerly 8353920
201	8284095	1	-	NUT .. Lock - 1/2-20 hex.
202	8284096	2	-	NUT .. Tube - 1/2-20 hex.
203	8284097	2	-	SLEEVE .. Tube - 1/4
204	181568	-	2	BOLT .. Hex head 1/4-28 x 1
205	103361	1	-	PIN .. Cotter - 1/16 x 1/2 in. long
*206	3304054	2	-	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 in. thick
*207	8068533	1	-	WASHER .. Orifice stack - 1/8
208	221416	2	-	WASHER .. Plain - .125 I.D. x .312 O.D. x .032 in. thick
209	446152	1	-	WASHER .. .203 I.D. x .500 O.D. x .062 in. thick
210	443802	1	-	SCREW .. Cap - 10-32 x 1-1/4 socket head
211	8284037	3	2	NUT .. Shutdown - 8-32 hex.
212	8352782	1	-	TUBE ASSEMBLY .. Air box pressure
213	8338392	1	-	BLOCK .. Shutdown - Replaces 8284033
213A	443871	1	-	SCREW .. Set - 8-32 x 5/8 socket head
213B	8292115	1	-	SCREW .. Adjusting - 10-32 x 1/2 in. long
*213C	140855	1	-	SCREW .. Set - 8-32 x 1/16 in. long
ϕ214	8330234	1	-	LEVER ASSEMBLY .. Pick-up
215	8412096	1	-	SCREW .. Lever - Replaces 8309692
216	8284091	1	-	INSERT .. Helicoil
*217	8412097	1	-	NUT .. Lock - No. 6-32 hex.
ϕ218	8433212	1	-	LEVER ASSEMBLY .. Pick-up - Includes stop block
*219	119981	1	-	PIN .. Cotter - 1/16 x 3/8 in. long
220	8292129	1	-	FILTER ASSEMBLY .. Oil
221	8297955	1	-	FILTER .. Oil - Includes plug
222	9093493	1	-	SEAL .. O-ring - Filter - Replaces 8330683
223	8286156	1	-	CASE .. Filter cartridge
224	3292039	1	-	PLUG .. Filter drain
225	5156913	1	-	GASKET .. Copper
225A	9098533	1	-	SEAL .. O-ring - .674 I.D. x .777 O.D. x .103 in. - Repl. 8156971
226	8444617	2	-	SEAL .. O-ring - Replaces 8292130
227	8113800	3	-	WASHER .. Lock - 1/4
228	138219	3	-	SCREW .. Cap - 1/4-28 x 2-3/4 hex. socket head
229	8201590	1	1	PISTON .. Power - Compensating
230	8113656	1	1	RING .. Seal - Spring guard
231	8113657	1	1	ROD .. Tail - Power piston
232	8113658	1	1	NUT .. Lift - Tail rod - 3/8-24
233	8201591	1	1	BEARING .. Needle - Terminal shaft
234	456382	1	1	BEARING .. Needle - Terminal shaft
235	8061742	1	1	SEAL .. Oil - 1.379 O.D. x 13/16 I.D. x 13/32 in. diameter
236	8211818	1	1	SEAL .. Oil - 1.379 O.D. x 11/16 I.D. x 13/32 in. diameter
237	8444617	1	1	SEAL .. O-ring - Needle valve - Replaces 8223697
238	8223700	1	1	SEAL .. O-ring - Spring guard - 2.093 I.D. x 2.500 O.D.
239	111840	1	1	PIN .. Taper - No. 2 x 3/4 in. long
240	444687	1	1	PLUG .. Pipe - 1/8 M.P.T. hex. socket head
241	120423	4	4	WASHER .. Lock - Spring guard - 1/4 - Internal teeth
242	8057114	2	2	WASHER .. Lock - Power lever - 5/16
243	115549	1	1	WASHER .. Lock - 3/8 - Internal teeth
244	145368	2	2	SCREW .. Drive - Scale - No. 2 x 3/16 round head
245	132046	1	1	SCREW .. Rack lever - 10-24 x 5/8 fil. head
246	217908	2	2	SCREW .. Cap - 5/16-18 x 7/8 hex. socket head
247	8113800	8	8	WASHER .. Lock - 1/4
248	9413435	2	2	RING .. Snap - Rod pin
249	106496	2	2	WASHER .. Lock - Pointer - No. 8
250	8113663	1	1	NUT .. Lock - Tail rod - 3/8-24 hex.
251	138211	8	8	SCREW .. Cap - 1/4-28 x 3/4 hex. socket head
252	8134427	4	4	BOLT .. Spring guard - 1/4-28 x 1/2 hex. socket head

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
253	106497	1	1	WASHER .. Lock - No. 10
254	9421614	2	2	SCREW .. Cap - 8-32 x 3/8 hex. socket head
255	8201593	1	1	NUT .. Lock - Piston rod - 7/16-20 hex.
256	9411494	2	2	RING .. Retaining - .338 I.D.
257	8113664	1	1	SPRING .. Guard seal
258	8149111	1	1	SPRING .. Servo
259	8152339	1	1	GASKET .. Guard to power cylinder
260	8201595	1	1	GASKET .. Cover to power cylinder
261	8201594	1	1	SCALE .. Terminal shaft
262	8149113	1	1	VALVE .. Needle
263	8149115	1	-	GUARD .. Spring
*263A	8326406	-	1	GUARD ASSEMBLY .. Spring
*263B	452652	-	1	INSERT .. Helicoil
264	8201598	1	1	COVER .. Power cylinder
265	8201600	2	2	LINK .. Power piston
266	8201601	1	1	PIN .. Power lever
267	8201604	1	1	PIN .. Piston rod
268	8201596	1	1	LEVER .. Rack dial
269	8346334	1	1	POINTER .. Rack scale - All governors except those listed in Reference Nos. 270 and 270A
270	8201597	-	1	POINTER .. Rack scale - 8337897, 8337898, 8377253, 8378135, 8378136, 8378137, 8384063, 8384064, 8384223, 8436281, 8436283, and 8445798 Governors - Previously applied
270A	8463567	1	1	POINTER .. Rack scale - 8424078, 8424079, 8424080, 8437963, 8438887, 8450911, 8424218, 8424220, 8424221, 8424222, 8424299, 8424325, 9091532, 9091535, 9508105, and 9517563 Governors - Currently applied
271	8201599	1	1	LEVER .. Power - Serrated
ϕ272	8201602	1	1	SHAFT .. Terminal - Previously applied
ϕ272	8460057	1	1	SHAFT .. Terminal - Currently applied
273	8346333	1	1	CYLINDER ASSEMBLY .. Power - All governors except those listed in Reference Nos. 274 and 274A
274	8284309	-	1	CYLINDER ASSEMBLY .. Power - 8337897, 8337898, 8377253, 8378135, 8378136, 8378137, 8384063, 8384064, 8384223, 8436281, 8436283, and 8445798 Governors - Previously applied
274A	8460058	1	1	CYLINDER ASSEMBLY .. Power - 8424078, 8424079, 8424080, 8437963, 8438887, 8450911, 8424218, 8424220, 8424221, 8424222, 8424299, 8424325, 9091532, 9091533, 9508105, and 9517563 Governors - Currently applied
*275	120613	-	1	NUT .. Lock - 1/4-28 hex.
*276	8326407	-	1	SCREW .. Stop
*277	8284078	1	-	SERVO ASSEMBLY .. Speeder spring
*277A	8149302	-	1	SERVO ASSEMBLY .. Speeder spring - See Ref. No. 508 for currently applied servo assembly 9331279
278	8217606	1	1	PISTON ASSEMBLY .. Power
279	8113963	1	1	CYLINDER .. Power
280	8284088	1	-	FULCRUM ASSEMBLY .. Power piston
*280A	8113967	-	1	FULCRUM ASSEMBLY .. Power piston
281	8113970	2	2	LEVER .. Power piston - Replaces 8145336 lever asm.
282	8113971	1	1	SCREW .. Special - Adjusting fulcrum
283	8113764	1	1	PIN .. Adjustable fulcrum
284	8452881	1	1	LINK .. Pivot pin - Replaces 8113972
285	8113973	1	1	LINK .. Floating lever
286	119981	3	3	PIN .. Cotter - 1/16 x 3/8 in. long
*287	8134415	1	1	PIN .. Straight - 3/16 x 3/4 in. long
288	8113832	2	1	PIN .. Headed - 3/16 x 25/32 in. long
289	8113974	1	1	PIN .. Straight - 1/8 x 1 in. long
290	8284089	1	-	STUD .. Speed setting

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
	8284078	1	-	SERVO ASSEMBLY .. Speeder spring
	8149302	-	1	SERVO ASSEMBLY .. Speeder spring
291	8113976	4	2	SPACER .. Link
292	8113662	3	3	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
293	120614	1	1	NUT .. 10-32 hex.
294	148028	1	1	SCREW .. 10-32 x 3/8 round head - Cross recess
295	8113977	1	1	NUT .. Lock - 10-32 hex.
296	222384	1	1	SCREW .. Set - Piston stop - 10-32 x 1-1/4 hex. socket
297	8113772	1	1	SPRING .. Link - Adjusting
298	8149306	1	1	SCALE .. Speed indicator
*299	8113975	-	1	STUD .. Cover - 3/8-16 x 3-1/16 in. long
300	8160339	1	1	CUP ASSEMBLY .. "D" solenoid
301	9333521	1	1	PLATE ASSEMBLY .. Triangular { Repl. 8383168 & 8459855 - Must be applied with Ref. No. 88 - 9333520 Lever
*302	8113773	1	1	PLUNGER ASSEMBLY .. Shutdown
303	8113775	1	1	PLUNGER .. Shutdown
304	8113779	1	1	TUBING .. Plunger
305	8444618	1	1	SEAL .. O-ring - Replaces 8223698
306	3292030	1	1	SPRING .. Relief valve
307	8113778	1	1	PIN .. Spring - 5/32 x 3/4 in. long
308	104918	1	1	BALL .. 1/4 in. diameter
309	8113774	1	1	PIN .. Plunger
310	8113776	1	1	SEAT .. Ball valve
311	8433775	1	-	LEVER ASSEMBLY .. Adjusting floating - Formerly 8362298
312	8149959	-	1	LEVER ASSEMBLY .. Adjusting floating
*313	8306003	1	-	SPRING .. Adjusting link
*313A	8113772	-	1	SPRING .. Adjusting link
*314	8113767	1	1	KNOB .. Adjusting screw
*315	8113768	1	1	PIN .. Adjusting screw
316	8433218	1	-	ECCENTRIC
316A	8113770	-	1	ECCENTRIC
317	8433219	1	-	BLOCK .. Adjusting
317A	8113771	-	1	BLOCK .. Adjusting
318	119981	4	2	PIN .. Cotter - 1/16 x 3/8 in. long
319	442039	1	-	SCREW .. Cap - 8-32 x 7/8 in. long
319A	138211	-	1	SCREW .. Cap - 1/4-28 x 3/4 hex. socket head
*320	8433217	1	-	PIN .. Moveable fulcrum
321	8433215	2	-	LINK .. Pilot valve
322	8433216	1	-	STRAP .. Pilot valve - Formerly 8284086
323	8446359	1	-	LINK .. Pilot valve - Formerly 8284085
324	8214389	1	-	PIN .. Power lever - .880 in. long x .2493 in. diameter
325	8433225	1	-	PIN .. .812 in. long x .1865 in. diameter - Formerly 8113833
326	3304054	2	-	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 in. thick
*327	8113761	-	18	WASHER
328	8113780	1	1	BUSHING .. Oil failure valve
*329	8201608	1	1	VALVE ASSEMBLY .. Lube oil - All governors except 8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325 8437963, 8438887, 8450911, 9091532, 9091533, 9508105, and 9517563
330	8113790	1	1	NUT .. Valve
331	104916	1	1	BALL .. Valve
332	8201615	1	1	SEAT .. Ball
*333	8201616	1	1	BODY .. Valve - See Note on Page 11
*334	8259474	1	-	WASHER .. .210 I.D. x .340 O.D. x .25 thick - 8356392, 8364689, 8367420, 8376477, 8378131, 8378132, 8378133, 8378134 and 8384254 gov. only
335	8284081	1	-	WASHER .. .203 I.D. x .380 O.D. x .05 thick
*336	444687	1	1	PLUG .. Pipe - 1/8 M.P.T. hex. socket
337	444040	1	1	ELBOW .. Street - 1/4 M.P.T. - 90°
338	8040382	1	1	TEE .. 1/4 M.P.T. x 1/4 tube x 1/4 tube

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
*339	120217	1	-	WASHER .. Lock - No. 10
*340	139009	1	1	SCREW .. Set - 1/4-28 x 1/4 hex. socket
341	8147713	3	3	SCREW .. Cap - 1/4-28 x 2-3/8 socket head
342	8348345	1	-	SPRING .. Speeder spring servo
*343	8113841	-	1	SPRING .. Speeder spring servo - All governors except those listed in Ref. No. 343A
*343A	8330235	-	1	SPRING .. Speeder spring servo - 8384063, 8384064, 8384223, 8424220, 8424221 and 8424222 governors only
344	8113811	1	1	PISTON .. Oil failure
345	8231570	1	1	PLUNGER .. Pilot valve - Overriding
346	8113819	1	1	WASHER .. Diaphragm
347	8113788	1	1	DIAPHRAGM .. Vacuum
348	8113790	2	2	NUT .. Diaphragm
349	8113791	1	1	HOLDER .. Vacuum diaphragm
350	8061137	1	1	WASHER .. Copper - Vacuum diaphragm
351	118750	1	1	CONNECTOR .. Half - Lube vacuum - 3/8 O.D. x 1/4 M.P.T.
352	8113794	1	1	SPRING .. Vacuum diaphragm
353	8201612	1	1	CAP .. Diaphragm
354	8201613	1	1	SCREW .. Diaphragm stop
				All governors except 8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325, 8437963, 8438887, 8450911, 9091532, 9091533, 9091534, 9507274, 9508105, and 9517563
*355	8429435	1	1	CAP .. Diaphragm - Lube oil
∤*356	8436325	1	1	GASKET
*357	8348618	1	1	PLUG .. Pipe - 1/4 M.P.T. soc. hd.
∤*358	8429434	1	1	PLUG .. Low vacuum hole
				8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325, 8437963, 8438887, 8450911, 9091532, 9091533, 9091534, 9507274, 9508105, and 9517563 governors
359	8158716	1	1	DIAPHRAGM .. Lube oil
*360	8223696	2	2	SEAL .. O-ring - 3/8 O.D.
361	8223701	3	3	SEAL .. O-ring - 2.012 O.D.
362	118752	4	4	CONNECTOR .. Half - Load control - 1/2 O.D. x 3/8 M.P.T.
363	5939163	1	1	NUT .. Diaphragm - 10-32 hex.
364	8113800	19	19	WASHER .. Lock - 1/4
*365	181316	1	-	BOLT .. Hex head - 1/4-28 x 1-1/8 - Overriding cylinder
366	8134416	2	2	SCREW .. Servo - 1/4-28 x 1-3/8 hex. head
367	217940	1	1	SCREW .. Cap - Bushing retainer - 1/4-28 x 3/8 hex. socket head
368	8163437	1	1	WASHER .. Plain - 1/4
369	138216	4	4	SCREW .. Diaphragm cap - 1/4-28 x 2 hex. socket head
370	138214	3	3	SCREW .. Side plate - 1/4-28 x 1-1/2 hex. socket head
370A	138211	4	7	SCREW .. Cap - Side plate - 1/4-28 x 3/4 hex. socket head
371	8113832	1	1	PIN .. Headed - 3/16 x 25/32 in. long
372	8113836	1	1	SPRING .. Pilot valve plunger - Overriding
373	8113846	1	1	SPRING .. Shutdown plunger
374	8113837	1	1	SPRING .. Diaphragm
375	8113844	1	1	SPRING .. Link - Floating lever
376	8113838	1	1	SPRING .. Oil failure piston
377	8113850	1	1	GASKET .. Oil failure bushing
378	8201610	1	1	GASKET .. Side plate
379	8193508	1	1	PLUNGER .. Oil failure
380	8286155	1	-	PLATE .. Side - Drilled for oil filter
*380A	8201611	-	1	PLATE .. Side - Lube oil diaphragm
*381	8284080	1	-	POWER PACK .. Electrical equipment - all governors in Column A and governors 8393219 and 8424218 in Column B
*381A	8201606	-	1	POWER PACK .. Electrical equipment - All governors in Column B except 8393219, 8424218, 9091532, 9091533, 9091534, 9091535, 9507274, 9508105, and 9517563 - See Reference Number 448A for currently applied receiver assembly 9514121
382	8113683	5	5	PLUNGER ASSEMBLY .. Solenoid

∤ Gasket 8436325 is not required when Plug 8429434 is applied in place of valve body 8201616 ref. No. 333.

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
	8424080	1	-	POWER PACK .. Electrical equipment } See Page 13 for
	8201606	-	1	POWER PACK .. Electrical equipment } applicable governors
383	8163953	5	5	GUIDE ASSEMBLY .. Solenoid
384	8113743	5	5	PIN .. Locating
385	8133719	10	10	BUSHING .. Plunger guide
*386	8191878	-	1	SHAFT .. Switch
*387	8191879	-	1	LEVER
*388	8191880	-	1	LEVER .. Switch
*389	8191881	-	1	LEVER .. Adjusting switch
390	8284092	1	-	CONNECTOR ASSEMBLY .. Male - 12 point - Includes wire and lugs
*390A	8201620	-	1	CONNECTOR ASSEMBLY .. Male - 12 point - Includes wire and lugs
*391	8329355	A.R.		WIRE .. Teflon - Black
*392	8329356	A.R.		WIRE .. Teflon - Red
*393	8329357	A.R.		WIRE .. Teflon - Blue
*394	8329358	A.R.		WIRE .. Teflon - White
*395	8329359	A.R.		WIRE .. Teflon - Yellow } 25 ft. Length
*396	8329360	A.R.		WIRE .. Teflon - Green
*397	8329361	A.R.		WIRE .. Teflon - Pink
*398	8329362	-	A.R.	WIRE .. Teflon - Orange
*399	8329363	-	A.R.	WIRE .. Teflon - Brown
*400	8097414	1	1	HOUSING .. Connector - Flanged
*401	8200229	4	2	LUG .. Terminal - No. 6 stud - Non-insulated
*402	8326434	A.R.		TUBING .. Plastic - Clear
*403	8203174	1	1	PLUG .. Connector
404	8284093	1	-	BRACKET ASSEMBLY .. Switch
*404A	8193296	-	1	BRACKET ASSEMBLY .. Switch
*404B	8192136	1	1	PIN .. Bracket
*404C	8193297	-	2	BUSHING .. Oilite
405	8113681	5	5	CASE .. Solenoid
406	8113684	5	5	ROD .. Solenoid plunger
407	8113761	5	5	WASHER .. Solenoid plunger
408	8113738	5	5	PLUG .. Plunger stop
409	8113739	5	5	NUT .. Lock - 3/4-32 hex.
410	8113989	5	5	SPRING .. Load
*411	8191962	-	1	SPRING .. Torsion - Switch lever shaft
412	8113740	1	1	COVER .. Wiring
413	8113742	1	1	PLATE .. Connector clamp
414	8113744	10	10	WASHER .. Soldering shield - 1/2 O.D.
415	120217	2	2	WASHER .. Lock - No. 10 - Spring lock
*416	115545	-	4	WASHER .. Lock - No. 10 - Internal teeth
*417	115544	-	1	WASHER .. Lock - No. 8 - Internal teeth
*418	222380	-	1	SCREW .. Set - 10-32 x 5/8 hex. socket - Flat point
419	140880	5	5	SCREW .. Set - 10-32 x 1/4 hex. socket - Cup point
*420	455674	-	2	SCREW .. Machine - 6-32 x 1-7/8 round head
421	8113745	5	5	RING .. Snap - .187 O.D.
422	8113746	3	3	NUT .. Speed
423	145154	3	3	SCREW .. Tapping - 8-1/8 x 1-1/4 round head
*424	8191964	-	1	SPACER .. Switch shaft
*425	9415674	-	2	SCREW .. Switch bracket - 10-32 x 3/4 hex. head
*426	8116931	A.R.		CEMENT .. Gasket - 1 pint
427	8152184	10	10	TUBING .. Varnished - .337 I.D.
*428	121832	-	1	SCREW .. Machine - 8-32 x 3/8 round head
429	155998	4	4	SCREW .. Machine - 10-32 x 3/8 flat head - Cross recess
430	8377913	2	2	SCREW .. Switch bracket - 10-32 x 2-5/16 fil. head - Cross recess - Replaces 153528
431	8113755	1	1	SWITCH .. Lube oil signal
432	8113756	5	5	COIL .. Solenoid - 700 Ohms
*433	8311242	-	2	SWITCH .. Micro
*434	8329469	-	1	CLAMP ...Wire

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
	8424080	1	-	POWER PACK .. Electrical equipment } See Page 13 for
	8201606	-	1	POWER PACK .. Electrical equipment } applicable governors
*435	8035119	-	2	NUT .. Stop - No. 6-32 hex.
*436	274676	-	1	RING .. Snap
*437	8284081	-	1	WASHER .. .203 I.D. x .38 O.D. x .05 thick
438	8129082	5	5	PAPER .. Insulating
*439	8189218	-	5	TERMINAL .. Stakon lug
440	8113760	1	1	GASKET .. Connector plate
441	8191876	1	1	BRACKET .. Solenoid
442	8202849	1	1	BRACKET .. Switch mounting
443	8202850	1	1	PLATE .. Switch bracket clamp
*444	125982	-	2	SCREW .. Switch lever - 10-32 x 1/2 hex. head
445	8113672	2	-	PIN .. Drive lock
†*446	8129083	8	-	TUBING .. Plastic - Clear .133 I.D. x 3/4 long
†*466A	8129084	3	-	TUBING .. Plastic - Clear - .133 I.D. x 1-1/2 long
†*446B	8247156	A.R.	-	SPAGHETTI .. Clear - 36 in. long
†*446C	455581	2	-	SCREW .. Switch bracket - No. 10-32 x 2-1/4 hex. socket head
*447	120614	-	3	NUT .. No. 10-32 hex.
*448	8113662	3	1	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
*448A	9514121	-	1	RECEIVER ASSEMBLY - Electrical equipment - Currently applied - Component list will be provided upon request
449	8217607	1	1	PLUG ASSEMBLY .. Spring check
450	456350	1	1	PIN .. Stop - Formerly 8217608
451	8367213	1	1	COVER ASSEMBLY .. Governor
452	8131835	2	2	BUSHING .. Cover doweling
453	8017559	1	1	CUP .. Oil filler
454	8140550	1	1	GASKET .. Cover
455	8365140	2	2	BOLT .. Hex head 5/16-24 x 7-1/4 - Drilled - Cover
*456	8068098	6	6	WASHER .. Plain - 5/16
ϕ457	8429419	1	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Square body - Replaced by 8482432 - See Ref. No. 472 - 8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325, 8437963, 8438887 and 8450911 governors only
458	8113811	1	1	PISTON .. Oil failure
459	120614	4	4	NUT .. No. 10-32 hex.
460	120217	4	4	WASHER .. Lock - No. 10
461	8327416	4	4	WASHER .. .255 I.D. x .400 O.D. x .031 in. thick
462	8393771	2	2	ELBOW .. 1/4 tube x 1/8 M.P.T.
463	117608	4	4	SCREW .. 10-32 x 3 fil. head slotted
464	225585	4	4	SCREW .. 1/4-28 x 2-1/4 fil. head slotted
465	8429426	1	1	SPRING .. Accumulator
466	8429427	2	2	GASKET .. Accumulator cover
*467	8429428	1	1	GASKET .. Accumulator body to case
468	8429429	1	1	COVER .. Accumulator
469	8429430	1	1	COVER .. Accumulator
470	8429431	1	1	TUBE .. Accumulator - No longer furnished - Contact EMD Parts Center for replacement information
471	8429432	1	1	BODY .. Accumulator

† *Not required for current design governors.*

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	GOVERNOR ASSEMBLY .. Engine
ϕ472	8482432	1	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Round body - 8424078, 8424079, 8424080, 8424218, 8424220, 8424221, 8424222, 8424298, 8424299, 8424325, 8437963, 8438887, 8450911, 9091532, 9091533, 9091535, 9507274, 9508105, and 9517563 governors only
473	8113811	1	1	PISTON .. Oil failure
474	8327416	4	4	WASHER .. .255 I.D. x .400 O.D. x .031 in. thick
475	190741	4	4	SCREW .. 1/4-28 x 1 fil. head slotted
476	8393771	2	2	ELBOW .. 1/4 tube x 1/8 M.P.T.
477	8429426	1	1	SPRING .. Accumulator
478	8482434	1	1	GASKET .. Accumulator body to case
479	8488280	1	1	BODY .. Accumulator - Replaces 8482435
480	8488281	1	1	TUBE .. Accumulator - Replaces 8482436
481	138242	4	4	SCREW .. Cap - Power cylinder to power case - 3/8-16 x 1 hex. socket head
482	8152079	4	4	WASHER .. Lock - 3/8
483	159572	4	4	SCREW .. Column name plate - 8-32 x 1/4 pan head - Cross recess
*484	9327637	2	2	SCREW .. Name plate insert - No. 5-40 x 1/4 - Replaces 432267
*485	8132974	2	2	CAP .. Plastic - 7/16-20 } Shipping purpose only
*486	8132975	1	1	CAP .. Plastic - 5/8-18 } Shipping purpose only
*487	8132976	4	4	CAP .. Plastic - 3/4-16 } Shipping purpose only
488	8152077	2	2	PLATE .. Name - Bleed hole
489	8356332	1	1	PLATE .. Name - Column
*490	8356333	1	1	INSERT .. Name plate - Blank - Includes setting - .625 x 2.188 in. long
491	220342	6	6	SCREW .. Drive - Bleed hole name plate - No. 0
492	8483071	1	1	GASKET .. Power cylinder case - Replaces 8152078
*493	9332176	1	1	LABEL .. Piping - Set of decals - Replaces 8113865
494	119981	1	1	PIN .. Cotter - Tail rod - 1/16 x 3/8 in. long
495	8113832	1	1	PIN .. Headed - Tail rod - 3/16 x 25/32 in. long
496	8201587	4	4	BOLT .. Column to case - 5/16-24 x 4-3/4 hex. head
497	8284081	1	-	WASHER .. Connecting beam - .203 I.D. x .380 O.D.
498	8284039	1	-	PIN .. Headed - Tail rod
499	8284040	1	-	BEAM .. Connecting
500	8113869	1	1	GASKET .. Column to case - Transfer hole
501	8113870	1	1	GASKET .. Case to column
*502	8075907	-	1	NUT .. Knurled screw - No. 10-32 } All governors except 8393219 & 8424218
*503	8191863	-	1	ARM .. Tail rod } All governors except 8393219 & 8424218
*504	273641	-	1	SCREW .. Tail rod arm - No. 10-32 x 7/8 in. long Formerly 455644 } All governors except 8393219 & 8424218
*505	115545	-	1	WASHER .. Lock - No. 10 - Tail rod arm } All governors except 8393219 & 8424218
*506	8191864	-	1	SCREW .. Special - No. 10-32 - Knurled head } All governors except 8393219 & 8424218
*507	8419697	1	1	DECAL .. Caution - Not furnished separately - Included in Ref. No. 493
*508	9331279	-	1	SERVO ASSEMBLY .. Speeder spring - Currently applied
*509	8217606	-	1	PISTON ASSEMBLY .. Power
*510	8284088	-	1	FULCRUM ASSEMBLY .. Power
*511		-	1	CYLINDER ASSEMBLY .. Speeder spring
*512	8113970	-	2	LEVER .. Power piston
*513	8113971	-	1	SCREW .. Special - Adjusting fulcrum
*514	8113764	-	1	PIN .. Adjustable fulcrum
*515	8113973	-	1	LINK .. Floating lever
*516	8134415	-	1	PIN .. Speed droop - 3/16 x 3/4 in. long
*517	8113832	-	1	PIN .. Headed - 3/16 x 25/32 in. long
*517	8113974	-	1	PIN .. Straight - 1/8 x 1 in. long
*518	8113975	-	1	STUD .. 3/8-16 x 3-1/16 in. long
*519	8113976	-	2	SPACER .. Link
*520	8113662	-	4	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
*521	8113977	-	1	NUT .. Lock - No. 10-32 hex.
*522	8134416	-	2	SCREW .. 1/4-28 x 1-3/8 hex. head
*523	8113772	-	1	SPRING .. Link adjusting
*524	8149306	-	1	SCALE .. Speed indicator
*525	9087347	-	1	SEAL .. O Ring
*526	8240528	1	1	RECEPTACLE .. Female - 12 point

P.L. No. F166

GOVERNOR ASSEMBLY

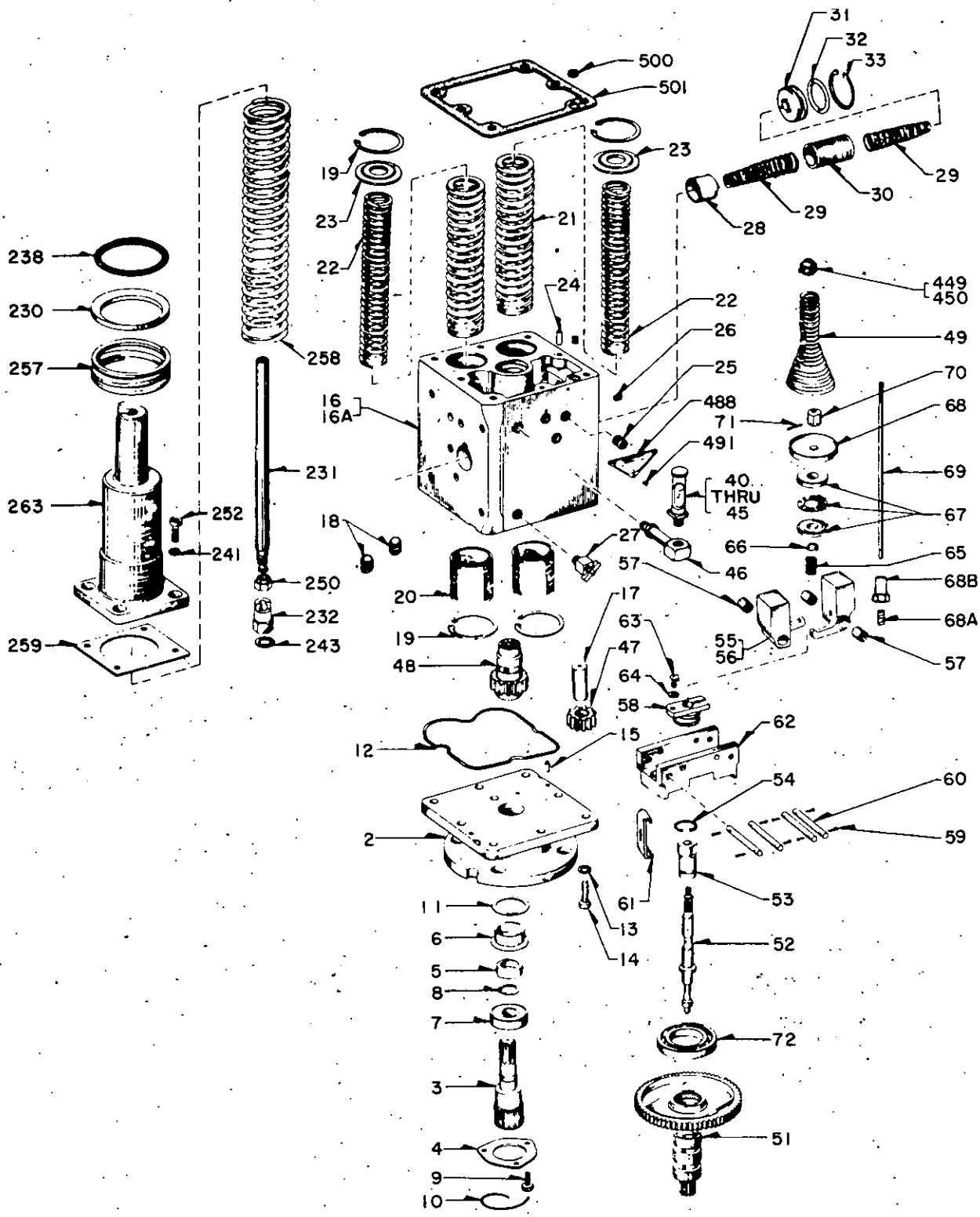


PLATE C166-1

P.L. No. F166

GOVERNOR ASSEMBLY

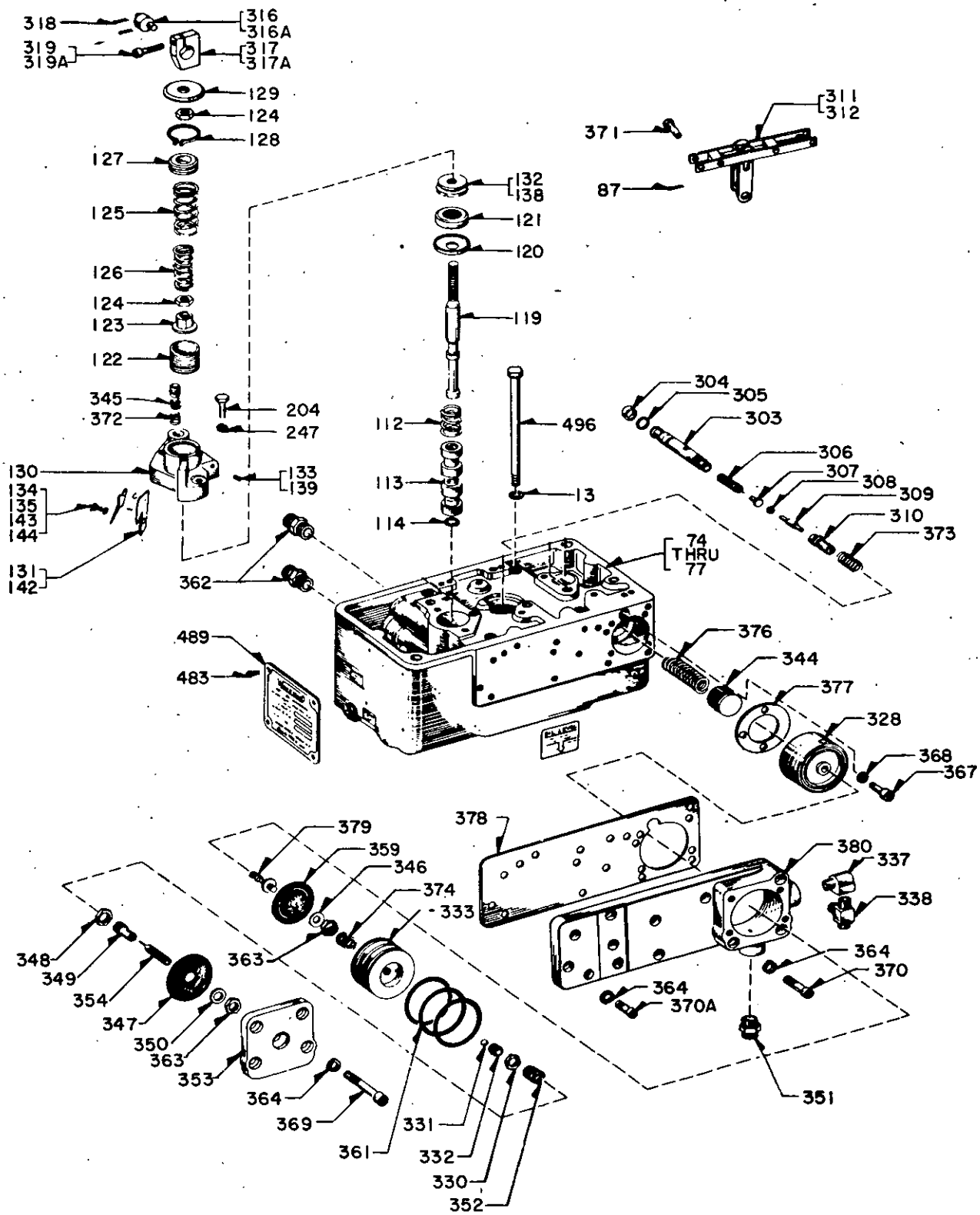


PLATE B166-2

P.L. No. F166

GOVERNOR ASSEMBLY

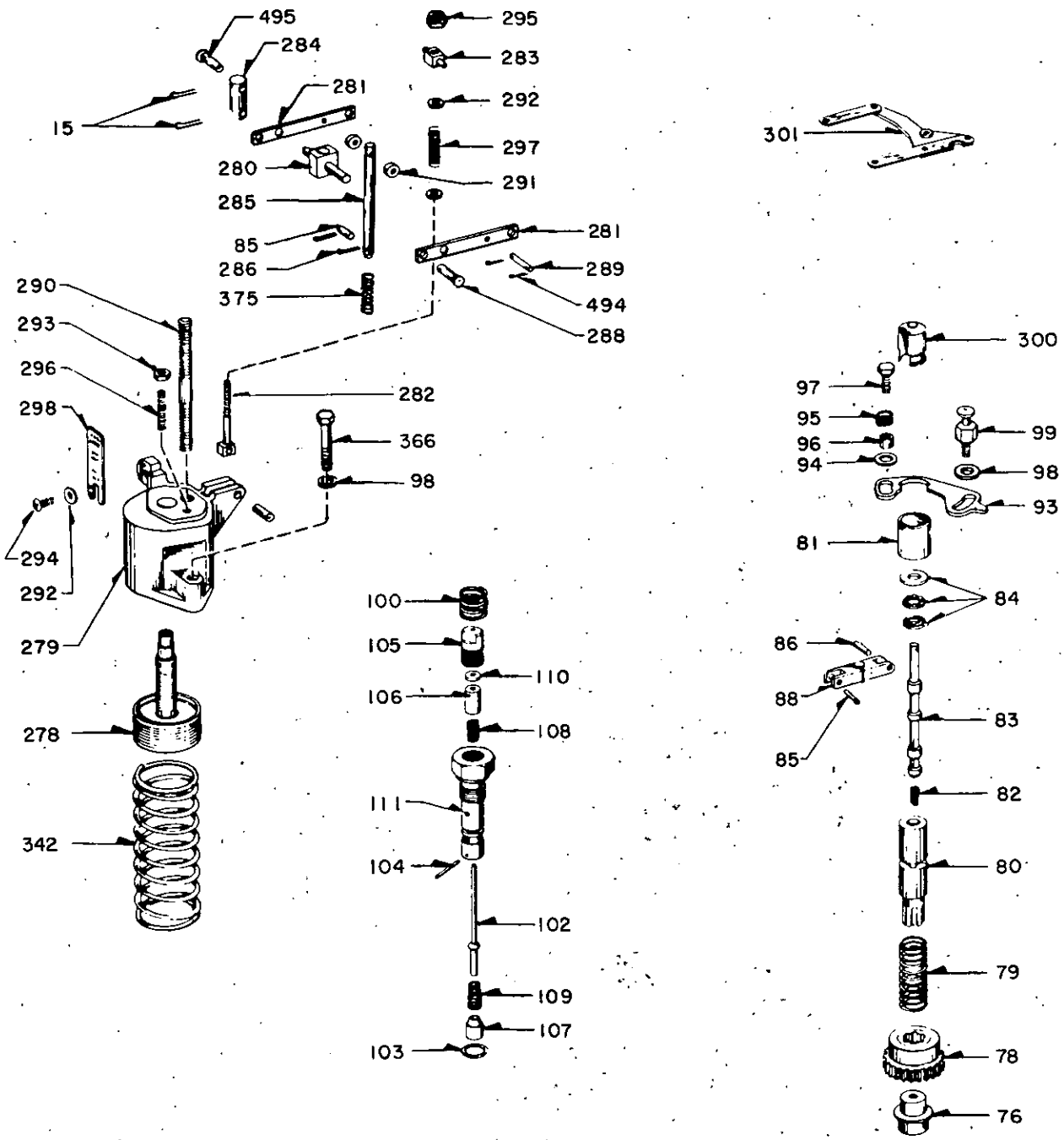


PLATE B166-3

P.L. No. F166

GOVERNOR ASSEMBLY

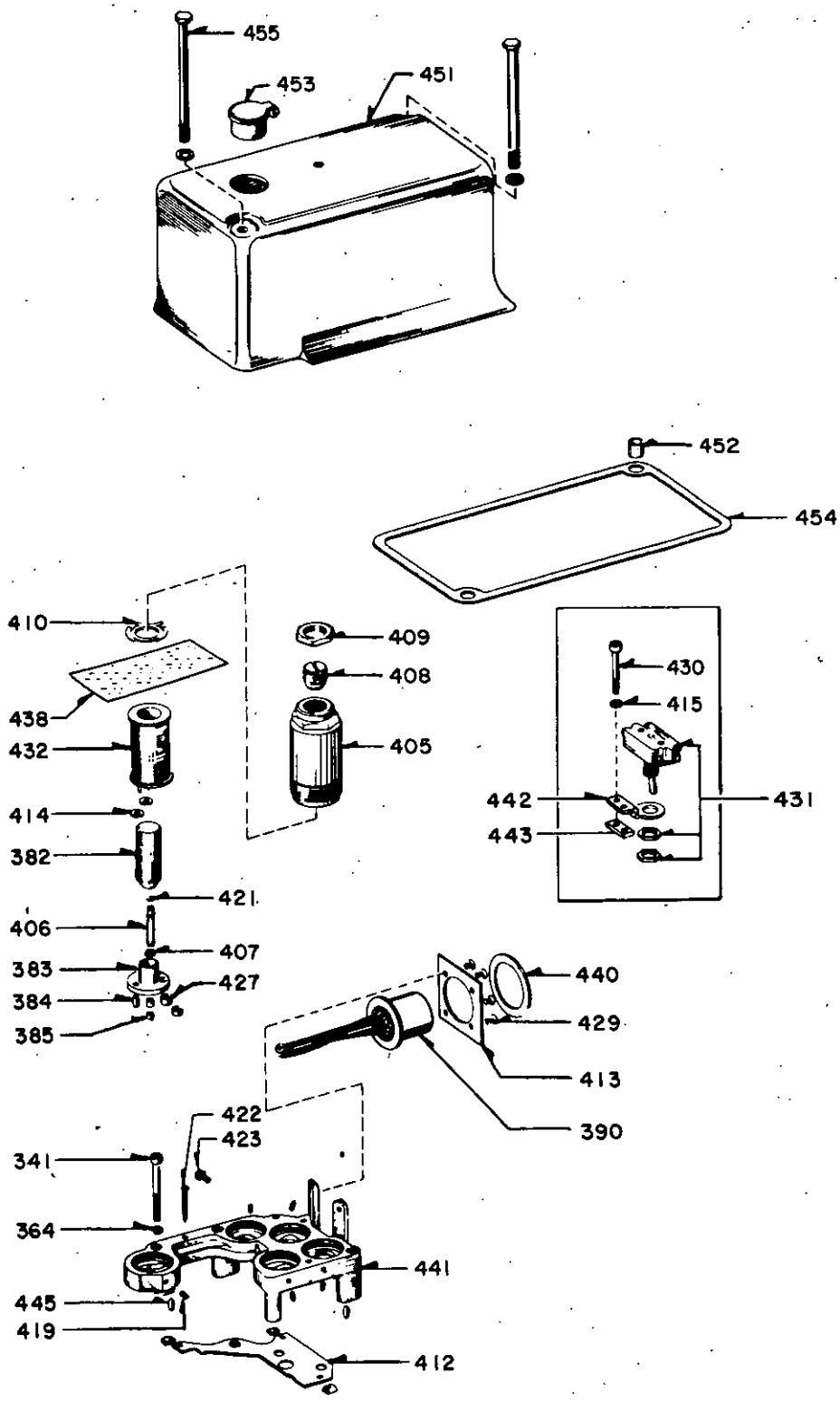
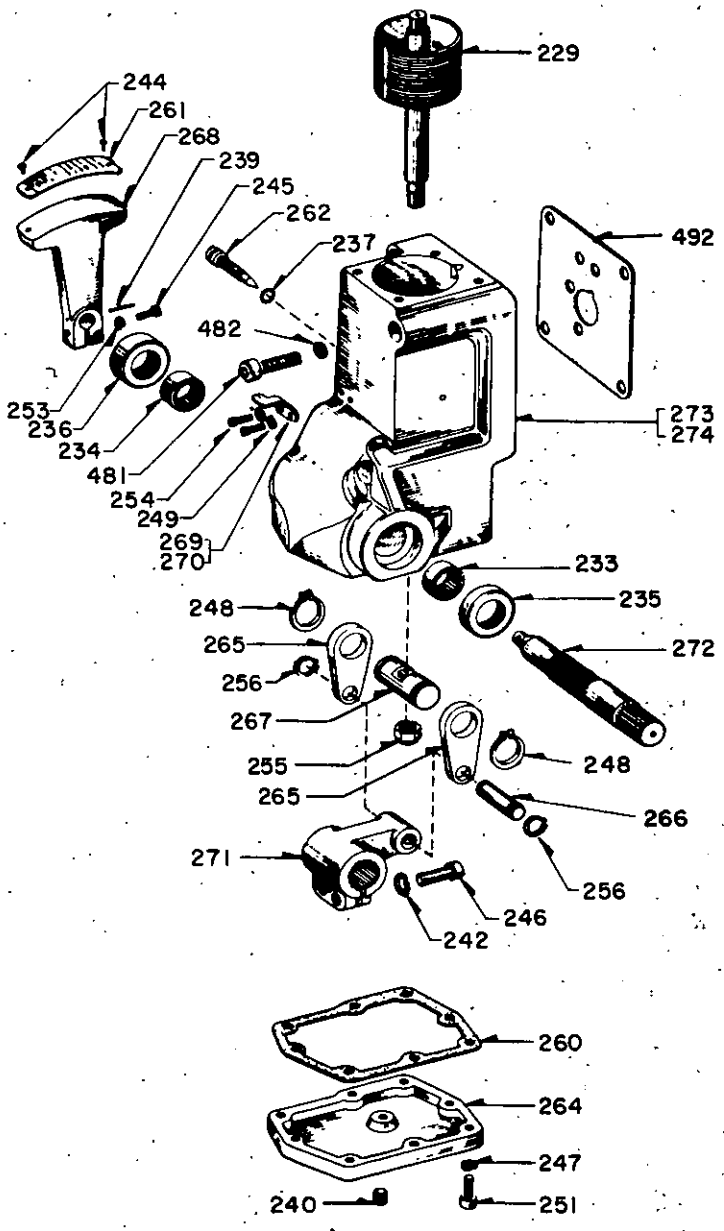
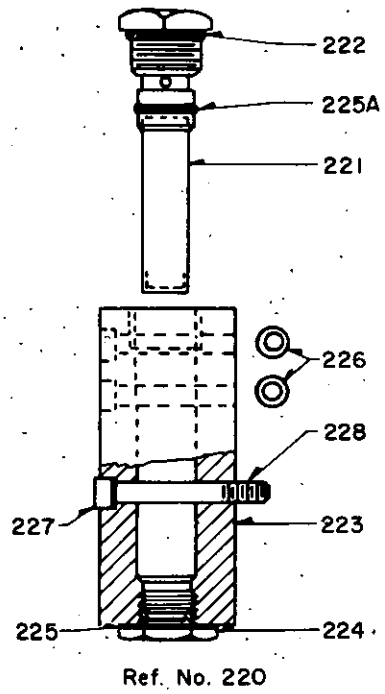


PLATE B166-4

P.L. No. F166

GOVERNOR ASSEMBLY



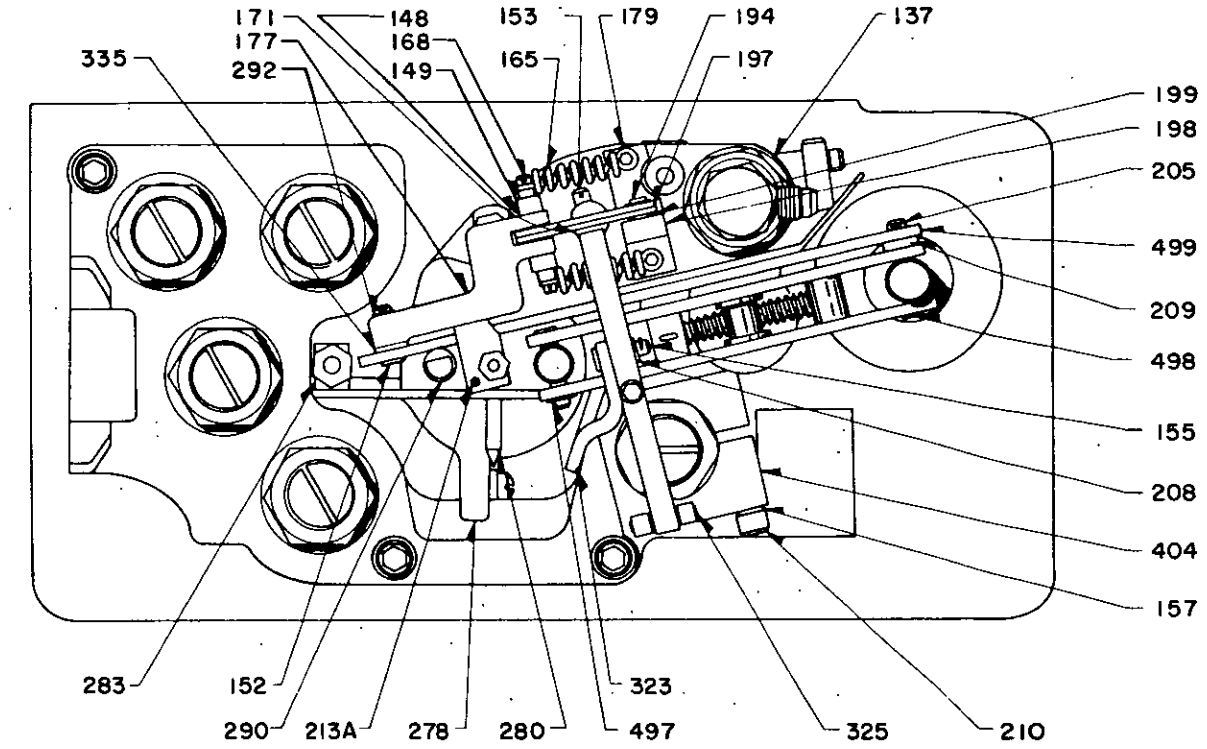


Ref. No. 220

PLATE B166-5

P.L. No. F166

GOVERNOR ASSEMBLY



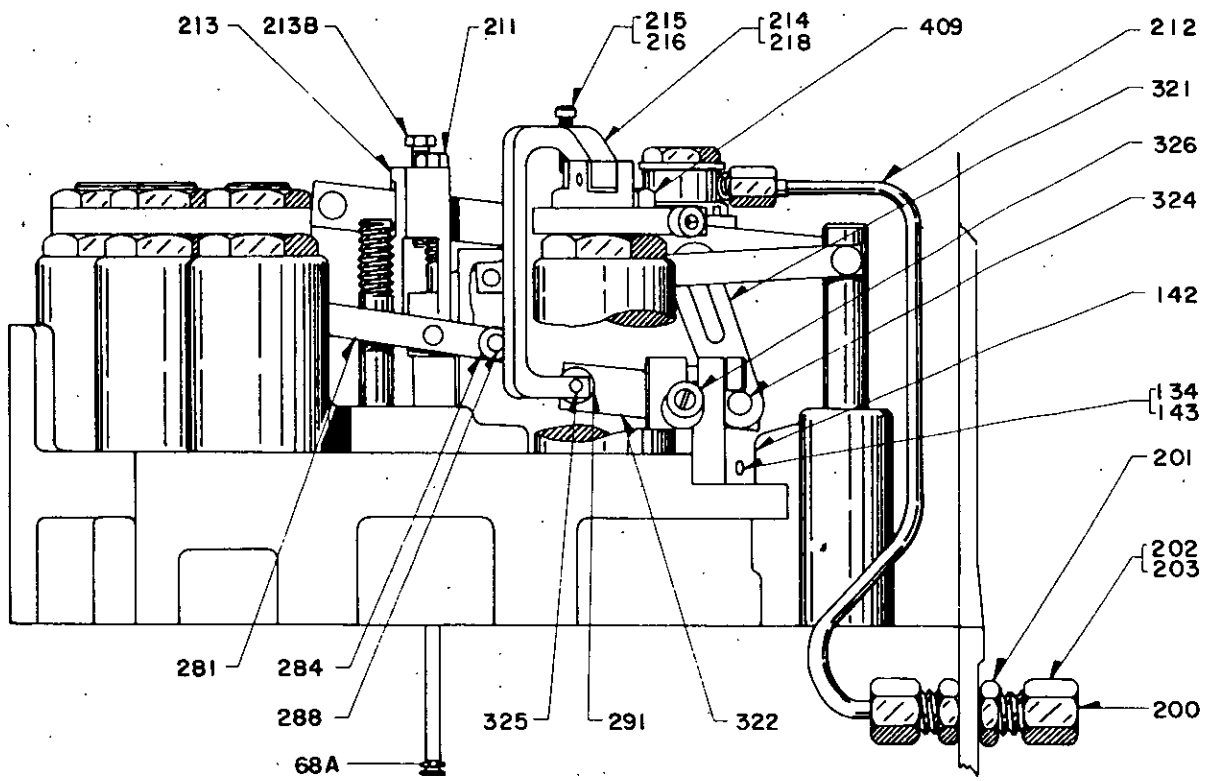
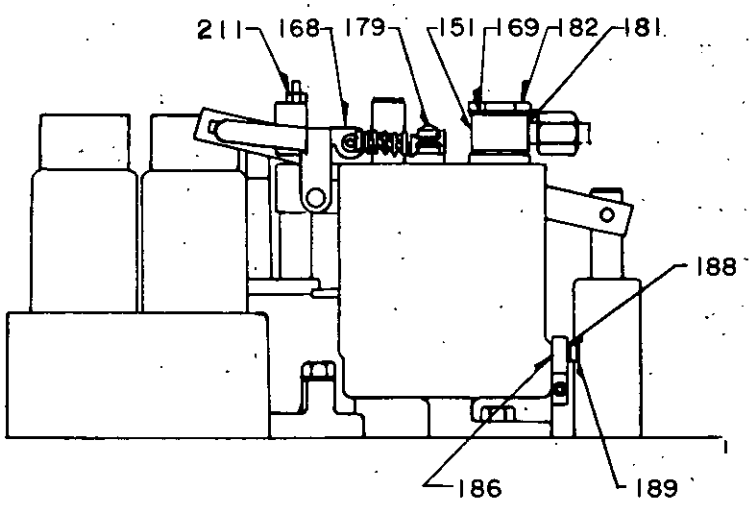
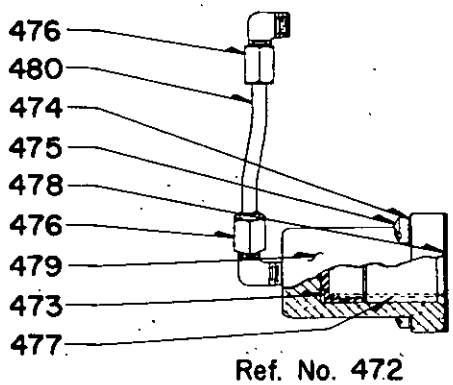


PLATE B166-6

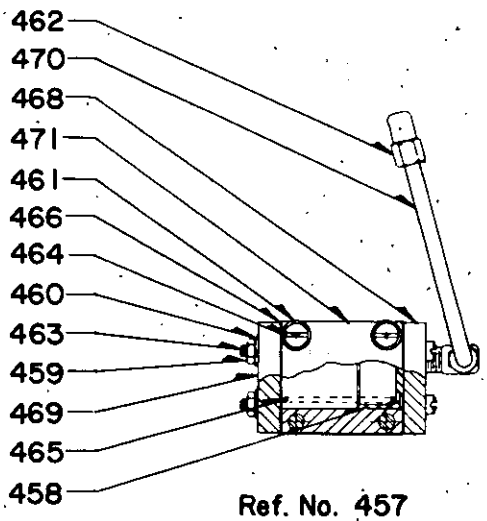
P.L. No. F166

GOVERNOR ASSEMBLY

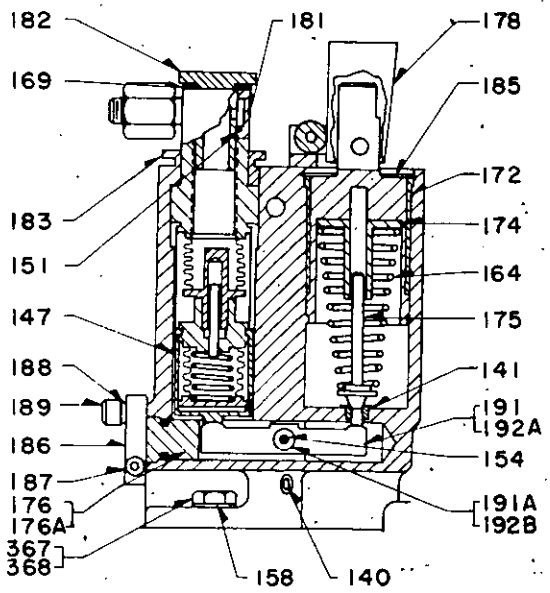




Ref. No. 472



Ref. No. 457



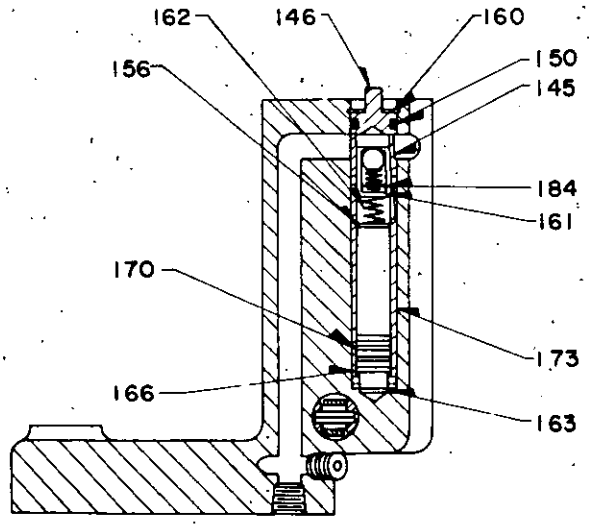


PLATE B166-7

P.L. No. F166

GOVERNOR ASSEMBLY

16 Pole Electro-Hydraulic PGR Governors
8,12,16-645E Engines
PLATES A166-8 thru A166-10

GOVERNOR REFERENCE CHART

Ref. No. 1 Governor Part No.	RPM	Rack	Col.	Ref. No. 1 Governor Part No.	RMP	Rack	Col.	Ref. No. 1 Governor Part No.	RMP	Rack	Col.
8453389	900	.83	A	†9521597	900	.85	††	8470396	900	.83	B
†8453928 †8453930 †8466101	900	.83	A	†9530435	900	.88	††	†8482394	900	.85	B
				†9540062	900	.85	††	†8482395	900	.87	B
8469802	900	.87	A	9540063	900	.85	††	†9539282	900	.75	††
†8482396 †9084020	900	.85	A	†9545910	900	.85	††	†8545909	900	.85	††
				†8453388	900	.83	B	9311979	900	.87	C
9097320	900	.85	A								
†9549938	900	.85	††	†8460536	900	.83	B	†9540602	893	.84	††

† Indicates Governor has low idle setting

†† Component Parts List will be provided upon request

Ref. No.	Part Number	Quantity Required A	B	C	Description
1	- - - -				GOVERNOR ASY. .. Engine - See chart above and Page 2
2					Reference number not used
3	8149658	1	1	1	BASE .. Governor
4	954298	1	1	1	BEARING .. Ball - Drive shaft
5	8062007	1	1	1	RETAINER .. Bearing
6	8149695	1	1	1	SEAL .. Oil
7	8149697	1	1	1	RETAINER
8	8149677	1	1	1	RING .. Snap
9	8113929	3	3	3	BOLT .. Bearing retainer to base - 1/4-28 x 5/8 hex. head - Drilled
10	8288663	A.R.			WIRE .. Lock - .026 in. diameter - Available 500 ft. length
11	8149696	1	1	1	SHAFT .. Drive
12	8149679	1	1	1	GASKET .. Retainer to base
13	8152068	1	1	1	SEAL .. Oil - Case to base
14	120379	12	12	12	WASHER .. Lock - 5/16
15	179818	8	8	8	BOLT .. Case to base - 5/16 x 1 hex. head
16	103613	2	2	2	PIN .. Dowel - Case to base - No. 5 x 3/4 in. long
17	8429420	1	1	1	CASE ASSEMBLY .. Power
*18	8149470	1	1	1	STUD .. Idler
19	8201045	2	2	2	PLUG .. Drive - Ball check
20	9413465	4	4	4	RING .. Snap - Accumulator
21	8149469	2	2	2	PISTON .. Accumulator
22	8149471	2	2	2	SPRING .. Accumulator - Outer
23	8057784	2	2	2	SPRING .. Accumulator - Inner
24	8149474	2	2	2	SEAT .. Spring - Retainer
25	8113672	2	2	2	PIN .. Grooved - Dowel case to column
26	444687	9	9	-	PLUG .. Pipe - 1/8 M.P.T. hex. socket
27	9409954	1	1	-	PLUG .. Pipe - 1/16 M.P.T. hex. socket - Replaces 8134425
28	8118445	1	1	1	COCK .. Drain - 1/8 M.P.T.
29	8152071	1	1	1	SEAT .. Buffer spring
30	8152072	2	2	2	SPRING .. Buffer
31	8152073	1	1	1	PISTON .. Buffer
32	8152074	1	1	1	PLUG .. Buffer spring - 1-5/16 in. diameter

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
		A	B	C	GOVERNOR ASSEMBLY .. Engine
33	8478711	1	1	1	SEAL .. O-ring - Replaces 8223699
34	9413448	1	1	1	RING .. Snap - Buffer plug
35	8442288	1	1	1	GAUGE ASSEMBLY .. Oil level - Repl. by 9328197
36	8444618	2	2	2	SEAL .. O-ring - Replaces 8319674
ϕ37	8350082	2	2	2	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
ϕ38	8174780	3	3	3	GASKET .. .312 I.D. x .500 O.D. x .062 in. thick
39	8451831	1	1	1	GLASS .. Sight
40	8319675	1	1	1	CAP .. Gauge - 9/16-18 thread
*40A	9328197	1	1	1	GAUGE ASSEMBLY .. Oil level - Repl. 8113998 and 8442288
41	8113999	1	1	1	ELBOW .. Oil gauge
42	8152070	1	1	1	GEAR .. Idler
43	8152069	1	1	1	GEAR .. Drive
44	8383167	1	1	1	SPRING .. Speeder
45	8217607	1	1	1	PLUG ASSEMBLY .. Spring check
46	456350	1	1	1	PIN .. Stop
*47	8238927	1	1	1	SLEEVE ASSEMBLY .. Rotating - Repl. by 9327175 - See Page 36
48	8160610	1	1	1	GEAR ASSEMBLY .. Ball head - Includes sleeve
49	8149343	1	1	1	PLUNGER .. Pilot valve
50	8149341	1	1	1	BUSHING .. Compensating
51	274416	1	1	1	RING .. Snap - Bushing - Pilot valve body
*52	8353912	1	1	1	BALL HEAD ASSEMBLY
53	8149340	2	2	2	ARM ASSEMBLY .. Ball
54	148401	4	4	4	BEARING .. Needle - 1/4 in. shaft
55	8228384	1	1	1	COUPLING ASSEMBLY .. Spring drive
56	103361	8	8	8	PIN .. Cotter - 1/16 x 1/2 in. long
57	8149338	4	4	4	PIN .. Ball arm
58	8353911	1	1	1	RETAINER .. Ball head
59	8353910	1	1	1	BALL HEAD .. Governor
60	121839	1	1	1	SCREW .. 6-32 x 5/16 round head
61	131181	1	1	1	WASHER .. Lock - No. 6
62	8152338	1	1	1	SPRING .. Adjusting - Pilot valve
63	8068098	1	1	1	WASHER .. Plain - 5/16
64	8149345	1	1	1	BEARING .. Thrust
65	8149346	1	1	1	SEAT .. Speeder spring
66	8350083	1	1	1	ROD ASSEMBLY .. Shutdown
67	8017599	1	1	1	NUT .. Plunger - Pilot valve
68	107761	1	1	1	PIN .. Cotter 1/16 x 5/8 in. long
69	8160641	1	1	1	BEARING .. Ball
70	8284037	2	2	2	NUT .. Shutdown rod - 8-32 hex.
71	8447875	1	1	-	COLUMN ASSEMBLY .. Governor - Includes bushings and studs
*71		-	-	1	COLUMN ASSEMBLY .. Governor
72	8113839	1	1	-	SPRING .. Regulating bushing
73	8113848	1	1	-	GEAR .. Drive - Pilot valve bushing
74	8167317	1	1	-	BUSHING .. Speed adjusting pilot valve - Except governors 8469802, 8453389 and 9097320
74	8377907	1	-	-	BUSHING .. Speed adjusting pilot valve - Governors 8469802, 8453389 and 9097320
74	8275539	-	-	1	BUSHING .. Speed adjusting pilot valve
75	8113815	1	1	-	BUSHING .. Regulating
76	8113835	3	3	2	SPRING .. Pilot valve plunger
77	8113830	1	1	1	BEARING .. Thrust
78	8113833	1	1	3	PIN .. Straight - 1/8 x 3/4 drilled head
79	8113831	1	1	1	PIN .. Pilot valve - 1/8 x 9/16 in. long
80	119981	3	3	-	PIN .. Cotter - 1/16 x 3/8 in. long
81	9333520	1	1	-	LEVER .. Floating - Lower - Repl. 8383169 { Must be applied with Ref. No. 239 - 9333521 Plate

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
		A	B	C	GOVERNOR ASSEMBLY .. Engine
82	8113816	1	1	-	RETAINER .. Regulating bushing
83	6101223	1	1	-	WASHER .. Plain - Retainer spring - 5/8
84	8113845	1	1	-	SPRING .. Regulating bushing retainer
85	8113817	1	1	-	COLLAR .. Retaining spring
86	181566	1	1	-	BOLT .. Retainer - 1/4-28 x 3/4 hex. head
87	8113991	3	3	3	WASHER .. Plain - 1/4
88	8113822	1	1	1	SCREW .. Retainer - Special - 1/4-28
89	8113840	1	1	1	SPRING .. Solenoid counterbalance
90	8131473	1	1	1	SPRING .. Pilot valve bushing
91	8235782	1	1	1	VALVE ASSEMBLY .. By-pass
92	8235784	1	1	1	PLUNGER ASSEMBLY .. By-pass valve
93	8444617	1	1	1	SEAL .. O-ring - Valve body - Replaces 8223697
94	456342	1	1	1	PIN .. Straight - 1/16 x 7/16 in. long
95	8235785	1	1	1	NUT .. Seal retainer
96	8235786	1	1	1	RETAINER .. Sleeve
97	8235787	1	1	1	SEAT .. By-pass valve spring
98	8235788	1	1	1	SPRING .. Seal retainer
99	8235789	1	1	1	SPRING .. By-pass valve
100	9318632	1	1	1	WASHER .. Seal - Replaces 8235790
101	8235783	1	1	1	BODY .. By-pass valve
102	8468489	1	-	1	BUSHING .. Pilot valve - Load control - Except governors 8469802, 8453389 and 9097320
102	8383170	1	-	-	BUSHING .. Pilot valve - Load control - Governors 8469802, 8453389 and 9097320
102	8227009	-	1	-	BUSHING .. Pilot valve - Load control
103	8113805	1	-	1	PLUNGER .. Pilot valve - Load control
103	8188851	-	1	-	PLUNGER .. Pilot valve - Load control
104	8113849	1	1	1	GASKET .. Oil seal - Load control
105	8047553	1	1	1	SEAL .. Oil - Load control plunger
106	9413362	1	1	1	RING .. Retaining - Load control pilot valve bushing
107	8113807	1	1	1	PISTON .. Overriding
108	8113806	1	1	1	COLLAR .. Spring
109	8129778	2	2	2	NUT .. 5/16-24 hex.
110	8113843	1	1	1	SPRING .. Valve - Outer
111	8126520	1	1	1	SPRING .. Valve - Inner
112	8188850	1	1	1	RETAINER .. Spring
113	8113827	1	1	1	RETAINER .. Snap ring
114	8132087	1	1	-	WASHER .. Indicator
115	8113800	19	19	-	WASHER .. Lock - 1/4
116	9087347	2	2	3	SEAL .. O-ring - .239 I.D. - Replaces 8223696
117	8113836	1	1	1	SPRING .. Plunger
118	8231570	1	1	1	PLUNGER .. Pilot valve
*119	8149302	1	1	-	SERVO ASSEMBLY .. Speeder spring
*119	8284078	-	-	1	SERVO ASSEMBLY .. Speeder spring
120	8217606	1	1	1	PISTON .. Power
121	8113963	1	1	1	CYLINDER .. Power
122	222384	1	1	1	SCREW .. Set - Piston stop - 10-32 x 1-1/4 hex. socket
123	120614	1	1	1	NUT .. 10-32 hex.
124	8113967	1	1	-	FULCRUM .. Power piston
124	8284088	-	-	1	FULCRUM .. Power piston
125	8113971	1	1	1	SCREW .. Special - Adjusting
126	8134415	1	1	1	PIN .. Straight - 3/16 x 3/4 in. long
127	8113662	3	3	3	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
128	8113772	1	1	1	SPRING .. Link - Adjusting
129	8113764	1	1	1	PIN .. Fulcrum
130	8113977	1	1	1	NUT .. Lock - 10-32 hex.
131	8113970	2	2	2	LEVER .. Power piston - Replaces 8145336 lever asm.

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
		A	B	C	GOVERNOR ASSEMBLY .. Engine
	8149302	1	1	-	SERVO ASSEMBLY .. Speeder spring
	8284078	-	-	1	SERVO ASSEMBLY .. Speeder spring
132	8113973	1	1	1	LINK .. Floating lever
133	8113974	1	1	1	PIN .. Straight - 1/8 x 1 in. long
134	8113976	2	2	4	LINK .. Spacer
135	119981	3	3	3	PIN .. Cotter - 1/16 x 3/8 in. long
136	8452881	1	1	1	LINK .. Pivot pin - Replaces 8113972
137	8113832	2	2	2	PIN .. Headed - 3/16 x 25/32 in. long
138	8113975	1	1	-	STUD .. Cover
138	8284089	-	-	1	STUD .. Cover
139	8149306	1	1	1	SCALE .. Speed indicator
140	148028	1	1	1	SCREW .. 10-32 x 3/8 round head - Cross recess
141	8134416	2	2	2	BOLT .. 1/4-28 x 1-3/8 hex. head
142	8113841	1	1	-	SPRING .. Servo - Except govs. 8469802, 8453389 and 9097320
142	8482433	1	-	-	SPRING .. Servo - Govs. 8469802, 8453389 and 9097320
142	8348345	-	-	1	SPRING .. Servo
143	8113844	1	1	1	SPRING .. Link - Floating lever
144	8149959	1	1	-	LEVER ASSEMBLY .. Adjusting floating - Formerly applied
*144	8479252	1	1	-	LEVER ASSEMBLY .. Adjusting floating - Currently applied
*144		-	-	1	LEVER ASSEMBLY .. Adjusting floating
145	8113771	1	1	-	BLOCK .. Adjusting - Applicable to 8149959 lever only
145	8433219	1	1	-	BLOCK .. Adjusting - Applicable to 8479252 lever only
146	8113767	1	1	-	KNOB .. Adjusting screw
147	8113768	1	1	-	PIN .. Adjusting screw
148	8113770	1	1	-	ECCENTRIC .. Applicable to 8149959 lever only
148	8479253	1	1	-	ECCENTRIC .. Wide link - Applicable to 8479252 lever only
149	119981	2	2	-	PIN .. Cotter - 1/16 x 3/8 in. long
*149A	8433217	1	1	-	PIN .. Movable fulcrum - Applicable to 8479252 lever only
150	138211	1	1	-	SCREW .. 1/4-28 x 3/4 - Applicable to 8149959 lever only
150	442039	1	1	-	SCREW .. Cap - 8-32 x 7/8 - Applicable to 8479252 lever only
151	8113772	1	1	-	LINK .. Adjusting spring
*151A	8479254	2	2	-	LINK .. Bent pilot valve - Appl. to 8479252 lever only
*151B	8113761	1	1	-	WASHER .. Solenoid
*152	8460060	1	1	-	RECEIVER ASSEMBLY .. Electric
*152		-	-	1	RECEIVER ASSEMBLY .. Electric
153	8113683	5	5	-	PLUNGER .. Solenoid
154	8163953	5	5	-	GUIDE ASSEMBLY .. Solenoid plunger
155	8113743	5	5	-	PIN .. Locating
156	8133719	10	10	-	BUSHING .. Plunger guide
*157	8459854	1	1	-	CONNECTOR ASSEMBLY .. Wiring
*158	8329355	A.R.		-	WIRE .. Teflon - Black
*159	8329356	A.R.		-	WIRE .. Teflon - Red
*160	8329357	A.R.		-	WIRE .. Teflon - Blue
*161	8329358	A.R.		-	WIRE .. Teflon - White (25 ft. length)
*162	8329359	A.R.		-	WIRE .. Teflon - Yellow
*163	8329360	A.R.		-	WIRE .. Teflon - Green
*164	8329361	A.R.		-	WIRE .. Teflon - Pink
*165	8200229	2	2	-	LUG .. Terminal - No. 6 stud - Non-insulated
166	8460061	1	1	-	RECEPTACLE .. 16 pole male
167	8113681	5	5	-	CASE .. Solenoid
168	8113684	5	5	-	ROD .. Solenoid plunger
169	8113761	5	5	-	WASHER .. Solenoid
170	8113738	5	5	-	PLUG .. Plunger stop
171	8113739	5	5	-	NUT .. Lock - 3/4-32 hex.
172	8113989	5	5	-	SPRING .. Load
173	8459959	1	1	-	PLATE .. Connector
174	8113740	1	1	-	COVER .. Wiring
175	8202849	1	1	-	BRACKET .. Switch mounting
176	8113744	10	10	-	WASHER .. Soldering shield - 1/2 O.D.

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
		A	B	C	GOVERNOR ASSEMBLY .. Engine
	8460060	1	1	-	RECEIVER ASSEMBLY .. Electric
		-	-	1	RECEIVER ASSEMBLY .. Electric
177	140880	5	5	-	SCREW .. Set - 10-32 x 1/4 hex. socket head
178	8113745	5	5	-	RING .. Snap - .187 O.D.
179	8113746	3	3	-	NUT .. Speed
180	8377913	2	2	-	SCREW .. 10-32 x 2-5/16 fil. head - Cross recess
*181	8152184	10	10	-	TUBING .. Teflon - .337 I.D.
182	145154	3	3	-	SCREW .. Tapping - 8-18 x 1-1/4 round head
183	155998	4	4	-	SCREW .. 10-32 x 3/8 flat head - Cross recess
*184	8116931	A.R.		-	CEMENT .. Gasket - Sold in 1 pint can
185	120217	2	2	-	WASHER .. Lock - No. 10
186	8113755	1	1	-	SWITCH .. Toggle
187	8113756	5	5	-	COIL .. Solenoid - 700 Ohms
188	8129082	5	5	-	PAPER .. Insulating
189	8468488	1	1	-	GASKET .. Connector assembly - Formerly 8459852
190	8202850	1	1	-	PLATE .. Switch mounting

Reference numbers 191 thru 199 not used.

200	8191876	1	1	-	BRACKET .. Solenoid
*201	9433508	4	4	-	SCREW .. Formerly 9433265
*202	131043	4	4	-	WASHER .. Lock - No. 4 split
*203	8113773	1	1	-	PLUNGER ASSEMBLY .. Shutdown
*203		-	-	1	PLUNGER ASSEMBLY .. Shutdown
204	8113775	1	1	-	PLUNGER .. Shutdown
*205	8113779	1	1	-	TUBING .. Plunger
206	8444618	1	1	-	SEAL .. O-ring - Replaces 8223698
207	3292030	1	1	-	SPRING .. Relief valve
208	8113778	1	1	-	PIN .. Spring - 5/32 x 3/4 in. long
209	104918	1	1	-	BALL .. 1/4 in. diameter
210	8113774	1	1	-	PIN .. Plunger
211	8113776	1	1	-	SEAT .. Ball valve
212	8113811	1	1	-	PISTON .. Oil failure
213	8113838	1	1	-	SPRING .. Oil failure piston
214	8113846	1	1	-	SPRING .. Shutdown plunger
215	8113780	1	1	-	BUSHING .. Oil failure valve
216	8113850	1	1	-	GASKET .. Oil failure bushing
217	217940	1	1	-	SCREW .. Cap - Bushing retainer - 1/4-28 x 3/8 hex. socket head
218	8163437	1	1	-	WASHER .. Plain - 1/4
219	8193508	1	1	-	PLUNGER .. Oil failure
220	8113819	1	1	-	WASHER .. Diaphragm
221	8158716	1	1	-	DIAPHRAGM .. Lube oil
*221		-	-	1	DIAPHRAGM .. Lube oil
222	5939163	1	1	-	NUT .. Diaphragm - 10-32 hex.
223	8113837	1	1	-	SPRING .. Diaphragm
224	8429435	1	1	-	CAP .. Diaphragm - Lube oil
225	8201611	1	1	-	PLATE .. Column side
*225		-	-	1	PLATE ASSEMBLY .. Filter and side
226	8201610	1	1	-	GASKET .. Side plate
227	138211	7	7	-	SCREW .. Cap - 1/4-28 x 3/4 hex. socket head
*228	181568	2	2	-	SCREW .. Cap - 1/4-28 x 1 hex. head
229	9093702	2	2	-	SEAL .. O-ring - 1.734 I.D. - Replaces 8223701
230	444040	1	1	1	ELBOW .. Street - 1/4 M.P.T. - 90°
231	118752	4	4	4	CONNECTOR .. 3/8 M.P.T. x 1/2 tube
232	138216	4	4	2	SCREW .. Diaphragm cap - 1/4-28 x 2 hex. socket head
233	8040382	1	1	1	TEE .. 1/4 M.P.T. x 1/4 tube x 1/4 tube
234	138214	3	3	-	SCREW .. Side plate - 1/4-28 x 1-1/2 hex. socket head

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
		A	B	C	GOVERNOR ASSEMBLY .. Engine
235	8113832	1	1	-	PIN .. Headed - 3/16 x 25/32 in. long
236	139009	1	1	1	SCREW .. Set - 1/4-28 x 1/4 hex. socket head
237	444687	7	7	-	PLUG .. Pipe - 1/8 M.P.T. hex. socket
238	8160339	1	1	1	CUP ASSEMBLY .. "D" solenoid
239	9333521	1	1	1	PLATE ASSEMBLY .. Triangular { Repl. 8459855 - Must be applied with Ref. No. 81 - 9333520 Lever
*240	223004	1	1	1	SCREW .. Socket head - Dog point
241	8147713	3	3	3	SCREW .. 1/4-28 x 2-3/8 fil. head
242	8113823	1	1	-	STUD .. Bearing
243	8348618	1	1	-	PLUG .. Pipe - 1/4 M.P.T. socket head - Repl. 444691
244	8429434	1	1	-	PLUG .. Low vacuum hole
245	8433771	1	1	-	WASHER .. Lube oil diaphragm
246	8460088	2	2	-	SCREW .. 1/4-28 x 3/4 fil. head
247	446186	2	2	-	WASHER .. Plain - 1/4 I.D. x 1/2 O.D. x .049 thick
248	8288663	A.R.		-	WIRE .. Lock - Steel - .026 in. diameter - Sold in 1 lb. spool - Approximately 1 ft. required
249	8460089	1	1	-	BLOCK .. Retainer - Ball head
250	8113810	1	1	-	CYLINDER .. Overriding
250		-	-	1	CYLINDER .. Overriding
251	8293770	1	1	-	INDICATOR .. Load control - Replaces 8113847
*252	8113808	1	1	-	HEAD .. Cylinder
253	8017584	2	2	-	SCREW .. Taper
254	155173	1	1	-	SCREW .. 10-32 x 1/4 round head - Cross recess
255	8113662	1	1	-	WASHER .. Lock - 3/16
256	8113869	1	1	1	GASKET .. Column to case - Transfer hole
257	8113870	1	1	1	GASKET .. Case to column
258	8367213	1	1	1	COVER ASSEMBLY .. Governor
259	8131835	2	2	2	BUSHING .. Cover doweling
260	8017559	1	1	1	CUP .. Oil filler
261	8140550	1	1	1	GASKET .. Cover
262	8365140	2	2	2	BOLT .. Cover - 5/16-24 x 7-1/4 hex. head drilled
263	8068098	6	6	6	WASHER .. Plain - 5/16
*264	9332176	1	1	1	LABEL .. Piping - Set of 10 decals - Replaces 8113865
*265	119981	1	1	1	PIN .. Cotter - Tail rod - 1/16 x 3/8 in. long
*266	8113832	1	1	1	PIN .. Headed - 3/16 x 25/32 in. long
*267	107761	-	1	-	PIN .. Cotter - 1/16 x 5/8 in. long
*268	8460052	1	1	1	CYLINDER ASSEMBLY .. Power - With rotary terminal shaft
269	8460058	1	1	1	CYLINDER .. Power
270	8201590	1	1	1	PISTON .. Power - Compensating
271	8113656	1	1	1	RING .. Spring guard seal
272	8113657	1	1	1	ROD .. Power piston tail
273	8113658	1	1	1	NUT .. Tail rod lift - 3/8-24
274	9411494	2	2	2	RING .. Snap - .338 I.D.
275	8201591	1	1	1	BEARING .. Needle - Terminal shaft
276	456382	1	1	1	BEARING .. Needle - Terminal shaft
277	8061742	1	1	1	SEAL .. Oil - 1.379 O.D. x 13/16 I.D. x 13/32 in. diameter
278	8211818	1	1	1	SEAL .. Oil - 1.379 O.D. x 11/16 I.D. x 13/32 in. diameter
279	8446617	1	1	1	SEAL .. O-ring - Needle valve - Replaces 8223697
280	8223700	1	1	1	SEAL .. O-ring - Spring guard - 2.093 I.D. x 2.500 O.D.
281	8201604	1	1	1	PIN .. Piston rod
282	444687	1	1	1	PLUG .. Pipe - 1/8 M.P.T. hex. socket head
283	120423	4	4	4	WASHER .. Lock - 1/4 - Internal teeth
284	115549	1	1	1	WASHER .. Lock - 3/8 - Internal teeth
285	8057114	2	2	2	WASHER .. Lock - 5/16
286	145368	2	2	2	SCREW .. Drive - Scale - No. 2 x 3/16 round head
287	217908	2	2	2	SCREW .. Cap - 5/16-18 x 7/8 hex. socket head
288	9413435	2	2	2	RING .. Snap - Rod pin

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	Description
					GOVERNOR ASSEMBLY .. Engine
289	8113663	1	1	1	NUT .. Lock - 3/8-24 hex.
290	138211	8	8	8	SCREW .. Cap - 1/4-28 x 3/4 hex. socket head
291	138212	1	1	1	SCREW .. Cap - 1/4-28 x 1 hex. socket head
292	8134427	4	4	4	BOLT .. Spring guard - 1/4-28 x 1/2 hex. socket head
293	8113800	10	10	10	WASHER .. Lock - 1/4
294	8149705	1	1	1	WASHER .. Lock - 1/4 split
295	8201593	1	1	1	NUT .. Lock - 7/16-20 hex.
296	8113664	1	1	1	SPRING .. Guard seal
297	8149111	1	1	1	SPRING .. Servo
298	8460056	1	1	1	SCALE .. Terminal shaft
299	8152339	1	1	1	GASKET .. Guard to power cylinder
300	8201595	1	1	1	GASKET .. Cover to power cylinder
301	8459853	1	1	1	LEVER .. Rack dial
302	8460055	1	1	1	POINTER .. Rack scale
303	8149113	1	1	1	VALVE .. Needle
304	8326406	1	1	1	GUARD ASSEMBLY .. Spring
*305	452652	1	1	1	INSERT .. Helicoil
306	8201598	1	1	1	COVER .. Power cylinder
307	8201599	1	1	1	LEVER .. Power - Serrated
308	8201600	2	2	2	LINK .. Power piston
309	8201601	1	1	1	PIN .. Power lever
310	8460057	1	1	1	SHAFT .. Terminal - Serrated
311	111840	1	1	1	PIN .. Taper - 3/4 in. long
*312	8326407	1	1	1	SCREW .. Stop
*313	120613	1	1	1	NUT .. Lock - 1/4-28 hex.
314	427729	2	2	2	SCREW .. Cap - 1/4-28 x 5/8 hex. socket head
315	8460054	1	1	1	SCREW .. Nylock
316	8460059	1	1	1	BRACKET .. Rack pointer scale
317	8429419	1	1	-	ACCUMULATOR ASSEMBLY .. Low lube oil - Square body - Replaced by 8482432 - See Ref. No. 332
318	8113811	1	1	-	PISTON .. Oil failure
319	120614	4	4	-	NUT .. 10-32 hex.
320	120217	4	4	-	WASHER .. Lock - No. 10
321	8327416	4	4	-	WASHER .. .225 I.D. x .400 O.D. x .031 in. thick
322	8393771	2	2	-	ELBOW .. 1/4 tube x 1/8 M.P.T.
323	117608	4	4	-	SCREW .. 10-32 x 3 fil. head slotted
324	225585	4	4	-	SCREW .. 1/4-28 x 2-1/4 fil. head slotted
325	8429426	1	1	-	SPRING .. Accumulator
326	8429427	2	2	-	GASKET .. Accumulator cover
327	8429428	1	1	-	GASKET .. Accumulator body to case
328	8429429	1	1	-	COVER .. Accumulator
329	8429430	1	1	-	COVER .. Accumulator
330	8429431	1	1	-	TUBE .. Accumulator
331	8429432	1	1	-	BODY .. Accumulator
332	8482432	1	1	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Round body - Replaces 8429419 - See Ref. No. 317
333	8113811	1	1	1	PISTON .. Oil failure
334	8327416	4	4	4	WASHER .. .225 I.D. x 4 O.D. x .031 in. thick
335	190741	4	4	4	SCREW .. 1/4-28 x 1 - Fillister head
336	8393771	2	2	2	ELBOW .. 1/4 tube x 1/8 M.P.T.
337	8429426	1	1	1	SPRING .. Accumulator
338	8482434	1	1	1	GASKET .. Accumulator body to case
339	8488280	1	1	1	BODY .. Accumulator - Replaces 8482435
340	8488281	1	1	1	TUBE .. Accumulator - Replaces 8482436

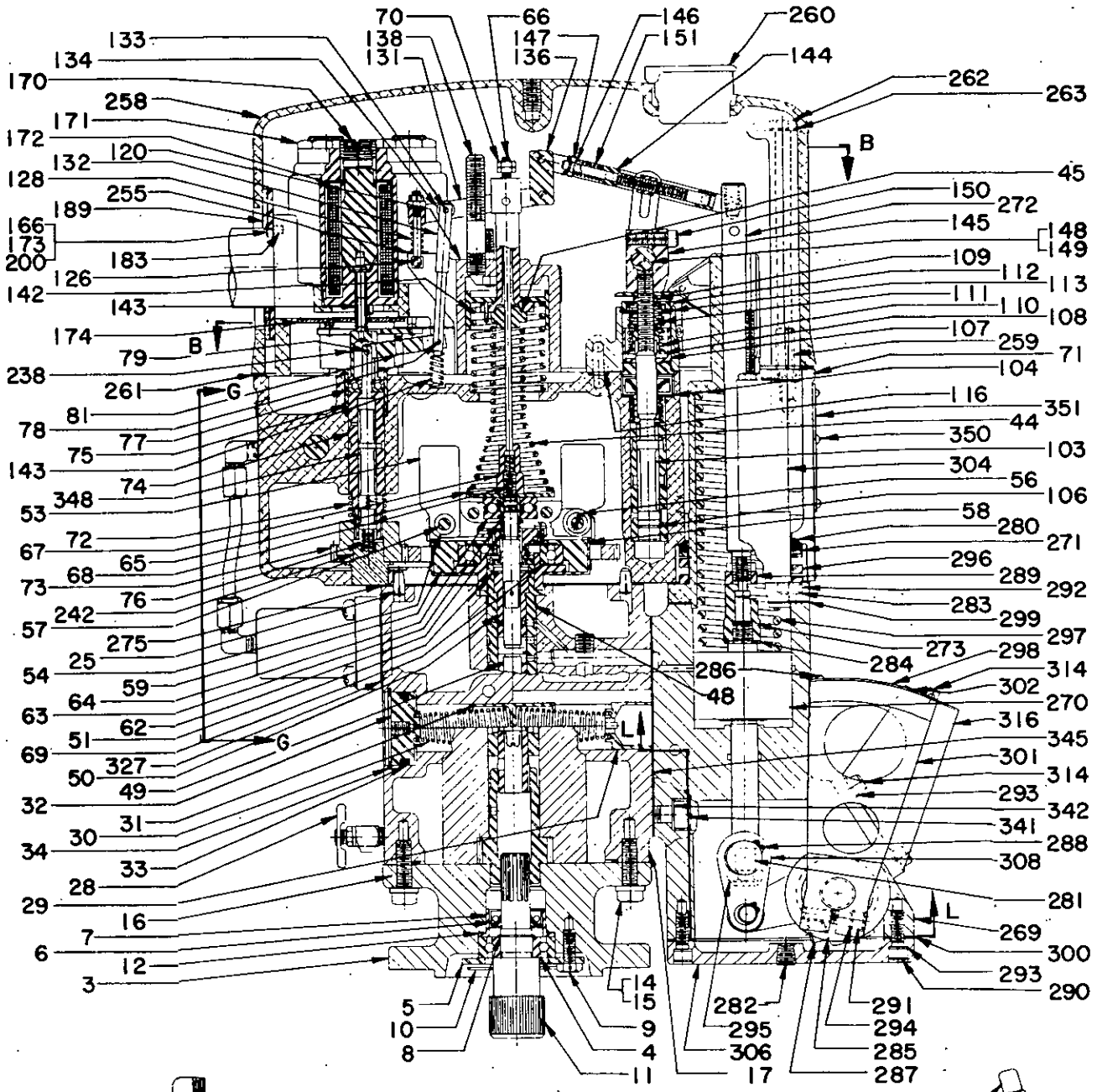
P.L. No. F166

GOVERNOR ASSEMBLY

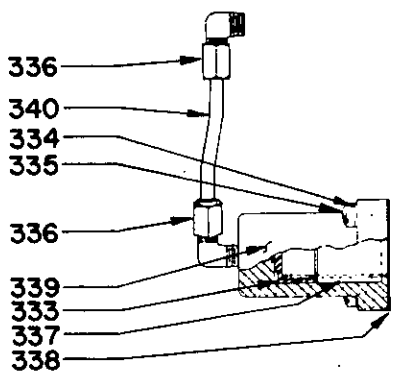
Ref. No.	Part Number	Quantity Required A	B	C	Description
					GOVERNOR ASSEMBLY .. Engine
341	138242	4	4	4	SCREW .. Cap - Power cylinder to power case - 3/8-16 x 1 hex. socket hd.
342	8152079	4	4	4	WASHER .. Lock - 3/8
343	8152077	2	2	2	PLATE .. Name - Bleed hole
344	220342	6	6	6	SCREW .. Drive - Bleed hole name plate
345	8483071	1	1	-	GASKET .. Power cylinder case - Replaces 8152078
*346	8356332	1	1	1	PLATE .. Name - Column
*347	8356333	1	1	1	INSERT .. Name plate - Blank
348	8284087	1	1	1	PLUNGER .. Speed setting - Pilot valve
349	8419697	1	1	1	DECAL .. Caution - Not furnished separately - Included in Ref. No. 264
350	9327637	2	2	2	SCREW .. Name plate insert - No. 5-40 x 1/4 - Replaces 432267
351	159572	4	4	4	SCREW .. Column name plate - 8-32 x 1/4 - Pan head
*352	8132974	2	2	2	CAP .. Plastic - 7/16-20 } Shipping purposes only
*353	8132975	1	1	1	CAP .. Plastic - 5/8-18 } Shipping purposes only
*354	8132976	4	4	4	CAP .. Plastic - 3/4-16 } Shipping purposes only
355	8201587	4	4	4	BOLT .. Column to case - 5/16-24 x 4-3/4 hex. head
*356	8284040	-	-	1	BEAM .. Connecting
*357		-	-	1	SENSOR ASSEMBLY .. Pressure
*358	8453146	1	1	1	PLUG .. Governor - 16 pole - Female

P.L. No. F166

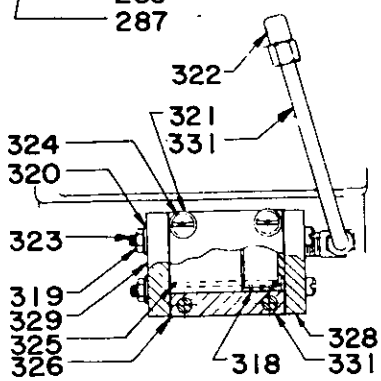
GOVERNOR ASSEMBLY



Ref. Nos. 1 and 2
SECTION A-A



SECTION G-G
Ref. No. 332

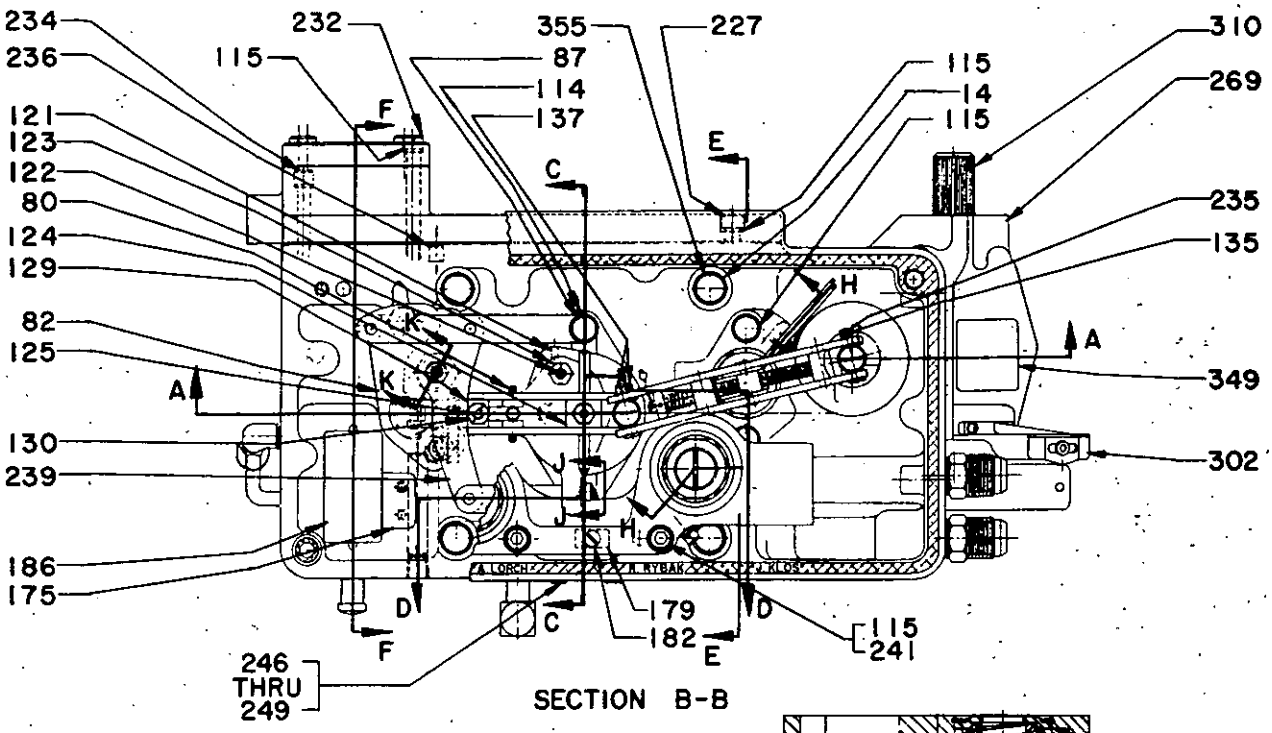


Ref. No. 317

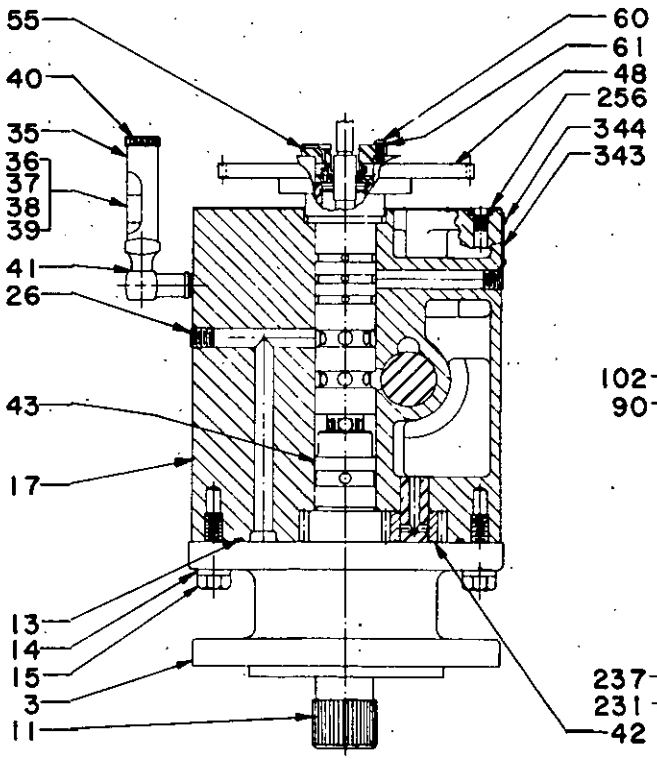
PLATE A166-8

P.L. No. F166

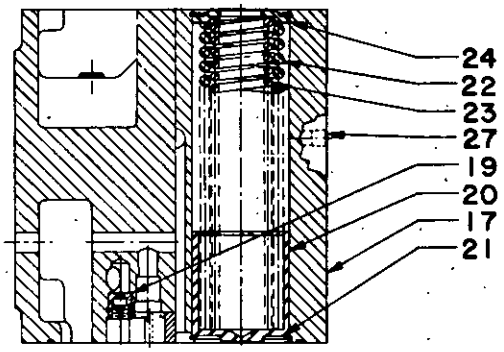
GOVERNOR ASSEMBLY



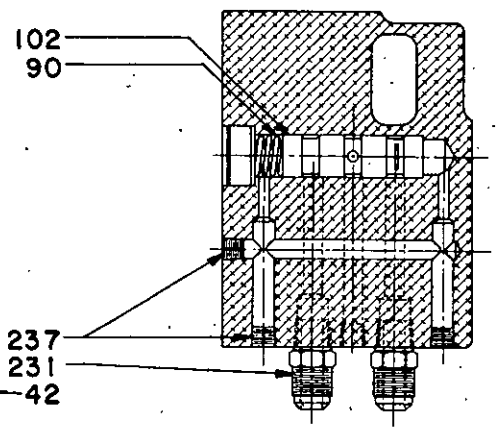
SECTION B-B



SECTION C-C



SECTION D-D

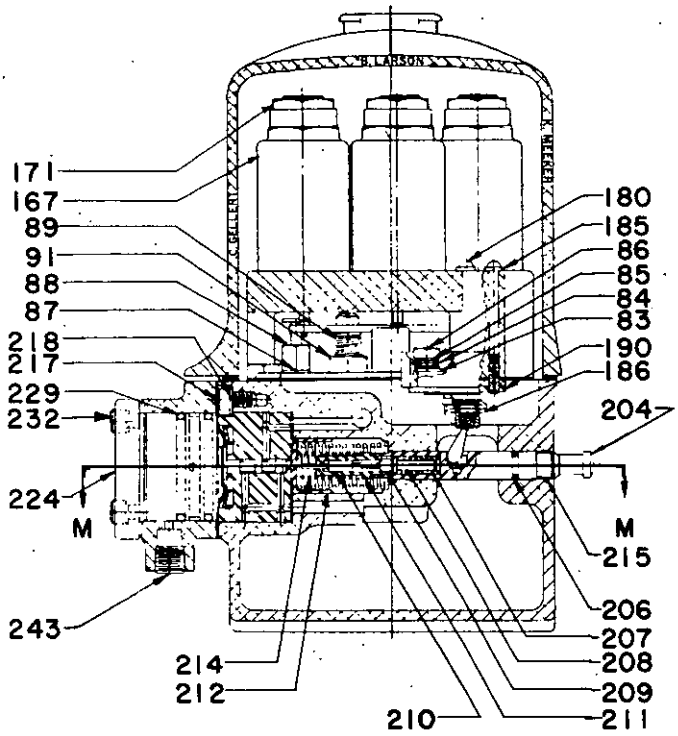


SECTION E-E

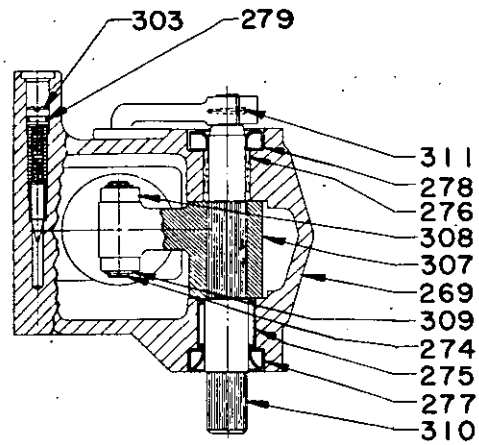
PLATE A166-9

P.L. No. F166

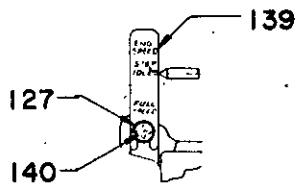
GOVERNOR ASSEMBLY



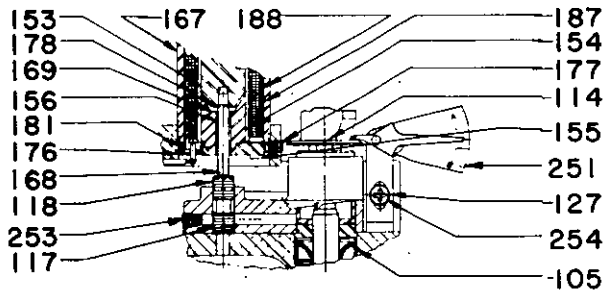
SECTION F-F



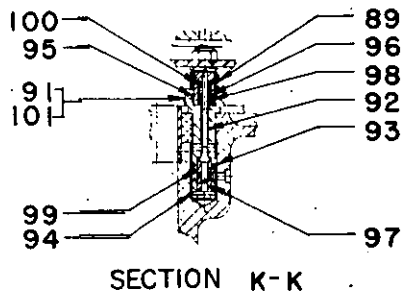
SECTION L-L



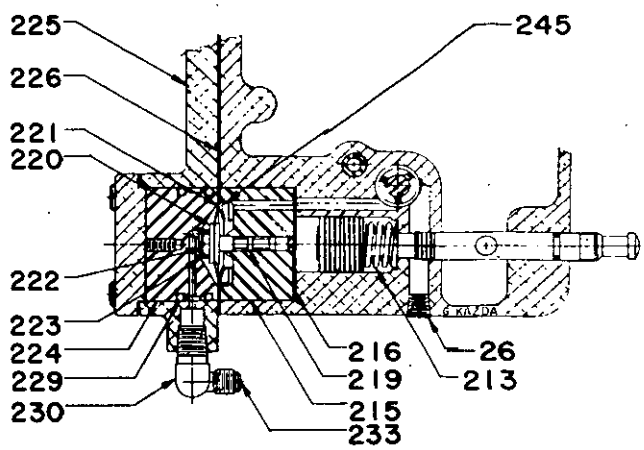
SECTION J-J



SECTION H-H



SECTION K-K



SECTION M-M

PLATE A166-10

GOVERNOR ASSEMBLY

16 Pole Electro-Hydraulic PGR Governors
12,16,20-645E; 16-645E3A; 8,12,16,20-645E3B;
8,12,16-645E3C; 12,16-645F3, and 8,12,16-645F3B Engines
Plates B166-11 thru B166-14 and A166-15

GOVERNOR REFERENCE CHART

Ref. No. 1 Governor Part No.	RPM	Rack	Col.	Ref. No. 1 Governor Part No.	RMP	Rack	Col.	Ref. No. 1 Governor Part No.	RMP	Rack	Col.
8453648	900	.83	A	/8489288	900	.83	C	/9512180	893	.78	E
/8453921	900	.83	A	/8483536	900	.83	D	9516898	900	.80	E
/8453922	900	.78	A	/9322619	900	.87	D	/9531867	954	.78	E
/8453923	900	.87	A	9329963	900	.80	D	/9532462	954	.78	E
/8453924	900	.87	A	/9334835	900	.87	D	/9536860	900	.84	E
/8466096	900	.83	A	/9334836	900	.90	D	/9537086	900	.80	E
/8466097	900	.87	A	9334837	923	.74	D	/9544681	954	.76	E
/8466098	900	.87	A	/9334838	900	.80	D	/9545952	954	.84	E
/8466099	900	.92	A	/9512178	900	.82	D	/9546048	900	.84	E
8469954	900	.83	A	/9532792	900	.80	D	/9549965	916	.84	E
/8474937	900	.90	A	/9546810	900	.83	D	/9552511	900	.80	E
/8492049	900	.92	A	/9549691	900	.84	D	/9553548	900	.83	E
8494889	923	.74	A	/9549693	900	.84	D	/9553572	954	.82	E
/9084021	900	.83	A	/9328422	916	.78	E	/9556512	954	.78	E
/9090955	900	.83	A	/9335713	893	.83	E	/9559088	933	.86	E
/9098143	890	.83	B	/9335714	893	.83	E				
/9332869	893	.83	B	/9337153	900	.92	E				

/Indicates Governor has low idle setting

Governors listed in Columns D and E are equipped with single barrel fuel limiters

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
1	----						GOVERNOR ASY. .. Engine - See chart above and Pages 2, 3, and 4
2	8149658	1	1	1	1	1	BASE .. Governor
3	954298	1	1	1	1	1	BEARING .. Ball - Drive shaft
4	8062007	1	1	1	1	1	RETAINER .. Bearing
5	8149695	1	1	1	1	1	SEAL .. Oil
6	8149697	1	1	1	1	1	RETAINER .. Oil seal
7	8149677	1	1	1	1	1	RING .. Snap
8	8113929	3	3	3	3	3	BOLT .. Bearing retainer to base - 1/4-28 x 5/8 hex. hd. drilled
9	8288663	As Required					WIRE .. Lock - .026 in. diameter - Available 500 ft. length
10	8149696	1	1	1	1	1	SHAFT .. Drive
11	8149679	1	1	1	1	1	GASKET .. Retainer to base
12	8152068	1	1	1	1	1	SEAL .. Oil - Case to base
13	120379	12	12	12	12	12	WASHER .. Lock - 5/16
14	179818	8	8	8	8	8	BOLT .. Case to base - 5/16-18 x 1 hex. head
15	103613	2	2	2	2	2	PIN .. Dowel - Case to base - No. 5 x 3/4 in. long
16	8429420	1	1	1	1	1	CASE ASSEMBLY .. Power
*17	8149470	1	1	1	1	1	STUD .. Idler
18	8201045	2	2	2	2	2	PLUG .. Drive - Ball check
19	9413465	4	4	4	4	4	RING .. Snap - Accumulator
20	8149469	2	2	2	2	2	PISTON .. Accumulator
21	8149471	2	2	2	2	2	SPRING .. Accumulator - Outer
22	8057784	2	2	2	2	2	SPRING .. Accumulator - Inner
23	8149474	2	2	2	2	2	SEAT .. Spring - Retainer
24	8113672	2	2	2	2	2	PIN .. Grooved - Dowel case to column

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
25	444687	9	-	9	-	-	PLUG .. Pipe - 1/8 M.P.T. hex. socket
26	9409954	1	1	1	1	1	PLUG .. Pipe - 1/16 M.P.T. hex. socket
27	8118445	1	1	1	1	1	COCK .. Drain - 1/8 M.P.T.
28	8152071	1	1	1	1	1	SEAT .. Buffer spring
29	8152072	2	2	2	2	2	SPRING .. Buffer - Except governors 9536860 and 9546048
*29A	8326395	-	-	-	-	2	SPRING .. Buffer - Governors 9536860 and 9546048
30	8152073	1	1	1	1	1	PISTON .. Buffer
31	8152074	1	1	1	1	1	PLUG .. Buffer spring - 1-5/16 in. diameter
32	8478711	1	1	1	1	1	SEAL .. O-ring - Replaces 8223699
33	9413448	1	1	1	1	1	RING .. Snap - Buffer plug
34	8442288	1	1	1	1	-	GAUGE ASSEMBLY .. Oil level - Repl. by 9328197
35	8444618	2	2	2	2	-	SEAL .. O-ring - Replaces 8319674
ϕ36	8350082	2	2	2	2	-	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
ϕ37	8174780	3	3	3	3	-	GASKET .. .312 I.D. x .500 O.D. x .062 in. thick
38	8451831	1	1	1	1	-	GLASS .. Sight
39	8319675	1	1	1	1	-	CAP .. Gauge - 9/16-18 thread
*39A	9328197	1	1	1	1	1	GAUGE ASSEMBLY .. Oil level - Repl. 8113998 and 8442288
40	8113999	1	1	1	1	1	ELBOW .. Oil gauge
41	8152070	1	1	1	1	1	GEAR .. Idler
42	8152069	1	1	1	1	1	GEAR .. Drive
43	8383167	1	1	1	1	1	SPRING .. Speeder
44	8217607	1	1	1	1	1	PLUG ASSEMBLY .. Spring check
*45	456350	1	1	1	1	1	PIN .. Stop
*46	8269694	1	1	1	-	-	SLEEVE ASSEMBLY .. Rotating - Replaced by 9327175
*46A	9327175	1	1	1	1	1	SLEEVE ASSEMBLY .. Rotating - Replaces 8269694 - All governors except those listed in Ref. No. 70A
47	8160610	1	1	1	1	1	GEAR ASSEMBLY .. Ball head - Includes sleeve
48	8149343	1	1	1	1	1	PLUNGER .. Pilot valve
49	8149341	1	1	1	1	1	BUSHING .. Compensating
50	274416	1	1	1	1	1	RING .. Snap - Bushing - Pilot valve body
*51	8353912	1	1	1	1	1	BALL HEAD ASSEMBLY
52	8149340	2	2	2	2	2	ARM ASSEMBLY .. Ball
53	148401	4	4	4	4	4	BEARING .. Needle - 1/4 in. shaft
54	8228384	1	1	1	1	1	COUPLING ASSEMBLY .. Spring drive
55	103361	8	8	8	8	8	PIN .. Cotter - 1/16 x 1/2 in. long
56	8149338	4	4	4	4	4	PIN .. Ball arm
57	8353911	1	1	1	1	1	RETAINER .. Ball head
58	8353910	1	1	1	1	1	BALL HEAD .. Governor
59	121839	1	1	1	1	1	SCREW .. 6-32 x 5/16 round head
60	131181	1	1	1	1	1	WASHER .. Lock - No. 6
61	8152338	1	1	1	1	1	SPRING .. Adjusting - Pilot valve
62	8068098	1	1	1	1	1	WASHER .. Plain - 5/16
63	8149345	1	1	1	1	1	BEARING .. Thrust
64	8149346	1	1	1	1	1	SEAT .. Speeder spring
65	8291771	1	1	1	-	-	SPRING .. Shutdown rod
65		-	-	-	1	1	SPRING .. Shutdown rod
66	8291770	1	1	1	1	1	NUT .. Plunger - Pilot valve
67	8350084	1	1	1	-	-	ROD ASSEMBLY .. Shutdown - 7.375 in. long
67	8350086	-	-	-	1	-	ROD ASSEMBLY .. Shutdown - 7.812 in. long
68	107761	1	1	1	1	1	PIN .. Cotter - 1/16 x 5/8 in. long
69	8160641	1	1	1	1	1	BEARING .. Ball
70	8284036	2	2	2	2	2	NUT .. Shutdown rod - 8-32 hex.
70A		-	-	-	-	1	SLEEVE ASSEMBLY .. Rotating - Governors 9536860, 9544681, 9545952, 9546048, 9553572, and 9556512 only

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
71	9516196	-	-	-	-	1	COLUMN ASSEMBLY .. Includes bearing and stud - Governors 9335713, 9335714, 9512180, 9549965 and 9559088 only
71	9514006	1	-	1	1	1	COLUMN ASSEMBLY .. Includes bearing and stud - Formerly 8429433 - Governors 8466096, 8466097, 8466098, 8466099, 8469954, 8474937, 8483536, 8489288, 8494889, 8492049, 9084021, 9090955, 9322619, 9329963, 9334835, 9334836, 9334837, 9334838, 9337153, 9512178, 9516898, 9531867, 9532462, 9532792, 9536860, 9537086, 9544681, 9545952, 9546048, 9546810, 9549691, 9549693, 9553572, 9556512, 8453648, 8453921, 8453922, 8453923, 8453924 only
71	9333600	-	1	-	-	-	COLUMN ASSEMBLY .. Includes bearing and stud
72	8113848	1	-	-	1	1	GEAR .. Drive - Pilot valve drive bushing
73	8113839	1	1	-	1	1	SPRING .. Regulating bushing
74	8275539	1	1	1	1	1	BUSHING .. Speed adjusting pilot valve
75	8113815	1	1	-	1	1	BUSHING .. Regulating
76	8113835	2	2	-	2	2	SPRING .. Pilot valve plunger
77	8113830	1	1	-	1	1	BEARING .. Thrust
78	8113833	3	3	-	3	3	PIN .. Straight - 1/8 x 3/4 in. long drilled head
79	8113831	1	1	-	1	1	PIN .. Pilot valve - 1/8 x 9/16 in. long
80	119981	5	5	-	5	5	PIN .. Cotter - 1/16 x 3/8 in. long
81	8433212	1	1	-	-	-	LEVER ASSEMBLY .. Pickup - Includes stop block
81	9514004	-	-	-	1	1	LEVER ASSEMBLY .. Pickup
82	119981	1	1	-	-	-	PIN .. Cotter - 1/16 x 3/8 in. long
83	8113816	1	1	-	1	1	RETAINER .. Regulator bushing
84	6101223	1	1	-	1	1	WASHER .. Plain - Bushing retainer - 5/8
85	8113845	1	1	-	1	1	SPRING .. Bushing retainer
86	8113817	1	1	-	1	1	COLLAR .. Spring retainer
87	181566	1	1	-	1	1	BOLT .. Retainer - 1/4-28 x 3/4 hex. head
88	138211	4	4	-	4	1	SCREW .. Cap - Side plate - 1/4-28 x 3/4 socket head
89	8113991	3	3	-	3	3	WASHER .. Plain - Bushing retainer - 1/4
90	8113822	1	1	-	1	1	SCREW .. Retainer - Special - 1/4-28
91	8113840	1	1	-	1	1	SPRING .. Solenoid counter balance
91A	9567477	-	-	-	1	1	BUSHING .. Shutdown
91B	120368	-	-	-	1	1	NUT .. 5/16-24 hex.
92	8235782	1	1	1	1	1	VALVE ASSEMBLY .. By-pass
93	8235784	1	1	1	1	1	PLUNGER ASSEMBLY - By-pass valve
94	8444617	1	1	1	1	1	SEAL .. O-ring - Valve body - Replaces 8223697
95	456342	1	1	1	1	1	PIN .. Straight - 1/16 x 3/8 in. long
96	8235785	1	1	1	1	1	NUT .. Seal retainer
97	8235786	1	1	1	1	1	RETAINER .. Sleeve
98	8235787	1	1	1	1	1	SEAT .. By-pass valve spring
99	8235788	1	1	1	1	1	SPRING .. Seal retainer
100	8235789	1	1	1	1	1	SPRING .. By-pass valve
101	9318632	1	1	1	1	1	WASHER .. Seal - Replaces 8235790
102	8235783	1	1	1	1	1	BODY .. By-pass valve
103	8131473	1	1	1	1	1	SPRING .. Pilot valve bushing
104	8468489	1	1	1	1	1	BUSHING .. Pilot valve - Load control - All governors except 8453648, 8453921, 8453922, 8453923, 8453924 and 9337153
104A	9413362	1	1	-	1	1	RING.. Retainer - Load control pilot valve bushing
105	8146495	1	-	-	-	1	BUSHING .. Pilot valve - Load control - Governors 8453648, 8453921, 8453922, 8453923, 8453924, and 9337153
105A	9413362	1	-	-	-	1	RING .. Retaining - Load control pilot valve bushing

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
106	8113805	1	1	1	1	1	PLUNGER .. Pilot valve - Load control
107	8113849	1	1	-	1	1	GASKET .. Oil seal - Load control
108	8047553	1	1	-	1	1	SEAL .. Oil - Load control plunger
109	8113807	1	1	-	1	1	PISTON .. Overriding
110	8113806	1	1	1	1	1	COLLAR .. Spring
111	8129778	2	2	-	3	3	NUT .. Lock - 5/16-24 hex.
112	8113843	1	1	-	1	1	SPRING .. Valve - Outer
113	8126520	1	1	-	1	1	SPRING .. Valve - Inner
114	8188850	1	1	-	1	1	RETAINER - Spring
115	8113827	1	1	-	1	1	RING .. Snap - Retainer
116	8132087	1	1	-	1	1	WASHER .. Indicator
117	8113800	16	16	-	16	16	WASHER .. Lock - 1/4
118	9087347	2	2	-	2	2	SEAL .. O-ring - .239 I.D. - Replaces 8223696
119	8113836	1	1	-	1	1	SPRING .. Plunger
120	8231570	1	1	-	1	1	PLUNGER .. Pilot valve
*121	8284078	1	1	1	1	1	SERVO ASSEMBLY .. Speeder spring
122	8217606	1	1	1	1	1	PISTON .. Power
123	8113963	1	1	1	1	1	CYLINDER .. Power
124	222384	1	1	1	1	1	SCREW .. Set - Piston stop - 10-32 x 1-1/4 hex. socket
125	120614	1	1	1	1	1	NUT .. 10-32 hex.
126	8284088	1	1	1	1	1	FULCRUM .. Power piston
127	8113971	1	1	1	1	1	SCREW .. Special - Adjusting
128	8134415	1	1	1	1	1	PIN .. Straight - 3/16 x 3/4 in. long
129	8113662	3	3	3	3	3	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
130	8113772	1	1	1	1	1	SPRING .. Link - Adjusting
131	8113764	1	1	1	1	1	PIN .. Fulcrum
132	8113977	1	1	1	1	1	NUT .. Lock - 10-32 hex.
133	8145336	1	1	1	1	1	LEVER ASSEMBLY .. Power piston - Consist of two mated pieces
134	8113973	1	1	1	1	1	LINK .. Floating lever
135	8113974	1	1	1	1	1	PIN .. Straight - 1/8 x 1 in. long
136	8113976	4	4	4	4	4	SPACER .. Link
137	119981	3	3	3	3	3	PIN .. Cotter - 1/16 x 3/8 in. long
138	8452881	1	1	1	1	1	LINK .. Pivot pin - Replaces 8113972
139	8113832	2	2	2	2	2	PIN .. Headed - 3/16 x 25/32 in. long
140	8284089	1	1	1	1	1	STUD .. Speed setting
141	8149306	1	1	1	1	1	SCALE .. Speed indicator
142	148028	1	1	1	1	1	SCREW .. 10-32 x 3/8 round head - Cross recess
143	8134416	2	2	2	2	2	BOLT .. 1/4-28 x 1-3/8 hex. head
144	8348345	2	1	1	1	1	SPRING .. Speeder spring servo
145	8113844	1	1	1	1	1	SPRING .. Link - Floating lever
146	8433775	1	1	1	-	-	LEVER ASSEMBLY .. Adjustable floating
146	9514003	-	-	-	-	1	LEVER ASSEMBLY .. Adjustable floating - Governors 9516898, 9531867, 9532462, 9537086, 9544681, 9545952, 9553572, and 9556512 - Column E
146	9514437	-	-	-	1	1	LEVER ASSEMBLY .. Adjustable floating - Governors 9335713, 9335714, 9337153, 9512180, 9536860, 9546048, 9549965, 9552511, 9553548, 9559088, and 9328422, - Column E and all of Column D
147	8306003	1	1	1	1	1	SPRING .. Adjusting link
148	8113767	1	1	1	1	1	KNOB .. Adjusting screw
149	8113768	1	1	1	1	1	PIN .. Adjusting screw
150	8433219	1	1	1	1	1	BLOCK .. Adjusting
151	8433218	1	1	1	1	1	ECCENTRIC
152	119981	4	4	4	6	6	PIN .. Cotter - 1/16 x 3/8 in. long
153	8433217	1	1	1	1	1	PIN .. Movable fulcrum

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
		1	1	1	1	1	LEVER ASSEMBLY .: Adjustable floating - See Page 38
154	8433215	2	2	2	2	2	LINK .. Pilot valve
155	8433216	1	1	1	-	-	STRAP .. Pilot valve
155		-	-	-	1	1	STRAP .. Pilot valve
156	8446359	1	1	1	1	1	LINK .. Pilot valve
157	8214389	1	1	1	1	1	PIN .. Power lever - .880 in. long x .2493 in. dia.
158	8433225	1	1	1	1	1	PIN .. .812 in. long x .1865 in. dia.
159	442039	1	1	1	1	1	SCREW .. Cap - 8-32 x 7/8 in. long
160	3304054	2	2	2	2	2	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 in. thick
161	8460060	1	-	-	1	1	RECEIVER ASSEMBLY .. Electric - All governors - Col. A and D and governors 9337153, 9516898, 9531867, 9532462, 9536860, 9537086, 9544681, 9545952, 9546048, 9552511, 9553548, 9553572, and 9556512 - Column E
*161A	9333601	-	1	-	-	1	RECEIVER ASSEMBLY .. Electric - All governors Column B and governors 9335713, 9335714, 9512180, 9549965, and 9559088 - Column E
*161B	9520123	-	-	1	-	-	RECEIVER ASSEMBLY .. Electric
162	8113683	5	5	-	5	5	PLUNGER .. Solenoid
163	8163953	5	5	-	5	5	GUIDE ASSEMBLY .. Solenoid plunger
164	8113743	5	5	-	5	5	PIN .. Locating
165	8133719	10	10	-	10	10	BUSHING .. Plunger guide
*166	8459854	1	-	-	1	1	CONNECTOR ASSEMBLY .. Wiring - 8460060 Receiver
*166	9333604	-	1	-	-	1	CONNECTOR ASSEMBLY .. Wiring - 9333601 Receiver
*167	8329355	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Black } 25 Ft. Length
*168	8329356	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. Red
*169	8329357	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Blue
*170	8329358	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - White
*171	8329359	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Yellow
*172	8329360	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Green
*173	8329361	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Pink
*173A	8329364	A.R.		-	A.R.		WIRE .. 20 AWG. - Teflon insul. - Gray
*174	8200229	2	2	-	2	2	LUG .. Terminal - No. 6 stud - Non-insulated
*174A	8189218	-	2	-	-	2	LUG .. Terminal - No. 6 stud - Insulated crimp type } 9333601 Receiver
*174B	8480983	-	9	-	-	9	TUBING .. Heat shrinkable - 1/8 I.D. x 5/8 in. long
*174C	8481008	-	A.R.	-	-	A.R.	TUBING .. Teflon - No. 8 clear - 5 ft. long
175	8460061	1	1	-	1	1	RECEPTACLE .. Male - 16 pole
176	8113681	5	5	-	5	5	CASE .. Solenoid
177	8113684	5	5	-	5	5	ROD .. Solenoid plunger
178	8113761	5	5	-	5	5	WASHER .. Solenoid
179	8113738	5	5	-	5	5	PLUG .. Plunger stop
180	8113739	5	5	-	5	5	NUT .. Lock - 3/4-32 hex.
181	8113989	5	5	-	5	5	SPRING .. Load
182	8459959	1	1	-	1	1	PLATE .. Connector
183	8113740	1	1	-	1	1	COVER .. Wiring
184	8202849	1	1	-	1	1	BRACKET .. Switch mounting
185	8113744	10	10	-	10	10	WASHER .. Soldering shield - 1/2 O.D.
186	140880	5	5	-	5	5	SCREW .. Set - 10-32 x 1/4 hex. socket
187	8113745	5	5	-	5	5	RING .. Snap - .187 O.D.
188	8113746	3	3	-	3	3	NUT .. Speed
189	8377913	2	2	-	2	2	SCREW .. 10-32 x 2-5/16 fil. head - Cross recess
190	8152184	10	10	-	10	10	TUBING .. Teflon - .337 I.D. - 3/16 in. long
191	145154	3	3	-	3	3	SCREW .. Tapping - 8-18 x 1-1/4 round head
192	155998	4	4	-	4	4	SCREW .. 10-32 x 3/8 flat head - Cross recess
*193	131043	4	4	-	4	4	WASHER .. Lock - No. 4 - Split
*194	8116931	A.R.		-	A.R.		CEMENT .. Gasket - Sold in 1 pint can
195	120217	2	2	-	2	2	WASHER .. Lock - No. 10

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
	8460060	1	-	-	1	1	RECEIVER ASSEMBLY .. Electric - See Page 39
	9333601	-	1	-	-	1	RECEIVER ASSEMBLY .. Electric - See Page 39
	9520123	-	-	1	-	-	RECEIVER ASSEMBLY .. Electric
196	8113755	1	1	-	1	1	SWITCH .. Toggle
197	8113756	5	5	-	5	5	COIL .. Solenoid - 700 Ohms
198	8129082	5	5	-	5	5	PAPER .. Insulating
199	8468488	1	1	-	1	1	GASKET .. Connector assembly - Formerly 8459852
200	8202850	1	1	-	1	1	PLATE .. Switch bracket clamp
201	8191876	1	1	-	1	1	BRACKET .. Solenoid
201		-	1	-	-	1	BRACKET .. Solenoid - 9333601 Receiver
202	9433508	4	4	-	4	4	SCREW .. Cap - 4-40 x 3/8 hex. socket head - Formerly 9433265
203	8113662	3	3	-	3	3	WASHER .. 13/64 I.D. x 7/16 O.D. x 1/32 in. thick
*204	8113773	1	1	1	1	1	PLUNGER ASSEMBLY .. Shutdown
205	8113775	1	1	1	1	1	PLUNGER .. Shutdown
206	8113779	1	1	1	1	1	TUBING .. Plunger
207	8444618	1	1	1	1	1	SEAL .. O-ring - Replaces 8223698
208	3292030	1	1	1	1	1	SPRING .. Relief valve
209	8113778	1	1	1	1	1	PIN .. Spring 5/32 x 3/4 in. long
210	104918	1	1	1	1	1	BALL .. 1/4 in. diameter
211	8113774	1	1	1	1	1	PIN .. Plunger
212	8113776	1	1	1	1	1	SEAT .. Ball valve
213	8113811	1	1	1	1	1	PISTON .. Oil failure
214	8113838	1	1	1	1	1	SPRING .. Oil failure piston
215	8113846	1	1	1	1	1	SPRING .. Shutdown plunger
216	8113780	1	1	1	1	1	BUSHING .. Oil failure valve
217	8113850	1	1	1	1	1	GASKET .. Oil failure bushing
218	217940	1	1	1	1	1	SCREW .. Cap - Bushing retainer - 1/4-28 x 3/8 hex. socket head
219	8163437	1	1	1	1	1	WASHER .. Plain - 1/4
220	8193508	1	1	1	1	1	PLUNGER .. Oil failure
221	8113819	1	1	1	1	1	WASHER .. Diaphragm
222	8158716	1	1	1	1	1	DIAPHRAGM .. Lube oil
223	5939163	1	1	1	1	1	NUT .. Diaphragm - 10-32 hex.
224	8113837	1	1	1	1	1	SPRING .. Diaphragm
225	8429435	1	1	1	1	1	CAP .. Diaphragm - Lube oil
226	8286155	1	1	1	1	1	PLATE .. Side
227	8201610	1	1	1	1	1	GASKET .. Side plate
228	9093702	2	2	2	2	2	SEAL .. O-ring - 1.734 I.D. - Replaces 8223701
229	444040	1	1	1	1	1	ELBOW .. Street - 1/4 M.P.T. - 90°
230	118752	4	4	4	4	4	CONNECTOR .. 3/8 M.P.T. x 1/2 tube
231	8040382	1	1	1	1	1	TEE .. 1/4 M.P.T. x 1/4 tube x 1/4 tube
232	138216	4	4	4	4	4	SCREW .. Diaphragm cap - 1/4-28 hex. socket head
233	138214	3	3	3	3	3	SCREW .. Side plate - 1/4-28 x 1-1/2 hex. socket head
234	8113832	1	1	1	1	1	PIN .. Headed - 3/16 x 25/32 in. long
235	139009	1	1	1	1	1	SCREW .. Set - 1/4-28 x 1/4 hex. socket
236	444687	7	7	7	7	7	PLUG .. Pipe - 1/8 M.P.T. - Hex. socket
237	8160339	1	1	1	1	1	CUP ASSEMBLY .. "D" solenoid
238	9333521	1	1	1	1	1	PLATE ASSEMBLY .. Triangular - Repl. 8459855 - Must be applied with Ref. No. 265 - 9333520 Lever
239	223004	1	1	1	1	1	SCREW .. Socket head - Dog point
*240	8292129	1	1	1	1	1	FILTER ASSEMBLY .. Oil
241	8297955	1	1	1	1	1	FILTER .. Oil - Includes plug
242	9093493	1	1	1	1	1	SEAL .. O-ring - Filter - Replaces 8330683
243	8286156	1	1	1	1	1	CASE .. Filter cartridge
244	3292039	1	1	1	1	1	PLUG .. Filter drain
245	5156913	1	1	1	1	1	GASKET .. Copper
246	9098533	1	1	1	1	1	SEAL .. O-ring - .674 I.D. x .777 O.D. x .103 in. thick Formerly 8156971

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
247	8444617	2	2	2	2	2	SEAL .. "O" Ring - .301 I.D. x .441 O.D. - Replaces 8292130
248	138219	3	3	3	3	3	SCREW .. Cap - 1/4-28 x 2-3/4 hex. socket head
249	8113800	3	4	-	3	-	WASHER .. Lock - 1/4
250	8352782	1	1	-	1	-	TUBE ASSEMBLY .. Air box pressure
251	8284059	1	1	-	1	-	UNION ASM. .. Bulkhead
252	8284095	1	1	-	1	-	NUT .. Lock - 1/3-20 hex. } Formerly
253	8284096	2	2	-	2	-	NUT .. Tube - 1/2-20 hex. } Applied
254	8284097	2	2	-	2	-	SLEEVE .. Tube - 1/4 }
*254A	9514115	1	1	-	-	-	UNION ASM. .. Bulkhead
*254B	9514438	-	-	1	1	1	UNION ASM. .. Bulkhead } Currently
*254C	9327099	1	1	1	1	1	NUT .. Lock } applied
*254D		1	1	1	1	1	UNION ASM. }
*254E		1	1	1	1	1	SCREW .. Drive }
255	8113823	1	-	-	-	-	STUD .. Bearing
*256	8433225	1	-	-	-	-	PIN .. Straight - .812 in. long x .1865 in. dia.
*257	3304054	2	2	-	2	-	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 in. thick
258	8284081	1	1	-	1	-	WASHER .. .203 I.D. x .380 O.D.
259	444691	1	1	-	1	-	PLUG .. Pipe - 1/4 M.P.T. socket head
*260	120217	1	5	-	1	-	WASHER .. Lock No. 10
*261	181316	1	-	-	1	-	SCREW .. Cap - 1/4-28 x 1-1/8 in. long
262	8147713	3	3	-	3	3	SCREW .. Cap - 1/4-28 x 2-3/8 socket head
263	443802	1	1	-	1	-	SCREW .. Cap - 10-32 x 1-1/4 socket head
264	8429434	1	1	-	1	1	PLUG .. Low vacuum hole
265	9333520	1	1	-	1	1	LEVER .. Lower floating - Repl. 8383169 - Must be applied with Ref. No. 238 - 9333521 Plate
266	8433220	1	1	-	1	1	PIN .. Straight - 1.156 in. long x .1242 in. diameter
267	8433222	1	1	-	1	1	PIN .. Straight - .656 in. long x .1865 in. diameter
268	8433771	1	-	-	1	1	WASHER .. Lube oil diaphragm
269	8433224	1	1	-	1	1	BRACKET .. Clamp
*270	8460088	2	-	-	-	-	SCREW .. 1/4-28 x 3/4 fil. head
*271	446186	2	-	-	-	-	WASHER .. Plain - 1/4 I.D. x 1/2 O.D. x .049 in. thick
*272	8288663	A.R.	-	-	-	-	WIRE .. Lock - Steel - .026 in. dia. - Sold in 1 lb. spool - Approx. 1 ft. required
*273	8460089	1	-	-	-	-	BLOCK .. Retainer - Ball head
*273A	8410694	-	1	-	-	-	VALVE ASSEMBLY .. Solenoid shutdown - 74 V.D.C.
*273B	9333519	-	1	-	-	-	TUBE ASSEMBLY .. Shutdown valve
*273C		-	1	-	-	-	BLOCK .. Valve mounting
*273D		-	1	-	-	-	BOARD .. Terminal
274	8113869	1	1	1	1	1	GASKET .. Column to case - Transfer hole
275	8113870	1	1	1	1	1	GASKET .. Case to column
276	8367213	1	1	-	1	1	COVER ASSEMBLY .. Governor - Replaces 9326769
276	9520125	-	-	1	-	-	COVER ASSEMBLY .. Governor
276	9326769	-	-	-	1	-	COVER ASSEMBLY .. Governor - Replaced by 8367213
277	8131835	2	2	2	2	2	BUSHING .. Cover doweling
278	8017559	1	1	1	1	1	CUP .. Oil filler
279	8040550	1	1	1	1	1	GASKET .. Cover
280	8365140	2	2	2	2	2	BOLT .. Cover - 5/16-24 x 7-1/4 hex. head drilled
281	8068098	6	6	6	6	6	WASHER .. Plain - 5/16
*282	8460052	1	1	1	1	1	CYLINDER ASSEMBLY .. Power - With rotary terminal shaft
283	8460058	1	1	1	1	1	CYLINDER .. Power
284	8201590	1	1	1	1	1	PISTON .. Power - Compensating
285	8113656	1	1	1	1	1	RING .. Spring guard seal
286	8113657	1	1	1	1	1	ROD .. Power piston tail
287	8113658	1	1	1	1	1	NUT .. Tail rod lift - 3/8-24
288	9411494	2	2	2	2	2	RING .. Snap - .338 I.D.

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
							GOVERNOR ASSEMBLY .. Engine
	8460052	1	1	1	1	1	CYLINDER ASSEMBLY .. Power
289	8201591	1	1	1	1	1	BEARING .. Needle - Terminal shaft
290	456382	1	1	1	1	1	BEARING .. Needle - Terminal shaft
291	8061742	1	1	1	1	1	SEAL .. Oil - 1.379 O.D. x 13/16 I.D. x 13/32 in. diameter
292	8211818	1	1	1	1	1	SEAL .. Oil - 1.379 O.D. x 11/16 I.D. x 13/32 in. diameter
293	8446617	1	1	1	1	1	SEAL .. O-ring - Needle valve - Replaces 8223697
294	8223700	1	1	1	1	1	SEAL .. O-ring - Spring guard - 2.093 I.D. x 2.500 O.D.
295	8201604	1	1	1	1	1	PIN .. Piston rod
296	444687	1	1	1	1	1	PLUG .. Pipe - 1/8 M.P.T. hex. socket head
297	120423	4	4	4	4	4	WASHER .. Lock - 1/4 - Internal teeth
298	115549	1	1	1	1	1	WASHER .. Lock - 3/8 - Internal teeth
299	8057114	2	2	2	2	2	WASHER .. Lock - 5/16
300	145368	2	2	2	2	2	SCREW .. Drive - Scale - No. 2 x 3/16 round head
301	217908	2	2	2	2	2	SCREW .. Cap - 5/16-18 x 7/8 hex. socket head
302	9413435	2	2	2	2	2	RING .. Snap - Rod pin
303	8113663	1	1	1	1	1	NUT .. Lock - 3/8-24 hex.
304	138211	8	8	8	8	8	SCREW .. Cap - 1/4-28 x 3/4 hex. socket head
*304A	138212	1	1	1	1	1	SCREW .. Cap - 1/4-28 x 1 hex. socket head
305	8134427	4	4	4	4	4	BOLT .. Spring guard - 1/4-28 x 1/4 hex. socket head
306	8113800	10	10	10	10	10	WASHER .. Lock - 1/4
*306A	8149705	1	1	1	1	1	WASHER .. Lock - 1/4 - Split
307	8201593	1	1	1	1	1	NUT .. Lock - 7/16-20 hex.
308	8113664	1	1	1	1	1	SPRING .. Guard seal
309	8149111	1	1	1	1	1	SPRING .. Servo
310	8460056	1	1	1	1	1	SCALE .. Terminal shaft
311	8152339	1	1	1	1	1	GASKET .. Guard to power cylinder
312	8201595	1	1	1	1	1	GASKET .. Cover to power cylinder
313	8459853	1	1	1	1	1	LEVER .. Rack dial
314	8460055	1	1	1	1	1	POINTER .. Rack scale
315	8149113	1	1	1	1	1	VALVE .. Needle
316	8326406	1	1	1	1	1	GUARD ASSEMBLY .. Spring
*317	452652	1	1	1	1	1	INSERT .. Helicoil
318	8201598	1	1	1	1	1	COVER .. Power cylinder
319	8201599	1	1	1	1	1	LEVER .. Power - Serrated
320	8201600	2	2	2	2	2	LINK .. Power piston
321	8201601	1	1	1	1	1	PIN .. Power lever
322	8460057	1	1	1	1	1	SHAFT .. Terminal - Serrated
323	111840	1	1	1	1	1	PIN .. Taper - 3/4 in. long
*324	8326407	1	1	1	1	1	SCREW .. Stop
*325	120613	1	1	1	1	1	NUT .. Lock - 1/4-28 hex.
326	427729	2	2	2	2	2	SCREW .. Cap - 1/4-28 x 5/8 hex. socket head
327	8460054	1	1	1	1	1	SCREW .. Nylock
328	8460059	1	1	1	1	1	BRACKET .. Rack pointer scale
†φ*329	8367363	1	1	-	-	-	LIMITER ASSEMBLY .. Fuel - Formerly applied
†φ*329	9514114	1	1	-	-	-	LIMITER ASSEMBLY .. Fuel - Currently applied
*329	9520124	-	-	1	-	-	LIMITER ASSEMBLY .. Fuel
329	9326768	-	-	-	1	1	LIMITER ASSEMBLY .. Fuel
330	8349466	1	1	-	-	-	BODY BODY ASSEMBLY .. Fuel limiter
331	8113808	1	1	-	-	-	HEAD .. Cylinder
332	8017584	2	2	-	-	-	SCREW .. Taper
333	9409966	1	1	-	-	-	PLUG .. Pipe - 1/16 M.P.T. - Hex. socket head
334	8284062	1	1	-	-	-	SEAT .. Poppet valve
334A	9524039	-	-	-	1	1	BODY .. Pressure sensor
*334B		-	-	1	-	-	BODY .. Pressure sensor
334C	8113808	-	-	1	1	1	HEAD .. Cylinder

† Components of 8367363 and 9514114 Limiter Assemblies are identical except as indicated below

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
		1	1	1	1	1	LIMITER ASSEMBLY .. Fuel - See Page 42
334D	8017584	-	-	8	9	9	SCREW .. Taper
335	8293770	1	1	1	1	1	INDICATOR .. Load control - Except 9514114 limiter
336	159997	1	1	1	1	1	SCREW .. No. 10-32 x 1/4 pan head - Cross recess - Repl. 155173
337	8113662	1	1	-	1	1	WASHER .. Lock - 3/16 - Except 9514114 limiter
339	8284044	1	1	1	1	1	SCREEN ASSEMBLY .. Fuel limiter - Includes plug
338	8307375	1	1	1	1	1	VALVE ASSEMBLY .. Check
340	8283109	1	1	-	-	-	SENSOR ASSEMBLY .. Bellows - Absolute pressure
*341		-	-	1	-	-	BELLOWS ASSEMBLY .. Aneroid
342	9524027	-	-	1	1	1	BELLOWS ASSEMBLY .. Limiter
343	9524020	-	-	1	1	1	SPACER .. Bellows
344	9524037	-	-	1	1	-	STRAP .. Bellows
344A		-	-	-	1	1	BRACKET .. Fuel limiter linkage
344B	138215	-	-	-	1	1	SCREW .. Cap - 1/4-28 x 1-3/4 hex. socket head
344C	9406761	-	-	-	1	1	SCREW .. Cap - 1/4-28 x 1-1/4 hex. socket head
344D	8149705	-	-	-	2	2	WASHER .. Lock - 1/4 split
344E	9406755	-	-	-	1	-	SCREW .. Cap - No. 10-32 x 1-1/2 hex. socket head
345	9413499	1	1	-	-	-	BEARING .. Ball - Sleeve - Except 9514114 limiter
345	8132453	-	-	1	1	1	BEARING .. Needle
346	8354117	2	2	-	-	-	WASHER .. Spacer - Spring anchor
347	8444618	3	3	3	2	2	SEAL .. O-ring - 371 I.D. x .504 O.D. x .073 in. thick Formerly 8223698
348	8479338	1	1	-	-	-	SEAL .. O-ring - 475 I.D. x .624 O.D. x .081 thick - Replaces 8284046
348	9524013	-	-	1	1	1	SEAL .. O-ring - 1.114 I.D. x .070 in. thick
349	8351415	1	1	-	-	-	PIN .. Connecting beam
350	9524041	-	-	-	1	1	PIN .. Tailrod
351	8284047	1	1	-	-	-	PIN .. Lever - Fulcrum - .186 in. diameter
351		-	-	1	1	1	PIN .. Lever - Pivot
*352	8456970	1	1	-	-	-	PIN .. Lever - Straight - 7/16 in. long - Formerly 8192136
*353	8113833	-	-	-	2	2	PIN .. Straight - 1/8 x 3/4 in. long - Drilled head
354	119981	1	1	-	2	2	PIN .. Cotter - 1/16 x 3/8 in. long - Except 9514114 limiter
*354	103363	-	-	1	-	-	PIN .. Cotter - 1/16 x 1 in. long
354A	107761	-	-	-	2	2	PIN .. Cotter - 1/16 x 5/8 in. long
354B		-	-	-	1	1	PIN .. Roll - 1/8 x 3/8
354C	8460054	-	-	-	3	3	SCREW .. Nylock - No. 8-32 x 3/8
355	8284048	5	5	-	-	-	WASHER .. Special - .188 I.D. x .360 O.D. x .062 in. thick
356	120217	6	6	17	3	3	WASHER .. Lock - No. 10
*356A	9412311	-	-	-	1	1	NUT .. No. 10-32 hex.
357	181566	1	1	2	1	1	SCREW .. Cap - 1/4-28 x 3/4 hex. head - Formerly 181313
357A	446186	-	-	-	1	1	WASHER .. Plain - 1/4 I.D. x 1/2 O.D. x .049 in. thick
357B	9524023	-	-	-	1	1	ECCENTRIC .. Adjustment
357C	9524042	-	-	-	1	1	WASHER .. Eccentric
*358	431487	1	1	-	-	-	SCREW .. Cap - No. 10-32 x 5/8 hex. socket head
358	187828	-	-	-	2	2	SCREW .. Cap - No. 10-32 x 1/2 hex. socket head
359	9413463	1	1	-	-	-	RING .. Snap
360		-	-	2	1	1	RING .. Retainer
361	8308192	1	1	-	-	-	WASHER .. Special - 9/64 I.D. x 3/8 O.D. x 1/32 in. thick
362	8284050	1	1	-	-	-	SPRING .. Oil seal
363	8305137	1	1	-	-	-	SPRING .. Piston
364	8429101	2	2	-	-	-	SPRING .. Tension
*365		-	-	1	-	-	SPRING .. Load - Fuel limit
366	9524014	-	-	1	1	1	SPRING .. Load - Limiter linkage
367		-	-	1	1	1	SPRING .. Load .. Pilot valve
368	8284054	33	33	-	-	-	GASKET .. .250 I.D. x .360 O.D. x .031 in. thick
369	8284057	1	1	-	-	-	PIN .. .249 in. diameter x 1-1/8 in. long
370	8354116	1	1	-	-	-	PIN .. Spring anchor
371	8284060	1	1	-	-	-	WASHER .. O-ring - Except 9514114 limiter
372	8284063	32	32	-	-	-	PLATE .. Orifice

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
							GOVERNOR ASSEMBLY .. Engine
		1	1	1	1	1	LIMITER ASSEMBLY .. Fuel - See Page 42
373	9524025	-	-	2	1	1	ORIFICE ASSEMBLY .. Limiter
374	8284064	1	1	-	-	-	PISTON .. Fuel limiter
*375	9524021	-	-	1	1	1	PISTON .. Fuel limiter
376	8284065	1	1	-	-	-	SLEEVE .. Piston
376	9524033	-	-	2	1	1	SLEEVE .. Piston
377	9524034	-	-	1	1	1	PISTON .. Shutdown
*378	9524031	-	-	1	1	1	VALVE .. Shutdown pilot
379	8284066	1	1	-	-	-	CASE .. Orifice
380	8284067	1	1	-	-	-	SEAT .. Spring
381	8284068	1	1	-	-	-	PLUNGER .. Valve
†ϕ382	8284070	1	1	-	-	-	GUIDE .. Lever - No longer furnished - See note below
ϕ383	8458520	1	1	-	-	-	GUIDE .. Lever
384	8484072	1	1	-	-	-	ARM .. Cam follower
385	8367364	1	1	-	-	-	CAM .. 1.464 in. long x 1/8 in. thick
†ϕ386	8285454	1	1	-	-	-	ARM ASM. .. Rocker - No longer furnished - See note below
†ϕ387	8284069	1	1	-	-	-	LEVER .. Rocker arm - No longer furnished - See note below
388	9413498	1	1	-	-	-	BEARING .. Needle - .1247 in. shaft diameter
ϕ389	8458519	1	1	-	-	-	ARM ASM. .. Rocker
ϕ*390	8458521	1	1	-	-	-	LEVER .. Rocker arm
391	9413498	1	1	-	-	-	BEARING .. Needle
*392	8436004	1	1	-	-	-	BRACKET ASM. .. Cam guide
393	8284055	1	1	-	-	-	PIN .. Roller - .375 in. long x .122 in. diameter
394	8433773	1	1	-	-	-	SCREW .. Stop
*395	8284037	1	1	-	-	-	NUT .. Lock - No. 8-32 hex.
396	954330	1	1	-	-	-	BEARING .. Ball
397	8433221	1	1	-	-	-	BRACKET .. Cam guide
398	8284061	1	1	-	-	-	SHIM .. Shaft - Switch

† For governors requiring replacement of earlier design 8285454 rocker arm assembly, 8284070 guide, or 8284069 lever, use 8458518 kit which contains current design 8458519 arm assembly, 8458520 support guide, and 8456970 pin.

399	8284074	2	2	-	-	-	SCREW .. Spring anchor
*400	8329980	2	2	-	-	-	WASHER .. Anchor screw - .203 I.D. x .375 O.D. x .031 in. thick
401	8284076	1	1	-	-	-	BODY .. Banjo fitting
402	8284077	1	1	-	-	-	SCREW .. Fuel limiter body
403	8283110	1	1	-	-	-	NUT .. Lock - Bellows
404	9415901	1	1	-	1	-	RING .. Snap
405	9415903	1	1	-	-	-	RING .. Snap - Formerly 8426721
*406	8284350	1	1	-	-	-	BLOCK .. Lever support
*407	9413469	1	1	-	-	-	SCREW .. Cap - 6-32 x 1/2 hex. socket head
408	131181	2	2	-	-	-	WASHER .. Lock - No. 6
409	8293771	1	1	-	-	-	SCREW .. Lock - 6-32 x 1/2 hex. socket head
*410		-	-	1	-	-	BELLCRANK .. Limiter
410	9524017	-	-	-	1	1	BELLCRANK .. Limiter
*411		-	-	1	-	-	ARM ASSEMBLY .. Crank
*412		-	-	1	-	-	SHAFT ASSEMBLY .. Crank
413	9524040	-	-	1	1	1	LEVER .. Feedback
*414		-	-	1	-	-	LEVER .. Limit
414	9524016	-	-	-	1	1	LEVER .. Limit
*415		-	-	1	-	-	LEVER ASSEMBLY .. Pickup
*416		-	-	1	-	-	LEVER ASSEMBLY .. Floating unit
416	9524026	-	-	-	1	1	LEVER ASSEMBLY .. Floating unit
*417		-	-	1	-	-	ARM .. Rebalance crank
*418		-	-	1	-	-	CAM .. Rebalance stop
419	9524018	-	-	1	1	1	PIN .. Bellcrank pivot
419A	9524015	-	-	-	1	1	PIN .. Straight - Drilled

P.L. No. F166

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	Description
							GOVERNOR ASSEMBLY .. Engine
		1	1	1	1	1	LIMITER ASSEMBLY .. Fuel - See Page 42
*420		-	-	1	-	-	LINK .. Piston
*421		-	-	1	-	-	LINK .. Load limit
*422		-	-	1	-	-	PLUG .. Altimeter
423	9551676	-	-	2	1	1	DIAPHRAGM ASSEMBLY .. Limiter
423A	9524030	-	-	-	1	1	SEAT .. Limiter valve
423B	9524036	-	-	-	1	1	SEAT .. Sensor spring - Male
423C	9524022	-	-	-	1	1	PIN .. Diaphragm to sensor spring seat
423D	9524032	-	-	-	1	1	SEAT .. Sensor spring - Female
424	9524024	-	-	1	1	1	PIVOT ASSEMBLY
424A	9524028	-	-	-	1	1	SCREW .. Adjusting - Fuel limit floating lever
425	8429419	1	-	-	-	-	ACCUMULATOR ASSEMBLY .. Low lube oil - Square body - Replaced by 8482432 - See Ref. No. 440
426	8113811	1	-	-	-	-	PISTON .. Oil failure
427	120614	4	-	-	-	-	NUT .. No. 10-32 hex.
428	120217	4	-	-	-	-	WASHER .. Lock - No. 10
429	8327416	4	-	-	-	-	WASHER .. .255 I.D. x .400 O.D. x .031 in. thick
430	8393771	2	-	-	-	-	ELBOW .. 1/4 tube x 1/8 M.P.T.
431	117608	4	-	-	-	-	SCREW .. No. 10-32 x 3 fillister head - Slotted
432	225585	4	-	-	-	-	SCREW .. 1/4-28 x 2-1/4 fil. head slotted
433	8429426	1	-	-	-	-	SPRING .. Accumulator
434	8429427	2	-	-	-	-	GASKET .. Accumulator cover
435	8429428	1	-	-	-	-	GASKET .. Accumulator body to case
436	8429429	1	-	-	-	-	COVER .. Accumulator
437	8429430	1	-	-	-	-	COVER .. Accumulator
438	8429431	1	-	-	-	-	TUBE .. Accumulator - No longer furnished - Contact EMD Parts Center for replacement information
439	8429432	1	-	-	-	-	BODY .. Accumulator
440	8482432	1	1	1	1	1	ACCUMULATOR ASSEMBLY .. Low lube oil - Round body - Replaces 8429419 - See Ref. No. 425
441	8113811	1	1	1	1	1	PISTON .. Oil failure
442	8327416	4	4	4	4	4	WASHER .. .225 I.D. x 4 O.D. x .031 in. thick
443	190741	4	4	4	4	4	SCREW .. 1/4-28 x 1 - Fillister head
444	8393771	2	2	2	2	2	ELBOW .. 1/4 tube x 1/8 M.P.T.
445	8429426	1	1	1	1	1	SPRING .. Accumulator
446	8482434	1	1	1	1	1	GASKET .. Accumulator body to case
447	8488280	1	1	1	1	1	BODY .. Accumulator - Replaces 8482435
448	8488281	1	1	1	1	1	TUBE .. Seamless steel
449	8338392	1	1	1	-	-	BLOCK ..Shutdown - Replaces 8284033
450	443871	1	1	1	-	-	SCREW .. Set - No. 8-32 x 5/8 socket head
451	8292115	1	1	1	-	-	SCREW .. Adjusting - No. 10-32 x 1/2 in. long
452	140855	1	1	1	-	-	SCREW .. Set - No. 8-32 x 5/16 in. long
453	138242	4	4	4	4	4	SCREW .. Cap - Power cyl. to power case - 3/8-16 x 1 hex. soc. hd.
454	8152079	4	4	4	4	4	WASHER .. Lock - 3/8
455	159572	4	-	4	4	4	SCREW .. Col. name plate - 8-32 x 1/4 - Pan hd. cross recess
456	9327637	2	-	2	2	-	SCREW .. Name plate insert - 5-40 x 1/4 - Replaces 432267
*457	145368	-	2	-	-	2	SCREW .. Drive - No. 2 x 3/16 round head
*458	8132974	2	-	2	2	-	CAP .. Plastic - 7/16-20 } Shipping purposes only
*459	8132975	1	-	1	1	-	CAP .. Plastic - 5/8-18 } Shipping purposes only
*460	8132976	4	-	4	4	-	CAP .. Plastic - 3/4-16 } Shipping purposes only
461	8152077	2	2	2	2	2	PLATE .. Name - Bleed hole
*462	8356332	1	1	1	1	1	PLATE .. Name - Column
463	8356333	1	1	1	1	1	INSERT .. Name plate - Includes settings
464	220342	6	6	6	6	6	SCREW .. Drive - Bleed hole name plate - No. 0
465	8483071	1	-	1	-	-	GASKET .. Power cylinder case - Replaces 8152078
*466	9332176	1	1	1	1	1	LABEL .. Piping - Set of decals
467	119981	1	1	1	1	1	PIN .. Cotter - 1/16 x 3/8 in. long

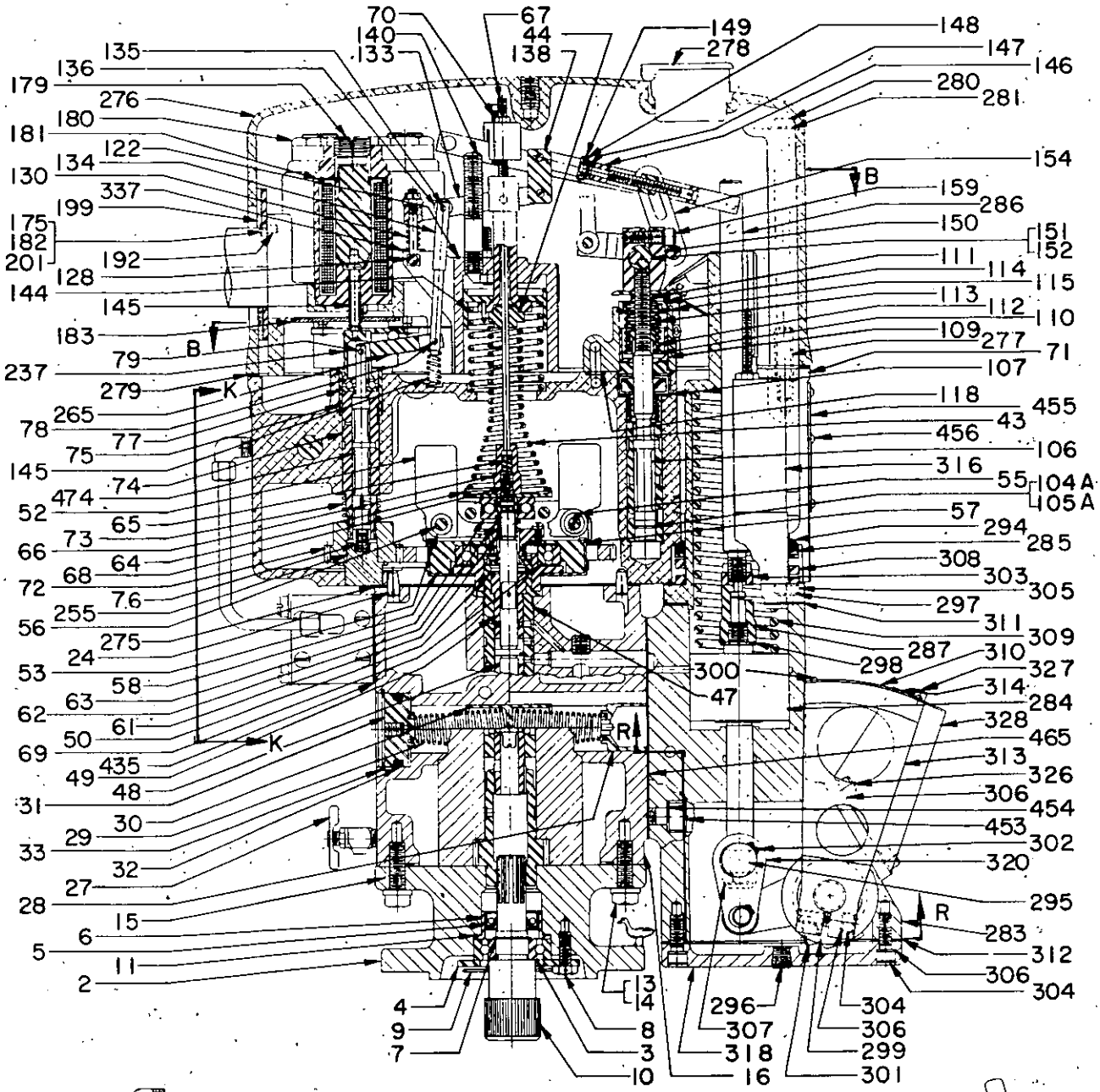
P.L. No. F166

GOVERNOR ASSEMBLY

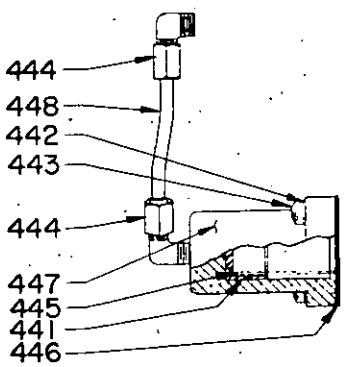
Ref. No.	Part Number	Quantity Required					Description
		A	B	C	D	E	GOVERNOR ASSEMBLY .. Engine
468	8113832	1	-	1	1	1	PIN .. Headed - 3/16 x 25/32 in. long
469	8201587	4	-	4	4	4	BOLT .. Column to case - 5/16-24 x 3/4 hex. head
470	446152	1	1	1	1	1	WASHER .. .203 I.D. x .500 O.D. x .062 in. thick
*471	8284081	1	1	1	1	1	WASHER .. .203 I.D. x .308 O.D.
472	8284039	1	1	1	-	-	PIN .. Headed
473	8284040	1	1	1	1	1	BEAM .. Connecting
474	8284087	1	1	1	1	1	PLUNGER .. Speed setting - Pilot valve
475	8419697	1	1	1	1	1	DECAL .. Caution - Not furnished separately - Included in Ref. No. 466
476	9326772	-	-	1	1	1	CAM .. Fuel limiter
477	9326771	-	-	1	1	1	SPRING .. Sensor - Except governors 9516928, 9531867, 9532462, 9537086, 9544681, 9545952, 9553572, and 9556512
477	9514008	-	-	-	-	1	SPRING SENSOR .. Governors 9516928, 9531867, 9532462, 9537086, 9544681, 9545952, 9553572, and 9556512
*478	113231	-	-	-	1	1	SCREW .. Drive - No. 6 x 1/4 in. long - Round head
*479	8453146	1	1	1	1	1	PLUG .. Governor - 16 pole - Female

P.L. No. F166

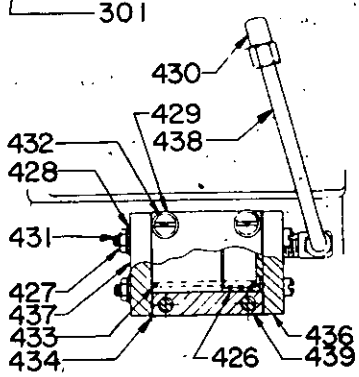
GOVERNOR ASSEMBLY



Ref. No. 1
SECTION A-A



Ref. No. 440

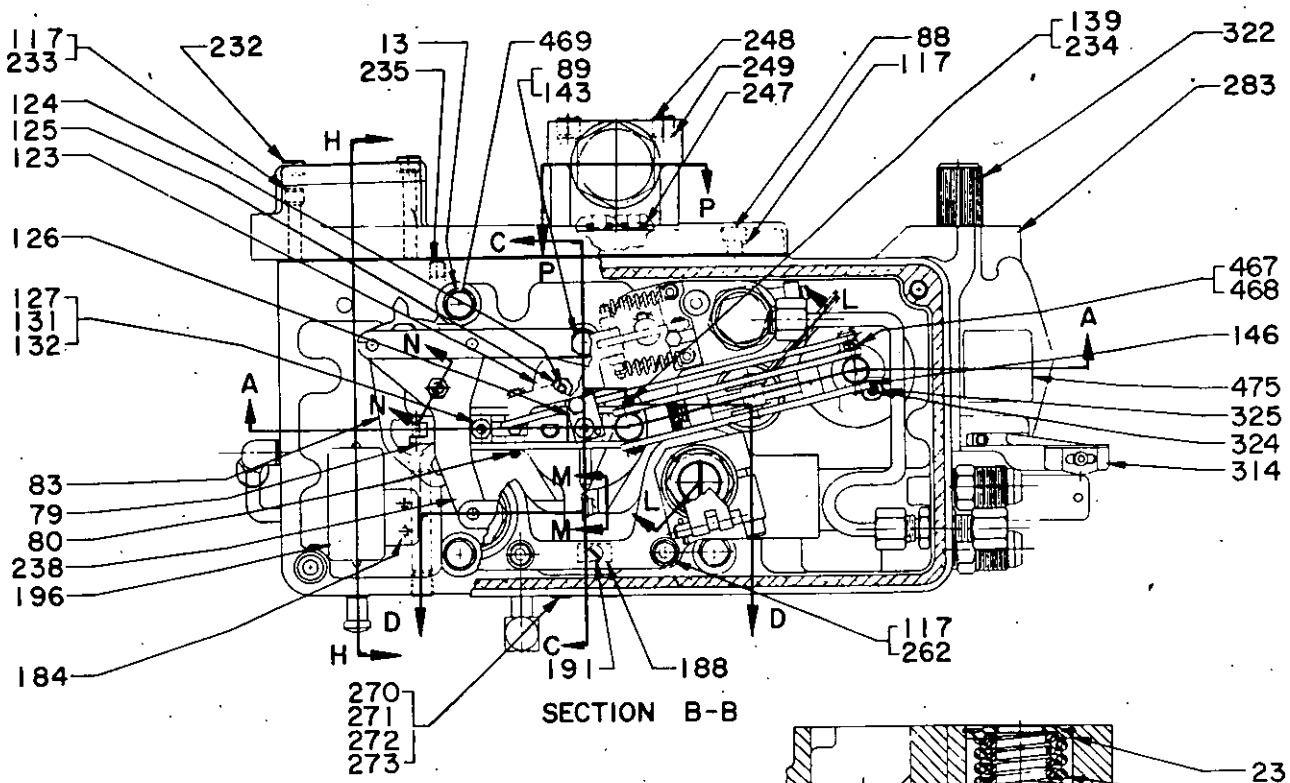


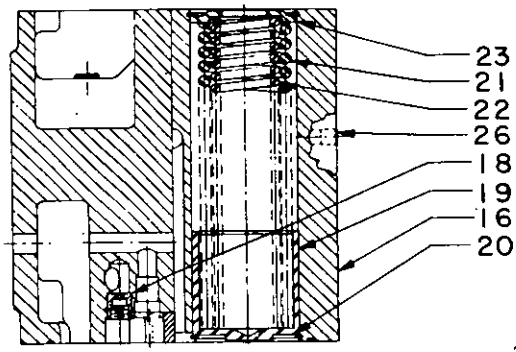
SECTION K-K
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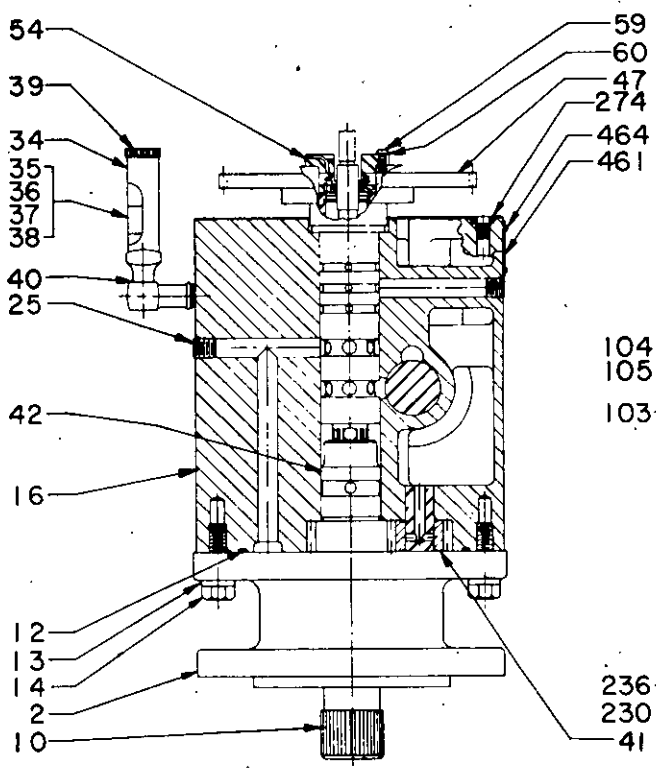
PLATE B166-11

P.L. No. F166

GOVERNOR ASSEMBLY







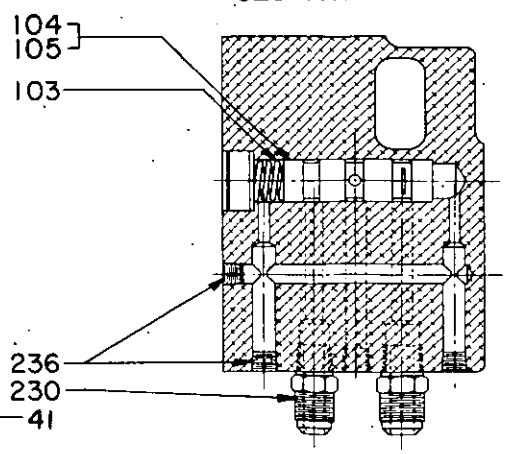


PLATE B166-12

P.L. No. F166

GOVERNOR ASSEMBLY

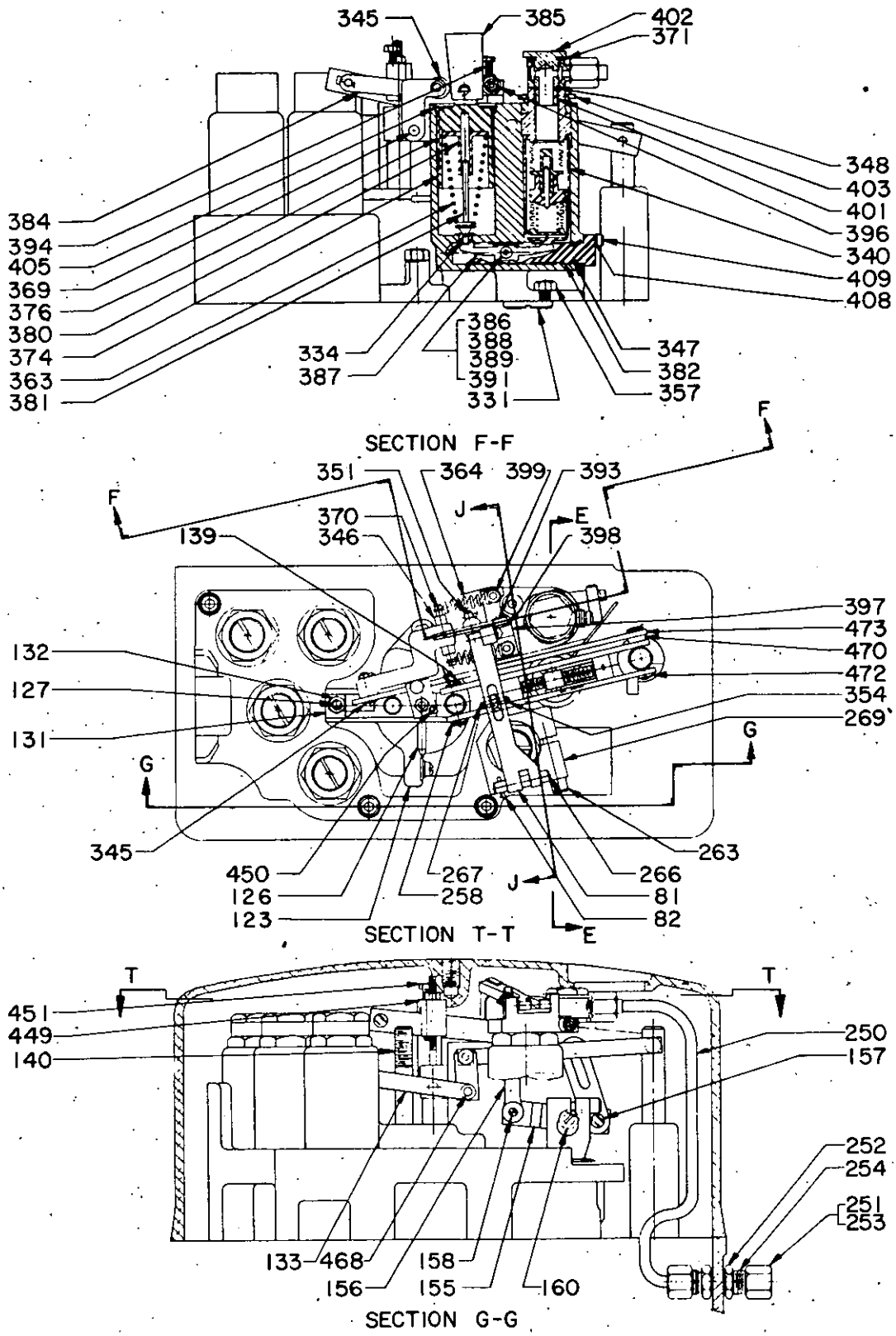
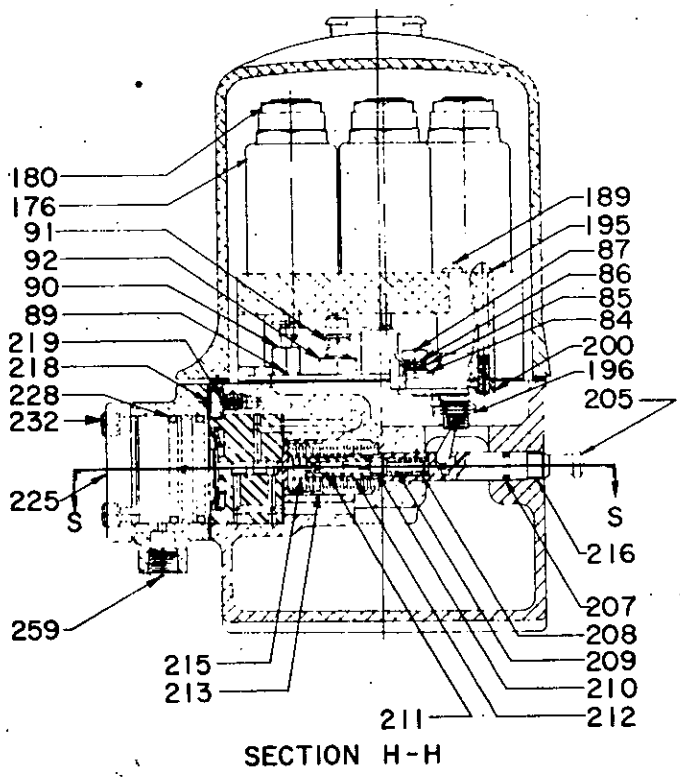


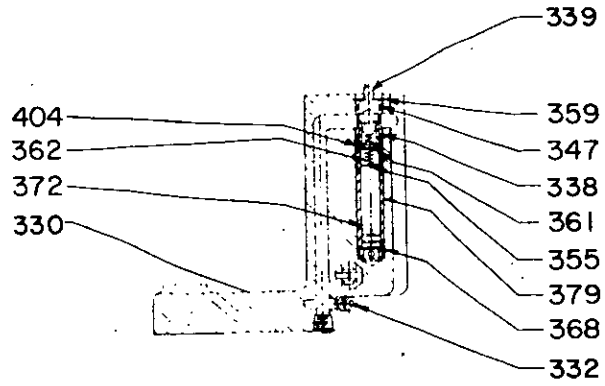
PLATE B166-13

P.L. No. F166

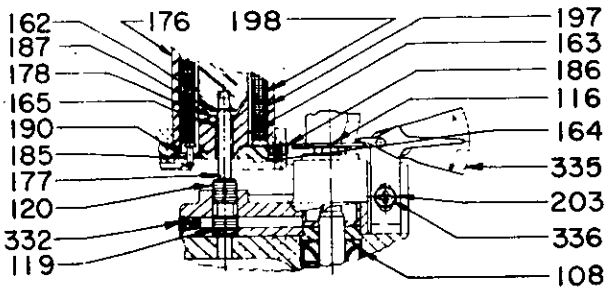
GOVERNOR ASSEMBLY



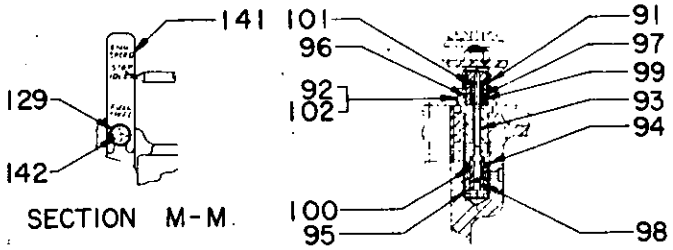
SECTION H-H



SECTION J-J

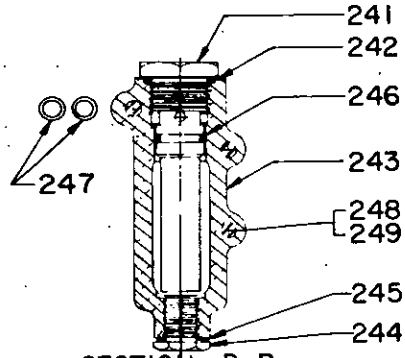


SECTION L-L

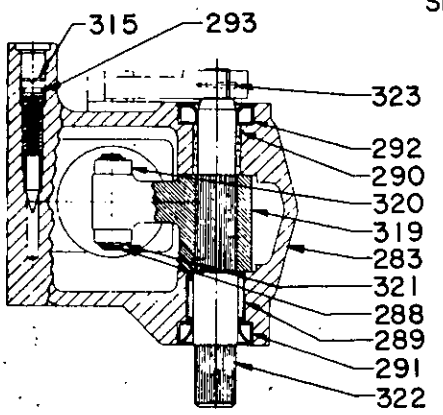


SECTION M-M

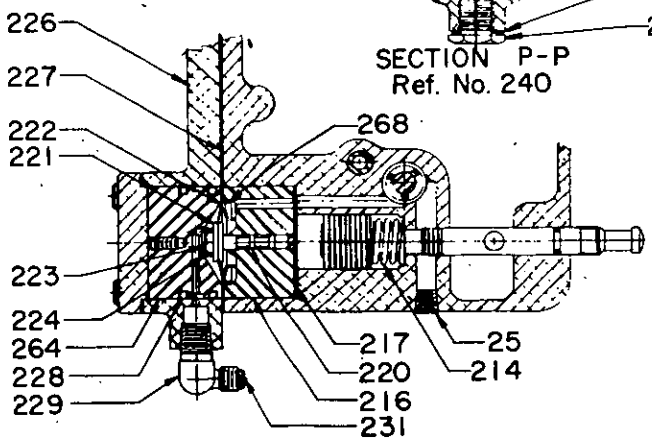
SECTION N-N



SECTION P-P
Ref. No. 240



SECTION R-R



SECTION S-S

PLATE B166-14

P.L. No. F166

GOVERNOR ASSEMBLY

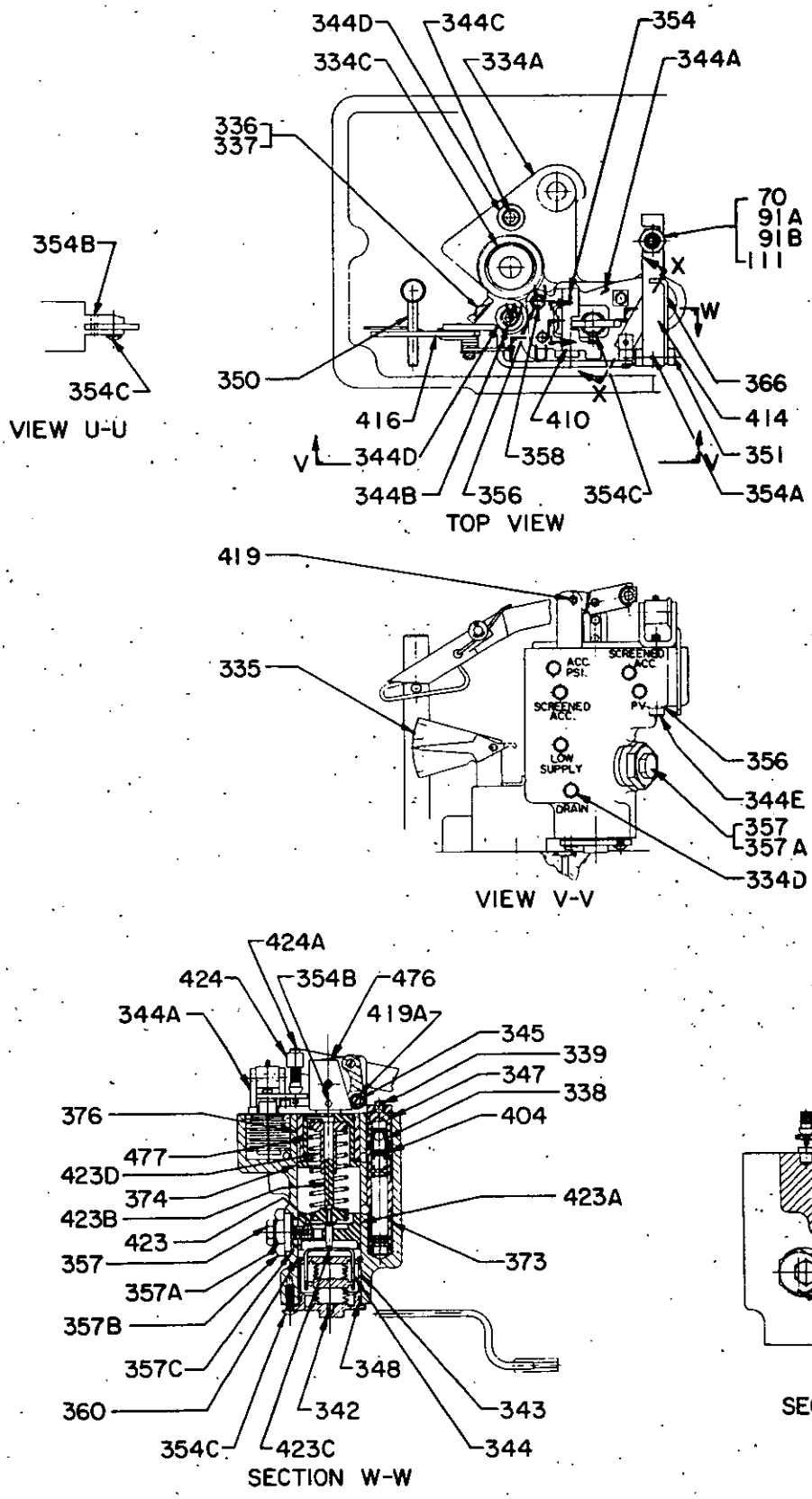


PLATE A166-15

GOVERNOR ASSEMBLY

Electro-Hydraulic PG Governors
16-567D1,D2,D3,D3A Engines
PLATES C167-1 thru 7

GOVERNOR REFERENCE CHART

Ref. No.	Part Number	Replaced By	Unit Exch. Part No.	Description	Col.	Locomotive Application
1	8281738	8381434	8285084	GOV. ASM. .. Eng.	A	SD24
1	8381434	----	8285084	GOV. ASM. .. Eng.	B	SD24
1	8305372	8381436	8296401	GOV. ASM. .. Eng.	A	GP30
1	8381436	----	8296401	GOV. ASM. .. Eng.	B	GP30
1	8304365	8381435	8296315	GOV. ASM. .. Eng.	A	GP20
1	8381435	----	8296315	GOV. ASM. .. Eng.	B	
1	8281140	----	8285085	GOV. ASM. .. Eng.	E	
1	8354994	8381431	8296448	GOV. ASM. .. Eng.	C	GP35,SD35
1	8333343	8381431	8296448	GOV. ASM. .. Eng.	C	GP35,DD35,DDA35,SD35,SDP35
1	8381431	----	8296448	GOV. ASM. .. Eng.	D	
1	8350698	8381432	8296476	GOV. ASM. .. Eng.	C	
1	8381432	----	8296476	GOV. ASM. .. Eng.	D	
1	8421748	----	8421749	GOV. ASM. .. Eng.	D	
1	8216206	----	8122846	GOV. ASM. .. Eng.	F	GP18
1	8425924	----	----	GOV. ASM. .. Eng.	G	GP18
1	8337897	----	8296480	GOV. ASM. .. Eng.	F	GP18,GP28
1	8195017	9091535	8122811	GOV. ASM. .. Eng.	F	SD18
†1	9091535	----	8122811	GOV. ASM. .. Eng.	-	
1	8425923	----	----	GOV. ASM. .. Eng.	G	SD18
1	8337898	9091535	8296481	GOV. ASM. .. Eng.	F	SD18,SD28

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	
*1	----								GOVERNOR ASSEMBLY .. Engine - See chart above
2									Reference number not used
3									Reference number not used
4	8149658	1	1	1	1	1	1	1	BASE .. Governor
5	8149696	1	1	1	1	1	1	1	SHAFT .. Drive - Serrated
6	8062007	1	1	1	1	1	1	1	RETAINER .. Bearing
7	8149695	1	1	1	1	1	1	1	SEAL .. Oil
8	8149697	1	1	1	1	1	1	1	RETAINER .. Oil seal
9	954298	1	1	1	1	1	1	1	BEARING .. Ball - Drive shaft
10	8149677	1	1	1	1	1	1	1	RING .. Snap
11	8113929	3	3	3	3	3	3	3	BOLT .. Bearing retainer to base - 1/4-28 x 5/8
12	8288663	As Required							WIRE .. Lock - .026 - 1 pound spool
13	8149679	1	1	1	1	1	1	1	GASKET .. Retainer to base
14	8152068	1	1	1	1	1	1	1	SEAL .. Oil - Case to base
15	120379	12	12	12	12	12	12	12	WASHER .. Lock 5/16
16	179818	8	8	8	8	8	8	8	BOLT .. Hex head 5/16-18 x 1 - Case to base
17	103613	2	2	2	2	2	2	2	PIN .. Dowel - Case to base - No. 5 x 3/4 in. long - Formerly 8132507

†*See Parts List No. F166, Page 5 for component list.*

P.L. No. E167

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
18	8149426	1	1	1	1	1	1	1	CASE ASSEMBLY .. Power
19	8149470	1	1	1	1	1	1	1	STUD .. Idler
20	8201045	2	2	2	2	2	2	2	PLUG .. Drive - Ball check
21	9413465	4	4	4	4	4	4	4	RING .. Snap - Accumulator - Repl. 8149472
22	8149469	2	2	2	2	2	2	2	PISTON .. Accumulator
23	8149471	2	2	2	2	2	2	2	SPRING .. Compression - Large
24	8057784	2	2	2	2	2	2	2	SPRING .. Compression - Small
25	8149474	2	2	2	2	2	2	2	SEAT .. Spring - Accumulator
26	8113672	2	2	2	2	2	2	2	PIN .. Grooved - Dowel - Case to column
27	8118445	1	1	1	1	1	1	1	COCK .. Drain - 1/8 MPT
28	8152071	1	1	1	1	1	1	1	SEAT .. Spring - Inner buffer
29	8152072	2	2	2	2	2	2	2	SPRING .. Buffer
30	8152073	1	1	1	1	1	1	1	PISTON .. Buffer
31	8152074	1	1	1	1	1	1	1	PLUG .. Buffer spring - 1-5/16 in. dia.
31A	8478711	1	1	1	1	1	1	1	SEAL .. O-ring - Plug - Replaces 8223699
31B	9413448	1	1	1	1	1	1	1	RING .. Snap - Buffer plug
ϕ32	8113998	1	1	1	1	1	1	1	GAUGE .. Oil level - Formerly applied - Replaced by 9328197
ϕ33	8350082	3	3	3	3	3	3	3	GASKET .. .312 I.D. - Replaces 8174780
*33A	8444618	2	2	2	2	2	2	2	SEAL .. O-ring - Replaces 8319674
ϕ*33B	8350082	2	2	2	2	2	2	2	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
34	8131381	1	1	1	1	1	1	1	GLASS .. Sight
35	8116360	1	1	1	1	1	1	1	NUT .. Threaded } No longer available -
36	8042652	1	1	1	1	1	1	1	CAP .. Gauge } Replaced by 9328197
*36A	8319675	1	1	1	1	1	1	1	CAP .. Gauge } gauge
ϕ*36B	8442288	1	1	1	1	1	1	1	GAUGE .. Oil level - Formerly applied - Replaced by 9328197
ϕ*36C	8350082	3	3	3	3	3	3	3	GASKET .. .312 I.D. - Replaces 8174780
*36D	8444618	2	2	2	2	2	2	2	SEAL .. O-ring - Replaces 8319674
ϕ*36E	8350082	2	2	2	2	2	2	2	GASKET .. .312 I.D. x .535 O.D. x .078 in. thick
*36F	8451831	1	1	1	1	1	1	1	GLASS .. Sight } No longer available - Replaced
*36G	8319675	1	1	1	1	1	1	1	CAP .. Gauge } by 9328197 gauge
*36H	9328197	1	1	1	1	1	1	1	GAUGE .. Oil level - Currently applied
37	8113999	1	1	1	1	1	1	1	ELBOW .. Oil gauge
38	8152070	1	1	1	1	1	1	1	GEAR .. Idler
39	8152069	1	1	1	1	1	1	1	GEAR .. Drive
40	8134425	1	1	1	1	1	1	1	PLUG .. Power case - 1/16 MPT
41	444687	9	9	9	9	9	9	9	PLUG .. Hex socket pipe 1/8-27
42	8113867	1	-	1	-	1	1	-	SPRING .. Speeder
*42A	8383167	-	1	-	1	1	-	1	SPRING .. Speeder
*43	8269694	1	1	1	1	1	-	-	SLEEVE ASSEMBLY .. Rotating } Repl. by
*43A	8238927	-	-	-	-	-	1	1	SLEEVE ASSEMBLY .. Rotating } 9327175
*43B	9327175	1	1	1	1	1	1	1	SLEEVE ASSEMBLY .. Rotating
44	8160610	1	1	1	1	1	1	1	GEAR ASM. .. Ball head - Includes sleeve
45	8149343	1	1	1	1	1	1	1	PLUNGER .. Pilot valve
46	8149341	1	1	1	1	1	1	1	BUSHING .. Compensating
47	274416	1	1	1	1	1	1	1	RING .. Snap - Bushing - Pilot valve body - Replaces 8149344
48	8353912	1	1	1	1	1	1	1	BALL HEAD ASSEMBLY
49	8149340	2	2	2	2	2	2	2	ARM ASSEMBLY .. Ball
50	148401	4	4	4	4	4	4	4	BEARING .. Needle - 1/4 inch shaft
51	8228384	1	1	1	1	1	1	1	COUPLING ASM. .. Spring drive
52	103361	8	8	8	8	8	8	8	PIN .. Cotter 1/16 x 1/2 in. long
53	8149338	4	4	4	4	4	4	4	PIN .. Ball arm
54	8353911	1	1	1	1	1	1	1	RETAINER .. Ball head
55	8353910	1	1	1	1	1	1	1	BALL HEAD .. Governor
56	121839	1	1	1	1	1	1	1	SCREW .. Mach. - 6-32 x 5/16 round head
57	131181	1	1	1	1	1	1	1	WASHER .. Lock - No. 6
58	8152338	1	1	1	1	1	1	1	SPRING .. Adjusting - Pilot valve
59	8068098	1	1	1	1	1	1	1	WASHER .. Plain - 5/16
60	8149345	1	1	1	1	1	1	1	BEARING .. Thrust
61	8149346	1	1	1	1	1	1	1	SEAT .. Speeder spring
61A	8291771	1	1	1	1	1	1	1	SPRING .. Rotating sleeve - Ref. No. 43 only
61B	8291770	1	1	1	1	1	1	1	NUT .. Plunger - P.V. - Ref. Nos. 43 and 43B

P.L. No. E167

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	F	G	Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
	- - - -	1	1	1	1	1	1	1	SLEEVE ASSEMBLY .. Rotating
62	8350084	1	1	1	1	1	-	-	ROD ASM. .. Shutdown - Ref. No. 43 only
*62A	8350083	-	-	-	-	-	1	1	ROD ASM. .. Shutdown - Ref. No. 43A only
*62B	8350086	1	1	1	1	1	1	1	ROD ASM. .. Shutdown - Ref. No. 43B only
63	8017599	-	-	-	-	-	1	1	NUT .. Plunger - P.V. - Ref. No. 43A only
64	107761	1	1	1	1	1	1	1	PIN .. Cotter 1/16 x 5/8 in. long
65	8160641	1	1	1	1	1	1	1	BEARING .. Ball
*65A	8284037	2	2	2	2	2	2	2	NUT .. Hex 8-32 - shutdown rod - Form. 120622
66	8269699	1	1	1	1	1	-	-	COLUMN ASSEMBLY .. Governor
*66A	8201617	-	-	-	-	-	1	1	COLUMN ASM. .. Governor - Replaces 8201607
67	8327394	2	2	2	2	2	2	2	INSERT .. Thread
68	8113823	1	1	1	1	1	1	1	STUD .. Bearing - Pilot valve drive gear
69	444687	6	6	6	6	6	6	6	PLUG .. Hex pipe - 1/8 MPT - Socket
70	8113848	1	1	1	1	1	1	1	GEAR .. Drive - Pilot valve bushing
71	8113839	1	1	1	1	1	1	1	SPRING .. Pilot valve bushing
72	8275539	1	1	1	1	1	-	-	BUSHING .. Rotating
*72A	8167317	-	-	-	-	-	1	1	BUSHING .. Rotating
73	8113815	1	1	1	1	1	1	1	BUSHING .. Regulating
74	8113835	2	2	2	2	2	1	1	SPRING .. Plunger - Pilot valve
75	8284087	1	1	1	1	1	-	-	PLUNGER .. Pilot valve
*75A	8113825	-	-	-	-	-	1	1	PLUNGER .. Pilot valve
76	8113830	1	1	1	1	1	1	1	BEARING .. Thrust - Rotating bushing
77	8113833	7	2	7	3	3	1	1	PIN .. Straight - 1/8 x 3/4 drilled head
78	8113831	1	1	1	1	1	1	1	PIN .. Pilot valve - 1/8 x 9/16 in. long
79	119981	3	3	3	3	3	3	3	PIN .. Cotter - 1/16 x 3/8 in. long
80	8113802	1	-	1	-	-	1	-	LEVER .. Low. floating - Not furnished - See Ref. No. 82A
81	8360030	1	-	1	-	-	1	-	PIN .. Contact - Replaces 8210081
82	8210082	1	-	1	-	-	1	-	SPRING .. Retainer
*82A	9333520	1	1	1	1	1	1	1	LEVER .. Lower floating } Repl. 8383169 - Must be applied with Ref. No. 304A - 9333521 Plate
83	8113816	1	1	1	1	1	1	1	RETAINER .. Reg. bush. }
84	6101223	1	1	1	1	1	1	1	WASHER .. Plain - Retainer spring - 5/8
85	8113845	1	1	1	1	1	1	1	SPRING .. Bushing retainer
86	8113817	1	1	1	1	1	1	1	COLLAR .. Spring retainer
87	181566	1	1	1	1	1	1	1	BOLT .. Hex head 1/4-28 x 3/4 - Retainer
88	8113991	3	3	3	3	3	3	3	WASHER .. Plain 1/4
89	8113822	1	1	1	1	1	1	1	SCREW .. Retainer - Special - 1/4-28
*89A	8433220	-	1	-	1	1	-	-	PIN .. Straight - 1.156 in. long x .1242 in. dia.
*89B	8433222	-	-	-	1	1	-	-	PIN .. Straight - .656 in. long x .1865 in. dia.
*89C	8433771	1	1	1	1	1	1	1	WASHER .. Lube oil diaphragm
*89D	8433224	-	1	-	1	1	-	-	BRACKET .. Clamp
*90	8235782	1	1	1	1	1	1	1	VALVE ASSEMBLY .. By-pass
91	8235784	1	1	1	1	1	1	1	PLUNGER ASSEMBLY .. By-pass valve
92	8444617	1	1	1	1	1	1	1	SEAL .. O-ring - Valve body - Repl. 8223697
93	456342	1	1	1	1	1	1	1	PIN .. Straight 1/16 x 3/8 in. long - Form. 3291742
94	8235785	1	1	1	1	1	1	1	NUT .. Seal retainer
95	8235786	1	1	1	1	1	1	1	RETAINER .. Sleeve
96	8235787	1	1	1	1	1	1	1	SEAT .. By-pass valve spring
97	8235788	1	1	1	1	1	1	1	SPRING .. Seal retainer
98	8235789	1	1	1	1	1	1	1	SPRING .. By-pass valve
99	9318632	1	1	1	1	1	1	1	WASHER .. Seal - Replaces 8235790
100	8235783	1	1	1	1	1	1	1	BODY .. By-pass valve
101	8113840	1	1	1	1	1	1	1	SPRING .. Solenoid counter balance
102	8131473	1	1	1	1	1	1	1	SPRING .. Pilot valve bushing
103	8146495	1	1	1	1	1	1	1	BUSHING .. Pilot valve - Load control - All governors except 8195017, 8425923 & 8337898
*103A	8227009	-	-	-	-	-	1	1	BUSHING .. Pilot valve - Load control - 8195017, 8425923 & 8337898 governors only
104	9413362	1	1	1	1	1	1	1	RING .. Retaining
105	8113805	1	1	1	1	1	1	1	PLUNGER .. Pilot valve - Load control - All governors except 8195017, 8425923 & 8337898
*105A	8188851	-	-	-	-	-	1	1	PLUNGER .. Pilot valve - Load control - 8195017, 8425923 & 8337898 governors only
106	8113849	1	1	1	1	1	1	1	GASKET .. Oil seal - Load control

P.L. No. E167

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
107	8047553	1	1	1	1	1	1	1	SEAL .. Oil - Load control plunger
109	8113807	1	1	1	1	1	1	1	PISTON .. Overriding
110	8113806	1	1	1	1	1	1	1	COLLAR .. Spring
111	8129778	2	2	2	2	2	2	2	NUT .. Hex 5/16-24
112	8113843	1	1	1	1	1	1	1	SPRING .. Valve - Outer
113	8126520	1	1	1	1	1	1	1	SPRING .. Valve - Inner
114	8188850	1	1	1	1	1	1	1	RETAINER .. Spring
115	8113827	1	1	1	1	1	1	1	RING .. Snap
116	8132087	1	1	1	1	1	1	1	WASHER .. Indicator
116A	8113810	-	-	-	-	-	1	1	CYLINDER .. Overriding
116B	8293770	-	-	-	-	-	1	1	INDICATOR .. Load control - Replaces 8113847
*116C	8113808	-	-	-	-	-	1	1	HEAD .. Cylinder
*116D	8017584	-	-	-	-	-	2	2	SCREW .. Taper
*116E	155173	-	-	-	-	-	1	1	SCREW .. 10-32 x 1/4 round head - Cross section
*116F	8113662	-	-	-	-	-	1	1	WASHER .. Lock 3/16
*117	8284035	1	1	1	1	-	-	-	LIMITER ASSEMBLY .. Fuel
*117A	8367363	-	-	-	-	1	-	-	LIMITER ASSEMBLY .. Fuel
117B	8349466	1	1	1	1	1	-	-	BODY ASSEMBLY .. Fuel limiter
117C	8113808	1	1	1	1	1	-	-	HEAD .. Cylinder
117D	8017584	2	2	2	2	2	-	-	SCREW .. Taper
117E	9409966	1	1	1	1	1	-	-	PLUG .. Pipe
117F	8284062	1	1	1	1	1	-	-	SEAT .. Poppet valve
117G	8293770	1	1	1	1	1	-	-	INDICATOR .. Load control
118	155173	1	1	1	1	1	-	-	SCREW .. 10-32 x 1/4 rnd. hd. - Cr. recs.
119	8113662	1	1	1	1	1	-	-	WASHER .. Lock 3/16
120	8207375	1	1	1	1	1	-	-	VALVE ASSEMBLY .. Check
121	8284044	1	1	1	1	1	-	-	SCREEN ASM. .. Fuel limiter - Incl. plug
122	8283109	1	1	1	1	1	-	-	SENSOR ASM. .. Bellows - Absolute press.
*123	9413499	1	1	1	1	1	-	-	BEARING .. Needle
124	8354117	2	2	2	2	2	-	-	WASHER .. Spacer anchor
126	8444618	3	3	3	3	3	-	-	SEAL .. O-ring - Replaces 8223698
127	8479338	1	1	1	1	1	-	-	SEAL .. O-ring - Replaces 8284046
128	8351415	1	1	1	1	1	-	-	PIN .. Connecting beam
129	8284047	1	1	1	1	1	-	-	PIN .. Headed - Lever fulcrum - .186 dia.
130	8456970	1	1	1	1	1	-	-	PIN .. Lever - Formerly 8192136
131	119981	1	1	1	1	1	-	-	PIN .. Cotter 1/16 x 3/8 in. long
132	8284048	2	2	2	2	2	-	-	WASHER .. Sp. - .188 I.D. x .360 O.D. x .062 thick
134	120217	6	6	6	6	6	-	-	WASHER .. Lock - No. 10
136	181313	-	-	-	-	1	-	-	BOLT .. Hex head 1/4-28 x 3/4
*136A	181566	1	1	1	1	-	-	-	BOLT .. Hex head 1/4-28 x 3/4
*137	431487	1	1	1	1	1	-	-	SCREW .. Hex cap 10-32 x 5/8 - Socket hd.
138	9413463	1	1	1	1	1	-	-	RING .. Snap
140	8308192	1	1	1	1	1	-	-	WASHER .. Spl. - 9/64 I.D. x 3/8 O.D. x 1/32 thick
141	8284050	1	1	1	1	1	-	-	SPRING .. Oil seal
142	8284051	1	1	1	1	1	-	-	WASHER .. Spring
143	8305137	1	1	1	1	1	-	-	SPRING .. Piston
144	8429101	2	2	2	2	2	-	-	SPRING .. Tension - Formerly 8284053
145	8284054	33	33	33	33	33	-	-	GASKET .. .250 I.D. x .360 O.D. x .031 thick
*146	8284057	1	1	1	1	1	-	-	PIN .. .249 in. diameter x 1.125 in. long
147	8354116	1	1	1	1	1	-	-	PIN .. Spring anchor
149	8284060	1	1	1	1	1	-	-	WASHER .. O-ring
153	8284063	32	32	32	32	32	-	-	PLATE .. Orifice
154	8284064	1	1	1	1	1	-	-	PISTON .. Fuel limiter
155	8284065	1	1	1	1	1	-	-	SLEEVE .. Piston
156	8284066	1	1	1	1	1	-	-	CASE .. Orifice
157	8284067	1	1	1	1	1	-	-	SEAT .. Spring
158	8284068	1	1	1	1	1	-	-	PLUNGER .. Valve
†ϕ159	8284070	1	1	1	1	1	-	-	GUIDE .. Lever - No longer furnished - See Note on Page 5
ϕ*159A	8458520	1	1	1	1	1	-	-	GUIDE .. Lever
161	8284072	1	1	1	1	1	-	-	ARM .. Cam follower

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	F	G	Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
	8284035	1	1	1	1	-	-	-	LIMITER ASSEMBLY .. Fuel
	8367363	-	-	-	-	1	-	-	LIMITER ASSEMBLY .. Fuel
162	8284073	1	1	1	1	-	-	-	CAM .. 1.464 in. long x 1/8 in. thick
*162A	8367364	-	-	-	-	1	-	-	CAM .. 1.464 in. long x 1/8 in. thick
163	8284074	2	2	2	2	2	-	-	SCREW .. Spring anchor
*164	8329980	2	2	2	2	2	-	-	WASHER .. Anchor screw
165	8284076	1	1	1	1	1	-	-	BODY .. Banjo fitting
166	8284077	1	1	1	1	1	-	-	SCREW .. Fuel limiter body
167	8283110	1	1	1	1	1	-	-	NUT .. Lock - Bellows
167A	9415901	1	1	1	1	1	-	-	RING .. Snap
167B	8426761	1	1	1	1	1	-	-	RING .. Snap - Formerly 9415903
167C	8284350	1	1	1	1	1	-	-	BLOCK .. Lever support
167D	9413469	1	1	1	1	1	-	-	SCREW .. Socket head
167E	131181	1	1	1	1	1	-	-	WASHER .. Lock - No. 6
167F	8293771	1	1	1	1	1	-	-	SCREW .. Hex lock - 6-32 x 1/2 socket hd.
†ϕ*167G	8285454	1	1	1	1	1	-	-	ARM ASSEMBLY .. Rocker - No longer furnished
†ϕ167H	8284069	1	1	1	1	1	-	-	LEVER .. Rocker arm - No longer furnished
167J	9413498	1	1	1	1	1	-	-	BEARING .. Needle - .1247 in. shaft dia.
ϕ*167K	8458519	1	1	1	1	1	-	-	ARM ASSEMBLY .. Rocker
ϕ*167L	8458521	1	1	1	1	1	-	-	LEVER .. Rocker arm
*167M	9413498	1	1	1	1	1	-	-	BEARING .. Needle - .1247 in. shaft dia.

† For governors requiring replacement of earlier design 8285454 Rocker Arm Assembly, 8284070 Guide, or 8284069 Lever, use 8458518 Kit which contains current design 8458519 Rocker Arm Assembly, 8458520 Support Guide and 8456970 Pin.

*168	8436004	1	1	1	1	1	-	-	BRACKET ASSEMBLY .. Cam guide
168A	8284055	1	1	1	1	1	-	-	PIN .. Roller - .375 in. long x .122 in. dia.
*168B	8433773	1	1	1	1	1	-	-	SCREW .. Stop
*168C	8284037	1	1	1	1	1	-	-	NUT .. Hex lock 8-32
168D	954330	1	1	1	1	1	-	-	BEARING .. Ball
168E	8433221	1	1	1	1	1	-	-	BRACKET .. Cam guide - Formerly 8284071
168F	8284061	1	1	1	1	1	-	-	SHIM .. Shaft - Switch
169	8284059	1	1	1	1	1	-	-	UNION ASM. .. Bulk head - Formerly 8353920
170	8284095	1	1	1	1	1	-	-	NUT .. Hex lock 1/2-20
171	8284096	2	2	2	2	2	-	-	NUT .. Hex tube 1/2-20
172	8284097	2	2	2	2	2	-	-	SLEEVE .. Tube - 1/4
173	181568	-	-	-	-	-	2	2	BOLT .. Hex head 1/4-28 - Fuel limiter
180	103361	1	1	1	1	1	-	-	PIN .. Cotter 1/16 x 1/2
184	3304054	2	2	2	2	2	-	-	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 thick
*185	8068533	1	1	1	1	1	-	-	WASHER .. Orifice stack - 1/8
186	221416	2	2	2	2	2	-	-	WASHER .. Plain - .125 I.D. x .312 O.D. x .032 thick
187	446152	1	1	1	1	1	-	-	WASHER .. Spacer - Link
188	443802	1	1	1	1	1	-	-	SCREW .. Cap - 10-32 x 1-1/4 socket head
191	8284037	1	1	1	1	1	-	-	NUT .. Hex shutdown 8-32
192	8352782	1	1	1	1	1	-	-	TUBE ASSEMBLY .. Air box pressure
200	8338392	1	1	1	1	1	-	-	BLOCK ASSEMBLY .. Shutdown - Replaces 8284033
200A	443871	1	1	1	1	1	-	-	SCREW .. Socket head 8-32 x 5/8 - Set
200B	8292115	1	1	1	1	1	-	-	SCREW .. Adjusting - 10-32 x 1/2 in. long
200C	140855	1	1	1	1	1	-	-	SCREW .. Set - 8-32 x 5/16 in. long
ϕ205	8330234	1	1	1	1	1	-	-	LEVER ASSEMBLY .. Pick-up
206	8412096	1	1	1	1	1	-	-	SCREW .. Lever - Replaces 8309692
207	8284091	1	1	1	1	1	-	-	INSERT .. Helicoil
*208	8412097	1	1	1	1	1	-	-	NUT .. Hex lock 6-32
ϕ*209	8433212	1	1	1	1	1	-	-	LEVER ASSEMBLY .. Pick-up - Incl. stop block
*210	119981	1	1	1	1	1	-	-	PIN .. Cotter - 1/16 x 3/8 in. long

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
212	8292129	1	1	1	1	1	-	-	FILTER ASSEMBLY .. Oil
213	8297955	1	1	1	1	1	-	-	FILTER .. Oil - Includes plug
214	9093493	1	1	1	1	1	-	-	SEAL .. O-ring - Filter - Replaces 8330683
215	8286156	1	1	1	1	1	-	-	CASE .. Filter cartridge
216	3292039	1	1	1	1	1	-	-	PLUG .. Filter drain
217	5156913	1	1	1	1	1	-	-	GASKET .. Copper
217A	9098533	1	1	1	1	1	-	-	SEAL .. O-ring - .674 I.D. - Form. 8156971
218	8444617	2	2	2	2	2	-	-	SEAL .. O-ring - Replaces 8292130
220	8113800	3	3	3	3	3	-	-	WASHER .. Lock 1/4
221	138219	3	3	3	3	3	-	-	SCREW .. Hex cap 1/4-28 x 2-3/4 - Socket head
231	8201590	1	1	1	1	1	1	1	PISTON ASSEMBLY .. Power
232	8113656	1	1	1	1	1	1	1	RING .. Seal - Spring guard
233	8113657	1	1	1	1	1	1	1	ROD .. Tail - Power piston
234	8113658	1	1	1	1	1	1	1	NUT .. Lift - Tail rod
236	8201591	1	1	1	1	1	1	1	BEARING .. Needle - Terminal shaft
237	456382	1	1	1	1	1	1	1	BEARING .. Needle - Terminal shaft
238	8061742	1	1	1	1	1	1	1	SEAL .. Oil
239	8211818	1	1	1	1	1	1	1	SEAL .. Oil
240	8444617	1	1	1	1	1	1	1	SEAL .. O-ring - Needle valve - Repl. 8223697
241	8223700	1	1	1	1	1	1	1	SEAL .. O-ring - Spring guard - 2.093 I.D.
242	111840	1	1	1	1	1	1	1	PIN .. Taper - No. 2 x 3/4 in. long
243	444687	1	1	1	1	1	1	1	PLUG .. Hex socket 1/8 MPT - Pipe
244	120423	4	4	4	4	4	4	4	WASHER .. Lock 1/4 - Internal teeth
245	8057114	2	2	2	2	2	2	2	WASHER .. Lock 5/16 - Power lever
246	115549	1	1	1	1	1	1	1	WASHER .. Lock 3/8 - Internal teeth
247	145368	2	2	2	2	2	2	2	SCREW .. Drive - No. 2 x 3/16 round head
248	132046	1	1	1	1	1	1	1	SCREW .. Mach. - 10-24 x 5/8 fil. head
249	217908	2	2	2	2	2	2	2	SCREW .. Hex socket head 5/16-18 x 7/8 - Cap
250	8113800	8	8	8	8	8	8	8	WASHER .. Lock 1/4
252	9413435	2	2	2	2	2	2	2	RING .. Snap - Rod pin
253	106496	2	2	2	2	2	2	2	WASHER .. Lock - Pointer - No. 8
254	8113663	1	1	1	1	1	1	1	NUT .. Hex 3/8-24 - Tail rod
255	138211	8	8	8	8	8	8	8	SCREW .. Hex socket head 1/4-28 x 3/4 - Cap
256	8134427	4	4	4	4	4	4	4	BOLT .. Hex 1/4-28 x 1/2 - Spring guard
257	106497	1	1	1	1	1	1	1	WASHER .. Lock - No. 10
258	9421614	2	2	2	2	2	2	2	SCREW .. Hex socket head 8-32 x 3/8 - Cap
259	8201593	1	1	1	1	1	1	1	NUT .. Hex 7/16-20 - Stop - Piston rod
260	9411494	2	2	2	2	2	2	2	RING .. Retainer - .338 I.D.
*260A	8222631	-	-	-	-	2	2	-	SPRING .. Retainer - Early design 8195017, 8216206 and 8281140 governors only
261	8113664	1	1	1	1	1	1	1	SPRING .. Guard seal
262	8149111	1	1	1	1	1	1	1	SPRING .. Servo
263	8152339	1	1	1	1	1	1	1	GASKET .. Guard to power cylinder
264	8201595	1	1	1	1	1	1	1	GASKET .. Cover to power cylinder
266	8463603	1	1	1	1	1	1	1	SCALE .. Terminal shaft - Formerly 8284042
*266A	8201594	-	-	-	-	1	1	1	SCALE .. Terminal shaft
267	8149113	1	1	1	1	1	1	1	VALVE .. Needle
268	8149115	1	1	1	1	1	1	-	GUARD .. Spring - All governors except those listed in Ref. No. 268A
*268A	8326406	-	-	-	-	-	1	1	GUARD ASSEMBLY .. Spring 8337897, 8337898, 8425923 and 8425924 governors only
*268B	452652	-	-	-	-	-	1	1	INSERT .. Helicoil
269	8201598	1	1	1	1	1	1	1	COVER .. Power cylinder
270	8201600	2	2	2	2	2	2	2	LINK .. Power piston
271	8201601	1	1	1	1	1	1	1	PIN .. Power level
272	8201604	1	1	1	1	1	1	1	PIN .. Power rod
273	8459853	1	1	1	1	1	1	1	LEVER .. Rack dial - Formerly 8201596
ϕ274	8201597	1	1	-	-	1	1	1	POINTER .. Rack scale
ϕ*274A	8463597	1	1	1	1	1	1	-	POINTER .. Rack scale - Formerly 8346334
275	8201599	1	1	1	1	1	1	1	LEVER .. Power

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
276	8284043	1	1	1	1	-	-	-	SHAFT .. Terminal
*277	8460057	-	-	-	-	1	1	1	SHAFT .. Terminal - Formerly 8201602
ϕ278	8248309	1	1	-	-	1	1	1	CYLINDER ASSEMBLY .. Power - Replaces 8201589
ϕ*278A	8346333	1	1	1	1	1	1	-	CYLINDER ASSEMBLY .. Power
*278B	120613	-	-	-	-	-	1	1	NUT .. Hex lock 1/4-28
*278C	8326407	-	-	-	-	-	1	1	SCREW .. Stop
*279	8284078	1	1	1	1	1	-	-	SERVO ASSEMBLY .. Speeder spring
*279A	8149302	-	-	-	-	-	1	1	SERVO ASSEMBLY .. Speeder spring
279B	8217606	1	1	1	1	1	1	1	PISTON ASSEMBLY .. Speed setting
279C	8113963	1	1	1	1	1	1	1	CYLINDER .. Speed setting
280	8284088	1	1	1	1	1	-	-	FULCRUM ASSEMBLY .. Power piston
*280A	8113967	-	-	-	-	-	1	1	FULCRUM ASSEMBLY .. Power piston
281	8113970	2	2	2	2	2	2	2	LEVER .. Power piston - Replaces 8145336
282	8113971	1	1	1	1	1	1	1	SCREW .. Adjustable fulcrum
283	8113764	1	1	1	1	1	1	1	PIN .. Adjustable fulcrum
284	8452881	1	1	1	1	1	1	1	LINK .. Pivot pin - Replaces 8113972
285	8113973	1	1	1	1	1	1	1	LINK .. Floating lever
286	119981	3	3	3	3	3	3	3	PIN .. Cotter - 1/16 x 3/8 in. long
*287	8134415	1	1	1	1	1	1	1	PIN .. .1865 x 3/4 in. long
288	8113832	2	2	2	2	2	2	2	PIN .. Headed 3/16 x 25/32 in. long
289	8113974	1	1	1	1	1	1	1	PIN .. Straight - Drilled
290	8284089	1	1	1	1	1	-	-	STUD .. Speed setting
291	8113976	4	4	4	4	4	2	2	SPACER .. Link
292	8113662	3	3	3	3	3	3	3	WASHER .. 13/64 I.D. x 7/16 O.D. x 1/32 thick
293	120614	1	1	1	1	1	1	1	NUT .. Hex 10-32
294	148028	1	1	1	1	1	1	1	SCREW .. Mach. - 10-32 x 3/8 rnd. hd. - Cr. recess
295	8113977	1	1	1	1	1	1	1	NUT .. Hex lock 10-32
296	222384	1	1	1	1	1	1	1	SCREW .. Hex socket 10-32 x 1-1/4 - Set Flat point
297	8113772	1	1	1	1	1	1	1	SPRING .. Adjusting link
298	8149306	1	1	1	1	1	1	1	SCALE .. Speed setting
*299	8113975	-	-	-	-	-	1	1	STUD .. Cover - 3/8-16 x 3-1/16 in. long
302	8160339	1	1	1	1	1	1	1	CUP ASSEMBLY .. "D" solenoid
303	8113795	1	-	1	-	-	1	-	PLATE ASM. .. Tri. - Not furnished - See Ref. No. 304A
304	223004	1	-	1	-	-	1	-	SCREW .. Hex socket set 10-32 x 1/2 - Dog point
*304A	9333521	1	1	1	1	1	1	1	PLATE ASSEMBLY .. Triangular - Repl. 8459855 - Must be applied with Ref. No. 82A - 9333520 lever
*305	8113773	1	1	1	1	1	1	1	PLUNGER ASSEMBLY .. Shutdown
306	8113775	1	1	1	1	1	1	1	PLUNGER .. Shutdown
307	8113779	1	1	1	1	1	1	1	TUBING .. Plunger
308	8444618	1	1	1	1	1	1	1	SEAL .. O-ring - Replaces 8223698
309	3292030	1	1	1	1	1	1	1	SPRING .. Relief valve
310	8113778	1	1	1	1	1	1	1	PIN .. Spring - 5/32 x 3/4 in. long
311	104918	1	1	1	1	1	1	1	BALL .. 1/4 in. diameter
312	8113774	1	1	1	1	1	1	1	PIN .. Plunger
313	8113776	1	1	1	1	1	1	1	SEAT .. Ball valve
314	8149959	-	-	-	-	-	1	1	LEVER ASSEMBLY .. Adjusting floating
315	8433775	1	1	1	1	1	-	-	LEVER ASSEMBLY .. Adjusting floating formerly 8362298 and 8303849
*316	8306003	1	1	1	1	1	-	-	SPRING .. Adjusting link
*316A	8113772	-	-	-	-	-	1	1	SPRING .. Adjusting link
*317	8113767	1	1	1	1	1	1	1	KNOB .. Adjusting screw
*318	8113768	1	1	1	1	1	1	1	PIN .. Adjusting screw
319	8113770	-	-	-	-	-	1	1	ECCENTRIC
*319A	8433218	1	1	1	1	1	-	-	ECCENTRIC
320	8433219	1	1	1	1	1	1	1	BLOCK .. Adjusting - Formerly 8113771

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
	8149959	-	-	-	-	-	1	1	LEVER ASSEMBLY .. Adjusting floating
	8433775	1	1	1	1	1	-	-	LEVER ASSEMBLY .. Adjusting floating
321	138211	-	-	-	-	-	1	1	SCREW .. Hex head 1/4-28 x 3/4 - Cap
*321A	442039	1	1	1	1	1	-	-	SCREW .. Cap - 8-32 x 7/8 in. long
322	119981	4	4	4	4	4	2	2	PIN .. Cotter 1/16 x 3/8 in. long
*322A	8433217	1	1	1	1	1	-	-	PIN .. Movable fulcrum
322B	8433215	2	2	2	2	2	-	-	LINK .. Pilot valve
322C	8446359	1	1	1	1	1	-	-	LINK .. Pilot valve - Formerly 8284085
322D	8433216	1	1	1	1	1	-	-	STRAP .. Pilot valve - Formerly 8284086
322E	8214389	1	1	1	1	1	-	-	PIN .. Power lever
322F	8433225	1	1	1	1	1	-	-	PIN .. .812 in. long x .1865 in. diameter - Formerly 8113833
*322G	3304054	2	2	2	2	2	-	-	WASHER .. Plain - 17/64 I.D. x 1/2 O.D. x 1/16 in. thick
323	8113780	1	1	1	1	1	1	1	BUSHING ASSEMBLY .. Oil failure valve
*324	8201608	1	1	1	1	1	1	1	VALVE ASSEMBLY .. Lube oil
325	8113790	1	1	1	1	1	1	1	NUT .. Valve
326	104916	1	1	1	1	1	1	1	BALL .. Valve
327	8201615	1	1	1	1	1	1	1	SEAT .. Ball
328	8201616	1	1	1	1	1	1	1	BODY .. Valve
*329	8259474	1	1	1	1	1	-	-	WASHER .. .210 I.D. x .340 O.D. x .25 thick
330	8284081	1	1	1	1	1	-	-	WASHER .. .203 I.D. x .380 O.D. x .05 thick
*331	444687	1	1	1	1	1	1	1	PLUG .. Hex socket - 1/8 MPT - Pipe
332	444040	1	1	1	1	1	1	1	ELBOW .. Street - 1/4 MPT - 90°
333	8040382	1	1	1	1	1	1	1	TEE .. 1/4 tube x 1/4 MPT x 1/4 tube
*334	120217	1	1	1	1	1	-	-	WASHER .. Lock - No. 10
*355	139009	1	1	1	1	1	1	1	SCREW .. Hex socket set 1/4-28 - Cup point
*337	8147713	2	2	2	2	2	2	2	SCREW .. Hex socket head 1/4-28 x 2-3/8 - Cap
338	8348345	1	1	1	1	1	-	-	SPRING .. Speeder spring servo
*340	8113841	-	-	-	-	-	1	1	SPRING .. Speeder spring servo
342	8113811	1	1	1	1	1	1	1	PISTON .. Oil failure
343	8231570	1	1	1	1	1	1	1	PLUNGER .. Pilot valve - Overriding
345	8113819	1	1	1	1	1	1	1	WASHER .. Diaphragm
346	8113788	1	1	1	1	1	1	1	DIAPHRAGM .. Vacuum
347	8113790	2	2	2	2	2	2	2	NUT .. Diaphragm
348	8113791	1	1	1	1	1	1	1	HOLDER .. Vacuum diaphragm
349	8158716	1	1	1	1	1	1	1	DIAPHRAGM .. Oil failure
*350	9087347	2	2	2	2	2	2	2	SEAL .. O-ring - .239 I.D. - Repl. 8223696
351	9093702	3	3	3	3	3	3	3	SEAL .. O-ring - 1.734 I.D. - Repl. 8223701
352	8061137	1	1	1	1	1	1	1	WASHER .. Copper - Vacuum diaphragm
353	118750	1	1	1	1	1	1	1	CONNECTOR .. Half - Lube vacuum - 3/8 O.D. x 1/4 MPT
354	118752	4	4	4	4	4	4	4	CONNECTOR .. Half - Load control - 1/2 O.D. x 3/8 MPT
355	5939163	1	1	1	1	1	1	1	NUT .. Hex lock 10-32
356	8113800	19	19	19	19	19	19	19	WASHER .. Lock 1/4
*357	181316	2	2	2	2	2	2	2	BOLT .. Hex head 1/4-28 x 1-1/8 - Overriding cylinder
358	8134416	2	2	2	2	2	2	2	SCREW .. Hex head 1/4-28 x 1-3/8 - Servo
359	217940	1	1	1	1	1	1	1	SCREW .. Hex socket head 1/4-28 x 3/8 - Cap
360	8147713	1	1	1	1	1	1	1	SCREW .. Hex socket head 1/4-28 x 2-3/8 - Cap
361	8163437	1	1	1	1	1	1	1	WASHER .. Valve bushing - 1/4 I.D.
362	138216	4	4	4	4	4	4	4	SCREW .. Hex socket head 1/4-28 x 2 - Cap
363	138214	3	3	3	3	3	3	3	SCREW .. Hex socket head 1/4-28 x 1-1/2 - Cap
363A	138211	4	4	4	4	4	7	7	SCREW .. Hex socket head 1/4-28 x 3/4 - Cap
364	8113832	1	1	1	1	1	1	1	PIN .. Headed - 3/16 x 25/32 in. long
365	8113836	1	1	1	1	1	1	1	SPRING .. Pilot valve plunger - Overriding
366	8113846	1	1	1	1	1	1	1	SPRING .. Shutdown plunger
367	8113837	1	1	1	1	1	1	1	SPRING .. Diaphragm
368	8113794	1	1	1	1	1	1	1	SPRING .. Vacuum diaphragm
369	8113844	1	1	1	1	1	1	1	SPRING .. Link - Floating lever

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GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required A	B	C	D	E	F	G	Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
370	8113838	1	1	1	1	1	1	1	SPRING .. Oil failure piston
371	8113850	1	1	1	1	1	1	1	GASKET .. Oil failure bushing
372	8201610	1	1	1	1	1	1	1	GASKET .. Side plate
373	8193508	1	1	1	1	1	1	1	PLUNGER .. Oil failure
374	8286155	1	1	1	1	1	-	-	PLATE .. Side - Drilled for oil filter
*374A	8201611	-	-	-	-	-	1	1	PLATE .. Lube oil diaphragm
375	8201612	1	1	1	1	1	1	1	CAP .. Diaphragm
376	8201613	1	1	1	1	1	1	1	SCREW .. Diaphragm stop
*378	8284080	1	1	1	1	1	-	-	POWER PACK .. Electrical equipment
*378A	8201606	-	-	-	-	-	1	1	POWER PACK .. Electrical equipment
379	8113683	5	5	5	5	5	5	5	PLUNGER ASSEMBLY .. Solenoid
380	8163953	5	5	5	5	5	5	5	GUIDE .. Solenoid
381	8113743	5	5	5	5	5	5	5	PIN .. Locating
382	8133719	10	10	10	10	10	10	10	BUSHING .. Locating
*382A	8191878	-	-	-	-	-	1	1	SHAFT .. Switch
*382B	8191879	-	-	-	-	-	1	1	LEVER
*382C	8191880	-	-	-	-	-	1	1	LEVER .. Switch
*382D	8191881	-	-	-	-	-	1	1	LEVER .. Adjusting switch
383	8284092	1	1	1	1	1	-	-	CONNECTOR ASSEMBLY .. Male - 12 point - Incl. wire and lugs
*383A	8201620	-	-	-	-	-	1	1	CONNECTOR ASSEMBLY .. Male - 12 point - Incl. wire and lugs
*384	8329355	As Required							WIRE .. Teflon - Black
*385	8329356	As Required							WIRE .. Teflon - Red
*386	8329357	As Required							WIRE .. Teflon - Blue
*387	8329358	As Required							WIRE .. Teflon - White
*388	8329359	As Required							WIRE .. Teflon - Yellow — 25 ft. length
*389	8329360	As Required							WIRE .. Teflon - Green
*390	8329361	As Required							WIRE .. Teflon - Pink
*391	8329362	-	-	-	-	-	A.R.		WIRE .. Teflon - Orange
*392	8329363	-	-	-	-	-	A.R.		WIRE .. Teflon - Brown
*393	8097414	1	1	1	1	1	1	1	HOUSING .. Connector - Flanged
*394	8200229	4	4	4	4	4	2	2	LUG .. Terminal
*395	8203174	1	1	1	1	1	1	1	PLUG .. Connector
*395A	8481010	As Required							TUBING .. Plastic - Clear - Rep. 8326434
396	8284093	1	1	1	1	1	-	-	BRACKET ASSEMBLY .. Switch
*396A	8193296	-	-	-	-	-	1	1	BRACKET ASSEMBLY .. Switch
*396B	8192136	1	1	1	1	1	1	1	PIN .. Bracket
*396C	8193297	-	-	-	-	-	2	2	BUSHING .. Oilite
398	8113681	5	5	5	5	5	5	5	CASE .. Solenoid
399	8113684	5	5	5	5	5	5	5	ROD .. Solenoid
400	8113761	5	5	5	5	5	5	5	WASHER .. Solenoid plunger
401	8113738	5	5	5	5	5	5	5	PLUG .. Plunger stop
402	8113739	5	5	5	5	5	5	5	NUT .. Hex lock 3/4-32
403	8113989	5	5	5	5	5	5	5	SPRING .. Load
*403A	8191962	-	-	-	-	-	1	1	SPRING .. Torsion - Switch lever shaft
404	8113740	1	1	1	1	1	1	1	COVER .. Wiring
405	8113742	1	1	1	1	1	1	1	PLATE .. Connection clamp
406	8113672	2	2	2	2	2	-	-	PIN .. Drive lock
407	8113744	10	10	10	10	10	10	10	WASHER .. Soldering shield
409	120217	2	2	2	2	2	2	2	WASHER .. Lock - No. 10 - Spring lock
*409A	115545	-	-	-	-	-	4	4	WASHER .. Lock - No. 10 - Internal teeth
*409B	115544	-	-	-	-	-	1	1	WASHER .. Lock - No. 8 - Internal teeth
*409C	222380	-	-	-	-	-	1	1	SCREW .. Hex soc. 10-32 x 5/8 - Flat pnt. - Set
410	140880	5	5	5	5	5	5	5	SCREW .. Hex soc. 10-32 x 1/4 - Cup pnt. - Set
*410A	455674	-	-	-	-	-	2	2	SCREW .. Mach. 6-32 x 1-7/8 round head
411	8113745	5	5	5	5	5	5	5	RING .. Retaining - Solenoid pin
412	8113746	3	3	3	3	3	3	3	NUT .. Speed
413	145154	3	3	3	3	3	3	3	SCREW .. Tapping - 8-18 x 1-1/4 round head
*414A	8191964	-	-	-	-	-	1	1	SPACER .. Switch shaft
*414B	9415674	-	-	-	-	-	2	2	SCREW .. Hex head 10-32 x 3/4 - Switch brkt.

P.L. No. E167

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
	8284080	1	1	1	1	1	-	-	POWER PACK .. Electrical equipment
	8201606	-	-	-	-	-	1	1	POWER PACK .. Electrical equipment
*415	8116931	As Required							CEMENT .. Gasket - 1 pint
417	8152184	10	10	10	10	10	10	10	TUBING .. Varnished - .337 I.D.
*417A	121832	-	-	-	-	-	1	1	SCREW .. Round head 8-32 x 3/8 - Mach.
418	155998	4	4	4	4	4	4	4	SCREW .. Flat head 10-32 x 3/8 - Mach. - Cross recess
419	8377913	2	2	2	2	2	2	2	SCREW .. Fil. head 10-32 x 2-5/16 - Mach. - Cross recess - Replaces 153528
421	8113755	1	1	1	1	1	1	1	SWITCH .. Lube oil signal
422	8113756	5	5	5	5	5	5	5	COIL .. Solenoid - 700 Ohms
*422A	8311242	-	-	-	-	-	2	2	SWITCH .. Micro
*422B	8329469	-	-	-	-	-	1	1	CLAMP .. Wire
*422C	8035119	-	-	-	-	-	2	2	NUT .. Hex lock 6-32
*423	274676	-	-	-	-	-	1	1	RING .. Snap
*424	8284081	-	-	-	-	-	1	1	WASHER .. .203 I.D. x .38 O.D. x .05 thick
425	8129082	5	5	5	5	5	5	5	PAPER .. Insulating
*426	8189218	-	-	-	-	-	5	5	TERMINAL .. Stakon lug - Formerly 8291466
428	8113760	1	1	1	1	1	1	1	GASKET .. Connector plate
429	8191876	1	1	1	1	1	1	1	BRACKET .. Solenoid
430	8202849	1	1	1	1	1	1	1	BRACKET .. Switch mounting
431	8202850	1	1	1	1	1	1	1	PLATE .. Switch bracket clamp
*432A	125982	-	-	-	-	-	2	2	SCREW .. Hex head 10-32 x 1/2 - Switch lever
*432B	120614	-	-	-	-	-	3	3	NUT .. Hex 10-32
*432C	8113662	3	3	3	3	3	1	1	WASHER .. Plain - 13/64 I.D. x 7/16 O.D. x 1/32 inch thick
433	8217607	1	1	1	1	1	1	1	PLUG ASSEMBLY .. Spring check
434	456350	1	1	1	1	1	1	1	PIN .. Stop - Formerly 8217608
440	8367213	1	1	1	1	1	1	1	COVER ASSEMBLY .. Governor - Replaces 8292113 and 8201585
441	8131835	2	2	2	2	2	2	2	BUSHING .. Cover doweling
443	8017559	1	1	1	1	1	1	1	CUP .. Oil filler
445	8140550	1	1	1	1	1	1	1	GASKET .. Cover
446	8365140	2	2	2	2	2	2	2	BOLT .. Hex head 5/16-24 x 7-1/4 - Cover
*447	8068098	6	6	6	6	6	6	6	WASHER .. Plain 5/16
*448	9332176	1	1	1	1	1	1	1	LABEL .. Piping - Set - Replaces 8113865
450	119981	1	1	1	1	1	1	1	PIN .. Cotter 1/16 x 3/8 inch long - Tail rod
451	8113832	1	1	1	1	1	1	1	PIN .. Headed 3/16 x 25/32 inch long - Tail rod
454	8130450	2	2	2	2	2	2	2	BOLT .. Drilled hex head 5/16-24 x 6-1/4
455	138242	4	4	4	4	4	4	4	SCREW .. Hex socket head 3/8-16 x 1 - Cap
*457	432267	2	2	2	2	2	2	2	SCREW .. Round head 5-40 x 1/4 - Mach. - Cross recess
458	159572	4	4	4	4	4	4	4	SCREW .. Pan head 8-32 x 1/4 - Mach - Name plate mounting - Cross recess
461	8152079	4	4	4	4	4	4	4	WASHER .. Lock 3/8
*462	443871	1	1	1	1	1	-	-	SCREW .. Hex socket 8-32 x 5/8 - Set - Cup point
463	8201587	4	4	4	4	4	4	4	BOLT .. Hex head 5/16-24 x 4-3/4 - Column to case
465	8152077	2	2	2	2	2	2	2	NAME PLATE .. Bleed hole
*466	8356333	1	1	1	1	1	1	1	INSERT .. Name plate - Blank
467	8356332	1	1	1	1	1	1	1	NAME PLATE .. Governor - Column
468	8113869	1	1	1	1	1	1	1	GASKET .. Column to case
469	8113870	1	1	1	1	1	1	1	GASKET .. Case to column
470	8483071	1	1	1	1	1	1	1	GASKET .. Power cylinder case - Replaces 8152078
471	220342	6	6	6	6	6	6	6	SCREW .. Drive - Bleed hole name plate - No. 0
473	8284039	1	1	1	1	1	-	-	PIN .. Tail rod
474	8284040	1	1	1	1	1	-	-	BEAM .. Connecting
474A	8284081	1	1	1	1	1	-	-	WASHER .. Connecting beam - Formerly 8384081
*475	8132974	2	2	2	2	2	2	2	CAP .. Plastic - 7/16-20 } Shipping purpose only
*476	8132975	1	1	1	1	1	1	1	CAP .. Plastic - 5/8-18 } Shipping purpose only
*477	8132976	4	4	4	4	4	4	4	CAP .. Plastic - 3/4-16 } Shipping purpose only
*478	8075907	-	-	-	-	-	1	1	NUT .. Knurles screw - 10-32

GOVERNOR ASSEMBLY

Ref. No.	Part Number	Quantity Required							Description
		A	B	C	D	E	F	G	GOVERNOR ASSEMBLY .. Engine
*479	8191863	-	-	-	-	-	1	1	ARM .. Tail rod
*480	273641	-	-	-	-	-	1	1	SCREW .. Tail rod arm - No. 10-32 x 7/8 inch long - Formerly 455644
*481	115545	-	-	-	-	-	1	1	WASHER .. Lock - No. 10 - Tail rod arm
*482	8191864	-	-	-	-	-	1	1	SCREW .. Special - No. 10-32 - Knurled head
*483	8419697	-	1	-	1	1	1	1	DECAL .. Caution - Not furnished separately - See Ref. No. 448
*484	8285799	-	-	-	-	-	1	1	BLOCK .. Stop - Applied to 8337897 and 8337898 governors only
*485	147119	-	-	-	-	-	2	2	SCREW .. Cap - Block mounting - 10-32 x 1 hex socket - Applied to 8337897 and 8337898 governors only
*486	120217	-	-	-	-	-	2	2	WASHER .. Lock - No. 10 - Applied to 8337897 and 8337898 governors only
*487	8284048	-	-	-	-	-	2	2	WASHER .. Plain - Applied to 8337897 and 8337898 governors only
*488	8240528	1	1	1	1	1	1	1	RECEPTACLE .. Female - 12 point

P.L. No. E167

GOVERNOR ASSEMBLY

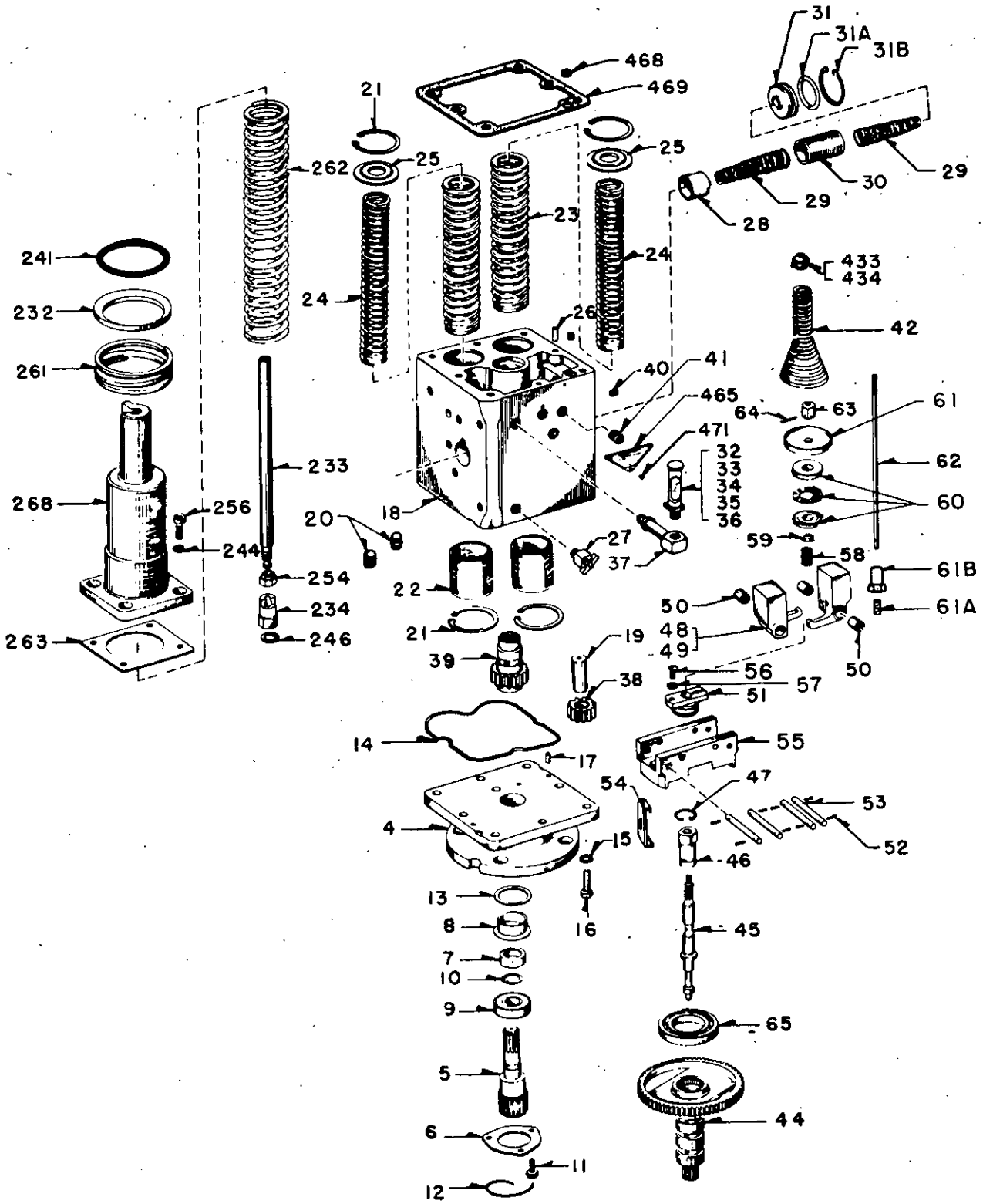


PLATE C167-1

P.L. No. E167

GOVERNOR ASSEMBLY

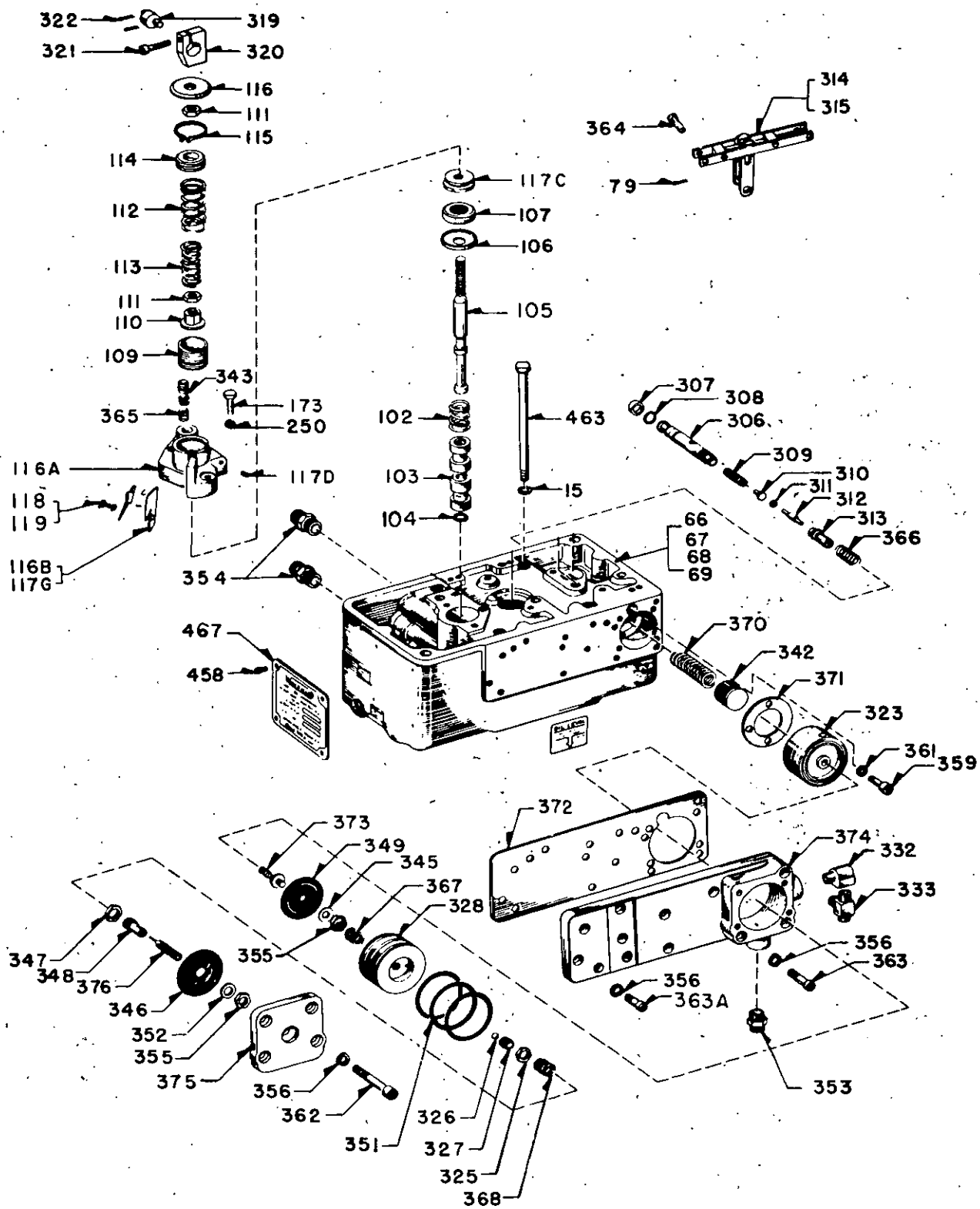


PLATE C167-2

P.L. No. E167

GOVERNOR ASSEMBLY

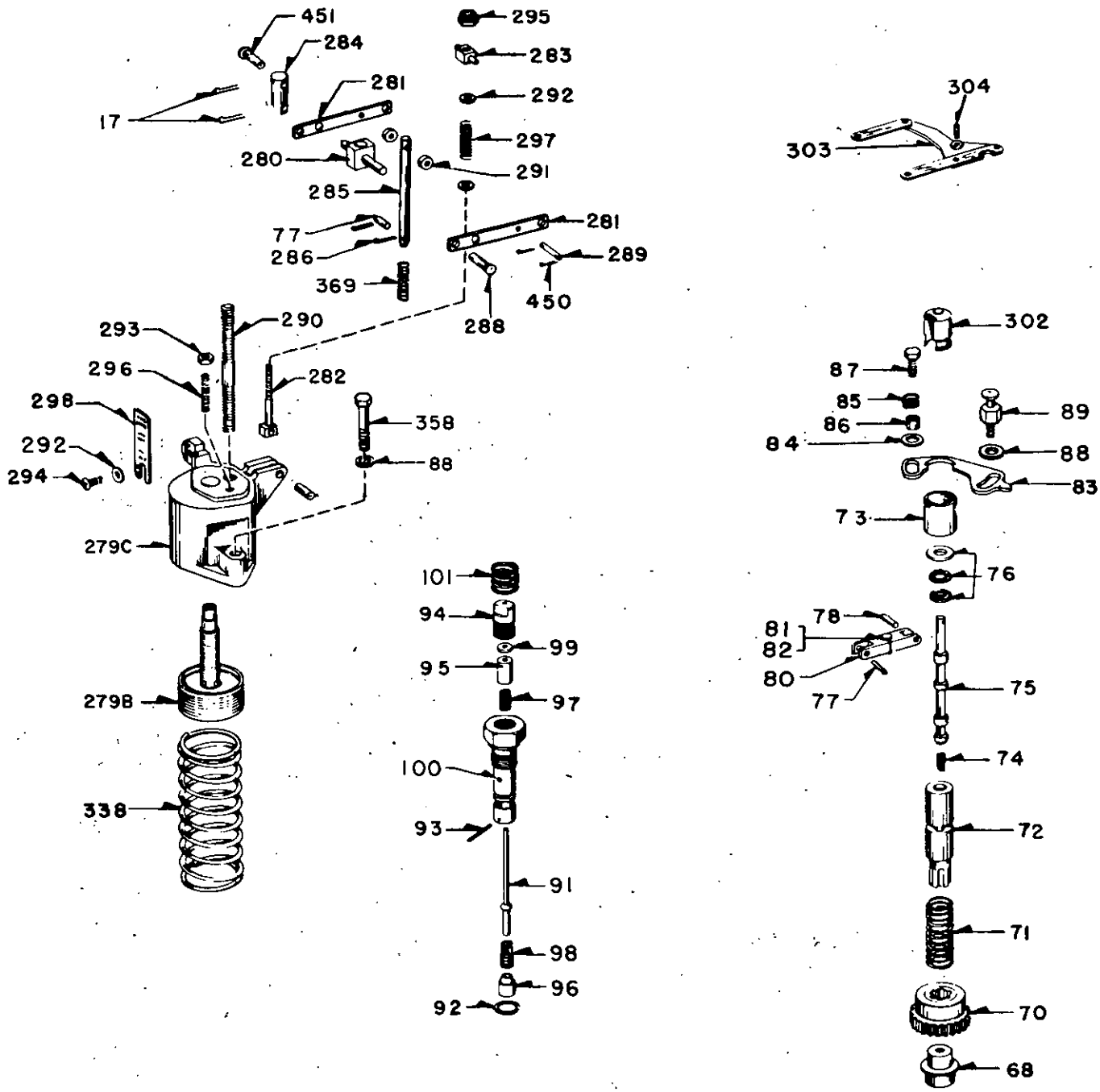


PLATE C167-3

GOVERNOR ASSEMBLY

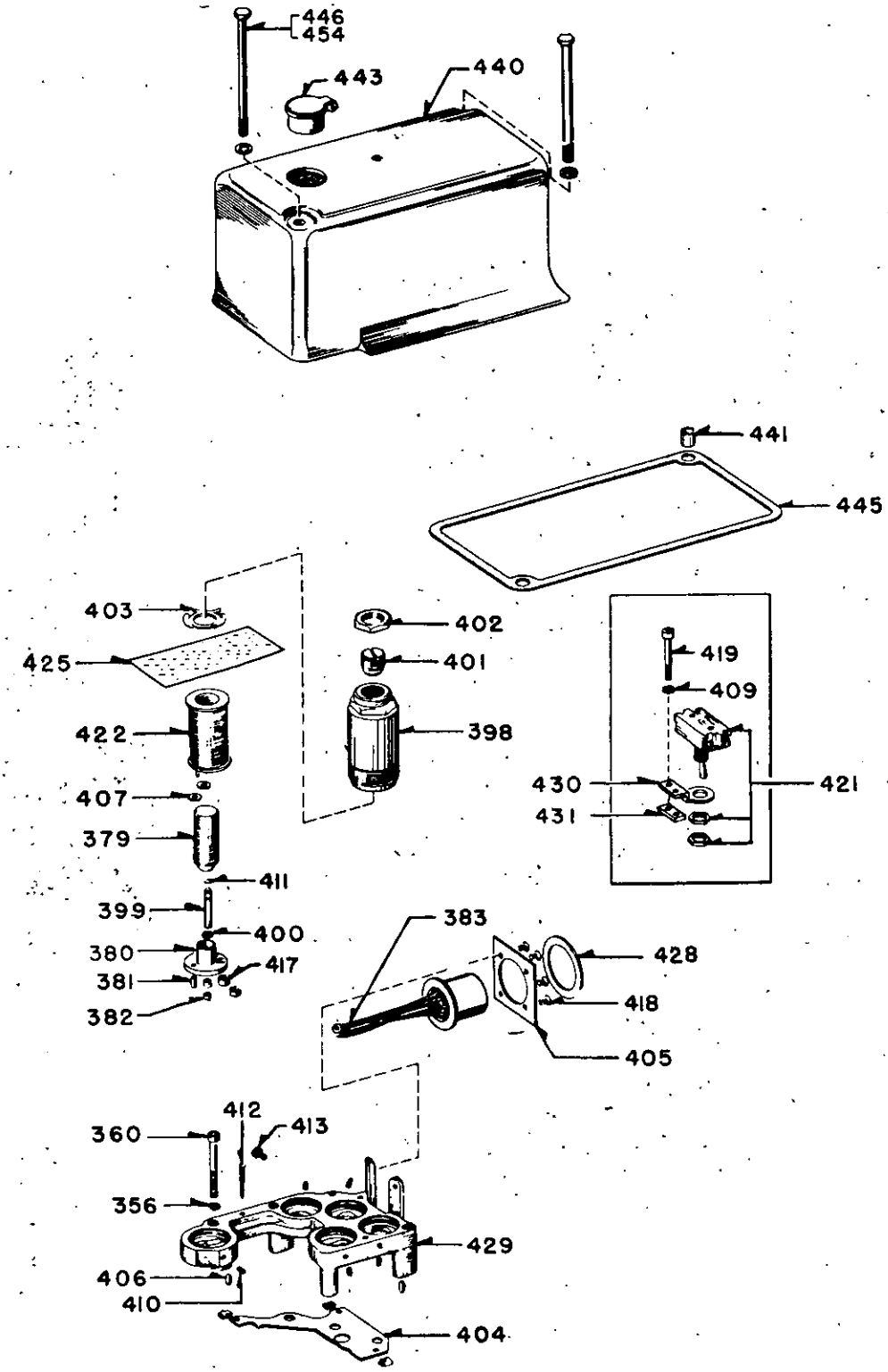


PLATE C167-4

P.L. No. E167

GOVERNOR ASSEMBLY

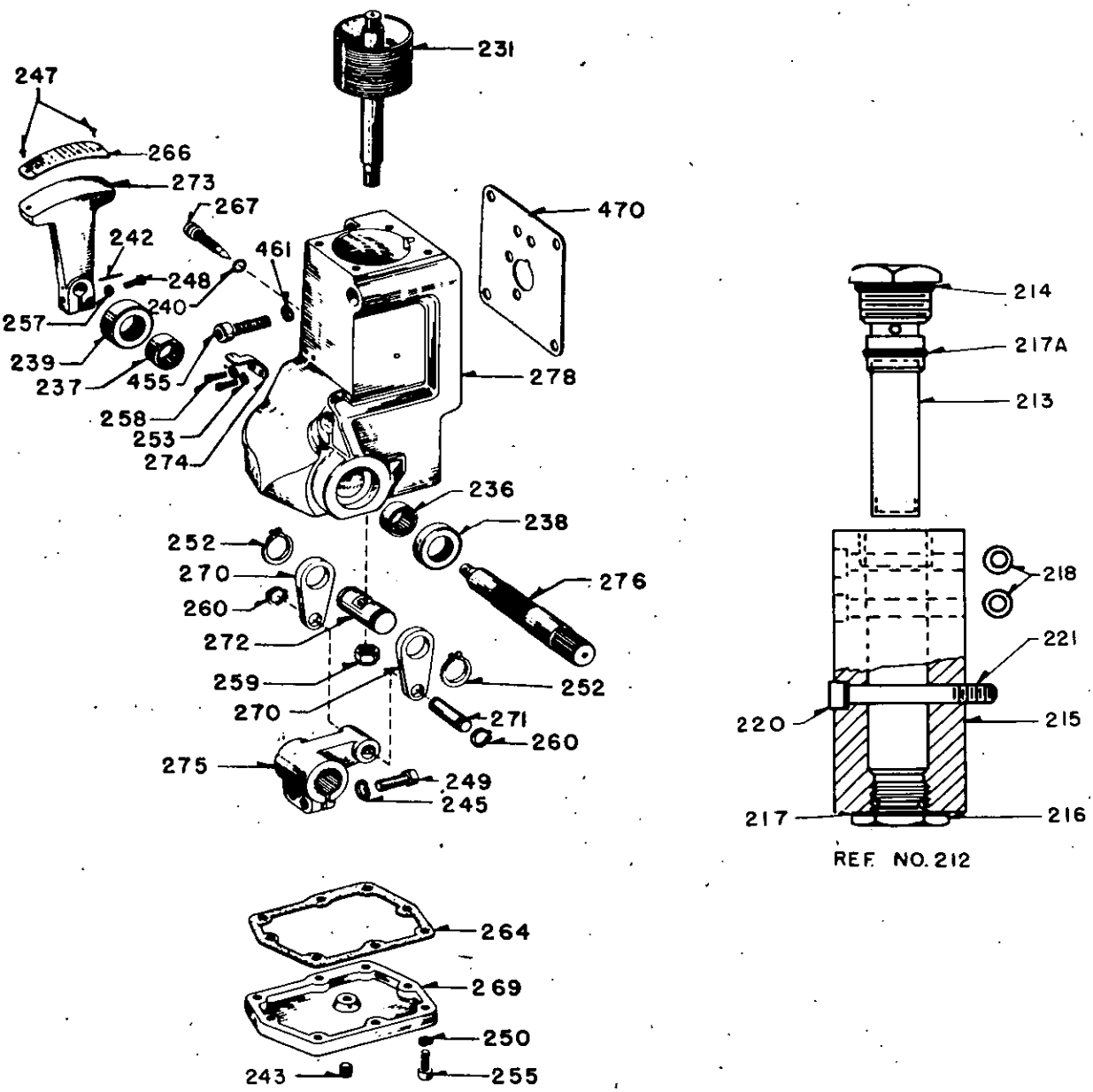


PLATE C167-5

GOVERNOR ASSEMBLY

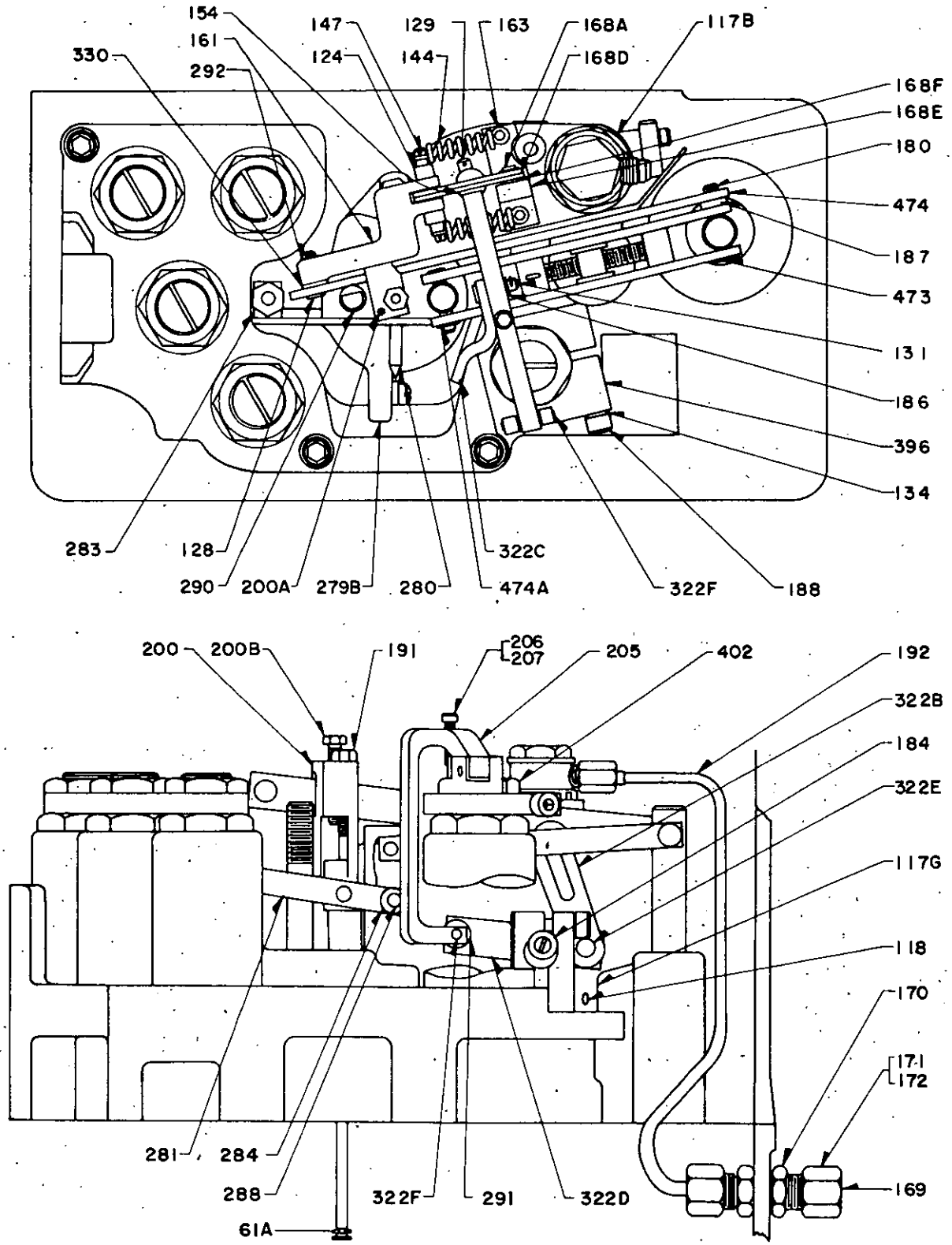
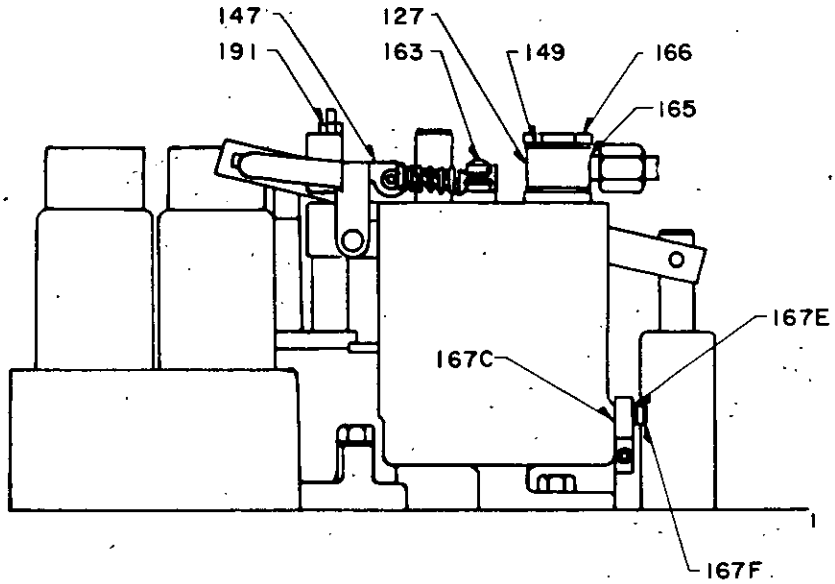
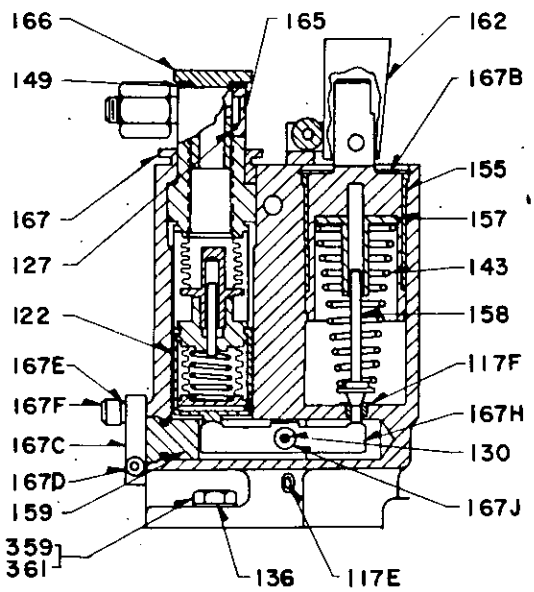


PLATE C167-6

P.L. No. E167

GOVERNOR ASSEMBLY





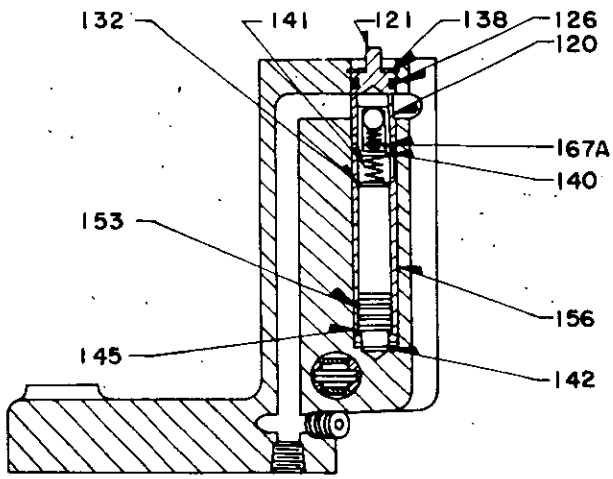


PLATE C167-7

Parts List No. F170

GOVERNOR DRIVE AND GOVERNOR DRIVE GEAR

Governor Drive Gear Application
All Engines

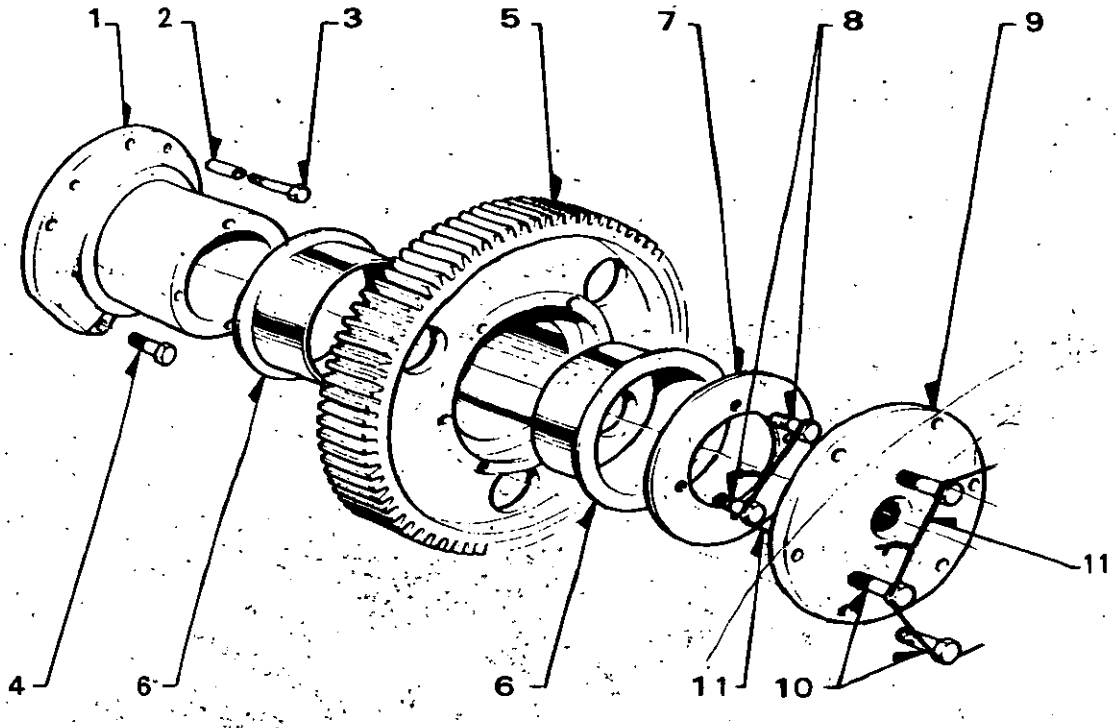


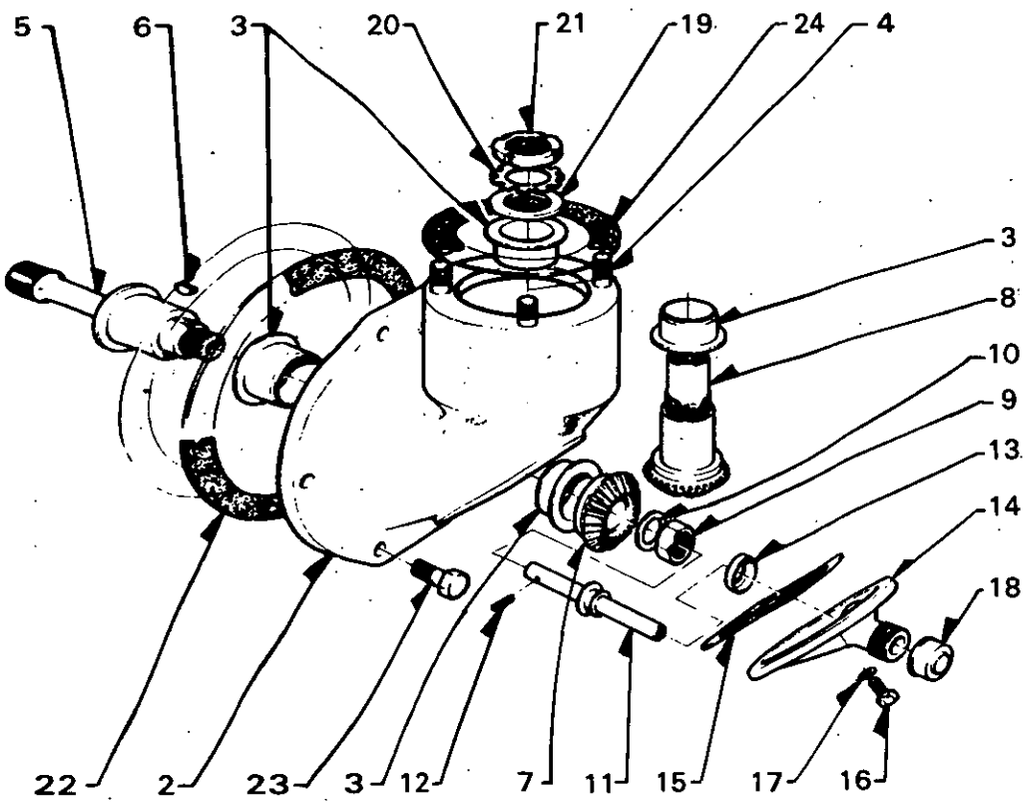
PLATE C170-1

Ref. No.	Part Number	Qty. Req.	Description
1	8084468	1	STUBSHAFT .. Drive Gear
2	8070243	2	PIN .. Dowel - Locating .500 dia. x 1 in. long with 1/4-28 threaded end 8115096 .. .505 dia. 8115097 .. .510 dia. 8115098 .. .515 dia.
3	8060180	2	BOLT .. Hex head drilled 1/4-28 x 3/8
4	8028291	5	BOLT .. Hex head drilled 1/2-20 x 1-1/8
5	8041930	1	GEAR .. Governor drive - 113 tooth
6	8039671	2	BUSHING .. Drive gear
7	8028188	1	PLATE .. Retaining
8	8028314	4	BOLT .. Hex head drilled 3/8-24 x 7/8
9	8028480	1	FLANGE .. Drive - Splined
10	8028312	6	BOLT .. Hex head drilled 3/8-24 x 1
11	8116738	A.R.	WIRE .. Lock - 3/64 dia. x 500 ft.

P.L. No. F170

GOVERNOR DRIVE AND GOVERNOR DRIVE GEAR

Governor Drive Assemblies
All 567 and 645 Engines



Ref. No. 1 - Column E

PLATE A170-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	Standard Governor Drive - Without Tachometer Generator Drive Shaft
		-	B	Special Governor Drive - With Tachometer Generator Drive Shaft
*1	8175893	1	-	DRIVE ASM. .. Governor - Without tachometer drive shaft
1	8219659	-	1	DRIVE ASM. .. Governor - With tachometer drive shaft
2	8176657	1	1	HOUSING ASM. .. Governor drive
3	8039674	4	4	BUSHING .. Shaft
4	8028951	4	4	STUD .. 1/2-13 x 1/2-20 x 1-7/8 in. long
5	9514175	1	-	SHAFT .. Governor drive gear - Formerly 8196728
5	8196728	-	1	SHAFT .. Governor drive gear
6	106750	1	1	KEY .. Woodruff
7	8028238	1	1	GEAR .. Drive - 24 teeth
8	8028499	1	1	GEAR .. Driven - 22 teeth - Includes driven shaft
9	8060089	1	-	NUT .. Hex lock 3/4-16
9	8059714	-	1	NUT .. Hex lock 3/4-16 - Slotted
10	8028733	1	1	WASHER .. Flat 3/4
11	8196727	-	1	SHAFT .. Tachometer generator drive
12	455277	-	1	PIN .. Roll 1/8 x 1-1/8
13	8196726	-	1	BAFFLE .. Oil slinger

P.L. No. F170

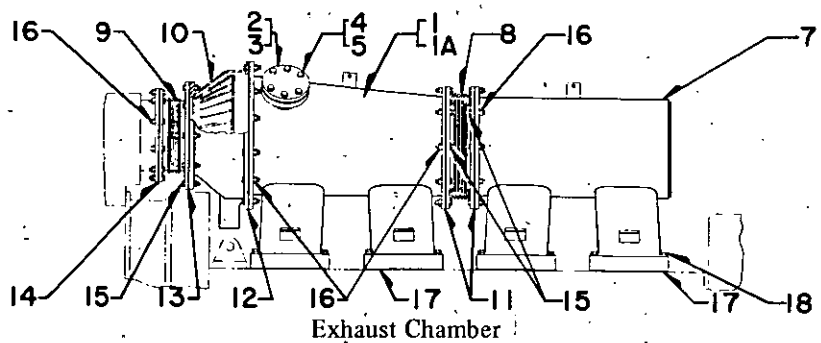
GOVERNOR DRIVE AND GOVERNOR DRIVE GEAR

Ref. No.	Part Number	Qty. Req.		Description
		-	-	DRIVE ASM. .. Governor
*14	9513178	1	-	COVER .. Housing - Formerly 8196833
14	8028618	-	1	COVER .. Housing
15	8028209	1	1	GASKET .. Cover
16	179839	7	7	BOLT .. Hex head 3/8-16 x 1
17	103321	7	7	WASHER .. Lock 3/8
18	849330	-	1	CAP .. Tachometer drive
19	8028365	-	1	SPACER .. Gear
20	127688	-	1	WASHER .. Lock
21	127711	-	1	NUT .. Lock
22	8028229	1	1	GASKET .. Mounting
23	181433	6	6	BOLT .. Hex head 1/2-20 x 1-3/4
24	8028239	1	1	GASKET .. Governor to drive housing
*25	103028	4	4	NUT .. Hex 1/2-20
*26	103323	4	4	WASHER .. Lock 1/2
*27	3261563	-	1	GENERATOR .. Tachometer - 6 volts DC per 1000 RPM
*28	3329218	-	1	SHAFT .. Flexible drive - 2.62 in. long
*29	8126591	-	1	KIT .. Brush replacement

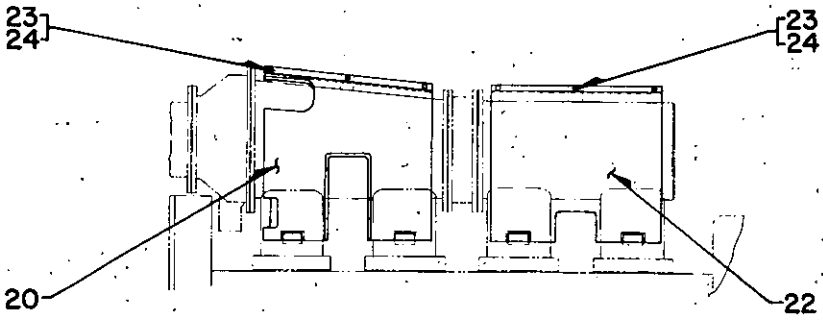
Parts List No. F172

EXHAUST CHAMBER ASSEMBLY

Exhaust Chambers with Straight Leg Manifolds, Heat Shields and Water Discharge Flange
8-645E3C Engine
GP15T and MP15T Locomotives



Exhaust Chamber



Heat Shield

PLATE F172-1

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	9520131	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 9329390
1A	9316234	1	CHAMBER ASM. .. Exhaust - Rear
2	9316673	1	FLANGE .. Cover
3	9316672	1	GASKET .. Cover - Flange to manifold flange
4	8287827	6	BOLT .. Cover to flange - 1/2-20 x 2 hex head
5	9338626	6	NUT .. 1/2-20 hex - Formerly 8284621
/ ϕ*6	8358830	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 8466603
7	9316231	1	CHAMBER ASM. .. Exhaust - Front - Replaces 8351182 and 8445995
8	8408985	1	JOINT ASM. .. Expansion - Replaces 8321099 and 8434114
9	8408987	1	JOINT ASM. .. Expansion - Adapter to turbocharger - Replaces 8321126
10	9557143	1	SCREEN ASM. .. Trap type - Replaces 8482700 and 9526331
11	8309214	2	GASKET .. Expansion joint
12	8358834	1	GASKET .. Chamber to adapter
13	8309213	1	GASKET .. Adapter to expansion joint
14	8309212	1	GASKET .. Expansion joint to turbocharger
15	8287827	52	BOLT .. Expansion joint and adapter mtg. - 1/2-20 x 2 hex head
16	9338626	52	NUT .. 1/2-20 hex - Formerly 8284621
17	9337724	4	GASKET .. Chamber to crankcase - Replaces 8281295 and 8459714
18	9318052	24	BOLT AND WASHER ASM. .. Chamber to crankcase - For 2-1/8 in. hold down flange
*19	- - - -	A.R.	COMPOUND .. Thread - Applied to Ref. No. 18 8315394 .. 4 oz tube 8278929 .. 1 quart
20	9320186	1	SHIELD ASM. .. Heat - Rear - Right hand - Inspection port
*21	8358827	1	SHIELD ASM. .. Heat - Rear - Left hand
22	8351254	2	SHIELD ASM. .. Heat - Front - Replaces 8419893 and 8419894
23	181370	6	BOLT .. Heat shield mtg. - 3/8-24 x 1-1/4 hex head
24	8261074	6	NUT .. Special - 3/8-24 hex
+*25	8359613	1	"Y" FLANGE .. Water discharge
*26	8347756	1	GASKET .. Flange to crankcase
*27	272563	4	BOLT .. Flange mtg. - 1-14 x 2-1/4 hex head
*28	121326	4	WASHER .. Lock - 1 in.

/ See note on page 2

42434

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Exhaust Chambers with Straight Leg Manifolds, Heat Shields and Water Discharge Flange
12-645E3,E3B,E3C,F3,F3B Engines

PLATE F172-2 and C172-3

Ref. No.	Part Number	Qty. Req. A	B	C	D	Description
		X	-	-	-	12-645E3 - GP39-2, GT22C, GT22CU, GT22CW, GT22LC, GT22LC-2 JT22CW
		-	X	-	-	12-645E3 - GP39, GP39AC, GP39-2, SD39, SDL39, GT22C, GT22CU, GT22CW, GT22HW, GT22LC, J22CW, JT22CW, JT22CW-2, JT22MC
		-	X	-	-	12-645E3B-GP39-2, GT22CU, GT22CW, GT22LC, GT22LC-2, JT22CW-2, JT22LC-2
		-	-	X	-	12-645E3B - GP39-2 , GT22CU, GT22CUM-1, GT22CW, GT22LC, GT22LC -2, GT22HW, JT22CW, JT22CW-2 JT22LC-2, JT22MC
		-	-	-	X	12-645E3B-GP39-2
		-	-	X	-	12-645E3C- GP39-2
		-	-	-	X	12-645E3C - GP49
		-	-	-	X	12-645F3 - GP39 - 2, GP39X, GP49
		-	-	-	X	12-645F3B - GP49
1	8351179	1	-	-	-	CHAMBER ASM. .. Exhaust - Rear
/ϕ2	8358830	-	1	-	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8466603
ϕ2	9520131	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 9329390
2A	9316234	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear
3	9316673	-	-	-	1	FLANGE .. Cover
4	9316672	-	-	-	1	GASKET .. Cover - Flange to manifold flange
5	8287827	-	-	-	6	BOLT .. Cover to flange - 1/2-20 x 2 hex head
6	9338626	-	-	-	6	NUT .. 1/2-20 hex - Formerly 8284621
/ϕ7	9516746	-	-	1	-	CHAMBER ASM. .. Exhaust - Rear
ϕ7	9316234	-	-	1	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8454285 and 9320938 - Designed for exhaust screen inspection port - See Page 13 for inspection port kit 9336983

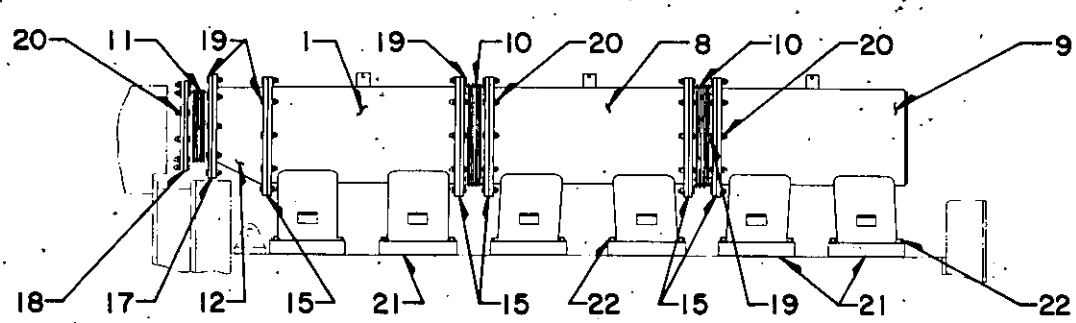
/ To apply an exhaust screen inspection port to the standard tapered barrel rear exhaust manifold on 8-645E3C & 12-645E3, E3B engines, use 9336983 inspection port kit on page 13. Refer to M.I. 9622 for details.

*8	8410461	1	1	-	-	CHAMBER ASM. .. Center - Formerly 8410641 - Repl. by9518913
8	9518913	-	-	1	1	CHAMBER ASM. .. Center - Replaces 8410461
9	8351182	1	1	-	-	CHAMBER ASM. .. Front - Replaces 8466602 - Repl. by 9316231
9	9316231	-	-	1	1	CHAMBER ASM. .. Front - Replaces 8351182 and 8445955
10	8408985	2	2	2	2	JOINT ASM. .. Expansion - Replaces 8321099 and 8434114
11	8408987	1	1	1	1	JOINT ASM. .. Expansion - Adapter to turbocharger - Replaces 8321126
12	8328188	1	-	-	-	SCREEN ASM. .. Adapter - Non trap type - Utex No. 8393922
13	8482700	-	1	-	-	SCREEN ASM. .. Adapter - Trap type - Utex No. 9080356 - Replaces 8358828 - Replaced by 9557143
14	9557143	-	-	1	1	SCREEN ASM. .. Adapter - Trap type - Utex No. 9558715 - Replaces 8482700 and 9526331
15	8309214	5	4	4	4	GASKET .. Expansion joint
16	8358834	1	1	1	1	GASKET .. Chamber to adapter
17	8309213	1	1	1	1	GASKET .. Adapter to expansion joint
18	8309212	1	1	1	1	GASKET .. Expansion joint to turbocharger
19	8287827	70	72	72	72	BOLT .. Expansion joint and adapter mtg. - 1/2-20 x 2 hex head
20	9338626	70	72	72	72	NUT .. 1/2-20 hex - Formerly 8284621
21	9337724	6	6	6	6	GASKET .. Chamber to crankcase - Replaces 8281295 and 8459714
ϕ22	9318052	36	36	36	36	BOLT AND WASHER ASM. .. Chamber to crankcase - For 2-1/8 in. hold down flange -Formerly 9431966 bolt and 8431631 washer - Replaces 8453449
ϕ22	8460207	36	-	-	-	BOLT AND SPACER ASM. .. Chamber to crankcase - For 1-3/8 in. hold down flange - Formerly 271749 bolt and 8133334 washer
*23		As Req.				COMPOUND .. Thread - Applied to Ref. No. 22 8315394 .. 4 oz tube 8278929 .. 1 quart

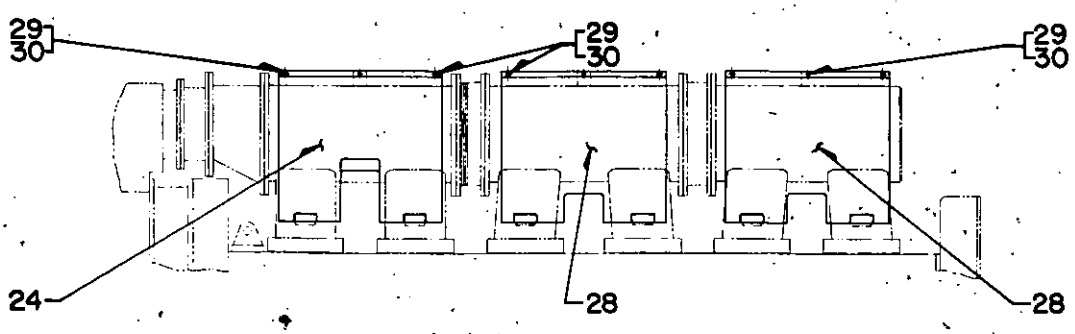
P.L. No. 172

EXHAUST CHAMBER ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	B	C	D	Description
		X	-	-	-	12-645E3
		-	X	-	-	12-645E3
		-	X	-	-	12-645E3B
		-	-	X	-	12-645E3B
		-	-	-	X	12-645E3B
		-	-	X	-	12-645E3C
		-	-	-	X	12-645E3C
		-	-	-	X	12-645F3
		-	-	-	X	12-645F3B
						See page 2 for locomotive models
24	8351248	2	-	-	-	SHIELD ASM. .. Heat - Rear
ϕ25	8358826	-	1	1	-	SHIELD ASM. .. Heat - Rear - Right hand - Formerly 8420130
ϕ26	9320186	-	-	-	1	SHIELD ASM. .. Heat - Rear - Right hand - Optional to 8358826 shield on engines with inspection port
*27	8358827	-	1	1	1	SHIELD ASM. .. Heat - Rear - Left hand
28	8351254	4	4	4	4	SHIELD ASM. .. Heat - Center and Front - Replaces 8419893 and 8419894
29	181370	9	9	9	9	BOLT .. Heat shield mtg. - 3/8 - 24 x 1-1/4 hex. head
30	8261074	9	9	9	9	NUT .. Special - 3/8-24 hex.
+ϕ*31	8359613	1	1	1	1	"Y" FLANGE .. Water discharge - Domestic and export
+ϕ*32	8348845	1	1	1	-	ELBOW .. Water discharge - Export only
+ϕ*33	8492587	1	1	1	-	"Y" FLANGE .. Water discharge - With 3/4 N.P.T.F. threaded hole - Export only,
+*34	8347756	1	1	1	1	GASKET .. Flange or elbow to crankcase
+*35	272563	4	4	4	4	BOLT .. Flange or elbow mtg. - 1-14 x 2-1/4 hex head
+*36	121326	4	4	4	4	WASHER .. Lock - 1 in.



EXHAUST CHAMBER
Column A



HEAT SHIELD
Column A

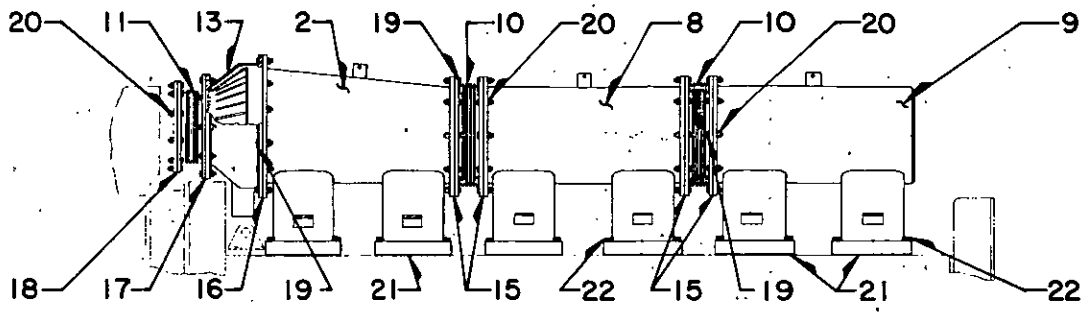
PLATE F172-2

39382, 43822

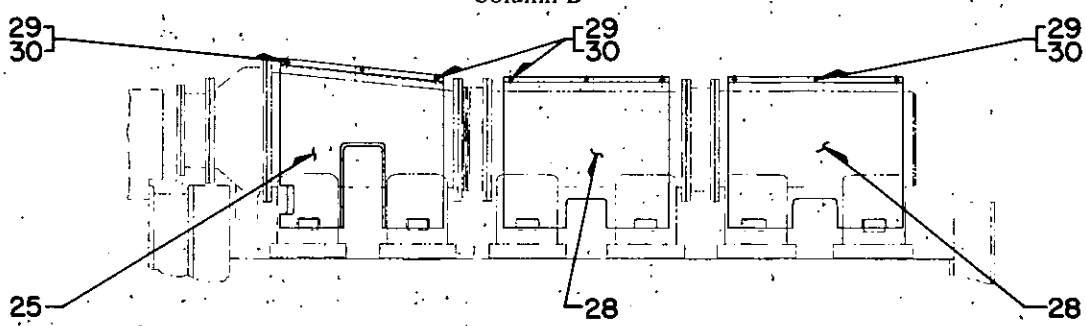
8410531F 9083881D 9518917D 9518914D
8410284A 9083886 9519833

P.L. No. F172

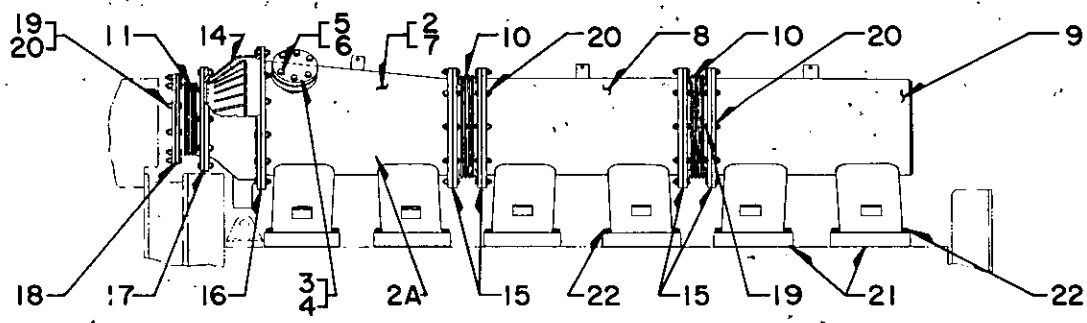
EXHAUST CHAMBER ASSEMBLY



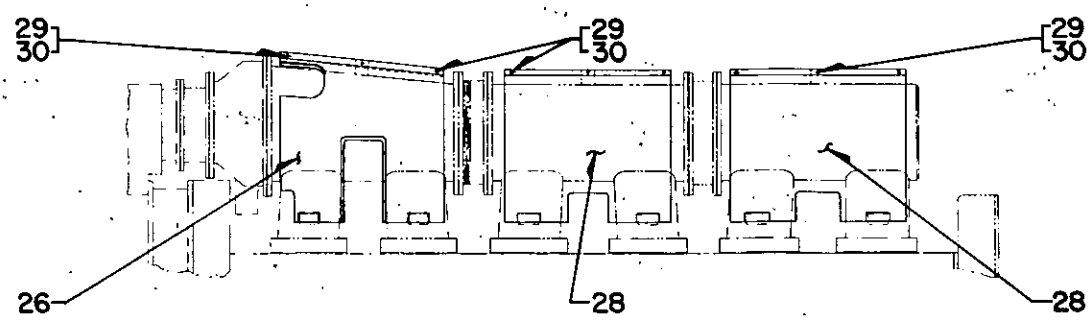
EXHAUST CHAMBER
Column B



HEAT SHIELD
Column B



EXHAUST CHAMBER
Columns C and D



HEAT SHIELD
Columns C and D

PLATE C172-3

EXHAUST CHAMBER ASSEMBLY

Exhaust Chambers with Straight Leg Manifolds, Heat Shields and Water Discharge Flange
16-645E3,E3A,E3B,E3C,F3,F3B Engines
Except F40 Series Locomotives
PLATE D172-4 and 5

Ref. No.	Part Number	Qty. Req. A	B	C	D	Description
		X	-	-	-	16-645E3 - GP40, GP40-2, GP40P-2, SD40, SD40-2, SD40B-2, SD40T-2, SDP40, SDP40F, GT26, GT26C, GT26CU-2, GT26CW, GT26CW-2, GT26M2C, SD40-2
		-	X	-	-	16-645E3A - DDA40X
		X	-	-	-	16-645E3B - GP40-2, SD40-2, BBC AC/AC, GT26CU, GT26CU-2, GT26CW, GT26CW-2, JT26C-SS, SD40-2
		-	-	X	-	16-645E3B - GP40-2, SD40-2, GT26CU-2, GT26CW, GT26CW-2, JT26C-SS, SD40-2
		-	-	-	X	16-645E3B - GP40-2, SD40-2, SD40T-2, GT26CW, GT26CW-2
		X	-	-	-	16-645E3C - GP40-2, SD40-2, SD40T-2, SDL40-2, SD40-2
		-	-	-	X	16-645E3C - GP40-2
		-	-	-	X	16-645F3 - GP40X, GP50, SD40X, SD50, SD50S, SD40T-2
		-	-	-	X	16-645F3B - GP50, GP50T, SD50, SD50S, SD50T, SDL50, GT36HCW-2
+ϕ*1	9516746	1	-	-	-	CHAMBER ASM. .. Exhaust - Rear
ϕ*1	9316234	1	-	-	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8454285 and 9320938 - Designed for exhaust screen inspection port. See page 13 for inspection port kit 9336983
/ 2	8454285	-	1	-	-	CHAMBER ASM. .. Exhaust - Rear - Replaced by 9316234
/ϕ 3	8358830	-	-	1	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8466603
ϕ 3	9520131	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 9329390
4	9316234	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear
5	9316673	-	-	-	1	FLANGE .. Cover
6	9316672	-	-	-	1	GASKET .. Cover - Flange to manifold flange
7	8287827	-	-	-	6	BOLT .. Cover to flange - 1/2-20 x 2 hex head
8	9338626	-	-	-	6	NUT .. 1/2-20 hex - Formerly 8284621

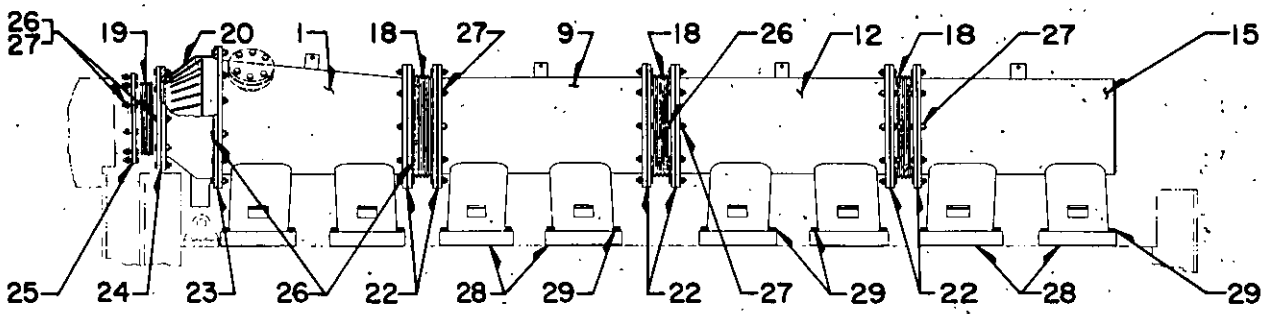
/ To apply an exhaust screen inspection port on the standard tapered barrel rear exhaust manifold on 16-645E3,E3A and E3B engines, use 9336983 inspection port kit on page 13. Refer to M.I. 9622 for details.

9	9316233	1	-	-	1	CHAMBER ASM. .. Intermediate rear - Replaces 8454284
10	8454284	-	1	-	-	CHAMBER ASM. .. Intermediate rear - Replaced by 9316233
11	8351180	-	-	1	-	CHAMBER ASM. .. Intermediate rear
12	9316232	1	-	-	1	CHAMBER ASM. .. Intermediate front - Replaces 8418918 and 8454283
13	8454283	-	1	-	-	CHAMBER ASM. .. Intermediate front - Replaced by 9316232
14	8351181	-	-	1	-	CHAMBER ASM. .. Intermediate front
15	9316231	1	-	-	1	CHAMBER ASM. .. Front - Replaces 8351182 and 8445955
16	8445955	-	1	-	-	CHAMBER ASM. .. Front - Replaced by 9316231
17	8351182	-	-	1	-	CHAMBER ASM. .. Front - Repl. 8466602 - Repl. by 9316231
18	8408985	3	3	3	3	JOINT ASM. .. Expansion - Replaces 8321099 and 8434114
19	8408987	1	1	1	1	JOINT ASM. .. Expansion - Adapter to turbocharger - Replaces 8321126
20	9557143	1	-	-	1	SCREEN ASM. .. Adapter - Trap type - Utex No. 9558715 - Replaces 8482700 and 9526331
21	8482700	-	1	1	-	SCREEN ASM. .. Adapter - Trap type- Utex No. 9080356 - Replaces 8358828 - Replaced by 9557143
22	8309214	6	6	6	6	GASKET .. Expansion joint
23	8358834	1	1	1	1	GASKET .. Chamber to adapter
24	8309213	1	1	1	1	GASKET .. Adapter to expansion joint
25	8309212	1	1	1	1	GASKET .. Expansion joint to turbocharger
26	8287827	92	92	92	92	BOLT .. Expansion joint and adapter mtg. - 1/2-20 x 2 hex head
27	9338626	92	92	92	92	NUT .. 1/2-20 hex - Formerly 8284621
28	9337724	8	8	8	8	GASKET .. Chamber to crankcase - Repl. 8281295 and 8459714
ϕ 29	9318052	48	48	48	48	BOLT AND WASHER ASM. .. Chamber to crankcase - For 2-1/8 in. hold down flange - Formerly 9431966 bolt and 8431631 washer - Replaces 8453449

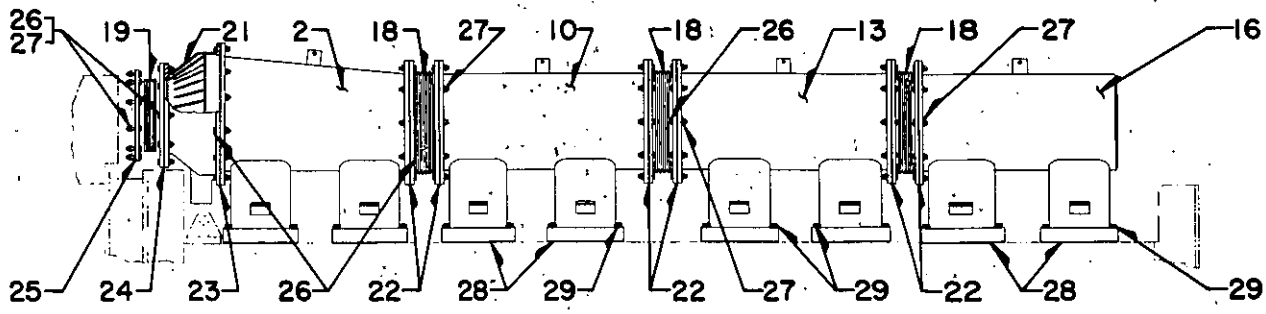
P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	B	C	D	Description
		X	-	-	-	16-645E3
		-	X	-	-	16-645E3A
		X	-	-	-	16-645E3B
		-	-	X	-	16-645E3B
		-	-	-	X	16-645E3B
		X	-	-	-	16-645E3C
		-	-	-	X	16-645E3C
		-	-	-	X	16-645F3
		-	-	-	X	16-645F3B
						See page 5 for locomotive models
ϕ29	8460207	-	48	48	-	BOLT AND SPACER ASM. .. Chamber to crankcase - For 1-3/8 in. hold down flange - Formerly 271749 bolt and 8133334 washer
*30	- - - - -	As Req.				COMPOUND .. Thread - Applied to ref. no. 29 8315394 .. 4 oz tube 8278929 .. 1 quart
ϕ31	9320186	1	1	1	1	SHIELD ASM. .. Heat - rear - Right hand - Applied to engines with inspection port - Optional to 8358826
ϕ32	8358826	1	1	1	-	SHIELD ASM. .. Heat - Rear - Right hand
*33	8358827	1	1	1	1	SHIELD ASM. .. Heat - Rear - Left hand
34	8439800	2	2	2	2	SHIELD ASM. .. Heat - Intermediate rear - Right hand and Intermediate front - Left hand
35	8351251	2	2	2	2	SHIELD ASM. .. Heat - Intermediate rear - Left hand and Intermediate front - Right hand
36	8351254	2	2	2	2	SHIELD ASM. .. Heat - Front - Replaces 8419893 and 8419894
37	180370	12	12	12	12	BOLT .. Heat shield mtg. - 3/8-24 x 1-1/4 hex head
38	8261074	12	12	12	12	NUT .. Special - 3/8-24 hex
+ϕ*39	8359613	1	1	1	1	"Y" FLANGE .. Water discharge - Domestic and export
+ϕ*40	8348845	1	-	1	-	ELBOW .. Water discharge - Export only
+ϕ*41	8492587	1	-	1	-	"Y" FLANGE .. Water discharge - With 3/4 N.P.T.F. threaded hole - Export only
*42	8437756	1	1	1	1	GASKET .. Flange or elbow to crankcase
*43	272563	4	4	4	4	BOLT .. Flange - Elbow mounting - 1-14 x 2-1/4 hex head
*44	121326	4	4	4	4	WASHER .. Lock - 1 in.



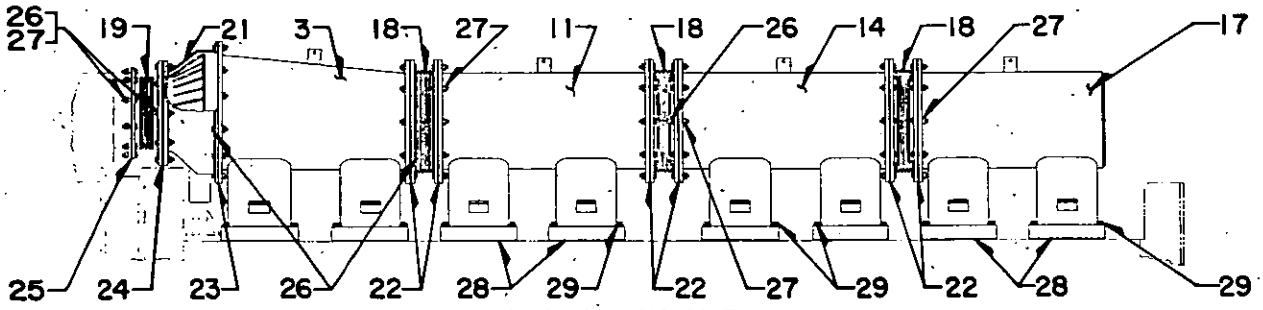
EXHAUST CHAMBER
Column A



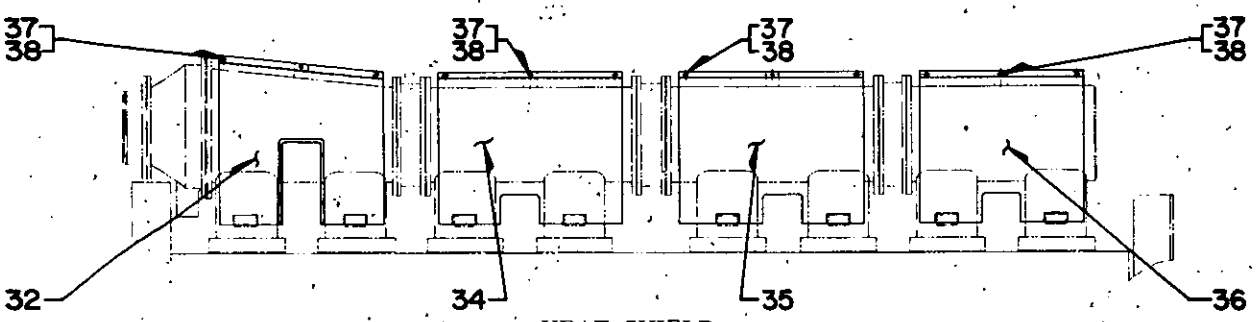
EXHAUST CHAMBER
Column B
PLATE D172-4

38287 43065
9518703G 8454286C 8351183P 9316235G
8351255C 9320187

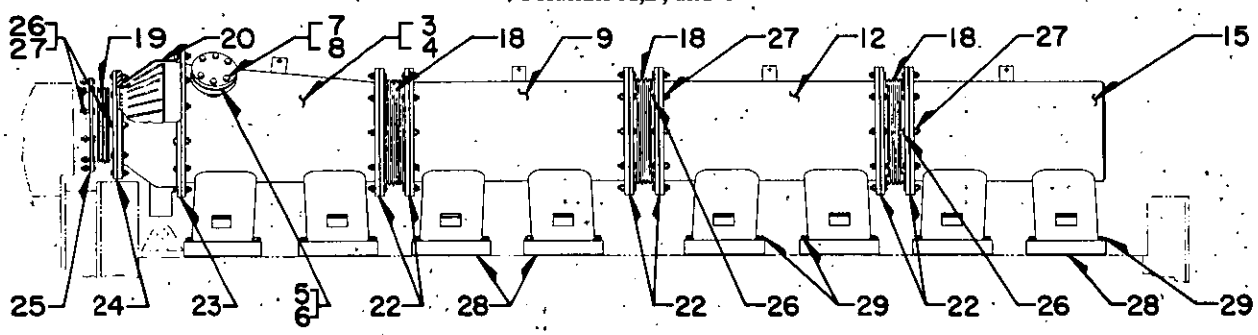
EXHAUST CHAMBER ASSEMBLY



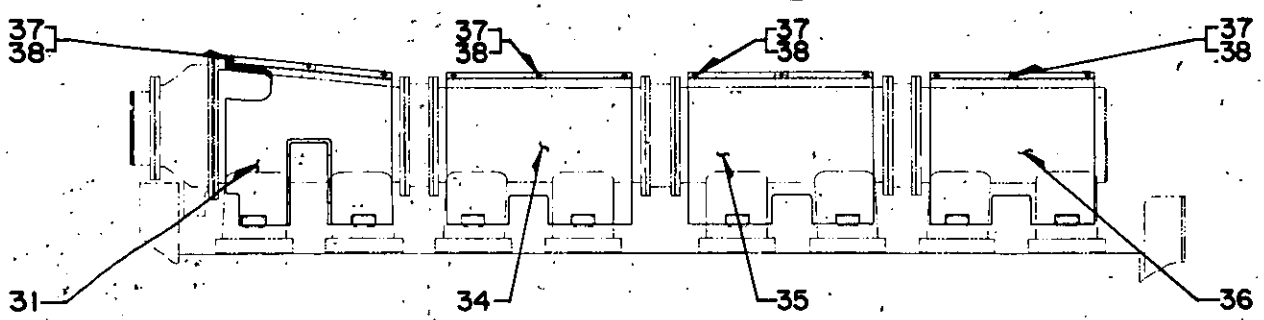
EXHAUST CHAMBER
Column C



HEAT SHIELD
Columns A,B, and C



EXHAUST CHAMBER
Column D



HEAT SHIELD
Column D

PLATE D172-5

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Exhaust Chambers with Straight Leg Manifolds, Heat Shields and Water Discharge Flange
16-645E3,E3A,E3B,E3C Engines
F40 Series Locomotives
PLATES E172-6 and D172-7

Ref. No.	Part Number	Qty. Req. A	B	C	D	E	Description
		X	-	-	-	-	16-645E3 - F40PH
		-	X	-	-	-	16-645E3A - F40C
		-	-	X	-	-	16-645E3A - F40C, F40PH
		X	-	-	-	-	16-645E3B - F40PH, F40PH-2
		-	-	-	X	-	16-645E3B - F40PH, F40PH-2
		-	-	-	X	-	16-645E3C - F40PH, F40PH-2
		-	-	-	-	X	16-645E3C - F40PH-2
/ϕ1	9516746	-	-	1	1	-	CHAMBER ASM. .. Exhaust - Rear
/ϕ1	9316234	-	-	1	1	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8454285 and 9320938 - Designed for exhaust screen inspection port. See page 13 for inspection port kit 9336983
/ϕ2	8358830	1	1	-	-	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8466603
/ϕ2	9520131	-	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 9329390
3	9316234	-	-	-	-	1	CHAMBER ASM. .. Exhaust - Rear
4	9316673	-	-	-	-	1	FLANGE .. Cover
5	9316672	-	-	-	-	1	GASKET .. Cover - Flange to manifold flange
6	8287827	-	-	-	-	6	BOLT .. Cover to flange - 1/2 - 1/2-20 x 2 hex head
7	9338626	-	-	-	-	6	NUT .. 1/2-20 hex - Formerly 8284621

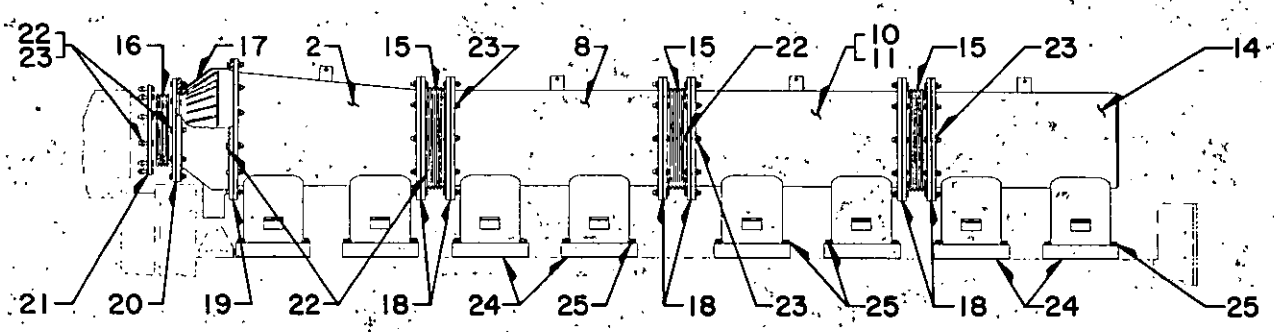
/ To apply on exhaust screen inspection port on the standard tapered barrel rear exhaust manifold on 16-645E3,E3A and E3B engines, use 9336983 inspection port kit on page 13. Refer to M.I. 9622 for details.

8	8351180	1	1	-	-	-	CHAMBER ASM. .. Intermediate rear
9	9316233	-	-	1	1	1	CHAMBER ASM. .. Intermediate rear - Replaces 8454284
10	9099692	1	-	-	-	-	CHAMBER ASM. .. Intermediate front
11	8351181	-	1	-	-	-	CHAMBER ASM. .. Intermediate front
12	9316232	-	-	1	-	1	CHAMBER ASM. .. Intermediate front - Replaces 8418918 and 8454283
13	9518777	-	-	-	1	-	CHAMBER ASM. .. Intermediate front
14	8351182	1	1	-	-	-	CHAMBER ASM. .. Front - Repl. 8466602 - Repl. by 9316231
14	9316231	-	-	1	1	1	CHAMBER ASM. .. Front - Replaces 8351182 and 8445955
15	8408985	3	3	3	3	3	JOINT ASM. .. Expansion -Replaces 8321099 and 8434114
16	8408987	1	1	1	1	1	JOINT ASM. .. Expansion - Adapter to turbocharger - replaces 8321126
17	8482700	1	1	-	-	-	SCREEN ASM. .. Adapter - Trap type - Utex No. 9080356 - replaces 8358828 - Replaced by 9557143
17	9557143	-	-	1	1	1	SCREEN ASM. .. Adapter - Trap type - Utex No. 9558715 replaces 8487200 and 9526331
18	8309214	6	6	6	6	6	GASKET .. Expansion joint
19	8358834	1	1	1	1	1	GASKET .. Chamber to adapter
20	8309213	1	1	1	1	1	GASKET .. Adapter to expansion joint
21	8309212	1	1	1	1	1	GASKET .. Expansion joint to turbocharger
22	8287827	92	92	92	92	92	BOLT .. Expansion joint and adapter mtg. - 1/2-20 x 2 hex head
23	9338626	92	92	92	92	92	NUT .. 1/2-20 hex - Formerly 8284621
24	9337724	8	8	8	8	8	GASKET .. Chamber to crankcase - Repl. 8281295 and 8459714
25	9318052	48	48	48	48	48	BOLT AND WASHER ASM. .. Chamber to crankcase - For 2-1/8 in. hold down flange - Formerly 9431966 bolt and 8431631 washer - Replaces 8453449
*26	- - - -	As Req.					COMPOUND .. Thread - Applied to Ref. No. 25 8315394 .. 4 oz tube 8287929 .. 1 quart
ϕ27	8358826	1	1	1	1	-	SHIELD ASM. .. Heat - Rear - Right hand
ϕ28	9320186	-	-	-	-	1	SHIELD ASM. .. Heat - Rear - Right hand - Applied to engines with inspection port - Optional to 8358826
*29	8358827	1	1	1	1	1	SHIELD ASM. .. Heat - Rear - Left hand
30	8439800	1	1	1	1	1	SHIELD ASM. .. Heat - Intermediate rear - Right hand
*31	8351251	1	1	1	1	1	SHIELD ASM. .. Heat - Intermediate rear - Left hand

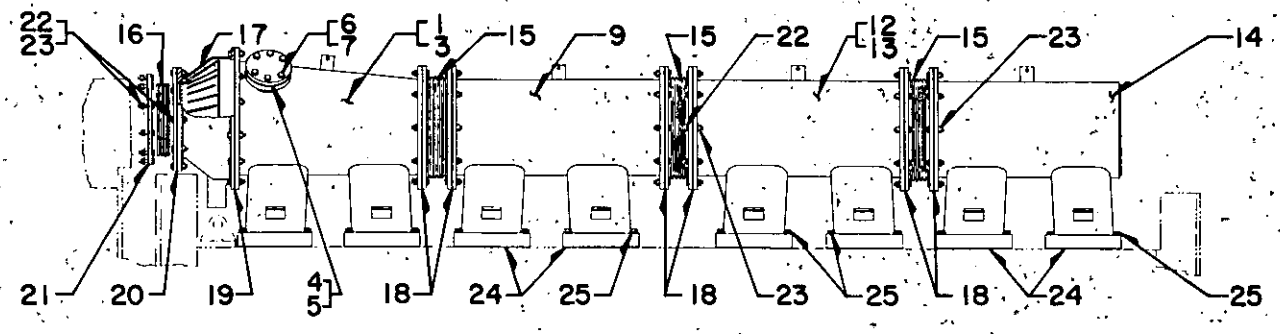
P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	B	C	D	E	Description
		X	-	-	-	-	16-645E3 - F40PH
		-	X	-	-	-	16-645E3A - F40C
		-	-	X	-	-	16-645E3A - F40C, F40PH
		X	-	-	-	-	16-645E3B - F40PH, F40PH-2
		-	-	-	X	-	16-645E3B - F40PH, F40PH-2
		-	-	-	X	-	16-645E3C - F40PH, F40PH-2
		-	-	-	-	X	16-645E3C - F40PH-2
32	9099682	1	-	-	1	1	SHIELD ASM. .. Heat - Intermediate front - Right hand - Lower
*33	9099685	1	-	-	1	1	SHIELD ASM. .. Heat - Intermediate front - Left hand - Lower
34	9099688	2	-	-	2	2	SHIELD ASM. .. Heat - Intermediate front - Right and left hand - Upper
35	9099691	1	-	-	1	1	SHIELD ASM. .. Heat - Intermediate front - Top
36	8351251	-	1	1	-	-	SHIELD ASM. .. Heat - Intermediate front - Right hand
*37	8439800	-	1	1	-	-	SHIELD ASM. .. Heat - Intermediate front - Left hand
38	8351254	2	2	2	2	2	SHIELD ASM. .. Heat - Front - Replaces 8419893 and 8419894
39	180370	21	12	12	21	21	BOLT .. Heat shield mtg. - 3/8-24 x 1-1/4 hex head
40	8261074	21	12	12	21	21	NUT .. Special - 3/8-24 hex
+*41	8359613	1	1	1	1	1	"Y" FLANGE .. Water discharge
+*42	8347756	1	1	1	1	1	GASKET .. Flange to crankcase
+*43	272563	4	4	4	4	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
+*44	121326	4	4	4	4	4	WASHER .. Lock - 1 in.



EXHAUST CHAMBER
Columns A and B



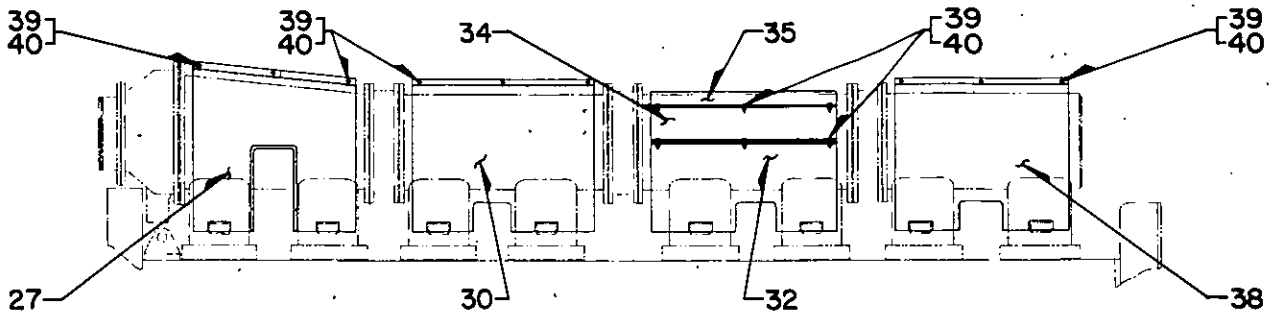
EXHAUST CHAMBER
Columns C, D and E

PLATE E172-6

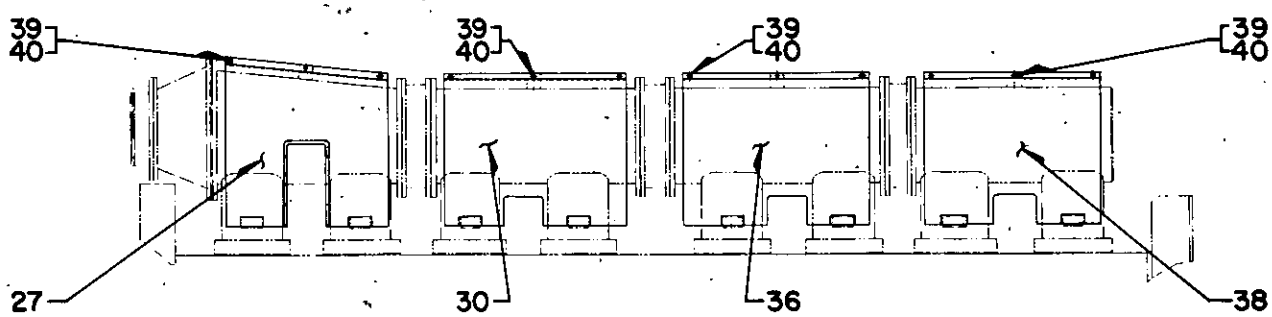
9099804D 8351183P 9518703G 9519117G 42883
9099681 8351255C 9099681

P.L. No. F172

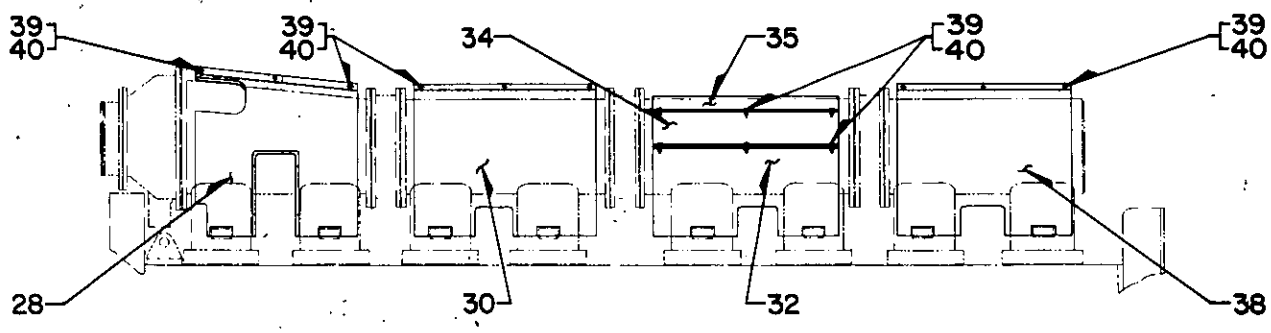
EXHAUST CHAMBER ASSEMBLY



HEAT SHIELD
Columns A, and D



HEAT SHIELD
Columns B and C



HEAT SHIELD
Column E

PLATE D172-7

EXHAUST CHAMBER ASSEMBLY

Exhaust Chambers with Straight Leg Manifolds, Heat Shields and Water Discharge Flange
20-645E3,E3B Engines
PLATE C172-8 and 9

Ref. No.	Part Number	Qty. Req. A	B	C	Description
		X	-	-	20-645E3 - F45, FP45, SD45, SD45-2, SD45T-2 SDP45, DDM45
		-	X	-	20-645E3 - F45, FP45, SD45, SD45-2, SD45-2R, SD45T-2, SDP45
		-	X	-	20-645E3B - SD45-2, SD45T-2
		-	-	X	20-645E3B - SD45-2, SD45T-2
/◊*1	9516746	-	1	-	CHAMBER ASM. .. Exhaust - Rear
◊ 1	9316234	-	1	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8454285 and 9320938 - Designed for exhaust screen inspection port - See page 13 for inspection port kit 9336983
/◊2	8358830	1	-	-	CHAMBER ASM. .. Exhaust - Rear - Replaces 8466603
◊2	9520131	-	-	1	CHAMBER ASM. .. Exhaust - Rear - Replaces 9329390
3	9316234	-	-	1	CHAMBER ASM. .. Exhaust - Rear
4	9316673	-	-	1	FLANGE .. Cover
5	9316672	-	-	1	GASKET .. Cover - Flange to manifold flange
6	8287827	-	-	6	BOLT .. Cover to flange - 1/2-20 x 2 hex. head
7	9338626	-	-	6	NUT .. 1/2-20 hex. - Formerly 8284621

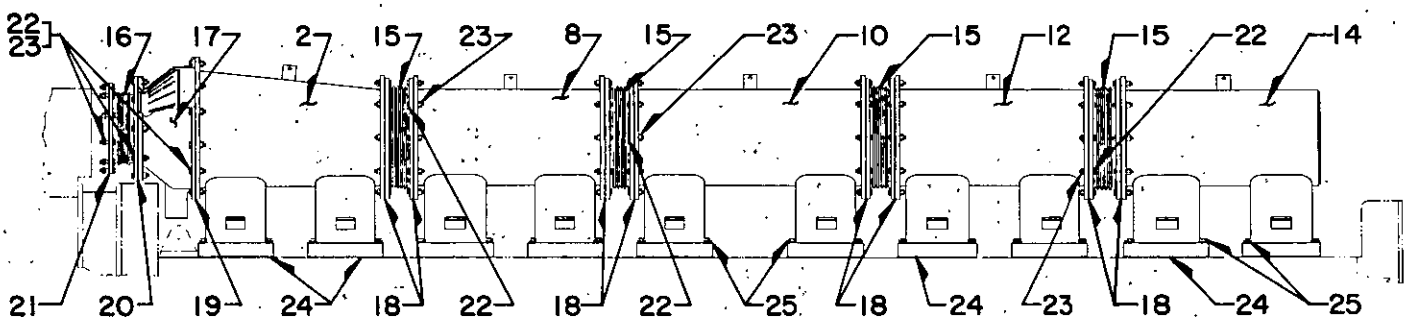
/ To apply an exhaust screen inspection port on the standard tapered barrel rear exhaust manifold on 20-645E3 engines, use 9336983 inspection port kit on page 13. Refer to M.I. 9622 for details.

8	8360484	1	-	-	CHAMBER ASM. .. Exhaust - Intermediate rear
9	9518222	-	1	1	CHAMBER ASM. .. Exhaust - Intermediate rear - Repl. 8445956
10	8160480	1	-	-	CHAMBER ASM. .. Exhaust - Center
11	9518705	-	1	1	CHAMBER ASM. .. Exhaust - Center - Replaces 8445958
12	8360484	1	-	-	CHAMBER ASM. .. Exhaust - Intermediate front
13	9518222	-	1	1	CHAMBER ASM. .. Exhaust - Intermediate front - Repl. 8445956
14	8351182	1	-	-	CHAMBER ASM. .. Exhaust - Front - Replaces 8466602 - Replaced by 9316231
14	9316231	-	1	1	CHAMBER ASM. .. Exhaust - Front - Replaces 8445955 and 8351182
15	8408985	4	4	4	JOINT ASM. .. Expansion - Replaces 8321099 and 8434114
16	8408987	1	1	1	JOINT ASM. .. Expansion - Adapter to turbocharger - Replaces 8321126
17	8482700	1	-	-	SCREEN ASM. .. Adapter - Trap type - Utex No. 9080356 Replaces 8358828 - Replaced by 9557143
17	9557143	-	1	1	SCREEN ASM. .. Adapter - Trap type - Utex No. 9558715 Replaces 8487200 and 9526331
18	8309214	8	8	8	GASKET .. Expansion joint
19	8358834	1	1	1	GASKET .. Chamber to adapter
20	8309213	1	1	1	GASKET .. Adapter to expansion joint
21	8309212	1	1	1	GASKET .. Expansion joint to turbocharger
22	8287827	112	112	112	BOLT .. Expansion joint and adapter mtg. - 1/2-20 x 2 hex head
23	9338626	112	112	112	NUT .. 1/2-20 hex - Formerly 8284621
24	9337724	10	10	10	GASKET .. Chamber to crankcase - Repl. 8281295 and 8459714
25	9318052	60	60	60	BOLT AND WASHER ASM. .. Chamber to crankcase - For 2-1/8 in. hold down flange - Formerly 9431966 bolt and 8431631 washer - Replaces 8453449
*26	- - - -	As Req.			COMPOUND .. Thread - Applied to ref. no. 25 8351394 .. 4 oz tybe 8287929 .. 1 quart
◊*27	8358826	1	-	-	SHIELD ASM. .. Heat - Rear - Right hand
◊ 28	9320186	-	1	1	SHIELD ASM. .. Heat - Rear - Right hand - Applied to engines with inspection port - Optional to 8358826
*29	8358827	1	1	1	SHIELD ASM. .. Heat - Rear - Left hand

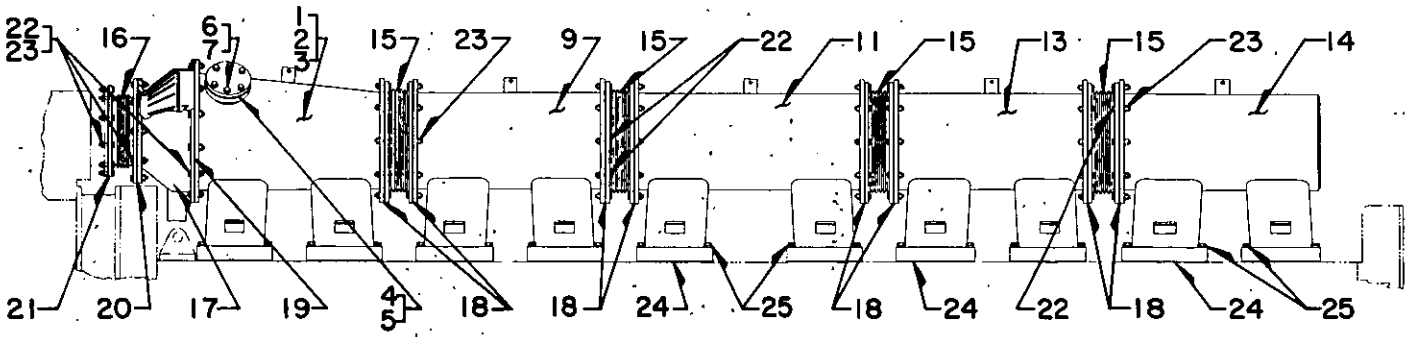
P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Ref. No.	Part Number	Qty. Req. A	B	C	Description
		X	-	-	20-645E3
		-	X	-	20-645E3
		-	X	-	20-645E3B
		-	-	X	20-645E3B
					See page 11 for locomotive models
30	8351254	6	6	6	SHIELD ASM. .. Heat - Intermediate rear - Right and left hand Intermediate front - Right and left hand Front - Right and left hand - Replaces 8419893 and 8419894
31	8360478	2	2	2	SHIELD ASM. .. Heat - Center
32	181370	15	15	15	BOLT .. Heat shield mtg. - 3/8-24 x 1-1/4 hex head
33	8261074	15	15	15	NUT .. Special - 3/8-24 hex
†◊*34	8359613	1	1	1	"Y" FLANGE .. Water discharge - Domestic and export
†◊*35	8348845	1	-	-	ELBOW .. Water discharge - Export only
†◊*36	8492587	1	-	-	"Y" FLANGE .. Water discharge - With 3/4 NPTF threaded hole - export only
*37	8347756	1	1	1	GASKET .. Flange or elbow to crankcase
*38	272563	4	4	4	BOLT .. Flange or Elbow mtg. - 1-14 x 2-1/4 hex head
*39	121326	4	4	4	WASHER ...Lock - 1 in.



EXHAUST CHAMBER
Column A

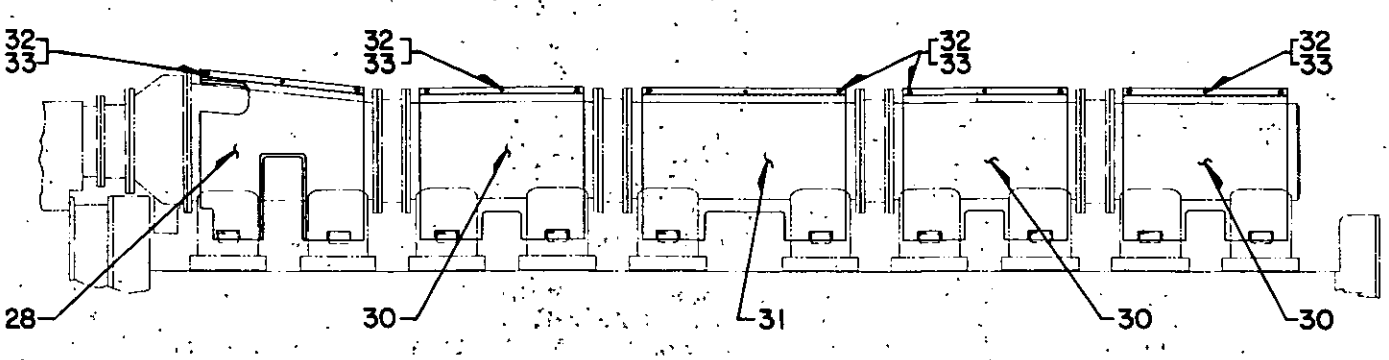


EXHAUST CHAMBER
Columns B and C

PLATE C172-8

8360483L 9518707D 9518704D
8360479C

EXHAUST CHAMBER ASSEMBLY



HEAT SHIELD - 20-645E3, E3B ENGINES
Columns A, B, and C

PLATE C172-9

INSPECTION PORT KIT

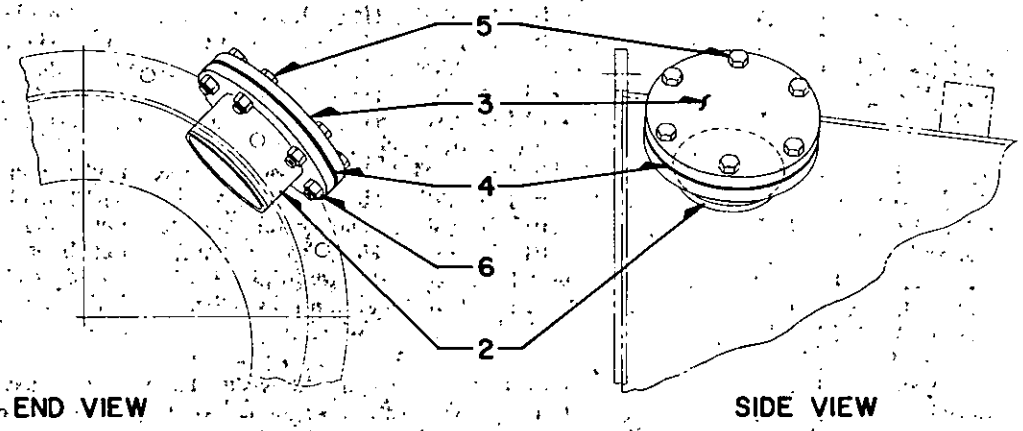


PLATE B172-10

Ref. No.	Part Number	Qty. Req.	Description

The following kit 9336983 is required for applying an exhaust screen inspection port to the standard tapered barrel rear exhaust manifold on 12,16,20-645E3,E3B; 8,12,16-645E3C; 12,16-645F3,F3B; and 16-645E3A engines. In addition, the existing heat shield assembly must be altered to accept the inspection port or a modified heat shield assembly 9320186 may be purchased. Refer to M.I. 9622 for complete details.

*1	9336983	1	KIT .. Inspection port
2	9316671	1	FLANGE ASM. .. Manifold - Includes tube
3	9316673	1	FLANGE .. Cover
/4	9316672	1	GASKET .. Cover flange to manifold flange

/NOTE: This gasket must be replaced at each inspection.

5	8287827	6	BOLT .. Cover flange to manifold flange - 1/2-20 x 2 hex. head
6	9338626	6	NUT .. 1/2-20 hex - Formerly 8284621
*7	9336982	1	KIT .. Electrode welding
*8	8159363	A.R.	PAINT .. Hi - Temp - Silver aluminum - 5 gal. can

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Exhaust Chamber and Heat Shields
16-567D2,D3 and D3A Engines
PLATE B172-11

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	16-567D2 engine with curved leg manifolds
		-	B	-	-	16-567D3 engine with curved leg manifolds
		-	-	C	-	16-567D3A engine with curved leg manifolds
		-	-	-	D	16-567D3A engine with straight leg manifolds
1	8305546	1	1	1	-	CHAMBER ASSEMBLY .. Exhaust - Rear
* 2	8351179	-	-	-	1	CHAMBER ASSEMBLY .. Exhaust - Rear
3	8305547	1	1	1	-	CHAMBER ASSEMBLY .. Exhaust - Intermediate rear
* 4	9316233	-	-	-	1	CHAMBER ASSEMBLY .. Exhaust - Intermediate rear - Repl. 8351180
5	8305548	1	1	1	-	CHAMBER ASSEMBLY .. Exhaust - Intermediate front
* 6	9316232	-	-	-	1	CHAMBER ASSEMBLY .. Exhaust - Intermediate front- Repl. 8351181
7	8305549	1	1	1	-	CHAMBER ASSEMBLY .. Exhaust - Front - Repl. by 8365876
* 8	8365876	-	-	-	1	CHAMBER ASSEMBLY .. Exhaust - Front - Replaces 8305549
9	8289083	-	1	1	-	SHIELD ASM. .. Heat - Rear chamber - Right hand
10	8289084	-	1	1	-	SHIELD ASM. .. Heat - Rear chamber - Left hand
*11	8351248	-	-	-	2	SHIELD ASM. .. Heat - Rear chamber - Right and left hand
*12	8288145	1	-	-	-	SHIELD ASM. .. Heat - Rear chamber - Right hand
*13	8288148	1	-	-	-	SHIELD ASM. .. Heat - Rear chamber - Left hand
14	8287855	1	1	1	-	SHIELD ASM. .. Heat - Rear inter. chamber - Right hand
15	8287843	1	1	1	-	SHIELD ASM. .. Heat - Rear inter. chamber - Left hand
16	8287845	1	1	1	-	SHIELD ASM. .. Heat - Front inter. chamber - Right hand
17	8287849	1	1	1	-	SHIELD ASM. .. Heat - Front inter. chamber - Left hand
*18	8351251	-	-	-	2	SHIELD ASM. .. Heat - Right front inter. and left rear inter. chamber
*19	8439800	-	-	-	2	SHIELD ASM. .. Heat - Right rear inter. and left front inter. chamber - Formerly 8351251
20	8318360	1	1	1	-	SHIELD ASM. .. Heat - Front chamber - Right hand
* 21	8365872	-	-	-	1	SHIELD ASM. .. Heat - Front chamber - Right hand
22	8318357	1	1	1	-	SHIELD ASM. .. Heat - Front chamber - Left hand
* 23	8365875	-	-	-	1	SHIELD ASM. .. Heat - Front chamber - Left hand
24	181364	12	12	12	-	BOLT .. Heat shield mounting - 3/8-24 x 1 hex head
* 25	181370	-	-	-	12	BOLT .. Heat shield mounting - 3/8-24 x 1-1/4 hex head
26	8261074	12	12	12	12	NUT .. Special - 3/8-24 hex
27	8408985	3	3	3	3	JOINT ASM. .. Expn. - Between chambers - Replaces 8321099
28	8408987	1	1	1	1	JOINT ASM. .. Expn. - Adapter to turbo - Replaces 8321126
29	8328188	1	1	1	1	SCREEN ASM. .. Adapter - Exhaust chamber - Utex Part No. 8393922

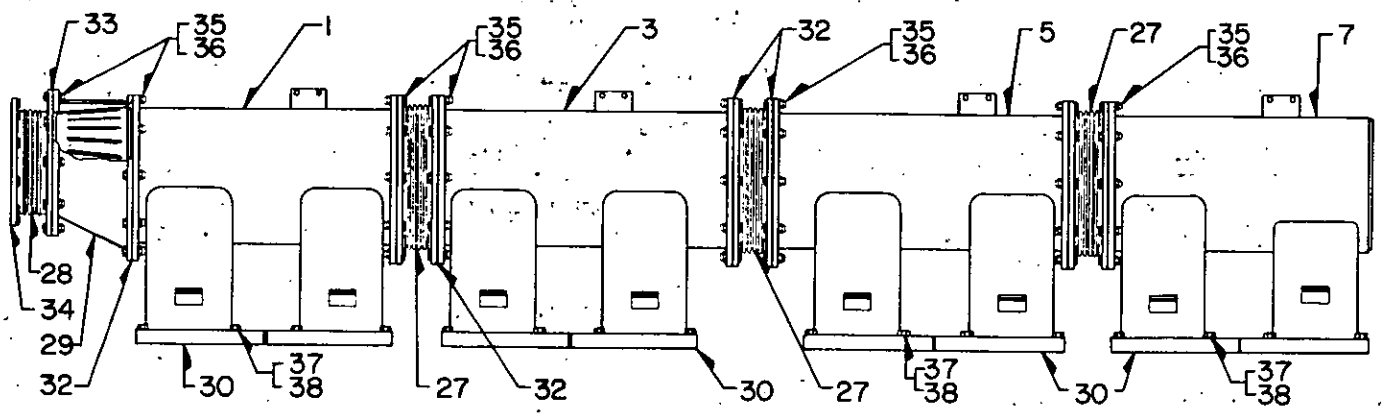
8287831 Adapter and 8287830 Baffle are no longer available. When replacement is necessary, use the following items: 1 - 8328188 Screen Asy. (Ref. No. 29), 1 - 8309213 Gasket (Ref. No. 33), 1 - 8309214 Gasket (Ref. No. 32) and 10 - 8387827 Bolt (Ref. No. 35).

30	9337724	8	8	8	8	GASKET .. Chamber to crankcase - Replaces 8459714
*31	8070513	-	2	2	2	GASKET .. Water discharge elbow and "Y" flange to crankcase
32	8309214	7	7	7	7	GASKET .. Expansion joint to chamber
33	8309213	1	1	1	1	GASKET .. Adapter to expansion joint
34	8309212	1	1	1	1	GASKET .. Expansion joint to turbocharger
35	8287827	90	90	90	90	BOLT .. Expansion joint and adapter mounting - 1/2-20 x 2 hex hd.
36	9338626	90	90	90	90	NUT .. Lock - 1/2-20 hex - Replaces 8284621
37	9318052	48	48	48	48	BOLT AND WASHER ASSEMBLY .. Chamber to crankcase - For 2-1/8 in. hold down flange - Replaces 8453449
38	8460207	48	48	48	48	BOLT AND SPACER ASSEMBLY .. Chamber to crankcase - For 1-3/8 in. hold down flange - Formerly 271749 Bolt and 8133334 Washer
*39	8278929	As Required				COMPOUND .. Thread - 1 Quart - Applied to Ref. No's. 37 and 38 8315394 .. 4 oz. tube

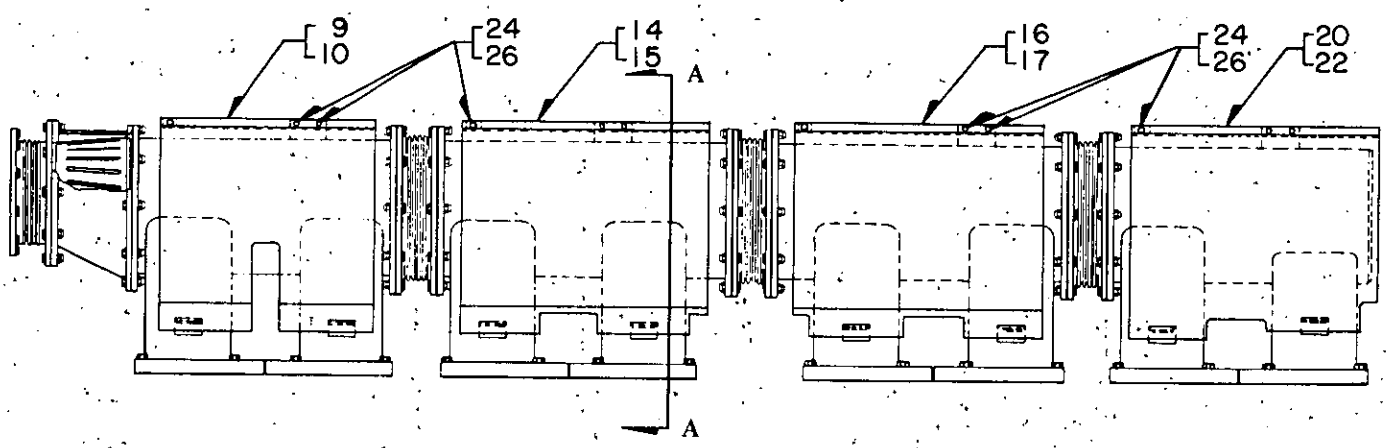
8333197E 8288528E 8365965C
8288705G 8289085F 8365966A

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY



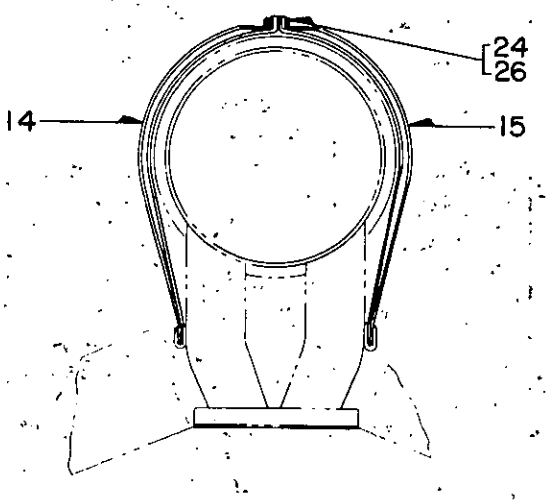
EXHAUST CHAMBER ARRANGEMENT



HEAT SHIELD ARRANGEMENT

CAMSHAFT DRIVE END

ACCESSORY DRIVE END



SECTION A-A

PLATE B172-11

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Exhaust Chamber Reference Chart
16-567D1, 8, 12, and 16-645E Normally Aspirated Engines
Domestic Locomotives

Ref. No.	EXHAUST CHAMBER ASSEMBLY: Standard	† Spark Arrester	## Spark Retention	Silencer Spark Arrester	Silencer	Locomotive Application	Page No.
	NOTE: For mounting hardware, gaskets and water discharge piping, refer to the applicable page for exhaust chambers contained in this parts list. Exhaust chambers are not included as part of the engine assembly for normally aspirated engines.						
1	# 8158867 Repl. By # 8375281	# 8273705	# 8426352	- - - -	- - - -	GP18,GP28,SD18,SD28 with/without dyn. brakes	18
2	8158868 Repl. By 8375445	8273724	8426353	- - - -	- - - -		28
3	# 8182180 Repl. By # 8387631	# 8297298	# 8426354	- - - -	- - - -	SD18,SD28 with dynamic brakes only	18
4	8158868 Repl. By 8375445	8273724	8426353	- - - -	- - - -		28
5	# 8373986	# 8282933	# 8426355	- - - -	- - - -	SW1000,SW1001	20
6	8374192	8273724	8426353	- - - -	- - - -		21
7	- - - -	- - - -	9093983	- - - -	- - - -	SW1000,SW1001	21
8	- - - -	- - - -	8426353	- - - -	- - - -		
9	- - - -	- - - -	- - - -	# 9501801	- - - -	SW1001	22
10	- - - -	- - - -	- - - -	9509571	- - - -		
11	# 8370162	# 8282911	# 8426356	- - - -	- - - -	SW1500	20
							23
12	- - - -	- - - -	ϕ # 8426356	- - - -	- - - -	MP15DC	23
13	- - - -	- - - -	ϕ # 9093984	- - - -	- - - -	MP15DC,MP15AC	
14	- - - -	- - - -	- - - -	# 9515814	- - - -	GP15-1	24
15	# 9315936	- - - -	# 9315865	- - - -	- - - -	GP15-1,GP15-2	20
						GP15-1	23
16	- - - -	- - - -	- - - -	- - - -	# 9536624	GP15-1,GP15-2	25
17	# 8375281	- - - -	# 8426352	- - - -	- - - -	GP38,GP38AC,GP38-2 with/without dyn. brakes	26
18	8375445	- - - -	8426353	- - - -	- - - -	SD38 with dyn. brakes	28
19	# 8375281	- - - -	- - - -	- - - -	- - - -	GP38-2 without dyn. brakes	27
20	# 8387631	- - - -	- - - -	- - - -	- - - -		
21	- - - -	- - - -	# 9093985	- - - -	- - - -	GP38-2 with/without dyn. brakes	28
22	- - - -	- - - -	8426353	- - - -	- - - -		
23	# 8387631	- - - -	# 9083476	- - - -	- - - -	GP38-2 without dyn. brakes	29
24	- - - -	- - - -	- - - -	# 9501801	- - - -	F40PH-2M,GP38-2,SD38-2	30
25	- - - -	- - - -	- - - -	9501536	- - - -		
26	- - - -	- - - -	- - - -	- - - -	# 9530919	GP38-2 without dyn. brakes	31
27	- - - -	- - - -	- - - -	- - - -	9501536		

† *Early design spark arrester exhaust chambers are no longer available. See spark retention exhaust chamber column for replacement.*

\# *Includes exhaust stack*

\#\# *See note on Page 17*

EXHAUST CHAMBER ASSEMBLY

/// *As an option on 645 Engines, the following Spark Retainer Exhaust Chambers are available. These manifolds are identical to the earlier chambers, except the water outlet opening has been deleted from the chamber inlet leg. The earlier chambers are required on 567 engines and can be used on 645 engines. The optional chambers can be used only on 645 engines.*

Earlier Exhaust Chamber	Optional Exhaust Chamber
8426352	9093985
8426354	9093986
8426355	9093983
8426356	9093984

22155	23691	30891	32641	33872
22406	25613	32639	33255	33873
23690	26306	32640	33379	33875

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

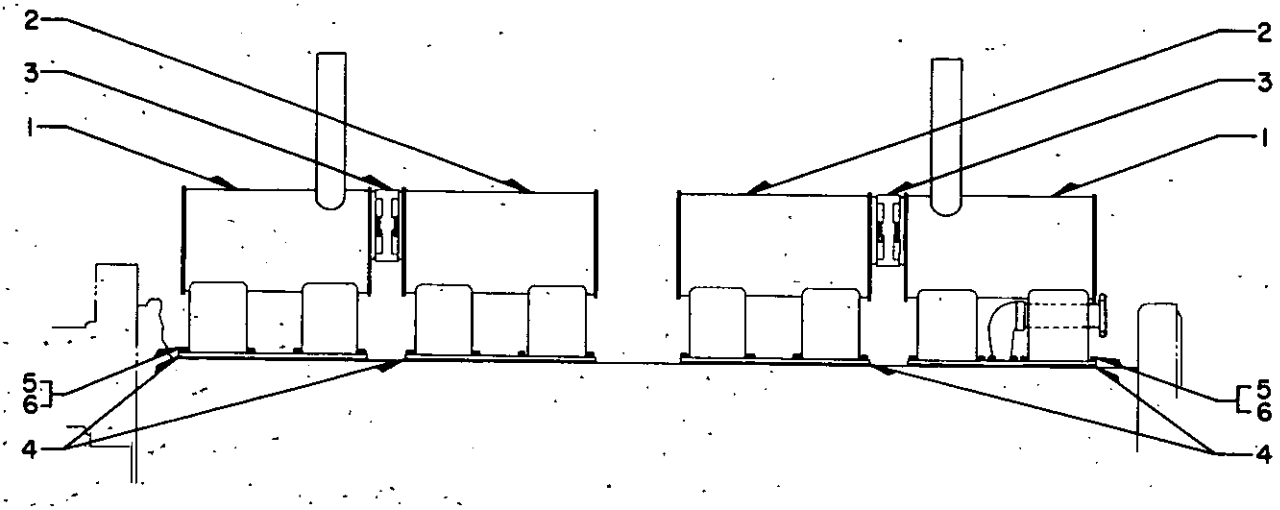
Standard Exhaust Chamber Assembly
16-567D1 Engine
GP18,GP28,SD18,SD28 Locomotives
PLATE B172-12

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	GP18 locomotive - 16-567D1 Engine
		-	B	-	-	GP28 locomotive - 16-567D1 Engine
		-	-	C	-	SD18 locomotive - 16-567D1 Engine
		-	-	-	D	SD28 locomotive - 16-567D1 Engine
1	8375281	2	2	2	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet - Replaces 8158867
*1	8182180	-	-	2	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet - Applied to locomotives with dynamic brakes only
2	8375445	2	2	2	2	CHAMBER ASSEMBLY .. Exhaust - Less exhaust outlet - Repl. 8158868
3	8158870	2	2	2	2	CLAMP .. Exhaust chamber - 10 inch
4	9337724	8	8	8	8	GASKET .. Exhaust chamber to crankcase - Repl. 8281295,8459714
5	271584	48	48	48	48	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head - Replaces 109581,181481
6	8133334	48	48	48	48	WASHER .. Lock - 5/8
7	8135183	1	-	-	-	ELBOW .. Water discharge
8	8262980	-	-	1	-	ELBOW .. Water discharge
*9	8352671	-	1	-	1	ELBOW .. Water discharge - Formerly 8289286
10	8136201	1	-	-	-	PIPE .. Water discharge
11	8262979	-	1	1	1	PIPE .. Water discharge - Formerly 8289285
12	8146490	1	-	-	-	GASKET .. Mounting - Water discharge pipe
13	8354611	-	1	1	1	GASKET .. Mounting - Water discharge pipe - Replaces 8204326
14	8070513	1	1	1	1	GASKET .. Discharge elbow to crankcase
15	271584	4	-	4	-	BOLT .. Elbow to crankcase - 5/8-18 x 1-5/8 hex head - Repl. 181481
*16	271585	-	4	-	4	BOLT .. Elbow to crankcase - 5/8-18 x 1-3/4 hex head - Repl. 181482
17	8133334	4	-	4	-	WASHER .. Lock - 5/8
*18	103325	-	4	-	4	WASHER .. Lock - 5/8
19	106267	4	-	4	-	WASHER .. Plain - 5/8
*20	6101223	-	4	-	4	WASHER .. Plain - 5/8
21	103880	1	1	-	-	PLUG .. Pipe - 1/2 M.P.T. square head - Repl. 8036396
22	103881	-	-	1	-	PLUG .. Pipe - 3/4 M.P.T. square head
23	179887	8	-	-	-	BOLT .. 1/2-13 x 1-3/4 hex head - Repl. 173829,100161
24	103343	8	-	-	-	WASHER .. Plain - 1/2 - Repl. 8062893,8196647
25	179885	-	4	4	4	BOLT .. 1/2-13 x 1-1/2 hex head - Repl. 100160,173827,7490494
26	103323	8	4	4	4	WASHER .. Lock - 1/2
27	8192855	1	-	-	-	ELBOW .. Water discharge
28	8271714	-	1	1	1	TEE .. Flanged - Water discharge
29	8259219	1	-	-	-	DISCHARGE "Y" .. Water
30	8193260	1	-	-	-	GASKET .. Elbow to discharge "Y"
31	8192852	1	-	-	-	BRACKET .. Support
32	8272121	-	1	1	1	BRACKET .. Support
33	8176189	2	-	-	-	BOLT .. 1/2-20 x 3 - Studded head
34	103028	2	-	-	-	NUT .. 1/2-20 hex - Repl. 3211691,117051,174802,451406
35	103343	3	-	-	-	WASHER .. Plain - 1/2 - Repl. 8062893,8196647
36	179881	1	-	-	-	BOLT .. 1/2-13 hex head - Repl. 217051,100158,173819
37	103323	5	-	-	-	WASHER .. Lock - 1/2
38	181374	-	2	2	2	BOLT .. 3/8-24 x 1-1/2 hex head - Repl. 8289109,100028
39	103321	-	4	4	4	WASHER .. Lock - 3/8 - Repl. 8042744
*40	106263	-	4	4	4	WASHER .. Plain - 3/8
41	179838	-	2	2	2	BOLT .. 3/8-16 x 7/8 hex head - Repl. 106330
+*42	8080858	1	1	1	1	FLANGE .. Blind - Water discharge
+*43	8070513	1	1	1	1	GASKET .. Blind flange to crankcase
+*44	271583	4	4	4	4	BOLT .. Flange to crankcase - 5/8-18 x 1-1/2 hex head - Repl. 100076
+*45	8133334	4	4	4	4	WASHER .. Lock - 5/8

8341060D 8283795B 8283902M
8340674G 8277756G

P.L. No. F172

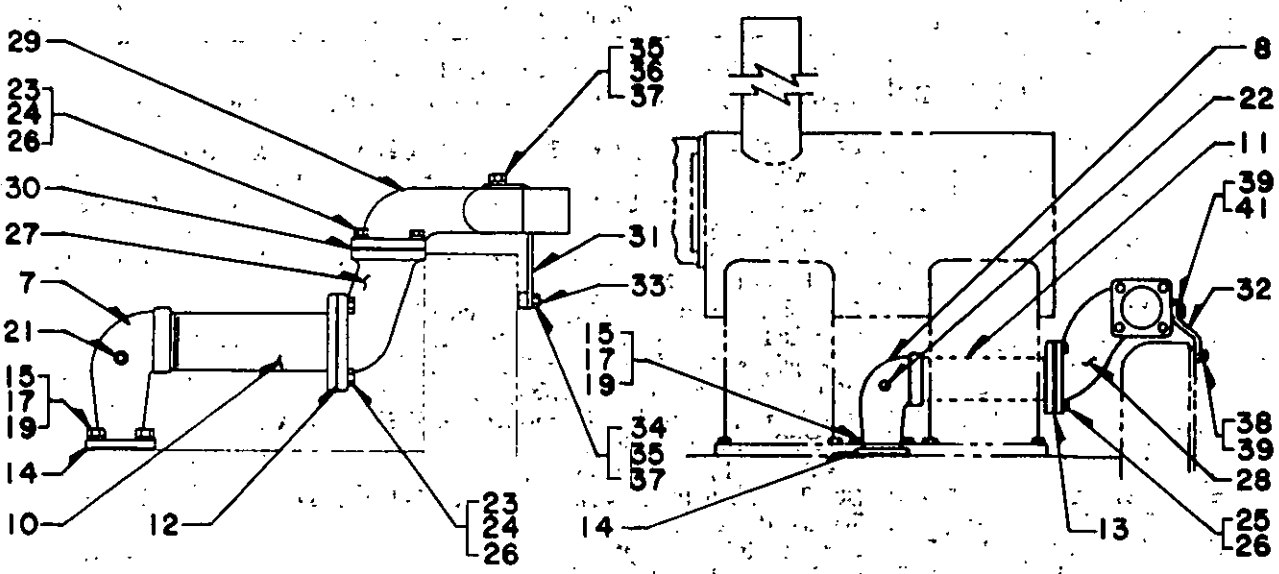
EXHAUST CHAMBER ASSEMBLY



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

EXHAUST CHAMBER APPLICATION



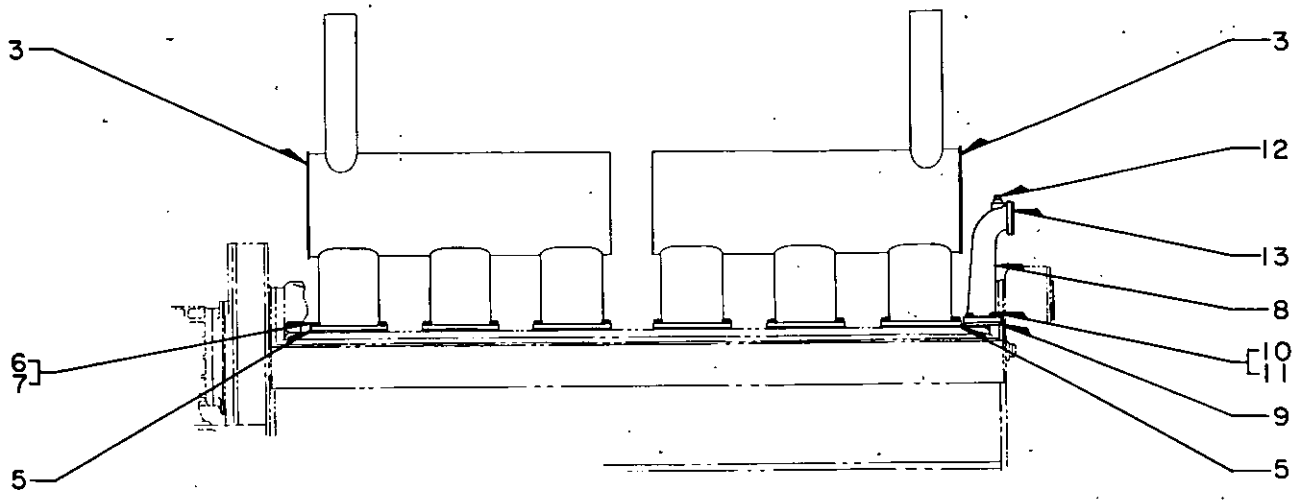
WATER DISCHARGE PIPING ARRANGEMENT

PLATE B172-12

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
8 and 12-645E Engines
SW1000,SW1001,SW1500,SW1504,GP15-1 and GP15-2 Locomotives



CAMSHAFT DRIVE END ACCESSORY DRIVE END

PLATE B172-13

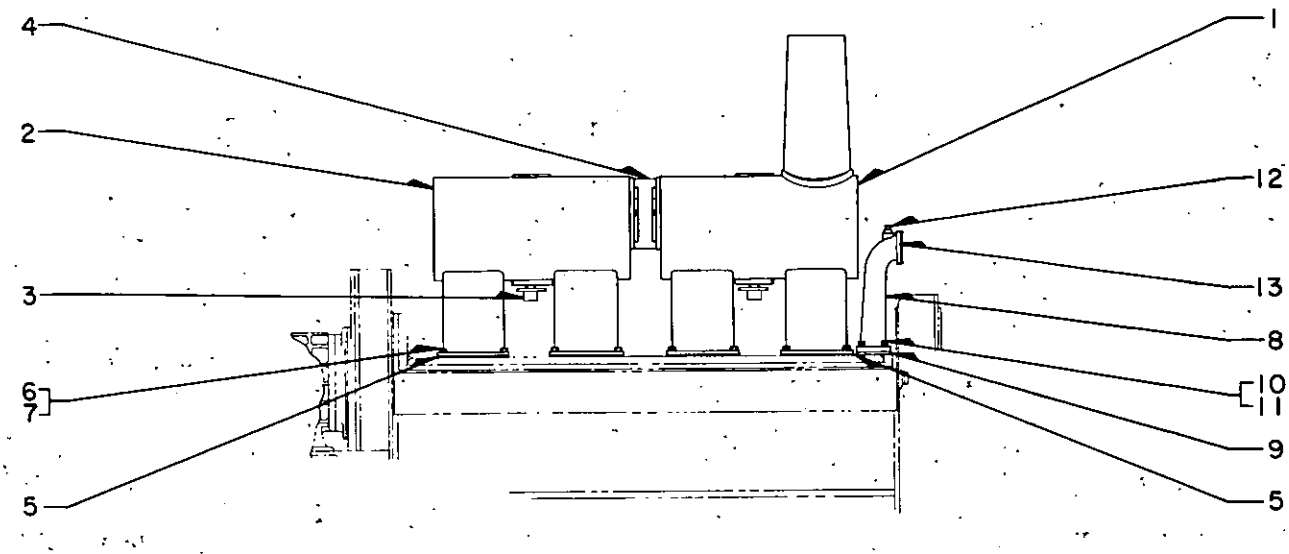
Ref. No.	Part Number	Qty. Req.		Description
		A	-	8-645E engine - SW1000 and SW1001 locomotives
		-	B	12-645E engine - SW1500,SW1504, GP15-1, and GP15-2 locomotive
* 1	8373986	1	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet
* 2	8374192	1	-	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
3	8370162	-	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet - SW1500 and SW1504 locomotives
3	9315936	-	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet - GP15-1 loco. GP15-1,GP15-2 locomotives
* 4	8164745	1	-	CLAMP .. Exhaust chamber - 8-1/4 inch
5	9337724	4	6	GASKET .. Exhaust chamber to crankcase - Replaces 8281295 Replaces 8281295 and 8459714
6	271584	24	36	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex. head
7	8291560	24	36	WASHER .. 5/8 hardened - Formerly 8133334
+ 8	8367400	1	1	ELBOW .. Water discharge
+ 9	8347756	1	1	GASKET .. Elbow to crankcase
10	272563	4	4	BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex. head
11	121326	4	4	WASHER .. Lock - 1
12	103869	1	1	PLUG .. Pipe - 3/4 M.P.T.
13	8368824	1	1	GASKET .. Elbow to pipe assembly
*14	8116738	A.R.	-	WIRE .. 500 ft. - Use with Ref. No. 4

8375854K 8370239K 8482653 9315937 33880 42025 33255 33379
8374919M 8369347N 8482984

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Spark Retainer Exhaust Chamber Assembly
8-645E Engine
SW1000 and SW1001 Locomotives



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

PLATE B172-14

Ref. No.	Part Number	Qty. Req.		Description
ϕ1	8426355	1	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and water outlet opening in manifold leg - Original application
ϕ1	9093983	-	1	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg - Current application
2	8426353	1	1	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
3	8461355	2	2	CAP ASSEMBLY .. Pipe
4	8158870	1		CLAMP .. Exhaust chamber - 10 inch
5	9337724	4		GASKET .. Exhaust chamber to crankcase - Replaces 8281295, 8459714
6	271584	24		BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex. head
7	8291560	24		WASHER .. 5/8 hardened
+ 8	8367400	1		ELBOW .. Water discharge
+ 9	8347756	1		GASKET .. Elbow to crankcase
10	272563	4		BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex. head
11	121326	4		WASHER .. Lock - 1
12	103869	1		PLUG .. Pipe - 3/4 M.P.T.
13	8368824	1		GASKET .. Elbow to pipe assembly
*14	8116738	A.R.		WIRE .. 500 ft. - Use with Ref. No. 4
*15	9518064	2		KIT .. Clean out port - See Page 32

32640 9318550 A

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Silencer - Spark Arrester Exhaust Chamber Assembly
8-645E Engine
SW1001 Locomotives

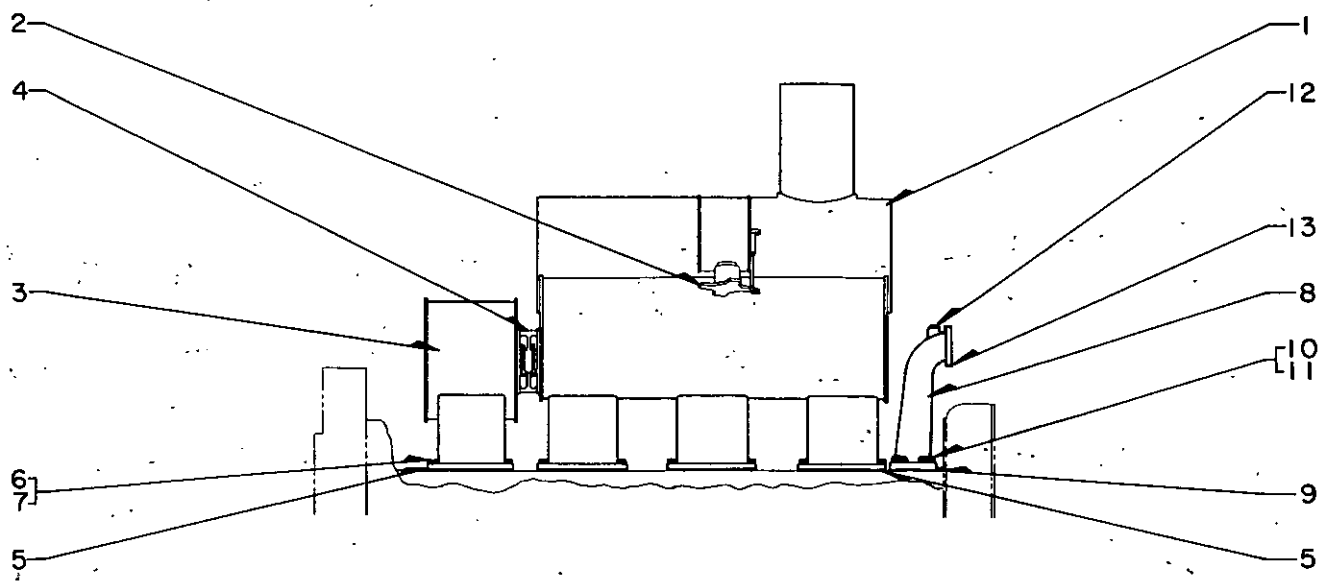


PLATE B172-15

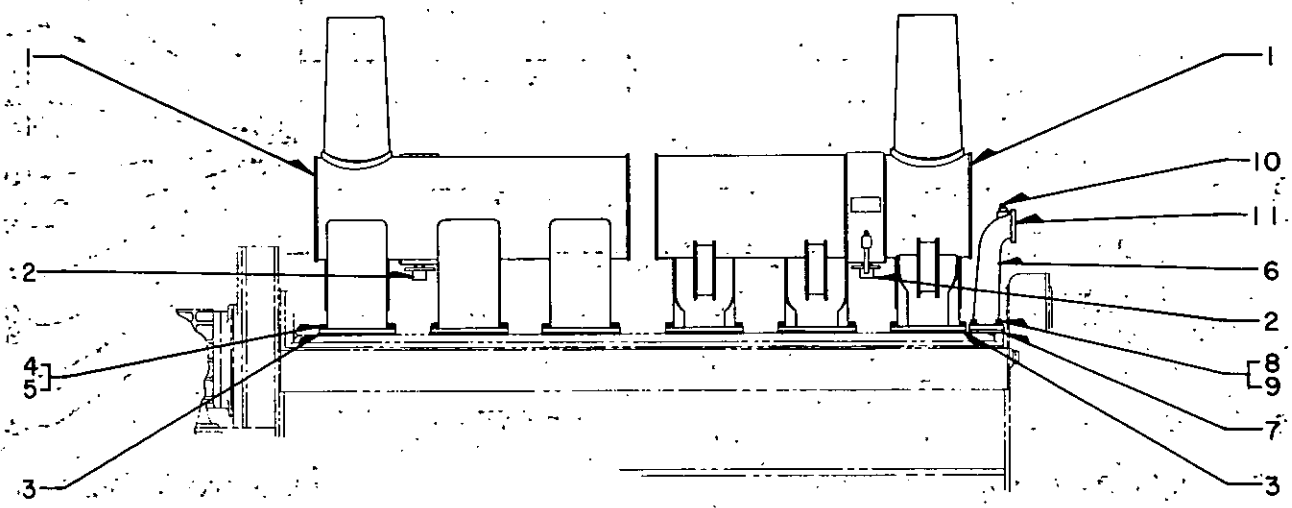
Ref. No.	Part Number	Qty. Req.	Description
1	9501801	1	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
2	9501936	1	HANDLE ASSEMBLY .. Trap
3	9509571	1	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
4	8158870	1	CLAMP .. Exhaust chamber - 10 inch
5	9337724	4	GASKET .. Exhaust chamber to crankcase - Replaces 8281295 and 8459714
6	271584	24	BOLT .. Chamber to crankcase - 5/8-11 x 1-5/8 hex head
7	8291560	24	WASHER .. 5/8 hardened
+8	8367400	1	ELBOW .. Water discharge
+9	8347756	1	GASKET .. Elbow to crankcase
10	272563	4	BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex head
11	121326	4	WASHER .. Lock - 1 in.
12	103869	1	PLUG .. Pipe - 3/4 M.P.T.
+13	8368824	1	GASKET .. Elbow to pipe assembly
+14	8116738	A.R.	WIRE .. 500 ft. - Use with Ref. No. 4
*15	8278929	A.R.	COMPOUND .. Thread - 1 qt. - Applied to Ref. No. 2 8315394 .. 4 oz. tube
*16	9518064	1	KIT .. Clean out port - See page 32

37846 38911 39825

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Spark Retainer Exhaust Chamber Assembly
12-645E Engine
SW1500,MP15DC,MP15AC and GP15-1 Locomotives



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

PLATE A172-16

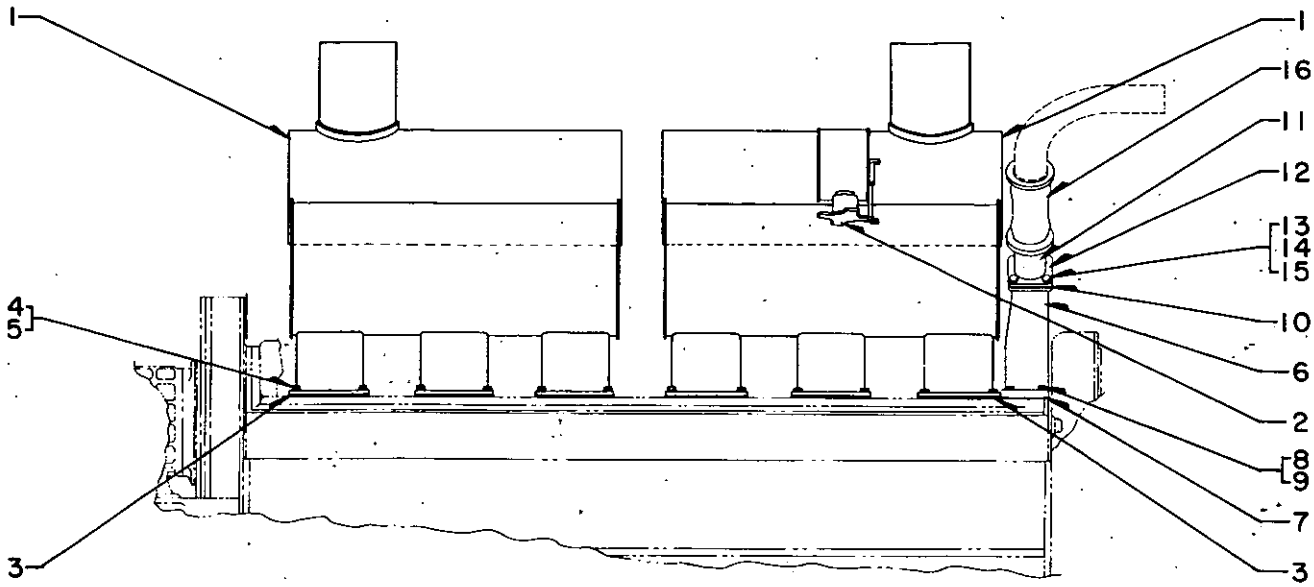
Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	SW1500 and MP15DC locomotives - Original application
		-	B	-	SW1500,MP15DC and MP15AC locomotives - Current application
		-	-	C	GP15-1 locomotive
ϕ*1	8426356	2	-	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and water outlet opening in manifold leg - Replaces 8282911
ϕ*1	9093984	-	2	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
1	9315865	-	-	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet
2	8461355	2	2	2	CAP ASSEMBLY .. Pipe
3	8459714	6	6	6	GASKET .. Manifold to crankcase
4	271584	36	36	36	BOLT .. Manifold to crankcase - 5/8-18 x 1-5/8 hex. head
5	8291560	36	36	36	WASHER .. 5/8 hardened - Formerly 8133334
+ 6	8367400	1	1	1	ELBOW .. Water discharge
+ 7	8347756	1	1	1	GASKET .. Elbow to crankcase
8	272563	4	4	4	BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex. head
9	121326	4	4	4	WASHER .. Lock - 1
10	103869	1	1	1	PLUG .. Pipe - 3/4 M.P.T.
11	8368824	1	1	1	GASKET .. Elbow to pipe assembly
*12	8278929	As Req.			COMPOUND .. Thread - 1 qt. applied to Ref. No. 2
*13	9518064	-	-	2	KIT .. Clean out port - See Page 32

8492972D 33875 9315937
8492594 33379

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Silencer - Spark Arrester Exhaust Chamber Assembly
12-645E Engine
GP15-1 Locomotive



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

PLATE A172-17

Ref. No.	Part Number	Qty. Req.	Description
1	9515814	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
2	9501936	2	HANDLE ASM. .. Trap
3	9337724	6	GASKET .. Exhaust chamber to crankcase - Replaces 8281295 and 8459714
4	271584	36	BOLT .. Chamber to crankcase - 5/8-11 x 1-5/8 hex. head
5	8291560	36	WASHER .. 5/8 hardened
+6	8359613	1	"Y" FLANGE .. Water discharge
+7	8347756	1	GASKET .. Flange to crankcase
8	272563	4	BOLT .. Flange to mounting - 1-14 x 2-1/4 hex head
9	121326	2	WASHER .. Lock - 1 in.
+10	8347757	2	GASKET .. Flange to radiator piping
+11	8409533	2	PIPE .. "Y" flang to coupling - Formerly 8409349
+12	8363147	2	FLANGE .. Pipe - Welded to pipe
13	179889	8	BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head
14	103323	8	WASHER .. Lock - 1/2
15	102637	8	NUT .. 1/2-13 hex.
+16	8468179	2	COUPLING ASSEMBLY .. Flexible - 3 in. - Replaces 8339732 - See Catalog 190, P.L. 1801
*17	8278929	A.R.	COMPOUND .. Thread - 1 qt. - Applied to Ref. No. 2 8315394 .. 4 oz. tube
*18	9518064	2	KIT .. Clean outport - See page 32

38482

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Silencer - Exhaust Chamber Assembly
12-645E Engine
GP15-1 and GP15-2 Locomotives

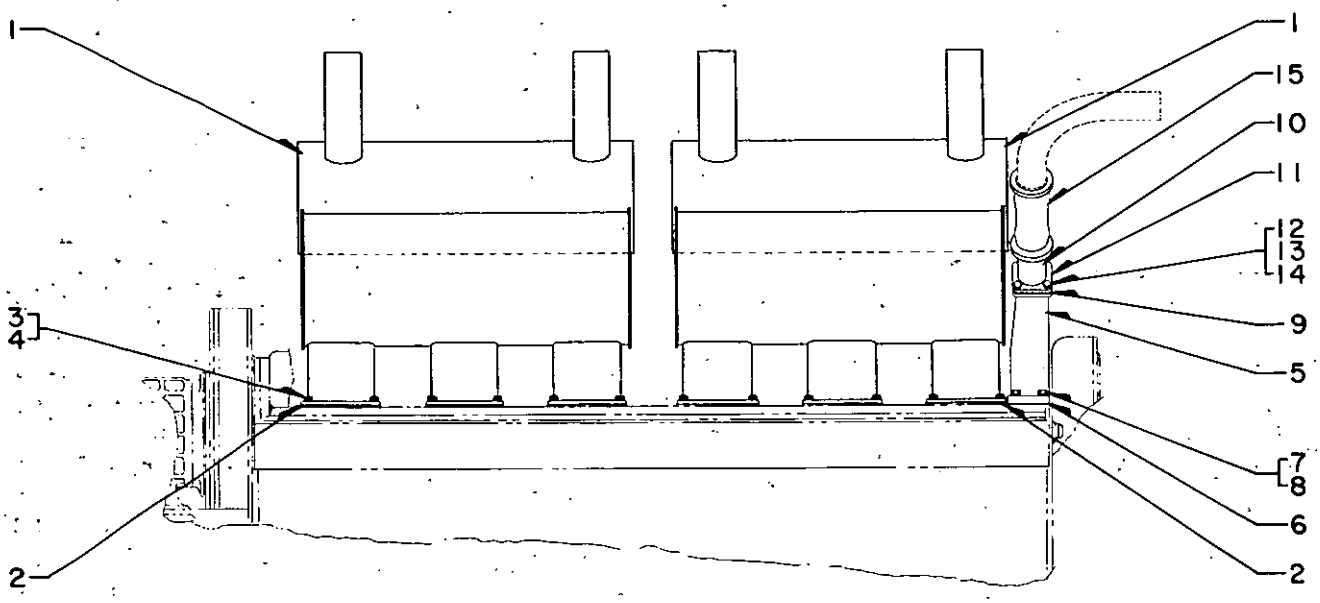


PLATE A172-18

Ref. No.	Part Number	Qty. Req.	Description
1	9536624	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
2	9337724	6	GASKET .. Exhaust chamber to crankcase - Replaces 8281295 and 8459714
3	271584	36	BOLT .. Chamber to crankcase - 5/8-11 x 1-5/8 hex head
4	8291560	36	WASHER .. 5/8 hardened
+5	8359613	1	"Y" FLANGE .. Water discharge
+ 6	8347756	1	GASKET .. Flange to crankcase
7	272563	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
8	121326	4	WASHER .. Lock - 1 in.
+9	8347757	2	GASKET .. Flange to radiator piping
+10	8409533	2	PIPE .. "Y" flange to coupling - Formerly 8409349
+11	8363147	2	FLANGE ...Pipe - Welded to pipe
12	179889	8	BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head
13	103323	8	WASHER .. Lock - 1/2
14	102637	8	NUT .. 1/2-13 hex
+15	8468179	2	COUPLING ASSEMBLY .. Flexible - 3 in. replaces 8339732 - See catalog 190, P.L. 1801

41027

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
16-645E Engine
GP38,GP38AC,GP38-2,SD38,SD38M and SD38-2 Locomotives

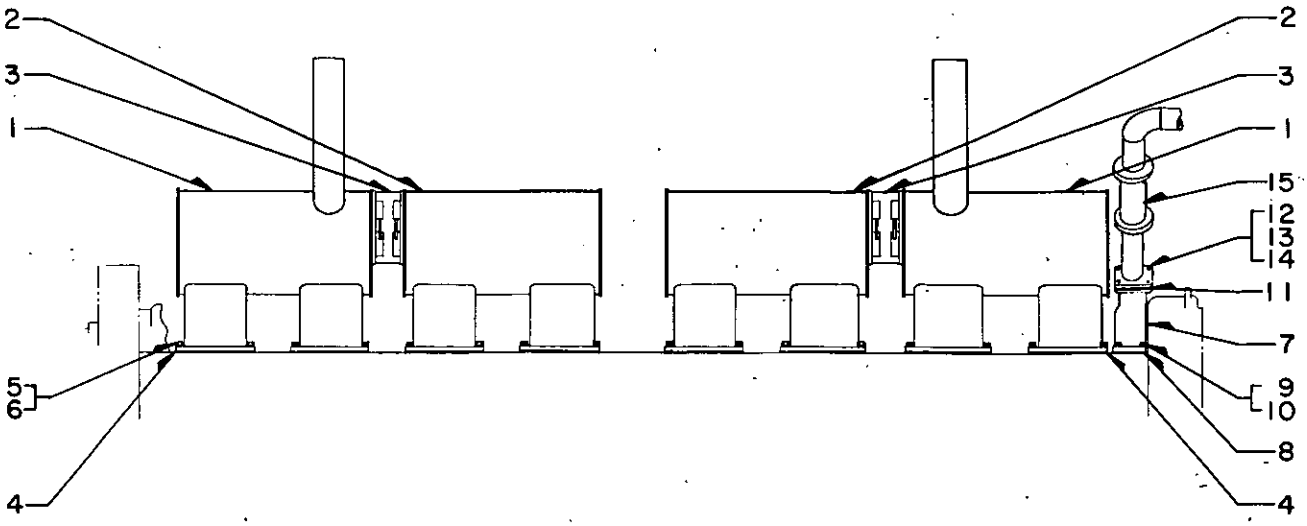


PLATE A172-19

Ref. No.	Part Number	Qty. Req.		Description
		A	-	GP38,GP38AC,GP38-2 locomotives with or without dynamic brakes and SD38 locomotive without dynamic brakes
		-	B	SD38,SD38M locomotives with dynamic brakes and SD38-2 locomotives with or without dynamic brakes
1	8375281	2	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet adjacent clamp
* 1	8387631	-	1	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet opposite clamp
2	8375445	2	2	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
3	8158870	2	2	CLAMP .. Exhaust chamber - 10 inch
4	9337724	8	8	GASKET .. Exhaust chamber to crankcase - Replaces 8281295, 8459714
5	271584	48	48	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head
6	8133334	48	48	WASHER .. Lock - 5/8
+ 7	8359613	1	1	"Y" FLANGE .. Water discharge
+ 8	8347756	1	1	GASKET .. Flange to crankcase
9	272563	4	4	BOLT .. Flange mounting - 1-1/4 x 2-1/4 hex head
10	121326	4	4	WASHER .. Lock - 1 inch
11	8347757	2	2	GASKET .. Flange to radiator piping
12	179889	8	8	BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head
13	103323	8	8	WASHER .. Lock - 1/2
14	102637	8	8	NUT .. 1/2-13 hex
+15	8468179	2	2	COUPLING ASSEMBLY .. Flexible - 3 inch - Replaces 8339732 - See Catalog 190, P.L. 1801
*16	8116738	A.R.		WIRE .. 500 ft. - Use with Ref. No. 3

8449443C 8450741D 8362940M 9319293A 33873
8464720B 8386391D 8470761 9319294A 32639
8449444C 8464721 8386300E

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Four Stack-Standard Exhaust Chamber Assembly
16-645E Engine
GP38-2 Locomotive Without Dynamic Brakes

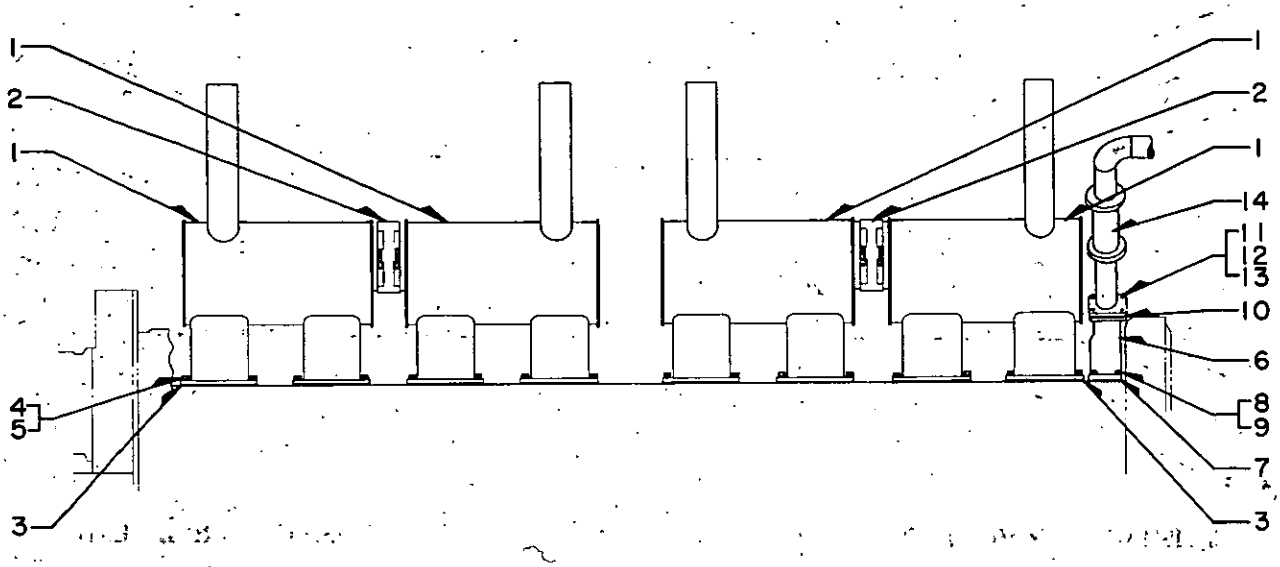


PLATE A172-20

Ref. No.	Part Number	Qty. Req.		Description
ϕ*1	8375281		2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet adjacent clamp
ϕ 1	8387631	4	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet opposite clamp
2	8158870	2		CLAMP .. Exhaust chamber - 10 inch
3	9337724	8		GASKET .. Exhaust chamber to crankcase - Replaces 8281295, 8459714
4	271584	48		BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head
5	8133334	48		WASHER .. Lock - 5/8
+ 6	8359613	1		"Y" FLANGE .. Water discharge
+ 7	8347756	1		GASKET .. Flange to crankcase
8	272563	4		BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
9	121326	4		WASHER .. Lock - 1 inch
+10	8347757	2		GASKET .. Flange to radiator piping
11	179889	8		BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head
12	103323	8		WASHER .. Lock - 1/2
13	102637	8		NUT .. 1/2-13 hex
+14	8468179	2		COUPLING ASSEMBLY .. Flexible - 3 inch - Replaces 8339732 - See Catalog 190, P.L. 1801
*15	8116738	A.R.		WIRE .. 500 ft. - Use with Ref. No. 2

26306

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Spark Retainer Exhaust Chamber Assembly
16-567D1 and 16-645E Engines
GP18,GP28,GP38,GP38AC,GP38-2,SD18,SD28,
SD38,SD38M and SD38-2 Locomotives

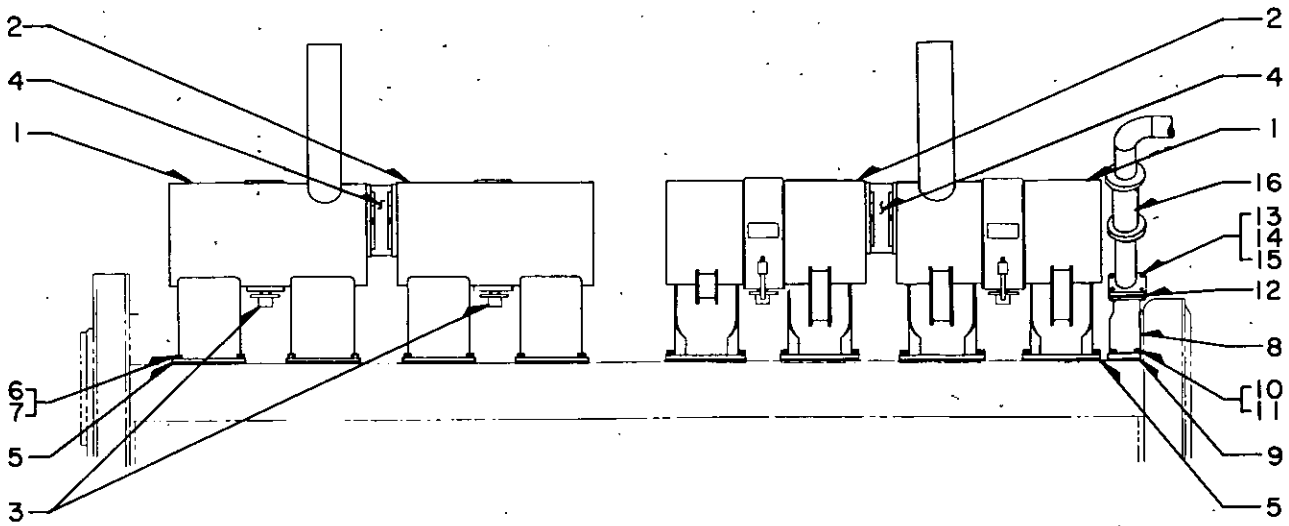


PLATE A172-21

Ref. No.	Part Number	Quantity Required			Description	
		A	-	-	GP18,GP28,GP38,GP38AC,GP38-2,SD18,and SD28 locomotives with or without dynamic brakes and SD38 locomotive without dynamic brakes	
		-	B	-	SD18,SD28,SD38,SD38M locomotives with dynamic brakes and SD38-2 locomotive with or without dynamic brakes	
		-	-	C	GP38-2 locomotive with or without dynamic brakes	
1	8426352	2	-	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet adjacent clamp and water outlet opening in manifold leg	
1	9093985	-	-	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet adjacent clamp and less water outlet opening in manifold leg	
*ϕ1	8426354	-	2	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet opposite clamp and water outlet opening in manifold leg	
*ϕ1	9093986	-	2	-	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet opposite clamp and less water outlet opening in manifold leg - Optional to 8426354 chamber on 645 engines only	
2	8426353	2	2	2	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet	
3	8461355	4	4	4	CAP ASSEMBLY .. Pipe	
4	8158870	2	2	2	CLAMP .. Exhaust chamber - 10 inch	
5	9337724	8	8	8	GASKET .. Exhaust chamber to crankcases - Replaces 8281295, 8459714	
6	271584	48	48	48	BOLT .. Chamber to crankcase - 5/8-29 x 1-5/8 hex head	
7	8133334	48	48	48	WASHER .. Lock 5/8	
8	8359613	1	1	1	"Y" FLANGE .. Water discharge	Except GP18, GP28,SD18, SD28 Locomotives
9	8347756	1	1	1	GASKET .. Flange to crankcase	
10	272563	4	4	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head	
11	121326	4	4	4	WASHER .. Lock - 1 inch	
12	8347757	2	2	2	GASKET .. Flange to radiator piping	
13	179889	8	8	8	BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head	
14	103323	8	8	8	WASHER .. Lock - 1/2	
15	102637	8	8	8	NUT .. 1/2-13 hex	
+16	8468179	2	2	2	COUPLING ASSEMBLY .. Flexible - 3 inch - Replaces 8339732 - See Cat. 190, P.L. 1801	
*17	8116738	As Req.			WIRE .. 500 ft. - Use with Ref. No. 4	
*18	8278929	As Req.			COMPOUND .. Thread - 1 qt. - Applied to Ref. No. 3	
19	9518064	4	4	4	KIT .. Clean out port - See Page 32	

22155 23691 32639 32641

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Four Stack-Spark Retainer Exhaust Chamber Assembly
16-645E Engine
GP38-2 Locomotive Without Dynamic Brakes

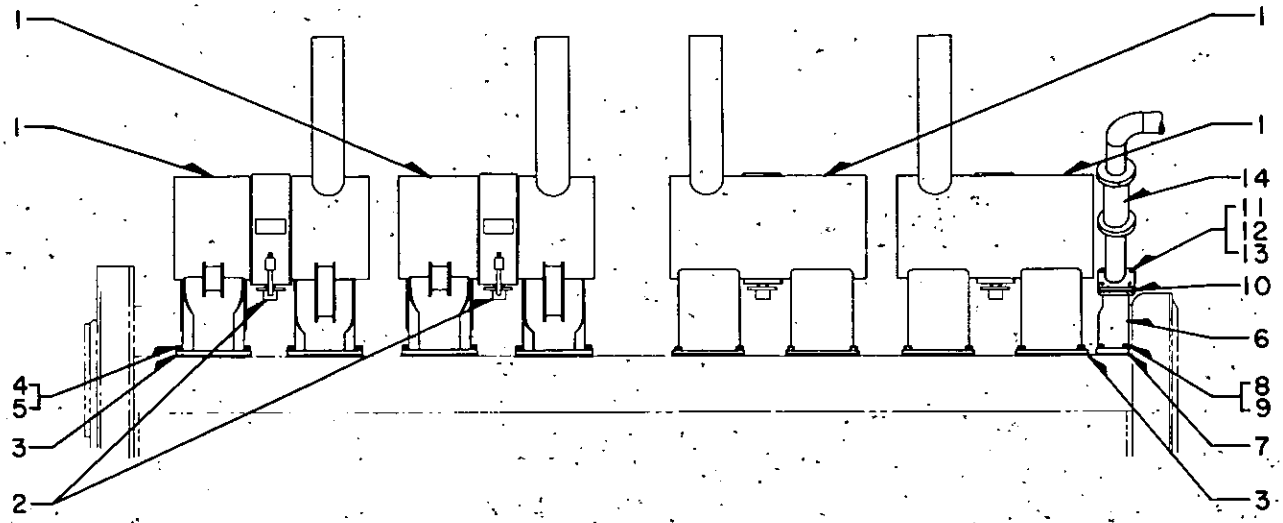


PLATE A172-22

Ref. No.	Part Number	Qty. Req.	Description
1	9083476	4	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet
2	8461355	4	CAP ASSEMBLY .. Pipe - Formerly 8461335
3	9337724	8	GASKET .. Exhaust chamber to crankcase - Replaces 8281295,8459714
4	271584	48	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head
5	8133334	48	WASHER .. Lock - 5/8
+ 6	8359613	1	"Y" FLANGE .. Water discharge
+ 7	8347756	1	GASKET .. Flange to crankcase
8	272563	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
9	121326	4	WASHER .. Lock - 1 inch
10	8347757	2	GASKET .. Flange to radiator piping
11	179889	8	BOLT .. Radiator pipe to flange - 1/2-13 x 2 hex head
12	103323	8	WASHER .. Lock - 1/2
13	102637	8	NUT .. 1/2-13 hex
+14	8468179	2	COUPLING ASSEMBLY .. Flexible - 3 inch - Replaces 8339732 - See Catalog 190 - Parts List 1801
*15	8278929	A.R.	COMPOUND .. Thread - 1 qt. applied to Ref. No. 2 - 8315394 .. 4 oz. tube
*16	9518064	4	KIT .. Clean out port - See page 32

30891

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Silencer - Spark Arrester Exhaust Chamber Assembly
16-645E Engine
F40PH-2M, GP38-2 and SD38-2 Locomotives

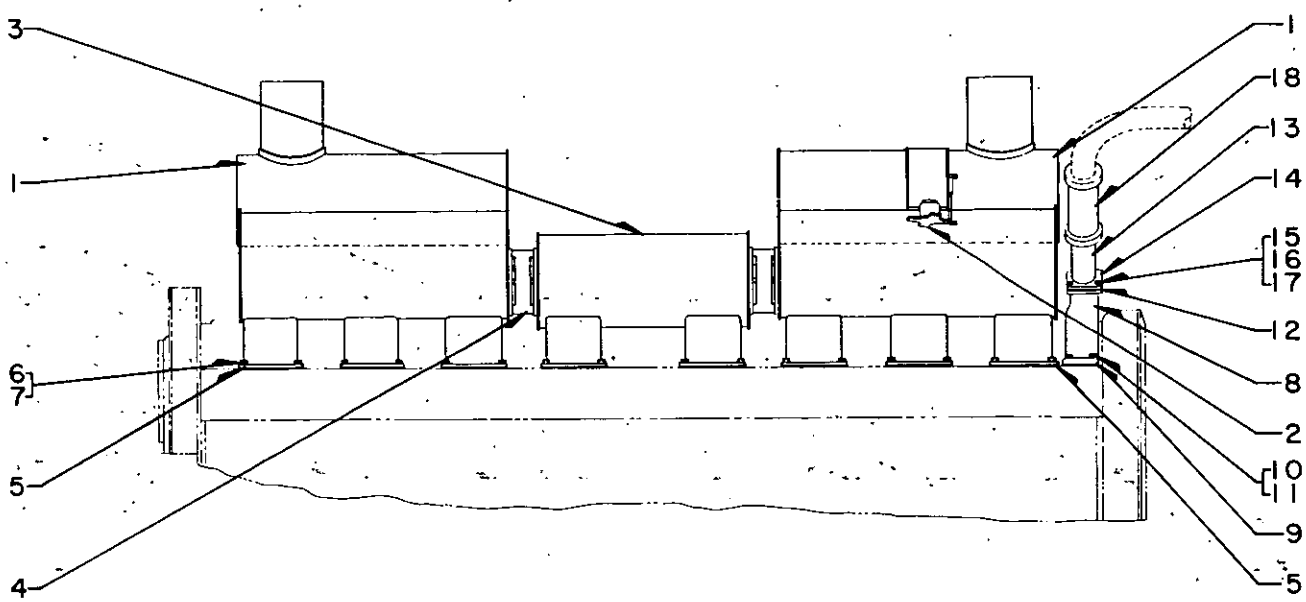


PLATE A172-23

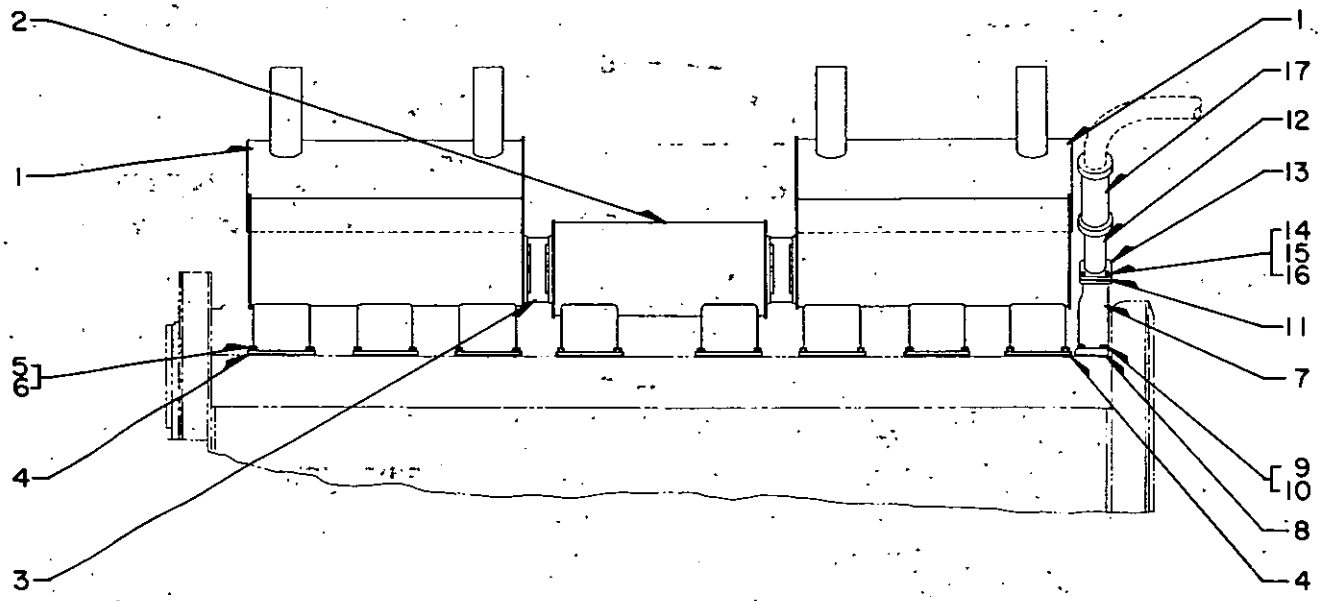
Ref. No.	Part Number	Qty. Req.	Description
1	9501801	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
2	9501936	2	HANDLE ASSEMBLY .. Trap
3	9501536	1	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
4	8158870	2	CLAMP .. Exhaust chamber - 10 inch
5	9337724	8	GASKET .. Exhaust chamber to crankcase - Replaces 8281295 and 8459714
6	271584	48	BOLT .. Chamber to crankcase - 5/8-11 x 1-5/8 hex head
7	8133334	48	WASHER .. Lock - 5/8
+8	8359613	1	"Y" FLANGE .. Water discharge
+9	8347756	1	GASKET .. Flange to crankcase
10	272563	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
11	121326	4	WASHER .. Lock - 1 in.
+12	8347757	2	GASKET .. Flange to radiator piping
+13	9315479	2	PIPE .. "Y" flange to coupling - GP38-2, SD38-2
+13	8363175	2	PIPE .. "Y" flange to coupling - F40PH-2
+14	8363147	2	FLANGE .. Pipe - Welded to pipe
15	179889	8	BOLT .. Radiator pipe to flange - 1/2 - 13 x 2 hex head
16	103323	8	WASHER .. Lock - 1/2
17	102637	8	NUT .. 1/2-13 hex
+18	8468179	2	COUPLING ASSEMBLY .. Flexible - 3 in. - Replaces 8339732 - See Catalog 190, P.L. 1801
*19	8116738	A.R.	WIRE .. 500 ft. - Use with Ref. No. 4
*20	8278929	A.R.	COMPOUND .. Thread - 1 qt. applied to Ref. No. 2 8315394 .. 4 oz. tube
*21	9518064	2	KIT .. Clean out port - See page 32

38914

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Silencer - Exhaust Chamber Assembly
16-645E Engine
GP38-2 Locomotive Without Dynamic Brakes



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

PLATE A172-24

Ref. No.	Part Number	Qty. Req.	Description
1	9530919	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet and less water outlet opening in manifold leg
2	9501536	1	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
3	8158870	2	CLAMP .. Exhaust chamber - 10 inch
4	9337724	8	GASKET .. Exhaust chamber to crankcase Replaces 8281295 and 8459714
5	271584	48	BOLT .. Chamber to crankcase - 5/8 - 11 x 1 5/8 hex head
6	8133334	48	WASHER .. Lock - 5/8
+7	8359613	1	"Y" FLANGE .. Water discharge
+8	8347756	1	GASKET .. Flange to crankcase
9	272563	4	BOLT .. Flange mounting - 1-14 x 2-1/4 hex head
10	121326	4	WASHER .. Lock - 1 in.
+11	8347757	2	GASKET .. Flange to radiator piping
+12	9315479	2	PIPE .. "Y" flange to coupling
+13	8363147	2	FLANGE .. Pipe - Welded to pipe
14	179889	8	BOLT .. Radiator pipe to flange - 1/2 - 13 x 2 hex head
15	103323	8	WASHER .. Lock - 1/2
16	102637	8	NUT .. 1/2 - 13 hex
+17	8468179	2	COUPLING ASSEMBLY .. Flexible - 3 in. - Replaces 8339732 - See Catalog 190, P.L. 1801
*18	8116738	A.R.	WIRE .. 500 ft. - Use with Ref. No. 3

40866

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Spark Arrester Manifold Trap
Clean Out Port

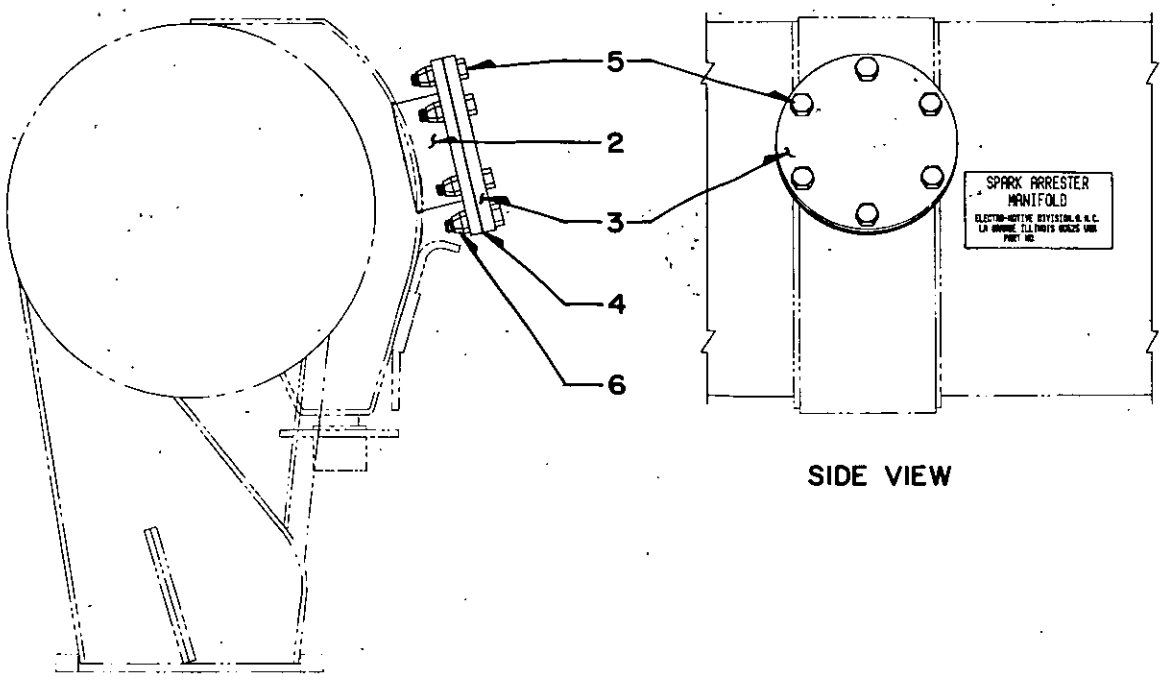


PLATE A172-25

Ref. No.	Part Number	Qty. Req.	Description
			CLEAN OUT PORT KIT
			The following kit 9518064 is required for applying a clean out port kit to spark arrester manifold trap on 8, 12 and 16-645E and 16-567D1 engines. One kit is required per manifold.
*1	9518064	1	KIT .. Clean out port
2	9516066	1	FLANGE ASM. .. Manifold - Includes tube
3	9316673	1	FLANGE .. Cover
/4	8316672	1	GASKET .. Cover flange to manifold flange
			/NOTE: This gasket must be replaced at each cleanout or inspection.
5	8287827	6	BOLT .. Cover flange to manifold flange - 1/2 - 20 x 2 hex head
6	9338626	6	NUT .. 1/2 - 20 hex. - Formerly 8284621
*7	9336982	1	KIT .. Electrode welding
*8	8159363	A.R.	PAINT .. Hi temp - Silver aluminum - 5 gal. can

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
8,12,16-645E Engines
(Replacement Engines For Korean 567C Engines)
G8,G12 and SD9 Locomotives

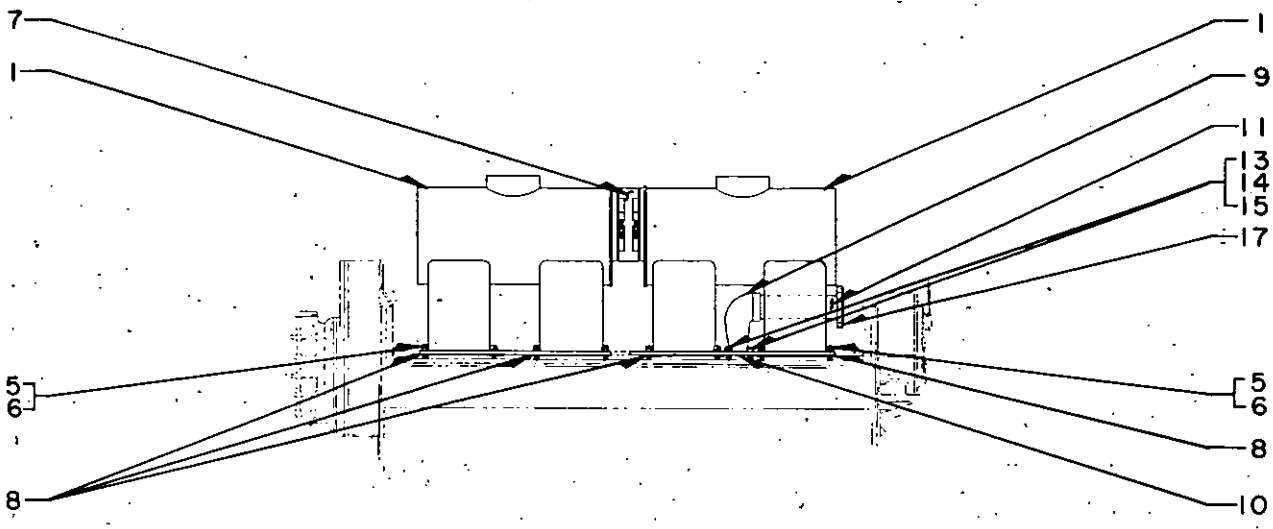


PLATE A172-26

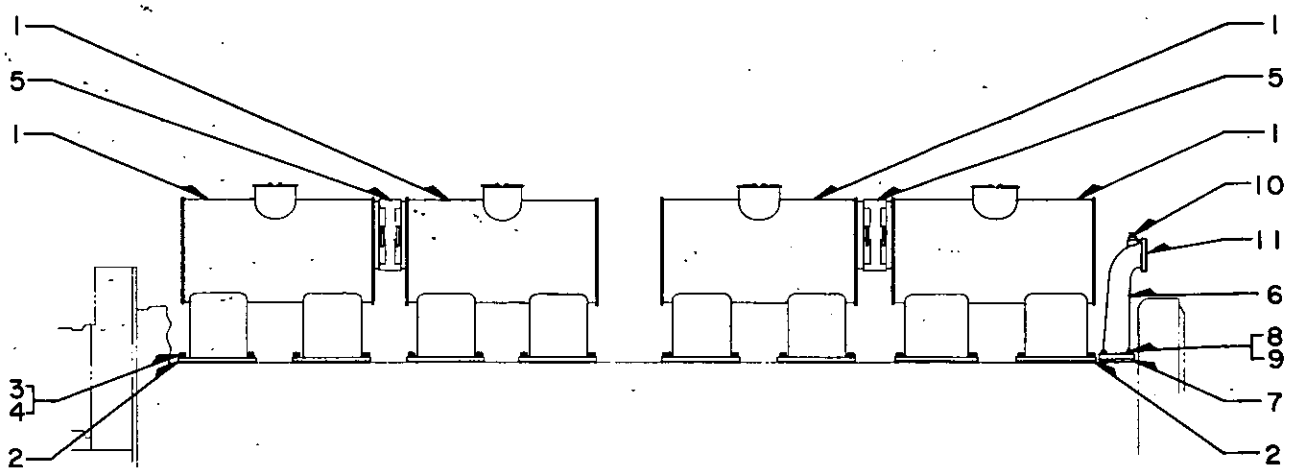
Ref. No.	Part Number	Quantity Required			Description
		A	-	-	G8 locomotive
		-	B	-	G12 locomotive
		-	-	C	SD9 locomotive
1	8278674	2	-	-	CHAMBER .. Exhaust - With exhaust stack outlet - Replaces 8209233
* 2	8205112	-	2	-	CHAMBER .. Exhaust - With exhaust stack outlet
* 3	8375281	-	-	2	CHAMBER .. Exhaust - With exhaust stack outlet - Replaces 8158867
* 4	8375445	-	-	2	CHAMBER .. Exhaust - Less exhaust stack outlet - Replaces 8158868
5	271584	24	36	48	BOLT .. Manifold to crankcase - 5/8-18 x 1-5/8 hex head
6	8133334	24	36	48	WASHER .. Lock - 5/8
7	8158870	1	-	2	CLAMP .. Exhaust chamber - 10 inch
8	9337724	4	6	8	GASKET .. Manifold to crankcase - Replaces 8281295,8459714
+ 9	8135183	1	1	1	ELBOW .. Water discharge
+10	8070513	1	1	1	GASKET .. Discharge elbow to crankcase
11	8204324	1	1	-	PIPE .. Water discharge
*12	8135201	-	-	1	PIPE .. Water discharge
13	271583	4	-	-	BOLT .. Water discharge elbow to crankcase - 5/8-18 x 1-1/2 hex head
14	271584	-	4	4	BOLT .. Water discharge elbow to crankcase - 5/8-18 x 1-5/8 hex head
15	8133334	4	4	4	WASHER .. Lock - 5/8
*16	106267	-	-	4	WASHER .. Plain - 5/8
17	8354611	1	1	-	GASKET .. Water discharge pipe flange
*18	8146490	-	-	1	GASKET .. Water discharge pipe flange
*19	8164709	-	-	1	ELBOW .. Water outlet
*20	179885	-	-	4	BOLT .. Elbow to water discharge pipe - 1/2-13 x 1-1/2 hex head
*21	103323	-	-	4	WASHER .. Lock - 1/2
*22	103343	-	-	4	WASHER .. Plain - 1/2
*23	8179624	-	-	1	BRACKET .. Support - Discharge elbow - Right side
*24	8179623	-	-	1	BRACKET .. Support - Discharge elbow - Left side
*25	8116738	A.R.	-	A.R.	WIRE .. 500 ft. - Use with Ref. No. 7

8209213S 6917072
8209222C 8198654

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
8 and 16-645E Engines
G18,GA18,G18U,G18W,GL18M,G26,G26C,G26CU,G26CW,G26CW-2 and GL26CW Locomotives



CAMSHAFT DRIVE END

ACCESSORY DRIVE END

PLATE A172-27

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A -	- B	G18,GA18,G18U,G18W and GL18M locomotives - 8-645E engine G26,G26C,G26U,G26CW,G26CW-2 and GL26CW locomotives - 16-645E engines
1	8373715	2	4	CHAMBER ASSEMBLY .. Exhaust
2	9337724	4	8	GASKET .. Chamber to crankcase - Replaces 8281295, 8459714
3	271584	24	48	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head
4	8291560	24	48	WASHER .. 5/8 hardened - Formerly 8133334
5	8158870	1	2	CLAMP .. Exhaust chamber - 10 inch
+ 6	8367400	1	1	ELBOW .. Water outlet
+ 7	8347756	1	1	GASKET .. Elbow to crankcase
8	272563	4	4	BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex head
9	121326	4	4	WASHER .. Lock - 1-1/4
10	103869	1	1	PLUG .. Pipe - 3/4 M.P.T. - Square head
+11	8352787	1	1	GASKET .. Flanged pipe to water outlet elbow
*12	8116738	A.R.		WIRE .. 500 ft. - Use with Ref. No. 5

8396832C 8417820D 33877 33879 9318456
8414137 8399082F 8388221 9318454

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
12-645E Engine
G22,G22U,G22W,G22CU,G22CW and GL22C Export Locomotives

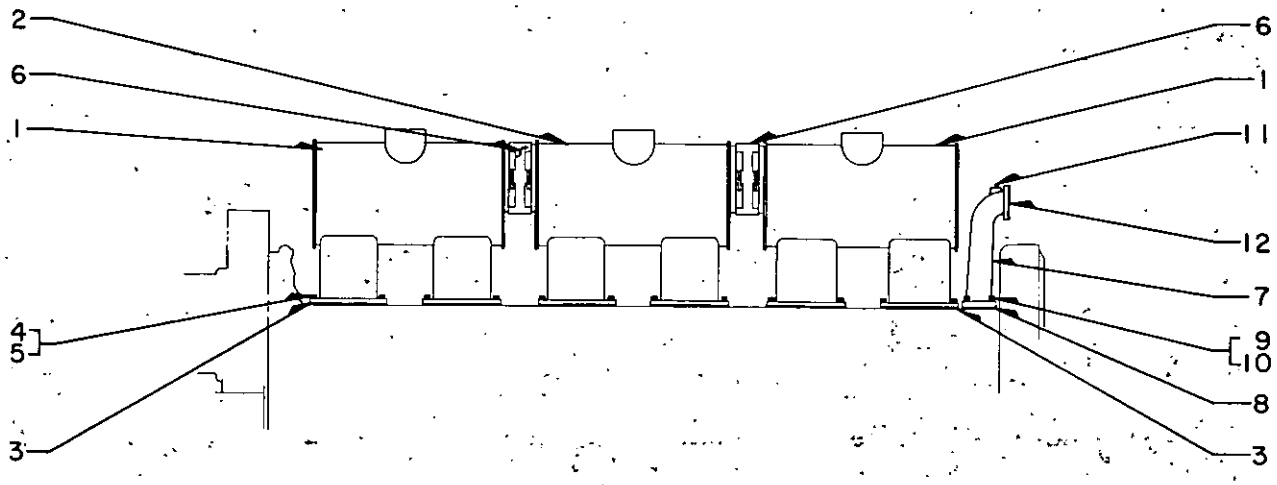


PLATE A172-28

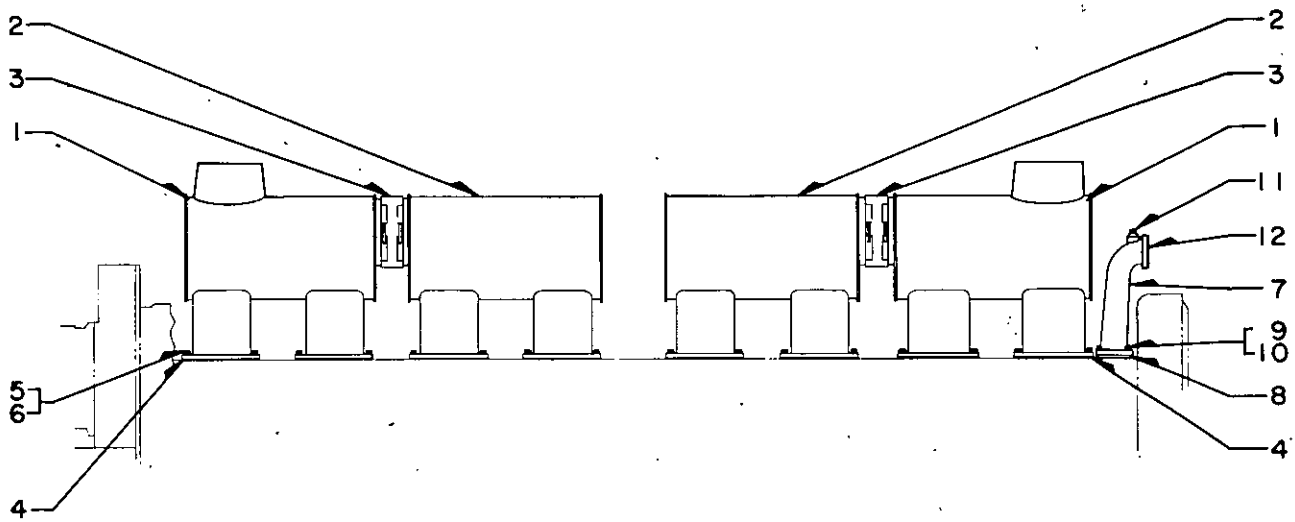
Ref. No.	Part Number	Qty. Req.	Description
1	8373715	2	CHAMBER ASSEMBLY .. Exhaust - End
2	8382680	1	CHAMBER ASSEMBLY .. Exhaust - Center
3	9337724	6	GASKET .. Chamber to crankcase - Replaces 8281295, 8459714
4	271584	36	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex. head
5	8291560	36	WASHER .. 5/8 hardened - Formerly 8133334
6	8158870	2	CLAMP .. Exhaust chamber - 10 inch
+ 7	8367400	1	ELBOW .. Water outlet
+ 8	8347756	1	GASKET .. Elbow to crankcase
9	272563	4	BOLT .. Elbow to crankcase - 1-1/4 x 2-1/4 hex. head
10	121326	4	WASHER .. Lock - 1-1/4
11	103869	1	PLUG .. Pipe - 3/4 M.P.T. - Square head
+12	8352787	1	GASKET .. Flanged pipe to water outlet elbow
*13	8116738	A.R.	WIRE .. 500 ft. - Use with Ref. No. 6

8384426H 33878
8391925B 9318455A
8463330

P.L. No. F172

EXHAUST CHAMBER ASSEMBLY

Standard Exhaust Chamber Assembly
16-645E Engine
G26C and G26CW Export Locomotives



CAMSHAFT DRIVE END ACCESSORY DRIVE END

PLATE A172-29

Ref. No.	Part Number	Qty. Req.	Description
1	8451090	2	CHAMBER ASSEMBLY .. Exhaust - With exhaust stack outlet
2	8374192	2	CHAMBER ASSEMBLY .. Exhaust - Less exhaust stack outlet
3	8164745	2	CLAMP .. Exhaust chamber - 8-1/4 inch
4	9337724	8	GASKET .. Exhaust chamber to crankcase - Replaces 8281294,8459714
5	271584	48	BOLT .. Chamber to crankcase - 5/8-18 x 1-5/8 hex head
6	8291560	48	WASHER .. 5/8 hardened - Formerly 8133334
+ 7	8367400	1	ELBOW .. Water discharge
+ 8	8347756	1	GASKET .. Elbow to crankcase
9	272563	4	BOLT .. Elbow to crankcase - 1-14 x 2-1/4 hex head
10	121326	4	WASHER .. Lock - 1
11	103869	1	PLUG .. Pipe - 3/4 M.P.T.
+12	8352787	1	GASKET .. Elbow to pipe assembly
*13	8116738	A.R.	WIRE .. 500 ft. - Use with Ref. No. 3

24444
8451091A

TURBOCHARGER APPLICATION

Turbocharger, Aftercooler, Air Duct and Auxiliary Generator Drive
All 567D and 645 Turbocharged Engines

TURBOCHARGER REFERENCE CHART

Engine Model	Turbo Gear Ratio	Part Number				
		New Turbocharger	Replaced By	†Unit Exch. Turbocharger	††Turbocharger Change Out Gasket Kit	††Aftercooler Change Out Gasket Kit
567 Engine Turbochargers						
16-567D2	20:1 18:1	8289470 8333500	8333500 ----	8296440	8328309	----
16-567D3	18:1 18:1	8329851 8333500	8333500 ----	8296440	8328308	ϕ8306238 ϕ8306239
16-567D3A	18:1	8333500	----	8296440		8306238
645 Engine Turbochargers						
8-645E3B	19.7:1	9554353	----	----	8414907	8306238
8-645E3C	19.7:1	9546861	----	9551898	8414907	8306238
8-645F3B	17.9:1	9517507	----	----	8380244	8365646
12-645E3	18:1	†††8421871 8410283	8410283 ----	8413707	8414907	8306238
12-645E3B,E3C	18:1	9511706	----	9524135	8414907	8306238
12-645E3B JT22CW Locomotive Only	18:1	9541264	----	----	8414907	8306238
12-645E3C GP39-2 and GP49 Locomotives Only	18:1	9547270	----	----	8414907	8306238
12-645E3C GP39-2 Locomotive Only	17.9:1	9548913	----	9558255	8414907	8306238
12-645F3	16.8:1	9520701	----	9532905	8380244	8365646
12-645F3	17.9:1	9548913	----	9558255	8380244	8365646
16-645E3	18:1	††8422199 8358500	8358500 ----	8368596	8380244	8365646
16-645E3 SDP40F Locomotive Only	18:1	8482766	----	8490264	8380244	8365646
16-645E3 F40PH Locomotive Only	16.8:1	9099302	----	9311576	8380244	8365646
16-645E3 GT26M2C Locomotive Only	18:1	8493711	----	9317663	8380244	8365646

† Includes Turbocharger Gasket Kits
†† See Parts List No. 199
††† Special Application Only

P.L. No. F174

TURBOCHARGER APPLICATION

TURBOCHARGER REFERENCE CHART

Engine Model	Turbo Gear Ratio	Part Number				
		New Turbocharger	Replaced By	†Unit Exch. Turbocharger	††Turbocharger Change Out Gasket Kit	††Aftercooler Change Out Gasket Kit
645 Engine Turbochargers						
16-645E3A DDA40X Locomotive Only	18:1	8420497	----	8424321	8380244	8365646
16-645E3A F40PH and F40C Locomotives Only	16.8:1	8493806	----	9082475	8380244	8365646
16-645E3B	18:1	9338194	----	9339283	8380244	8365646
16-645E3B F40PH and F40PH-2 Locomotives Only	16.8:1	9512453	----	9524134	8380244	8365646
16-645E3B GT26CU-2 Locomotive Only	18:1	9532709	9338194	9339283	8380244	8365646
16-645E3C GP40-2, SD40-2 SD40T-2 and SDL40-2 Locomotives Only	17.9:1	9528223	----	9543498	8380244	8365646
16-645E3C F40PH and F40PH-2 Locomotives Only	16.8:1	9546632	----	9552711	8380244	8365646
16-645F3	17.9:1	9320570	----	9332826	8380244	8365646
16-645F3B	17.9:1	9528223	----	9543498	8380244	8365646
20-645E3	18:1	8361058	----	8370751	8380244	8365646
20-645E3B	18:1	9338196	----	----	8380244	8365646

† Includes Turbocharger Gasket Kits

†† See Parts List No. 199

TURBOCHARGER APPLICATION

Turbocharger, Aftercooler and Air Duct Mounting
16-567D2,D3,D3A Engines
PLATE D174-1

Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	16-567D2 engine
		-	B	-	16-567D3 engine
		-	-	C	16-567D3A engine
1	----	1	1	1	TURBOCHARGER ASSEMBLY .. Engine - Refer to reference chart on Page 1
2	8451659	1	1	1	GASKET .. Turbocharger mounting - Replaces 8185583
3	181429	23	21	21	BOLT .. Hex head 1/2-20 x 1-1/4 - Turbocharger to camshaft housing
4	6101229	23	23	23	WASHER .. Plain 1/2
†5	8261256	1	1	-	BOLT .. Hex head 1/2-20 x 8 - Turbocharger to camshaft housing
6	8116738	As Req.			WIRE .. Lock - 3/64 diameter - Available 500 foot roll
†7	8347055	2	2	-	BOLT .. Drilled hex head 3/4-16 x 13-3/8 - Turbocharger to camshaft housing
8	8261288	-	-	-	BOLT .. Hex head 3/4-16 x 11-5/16 - Turbocharger to camshaft housing † 4 required - For previous design turbocharger housing 6 required - For current design turbocharger housing
9	8140912	6	6	6	WASHER .. Plain - 13/16 I.D. x 1-3/8 O.D. x 1/8 inch thick - Hardened
10	8354101	6	6	6	DAMPER .. Bolt
11	186342	-	-	-	BOLT .. Hex head 1/2-20 x 6 - Turbocharger to camshaft housing † 3 required - For previous design turbocharger housing 4 required - For current design turbocharger housing
12	6101229	4	4	4	WASHER .. Plain 1/2
13	181431	2	4	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Turbocharger to camshaft housing - Replaces 8282323
+14	8460738	1	1	1	DRIVE ASSEMBLY .. Auxiliary generator - Replaces 8261196 - See Parts List No. 162
15	8261200	1	1	1	GASKET .. Drive mounting
16	186339	2	2	2	BOLT .. Hex head 1/2-20 x 5-1/4 - Drive mounting
17	6101229	2	2	2	WASHER .. Plain 1/2
18	179845	9	9	9	BOLT .. Hex head 3/8-16 x 1-3/4 - Drive mounting
19	6101225	9	9	9	WASHER .. Plain 3/8
20	8288974	-	2	2	AFTERCOOLER ASSEMBLY .. Turbocharger - Used on engines with single flange mounting of cooling system to aftercooler - Unit Exchange No. 8296301
*21	8282738	-	2	-	AFTERCOOLER ASSEMBLY .. Turbocharger - Used on engines with double flange mounting of cooling system to aftercooler - Unit Exchange No. 8296302
22	8288847	-	2	2	HEADER .. Aftercooler core - Outer
*23	8262314	-	2	-	HEADER .. Aftercooler core - Outer - Applied to 8282738 only
24	8282174	-	2	2	COVER ASSEMBLY .. Aftercooler core - Inner
25	8282179	-	4	4	PIN .. Dowel - Locating
ϕ26	8284598	-	2	2	CORE ASSEMBLY .. Aftercooler (Young) - Replaces 8529762 (Harrison - See Ref. No. 29
27	8296701	-	8	8	ROD .. Air baffle
28	9428566	-	16	16	SCREW .. Hex socket 5/16-24 x 7/8 - Cap - Incl. nylon insert
ϕ29	8529762	-	2	2	CORE ASSEMBLY .. Aftercooler (Harrison) - Replaced by 8284598 (Young) - See Ref. No. 26
30	8449038	-	8	8	ROD .. Air baffle
31	9428566	-	16	16	SCREW .. Hex socket 5/16-24 x 7/8 - Cap - Incl. nylon insert

† *Applied to previous design turbocharger housings with cover or raised casting.*

P.L. No. F174

TURBOCHARGER APPLICATION

Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	16-567D2 engine
		-	B	-	16-567D3 engine
		-	-	C	16-567D3A engine
	8288974	-	2	2	AFTERCOOLER ASSEMBLY .. Turbocharger
	8282738	-	2	-	AFTERCOOLER ASSEMBLY .. Turbocharger
32	9087078	-	2	2	GASKET .. Header to core - Replaces 8357299
33	8499569	-	2	2	GASKET .. Aftercooler cover to core - Replaces 8261245
34	454914	-	104	104	BOLT .. Hex head 3/8-24 x 1-1/2 - Core mounting - Replaces 9422262
*35	181374	-	88	-	BOLT .. Hex head 3/8-24 x 1-1/2 - Applied to 8282738 only
36	193930	-	12	12	BOLT .. Hex head 3/8-24 x 3-1/2 - Header to core - Replaces 9422263
*37	186310	-	16	-	BOLT .. Hex head 3/8-24 x 3-1/2 - Applied to 8282738 only
38	103341	-	116	116	WASHER .. Plain 3/8
*39	181385	-	12	-	BOLT .. Hex head 3/8-24 x 3 - Applied to 8282738 only
40	8357298	-	2	2	GASKET .. Aftercooler mounting
41	181364	-	32	32	BOLT .. Hex head 3/8-24 x 1 - Aftercooler mounting
42	6101225	-	32	32	WASHER .. Plain 3/8
43	8282175	-	2	2	PAD .. Tapping
44	8282176	-	2	2	GASKET .. Pad to air duct
45	8282177	-	4	4	BOLT .. Drilled hex head 5/8-18 x 1-3/8 - Pad mounting
46	8282178	-	4	4	WASHER .. Plain - .656 I.D. x 1.3125 O.D. x 3/16 inch thick - Hardened
47	8269985	-	1	1	DUCT ASSEMBLY .. Air - Heat exchanger - Right side - Unit Exchange No. 8296305
*48	8273798	1	-	-	DUCT ASSEMBLY .. Air - Heat exchanger - Right side
49	9530105	-	1	1	DUCT ASSEMBLY .. Air - Heat exchanger - Left side - Replaces 8269986
*50	8273797	1	-	-	DUCT ASSEMBLY .. Air - Heat exchanger - Left side
51	8416803	2	2	2	GASKET .. Air duct to air box - Replaces 8261266
52	8460205	2	2	2	GASKET .. Compressor scroll discharge - Replaces 8261264
53	181429	22	22	22	BOLT .. Hex head 1/2-20 x 1-1/4 - Air duct to air box
54	6101229	22	22	22	WASHER .. Plain 1/2
55	181436	4	4	4	BOLT .. Hex head 1/2-20 x 2-1/4 - Air duct to air box

Original air duct inspection covers were circular in shape (Ref. Nos. 62 and 63). A design modification changed the circular shape cover to a trapezoidal shape cover (Ref. Nos. 56 thru 59). Current air ducts are without inspection covers.

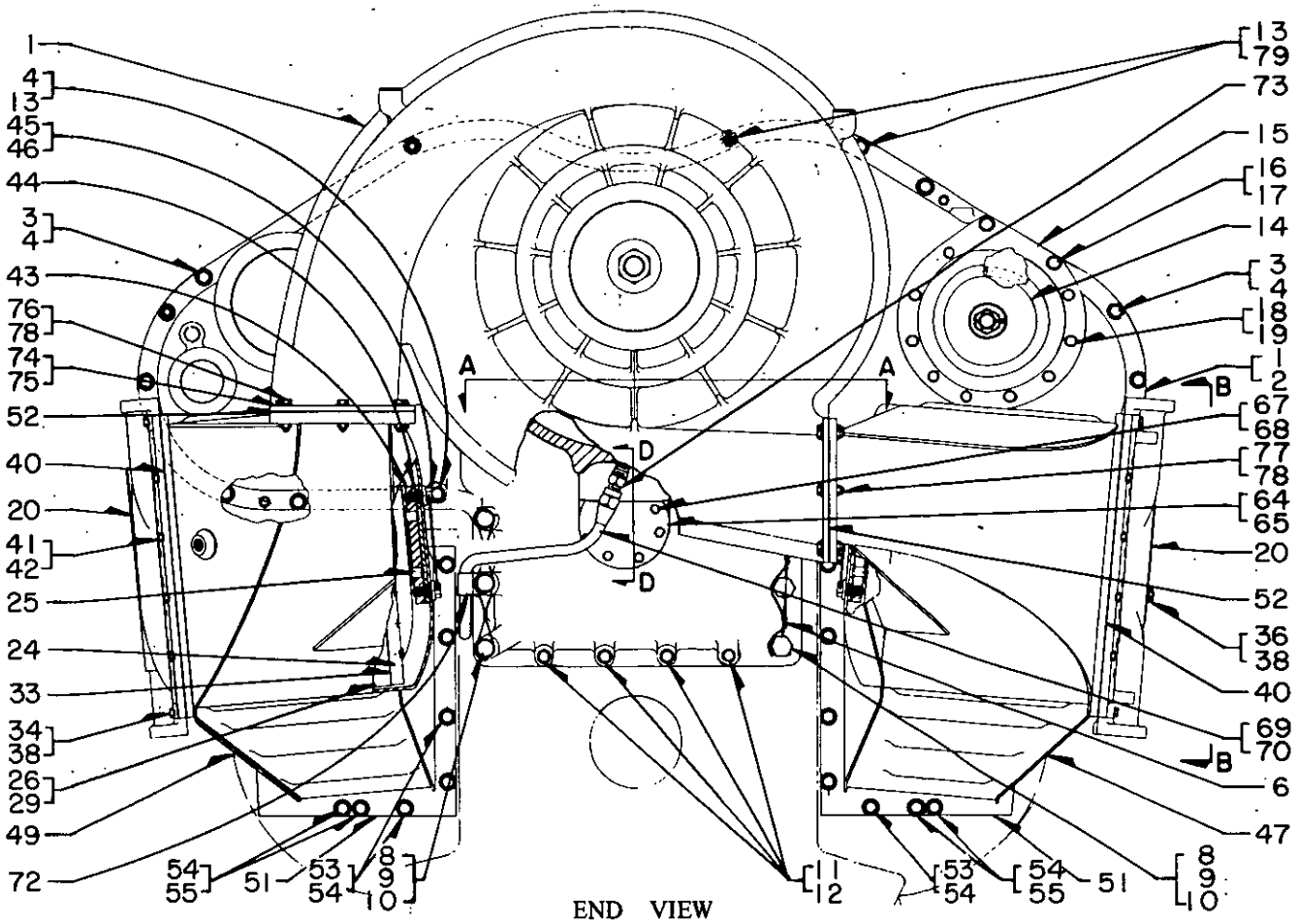
*56	8312987	-	1	-	COVER .. Inspection - Air duct - Right side - Trapezoidal shape
*57	8312986	-	1	-	GASKET .. Cover
*58	8312983	-	1	-	COVER .. Inspection - Air duct - Left side - Trapezoidal shape
*59	8312985	-	1	-	GASKET .. Cover
*60	181364	-	16	-	BOLT .. Hex head 3/8-24 x 1 - Cover mounting
*61	103321	-	16	-	WASHER .. Lock 3/8
*62	8261456	-	2	-	COVER .. Inspection - Air duct - Circular shape
*63	8261265	-	2	-	GASKET .. Cover
64	8261198	1	1	1	COVER .. Stubshaft
65	8261282	1	1	1	GASKET .. Cover mounting
66	8294874	1	1	1	SEAL .. Stubshaft
67	179841	6	6	6	BOLT .. Hex head 3/8-16 x 1-1/4 - Cover mounting
68	103321	6	6	6	WASHER .. Lock 3/8
69	8289350	1	1	1	TUBE ASSEMBLY .. Drain
70	8098595	As Req.			TUBING .. 1/2 O.D. x .035 wall copper brazed steel - Sold by foot - 20 ft. minimum
*71	120141	1	1	1	NUT .. Tube 1/2 - Replaces 118541
72	8289576	1	1	1	CLIP .. Pipe
73	8027428	1	1	1	CONNECTOR .. 1/2 tube x 1/2 MPT
74	427560	-	4	4	BOLT .. Hex head 7/16-14 x 1-1/2 - Air duct to scroll - Formerly 179841
75	8460239	32	28	28	WASHER .. Plain - .479 I.D. x 3/4 O.D. x 1/8 inch thick - Hardened - Formerly 6101225

TURBOCHARGER APPLICATION

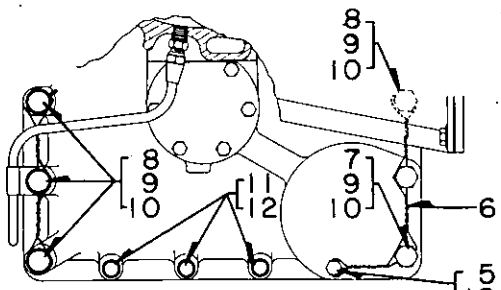
Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	16-567D2 engine
		-	B	-	16-567D3 engine
		-	-	C	16-567D3A engine
76	446681	-	4	4	BOLT .. Hex head 7/16-14 x 2-1/4 - Air duct to scroll - Formerly 179847
77	9418045	16	8	8	BOLT .. Hex head 7/16-14 x 1-7/8 - Air duct to scroll - Formerly 179845
78	9416515	16	12	12	NUT .. Hex lock 7/16-14 - Formerly 442813
79	8260114	-	2	2	WASHER .. Plain 1/2
†80	8464353	-	1	1	KIT .. Aftercooler duct modification - Applicable to engines built prior to November, 1971 - See M.I. 9588

P.L. No. F174

TURBOCHARGER APPLICATION

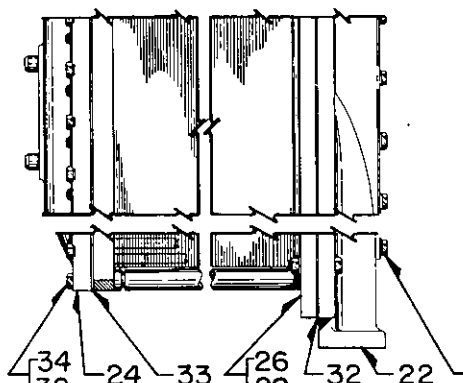


END VIEW

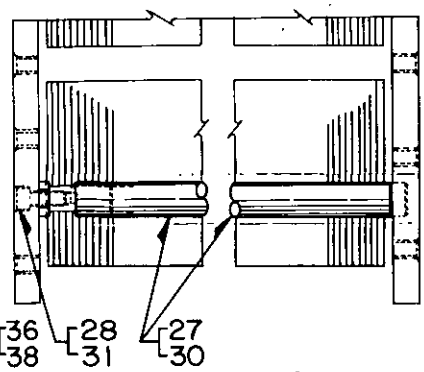


VIEW A-A

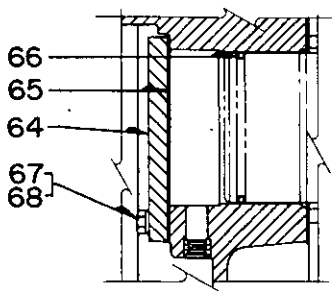
Previous design housing
with covered or raised casting



VIEW B-B



VIEW C-C



SECTION D-D

PLATE D174-1

TURBOCHARGER APPLICATION

Turbocharger, Aftercooler and Air Duct Mounting
All 645 Turbocharged Engines
PLATE E174-2

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C; 12-645E3,E3B engines and 12-645E3C engine with 9547270 turbocharger or 9511706 turbocharger
		-	B	-	-	12-645E3C engine with 9548913 turbocharger
		-	-	C	-	8-645F3B; 12-645F3,F3B; 16-645E3,E3A,E3B,E3C,F3 and 20-645E3,E3B engines
		-	-	-	D	16-645F3B engines
1	----	1	1	1	1	TURBOCHARGER ASSEMBLY .. Engine - Refer to reference chart on Pages 1 and 2
2	8451659	1	1	1	1	GASKET .. Turbocharger mounting - Replaces 8185583
3	181429	22	22	22	22	BOLT .. Hex head 1/2-20 x 1-1/4 - Turbocharger to camshaft housing
4	181431	4	4	4	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Turbocharger to camshaft housing - Replaces 8282323
5	8260114	2	2	2	2	WASHER .. Flat 1/2
6	186342	4	4	4	4	BOLT .. Hex head 1/2-20 x 6 - Turbocharger to camshaft housing
7	6101229	30	30	30	30	WASHER .. Plain 1/2
8	8261288	6	6	6	6	BOLT .. Hex head 3/4-16 x 11-5/16 - Turbocharger to camshaft housing
9	8140912	6	6	6	6	WASHER .. Special - 13/16 I.D. x 1-3/8 O.D. x 1/8 thick - Hardened
10	8354101	6	6	6	6	DAMPER .. Bolt
11	8116738	As Required				WIRE .. Lock - 3/64 diameter
+12	8460738	1	1	1	1	DRIVE ASSEMBLY .. Auxiliary generator - Replaces 8261196 - See Parts List No. 162
13	8261200	1	1	1	1	GASKET .. Drive mounting
14	186339	2	2	2	2	BOLT .. Hex head 1/2-20 x 5-1/4 - Drive mounting
15	6101229	2	2	2	2	WASHER .. Plain 1/2
16	179845	9	9	9	9	BOLT .. Hex head 3/8-16 x 1-3/4 - Drive mounting
17	6101225	9	9	9	9	WASHER .. Plain 3/8

† All current production aftercoolers applying to the engine models listed in columns B and C have 1 inch support dowels and Mating Tapping Pads 8399695. Previous design aftercoolers applied to 16 and 20 cylinder engines had 5/8 inch support dowels and Tapping Pads 8282175. It is recommended that when these previous design aftercoolers are removed for cleaning, the 5/8 inch dowels be replaced with Step Down Support Dowels 8399694 (5/8 to 1 inch) and Tapping Pad 8282175 be replaced with 8399695. Inner Cover 8357354 has been redesigned for 1 inch Dowels 8399786.
Unit Exchange Aftercooler 8398024 includes 8399695 Pad.

18	8288974	2	-	-	-	AFTERCOOLER ASSEMBLY .. Turbocharger - Unit Exchange No. 8296301
†18	8365645	-	2	2	-	AFTERCOOLER ASSEMBLY .. Turbocharger - Unit Exchange No. 8398024 - Replaces 8409891
18	9541961	-	-	-	2	AFTERCOOLER ASSEMBLY .. Turbocharger
19	8288847	2	-	-	-	HEADER .. Aftercooler core - Outer
19	8357355	-	2	2	2	HEADER .. Aftercooler core - Outer
20	8282174	2	-	-	-	COVER ASSEMBLY .. Aftercooler core - Inner
20	8357354	-	2	2	2	COVER ASSEMBLY .. Aftercooler core - Inner
21	8282179	4	-	-	-	PIN .. Dowel - Locating
ϕ22	8284598	2	-	-	-	CORE ASSEMBLY .. Aftercooler (Young) - Replaces 8529762 (Harrison) - See Ref. No. 26
ϕ22	8352305	-	2	2	-	CORE ASSEMBLY .. Aftercooler (Young) - Replaces 8534519 (Harrison) - See Ref. No. 26
ϕ22	8435460	-	-	-	2	CORE ASSEMBLY .. Aftercooler (Young) - Replaces 8534979 (Harrison) - See Ref. No. 26
*23	8296701	8	-	-	-	ROD .. Air baffle
*23	8405520	-	8	8	8	ROD .. Air baffle
*24	8405519	-	8	8	8	PLUG .. Expansion end
*25	9428566	16	8	8	8	SCREW .. Hex socket 5/16-24 x 7/8 - Cap - Incl. nylon insert

P.L. No. F174

TURBOCHARGER APPLICATION

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C; 12-645E3,E3B engines and 12-645E3C engine with 9547270 turbocharger or 9511706 turbocharger
		-	B	-	-	12-645E3C engine with 9548913 turbocharger
		-	-	C	-	8-645F3B; 12-645F3,F3B; 16-645E3,E3A,E3B,E3C,F3 and 20-645E3,E3B engines
		-	-	-	D	16-645F3B engines
	8288974	2	-	-	-	AFTERCOOLER ASSEMBLY .. Turbocharger - Unit exchange No. 8296301
	8365645	-	2	2	-	AFTERCOOLER ASSEMBLY .. Turbocharger - Unit exchange No. 8398024
	9541961	-	-	-	2	AFTERCOOLER ASSEMBLY .. Turbocharger
ϕ26	8529762	2	-	-	-	CORE ASSEMBLY .. Aftercooler (Harrison) - Replaced by 8284598 (Young) - See Ref. No. 22
ϕ26	8534519	-	2	2	-	CORE ASSEMBLY .. Aftercooler (Harrison) - Replaced by 8352305 (Young) - See Ref. No. 22
ϕ26	8534979	-	-	-	2	CORE ASSEMBLY .. Aftercooler (Harrison) - Replaced by 8435460 (Young) - See Ref. No. 22
*27	8449038	8	-	-	-	ROD .. Air baffle
*27	8405600	-	8	8	8	ROD .. Air baffle
*28	8405599	-	8	8	8	PLUG .. Expansion end
*29	9428566	16	8	8	8	SCREW .. Hex socket 5/16-24 x 7/8 - Cap - Incl. nylon insert
30	9570705	2	-	-	-	GASKET .. Outer header to core - Replaces 8357299, 8496124 and 9087078
30	9570636	-	2	2	2	GASKET .. Outer header to core - Replaces 8357357 and 8403485
31	9570611	2	-	-	-	GASKET .. Inner cover to core - Replaces 8261245 and 8499569
31	9571666	-	2	2	2	GASKET .. Inner cover to core - Replaces 8357356 and 9087079
32	454914	104	-	-	-	BOLT .. Hex head 3/8-24 x 1-1/2 - Core mounting - Replaces 9422262
32	427563	-	56	56	56	BOLT .. Hex head 3/8-24 x 1-1/4 - Core mounting
33	193930	12	-	-	-	BOLT .. Hex head 3/8-24 x 3-1/2 - Header to core - Replaces 9422263
33	9423205	-	16	16	16	BOLT .. Hex head 3/8-24 x 3-1/4 - Header to core
34	6101225	116	72	72	72	WASHER .. Plain 3/8
ƒ35	8399786	-	4	4	4	PIN .. Dowel - .9970 x 1-7/16 inches long - One end drilled - 3/8-24 - Formerly 8282179 - See Note on Page 7
ƒ35	8399694	-	-	4	-	PIN .. Dowel - Stepdown - 5/8 to 1 inch - One end drilled - 3/8-24 - Applied only to inner covers with 5/8 straight support dowels - See Note on Page 7
36	186485	-	4	4	4	BOLT .. Hex head 3/8-24 x 1-3/4 - Header to core - For shipping purposes only
37	6101225	-	8	8	8	WASHER .. Plain 3/8
38	103026	-	8	8	8	NUT .. Hex 3/8-24
39	9570596	2	-	-	-	GASKET .. Aftercooler mounting - Replaces 8357298
39	9570602	-	2	2	2	GASKET .. Aftercooler mounting - Replaces 8357358 and 8403484
40	181364	32	-	-	-	BOLT .. Hex head 3/8-24 x 1 - Aftercooler mounting
40	186485	-	52	52	52	BOLT .. Hex head 3/8-24 x 1-3/4 - Aftercooler mounting
41	6101225	32	52	52	52	WASHER .. Plain 3/8
42	8282175	2	-	-	-	PAD .. Tapping
ƒ43	8399695	-	2	2	2	PAD .. Tapping - 1 inch dowel holes - Formerly 8282175 - See Note on Page 7
44	9571563	2	-	-	-	GASKET .. Pad to air duct - Replaces 8282176
45	8282177	4	-	-	-	BOLT .. Drilled hex head 5/8-18 x 1-3/8 - Pad mounting
45	8400470	-	4	4	4	BOLT .. Drilled hex head 5/8-18 x 1-5/8 - Pad mounting - Formerly 8282177
46	8282178	4	4	4	4	WASHER .. Plain - .656 I.D. x 1.3125 O.D. x 3/16 inches thick - Hardened

TURBOCHARGER APPLICATION

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	8-645E3B,E3C; 12-645E3,E3B engines and 12-645E3C engine with 9547270 turbocharger or 9511706 turbocharger
		-	B	-	-	12-645E3C engine with 9548913 turbocharger
		-	-	C	-	8-645F3B; 12-645F3,F3B; 16-645E3,E3A,E3B,E3C,F3 and 20-645E3,E3B engines
		-	-	-	D	16-645F3B engines
47	8269985	1	-	-	-	DUCT ASSEMBLY .. Air - Heat exchanger - Right bank - Unit Exchange No. 8296305
47	8460309	-	1	1	-	DUCT ASSEMBLY .. Air - Heat exchanger - Right bank - Replaces 8356695 - Applicable to all models Column C except 12,16-645F3 and 8,12-645F3B engines
47	9531625	-	-	1	1	DUCT ASSEMBLY .. Air - Heat exchanger - Right bank - Column C - Applicable to 12,16-645F3 and 8,12-645F3B. engines
48	8460240	6	6	6	6	NUT .. Spline 7/16-14
49	9530105	1	-	-	-	DUCT ASSEMBLY .. Air - Heat exchanger - Left bank - Replaces 8269986
49	9327567	-	1	1	-	DUCT ASSEMBLY .. Air - Heat exchanger - Left bank - Applicable to all models Column C except 12,16-645F3 and 8,12-645F3B engines and 16-645E3,E3A engines applied to F40PH, F40PH-2 and F40C locomotives - Replaces 8460310
49	8460334	-	-	1	-	DUCT ASSEMBLY .. Air - Heat exchanger - Left bank - Applicable to 16-645E3,E3A engines on F40PH, F40PH-2 and F40C locomotives - Formerly applied to 16-645E3B engines on F40PH and F40PH-2 locomotives
49	9531624	-	-	1	1	DUCT ASSEMBLY .. Air - Heat exchanger - Left bank - Applicable to 12,16-645F3 and 8,12-645F3B engines in Column C and 16-645F3B engine in Column D
*50	8460240	7	7	7	7	NUT .. Spline 7/16-14
51	8460205	2	2	2	2	GASKET .. Air duct to compressor scroll
52	9571669	2	2	-	-	GASKET .. Air duct to air box - Replaces 8261266 and 8416803
52	9571670	-	-	2	2	GASKET .. Air duct to air box - Replaces 8416804
53	9418045	8	8	13	13	BOLT .. Hex head 7/16-14 x 1-7/8 - Air duct to scroll
54	193221	-	-	3	3	BOLT .. Hex head 7/16-14 x 1-1/4 - Air duct to scroll
*55	427560	4	4	-	-	BOLT .. Hex head 7/16-14 x 1-1/2 - Air duct to scroll
*56	446681	4	4	-	-	BOLT .. Hex head 7/16-14 x 2-1/4 - Air duct to scroll
57	8460239	28	28	16	16	WASHER .. Plain - .479 I.D. x 3/4 O.D. x 1/8 in. thick - Hardened
58	9416515	12	12	-	-	NUT .. Hex lock 7/16-14
59	181429	23	23	21	21	BOLT .. Hex head 1/2-20 x 1-1/4 - Air duct to air box
60	6101229	23	23	21	21	WASHER .. Plain 1/2
61	8261198	1	1	1	1	COVER .. Stubshaft
62	8261282	1	1	1	1	GASKET .. Cover mounting
63	8294874	1	1	1	1	SEAL .. Stubshaft
64	179841	6	6	6	6	BOLT .. Hex head 3/8-16 x 1-1/4 - Cover mounting
65	6101225	6	6	6	6	WASHER .. Plain 3/8
66	8289350	1	1	1	1	TUBE ASSEMBLY .. Drain
67	8098595	As Required				TUBING .. 1/2 O.D. x .035 wall - Copper brazed steel - Sold by the foot - 20 ft. minimum
68	120141	1	1	1	1	NUT .. Tube 1/2 inch
69	8027428	1	1	1	1	CONNECTOR .. 1/2 MPT x 1/2 tube
70	8289576	1	1	1	1	CLIP .. Tube support
*71	8173319	-	1	1	-	PLUG .. Pipe - 1 MPT recessed head - Applied to 9327567 and 9530105 duct assemblies
*72	8464353	1	-	-	-	KIT .. Aftercooler duct modification - Applicable to engines build prior to November, 1971 - See M.I. 9588
*73	8464145	-	-	1	-	KIT .. Aftercooler duct modification - Applicable to engines built prior to November, 1971 - See M.I. 9588

P.L. No. F174

TURBOCHARGER APPLICATION

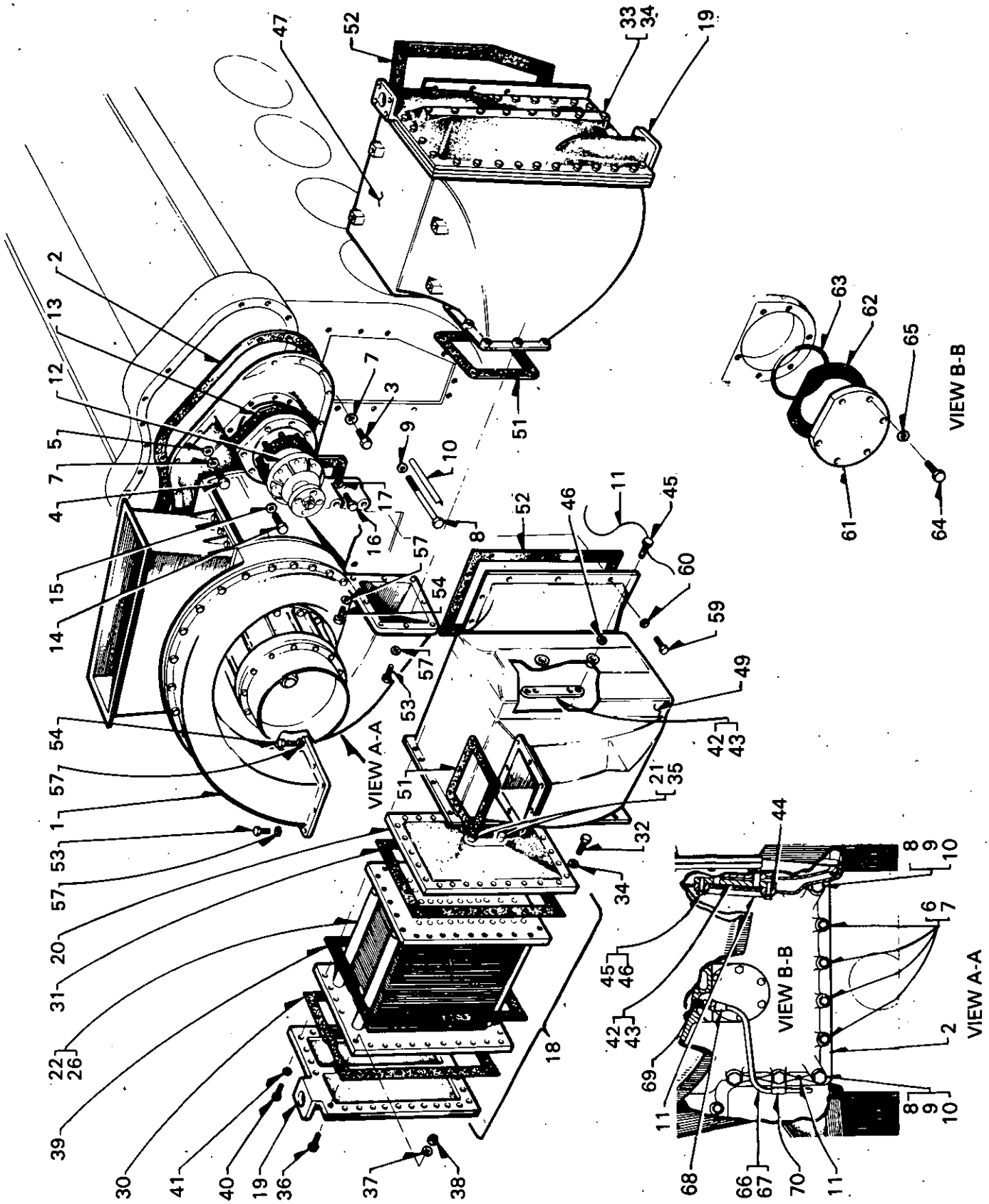
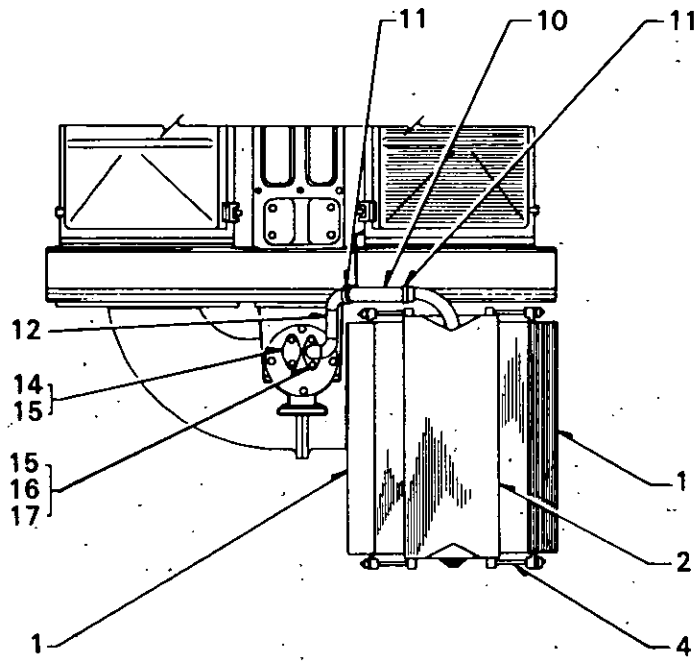


PLATE E174-2

Parts List No. E178

OIL BATH ENGINE AIR FILTERS

Oil Bath Panel Type Filter Assemblies
8-645E - SW1000, SW1001 and G8, G18, G18U, G18W and GA18 (Export) Locomotives
16-645E - FP7, FP7A and SD9



Top View

PLATE C178-1

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	8-645E - SW1000, SW1001 and G8, G18, G18U, G18W and GA18 (Export) locomotives
		-	B	-	8-645E - SW1000 locomotive
		-	-	C	16-645E - FP7, FP7A and SD9 locomotives

Note: For conversion to Paper Engine Air Filters on SW1000 and SW1001 locomotives, see P.L. No. E181, Page 39.

1	8357717	2	-	4	FILTER ASSEMBLY .. Oil bath - 29-1/2 x 15-1/2 inches - Farr
1	8369433	-	2	-	FILTER ASSEMBLY .. Oil bath - 29-1/2 x 15-1/2 inches - Air Maze
2	8392643	1	1	1	FRAME ASSEMBLY .. Filter - Formerly 8364795 - Right bank
*3	8392644	-	-	1	FRAME ASSEMBLY .. Filter - Left bank
†4	8303844	8	-	16	FASTENER .. Filter - Applied to 8357717 filter only
†4	8310300	-	8	-	FASTENER .. Filter - Applied to 8369433 filter only
†*5	8380069	4	4	8	GASKET .. Filter mounting - 1/8 x 1/2 x 28-7/8 inches long
†*6	8380070	4	4	8	GASKET .. Filter mounting - 1/8 x 5/8 x 14-7/8 inches long
*7	8024287	1	1	2	GASKET .. Frame to blower
*8	179885	10	10	20	BOLT .. Hex head 1/2-13 x 1-1/2 - Frame to blower
*9	103323	10	10	-	WASHER .. Lock 1/2
*9	6101229	-	-	20	WASHER .. Aircraft 1/2
10	8291949	1	1	2	HOSE .. Oil separator to filter
11	8048698	2	2	4	CLAMP .. Hose
12	8371935	1	1	1	PIPE ASSEMBLY .. Flanged - Oil separator to hose - Right bank
*13	8371936	-	-	1	PIPE ASSEMBLY .. Flanged - Oil separator to hose - Left bank
14	8048967	1	1	-	FLANGE .. Blind
15	8084407	2	2	2	GASKET .. Mounting - Blind flange and pipe assembly
16	181433	4	4	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Blind flange and pipe assembly
17	6101229	4	4	4	WASHER .. Plain 1/2

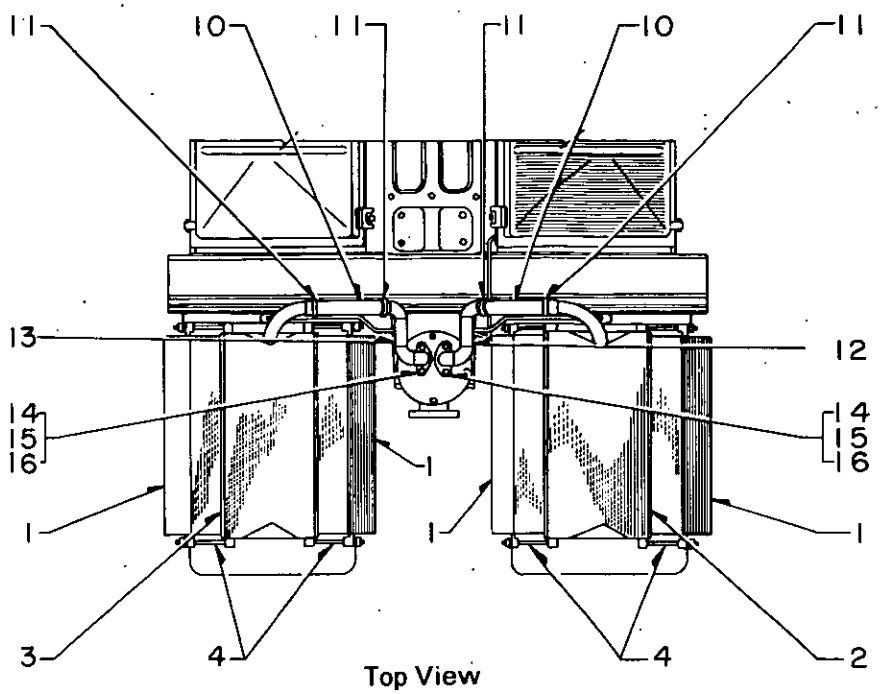
† Components listed are also applicable to 8364795 frame which was previously applied.

8375117T 9091877D
8397204M 17624 9508093D

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Oil Bath Panel Type Filter Assemblies
12-645E - SW1500, SW1504, MP15, MP15DC and G12, G22, G22U, G22W, G22CU, G22CW, GL22C (Export) Locomotives



Top View

PLATE B178-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645E - SW1500, SW1504, MP15, MP15DC and G12, G22, G22U, G22W, G22CU, G22CW, GL22C (Export) locomotives
		-	B	12-645E - SW1500 locomotives

Note: For conversion to Paper Engine Air Filters on SW1500 and MP15DC locomotives, see P.L. No. E181, Page 39.

1	8356190	4	-	FILTER ASSEMBLY .. Oil bath - 24-1/2 x 15-1/2 inches - Farr
1	8277202	-	4	FILTER ASSEMBLY .. Oil bath - 24-1/2 x 15-1/2 inches - Air Maze
2	8392645	1	1	FRAME ASSEMBLY .. Filter - Right bank - Formerly 8381333 and 8345169
3	8392646	1	1	FRAME ASSEMBLY .. Filter - Left bank - Formerly 8381334 and 8345168
†4	8303844	16	-	FASTENER .. Filter
4	8310300	-	16	FASTENER .. Filter
†*5	8380070	8	8	GASKET .. Filter mounting - 1/8 x 5/8 x 14-7/8 inches long
†*6	8351427	8	8	GASKET .. Filter mounting - 1/8 x 5/8 x 27-3/8 inches long
*7	8024287	2	2	GASKET .. Frame to blower
*8	179885	20	20	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter to blower
*9	6101229	20	20	WASHER .. Flat 1/2 - Formerly 103323
10	8291949	2	2	HOSE .. Oil separator to filter
11	8048698	4	4	CLAMP .. Hose
12	8371935	1	1	PIPE ASSEMBLY .. Flanged - Oil separator to hose - Right bank
13	8371936	1	1	PIPE ASSEMBLY .. Flanged - Oil separator to hose - Left bank
14	8084407	2	2	GASKET .. Mounting - Flanged pipe
15	181433	4	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flanged pipe mounting
16	6101229	4	4	WASHER .. Plain 1/2

† Components listed are also applicable to 8381333, 8381334, 8345168 and 8345169 frames which were previously applied.

8367383P 8454331L
8383612M 8461852M 16796
8493254J 9557076

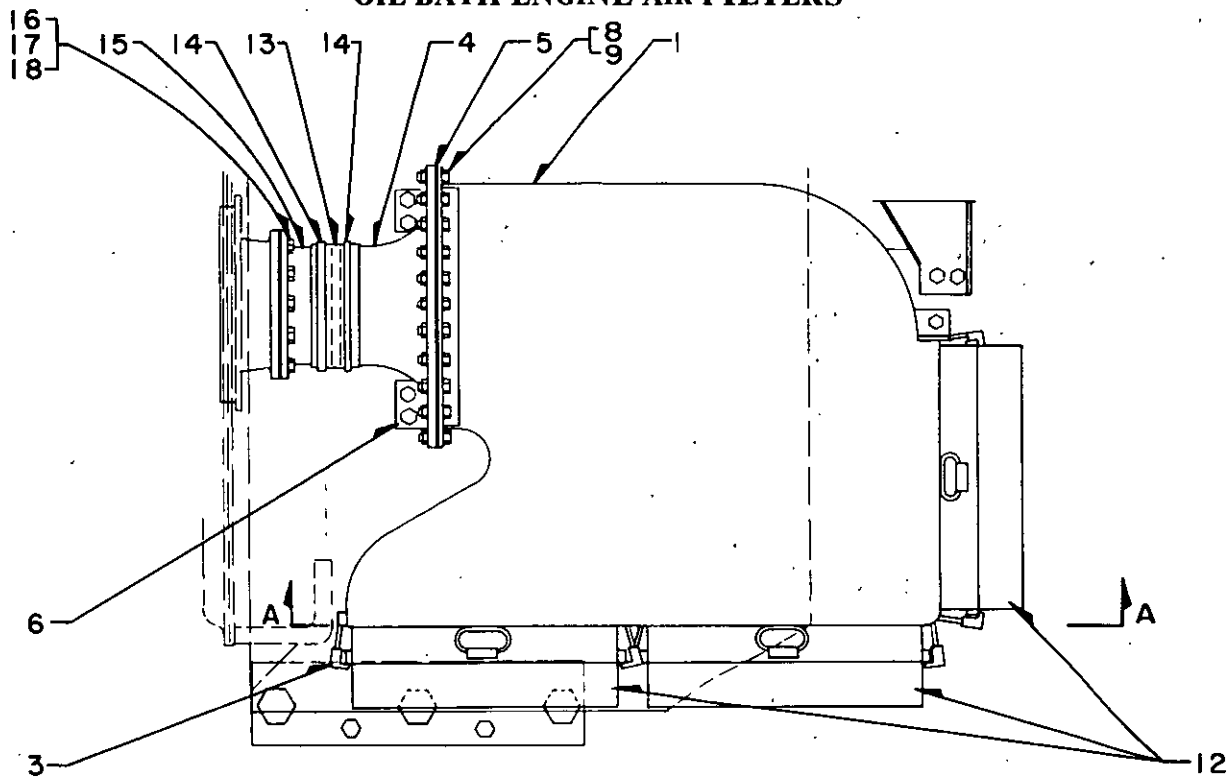
OIL BATH ENGINE AIR FILTERS

Air Intake Silencer Assembly
16-567D3 - SD24 Locomotive
PLATE B178-3

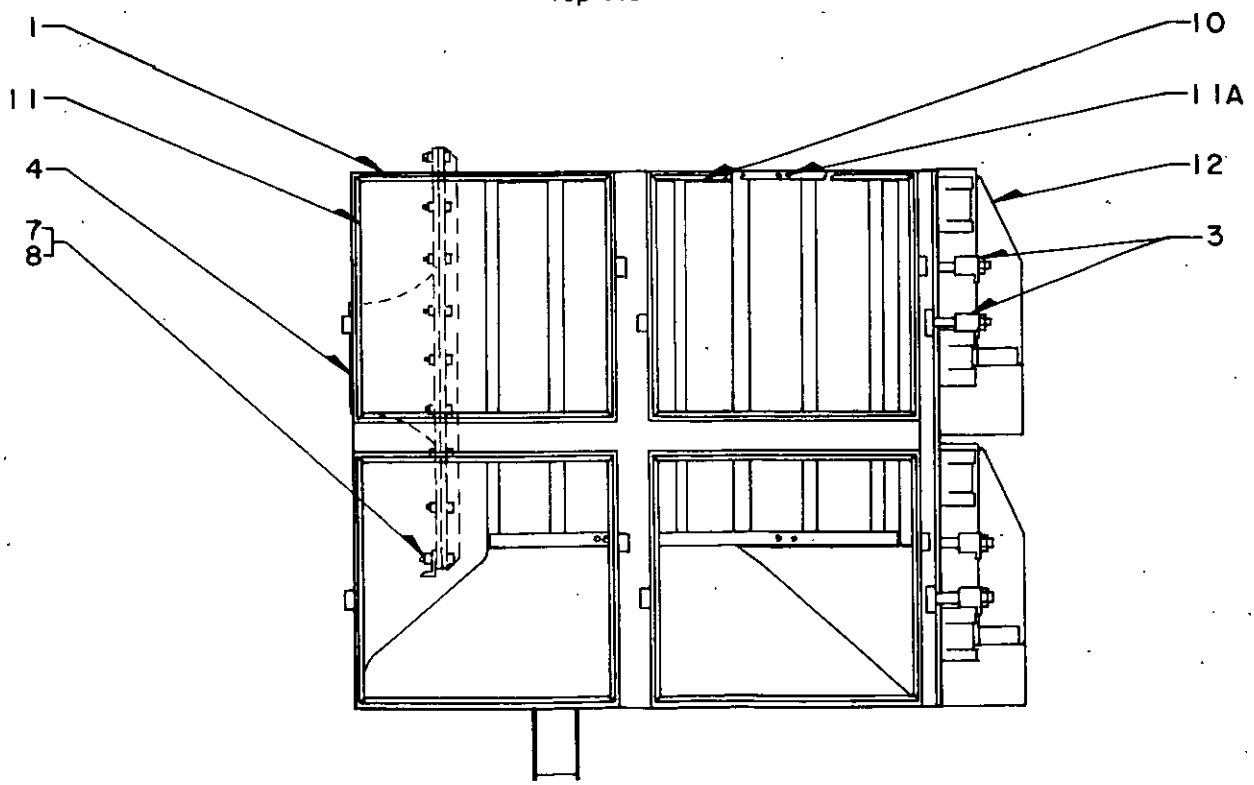
Ref. No.	Part Number	Qty. Req.	Description
1	8264837	1	SILENCER ASSEMBLY .. Air intake - Turbocharger
*2	8264198	1	CLIP .. Filter holding
3	8281874	8	FASTENER .. Filter holding - Formerly 8214964
3	8281872	4	FASTENER .. Filter holding
4	8264028	1	DUCT ASSEMBLY .. Air
5	8264026	1	GASKET .. Air duct to air intake box
6	8264199	2	ANGLE .. Mounting
7	179843	4	BOLT .. Hex head 3/8-16 x 1-1/2 - Angle mounting
8	8032743	28	NUT .. Hex lock 3/8-16
9	179841	24	BOLT .. Hex head 3/8-16 x 1-1/4 - Air duct to air box
10	8264406	2	ANGLE .. Mounting
11	8273655	A.R.	SEAL .. Filter to intake box
11A	8028289	8	BOLT .. Hex head 5/16-18 x 3/4 - Angle mounting
12	8356193	-	FILTER .. Oil bath - Panel type - 6 required per engine - Replaces 8306904 - Farr
12	8274582	-	FILTER .. Oil bath - Panel type - 6 required per engine - Replaces 8281342 - Air Maze
13	8264513	1	AIR DUCT .. Turbocharger inlet
14	8375876	2	CLAMP .. Air duct - Formerly 8264450
+15	8287326	1	CONE .. Air inlet
+16	186619	11	BOLT .. Hex head 3/8-16 x 1-1/8 - Flange
+17	103321	11	WASHER .. Lock 3/8
+18	6101225	11	WASHER .. Plain 3/8

P.L. No. E178

OIL BATH ENGINE AIR FILTERS



Top View



VIEW A-A
Side View
Turbocharger Air Intake Filter

PLATE B178-3

OIL BATH ENGINE AIR FILTERS

Oil Bath Filter Kit Assembly
16-567D1 - GP18 Locomotive

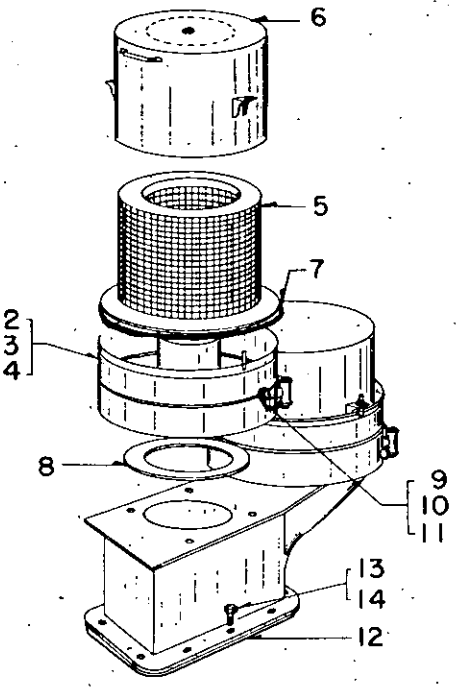


PLATE A178-4

Ref. No.	Part Number	Qty. Req.	Description
*1	8232226	1	KIT ASSEMBLY .. Oil bath filter - Replaces 8232404
2	8232224	1	FILTER ASSEMBLY .. Oil bath air - Consists of two oil bath filters and one air duct assembly - Left bank blower
3	8232225	1	FILTER ASSEMBLY .. Oil bath air - Consists of two oil bath filters and one air duct assembly - Right bank blower
4	8328461	4	FILTER ASSEMBLY .. Oil bath air
5	8240657	4	ELEMENT .. Oil bath
6	8259974	4	GASKET .. Top cover
7	8328596	4	GASKET .. Bowl - Support plate diameter for element 8240657 Ref. No. 5 was changed from 18.75 O.D. to 18.62 O.D. to accommodate new gasket 8328596. For elements with 18.75 O.D. use 8240660 gasket
8	8240658	4	GASKET .. Manifold
9	8402111	4	GLASS .. Indicator plate
*10	8399953	4	GASKET .. Indicator plate glass
11	8255412	4	CAP .. Glass holding
12	8255413	4	NIPPLE .. Filter - Welds to oil bath filter
13	8024287	2	GASKET .. Air duct to blower
14	179885	16	BOLT .. Hex head 1/2-13 x 1-3/4 - Air duct to blower
15	103323	16	WASHER .. Lock 1/2
*16	8084407	2	GASKET .. Oil separator outlet flange
*17	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4 - Flange mounting
*18	6101229	4	WASHER .. Lock 1/2
*19	8305507	1	GASKET KIT .. Oil bath filter - For elements with 18.75 O.D. only - Includes Ref. Nos. 6 thru 10

8232226A, 9790, 9954

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Air Intake Silencer Assembly
16-567D2 - GP20 Locomotive

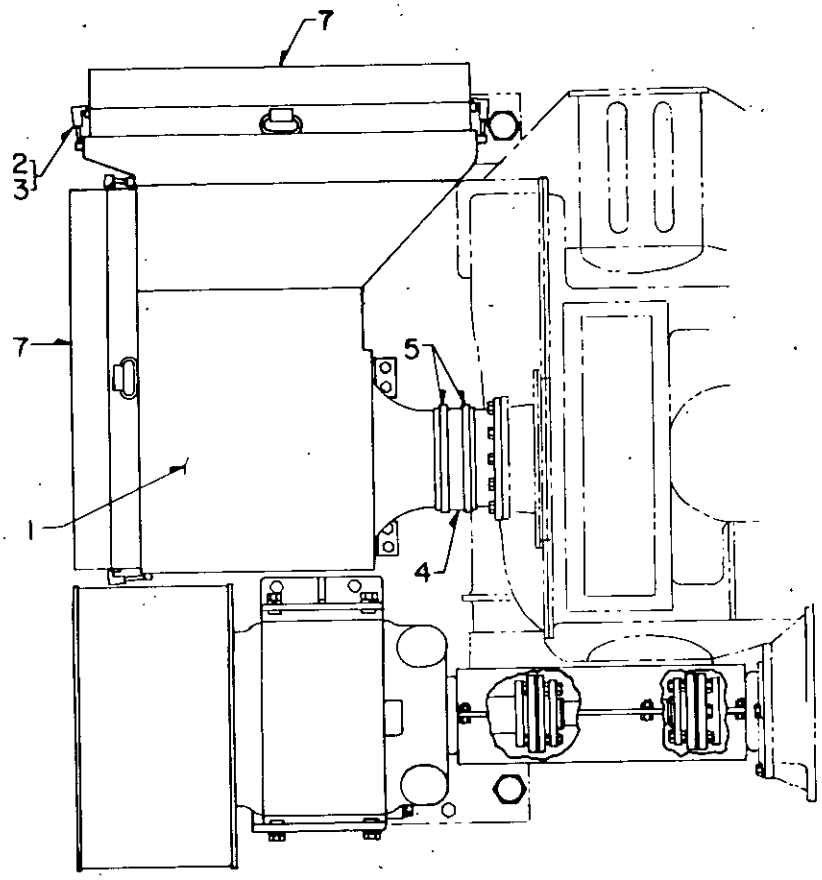


PLATE A178-5

Ref. No.	Part Number	Qty. Req.	Description
1	8274690	1	SILENCER ASSEMBLY .. Air intake
2	8281874	10	FASTENER .. Filter holding - Formerly 8214964
3	8281873	2	FASTENER .. Filter holding - Formerly 8274769
4	8264513	1	DUCT ASSEMBLY .. Air
5	8375876	2	CLAMP .. Air duct - Formerly 8264450
*6	8281343	-	FILTER .. Oil bath - Panel type - 19-1/2 x 34 inches - 3 required per engine - Air Maze
7	8356191	-	FILTER .. Oil bath - Panel type - 19-1/2 x 34 inches - 3 required per engine - Farr - Replaces 8306906

8279105E, 9770

OIL BATH ENGINE AIR FILTERS

Oil Bath Panel Type Filter Assembly
16-567D1 - GP18 and SD18 Locomotives

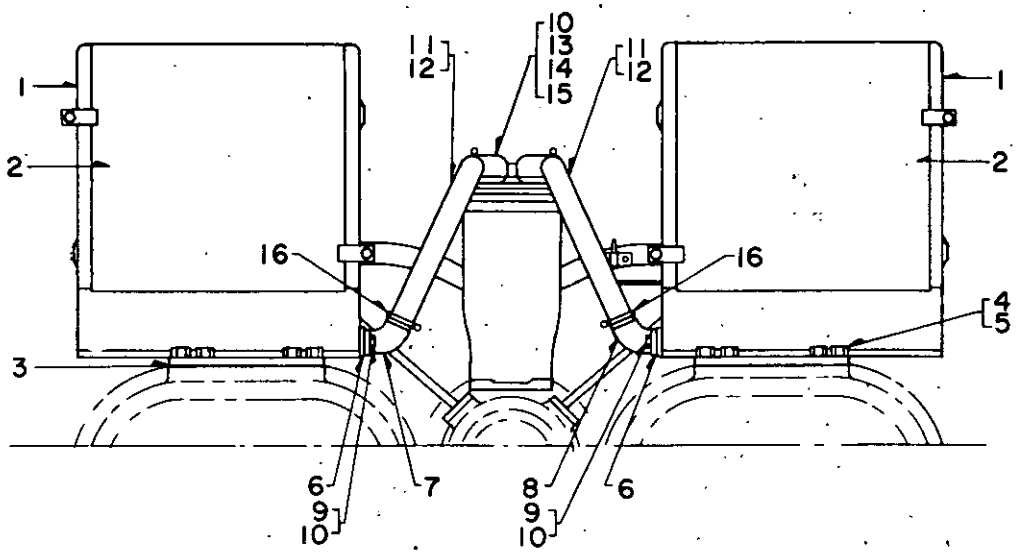


PLATE A178-6

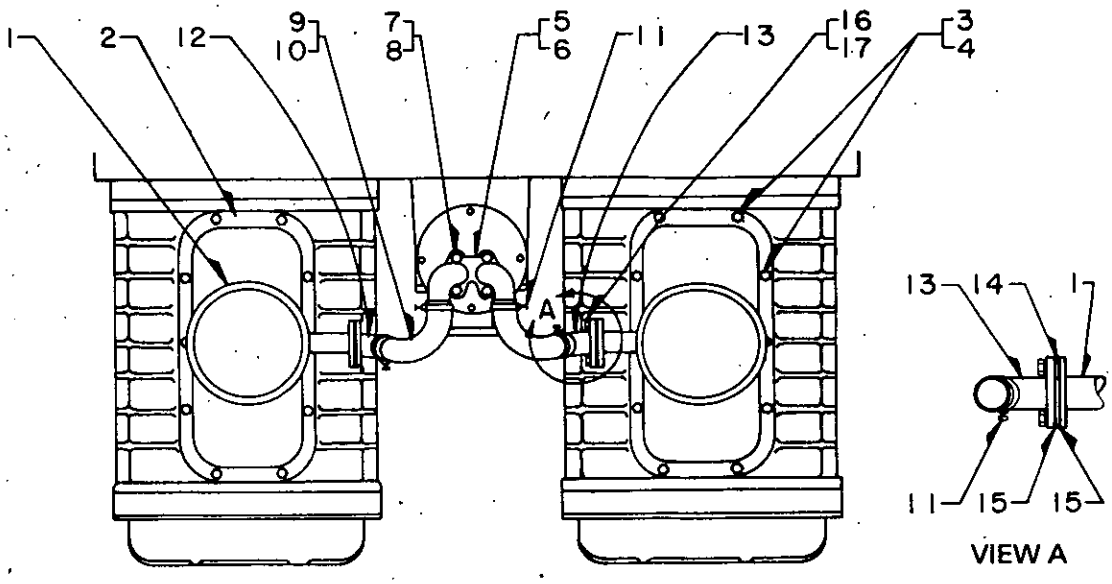
Ref. No.	Part Number	Qty. Req.	Description
1	8205971	2	FRAME .. Air intake filter
2	- - - -	4	FILTER .. Air - Oil bath panel - 19-1/2 x 19-1/2 inches 8356193 - Farr - Replaces 8306904 8274582 - Air Maze
3	8024287	2	GASKET .. Filter frame to blower
4	179885	18	BOLT .. Hex head 1/2-13 x 1-1/2 - Frame to blower
5	103323	18	WASHER .. Lock 1/2
6	8084407	2	GASKET .. Hose to frame
7	8164482	1	ELBOW .. Flanged - Left side
8	8164483	1	ELBOW .. Flanged - Right side
9	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4 - Elbow to frame
10	6101229	8	WASHER .. Plain 1/2
11	8131113	2	HOSE .. Oil separator
12	8131112	2	SPRING .. Hose
13	181433	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flange to oil separator
14	8155201	1	FLANGE ASSEMBLY .. Oil separator
15	8155202	1	GASKET .. Flange
16	8374760	4	CLAMP .. Hose - Replaces 8132042

8278119F, 8283199G, 9965

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Air Intake Adapter Assembly
16-567D1 - GP28 and SD28 Locomotives



Top View

PLATE C178-7

Ref. No.	Part Number	Qty. Req.		Description
		A	-	16-567D1 - GP28 locomotive
		-	B	16-567D1 - SD28 locomotive
1	8341631	2	2	ADAPTER ASSEMBLY .. Air intake
2	8024287	2	2	GASKET .. Air intake adapter to blower
3	179885	18	18	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter to blower
4	6101229	18	18	WASHER .. Plain 1/2
5	8155201	1	1	FLANGE ASSEMBLY .. Oil separator
6	8155202	1	1	GASKET .. Flange to oil separator
7	181433	4	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flange to oil separator
8	6101229	4	4	WASHER .. Plain 1/2
9	8131113	2	2	HOSE .. Oil separator
10	8131112	2	2	SPRING .. Hose
11	8374760	4	4	CLAMP .. Hose - Replaces 8132042
12	8164482	1	1	ELBOW .. Flanged - Left side
13	8164483	1	1	ELBOW .. Flanged - Right side
14	8347779	2	-	ORIFICE
15	8084407	4	2	GASKET .. Adapter to elbow
16	181429	4	4	BOLT .. Hex head 1/2-20 x 1-1/4 - Adapter to elbow
17	6101229	4	4	WASHER .. Plain 1/2
+*18	8340761	2	2	DUCT .. Flexible - Adapter to air intake filter
+*19	8341882	4	4	CLAMP .. Flexible duct - 10-1/8 in. minimum diameter - 11-1/8 in. maximum diameter

8340852A, 8345173

OIL BATH ENGINE AIR FILTERS

Oil Bath Air Intake Filter and Adapter
16-645E - GP38, GP38AC, GP38-2, SD38 and SD38M (Export) Locomotives
PLATE C178-8

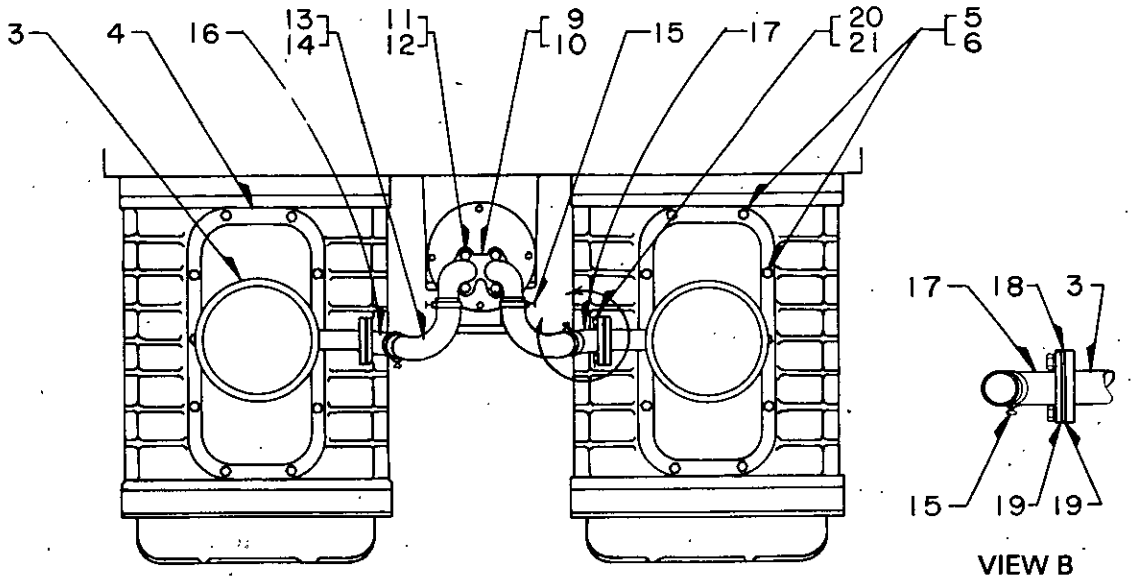
Ref. No.	Part Number	Qty. Req.	Description
†1	8366065	1	FILTER ASSEMBLY .. Air - Oil bath - No longer furnished - See Note
2	179837	20	BOLT .. Hex head 3/8-16 x 3/4 - Filter mounting
2A	103321	20	WASHER .. Lock 3/8
3	8366064	2	ADAPTER ASSEMBLY .. Air intake
4	8024287	2	GASKET .. Air intake adapter to blower
5	179885	18	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter to blower
6	6101229	18	WASHER .. Plain 1/2
7	8366121	2	DUCT ASSEMBLY .. Flexible - Adapter to air intake filter
8	8373018	4	CLAMP .. Flexible duct - Replaces 8341882
9	8155201	1	FLANGE ASSEMBLY .. Oil separator
10	8155202	1	GASKET .. Flange to oil separator
11	181433	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flange to oil separator
12	6101229	4	WASHER .. Plain 1/2
13	8131113	2	HOSE .. Oil separator - 18 inches long - Not furnished - For replacement use 8040167 hose - 36 inches long - Cut to length
14	8131112	2	SPRING .. Hose
15	8374760	4	CLAMP .. Hose - Replaces 8132042
16	8164482	1	ELBOW .. Flanged - Left side
17	8164483	1	ELBOW .. Flanged - Right side
18	8407198	2	PLATE .. Orifice - Formerly 8347779
19	8084407	4	GASKET .. Adapter to elbow
20	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4 - Adapter to elbow
21	6101229	4	WASHER .. Plain 1/2
*22	8358203	1	VALVE ASSEMBLY .. 1 FPT - Filter drain
*23	8060954	2	NIPPLE .. Close pipe - 1 MPT
*24	119096	1	ELBOW .. Pipe - 1 MPT x 45°
*25	103870	1	PLUG .. Pipe - 1 inch

† *Filter 8366065 is no longer available as an assembly from Electro-Motive. Service components are still available and are shown on Page 17 of this parts list. If replacement of the assembly is required, it is recommended to convert to fiberglass engine air filters by using kit 8496581. See Parts List No. E181, Page 42 for details.*

8366764F, 16167, 16196, 20257, 24915, 26261

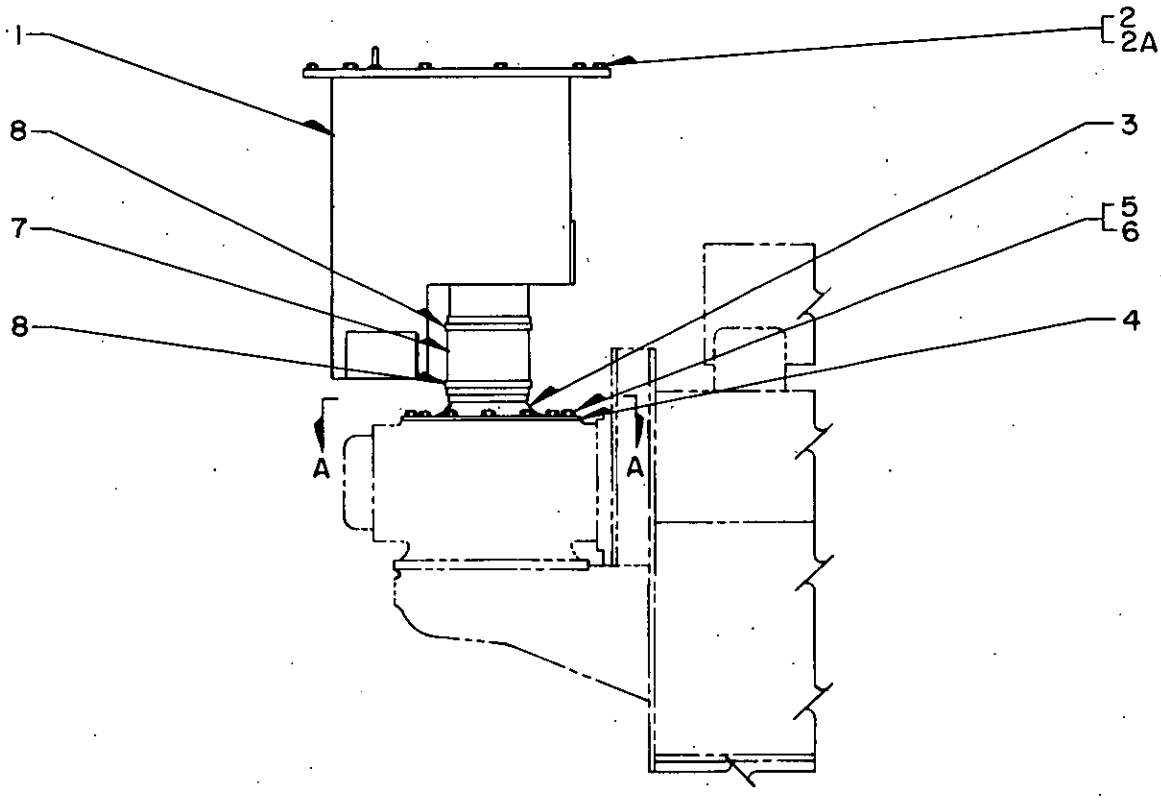
P.L. No. E178

OIL BATH ENGINE AIR FILTERS



VIEW B

VIEW A-A
Top View



Side View

PLATE C178-8

OIL BATH ENGINE AIR FILTERS

Roof Mounted Oil Bath Panel Type Filter Assemblies
16-645E - G26C, G26CU, G26CW (Export) Locomotives

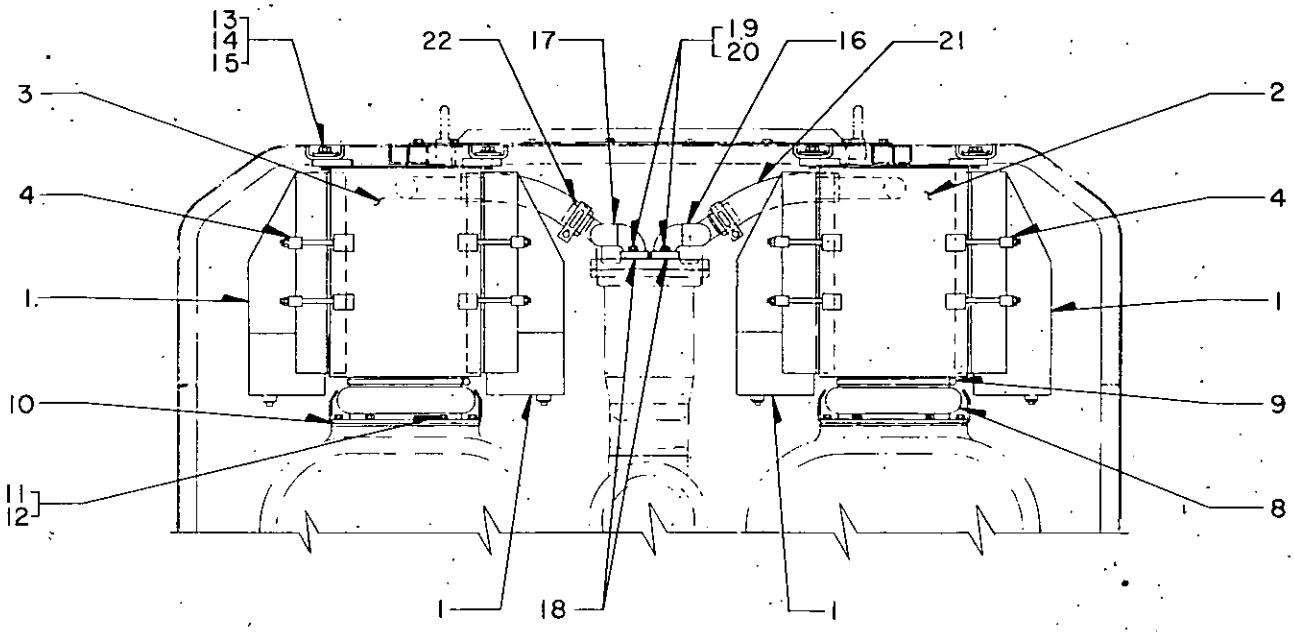


PLATE B178-9

Ref. No.	Part Number	Qty. Req.		Description
1	8357717	4		FILTER ASSEMBLY .. Oil bath - 29-1/2 x 15-1/2 inches - Farr
2	8420269	1	-	FRAME ASSEMBLY .. Filter - Right bank
3	8420270	-	1	FRAME ASSEMBLY .. Filter - Left bank
4	8303844	8	8	FASTENER .. Filter
*5	8380069	4	4	GASKET .. Filter mounting - Approximately 28-7/8 inches long
*6	8380070	4	4	GASKET... Filter mounting - Approximately 14-7/8 inches long
*7	8186807	A.R.		CEMENT .. Gasket mounting - 1 quart can
8	9335644	1	1	BOOT .. Rubber
9	9565467	2	2	CLAMP .. Rubber boot
10		1	1	PLATE .. Pressure
11	179885	20		BOLT .. Hex head 1/2-13 x 1-1/2 - Pressure plate and boot to blower
12	103325	20		WASHER .. Lock 1/2
13	179883	16		BOLT .. Hex head 1/2-13 x 1-1/4 - Frame to hood
14	8260114	16		WASHER .. Plain 17/32 I.D. x 1-1/6 O.D. - Hardened
15	8420094	4		PLATE .. Adjustment - 3/16 x 2 x 28 inches long
16	8420239	1		PIPE ASSEMBLY .. Flanged - Oil separator hose - Right bank
17	8420240	1		PIPE ASSEMBLY .. Flanged - Oil separator hose - Left bank
18	8084407	2		GASKET .. Mounting - Flanged pipe
19	118433	4		BOLT .. Hex head 1/2-20 x 1-3/4 - Pipe mounting
20	6101229	4		WASHER .. Plain 1/2
21	8291949	2		HOSE .. Oil separator to filter frame
22	8048698	4		CLAMP .. Hose - Formerly 8046898

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P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Roof Mounted Oil Bath Panel Type Filter Assemblies
12-645E - SW1504 Locomotives

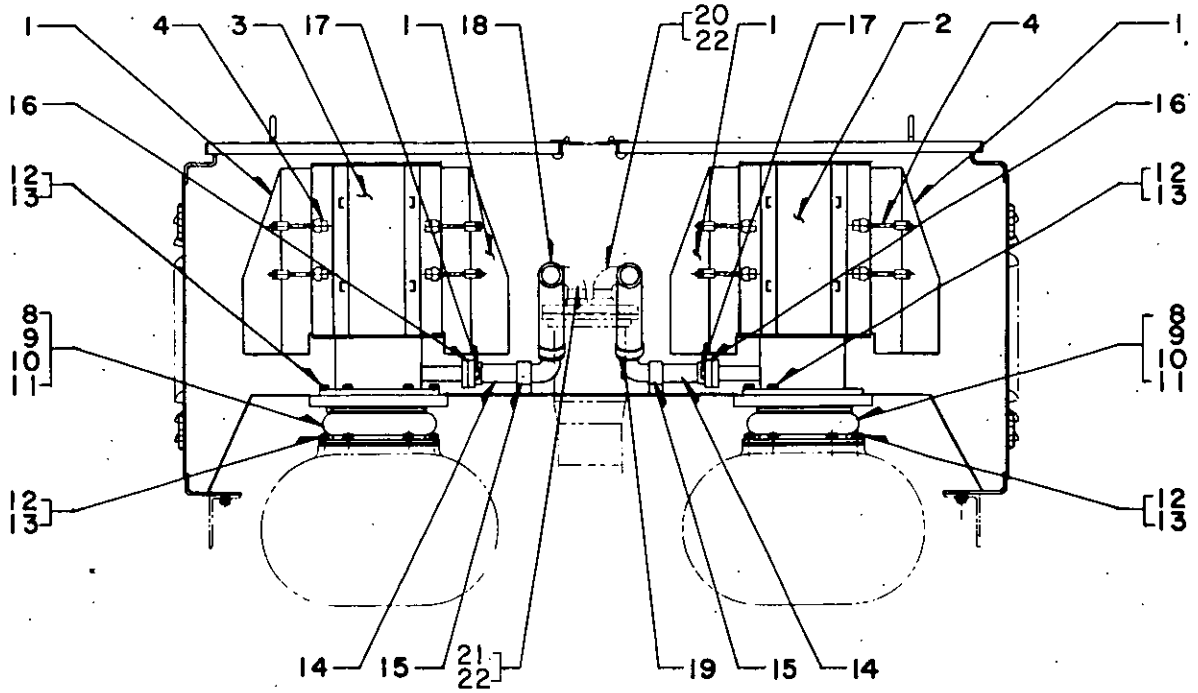


PLATE B178-10

Ref. No.	Part Number	Qty. Req.		Description
1	8356190	4		FILTER ASSEMBLY .. Oil bath - 24-1/2 x 15-1/2 inches - Farr
2	8485020	1	-	FRAME ASSEMBLY .. Filter - Right bank
3	8485021	-	1	FRAME ASSEMBLY .. Filter - Left bank
4	8303844	8	8	FASTENER .. Filter
*5	8351427	4	4	GASKET .. Filter mounting - Approximately 23-7/8 inches long
*6	8380070	4	4	GASKET .. Filter mounting - Approximately 14-7/8 inches long
*7	8186807	A.R.		CEMENT .. Gasket - 1 quart can
8	8485022	2		ADAPTER ASSEMBLY .. Air inlet
9	9335644	2		BOOT .. Rubber
10	9565467	4		CLAMP .. Rubber boot
11		2		PLATE .. Adapter mounting
12	179885	38		BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter plate and blower
13	103323	38		WASHER .. Lock 1/2
14	8483525	2		PIPE ASSEMBLY .. Flanged - Oil separator hose
15	8108219	2		CLAMP .. Pipe
16	8426745	2		GASKET .. Flanged pipe
17	271556	4		BOLT .. Hex head 5/8-11 x 1-1/4 - Flanged pipe
18	8483523	2		HOSE .. Oil separator pipe
19	8048698	4		CLAMP .. Hose - Formerly 8046898
20	8483518	1		PIPE ASSEMBLY .. Flanged - Hose to oil separator - Right bank
21	8483518	1		PIPE ASSEMBLY .. Flanged - Hose to oil separator - Left bank
22	8084407	2		GASKET .. Flanged pipe to separator
*23	181433	4		BOLT .. Hex head 1/2-20 x 1-3/4 - Flanged pipe
*24	6101229	4		WASHER .. Plain 1/2
*25	8494707	2		SPRING .. Coil - Used with Ref. No. 18, 8483523 hose

8485123B

OIL BATH ENGINE AIR FILTERS

Oil Bath Panel Type Filter Assemblies
12,16-645E3,E3B Engines - JT22CW, GT26CW (Export) Locomotives

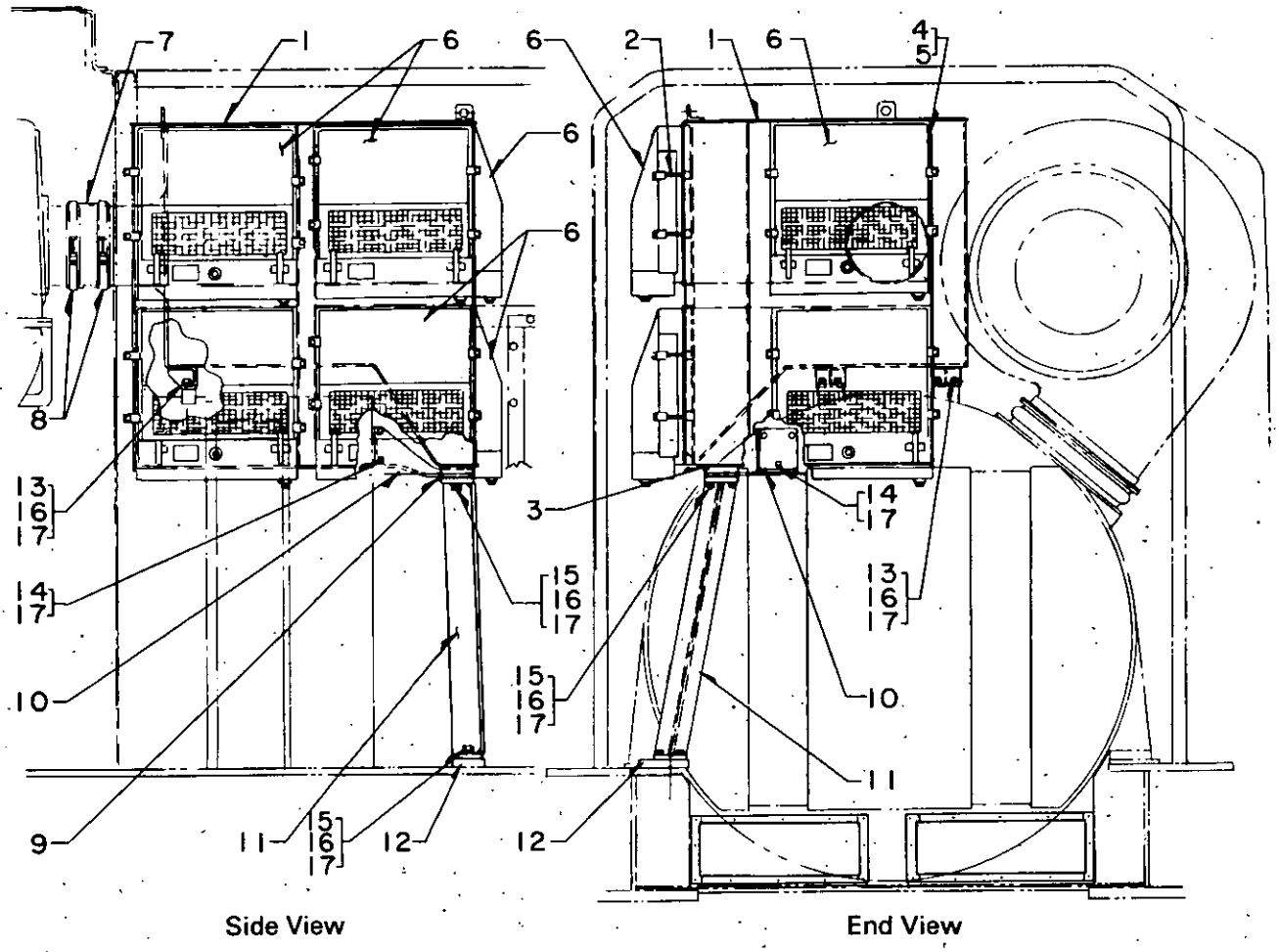


PLATE A178-11

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645E3,E3B - JT22CW (Export) locomotives
		-	B	16-645E3,E3B - GT26CW (Export) locomotives
1	9312171	1	-	HOUSING ASSEMBLY .. Filter
1	9093059	-	1	HOUSING ASSEMBLY .. Filter
2	8303844	24	24	FASTENER .. "T" bolt - 5/16 x 4-3/8 inches long
3	8454856	1	1	PAD .. Tapping
4	8273655	A.R.		SEAL .. Rubber - Sold per foot - Approximately 40 feet required
5	8255268	A.R.		ADHESIVE .. Gasket - 1 quart can
6	8356193	6	6	FILTER .. Oil bath - 19-5/8 x 21-5/16 inches
7	8303837	1	1	DUCT .. Air
8	8375876	2	2	CLAMP .. Air duct
9	8458961	A.R.		SHIM .. Alignment - 4 in. x 4 in. x 16 ga.
10	8459071	1	-	BRACKET .. Air filter to alternator
10	9092655	-	1	BRACKET .. Air filter to alternator
11	9313647	1	-	BRACKET .. Air filter to underframe
11	9092661	-	1	BRACKET .. Air filter to underframe
12	8459126	1	1	PAD .. Tapping - Bracket to underframe
13	179881	4	4	BOLT .. Hex head 1/2-13 x 1
14	179883	3	3	BOLT .. Hex head 1/2-13 x 1-1/4
15	179887	4	4	BOLT .. Hex head 1/2-13 x 1-3/4
16	8275731	8	8	WASHER .. Plain 1/2
17	103323	11	11	WASHER .. Lock 1/2

9311291G, 9093313A, 32319

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

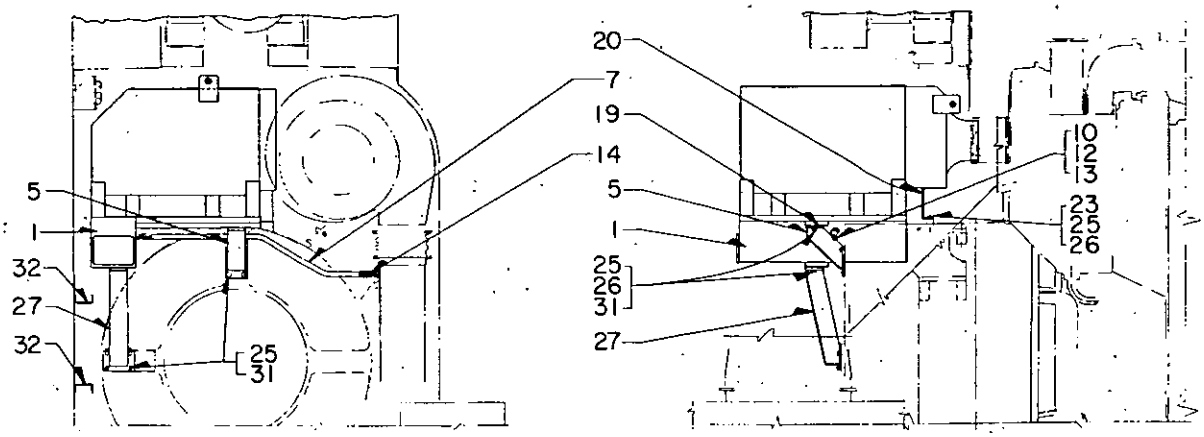
Cycoil Oil Bath Air Intake Filter and Mounting
16-567D3A; 16-645E and 16,20-645E3 Engines
PLATE A178-12

Ref. No.	Part Number	Qty. Req.				Description
		A	-	-	-	16-567D3A engines
		-	B	-	-	16-645E engine
		-	-	C	-	16-645E3 engine
		-	-	-	D	20-645 engine
1	8399792	1	-	-	-	FILTER ASSEMBLY .. Air intake - Replaces 8399543, 8383076, and 8350169 - No longer furnished - See Page 18
2	8366065	-	1	-	-	FILTER ASSEMBLY .. Air intake - No longer furnished - See Page 18
3	8371515	-	-	1	-	FILTER ASSEMBLY .. Air intake - Replaces 8365425 - See Page 18
4	8365424	-	-	-	1	FILTER ASSEMBLY .. Air intake - See Page 18
5	8350870	1	-	-	-	BRACKET ASSEMBLY .. Mounting
6	8365936	-	-	1	1	BRACKET ASSEMBLY .. Mounting
7	8353774	1	-	1	1	HOSE ASSEMBLY .. Air pressure
8	8116729	-	AR	-	-	TUBING .. Copper - 5/8 O.D. x .049 thick - 50 feet - Approximately 7-1/2 feet required
9	144308	-	4	-	-	NUT .. Tube 5/8
10	8168454	1	-	1	1	CLAMP .. Hose - Insulated
11	8108211	-	3	-	-	CLAMP .. Tubing
12	179791	1	-	1	1	BOLT .. Hex head 1/4-20 x 1/2 - Clamp mounting
13	103319	1	-	1	1	WASHER .. Lock 1/4
14	8218282	1	-	1	1	CONNECTOR .. 5/8 tube x 3/4 MPT
15	8040322	-	2	-	-	CONNECTOR .. 5/8 tube x 3/4 MPT
16	8348610	-	-	AR		SHIM .. Filter mounting - 3-3/4 x 4-5/8 - 11 gauge
17	8348611	-	-	AR		SHIM .. Filter mounting - 3-3/4 x 4-5/8 - 16 gauge
18	8348612	-	-	AR		SHIM .. Filter mounting - 3-3/4 x 4-5/8 - 24 gauge
19	8350971	AR	-	AR		SHIM .. Filter mounting - 4 x 4 - 16 gauge
20	8337906	AR	-	AR		SHIM .. Filter mounting - 2 x 3 - 16 gauge
21	8366769	-	2	-	-	FLASHING .. 48-15/16 inches long x 14 gauge
22	8366770	-	2	-	-	FLASHING .. 11-15/16 inches long x 14 gauge
23	179881	4	-	6	6	BOLT .. Hex head 1/2-13 x 1 - Mounting
24	179880	-	-	4	4	BOLT .. Hex head 1/2-13 x 7/8 - Mounting
25	103323	16	-	14	14	WASHER .. Lock 1/2
26	103343	8	-	-	-	WASHER .. Plain 1/2
26	8275731	-	-	10	10	WASHER .. Plain 1/2 - Formerly 103343
27	8350869	1	-	-	-	BRACKET ASSEMBLY .. Mounting
28	8399509	-	-	1	1	BRACKET ASSEMBLY .. Mounting
29	6921049	-	-	1	1	PAD .. Tapping
30	179885	-	-	4	4	BOLT .. Hex head 1/2-13 x 1-1/2
31	179883	12	-	-	-	BOLT .. Hex head 1/2-13 x 1-1/4
32	8304057	2	-	-	-	ROD .. Trouble light mounting
33	8358203	-	1	1	1	VALVE .. Ball - 1 inch
34	8060975	-	-	1	1	NIPPLE .. Short - 1MPT
35	103870	-	1	1	1	PLUG .. Pipe - 1 MPT
36	119096	-	1	-	-	ELBOW .. 1 FPT
37	8060954	-	2	-	-	NIPPLE .. Close - 1 MPT
38	179835	-	22	-	-	BOLT .. Hex head 3/8-16 x 5/8
39	179837	-	20	-	-	BOLT .. Hex head 3/8-16 x 3/4
40	103321	-	42	-	-	WASHER .. Lock 3/8
41	9420156	-	20	-	-	SCREW .. Hex head 1/4-20 x 1/2 - Tapping
42	144277	-	1	-	-	ELBOW .. 5/8 tube
43	8366121	-	2	-	-	DUCT .. Flexible
44	8373018	-	4	-	-	CLAMP .. Duct
45	8366768	-	1	-	-	DUCT .. Air
46	8347632	-	-	1	-	DUCT .. Air
47	8365038	-	-	-	1	DUCT .. Air
48	8373018	-	-	2	2	CLAMP .. Hose - Formerly 8341882
49	8303837	1	-	-	-	DUCT .. Air
50	8375876	2	-	-	-	CLAMP .. Hose
*51	8374278	-	-	2	2	RETAINER .. Hose

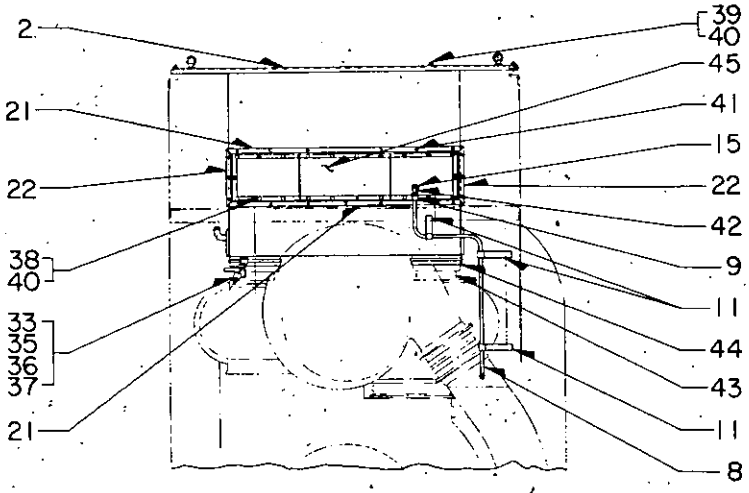
16145, 16153, 16155, 17169, 20254, 20257, 20260, 15971, 14714

P.L. No. E178

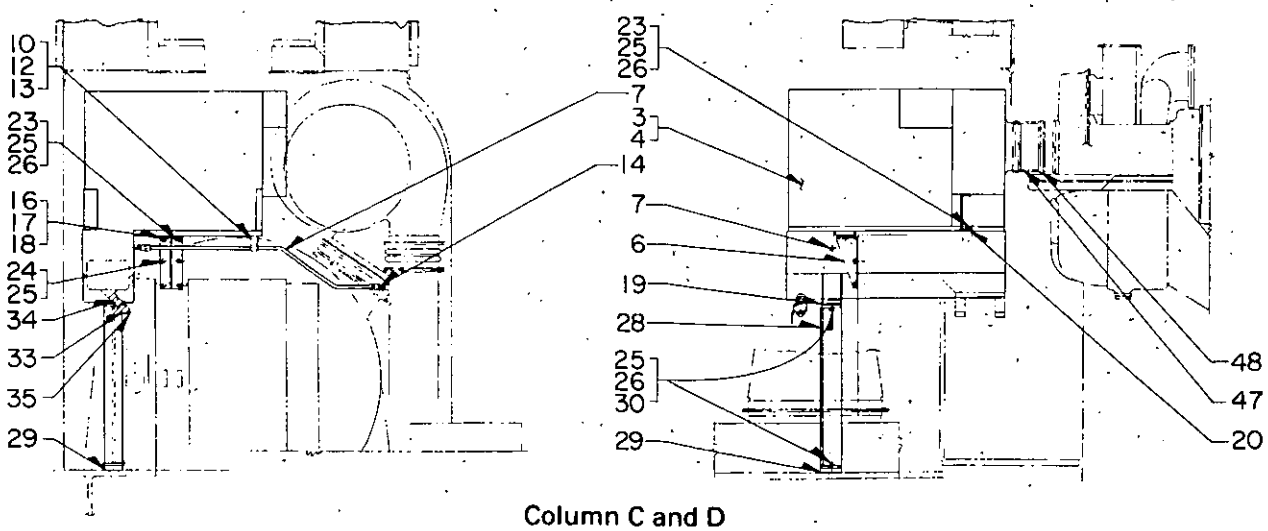
OIL BATH ENGINE AIR FILTERS



Column A



Column B



Column C and D

PLATE A178-12

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Cycoil Oil Bath Air Intake Filter and Mounting
16-645E3,E3B Engines - GT26CW and GT26CU-2 Locomotives

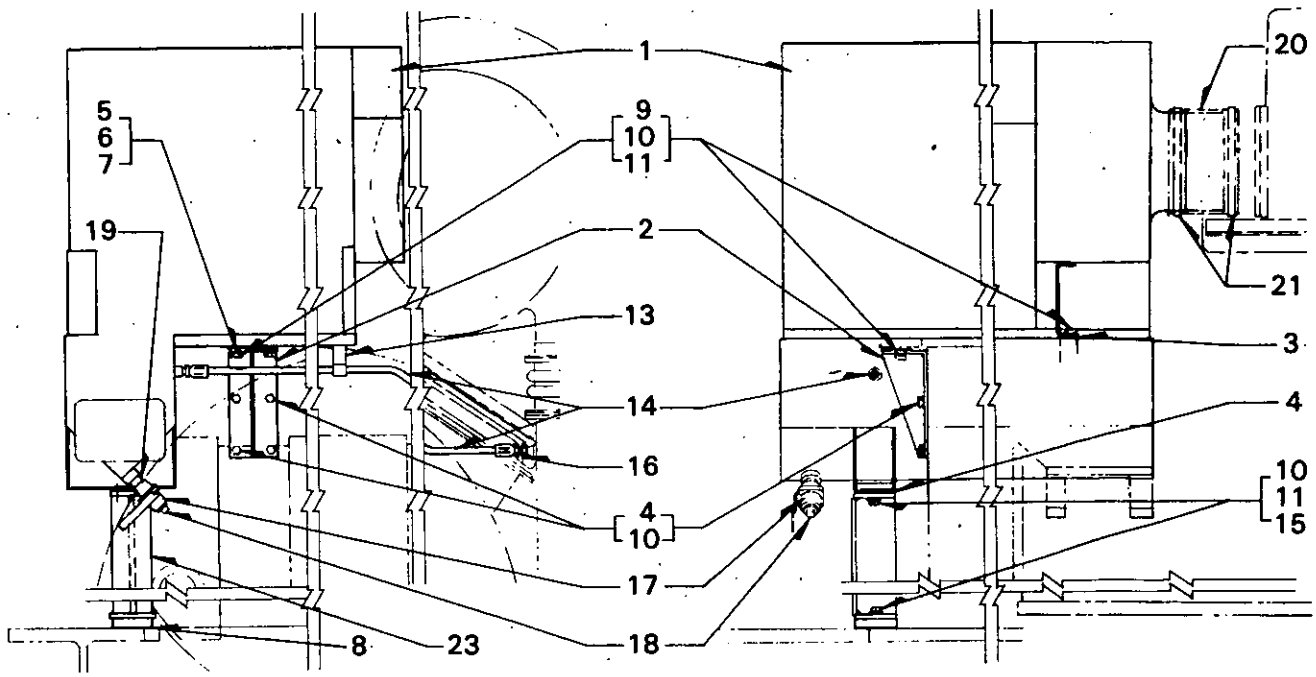


PLATE B178-13

Ref. No.	Part Number	Qty. Req.	Description
1	8451366	1	FILTER ASSEMBLY .. Air intake - See Page 17
2	8452384	1	BRACKET ASSEMBLY .. Filter assembly mounting
3	8337906	A.R.	SHIM .. Filter mounting - 2 x 3-16 gauge
4	8350971	A.R.	SHIM .. Filter mounting - 4 x 4-16 gauge
5	8348610	A.R.	SHIM .. Filter mounting - 3-3/4 x 4-5/8-11 gauge
6	8348611	A.R.	SHIM .. Filter mounting - 3-3/4 x 4-5/8-16 gauge
7	8348612	A.R.	SHIM .. Filter mounting - 3-3/4 x 4-5/8-24 gauge
8	6921049	1	PAD .. Tapping
9	179883	6	BOLT .. Hex head 1/2-13 x 1-1/4
10	103323	13	WASHER .. Lock 1/2
11	8275731	10	WASHER .. Plain 1/2
12	179881	3	BOLT .. Hex head 1/2-13 x 1
13	8108214	1	CLAMP .. Tubing
14	8353774	1	HOSE ASSEMBLY .. Air pressure
15	179885	4	BOLT .. Hex head 1/2-13 x 1-1/2
16	8218282	1	CONNECTOR .. 5/8 tube x 3/4 MPT
17	8358203	1	VALVE .. Ball - 1 inch
18	103870	1	PLUG .. Pipe - 1 MPT
19	8060975	1	NIPPLE .. Short - 1 MPT
20	8347632	1	DUCT .. Air
21	8373018	2	CLAMP ASSEMBLY .. Air duct
†22	8374278	2	RETAINER .. Air duct
23	8399509	1	BRACKET ASSEMBLY .. Mounting - GT26CW locomotive
23	8484561	1	BRACKET ASSEMBLY .. Mounting - GT26CU locomotive

24648, 28742

P.L. No. E178

OIL BATH ENGINE AIR FILTERS

Cycoil Oil Bath Air Intake Filter Assembly
16-567D3A; 16-645E and 16,20-645E3 Engines
PLATE A178-14

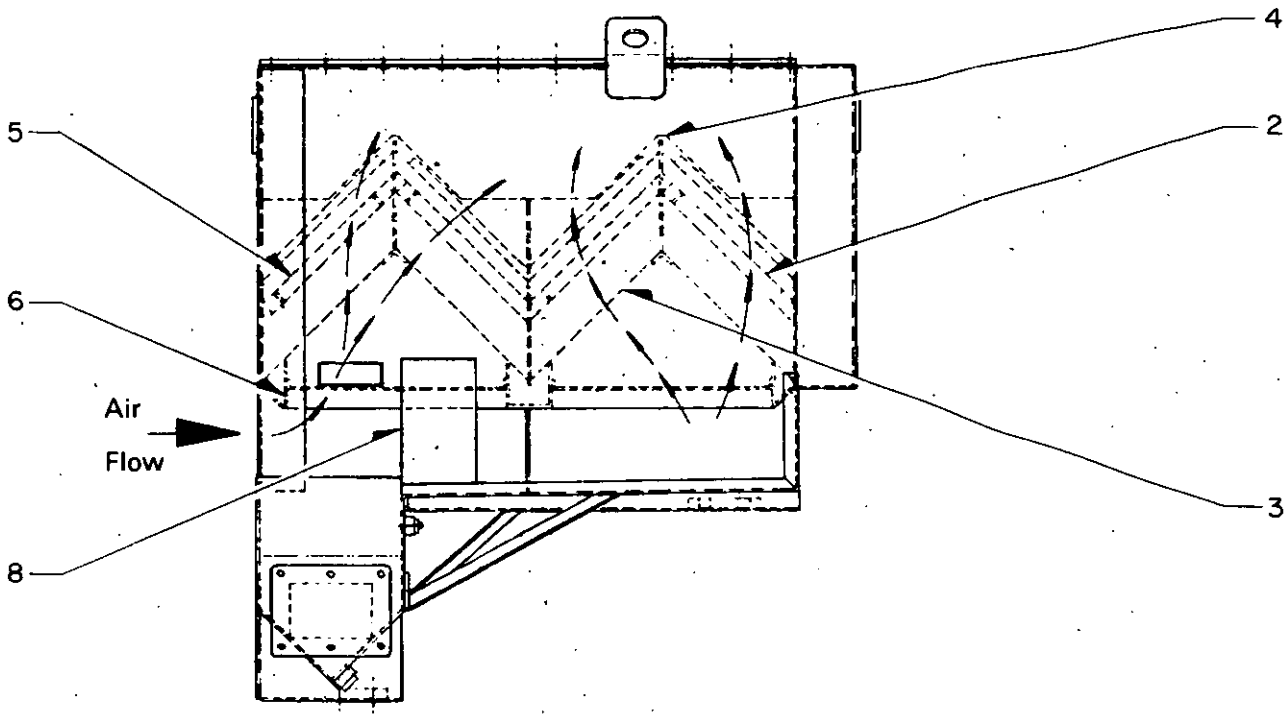
Ref. No.	Part Number	Quantity Required									Description
†1	8399792	A	-	-	-	-	-	-	-	-	FILTER ASSEMBLY .. Air intake - 16-567D3A engine
†1	8399543	-	B	-	-	-	-	-	-	-	FILTER ASSEMBLY .. Air intake - 16-567D3A engine
†1	8383076	-	-	C	-	-	-	-	-	-	FILTER ASSEMBLY .. Air intake - 16-567D3A engine
†1	8350169	-	-	-	D	-	-	-	-	-	FILTER ASSEMBLY .. Air intake - 16-567D3A engine
†1	8366065	-	-	-	-	E	-	-	-	-	FILTER ASSEMBLY .. Air intake - 16-65E engine
1	8371515	-	-	-	-	-	F	-	-	-	FILTER ASSEMBLY .. Air intake - 16-645E3 engine - Replaces 8365425
1	8365425	-	-	-	-	-	-	G	-	-	FILTER ASSEMBLY .. Air intake - 16-645E3 engine - Replaced by 8371515
1	8451366	-	-	-	-	-	-	-	H	-	FILTER ASSEMBLY .. Air intake - 16-645E3 engine - GT26CW and GT26CU-2 locomotives
1	8365424	-	-	-	-	-	-	-	-	J	FILTER ASSEMBLY .. Air intake - 20-645E3 engine

†*Cycoil Filter Assemblies 8399792, 8399453, 8383076 and 8350169 are no longer available. When replacement is required, it is recommended to convert to Fiberglass Engine Air Filters by using Kit 8483612. See Parts List No. E181, Page 41. Cycoil Filter Assembly 8366065 is no longer available. When replacement is required, it is recommended to convert to fiberglass engine air filters by using Kit 8496581. See Parts List No. E181, Page 42.*

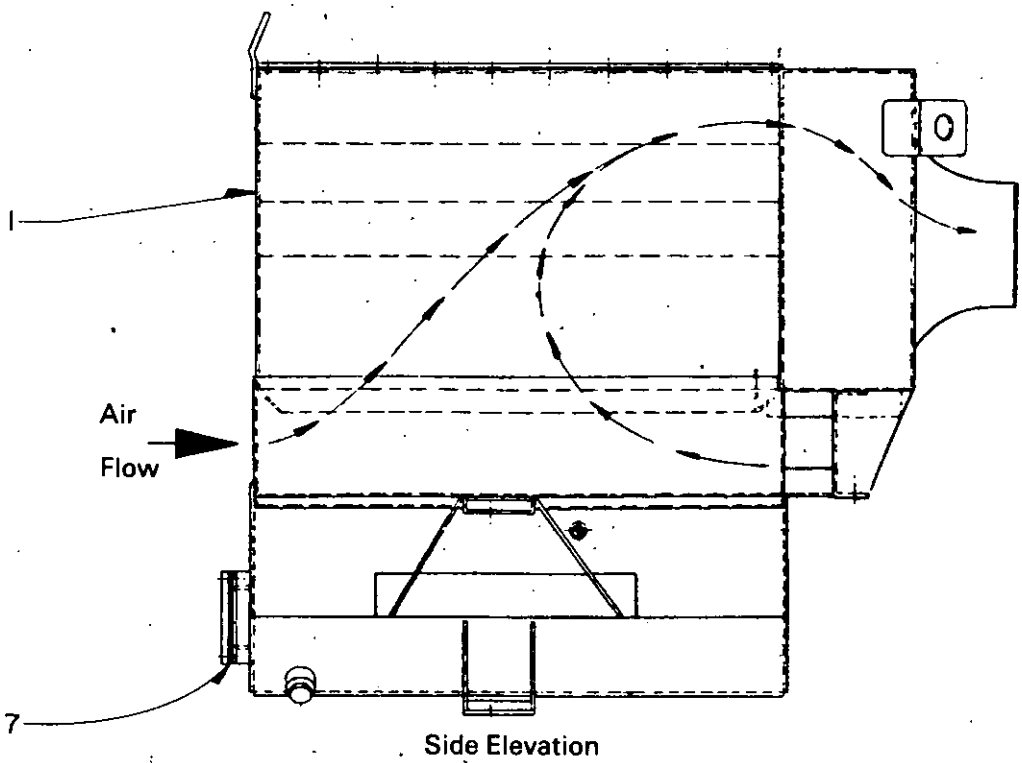
2	8392669	4	4	4	-	-	-	-	-	-	PAD .. Upper
2	8392674	-	-	-	4	-	-	-	-	-	PAD .. Upper
2		-	-	-	-	3	-	-	-	-	PAD .. Upper
2	8392687	-	-	-	-	-	2	2	2	-	PAD .. Upper - Right side
2	8392688	-	-	-	-	-	2	2	2	-	PAD .. Upper - Left side
2	8392678	-	-	-	-	-	-	-	-	2	PAD .. Upper - Right side
2	8392679	-	-	-	-	-	-	-	-	2	PAD .. Upper - Left side
3		4	4	-	-	-	-	-	-	-	PAD .. Lower
3	8392670	-	-	4	-	-	-	-	-	-	PAD .. Lower
3	8392675	-	-	-	4	-	-	-	-	-	PAD .. Lower
3		-	-	-	-	3	-	-	-	-	PAD .. Lower
3	8392689	-	-	-	-	-	2	2	2	-	PAD .. Lower - Right side
3	8392690	-	-	-	-	-	2	2	2	-	PAD .. Lower - Left side
3	8392680	-	-	-	-	-	-	-	-	2	PAD .. Lower - Right side
3	8392681	-	-	-	-	-	-	-	-	2	PAD .. Lower - Left side
4	8392671	2	2	4	-	-	-	-	-	-	RETAINER .. Pad
4	8392676	-	-	-	4	-	-	-	-	-	RETAINER .. Pad
4		-	-	-	-	2	-	-	-	-	RETAINER .. Pad - Center
4		-	-	-	-	2	-	-	-	-	RETAINER .. Pad - End
4	8392691	-	-	-	-	-	2	2	2	-	RETAINER .. Pad - Right side
4	8392692	-	-	-	-	-	2	2	2	-	RETAINER .. Pad - Left side
4	8392682	-	-	-	-	-	-	-	-	2	RETAINER .. Pad - Right side
4	8392683	-	-	-	-	-	-	-	-	2	RETAINER .. Pad - Left side
5	8392672	4	4	4	-	-	-	-	-	-	PAD .. Spacer
5	8392677	-	-	-	4	-	-	-	-	-	PAD .. Spacer
5		-	-	-	-	3	-	-	-	-	PAD .. Spacer
5	8392693	-	-	-	-	-	2	2	2	-	PAD .. Spacer - Right side
5	8392694	-	-	-	-	-	2	2	2	-	PAD .. Spacer - Left side
5	8392684	-	-	-	-	-	-	-	-	2	PAD .. Spacer - Right side
5	8392685	-	-	-	-	-	-	-	-	2	PAD .. Spacer - Left side
6	8398863	2	2	2	2	-	-	-	-	-	VALVE ASSEMBLY .. Vari-flow
6	8418032	-	-	-	-	3	-	-	-	-	VALVE ASSEMBLY .. Vari-flow
6	8398862	-	-	-	-	-	1	1	1	-	VALVE ASSEMBLY .. Vari-flow
6	8398864	-	-	-	-	-	1	1	1	-	VALVE ASSEMBLY .. Vari-flow
6	8398865	-	-	-	-	-	-	-	-	1	VALVE ASSEMBLY .. Vari-flow
6	8398866	-	-	-	-	-	-	-	-	1	VALVE ASSEMBLY .. Vari-flow
7	8391474	1	1	1	1	1	1	1	1	1	GASKET .. Clean out door
8	8390027	1	1	1	1	-	1	1	1	1	GAUGE .. Oil level - Dipstick - "Full" and "Add" reading
*9	8412895	-	-	-	-	1	-	1	-	-	GAUGE ASSEMBLY .. Sight - Oil level
*10	8392014	As Required									GASKET .. Tape - 1/16 thick x 1-1/2 wide - 100 foot roll

P.L. No. E178

OIL BATH ENGINE AIR FILTERS



Front Elevation



Side Elevation

PLATE A178-14

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS

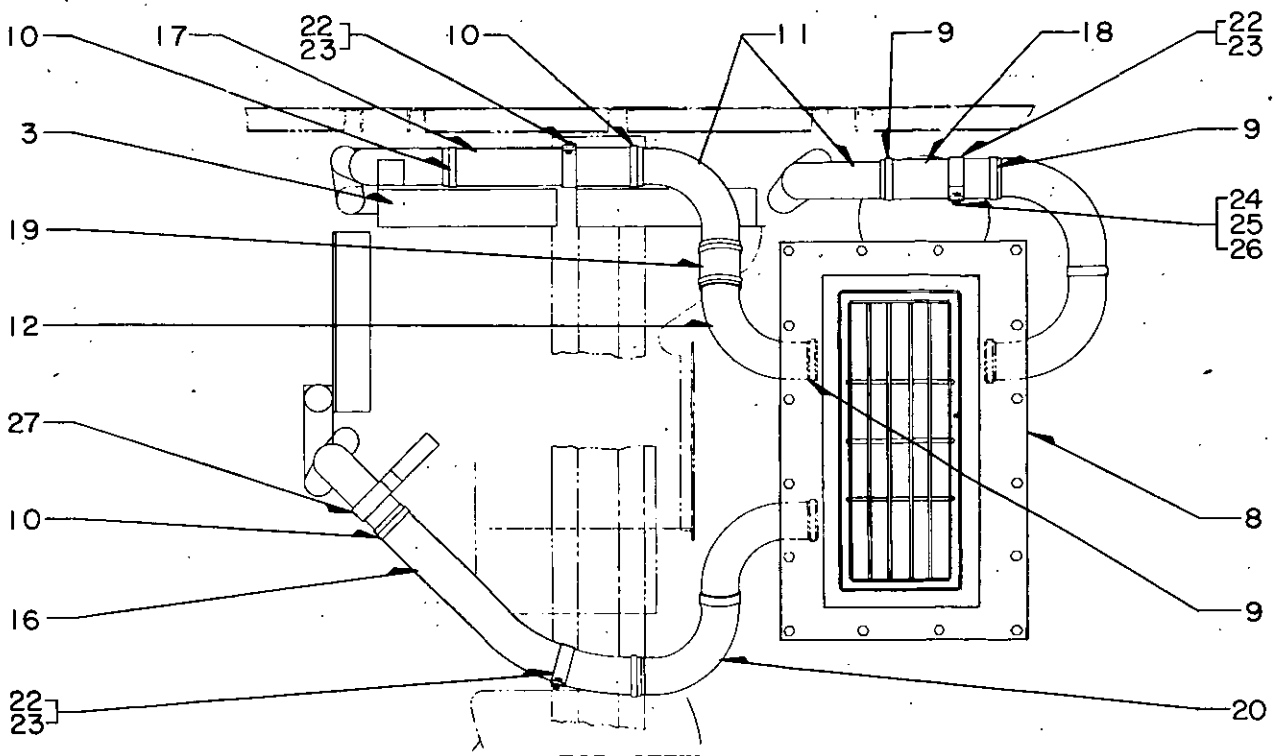
Rotonamic Engine Air Filters
16-567D3 - SD24 Locomotives
PLATE B180-1

Ref. No.	Part Number	Qty. Req.	Description.
1	8275692	2	FILTER .. Rotonamic air intake - 19-1/2 x 21-13/16
2	8275693	2	FILTER .. Rotonamic air intake - 19-1/2 x 21-13/16
3	8275697	2	FILTER .. Rotonamic air intake - 19-1/2 x 21-13/16
4	8289764	1	STACK ASM. .. Exhaust - 30 inch outlet
6	9416368	28	BOLT .. Hex head - 1/2-20 x 2 - Exhaust stack
7	9338626	28	NUT .. Hex 1/2-20 - Self-locking - Replaces 8284621
8	8289705	1	SHIELD ASM. .. Stack
9	8293203	5	CLAMP .. Hose - Formerly 8048702 clamp - 15 required
10	8289880	11	CLAMP .. Hose - Formerly 8166524 clamp - 12 required
10A	8220797	11	CLAMP .. Hose
11	8275460	2	ELBOW .. Hose - 4 inch
12	8275459	3	ELBOW .. Hose -4 inch
13	8275695	3	"Y" FITTING
14	8275580	3	HOSE .. Upper cleaner to "Y" fitting - 3 in. I.D. x 4-1/4 in. long
15	8275581	3	HOSE .. Lower to upper cleaner "Y" fitting - 3 in. I.D. x 29 in. long
16	8275579	1	HOSE .. "Y" fitting to aspirator - 4 in. I.D. x 18 in. long
17	8288254	1	HOSE .. "Y" fitting to aspirator - 4 in. I.D. x 22 in. long
18	8289296	2	HOSE .. "Y" fitting to aspirator - 4 in. I.D. x 13 in. long
19	8289299	1	HOSE .. Elbow to aspirator - 4 in. I.D. x 6 in. long
20	8282307	1	ELBOW ASM. .. Hose fitting
21	8291286	1	ELBOW ASM. .. Hose fitting
22	8275574	3	CLAMP .. Hose
23	8291366	3	STRAP .. Clamp
24	179839	6	BOLT .. Hex head 3/8-16 x 1 - Strap mounting
25	102635	6	NUT .. Hex 3/8-16
26	103321	6	WASHER .. Lock 3/8
27	8255304	1	CLAMP ASM. .. Includes hanger
28	179879	16	BOLT .. Hex head 1/2-13 x 3/4 - Shield mounting
29	103323	16	WASHER .. Lock 1/2
30	8288256	1	PAD .. Tapping - Shield mounting
*31	8264513	1	AIR DUCT .. Turbocharger inlet
*32	8375876	2	CLAMP .. Air duct - Formerly 8264450

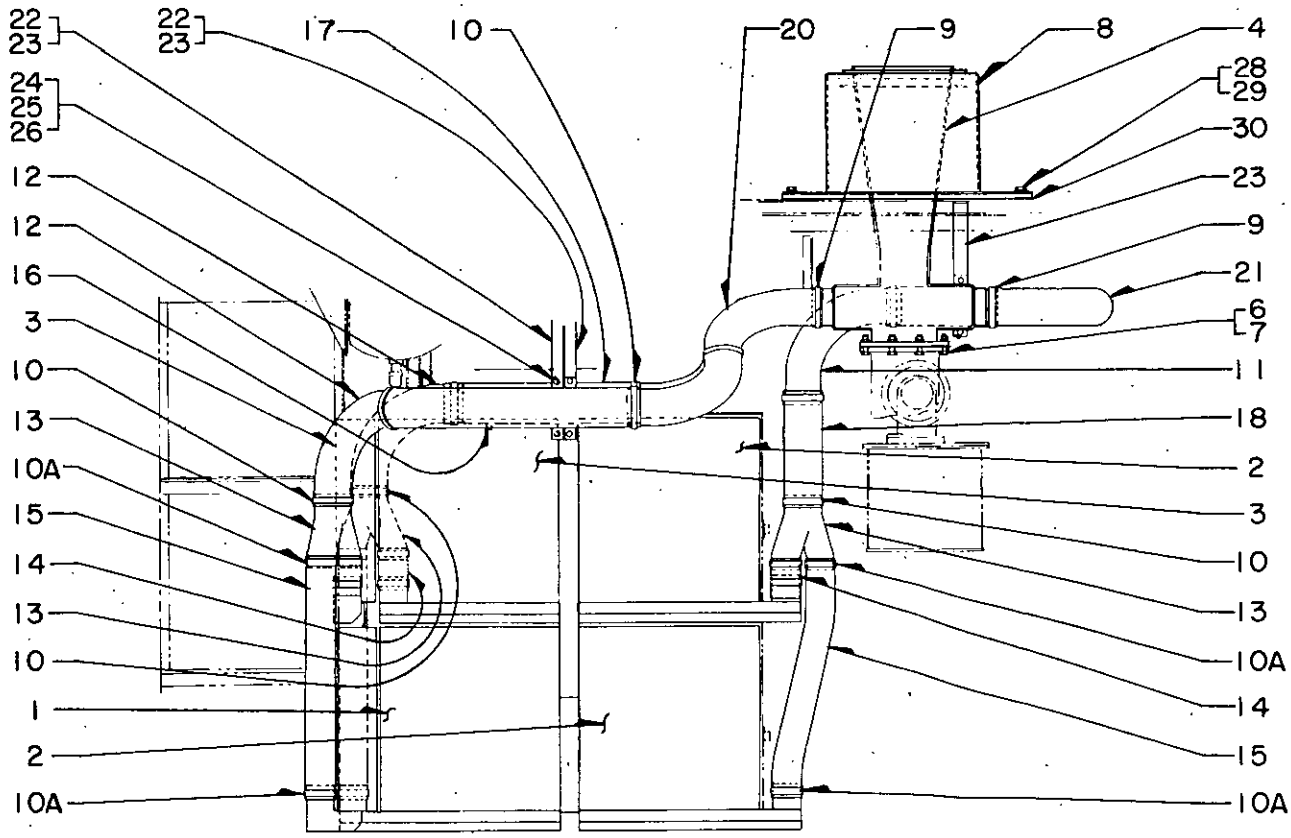
8275505D 9343 10411

P.L. No. C180

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS



TOP VIEW



SIDE VIEW

PLATE B180-1

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS

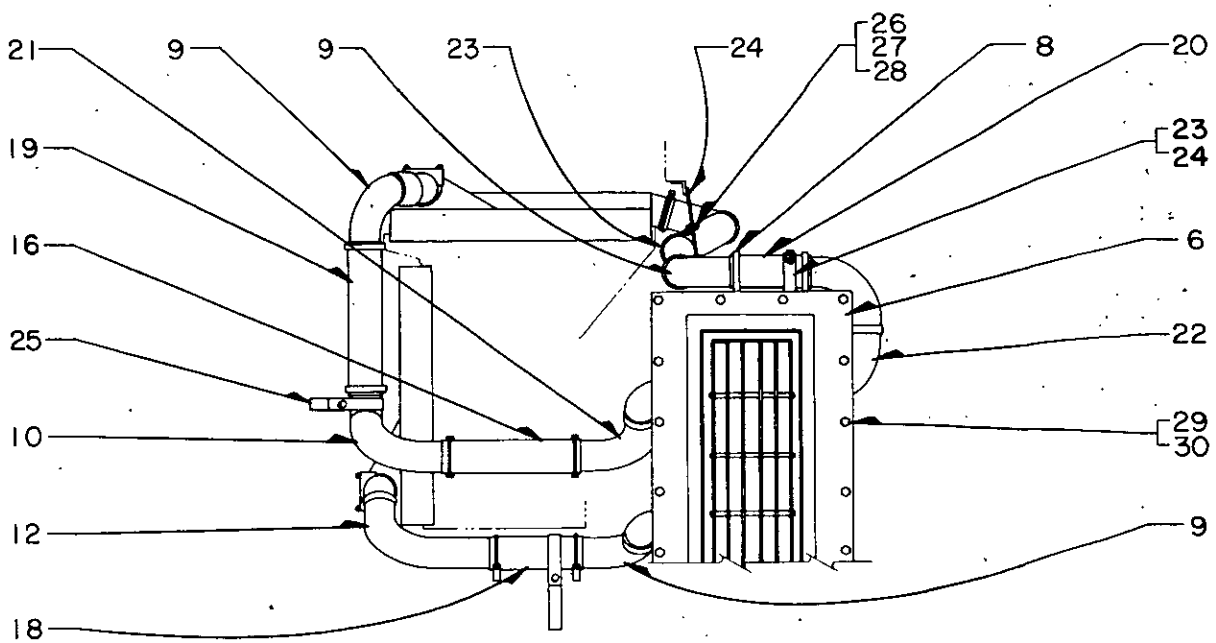
Rotonamic Engine Air Filters
16-567D2 - GP20 Locomotives
PLATE B180-2

Ref. No.	Part Number	Qty. Req.	Description
1	8291514	1	FILTER .. Rotonamic air intake - 23-3/4 x 34 inches
2	8291515	2	FILTER .. Rotonamic air intake - 21-13/16 x 34 inches
3	8291572	1	STACK ASM. .. Exhaust
4	9416368	28	BOLT .. Hex head 1/2-20 x 2 - Exhaust stack mounting
5	9338626	28	NUT .. Hex lock 1/2-20 - Replaces 8284621
6	8289705	1	SHIELD ASM. .. Stack
7	8293203	5	CLAMP .. Hose
8	8289880	18	CLAMP .. Hose
9	8289289	3	ELBOW .. Hose
10	8289303	1	ELBOW .. Hose
11	8289290	2	ELBOW .. Hose
12	8289292	1	ELBOW .. Hose
13	8289291	2	ELBOW .. Hose
14	8289300	2	HOSE .. Flexible metal - 4-7/32 O.D. x 4 in. long
15	8289299	2	HOSE .. Flexible metal - 4-7/32 O.D. x 6 in. long
16	8275578	1	HOSE .. Flexible metal - 4-7/32 O.D. x 18 in. long
17	8289297	1	HOSE .. Flexible metal - 4-7/32 O.D. x 60 in. long
18	8291602	1	HOSE .. Flexible metal - 4-7/32 O.D. x 12 in. long
19	8291601	1	HOSE .. Flexible metal - 4-7/32 O.D. x 20 in. long
20	8291603	1	HOSE .. Flexible metal - 4-7/32 O.D. x 10-1/2 in. long
21	8291605	1	ELBOW ASM. .. Hose fitting
22	8291604	1	ELBOW ASM. .. Hose fitting
23	8275574	3	CLAMP .. Hose
24	8275618	3	STRAP .. Clamp
25	8255304	1	CLAMP ASM. .. Hose - Includes hanger
26	179839	6	BOLT .. Hex head 3/8-16 x 1 - Strap mounting
27	103321	6	WASHER .. Lock 3/8
28	102635	6	NUT .. Hex 3/8-16
29	179879	16	BOLT .. Hex head 1/2-13 x 3/4 - Shield mounting
30	103323	16	WASHER .. Lock 1/2
31	8288256	1	PAD .. Tapping
*32	8264513	1	AIR DUCT .. Turbocharger inlet
*33	8375876	2	CLAMP .. Air duct - Formerly 8264450

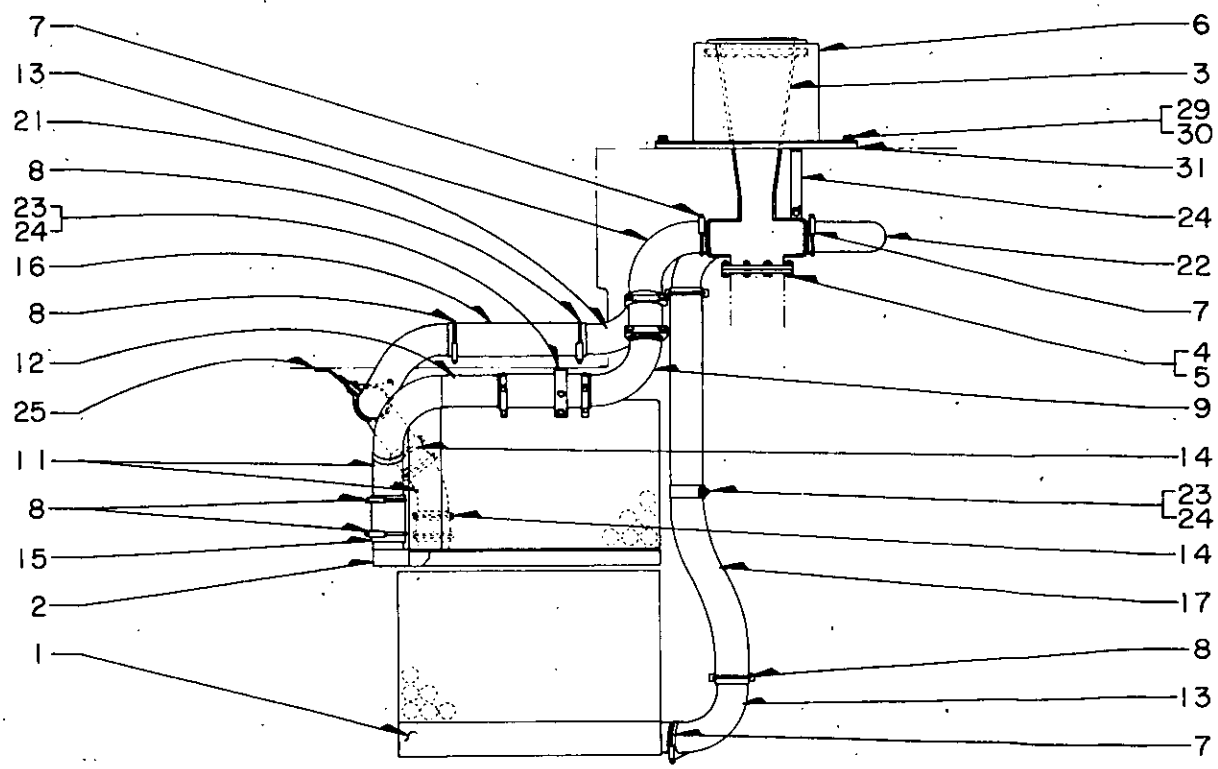
8290336B 10351
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P.L. No. C180

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS



TOP VIEW



SIDE VIEW

PLATE B180-2

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS

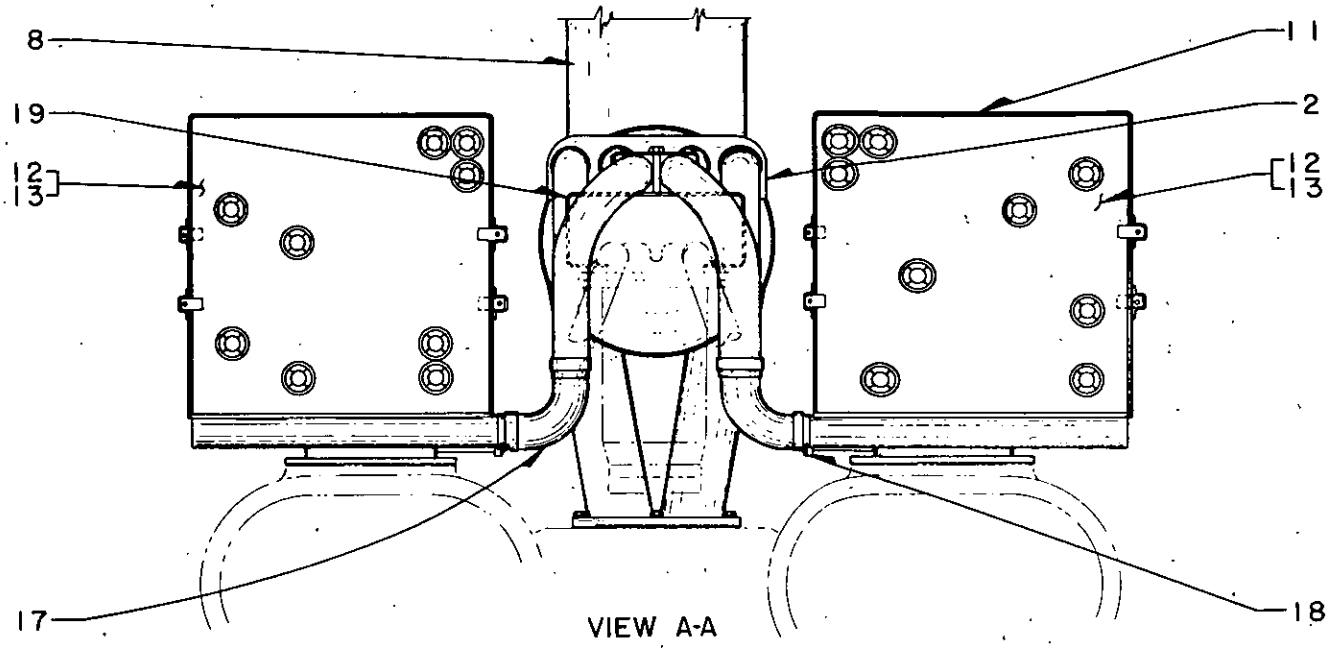
Rotonamic Engine Air Filters
16-567D1 - GP18, SD18 Locomotives
PLATE B180-3

Ref. No.	Part Number	Qty. Req.	Description
*1	8212447	1	CHAMBER ASM. .. Exhaust
2	8212191	1	HEADER ASM. .. Aspirator
3	8212027	1	ASPIRATOR ASM. .. Manifold
4	8212453	1	PIPE .. Aspirator inlet
5	8212190	1	CHAMBER END .. Manifold
6	8212451	1	PLATE .. Baffle
7	8212448	1	CYLINDER .. Chamber
8	8212449	1	PIPE ASM. .. Outlet
*9	8205971	2	FRAME ASM. .. Rotonamic filter
10	8303844	16	FASTENER .. Filter frame
*11	8210538	16	GASKET .. Frame
12	8206404	2	ELEMENT .. Rotonamic filter - 19-1/2 x 19-1/2 x 4-1/8 inches
13	8206513	2	ELEMENT .. Rotonamic filter - 19-1/2 x 19-1/2 x 4-1/8 inches
14	8205989	2	HOSE .. Filter frame to chamber - 2-3/8 I.D. x 40 in. long
15	8205990	2	HOSE .. Filter frame to chamber - 2-3/8 I.D. x 25 in. long
16	8166522	8	CLAMP .. Hose
17	8206369	4	ELBOW .. Frame to hose
18	8206394	4	CLAMP .. T-bolt - Elbow to hose
19	8209578	1	SUPPORT .. Hose - Includes clamp
20	8024287	2	GASKET .. Frame to blower
21	179885	18	BOLT .. Hex head 1/2-13 x 1-1/2 - Frame to blower
22	103323	18	WASHER .. Lock 1/2
*23	8164483	1	ELBOW .. Flanged - Right side - Filter frame to separator hose
*24	8164482	1	ELBOW .. Flanged - Left side - Filter frame to separator hose
*25	8084407	2	GASKET .. Elbow mounting
*26	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4 - Elbow mounting
*27	6101229	4	WASHER .. Plain 1/2
28	8155201	1	ELBOW .. Flanged - Oil separator
29	8155202	1	GASKET .. Flange mounting
30	181433	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flange mounting
31	6101229	4	WASHER .. Plain 1/2
32	8131113	2	HOSE .. Oil separator - 18 in. long - Not furnished - For replacement, use 8040167 hose - 36 in. long - Cut to length
33	8131112	2	SPRING .. Oil separator hose
34	8132042	4	CLAMP .. Hose

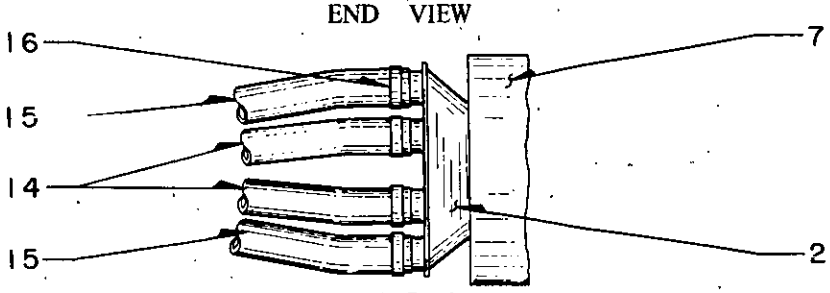
8209579E 10390 11196

P.L. No. C180

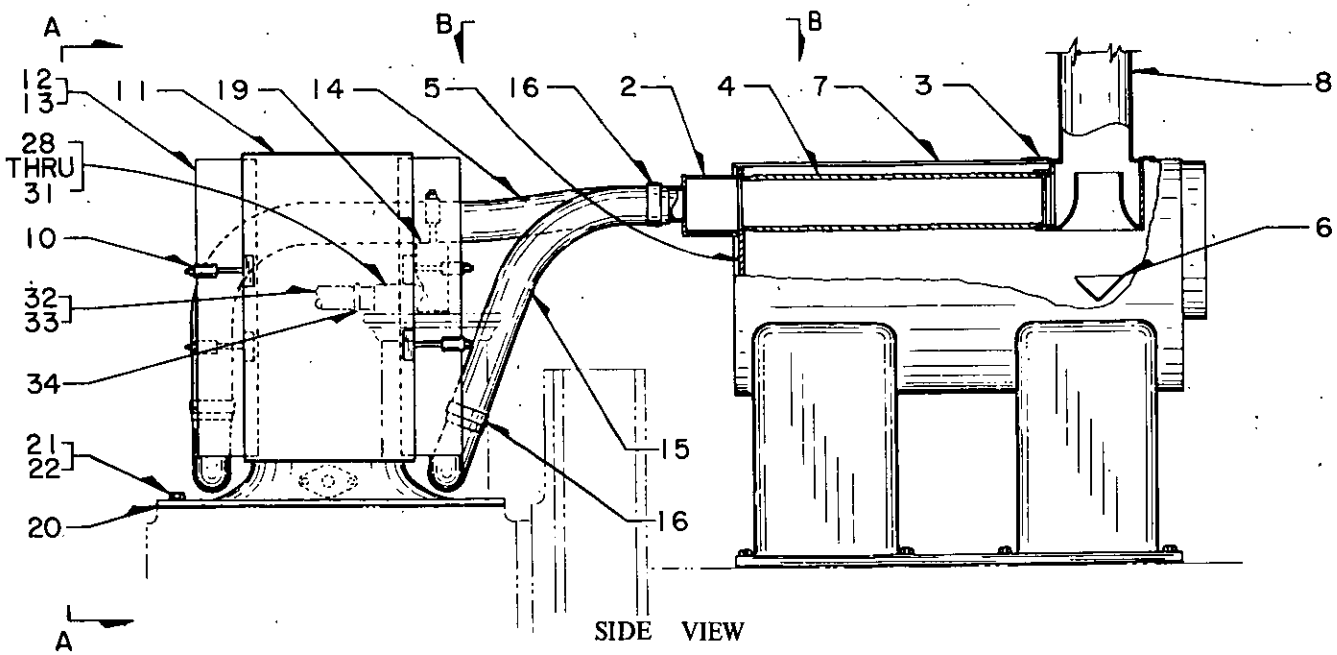
ROTONAMIC AND INERTIAL ENGINE AIR FILTERS



VIEW A-A
END VIEW



VIEW B-B

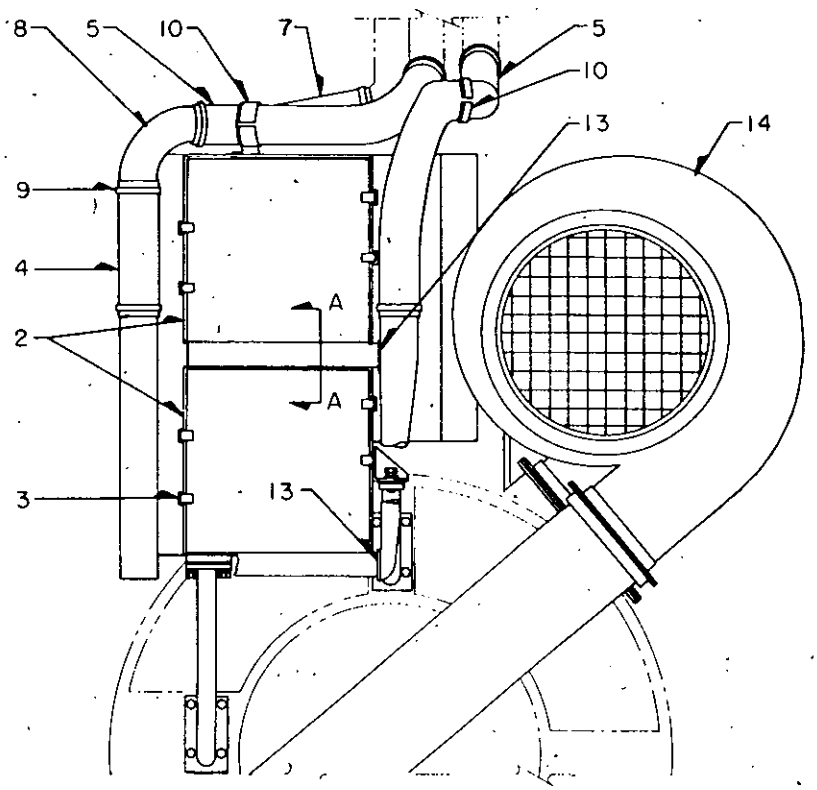


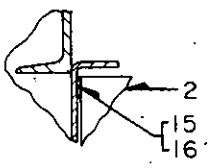
SIDE VIEW

PLATE B180-3

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS

Rotonamic Engine Air Filters
16-567D3 Engine - GP30 Locomotive





SECTION A-A

PLATE B180-4

Ref. No.	Part Number	Qty. Req.	Description
*1	8303828	2	FILTER .. Rotonamic air
2	8303829	4	FILTER .. Rotonamic air
3	8303844	24	FASTENER .. Rotonamic air cleaner
4	8304438	1	HOSE .. Flexible - 4 in. I.D. x 12-3/4 in. long
5	8304437	2	HOSE .. Flexible - 4 in. I.D. x 50-1/2 in. long
7	8304440	1	HOSE .. Flexible - 4 in. I.D. x 40-1/2 in. long
8	8289289	1	ELBOW .. Hose connecting
9	8289880	8	CLAMP .. Flexible hose
10	8285287	3	CLAMP .. Hanger - Flexible hose
*11	8303837	1	DUCT .. Air - Turbocharger to air intake silencer box assembly - 8-3/4 in. I.D. x 8 in. long
*12	8375876	2	CLAMP .. Air duct - Formerly 8264450
13	8329239	6	SEAL .. Vertical duct to silencer box assembly - 4 in. square O.D. x 2-5/8 in. square I.D. x 3/8 thick
14	----	-	TRACTION MOTOR BLOWER, AUXILIARY GENERATOR MOUNTING AND DRIVE - See Catalog 190, Parts List No. 3610
15	8273655	-	SEAL .. Rubber - 1/8 in. thick x 1/2 in. wide - Sold by the foot - Approximately 40 ft. required
16	8255268	1	CEMENT .. Rubber seal - 1 quart

NOTE: For conversion to paper or fiberglass engine air filters, See P.L. E181 Conversion Index, Page 37

8304840J

P.L. No. C180

ROTONAMIC AND INERTIAL ENGINE AIR FILTERS

Inertial Engine Air Filters
16-567D3A Engine - GP35,DD35,DDA35,SD35,SDP35 Locomotives

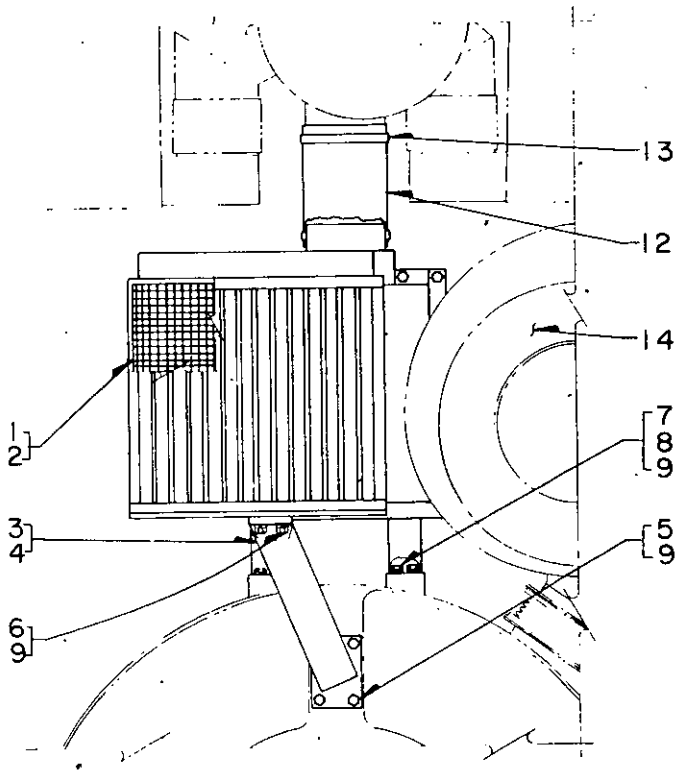


PLATE B180-5

Ref. No.	Part Number	Qty. Req.	Description
			† Reference numbers 1, 1A, 2 and 2A are no longer available as serviceable parts. For replacement it is recommended to convert to Paper or Fiberglass Filters. See P.L. E181, Page 37.
† 1	8343812	1	FILTER ASM. .. Inertial air - Farr Co. - Optional
†*1A	8366994	1	GASKET KIT .. Filter
† 2	8343813	1	FILTER ASM. .. Inertial air - American Air Filter Co. - Optional
†*2A	8371803	1	GASKET KIT .. Filter
3	8333756	1	BRACKET ASM. .. Filter - Applied with Ref. No. 1
4	8333553	1	BRACKET ASM. .. Filter - Applied with Ref. No. 2
5	179883	4	BOLT .. Hex head 1/2-13 x 1-1/4 - Bracket to generator
6	179885	2	BOLT .. Hex head 1/2-13 x 1-1/2 - Bracket to filter
7	179880	4	BOLT .. Hex head 1/2-13 x 7/8 - Filter to generator
8	103343	4	WASHER .. Plain 1/2
9	103323	10	WASHER .. Lock 1/2
*10	8303837	1	DUCT .. Air - Turbocharger to filter - 8-3/4 in. I.D. x 8 in. long
*11	8375876	2	CLAMP .. Turbocharger to filter air duct
ϕ12	8354879	1	HOSE .. Rubber - 8 I.D. x 16-7/8 in. long
ϕ12	8332747	1	HOSE .. Rubber - 8 I.D. x 11-1/4 in long
13	8264450	3	CLAMP .. Hose
14	----	-	TRACTION MOTOR BLOWER, AUXILIARY GENERATOR MOUNTING AND DRIVE - See Catalog 190, Parts List No. 3611

Parts List No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
16-645E Engine
GP38 and SD38 Locomotives
PLATE C181-1

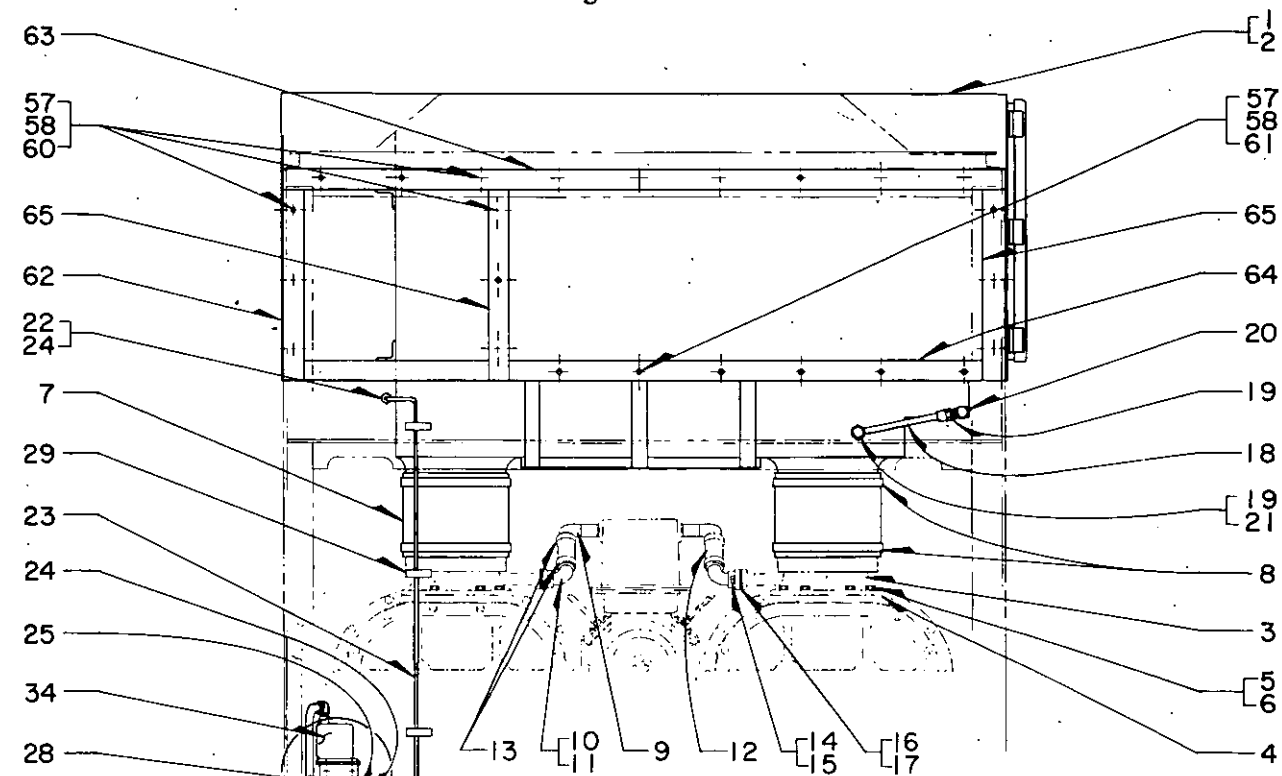
Ref. No.	Part Number	Qty. Req.	Description	
1	8431007	1	FILTER ASM. .. Air intake - Paper	
2	9093588	10	ELEMENT .. Filter - Replaces 8375073	
3	8366064	2	ADAPTER ASM. .. Air intake	
4	8024287	2	GASKET .. Air intake adapter to blower	
5	179885	18	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter to blower	
6	6101229	18	WASHER .. Plain 1/2	
7	8430475	2	DUCT ASM. .. Flexible - Adapter to air intake filter	
8	8373018	4	CLAMP ASM. .. Flexible duct	
9	8432170	2	ELBOW .. Pipe - Lube oil separator	
10	8432171	2	ELBOW .. Pipe - Swivel flanged	
11	8306502	2	GASKET .. Flanged pipe	
12	8040171	A.R.	HOSE .. Oil separator pipe - 36 in. long - Replaces 8432322 - Cut to size	
13	8131615	4	CLAMP .. Hose - Formerly 8048697	
14	181431	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Adapter to elbow	
15	6101229	4	WASHER .. Plain 1/2	
16	8407198	2	PLATE .. Orifice - Formerly 8436986	
17	8084407	4	GASKET .. Adapter to elbow	
18	8116729	1	TUBING .. 5/8 O.D. copper - .049 wall - 50 ft. length - 2 ft. req.'d	
19	144308	2	NUT .. 5/8 tube	
20	144283	1	ELBOW .. 1/2 FPT x 5/8 tube	
21	144461	1	CONNECTOR .. 5/8 tube x 1/2 FPT	
22	116453	1	ELBOW .. 90 degree - 1/4 tube x 1/4 MPT	
23	8116511	1	TUBING .. 1/4 O.D. copper - 50 ft. length - 8 ft. req.'d	
24	116452	2	NUT .. 1/4 tube	
25	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT	Used only with 8431248 switch
26	103878	1	PLUG .. Pipe - 1/4 MPT - Square head	
27	105417	1	TEE .. Pipe - 1/4	
28	8060971	1	NIPPLE .. Short pipe - 1/4 MPT	
29	8108110	3	CLAMP ASM. .. Vacuum switch tube	
*30	8108201	3	CLAMP ASM. .. Vacuum switch tube - Formerly 8108199	
*31	8165083	1	PAD .. Tapping	
*32	179791	2	BOLT .. Hex head 1/4-20 x 1/2	
*33	103319	2	WASHER .. Lock 1/4	
ϕ34	8431248	1	SWITCH .. Vacuum - Includes manual reset - Replaced by 8490138	
ϕ34A	8490138	1	SWITCH .. Pressure - Replaces 8431248	Used only with 8490138 switch
35	8490132	1	PLATE .. Pressure switch	
36	9419643	2	SCREW .. Hex washer head tapping 8-32 x 1/2	
37	8473448	1	TUBE ASSEMBLY .. Air intake filter to vacuum switch	
38	9316152	A.R.	TUBING .. 1/4 O.D. x .170 I.D. - Nylon - Sold by foot - Approx. 8-1/4 in. req.'d - Formerly 8860536	
39	8453868	2	NUT .. 1/4 O.D. tube	
40	8453869	2	SLEEVE .. 1/4 O.D. tube	
41	8453870	2	SEAT .. 1/4 O.D. tube	
42	114794	1	NIPPLE .. 1/8 MPT x 2 in. long	
43	127887	1	ELBOW .. 1/4 tube x 1/8 FPT	
44	118810	1	ELBOW .. 1/4 tube	
45	8330835	1	CONNECTOR .. 1/2 box - Straight liquid tight	
46	8455349	1	PLUG .. Filter 1/8 N.P.T.	
*47	8392855	1	RELAY .. Latching	
*48	103869	1	PLUG .. Pipe - 3/4 N.P.T. - Square head	
49A	8455574	A.R.	CONDUIT .. 1/2 in. liquid tight flexible metallic - 25 ft. length - Approx. 2 ft. req.'d	
49B	8116953	A.R.	CONDUIT .. 1/2 in. rigid aluminum - 12 ft. length - Approx. 7 ft. req.'d	
49C	8330797	1	CONNECTOR .. 1/2 in. female - Straight	
49D	8240529	1	CONNECTOR .. 1/2 in. male - 90°	
49E	8038594	1	BUSHING .. Female insulated - 1/2 in.	
50	8108115	3	CLAMP ASM. .. Pressure switch conduit	
51	8332580	A.R.	GROMMET .. Nylon - 12-3/4 in. long - Approx. 3-3/8 in. required	
*52	8468611	A.R.	CABLE .. No. 14 insulated - 500 ft. length - Approx. 75 ft. required	
*53	8126723	3	CONNECTOR .. Butt - Pre-insulated	
*54	8123282	2	LUG .. Terminal - 1/4 stud hole diameter	

22416, 23564, 8453157B, 23062, 26132, 8490135

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Ref. No.	Part Number	Qty. Req.	Description
*55	8272337	1	TERMINAL .. Faston tab
*56	8123281	3	LUG .. Terminal - No. 10 stud hole diameter
57	103323	30	WASHER .. Lock 1/2
58	103343	30	WASHER .. Plain 1/2
*59	179883	6	BOLT .. Hex head 1/2-13 x 1-1/4
60	179887	15	BOLT .. Hex head 1/2-13 x 1-3/4
61	179885	9	BOLT .. Hex head 1/2-13 x 1-1/2
62	8431581	1	GASKET .. Filter - Left side
63	8431582	1	GASKET .. Filter - Top
64	8431583	1	GASKET .. Filter - Bottom
65	8431584	2	GASKET .. Filter - Right side and near left



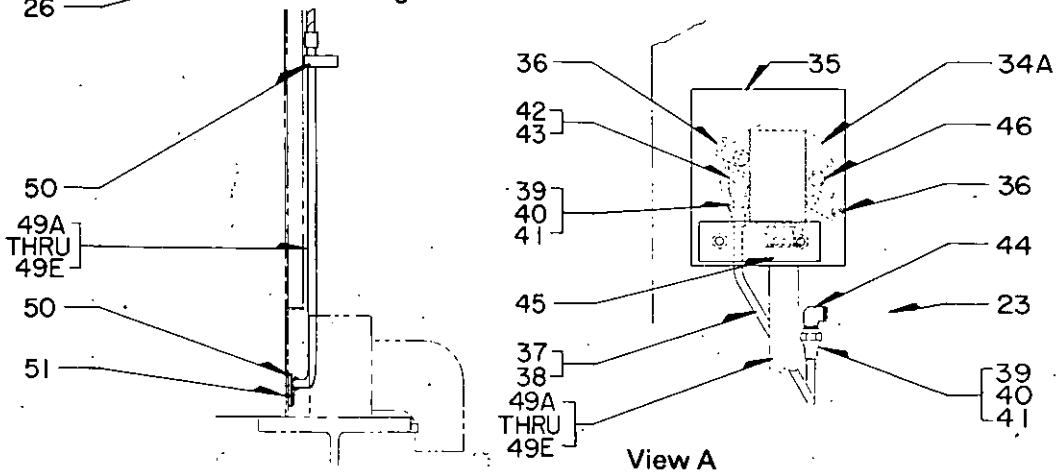


PLATE C181-1

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

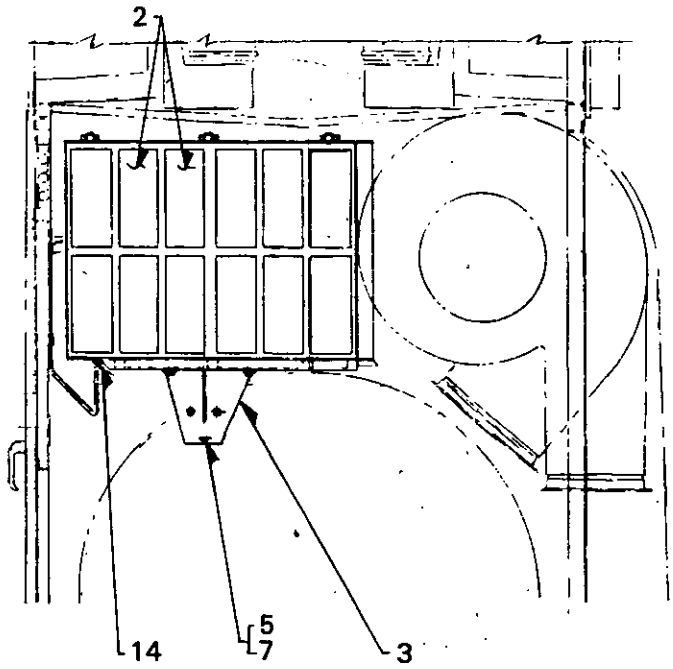
Paper Element Engine Air Filter and Mounting
12,16,20-645E3, 16-645E3A, 20-645E3B, 8,16-645E3C and 12,16-645F3B Engines
GP15T, GP39-2, GP40-2, GP49, GP49B, GP50, SD40-2, SD40T-2, SDL40-2,
SDL50, SDP40-F, SD45-2, SD45T-2, F40, F40PH and F40PH-2 Locomotives
PLATE E181-2

Ref. No.	Part Number	Quantity Required				Description
		A	B	-	-	GP15T,GP39-2,GP40-2,GP49,GP49B,GP50,SDL50, F40PH and F40PH-2
		-	-	C	D	SD40-2,SD40T-2,SDL40-2,SDP40-F,SD45-2,SD45T-2 and F40C
1	8426301	1	-	-	-	HOUSING ASM. .. Filter - GP39-2 and GP49B only
1	8410745	1	-	-	-	HOUSING ASM. .. Filter - GP15T,GP40-2,GP50,SDL50,F40PH and F40PH-2
1	9554404	1	-	-	-	HOUSING ASM. .. Filter - GP49 only
1	9089288	-	1	-	-	HOUSING ASM. .. Filter - GP39-2 and GP49B only
1	8469005	-	1	-	-	HOUSING ASM. .. Filter - GP15T,GP39-2, and GP40-2
1	8410726	-	-	1	-	HOUSING ASM. .. Filter - Except SDP40F
1	8469004	-	-	-	1	HOUSING ASM. .. Filter
2	9093588	12	-	-	-	ELEMENT .. Filter - Replaces 8375073
2	8498366	-	12	-	-	ELEMENT .. Filter - Replaces 8469002 - Except F40PH
2	9093587	-	-	12	-	ELEMENT .. Filter - Replaces 8377042 - Except SDP40F
2	8498367	-	-	-	12	ELEMENT .. Filter - Replaces 8468999
3	8426375	1	1	1	1	BRACKET ASM. .. Mounting
4	----	As Req.				SHIM .. Filter mounting 8348608 - 2 x 3 x 16 gauge 8355864 - 2 x 2 x 20 gauge 8355863 - 2 x 2 x 16 gauge } GP39-2 only 8355865 - 2 x 2 x 11 gauge
5	179881	7	7	7	7	BOLT .. Hex head 1/2-13 x 1
*6	103323	9	9	9	9	WASHER .. Lock 1/2 - Formerly applied
7	8423734	9	9	9	9	WASHER .. 17/32 I.D. x 1-1/4 O.D. - Formerly 8275731 (6) req.'d
8	102637	2	2	2	2	NUT .. Hex 1/2-13
9	179885	2	2	2	2	BOLT .. Hex head 1/2-13 x 1-1/2
*10	8465304	4	4	4	4	HOSE ASM. .. Vacuum - 15 in. long - Formerly applied
*11	8468533	2	2	-	-	HOSE ASM. .. Vacuum - 8 in. long - Formerly applied
*12	8040312	2	2	-	-	CONNECTOR .. 3/8 tube x 1/8 MPT - Formerly 118748
*13	8209909	4	4	4	4	UNION .. 3/8 tube x 1/4 MPT - Formerly applied
14	121323	2	2	2	2	CONNECTOR .. 1/4 FPT x 3/8 tube - Col. C&D SD40-2 only
14	8040325	-	-	2	2	CONNECTOR .. 1/4 FPT x 1/4 tube
15	8453502	2	-	2	2	TUBE ASM. .. Cabinet to filter
15	9329851	-	2	-	-	TUBE ASM. .. Cabinet to filter
16	8347632	1	1	1	1	DUCT .. Air - Except GP15T,GP39-2,GP49,GP49B,SD45-2 and SD45T-2
16	9085189	1	1	-	-	DUCT .. Air - GP15T only
16	9553516	1	1	-	-	DUCT .. Air - GP39-2, GP49 and GP49B only
16	8365038	-	-	1	1	DUCT .. Air - SD45-2 and SD45T-2 only
17	8373018	2	2	2	2	CLAMP .. Hose - Except GP15T, GP39-2, GP49 and GP49B
17	9096140	2	2	-	-	CLAMP .. Hose - T-bolt - 8.56 to 9.22 adjustable - GP15T only
17	9528932	2	2	-	-	CLAMP .. Hose - T-bolt - 9.47 to 9.97 adjustable - GP39-2 only
17	9553518	2	2	-	-	CLAMP .. Hose - T-bolt - 9.66 to 9.82 adjustable - GP49 and GP49B only
*18	8374278	2	2	2	2	RETAINER .. Hose - Formerly applied

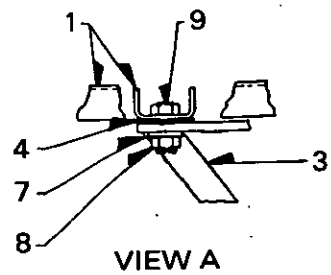
25679, 25960, 26969, 26970, 27836, 27837, 30329, 30462,
31050, 31998, 35972, 39660, 39769, 42451, 43535

P.L. No. E181

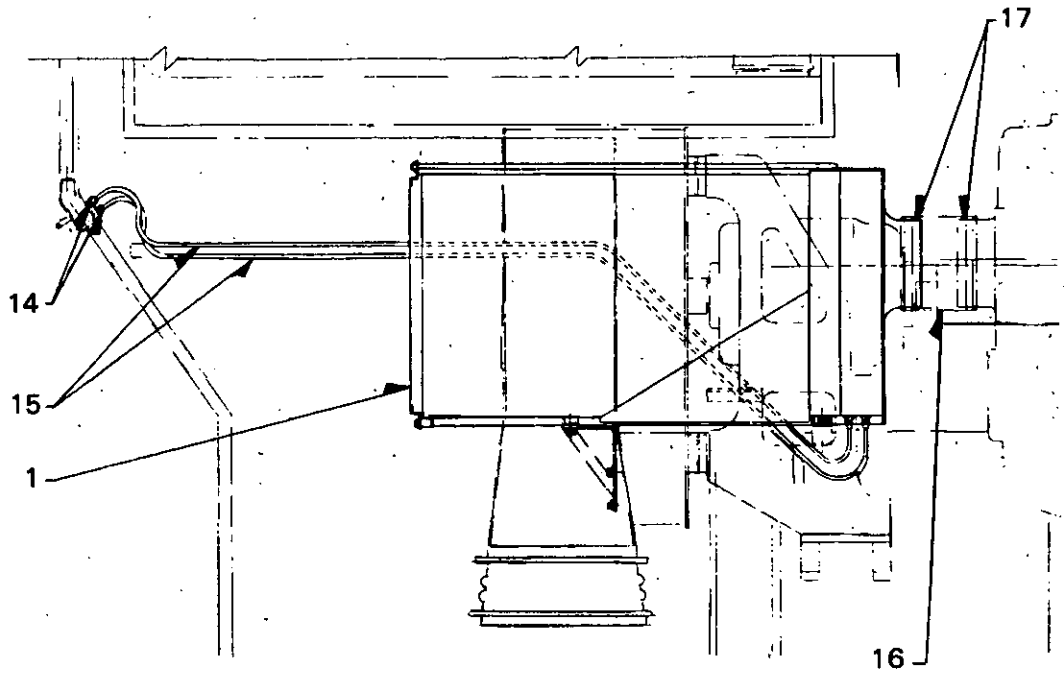
PAPER AND FIBERGLASS ENGINE AIR FILTERS



END VIEW



VIEW A



SIDE VIEW

PLATE E181-2

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
16-645F3B Engines
SD50 and SD50S Locomotives

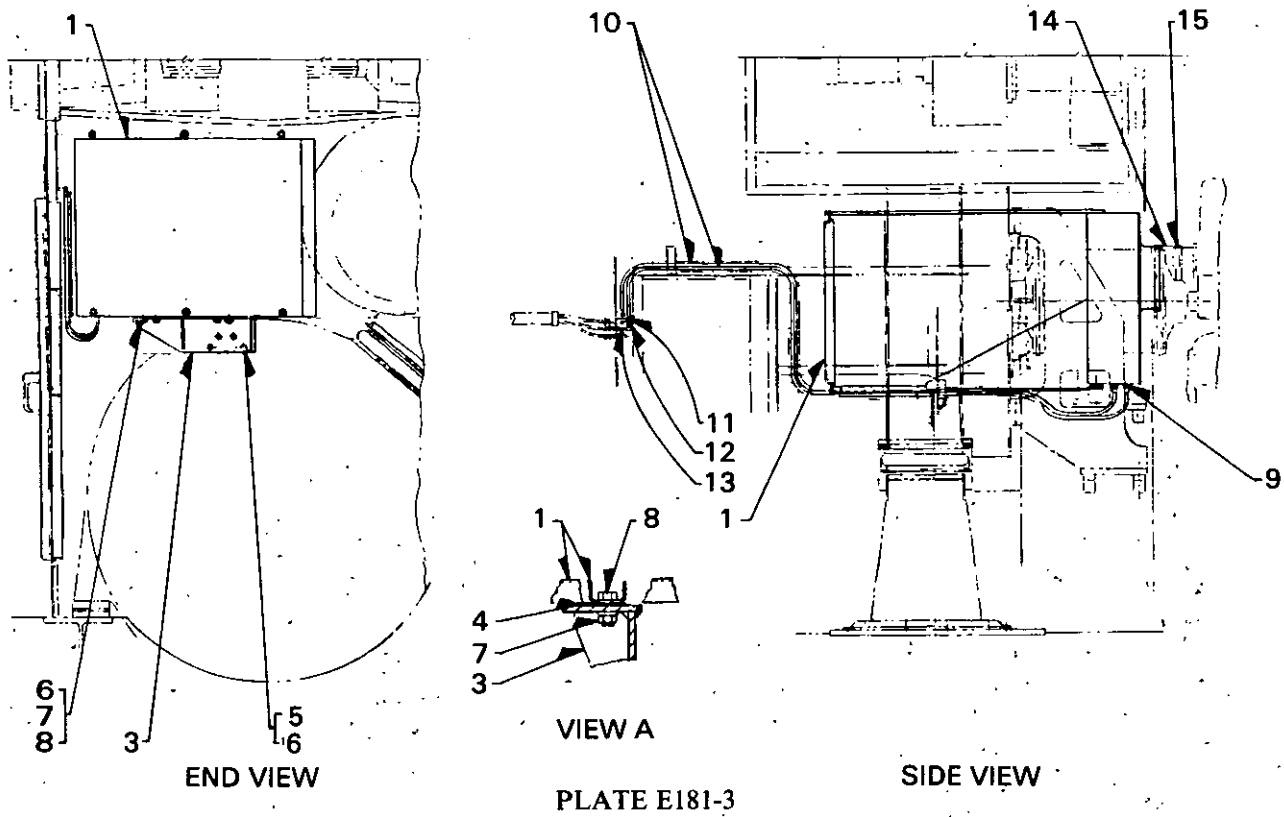


PLATE E181-3

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	B	SD50 and SD50S locomotives
1	8410726	1	-	HOUSING ASM. .. Filter
1	8469004	-	1	HOUSING ASM. .. Filter
*2	9093587	12	-	ELEMENT .. Filter
*2	8498367	-	12	ELEMENT .. Filter
3	9544323	1	1	BRACKET ASM. .. Mounting
4	8348608	A.R.		SHIM .. Filter mounting - 2 x 3 x 16 gauge
5	179881	8	8	BOLT .. Hex head 1/2-13 x 1
6	8423734	12	12	WASHER .. 17/32 I.D. x 1-1/4 O.D.
7	102637	4	4	NUT .. Hex 1/2-13
8	179885	4	4	BOLT .. Hex head 1/2-13 x 1-1/2
9	8040312	2	2	CONNECTOR .. 3/8 tube x 1/8 MPT
10	8461389	2	2	TUBE ASM. .. Cabinet to filter
11	118755	1	1	ELBOW .. 3/8 tube x 1/4 MPT - 90°
12	118576	1	1	ELBOW .. 3/8 tube x 1/4 FPT - 90°
13	8072396	1	1	NIPPLE .. 1/4 x 2 threaded both ends
14	8347632	1	1	DUCT .. Air
15	8373018	2	2	CLAMP .. Hose

42180

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filters and Mounting
12,16,20-645E3 and 16-645E3A Engines
PLATE D181-4

Ref. No.	Part Number	Quantity Required										Description
		A	-	-	-	-	-	-	-	-	-	12-645E3 engine - GP39 locomotive
		-	B	-	-	-	-	-	-	-	-	12-645E3 engine - SD39, SDL39 locomotives
		-	-	C	-	-	-	-	-	-	-	12-645E3 engine - SDL39 locomotive
		-	-	-	D	E	-	-	-	-	-	16-645E3 engine - GP40 locomotive
		-	-	-	-	-	F	-	-	-	-	16-645E3 engine - SD40 locomotive
		-	-	-	-	-	-	G	-	-	-	16-645E3 engine - GT26, GT26CW locomotives
		-	-	-	-	-	-	-	H	-	-	16-645E3A engine - DD40X locomotive
		-	-	-	-	-	-	-	-	J	-	20-645E3 engine - SD45 locomotive
		-	-	-	-	-	-	-	-	-	K	20-645E3 engine - F45 and FP45 locomotive
1	8426301	1	-	-	-	-	-	-	-	-	-	HOLDER ASM. .. Filter
1	8410667	-	1	-	-	-	-	-	-	-	-	HOLDER ASM. .. Filter
1	8469476	-	-	1	-	-	-	-	-	-	-	HOLDER ASM. .. Filter
1	8410745	-	-	-	1	1	-	-	-	-	-	HOLDER ASM. .. Filter
1	8410726	-	-	-	-	-	1	-	-	1	1	HOLDER ASM. .. Fltr. - Repl. 8377709
1	8447202	-	-	-	-	-	-	1	-	-	-	HOLDER ASM. .. Filter
1	8424749	-	-	-	-	-	-	-	1	-	-	HOLDER ASM. .. Filter
2	9093588	12	12	-	12	12	-	12	-	-	-	ELEMENT .. Filter - Repl. 8375073
2	8498366	-	-	12	-	-	-	-	-	-	-	ELEMENT .. Filter - Repl. 8469002
2	9093587	-	-	-	-	-	12	-	12	12	12	ELEMENT .. Filter - Repl. 8377042
3	8377613	1	-	-	1	-	1	-	-	1	1	BRACKET ASM. .. Mounting
3	8411372	-	1	1	-	-	-	-	-	-	-	BRACKET ASM. .. Mounting
3	8426375	-	-	-	-	1	-	1	1	-	-	BRACKET ASM. .. Mounting
4	8415273	1	1	1	1	1	1	1	-	1	1	SWITCH .. Vacuum - Repl. by 8490137
4	8388557	-	-	-	-	-	-	-	1	-	-	SWITCH .. Vacuum - Repl. by 8490137
4A	8490137	1	1	1	1	1	1	1	1	1	1	SWITCH .. Press. Repl. 8415273 and and 8388557
5	8490132	1	1	1	1	1	1	1	1	1	1	PLATE .. Pressure switch
6	8473448	1	1	1	1	1	1	1	1	1	1	TUBE ASM. .. Filter to vacuum switch
7	9316152	As Required										Tubing - 1/4 O.D. x .170 I.D. - Nylon - approx. 8-1/4 in. req.'d - Formerly 8860536
8	8453868	2	2	2	2	2	2	2	2	2	2	NUT .. 1/4 O.D. tube
9	8453869	2	2	2	2	2	2	2	2	2	2	SLEEVE .. 1/4 O.D. tube
10	8453870	2	2	2	2	2	2	2	2	2	2	SEAT .. 1/4 O.D. tube
11	114794	1	1	1	1	1	1	1	1	1	1	NIPPLE .. 1/8 MPT x 2 in. long
12	127887	1	1	1	1	1	1	1	1	1	1	ELBOW .. 1/4 tube x 1/8 FPT
13	8160443	1	1	1	1	1	1	1	1	1	1	ELBOW .. 1/4 tube x 1/4 tube
14	120395	2	2	2	2	2	2	2	2	2	2	WASHER .. 15/32 I.D. flat
15	272121	1	1	1	1	1	1	1	1	1	1	NUT .. Hex head 7/16-20
16	8455349	1	1	1	1	1	1	1	1	1	1	PLUG .. Filter - 1/8 N.P.T.
17	8330835	1	1	1	1	1	1	1	1	1	1	CONNECTOR .. 1/2 box - Straight liquid tight
*18	9419643	2	2	2	2	2	2	2	2	2	2	SCREW .. Hex washer 8/32 x 1/2 - Head tapping
*19	8392855	1	1	1	1	1	1	1	1	1	1	RELAY .. Latching

Used Only with 8490137 switch

19177, 20265, 20564, 22096, 25458, 20264, 20383, 21164, 23688, 27664

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Ref. No.	Part Number	Quantity Required										Description
		A	B	C	D	E	F	G	H	J	K	
*20	8165083	1	1	1	1	1	1	1	1	1	1	PAD .. Tapping - Formerly applied Column G
*20	8219890	-	-	-	-	-	-	1	-	-	-	PAD .. Tapping
21	8455574	As Required										CONDUIT .. 1/2 in. liquid tight flex. - metallic - 25 ft.
22	8116953	As Required										CONDUIT .. 1/2 in. rigid alum. - 12 ft. -
23	8330797	1	1	1	1	1	1	1	1	1	1	CONNECTOR .. 1/2 in. female - Straight
24	8240529	1	1	1	1	1	1	1	2	1	1	CONNECTOR .. 1/2 in. male - 90° formerly applied Column G
24	8330835	-	-	-	-	-	-	1	-	-	-	CONNECTOR .. 1/2 in. male - Straight
25	8038594	1	1	1	1	1	1	1	1	1	1	BUSHING .. Female insul. - 1/2 in.
*26	8038584	-	-	-	-	-	-	-	-	2	2	NUT .. Lock - 1/2 in. conduit
*27	8419416	-	-	-	-	-	-	-	1	-	-	CONNECTOR .. Conduit - 1/2 FPT
*28	8426990	-	-	-	-	-	-	-	1	-	-	FLANGE .. Conduit hub
29	179880	8	8	8	4	-	4	4	4	4	4	BOLT .. Hex head 1/2-13 x 7/8
30	179881	-	-	-	4	7	4	-	-	4	4	BOLT .. Hex head 1/2-13 x 1
31	8060971	1	1	1	1	1	1	1	1	1	1	NIPPLE .. Short pipe - 1/4 MPT
32	119290	1	1	1	1	1	1	1	1	1	1	NIPPLE .. Pipe - 1/4 MPT x 2-1/2 in.
33	8050093	1	1	1	1	1	1	1	1	1	1	TEE .. 1/4 FPT x 1/4 FPT x 1/4 FPT
34	103878	1	1	1	1	1	1	1	1	1	1	PLUG .. Pipe - 1/4 MPT - Sq. hd.
35	8040347	1	1	1	1	1	1	1	1	1	1	ELBOW .. 1/4 tube - 90° Formerly applied Column G
35	8160443	-	-	-	-	-	-	1	-	-	-	ELBOW .. 1/4 flared tube - 90°
36	187395	1	1	1	-	-	-	-	-	-	-	COUPLING .. Pipe - 1/4 FPT
*37	105409	-	-	-	1	1	1	1	1	1	1	COUPLING .. Pipe - 1/4 FPT
38	103878	1	1	1	1	1	1	1	1	1	1	PLUG .. Pipe - 1/4 MPT - Sq. head
39	103881	1	1	1	1	-	1	-	-	1	1	PLUG .. Pipe - 3/4 MPT - Sq. head
40	118748	1	1	1	1	1	1	1	1	1	1	CONNECTOR .. 1/4 tube x 1/8 MPT
41	6531397	2	2	2	2	2	2	2	2	2	2	FITTING .. Hose connector - 1/4 tube
42	8337906	As Req.				-	AR	-	-	AR	AR	SHIM .. Holder mounting - 2 x 3-16 gauge
43	8348608	-	-	-	-	AR	-	-	-	-	-	SHIM .. Holder mounting - 2 x 3-16 gauge
44A	8432866	-	-	-	-	-	-	A.R.		-	-	SHIM .. Holder mounting - 1-1/2 x 3-1/2 - 16 gauge - Formerly applied Col. G
44B	8432867	-	-	-	-	-	-	A.R.		-	-	SHIM .. Holder mounting - 1-1/2 x 3-1/2 - 11 gauge - Replaces 8432868
44C	8432868	-	-	-	-	-	-	A.R.		-	-	SHIM .. Holder mounting - 1-1/2 x 3-1/2 - 1/4 in. thick - Replaced by 2-8432867
45	179791	2	2	2	2	2	2	4	2	2	2	BOLT .. Hex head 1/4-20 x 1/2
46	103319	2	2	2	2	2	2	4	2	2	2	WASHER .. Lock 1/4
*47	8123281	2	2	2	2	2	2	2	2	2	2	LUG .. Terminal - No. 10
*48	8272337	6	6	6	6	6	6	2	2	6	6	RECEPTACLE .. Terminal
49	103343	8	8	8	-	-	-	-	-	-	-	WASHER .. Plain 1/2
50	179885	4	4	4	4	2	4	-	-	4	4	BOLT .. Hex head 1/2-13 x 1-1/2
51	103323	12	12	12	12	9	12	9	9	12	12	WASHER .. Lock 1/2 - Form. appl. Col. G
52	102637	4	4	4	4	2	4	2	2	4	4	NUT .. Hex 1/2-13
*53	179879	-	-	-	-	-	-	3	3	-	-	BOLT .. Hex head 1/2-13 x 3/4
*54	179883	-	-	-	-	-	-	2	2	-	-	BOLT .. Hex head 1/2-13 x 1-1/4
*55	8275731	-	-	-	4	6	4	6	6	4	4	WASHER .. Plain 1/2 formerly applied Column G
*55	8423734	-	-	-	-	-	-	9	-	-	-	WASHER .. Plain 1-1/4

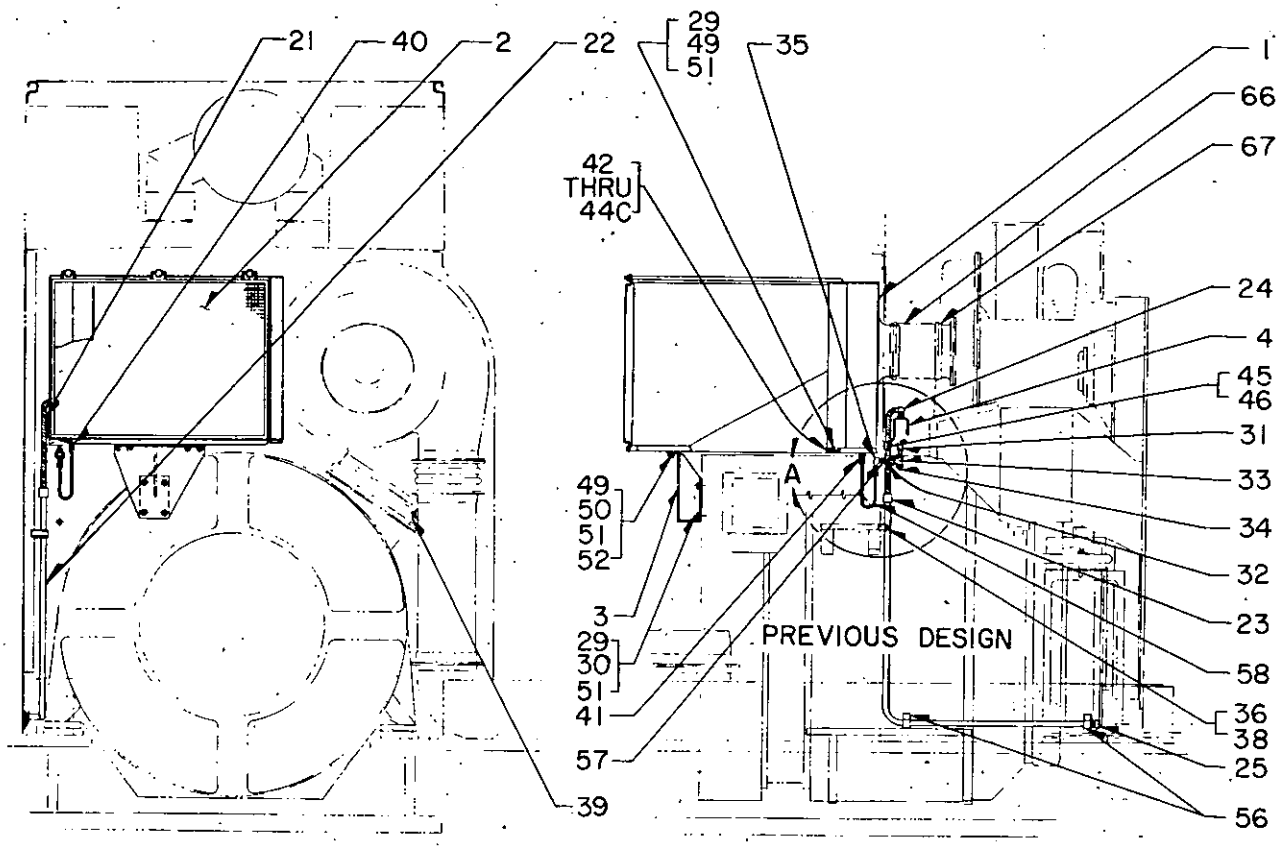
Used only with 8415273 and 8388557 switches

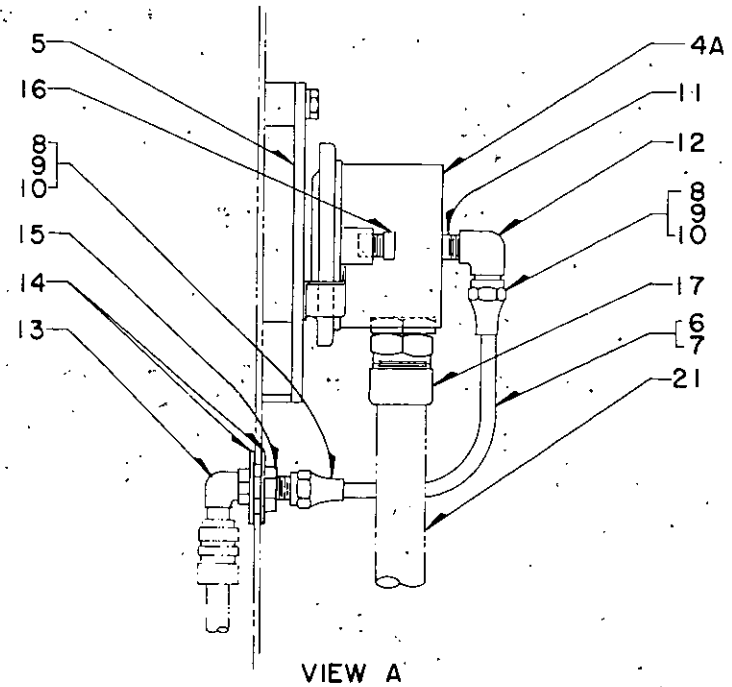
P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Ref. No.	Part Number	Quantity Required										Description
		A	B	C	D	E	F	G	H	J	K	
56	8108115	3	3	3	3	3	3	2	2	3	3	CLAMP ASM. .. Conduit retaining
57	8390271	1	1	1	1	1	1	1	1	1	1	GROMMET .. Rubber - 9/16 I.D. - Used only with 8415273 and 8388557 switches - Formerly applied Column G
58	8379526	As Required										HOSE .. 3/16 I.D. x 3/8 O.D. Approx. 15 in. required formerly applied Column G
*59	8468611	As Required										CABLE .. No. 14 - 19/27 - 500 ft. lg. - Replaces 8421202 and 8187790 - Approx. 75 ft. req. except DDA40X and GT26 - Aprox. 50 ft. req. DDA40X and GT26
*60	8332580	-	-	-	1	1	1	-	-	-	-	GROMMET .. Non-metallic - 12-3/4 in. lg.
*61	103877	-	-	-	-	-	-	1	-	-	-	PLUG .. Pipe - 1/8 MPT - Sq. hd.
*62	8038644	-	-	-	-	-	-	1	-	-	-	BUSHING .. Conduit - 3/4 MPT
*63	8038595	-	-	-	-	-	-	1	-	-	-	BUSHING .. End - 3/4 insulated
*64	9420156	-	-	-	-	-	-	-	4	-	-	SCREW .. Hex washer head 1/4-20 x 1/2 - Tapping
*65	8221975	-	-	-	-	-	-	-	1	-	-	GASKET .. Neoprene - 1 in. wide x 3/16 thick - Approx. 1 foot req'd.
66	8303837	1	1	1	-	-	-	-	-	-	-	DUCT .. Air
66	8347632	-	-	-	1	1	1	1	1	-	-	DUCT .. Air
66	8365038	-	-	-	-	-	-	-	-	1	1	DUCT .. Air
67	8375876	2	2	2	-	-	-	-	-	-	-	CLAMP .. Hose
67	8373018	-	-	-	2	2	2	2	2	2	2	CLAMP .. Hose
*68	8384186	2	2	2	-	-	-	-	-	-	-	RETAINER .. Hose
*68	8374278	-	-	-	2	2	2	2	2	2	2	RETAINER .. Hose - Formerly applied

PAPER AND FIBERGLASS ENGINE AIR FILTERS





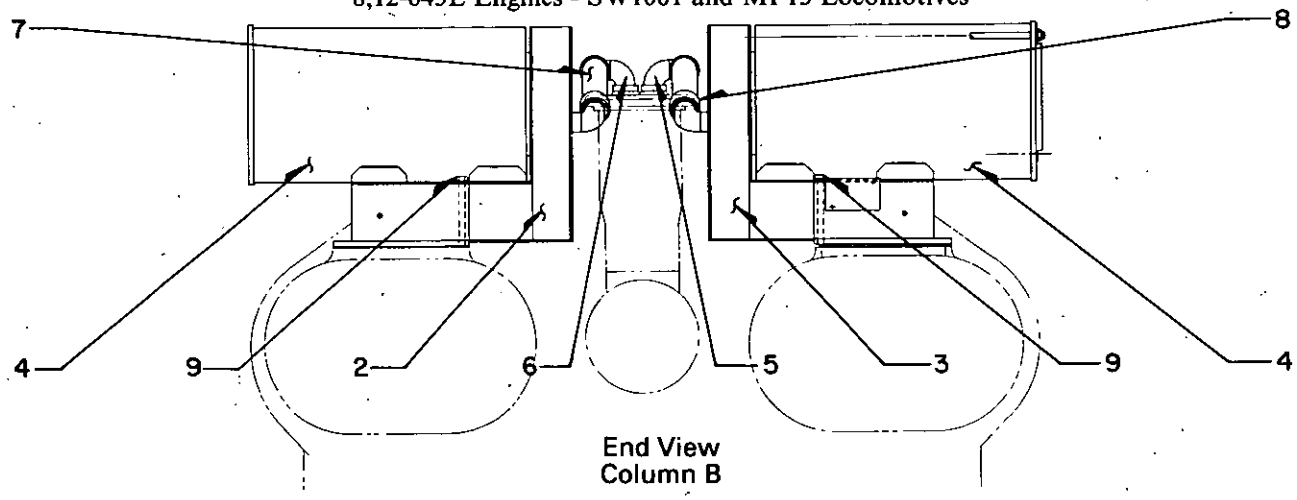
VIEW A
CURRENT DESIGN

PLATE D181-4

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
8,12-645E Engines - SW1001 and MP15 Locomotives



End View
Column B

PLATE D181-5

Ref. No.	Part Number	Qty. Req.		Description
		A	-	SW1001 locomotives
		-	B	MP15 locomotives
*1	9325161	1	-	HOLDER ASM. .. Filter
2	9093555	-	1	HOLDER ASM. .. Filter - Left side
3	9093554	-	1	HOLDER ASM. .. Filter - Right side
4	9093553	3	4	ELEMENT .. Filter - Paper
5	8483518	1	1	PIPE ASM. .. Flanged - Oil separator to hose - Right bank
6	8483517	-	1	PIPE ASM. .. Flanged - Oil separator to hose - Left bank
7	9505277	1	-	HOSE .. Oil separator pipe - 5 in. long - Formerly 8291949
7	8291949	-	2	HOSE .. Oil separator pipe - 10 in. long
8	8048698	2	4	CLAMP .. Hose
9	179885	4	4	BOLT .. Hex head 1/2-13 x 1-1/2 - Filter holder mounting
9	215722	6	6	BOLT .. Hex head 1/2-13 x 5-3/4 - Filter holder mounting
*10	103323	4	4	WASHER .. Lock 1/2
*11	8490138	1	-	SWITCH .. Pressure - Setting 18 in. water
*12	8116953	AR	-	CONDUIT .. 1/2 inch rigid aluminum - 12 ft. length - Approximately 4 feet required
*13	8455574	AR	-	CONDUIT .. 1/2 inch liquid tight flexible metallic - 25 ft. length - Approximately 2 feet required
*14	8330797	1	-	CONNECTOR .. 1/2 inch male - 45°
*15	8240529	1	-	CONNECTOR .. Liquid tight - 1/2 inch - 90° male
*16	8468611	AR	-	CABLE .. No. 14 - Gray - 500 ft. length - 19 ft. required
*17	9316152	AR	-	TUBING .. 1/4 O.D. x .170 I.D. - Nylon - Sold by foot - Approximately 1 ft. required
*18	8453868	2	-	NUT .. Tube - 1/4
*19	8453869	2	-	SLEEVE .. Tube - 1/4
*20	8453870	2	-	SEAT .. Tube - 1/4
*21	8108197	2	-	CLAMP ASM. .. 1/2 in. pipe
*22	125620	1	-	CONNECTOR .. 1/4 tube x 1/8 FPT
*23	127887	1	-	ELBOW .. 1/4 tube x 1/8 FPT - 90°
*24	114794	1	-	NIPPLE .. 1/8 MPT x 2 in. long
*25	8455349	1	-	PLUG .. Filter - 1/8 MPT
*26	8419416	1	-	CONNECTOR .. Conduit - 1/2 FPT
*27	9419643	2	-	SCREW .. Hex washer head - No. 8-32 x 1/2 - Tapping

32457, 36323, 38730, 40277

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
8-645E Engine - GL18M Locomotive

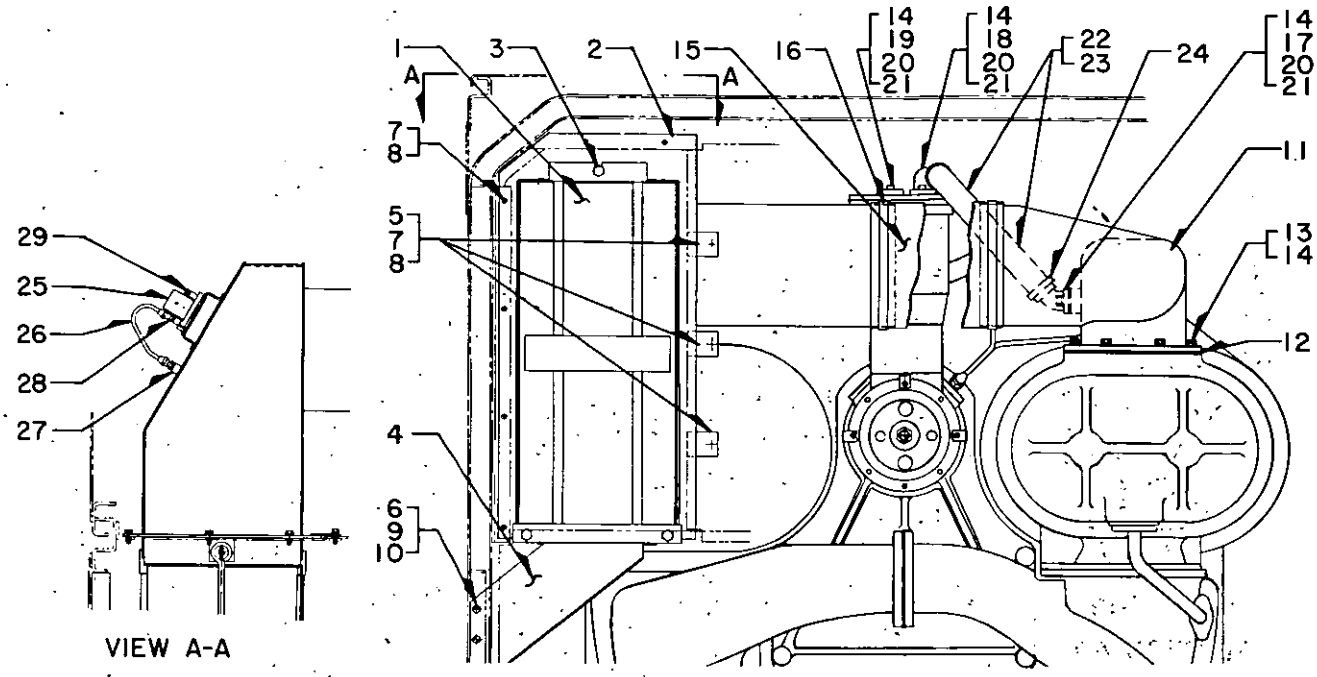


PLATE B181-6

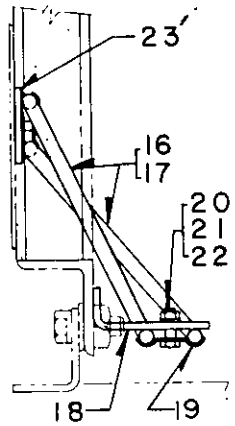
Ref. No.	Part Number	Qty. Req.	Description
1	9093588	4	ELEMENT .. Filter - Paper - Replaces 8375073
2	9328000	1	HOLDER ASM. .. Filter
3	9329169	1	ROD ... Holder frame
4	9329460	1	BRACKET .. Holder support
5	8425397	5	CLIP .. Holder to engineroom partition
6	179839	6	BOLT .. Hex head 3/8-16 x 1 - Bracket mounting
7	180078	11	BOLT .. Hex head 5/16-18 x 7/8 - Holder mounting
8	120214	11	WASHER .. Lock 5/16
9	103321	6	WASHER .. Lock 3/8
10	102635	6	NUT .. Hex 3/8-16
11	9327562	1	ADAPTER .. Engine blower to air filter
12	8024287	1	GASKET ...Adapter to engine blower
13	179885	10	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter mounting
14	6101229	10	WASHER ... Plain 1/2
15	8273627	1	DUCT .. Flexible - Adapter to filter holder
16	8373018	2	CLAMP .. Hose - T-bolt adjustable - Replaces 8273666
17	8165269	1	ELBOW .. Flanged - Right side
ϕ18	8165250	1	ELBOW .. Flanged - Oil separator
ϕ18	8243790	1	ELBOW .. Flanged - Oil separator
19	8048967	1	FLANGE .. Oil separator
20	8084407	3	GASKET .. Elbow and flange
21	181429	6	BOLT .. Hex head 1/2-20 x 1-1/4 - Elbow and flange mounting - Form. 181433
22	8131113	1	HOSE .. Oil separator
23	8131112	1	SPRING .. Hose
24	8374760	2	CLAMP .. Hose
25	8490137	1	SWITCH .. Pressure - Setting - 14 in. water - Formerly 8490138
26	8453472	1	TUBE ASM. .. Switch to filter holder - Fomerly 9329618
27	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT
28	118748	1	CONNECTOR .. 1/4 tube x 1/8 MPT
29	8455349	1	PLUG .. Filter - 1/8 N.P.T.

9329571B, 9327563D

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12,16-645E3,E3B Engines - GT22C,GT22CU,GT22CW,GT22LC,GT26CW
GT26CU-2 and GT26CW-2 Locomotives



SECTION A-A

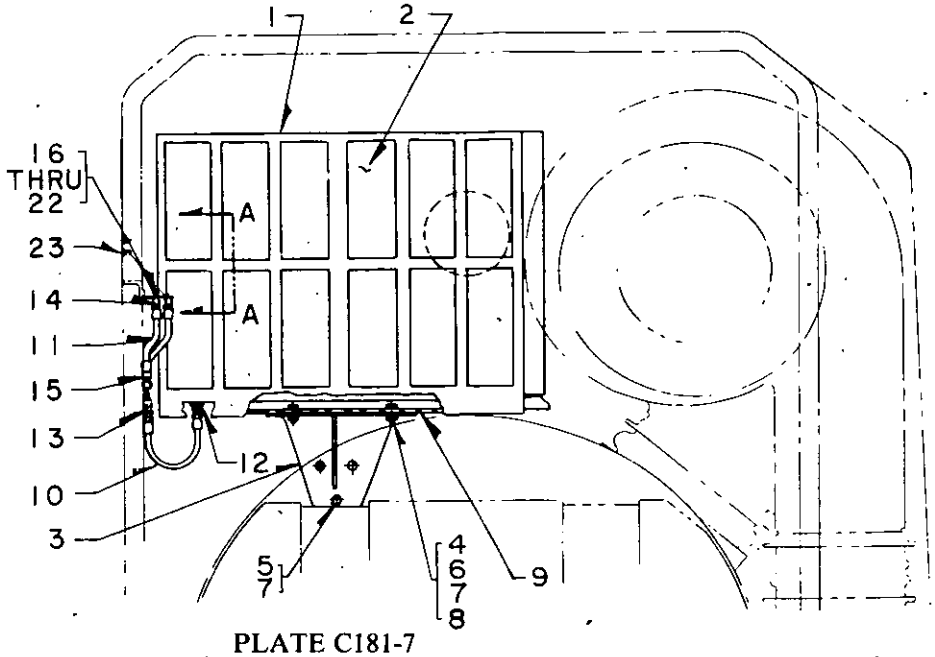


PLATE C181-7

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645E3,E3B engines - GT22C,GT22CU,GT22CW and GT22LC locomotives
		-	B	16-645E3,E3B engines - GT26CW,GT26CU-2 and GT26CW-2 locomotives
1	8473706	1	-	HOLDER ASM. .. Filter
1	8447202	-	1	HOLDER ASM. .. Filter
2	9093588	12	12	ELEMENT .. Filter - Replaces 8375073
3	8426375	1	1	BRACKET ASM. .. Filter holder mounting
4	179885	2	2	BOLT .. Hex head 1/2-13 x 1-1/2 - Housing to bracket
5	179881	7	7	BOLT .. Hex head 1/2-13 x 1 - Bracket to air box and holder to alternator
6	8275731	6	6	WASHER .. Plain 1/2 - Column B formerly applied
6	8423734	-	9	WASHER .. Plain 1-1/4 - Special
7	103323	9	9	WASHER .. Lock 1/2 - Column B formerly applied
8	102637	2	2	NUT .. Hex 1/2-13
9	8348608	1	1	SHIM .. Housing to bracket - 16 ga. x 2 x 3 in.
10	8465304	2	2	HOSE ASM. .. Vacuum - Incl. female fittings - 15 in. long
11	8468533	2	2	HOSE ASM. .. Vacuum - Incl. female fittings - 8 in. long
12	118748	1	1	CONNECTOR .. 1/4 tube x 1/8 MPT
13	8209909	1	1	UNION .. 1/4 tube x 3/8 tube
14	8291316	2	2	ELBOW .. 1/4 tube x 3/8 tube - 90°
15	116453	2	-	ELBOW .. 90° - 1/4 tube x 1/4 MPT
15	187395	2	-	COUPLING .. Pipe 1/4 FPT
15	8040347	-	2	ELBOW .. 1/4 tube x 1/4 FPT - 90°
16	8098594	A.R.		TUBING .. 3/8 O.D. x .028 wall copper brazed steel 20 ft. - Approx. 26 ft. req.
17	121758	4		NUT .. 3/8 tube
18	8473813	4		BRACKET .. Clamp - Welds to hood
19	8081609	4		CLAMP .. Two way - 3/8 tube x 3/8 tube - 1-1/4 in. tube centers
20	179796	4		BOLT .. Hex head 1/4-20 x 7/8 - Clamp to bracket
21	103319	4		WASHER .. Lock 1/4
22	109084	4		NUT .. Hex 1/4-20
23	8108263	3		CLAMP ASM. .. Two way - 3/8 tube x 3/8 tube - Welds to hood
*24	8108202	2		CLAMP ASM. .. Hanger - 3/8 tube - 6 in. long - Welds to hood
*25	8303837	1	-	DUCT .. Air
*25	8347632	-	1	DUCT .. Air
*26	8375876	2	-	CLAMP .. Air duct
*26	8373018	-	2	CLAMP .. Air duct
*27	8384186	2	-	RETAINER .. Hose - Formerly applied
*27	8374278	-	2	RETAINER .. Hose - Formerly applied

26288, 41619, 8473640A, 27295, 43900, 8476133A

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12-645E3,E3B Engine - JT22CU-2,JT22CW-2,JT22LC-2, and JT22MC Locomotives

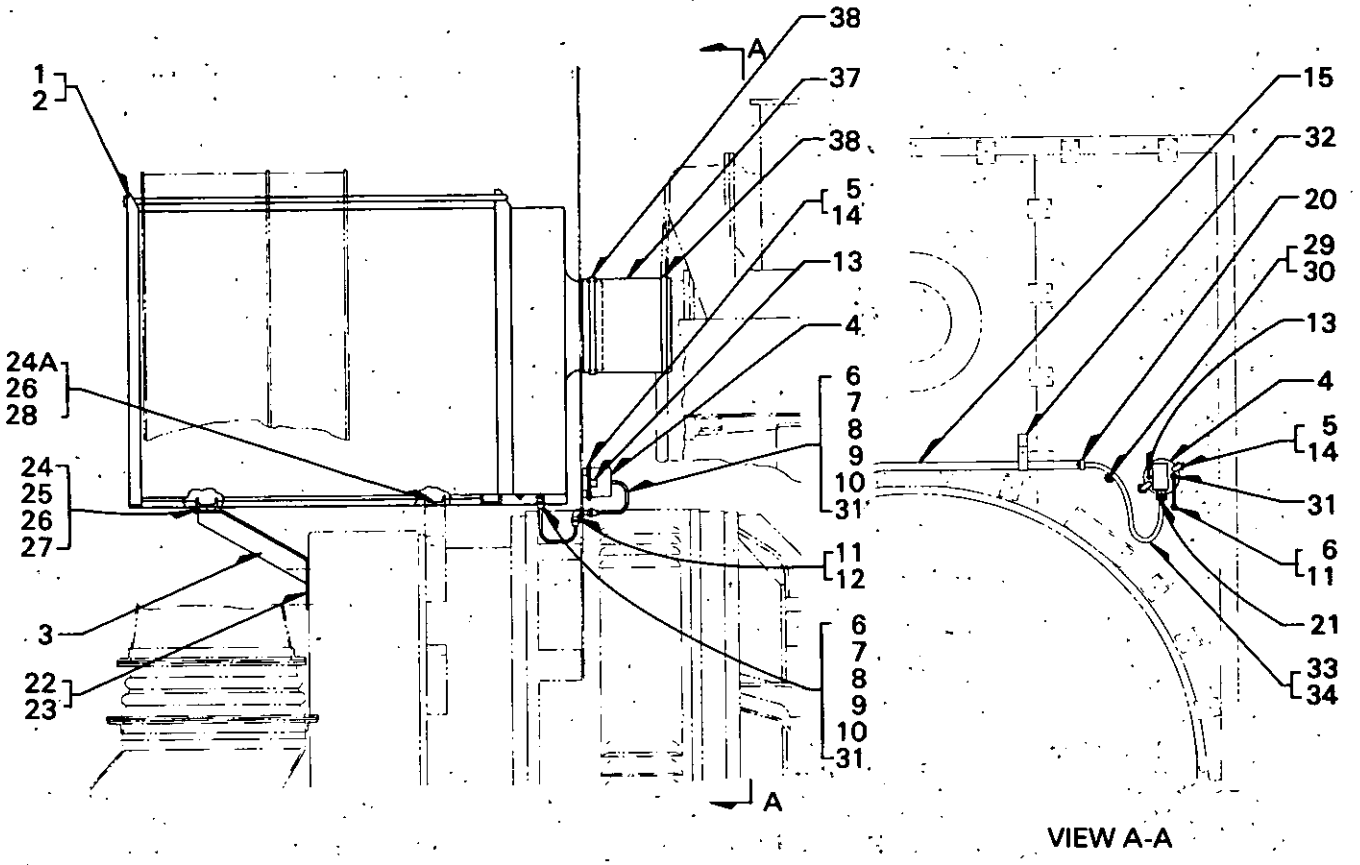


PLATE C181-8

Ref. No.	Part Number	Qty. Req.	Description	
1	8473706	1	FILTER ASM. .. Air intake	
2	9093588	12	ELEMENT .. Filter - Paper	
3	9500845	1	BRACKET ASSEMBLY .. Mounting	
4	8490137	1	SWITCH .. Pressure	
5	8218508	1	PLATE .. Pressure switch mounting	
6	8473448	2	TUBE ASM. .. Air intake filter to vacuum switch	
7	9316152	A.R.	TUBING .. 1/4 O.D. x .170 I.D. - Nylon - 1 ft. length - Approximately 8-1/2 in. required - Formerly 8860536	
8	8453868	4	NUT .. 1/4 O.D. tube	Formerly applied
9	8453869	4	SLEEVE .. 1/4 O.D. tube	
10	8453870	4	SEAT .. 1/4 O.D. tube	
11	8160443	1	ELBOW .. 1/4 tube x 1/4 tube	
12	272121	1	NUT .. Hex 7/16-20	
13	8455349	1	PLUG .. Filter - 1/8 N.P.T.	
14	9419643	2	SCREW .. Hex washer head 8-32 x 1/2 - Tapping - Switch plate mtg.	
15	8116953	A.R.	CONDUIT .. 1/2 in. rigid aluminum - 12 ft. - Approx. 3 ft. 7-7/8 in. required	
*16	8260160	1	ELBOW .. 1/2 N.P.T. pulling	
*17	8271857	1	COVER ASM. .. Pulling elbow	
*18	8271869	1	GASKET .. Cover assembly mounting	
*19	122159	2	SCREW .. Round head No. 8-32 x 1/4 - Slotted	
*19	8038594	2	BUSHING .. Female - Insulated - 1/2	
21	8086270	1	BUSHING .. Strain relief - Male - 1/2 N.P.T.	

36348, 9500846

P.L. No. E181

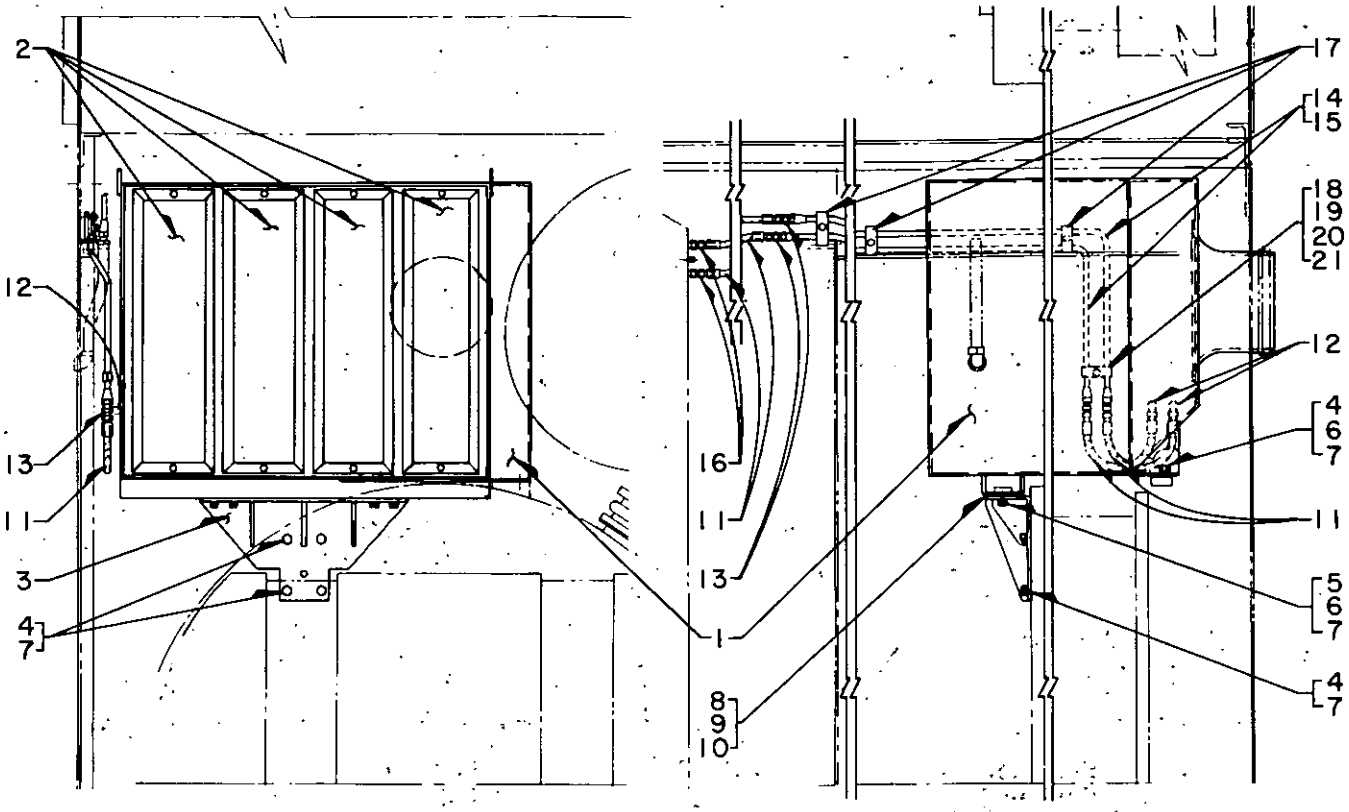
PAPER AND FIBERGLASS ENGINE AIR FILTERS

Ref. No.	Part Number	Qty. Req.	Description	
22	179879	3	BOLT .. Hex head 1/2-13 x 3/4 - Filter brkt. mtg.	
23	8423734	9	WASHER .. Plain - 17/32 I.D. x 1-1/4 O.D. x 3/16 in. thick - Hardened	
24	8432866	A.R.	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 16 gauge - 8432867 - 11 gauge	
24A	8136602	A.R.	SHIM .. Filter Mounting - 1-1/2 x 3 - 22 gauge - 8048974 - 11 gauge	
25	179885	2	BOLT .. Hex head 1/2-13 x 1-1/2 - Filter mtg.	
26	120396	2	WASHER .. Plain 1/2 - Formerly applied	
27	102637	2	NUT .. Hex 1/2-13	
28	179880	4	BOLT .. Hex head 1/2-13 x 7/8 - Filter mtg.	
29	103878	1	PLUG .. Pipe - 1/4 MPT square head	Formerly applied
30	105409	1	COUPLING .. Pipe - 1/4 FPT	
31	118748	2	CONNECTOR .. 1/4 tube x 1/8 MPT	
32	8108197	1	CLAMP ASM. .. 1/2 pipe	
33	8468611	A.R.	CABLE .. No. 14 - 19/27 - 500 ft. - Approximately 66 ft. required	
34	8427194	A.R.	SLEEVING .. Insulation - .512 I.D. - 2 feet required - Form. 8437194	
*35	8272337	2	RECEPTACLE .. Terminal - Faston tab	
*36	8123281	2	LUG .. Terminal - No. 10 stud hole diameter	
37	8303837	1	DUCT .. Air	
38	8375876	2	CLAMP ASM. .. Hose	
*39	8384186	2	RETAINER .. Hose	
*40	8040312	2	CONNECTOR .. 3/8 tube x 1/8 MPT	Currently applied
*41	121323	2	CONNECTOR .. 3/8 tube x 1/4 FPT	
*42	8495879	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - 100 feet - Approximately 17 feet required	
*43	8453871	2	NUT .. Tube 3/8	
*44	8453872	2	SLEEVE .. Tube 3/8	
*45	8453873	2	SEAT .. Tube 3/8	
*46	8108263	2	CLAMP ASM. .. Tube 3/8 - Double	
*47	9559485	5	BRACKET .. Clamp	
*48	8081609	5	CLAMP .. Tube 3/8 - 2 way	
*49	179796	5	BOLT .. Hex head 1/4-20 x 7/8	
*50	103319	5	WASHER .. Lock 1/4	
*51	109084	5	NUT .. Hex 1/4	

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
20-645E3 Engine - DDM45 Locomotive



END VIEW SIDE VIEW

PLATE B181-9

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
1	8410726	1	-	HOUSING ASM. .. Filter
1	8470902	-	1	HOUSING ASM. .. Filter
2	9093587	12	-	ELEMENT .. Filter - Paper
2	8470903	-	4	ELEMENT .. Filter - Fiberglass disposable bag type
3	8377613	1	-	BRACKET ASM. .. Mounting
3	8470904	-	1	BRACKET ASM. .. Mounting
4	179881	8	8	BOLT .. Hex head 1/2-13 x 1
5	179887	4	4	BOLT .. Hex head 1/2-13 x 1-3/4
6	106265	8	8	WASHER .. Plain 1/2
7	103323	12	12	WASHER .. Lock 1/2
8	8432866	AR	AR	SHIM .. 1-1/2 x 3-1/2 in. long - 16 gauge
9	8432867	AR	AR	SHIM .. 1-1/2 x 3-1/2 in. long - 11 gauge
10	8432868	AR	AR	SHIM .. 1-1/2 x 3-1/2 in. long - 1/4 in. thick - Formerly applied
11	8465304	4	4	HOSE ASM.
12	118753	2	2	ELBOW .. 1/4 tube x 1/8 MPT
13	8209909	4	4	UNION .. 1/4 tube x 3/8 tube
14	8098594	A.R.		TUBING .. Copper brazed steel - 3/8 O.D. x .028 wall - Approx. 11 ft. required
15	121758	4	4	NUT .. 3/8 tube
16	8040325	2	2	CONNECTOR .. 1/4 tube x 1/4 FPT
17	8250529	3	3	CLAMP .. Double tube 3/8
18	8173765	2	2	CLAMP .. Two way - 3/8 in. x 3/8 in. tube
19	179796	1	1	BOLT .. Hex head 1/4-20 x 7/8 - Clamp mounting
20	103319	1	1	WASHER .. Lock 1/4
21	109084	1	1	NUT .. Hex 1/4-20
*22	8365038	1	1	DUCT .. Air
*23	8373018	2	2	CLAMP .. Hose
*24	8374278	2	2	RETAINER .. Hose

30593, 29658

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12-645E Engine - GP15-1 Locomotive

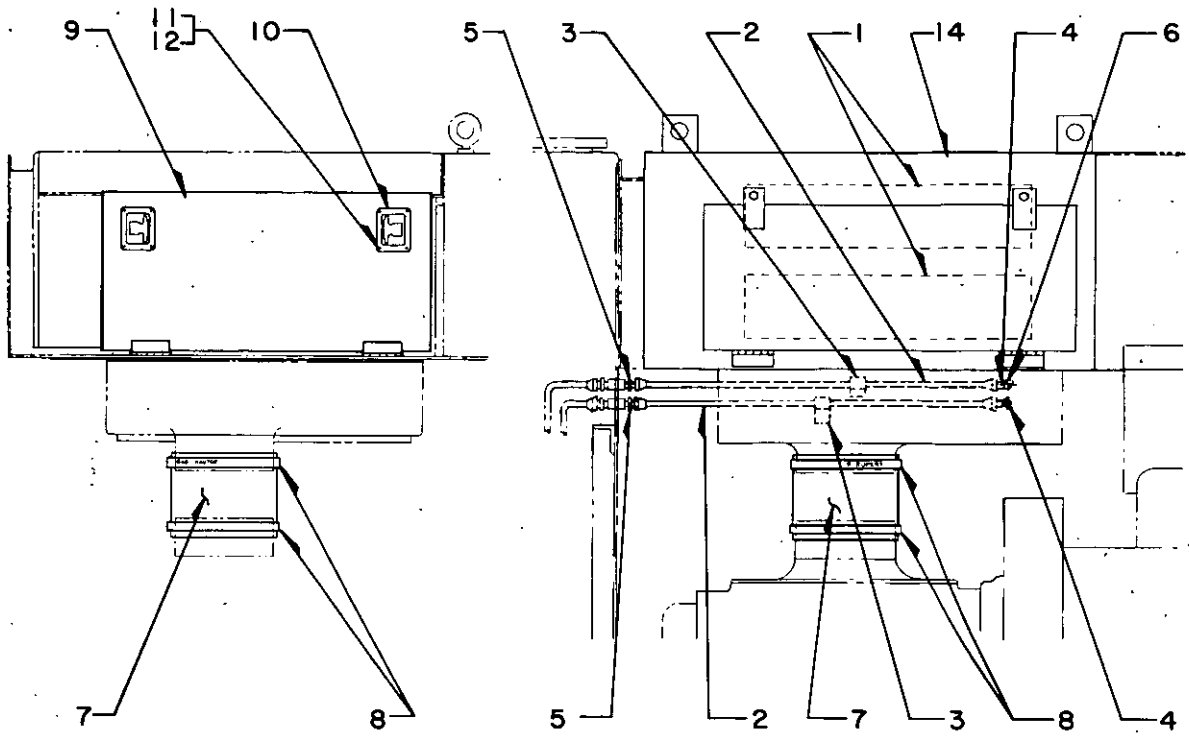


PLATE B181-10

Ref. No.	Part Number	Qty. Req.		Description
		A	-	GP15-1 locomotives with air filter hatch *welded* to carbody
		-	B	GP15-1 locomotives with air filter hatch *bolted* to carbody
ϕ*1	9093588	6	6	ELEMENT .. Filter - Paper
ϕ1	8470903	2	2	ELEMENT .. Filter - Fiberglass
2	8461408	2	2	TUBE ASM. .. Air intake filter to engineroom partition - Formerly 9316206, 9536053, 8453486
3	8108110	2	2	CLAMP ASM. .. Tube
4	118755	2	2	ELBOW .. 3/8 tube x 1/4 MPT
5	8037261	2	2	CONNECTOR .. 3/8 tube x 1/2 MPT
6	103878	1	1	PLUG .. Pipe - 1/4 MPT - Square head
7	8430475	2	2	DUCT .. Air intake
8	8373018	4	4	CLAMP ASM. .. Hose
9	9316183	1	-	DOOR ASM. .. Filter access - Incl. hinges - Welded to hatch
10	8324696	2	-	LATCH .. Door - "T" handle
11	155198	8	-	SCREW .. Round head No. 10-32 x 5/8 - Cross recess
12	8035122	8	-	NUT .. Hex lock 10-32
*13	8421197	AR	-	SEAL .. Door - 1-1/4 x 3/8 in. - Sold per ft. - Approx. 8 ft. requried
14	9502247	-	1	HATCH ASM. .. Filter - Includes access doors - Bolted to carbody
*15	179885	-	12	BOLT .. Hex head 1/2-13 x 1-1/2 - Hatch mounting
*16	103343	-	12	WASHER .. Plain 1/2

33252, 33375, 34513, 36978

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

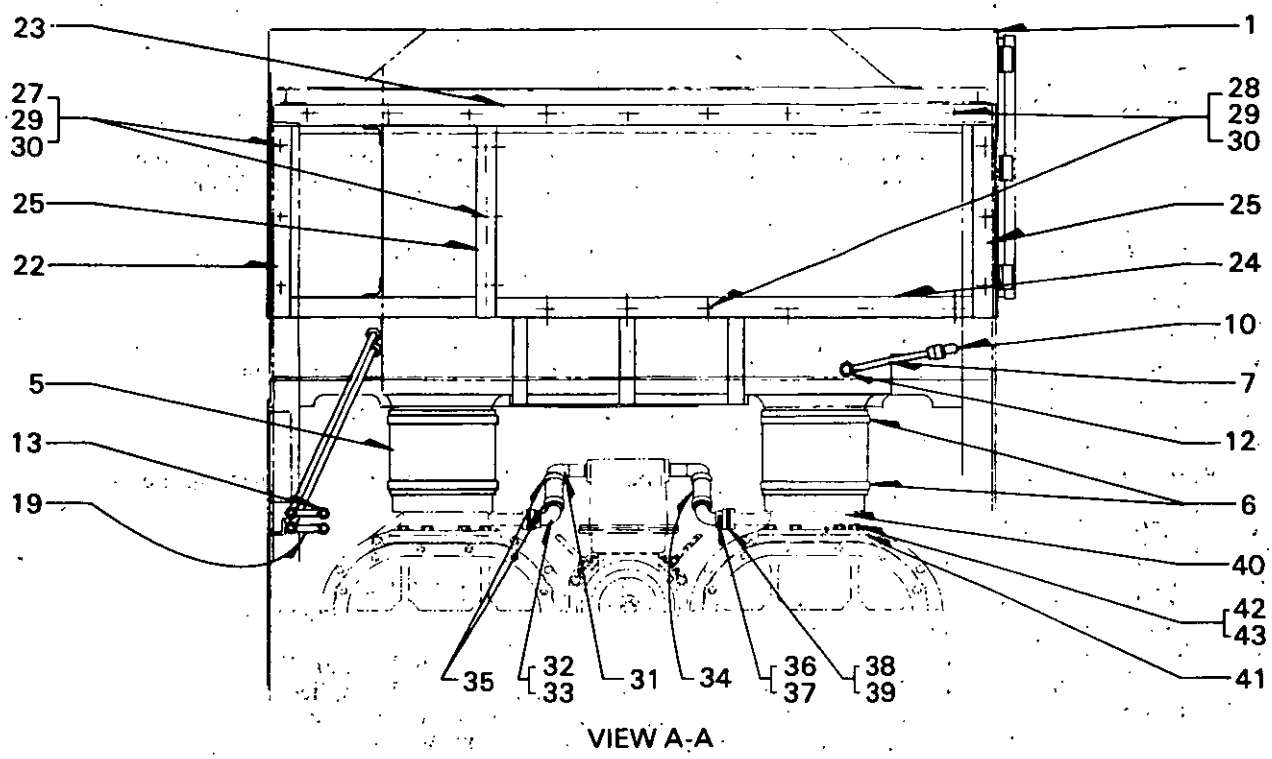
Paper Element Engine Air Filter and Mounting
16-645E Engine - GP38-2, SD38-2 and SDL38-2 Locomotives
PLATE C181-11

Ref. No.	Part Number	Qty. Req.		Description
		A	-	GP38-2,SD38-2 and SDL38-2 locomotives with paper element air filters
		-	B	GP38-2 and SD38-2 locomotives with fiberglass element air filters
*1	8431007	1	-	FILTER ASM. .. Air intake - Paper
1	8475458	-	1	HOUSING ASM. .. Air intake filter - Fiberglass
*2	8486279	-	3	FRAME .. Sealing
*3	8035146	-	6	NUT .. Stop - Elastic - 3/8-16
*4	9093588	10	-	ELEMENT .. Filter - Paper
4	8470903	-	3	ELEMENT .. Filter - Fiberglass disposable bag-type cartridge
5	8430475	2	2	DUCT ASM. .. Flexible - Adapter to air intake filter
6	8373018	4	4	CLAMP .. Flexible hose
7	8116729	AR	AR	TUBING .. 5/8 O.D. copper .049 thick - 50 feet length - Form. applied - Approximately 2 feet required
8	144308	2	2	NUT .. Tube 5/8 - Formerly applied
*9	118755	2	2	ELBOW .. 3/8 tube x 1/4 MPT
10	144283	1	1	ELBOW .. 5/8 tube x 1/2 FPT - Formerly applied
11	118750	2	2	CONNECTOR .. 3/8 tube x 1/4 MPT - Formerly applied
12	8037261	2	2	CONNECTOR .. 3/8 tube x 1/2 MPT
13	121323	2	2	CONNECTOR .. 3/8 tube x 1/4 FPT - Formerly 8040325
14	144461	1	1	CONNECTOR .. 5/8 tube x 1/2 FPT - Formerly applied
15	9315292	AR	AR	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approx. 7 feet required - Formerly 8098594
16	8453871	4	4	NUT .. Tube 3/8 - Formerly 144308
17	8453872	4	4	SLEEVE .. 3/8 tube
18	8453873	4	4	SEAT .. 3/8 tube
19	8465304	2	2	HOSE ASM. .. Inertial filter tubing - Formerly 8065304 - Form. appl.
20	8209909	2	2	UNION .. 1/4 tube x 3/8 tube - Formerly applied
21	8108110	2	2	CLAMP .. Tube - Except Col. B SD38-2 locomotives only
21	8108111	-	2	CLAMP .. Tube - SD38-2 locomotive only
22	8431581	1	1	GASKET .. Filter - Left side
23	8431582	1	1	GASKET .. Filter - Top
24	8431583	1	1	GASKET .. Filter - Bottom
25	8431584	2	2	GASKET .. Filter - Right side
26	179883	4	4	BOLT .. Hex head 1/2-13 x 1-1/4 - Formerly Qty. (6) required
27	179885	9	9	BOLT .. Hex head 1/2-13 x 1-1/2
28	179887	17	17	BOLT .. Hex head 1/2-13 x 1-3/4 - Formerly Qty. (15) required
29	103343	30	30	WASHER .. Plain 1/2
30	103323	30	30	WASHER .. Lock 1/2
31	8432170	2	2	PIPE ASM. .. Lube oil separator
32	8432171	2	2	PIPE ASM. .. Swivel flanged
33	8306502	2	2	GASKET .. Flanged pipe
34	8040171	A.R.		HOSE .. Oil separator pipe - 36 in. long - Replaces 8432322 - Cut to size
35	8131615	4	4	CLAMP .. Hose
36	181431	4	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Adapter to elbow
37	6101229	4	4	WASHER .. Plain 1/2
38	8407198	2	2	PLATE .. Orifice - Formerly 8436986
39	8084407	4	4	GASKET .. Adapter to elbow
40	8366064	2	2	ADAPTER ASM. .. Air intake
41	8024287	2	2	GASKET .. Air intake adapter to blower
42	179885	18	18	BOLT .. Hex head 1/2-13 x 1-1/2
43	6101229	18	18	WASHER .. Plain 1/2

27575, 8479370C, 25676, 8465303C,
27604, 8475452H, 28521, 8484056A

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS



VIEW A-A

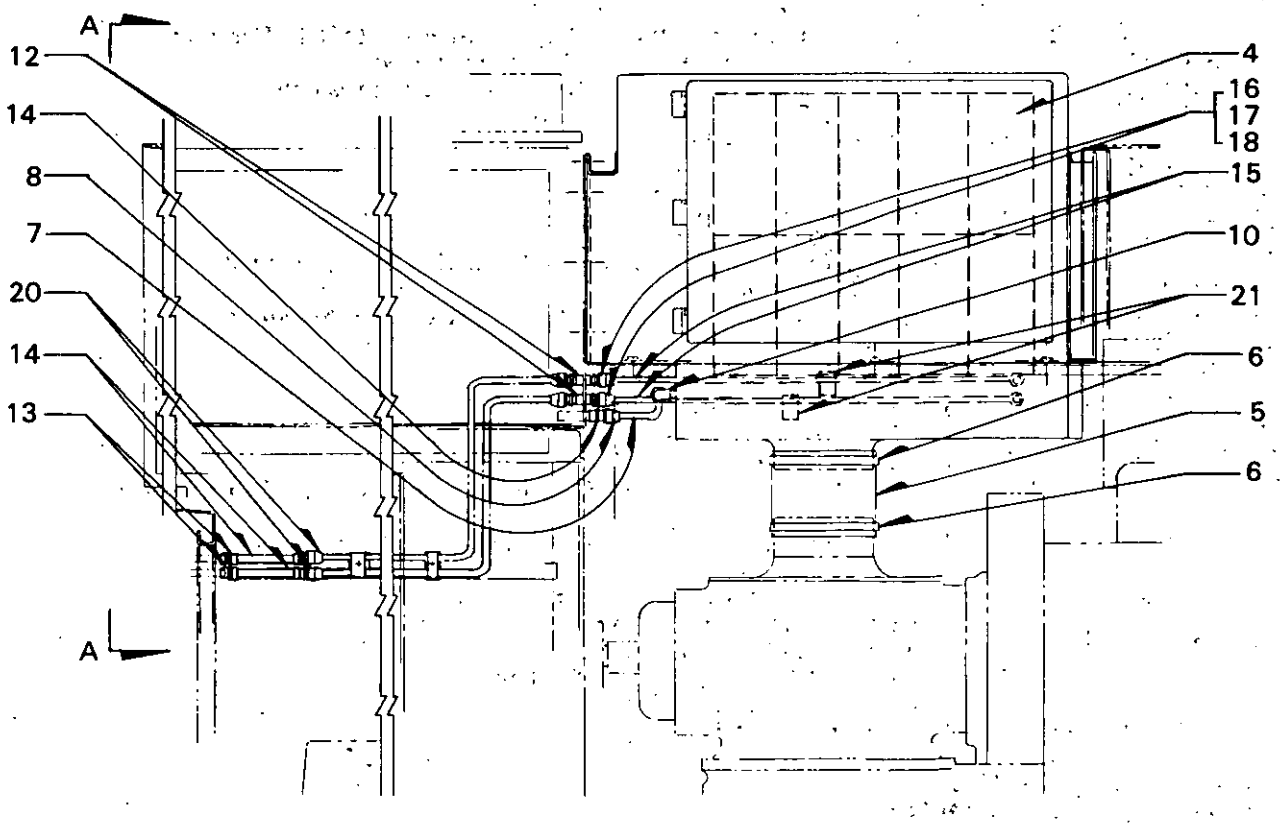


PLATE C181-11

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper and Fiberglass Element Engine Air Filter and Mounting
12-645E3 Engine - SW1500 and MP15 Locomotives
PLATE C181-12

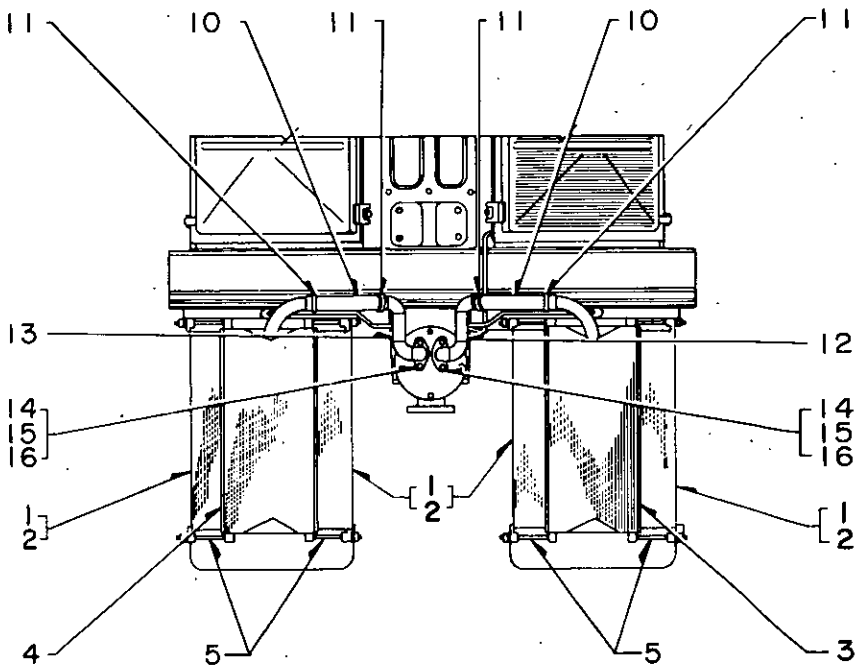
Ref. No.	Part Number	Qty. Req.			Description
		A	-	-	SW1500,MP15 locomotives with fiberglass element air filter
		-	B	-	MP15 locomotive with rectangular paper element air filter
		-	-	C	MP15 locomotive with cylindrical paper element air filter
†1	8449960	4	-	-	FRAME ASM. .. Filter element
†2	8380459	8	-	-	PAD .. Filter - Fiberglass - 16-1/4 x 25-1/4
*2	9331454	-	4	-	ELEMENT .. Rectangular filter - Paper - 19 x 29
2	9093553	-	-	4	ELEMENT .. Cylindrical filter - Paper - 12-3/4 in. O.D.
3	8392645	1	-	-	ADAPTER ASM. .. Filter - Right bank
*3	9331449	-	1	-	ADAPTER ASM. .. Filter - Right bank
3	9093554	-	-	1	HOLDER .. Filter - Right bank
4	8392646	1	-	-	ADAPTER ASM. .. Filter - Left bank
*4	9331448	-	1	-	ADAPTER ASM. .. Filter - Left bank
4	9093555	-	-	1	HOLDER .. Filter - Left bank
5	8303844	16	-	-	FASTENER .. Filter
*5		-	16	-	FASTENER .. Filter
*6	8380070	8	-	-	GASKET .. Filter mounting - 1/8 x 5/8 x 14-7/8 in. long
*7	8351427	8	-	-	GASKET .. Filter mounting - 1/8 x 5/8 x 27-3/8 in. long
*8	8024287	2	-	-	GASKET .. Frame to blower
*9	179885	20	-	-	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter to blower
10	8291949	2	2	2	HOSE .. Oil separator to filter
11	8048698	4	4	4	CLAMP .. Hose
12	8371935	1	-	-	PIPE ASM. .. Flanged - Oil separator to hose - Right bank
*12	9523076	-	1	-	PIPE ASM. .. Flanged - Oil separator to hose - Right bank
12	8483518	-	-	1	PIPE ASM. .. Flanged - Oil separator to hose - Right bank
13	8371936	1	-	-	PIPE ASM. .. Flanged - Oil separator to hose - Left bank
*13	9523077	-	1	-	PIPE ASM. .. Flanged - Oil separator to hose - Left bank
13	8483517	-	-	1	PIPE ASM. .. Flanged - Oil separator to hose - Left bank
14	8084407	2	-	-	GASKET .. Mounting - Flanged pipe
15	181433	4	-	-	BOLT .. Hex head 1/2-20 x 1-3/4 - Flanged pipe mounting
16	6101229	4	-	-	WASHER .. Plain 1/2
*17	9331510	-	2	-	INDICATOR... Pressure - Mechanical
18	215722	-	-	6	BOLT .. Hex head 1/2-13 x 5-3/4 - Holder mounting

† It is recommended that those units which convert from the four panel oil bath engine air filters to the above fiberglass filters also incorporate carbody door filters (See Catalog 310, Parts List B2502-SW, Pages 1 thru 3).

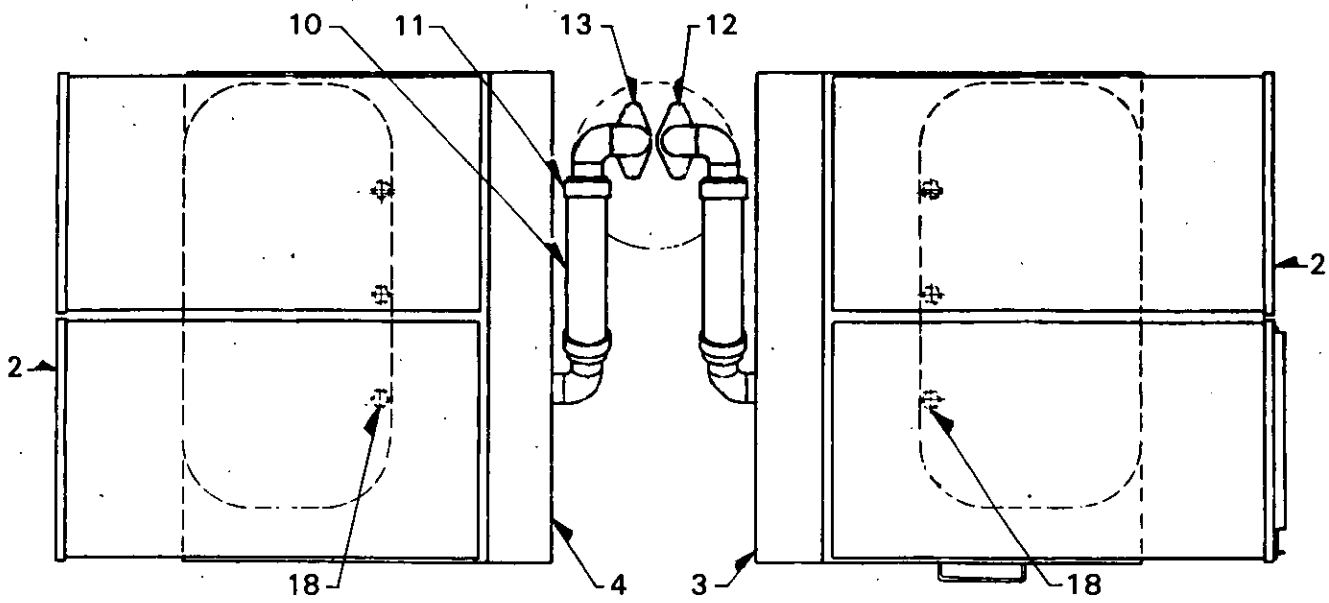
24671, 39178, 17362, 40236, 29848, 35948

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS



Top View
Column A



Top View
Column C

PLATE C181-12

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12-645E Engine - MP15 and MP15AC Locomotives
PLATES C181-13 and B181-14

Ref. No.	Part Number	Qty. Req.		Description
		A	-	AIR FILTER APPLICATION - MP15 locomotive
		-	B	AIR FILTER APPLICATION - MP15AC locomotive
1	9083302	1	-	HATCH .. Engine air filter
*1	9092970	-	1	HATCH .. Engine air filter
2	9082758	1	1	STRIP .. Filler - Left side
3	9082759	1	1	STRIP .. Filler - Right side
4	179839	12	12	BOLT .. Hex head 3/8-16 x 1 - Strip mounting
5	103321	12	12	WASHER .. Lock 3/8
6	106263	12	12	WASHER .. Flat 3/8
7	179885	44	44	BOLT .. Hex head 1/2-13 x 1-1/2 - Adapter and hatch mounting
8	103343	24	28	WASHER .. Plain 1/2
9	9416517	24	28	NUT .. Hex 1/2-13 - Self locking
10	8031891	2	2	BOLT .. Eye 1-8 x 3 in. shank - 1-3/16 I.D. x 3-9/16 O.D.
11	9416526	2	2	NUT .. Hex 1-8 - Self locking
12	8366064	2	2	ADAPTER ASM. .. Air intake
13	8024287	2	2	GASKET .. Air intake adapter to blower
14	6101229	28	28	WASHER .. Plain 1/2
15	8430475	2	2	DUCT ASM. .. Flexible - Adapter to air intake filter
16	8373018	4	4	CLAMP ASM. .. Flexible duct
17	8155201	1	1	ELBOW .. Flanged - Lube oil separator
18	8155202	1	1	GASKET .. Flanged elbow to oil separator
19	8131113	2	2	HOSE .. Oil separator - Formerly 8113113 - Not furnished - Use: 8040167 which makes 2 pieces
20	8131112	2	2	SPRING .. Hose - Formerly 8113112
21	8374760	4	4	CLAMP .. Hose
*22	8164482	1	1	ELBOW .. Flanged - Left side
23	8164483	1	1	ELBOW .. Flanged - Right side
24	8084407	2	2	GASKET .. Adapter to elbow
25	181433	4	4	BOLT .. Hex head 1/2-20 x 1-3/4 - Flange to oil separator
26	181431	4	4	BOLT .. Hex head 1/2-20 x 1-1/2 - Adapter to elbow
27	8122074	A.R.		TAPE .. Anti-squeak - 1/16 x 1-7/8 inch - Avail. 50 ft. length
28	8470903	2	2	ELEMENT .. Filter - Fiberglass
*29	8331927	-	2	IRON .. Grab - Right rear side and top
*30	8094682	-	1	IRON .. Grab - Right rear top - Formerly applied
*31	179889	-	4	BOLT .. Hex head 1/2-13 x 2 - Grab iron mounting
ϕ32	8490137	1	-	SWITCH .. Pressure - Setting 14 inch water
ϕ32	8490138	1	1	SWITCH .. Pressure - Setting 18 inch water
33	8116953	A.R.		CONDUIT .. 1/2 inch rigid aluminum - 12 ft. length approximately 9 feet required for MP15 approximately 5 feet required for MP15AC
33	8455574	A.R.		CONDUIT .. 1/2 inch liquid tight flexible metallic - 25 feet length - Approximately 2 feet required
ϕ34	8335601	1	1	CONNECTOR .. 1/2 in. male - 45°
*ϕ34	8240529	1	-	CONNECTOR .. Liquid tight - 1/2 in. 90° - Male
*ϕ34	8397071	1	-	ELBOW .. Pulling - 1/2 in. 90°
35	8330797	1	1	CONNECTOR .. 1/2 in. male - 45°
*36	8038594	-	1	BUSHING .. Female insulated - 1/2
37	8116953	AR	-	CONDUIT .. 1/2 inch rigid aluminum - 12 ft. length - Approximately 5 feet required
*37	8455574	AR	-	CONDUIT .. 1/2 inch liquid tight flexible metallic - 25 ft. length - Approximately 2 feet required

30406, 31079, 32374, 32759, 34376,
35948, 39083, 39855, 40236

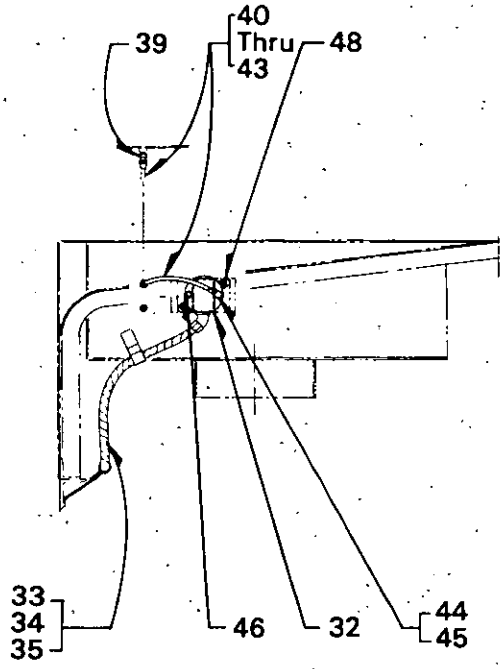
P.L. No. E181

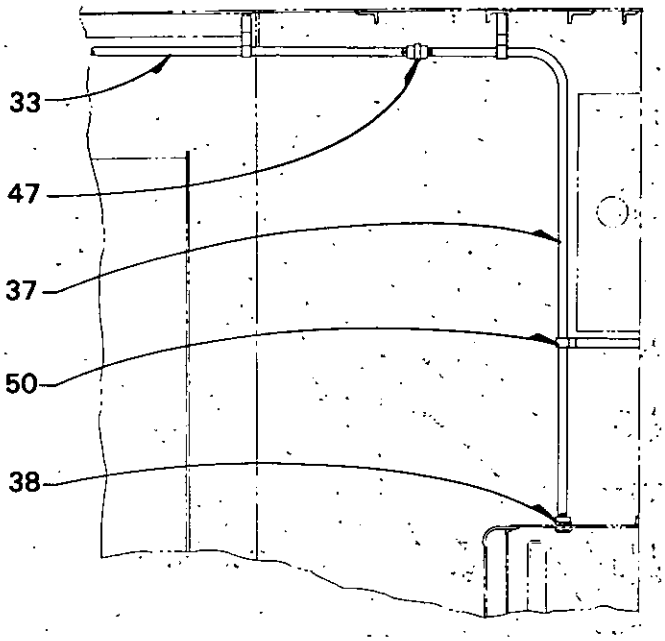
PAPER AND FIBERGLASS ENGINE AIR FILTERS

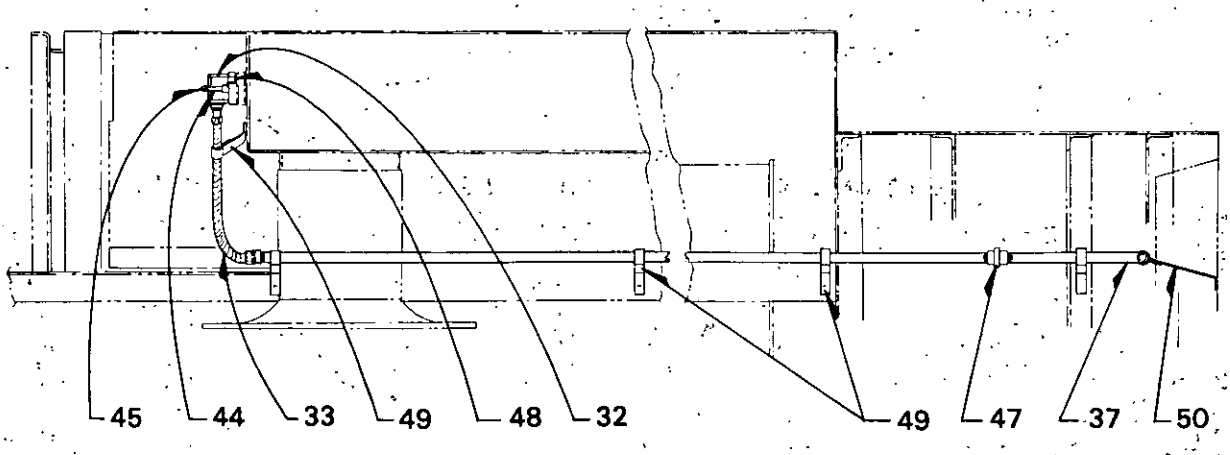
Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
ϕ38	8419416	1	-	CONNECTOR .. Conduit - 1/2 FPT
*ϕ38	8250975	1	-	CONNECTOR .. Conduit - 1/2 "FCCM"
*ϕ38	8330835	1	-	CONNECTOR .. Liquid tight box - 1/2 in. straight female
39	116436	1	1	CONNECTOR .. 1/4 tube x 1/4 MPT
ϕ40	9316152	A.R.		TUBING .. 1/4 O.D. x .170 I.D. - Nylon - Sold by foot - Approximately 1 foot required - Formerly 8860536
ϕ40	8098593	AR	-	TUBING .. 1/4 O.D. x .028 wall - Copper brazed steel - 20 ft. length - Approximately 1 foot required
ϕ41	8453868	2	2	NUT .. Tube 1/4
ϕ41	116452	2	-	NUT .. Tube 1/4
42	8453869	2	2	SLEEVE .. Tube 1/4
43	8453870	2	2	SEAT .. Tube 1/4
44	114794	1	1	NIPPLE .. 1/8 MPT x 2 in. long
45	127887	1	1	ELBOW .. 1/4 tube x 1/8 FPT - 90°
46	8455349	1	1	PLUG .. Filter - 1/8 MPT
ϕ47	8038538	1	-	UNION .. 1/2 "CCF" conduit
*ϕ47	8330797	1	-	COUPLING .. 1/2 "FCCF" conduit
48	9419643	2	2	SCREW .. Hex washer head No. 8-32 x 1/2 - Tapping
49	8108197	5	2	CLAMP ASM. .. 1/2 in. pipe
50	8315118	1	1	CLAMP ASM. .. 1/2 in. pipe
*51	8468611	A.R.		CABLE .. No. 14 - Gray - 500 feet length 36 feet required on MP15 42 feet required on MP15AC
*52	8250906	2	2	TERMINAL .. Faston tab - 14 AWG - Blue
*53	8210498	2	2	LUG .. No. 10
*54	8038584	1	-	LOCKNUT .. Conduit 1/2 inch

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTER





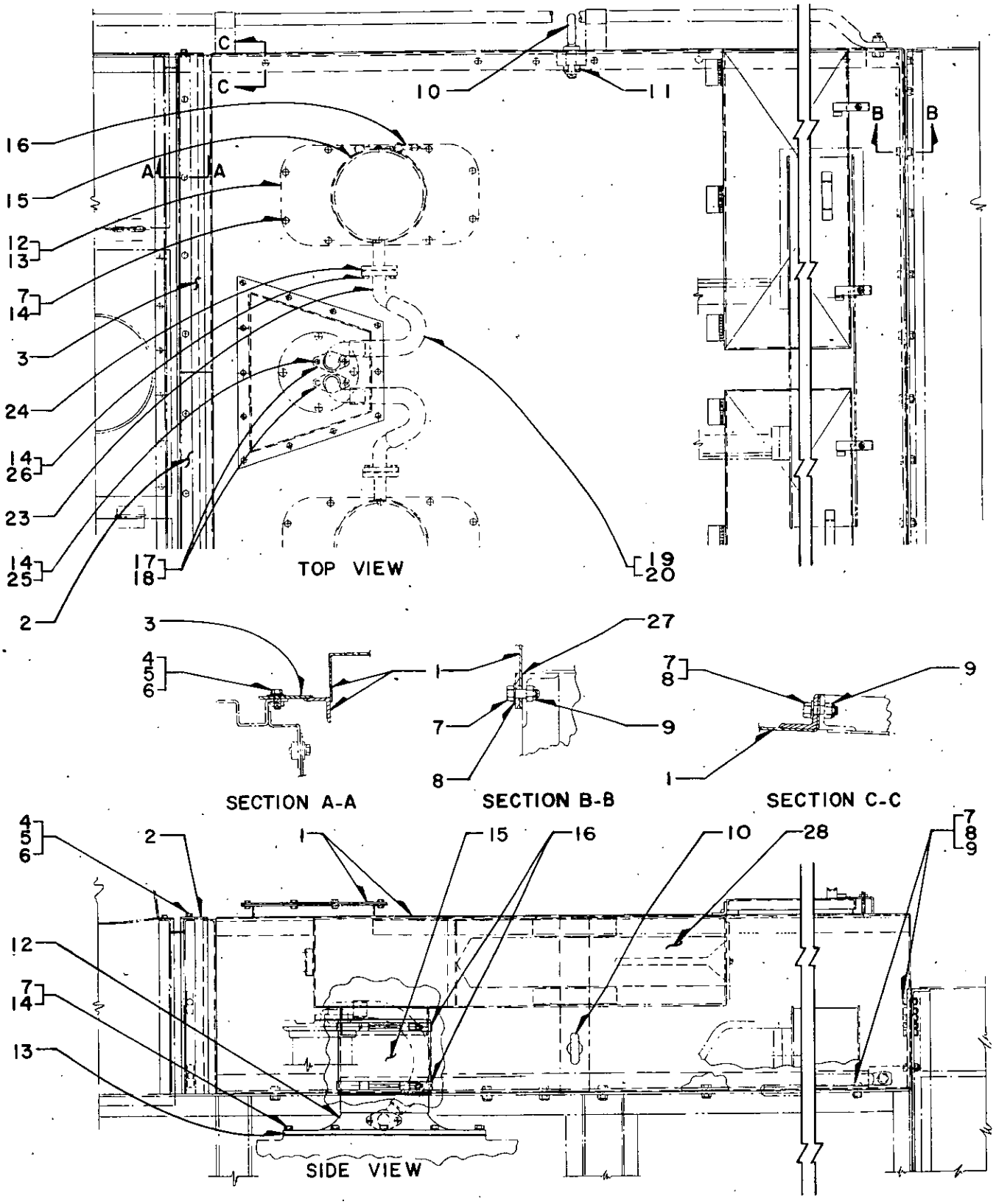


Pressure Switch Application

PLATE C181-13

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTER



Air Filter Hatch Application

PLATE B181-14

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filters and Mounting
12,16,20-645E3; 12-645E3B,E3C; 16-645E3A,E3B,E3C Engines - GP39-2, GP40, GP40-2, GP40P-2, SD40, SD40-2, SD40T-2, SDP40F, SD45, SD45-2, SD45T-2, F40PH and F40PH-2 Locomotives

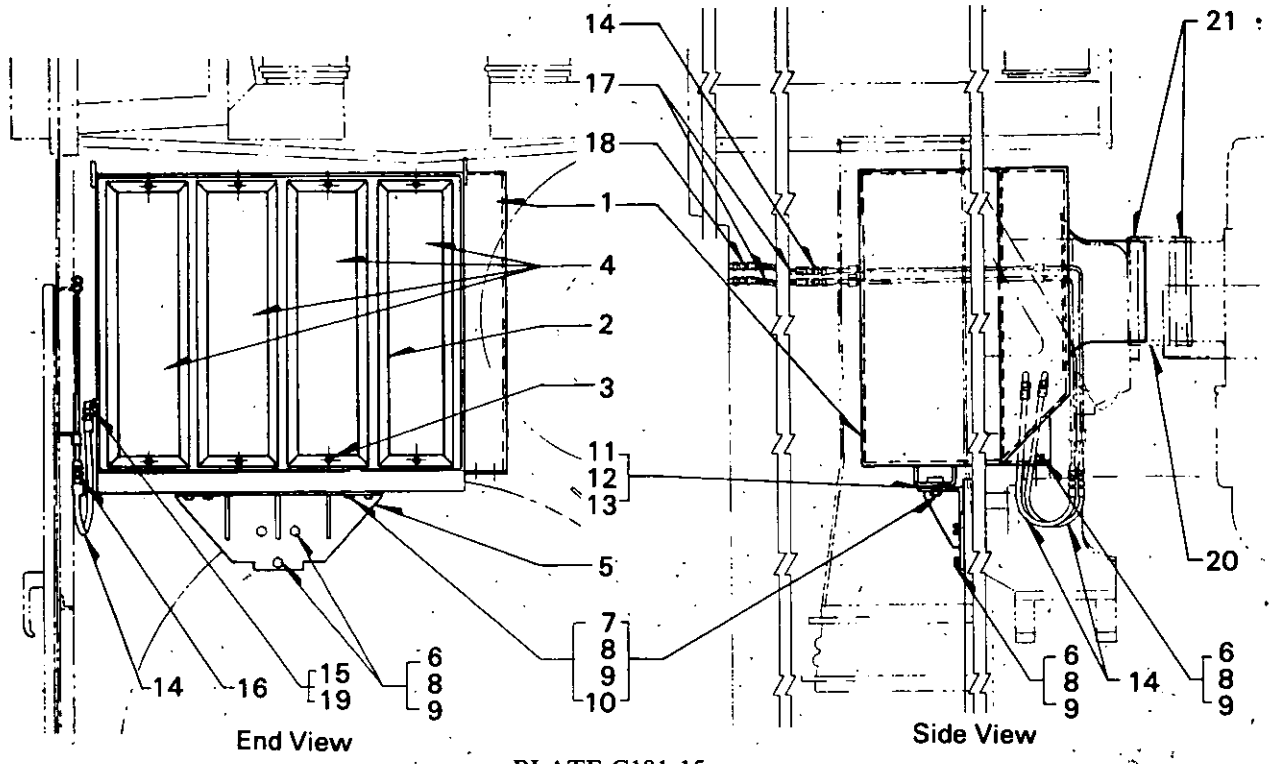


PLATE C181-15

Ref. No.	Part Number	Qty. Req. A	Qty. Req. B	Description
		A	-	GP39-2 locomotives
		-	B	GP40, GP40-2, GP40P-2, SD40, SD40-2, SD40T-2, SDP40F, SD45, SD45-2, SD45T-2, F40PH and F40PH-2 locomotives
1	8499807	1	-	HOUSING ASSEMBLY .. Filter
1	8470902	-	1	HOUSING ASSEMBLY .. Filter
2	8486279	4	4	FRAME .. Sealing
3	8035146	8	8	NUT .. Stop - Elastic - 3/8-16
4	8470903	4	4	ELEMENT .. Filter - Fiberglass disposable bag-type cartridge
5	8470904	1	1	BRACKET ASSEMBLY .. Mounting
6	179881	7	7	BOLT .. Hex head 1/2-13 x 1
7	179887	4	4	BOLT .. Hex head 1/2-13 x 1-3/4
8	8423734	11	11	WASHER .. Special - 17/32 I.D. x 1-1/4 O.D. - Formerly 106265
9	103323	11	11	WASHER .. Lock 1/2 - Formerly applied
10	102637	4	4	NUT .. Hex 1/2-13
11	8432866	A.R.		SHIM .. 1-1/2 x 3-1/2 inches long - 16 gauge
12	8432867	A.R.		SHIM .. 1-1/2 x 3-1/2 inches long - 11 gauge
13	8432868	A.R.		SHIM .. 1-1/2 x 3-1/2 inches long - 1/4 inch thick - Formerly applied
14	8461389	2	-	TUBE ASSEMBLY .. Cabinet to filter
14	8461833	-	2	TUBE ASSEMBLY .. Cabinet to filter
14	8465600	2	2	HOSE ASSEMBLY .. Vacuum - Formerly applied
15	8040349	2	2	ELBOW .. 3/8 tube x 1/8 FPT - Formerly 118753
16	8209909	4	4	UNION .. 1/4 tube x 3/8 tube - Formerly applied
17	8465304	2	2	HOSE ASSEMBLY .. Vacuum - Formerly applied
18	121323	2	2	CONNECTOR .. 3/8 tube x 1/4 FPT - Formerly 8040325
19	8027510	2	2	NIPPLE .. 1/8 close - Threaded both ends
20	8347632	1	1	DUCT .. Air - Except SD45, SD45-2 and SD45T-2
20	8365038	-	1	DUCT .. Air - SD45, SD45-2 and SD45T-2 only
21	8373018	2	2	CLAMP .. Hose
*22	8374278	2	2	RETAINER .. Hose - Formerly applied

27128, 8470901D, 30268, 8499806D

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
8-645E Engine - SW1001 Locomotive

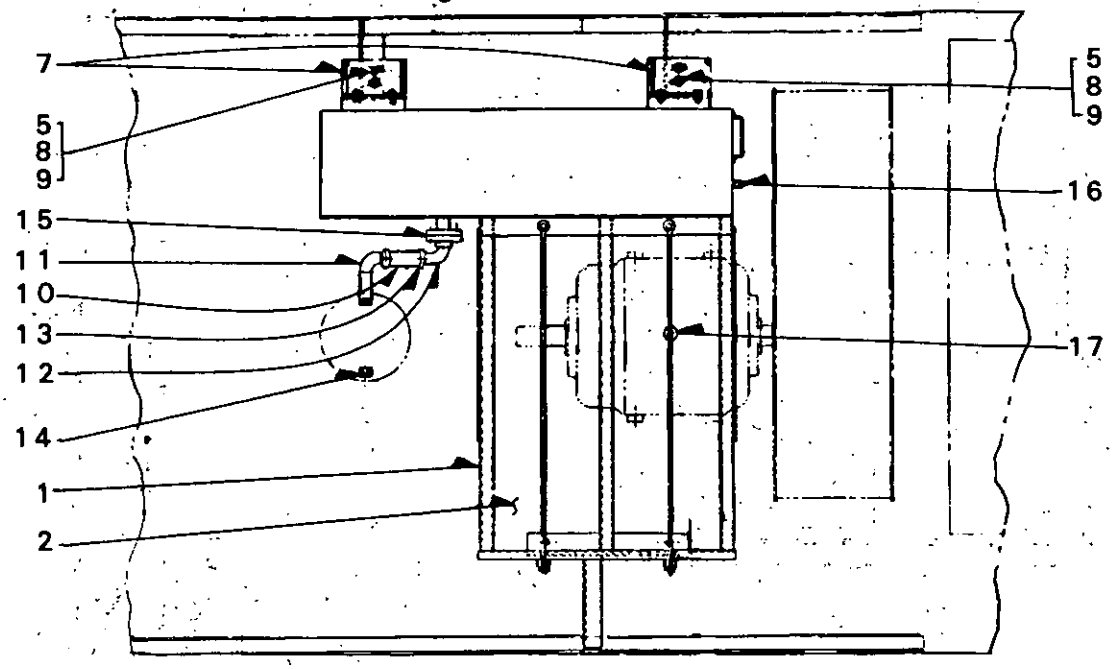


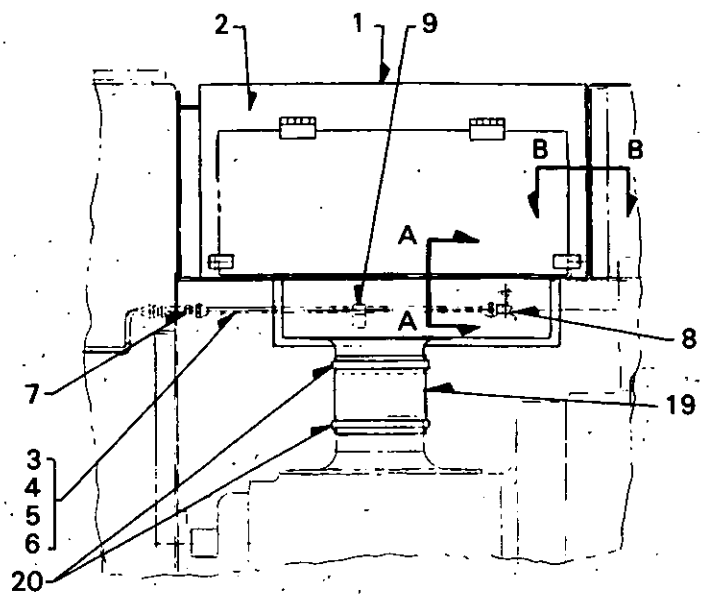
PLATE C181-16

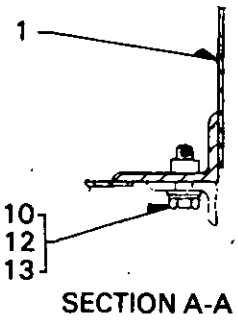
Ref. No.	Part Number	Qty. Req.	Description
1	9545793	1	HOLDER ASSEMBLY .. Filter
2	9093588	4	ELEMENT .. Filter - Paper
*3	9545938	1	SUPPORT ASSEMBLY .. Filter
*4	8024287	1	GASKET .. Housing to blower
5	179885	22	BOLT .. Hex head 1/2-13 x 1-1/2 - Housing mounting
6	6101229	12	WASHER .. Plain 1/2
7	9545623	2	SUPPORT ASSEMBLY .. Filter to side angle
8	103343	16	WASHER .. Flat 1/2
ϕ9	8032745	10	NUT .. Lock 1/2-13 - Non-metallic insert
ϕ9	9416517	10	NUT .. Lock 1/2-13 - "CLT" all metal
10	8432322	1	HOSE .. Vacuum - 1-9/32 I.D. x 1-27/32 O.D. x 5 inch length
11	9316974	1	ELBOW .. Oil separator
12	8432171	1	ELBOW .. Swivel flange - Oil separator line
13	8048697	2	CLAMP .. Hose
14	8173319	1	PLUG .. 1 inch MPT - Square inverted head
15	8306502	1	GASKET .. Flange mounting
16	103877	1	PLUG .. 1/8 MPT
17	271552	1	BOLT .. Hex head 5/8-11 x 3/4
*18	8490138	1	SWITCH .. Pressure - Setting 18 in. water
*19	9316152	A.R.	TUBING .. 1/4 O.D. x 170 I.D. - Nylon - Sold by foot - Approximately 2 feet required
*20	8453868	2	NUT .. Tube 1/4
*21	8453869	2	SLEEVE .. Tube 1/4
*22	8453870	2	SEAT .. Tube 1/4
*23	8455574	A.R.	CONDUIT .. 1/2 inch liquid tight flexible metallic - 25 foot length - Approximately 2 feet required
*24	8116953	A.R.	CONDUIT .. 1/2 inch rigid aluminum - 12 foot length - Approximately 3 feet required
*25	8260167	1	ELBOW .. Pulling - 1/2 inch conduit - 90°
*26	8240529	1	ELBOW .. Liquid tight - 1/2 inch conduit - 90°
*27	8330797	1	CONNECTOR .. Liquid tight - Straight female - 1/2 inch
*28	118748	1	CONNECTOR .. 1/4 tube x 1/8 MPT
*29	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT
*30	8108197	2	CLAMP ASSEMBLY .. 1/2 inch conduit

42359

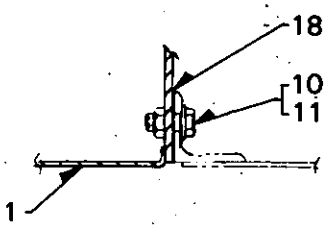
PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12-645E Engine - GP15-2 Locomotive





SECTION A-A



SECTION B-B

PLATE C181-17

Ref. No.	Part Number	Qty. Req.	Description
1	9522753	1	HATCH ASSEMBLY .. Filter
2	9093588	6	ELEMENT .. Filter - Paper
3	9315292	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 4 feet required
4	8453871	2	NUT .. 3/8 O.D. tube
5	8453872	2	SLEEVE .. 3/8 O.D. tube
6	8453873	2	SEAT .. 3/8 O.D. tube
7	8037261	1	CONNECTOR .. 3/8 tube x 1/2 MPT
8	118755	1	ELBOW .. 3/8 tube x 1/4 MPT - 90°
9	8108110	1	CLAMP ASSEMBLY .. 3/8 tube
10	179883	6	BOLT .. Hex head 1/2-13 x 1-1/4 - Hatch mounting
11	179885	21	BOLT .. Hex head 1/2-13 x 1-1/2 - Hatch to frame
12	103323	15	WASHER .. Lock 1/2
13	103343	27	WASHER .. Flat 1/2
*14	8431581	1	GASKET .. 2 x 19-3/8 inches long
*15	8431582	1	GASKET .. 2 x 71-3/4 inches long
*16	8431584	1	GASKET .. 2 x 47-1/8 inches long
*17	9542313	1	GASKET .. 2 x 67-7/8 inches long
18	8133198	A.R.	TAPE .. Press sensitive - 100 foot length
19	8430475	2	DUCT .. Air
20	8373018	4	CLAMP .. Hose

42047

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
16-645F3,F3B Engines - GP50, GP50T and SDL50 Locomotives

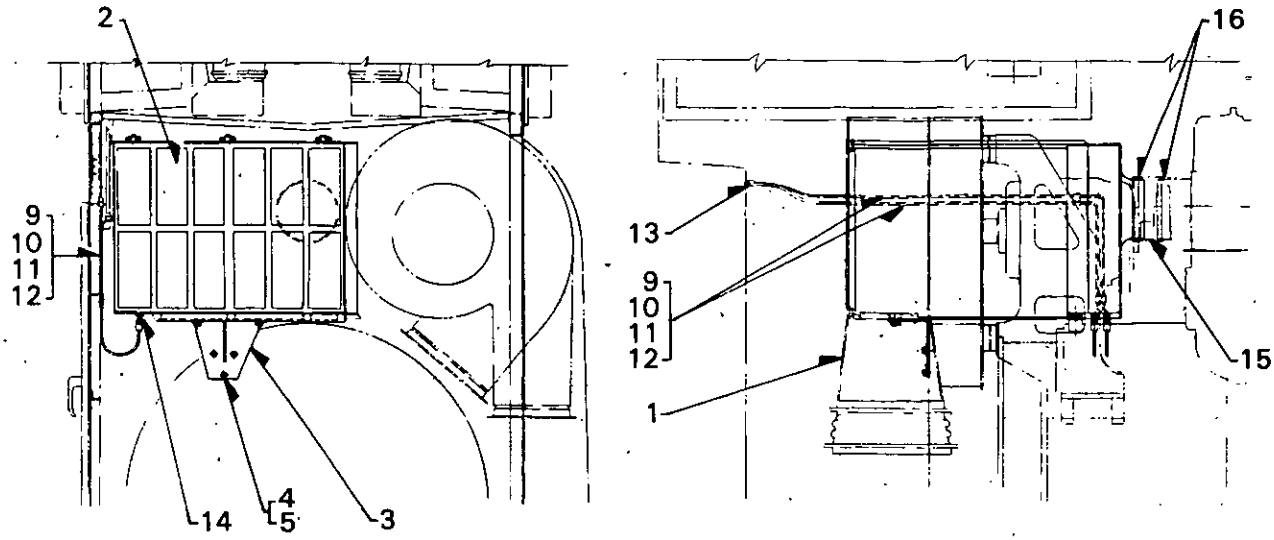


PLATE B181-18

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	8410745	1	HOUSING ASSEMBLY .. Filter
ϕ1	8469005	1	HOUSING ASSEMBLY .. Filter
ϕ2	9093588	12	ELEMENT .. Filter
ϕ2	8498366	12	ELEMENT .. Filter
3	8426375	1	BRACKET ASSEMBLY .. Mounting
4	179881	7	BOLT .. Hex head 1/2-13 x 1
5	8423734	9	WASHER .. 17/32 I.D. x 1-1/4 O.D.
*6	179885	2	BOLT .. Hex head 1/2-13 x 1-1/2 - Bracket to housing
*7	102637	2	NUT .. Hex head 1/2-13
*8	8348608	2	SHIM .. 2 x 3 x 16 gauge
9	9315292	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 14 feet required
10	8453871	4	NUT .. Tube 3/8
11	8453872	4	SLEEVE .. Tube 3/8
12	8453873	4	SEAT .. Tube 3/8
13	121323	2	CONNECTOR .. 3/8 tube x 1/4 FPT
14	8040312	2	CONNECTOR .. 3/8 tube x 1/8 MPT
15	8347632	1	DUCT .. Air
16	8373018	2	CLAMP .. Hose

37320

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filter and Mounting
12-645E3C,F3,F3B Engines - GP39X and GP49 Locomotives

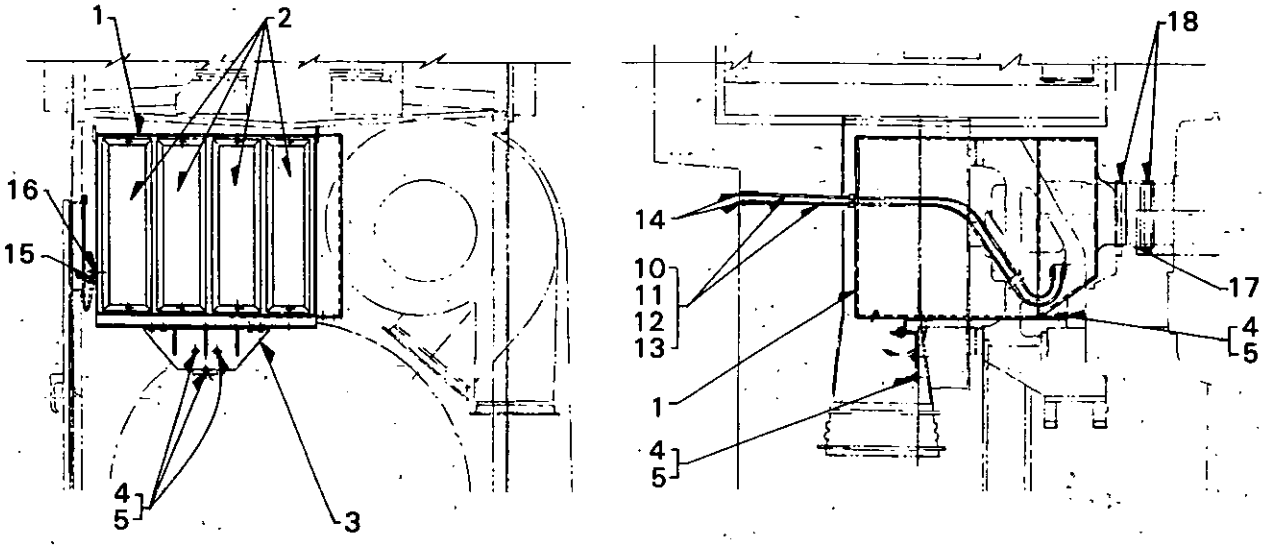


PLATE A181-19

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645F3 engine - GP39X locomotive
		-	B	12-645E3C,F3,F3B engines - GP49 locomotive
1	9560398	1	-	HOUSING .. Filter
1	9553997	-	1	HOUSING .. Filter
2	8470903	4	4	ELEMENT .. Filter - Fiberglass disposable bag-type cartridge
3	8470904	1	1	BRACKET ASSEMBLY .. Mounting
4	179881	7	7	BOLT .. Hex head 1/2-13 x 1
5	8423734	11	11	WASHER .. 17/32 I.D. x 1-1/4 O.D.
*6	179887	4	4	BOLT .. Hex head 1/2-13 x 1-3/4 - Housing to bracket
*7	102637	4	4	NUT .. Hex head 1/2-13
*8	8432866	AR	AR	SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 16 gauge
*9	8432867	AR	AR	SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 11 gauge
10	9315292	AR	AR	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 14 feet required
11	8453871	4	4	NUT .. Tube 3/8
12	8453872	4	4	SLEEVE .. Tube 3/8
13	8453873	4	4	SEAT .. Tube 3/8
14	121323	2	2	CONNECTOR .. 3/8 tube x 1/4 FPT
15	8040349	2	2	ELBOW .. 3/8 tube x 1/8 FPT - 90°
16	8027510	2	2	NIPPLE .. 1/8 x 3/4 long - Threaded both ends
17	9528922	1	-	DUCT .. Flexible - Air
17	9553516	-	1	DUCT .. Flexible - Air - Formerly 9528922
18	9528932	2	-	CLAMP .. Hose - T-Bolt
18	9553518	-	2	CLAMP .. Hose - T-Bolt - Formerly 9528932

39671, 43412, 43655

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filters and Mounting
16-645F3,F3B Engines - GP50, SD40X, SD50 and SD50S Locomotives

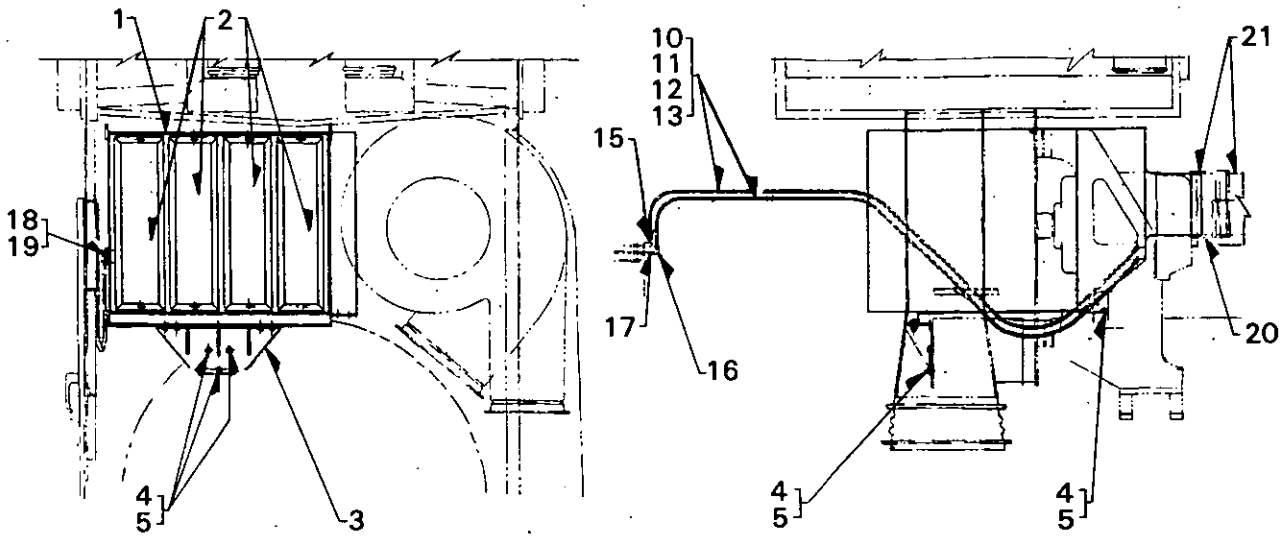


PLATE A181-20

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-645F3,F3B engines - GP50 locomotive
		-	B	-	16-645F3,F3B engines - SD50 locomotive
		-	-	C	16-645F3,F3B engines - SD40X, SD50 and SD50S locomotives
*1	9560400	1	-	-	HOUSING .. Filter
*1	9544340	-	1	-	HOUSING .. Filter
1	9560399	-	-	1	HOUSING .. Filter
2	8470903	4	4	4	ELEMENT .. Filter - Fiberglass disposable bag-type cartridge
3	8470904	1	-	1	BRACKET ASSEMBLY .. Mounting
ϕ*3	9544339	-	1	-	BRACKET ASSEMBLY .. Mounting
ϕ*3	9540537	-	1	-	BRACKET ASSEMBLY .. Mounting
4	179881	7	8	7	BOLT .. Hex head 1/2-13 x 1
5	8423734	11	12	11	WASHER .. 17/32 I.D. x 1-1/4 O.D.
*6	179887	4	-	4	BOLT .. Hex head 1/2-13 x 1-3/4
*6	179885	-	4	-	BOLT .. Hex head 1/2-13 x 1-1/2
*7	102637	4	4	4	NUT .. Hex head 1/2-13
*8	8432866	As Req.			SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 16 gauge
*9	8432867	As Req.			SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 11 gauge
10	9315292	As Req.			TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 17 feet required
11	8453871	4	4	4	NUT .. Tube 3/8
12	8453872	4	4	4	SLEEVE .. Tube 3/8
13	8453873	4	4	4	SEAT .. Tube 3/8
*14	121323	2	-	-	CONNECTOR .. 3/8 tube x 1/4 FPT
15	118755	-	1	1	ELBOW .. 3/8 tube x 1/4 MPT
16	118576	-	1	1	ELBOW .. 3/8 tube x 1/4 FPT
17	8072396	-	1	1	NIPPLE .. 1/4 x 2 long
18	8040349	2	2	2	ELBOW .. 3/8 tube x 1/8 FPT
19	8027510	2	2	2	NIPPLE .. 1/8 x 3/4 long - Threaded both ends
20	8347632	1	1	1	DUCT .. Air
21	8373018	2	2	2	CLAMP .. Hose

39124, 42035, 43879, 38559

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filters and Mounting
20-645E3 Engine - SD45 Locomotives

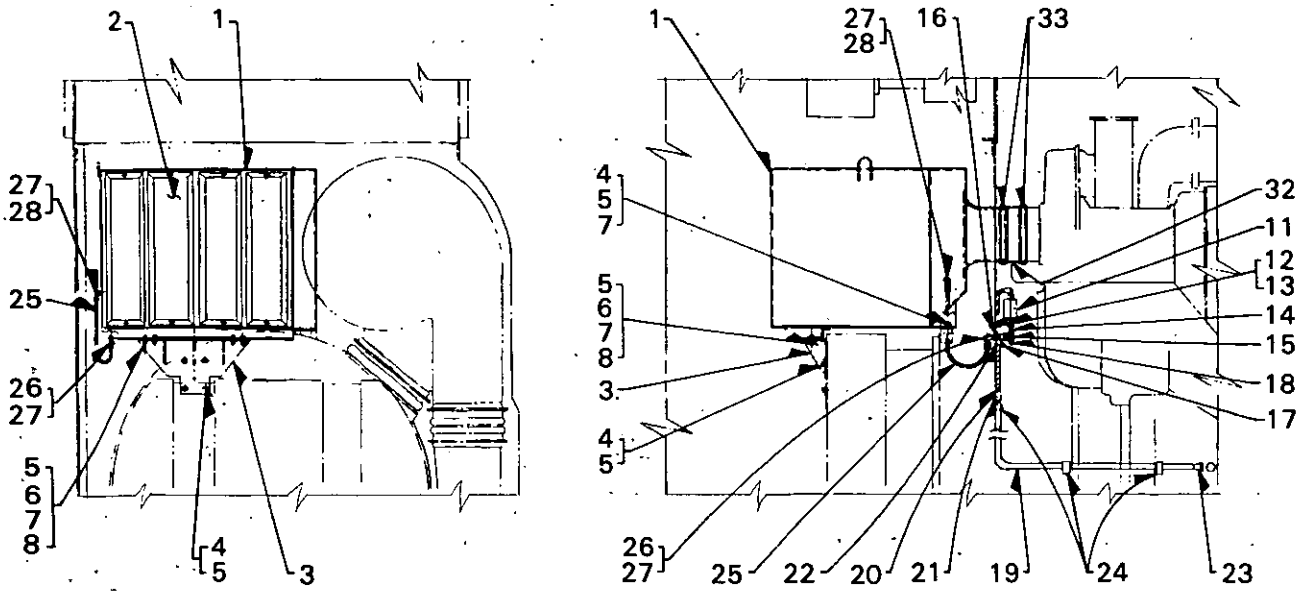


PLATE A181-21

Ref. No.	Part Number	Qty. Req.	Description
1	9560400	1	HOUSING .. Filter
2	8470903	4	ELEMENT .. Filter - Fiberglass disposable bag-type cartridge
3	8470904	1	BRACKET ASSEMBLY .. Mounting
4	179881	8	BOLT .. Hex head 1/2-13 x 1
5	103323	12	WASHER .. Lock 1/2
6	179883	4	BOLT .. Hex head 1/2-13 x 1-1/4
7	106265	8	WASHER .. Flat 1/2
8	114505	4	NUT .. Hex 1/2-13
9	8432866	A.R.	SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 16 gauge
10	8432867	A.R.	SHIM .. Housing mounting - 1-1/2 x 3-1/2 - 11 gauge
11	8415273	1	SWITCH .. Vacuum
12	179791	2	BOLT .. Hex head 1/4-20 x 1/2 - Switch mounting
13	103319	2	WASHER .. Lock 1/4
14	8060971	1	NIPPLE .. 1/4 x 1-1/2 long - Threaded both ends
15	8050093	1	TEE .. Union - 1/4 FPT
16	8390271	1	GROMMET .. 9/16 I.D. x 1-1/16 O.D. x 3/8 thick
17	119290	1	NIPPLE .. 1/4 x 2-1/2 long - Threaded on both ends
18	103878	2	PLUG .. 1/4 MPT - Square head
19	8116953	A.R.	CONDUIT .. 1/2 inch rigid aluminum - 12 foot length - Approximately 7 feet required
20	8455574	A.R.	CONDUIT .. 1/2 inch liquid tight flexible metallic - 25 foot length - Approximately 2 feet required
21	8330797	1	CONNECTOR .. 1/2 inch female - Straight
22	8240529	1	CONNECTOR .. Liquid tight - 1/2 inch 90° - Male
23	8038594	1	BUSHING .. Female insulated - 1/2
24	8108115	3	CLAMP ASSEMBLY .. Pressure switch conduit
25	8379526	A.R.	HOSE .. 3/16 I.D. x 3/8 O.D. - Sold by foot - Approximately 2 feet required
26	8040347	1	ELBOW .. 1/4 tube - 90°
27	6531397	2	FITTING .. Hose connector - 1/4 tube
28	118753	1	ELBOW .. 1/4 tube x 1/4 MPT - 90°
*29	8468611	A.R.	CABLE .. No. 14 insulated - 500 foot length - Approximately 75 feet required
*30	8272337	6	TERMINAL .. Faston tab
*31	8123281	2	LUG .. Terminal - No. 10 stud hole diameter
32	8365038	1	DUCT .. Air
33	8373018	2	CLAMP .. Hose

37054

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filter and Mounting
16-645E3B,E3C Engine - F40PH-2 Locomotive

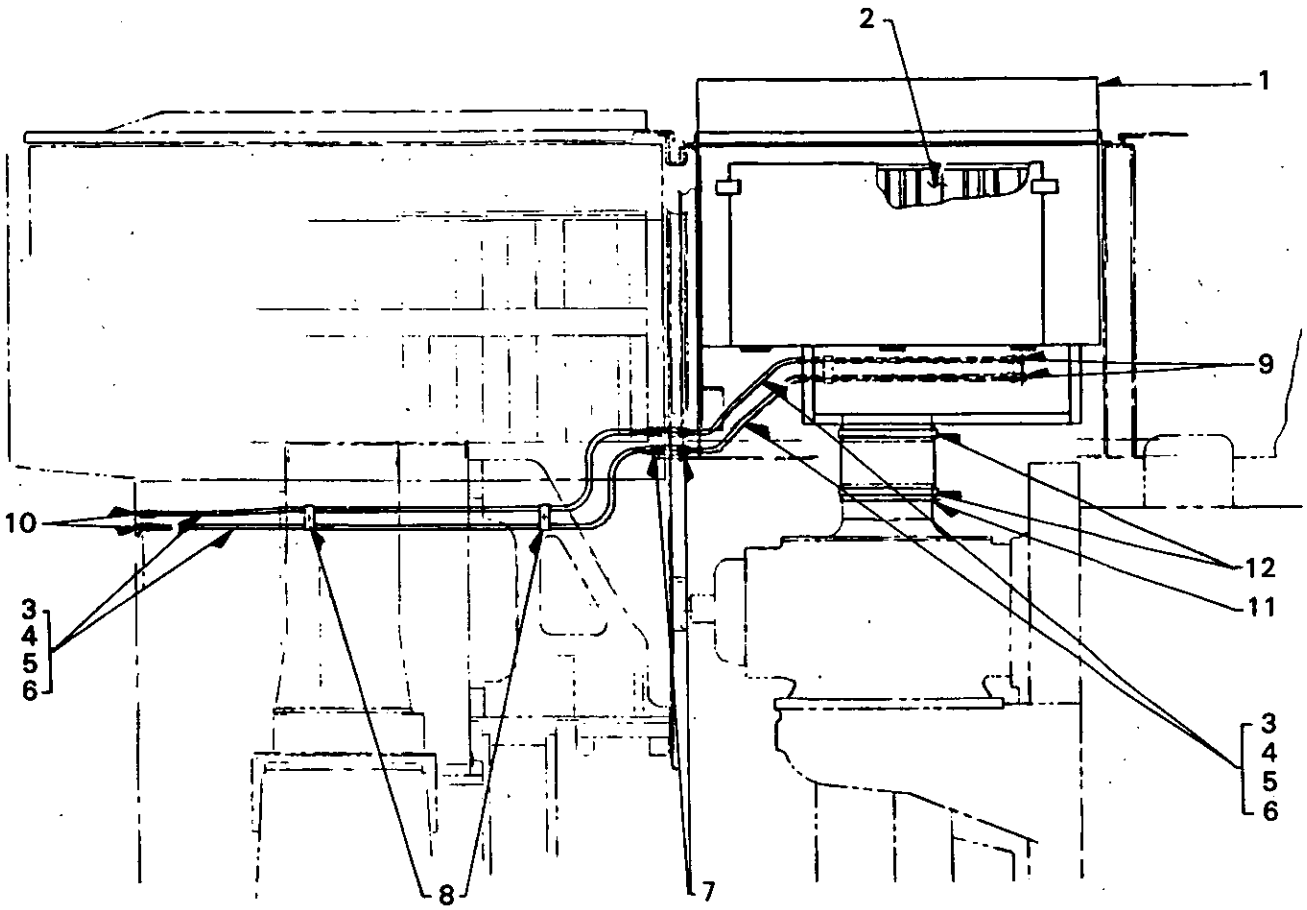


PLATE A181-22

Ref. No.	Part Number	Qty. Req.	Description
1	9541486	1	FILTER ASSEMBLY .. Air intake
2	8470903	3	ELEMENT .. Filter - Fiberglass disposable bag-type
3	9315292	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 20 feet required
4	8453871	8	NUT .. Tube 3/8
5	8453872	8	SLEEVE .. Tube 3/8
6	8453873	8	SEAT .. Tube 3/8
7	8037261	4	CONNECTOR .. 3/8 tube x 1/2 MPT
8	8250529	3	CLAMP ASSEMBLY .. 3/8 tube - Double
9	118755	2	ELBOW .. 3/8 tube x 1/4 MPT
10	121323	2	CONNECTOR .. 3/8 tube x 1/4 FPT
11	8430475	2	DUCT .. Air
12	8373018	4	CLAMP .. Air duct

41982, 9541528

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Engine Air Filter and Mounting
8-645E3C Engine - GP15T Locomotive

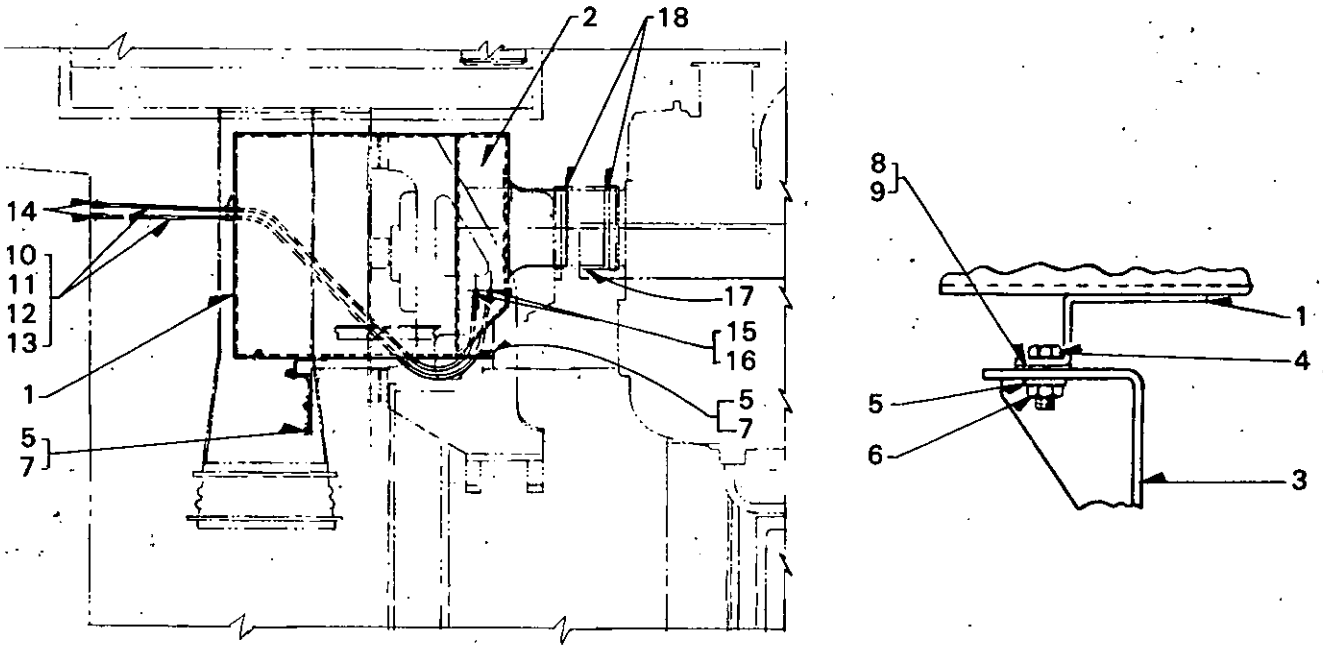


PLATE A181-23

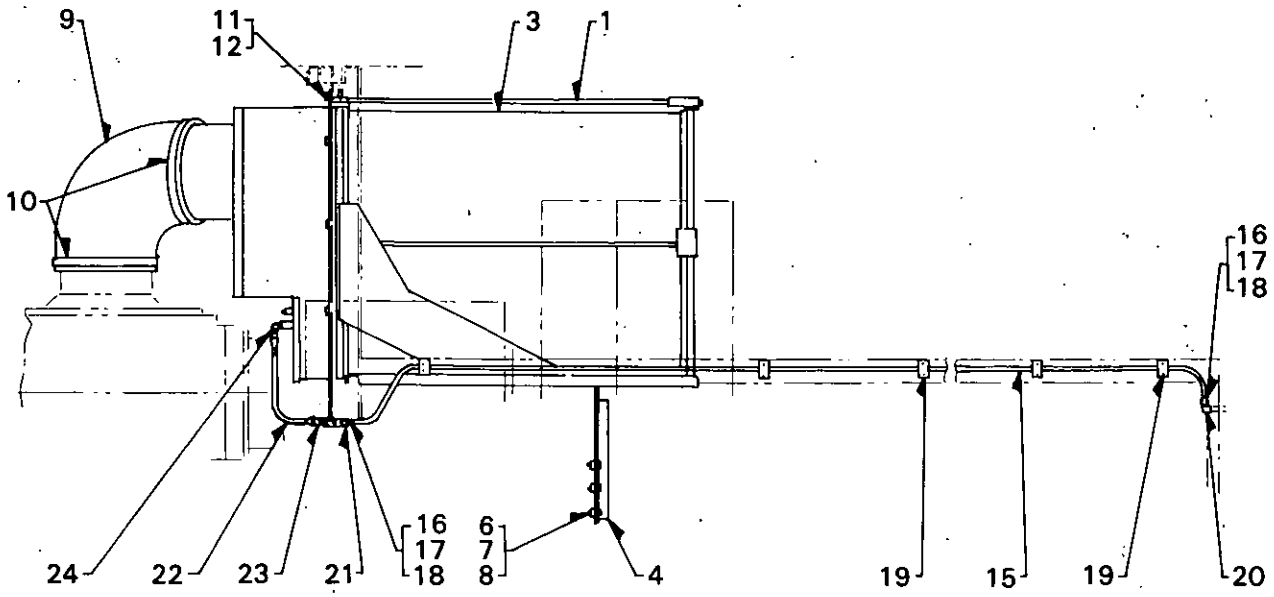
Ref. No.	Part Number	Qty. Req.	Description
1	9547533	1	HOUSING .. Filter
2	8470903	2	ELEMENT .. Filter - Fiberglass disposable bag-type
ϕ3	9547560	1	BRACKET .. Housing mounting
ϕ3	9547597	1	BRACKET .. Housing mounting
4	179887	2	BOLT .. Hex head 1/2-13 x 1-3/4 - Housing to bracket
5	8423734	9	WASHER .. Plain - 17/32 I.D. x 1-1/4 O.D. x 3/16 inch thick - Hardened
6	102637	2	NUT .. Hex head 1/2-13
7	179881	7	BOLT .. Hex head 1/2-13 x 1 - Bracket mounting
8	8432866	A.R.	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 16 gauge
9	8432867	A.R.	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 11 gauge
10	9315292	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 14 feet required
11	8453871	4	NUT .. Tube 3/8
12	8453872	4	SLEEVE .. Tube 3/8
13	8453873	4	SEAT .. Tube 3/8
14	121323	2	CONNECTOR .. 3/8 tube x 1/4 FPT
15	8040349	2	ELBOW .. 3/8 tube x 1/8 FPT
16	8027510	2	NIPPLE .. 1/8 x 3/4 - Threaded both ends
17	9085189	1	DUCT .. Air
18	9096140	2	CLAMP .. "T" bolt type - Stainless steel

42489, 9547598

P.L. No.E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
16-645E Engine - G26CW-2 Locomotive



Left Side

PLATE A181-24

Ref. No.	Part Number	Qty. Req.	Description
ϕ1	9540763	1	HOLDER ASSEMBLY .. Filter - Left side
ϕ1	9537912	1	HOLDER ASSEMBLY .. Filter - Left side
*ϕ2	9540764	1	HOLDER ASSEMBLY .. Filter - Right side
*ϕ2	9537583	1	HOLDER ASSEMBLY .. Filter - Right side
3	9093588	8	ELEMENT .. Filter - Paper
4	9541735	1	BRACKET .. Filter holder mounting - Left side
*5	9549245	1	BRACKET ASSEMBLY .. Filter holder mounting - Right side
6	179839	11	BOLT .. Hex head 3/8-16 x 1 - Bracket mounting
7	103321	11	WASHER .. Lock 3/8
8	102635	11	NUT .. Hex 3/8-16
9	9532804	2	ELBOW .. 10 inch - Rubber
10	9537044	4	CLAMP ASSEMBLY .. "T" bolt type - Stainless steel
*11	179816	15	BOLT .. Hex head 5/16-18 x 3/4 - Filter mounting
*12	103320	15	WASHER .. Lock 5/16
*13	8425397	11	STRIP .. Mounting
*14	9419648	11	SCREW .. Tapping - 5/16-18 x 3/4 hex washer head
15	9315292	A.R.	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 15 feet required
16	8453871	4	NUT .. Tube 3/8
17	8453872	4	SLEEVE .. Tube 3/8
18	8453873	4	SEAT .. Tube 3/8
19	8408727	5	CLAMP ASSEMBLY .. 3/8 tube
20	118576	1	ELBOW .. 3/8 tube x 1/4 FPT - 90°
21	118750	1	CONNECTOR .. 3/8 tube x 1/4 MPT
22	9512850	1	HOSE ASSEMBLY .. 3/16 I.D. with female swivel both ends - 14 in. long
23	116436	1	CONNECTOR .. 1/4 tube x 1/4 MPT
24	116453	1	ELBOW .. 1/4 tube x 1/4 MPT - 90°
41838, 9541733			

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter and Mounting
12,16-645E3,E3B Engines - JT22MC, GT22LC-2 and G726CW-2 Locomotives
PLATE A181-25

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	JT22MC locomotive
		-	B	-	GT22LC-2 locomotive
		-	-	C	GT26CW-2 locomotive
1	8473706	1	1	-	HOLDER ASSEMBLY .. Filter
*1	8447202	-	-	1	HOLDER ASSEMBLY .. Filter
2	9093588	12	12	12	ELEMENT .. Filter - Paper
*ϕ3	8426375	1	-	1	BRACKET ASSEMBLY .. Filter holder mounting
ϕ3	9500845	-	1	-	BRACKET ASSEMBLY .. Filter holder mounting
4	179885	2	2	2	BOLT .. Hex head 1/2-13 x 1-1/2 - Holder to bracket
5	8423734	9	9	9	WASHER .. Plain - 17/32 I.D. x 1-1/4 O.D. x 3/16 inch thick - Hardened
6	102637	2	2	2	NUT .. Hex head 1/2-13
ϕ7	8432866	AR	AR	AR	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 16 gauge
*ϕ7	8348608	-	-	AR	SHIM .. Filter mounting - 2 x 3 - 16 gauge
8	8432867	AR	AR	AR	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 11 gauge
9	8136602	-	AR	AR	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 22 gauge
10	8048974	-	AR	AR	SHIM .. Filter mounting - 1-1/2 x 3-1/2 - 11 gauge
ϕ11	179879	3	3	3	BOLT .. Hex head 1/2-13 x 3/4 - Bracket mounting
*ϕ11	179881	-	-	7	BOLT .. Hex head 1/2-13 x 1 - Bracket mounting
12	179880	4	4	4	BOLT .. Hex head 1/2-13 x 7/8 - Holder mounting
13	120396	2	2	2	WASHER .. Flat 1/2
*14	8468533	4	-	1	HOSE ASSEMBLY .. Vacuum - 8 inches long
14	8465304	-	4	-	HOSE ASSEMBLY .. Vacuum - 15 inches long
15	118748	2	2	1	CONNECTOR .. 1/4 tube x 1/8 MPT
*16	8236518	1	-	-	CLAMP ASSEMBLY .. Vacuum hose mounting
*17	8291316	2	-	-	ELBOW .. 3/8 tube x 1/4 tube
17	8209909	2	4	1	UNION .. 3/8 tube x 1/4 tube
ϕ17	8291316	-	-	1	ELBOW .. 3/8 tube x 1/4 tube
ϕ17	121323	-	-	2	CONNECTOR .. 3/8 tube x 1/4 FPT
18	8040325	2	2	1	CONNECTOR .. 1/4 tube x 1/4 FPT
*19	8040312	-	-	2	CONNECTOR .. 3/8 tube x 1/8 MPT
*20	105409	-	-	1	COUPLING .. 1/4 MPT
*21	103878	-	-	1	PLUG .. 1/4 MPT
*22	103877	-	-	1	PLUG .. 1/8 MPT
23	8098594	AR	-	-	TUBING .. 3/8 O.D. x .028 wall - Copper brazed steel - 20 foot length - Approximately 29 feet required
23	9315292	-	AR	AR	TUBING .. 3/8 O.D. x .251 I.D. - Nylon - Sold by foot - Approximately 29 feet required
24	121758	4	-	-	NUT .. Tube 3/8
24	8453871	-	4	4	NUT .. Tube 3/8
25	8453872	-	4	4	SLEEVE .. Tube 3/8
26	8453873	-	4	4	SEAT .. 3/8 O.D. tube
*27	8108263	5	4	4	CLAMP ASSEMBLY .. 3/8 tube - Double
*28	8137589	2	-	-	CLAMP ASSEMBLY .. 3/8 tube - Double
*29	8108202	1	-	-	CLAMP ASSEMBLY .. 3/8 tube
30	8473813	-	4	4	BRACKET .. 3/16 x 1-1/8 x 3 - "L" shaped
31	8081609	-	4	4	CLAMP .. 3/8 tube - Double
32	179796	-	4	4	BOLT .. Hex head 1/4-20 x 7/8 - Clamp mounting
33	103319	-	4	4	WASHER .. Lock 1/4
34	109084	-	4	4	NUT .. Hex head 1/4
35	8303837	1	1	-	DUCT .. Air
35	8347632	-	-	1	DUCT .. Air
36	8375876	2	2	-	CLAMP .. Air duct
36	8373018	-	-	2	CLAMP .. Air duct

43382, 38897, 9554151, 9518955A,
41722, 38930, 9511069B, 9519131C

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

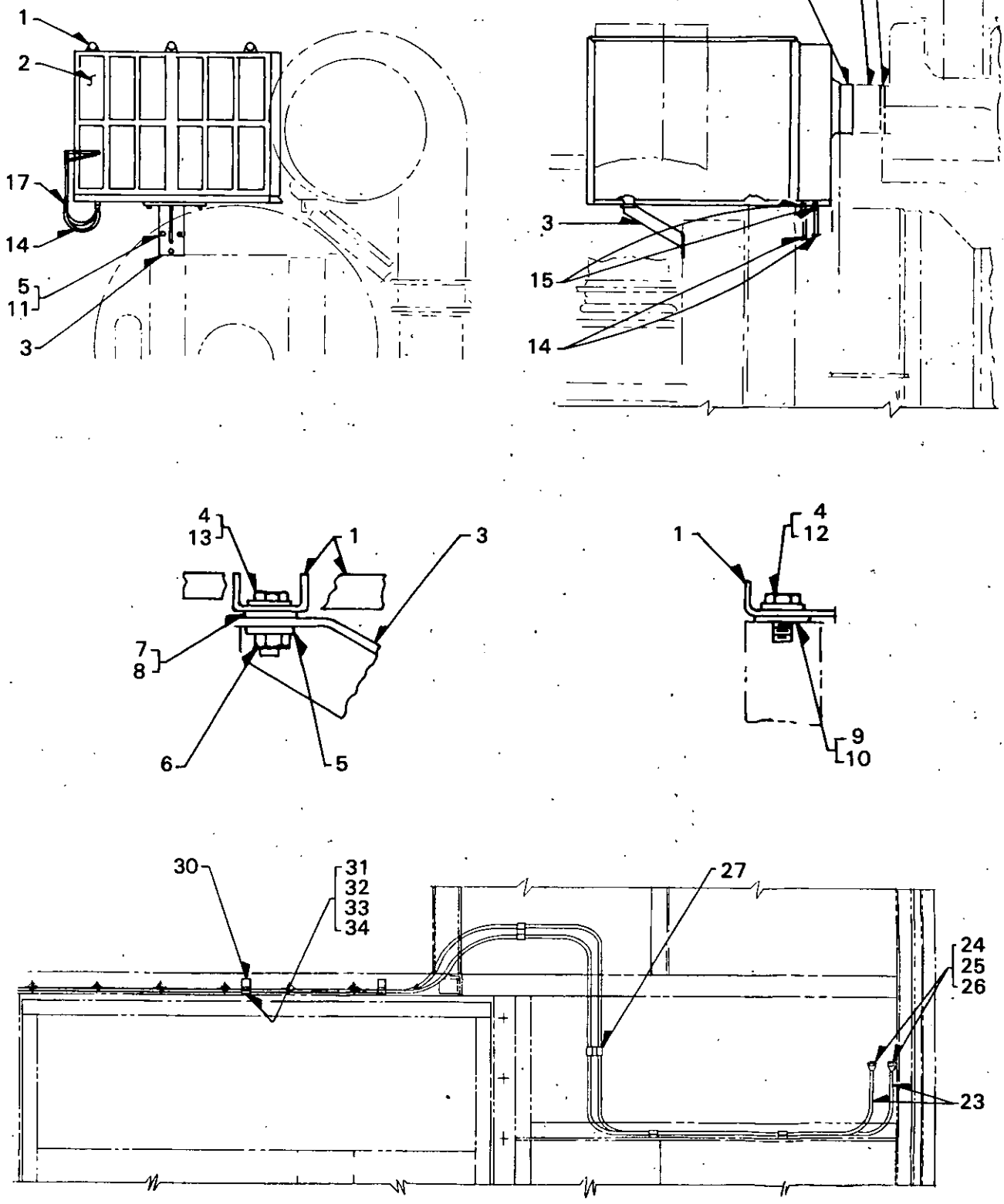


PLATE A181-25

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Engine Air Filter Conversion Assemblies
16-567D3,D3A; 16-645E; 16,20-645E3 and 16-645E3A Engines

INDEX

Note: See Page 39 for SW1000, 1001, 1500 and MP15DC conversion to Paper Element Filters.

Ref. No.	Part Number	Quantity Required							Description	Page No.	Ref. No.	Col.
		A	-	-	-	-	-	-	GP30 with and without dynamic brakes			
		-	B	-	-	-	-	-	GP35 and SD35 with dynamic brakes			
		-	-	C	-	-	-	-	GP35 and SD35 without dynamic brakes			
		-	-	-	D	-	-	-	GP38,GP38-2,SD38 and SD38-2			
		-	-	-	-	E	-	-	GP40 with and without dynamic brakes			
		-	-	-	-	-	F	-	SD40 and SD45 with and without dyn. brakes			
		-	-	-	-	-	-	G	GP40P,GP40-2,SDP40,SD40-2,DDA40X,SDP45, SD45-2,SDP45-2,F45 and FP45			
ROTONAMIC, INERTIAL AND CYCOIL CONVERSION TO PAPER ENGINE AIR FILTER												
†ϕ1	8412863	1	-	-	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	1	A
†ϕ1	8469477	1	-	-	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	26	A
†ϕ2	8412500	-	1	1	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	2	B
†ϕ2	8469478	-	1	1	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	27	B
†ϕ3	8413448	-	-	-	-	1	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	3	C
†ϕ3	8469479	-	-	-	-	1	-	-	KIT ASSEMBLY .. Air intake filter - Paper	38	28	C
†ϕ4	8413449	-	-	-	-	-	1	-	KIT ASSEMBLY .. Air intake filter - Paper	38	4	D
†ϕ4	8469480	-	-	-	-	-	1	-	KIT ASSEMBLY .. Air intake filter - Paper	39	29	D
ROTONAMIC, INERTIAL AND CYCOIL CONVERSION TO FIBERGLASS ENGINE AIR FILTER												
††5	8483611	1	-	-	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Fiberglass	41	1	A
††6	8483612	-	1	1	-	-	-	-	KIT ASSEMBLY .. Air intake filter - Fiberglass	41	2	B
7	8499865	1	1	1	-	-	-	-	KIT .. Air intake filter - Less hardware	41	4	-
8	8496581	-	-	-	1	-	-	-	KIT ASSEMBLY .. Air intake filter - Fiberglass - Does not include filter element	42	1	-
9	8499864	-	-	-	1	-	-	-	KIT .. Contains elements and housing only	42	-	-
††10	8483613	-	-	-	-	1	1	1	KIT ASSEMBLY .. Air intake filter - Fiberglass	41	3	C
11	8499866	-	-	-	-	1	1	1	KIT .. Air intake filter - Less hardware	41	5	C
AIR FILTER PRESSURE INDICATING SYSTEM												
12		1	-	-	-	-	-	-	INDICATOR WARNING LIGHT APPL.	43-44	-	A
13		-	1	1	-	-	-	-	INDICATOR WARNING LIGHT APPL.	43-44	-	B
14		-	-	-	1	-	-	-	INDICATOR WARNING LIGHT APPL.	43-44	-	D
15		-	-	-	-	1	1	-	INDICATOR WARNING LIGHT APPL.	43-44	-	C
16	8412501	1	1	1	-	1	1	-	KIT ASSEMBLY .. Mechanical indicator	44	73	-
17	8412499	1	1	1	-	1	1	1	KIT ASSEMBLY .. Manual indicator	44	83	-
18	8412503	-	1	-	-	-	-	-	KIT .. Alteration - Dyn. brake cable	44	90	-

† *Refer to M.I. 9569 for complete details regarding conversion to paper engine air filters.*

†† *Refer to M.I. 9597 for complete details regarding conversion to fiberglass bag-type engine air filters.*

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Element Engine Air Filter Kits
16-567D3,D3A and 16,20-645E3 Engines
(Not Illustrated)

Ref. No.	Part Number	Quantity Required A	B	C	D	Description	
KIT ASSEMBLY .. Air Intake Filter - Paper - See Index, Page 37 For Application							
		A	B	C	D		
For Appropriate Filter Element Identification, See Fig. A, Plate A181-26, Page 40.							
1	8412863	1	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	See Ref. Nos. 26 thru 29 for Optional Filter Kits
2	8412500	-	1	-	-	KIT ASSEMBLY .. Air intake filter - Paper	
3	8413448	-	-	1	-	KIT ASSEMBLY .. Air intake filter - Paper	
4	8413449	-	-	-	1	KIT ASSEMBLY .. Air intake filter - Paper	
5	8410667	1	1	-	-	HOLDER ASSEMBLY .. Engine air filter	
6	8410745	-	-	1	-	HOLDER ASSEMBLY .. Engine air filter	
7	8410726	-	-	-	1	HOLDER ASSEMBLY .. Engine air filter	
8	9093588	12	12	12	-	ELEMENT .. Filter - Replaces 8375073	
9	9093587	-	-	-	12	ELEMENT .. Filter - Replaces 8377042	
10	8411372	1	1	-	-	BRACKET ASSEMBLY .. Filter mounting	
11	8377613	-	-	1	1	BRACKET ASSEMBLY .. Filter mounting	
12	8250038	3	-	-	-	PLATE .. Cover	
13	179880	8	8	4	4	BOLT .. Hex head 1/2-13 x 7/8	
14	103323	12	12	12	12	WASHER .. Lock 1/2	
15	103343	8	8	-	-	WASHER .. Plain 1/2	
16	8275731	-	-	4	4	WASHER .. Plain 1/2	
17	179885	4	4	4	4	BOLT .. Hex head 1/2-13 x 1-1/2	
18	179881	-	-	4	4	BOLT .. Hex head 1/2-13 x 1	
19	102637	4	4	4	4	NUT .. Hex 1/2-13	
20	8337906	3	3	3	3	SHIM .. Mounting	
21	8303837	1	1	-	-	DUCT .. Air	
22	8375876	2	2	-	-	CLAMP .. Hose	
23	103877	1	1	-	-	PLUG .. Pipe - 1/8 MPT square head	
24	103869	-	1	-	-	PLUG .. Pipe - 3/4 MPT square head	
For Appropriate Filter Element Identification, See Fig. B, Plate A181-26, Page 40.							
26	8469477	1	-	-	-	KIT ASSEMBLY .. Air intake filter - Paper	See Ref. Nos. 1 thru 4 for Optional Filter Kits
27	8469478	-	1	-	-	KIT ASSEMBLY .. Air intake filter - Paper	
28	8469479	-	-	1	-	KIT ASSEMBLY .. Air intake filter - Paper	
29	8469480	-	-	-	1	KIT ASSEMBLY .. Air intake filter - Paper	
30	8469476	1	1	-	-	HOLDER ASSEMBLY .. Engine air filter	
31	8469005	-	-	1	-	HOLDER ASSEMBLY .. Engine air filter	
32	8469004	-	-	-	1	HOLDER ASSEMBLY .. Engine air filter	
33	8498366	12	12	12	-	ELEMENT .. Filter - Replaces 8469002	
34	8498367	-	-	-	12	ELEMENT .. Filter - Replaces 8468999	
35	8411372	1	1	-	-	BRACKET ASSEMBLY .. Filter	
36	8377613	-	-	1	1	BRACKET ASSEMBLY .. Filter	
37	8250038	3	-	-	-	PLATE .. Cover	
38	179880	8	8	4	4	BOLT .. Hex head 1/2-13 x 7/8	
39	103323	12	12	12	12	WASHER .. Lock 1/2	
40	103343	8	8	-	-	WASHER .. Plain 1/2	
41	8275731	-	-	4	4	WASHER .. Plain 1/2	
42	179885	4	4	4	4	BOLT .. Hex head 1/2-13 x 1-1/2	
43	179881	-	-	4	4	BOLT .. Hex head 1/2-13 x 1	
44	102637	4	4	4	4	NUT .. Hex 1/2-13	
45	8337906	3	3	3	3	SHIM .. Mounting	
46	8303837	1	1	-	-	DUCT .. Air	
47	8375876	2	2	-	-	CLAMP .. Hose	
48	103877	1	1	-	-	PLUG .. Pipe - 1/8 MPT square head	
49	103869	-	1	-	-	PLUG .. Pipe - 3/4 MPT square head	

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Conversion From Cycoil, Rotonamic and Inertial To Paper Element Filters
8,12-645E Engines
SW1000, SW1001, SW1500 and MP15DC Locomotives
(Not Illustrated)

Ref. No.	Part Number	Quantity Required					Description
		A	B	-	-	-	SW1000 and SW1001 locomotives
		-	-	C	D	E	SW1500 and MP15DC locomotives
1	9093553	3	-	4	-	-	ELEMENT .. Cylindrical filter - Paper - 12-3/4 inches O.D.
2	9331454	-	2	-	4	-	ELEMENT .. Rectangular filter - Paper - 19 x 29 inches
†3	9331452	-	-	-	-	4	ELEMENT .. Rectangular filter - Paper - 20 x 20 inches
4	9325161	1	-	-	-	-	ADAPTER ASSEMBLY .. Filter
5	9503673	-	1	-	-	-	ADAPTER ASSEMBLY .. Filter
6	9093555	-	-	1	-	-	HOLDER ASSEMBLY .. Filter
7	9331449	-	-	-	1	-	ADAPTER ASSEMBLY .. Filter } Left Bank
†8	9331450	-	-	-	-	1	ADAPTER ASSEMBLY .. Filter } Left Bank
9	9093554	-	-	1	-	-	HOLDER ASSEMBLY .. Filter
10	9331448	-	-	-	1	-	ADAPTER ASSEMBLY .. Filter } Right Bank
†11	9331451	-	-	-	-	1	ADAPTER ASSEMBLY .. Filter } Right Bank
12	8483518	1	-	-	-	-	PIPE ASSEMBLY .. Flanged - Oil separator
13	9331510	1	1	1	1	1	INDICATOR .. Pressure - Mechanical

Note: Although there are two different rectangular elements listed above, it is recommended that the larger element 9331454, be used wherever possible. The larger element will operate at a lower pressure drop and will have a longer service life than the smaller element 9331452. Cylindrical element 9093553 and rectangular element 9331454 are equivalent in performance.

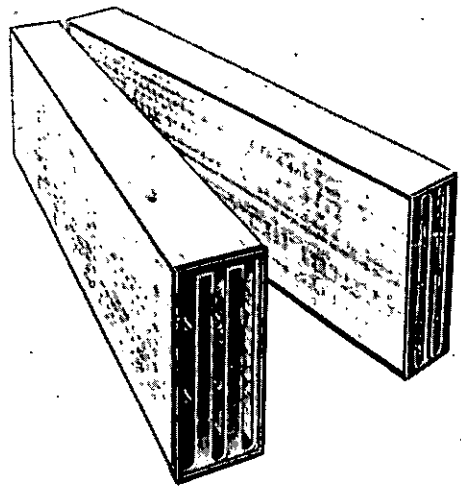
† For existing applications using 20 x 20 inch. elements, it may not be necessary to purchase new filter holders. If the existing holders are in good condition, they can be modified to accept the 9331452 element by using rework kit 9331456 per installation drawing 9331453. If there is any question as to the integrity of the existing holders, they should be replaced with the new adapters 9331450 and 9331451.

P.L. No. E181

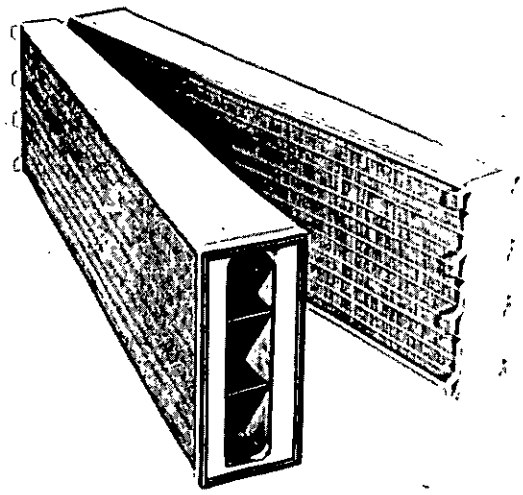
PAPER AND FIBERGLASS ENGINE AIR FILTERS

Paper Air Intake Filter Elements

See Pages 1 Through 20, 26, 27, 28 and 34 Through 39 For Application



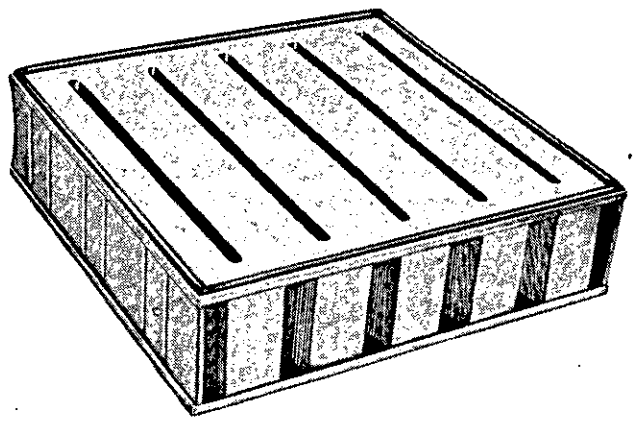
Ref. Nos. 1 thru 4



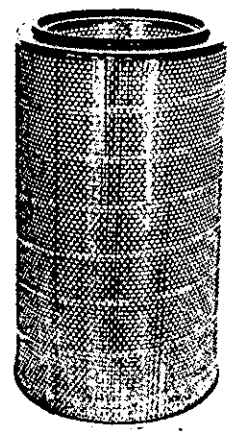
Ref. Nos. 5 thru 8

PLATE A181-26

Ref. No.	Part Number	Description
1	8375073	ELEMENT .. Air intake filter - Paper - 36-1/8 in. long - R-250 - Repl. by 9093588
2	9093588	ELEMENT .. Air intake filter - Paper - 36-1/8 in. long - RC-250 - Repl. 8375073
3	8377042	ELEMENT .. Air intake filter - Paper - 45-1/8 in. long - R-300 - Repl. by 9093587
4	9093587	ELEMENT .. Air intake filter - Paper - 45-1/8 in. long - RC-300 - Repl. 8377042
5	8469002	ELEMENT .. Air int. fltr. - Paper - 36-1/8 in. long - Slim Vee Pac I - Repl. by 8498366
6	8498366	ELEMENT .. Air int. fltr. - Paper - 36-1/8 in. long - Slim Vee Pac II - Repl. 8469002
7	8468999	ELEMENT .. Air int. fltr. - Paper - 45-1/8 in. long - Slim Vee Pac I - Repl. by 8498367
8	8498367	ELEMENT .. Air int. fltr. - Paper - 45-1/8 in. long - Slim Vee Pac II - Repl. 8468999



Ref. Nos. 9 and 10



Ref. No. 11

PLATE A181-27

Ref. No.	Part Number	Description
9	9331452	ELEMENT .. Air intake filter - Paper - 20 in. x 20 in. - T-520DR
10	9331454	ELEMENT .. Air intake filter - Paper - 19 in. x 29 in. - T-529DR
11	9093553	ELEMENT .. Air intake filter - Paper - 12-3/4 in. O.D.

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Fiberglass Element Bag-Type Engine Air Filter Kits
16-567D3,D3A; 16,20-645E3 and 16-645E3A Engines

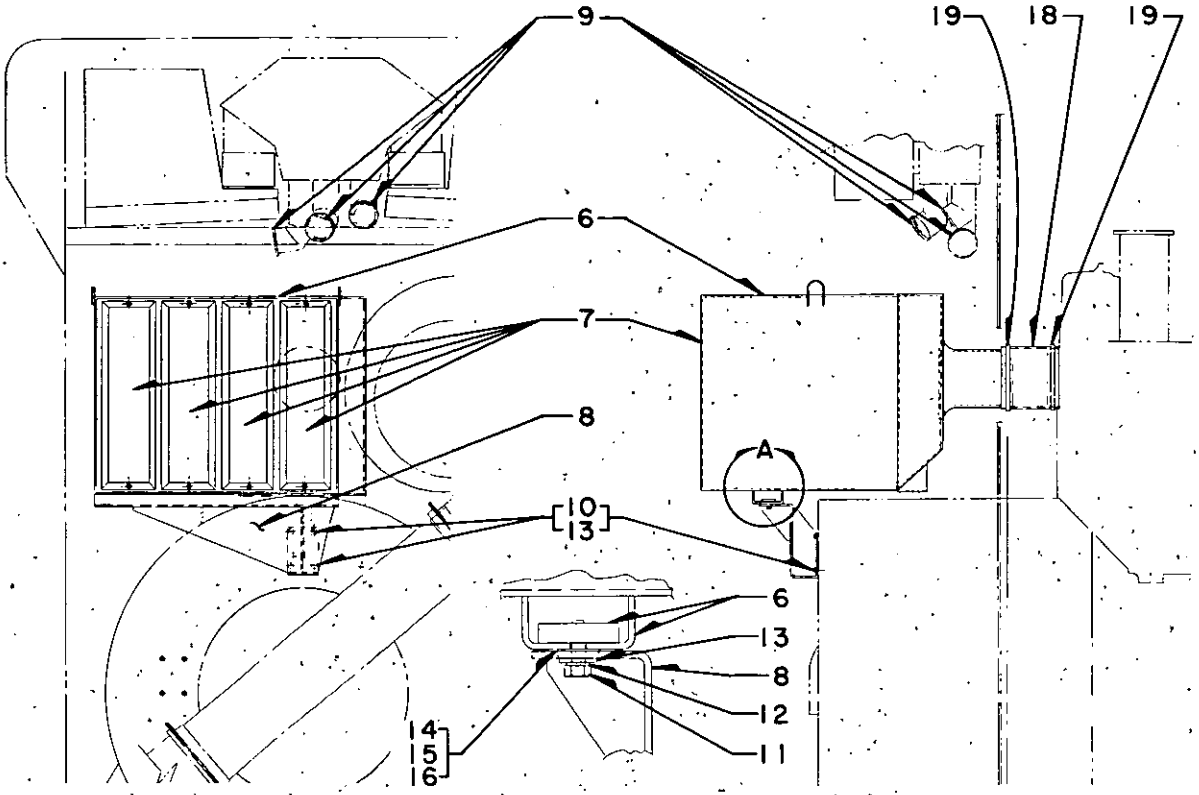


PLATE A181-28

Ref. No.	Part Number	Quantity Required			Description
KIT ASSEMBLY .. Air Intake Filter - Fiberglass - See Index, Page 37 For Application					
		A	B	C	
*1	8483611	1	-	-	KIT ASSEMBLY .. Air intake filter - Fiberglass
*2	8483612	-	1	-	KIT ASSEMBLY .. Air intake filter - Fiberglass
*3	8483613	-	-	1	KIT ASSEMBLY .. Air intake filter - Fiberglass
*4	8499865	1	1	-	KIT .. Air intake filter - Fiberglass - Less hardware
*5	8499866	-	-	1	KIT .. Air intake filter - Fiberglass - Less hardware
6	8483609	1	1	-	HOUSING ASSEMBLY .. Filter
6	8470902	-	-	1	HOUSING ASSEMBLY .. Filter
7	8470903	4	4	4	ELEMENT .. Filter
8	8483610	1	1	-	BRACKET ASSEMBLY .. Filter mounting
8	8470904	-	-	1	BRACKET ASSEMBLY .. Filter mounting
9	8250038	3	-	-	PLATE .. Cover
10	179881	8	8	8	BOLT .. Hex head 1/2-13 x 1
11	179887	4	4	4	BOLT .. Hex head 1/2-13 x 1-3/4
12	106265	8	8	8	WASHER .. Plain 1/2
13	103323	12	12	12	WASHER .. Lock 1/2
14	8432866	2	2	2	SHIM .. Filter mounting - 1-1/2 x 3-1/2 x 16 gauge
15	8432867	2	2	2	SHIM .. Filter mounting - 1-1/2 x 3-1/2 x 11 gauge
16	8432868	2	2	2	SHIM .. Filter mounting - 1-1/2 x 3-1/2 x 1/4 in. thick - Formerly applied
*17	103869	-	1	-	PLUG .. 3/4 MPT square head
18	8303837	1	1	-	DUCT .. Air
19	8375876	2	2	-	CLAMP .. Hose

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Conversion From Cycoil To Fiberglass Element Filters
16-645E Engines
GP38, GP38-2, SD38 and SD38-2 Locomotives
(Not Illustrated)

Ref. No.	Part Number	Qty. Req.	Description
1	8496581	1	KIT ASSEMBLY .. Filter housing - Does not include element
†2	8475458	1	HOUSING .. Filter
3	8496573	1	PANEL .. Filler
4	8496574	1	CHANNEL .. Housing mounting - Side
5	8496575	1	CHANNEL .. Housing mounting - Side
6	8496576	1	CHANNEL .. Housing mounting - Top
7	8496577	2	PLATE .. Filler
8	8496578	1	COUPLING .. Pipe
9	8496579	1	UNION .. Pipe
10	8496580	1	PIPE
†11	8470903	3	ELEMENT .. Filter - Disposable bag-type - Fiberglass

In addition to the parts shown above, the existing lube oil separator 8173846, must be replaced with a new low profile lube oil separator. The new separator and associated piping is shown below. Contact our Service Department for further details.

12	8431499	1	SEPARATOR ASSEMBLY .. Lube oil - Low profile - See P.L. No. 142
13	8432170	2	ELBOW ASSEMBLY .. Pipe - Lube oil separator
14	8432171	2	ELBOW ASSEMBLY .. Pipe - Swivel flange
15	8306502	2	GASKET .. Flanged pipe

† *For Kit which includes Filter Housing 8475458 and (3) Filter Elements 8470903 only, order Filter Kit 8499864.*

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PAPER AND FIBERGLASS ENGINE AIR FILTERS

Indicator Warning Light Application, Mechanical and Manual Indicator and Dynamic Brake Cable Alteration Kit Assemblies
16-567D3,D3A; 16-645E; 16,20-645E and 16-645E3A Engines
(Not Illustrated)

Ref. No.	Part Number	Quantity Required A	B	C	D	Description
		The following material is required for application of an air filter indicator warning light on the engine control panel. See index, Page 37, for applicable column.				
1	8392855	1	1	1	1	RELAY .. Latching - Warniong light - To be mounted on main control panel
2	9420156	2	2	2	2	SCREW .. Hex 1/2-20 x 1/2 - Tapping
3	8287294	1	-	-	-	HOLDER .. Lamp - D.C. bayonet base
4	8306534	-	1	1	1	HOLDER .. Lamp - S.C. miniature bayonet base
5	8408364	1	1	1	1	CAP .. Lens - Check filter - Formerly 8331057
6	8222023	1	-	-	-	LAMP .. D.C. bayonet base - 80 volts
7	8140357	-	1	1	1	LAMP .. S.C. miniature
8	8388713	1	1	1	1	PLATE .. Name
9	8388557	1	1	1	-	SWITCH .. Vacuum - Not furnished - See Ref. Nos. 56 thru 72 for repl.
10	8431248	-	-	-	1	SWITCH .. Vacuum - Not furnished - See Ref. Nos. 57 thru 72 for repl.
11	8165083	1	1	1	1	PAD .. Tapping
12	179791	2	2	2	2	BOLT .. Hex head 1/4-20 x 1/2
13	103319	2	2	2	2	WASHER .. Lock 1/4
14	8060971	1	1	1	1	NIPPLE .. Pipe - 1/4 MPT
15	8050093	1	1	1	-	TEE .. 1/4 FPT x 1/4 FPT x 1/4 FPT union
16	105417	-	-	-	1	TEE .. 1/4 FPT x 1/4 FPT x 1/4 FPT MPT
17	119290	1	1	1	-	NIPPLE .. Pipe - 1/4 MPT x 2-1/2 inches long
18	116436	-	-	-	1	CONNECTOR .. 1/4 tube x 1/4 MPT
19	8040347	1	1	1	-	ELBOW .. 1/4 tube x 1/4 FPT - 90°
20	116453	-	-	-	1	ELBOW .. 1/4 tube x 1/4 MPT - 90°
21	6531397	2	2	2	-	FITTING .. S.A.E. nut to hose - 1/4 O.D. tube
22	9091924	-	AR	-	-	HOSE .. 3/16 I.D. x 3/8 O.D. rubber covered - 1 ft. length - Form 8379526
23	118748	1	1	1	-	CONNECTOR .. 1/4 tube x 1/4
24	8390271	1	1	1	-	GROMMET .. Rubber - 9/16 I.D.
25	103878	2	2	2	1	PLUG .. Pipe - 1/4 MPT square head
26	103869	-	-	-	1	PLUG .. Pipe - 3/4 MPT square head
27	8455574	-	-	-	-	CONDUIT .. 1/2 in. liquid tight flexible metallic - 25 ft. length Column "A" and "B": 10 ft. required Column "C": 14 ft. req'd. - Column "D": 20 in. req'd. - Form. 8240495
28	8116953	-	-	-	AR	CONDUIT .. 1/2 in. rigid aluminum - 12 ft. length - 6 ft. 4 in. req'd.
29	8335601	1	1	1	-	CONNECTOR .. 1/2 in. male - 45°
30	8240529	2	2	2	1	CONNECTOR .. 1/2 in. male - 90°
31	8250975	1	1	1	-	CONNECTOR .. 1/2 in. female - Straight
32	8330797	-	-	-	1	COUPLING .. 1/2 in. male - Straight
33	8338594	-	-	1	1	BUSHING .. Female insulated - 1/2 in.
34	8452133	-	-	-	1	TUBE ASSEMBLY .. Air filter to vacuum switch
35	187397	1	1	1	-	COUPLING .. Pipe - 1/2 FPT
36	8123282	1	1	1	2	LUG .. Terminal - 1/4 stud
37	8198189	3	3	3	-	LUG .. Terminal - 1/4 stud
38	8123281	-	-	-	3	LUG .. Terminal - No. 10 stud
39	8147234	5	-	-	-	CLAMP ASSEMBLY .. Hose
40	8108197	1	1	2	-	CLAMP ASSEMBLY .. Hose
41	8108115	-	1	2	3	CLAMP ASSEMBLY .. Hose
42	8108110	-	-	-	3	CLAMP ASSEMBLY .. Hose
43	8274588	-	2	-	-	CLAMP .. Insulated - 1/2
44	9419650	2	2	-	-	SCREW .. Hex washer head 3/8-16 x 3/4 - Tapping
45	187395	1	1	1	-	COUPLING .. Pipe - 1/4 FPT
46	8468611	-	-	-	-	CABLE .. 14 AWG - LF insul. - 500 ft. length Col. "A", "B" & "C": Approx. 90 ft. req'd. - Col. "D": 75 ft. req'd.
47	8330835	-	1	-	-	CONNECTOR .. 1/2 in. female - Straight
48	8272337	1	1	1	1	TERMINAL .. Faston tab - 14 AWG. - Yellow
49	8250906	7	7	7	-	TERMINAL .. Faston tab - 14 AWG. - Blue
50	8333192	4	4	4	-	TERMINAL .. Faston tab - 14 AWG. - Non-insulated
51	8126723	-	-	-	3	CONNECTOR .. Insulated crimp type - 14 AWG.
52	WS17058	1	-	-	-	DIAGRAM .. Wiring
53	WS17059	-	1	-	-	DIAGRAM .. Wiring — Contact the EMD Service
54	WS17060	-	-	1	-	DIAGRAM .. Wiring — Department for diagrams
55	WS18579	-	-	-	1	DIAGRAM .. Wiring

P.L. No. E181

PAPER AND FIBERGLASS ENGINE AIR FILTERS

Ref. No.	Part Number	Qty. Req.		Description
		A	-	Ref. Nos. 56 thru 72 replace 8388557 vacuum switch
		-	B	Ref. Nos. 57 thru 72 replace 8431248 vacuum switch
56	8490137	1	-	SWITCH .. Pressure
57	8490138	-	1	SWITCH .. Pressure
58	8409132	1	1	PLATE .. Pressure switch mounting
59	8473448	1	1	TUBE ASSEMBLY .. Vacuum switch to air intake filter
60	9316152	A.R.		TUBING .. 1/4 O.D. x .170 I.D. - Nylon - Sold per ft. - Approximately 8-1/2 in. required - Replaces 8860536
61	8453868	2	2	NUT .. Tube 1/4
62	8453869	2	2	SLEEVE .. Tube 1/4
63	8453870	2	2	SEAT .. Tube 1/4
64	114794	1	1	NIPPLE .. 1/8 MPT x 2 inches long
65	127887	1	1	ELBOW .. 1/4 tube x 1/8 FPT
66	8160443	1	-	ELBOW .. 1/4 tube x 1/4 tube - Bulkhead
67	118810	-	1	ELBOW .. 1/4 tube x 1/4 tube
68	120395	2	-	WASHER .. Flat 15/32 I.D.
69	272121	2	-	NUT .. Hex 7/16-20
70	8455349	1	1	PLUG .. Filter - 1/8 NPT
71	8330835	1	1	CONNECTOR .. 1/2 box - Straight liquid tight
72	9419643	2	2	SCREW .. Hex washer head 8-32 x 1/2 - Tapping

KIT ASSEMBLY .. Mechanical Indicator

73	8412501	1	KIT ASSEMBLY .. Mechanical indicator
74	8407835	1	INDICATOR .. Service
75	8379557	1	PAD .. Tapping
76	8379526	1 ft.	HOSE .. 3/16 I.D. x 3/8 O.D. rubber covered - Sold per foot
77	6531397	2	FITTING .. S.A.E. nut to hose - 1/4 O.D. tube
78	125620	1	CONNECTOR .. 1/4 tube x 1/8 FPT
79	118748	1	CONNECTOR .. 1/4 tube x 1/8 MPT
80	8060970	1	NIPPLE .. Short pipe - 1/8 MPT
81	179791	2	BOLT .. Hex head 1/4-20 x 1/2
82	103319	2	WASHER .. Lock 1/4

KIT ASSEMBLY .. Manual Indicator

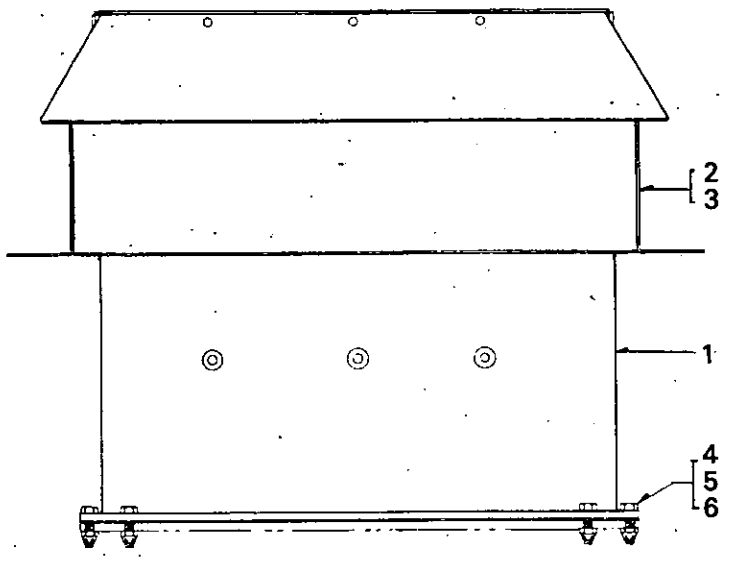
83	8412499	1	KIT ASSEMBLY .. Manual indicator
84	8411568	1	PLATE ASSEMBLY .. Pressure tap
85	8379526	18 in.	HOSE .. 3/16 I.D. x 3/8 O.D. rubber covered - Sold per foot
86	6531397	2	FITTING .. S.A.E. nut to hose - 1/4 O.D. tube
87	118748	2	CONNECTOR .. 1/4 tube x 1/8 MPT
88	8411571	1	GASKET .. Rubber - 1/16 x 4 x 7 in.
89	171603	6	SCREW .. Round head 1/4-20 x 3/4 - Tapping

KIT ASSEMBLY .. Alteration - Dynamic Brake Cable

90	8412503	1	KIT ASSEMBLY .. Alteration - Dynamic brake cable
91	8412657	2	CHANNEL ASSEMBLY .. Dynamic brake
92	8330912	2	ANGLE .. Channel
93	8370725	1	ANGLE .. Channel
94	8375054	1	DUCT ASSEMBLY
95	8412654	1	ANGLE .. Support
96	8412655	3	ANGLE .. Support
97	180124	8	BOLT .. Hex head 3/8-16 x 1-1/4
98	8035146	8	NUT .. Hex lock 3/8-16 - Formerly 8035416
99	180116	2	BOLT .. Hex head 3/8-16 x 1/2
100	120382	2	WASHER .. Lock 3/8
101	102637	2	NUT .. Hex 1/2-13
102	8370722	1	ROD .. Duct support - 8-3/4 inches long

EXHAUST STACKS AND SILENCERS

Exhaust Stack Assembly
16-567D2,D3,D3A; 12,16,20-645E3,E3B; 16-645E3A,E3C,F3B Engines



End View

PLATE C182-1

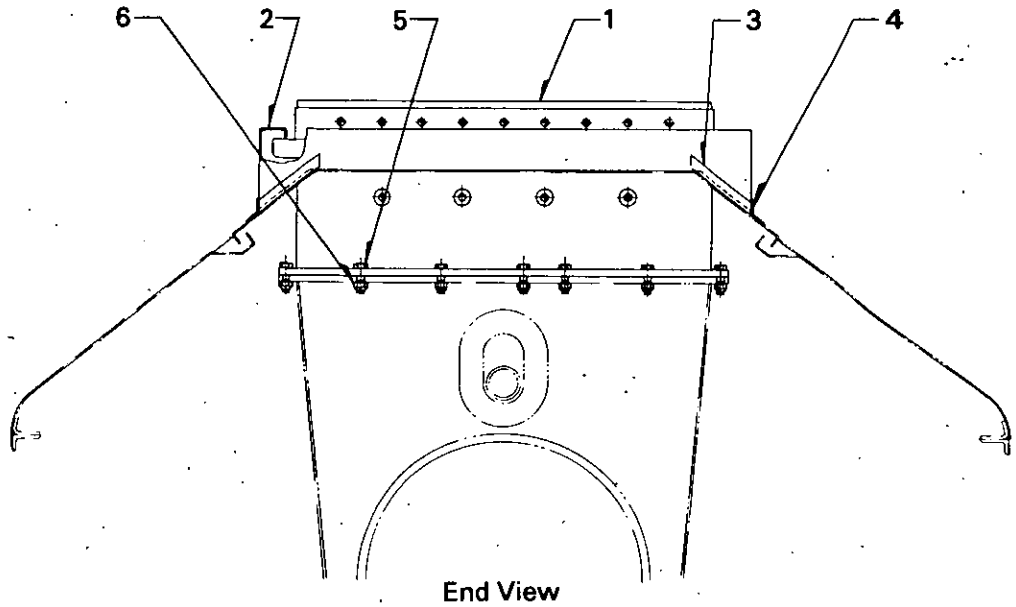
Ref. No.	Part Number	Quantity Required								Description
		A	-	-	-	-	-	-	-	16-567D2 GP20; 16-567D3 SD24
		-	B	-	-	-	-	-	-	16-567D3 GP30
		-	-	C	-	-	-	-	-	16-567D3 GP30
		-	-	-	D	-	-	-	-	16-567D3A GP35
		-	-	-	-	E	-	-	-	16-567D3A GP35, DD35, DDA35, SD35, SDP35
		-	-	-	-	-	F	-	-	12-645E3 GP39, GP39AC, GP39-2, SD39; 16-645E3 GP40, GP40-2 SD40, SD40-2, SD40T-2; 20-645E3 SD45, SD45-2, SD45T-2 SDP45, F45, FP45, DDM45
		-	-	-	-	-	-	G	-	16-645E3A DDA40X
		-	-	-	-	-	-	-	H	16-645E3C SDL40-2; 16-645F3B SDL50
		-	-	-	-	-	-	-	J	12-645E3B GP39-2; 16-645E3B GP40-2, SD40-2, SD40T-2 20-645645E3B SD45-2; SD45T-2 (Prior to Jan. 1, 1980)
1	8289178	1	-	-	-	-	-	-	-	STACK ASM. .. Exhaust
1	8315277	-	1	-	-	-	-	-	-	STACK ASM. .. Exhaust - 36-1/2 in. height
1	8304551	-	-	1	-	1	-	-	-	STACK ASM. .. Exhaust - 32-7/16 in. height
1	8352285	-	-	-	1	-	-	-	-	STACK ASM. .. Exhaust
1	8353595	-	-	-	-	-	1	-	1	STACK ASM. .. Exhaust
1	8421977	-	-	-	-	-	-	1	-	STACK ASM. .. Exhaust
2	8289204	1	-	-	-	-	-	-	-	DAM ASM. .. Exhaust stack
3	8315357	-	1	-	-	-	-	-	-	COLLAR ASM. .. Exhaust stack
3	8304556	-	-	1	-	-	-	-	-	COLLAR ASM. .. Exhaust stack
3	8352284	-	-	-	1	-	-	-	-	COLLAR ASM. .. Exhaust stack
3	8332459	-	-	-	-	1	-	-	-	COLLAR ASM. .. Exhaust stack
3	8353598	-	-	-	-	-	1	-	-	COLLAR ASM. .. Exhaust stack
3	8421986	-	-	-	-	-	-	1	-	COLLAR ASM. .. Exhaust stack
*3	9516358	-	-	-	-	-	-	-	1	COLLAR ASM. .. Exhaust stack
4	9416368	28	28	28	28	28	18	18	20	BOLT .. Hex head - 1/2-20 x 2 - Stack to turbocharger
5	9338626	28	28	28	28	28	18	18	20	NUT .. Hex - 1/2-20 - Special - Replaces 8284621
6	8278929	As Required								COMPOUND .. Thread sealing - 1 quart - Bolts are to be coated with thread compound before application.

9516357

P.L. No. F182

EXHAUST STACKS AND SILENCERS

Exhaust Stack Assembly
Export Locomotives
12-645E3,E3B; 16-645E3,E3B Engines



End View

PLATE A182-2

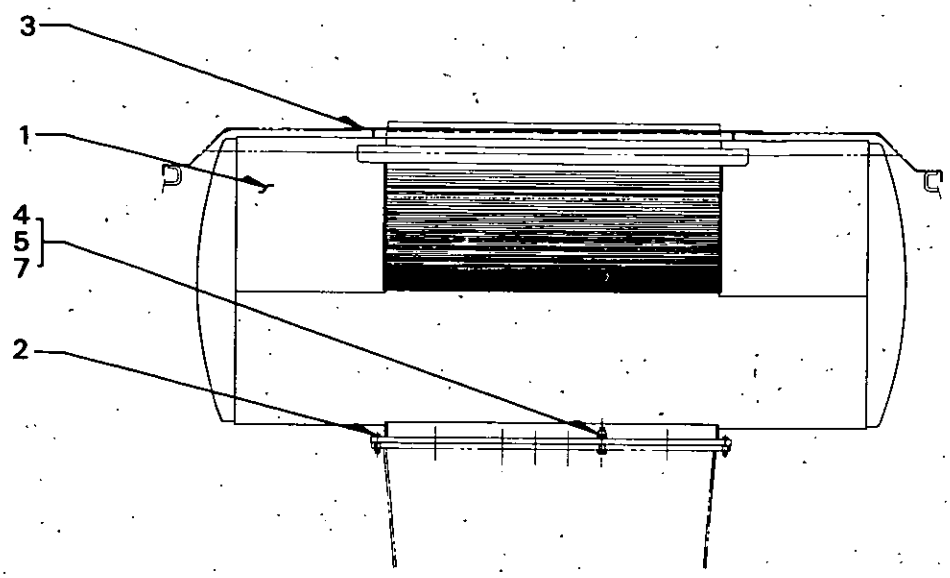
Ref. No.	Part Number	Quantity Required					Description
		A	-	-	-	-	12-645E3 GT22C,CU,CW,LC,JT22CW-2; 16-645E3 GT26CW,CW-2,CU-2
		-	B	-	-	-	12-645E3 JT22CW
		-	-	C	-	-	16-645E3 GT26
		-	-	-	D	-	16-645E3 GT26M2C
		-	-	-	-	E	12-645E3B GT22CU,CW,LC,JT22CW; 16-645E3B GT26CU-2, CW-2
1	8471400	1	-	-	-	-	STACK ASM. .. Exhaust
1	8458057	-	1	-	1	-	STACK ASM. .. Exhaust
1	8447078	-	-	1	-	1	STACK ASM. .. Exhaust
2	8471403	1	-	-	-	-	COLLAR ASM. .. Exhaust stack
2	9313490	-	1	-	-	-	COLLAR ASM. .. Exhaust stack
2	8447077	-	-	1	-	-	COLLAR ASM. .. Exhaust stack
2	8458620	-	-	-	1	-	COLLAR ASM. .. Exhaust stack
2	9518284	-	-	-	-	1	COLLAR ASM. .. Exhaust stack
3	8447069	-	-	4	-	-	STRIP .. Batten
4	8447068	-	-	2	-	-	ANGLE .. Batten
5	9416368	18	18	18	18	17	BOLT .. Hex head 1/2-20 - Stack to turbocharger
6	9338626	18	18	18	18	17	NUT .. Hex 1/2-20 - Special - Replaces 8284621
*7	8278929	As Required					COMPOUND .. Thread sealing - 1 quart - Bolts are to be coated with thread compound before application.

8471404, 8447079, 9518283, 9313489, 8458621

P:L. No. F182

EXHAUST STACKS AND SILENCERS

Exhaust Stack Assembly
16-645E3,E3A, 12,16,20-645E3B; 12,16-645F3 Engines



End View

PLATE B182-3

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	16-645E3 F40PH, SDP40F; 16-645E3A F40C; 16-645E3B F40PH, F40PH-2 (Prior to January 1, 1980)
		-	B	-	12-645E3B GP39-2; 16-645E3B GP40-2, SD40-2, SD40T-2; 16-645F3 GP40X; 20-645E3B SD45-2; SD45T-2 (After January 1, 1980)
		-	-	C	12-645F3 GP39X; 16-645F3 SD40X, GP50; 16-645E3B F40PH, F40PH-2 (After January 1, 1980)
†1	8493999	1	1	-	SILENCER ASM. .. Exhaust } No longer funished - See note below
*†1	9518778	-	-	1	SILENCER ASM. .. Exhaust }
2	8499039	2	2	2	PIN .. Taper - 1/2 x 1-3/8 in. long
3	8494035	1	-	-	COLLAR ASM. .. Exhaust silencer
3	9519316	-	1	1	COLLAR ASM. .. Exhaust silencer
4	8287827	16	16	16	BOLT .. Hex head 1/2-20 x 2 - Silencer to turbocharger - 645E3,E3A;E3B engines only
4	181440	-	16	16	BOLT .. Hex head 1/2-20 x 2-1/2 - Silencer to turbocharger - 645F3 engines only
5	9338626	16	16	16	NUT .. Hex 1/2-20 - Special - Replaces 8284621
*6	8260114	2	2	2	WASHER .. Plain - 17/32 I.D. x 1-1/16 O.D. x .105 thick
7	8278929	A.R.			COMPOUND .. Thread sealing - 1 quart - Bolts are to be coated with thread compound before application

† Silencers 8493999 and 9518778 are no longer available. Reference numbers 8 through 13 are recommended for replacement.

*8	9529633	1	SILENCER ASM. .. Exhaust - Straight thru - Replaces 8493999 and 9518778
*9	8499039	1	PIN .. Taper - 1/2 x 1-3/8 in. long
*10	9536591	1	COVER .. Hatch - Required because of exhaust outlet relocation
*ϕ11	9531636	16	BOLT .. Hex head 1/2-20 x 2-1/2 - Silencer to turbocharger - For thin flange turbocharger duct
*ϕ11	8259128	16	BOLT .. Hex head 1/2-20 x 2-15/16 - Silencer to turbocharger - For heavy flange turbocharger duct
*12	8260114	32	WASHER .. Plain 17/32 I.D. x 1-1/16 O.D. x .105 thick
*13	9338626	16	NUT .. Hex 1/2-20 - Special - Silencer mounting

P.L. No. F182

EXHAUST STACKS AND SILENCERS

Exhaust Silencer Assembly
8-645E3C; 12,16-645E3B,E3C,F3,F3B Engines

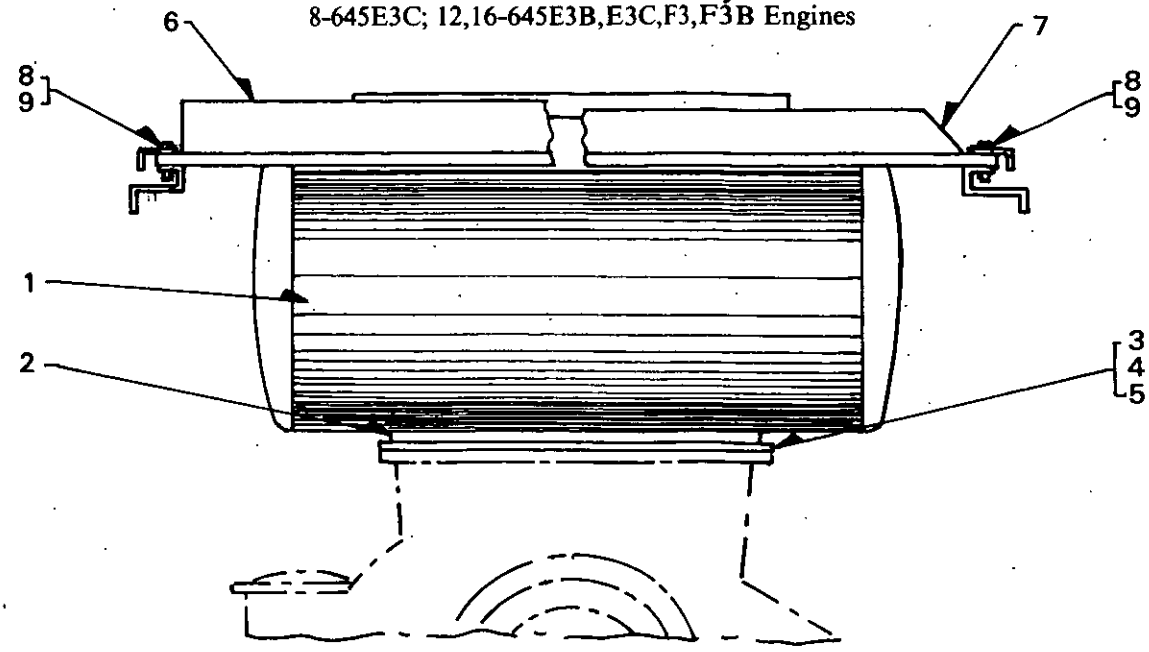


PLATE B182-4

Ref. No.	Part Number	Quantity Required			Description
		A	-	-	8-645E3C GP15T
		-	B	-	12-645E3,E3B GP39-2; 12-645E3C GP49; 12-645F3,F3B GP39X, GP49 16-645E3B,E3C F40PH, F40PH-2,GP40-2, SD40-2,SD40T-2 16-645F3,F3B GP50,GP50T
		-	-	C	16-645F3,F3B SD50,SD50S
1	9529633	1	1	1	SILENCER ASM. .. Exhaust - Replaces 8493999 and 9518778
2	8499039	2	2	2	PIN .. Taper - 1/2 x 1-3/8 in. long
3	8259128	16	16	16	BOLT .. Silencer to turbocharger - 1/2-20 x 2-15/16 - Special
4	8260114	32	32	32	WASHER .. Plain - 17/32 I.D. x 1-1/16 O.D. x .105 thick
5	9338626	16	16	16	NUT .. Hex 1/2-20 - Special - Replaces 8284621
6	9537677	1	-	1	HATCH ASM. .. Silencer
7	9536591	-	1	-	COVER ASM. .. Silencer
8	180120	16	22	16	BOLT .. 3/8-16 x 3/4 - Hatch and cover mtg.
9	120382	16	22	16	WASHER .. Lock 3/8
*10	8278929	A.R.			COMPOUND .. Thread sealing - 1 quart - Bolts are to be coated with thread compound before application

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EXHAUST STACKS AND SILENCERS

Exhaust Silencer Assembly
16-64E3 Engine - SDP40F

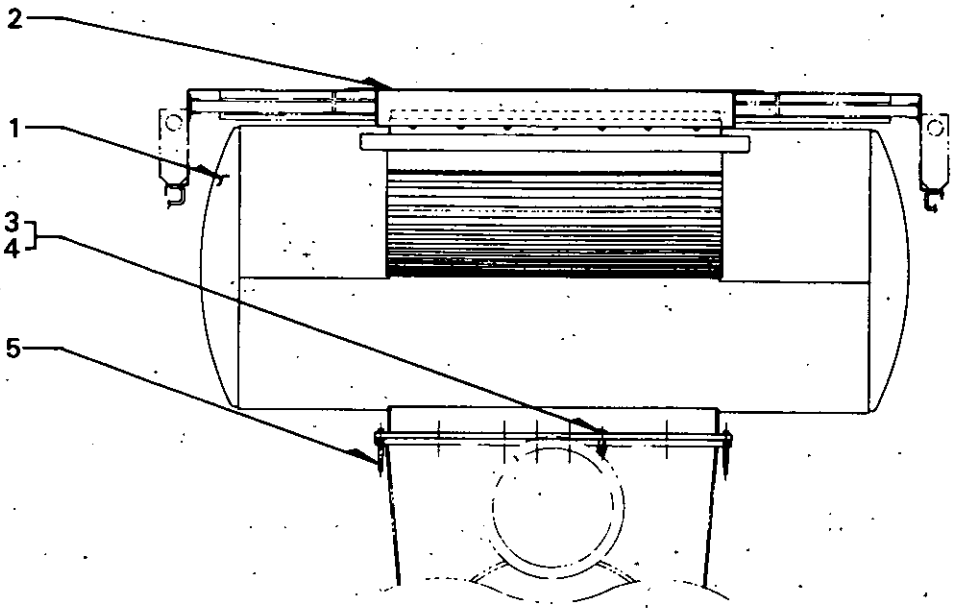


PLATE B182-5

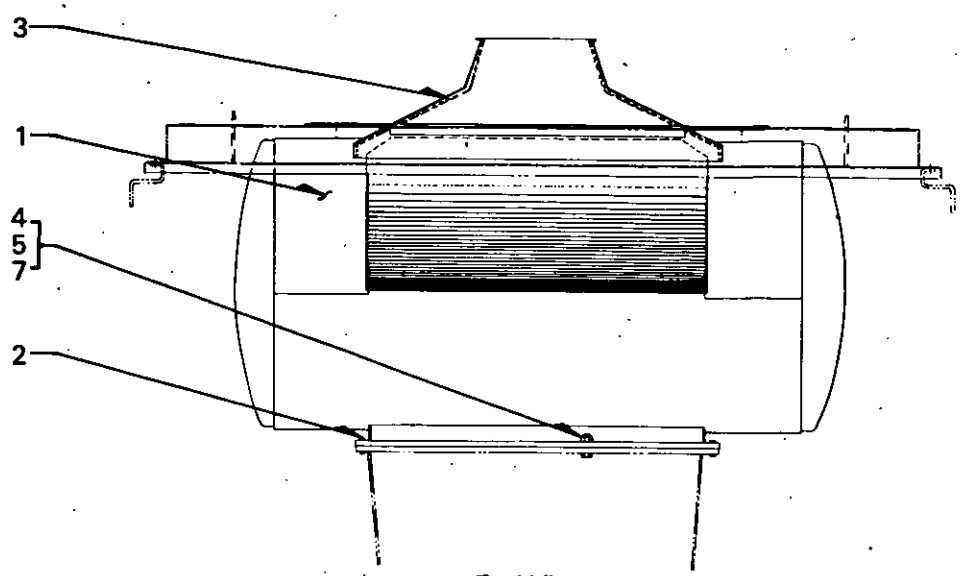
Ref. No.	Part Number	Qty. Req.	Description
1	8483587	1	SILENCER ASSEMBLY .. Exhaust
2	8485665	1	COLLAR ASSEMBLY .. Exhaust silencer
3	9416368	16	BOLT .. Hex head 1/2-20 x 2 - Silencer to turbocharger
4	9338626	16	NUT .. Hex 1/2-20 - Special - Replaces 8284621
5		2	PIN .. Taper - Component of Ref. No. 1
*6	8278929	A.R.	COMPOUND .. Thread sealing - 1 quart Bolts are to be coated with thread compound before application

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P.L. No. F182

EXHAUST STACKS AND SILENCERS

Exhaust Silencer Assembly
16-64E3 Engine - F40PH



End View

PLATE A182-6

Ref. No.	Part Number	Qty. Req.	Description
1	9332389	1	SILENCER ASSEMBLY .. Exhaust
2	8499039	2	PIN .. Taper - 1/2 x 1-3/8 in. long
3	9332572	1	ADAPTER ASSEMBLY .. Center
4	8287827	46	BOLT .. Hex head 1/2-20 x 2 - Silencer to turbocharger
5	9338626	16	NUT .. Hex 1/2-20 - Special - Replaces 8284621
*6	8260114	2	WASHER .. Plain - 17/32 I.D. x 1-1/16 O.D. x .105 thick
7	8278929	A.R.	COMPOUND .. Thread sealing - 1 quart - Bolts are to be coated with thread compound before application

Parts List No. F185

ROOTS BLOWER AND BLOWER SUPPORT

Air Duct, Blind Cover, Blower and Blower Support Mounting Application
8-645E Engine

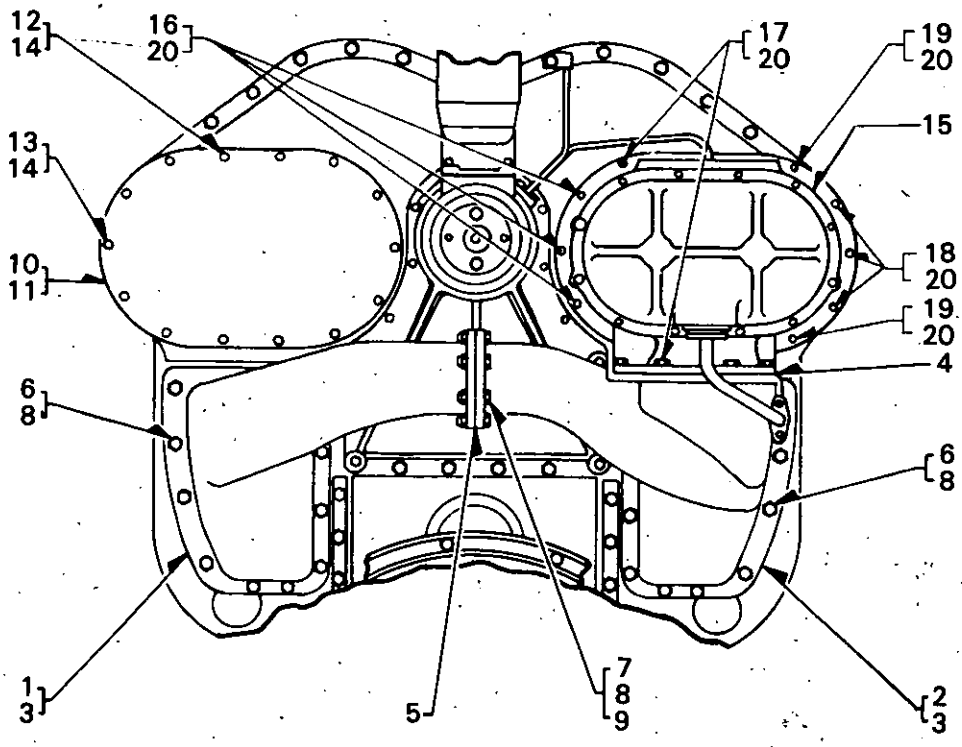


PLATE C185-1

Ref. No.	Part Number	Qty. Req.	Description
1	9523881	1	DUCT .. Air - Left bank - Replaces 8371463
2	9523883	1	SUPPORT .. Blower - Right bank - Replaces 8371473
3	8416803	1	GASKET .. Air duct - Replaces 8261226
3	8095027	1	GASKET .. Blower support to crankcase
4	8028465	1	GASKET .. Blower to support
5	8371461	1	GASKET .. Air duct to blower support
6	181429	24	BOLT .. Hex head 1/2-20 x 1-1/4 - Air duct and support to crankcase
7	181436	12	BOLT .. Hex head 1/2-20 x 2-1/4 - Air duct to blower support
8	6101229	36	WASHER .. Flat 1/2
9	8032719	12	NUT .. Hex lock 1/2-20
10	8075785	1	COVER .. Blind
11	8028148	2	GASKET .. Blind cover and blower to crankcase
12	181429	6	BOLT .. Hex head 1/2-20 x 1-1/4 - Blind cover to crankcase
13	181435	8	BOLT .. Hex head 1/2-20 x 2 - Blind cover to crankcase
14	6101229	14	WASHER .. Flat 1/2
15	8369676	1	BLOWER ASM. .. Right bank - See Page 3
16	181429	3	BOLT .. Hex head 1/2-20 x 1-1/4 - Blower to drive housing cover
17	181433	15	BOLT .. Hex head 1/2-20 x 1-3/4 - Blower to support and drive housing cover
17	181433	15	BOLT .. Hex head 1/2-20 x 1-3/4 - Blower to support and drive housing cover
18	181436	3	BOLT .. Hex head 1/2-20 x 2-1/4 - Blower to drive housing cover
19	181441	5	BOLT .. Hex head 1/2-20 x 2-3/4 - Blower to drive cover
20	6101229	26	WASHER .. Flat 1/2
*21	8178639	A.R.	CEMENT .. Blower and support gasket - 1 pint can

P.L. No. F185

ROOTS BLOWER AND BLOWER SUPPORT

Roots Blower Application
16-567D1 and 12,16-645E Engines

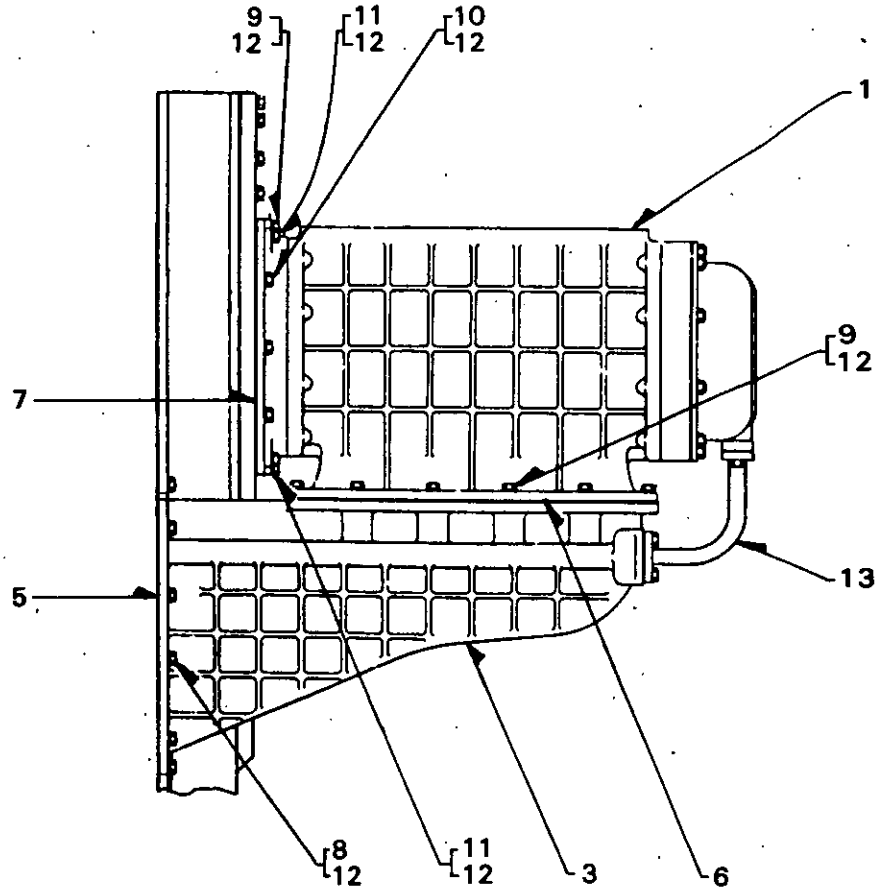


PLATE D185-2

Ref. No.	Part Number	Qty. Req.		Description
		A	-	12-645E
		-	B	16-567D1 and 16-645E engines
1	----	1	1	BLOWER ASM. .. Roots - Left bank } See Page 3
*2	----	1	1	BLOWER ASM. .. Roots - Right bank } See Page 3
3	8098038	1	-	SUPPORT .. Blower - Left bank
3	8084574	-	1	SUPPORT .. Blower - Left bank
*4	8098037	1	-	SUPPORT .. Blower - Right bank
*4	8084575	-	1	SUPPORT .. Blower - Right bank
5	8095027	2	2	GASKET .. Support to crankcase
6	8028465	2	2	GASKET .. Blower to support
7	8028148	2	2	GASKET .. Blower to drive housing
8	181429	30	30	BOLT .. Hex head 1/2-20 x 1-1/4
9	181433	30	30	BOLT .. Hex head 1/2-20 x 1-3/4
10	181436	6	6	BOLT .. Hex head 1/2-20 x 2-1/4
11	181441	10	10	BOLT .. Hex head 1/2-20 x 2-3/4
12	6101229	76	76	WASHER... Flat 1/2
13	----	2	2	LINE .. Lube oil - See Parts List No. 134
*14	8178639	A.R.		CEMENT .. Blower and support gasket - 1 pint can

ROOTS BLOWER AND BLOWER SUPPORT

Roots Blower Assembly
16-567D1 and 8,12,16-645E Engines
PLATE E185-3

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	16-567D1 engine
		-	B	-	-	8-645E engine
		-	-	C	-	12,16-645E engine
		-	-	-	D	16-645E engine - Canadian National Railways GP38-2
†1	8069433	1	-	-	-	BLOWER ASM. .. Left bank - Replaced by 8369677 - See Note below
1	8369677	-	-	1	-	BLOWER ASM. .. Left bank - Replaces 8069433
1	9080513	-	-	-	1	BLOWER ASM. .. Left bank - Canadian National Railways
†2	8069492	1	-	-	-	BLOWER ASM. .. Right bank - Replaced by 8369676 - See note below
2	8369676	-	1	1	-	BLOWER ASM. .. Right bank - Replaces 8069492
2	9080512	-	-	-	1	BLOWER ASM. .. Right bank - Canadian National Railways

†16-567D1 engine blower assemblies 8069433 and 8069492 are replaced by current 645 engine blower assemblies 8369677 and 8369676 respectively. When applying replacement 645 blower assemblies in 567 engines, new drain lines must be applied or existing drain lines reworked as outlined in Pointers Article 12L-75 dated November 21, 1975. The following drain lines are required if rework is not made: 8369720 - Left bank; 8369719 - Right bank.

The following components are applicable to left and right bank blower assemblies, Ref. Nos. 1 and 2.

3	8189438	1	HOUSING .. Blower
4	8028715	12	STUD .. Rear end plate - 1/2 x 3-5/8 in. long 8123072 .. .002 O.S. 8126927 O.S. 8123073 .. .005 O.S. 8126928 O.S. 8126926 .. .015 O.S.
5	8028741	4	DOWEL .. End plate - 1/2 x 1-1/4 in. long - Inner and outer
6			Reference number not used
7	8028710	12	STUD .. Front end plate - 1/2 x 4-1/4 in. long 8123070 .. .002 O.S. 8126921 .. .017 O.S. 8123071 .. .005 O.S. 8126922 .. .019 O.S. 8126920 .. .015 O.S.
8	8189439	1	PLATE .. End - Rear
9	8028709	8	STUD .. Bearing - 1/2-13 -20 x 2 in. long 8115277 .. .002 O.S. 8115280 .. .017 O.S. 8115278 .. .004 O.S. 8115281 .. .019 O.S. 8115279 .. .015 O.S.
10	8029137	2	STUD .. Oil line to end plate - 3/8-16-24 x 1-3/4 in. long 8115306 .. .002 O.S. 8115309 .. .017 O.S. 8115307 .. .004 O.S. 8115310 .. .019 O.S. 8115308 .. .015 O.S.
11	8434196	2	SEAL .. Oil - Blower shaft - Replaces 8327049
12	8054404	2	GASKET .. Oil seal
13	110487	12	SCREW .. 10-24 x 1/2 fil. head
14	106497	12	WASHER .. Lock - No. 10
15	8206553	2	BEARING .. Rotor plate
16	9530309	8	NUT .. Hex lock 1/2-20 - Formerly 102647 slotted nut
17	8116738	A.R.	WIRE .. Lock - 3/64 dia. x 500 ft. - No longer applied - Use Ref. 16
18	103343	12	WASHER .. Plain 1/2
19	8055819	A.R.	CEMENT .. Gasket - Non-hardening - 1 pint
20	8400148	A.R.	THREAD .. Silk - 100 yd. spool

P.L. No. F185

ROOTS BLOWER AND BLOWER SUPPORT

Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	16-567D1 engine
		-	B	-	-	8-645E engine
		-	-	C	-	12,16-645E engine
		-	-	-	D	16-645E engine - Canadian National Railways GP38-2
	8069433	1	-	-	-	BLOWER ASM. .. Left bank
	8369677	-	-	1	-	BLOWER ASM. .. Left bank
	9080513	-	-	-	1	BLOWER ASM. .. Left bank
	8069492	1	-	-	-	BLOWER ASM. .. Right bank
	8369676	-	1	1	-	BLOWER ASM. .. Right bank
	9080512	-	-	-	1	BLOWER ASM. .. Right bank
21	8070342	1	1	1	1	PLATE ASSEMBLY .. Front end
22	8204451	1	1	1	1	PLATE .. End - Front
23	8028709	8	8	8	8	STUD .. 1/2-13-20 x 2 in. long
24	103878	1	1	1	1	PLUG .. Pipe - 1/4 MPT
25	8434196	2	2	2	2	SEAL .. Oil - Blower shaft - Replaces 8327049
26	8054404	2	2	2	2	GASKET .. Oil seal
27	110487	12	12	12	12	SCREW .. 10-24 x 1/2 fil. head
28	106497	12	12	12	12	WASHER .. Lock No. 10
29	103028	8	8	8	8	NUT .. Hex 1/2-20
30	103323	8	8	8	8	WASHER .. Lock 1/2
31	103343	8	8	8	8	WASHER .. Plain 1/2
32	8048295	1	1	1	-	ROTOR SET .. Matched and balanced - Includes Ref. No's. 33 thru 45
32	9500336	-	-	-	1	ROTOR SET .. Matched and balanced - Includes Ref. Nos. 33 thru 45
33	100364	8	8	8	8	PIN .. Taper - No. 7 x 2-1/4 in. long
34	8028591	2	2	2	2	HUB .. Gear
35	8454020	1	1	1	-	GEAR SET .. Matched and balanced - Replaces 8081124
35	9081724	-	-	-	1	GEAR SET .. Matched and balanced
36	8028721	2	2	2	2	NUT .. Hex 2-1/4-16 - Drive sleeve
37	8028735	2	2	2	2	DOWEL .. Quillshaft to hub - 1/2 x 1-9/16 in. long 8084334 .. .005 O.S. 8084335 .. .015 O.S. 8081274 .. .010 O.S.
38	8028736	2	2	2	2	DOWEL .. Gear to hub - 1/2 x 1-1/16 in. long 8082371 .. .005 O.S. 8082369 .. .015 O.S. 8082370 .. .010 O.S.
39	8028464	1	1	1	1	PLATE .. Dowel retaining
40	8039653	1	1	1	1	PLATE .. Retainer
41	8028467	2	2	2	2	PLATE .. Lock
42	8028327	4	4	4	4	BOLT .. Hex head 5/16-24 x 7/16
43	8028295	4	4	4	4	BOLT .. Hex head 1/2-20 x 1-9/16
44	8028291	4	4	4	4	BOLT .. Hex head 1/2-20 x 1-1/8
45	8116738	As Req.				WIRE .. Lock - 3/64 dia. - Available 500 ft. length
46	8028466	2	2	2	2	COLLAR .. Thrust
††47	8028146	2	-	-	-	BEARING ASM. .. Blower - 16-567D1 engine
††47	8369675	-	2	2	2	BEARING ASM. .. Blower - 8,12,16-645E engines
48	8039673	4	-	-	-	BUSHING .. Bearing - Precision bored after assembly
48	8369674	-	4	4	4	BUSHING .. Bearing - Precision bored after assembly
49	102647	8	8	8	8	NUT .. Hex 1/2-20
50	8116738	As Req.				WIRE .. Lock 3/64 dia. - Available 500 Ft. length

††It is recommended when 16-567D1 blower assemblies 8069433 and 8069492 are rebuilt, that the "E" type bearing assembly 8361675 and the appropriate drain line be applied as outlined on Page 3.

P.L. No. F185

ENGINE BLOWER AND BLOWER SUPPORT

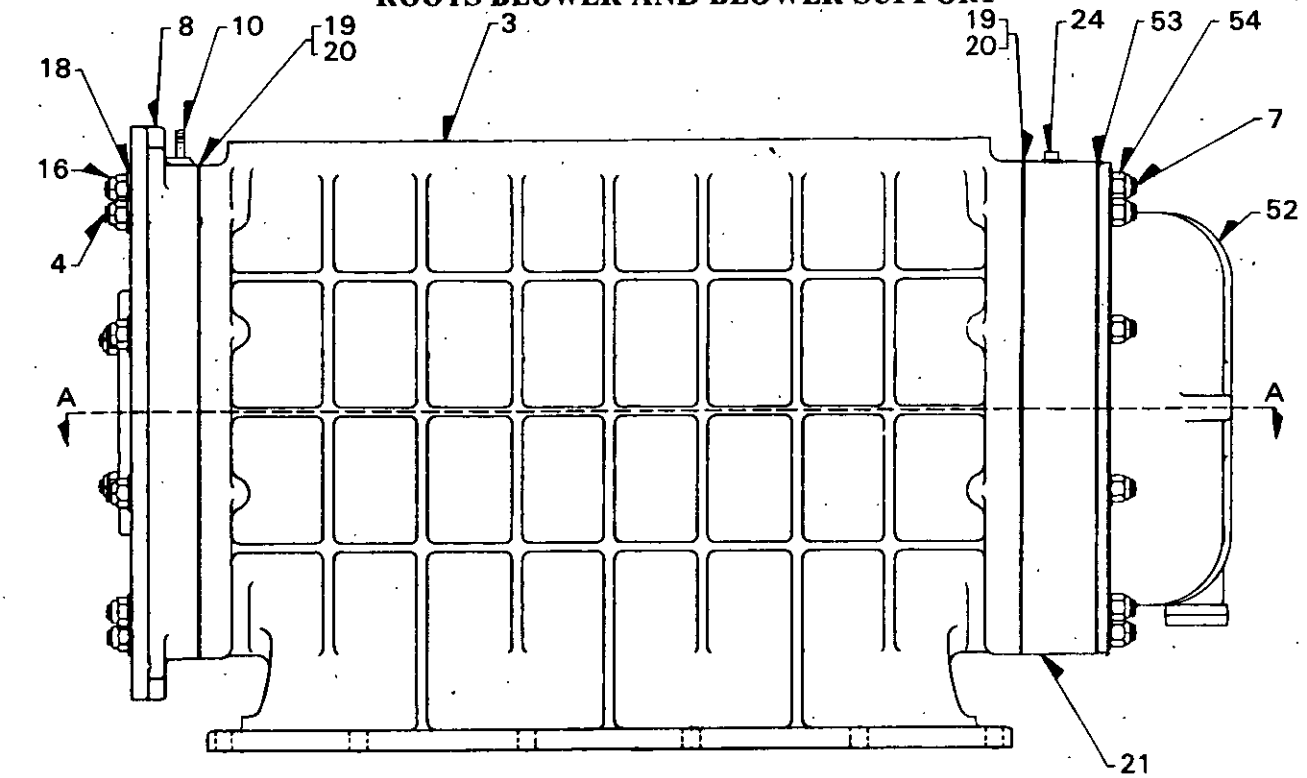
Ref. No.	Part Number	Quantity Required				Description
		A	-	-	-	16-567D1 engine
		-	B	-	-	8-645E engine
		-	-	C	-	12,16-645E engine
		-	-	-	D	16-645E engine - Canadian National Railways GP38-2
	8069433	1	-	-	-	BLOWER ASM. .. Left bank
	8369677	-	-	1	-	BLOWER ASM. .. Left bank
	9080513	-	-	-	1	BLOWER ASM. .. Left bank
	8069492	1	-	-	-	BLOWER ASM. .. Right bank
	8369676	-	1	1	-	BLOWER ASM. .. Right bank
	9080512	-	-	-	1	BLOWER ASM. .. Right bank
51	8028594	1				SHAFT .. Quill
52	8065752	1				COVER .. Timing gear
53	8204450	1				GASKET .. Cover
54	8032719	24				NUT .. Hex lock 1/2-20

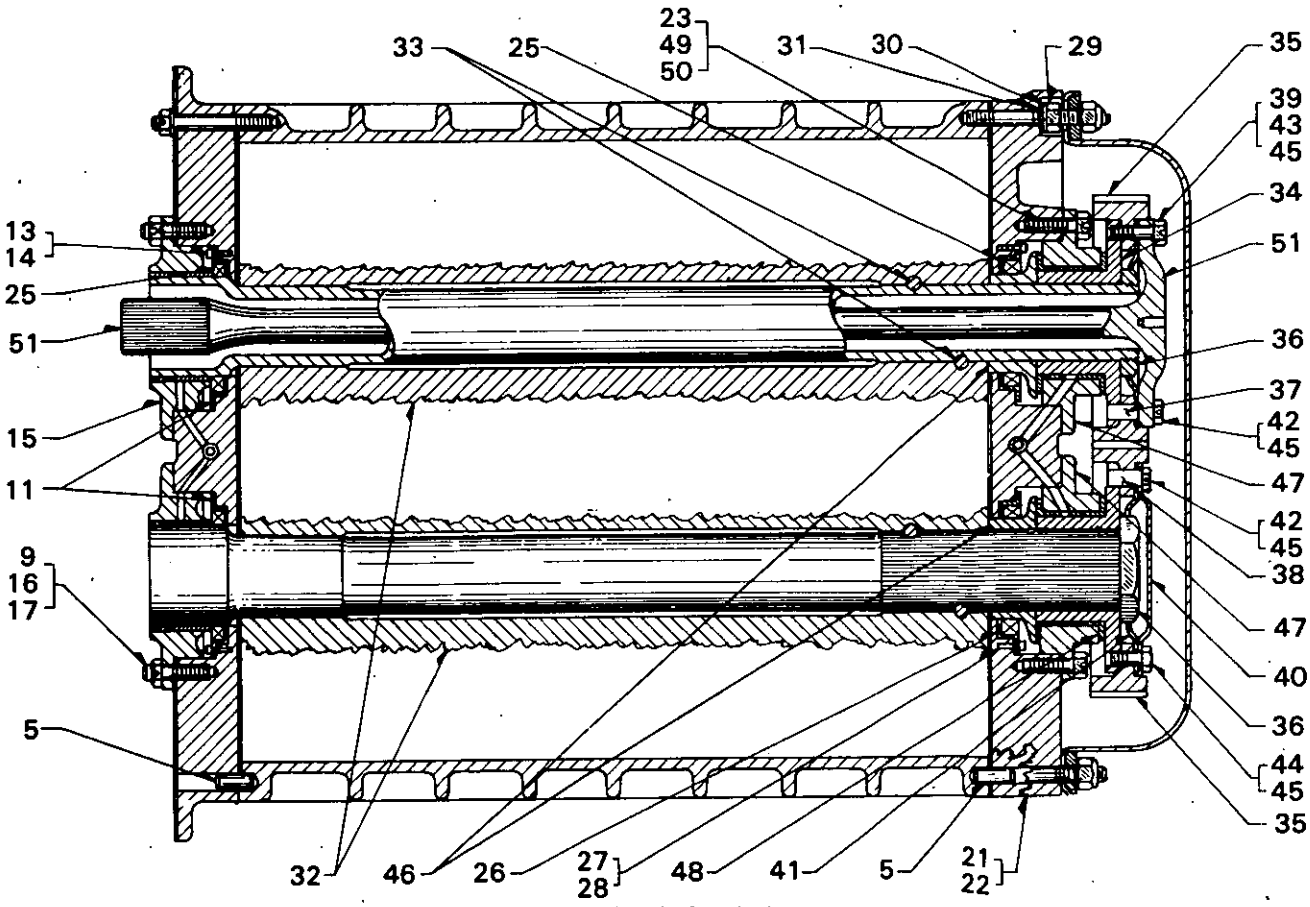
BLOWER REPAIR MATERIAL

*55	8178070	A.R.	SHIM .. End plate - .002	Required for adjusting rotor to Front end play clearance
*56	8178081	A.R.	SHIM .. End plate - .003	
*57	8178082	A.R.	SHIM .. End plate - .004	
*58	8178083	A.R.	SHIM .. End plate - .006	
*59	9329939	A.R.	SLEEVE .. "SPEED1"	For repair of engine blower rotor shafts and thrust collars
*60	9330997	A.R.	KIT .. Epoxy resin	
*61	9331061	1	TOOL .. Installation	

P.L. No. F185

ROOTS BLOWER AND BLOWER SUPPORT





SECTION A-A

Ref. Nos. 1 and 2

PLATE E185-3

ENGINE GASKET KITS

Index
16-567D1,D2,D3,D3A Engines

Ref. No.	Part Number	Description	Quantity Per Engine 16-567 D1	D2	D3	D3A	Pg. No.	Ref. No.
ϕ1	8427111	Cylinder Head	16	16	16	16	4	1
ϕ1	8479836	Cylinder Head	16	16	16	16	4	8
2	9317971	Power Assembly Installation	16	16	16	16	4	27
3	9320844	Cylinder Liner Installation	16	16	16	16	4	36
4	9580706	Overspeed Trip Housing	1	1	1	1	5	1
5	9580698	Camshaft Drive Housing	1	-	-	-	5	38
6	8306359	Camshaft Drive Housing	-	1	1	1	5	43
7	8496989	Lube Oil Strainer Element	1	1	1	1	6	6
8	8496990	Lube Oil Suction Strainer	1	1	1	1	6	11
9	9580708	Piston Cooling and Pressure Pump	1	-	-	-	6	26
10	9580715		-	1	1	1	6	37
11	8210018	Lube Oil Scavenging Pump	1	-	-	-	7	20
12	8306357		-	1	1	1	7	24
13	9580709	Lube Oil Separator	1	-	-	-	7	36
14	9580717	Lube Oil Separator	-	1	1	1	7	40
15	9580714	Water Pump	2	2	2	2	8	1
16	9580697	Fuel Oil Manifold	1	1	1	1	8	37
17	8340405	Fuel Oil Filter (Viscose and Spin-On)	1	1	1	1	8	43
18	9580711	Cylinder Head Cover and Support Frame - Square Inside Corners	1	1	1	1	8	49
19	9087946	Cylinder Head Cover and Support Frame - Round Inside Corners	1	1	1	1	9	22
20	9580710	Accessory Drive Housing	1	1	1	1	9	43
21	8209989	Auxiliary Generator Drive	1	-	-	-	10	1
22	9580721	Governor Drive	1	1	1	1	10	7
23	9580694	Engine Blower	2	-	-	-	10	12
24	9580720	Turbocharger Changeout	-	1	-	-	10	21
25	9580719	Turbocharger Changeout	-	-	1	1	10	33
ϕ26	8306238	Aftercooler Changeout - 2 Flange Header	-	-	2	2	11	30
ϕ27	8306239	Aftercooler Changeout - 4 Flange Header	-	-	2	-	11	33

P.L. No. F199

ENGINE GASKET KITS

8-645E,E3B,E3C,F3B; 12-645E,E3,E3B,E3C,F3,F3B Engines

Ref. No.	Part Number	Description	Quantity Per Engine										Pg. No.	Ref. No.
			8-645				12-645							
			E	E3B	E3C	F3B	E	E3	E3B	E3C	F3	F3B		
ϕ1	8427111	Cylinder Head	8	8	-	-	12	12	12	-	-	-	4	1
ϕ1	8479836	Cylinder Head	8	8	-	-	12	12	12	-	-	-	4	8
ϕ1	9561068	Cylinder Head	-	-	8	8	-	-	-	12	12	12	4	14
ϕ1	9561069	Cylinder Head	-	-	8	8	-	-	-	12	12	12	4	20
ϕ2	9317971	Power Assembly Installation	8	8	-	-	12	12	12	-	-	-	4	27
ϕ2	9327287	Power Assembly Installation	-	-	8	8	-	-	-	12	12	12	4	27
ϕ3	9320844	Cylinder Liner Installation	8	-	-	-	12	12	-	-	-	-	4	36
ϕ3	9525089	Cylinder Liner Installation	-	8	8	8	-	-	12	12	12	12	4	36
ϕ4	9580706	Overspeed Trip Housing	-	-	-	-	1	1	-	-	-	-	5	1
ϕ5	9580704	Overspeed Trip Housing	1	1	1	1	-	-	-	-	-	-	5	15
ϕ6	9580770	Overspeed Trip Housing	-	-	-	-	1	1	1	1	1	1	5	28
7	9580698	Camshaft Drive Housing	1	-	-	-	-	-	-	-	-	-	5	38
8	9580725	Camshaft Drive Housing	-	1	1	1	-	1	1	1	1	1	5	48
9	9580699	Camshaft Drive Housing	-	-	-	-	1	1	-	-	-	-	6	1
10	8496989	Lube Oil Strainer Element	1	1	1	1	1	1	1	1	1	1	6	6
11	8496990	Lube Oil Suction Strainer	1	1	1	1	1	1	1	1	1	1	6	11
12	9580708	Piston Cooling and Pressure Pump	1	-	-	-	-	1	1	1	1	1	6	26
13	9580696		-	1	1	1	1	-	-	-	-	-	7	1
14	8210018	Lube Oil Scavenging Pump	-	-	-	-	-	1	1	1	1	1	7	20
15	8210308		1	-	-	-	-	-	-	-	-	-	7	28
16	8210019		-	1	1	1	1	-	-	-	-	-	7	32
17	9580709	Lube Oil Separator	1	-	-	-	1	-	-	-	-	-	7	36
18	9580717	Lube Oil Separator	-	1	1	1	-	1	1	1	1	1	7	40
19	9580724	Water Pump	1	-	-	-	2	2	2	2	2	2	8	8
20	8490943	Water Pump	-	-	-	-	1	-	-	-	-	-	8	25
21	9571961	Water Pump	-	1	1	1	-	-	-	-	-	-	8	31
22	9580697	Fuel Oil Manifold	1	1	1	1	1	1	1	1	1	1	8	37
23	8340405	Fuel Oil Filter (Viscose and Spin-On)	1	1	1	1	1	1	1	1	1	1	8	43
24	9580712	Cylinder Head Cover and Support Frame - Square Inside Corners	1	-	-	-	-	-	-	-	-	-	9	1
25	9580713		-	-	-	-	1	-	-	-	-	-	9	7
26	9087944	Cylinder Head Cover and Support Frame - Round Inside Corners	1	1	1	1	-	-	-	-	-	-	9	14
27	9087945		-	-	-	-	1	1	1	1	1	1	9	18
28	9580705	Accessory Drive Housing	1	1	1	1	-	-	-	-	-	-	9	30
29	9580710	Accessory Drive Housing	-	-	-	-	1	1	1	1	1	1	9	43
30	8209989	Auxiliary Generator Drive	1	-	-	-	1	-	-	-	-	-	10	1
31	9580721	Governor Drive	1	1	1	1	1	1	1	1	1	1	10	7
32	9580694	Engine Blower	1	-	-	-	2	-	-	-	-	-	10	12
33	8414907	Turbocharger Changeout	-	1	1	1	-	1	1	1	1	1	11	1
34	8306238	Aftercooler Changeout	-	2	2	-	-	2	2	2	-	-	11	30
35	9580722	Aftercooler Changeout	-	-	-	2	-	-	-	-	2	2	11	40

ENGINE GASKET KITS

16-645E,E3,E3A,E3B,E3C,F3,F3B and 20-645E3,E3B Engines

Ref. No.	Part Number	Description	Quantity Per Engine									Pg. No.	Ref. No.
			16-645							20-645			
			E	E3	E3A	E3B	E3C	F3	F3B	E3	E3B		
ϕ1	8427111	Cylinder Head	16	16	16	16	-	-	-	20	20	4	1
ϕ1	8479836	Cylinder Head	16	16	16	16	-	-	-	20	20	4	8
ϕ1	9561068	Cylinder Head	-	-	-	-	16	16	16	-	-	4	14
ϕ1	9561069	Cylinder Head	-	-	-	-	16	16	16	-	-	4	20
ϕ2	9317971	Power Assembly Installation	16	16	16	16	-	-	-	20	20	4	27
ϕ2	9327287	Power Assembly Installation	-	-	-	-	16	16	16	-	-	4	27
ϕ3	9320844	Cylinder Liner Installation	16	16	16	-	-	-	-	20	-	4	36
ϕ3	9525089	Cylinder Liner Installation	-	-	-	16	16	16	16	-	20	4	36
ϕ4	9580706	Overspeed Trip Housing	1	1	1	-	-	-	-	1	1	5	1
ϕ5	9580770	Overspeed Trip Housing	1	1	1	1	1	1	1	1	1	5	28
6	9580698	Camshaft Drive Housing	1	-	-	-	-	-	-	-	-	5	38
7	9580725	Camshaft Drive Housing	-	1	1	1	1	1	1	1	1	5	48
8	8496989	Lube Oil Strainer Element	1	1	1	1	1	1	1	1	1	6	6
ƒ9	8496990	Lube Oil Suction Strainer	1	1	1	1	1	1	1	1	1	6	11
10	9580708	Piston Cooling and Pressure Pump	1	-	-	-	-	-	-	-	-	6	26
11	9580715		-	1	1	1	1	1	1	-	-	6	37
12	8375381		-	-	-	-	-	-	-	1	1	7	11
13	8210018	Lube Oil Scavenging Pump	1	-	-	-	-	-	-	-	-	7	20
14	8306357		-	1	1	1	1	1	1	1	1	7	24
15	9580709	Lube Oil Separator	1	-	-	-	-	-	-	-	-	7	36
16	9580717	Lube Oil Separator	-	1	1	1	1	1	1	1	1	7	40
17	9580724	Water Pump	2	-	-	-	-	-	-	-	-	8	8
18	9580723	Water Pump	-	2	2	2	2	2	2	2	2	8	17
19	8490943	Water Pump	1	-	-	-	-	-	-	-	-	8	25
20	9580697	Fuel Oil Manifold	1	1	1	1	1	1	1	1	1	8	37
21	8340405	Fuel Oil Filter (Viscose and Spin-On)	1	1	1	1	1	1	1	1	1	8	43
22	9580711	Cylinder Head Cover and Support Frame - Square Inside Corners	1	1	-	-	-	-	-	-	-	8	49
23	9087946	Cylinder Head Cover and Support Frame - Round Inside Corners	1	1	1	1	1	1	1	-	-	9	22
24	9087947		-	-	-	-	-	-	-	1	1	9	26
25	9580710	Accessory Drive Housing	1	1	1	1	1	1	1	1	1	9	43
26	8209989	Auxiliary Generator Drive	1	-	-	-	-	-	-	-	-	10	1
27	9580721	Governor Drive	1	1	1	1	1	1	1	1	1	10	7
28	9580694	Engine Blower	2	-	-	-	-	-	-	-	-	10	12
29	8380244	Turbocharger Changeout	-	1	1	1	1	1	1	1	1	11	16
30	9580722	Aftercooler Changeout	-	2	2	2	2	2	2	2	2	11	40

ƒ Refer to individual Gasket Kit component list for possible exceptions and additions.

P.L. No. F199

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Cylinder Head			
1	8427111	1	GASKET KIT .. Cylinder head - With double groove water outlet elbow Replaces 8419914, 8413288 and 8472070
2	8442936	1	GASKET .. Cylinder head to liner - Full width - Replaces 8422443
3	8029167	2	GASKET .. Rocker arm oil line to camshaft block
4	8392118	1	SEAL KIT .. Cylinder head to liner - Consists of (12) heat dam insulator and (12) grommet seal - NOTE: Grommet and heat dam must be applied as an assembly
5	8328687	1	SEAL .. Cylinder test valve
6	8305815	1	SEAL .. Water outlet elbow
7	8413892	2	SEAL .. Water outlet elbow to crankcase
8	8479836	1	GASKET KIT .. Cylinder head - With double groove water outlet elbow
9	8476400	1	GASKET ASSEMBLY .. Cyl. head to liner - Full width - Incl. grommet seals
10	8029167	2	GASKET .. Rocker arm oil line to camshaft block
11	8328687	1	SEAL .. Cylinder test valve
12	8305815	1	SEAL .. Water outlet elbow
13	8413892	2	SEAL .. Water outlet elbow to crankcase
14	9561068	1	GASKET KIT .. Cylinder head - With double groove water outlet elbow
15	9561067	1	GASKET ASSEMBLY .. Cylinder head
16	8029167	2	GASKET .. Rocker arm oil line to camshaft block
17	8328687	1	SEAL .. Cylinder test valve
18	8305815	1	SEAL .. Water outlet elbow
19	9317972	2	SEAL .. Water outlet elbow to crankcase
20	9561069	1	GASKET KIT .. Cylinder head - With double groove water outlet elbow
21	9556032	1	GASKET .. Cylinder head
22	8029167	2	GASKET .. Rocker arm oil line to camshaft block
23	8392118	1	SEAL KIT .. Cylinder head to liner - Consists of (12) heat dam insulator and (12) grommet seal - NOTE: Grommet and heat dam must be applied as an assembly
24	8328687	1	SEAL .. Cylinder test valve
25	8305815	1	SEAL .. Water outlet elbow
26	9317972	2	SEAL .. Water outlet elbow to crankcase
GASKET KIT .. Power Assembly Installation			
ϕ27	9317971	1 -	GASKET KIT .. Power assembly installation - Replaces 9320843 power assembly installation gasket kit
ϕ27	9327287	- 1	GASKET KIT .. Power assembly installation
28	8228554	1 -	SEAL .. Lower liner - Upper groove
29	9316850	1 2	SEAL .. Lower liner - Lower groove
30	8025988	1 1	GASKET .. Piston cooling tube
31	8305815	2 2	SEAL .. Elbow to cylinder head and jumper line to liner
32	9317972	2 2	SEAL .. Water outlet elbow to crankcase - Replaces 8413892
33	8142354	1 1	GASKET .. Water inlet tube to manifold
34	8328687	1 1	SEAL .. Cylinder test valve
35	8029167	2 2	GASKET .. Rocker arm oil line to camshaft block
GASKET KIT .. Cylinder Liner Installation			
ϕ36	9320844	1 -	GASKET KIT .. Cylinder liner installation - Replaces 8284873 cylinder liner gasket kit
ϕ36	9525089	- 1	GASKET KIT .. Cylinder liner installation
37	8228554	1 -	SEAL .. Lower liner - Upper groove
38	9316850	1 2	SEAL .. Lower liner - Lower groove
39	8025988	1 1	GASKET .. Piston cooling tube
40	8305815	1 1	SEAL .. Elbow to cylinder head and jumper line to liner
41	8142354	1 1	GASKET .. Water inlet tube to manifold

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Overspeed Trip Housing			
1	9580706	1	GASKET KIT .. Overspeed trip housing - With bottom oil drains - Replaces 8261161
2	8218476	2	GASKET .. Fuel lines to manifold blocks
3	9570688	2	GASKET .. Overspeed trip housing to crankcase - Replaces 8044742
4	8044723	2	GASKET .. Overspeed trip housing to accessory drive cover
5	8049496	1	GASKET .. Cover to overspeed trip housing
6	8028765	2	GASKET .. Plate to cover
7	9571656	2	GASKET .. Cover - Tachometer opening - Replaces 8058257
8	8028766	1	GASKET .. Lockshaft plate
9	8028754	1	SEAL .. Oil lockshaft
10	8104300	2	GASKET .. Jumper line
11	8104276	2	GASKET .. Jumper line
12	8143446	2	SEAL .. O-ring - Retainer sleeve - Bottom groove
13	9570738	2	GASKET .. Crossover pipe to fuel oil manifold - Replaces 8160114
14	9095686	2	SEAL .. O-ring - Retainer sleeve - Viton - Top groove
15	9580704	1	GASKET KIT .. Overspeed trip housing - With bottom oil drains - Replaces 8242502
16	9570739	2	GASKET .. Fuel lines to manifold blocks - Formerly 8218476 - Replaces 8160114
17	9570688	2	GASKET .. Overspeed trip hsg. to crankcase - Except 8-645E engine - Repl. 8044742
18	9570589	2	GASKET .. Overspeed trip hsg. to crankcase - 8-645E engine only - Repl. 8235617
19	8235618	1	GASKET .. Cover to overspeed trip housing
20	8028765	2	GASKET .. Plate to cover
21	9571656	2	GASKET .. Cover - Tachometer opening - Replaces 8058257
22	8028766	1	GASKET .. Fuel lockshaft plate
23	8028754	1	SEAL .. Oil lockshaft
24	8104300	2	GASKET .. Jumper line
25	8104276	2	GASKET .. Jumper line
26	8143446	2	SEAL .. O-ring - Retainer sleeve - Bottom groove
27	9095686	2	SEAL .. O-ring - Retainer sleeve - Viton - Top groove
28	9580770	1	GASKET KIT .. Overspeed trip housing - With rear oil drains - Replaces 9564698
29	9570616	2	GASKET .. Housing to crankcase - Replaces 9529800
30	9529801	1	GASKET .. Cover to housing
31	8028765	1	GASKET .. Cover plate
32	9571656	1	GASKET .. Tachometer cover - Replaces 8058257
33	9570739	3	GASKET .. Fuel manifold mounting - Replaces 8160114
34	9096523	1	RETAINER .. Oil
35	9529807	2	SEAL .. Oil - Rear drain to crankcase
36	8242408	1	SEAL .. Oil - Shaft
37	8028754	1	SEAL .. Oil - Lockshaft
GASKET KIT .. Camshaft Drive Housing			
38	9580698	1	GASKET KIT .. Camshaft drive housing - Replaces 8210665
39	9570635	1	GASKET .. Camshaft drive housing to crankcase - Replaces 8081380
40	9570643	1	GASKET .. Cover to housing - Upper - Replaces 8185923
41	9570645	1	GASKET .. Oil retainer - Replaces 8175858
42	9570576	2	GASKET .. Blower support to crankcase - Replaces 8095027
43	8306359	1	GASKET KIT .. Camshaft drive housing
44	9570635	1	GASKET .. Camshaft drive housing to crankcase - Replaces 8081380
45	9570645	1	GASKET .. Oil retainer - Replaces 8175858
46	9570764	1	GASKET .. Lube oil filter mounting - Replaces 8366331
47	9570763	2	GASKET .. Lube oil manifold to filter - Replaces 8366330
48	9580725	1	GASKET KIT .. Camshaft drive housing - Replaces 8368758
49	9570635	1	GASKET .. Camshaft drive housing to crankcase - Replaces 8081380
50	9570645	1	GASKET .. Oil retainer - Replaces 8175858
51	9570764	1	GASKET .. Lube oil manifold to filter mounting - Replaces 8366331
52	9570763	2	GASKET .. Lube oil manifold to filter mounting - Replaces 8366330
53	9570677	1	GASKET .. Filter to camshaft housing - Replaces 8366424

P.L. No. F199

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Camshaft Drive Housing			
1	9580699	1	GASKET KIT .. Camshaft drive housing - Replaces 8210666
2	9570635	1	GASKET .. Camshaft drive housing to crankcase - Replaces 8081380
3	9570827	1	GASKET .. Cover to housing - Upper - Replaces 8185583 and 8451659
4	9570645	1	GASKET .. Oil retainer - Replaces 8175858
5	9570576	2	GASKET .. Blower support to crankcase - Replaces 8095027
GASKET KIT .. Lube Oil Strainer Element			
6	8496989	1	GASKET KIT .. Lube oil suction strainer element - Replaces 8210014
7	8085182	2	SEAL .. Piston cooling and main bearing strainer elements to strainer housing
8	8080852	1	GASKET .. Scavenging oil strainer element to strainer
9	8085253	1	GASKET .. Strainer cover to housing
10	8478924	1	SEAL .. Ring - Scavenging oil strainer
GASKET KIT .. Lube Oil Suction Strainer			
†11	8496990	1	GASKET KIT .. Lube oil suction strainer - Replaces 8306358
12	8080850	1	GASKET .. Strainer housing to accessory drive cover
13	8074661	2	GASKET .. Lube oil pipe to strainer
14	8174208	1	GASKET .. Drain plug
15	8366785	1	GASKET .. Oil return elbow to strainer case - Replaces 8347468
16	8269415	1	GASKET .. Relay valve
17	8085182	2	SEAL .. Piston cooling and main bearing strainer element
18	8080852	1	GASKET .. Scavenger, oil strainer element to strainer
19	8085253	1	GASKET .. Strainer cover to housing
20	8251951	1	GASKET .. Pipe to scavenging pump
21	8251950	1	GASKET .. Pipe to piston cooling pump
22	8029467	4	GASKET .. Pipe to scavenging pump - D1 engine
23	8029470	2	GASKET .. Elbow to pressure pump - D1 engine
24	8029150	2	GASKET .. Elbow to pressure pump - D2,D3,D3A engines
25	8478924	1	SEAL .. Ring - Scavenging oil strainer

† For 20-645E3 engines, one (1) 8360530 Gasket is required in addition to kit.

GASKET KIT .. Piston Cooling and Pressure Pump

26	9580708	1	GASKET KIT .. Lube oil pressure pump - Replaces 8261167 and 8261166
27	8028264	1	GASKET .. Pump to accessory drive cover
28	8074661	1	GASKET .. Strainer to pump elbow
29	8029470	2	GASKET .. Piston cooling pressure portion inlet and outlet to elbow
30	8082965	1	GASKET .. Main bearing pressure portion elbow to accessory drive cover
31	8082586	1	SEAL .. Piston cooling pressure portion elbow to accessory drive cover
32	8082587	1	SEAL .. Main bearing pressure portion elbow to accessory drive cover
33	8082964	1	GASKET .. Piston cooling pressure portion elbow to accessory drive cover
34	9570732	3	GASKET .. Governor drive oil line - Replaces 8029154
35	8029482	2	GASKET .. Piston cooling pressure portion inlet and outlet to elbow
36	8029467	2	GASKET .. Main bearing pressure portion inlet and outlet to elbow
37	9580715	1	GASKET KIT .. Lube oil pressure pump - Replaces 8306356
38	8029150	2	GASKET .. Piston cooling inlet and outlet elbow
39	8028264	1	GASKET .. Pump mounting
40	8082586	1	SEAL .. Piston cooling elbow to accessory drive housing
41	8082965	1	GASKET .. Elbow to accessory drive housing - Main bearing portion
42	8082587	1	SEAL .. Elbow to accessory drive housing - Main bearing portion
43	8251950	2	GASKET .. Elbow to pump - Main bearing portion
44	9570732	2	GASKET .. Governor drive oil line - Replaces 8029154
45	8074661	1	GASKET .. Strainer to main bearing pump elbow
46	8082964	1	GASKET .. Elbow to accessory drive cover - Piston cooling portion

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Piston Cooling and Pressure Pump			
1	9580696	1	GASKET KIT .. Lube oil pressure pump - Replaces 8210023
2	8028264	1	GASKET .. Pump to accessory drive cover
3	8074661	1	GASKET .. Strainer to pump elbow
4	8082965	1	GASKET .. Main bearing pressure portion elbow to accessory drive cover
5	8082586	1	SEAL .. Piston cooling pressure portion elbow to accessory drive cover
6	8082587	1	SEAL .. Main bearing pressure portion elbow to accessory drive cover
7	8082964	1	GASKET .. Piston cooling pressure portion elbow to accessory drive cover
8	9570732	3	GASKET .. Governor drive oil line - Replaces 8029154
9	8029150	2	GASKET .. Main bearing pressure portion inlet and outlet to elbow
10	8029151	2	GASKET .. Piston cooling pressure portion inlet and outlet to elbow
11	8375381	1	GASKET KIT .. Lube oil pressure pump
12	8360530	2	GASKET .. Piston cooling inlet and outlet elbow
13	8028264	1	GASKET .. Pump mounting
14	8082586	1	SEAL .. Piston cooling elbow to accessory drive housing
15	8082965	1	GASKET .. Elbow to accessory drive housing - Main bearing portion
16	8082587	1	SEAL .. Elbow to accessory drive housing - Main bearing portion
17	8029154	2	GASKET .. Governor drive oil line
18	8074661	1	GASKET .. Strainer to main bearing pump elbow
19	8082964	1	GASKET .. Elbow to accessory drive cover - Piston cooling portion
GASKET KIT .. Lube Oil Scavenging Pump			
20	8210018	1	GASKET KIT .. Scavenging oil pump
21	8028264	1	GASKET .. Pump to accessory drive housing cover
22	8029467	4	GASKET .. Pump to inlet and outlet elbows
23	8074661	1	GASKET .. Strainer pipe to oil strainer housing
24	8306357	1	GASKET KIT .. Scavenging oil pump
25	8028264	1	GASKET .. Pump mounting
26	8074661	1	GASKET .. Strainer to scavenging pump elbow
27	8251951	2	GASKET .. Pipe to scavenging pump
28	8210308	1	GASKET KIT .. Scavenging oil pump
29	8028264	1	GASKET .. Pump to accessory drive housing cover
30	8029467	2	GASKET .. Pump to inlet and outlet elbows
31	8074661	1	GASKET .. Strainer pipe to oil strainer housing
32	8210019	1	GASKET KIT .. Scavenging oil pump
33	8028264	1	GASKET .. Pump to accessory drive housing cover
34	8029150	4	GASKET .. Pump to inlet and outlet elbows
35	8074661	1	GASKET .. Strainer pipe to oil strainer housing
GASKET KIT .. Lube Oil Separator			
36	9580709	1	GASKET KIT .. Lube oil separator - Replaces 8261172
37	8084670	1	GASKET .. Oil separator mounting
38	9571659	4	GASKET .. Outlet pipe flange to oil separator and blower adapter - Replaces 8084407
39	8173851	1	GASKET .. Housing cover
40	9580717	1	GASKET KIT .. Lube oil separator - Replaces 8306360
41	8028760	1	GASKET .. Flange - Inlet elbow
42	8306958	2	GASKET .. Elbow to oil separator
43	9570751	2	GASKET .. Elbow to ejector tube - Replaces 8271729
44	8262488	1	GASKET .. Drain tube flange
45	8285733	1	SEAL .. Ring assembly
46	8284874	1	SLEEVE .. Rubber seal

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ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Water Pump			
1	9580714	1	GASKET KIT .. Water pump - Replaces 8276312
2	8028760	1	GASKET .. Pump to accessory drive housing cover
3	9570731	1	GASKET .. Pump outlet to pipe - Replaces 8029149
4	9570679	2	GASKET .. Pump inlet to pipe - Replaces 8366787
5	9570734	1	GASKET .. Elbow to intermediate pipe - 6-8 cylinder engines only - Replaces 8029163
6	8231838	2	GASKET .. Pipe flange to crankcase
8	9580724	1	GASKET KIT .. Water pump - Replaces 8368757
9	8028760	1	GASKET .. Pump to accessory drive housing cover
10	9570731	1	GASKET .. Pump outlet to pipe - Replaces 8029149
11	9570679	2	GASKET .. Pump inlet to pipe - Replaces 8366787
12	8347416	1	GASKET .. Pipe to crankcase
13	9570735	1	GASKET .. Water drain pipe to elbow - Replaces 8029469
14	9570734	1	GASKET .. Elbow to intermediate pipe - 8 cylinder only - Replaces 8029163
17	9580723	1	GASKET KIT .. Water pump - Replaces 8365648
18	8028760	1	GASKET .. Pump to accessory drive housing cover
19	8347417	1	GASKET .. Pump outlet to pipe
20	9570678	1	GASKET .. Pump inlet to pipe - Replaces 8366785
21	8347416	1	GASKET .. Pipe to crankcase
22	9570735	1	GASKET .. Water drain pipe to elbow - Replaces 8029469
25	8490943	1	GASKET KIT .. Water pump - With single water pumps only
26	8028760	1	GASKET .. Pump to accessory drive housing cover
27	8347417	1	GASKET .. Pump outlet to pipe
28	8366785	1	GASKET .. Pump inlet to pipe
29	8347416	1	GASKET .. Pipe to crankcase
30	8454337	1	GASKET .. Water drain pipe to elbow
31	9571961	1	GASKET KIT .. Water pump - With single water pumps only
32	8028760	1	GASKET .. Pump to accessory drive housing cover
33	8347417	1	GASKET .. Pump outlet to pipe
34	8366787	1	GASKET .. Pump inlet to pipe
35	8347416	2	GASKET .. Inlet elbow
36	8454337	2	GASKET .. Water drain pipe to elbow
GASKET KIT .. Fuel Oil Manifold			
37	9580697	1	GASKET KIT .. Fuel oil manifold - Replaces 8210660
38	8165276	2	GASKET .. Supply line to manifold line
39	9570739	2	GASKET .. Supply line to manifold line - Replaces 8160114
40	8104300	2	GASKET .. Connection block
41	8104292	1	GASKET .. Inlet line to filter
42	8104276	2	GASKET .. Flange to filter
GASKET KIT .. Fuel Oil Filter - Viscose and Spin-On Type			
43	8340405	1	GASKET KIT .. Fuel oil filter - Replaces 9082404
44	8104300	2	GASKET .. Connection block
45	8104276	2	GASKET .. Flange to filter
46	8104292	1	GASKET .. Drain lines to filter
47	8177030	2	SEAL .. Filter housing to body
48	8104055	2	GASKET .. Bowl to filter body
GASKET KIT .. Cylinder Head Cover and Support Frame With Square Inside Corners			
49	9580711	1	GASKET KIT .. Cylinder head cover and support frame - Replaces 8271649
50	9570609	2	GASKET .. Frame to crankcase - Outside - Replaces 8275294 and 8470797
51	9570610	2	GASKET .. Frame to crankcase - Inside - Replaces 8275292 and 8470798
52	8275289	2	GASKET .. Camshaft drive end
53	8271623	4	GASKET .. Cylinder head cover

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Cylinder Head Cover and Support Frame With Square Inside Corners			
1	9580712	1	GASKET KIT .. Cylinder head cover and support frame - Replaces 8271650
2	9570606	2	GASKET .. Frame to crankcase - Outside - Replaces 8275291 and 8470793
3	9570607	2	GASKET .. Frame to crankcase - Inside - Replaces 8275295 and 8470794
4	8275289	2	GASKET .. Camshaft drive end
5	8271623	2	GASKET .. Cylinder head cover
7	9580713	1	GASKET KIT .. Cylinder head cover and support frame - Replaces 8271651
8	9570608	2	GASKET .. Frame to crankcase - Outside - Replaces 8275296 and 8470795
9	9570843	2	GASKET .. Frame to crankcase - Inside - Replaces 8275290 and 8470796
10	8275289	2	GASKET .. Camshaft drive end
11	8271624	4	GASKET .. Cylinder head cover
GASKET KIT .. Cylinder Head Cover and Support Frame With Round Inside Corners			
14	9087944	1	GASKET KIT .. Cylinder head cover and support frame
15	8470793	2	GASKET .. Frame to crankcase - Outside
16	8470794	2	GASKET .. Frame to crankcase - Inside
17	9087073	2	SEAL .. Cylinder head cover
18	9087945	1	GASKET KIT .. Cylinder head cover and support frame
19	8470795	2	GASKET .. Frame to crankcase - Outside
20	8470796	2	GASKET .. Frame to crankcase - Inside
21	9087074	4	SEAL .. Cylinder head cover
22	9087946	1	GASKET KIT .. Cylinder head cover and support frame
23	8470797	2	GASKET .. Frame to crankcase - Outside
24	8470798	2	GASKET .. Frame to crankcase - Inside
25	9087073	4	SEAL .. Cylinder head cover
26	9087947	1	GASKET KIT .. Cylinder head cover and support frame
27	8470799	2	GASKET .. Frame to crankcase - Outside
28	8470800	2	GASKET .. Frame to crankcase - Inside
29	9087072	4	SEAL .. Cylinder head cover
GASKET KIT .. Accessory Drive Housing			
30	9580705	1	GASKET KIT .. Accessory drive housing - Replaces 8254494
31	9570623	1	GASKET .. Accessory drive housing to crankcase - Replaces 8084665
32	8028760	1	GASKET .. Blind cover - Water pump opening - 8 cylinder
33	8084685	1	GASKET .. Cover - Lube oil relief valve
34	8028763	1	GASKET .. Auxiliary drive cover
35	8055158	1	SEAL .. Oil
36	9570734	3	GASKET .. Water line crossover - 8 cylinder - Replaces 8029163
37	8167060	1	GASKET .. Manifold to crankcase - Lube oil
38	8082586	1	SEAL .. Elbow to accessory drive cover
39	8082587	1	SEAL .. Elbow to accessory drive cover
40	8029165	2	GASKET .. Oil stubshaft to manifold
41	8069445	1	GASKET .. Oil pressure valve to manifold
42	9570735	2	GASKET .. Flange to drain pipe - Replaces 8029469
43	9580710	1	GASKET KIT .. Accessory drive housing - Replaces 8261173
44	9570623	1	GASKET .. Accessory drive housing to crankcase - Replaces 8084665
45	8084685	1	GASKET .. Cover - Lube oil relief valve
46	8028763	1	GASKET .. Auxiliary drive cover
47	8055158	1	SEAL .. Oil
48	8167060	1	GASKET .. Manifold to crankcase - Lube oil
49	8082586	1	SEAL .. Elbow to accessory drive cover
50	8082587	1	SEAL .. Elbow to accessory drive cover
51	8029165	2	GASKET .. Oil stubshaft to manifold
52	8069445	1	GASKET .. Oil pressure valve to manifold
53	9570735	2	GASKET .. Flange to drain pipe - Replaces 8029469

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ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Auxiliary Generator			
1	8209989	1	GASKET KIT .. Auxiliary generator drive
2	8081398	1	GASKET .. Drive to camshaft drive cover
3	8081359	1	GASKET .. Stubshaft cover
4	8081365	1	GASKET .. Cover - Rear
5	8029153	8	GASKET .. Oil line from blowers to auxiliary generator drive housing
6	8081494	1	GASKET .. Split line
GASKET KIT .. Governor Drive			
7	9580721	1	GASKET KIT .. Governor drive - Replaces 8336989
8	8028229	1	GASKET .. Governor drive mounting
9	8028239	1	GASKET .. Governor to governor drive
10	9570732	3	GASKET .. Oil line fitting - Replaces 8029154
11	8028209	1	GASKET .. Governor drive housing cover plate
GASKET KIT .. Engine Blower			
12	9580694	1	GASKET KIT .. Engine blower - Replaces 8209988
13	8028465	1	GASKET .. Blower to blower support
14	9570699	1	GASKET .. Blower to blower drive housing cover - Replaces 8028148
15	8024287	1	GASKET .. Air filter adapter to blower housing
16	9570733	2	GASKET .. Blower housing to oil drain line flange - Replaces 8029159
17	9570841	2	GASKET .. Oil line flange to blower housing - Replaces 8029153
18	9571659	2	GASKET .. Oil separator pipe to blower adapter - Replaces 8084407
19	8048058	1	GASKET .. Oil line to drive housing flange
20	8070199	2	GASKET .. Oil separator pipe to blower adapter
GASKET KIT .. Turbocharger Changeout			
21	9580720	1	GASKET KIT .. Turbocharger changeout - Replaces 8328309
22	9570751	1	GASKET .. Oil separator to turbocharger - Replaces 8271729
23	8262488	1	GASKET .. Oil separator drain tube flange to engine
24	8028760	1	GASKET .. Oil separator flange to engine
25	8460205	2	GASKET .. Air duct to scroll - Replaces 8261264
26	8261200	1	GASKET .. Auxiliary generator drive to turbocharger
27	9570827	1	GASKET .. Turbocharger to camshaft drive housing - Replaces 8185583 and 8451659
28	9571669	2	GASKET .. Air duct to crankcase - Replaces 8416803
29	8294874	1	SEAL .. Outer stubshaft
30	8280352	1	SEAL .. Inner stubshaft
31	8261282	1	GASKET .. Outer stubshaft cover
32	8309212	1	GASKET .. Exhaust manifold expansion joint to turbocharger
33	9580719	1	GASKET KIT .. Turbocharger changeout - Replaces 8328308
34	9570827	1	GASKET .. Turbocharger to camshaft drive housing - Replaces 8185583 and 8451659
35	8261200	1	GASKET .. Auxiliary generator drive to turbocharger
36	9571669	2	GASKET .. Air duct to crankcase - Replaces 8416803
37	8460205	2	GASKET .. Air duct to scrool - Replaces 8261264
38	9570596	2	GASKET .. Aftercooler mounting to air duct - Replaces 8357298
39	8294874	1	SEAL .. Outer stubshaft
40	8280352	1	SEAL .. Inner stubshaft
41	8261282	1	GASKET .. Outer stubshaft cover
42	8309212	1	GASKET .. Exhaust manifold expansion joint to turbocharger
43	9570757	6	GASKET .. Inlet pipe to aftercooler and engine outlet "Y" - Replaces 8289171
44	8028760	1	GASKET .. Oil separator flange to engine
45	9570751	1	GASKET .. Oil separator to turbocharger - Replaces 8271729
46	8262488	1	GASKET .. Oil separator drain tube
47	9570695	1	GASKET .. Aftercooler pipe to engine water outlet - Replaces 8070513
48	8262821	6	GASKET .. Aftercooler pipes to aftercooler - Small
49	8262705	2	GASKET .. Aftercooler pipes to aftercooler - Large
50	8326114	2	GASKET .. Aftercooler supply pipe flange

ENGINE GASKET KITS

Ref. No.	Part Number	Qty. Req.	Description
GASKET KIT .. Turbocharger Changeout			
1	8414907	1	GASKET KIT .. Turbocharger changeout
2	8451659	1	GASKET .. Turbocharger to camshaft drive housing - Replaces 8185583
3	8261200	1	GASKET .. Generator and dust bin blower drive to turbocharger
4	8416803	2	GASKET .. Air duct to air box
5	8460205	2	GASKET .. Air duct to compressor scroll - Replaces 8261264
6	8357298	2	GASKET .. Aftercooler mounting to air duct
7	8294874	1	SEAL .. Stubshaft
8	8261282	1	GASKET .. Stubshaft cover
9	8309212	1	GASKET .. Exhaust chamber expansion joint to turbocharger
10	8289171	6	GASKET .. Inlet pipe to aftercooler and engine outlet "Y"
11	8028760	1	GASKET .. Oil separator flange to engine
12	8271729	2	GASKET .. Oil separator to turbocharger
13	8070513	1	GASKET .. Aftercooler pipe to engine water outlet
14	8347396	2	GASKET .. Inlet pipe to crankcase
15	8282176	2	GASKET .. Pad to air duct
16	8380244	1	GASKET KIT .. Turbocharger changeout
17	8451659	1	GASKET .. Turbocharger to camshaft drive housing - Replaces 8185583
18	8261200	1	GASKET .. Auxiliary generator drive to turbocharger
19	8416804	2	GASKET .. Air duct to air box
20	8460205	2	GASKET .. Air duct to scroll - Replaces 8261264
21	8403484	2	GASKET .. Aftercooler mounting to air duct
22	8294874	1	SEAL .. Stubshaft
23	8261282	1	GASKET .. Stubshaft cover
24	8309212	1	GASKET .. Exhaust manifold expansion joint to turbocharger
25	8289171	6	GASKET .. Inlet pipe to aftercooler and engine outlet "Y"
26	8028760	1	GASKET .. Oil separator flange to engine
27	8271729	2	GASKET .. Oil separator to turbocharger
28	8070513	1	GASKET .. Aftercooler pipe to engine water outlet
29	8347396	2	GASKET .. Aftercooler pipe to crankcase
GASKET KIT .. Aftercooler Changeout			
30	8306238	1	GASKET KIT .. Aftercooler changeout - 2 flange header
31	8289171	3	GASKET .. Inlet pipe to aftercooler and engine "Y"
32	8357298	1	GASKET .. Aftercooler to air duct
33	8306239	1	GASKET KIT .. Aftercooler changeout - 4 flange header
34	8262705	1	GASKET .. Inlet pipe flange - Large
35	8262821	3	GASKET .. Inlet pipe flange - Small
36	8070513	1	GASKET .. Engine water outlet to aftercoolers
37	8289171	1	GASKET .. Flanged "Y" to aftercooler pipes
38	8261265	1	GASKET .. Cover - Inspection plate
39	8357298	1	GASKET .. Aftercooler to air duct
40	9580722	1	GASKET KIT .. Aftercooler changeout - Replaces 8365646
41	9570757	3	GASKET .. Inlet pipes to aftercooler and engine "Y" - Replaces 8289171
42	9570602	1	GASKET .. Aftercooler air duct - Replaces 8403484
43	9570762	1	GASKET .. Inlet pipe to crankcase - Replaces 8347396

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193228	142	2	6
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908378	146	2	34
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8017809	134	26	20

PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8035528	126S3	1	4

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8055158	124S4	1	21
8055158	124S4	1	25
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8055158	199	9	47
8055322	113	1	5
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8055346	146S2	1	21
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8453936	144S3	1	13
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8453995	144S3	1	12
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8454328	144S3	1	17
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8454337	144S2	1	18
8454337	144S3	1	18
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8455083	118	2	12
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8455349	181	44	70
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8455349	181S2	1	13
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8455556	108	14	1
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8455574	181	21	37
8455574	181	26	23
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8455574	181	43	27
8455660	124S4	1	35
8455665	118	1	8
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8456682	134	1	22
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8456970	166	43	352
8456970	167	4	130
8456971	165	3	159
8457498	159	11	11
8457772	159	8	13
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8457991	159	7	43
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8457991	159	9	13

PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8457991	159S3	1	34
8458057	174S2	4	1
8458057	182	2	1
8458060	174S2	4	3
8458518	167	5	0
8458519	166	9	192
8458519	166	44	389
8458519	167	5	167
8458520	166	9	176
8458520	166	44	383
8458520	167	4	159
8458520	167	5	0
8458521	166	9	192
8458521	166	44	390
8458521	167	5	167
8458530	138	3	37
8458620	174S2	4	5
8458620	182	2	2
8458961	178	13	9
8458961	178S1	1	9
8459071	178	13	10
8459071	178S1	1	10
8459126	178	13	12
8459126	178S1	1	12
8459702	108	11	2
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8459714	172E1	1	4
8459714	172S2	1	8
8459714	172S3	1	7
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8459853	166	30	301
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8459853	167	6	273
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8459854	166	39	166
8459855	165	5	302
8459855	166	12	301

PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
8459855	166	29	239
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8459855	167	7	304
8459959	166	27	173
8459959	166	39	182
8459971	122	3	8
8459972	122	3	8
8459973	122	3	8
8459974	122	3	8
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8460054	166	30	315
8460054	166	42	327
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8460055	166	42	314
8460056	166	30	298
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8460057	166	11	272
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8460057	166	42	322
8460057	167	7	277
8460058	166	11	274
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8460058	166	41	283
8460059	166	30	316
8460059	166	42	328
8460060	166	27	152
8460060	166	39	161
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8460205	199	10	25
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8460239	174	4	75
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8460239	174S2	2	52
8460240	174	9	48
8460240	174	9	50
8460240	174S1	1	41
8460240	174S2	1	45
8460240	174S2	1	47
8460309	174	9	47
8460309	174S1	1	39
8460309	174S2	1	44
8460310	174	9	49
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8460310	174S2	1	46
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8460536	166	2	52
8460536	166	24	1
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8461268	144S2	1	23
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8461610	159S2	1	9
8461610	159S2	1	23
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8463603	167	6	266
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8464070	108	11	17
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8464953	108	19	8
8464953	108	19	14
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8464953	114S4	2	8
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8464953	114S4	2	20
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8464954	108	13	18
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8464955	108	7	24
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8466603	172	8	2
8466603	172	11	2
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8466603	172S3	1	1
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8470098	108	8	18
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8470154	126S3	1	14
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8479254	166	27	151
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8479338	167	4	127
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8479836	106S3	1	19
8479836	106S4	1	19
8479836	199	1	1
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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8483947	126S6	1	8
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8484128	126S6	1	18
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8498156	134S2	2	4
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8499216	130	2	32
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8534519	174	8	26
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8534979	174	7	22
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.
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9085367	134	22	13
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9414418	125S2	5	13
9414864	126	8	18
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9414864	126S3	1	13
9415235	125	5	93
9415235	125	5	101
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9415235	125S1	3	81
9415235	125S2	3	74
9415235	125S2	3	81
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9415901	165	4	172
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9415901	166	44	404
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9421427	125S2	2	45
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9422262	174	4	34
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9422263	174	4	36
9422263	174	8	33
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9422422	159S2	3	38
9422422	159S3	1	38
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9508105	166	1	39
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9514114	166	42	329
9514115	166	41	254
9514121	166	15	448
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9514143	134	26	24
9514144	134	26	23
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9515332	126	4	9
9515332	126	8	5
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9515339	126	4	9
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9516110	146	1	50
9516111	146	1	50
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9518934	100	3	29
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9527310	109	1	19
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9527313	109	1	21
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9528932	181	29	18
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9530105	174	4	49
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9530407	144	8	2
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9531033	100	4	50
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9531766	154	5	16
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9533165	114S4	1	17
9533166	108	17	1
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9541961	174	7	18
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9542313	181	27	17
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9544760	154	5	3
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PART NUMBER	PARTS LIST NO.	PAGE NO.	REF. NO.

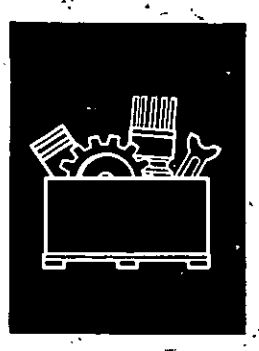
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ELECTRO-MOTIVE

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