

# **SERVICE TOOLS CATALOG**

**January, 2007**

**4th Edition**

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# FORWARD

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It is the intent of this catalog to provide information relating to the special tools recommended for use in servicing Electro-Motive equipment. It has been updated to include the latest tools available for servicing 710 engines and 60-series locomotives.

This catalog supersedes all catalogs previously issued.

The catalog is divided into several sections to facilitate tool location. Four of the sections are titled to define the general application of the tool, such as "ENGINE" or "ELECTRICAL." Sub-groupings within the section, such as "CYLINDER HEAD" further identifies the area where the tool would be found in the catalog. Other sections include alphabetical and numerical listings of all the tools contained in the catalog. In addition, the Section No. and Page No. are referenced showing where the tool is listed. Pages in the catalog are numbered consecutively within each section, such as "2-4" and "2-5".

Items indented under an Assembly No. are included in the assembly, but are not necessarily all of the items making up the assembly. Only those items, which are considered subject to replacement, are listed.

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## **TERMS AND CONDITIONS**

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### **WARRANTY:**

Seller warrants to the original purchaser of Service Tools or Replacement Parts that it will repair or replace any Service Tool or Replacement Part (C.I.F. purchaser's port for export shipments) that fails during the warranty period where such failure results from a defect in workmanship or materials. This warranty is conditioned upon the Service Tool or Replacement Part claimed to be defective being made available to Seller or its designated representative for examination of the claimed defect. Seller shall have the option of requiring, at Seller's expense, the delivery by Buyer of the Service Tool or Replacement Part claimed defective to Seller's factory in La Grange, Illinois, USA, in order to verify the claimed defect and to determine responsibility for the failure. The warranty period shall be within one (1) year after being placed into service or within three (3) years after shipment from Seller's warehouse whichever first occurs.

This warranty does not cover and Seller shall have no responsibility for:

- conditions which, in the reasonable judgment of Seller, arise from misuse, overloading, negligence, alteration, accident or lack of performance of necessary maintenance services;
- diagnostic, removal or re-installation labor charges;
- claims for loss of time, inconvenience, loss of use of the equipment or other special, incidental or consequential damages.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON-CONTRACTUAL LIABILITIES INCLUDING PRODUCT LIABILITIES BASED UPON NEGLIGENCE OR STRICT LIABILITY.

### **MAJOR TOOLS AND MACHINERY:**

Buyer shall have the responsibility to inquire about contracting an installation engineer to perform the initial set-up and commissioning of purchased item. If a separate quotation is not requested, EMD considers the Buyer to be responsible for tool or machine set-up and commissioning requirements.

### **PATENTS:**

Seller shall defend any suit or proceeding brought against Buyer so far as based on a claim that equipment of Seller's specification, or any part thereof, furnished against Buyer's purchase order constitutes an infringement of any patent, if notified promptly in writing and given authority, information and assistance (at Seller's expense) for the defense of same, and Seller shall pay all damages and costs awarded therein against Buyer.

### **NOTE:**

PRICES FOR PARTS LISTED HEREIN AND ADDITIONAL TERMS AND CONDITIONS OF SALE ARE DETAILED IN YOUR RESPECTIVE EMD REPLACEMENT PARTS PRICE BOOK.

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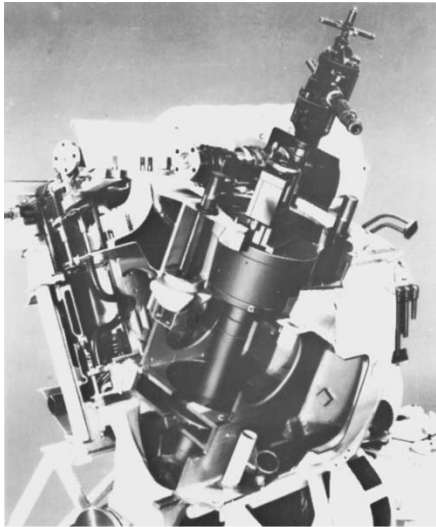
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# SECTION 1. ENGINE

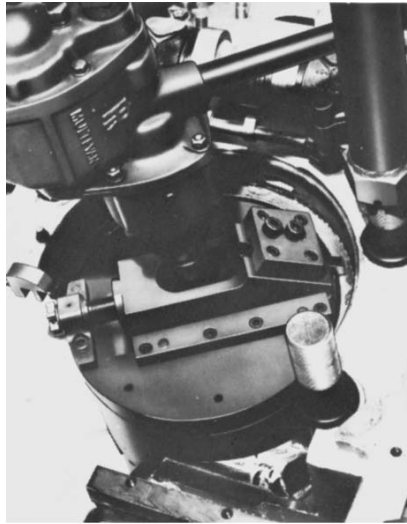
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|                                       |            |
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**ENGINE (CRANKCASE)**

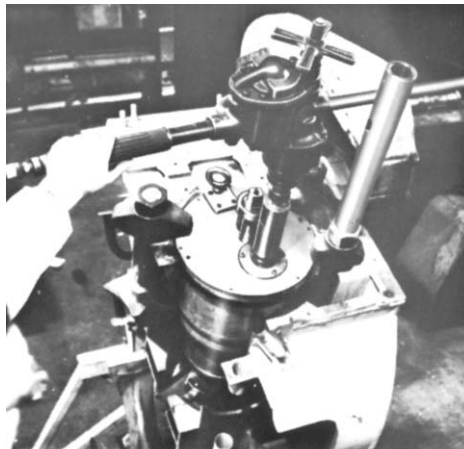


T6582



T6579

**Ref. No. 1**

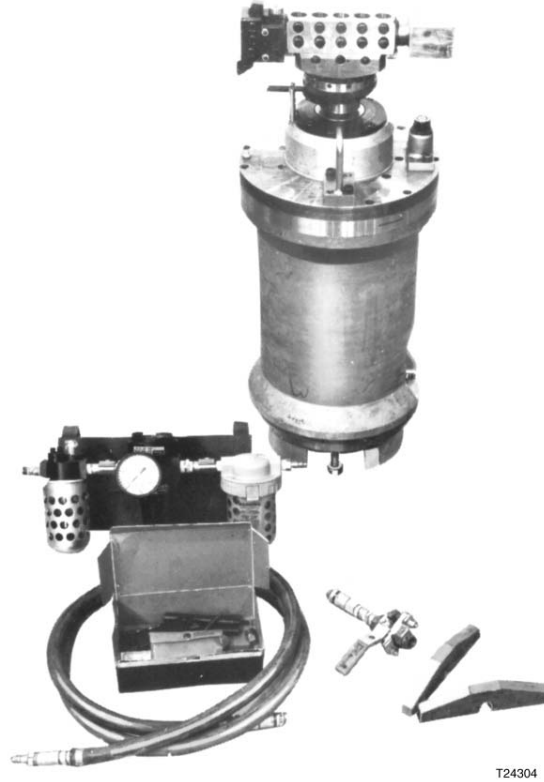


T7018

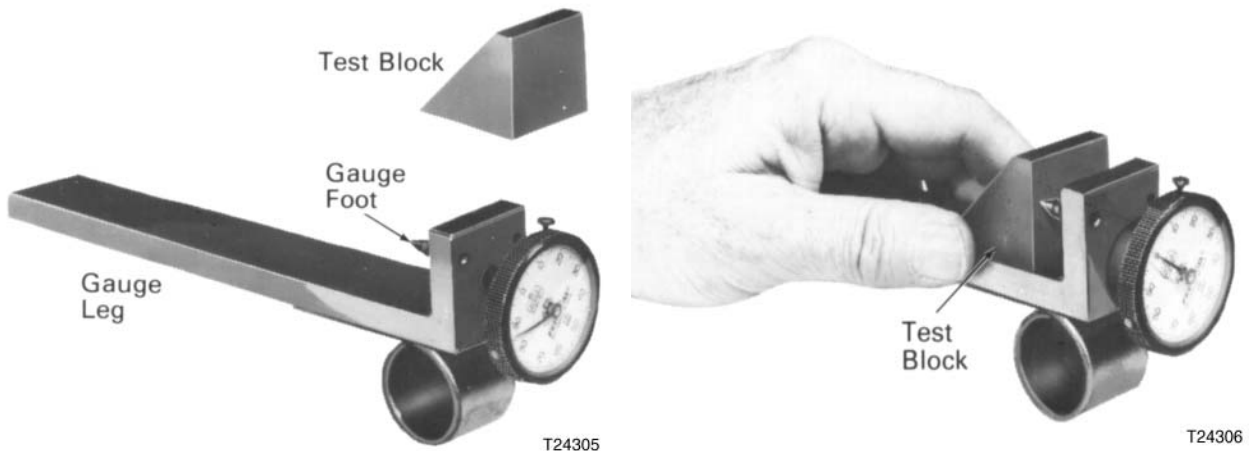
**Ref. No. 2**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|----------------------|--------------------|-------------|---|
| -1                   | <b>8048353</b>     | 1           | <b>FIXTURE..</b> Upper deck boring All 567, 645, and 710 engines (Does not include Air Motor 8359402)                                       |
| -2                   | <b>8215546</b>     | 1           | <b>FIXTURE..</b> Lower deck boring bar All 567 and 645 engines. 710 engines require adaptive hardware. (Does not include air motor 8359402) |
| -3                   | <b>8359402</b>     | 1           | <b>DRILL..</b> Air motor reversible multivane (Applicable to lower deck fixture 8215546 and upper deck fixture 8048353)                     |
| -4                   |                    | 1           | <b>ADAPTIVE HARDWARE..</b> (Permits 8215546 for use on 710 engines) (not shown)   |
| -5                   | <b>40033532</b>    | 1           | <b>LOWER RING</b>   |
| -6                   | <b>40033531</b>    | 1           | <b>ADAPTER</b>  |
| -7                   | <b>40033530</b>    | 1           | <b>KEY..</b> Rectangular  |
| -8                   | <b>138201</b>      | 1           | <b>CAP SCREW..</b> Hex socket head  |
| -9                   | <b>138300</b>      | 4           | <b>CAP SCREW..</b> Hex socket head  |
| -10                  | <b>8215554</b>     | 1           | <b>RING..</b> Pilot for 12.090" upper pilot (not shown)   |

**ENGINE (CRANKCASE)**



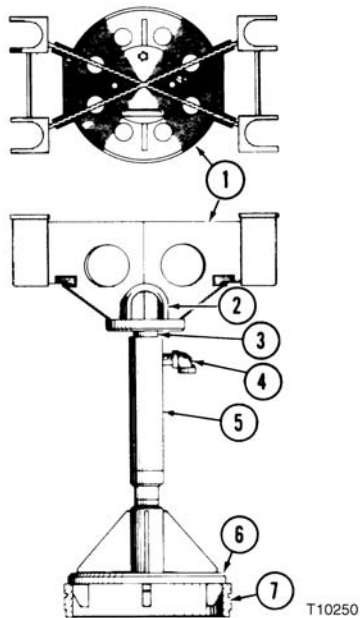
**Ref. No. 1**



**Ref. No. 2**

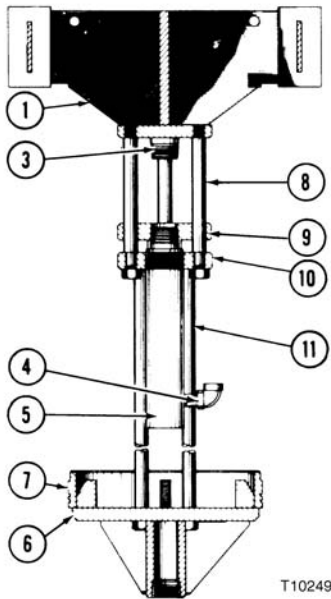
| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 9509391     | 1    | <b>RESURFACING TOOL..</b> Cylinder head retainer (Refer to M.I. 316) 567C, 567D, 645 and 710 Engines |
| -2            | 9320750     | 1    | <b>GAUGE..</b> Wear step head retainer -Used with 9509391  |
| -3            | 9568319     | 1    | <b>DIAL INDICATOR</b>  |
| -4            | 9320756     | 1    | <b>BLOCK..</b> Wear step calibration   |

**ENGINE (CRANKCASE)**



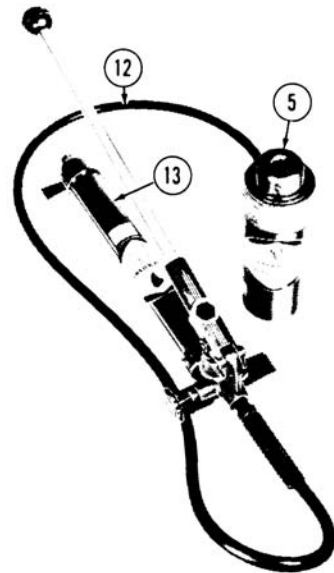
**a. Insert Application**

- 1. Crab Stud Holding Assembly
- 2. Hoisting Ring
- 3. Screw Plug
- 4. High Pressure Hose Connection
- 5. 10-Ton Ram (8266150)
- 6. Insert Plate



**b. Insert Removal**

- 7. Insert (8268641)
- 8. Holding Studs
- 9. Upper Plate
- 10. Ram Plate
- 11. Pulling Studs (40033585)

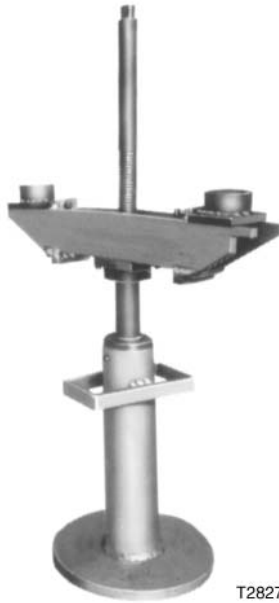


**c. Hydraulic Jack**

- 12. High Pressure Hose (8152395)
- 13. Hydraulic Pump (8266149)

**Ref. No. 1**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8275379     | 1    | <b>LOWER LINER INSERT TOOL..</b> Removing and installing -All engines  |
| -2            | 8078281     | 1    | <b>JACK..</b> Lower liner insert removal and application- (Figure (c)) |
| -3            | 8275380     | 1    | <b>PRESS AND PULLER..</b> Liner insert- (See Figure (a) and (b))       |
| -4            | 40033585    | 1    | <b>PULLING STUD</b>  |
| -5            | 8266150     | 1    | <b>10-TON RAM</b>  |
| -6            | 8268641     | 1    | <b>INSERT</b>  |
| -7            | 8152395     | 1    | <b>HIGH PRESSURE HOSE</b>  |
| -8            | 40052639    | 1    | <b>NIPPLE..</b> (Used for connection of high pressure hose)            |
| -9            | 40052640    | 1    | <b>ELBOW..</b> (Used for connection of high pressure hose)             |
| -10           | 8266149     | 1    | <b>HYDRAULIC PUMP</b>  |
| -11           | 9311252     | 1    | <b>ADAPTER..</b> New ram (not shown)                                   |
| -12           | 40033019    | 1    | <b>ADAPTER..</b> 710 engine puller (not shown)                         |

**ENGINE (CRANKCASE)**

T28275A

**Ref. No. 1**

T28275

**Ref. No. 3****Ref. No. 4**

T6420



T28276

**Ref. No. 5**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 9528882     | 1    | <b>INSTALLER..</b> Lower liner insert  |
| -2            | 40055908    | 1    | <b>BASE..</b> Liner insert installer (not shown)   |
| -3            | 9528883     | 1    | <b>REMOVER..</b> Lower liner insert  |
| -4            | 8055837     | 1    | <b>REMOVER..</b> Upper main bearing shell (Except rear bearings on 8 and 12 cylinder engines and 2 center bearings on 16 and 20 cylinder engines)- All 567, 645, and 710 engines |
| -5            | 8488833     | 1    | <b>REMOVER..</b> Upper main bearing shell - All 567 and 645 engines.   |
| -6            | 40004154    | 1    | <b>REMOVER..</b> Upper main bearing shell - 710 engines only (not shown)   |

**ENGINE (CRANKCASE)**



T6344

**Ref. No. 1**



T19578

**Ref. No. 2**



T6387

**Ref. No. 4**



T28277

**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8069934     | 1    | <b>GUIDE..</b> Crab bolt oil seal installing A and B engines   |
| -2            | 8399007     | 1    | <b>SEAL INSERTER..</b> Head frame (For use on square top inside frame covers)- All 567, 645, and 710 engines |
| -3            | 8399008     | 1    | <b>SEAL INSERTER..</b> Head frame (For use on round top inside frame covers)- 645 engines (not shown)        |
| -4            | 8087086     | 1    | <b>CLEANER..</b> Piston cooling oil pipe   |
| -5            | 8488128     | 1    | <b>PLATE..</b> Pre-crush (Line bore) Not for 567B and earlier engines (not shown)                            |
| -6            | 9549346     | 1    | <b>THREAD FILE..</b> For redressing rolled UNR threads on crab bolts and main bearing studs                  |

**ENGINE (CRANKCASE)****Ref. No. 1**

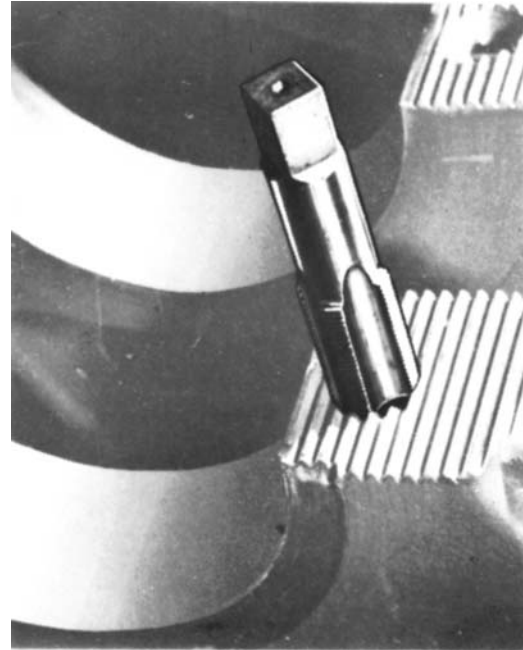
T28278

**Ref. No. 3**

T6950

**Ref. No. 12**

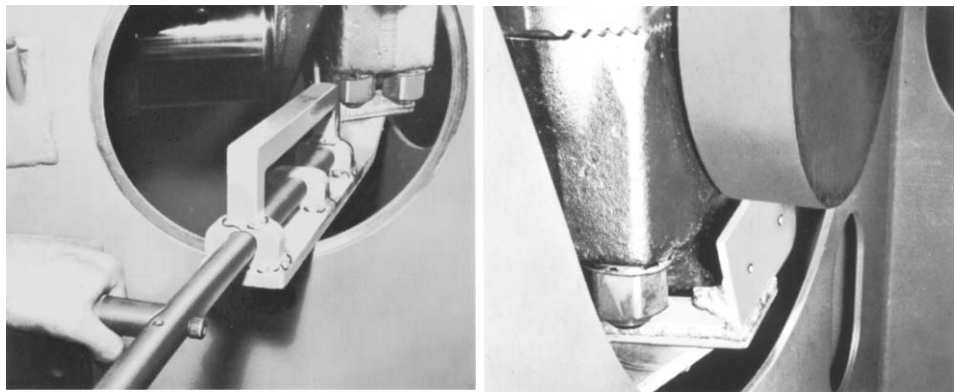
T52638

**Ref. No. 6**

T6374

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8177167     | 1    | <b>GAUGE..</b> Measuring main bearing cap serration spacing (Includes master gauge)                                       |
| -2            | 40038647    | 1    | <b>GAUGE..</b> Used on 710 engines (not shown)  |
| -3            | 8191591     | 1    | <b>WRENCH..</b> Offset ratchet- Main bearing- used with bearing power wrench or multiplier- All 567, 645, and 710 engines |
| -4            | 9548813     | 1    | <b>WRENCH..</b> Offset ratchet  |
| -5            | 8069965     | 1    | <b>SOCKET..</b> 1-7/8" hex. 3/4" sq. female drive   |
| -6            |             |      | <b>MAIN BEARING STUDS</b>   |
| -7            | 8060387     | 1    | <b>TAP..</b> 1-1/4"- 12 Main bearing stud- A, B, and BC engines   |
| -8            | 8072945     | 1    | <b>TAP..</b> 1-17/64"- 12 (.015" oversize) Main bearing stud A, B, and BC engines   |
| -9            | 8164416     | 1    | <b>TAP..</b> 1-5/16"- 12 (.062" oversize) Main bearing stud A, B, and BC engines  |
| -10           | 8164417     | 1    | <b>TAP..</b> 1-9/32"- 12 (.031" oversize) Main bearing stud A, B, and BC engines  |
| -11           | 8165480     | 1    | <b>TAP..</b> 1-3/8"- 12 (.125 oversize) Main bearing stud 567A, B, and BC engines   |
| -12           | 40080596    | 1    | <b>GUIDE STUD..</b> Main bearing.1-1/4"- 12   |

**ENGINE (CRANKCASE)**

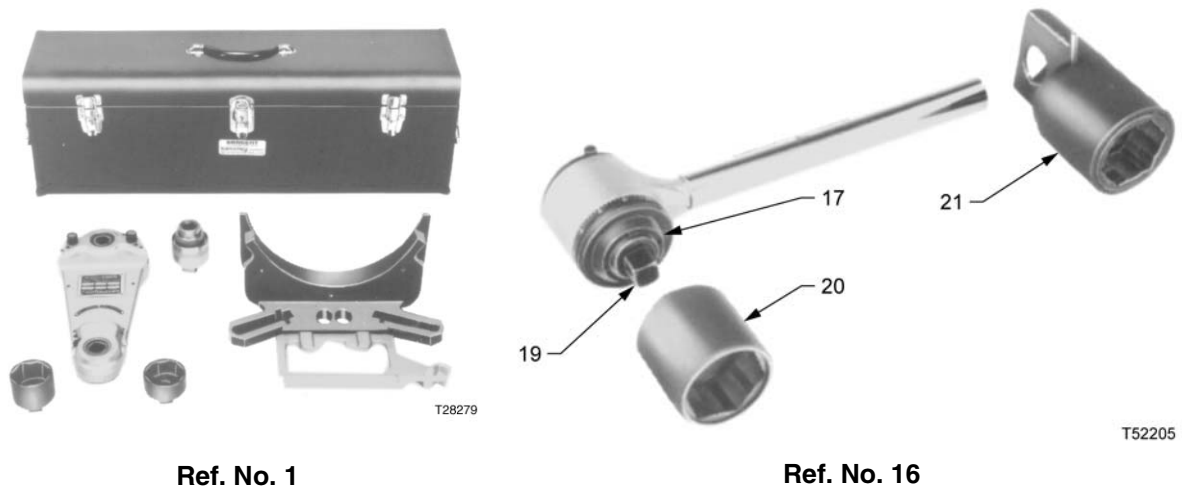


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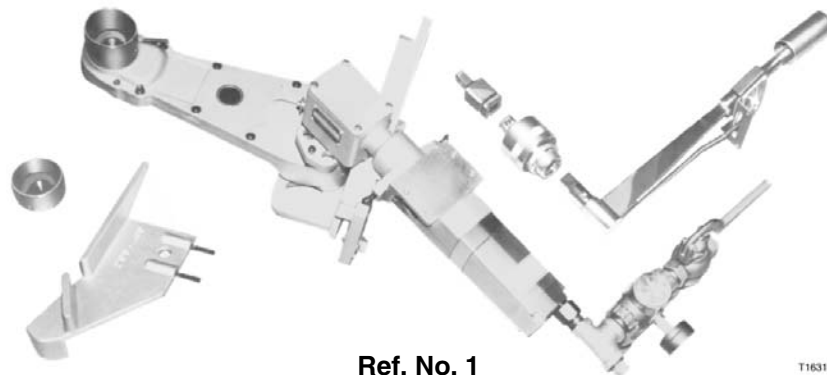


**Ref. No. 2**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8487487     | 1    | <b>MAIN BEARING CAP TOOL..</b> Installation and removal of caps - All 567 and 645 engines (not recommended for 710 engines). A support (not shown) is provided with the tool. The support, on which the tool can slide, may be bolted to the oil pan handhole if desired. |
| -2            | 8474807     | 1    | <b>POWER WRENCH..</b> Main Bearing Nuts- 567D, 645, and 710 Engines   |
| -3            | 8335627     | 1    | <b>POWER WRENCH..</b> 7:1 Power Ratio   |
| -4            | 8413343     | 1    | <b>ANCHOR PLATE ASSEMBLY..</b>  |
| -5            | 8474773     | 1    | <b>SOCKET..</b> Short 1-7/8" hex. tilt-on- 1" deep  |
| -6            | 8474774     | 1    | <b>SOCKET..</b> Long 1-7/8" hex. tilt-on- 1-17/32" deep   |
| -7            | 8140761     | 1    | <b>RATCHET..</b> Adapter 3/4" sq. male drive, 3/4" sq. female   |
| -8            | 8250085     | 1    | <b>CHEST..</b> 32-1/4" x 8-5/8" x 9-1/2"  |

**ENGINE (CRANKCASE)**

| Asm - Ref.No. | Part Number     | Qty. | Description  |
|---------------|-----------------|------|--|
| -1            | <b>8474808</b>  | 1    | <b>POWER WRENCH- AIR OPERATED..</b> Main bearing and crab nuts- All 567, 645, and 710 Engines                                |
| -2            | <b>8425973</b>  | 1    | <b>TORQUE MULTIPLIER..</b> 24 to 1 Power ratio- main bearing stud nut  |
| -3            |                 | 1    | <b>TORQUE MULTIPLIER..</b> 38 to1 Power ratio- cylinder head crab nut  |
| -4            |                 | 1    | <b>SPECIAL EXTENSION..</b> 3/4" sq. female and 1/2" male, 3" long  |
| -5            |                 | 1    | <b>AIR MOTOR..</b> Includes torque reaction pins   |
| -6            |                 | 1    | <b>AIR CONTROL KIT..</b> Includes shut-off valve, pressure regulator, pressure gauge, and fittings                           |
| -7            | <b>8484542</b>  | 1    | <b>ANCHOR PLATE..</b> Used on 567C, 567D and 845E only   |
| -8            |                 | 1    | <b>SUPPORT PLATE ANGLE DRIVE..</b> Used on 567C, 567D and 845E only 1:1 ratio 95° (Includes 1/2" and 3/4" sq. male adapters) |
| -9            |                 | 1    | <b>SOCKET..</b> Anchor 3" I.D.   |
| -10           | <b>8211090</b>  | 1    | <b>SOCKET..</b> Drive 2-3/4" hex. 1-1/2" sq. male drive  |
| -11           | <b>8140761</b>  | 1    | <b>ADAPTER..</b> Ratchet 3/4" sq. male drive   |
| -12           | <b>8474773</b>  | 1    | <b>SOCKET..</b> Short 1-7/8" hex. tilt-on 1" deep  |
| -13           | <b>8474774</b>  | 1    | <b>SOCKET..</b> Long 1-7/8" hex. tilt-on 1-17/32" deep   |
| -14           |                 | 1    | <b>CHEST..</b> 37" x 13-1/2" x 14" (accommodates 2 wrenches)   |
| -15           | <b>8437890</b>  | 1    | <b>KIT..</b> Anchor- Includes reaction cradle assembly and anchor plate (not shown)  |
| -16           | <b>9551713</b>  | 1    | <b>SET..</b> Manual torque multiplier- crab nuts- All 567, 645, and 710 engines  |
| -17           | <b>9566139</b>  | 1    | <b>TORQUE MULTIPLIER..</b> 18.5 to 1 Power ratio, 3200ft. lb. cap  |
| -18           | <b>9572172</b>  | 1    | <b>REACTION SOCKET</b>   |
| -19           | <b>9572173</b>  | 1    | <b>SQ DRIVE KIT</b>  |
| -20           | <b>9572174</b>  | 1    | <b>SOCKET..</b> 2-3/4"   |
| -21           | <b>9572175</b>  | 1    | <b>SOCKET ASM.</b>   |
| -22           | <b>9568374</b>  | 1    | <b>TORQUE WRENCH..</b> 30 to 250ft. lbs  |
| -23           | <b>9573454</b>  | 1    | <b>CHEST..</b> (not shown)   |
| -24           | <b>40125507</b> | 1    | <b>TORQUE WRENCH..</b> Pneumatic crab nut wrench. Hydraulic. Designed to handle super-duty bolting applications (not shown)  |

**ENGINE (CRANKCASE)****Ref. No. 1**

T16316



T52636

**Ref. No. 13**

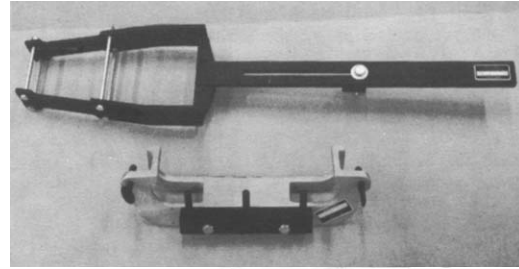
T52637

**Ref. No. 14**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | <b>8474806</b>     | 1           | <b>POWER WRENCH- AIR OPERATED..</b> Main bearing nuts 567C, 567D, 645 and 710 engines                                  |
| -2                   | <b>8425973</b>     | 1           | <b>TORQUE MULTIPLIER..</b> 24:1 Power ratio  |
| -3                   |                    | 1           | <b>AIR MOTOR..</b> (Includes torque reaction pins)   |
| -4                   |                    | 1           | <b>AIR CONTROL KIT..</b> (Includes regulator, pressure gauge, shut-off valve, and fittings)                            |
| -5                   | <b>8484542</b>     | 1           | <b>ANCHOR PLATE</b>  |
| -6                   |                    | 1           | <b>SUPPORT PLATE ANGLE DRIVE..</b> 1:1 Ratio- 90° (Includes 1/2" and 3/4" sq. male adapters)                           |
| -7                   | <b>8474773</b>     | 1           | <b>SOCKET..</b> Short 1-7/8" hex. tilt-on - 1" deep  |
| -8                   | <b>8474774</b>     | 1           | <b>SOCKET..</b> Long 1-7/8" hex. tilt-on - 1-17/32" deep   |
| -9                   | <b>8250085</b>     | 1           | <b>CHEST..</b> 32-1/4" x 8-5/8" x 9-1/2" (not shown)   |
| -10                  | <b>8140761</b>     | 1           | <b>RATCHET ADAPTER*..</b> 3/4" Sq. male drive  |
| -11                  |                    | 1           | <b>TORQUE WRENCH*..</b> 0-75 ft. lbs. 3/4" sq. male drive (SWE51)  |
| -12                  |                    | 1           | <b>SPECIAL EXTENSION..</b> 3/4" sq. female and 3/4" sq. male, 3" long  |
|                      |                    |             | *These Items are required only when manually verifying the air applied torque  |
|                      |                    |             | NOTE: All Components of this kit, except the chest 8250085, are available in the kit number 8474808.                   |
| -13                  | <b>40077260</b>    | 1           | <b>SOCKET 12PT..</b> Short socket, 1-1/4" hex ball drive, 1-1/4" 12 point socket for use with TAME main bearing wrench |
| -14                  | <b>40077261</b>    | 1           | <b>SOCKET 12PT..</b> Long socket, 1-1/4" hex ball drive, 1-1/4" 12 point socket for use with TAME main bearing wrench  |
| -15                  | <b>40080594</b>    | 1           | <b>SOCKET..</b> Long, main bearing, Use with Sweeney wrench (not shown)  |
| -16                  | <b>40080595</b>    | 1           | <b>SOCKET..</b> Short, main bearing, Use with Sweeney wrench (not shown)   |

**ENGINE (CRANKCASE)****Ref. No. 1 & 2**

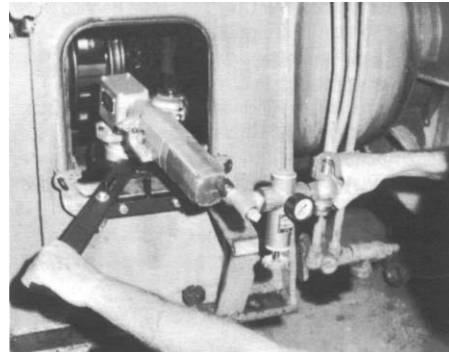
T35155

**Ref. No. 3**

T21451

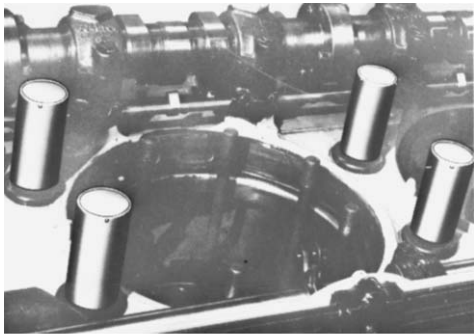
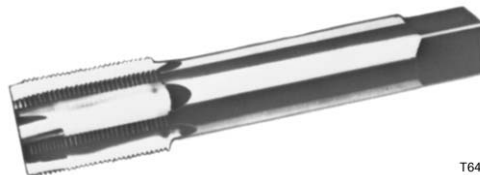


T16476

**Ref. No. 13**

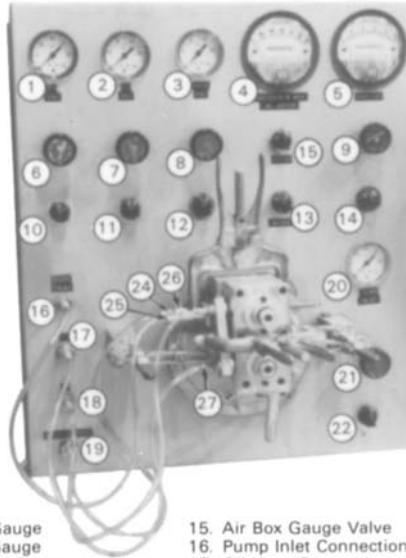
T16474

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|----------------------|--------------------|-------------|---|
| -1                   | <b>8093717</b>     | 1           | <b>EXTENSION HANDLE..</b> 36" Used with 8034085   |
| -2                   | <b>8034085</b>     | 1           | <b>OFFSET BOX WRENCH..</b> 2-3/4" Used on crab nuts   |
| -3                   | <b>40014456</b>    | 1           | <b>POWER WRENCH..</b> Air operated- crab nuts- 567, 645 and 710 engines   |
| -4                   |                    | 1           | <b>TORQUE MULTIPLIER..</b> 38:1 Power ratio   |
| -5                   | <b>9570166</b>     | 1           | <b>AIR CONTROL KIT..</b> Includes shut-off valve, pressure regulator, pressure gauge, and fittings.   |
| -6                   |                    | 1           | <b>AIR MOTOR..</b> Includes torque reaction pins  |
| -7                   | <b>40011705</b>    | 1           | <b>ANCHOR SOCKET..</b> 3" I.D.  |
| -8                   | <b>8211090</b>     | 1           | <b>SOCKET..</b> Drive 2-3/4" sq. male drive   |
| -9                   | <b>8140761</b>     | 1           | <b>ADAPTER*..</b> Ratchet 3/4" sq. male drive   |
| -10                  | <b>9568374</b>     | 1           | <b>TORQUE WRENCH*..</b> 0-75 ft. lbs. 3/4" sq. male drive   |
| -11                  | <b>40015990</b>    | 1           | <b>ADAPTER..</b> 1/2 sq. female - 3/4" sq. male   |
| -12                  | <b>8250085</b>     | 1           | <b>CHEST..</b> 36-1/4" x 8-5/8" x 9-1/2" (not shown)  |
|                      |                    |             | *These Items are required only when manually checking the air applied torque.   |
|                      |                    |             | NOTE: All components of this kit except for the chest, 8250085, are also contained in the kit number 8474808.   |
| -13                  | <b>8437890</b>     | 1           | <b>ADAPTER KIT..</b> 567, 567A, and 567B engines  |
| -14                  |                    | 1           | <b>REACTION CRADLE</b>  |
| -15                  |                    | 1           | <b>ANCHOR PLATE ASSEMBLY..</b>  |
|                      |                    |             | Two typical applications shown:<br>1. Torque multiplier, 8425973, mounted in reaction cradle.<br>2. Adapter kit in use with components of 8474806, applying air power to the bearing cap nut. |
|                      |                    |             | NOTE: All components of this kit are also available in the kit number 8474808 - See page 1-9  |

**ENGINE (CRANKCASE)****Ref. No. 1****Ref. No. 4****Ref. No. 2****Ref. No. 5**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | 8034600            | 1           | <b>TUBE..</b> Crab stud thread protector (4 required per cylinder)   |
| -2                   | 8081034            | 1           | <b>FIXTURE..</b> Crankcase water test upper deck jacket- A and B engines   |
| -3                   | 8190189            | 1           | <b>FIXTURE..</b> Crankcase water test lower deck jacket- A and B engines. (not shown)  |
| -4                   | 8050688            | 1           | <b>TAP-CRAB STUD NUT..</b> This tap cleans up the 1-3/4" - 12 threads of the nut.  |
| -5                   | 8249739            | 1           | <b>SHACKLE..</b> Crankcase anchor Includes pin- engine and generator lifting (1 per base)  |
| -6                   | 8344365            | 1           | <b>BASE..</b> Anchor shackle- 645E (2 per crankcase- on roots blown engines) (not shown)   |
| -7                   | 9096428            | 1           | <b>BOLT..</b> - 4 required per base (not shown)  |
| -8                   | 9311575            | 1           | <b>BASE..</b> Shackle anchor all turbocharged engines with "E" or "F" crankcase (This base does not interfere with trap screen) Use with one 8344365 base. (not shown) |
| -9                   | 9096320            | 1           | <b>BOLT..</b> - 4 required per base (not shown)  |
| -10                  | 8072352            | 1           | <b>BASE..</b> Crankcase anchor shackle - A, B, C, D engines (2 per crankcase) (not shown)  |
| -11                  | 40019577           | 1           | <b>BOLT..</b> - 4 required per base (not shown)  |

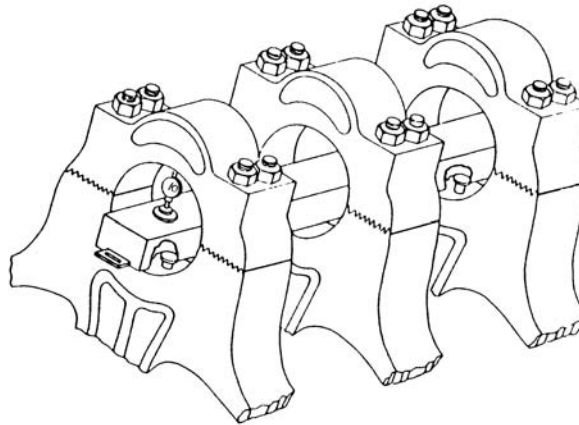
**ENGINE (CRANKCASE)**



- |   |   |
|---|---|
| 1. Air PSI Gauge                                  | 15. Air Box Gauge Valve                               |
| 2. Oil PSI Gauge                                  | 16. Pump Inlet Connection                             |
| 3. Water PSI Gauge                                | 17. Oil Hose Connection                               |
| 4. Water/Air Box Pressure Gauge (Inches Of Water) | 18. Air Hose Connection                               |
| 5. Crankcase Pressure Gauge                       | 19. Water High Pressure Connection                    |
| 6. Air PSI Pressure Regulator                     | 20. Pump Inlet Gauge                                  |
| 7. Oil PSI Regulator                              | 21. Pump Inlet Regulator                              |
| 8. Water PSI Pressure Regulator                   | 22. Pump Inlet Valve                                  |
| 9. Crankcase Pressure Regulator                   | 23. Vent Elbow (Not Shown - Located On Rear Of Panel) |
| 10. Air PSI Valve                                 | 24. Port No. 1 - (Pump Discharge Pressure)            |
| 11. Oil PSI Valve                                 | 25. Port No. 2 - (Pump Inlet Pressure)                |
| 12. Water PSI Valve                               | 26. Port No. 3 - (Air Box Pressure)                   |
| 13. Water Gauge Valve                             | 27. Port No. 4 - (Oil)                                |
| 14. Crankcase Valve                               |   |

T23767

**Ref. No. 1**



T22261

**Ref. No. 4**

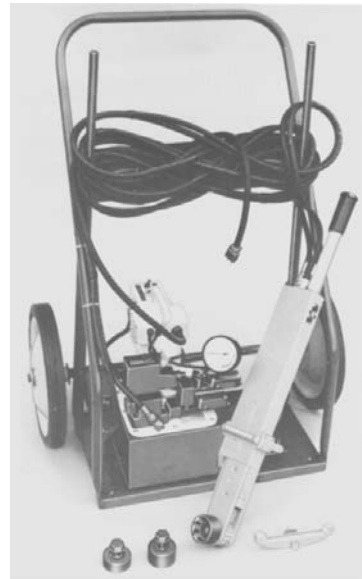
| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 9339066     | 1    | PANEL.. Engine test for use with 710 engines- air operated                                      |
| -2            | 9339065     | 1    | KIT.. Air regulator repair - used with 9339066 (not shown)                                      |
| -3            | 9339067     | 1    | KIT.. Conversion-To convert standard test panel to ΔP test panel- used with 9339066 (not shown) |
| -4            | 8467738     | 1    | MEASURING BAR.. Used for line bore (Refer to M.I. 100)  |
| -5            | 8467737     | 1    | GAUGE ASSEMBLY  |

**ENGINE (CRANKCASE)**



T24679

**Ref. No. 1**



T24678

**Ref. No. 4**



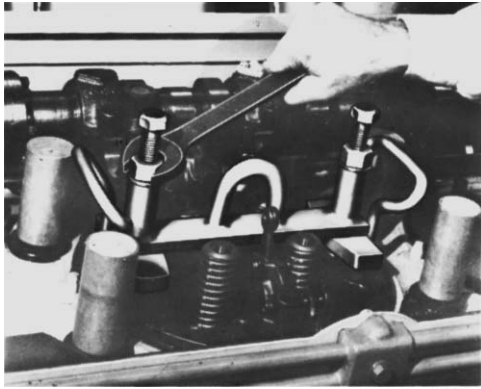
T34472

**Ref. No. 7**

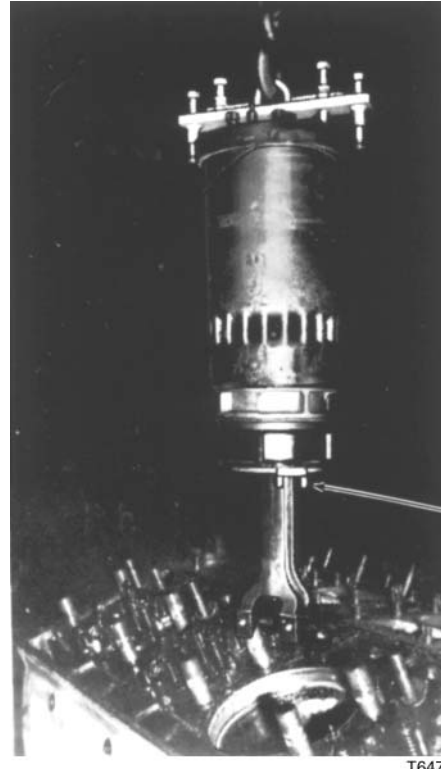
| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 40014689    | 1    | <b>WRENCH.</b> Crab nut- 115 volt- hydraulic- All engines - Includes the hydraulic pump and motor, wrench power head, socket & torque fixture, and cart.   |
| -2            | 40014690    | 1    | <b>WRENCH.</b> Crab nut- 230 volt- hydraulic- All engines - Includes similar components as 40014689 (See ref. no. 1 image)   |
| -3            | 40020518    | 1    | <b>SWITCH.</b> Limit (not shown)   |
| -4            | 9523800     | 1    | <b>WRENCH.</b> Main bearing- 115 volt- hydraulic- All engines - Includes hydraulic power unit on a cart, wrench, hoses, and cables, 4 hex dr. sockets, and an angle drive air motor and socket assembly. |
| -5            | 40009879    | 1    | <b>WRENCH.</b> Main bearing- 230 volt- hydraulic- All engines - Includes similar components as 9523800 (See ref. no. 4 image)  |
| -6            | 40024084    | 1    | <b>SOCKET- DEEP WELL.</b> 1-7/8" x 1-1/4" hex drive (not shown)  |
| -7            | 9532633     | 1    | <b>JACK.</b> Hydraulic- barring- 115 volt- All engines   |
| -8            | 40014730    | 1    | <b>JACK.</b> Hydraulic- barring- 230 volt- All engines (See ref. no. 7 image)  |

**ENGINE (POWER ASSEMBLY)**

T28282

**Ref. No. 1**

T27035

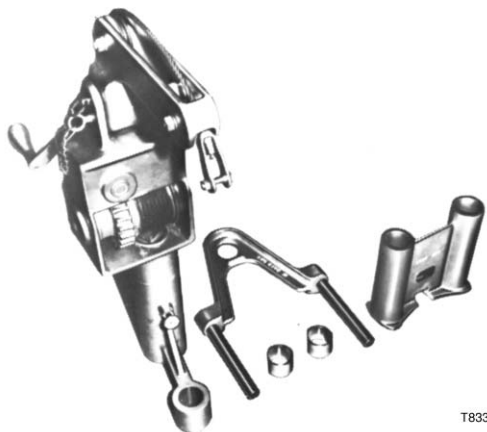
**Ref. No. 13**

T6471

**Ref. No. 2**

T8471

| Asm -<br>Ref.No. | Part<br>Number | Qty. | Description   |
|------------------|----------------|------|---|
| -1               | <b>8417858</b> | 1    | <b>LIFTER..</b> Power assembly (eccentric type)- C, D, E, F and G engines |
| -2               | <b>8158650</b> | 1    | <b>LIFTER..</b> Power assembly- 567A, 567B, and 710 engines               |
| -3               | <b>131017</b>  | 2    | <b>WASHER..</b> Flat 3/4" nom.  |
| -4               | <b>8187659</b> | 2    | <b>SCREW..</b> Pulling  |
| -5               | <b>9414485</b> | 2    | <b>RING..</b> Pulling screw   |
| -6               | <b>8211959</b> | 2    | <b>FOOT..</b> Swivel  |
| -7               | <b>8160626</b> | 1    | <b>STOP..</b> Piston  |
| -8               | <b>8160627</b> | 2    | <b>BOLT..</b> Piston stop   |
| -9               | <b>8035623</b> | 1    | <b>EYE-BOLT..</b> Standard  |
| -10              | <b>8209576</b> | 2    | <b>SCREW..</b> Jack   |
| -11              | <b>220086</b>  | 2    | <b>NUT..</b> Heavy hex.   |
| -12              |                | 1    | <b>BAR..</b> Pulling  |
| -13              | <b>8075894</b> | 1    | <b>REMOVER AND INSTALLER..</b> Cylinder head- All engines                 |
| -14              | <b>131017</b>  | 1    | <b>WASHER..</b> Flat 3/4" nom.  |
| -15              | <b>220086</b>  | 1    | <b>NUT..</b> Heavy hex.   |
| -16              | <b>8187659</b> | 1    | <b>SCREW..</b> Pulling  |
| -17              | <b>9414485</b> | 1    | <b>RING..</b> Pulling screw   |

**ENGINE (POWER ASSEMBLY)**

T8335

**Ref. No. 1**

T35163

**Ref. No. 21**

T6831

**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8213425     | 1    | <b>HOIST SET..</b> Cylinder head and liner- All engines  |
| -2            | 8206099     | 1    | <b>HOIST..</b> Cylinder head and liner   |
| -3            | 8213424     | 1    | <b>PULLER..</b> Cylinder liner   |
| -4            | 8213423     | 1    | <b>ADAPTER..</b> Used under the hoist- 567C, 567D and 710 engines  |
| -5            | 8288228     | 1    | <b>ADAPTER PAIR..</b> Used on GP and SD locomotives with dynamic braking- All engines                      |
| -6            | 8197044     | 1    | <b>LIFTER..</b> Power assembly (eccentric type)- 567A and 567B engines                                     |
| -7            | 131017      | 2    | <b>WASHER..</b> Flat 3/4" nom  |
| -8            | 8187659     | 2    | <b>SCREW..</b> Pulling   |
| -9            | 8250704     | 1    | <b>PIN..</b> Lifting   |
| -10           | 9414485     | 2    | <b>RING..</b> Pulling screw  |
| -11           | 8250706     | 1    | <b>ARM..</b> Lifting   |
| -12           | 8250707     | 1    | <b>SCREW..</b> Thumb   |
| -13           | 100737      | 2    | <b>SCREW..</b> Machine- R.H. 6-32 x 7/8" long  |
| -14           | 8211959     | 2    | <b>FOOT..</b> Swivel   |
| -15           | 8160626     | 2    | <b>STOP..</b> Piston   |
| -16           | 8160627     | 2    | <b>BOLT..</b> Piston stop  |
| -17           | 8313614     | 2    | <b>RING..</b> Jack screw   |
| -18           | 8209576     | 2    | <b>SCREW..</b> Jack  |
| -19           | 8250821     | 1    | <b>BAR..</b> Pulling   |
| -20           | 8208127     | AR   | <b>CHAIN..</b> Machine screw- lifting arm  |
| -21           | 40034179    | 1    | <b>BORGSCOPE..</b> Fiber optic internal inspection of power assembly components through the injector hole. |

**ENGINE (POWER ASSEMBLY)**



T15939

**Ref. No. 1**



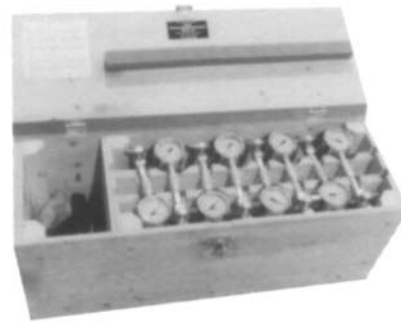
T13315

**Ref. No. 3**



T28283

**Ref. No. 2**

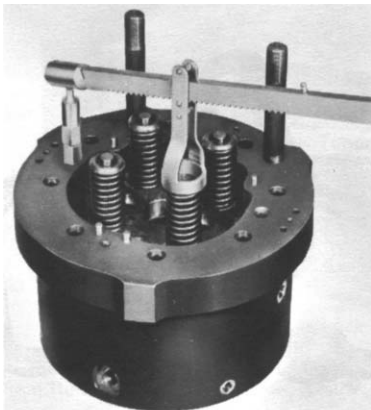


T29872

**Ref. No. 4**

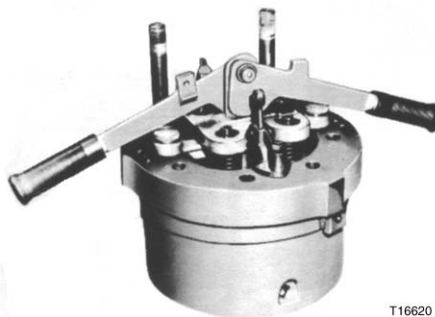
| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8417859     | 1    | TOOL.. Piston holding- power assembly lifting- All engines   |
| -2            | 9080908     | 1    | LOCATOR.. Crab bolt- 645 engines (Used to center crab bolts)   |
| -3            | 8417881     | 1    | CLAMP.. Connecting rod positioning- assembly removal- 645 engines  |
| -4            | 9572281     | 1    | COMPRESSION TESTER.. Set of eight and wooden case- used to measure compression in EMD power assemblies when the engine is shut down. |
| -5            | 9572282     | 1    | INDIVIDUAL TESTER.. (not shown)  |

**ENGINE (CYLINDER HEAD)**



T16619

**Ref. No. 1**



T16620

**Ref. No. 4**



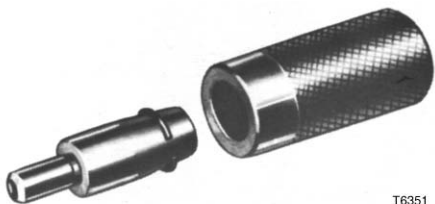
T6404

**Ref. No. 2**



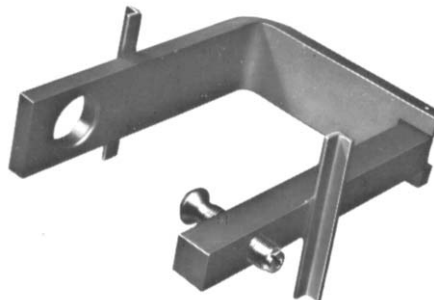
T19614

**Ref. No. 5**



T6351

**Ref. No. 3**

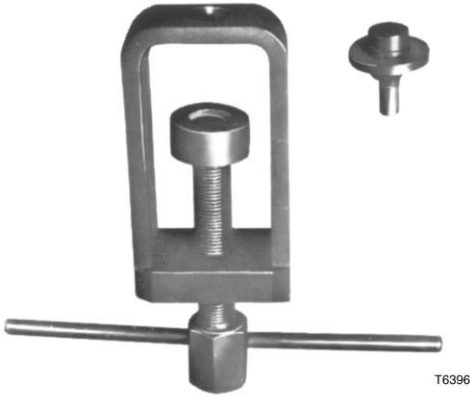


T6430

**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8033783     | 1    | COMPRESSOR.. Single valve spring (use with 8034054 adapter) - All 567, 645, and 710 engines    |
| -2            | 8034054     | 1    | ADAPTER.. Valve spring compressor (use with 8033783 compressor)- All 567, 645, and 710 engines |
| -3            | 8070903     | 1    | GUIDE.. Valve bridge snap ring installing- All 567, 645, and 710 engines                       |
| -4            | 9546582     | 1    | COMPRESSOR.. Multiple valve spring- manual- All 567, 645, and 710 engines                      |
| -5            | 8215081     | 1    | COMPRESSOR.. Multiple valve spring- hand crank type- All 567, 645, and 710 engines             |
| -6            | 8070883     | 1    | COMPRESSOR.. Valve bridge- All 567, 645, and 710 engines                                       |

**ENGINE (CYLINDER HEAD1)**



T6396

**Ref. No. 1**



T6421

**Ref. No. 4**



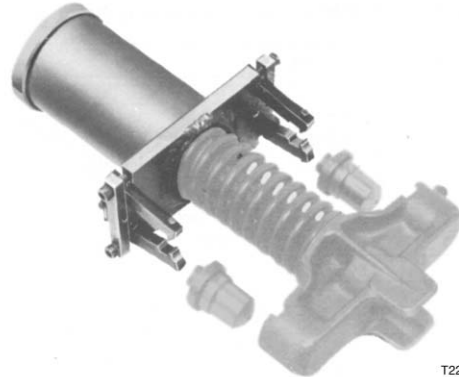
T21329

**Ref. No. 5**



T21325

**Ref. No. 2 & 3**

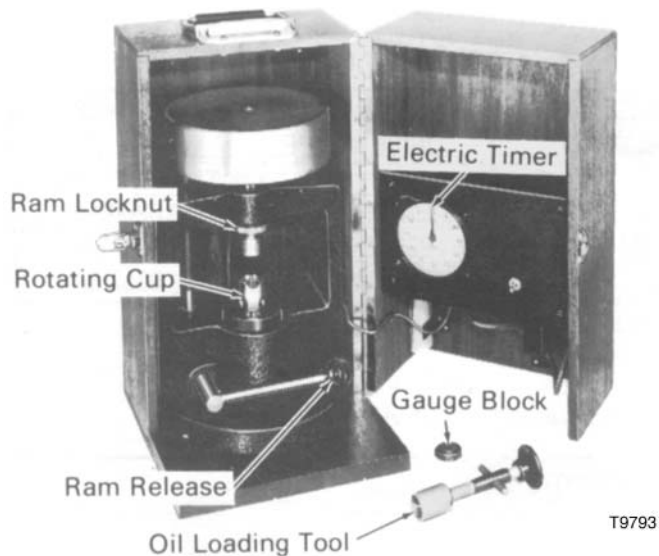


T22251

**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8072927     | 1    | <b>INSTALLER..</b> Hydraulic lash adjuster- All 567, 645, and 710 engines   |
| -2            | 9082392     | 1    | <b>WRENCH..</b> Triple hex. right hand 1-1/16" liner nuts (used without removing rocker arm assembly) All engines |
| -3            | 9082393     | 1    | <b>WRENCH..</b> Triple hex. left hand 1-1/16" liner nuts (used without removing rocker arm assembly) All engines  |
| -4            | 8032587     | 1    | <b>WRENCH..</b> Cylinder test value   |
| -5            | 8080632     | 1    | <b>REMOVER..</b> Hydraulic lash adjuster snap ring- All 567, 645, and 710 engines                                 |
| -6            | 8394719     | 1    | <b>PULLER..</b> Multiple- hydraulic lash adjuster- All engines  |
| -7            | 8395481     | 4    | <b>ARMS..</b> Lash adjuster puller  |
| -8            | 40026007    | 1    | <b>KIT..</b> Puller repair - includes (1) spring; (2) arms (Used for 8394719)                                     |

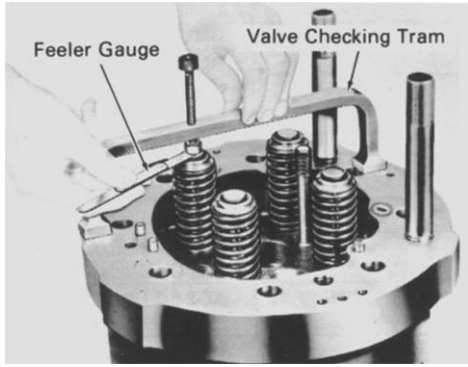
**ENGINE (CYLINDER HEAD)**



**Ref. No. 1**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            |             |      | <b>TEST STANDS</b>   |
| -2            | 8267432     | 1    | <b>TEST STAND..</b> Lash adjuster 110 volts 60 Hz- All 567, 645 and 710 engines  |
| -3            | 8267434     | 1    | <b>GAUGE BLOCK</b>   |
| -4            | 8267435     | 1    | <b>TOOL..</b> Oil loading  |
| -5            | 8276834     | 1    | <b>SHAFT..</b> Weight  |
| -6            | 8276835     | 1    | <b>CUP</b>   |
| -7            | 8299249     | 1    | <b>TEST STAND..</b> Lash adjuster 220 volts 60 Hz- All 567, 645, and 710 engines |
| -8            | 8267434     | 1    | <b>GAUGE BLOCK</b>   |
| -9            | 8267435     | 1    | <b>TOOL..</b> Oil Loading  |
| -10           | 8276834     | 1    | <b>SHAFT..</b> Weight  |
| -11           | 8276835     | 1    | <b>CUP</b>   |
| -12           | 8309795     | 1    | <b>TEST STAND..</b> 240 volts 50 Hz  |
| -13           | 8276528     | 1    | <b>OIL..</b> Lash adjuster test stand- five gallons quantity (not shown)         |

**ENGINE (CYLINDER HEAD)**



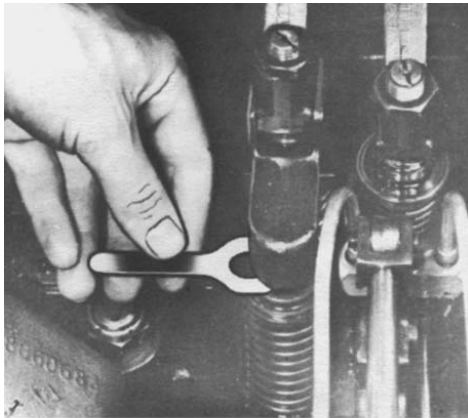
T16221

**Ref. No. 1**



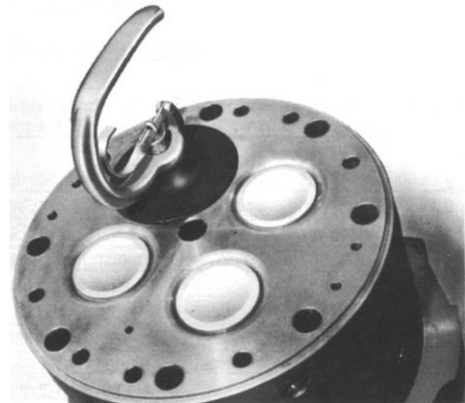
T6370

**Ref. No. 4**



T6365

**Ref. No. 2**



T13748

**Ref. No. 6**



T21326

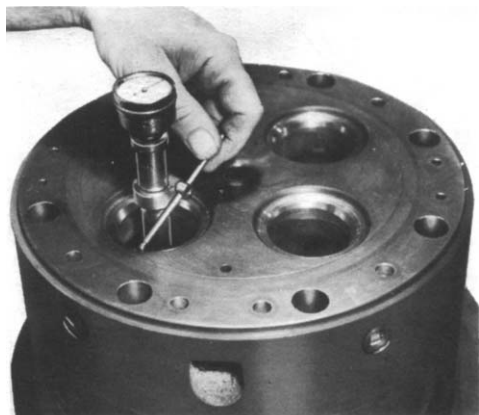
**Ref. No. 5**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8042773     | 1    | TRAM.. Valve height checking (used with a feeler gauge such as 8067337) |
| -2            | 8107788     | 1    | GAUGE.. Lash adjuster minimum clearance- 567, 645, and 710 engines      |
| -3            | 8227624     | 1    | INSTALLER/REMOVER.. Valve guide- dual fuel (not shown)                  |
| -4            | 8060247     | 1    | BASKET.. Cylinder head carrying   |
| -5            | 8224241     | 1    | INSTALLER/REMOVER.. Cylinder head exhaust valve guide- All engines      |
| -6            | 8213518     | 1    | TESTER.. Valve seat seal  |
| -7            | 8213519     | 1    | VACUUM CUP.. Valve seat tester (Shown on ref no. 6)                     |
| -8            | 8260462     | 1    | CUP.. Suction gas valve seat- dual fuel (not shown)                     |

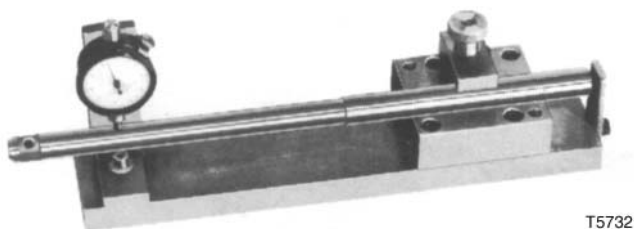
**ENGINE (CYLINDER HEAD)**



**Ref. No. 1**



**Ref. No. 3**



**Ref. No. 4 & 5**



**Ref. No. 2**



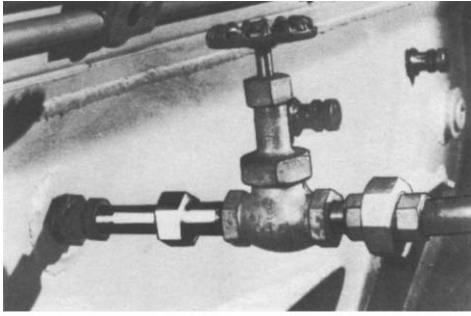
**Ref. No. 6**



**Ref. No. 7**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8069928     | 1    | <b>DRESSING TOOL..</b> Valve seat grinding wheel includes pilot   |
| -2            | 8214743     | 1    | <b>DIAMOND..</b> Hex 3/8" carat for female threaded shaft (for later model dressing tool 8069928)                       |
| -3            | 8073108     | 1    | <b>INDICATOR..</b> Dial- valve seat checking- used with valve reconditioning tapered pilots                             |
| -4            | 8173996     | 1    | <b>FIXTURE..</b> Tapered pilot checking - use with 8035775, 8041445, and 8332668 [discontinued valve seat grinder kits] |
| -5            | 8200947     | 1    | <b>INDICATOR..</b> Dial   |
| -6            | 8190311     | 1    | <b>COUNTERBORE..</b> Cylinder head nut seal   |
| -7            | 8228215     | 1    | <b>CUTTER..</b> Cylinder head counterbore   |

**ENGINE (CYLINDER HEAD)**



T6359



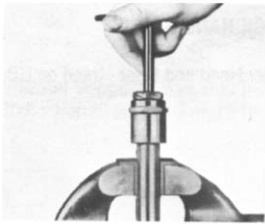
T28285

**Ref. No. 1**



T5262

**Ref. No. 4**



T6363

**Ref. No. 2**



T6367

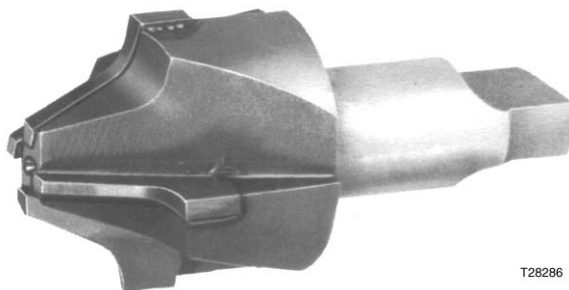


T19610

**Ref. No. 5**

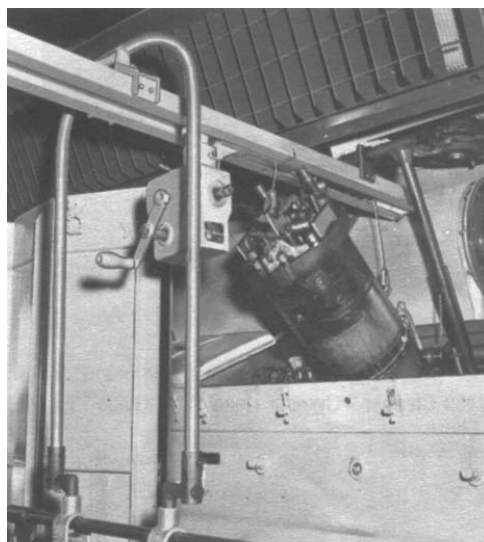
| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8070872     | 1    | ADAPTER.. Cylinder test valve- pressure test                        |
| -2            | 8064804     | 1    | REAMER.. Cylinder test valve seat                                   |
| -3            | 8080383     | 1    | CUTTER  |
| -4            | 8211907     | 1    | BRUSH CLEANER.. Cylinder head liner stud hole fits 1/4" drill chuck |
| -5            | 8141439     | 1    | CLEANER.. Cylinder head valve guide- fits 1/4" drill chuck          |
| -6            | 40118842    | 1    | CUTTER.. Used to recut valve seats in cylinder heads. (not shown)   |

**ENGINE (CYLINDER HEAD)**



T28286

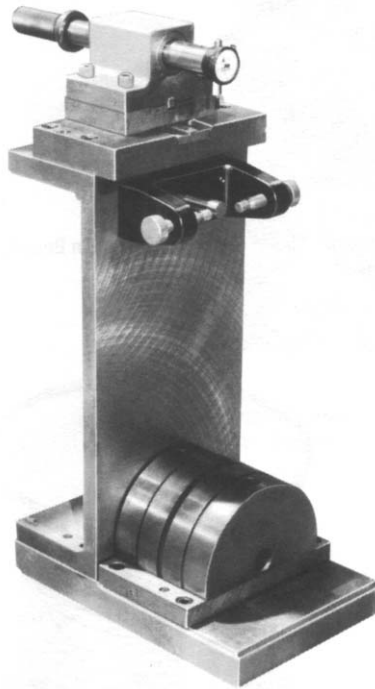
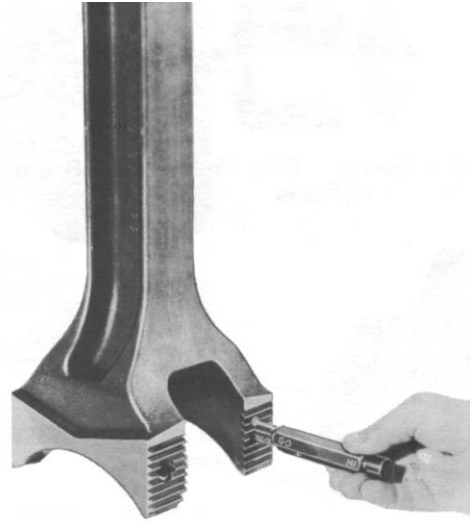
**Ref. No. 1**



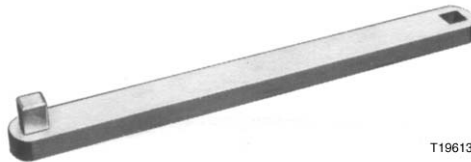
T12825

**Ref. No. 2**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | 9560927            | 1           | <b>CUTTER INJECTOR WELL RADIUS..</b> Used to change the 3/16" injector well to fireface radius to the 5/16" dimension used on current production cylinder heads (All heads prior to June 1982)   |
| -2                   | 8351742            | 1           | <b>HOIST SET..</b> Cylinder head and liner- used on GP, SD and DD locomotives with 567 engines- power pack hand hoist.   |
| -3                   | 40089609           | 1           | <b>REFACER..</b> Vertical Valve - 220 volt, 50/60 Hz, 1 phase - Includes refacer, set of 4 polyurethane pads, stem end grinding attachment, rocker arm attachment, diamond, set of 12 right filters, set of 12 left filters, chip recuperation grid, and set of 3 keys (balancing feeders, wheel, 12 hex.) - (not shown) |

**ENGINE (ROD)****Ref. No. 1**

T10126A

**Ref. No. 9**

T19613

**Ref. No. 8**

T6383

**Ref. No. 12**

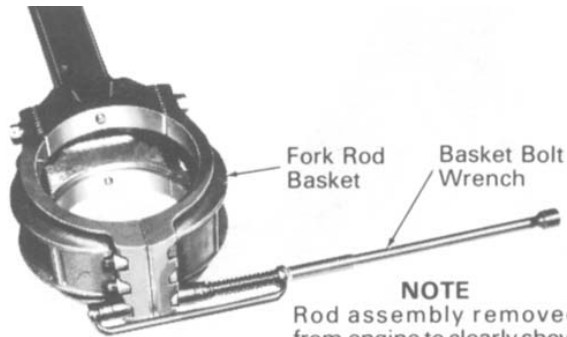
| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | 8257730            | 1           | <b>FIXTURE..</b> Connecting rod checking gauge   |
| -2                   | 9533794            | 1           | <b>DIAL INDICATOR</b>  |
| -3                   | 8257737            | 1           | <b>GAUGE PLATE</b>   |
| -4                   | 8257738            | 1           | <b>GAUGE PLATE</b>   |
| -5                   | 8257739            | 1           | <b>SPACER PLATE</b>  |
| -6                   | 9548502            | 1           | <b>MASTER ROD GAUGE..</b> Used to check rod checking fixture, 8257730, for accuracy. (not shown) |
| -7                   | 40038305           | 1           | <b>FIXTURE..</b> Similar to 8257730 with electronic digital readouts (not shown)                 |
| -8                   | 8210136            | 1           | <b>EXTENSION..</b> Torque wrench 3/4" drive- All 567, 645 and 710 engines- for pin to rod bolts  |
| -9                   | 8265955            | 1           | <b>GAUGE..</b> Assembly plug GO and HI - fork rod- tapped holes                                  |
| -10                  | 942440             | 1           | <b>GAUGE..</b> GO 5/8"- 18 UNF   |
| -11                  | 8265956            | 1           | <b>GAUGE..</b> HI 5/8"- 18 UNF   |
| -12                  | 8052958            | 1           | <b>SUPPORT..</b> Fork rod (used in the removal of blade rod)- For all 567, 645 and 710 engines   |

**ENGINE (ROD)**



T8331

**Ref. No. 1**



Fork Rod Basket  
Basket Bolt Wrench

**NOTE**  
Rod assembly removed from engine to clearly show tool application.

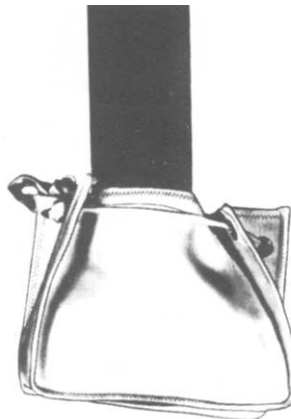
T18440

**Ref. No. 2**



T19591

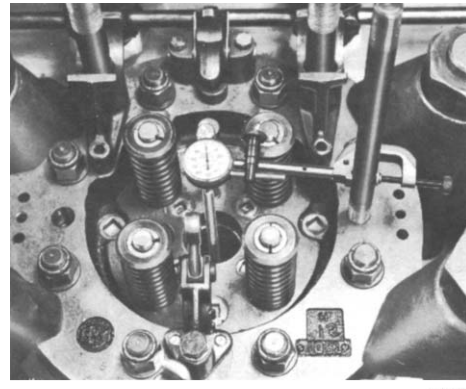
**Ref. No. 3**



T6389

**Ref. No. 4 & 5**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8220552     | 1    | <b>REMOVER..</b> Piston pin sleeve and floating bushing- A and B engines |
| -2            | 8236718     | 1    | <b>WRENCH..</b> Basket bolt and nut- All 567, 645 and 710 engines        |
| -3            | 8237117     | 1    | <b>PLIERS..</b> Sleeve snap ring piston pin bearing- A and B engines     |
| -4            | 8062033     | 1    | <b>BOOT..</b> Blade rod protector- for all 567, 645 and 710 engines      |
| -5            | 8062034     | 1    | <b>BOOT..</b> Fork rod protector- for all 567, 645 and 710 engines       |

**ENGINE (ROD)****Ref. No. 1****Ref. No. 2 & 3****Ref. No. 4**

| <b>Asm -<br/>Ref.No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>  |
|--------------------------|------------------------|-------------|---|
| -1                       | <b>8243220</b>         | 1           | <b>HOLDER..</b> Lead- piston to head compression readings- All 567, 645 and 710 engines (use 8243661 wire only) |
| -2                       | <b>8243661</b>         | 1           | <b>WIRE..</b> Lead 1/8" diameter for head to piston compression readings- 5lb. spool. (use with 8243220 holder) |
| -3                       | <b>8245511</b>         | 1           | <b>WIRE..</b> Lead 3/16" diameter for head to piston compression readings- 5lb. spool- 567 CDF engines          |
| -4                       | <b>8051833</b>         | 1           | <b>ROD..</b> Top dead center checking- 567, 645 and 710 engines   |

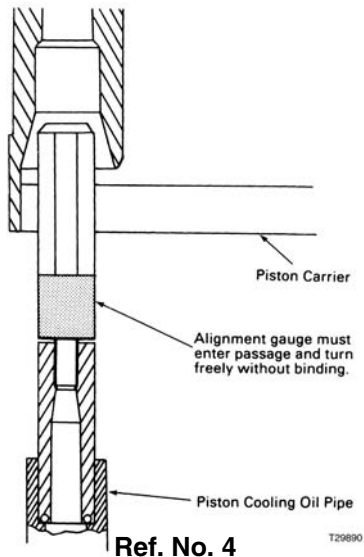
**ENGINE (CARRIER)**



**Ref. No. 1 & 2**



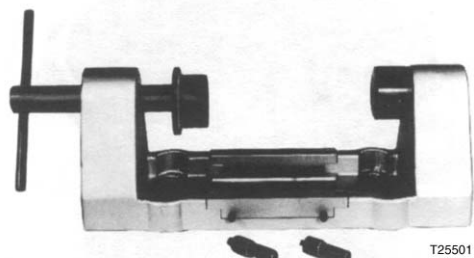
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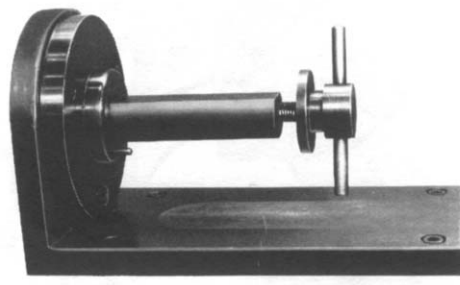
**Ref. No. 4**



**Ref. No. 6**

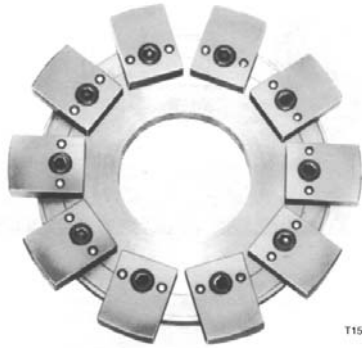


**Ref. No. 7**



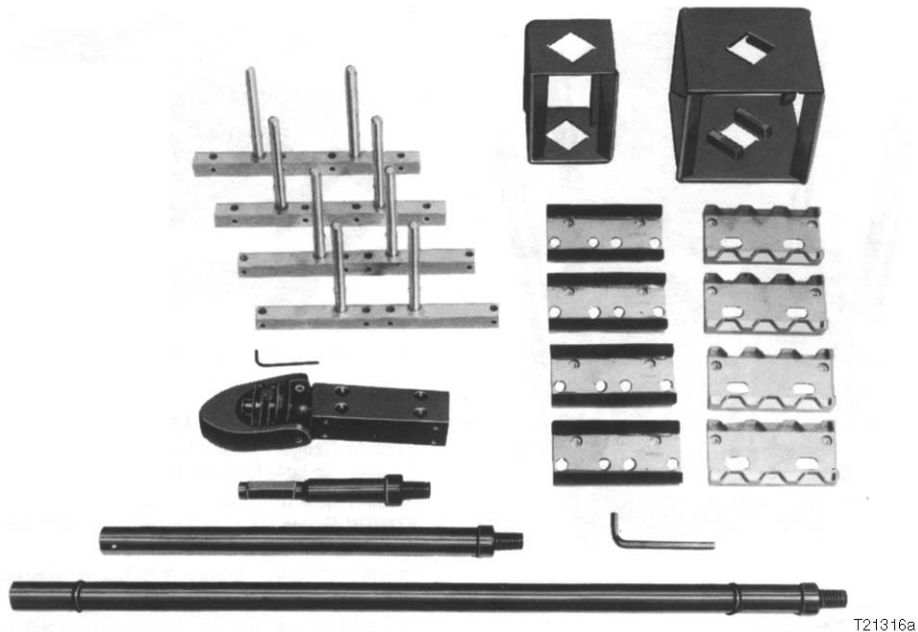
**Ref. No. 8**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8040413     | 1    | <b>BOLT..</b> Eye- piston pulling, 1-1/2" long  |
| -2            | 8071625     | 1    | <b>BOLT..</b> Eye- piston pulling, 18" long   |
| -3            | 8171633     | 1    | <b>REMOVER..</b> Piston carrier retainer snap ring  |
| -4            | 8071720     | 1    | <b>GAUGE..</b> Piston cooling oil pipe- All 567, 645 and 710 engines  |
| -5            | 9566330     | 1    | <b>TAP..</b> Special- 1/4-20-SL- (used for retapping piston pin carrier 8442120 with serial subsequent to 82-J0800 (not shown)) |
| -6            | 8311268     | 1    | <b>INDENTER..</b> Insert to carrier- C, D, and E engines only   |
| -7            | 9534635     | 1    | <b>FIXTURE..</b> Holder for piston carrier- for all engines   |
| -8            | 9542253     | 1    | <b>FIXTURE..</b> Holder for piston carrier- for all engines   |

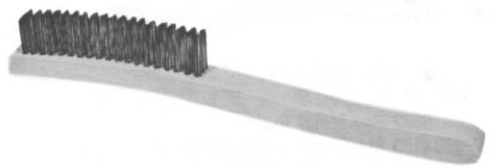
**ENGINE (PISTON)****Ref. No. 1****Ref. No. 8****Ref. No. 9 & 10****Ref. No. 11**

| Asm - Ref.No. | Part Number     | Qty. | Description   |
|---------------|-----------------|------|---|
| -1            |                 |      | <b>GAUGES</b>   |
| -2            | <b>8275503</b>  | 1    | <b>GAUGE..</b> Piston ring groove .194"-.203" (3/16" standard) D, E, F, and G engines                         |
| -3            | <b>8331113</b>  | 1    | <b>GAUGE..</b> Piston ring groove .210"-.219" (1/64" oversized) D, E, F, and G engines                        |
| -4            | <b>8331043</b>  | 1    | <b>GAUGE..</b> Piston ring groove .225"-.234" (1/32" oversized)- top groove- D, E, F, and G engines           |
| -5            | <b>8225256</b>  | 1    | <b>GAUGE..</b> Piston ring groove .251"-.260" A, B, and C engines   |
| -6            | <b>8225257</b>  | 1    | <b>GAUGE..</b> Piston ring groove .282"-.291" (1/32" oversized) A, B, and C engines                           |
| -7            | <b>8275378</b>  | 1    | <b>GAUGE..</b> Piston ring groove .266"-.275" (1/64" oversized with top groove) A, B, and C engines           |
| -8            | <b>8275489</b>  | 1    | <b>WIRE BRUSH..</b> Piston groove carbon removal  |
| -9            | <b>9333846</b>  | 1    | <b>GUIDE..</b> Piston ring compressor- standard- 645 and 710 engine (also available for oversize requirement) |
| -10           | <b>8034087</b>  | 1    | <b>GUIDE..</b> Piston ring compressor- standard diameter 567 engine   |
| -11           | <b>8194036</b>  | 1    | <b>EXPANDER..</b> Piston ring 567 engine  |
| -12           | <b>8349892</b>  | 1    | <b>EXPANDER..</b> Piston ring 645 and 710 engine (not shown)  |
| -13           | <b>40036373</b> | 1    | <b>SPRING RETURN..</b> (not shown)  |

**ENGINE (CYLINDER LINER)**



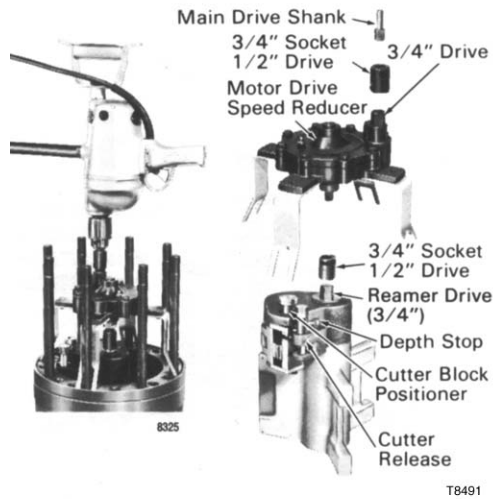
**Ref. No. 1**



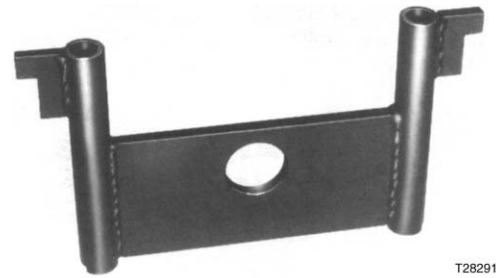
**Ref. No. 10**

| Asm - Ref.No. | Part Number | Qty. | Description                                   |
|---------------|-------------|------|---|
| -1            | 8491575     | 1    | HONE SET.. Complete 567 and 645 engines       |
| -2            | 8431586     | 1    | BODY HONE                                     |
| -3            | 8431588     | 1    | SHANK LONG DRIVE..                            |
| -4            | 8491576     | 1    | STONE AND GUIDE BLOCK SET..                   |
| -5            | 8343116     | 1    | MASTER HOLDER SET.. Double length             |
| -6            | 8058891     | 1    | SUPPORT STONE.. 6" to 9" liners               |
| -7            | 8068123     | 1    | SUPPORT STONE.. 8" to 11.5" liners            |
| -8            | 8084163     | 1    | SET OF REPLACEMENT STONES.. (not shown)       |
| -9            | 8431587     | 1    | MASTER HOLDER SET.. Single length (not shown) |
| -10           | 8078883     | 1    | WIRE BRUSH.. For cleaning honing stones       |

**ENGINE (CYLINDER LINER)**



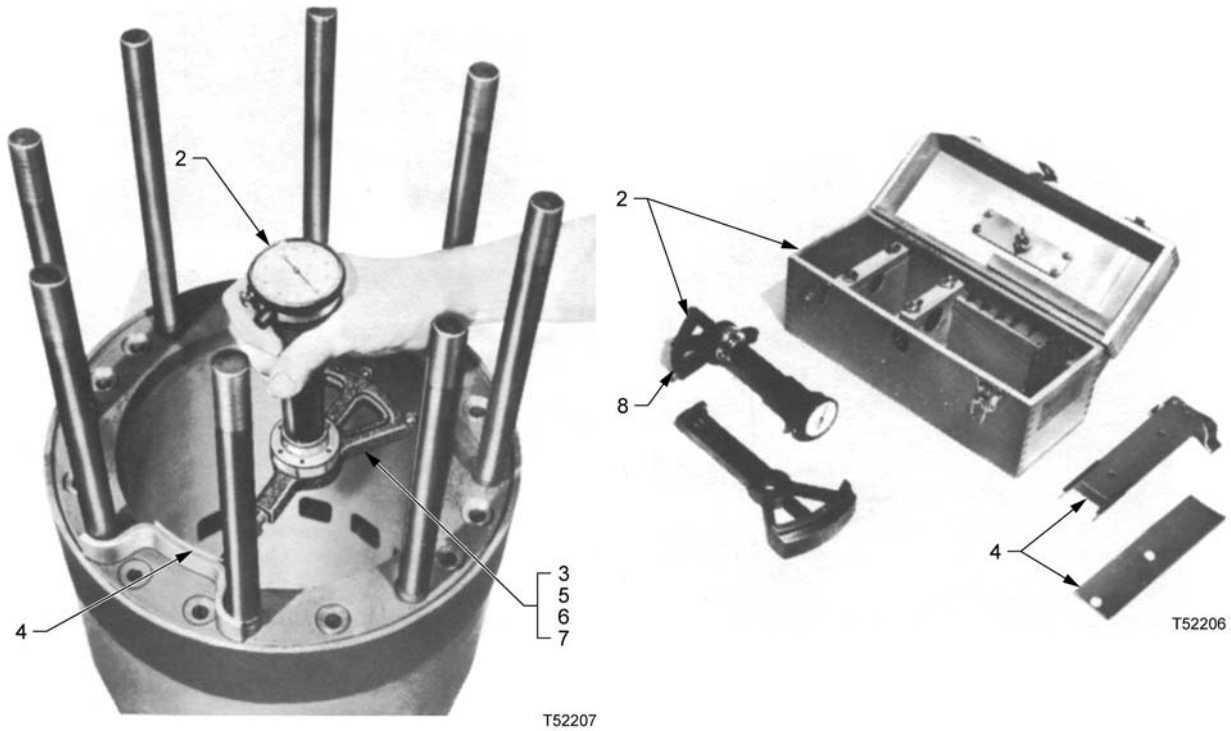
**Ref. No. 1**



**Ref. No. 8**

| Asm - Ref.No. | Part Number    | Qty. | Description  |
|---------------|----------------|------|--|
| -1            |                |      | <b>REAMERS AND BLADES</b>  |
| -2            | <b>8228303</b> | 1    | <b>REAMER..</b> Cylinder liner ridge- standard size- 567 engines                                   |
| -3            | <b>8228305</b> | 1    | <b>BLADE..</b> Cutter replacement  |
| -4            | <b>8374969</b> | 1    | <b>REAMER..</b> Cylinder liner ridge- standard and oversize- 645 and 710 engines                   |
| -5            | <b>8379037</b> | 1    | <b>BLADE..</b> Cutter  |
| -6            | <b>8228304</b> | 1    | <b>REDUCER..</b> Ridge reamer speed<br><br>Do not use above on chrome liners                       |
| -7            | <b>8157327</b> | 1    | <b>BLADE..</b> Cutter for engines prior to 567C ridge reamer (not shown)                           |
| -8            | <b>8116358</b> | 1    | <b>LIFTER..</b> Cylinder liner- All engines  |
| -9            | <b>8425724</b> | 1    | <b>GREASE..</b> Silicone- 5.3 Oz. tube (for application of engine seals and "O" rings) (not shown) |

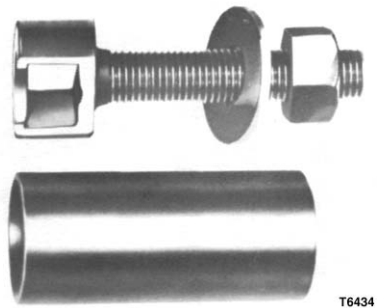
**ENGINE (CYLINDER LINER)**



**Ref. No. 1**

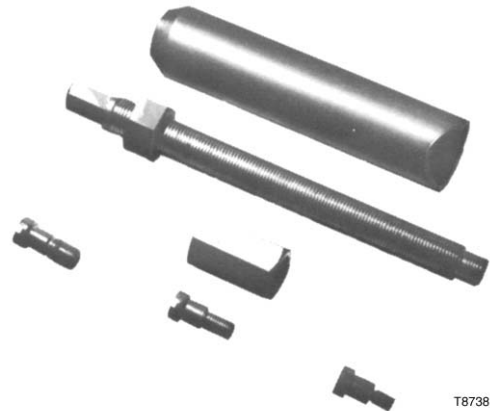
| Asm - Ref.No. | Part Number     | Qty. | Description  |
|---------------|-----------------|------|--|
| -1            |                 |      | <b>GAUGES</b>  |
| -2            | <b>8275258</b>  | 1    | <b>GAUGE..</b> Cylinder liner bore dial  |
| -3            | <b>8278540</b>  | 1    | <b>GAUGE..</b> Master calibration of 8275258 for 567 engines- variable tolerance 8.4996" to 8.5006" diameter |
| -4            | <b>40059860</b> | 1    | <b>LOCATOR..</b> Liner bore dial gauge   |
| -5            | <b>8374970</b>  | 1    | <b>GAUGE..</b> Master calibration of 8275258 for 645 engine- tolerance of 9/16" diameter                     |
| -6            | <b>9321276</b>  | 1    | <b>GAUGE..</b> Master 8.2500" for checking main bearing steel bore (used with 8275258)                       |
| -7            | <b>40038647</b> | 1    | <b>GAUGE..</b> Master, main bearing steel bore for 710 engine (similar to 9321276)                           |
| -8            | <b>40057412</b> | 1    | <b>TIP CONTACT</b>   |

**ENGINE (ACCESSORIES)**



T6434

**Ref. No. 1**



T8738

**Ref. No. 2**



T28292

**Ref. No. 7**

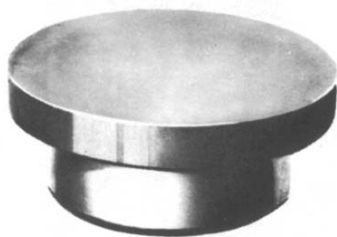


T6444

**Ref. No. 9**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8068028     | 1    | PULLER.. Flywheel bolt- for 3 piece flywheel- 567 engines |
| -2            | 8225989     | 1    | PULLER HARMONIC BALANCER.. Complete                       |
| -3            | 8225992     | 1    | SCREW.. Shoulder 3/8" - 24                                |
| -4            | 8225991     | 1    | SCREW.. Shoulder 5/16" - 24                               |
| -5            | 8225990     | 1    | SCREW.. Shoulder 1/4" - 28                                |
| -6            | 8220496     | 1    | PULLER.. Harmonic balancer (3 Required) (not shown)       |
| -7            | 8164914     | 1    | GUIDE.. Lower liner seal ring- A and B engines            |
| -8            | 8176923     | 1    | GUIDE.. Upper liner seal ring- A and B engines            |
| -9            | 8080197     | 1    | GAUGE.. Harmonic balancer spring pack deflection          |

**ENGINE (ACCESSORIES)**



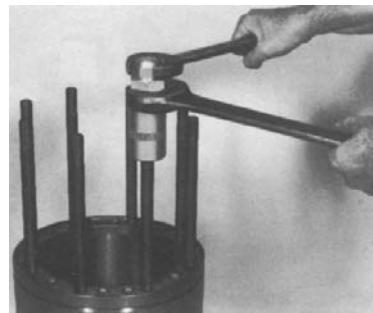
T6445

**Ref. No. 1**



T35164

**Ref. No. 2**



T15543

**Ref. No. 3**



T52643

**Ref. No. 4**

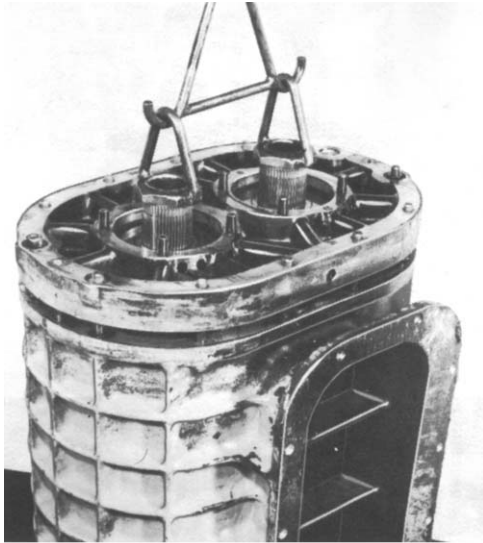


T52648

**Ref. No. 5**

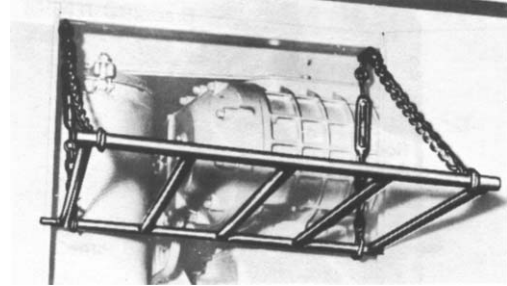
| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8067644     | 1    | ANVIL.. Pressing bushings in blower drive gears- 12 cylinder 567 engine |
| -2            | 8488380     | 1    | REMOVER TOOL.. Stud or dowel puller with 9/16" collet                   |
| -3            | 8414879     | 1    | PULLER AND DRIVER.. Liner studs   |
| -4            | 40109141    | 1    | JACK ASSEMBLY.. Engine turning for JT42CWR model, class 66 locomotives  |
| -5            | 8320802     | 1    | JACK ASSEMBLY.. Engine turning for 567D and 645 engines.                |

**ENGINE (AIR INTAKE AND EXHAUST)**



T9527

**Ref. No. 1**



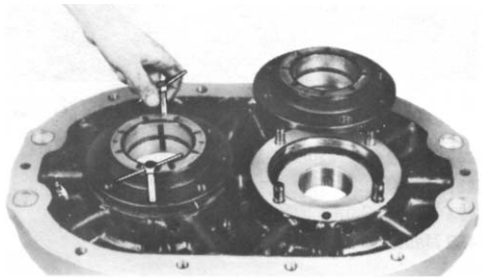
T6510

**Ref. No. 3**



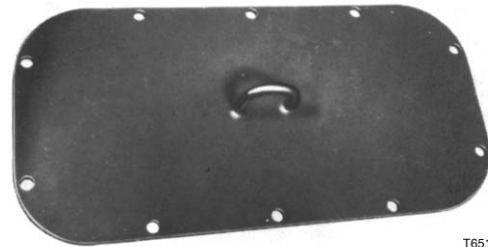
T6447

**Ref. No. 4 & 5**



T6514

**Ref. No. 2**

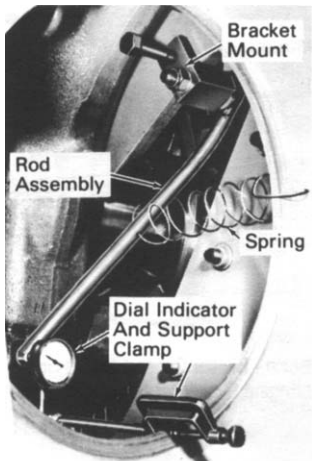


T6511

**Ref. No. 6**

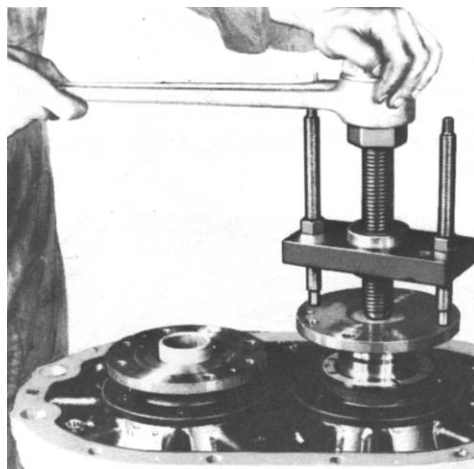
| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8052915     | 1    | <b>FIXTURE..</b> Blower rotor removal and installation  |
| -2            | 8070932     | 1    | <b>REMOVER..</b> Blower end plate bearing (2 required)  |
| -3            | 8062873     | 1    | <b>PLATFORM..</b> Blower support- assists in removal and installation of engine blower for switcher locomotives |
| -4            | 8067645     | 1    | <b>ANVIL..</b> Pressing bushings into governor drive gears  |
| -5            | 8067646     | 1    | <b>ANVIL..</b> Pressing bushings into idler gears - 567 engines   |
| -6            | 8072929     | 1    | <b>PLATE..</b> Blower lifting   |

**ENGINE (AIR INTAKE AND EXHAUST)**



T17843

**Ref. No. 1**



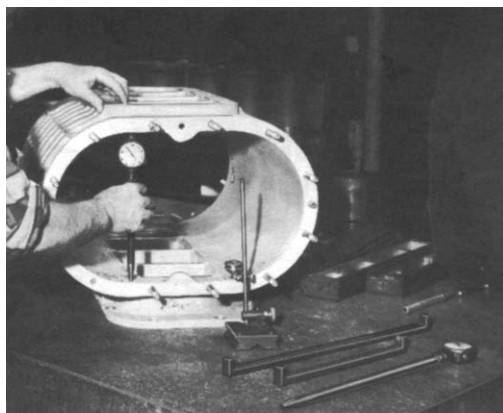
T6513

**Ref. No. 4**



T28293

**Ref. No. 7**



T9484

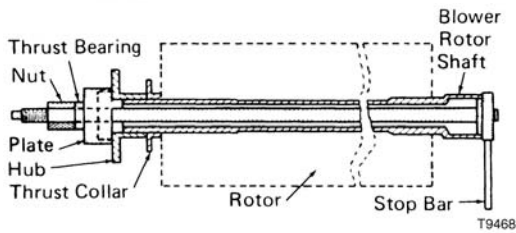
**Ref. No. 8**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            |             |      | <b>IDLER GEAR CHECKING</b>   |
| -2            | 8466308     | 1    | <b>BAR..</b> No. 1 idler gear clearance checking                     |
| -3            | 8121868     | 1    | <b>SPRING..</b> No. 1 idler gear checking- not included with 8466308 |
| -4            |             |      | <b>MANUAL- BLOWER GEAR HUB</b>                                       |
| -5            | 8049057     | 1    | <b>PULLER..</b> Manual- blower gear hub- removal only                |
| -6            | 8052916     | 1    | <b>PRESS..</b> Manual- blower gear hub- installation only            |
| -7            | 8268828     | 1    | <b>SOCKET..</b> Blower hub nut                                       |
| -8            |             |      | <b>GAUGES</b>  |
| -9            | 8268436     | 1    | <b>DIAL GAUGE..</b> Blower housing, horizontal                       |
| -10           | 8268437     | 1    | <b>DIAL GAUGE..</b> Blower housing, vertical                         |
| -11           | 8268438     | 1    | <b>MASTER GAUGE..</b> For 8268436                                    |
| -12           | 8268439     | 1    | <b>MASTER GAUGE..</b> For 8268437                                    |

**ENGINE (AIR INTAKE AND EXHAUST)**

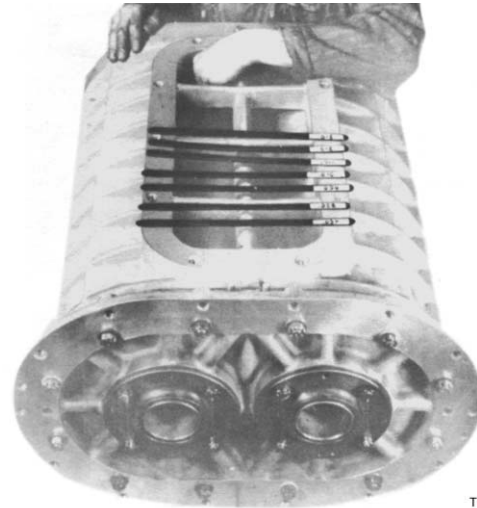


T6509



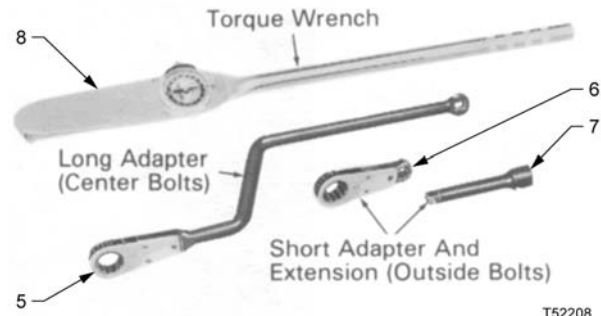
T9468

**Ref. No. 1**



T6521

**Ref. No. 2**

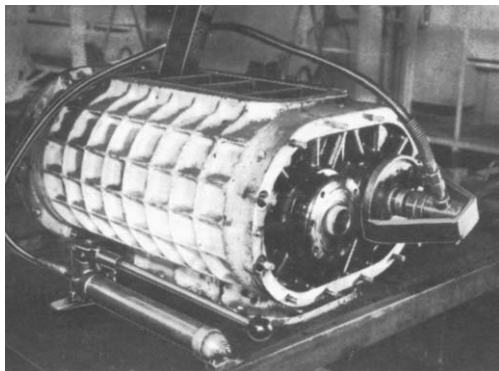


T52208

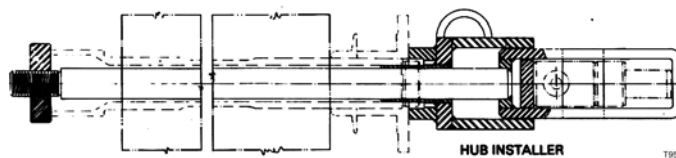
**Ref. No. 4**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8052916     | 1    | <b>PRESS..</b> Manual- blower gear hub- installation only                           |
| -2            | 8049132     | 1    | <b>GAUGE..</b> Feeler- .008" to .020" x 12" long                                    |
| -3            | 8049131     | 1    | <b>GAUGE..</b> Feeler- .010" to .020" x 36" long (not shown)                        |
| -4            | 8463511     | 1    | <b>TORQUE WRENCH KIT..</b> Exhaust manifold- 567, 645, and 710 turbocharged engines |
| -5            | 8463512     | 1    | <b>WRENCH</b>   |
| -6            | 8463513     | 1    | <b>ADAPTER</b>  |
| -7            | 8463514     | 1    | <b>EXTENSION..</b> - 5"   |
| -8            | 8463515     | 1    | <b>TORQOMETER..</b> - 0-200 ft. lbs. - 1/2" drive                                   |
| -9            | 8477369     | 1    | <b>BOX..</b> Used for 8463511 (not shown)   |

**ENGINE (AIR INTAKE AND EXHAUST)**

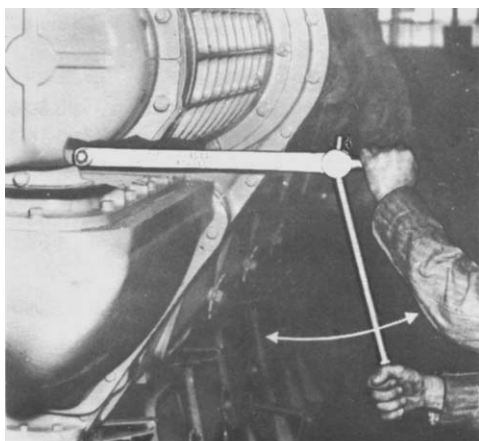


T9536



T9540

**Ref. No. 1**



T6536

**Ref. No. 3**



T6518

**Ref. No. 2**



T28294

**Ref. No. 4**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8264362     | 1    | <b>REMOVER/INSTALLER..</b> Hydraulic- blower timing gear hub   |
| -2            | 8070926     | 1    | <b>WRENCH..</b> Blower shaft locknut   |
| -3            | 8177166     | 1    | <b>WRENCH SET..</b> Blower nut- miscellaneous  |
| -4            | 9525495     | 1    | <b>DRIVER..</b> Used in freeing dowels from turbocharger carrier bearing support during rotation conversion on marine engines- (refer to M.I. 276) |

**ENGINE (COOLING AND LUBRICATION)**

T19602

**Ref. No. 1**

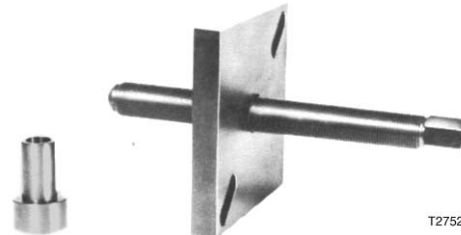
T19576

**Ref. No. 2**

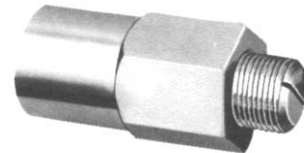
T24512

**Ref. No. 3**

T13962

**Ref. No. 5**

T27526

**Ref. No. 6**

T21331

**Ref. No. 10**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | <b>8212484</b>     | 1           | <b>BOX SOCKET WRENCH..</b> Water pump mounting nuts- half moon 5/8" x 3/4"   |
| -2                   | <b>8277270</b>     | 1           | <b>WRENCH..</b> Spanner- lube oil filter relief valve- Michiana  |
| -3                   | <b>9519601</b>     | 1           | <b>WRENCH..</b> Water pump mounting bolt- Offset water pump wrench fits all water pump mounting bolts. Pump changeout time can be cut nearly in half. The wrench fits around the housing, making the inner two mounting bolts easily accessible. Also, torquing of all mounting bolts is now possible. |
| -4                   | <b>8277271</b>     | 1           | <b>WRENCH..</b> Socket, screwdriver, lube oil filter relief valve- Michiana (not shown)  |
| -5                   | <b>8354367</b>     | 1           | <b>PULLER..</b> Water pump impeller  |
| -6                   | <b>9549072</b>     | 1           | <b>DISASSEMBLY TOOL..</b> - Water pump   |
| -7                   |                    | 1           | <b>PLATE</b>   |
| -8                   |                    | 1           | <b>SCREW..</b> Special   |
| -9                   |                    | 1           | <b>ADAPTER</b>   |
| -10                  | <b>8052959</b>     | 1           | <b>INSTALLER..</b> Water pump impeller- used to assemble the impeller to the drive shaft housing- All 567, 645, and 710 engines  |

**ENGINE (COOLING AND LUBRICATION)**



**Ref. No. 1 & 2**



**Ref. No. 9 & 10**

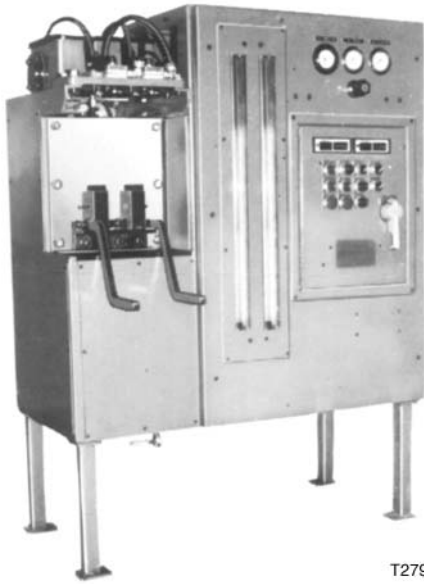


**Ref. No. 3**



**Ref. No. 11**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 9312771     | 1    | STEEL PLATE.. - 3/4"  |
| -2            | 9312770     | 1    | ADAPTER.. For removing water pump impeller housing- used with 8263531- jack hydraulic   |
| -3            |             |      | <b>LUBE OIL FILTER TANK PRESSURE TEST</b>   |
| -4            | 8032123     | 1    | GAUGE.. 0-100 psi   |
| -5            | 8471010     | 1    | HOSE ASSEMBLY   |
| -6            | 9321341     | 1    | SOCKET.. Female quick disconnect  |
| -7            | 8040325     | 1    | CONNECTOR   |
| -8            | 116436      | 1    | CONNECTOR.. Connected to the male quick disconnect provided on later model locomotives- (9321340- male quick disconnect- can be added to tanks not so equipped). Together, these items provide a convenient means for monitoring filter pressure drop to determine filter change out. |
| -9            | 9321340     | 1    | MALE QUICK DISCONNECT.. 1/4 FPT   |
| -10           | 9321341     | 1    | FEMALE QUICK DISCONNECT.. 1/4 FPT   |
| -11           | 40121024    | 1    | WATER PUMP BACKLASH TOOL  |

**ENGINE (FUEL)****Ref. No. 1****Ref. No. 7**

| Asm - Ref.No. | Part Number     | Qty. | Description   |
|---------------|-----------------|------|---|
| -1            |                 |      | <b>INJECTOR CALIBRATION TEST STANDS..</b> The EMD calibration stand can be used to determine injector fuel output so that each injector can be adjusted for rated fuel delivery. This will ensure a balanced set of injectors for smooth and economical engine performance. |
| -2            | <b>9545110</b>  | 1    | <b>TEST STAND..</b> 220 volts, 3 phase, 60 Hz   |
| -3            | <b>9547232</b>  | 1    | <b>TEST STAND..</b> 230/ 240 volts, 1 phase, 50 Hz  |
| -4            | <b>9547515</b>  | 1    | <b>TEST STAND..</b> 380 volts, 1 phase, 50 Hz   |
| -5            | <b>9547516</b>  | 1    | <b>TEST STAND..</b> 440 volts, 3 phase, 60 Hz   |
| -6            | <b>9547517</b>  | 1    | <b>TEST STAND..</b> 440 volts, 3 phase, 50 Hz   |
| -7            | <b>40021839</b> | 1    | <b>LEVER..</b> Injector pop test- 567, 645, and 710 engines   |

**ENGINE (FUEL)**



**Ref. No. 1**



**Ref. No. 5**



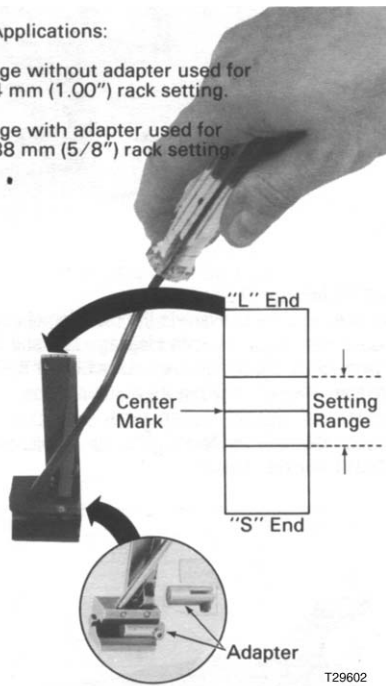
**Ref. No. 7**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 9549055     | 1    | <b>INJECTOR TESTER..</b> The tester is used to evaluate the condition of new, rebuilt, or used injectors by checking leakage rate and fuel spray patterns at the injector tip. |
| -2            | 40018091    | 1    | <b>HOLDER..</b> For 710 engine   |
| -3            | 9574910     | 1    | <b>BUCKET..</b> Plastic  |
| -4            | 40055201    | 1    | <b>TIP..</b> Fuel line   |
| -5            | 8017824     | 1    | <b>WRENCH..</b> Fuel pump cap nut- passenger SW, G8, G12, G16 and others that have 8498154 fuel pump   |
| -6            | 8201448     | 1    | <b>WISE..</b> Injector - for holding injector during assembly and disassembly (not shown)  |
| -7            | 8107539     | 1    | <b>WRENCH..</b> Screwdriver- 1/8" hex.- used to back out the set screw (4 turns only) to release the stop pin on the injector follower- All engines.                           |

**ENGINE (FUEL)**

Gauge Applications:

1. Gauge without adapter used for 25.4 mm (1.00") rack setting.
2. Gauge with adapter used for 15.88 mm (5/8") rack setting.



**Ref. No. 1**



**Ref. No. 7**



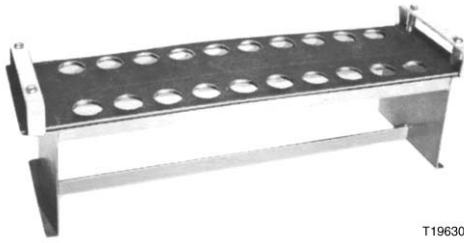
**Ref. No. 8**



**Ref. No. 9**

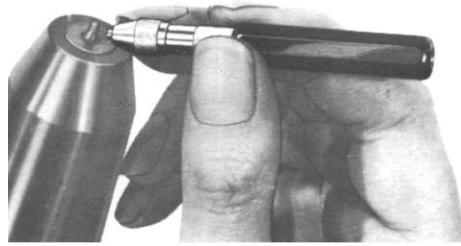
| Asm - Ref.No. | Part Number    | Qty. | Description   |
|---------------|----------------|------|---|
| -1            |                |      | <b>GAUGE AND ADAPTERS..</b>   |
| -2            | <b>8339610</b> | 1    | <b>GAUGE..</b> Rack setting indicating standard 1" setting  |
| -3            | <b>8357591</b> | 1    | <b>ADAPTER..</b> .625", 5/8" setting  |
| -4            | <b>8244900</b> | 1    | <b>BLOCK..</b> Gauge  |
| -5            | <b>8380701</b> | 1    | <b>ADAPTER..</b> For 56/64"   |
| -6            | <b>8380702</b> | 1    | <b>ADAPTER..</b> For 58/64"   |
| -7            | <b>8159147</b> | 1    | <b>WRENCH..</b> Fuel pump packing nut- GP, SD, DD, and GT pin size 3/16"  |
| -8            | <b>8017825</b> | 1    | <b>WRENCH..</b> Fuel pump plug (designed for removal of fuel pumps applied to passenger SW, G8, G12, G16 fuel pump 8498154) |
| -9            | <b>8330339</b> | 1    | <b>OPTOSCOPE..</b> Needle valve seat  |
| -10           | <b>8330338</b> | 1    | <b>BULB..</b> Light (not shown)   |

**ENGINE (FUEL)**



T19630

**Ref. No. 1**



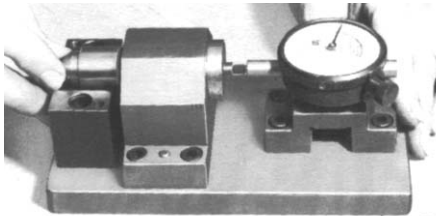
T6467

**Ref. No. 5**



T6468

**Ref. No. 2**



T13173

**Ref. No. 3**



T6462

**Ref. No. 7**



T21313

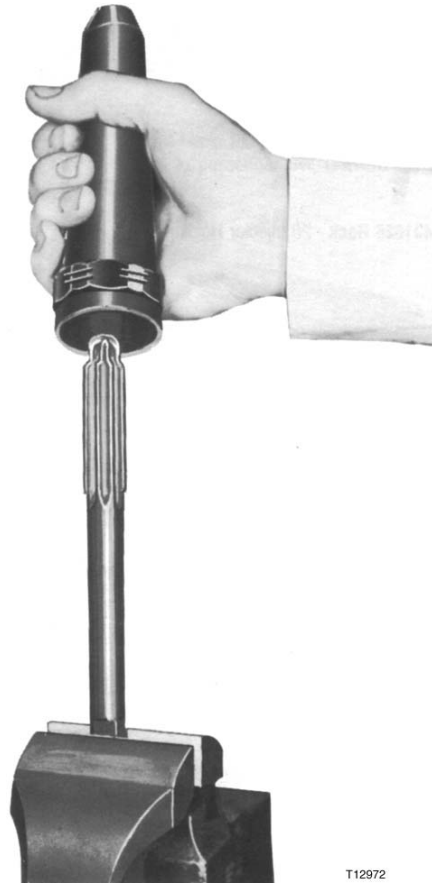
**Ref. No. 4**



T7565

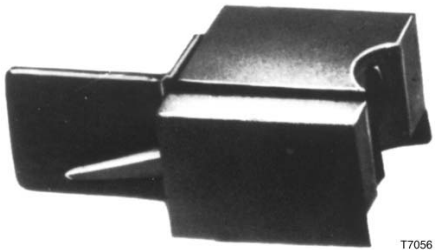
**Ref. No. 8**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8431626     | 1    | RACK.. 20 Injector holding                                       |
| -2            | 8034638     | 1    | GAUGE.. Injector timing- 567, 645, and 710 engines               |
| -3            | 8360447     | 1    | GAUGE AND MASTER.. Needle valve lifter indicator                 |
| -4            | 9083713     | 1    | WRENCH.. Spin-On fuel filter                                     |
| -5            | 8069989     | 1    | VISE.. Pin- 0.0"- .040"  |
| -6            | 8122519     | 1    | WIRE.. Hardened steel .011" diameter x 500 ft. long- (not shown) |
| -7            | 8041183     | 1    | BAR.. Pry- injector removing                                     |
| -8            | 8214852     | 1    | COUNTERSINK.. Fuel oil manifold block                            |

**ENGINE (FUEL)****Ref. No. 1****Ref. No. 6**

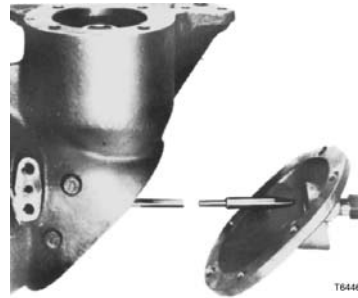
| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|----------------------|--------------------|-------------|---|
| -1                   | <b>8243516</b>     | 1           | <b>OIL CAN..</b> Forced feed- 7" long spout- positioned at 50° angle  |
| -2                   | <b>9579235</b>     | 1           | <b>ARBOR..</b> For removal of rocker arm follower bushing in 9571597 rocker arm roller assembly. All 710 engines.(not shown)        |
| -3                   | <b>9579236</b>     | 1           | <b>SLEEVE..</b> (not shown)   |
| -4                   | <b>9579237</b>     | 1           | <b>ARBOR..</b> For installation / removal of "Y" groove rocker arm bushing- All engines, including older style bushings (not shown) |
| -5                   | <b>9579238</b>     | 1           | <b>SLEEVE..</b> (not shown)   |
| -6                   | <b>8291642</b>     | 1           | <b>REAMER..</b> Injector nut- needle valve injectors  |
| -7                   | <b>9555276</b>     | 1           | <b>SOCKET..</b> 710 injector nut (not shown)  |
| -8                   | <b>9555886</b>     | 1           | <b>WRENCH..</b> Injector wrench assembly for loosening nut on 710 engines (not shown)   |

**ENGINE (GOVERNOR)**



**Ref. No. 1**

T7056



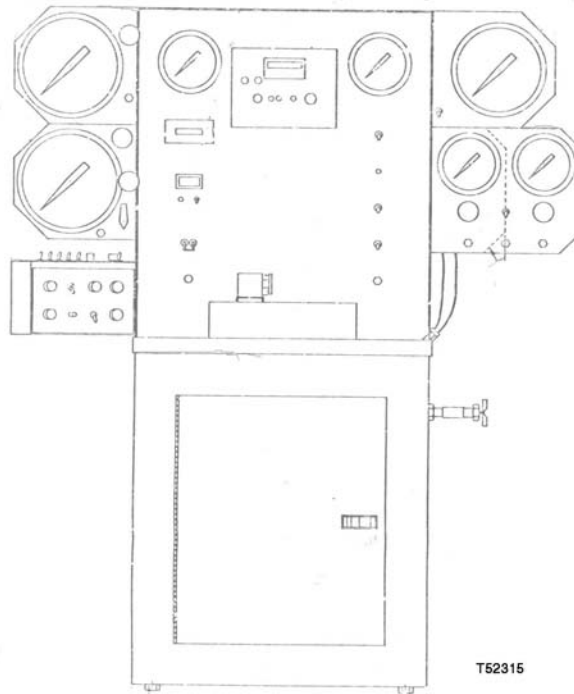
**Ref. No. 4**

T6446



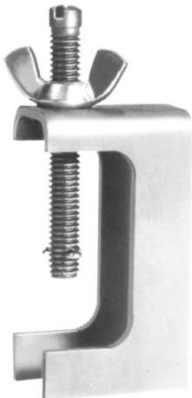
**Ref. No. 2**

T8332



**Ref. No. 5**

T52315



**Ref. No. 3**

T28296

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8062916     | 1    | <b>GAUGE..</b> Pilot valve- early style SI governors- 567 A and B engines with load regulator pilot valve not incorporated in governor |
| -2            | 8227463     | 1    | <b>CONTROLLER..</b> Engine speed 64 volt- SI or PG governors   |
| -3            | 8330230     | 1    | <b>TAIL ROD JACK..</b> - SI, PG governors  |
| -4            | 8062027     | 1    | <b>TOOL..</b> Tachometer drive oil seal installing- 567 engines and SI governor  |
| -5            | 40053037    | 1    | <b>STAND..</b> Governor test   |

**ENGINE (GOVERNOR)**



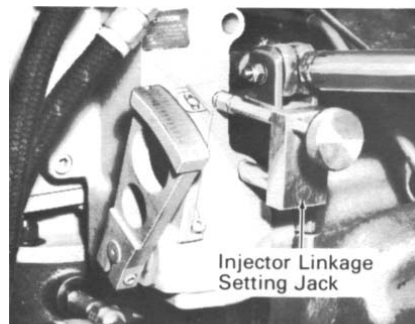
**Ref. No. 1**



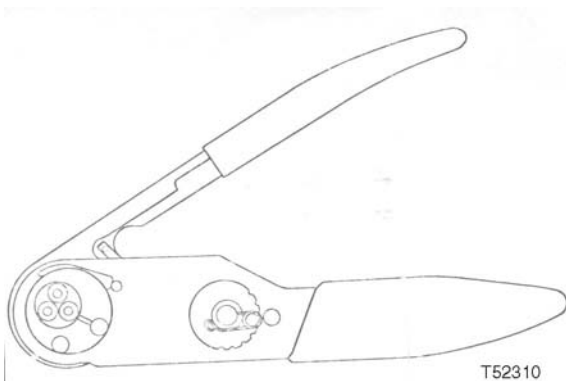
**Ref. No. 8**



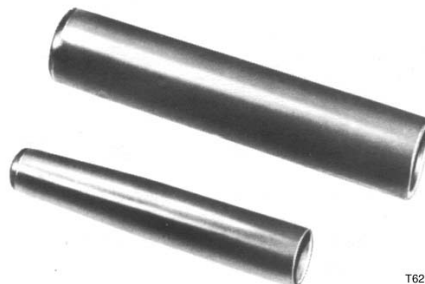
**Ref. No. 6**



**Ref. No. 9**



**Ref. No. 7**



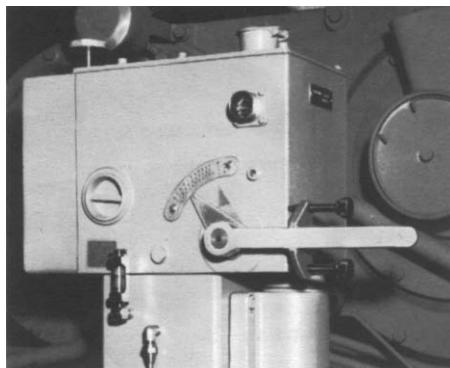
**Ref. No. 10**

| Asm - Ref.No. | Part Number     | Qty. | Description  |
|---------------|-----------------|------|--|
| -1            |                 |      | <b>ADAPTERS</b>  |
| -2            | <b>8210256</b>  | 1    | <b>ADAPTER..</b> Controller to governor (8 PT to 12 PT)- C engine governors                                    |
| -3            | <b>8210938</b>  | 1    | <b>ADAPTER..</b> Controller to governor (12 PT to 8 PT)- replacing 567B with 567C engine                       |
| -4            | <b>8469430</b>  | 1    | <b>ADAPTER..</b> Controller to governor (16 PT to 12 PT)   |
| -5            | <b>8469431</b>  | 1    | <b>ADAPTER..</b> Controller to governor (12 PT to 16 PT)   |
| -6            | <b>40003920</b> | 1    | <b>EXTRACTION TOOL..</b> Extraction/ Insertion tool- contact assembly tool- used on GP, SD60, 16-710G3 engines |
| -7            | <b>40003921</b> | 1    | <b>CRIMP TOOL..</b> Used on GP, SD60, 16-710G3 engines   |
| -8            | <b>8243093</b>  | 1    | <b>INSERTER..</b> Oil seal- UG8 governor industrial  |
| -9            | <b>8432485</b>  | 1    | <b>JACK..</b> Governor injector link setting- PG rail and marine governors                                     |
| -10           | <b>8061015</b>  | 1    | <b>INSTALLER..</b> Governor drive shaft snap ring- SI governors  |

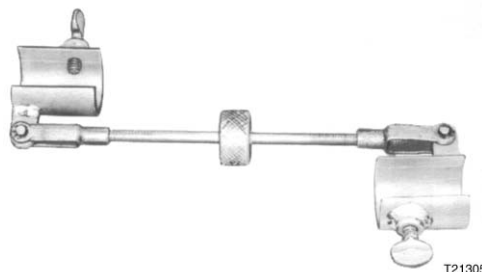
## ENGINE (GOVERNOR)



**Ref. No. 1**



**Ref. No. 2**



**Ref. No. 3**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8084868     | 1    | <b>GUIDE..</b> Governor drive shaft oil seal- SI governors  |
| -2            | 8295586     | 1    | <b>JACK..</b> Governor injector control linkage setting- industrial engines with LSG, EGB governors and MP36, MP45 units with (PG PH) governors |
| -3            | 8259734     | 1    | <b>JACK..</b> Injector linkage setting- UG8 and Marquette governors   |
| -4            | 8239526     | 1    | <b>COMPRESSOR..</b> Injector linkage actuator spring- dual fuel (not shown)   |
| -5            | 8208889     | 1    | <b>REMOVER / INSTALLATION TOOL..</b> Drive Shaft Seal- PG governors (not shown)   |

**ENGINE (GOVERNOR)**

T19602

**Ref. No. 1**

T21343

**Ref. No. 2**

T28299

**Ref. No. 7**

T19725

**Ref. No. 3**

T35154

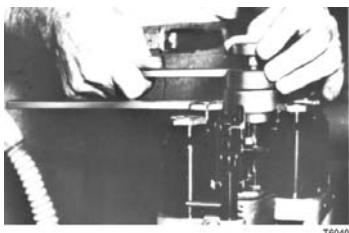
**Ref. No. 6**

T21348

**Ref. No. 8**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|----------------------|--------------------|-------------|---|
| -1                   | 8212484            | 1           | <b>BOX SOCKET WRENCH..</b> Half moon 5/8" x 3/4"- useful in removing two rear nuts retaining governor   |
| -2                   | 8113925            | 1           | <b>JACK NUT..</b> Speeder- used when making adjustments to the governor pilot valve SI and PG electro-hydraulic governors   |
| -3                   | 8208398            | 1           | <b>WRENCH..</b> Shutdown nut adjust- SI and PG governors  |
| -4                   | 8237117            | 1           | <b>PLIERS..</b> No. 1 internal retaining ring- PG governors (not shown)   |
| -5                   | 8237118            | 1           | <b>PLIERS..</b> No. 3 internal snap ring- PG governors (not shown)  |
| -6                   | 40034176           | 1           | <b>GOVERNOR HOUSING WRENCH..</b> 3/4"- Opening for use on housing bolts   |
| -7                   | 9546319            | 1           | <b>WRENCH..</b> Skinner shutdown solenoid valve body- F40PH locomotives only. This tool is required when removing and/or replacing the valve plunger and plunger spring |
| -8                   | 8228031            | 1           | <b>PLIERS..</b> External snap ring, drive shaft snap ring- PG governors   |

**ENGINE (GOVERNOR)**



**Ref. No. 1 & 2**



**Ref. No. 6**



**Ref. No. 3**



**Ref. No. 7**



**Ref. No. 5**



**Ref. No. 8**

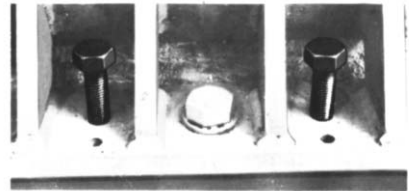
| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8343447     | 1    | WRENCH.. Engine speed adjusting- 1" nut socket                              |
| -2            | 8174868     | 1    | WRENCH.. Engine speed adjusting- 1 - 1/16" nut socket SI or PG governor     |
| -3            | 8208890     | 1    | BALL ARM.. Centering tool- PG and SI governors                              |
| -4            | 8209807     | 1    | BALL ARM.. Bearing removing and installation tool- PG governors (not shown) |
| -5            | 8225660     | 1    | REMOVER.. Rotary shaft oil seal- rotary shaft governors                     |
| -6            | 8225659     | 1    | ROD.. Rotary shaft oil seal driving- rotary shaft governors                 |
| -7            | 8225658     | 1    | INSTALLER.. Remover- rotary shaft bearing- rotary shaft governors           |
| -8            | 8055831     | 1    | REMOVER.. Drive shaft snap ring- SI governors                               |

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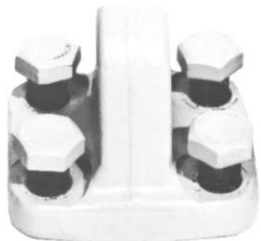
## **SECTION 2. ELECTRICAL**

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**ELECTRICAL**

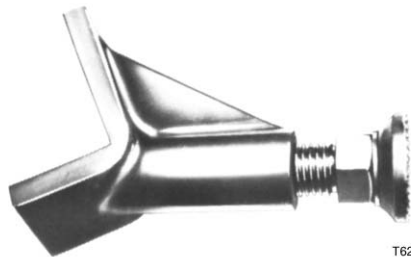


**Ref. No. 7**



T17192

**Ref. No. 1**



T6261

**Ref. No. 8**



T6299A

**Ref. No. 4**

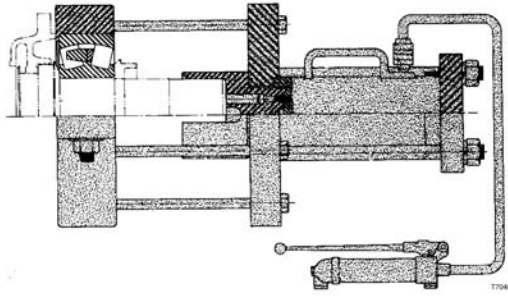


T19619

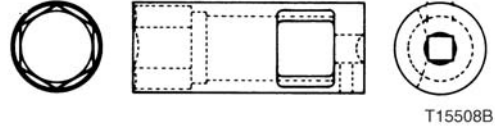
**Ref. No. 9**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8097939     | 1    | <b>SHACKLE BASE..</b> Generator- use with 8249739, shackle lifting shown in engine tool section (for D12,15,22, 25, and 32 generators) |
| -2             | 272563      | 4    | <b>BOLT</b>  |
| -3             | 8072352     | 1    | <b>SHACKLE..</b> All "AR" machines   |
| -4             | 8060275     | 1    | <b>GUIDE..</b> Armature bearing alignment- D4, 8, 15, and 25 generators and all "AR" machines  |
| -5             | 8215173     | 1    | <b>BOLT..</b> Jacking- coupling disc removal- D4 and 8 generators (not shown)  |
| -6             | 8227001     | 1    | <b>GAUGE..</b> Depth- generators with D14 and 16 alternators (not shown)   |
| -7             | 8164036     | 1    | <b>BOLT..</b> Generator alignment- All generators  |
| -8             | 8052977     | 1    | <b>JACK..</b> Generator align- D4, 8, 15, 25, and 32 generators  |
| -9             | 8159227     | 1    | <b>GUIDE..</b> Armature bearing alignment- D12, 22, and 32 generators  |

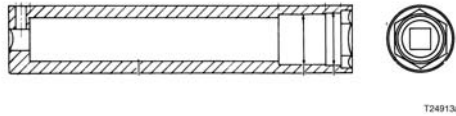
**ELECTRICAL**



**Ref. No. 1**



**Ref. No. 7**



**Ref. No. 6**



**Ref. No. 8**



**Ref. No. 9**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             |             |      | <b>HYDRAULIC BEARING PULLERS</b>   |
| -2             | 8213623     | 1    | <b>PULLER..</b> Hydraulic- D15 and 25 main generators bearing kit- export                        |
| -3             | 8217712     | 1    | <b>PULLER..</b> Hydraulic- D12, 22, and 32 main generators bearing kit- export                   |
| -4             | 8173948     | 1    | <b>PULLER KIT..</b> Hydraulic- main generator bearing kit- D4, 12, 15, 22, 25, and 32 generators |
| -5             | 8302969     |      | <b>PUMP..</b> Hand   |
| -6             | 40001415    | 1    | <b>SOCKET..</b> Diode removing- battery charging rectifiers                                      |
| -7             | 8361524     | 1    | <b>SOCKET..</b> Diode removing- AR6, 7, 10, 11, 12, 15, 16, and 17                               |
| -8             | 8159226     | 1    | <b>STUD..</b> Armature bearing align- D12, 15, 22, 25, and 32 generators                         |
| -9             | 8498344     | 1    | <b>TOOL..</b> Slotted elongated socket for lock wheel magnetic pick-up                           |

**ELECTRICAL**



**Ref. No. 1**



**Ref. No. 8**



**Ref. No. 6**



**Ref. No. 10**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8219264     | 1    | <b>GRINDER..</b> Alternator slip ring- All models of "A" and "AR" alternators  |
| -2             | 8208360     | 1    | <b>CASE..</b> Carrying   |
| -3             | 271548      | 1    | <b>MOUNTING SCREW</b>  |
| -4             |             | 1    | <b>SPRING..</b> Washer   |
| -5             |             | 1    | <b>GRINDER ASSEMBLY</b>  |
| -6             | 8364940     | 1    | <b>ADAPTER..</b> Alternator slip rings- AR5, 5A, and 10- alternators with small bearings only (use with 8219264 grinder)   |
| -7             | 9506268     | 1    | <b>ADAPTER..</b> Alternator slip rings- AR5B, 6, 7, 8, 10, 11, 12, 15, 16 and 17- alternators with large bearings only (use with 8219264- similar to ref. no. 6) |
| -8             | 8217141     | 1    | <b>FILE ASSEMBLY..</b> All commutator slots  |
| -9             | 8217142     | 1    | <b>FILE..</b> Replacement  |
| -10            | 8238905     | 1    | <b>FILE ASSEMBLY..</b> Commutator slot- D15 and 25 generators in frame and all traction motor commutators out of frame   |
| -11            | 8217142     | 1    | <b>FILE..</b> Replacement  |

**ELECTRICAL**



T28301

**Ref. No. 1**



T21304

**Ref. No. 3**



T10615

**Ref. No. 2**

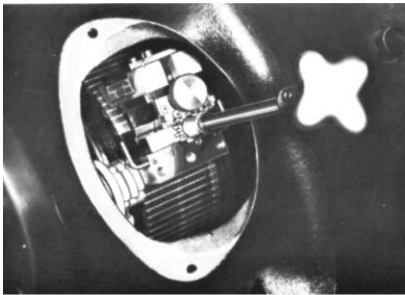


T21304

**Ref. No. 4**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8354239     | 1    | ADAPTER.. Commutator grinder- brush holder mount- All D43, D77/87 type traction motors   |
| -2             | 8354226     | 1    | ADAPTER.. Supporting- commutator grinder- All D77/87 traction motors- bottom opening while traction motors are still mounted on locomotive |
| -3             | 8359253     | 1    | ADAPTER.. Commutator grinder- D8 generator   |
| -4             | 8195928     | 1    | ADAPTER.. Commutator grinder- D12, 15, 22, 25 and 32   |
| -5             | 8210141     | 1    | BAR.. Alignment for adapters 8354239 and 8354226 domestic traction motors (not shown)  |

**ELECTRICAL**

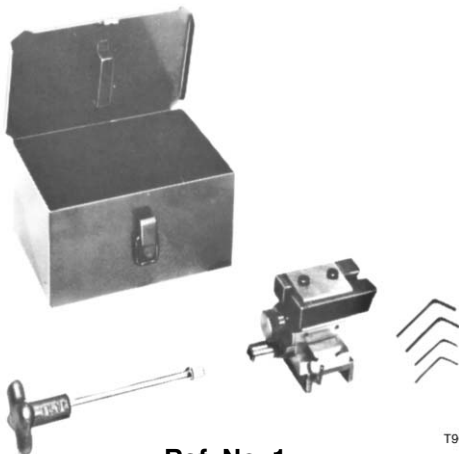


T9208



T21354

**Ref. No. 9**



**Ref. No. 1**

T9068



T21353

**Ref. No. 10**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8260844     | 1    | <b>GRINDER ASSEMBLY..</b> Auxiliary generator commutator- 10 and 18 kW generators  |
| -2             | 779429      | 1    | <b>WRENCH..</b> Allen- 5/64" hex.  |
| -3             | 779431      | 1    | <b>WRENCH..</b> Allen- 1/8" hex.   |
| -4             | 779432      | 1    | <b>WRENCH..</b> Allen 5/32" hex.   |
| -5             | 779433      | 1    | <b>WRENCH..</b> Allen 3/16" hex.   |
| -6             | 8279712     | 1    | <b>KIT..</b> Grinder- alternator slip ring- CA5, 6, 7, D14, 16, 18, HE3, 4 and 5 generators- (not shown)- use with grinder 8260844 |
| -7             | 8280596     | 1    | <b>DRIVER..</b> Flexible 1/4" square drive   |
| -8             | 8204047     | 1    | <b>EXTENSION..</b> Flexible 1/4" square drive  |
| -9             | 8085256     | 1    | <b>SAW..</b> 7/8" x .032" x 5/16"- Used to undercut traction motor commutator slots  |
| -10            | 8085255     | 1    | <b>SAW..</b> 7/8" x .030" x 5/16" - Used to undercut generator commutator slots  |

**ELECTRICAL**

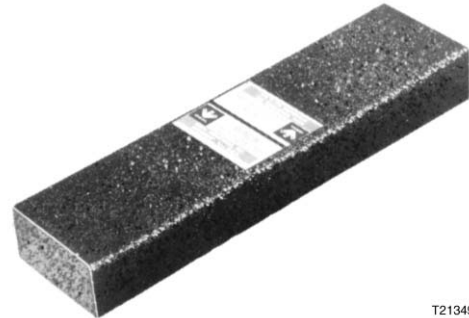
T19596

**Ref. No. 1**

T6529

**Ref. No. 9**

T21327

**Ref. No. 7**

T21349

**Ref. No. 10**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -1                        |                        |             | <b>GRINDING STONES..</b>   |
| -2                        | <b>8204167</b>         | 1           | <b>STONE..</b> Finish grind- 1" x 1-1/2" x 5"- D4, 8, and 15 generators. All traction motors (2 required)- used with grinder 8219264   |
| -3                        | <b>8496921</b>         | 1           | <b>STONE..</b> Medium- 1" x 1-1/2" x 5"- used with grinder 8219264   |
| -4                        | <b>8260375</b>         | 1           | <b>STONE..</b> Coarse grinding- 1" x 1-1/2" x 5" alt. slip ring- A11, A20, etc.- used with grinder 8219264   |
| -5                        | <b>8209151</b>         | 1           | <b>STONE..</b> Coarse- 1/2" x 1/2" x 3"  |
| -6                        | <b>40109410</b>        | 1           | <b>STONE..</b> Medium- 1/2" x 1/2" x 3"  |
| -7                        | <b>8260843</b>         | 1           | <b>STONE..</b> Finish grind (2 required)- auxiliary generator and CA5, 6, 7, D14, 16, 18, HE3, 4, and 5 slip rings   |
| -8                        | <b>8201791</b>         | 1           | <b>STONE..</b> Finish grind- 1" x 2" x 5"- D12, 22, and 32 generators (2 required - not shown)   |
| -9                        | <b>8149435</b>         | 1           | <b>ABRASIVE..</b> Flexible cleaning stone- used to clean and polish electrical current carrying surfaces without removing an excess amount of metal during the cleaning process. |
| -10                       | <b>8085259</b>         | 1           | <b>RESURFACING STONE..</b> Commutator- medium finish grade- 2" x 1" 8"- used with auxiliary generator grinder 8260844  |

**ELECTRICAL**



**Ref. No. 1**

T7050



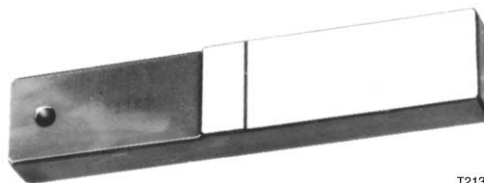
**Ref. No. 5**

T19594



**Ref. No. 2**

T21321



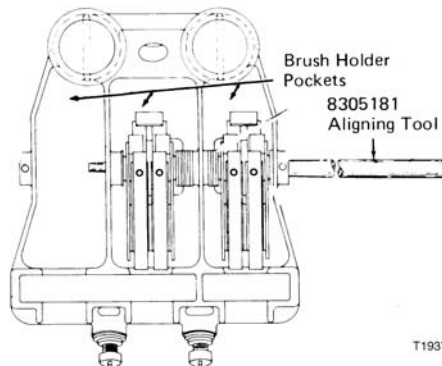
**Ref. No. 7**

T21309



**Ref. No. 4**

T21314

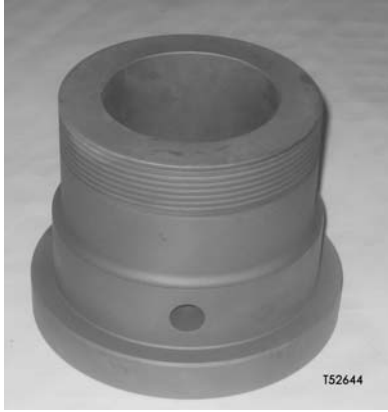


**Ref. No. 8**

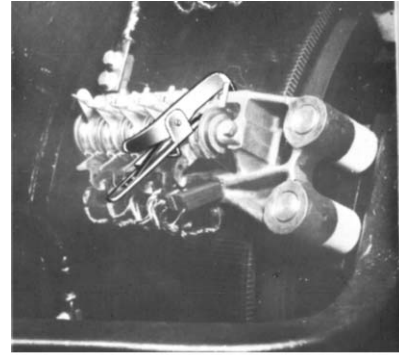
T1937

| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 8204957     | 1    | <b>SEATER..</b> Commutator brush- All commutators   |
| -2             | 8084164     | 1    | <b>HOLDER..</b> Honing stone master set- 4 pieces- 8" to 11.5" liners- used for generator bearing housings D4, D8   |
| -3             | 8098075     | 1    | <b>HOLDER..</b> Honing master set- 4 pieces- 6" x 9" liners- used with 8491575 hone set (not shown)   |
| -4             | 8141619     | 1    | <b>STONES..</b> Honing set finishing- All D generator bearing housings  |
| -5             | 8270339     | 1    | <b>KNIFE..</b> Burring- commutator bar- All generators and traction motors  |
| -6             | 8270341     | 1    | <b>BLADE..</b> Burring knife  |
| -7             | 8259133     | 1    | <b>GAUGE..</b> Brush slot- All EMD generators and traction motors (used to check wear on brush slots [Go or No Go] for reworking brush holders) "No Go 635- Go 626" |
| -8             | 8305181     | 1    | <b>TOOL..</b> Brush holder spring cell aligning- for all 3 and 4 cell traction motor brush holders  |

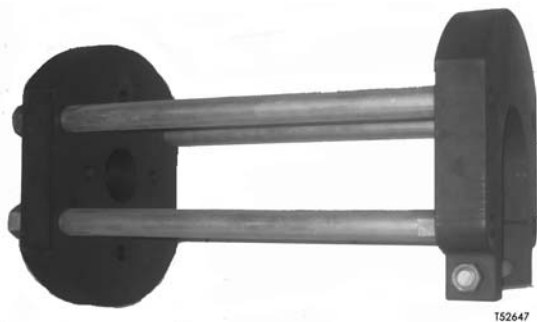
**ELECTRICAL**



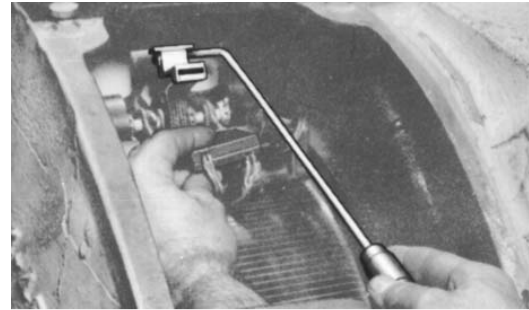
**Ref. No. 2**



**Ref. No. 8**



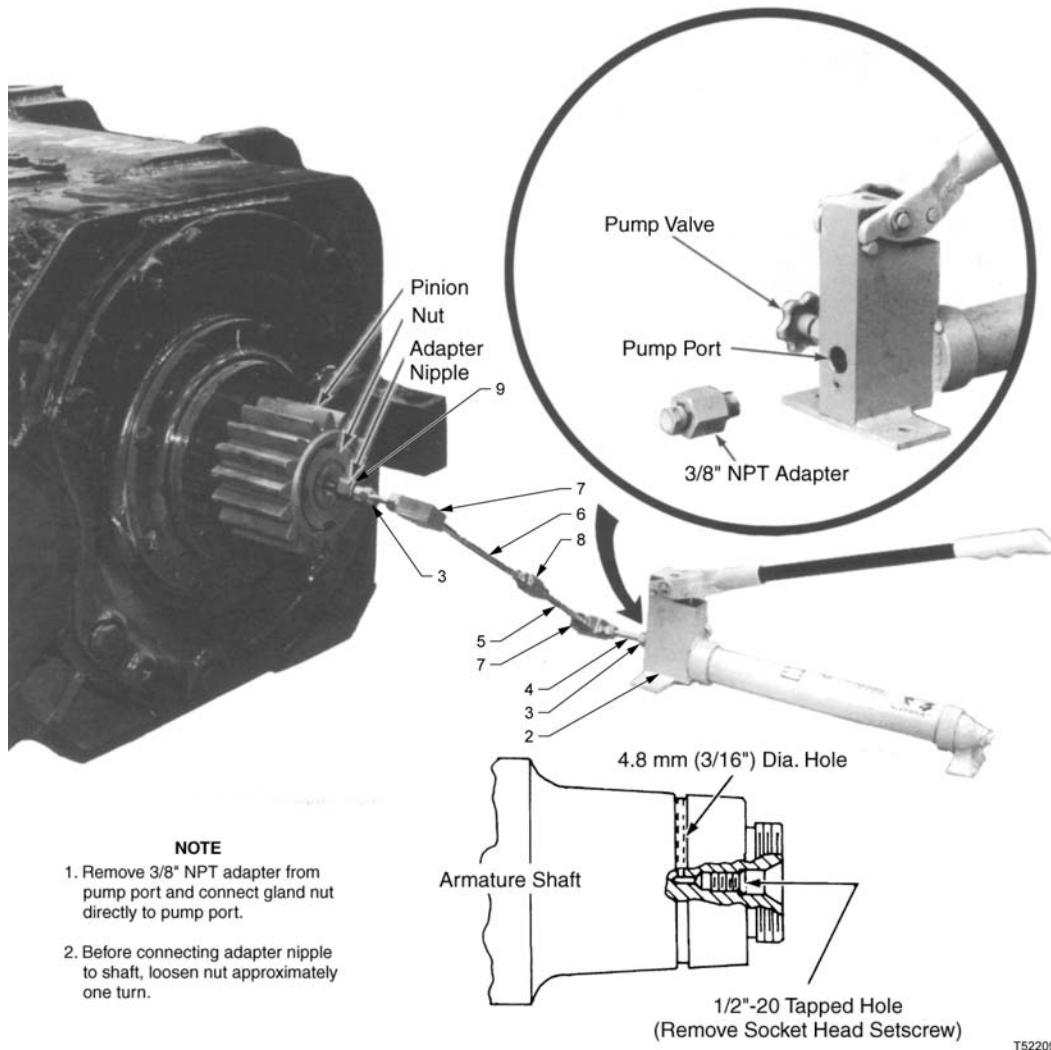
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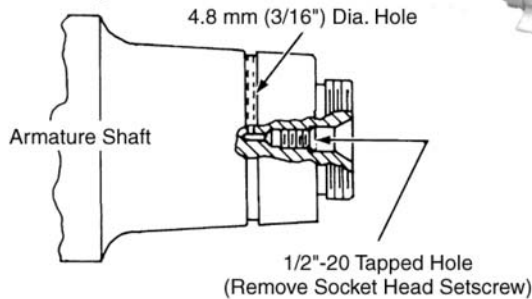
**Ref. No. 9**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|-----------------------|--------------------|-------------|---|
| -1                    |                    |             | <b>PULLER - PINION..</b> Hydraulic- drive flange  |
| -2                    | <b>8074425</b>     | 1           | <b>PILOT ONLY</b>   |
| -3                    | <b>8226542</b>     | 1           | <b>PULLER..</b> Hydraulic (not shown)   |
| -4                    | <b>8226543</b>     | 1           | <b>PULLER FRAME ASM TOOL</b>  |
| -5                    | <b>8224242</b>     | 1           | <b>ADAPTER..</b> For pulling drive coupling flange on D39, D49, and D59 traction motors     |
| -6                    | <b>8228886</b>     | 1           | <b>ADAPTER..</b> For pulling parts on a generator gear box used in oil rig applications.    |
| -7                    | <b>138463</b>      | 1           | <b>SCREW</b>  |
| -8                    | <b>8140868</b>     | 1           | <b>LIFTER..</b> Commutator brush spring lever- D12, 15, 22, 25 generator                    |
| -9                    | <b>8140869</b>     | 1           | <b>LIFTER..</b> Traction motor brush springs- used with traction motor brush holder 8417729 |

**ELECTRICAL**



- NOTE**
1. Remove 3/8" NPT adapter from pump port and connect gland nut directly to pump port.
  2. Before connecting adapter nipple to shaft, loosen nut approximately one turn.



**Ref. No. 1**

T52209

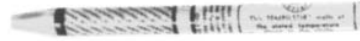
| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 9533321     | 1    | <b>REMOVER..</b> - Pinion or flange- for all traction motors and motor/generators having armature shafts machined for hydraulic float off. (Circumferential groove on taper connected by drilled passages to the 1/2"- 20 tapped hole in the end of the armature). |
| -2             | 8302969     | 1    | <b>HYDRAULIC PUMP..</b> Handles 40,000 psi   |
| -3             | 9533322     | 1    | <b>GLAND NUT WITH SLEEVE</b>   |
| -4             | 9533323     | 1    | <b>TUBE</b>  |
| -5             | 9533324     | 1    | <b>TUBE</b>  |
| -6             | 9533325     | 1    | <b>TUBE</b>  |
| -7             | 9533326     | 1    | <b>ELBOW</b>   |
| -8             | 9533327     | 1    | <b>COUPLING</b>  |
| -9             | 9533328     | 1    | <b>ADAPTER- NIPPLE..</b> 1/2"- 20 x 3/4"-16 female   |
| -10            | 9566297     | 1    | <b>ADAPTER NIPPLE..</b> 3/8"-24  |
| -11            | 8458505     | 1    | <b>ADAPTER NIPPLE..</b> 1/8"-27  |

**ELECTRICAL**



T19606

**Ref. No. 1**



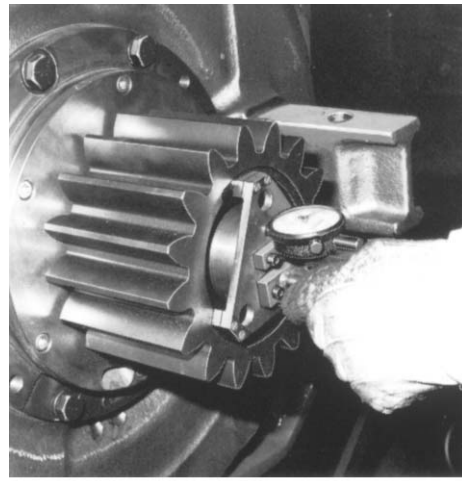
T6535

**Ref. No. 3**



T6485

**Ref. No. 2**



T27051

**Ref. No. 8**

| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 8300183     | 1    | <b>PINION RETAINING NUT..</b> Nut- 2 3/4"- 8 special                          |
| -2             | 8415805     | 1    | <b>SCALE..</b> Brush tension testing- 0 -15 pound range by 4 ounce increments |
| -3             |             |      | <b>INDICATORS</b>   |
| -4             | 8172031     | 1    | <b>INDICATOR..</b> Tempilstik heat- 300 degrees F- pinion gear                |
| -5             | 8172032     | 1    | <b>INDICATOR..</b> Tempilstik heat- 325 degrees F - pinion gear               |
| -6             | 8172033     | 1    | <b>INDICATOR..</b> Tempilstik heat- 338 degrees F - pinion gear               |
| -7             | 8172034     | 1    | <b>INDICATOR..</b> Tempilstik heat- 250 degrees F - pinion gear               |
| -8             |             |      | <b>GAUGE AND INDICATOR</b>  |
| -9             | 9539037     | 1    | <b>GAUGE..</b> Pinion advance- All traction motors                            |
| -10            | 9539031     | 1    | <b>INDICATOR..</b> Dial- All traction motors                                  |
| -11            | 40022032    | 1    | <b>GAUGE..</b> Pinion- traction motor- bluing (not shown)                     |

**ELECTRICAL**



T6317

**Ref. No. 1**



T28302

**Ref. No. 2**



T8542

**Ref. No. 3**



T6322

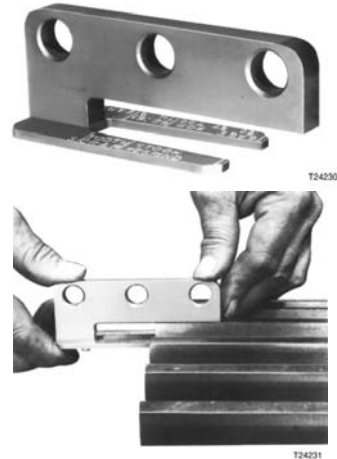
**Ref. No. 7 & 8**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8050721     | 1    | <b>DIE..</b> Traction motor armature shaft rethreading- 2-3/4" - 8 - traction motors (used with 8050722 holder)    |
| -2             | 8050722     | 1    | <b>HOLDER..</b> Die- includes four handles- traction motors (used with 8050721)                                    |
| -3             | 8239753     | 1    | <b>TAP ASSEMBLY..</b> Pinion thread- traction motor pinions  |
| -4             | 8245258     | 1    | <b>TAP..</b> Thread- replacements  |
| -5             | 8245259     | 1    | <b>PLATE..</b> Tap holder- replacement   |
| -6             | 9431469     | 4    | <b>SCREW..</b> 5/16" - 18 socket head cap replacement  |
| -7             | 8127528     | 1    | <b>HANDLE..</b> Traction motor pinion nut sliding T- 1" square drive- All traction motors                          |
| -8             | 8127529     | 1    | <b>WRENCH..</b> Traction motor pinion nut- All traction motors   |
| -9             | 40032065    | 1    | <b>TORQUE MULTIPLIER..</b> Traction motor axle cap bolts- 1" drive with built-in backlash 13.6:1 ratio (not shown) |

**ELECTRICAL**



**Ref. No. 1**



**Ref. No. 5**



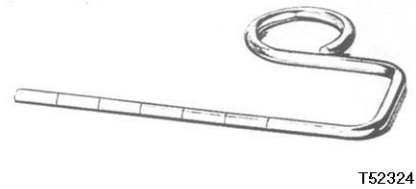
**Ref. No. 2**



**Ref. No. 6**



**Ref. No. 3**



**Ref. No. 7**

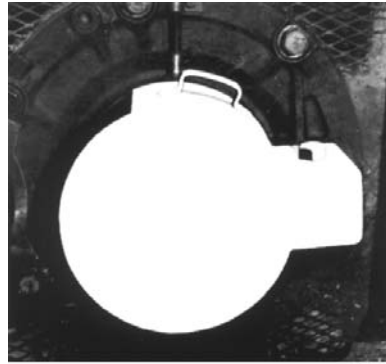
| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 8198632     | 1    | <b>DISPENSER..</b> Lube oil- support bearing- All model locomotives   |
| -2             | 8250241     | 1    | <b>REMOVER - INSTALLER..</b> Filler cap- traction motor gear case   |
| -3             | 40034745    | 1    | <b>CROWFOOT FLARE NUT SOCKET..</b> Designed to apply traction motor oil filler cap  |
| -4             | 40087921    | 1    | <b>CROWFOOT..</b> 1/2" square drive- EUI injector flexible fuel lines (not shown)   |
| -5             | 9512412     | 1    | <b>GAUGE..</b> Axle gear wear- This gauge has been designed to quickly check a gear tooth only on 62, 61, 60, and 57 tooth gears to determine if there is sufficient stock on the tooth for reprofiling. Can be used on 66, 67, 69, and 70 tooth gears on 50/60 series. |
| -6             | 9523997     | 1    | <b>GAUGE..</b> Gear contour. Used for traction motors D29, D29CC, 36 and 77 traction motors   |
| -7             | 8211193     | 1    | <b>GEAR CASE GREASE LEVER GAUGE..</b> Used to ensure proper minimum levels of lubricant in offset seal traction motor gear cases  |

**ELECTRICAL**



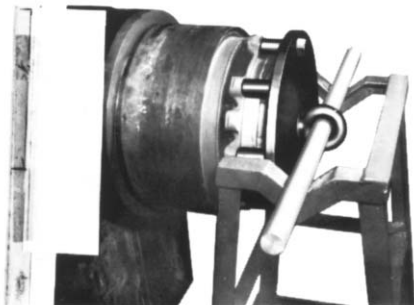
T35160

**Ref. No. 1**



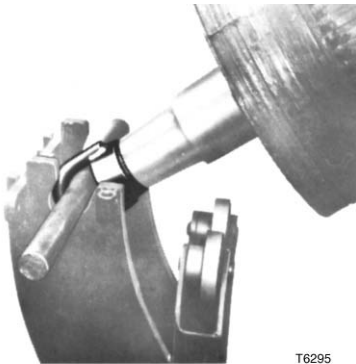
T6320

**Ref. No. 2**



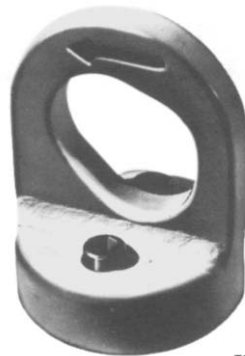
T6297

**Ref. No. 4**



T6295

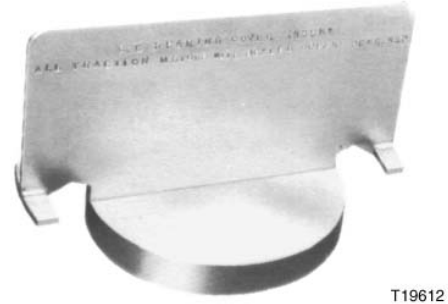
**Ref. No. 5**



T8579

**Ref. No. 6**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|-----------------------|--------------------|-------------|--|
| -1                    | 40034178           | 1           | <b>SOCKET..</b> Used for removing bolts on aluminum end bell of traction motor armatures                                     |
| -2                    | 8054871            | 1           | <b>PROTECTOR..</b> Traction motor pinion - all domestic motors   |
| -3                    | 8206970            | 1           | <b>PROTECTOR..</b> Traction motor pinion - all traction motors - export (not shown)  |
| -4                    | 8067147            | 1           | <b>PLATE..</b> Armature turning - domestic traction motors   |
| -5                    | 8067122            | 1           | <b>EYE..</b> Lifting- pinion end - other than 12 tooth (for 12 tooth use 8065527)  |
| -6                    | 8174221            | 1           | <b>EYE..</b> Lifting- commutator end - D77 and 87- 3.955 I.D. traction motor armature  |
| -7                    | 8219763            | 1           | <b>EYE..</b> Lifting- commutator end- D19, 29, 31, 36, and 43 traction motors (not shown)                                    |
| -8                    | 8315525            | 1           | <b>EYE..</b> Lifting- adapter- commutator end - SKF bearings- export (not shown)   |
| -9                    | 8065527            | 1           | <b>CLAMP..</b> Armature lifting fixture- pinion end - D7E, 17E, 27E, 37E, 47E, 57E, 67E, and 77E traction motors (not shown) |

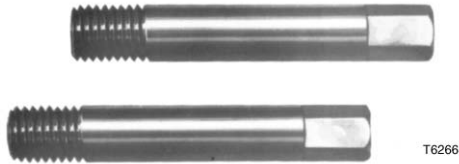
**ELECTRICAL****Ref. No. 1****Ref. No. 3****Ref. No. 2****Ref. No. 4**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -1                        | 8261579                | 1           | <b>MASK..</b> Grease- pinion end cap - D19, 29, 31, and 36   |
| -2                        | 8228024                | 1           | <b>MASK..</b> Grease- commutator end bearing cap - B and E and Industrial Motors   |
| -3                        | 8252767                | 1           | <b>MASK..</b> Grease- commutator end bearing cover- with insert (Used on all motors equipped with commutator end bearing cover 8248991)        |
| -4                        | 8228025                | 1           | <b>MASK..</b> Grease- pinion end bearing cap and cover - B series motors (Old seal arrangement until approximately 1971) and Industrial Motors |
| -5                        | 8238744                | 1           | <b>MASK..</b> Grease- pinion end cap and cover- E series motors (not shown)  |
| -6                        | 8276639                | 1           | <b>MASK..</b> Grease- pinion end bearing cover - D19, 29, 31, & 36 (not shown)   |
| -7                        | 8276636                | 1           | <b>MASK..</b> Grease- commutator end bearing cap - D19, 29, 31, & 36 (not shown)   |
| -8                        | 8261578                | 1           | <b>MASK..</b> Grease- commutator end bearing housing- D19, 29, 31,& 36(not shown)  |
| -9                        | 8276640                | 1           | <b>MASK..</b> Grease- main generator bearing cap & cover - D12, 22,& 32 (not shown)  |
| -10                       | 8278375                | 1           | <b>MASK..</b> Grease- main generator bearing cap and cover- D4 and 8 (not shown)   |
| -11                       | 8276637                | 1           | <b>MASK..</b> Grease- main bearing cap and cover - D15 and 25 caps only- A11 and 20 (not shown)  |
| -12                       | 8276638                | 1           | <b>MASK..</b> Grease- alternator bearing cover - A5, 5A, 7, 11, and 20 (not shown)   |
| -13                       | 9519023                | 1           | <b>MASK..</b> Grease- larger bearing cap and cover - AR6, 7, 10, 11, 12, 15, 16, & 17 (not shown)  |

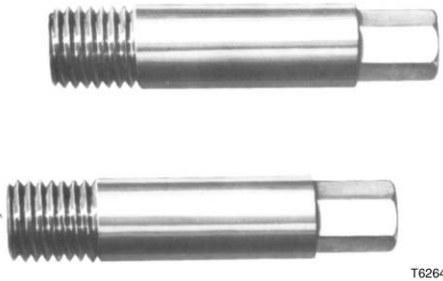
**ELECTRICAL**



**Ref. No. 1**



**Ref. No. 2**



**Ref. No. 3**



**Ref. No. 5**



**Ref. No. 7**

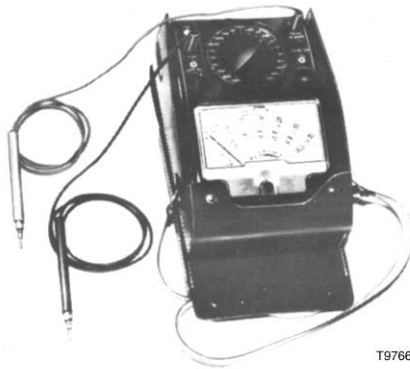
| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 8155976     | 1    | <b>STUD.</b> Locating- traction motor pinion end bearing cap- D7, 75, 77, 78, and 87 traction motors   |
| -2             | 8155977     | 1    | <b>STUD.</b> Locating- traction motor commutator end housing- D7, 75, 77, 78, and 87 traction motors   |
| -3             | 8155975     | 1    | <b>STUD.</b> Locating- traction motor commutator end bearing cap- D7, 75, 77, 78, and 87 traction motors   |
| -4             | 40058161    | 1    | <b>TESTER.</b> High voltage insulation tester- up to 100 gigaohms- test voltages of 0 to 500, 1000, 2500, and 5000 volts DC- battery powered (not shown) |
| -5             | 8174880     | 1    | <b>TESTER.</b> Insulation resistance- Megger- 0-2000 megaohms, 1000 volts; 0-1000 megaohms, 500 volts; 0-500 megaohms, 250 volts- generator type         |
| -6             | 8174878     | 1    | <b>LEAD.</b> Heavy duty- pair 12 ft. long  |
| -7             | 8071692     | 1    | <b>TESTER.</b> Midget Megger- 0-100 megaohms- 500 volts DC   |

**ELECTRICAL**

T21610

**Ref. No. 1**

T52330

**Ref. No. 7**

T9766

**Ref. No. 6**

T7562

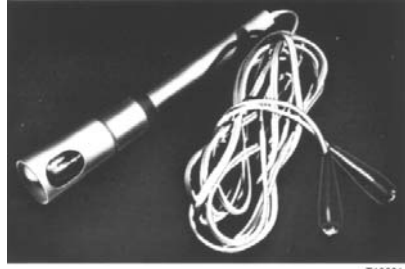
**Ref. No. 8**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -1                        | 9322571                | 1           | <b>OHMMETER KIT..</b> Digital low resistance   |
| -2                        | 9322574                | 1           | <b>OHMMETER..</b> Range 0 to 19.99 ohms in 5 ranges- 0 to 1.999 milliohms lowest range- four digit display   |
| -3                        | 9322575                | 1           | <b>BATTERY CHARGER..</b> With batteries  |
| -4                        | 40042380               | 1           | <b>LEADS..</b> Seven foot helical spring point   |
| -5                        | 9322577                | 1           | <b>BATTERIES..</b> For ohmmeter (used in 9322574 meter only)   |
| -6                        | 8276478                | 1           | <b>METER..</b> Volt ohm milliammeter- range- volts DC: 0- 2.5- 10-50-250-1000-5000 AC: 0-3-10-50-250-1000-5000 resistance; 1 to 100 megaohms in four ranges DC milliamperes- 0-10-100-1000 at 250 millivolts. Complete with leads, alligator clips, batteries, instruction manual and carrying case. |
| -7                        | 40045946               | 1           | <b>DIGITAL MULTI-METER..</b> 2000 volt peak<br>Ranges: [AC and DC volts- 200MV, 2V, 20 V, 200 V, 2KV]; [AC and DC current- amperes- 2μA, 20 mA, 200 mA, 2A]; [Ohms- 200 Ohm, 2 kOhm, 20 kOhm, 200 kOhm, 2 MOhm, 20 MOhm]; Includes banana plugs, internal battery pack and AC line operation         |
| -8                        | 8209343                | 1           | <b>VOLTMETER..</b> Alternating current- less leads 600/300/150 volts   |
| -9                        | 8212485                | 1           | <b>CASE..</b> Carrying   |

**ELECTRICAL****Ref. No. 1****Ref. No. 11**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|-----------------------|--------------------|-------------|---|
| -1                    | <b>8246474</b>     | 1           | <b>TESTER..</b> Wheel slip and ground delay - 0-1000 milliamperes - domestic and export   |
| -2                    | <b>8276526</b>     | 1           | <b>KNOB..</b> Rheostat  |
| -3                    | <b>8288045</b>     | 1           | <b>SWITCH..</b> 50 milliamperes- 1000 milliamperes  |
| -4                    | <b>8288046</b>     | 1           | <b>BUTTON..</b> Push  |
| -5                    | <b>8288049</b>     | 1           | <b>RHEOSTAT..</b> 3500 ohm- less knob   |
| -6                    | <b>8288050</b>     | 2           | <b>RHEOSTAT..</b> 300 ohm- less knob  |
| -7                    | <b>8288051</b>     | 1           | <b>RESISTOR..</b> 150 ohm- less knob- set at 120 ohms   |
| -8                    | <b>8288052</b>     | 1           | <b>RESISTOR..</b> 1000 ohm- less knob- set at 800 ohms  |
| -9                    | <b>8260337</b>     | 1           | <b>LEAD ASSEMBLY..</b> Battery  |
| -10                   | <b>8260338</b>     | 1           | <b>LEAD ASSEMBLY..</b> Test   |
| -11                   | <b>8218499</b>     | 1           | <b>METER..</b> 30-150-1500 volts - 75-150 millivolts - 30-60-300-600 milliamperes   |
| -12                   | <b>8190835</b>     | 1           | <b>LEAD..</b> Test- pair  |
| -13                   | <b>8070988</b>     | 1           | <b>SHUNT..</b> 10 amperes- 50 millivolt- shunt field (not shown)  |
| -14                   | <b>8042782</b>     | 1           | <b>SHUNT..</b> 100 amperes- 50 millivolt- battery field (not shown)   |
| -15                   | <b>8078329</b>     | 1           | <b>SHUNT..</b> 200 amperes- 50 millivolt- battery charging (not shown)  |
| -16                   | <b>8309746</b>     | 1           | <b>SHUNT..</b> 2000 amperes- 50 millivolt (Must be used with 4 spacers- 8309755)- used for transition and power limit settings and load testing DC generator equipped locomotives (not shown) |
| -17                   | <b>8351657</b>     | 1           | <b>SHUNT..</b> 4000 amperes- 50 millivolt- used for transition and power limit setting and load testing AR10 alternator equipped locomotives (not shown)                                      |
| -18                   | <b>9322324</b>     | 1           | <b>SHUNT..</b> 5000 amperes- 50 millivolt- used for transition and power limit setting and load testing AR11, 15, 16 and 17 alternator equipped locomotives (not shown)                       |
| -19                   | <b>8309755</b>     | 1           | <b>SPACER..</b> (4 required)- use with 8309746- (not shown)   |

**ELECTRICAL**



T10661

**Ref. No. 1**



T10864

**Ref. No. 4**



T9037

**Ref. No. 3**



T26471

**Ref. No. 5**



T52327

**Ref. No. 6**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|-----------------------|--------------------|-------------|---|
| -1                    | <b>8279561</b>     | 1           | <b>SAFETY TEST LAMP..</b> 8 foot leads alligator clips 64 to 125 AC-DC  |
| -2                    | <b>40031139</b>    | 1           | <b>BULB..</b> Light   |
| -3                    | <b>40100097</b>    | 1           | <b>DYNAMOTOR..</b> Output- variable 1200 volts - 6 amps DC - input 64-76 volts DC   |
| -4                    | <b>40084385</b>    | 1           | <b>TESTER..</b> AC hypot.- 220 VAC, 50/60 Hz, 15A, single phase- 3 KVA  |
| -5                    | <b>9541547</b>     | 1           | <b>EXTRACTING TOOL..</b> Necessary for the removal of module pins and receptacles on all "50 Series" locomotives and all electric locomotives |
| -6                    | <b>9576512</b>     | 1           | <b>EXTRACTING TOOL..</b> Similar to 9541547- for use on all "60 Series"and EM2000 locomotives   |

**ELECTRICAL**



**Ref. No. 1**

T19581



**Ref. No. 5**

T7010



**Ref. No. 3**

T52318



**Ref. No. 6**

T19601



**Ref. No. 4**

T26470



**Ref. No. 7**

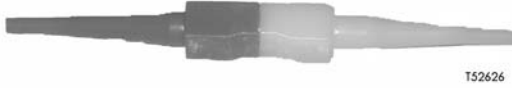
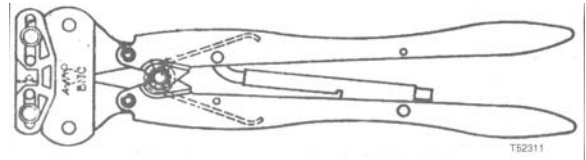
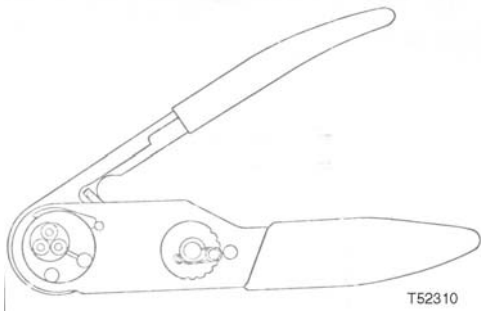
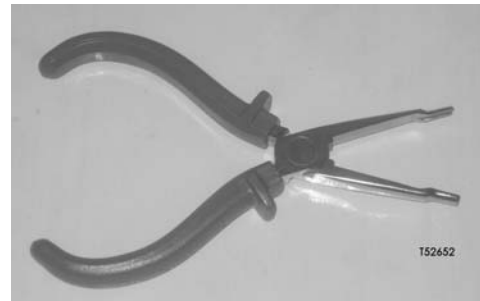
T52425



**Ref. No. 8**

T9696

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|-----------------------|--------------------|-------------|---|
| -1                    | 8417375            | 1           | <b>CABLE STRIPPER..</b> Cable 1/4" to 3/4" O.D.   |
| -2                    | 8417376            | 1           | <b>REPLACEMENT BLADE..</b> Cable stripper   |
| -3                    | 40061449           | 1           | <b>CABLE STRIPPER..</b> Cable 3/4" to 1-1/2" O.D.   |
| -4                    | 9540689            | 1           | <b>CRIMPER..</b> Used on module pins and receptacles on all "Super Series" locomotives and all electric locomotives |
| -5                    | 8196862            | 1           | <b>CRIMPER..</b> Jumper cable terminal  |
| -6                    | 8281927            | 1           | <b>CRIMPER..</b> For Faston receptacles   |
| -7                    | 12085270           | 1           | <b>CRIMPER..</b> EUI and pressure sensor terminals  |
| -8                    | 8147749            | 1           | <b>STRIPPER..</b> Wire insulation- used for No. 10 to No. 22 size wires)  |

**ELECTRICAL****Ref. No. 2****Ref. No. 4****Ref. No. 3****Ref. No. 6**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -1                        | 40025165               | 1           | <b>PIN EXTRACTOR..</b> For AMP rectangular pins. (not shown)   |
| -2                        | 40003920               | 1           | <b>CONTACT ASM TOOL..</b> Extraction/Insertion tool- used in plug ASM 8453146                              |
| -3                        | 40003921               | 1           | <b>CRIMP TOOL GOVERNOR PINS..</b> Used in plug assembly 8453146  |
| -4                        | 40050408               | 1           | <b>CRIMPING TOOL..</b> Designed to crimp AMP Twin BNC COAXICON Plug or Bulkhead Jack Crimp End Assemblies. |
| -5                        | 9582953                | 1           | <b>REMOVAL TOOL..</b> 3G2A plug (not shown)  |
| -6                        | 9582954                | 1           | <b>INSERTION TOOL..</b> 3G2A plug  |

**ELECTRICAL**

T8611

**Ref. No. 1**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>  |
|---------------------------|------------------------|-------------|---|
| -1                        | <b>8159254</b>         | 1           | <b>CRIMPER..</b> Hydraulic foot operated (Crimper does not include nests or indenters)    |
| -2                        |                        |             | <b>NESTS AND INDENTERS..</b> (not shown) Used with crimper 8159254                        |
| -3                        | <b>8227321</b>         | 1           | <b>NEST..</b> Used with indenter 8159252 on cable size 225 / 24 (1/0) and 2695 / 34 (1/0) |
| -4                        | <b>8159249</b>         | 1           | <b>NEST..</b> Used with indenter 8159252 on cable size 325 / 24                           |
| -5                        | <b>8159251</b>         | 1           | <b>NEST..</b> Used with indenter 8159252 on cable size 550 / 24                           |
| -6                        | <b>8159253</b>         | 1           | <b>NEST..</b> Used with indenter 8159252 on cable size 776 / 24                           |
| -7                        | <b>8399221</b>         | 1           | <b>NEST..</b> Used with indenter 8159252 on cable size 1100 / 24                          |
| -8                        | <b>8159252</b>         | 1           | <b>INDENTER..</b> Used with nests and cable sizes listed above                            |
| -9                        | <b>8228346</b>         | 1           | <b>NEST..</b> Used with indenter 8159250 on cable size 19 / .0745 (1/0)                   |
| -10                       | <b>8159249</b>         | 1           | <b>NEST..</b> Used with indenter 8159250 on cable size 19 / .0837 (2/0)                   |
| -11                       | <b>8229101</b>         | 1           | <b>NEST..</b> Used with indenter 8159250 on cable size 19 / .094 (3/0)                    |
| -12                       | <b>8228348</b>         | 1           | <b>NEST..</b> Used with indenter 8159250 on cable size 250 MCM                            |
| -13                       | <b>8159253</b>         | 1           | <b>NEST..</b> Used with indenter 8159250 on cable size 400 MCM                            |
| -14                       | <b>8159250</b>         | 1           | <b>INDENTER..</b> Used with nests and cable sizes listed above                            |
| -15                       | <b>8227077</b>         | 1           | <b>DIE SET..</b> Used on cable size 4256 / 34 (3/0)                                       |
| -16                       | <b>8227078</b>         | 1           | <b>DIE SET..</b> Used on cable size 2107 / 30 (4/0)                                       |
| -17                       | <b>9572742</b>         | 1           | <b>DIE SET..</b> Used on cable size 1325 / 24   |
| -18                       | <b>8167953</b>         | 1           | <b>NEST..</b> Used with indenter 8167952 on cable size 1325 / 24                          |
| -19                       | <b>8159255</b>         | 1           | <b>NEST..</b> Used with indenter 8167952 on cable size 1480 / 24- 1600 / 24               |
| -20                       | <b>8227079</b>         | 1           | <b>NEST..</b> Used with indenter 8167952 on cable size 1925 / 24                          |
| -21                       | <b>8167952</b>         | 1           | <b>INDENTER..</b> Used with nests and cable sizes listed above                            |
| -22                       | <b>8387503</b>         | 1           | <b>NEST..</b> Used with indenter 8387505 on cable size 750 MCM on Model MP45              |
| -23                       | <b>8387504</b>         | 1           | <b>NEST..</b> Used with indenter 8387505 on cable size 4/0 on Model MP45                  |
| -24                       | <b>8387806</b>         | 1           | <b>NEST..</b> Used with indenter 8387505 on cable size 500 MCM on Model MP45              |
| -25                       | <b>8387505</b>         | 1           | <b>INDENTER..</b> Used with nests and cable sizes listed above                            |

**ELECTRICAL**



T7003

**Ref. No. 1**



T52645

**Ref. No. 4**



T52634

**Ref. No. 2**



T52313

**Ref. No. 5**



T52646

**Ref. No. 3**



T8206

**Ref. No. 6**

| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 40069482    | 1    | <b>KIT..</b> Lug and connector- including crimpers - ( <b>Case Not Included</b> )   |
| -2             | 40060417    | 1    | <b>CRIMPER..</b> Wire range (AWG) 22-16, 16-14, and 12-10- lugs and connectors  |
| -3             | 8166676     | 1    | <b>CRIMPER..</b> No. 3, 4 & 6 wire size lugs and connectors   |
| -4             | 8159240     | 1    | <b>CRIMPER..</b> No. 8 & 12 wire size lugs and connectors   |
| -5             | 40052393    | 1    | <b>CRIMPER..</b> Hand tool- tool frame holds a die assembly with three crimping sections- size (AWG) 28-24, 24-20, and 18-16  |
| -6             | 8234387     | 1    | <b>TOOL..</b> Terminal used to crimp No. 10 to No. 22 size terminal lugs, also cut wire sizes No. 10 to No. 22 and machine bolts sizes No. 4-40, 6-32, 8-32, 10-32, 10-24 |
| -7             | 8208195     | 1    | <b>CRIMPER..</b> Emergency fuel cutoff and horn cord lug- used on steel cable (not shown)   |

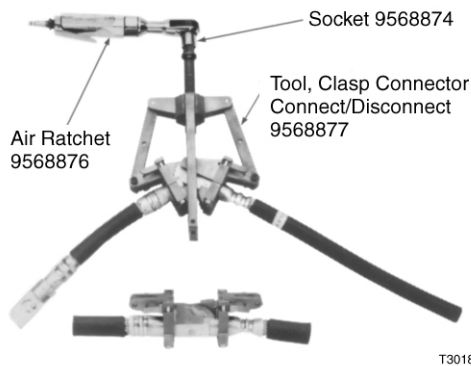
**ELECTRICAL**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>  |
|---------------------------|------------------------|-------------|---|
| -1                        | 40125505               | 1           | <b>LUG AND HARDWARE KIT..</b> For EM2000/EMDEC locomotives (not shown)  |
| -2                        | 40125504               | 1           | <b>TOOL BOX..</b> 35 Bin  |
| -3                        | 12034222               | 20          | <b>CONNECTOR..</b> Crimp terminal   |
| -4                        | 40069008               | 20          | <b>JACKSCREW..</b> PRG301 Mounting  |
| -5                        | 40028076               | 20          | <b>JACKSCREW..</b> Female - #6-32 - 1.200 long  |
| -6                        | 40028057               | 20          | <b>JACKSCREW..</b> Male - #6-32 - 1.180 long  |
| -7                        | 40028053               | 20          | <b>JACKSCREW..</b> Male - #6-32 - 2.285 long  |
| -8                        | 40028054               | 20          | <b>JACKSCREW..</b> Female - #6-32 - 2.305 long  |
| -9                        | 40019318               | 20          | <b>CONTACT..</b> Male - #16 and #14-12 AWG  |
| -10                       | 40022401               | 20          | <b>CONTACT..</b> Male, spade, #10 AWG   |
| -11                       | 40061271               | 20          | <b>CONTACT..</b> Male - #8 AWG  |
| -12                       | 40061272               | 20          | <b>CONTACT..</b> Female- #8 AWG   |
| -13                       | 12077413               | 25          | <b>CONTACT..</b> Female- crimp terminal   |
|                           |                        |             | <b>The following items (14 thru 24) are for use with plugs 40027876, 40027877, CMU, DIP, Computer, PDP, 353, 363, 383, 393, CPD (AMP)</b> |
| -14                       | 9584604                | 50          | <b>CONTACT..</b> Female, round, #18-16 AWG  |
| -15                       | 40024951               | 50          | <b>CONTACT..</b> Female, round, #18-16 AWG  |
| -16                       | 9555811                | 100         | <b>CONTACT..</b> Female, round, #18-14 AWG)- insulation diameter .110 - .150  |
| -17                       | 40022398               | 50          | <b>CONTACT..</b> Female, round, #18-14 AWG- insulation diameter .080 - .100   |
| -18                       | 40024950               | 50          | <b>CONTACT..</b> Male, round, #18-16 AWG  |
| -19                       | 9555810                | 50          | <b>CONTACT..</b> Male, round, #18-14 AWG- insulation diameter .110 - .150   |
| -20                       | 40022397               | 50          | <b>CONTACT..</b> Male, round, #18-14 AWG- (pin- .062)- insulation diameter .080 - .100  |
| -21                       | 40019317               | 20          | <b>CONTACT..</b> Female, spade, #16 and #14-12 AWG  |
| -22                       | 40022402               | 20          | <b>CONTACT..</b> Female, spade, #10 AWG   |
| -23                       | 40029053               | 50          | <b>CONTACT..</b> Female, #24-20 AWG- (socket .062)  |
| -24                       | 40038798               | 50          | <b>CONTACT..</b> Male, #24-20 AWG- (pin .062)   |
|                           |                        |             | <b>The following items (25 and 26) are for use with plugs 40013145, 40013147, D-connectors 25 pin, etc. (AMP)</b>                         |
| -25                       | 40013148               | 50          | <b>CONTACT..</b> Female, #24-20 AWG- (socket - .040 D CONN)   |
| -26                       | 40013149               | 50          | <b>CONTACT..</b> Male, #24-20 AWG- (pin- .040 D CONN)   |
|                           |                        |             | <b>The following items (27 and 28) are for use with plugs 10643872, 10643873, D-connector 15 pin (EMDEC, Radio etc.)</b>                  |
| -27                       | 10643861               | 50          | <b>CONTACT..</b> Female, #18-22 AWG- (socket - .040 D CONN)   |
| -28                       | 10643862               | 50          | <b>CONTACT..</b> Male, #18-22 AWG- (pin- .040 D CONN)   |
|                           |                        |             | <b>The following items (29 thru 37) are for use with plugs 12034400, 12124634, EMDEC harness EHS, VHS, Injectors</b>                      |
| -29                       | 12103881               | 50          | <b>CONTACT..</b> Female, 150 series without flag- (crimp terminal)  |
| -30                       | 12124075               | 50          | <b>CONTACT..</b> Female, 150.2 series with flag- (crimp terminal)   |
| -31                       | 12124634               | 50          | <b>CONTACT..</b> Female, 280 series- (CONN power harness)   |
| -32                       | 9581394                | 20          | <b>CONTACT..</b> Male, 3G2A plug- #12-14 AWG- (pin)   |
| -33                       | 9581395                | 20          | <b>CONTACT..</b> Female, 3G2A plug- #12-14 AWG- (socket)  |
| -34                       | 40051635               | 50          | <b>CONTACT..</b> Female (socket)  |
| -35                       | 12089040               | 50          | <b>CONTACT..</b> Crimp terminal   |
| -36                       | 9576512                | 1           | <b>EXTRACTION TOOL</b>  |
| -37                       | 40054405               | 100         | <b>PIN..</b> Roll - jackscrew   |

**ELECTRICAL****Ref. No. 1****Ref. No. 9**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>  |
|-----------------------|--------------------|-------------|---|
| -1                    | 9572744            | 1           | <b>ELECTRO-HYDRAULIC CRIMPING TOOL..</b> Crimping tool assembly- used in installing crimp type clasp connectors on 1100/24, 1325/24, and 1480/24 size cables. |
| -2                    | 9572745            | 1           | <b>ELECTRO-HYDRAULIC TOOL..</b> 110 VAC 60 Hz   |
| -3                    | 9572746            | 1           | <b>CRIMPING HEAD..</b> Power unit   |
| -4                    | 9572747            | 1           | <b>HANDLE CONTROL ASSEMBLY..</b> Seven foot hose and cord   |
| -5                    | 9572740            | 1           | <b>DIE SET..</b> (not shown)  |
| -6                    | 9572741            | 1           | <b>DIE..</b> 1100 / 24  |
| -7                    | 9572742            | 1           | <b>DIE..</b> 1325 / 24  |
| -8                    | 9572743            | 1           | <b>DIE..</b> 1480 / 24  |
| -9                    | 40122151           | 1           | <b>HAND OPERATED CRIMPING TOOL..</b> The crimping device is a portable hand-held tool. This device does not require any electrical hookup.                    |
| -10                   |                    |             | <b>CONNECTOR AND DIES..</b> Available for use with crimping tool 40122151 (not shown)   |
| -11                   | 9557075            | 1           | <b>CONNECTOR..</b> Used for cable size 1100 / 24 with upper die 9568873 and lower die 9568872   |
| -12                   | 9564991            | 1           | <b>CONNECTOR..</b> Used for cable size 1325 / 24 with upper die 9568870 and lower die 9568871   |
| -13                   | 9564992            | 1           | <b>CONNECTOR..</b> Used for cable size 1480 / 24 with upper die 9568870 and lower die 9568871   |
| -14                   | 9568870            | 1           | <b>UPPER DIE..</b> For use with crimping tool 40122151 and connectors as specified above  |
| -15                   | 9568871            | 1           | <b>LOWER DIE..</b> For use with crimping tool 40122151 and connectors as specified above  |
| -16                   | 9568872            | 1           | <b>LOWER DIE..</b> For use with crimping tool 40122151 and connectors as specified above  |
| -17                   | 9568873            | 1           | <b>UPPER DIE..</b> For use with crimping tool 40122151 and connectors as specified above  |

**ELECTRICAL**



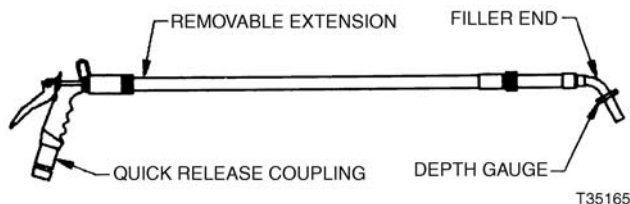
**Ref. No. 1**



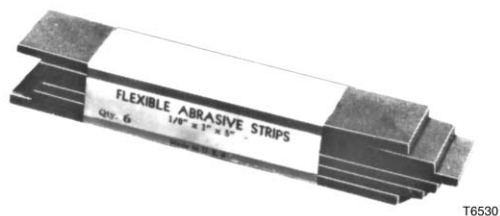
**Ref. No. 9**



**Ref. No. 5**



**Ref. No. 10**



**Ref. No. 8**

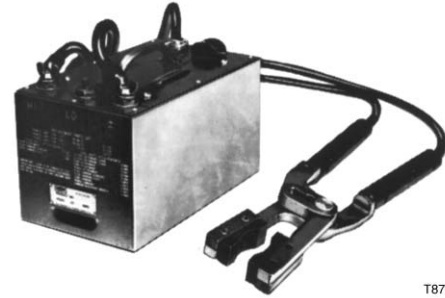


**Ref. No. 11**

| Asm - Ref. No. | Part Number     | Qty. | Description   |
|----------------|-----------------|------|---|
| -1             |                 |      | <b>CLASP CONNECTOR TOOL</b>   |
| -2             | <b>9568877</b>  | 1    | <b>CLASP TOOL..</b> Connector/Disconnect  |
| -3             | <b>9568876</b>  | 1    | <b>AIR RATCHET..</b> 3/8" Drive   |
| -4             | <b>9568874</b>  | 1    | <b>SOCKET..</b> 3/4" - 3/8" Drive   |
|                |                 |      | *For joining/breaking traction motor clasp-type connectors see ref. no. 9                         |
| -5             | <b>8077317</b>  | 1    | <b>HYDROMETER..</b> Battery testing   |
| -6             | <b>8044534</b>  | 1    | <b>FLOAT..</b> Liquid level   |
| -7             |                 | 1    | <b>BULB..</b> Rubber (no longer available separately)   |
| -8             | <b>8178937</b>  | 1    | <b>ABRASIVE..</b> Flexible cleaning strips  |
| -9             | <b>8243341</b>  | 1    | <b>BREAKER..</b> Traction motor lead- clasp half disconnecting drill rigs only                    |
| -10            | <b>40000871</b> | 1    | <b>FILLER..</b> Battery cell exide batteries only   |
| -11            | <b>8202702</b>  | 1    | <b>EXPANDER..</b> Ferrule- Howe cables- used to install Ferrule 8195541 in cable assembly 8195548 |

**ELECTRICAL**

T9075

**Ref. No. 1**

T8752

**Ref. No. 3**

T21363

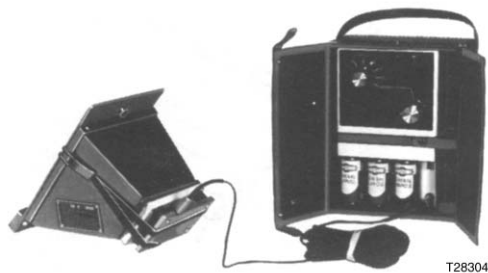
**Ref. No. 2**

T21367

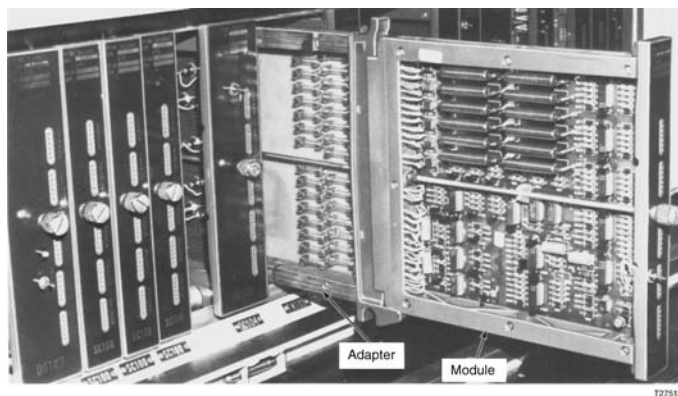
**Ref. No. 7**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -1                        | 8252809                | 1           | <b>SCALE..</b> Gram - interlock setting - through cable wheel slip relays  |
| -2                        | 8302030                | 1           | <b>PLIERS..</b> External snap ring No. 5 - magnetic switch gear- also floating bushing connecting rods on 567B engine  |
| -3                        | 8236325                | 1           | <b>PLIERS..</b> Thermo grip - 230 volts - 50-60 cycles - for heavy soldering   |
| -4                        | 8166464                | 1           | <b>ELECTRODE..</b> Standard  |
| -5                        | 8171256                | 1           | <b>PLIERS..</b> Special U washer on contractors (not shown)  |
| -6                        | 8223143                | 1           | <b>PLIERS..</b> Snap ring- cam switch (not shown)  |
| -7                        | 9087559                | 1           | <b>TESTER*..</b> Module and sub- assembly tester- (operates on 115 VAC 50/60 Hz) includes calibration self- test   |
| -8                        | 9087560                | 1           | <b>TESTER*..</b> Module and sub- assembly tester- export model (operates on 220 VAC 50/60 Hz)- includes calibration self- test (not shown)                   |
|                           |                        |             | *Does not include programs or program blocks. The programs and program blocks must be ordered separately according to the module testing capability desired. |
| -9                        | 9575502                | 1           | <b>ANTI-STATIC BAGS..</b> 14" x 18" (not shown)  |
| -10                       | 9575501                | 1           | <b>ANTI-STATIC BAGS..</b> 18" x 18" (not shown)  |
| -11                       | 40000012               | 1           | <b>ANTI-STATIC BAGS..</b> 7" x 11" (not shown)   |
| -12                       | 40000031               | 1           | <b>GROUNDING WRIST STRAP..</b> (not shown)   |
| -13                       | 40036919               | 1           | <b>DISPOSABLE STRAP..</b> (not shown)  |
| -14                       | 9576500                | 1           | <b>LABEL..</b> Electronic device caution label (not shown)   |

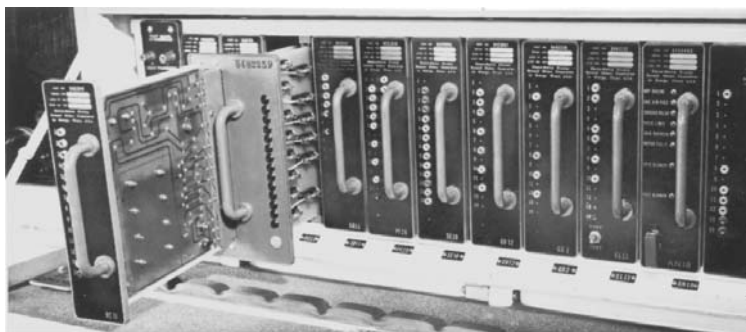
**ELECTRICAL**



**Ref. No. 1**

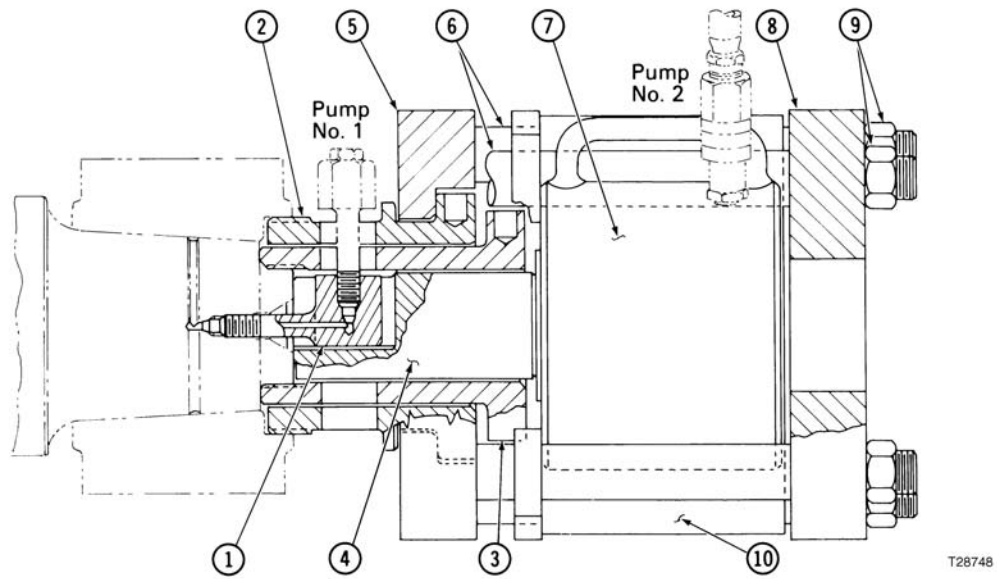


**Ref. No. 2**



**Ref. No. 8**

| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 9543733     | 1    | <b>KIT..</b> Radar band calibration - electronically simulates speed of locomotive (antenna shown applied to face of radar transceiver) |
| -2             |             |      | <b>EXTENSION BOARD ASSEMBLIES</b>   |
| -3             | 40017825    | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> "60 Series" - digital - CPU, MEM, ARC   |
| -4             | 40017828    | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> "60 Series" - analog/digital- IOE, IOL, IOD, FCS, ADP   |
| -5             | 40017872    | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> "60 Series" analog- FBE, FBL  |
| -6             | 40044051    | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> "70 Series" w/ EM2000 controllers- DIO  |
| -7             | 40044052    | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> "70 Series" w/ EM2000 controllers- ADA  |
| -8             | 8482259     | 1    | <b>EXTENSION BOARD ASSEMBLY..</b> Used as an aid in troubleshooting modules on Dash 2 locomotives                                       |
| -9             | 8415827     | 1    | <b>FUSE</b>   |

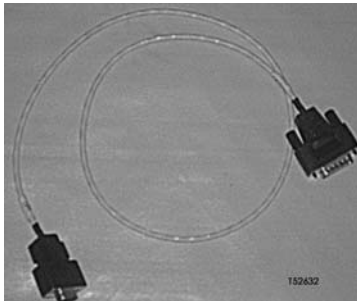
**ELECTRICAL****Ref. No. 0**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>   |
|---------------------------|------------------------|-------------|--|
| -0                        | <b>9568165</b>         | 1           | <b>HYDRAULIC PULLER ASSEMBLY..</b> Pinion- to remove pinions on D87 and earlier motors.  |
| -1                        | <b>9568100</b>         | 1           | <b>ADAPTER..</b> Nipple  |
| -2                        | <b>9568098</b>         | 1           | <b>SLEEVE..</b> Pinion   |
| -3                        | <b>9568101</b>         | 1           | <b>SLEEVE..</b> Shaft  |
| -4                        | <b>9568099</b>         | 1           | <b>SPACER..</b> Thrust   |
| -5                        | <b>9568104</b>         | 1           | <b>PLATE..</b> Yoke  |
| -6                        | <b>9568097</b>         | 4           | <b>SPACER..</b> Assembly   |
| -7                        | <b>9580138</b>         | 1           | <b>HYDRAULIC CYLINDER</b>  |
| -8                        | <b>9568105</b>         | 1           | <b>PLATE..</b> Ram   |
| -9                        | <b>8487866</b>         | 4           | <b>NUT..</b> 1-14 hex  |
| -10                       | <b>9568106</b>         | 1           | <b>PLATE..</b> Saddle  |
| -11                       |                        |             | <b>HYDRAULIC SOURCES..</b> Two independent hydraulic sources are required to operate puller 9568165. Suitable equipment is listed below. |
| -12                       | <b>9533321</b>         | 1           | <b>KIT- PINION REMOVAL..</b> 40,000 psi (not shown)  |
| -13                       | <b>8174285</b>         | 1           | <b>HYDRAULIC PUMP..</b> 10,000 psi (not shown)   |
| -14                       | <b>9581330</b>         | 1           | <b>HOSE..</b> (not shown)  |

**ELECTRICAL**



**Ref. No. 1**



**Ref. No. 2**



**Ref. No. 3**



**Ref. No. 9**



**Ref. No. 16**

| Asm - Ref. No. | Part Number | Qty. | Description  |
|----------------|-------------|------|--|
| -1             | 40052125    | 1    | <b>EM2000 LOAD/RESET BOX AND CABLE..</b> Interface, cable assembly   |
| -2             | 40059368    | 1    | <b>CABLE ASSEMBLY..</b> EM2000 Download  |
| -3             | 40094241    | 1    | <b>EMDEC COMMUNICATIONS CABLE KIT..</b> For Windows- used for communication with KNORR CCB II, Rockwell Event Recorder Cable, and Harmon Cab Signal. |
| -4             | 40055366    | 1    | <b>CABLE..</b> 9 pin female to 9 pin male cable - Used for downloading event recorders and cab signal.   |
| -5             | 40055364    | 1    | <b>CABLE..</b> PCT-R cable   |
| -6             | 40055365    | 1    | <b>CABLE..</b> 15DR plug connection cable  |
| -7             | 40094242    | 1    | <b>TRANSLATOR BOX..</b> EMDEC  |
| -8             | 40094243    | 1    | <b>SOFTWARE..</b> EMDEC communications   |
| -9             | 40055368    | 1    | <b>PC READER KIT ASM..</b> For Dos-based PC system.  |
| -10            | 40055363    | 1    | <b>TRANSLATOR BOX..</b> PC Reader  |
| -11            | 40055362    | 1    | <b>SOFTWARE..</b> PC Reader  |
| -12            | 40055364    | 1    | <b>READER CABLE..</b> PC Reader  |
| -13            | 40055365    | 1    | <b>ADAPTER..</b> PC Reader   |
| -14            | 40055366    | 1    | <b>SERIAL CABLE..</b> PC Reader  |
| -15            | 40103969    | 1    | <b>SENSOR BOX SIMULATOR..</b> EMDEC - Connects to an EMDEC sensor harness, qualifying up to six sensors simultaneously (not shown)                   |
| -16            | 40060038    | 1    | <b>EXTRACTION TOOL..</b> #8 pin/socket, EM2000   |
| -17            | 40076568    | 1    | <b>CIRCUIT MODULE..</b> MMB302 - For downloading EM2000 software (not shown)   |

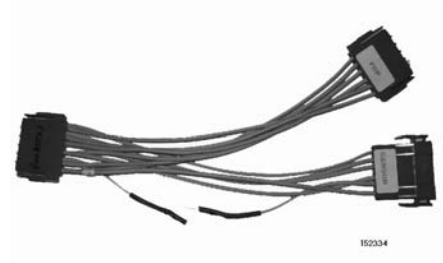
**ELECTRICAL**



**Ref. No. 2**



**Ref. No. 3**



**Ref. No. 4**



**Ref. No. 5**



**Ref. No. 6**



**Ref. No. 8**

| <b>Asm - Ref. No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|-----------------------|--------------------|-------------|--|
| -1                    | 40087939           | 1           | PCMCIA CARD.. 32 MB (small card requires adapter) (not shown)  |
| -2                    | 40087940           | 1           | ADAPTER.. For PCMCIA card 40087939   |
| -3                    | 40086977           | 1           | POWER INVERTER.. DC to AC  |
| -4                    | 40085567           | 1           | ANALOG CIRCUIT SPLITTER.. PDP cable.   |
| -5                    | 40086611           | 1           | KEYBOARD.. FIRE service- compact flat-tray keyboard with 5 pin DIN connector   |
| -6                    | 40095049           | 1           | FIRE CABLE ASSEMBLY.. FIRE computer keyboard adapter cable assembly  |
| -7                    | 40015789           | 1           | SPOTTER CONTROL KIT.. Locomotive control for retrofit on GP and SD locomotives (not shown)   |
| -8                    | 40083210           | 1           | EVENT RECORDER   |
| -9                    | 40100047           | 1           | DOWNLOAD CABLE.. Used with event recorder 40083210- required when user wants to download information from the recorder. (not shown)        |
| -10                   | 40112381           | 1           | SUPPORT KIT.. Event recorder- includes download cable, PCMCIA card, and Windows software (not shown)- For use with event recorder 40083210 |
| -11                   | 40125502           | 1           | CABLE.. Pulse Fuelink ( Not shown)   |

**ELECTRICAL**



**Ref. No. 3**



**Ref. No. 5**



**Ref. No. 7**

| Asm - Ref. No. | Part Number | Qty. | Description   |
|----------------|-------------|------|---|
| -1             | 40052125    | 1    | <b>EM2000 LOAD/RESET BOX AND CABLE</b> .. Interface, cable assembly (not shown).  |
| -2             | 40059368    | 1    | <b>CABLE ASSEMBLY</b> .. EM2000 Download (not shown)..  |
| -3             | 40094241    | 1    | <b>EMDEC PC READER KIT</b> ... EMDEC Communications Cable Kit for Windows-Based PC Systems  |
| -4             | 40094242    | 1    | <b>TRANSLATOR BOX</b> ... EMDEC PC Reader - Windows based version has hard wired Reader Cable.                                    |
| -5             | 40094243    | 1    | <b>LAPTOP SOFTWARE</b> ... EMDEC Communications-Windows Based PC System. WinEmmon. Includes “EMDEC HELP” troubleshooting program. |
| -6             | 40055365    | 1    | <b>ADAPTER PLUG</b> ... Windows and DOS Based PC Systems. PC Reader connects to locomotive port.                                  |
| -7             | 40103969    | 1    | <b>SENSOR BOX SIMULATOR</b> .. EMDEC - Connects to an EMDEC sensor harness, qualifying up to six sensors simultaneously.          |
| -8             | 40060038    | 1    | <b>EXTRACTION TOOL</b> .. #8 PIN/SOCKET, EM2000 (not shown).  |

**ELECTRICAL****Ref. No. 3****Ref. No. 9**

| <b>Asm -<br/>Ref. No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>  |
|---------------------------|------------------------|-------------|---|
| -1                        | 40052125               | 1           | <b>EM2000 LOAD/RESET BOX AND CABLE ..</b> Interface, cable assembly (not shown).  |
| -2                        | 40059368               | 1           | <b>CABLE ASSEMBLY..</b> EM2000 Download (not shown)..   |
| -3                        | 40055368               | 1           | <b>EMDEC PC READER KIT...</b> EMDEC Communications Cable Kit for DOS-Based PC Systems   |
| -4                        | 40055363               | 1           | <b>TRANSLATOR BOX ..</b> ENDEC - PC Reader-DOS Based PC System.   |
| -5                        | 40055362               | 1           | <b>LAPTOP SOFTWARE..</b> EMDEC Communications-DOS Emmon Based PC System (not shown).  |
| -6                        | 40055364               | 1           | <b>READER CABLE...</b> DOS Based PC System. Interface cable assembly. Cable can be used with "old style" Windows based Translator Box (Prior to Cable hardwired to Translator Box). |
| -7                        | 40055366               | 1           | <b>CABLE-PC-9D..</b> Windows and DOS Based PC Systems Serial Cable - 9 pin male cable - Used for downloading event recorders and cab signal.  |
| -8                        | 40055365               | 1           | <b>ADAPTER PLUG...</b> Windows and DOS Based PC Systems. PC Reader connects to locomotive port.   |
| -9                        | 40103969               | 1           | <b>SENSOR BOX SIMULATOR..</b> EMDEC - Connects to an EMDEC sensor harness, qualifying up to six sensors simultaneously.   |
| -10                       | 40060038               | 1           | <b>EXTRACTION TOOL..</b> #8 PIN/SOCKET, EM2000 (not shown).   |



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## **SECTION 3. EQUIPMENT**

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|                                   |            |
|-----------------------------------|------------|
| <b>SECTION 3. EQUIPMENT .....</b> | <b>3-1</b> |
| EQUIPMENT (AIR COMPRESSOR) .....  | 3-2        |
| EQUIPMENT (TRUCK).....            | 3-5        |

**EQUIPMENT (AIR COMPRESSOR)**



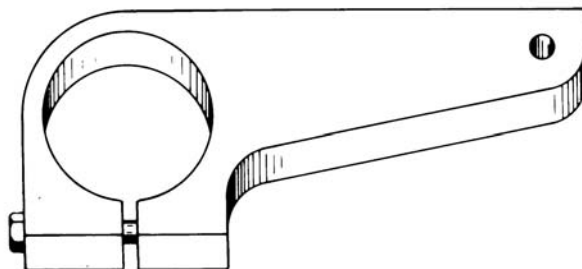
**Ref. No. 1**



**Ref. No. 6**



**Ref. No. 8**

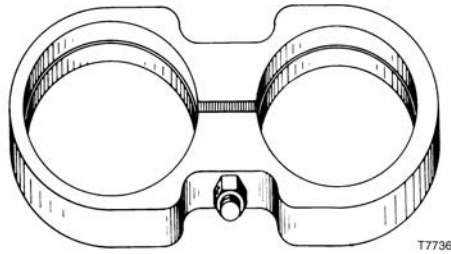
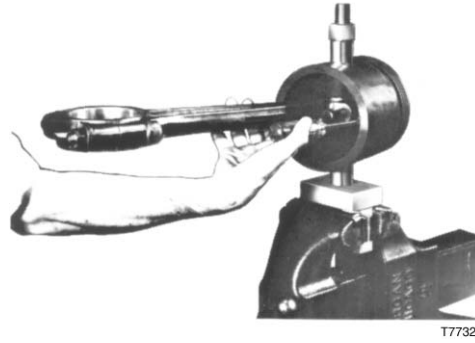


**Ref. No. 7**



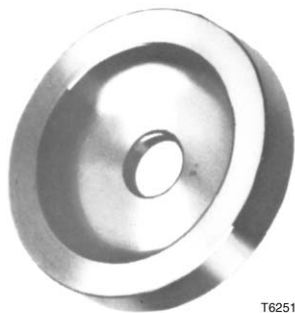
**Ref. No. 10**

| Asm - Ref.No. | Part Number    | Qty. | Description   |
|---------------|----------------|------|---|
| -1            |                |      | <b>GUIDES</b>   |
| -2            | <b>8205493</b> | 1    | <b>GUIDE..</b> Piston ring 7-7/8" - WXO, ABO, ADJ, WBO, ADJV, WXOV, WLN, WLO, WLQ, WLR, WLS               |
| -3            | <b>8205490</b> | 1    | <b>GUIDE..</b> Piston ring 4" - ABO, ADX, ADJ, ABOV, ADJV, WLP, WLQ, WLS                                  |
| -4            | <b>8205491</b> | 1    | <b>GUIDE..</b> Piston ring 5-3/4"- WXE, WXO, WBO, WBG, WXOV, WXG, WLO, WLN, WLG, WLR                      |
| -5            | <b>8205492</b> | 1    | <b>GUIDE..</b> Piston ring 7"- WXE, WXG, ADX, WLG   |
| -6            | <b>8231758</b> | 1    | <b>SCRAPER..</b> Piston bushing groove  |
| -7            | <b>8214756</b> | 1    | <b>HOLDER..</b> Unloader valve- ABO, ADX, ADJ, ADJV, ABOV, WLP, WLQ, WLS                                  |
| -8            | <b>8219900</b> | 1    | <b>GUIDE..</b> Oil seal 2-1/2"- ABO, ADX, ADJ, ADJV, WLQ, WLS   |
| -9            | <b>8219901</b> | 1    | <b>GUIDE..</b> Oil seal 3-1/4" - WXE, WXO, WXG, WBO, WBG, ABOV, WXOV, WLG, WLN, WLO, WLP, WLR (not shown) |
| -10           | <b>8231757</b> | 1    | <b>PULLER..</b> Piston bushing  |

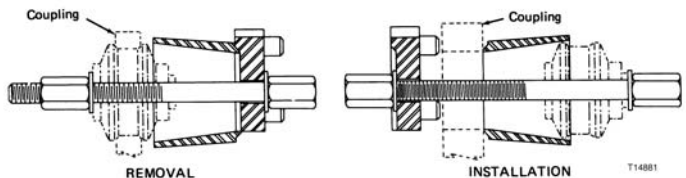
**EQUIPMENT (AIR COMPRESSOR)****Ref. No. 1****Ref. No. 2****Ref. No. 3****Ref. No. 4****Ref. No. 10**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8214755     | 1    | <b>HOLDER..</b> Unloader valve - WXE, WXO, WLQ, WBO, WBG, WXOV, WLO, WLQ, WLR   |
| -2            | 8213878     | 1    | <b>FIXTURE..</b> Piston assembly - used to assemble piston, rod and piston pin- all models  |
| -3            | 8214312     | 1    | <b>SPREADER..</b> Connecting rod - use with 8213878   |
| -4            |             |      | <b>EXPANDERS</b>  |
| -5            | 8205283     | 1    | <b>EXPANDER..</b> Piston ring 4"- ABO, ADX, ADJ, ABOV, ADJV, WLP, WLQ, WLS  |
| -6            | 8205284     | 1    | <b>EXPANDER..</b> Piston ring 5-3/4" - WXE, WXO, WXG, WBO, WBG, WXOV, WLQ, WLN, WLO, WLR  |
| -7            | 8205285     | 1    | <b>EXPANDER..</b> Piston ring 7"- WXE, WXG, ADX, WBG, WLQ   |
| -8            | 8205286     | 1    | <b>EXPANDER..</b> Piston ring 7-7/8"- WXO, ABO, ADJ, WBO, ADJV, WXOV, WLN, WLO, WLQ, WLR, WLS   |
| -9            | 8194036     | 1    | <b>EXPANDER..</b> Piston ring 8-1/2"- ABOV, WLP   |
| -10           | 8024101     | 1    | <b>ADAPTER..</b> Orifice test - 1/2" male pipe- air compressor- WBO, ADJ, ADX, ABO, WXO, WXE, WXG, WBG, ABOV, ADJV, WXOV, WLQ, WLN, WLO, WLP, WLQ, WLR, WLS |
| -11           | 8245757     | 1    | <b>ADAPTER..</b> Orifice test - 2" male- ADJV, WXOV- export compressor ABOV, WLQ, WLR, WLP (not shown)  |

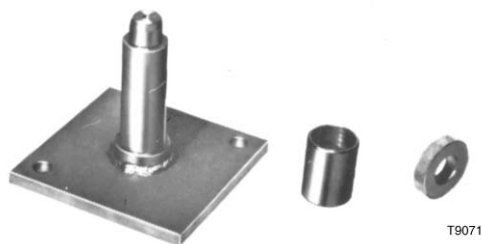
**EQUIPMENT (AIR COMPRESSOR)**



**Ref. No. 1**



**Ref. No. 10**



**Ref. No. 9**



**Ref. No. 11**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            |             |      | <b>ORIFICES</b>  |
| -2            | 8058885     | 1    | <b>ORIFICE..</b> .203- ADJ, ADJV, ADX, ABE, ABO, ABOV  |
| -3            | 8245759     | 1    | <b>ORIFICE..</b> .219- ADOA, ADD, ADO, ABO   |
| -4            | 8024102     | 1    | <b>ORIFICE..</b> .250- WXE   |
| -5            | 8062165     | 1    | <b>ORIFICE..</b> .281- WBO, W XO, WXOV, ABOV, WLN, WLO, WLP, WLR                             |
| -6            | 8058886     | 1    | <b>ORIFICE..</b> .359- WBG, WXG, WLG   |
| -7            | 8245758     | 1    | <b>ORIFICE..</b> .500- WXOV- Export ABOV, WLR, WLP   |
| -8            | 8336669     | 1    | <b>ORIFICE..</b> .625- ADJV, WLQ Exhausters  |
| -9            | 8231756     | 1    | <b>ANVIL..</b> Piston bushing installing   |
| -10           | 8239562     | 1    | <b>INSTALLER/REMOVER..</b> Bonded joint air compressor coupling                              |
| -11           | 8254465     | 1    | <b>GAUGE..</b> A.C. coupling- air compressor bond joint application checking                 |
| -12           | 8254466     | 1    | <b>GAUGE SET..</b> Master (base plate and calibration discs)- cooling fan drive (not shown)  |
| -13           | 8102249     | 1    | <b>HOLDER..</b> Honing master set- 4 pieces 4.75" to 7" air compressor cylinders (not shown) |

## EQUIPMENT (TRUCK)

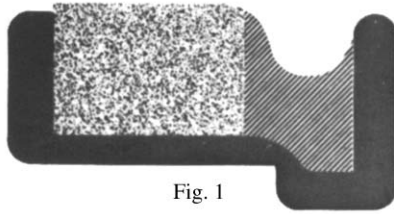


Fig. 1

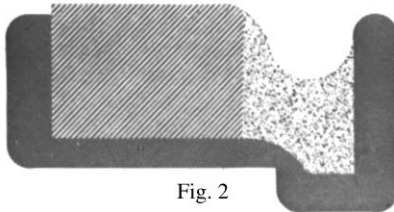


Fig. 2

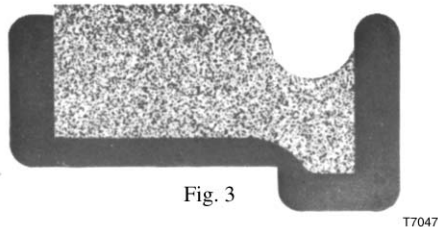


Fig. 3

Ref. No. 1



T21317

Ref. No. 11

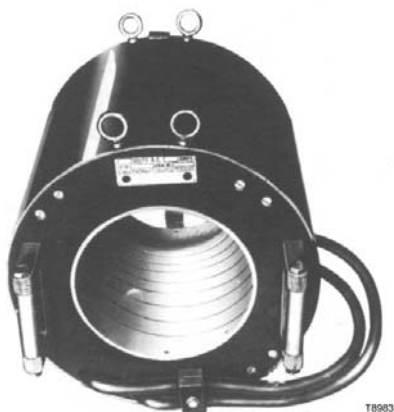


T19625

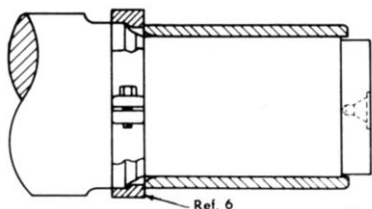
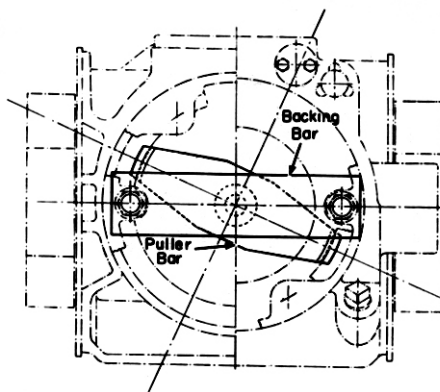
Ref. No. 12

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            |             |      | <b>BRAKE SHOES..</b> Abrasive, grinding  |
| -2            | 8255768     | 1    | <b>BRAKE SHOE..</b> Tread and flange - Fig. 3  |
| -3            | 8255769     | 1    | <b>BRAKE SHOE..</b> Flange only- Fig. 2  |
| -4            | 8255770     | 1    | <b>BRAKE SHOE..</b> Tread only- Fig. 1<br>For break head numbers 8197973, 8160060- Shoe size 18"- Replaces cast iron shoe number 8058776- Applications: switchers with flexible trucks, all 3 motor, 3 axle, SD trucks and all F and GP trucks.  |
| -5            | 8191637     | 1    | <b>BRAKE SHOE..</b> Tread and flange- Fig. 3   |
| -6            | 8191636     | 1    | <b>BRAKE SHOE..</b> Flange only- Fig. 2  |
| -7            | 8157177     | 1    | <b>BRAKE SHOE..</b> Tread only- Fig. 1<br>For break head numbers 8242785, 8160059- Shoe size 14"- Replaces cast iron shoe number 8059235- Applications: switchers with flexible trucks, all 3 motor, 3 axle, SD trucks, and all F and GP trucks. |
| -8            | 8031482     | 1    | <b>BRAKE SHOE..</b> Tread and flange- Fig. 3   |
| -9            | 8031481     | 1    | <b>BRAKE SHOE..</b> Flange only- Fig. 2  |
| -10           | 8031480     | 1    | <b>BRAKE SHOE..</b> Tread only- Fig. 1<br>For break head number 8151703- Shoe size 18"- Replaces cast iron shoe number 8055667- Application: all switchers with rigid switcher trucks.   |
| -11           | 9085874     | 1    | <b>SLACK ADJUSTER TOOL..</b> For pin type slack adjuster 8494013 and 8494109 fitted with clasp brakes and also EMD SD single shoe brake adjuster 9513003, 9513012, and 9516057.  |
| -12           | 8248656     | 1    | <b>WRENCH..</b> Open end- 2-1/2"- single shoe tread brake rigging  |

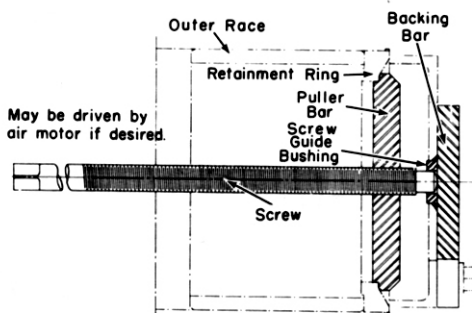
**EQUIPMENT (TRUCK)**



**Ref. No. 1**



**Ref. No. 3**



**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            |             |      | <b>HEATERS</b>  |
| -2            | 8254202     | 1    | <b>HEATER..</b> Induction- inner race- 6-1/2" x 12" journal box                       |
| -3            |             |      | <b>COLLARS</b>  |
| -4            | 8164608     | 1    | <b>COLLAR..</b> Inner race locating- 6-1/2" x 12" journal box                         |
| -5            | 8232368     | 1    | <b>COLLAR..</b> Inner race locating- 5-1/2" x 10" journal box                         |
| -6            |             |      | <b>PULLERS</b>  |
| -7            | 8160928     | 1    | <b>PULLER..</b> Outer bearing race- 6-1/2" x 12"- journal box with rubber thrust unit |
| -8            | 8218541     | 1    | <b>PULLER..</b> Outer bearing race- 5-1/2" x 10" journal box (export only)            |
| -9            | 8062137     | 1    | <b>PULLER..</b> Outer bearing race- 6-1/2" journal box with spring pack               |

**EQUIPMENT (TRUCK)**

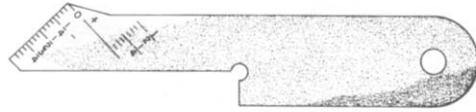


**Ref. No. 1**



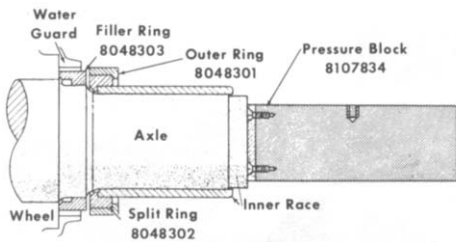
T4370

**Ref. No. 13**



T20799

**Ref. No. 15**



T6454

**Ref. No. 2**

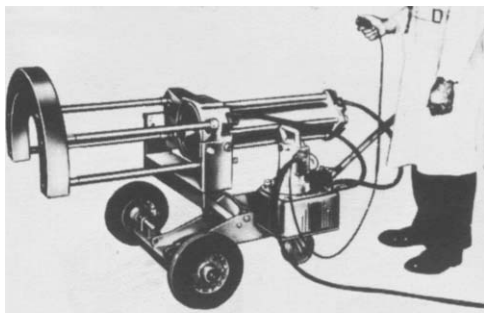


T21302

**Ref. No. 16**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 40069459    | 1    | <b>LIFTER FIXTURE..</b> Adapter, puller, applier, lifter for radial truck assembly. This tool was developed for removing and applying journal bearing adapters from Timken axle journal bearings. It was not designed to lift the entire axle assembly. |
| -2            | 8048299     | 1    | <b>REMOVER..</b> Inner race - 6-1/2" x 12" journal box  |
| -3            | 8048301     | 1    | <b>RING..</b> Outer   |
| -4            | 8048302     | 1    | <b>RING..</b> Split   |
| -5            | 8048303     | 1    | <b>RING..</b> Filler  |
| -6            | 8107834     | 1    | <b>BLOCK..</b> Pressure   |
| -7            |             |      | <b>REMOVER..</b> Inner race - 5-1/2" x 10" journal box (not shown)  |
| -8            | 8219259     | 1    | <b>RING..</b> Split   |
| -9            | 8219260     | 1    | <b>RING..</b> Outer   |
| -10           | 8219261     | 1    | <b>RING..</b> Filler  |
| -11           | 8219262     | 1    | <b>BLOCK..</b> Pressure   |
| -12           | 8219263     | 1    | <b>RING..</b> Filler  |
| -13           | 8084927     | 1    | <b>GAUGE..</b> Oil level- 6-1/2" x 12" journal  |
| -14           | 8229173     | 1    | <b>GAUGE..</b> Oil level 6" x 11" and 5-1/2" x 10" journal box (Export only- not shown)   |
| -15           | 9317668     | 1    | <b>GAUGE..</b> Oil level journal (for use on journals with filler cap assembly)   |
| -16           | 8391625     | 1    | <b>GAUGE..</b> Split collar locating- 6- 7/8" axle journal  |
| -17           | 8258486     | 1    | <b>GAUGE..</b> Split collar locating- 6" x 11" journal (not shown)  |

**EQUIPMENT (TRUCK)**



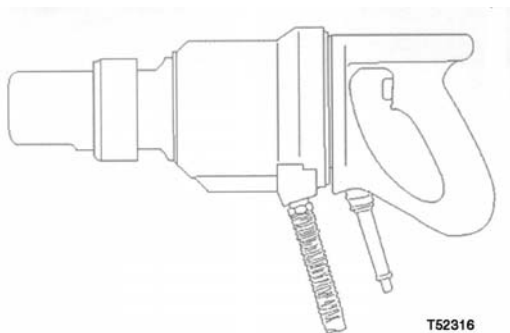
T11770

**Ref. No. 1**



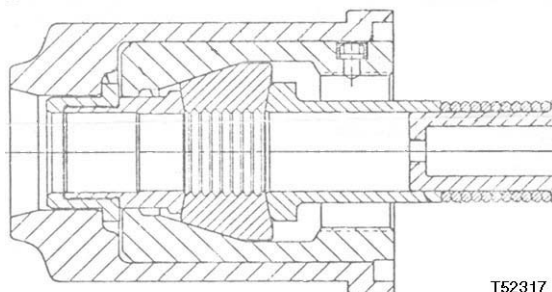
T19651

**Ref. No. 3**



T52316

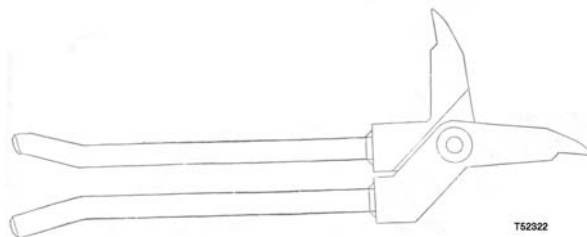
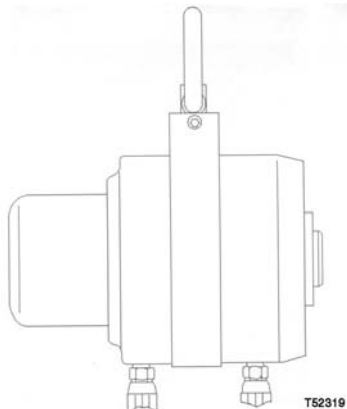
**Ref. No. 5**



T52317

**Ref. No. 6**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8303330     | 1    | <b>PULLER-INSTALLER..</b> 230V- Hydraulic 100 ton- includes 8284317 puller shoe (This tool is used with appropriate adapters (8303332 and 8330478 listed below) to remove and apply Timken "AP" and EMD "Hyatt" type journal boxes having tapered roller bearings |
| -2            | 40029012    | 1    | <b>PULLER..</b> 380V- 3 phase (not shown)   |
| -3            | 8303332     | 1    | <b>ADAPTER..</b> Use with 8303330 puller - installer for units having 6" x 11" Timken "AP" or EMD "Hyatt" journal boxes with tapered roller bearings  |
| -4            | 8330478     | 1    | <b>ADAPTER..</b> Use with 8303330 puller - installer for units having 6-1/2" x 12" Timken "AP" or EMD "Hyatt" journal boxes with tapered roller bearings (not shown)  |
| -5            | 40057701    | 1    | <b>HUCK FASTENER GUN..</b> Hydraulic- used for installation of HuckBolt fasteners up to 1" in diameter. Also features an unloading valve- relieves hydraulic pressure at both ends of stroke and pintail ejector on nose assembly.                                |
| -6            | 40057702    | 1    | <b>NOSE ASSEMBLY..</b> For HuckBolt C50L-32 self-releasing.   |

**EQUIPMENT (TRUCK)****Ref. No. 1****Ref. No. 2****Ref. No. 4**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | 40087892           | 1           | <b>REMOVER..</b> Spring depression tool for gear case filler cap - JT42CWR (class 66) locomotives.   |
| -2                   | 40085650           | 1           | <b>HUCK FASTENER GUN..</b> Hydraulic- incorporates the nose assembly for installation of the industry standard 1-3/8" diameter C50L HuckBolts- compact dimensions allow work in limited clearance applications |
| -3                   | 40085645           | 1           | <b>HUCK FASTENER GUN..</b> Hydraulic- 1" HuckBolts (not shown)   |
| -4                   |                    |             | <b>POWERIG UNITS</b>   |
| -5                   | 40086354           | 1           | <b>POWERIG UNIT..</b> Hydraulic- operates on 115V AC. portable unit, sized for moderate production and repair applications   |
| -6                   | 40057705           | 1           | <b>POWERIG UNIT..</b> Hydraulic- operates on 220V AC. portable unit, sized for moderate production and repair applications (Same as 40086354 except operates on a 220 V AC.)                                   |
| -7                   | 40125538           | 1           | <b>POWERIG UNIT..</b> Hydraulic- operates on a 380/400/440 V AC, 50 Hz, and 3 ph. (not shown)  |
| -8                   | 40125539           | 1           | <b>POWERIG UNIT..</b> Hydraulic- operates on a 220/240 V AC, 50 Hz, and 1 ph. (not shown)  |
| -9                   | 40125542           | 1           | <b>POWERIG UNIT..</b> Hydraulic- operates on a 110 V AC, 50 Hz. (not shown)  |
| -10                  | 40125543           | 1           | <b>HOSE..</b> 10 m long, tool to power unit (not shown)  |
| -11                  | 40125544           | 1           | <b>GAUGE..</b> Test pressure (not shown)   |



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## **SECTION 4. MISCELLANEOUS**

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**MISCELLANEOUS**



**Ref. No. 1**

T8729



**Ref. No. 3**

T35162



**Ref. No. 4**

T52312



**Ref. No. 2**

T9398



**Ref. No. 6**

T21320

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8045450     | 1    | <b>DRILL..</b> Electric- 1/4" 115 volts, 50-60 cycles, AC-DC   |
| -2            | 8140315     | 1    | <b>SET..</b> Hand tool- basic hand tools for all locomotives   |
| -3            | 8361215     | 1    | <b>TORQUE WRENCH AND DRIVERS..</b> Includes torque wrench (0-50 in lbs.), hand driver, 7/16" hex socket, 5/64", 3/32", 1/8", 5/32", and 3/16" hex head cap screw drivers, and tool box |
| -4            | 40052055    | 1    | <b>WRENCH..</b> 15/16 Offset box wrench  |
| -5            | 8244011     | 1    | <b>WRENCH..</b> Chain for drill rigs (not shown)   |
| -6            | 8386064     | 1    | <b>SOCKET..</b> Main bearing- 1-13/16" hex - 1" drive  |

**MISCELLANEOUS**



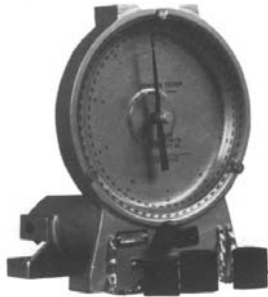
**Ref. No. 1**

T35161



**Ref. No. 9**

T35051



**Ref. No. 20**

T34471



**Ref. No. 21**

T34837

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8195349     | 1    | WRENCH SET.. Terminal stud nut                                   |
| -2            | 8195350     | 1    | WRENCH.. 3/16"   |
| -3            | 8195351     | 1    | WRENCH.. 1/4"  |
| -4            | 8195352     | 1    | WRENCH.. 5/16"   |
| -5            | 8195353     | 1    | WRENCH.. 11/32"  |
| -6            | 8195354     | 1    | WRENCH.. 3/8"  |
| -7            | 8195355     | 1    | WRENCH.. 7/16"   |
| -8            | 8195356     | 1    | WRENCH.. 1/2"  |
| -9            | 40040097    | 1    | WRENCH SET.. Air impact  |
| -10           | 40040099    | 1    | WRENCH.. Air impact  |
| -11           | 40040100    | 1    | SOCKET SET.. Impact 5/8" thru 15/16"                             |
| -12           | 40040106    | 1    | CHUCK.. Collet type  |
| -13           | 40040101    | 1    | HOSE.. Air 6 ft.- air supply to wrench                           |
| -14           | 40040105    | 1    | ADAPTER.. Impact wrench- for use with inserts listed below       |
| -15           | 40040102    | 1    | BIT.. Insert, Phillips screwdriver (2)                           |
| -16           | 40040103    | 1    | BIT.. Insert, Phillips screwdriver (3)                           |
| -17           | 40040104    | 1    | BIT.. Insert, Phillips screwdriver (4)                           |
| -18           | 40040098    | 1    | BOX.. Plastic  |
| -19           | 8233824     | 1    | SOCKET.. Impact- 9/16" hex- fits impact set 40040097 (not shown) |
| -20           | 9559516     | 1    | TESTER TORQUE WRENCH.. 0-6000 in. lbs. and 0-500 ft. lbs.        |
| -21           | 40038258    | 1    | WRENCH.. Ratchet 1/2" drive                                      |

**MISCELLANEOUS****Ref. No. 1**

| <b>Asm -<br/>Ref.No.</b> | <b>Part<br/>Number</b> | <b>Qty.</b> | <b>Description</b>  |
|--------------------------|------------------------|-------------|---|
| -1                       | <b>8243903</b>         | 1           | <b>SET..</b> Basic hand tools for domestic and export locomotives |
| -2                       |                        | 1           | <b>TOOL BOX</b>   |
| -3                       |                        | 1           | <b>PADLOCK..</b> Includes 2 keys                                  |
| -4                       |                        | 1           | <b>OPEN END WRENCH..</b> 5/16" x 3/8"                             |
| -5                       |                        | 1           | <b>OPEN END WRENCH..</b> 1/2" x 7/16"                             |
| -6                       |                        | 1           | <b>OPEN END WRENCH..</b> 1/2" x 9/16"                             |
| -7                       |                        | 1           | <b>OPEN END WRENCH..</b> 19/32" x 11/16"                          |
| -8                       |                        | 1           | <b>OPEN END WRENCH..</b> 5/8" x 3/4"                              |
| -9                       |                        | 1           | <b>OPEN END WRENCH..</b> 13/16" x 7/8"                            |
| -10                      |                        | 1           | <b>OPEN END WRENCH..</b> 7/8" x 1"                                |
| -11                      |                        | 1           | <b>OPEN END WRENCH..</b> 1-1/8" x 1-1/4"                          |
| -12                      |                        | 1           | <b>SOCKET..</b> 7/16", 1/2" drive                                 |
| -13                      |                        | 1           | <b>SOCKET..</b> 1/2", 1/2" drive                                  |
| -14                      |                        | 1           | <b>SOCKET..</b> 9/16", 1/2" drive                                 |
| -15                      |                        | 1           | <b>SOCKET..</b> 5/8", 1/2" drive                                  |
| -16                      |                        | 1           | <b>SOCKET..</b> 11/16", 1/2" drive                                |
| -17                      |                        | 1           | <b>SOCKET..</b> 3/4", 1/2" drive                                  |
| -18                      |                        | 1           | <b>SOCKET..</b> 13/16", 1/2" drive                                |
| -19                      |                        | 1           | <b>SOCKET..</b> 7/8", 1/2" drive                                  |
| -20                      |                        | 1           | <b>SOCKET..</b> 15/16", 1/2" drive                                |
| -21                      |                        | 1           | <b>SOCKET..</b> 1", 1/2" drive                                    |
| -22                      |                        | 1           | <b>SOCKET..</b> 1-1/16", 1/2" drive                               |
| -23                      |                        | 1           | <b>SOCKET..</b> 1-1/8", 1/2" drive                                |
| -24                      |                        | 1           | <b>RATCHET..</b> 1/2" drive                                       |
| -25                      |                        | 1           | <b>EXTENSION-SHORT..</b> 1/2" drive                               |
| -26                      |                        | 1           | <b>EXTENSION-MEDIUM..</b> 1/2" drive                              |
| -27                      |                        | 1           | <b>EXTENSION-LONG..</b> 1/2" drive                                |
| -28                      |                        | 1           | <b>UNIVERSAL..</b> 1/2" drive                                     |
| -29                      |                        | 1           | <b>HINGE HANDLE..</b> 1/2" drive                                  |
| -30                      |                        | 1           | <b>SOCKET..</b> 7/8", 3/4" drive                                  |
| -31                      |                        | 1           | <b>SOCKET..</b> 1-1/16", 3/4" drive                               |
| -32                      |                        | 1           | <b>SOCKET..</b> 1-1/8", 3/4" drive                                |
| -33                      |                        | 1           | <b>SOCKET..</b> 1-5/16", 3/4" drive                               |
|                          |                        |             | <i>(Continued)</i>  |

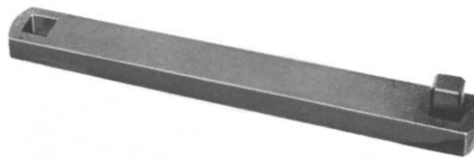
| Asm -<br>Ref.No. | Part<br>Number | Qty. | Description                               |
|------------------|----------------|------|---|
| -1               | 8243903        | 1    | <b>SET..</b> Basic hand tools (continued) |
| -34              |                | 1    | <b>SOCKET..</b> 1-7/16", 3/4" drive       |
| -35              |                | 1    | <b>SOCKET..</b> 1-1/2", 3/4" drive        |
| -36              |                | 1    | <b>SOCKET..</b> 2-1/4", 3/4" drive        |
| -37              |                | 1    | <b>SOCKET..</b> 15/16", 3/4" drive        |
| -38              |                | 1    | <b>UNIVERSAL..</b> 3/4" drive             |
| -39              |                | 1    | <b>HANDLE-HINGE..</b> 3/4" drive          |
| -40              |                | 1    | <b>RATCHET..</b> 3/4" drive               |
| -41              |                | 1    | <b>BOX WRENCH..</b> 3/8" x 7/16"          |
| -42              |                | 1    | <b>BOX WRENCH..</b> 1/2" x 9/16"          |
| -43              |                | 1    | <b>BOX WRENCH..</b> 3/4" x 7/8"           |
| -44              |                | 1    | <b>BOX WRENCH..</b> 15/16" x 1"           |
| -45              |                | 1    | <b>CHISEL</b>                             |
| -46              |                | 1    | <b>PUNCH</b>                              |
| -47              |                | 1    | <b>SCREW DRIVER..</b> Short               |
| -48              |                | 1    | <b>SCREW DRIVER..</b> Long                |
| -49              |                | 1    | <b>PRY BAR</b>                            |
| -50              |                | 1    | <b>HAMMER..</b> Ball peen                 |
| -51              |                | 1    | <b>PLIERS</b>                             |
| -52              |                | 1    | <b>DIAGONAL PLIERS</b>                    |
| -53              |                | 1    | <b>WRENCH..</b> 8" Adjustable             |

**MISCELLANEOUS**



T11954

**Ref. No. 1**



T19583

**Ref. No. 2**



T19882

**Ref. No. 3**



T8718

**Ref. No. 12**



T19608

**Ref. No. 13**

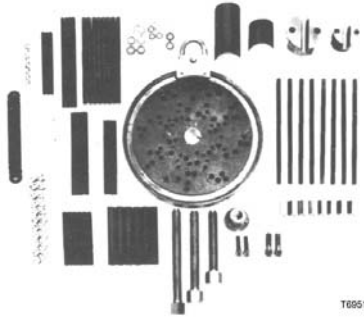


T7393

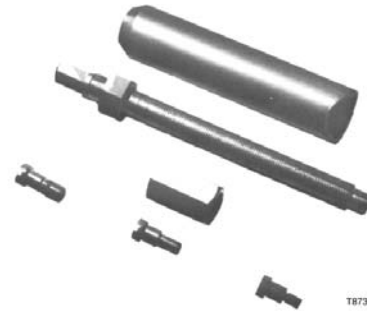
**Ref. No. 14**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8206869     | 1    | <b>WRENCH..</b> Ratchet torque 30-200 ft. lbs.- 1/2" drive  |
| -2            | 8290884     | 1    | <b>EXTENSION..</b> Torque wrench 8-5/8"- used with 8206869- torque wrench                                 |
| -3            |             |      | <b>WRENCHES..</b> Torque  |
| -4            | 8157122     | 1    | <b>WRENCH..</b> Torque- 0-25 ft. lbs.- 3/8" drive   |
| -5            | 8375396     | 1    | <b>WRENCH..</b> Torque- 0-50 ft. lbs.- 1/2" drive   |
| -6            | 8157120     | 1    | <b>WRENCH..</b> Torque- 0-100 ft. lbs.- 1/2" drive  |
| -7            | 8398513     | 1    | <b>WRENCH..</b> Torque- 0-250 ft. lbs.- 1/2" drive  |
| -8            | 8173332     | 1    | <b>WRENCH..</b> Torque- 0-200 ft. lbs.- 3/4" drive  |
| -9            | 8157121     | 1    | <b>WRENCH..</b> Torque- 0-300 ft. lbs.- 3/4" drive  |
| -10           | 8377322     | 1    | <b>WRENCH..</b> Torque- 0-500 ft. lbs.- 3/4" drive  |
| -11           | 40038257    | 1    | <b>METER..</b> Torque- 0-2000 ft. lbs.- 1" drive (not shown)  |
| -12           | 8236719     | 1    | <b>REMOVER SET..</b> Stud, 14 removers- 1/4" to 5/8" and metal box  |
| -13           | 8238336     | 1    | <b>REMOVER SET..</b> Stud 3/4"- 10, 3/4"- 16, 7/8"- 9, 7/8"- 14, 1"- 8, 1"-14- plus housing and metal box |
| -14           | 8044517     | 1    | <b>EXTRACTOR SET..</b> Broken stud, screw and pipe  |

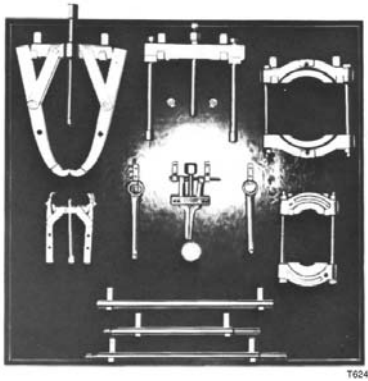
## MISCELLANEOUS



Ref. No. 1



Ref. No. 3



Ref. No. 7



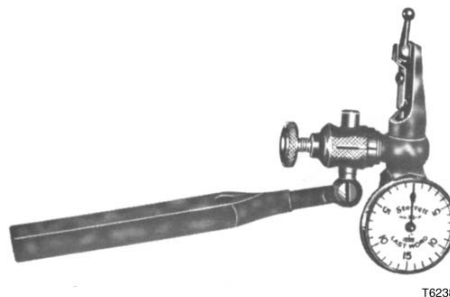
Ref. No. 17

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8168577     | 1    | <b>PLATE ASSEMBLY..</b> Manual pulling kit- main gen. bearing caps, traction motor bearing caps, couplings, and sheaves- Main gen:D4, 8, 10, 12, 12A, D22, 32, 15, 15A- Traction motors: D7, 77 |
| -2            | 8213622     | 1    | <b>PLATE ASSEMBLY..</b> Manual pulling kit- Traction motor export D12, 22, 32, 15, 25- Gen. D19, 29, 36   |
| -3            | 8225989     | 1    | <b>PULLER..</b> Complete, miscellaneous   |
| -4            | 8225992     | 1    | <b>SCREW..</b> Shoulder 3/8" - 24   |
| -5            | 8225991     | 1    | <b>SCREW..</b> Shoulder 5/16" - 24  |
| -6            | 8225990     | 1    | <b>SCREW..</b> Shoulder 1/4" - 28   |
| -7            |             |      | <b>BEARING PULLER</b>   |
| -8            | 8203626     | 1    | <b>LEG..</b> 16-1/2" Long pair  |
| -9            | 8203627     | 1    | <b>LEG..</b> 22-1/4" Long pair  |
| -10           | 8203628     | 1    | <b>NUT..</b> Coupling- for legs- pair   |
| -11           | 8203629     | 1    | <b>ATTACHMENT..</b> Bearing puller  |
| -12           | 8203630     | 1    | <b>ATTACHMENT..</b> Bearing cap pulling   |
| -13           | 8068022     | 1    | <b>ADAPTER..</b> Sheave puller  |
| -14           | 8068023     | 1    | <b>PULLER..</b> Gear - 28 ton   |
| -15           | 8107414     | 1    | <b>PULLER..</b> Gear- long jaws- 9 ton  |
| -16           | 8081157     | 1    | <b>PULLER..</b> Push- pair 9-1/2" long legs   |
| -17           | 8068029     | 1    | <b>PULLER..</b> Base dowel- engine, generator and air compressor  |

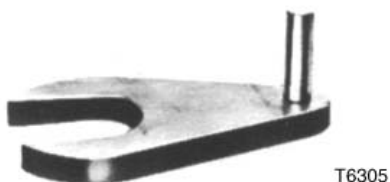
**MISCELLANEOUS**



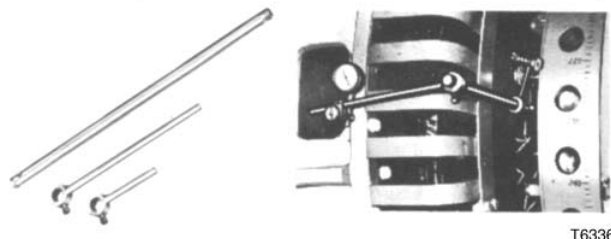
**Ref. No. 1**



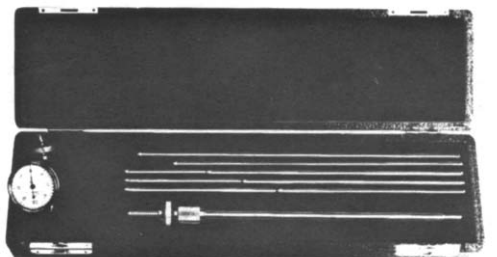
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**Ref. No. 3**



**Ref. No. 6**



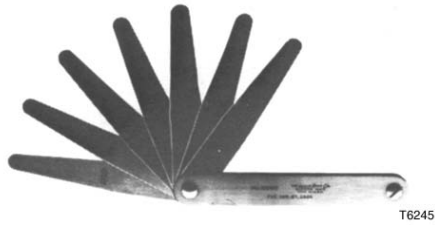
**Ref. No. 4**



**Ref. No. 7**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 40051621    | 1    | INDICATOR SET.. Dial - .001" to .100" generator alignment   |
| -2            | 40051622    | 1    | SLEEVE.. Attachment for dial indicator  |
| -3            | 8048327     | 1    | BRACKET.. Dial indicator support- GE 434 E1-544 B1 for alignment  |
| -4            | 8074566     | 1    | INDICATOR.. Dial set- deflection 0" to .020" by .001"- range 2-1/4" to 18"                                      |
| -5            | 8088245     | 1    | INDICATOR.. Dial, universal type  |
| -6            | 8122000     | 1    | ROD.. Support- dial indicator- CA5, 6, 7, D14, 16 and 18 alternators (A20 also requires 8067338 - See page 4-9) |
| -7            | 8048288     | 1    | RULE SET.. Pocket   |

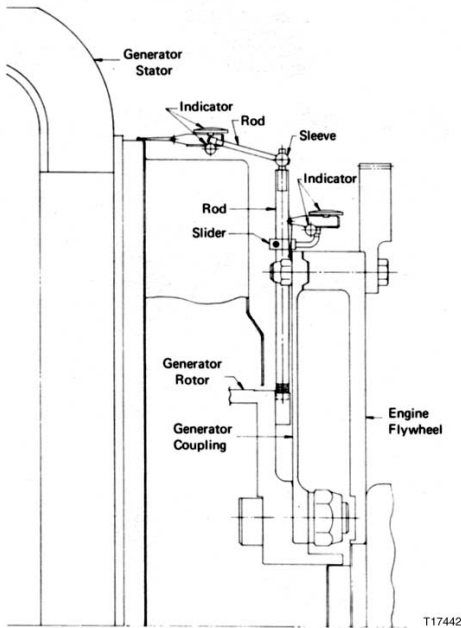
**MISCELLANEOUS**



**Ref. No. 1**



**Ref. No. 9**



**Ref. No. 2**



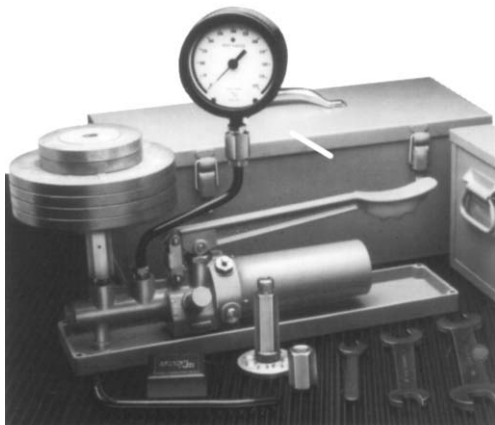
**Ref. No. 10**



**Ref. No. 11**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8067337     | 1    | GAUGE.. Thickness, 13 gauges, .0015" - .200"  |
| -2            | 8460471     | 1    | ALIGNMENT KIT.. Engine- generator   |
| -3            | 40061205    | 1    | INDICATOR.. Alignment   |
| -4            | 8460473     | 1    | SLIDER ASSEMBLY.. Alignment   |
| -5            | 8460476     | 1    | ROD.. Alignment   |
| -6            | 8460477     | 1    | ROD.. 12" 1/4 Pipe tap  |
| -7            | 8460478     | 1    | ROD.. 13" 1/4 Pipe tap  |
| -8            | 8460569     | 1    | SLEEVE.. Alignment  |
| -9            | 8460472     | 1    | INDICATOR.. Includes 9559047 ball contact point, swivel clamp, holding bar, and protective case for engine generator alignment of SD45 and 45X locomotives having thick generator coupling discs. |
| -10           | 8067338     | 1    | ROD.. Dial indicator support- all main generators- (A20 also requires 8122000 - See page 4-8)   |
| -11           | 8133046     | 1    | ROD.. Support- dial indicator air compressor couplings and miscellaneous  |

**MISCELLANEOUS**



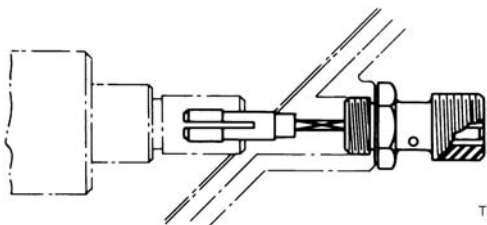
**Ref. No. 3**

T35313



**Ref. No. 7**

T52627



**Ref. No. 11**

T8686

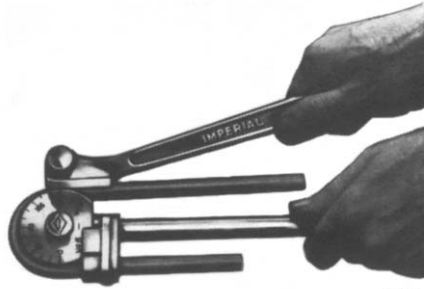


**Ref. No. 12**

T35156

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 40118779    | 1    | <b>DIGITAL THERMOMETER..</b> Used in combination with 40118780 to check temperature at various points on the traction motor pinion (not shown)                                 |
| -2            | 40118780    | 1    | <b>TEMPERATURE PROBE..</b> Surface - Used in combination with 40118779 to check temperature at various points on the traction motor pinion (-127 to 600 degrees C) (not shown) |
| -3            | 8064951     | 1    | <b>TESTER..</b> Gauge- dead weight type 10-1000 lbs.   |
| -4            | 40021300    | 3    | <b>WEIGHT..</b> 10 lb. weight- use with high pressure  |
| -5            | 40021301    | 2    | <b>WEIGHT..</b> 20 lb. weight- use with high pressure  |
| -6            | 40021302    | 3    | <b>WEIGHT..</b> 40 lb. weight- use with high pressure  |
| -7            | 40047935    | 1    | <b>TACHOMETER..</b> Hand digital - governor and miscellaneous  |
| -8            | 40034800    | 1    | <b>TIP..</b> Triangular steel  |
| -9            | 8141248     | 1    | <b>TIP..</b> Conical rubber  |
| -10           | 8204947     | 1    | <b>ROD..</b> Extension 1-1/2" long (not shown)   |
| -11           | 8210556     | 1    | <b>ADAPTER..</b> Tachometer drive for governor drive housing   |
| -12           | 40033472    | 1    | <b>TACHOMETER..</b> Contact / non- contact   |

**MISCELLANEOUS**



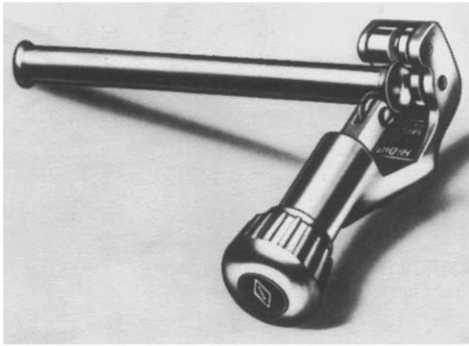
T6227

**Ref. No. 1**



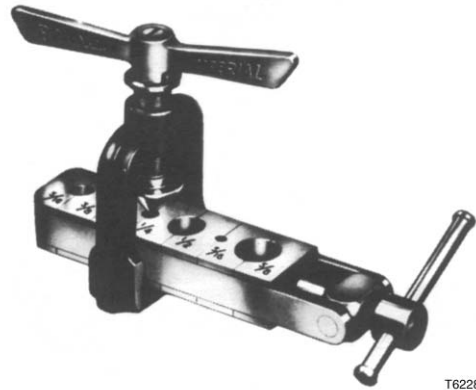
T19378

**Ref. No. 7**



T6730

**Ref. No. 13**

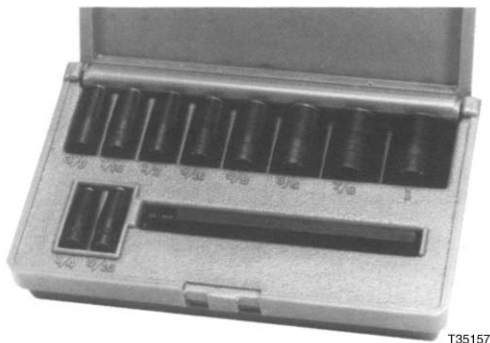


T6228

**Ref. No. 14**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            |             |      | <b>BENDERS</b>  |
| -2            | 8078996     | 1    | <b>BENDER..</b> Copper tubing- 1/4" O.D. tube   |
| -3            | 40034888    | 1    | <b>BENDER..</b> Copper tubing- 5/16" O.D. tube  |
| -4            | 8078998     | 1    | <b>BENDER..</b> Copper tubing- 3/8" O.D. tube   |
| -5            | 8078999     | 1    | <b>BENDER..</b> Copper tubing- 1/2" O.D. tube   |
| -6            | 8079000     | 1    | <b>BENDER..</b> Copper tubing- 5/8" O.D. tube   |
| -7            | 8491650     | 1    | <b>KIT..</b> Tube assembly  |
| -8            |             | 1    | <b>ASSEMBLY TOOL..</b> Tubing   |
| -9            |             | 1    | <b>RATCHET..</b> Tubing   |
| -10           |             | 1    | <b>ADAPTER..</b> For 1/4", 3/8", 1/2", 5/8"   |
| -11           |             | 1    | <b>MANDREL..</b> For 1/4", 3/8", 1/2", 5/8"   |
| -12           | 9323628     | 1    | <b>CUTTER..</b> For 1/4", 3/8", 1/2", 5/8"- for use with thermoplastic air brake tubing |
| -13           | 8097539     | 1    | <b>CUTTER..</b> Copper tubing- 1/8" to 1" O.D.  |
| -14           | 8042090     | 1    | <b>FLARE SET..</b> Copper tube- 3/16" to 5/8" O.D.                                      |

**MISCELLANEOUS**



**Ref. No. 1**



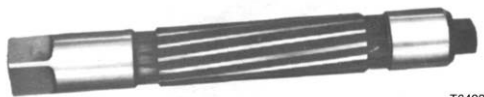
**Ref. No. 5**



**Ref. No. 2**



**Ref. No. 9**

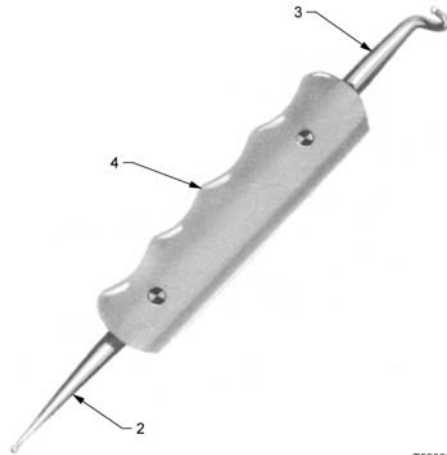


**Ref. No. 4**



**Ref. No. 10**

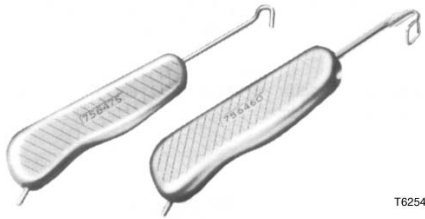
| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 40001105    | 1    | <b>PUNCH SET..</b> Gasket cutting- 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 3/4", 7/8", 1" holes |
| -2            | 8074592     | 1    | <b>REAMER..</b> Expansion- 15/16" to 1-1/16"   |
| -3            | 8074594     | 1    | <b>REAMER..</b> Expansion- 1-17/32" to 1-25/32" (not shown)  |
| -4            | 40040768    | 1    | <b>REAMER..</b> Expansion 1-3/4" - crankshaft  |
| -5            |             |      | <b>REAMERS..</b> Spiral flute  |
| -6            | 8074593     | 1    | <b>REAMER..</b> Hand 7/8"  |
| -7            | 8074595     | 1    | <b>REAMER..</b> Hand 29/32"  |
| -8            | 8074597     | 1    | <b>REAMER..</b> Hand 1-1/2"  |
| -9            | 8044484     | 1    | <b>REAMER..</b> 1/2"   |
| -10           | 8078994     | 1    | <b>REAMER..</b> I.D. and O.D. 3/16" to 1-1/2" in O.D. tubing   |

**MISCELLANEOUS****Ref. No. 1**

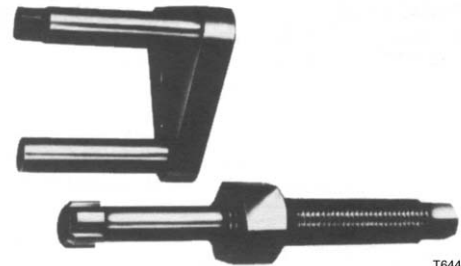
T52368



T6450

**Ref. No. 10**

T6254

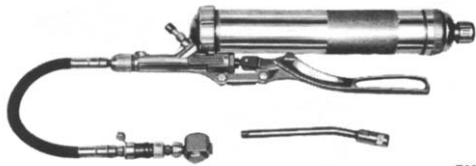
**Ref. No. 5**

T6449

**Ref. No. 12**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   |                    |             | <b>INSTALLATION TOOL..</b> High impact glazing                                 |
| -2                   | <b>9525023</b>     | 1           | <b>BIT..</b> Straight- used with 9525025                                       |
| -3                   | <b>9525024</b>     | 1           | <b>BIT..</b> Curved- used with 9525025   |
| -4                   | <b>9525025</b>     | 1           | <b>HANDLE..</b> Glazing installation   |
| -5                   |                    |             | <b>INSTALLERS..</b> Locomotive cab windows                                     |
| -6                   | <b>756475</b>      | 1           | <b>INSTALLER..</b> Weather seal  |
| -7                   | <b>756476</b>      | 1           | <b>INSTALLER..</b> Hook  |
| -8                   | <b>756460</b>      | 1           | <b>INSTALLER..</b> Rubber seal filler strip                                    |
| -9                   | <b>756461</b>      | 1           | <b>INSTALLER..</b> Eye   |
| -10                  | <b>8064859</b>     | 1           | <b>LATHE ADAPTER..</b> Idler axles and speedometer drive bushing               |
| -11                  | <b>8204252</b>     | 1           | <b>TAP AND DIE SET..</b> 1/4" to 1" tap, 1/4" to 1" die and collet (not shown) |
| -12                  | <b>8032710</b>     | 1           | <b>EXTRACTOR..</b> Speed recorder drive splined bushing- all bushings          |

**MISCELLANEOUS**



**Ref. No. 1**

T6226



T19582

**Ref. No. 5**



**Ref. No. 4**

T21334



T19617

**Ref. No. 7**



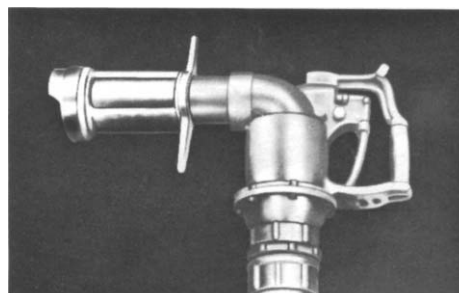
T8824

**Ref. No. 8**



T8791

**Ref. No. 9**



T7511

**Ref. No. 10**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 8078268     | 1    | GUN.. Grease - complete - up to 10,000 lbs. pressure   |
| -2            | 8078269     | 1    | GUN.. Grease only  |
| -3            | 40041566    | 1    | HOSE ASSEMBLY.. Grease gun   |
| -4            | 8216953     | 1    | ADAPTER.. Grease gun   |
| -5            | 8396624     | 1    | TESTER.. Belt tension  |
| -6            | 8499510     | 1    | TESTER.. U belt tension- dust bin blower drive- export and SW models (not shown)                                     |
| -7            | 8078273     | 1    | KIT.. Soldering torch- includes 5 torch stems, torch handle, hose assembly, case [Not shown], regulator, and adapter |
| -8            | 8231538     | 1    | DISPENSER.. Lubricant- non-asphalt type traction motor gear case   |
| -9            | 8099111     | 1    | PUMP.. Fits drums up to 400 lb. size-. delivery: 33 lbs of NLGI No. 1 grease per min. with 100 psi air pressure      |
| -10           |             |      | <b>COUPLINGS AND GASKETS</b>   |
| -11           | 8215342     | 1    | COUPLING.. Water filler only, locomotive having protectoseal, 1/4" turn tank fillers                                 |
| -12           | 8215724     | 1    | GASKET.. Coupling  |
| -13           | 8215343     | 1    | COUPLING.. Fuel filter only, locomotive having protectoseal, 1/4" turn tank fillers                                  |
| -14           | 8215723     | 1    | GASKET.. Coupling  |

**MISCELLANEOUS**



T12032

**Ref. No. 6**



T6225

**Ref. No. 9**



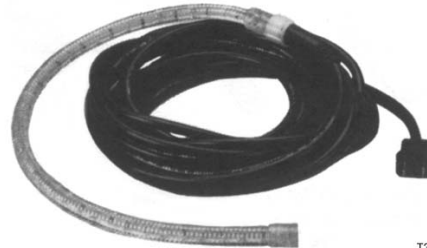
T6257

**Ref. No. 10**



T21351

**Ref. No. 8**



T35158

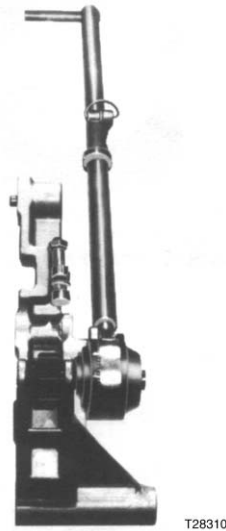
**Ref. No. 11**

| Asm - Ref.No. | Part Number | Qty. | Description  |
|---------------|-------------|------|--|
| -1            | 40120988    | 1    | SEPARATOR 200 GPM.. Filter assembly, complete (not shown)  |
| -2            | 8357003     | 1    | O RING COVER GASKET.. (1 Required- Not shown)  |
| -3            | 40120989    | 1    | COALESCAR ELEMENT.. (3 Required- Not shown)  |
| -4            | 40120990    | 1    | SEPARATOR ELEMENT.. (4 Required- Not shown)  |
|               |             |      | Dimensions 68" high, 26" diameter, requires another 15" clearance for cartridge removal                                |
| -5            | 8307731     | 1    | LUBRICANT.. Texaco Threadtex 70 lb. pail- used on crab bolt and nut threads- all 567, 645, and 710 engines (not shown) |
| -6            | 8342123     | 1    | COMPOUND.. Anti- seize and sealing- 1 lb. can  |
| -7            | 40056595    | 1    | COMPOUND.. Sealing - sold in a carton- carton will consist of 270 feet, 26 lbs. (not shown)                            |
| -8            | 8236902     | 1    | BRUSH.. Wire 1/2" diameter   |
| -9            | 8193041     | 1    | GUN.. Spray- general cleaning- air suction feed  |
| -10           | 8078995     | 1    | NOZZLE.. Air hose  |
| -11           | 40034180    | 1    | INSPECTION LIGHT.. Flexible  |

**MISCELLANEOUS**



**Ref. No. 1**



**Ref. No. 9**

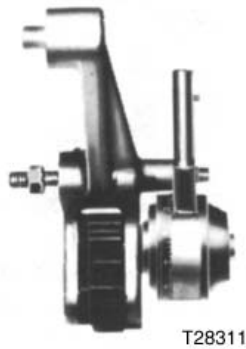


**Ref. No. 10**



**Ref. No. 11**

| Asm - Ref.No. | Part Number    | Qty. | Description   |
|---------------|----------------|------|---|
| -1            |                |      | <b>CLEANERS</b>   |
| -2            | <b>8172844</b> | 1    | <b>CLEANER..</b> Vacuum 115 volts, 50-60 cycle, 1 phase, AC-DC (same components as 8172845)   |
| -3            | <b>8172845</b> | 1    | <b>CLEANER..</b> Vacuum 230 volts, 50-60 cycle, 1 phase, AC-DC  |
| -4            | <b>8172852</b> | 1    | <b>SHOE..</b> Steel wear  |
| -5            | <b>8172850</b> | 1    | <b>GASKET..</b> Lid to tank, Doyle  |
| -6            | <b>8172851</b> | 1    | <b>BAG..</b> Dust, Doyle  |
| -7            | <b>8172855</b> | 1    | <b>HOSE..</b> Rubber covered- 10 ft. Doyle  |
| -8            | <b>8172857</b> | 1    | <b>CONNECTOR..</b> 2" diameter, Doyle   |
| -9            | <b>9560336</b> | 1    | <b>CRANKOVER TOOL..</b> Can utilize the saddle applied to most locomotives or can be mounted without removing starters - (Will not fit heavy flywheels) |
| -10           | <b>9560337</b> | 1    | <b>AIR DRIVE KIT..</b> For crankover tool 9560336   |
| -11           | <b>9560338</b> | 1    | <b>REMOTE CONTROL..</b> For air drive kit 9560333 and 9560337   |

**MISCELLANEOUS****Ref. No. 1****Ref. No. 2****Ref. No. 4**

| <b>Asm - Ref.No.</b> | <b>Part Number</b> | <b>Qty.</b> | <b>Description</b>   |
|----------------------|--------------------|-------------|--|
| -1                   | <b>9561844</b>     | 1           | <b>CRANKOVER TOOL..</b> Can be used on any engine with ring gear including heavy flywheel. Can be applied without removing starters.   |
| -2                   | <b>9560333</b>     | 1           | <b>AIR DRIVE KIT..</b> For crankover tool 9561844  |
| -3                   | <b>40009467</b>    | 1           | <b>ADAPTER..</b> 1/2 hex M to 1/2 sq. M adapter. For crankover tools 9561844 and 9560336 to be used with an electric drill motor having at least a 1/2 in. chuck and a 400 R.P.M. No load speed. (not shown) |
| -4                   | <b>8079401</b>     | 1           | <b>WRENCH SET..</b> Adjustable spanner   |
| -5                   |                    | 1           | <b>WRENCH..</b> Adjustable spanner 3/4" to 2"- Passenger, SW, G8, G12, G16   |
| -6                   |                    | 1           | <b>WRENCH..</b> Adjustable spanner 1-1/2" to 3"  |
| -7                   |                    | 1           | <b>WRENCH..</b> Adjustable spanner 2" to 4-3/4"  |
| -8                   | <b>40010625</b>    | 1           | <b>SANDPAPER..</b> 220 Grit aluminium oxide - 7" wide x 50 yards long (not shown)  |
| -9                   | <b>40082020</b>    | 1           | <b>CORWIPE 300..</b> Cleaner, degreaser, rust remover, corrosion inhibitor for multi metals - wipes pre-saturated with solution (not shown)  |

**MISCELLANEOUS**



**Ref. No. 1**

T21366



T21359

**Ref. No. 7**



T28316

**Ref. No. 11**



T21333

**Ref. No. 6**



T35158

**Ref. No. 12**

| Asm - Ref.No. | Part Number | Qty. | Description   |
|---------------|-------------|------|---|
| -1            | 8222901     | 1    | <b>THREADER..</b> Pipe ratchet handle complete- 1/8", 1/4", 3/8", 1/2", 3/4" die head   |
| -2            | 8263531     | 1    | <b>JACK..</b> Hydraulic (not shown)   |
| -3            | 8266149     | 1    | <b>PUMP..</b> Hydraulic jack  |
| -4            | 8152395     | 1    | <b>HOSE..</b> Hydrolic jack   |
| -5            | 8263532     | 1    | <b>RAM..</b> 10 Ton capacity- 6-7/8" ext. height, 4-5/8" collapsed height- 2-1/4" plunger travel, 2-1/4" outside diameter, 1-1/2" plunger diameter                    |
| -6            | 9320842     | 1    | <b>LAPPING COMPOUND..</b> Jewelers red paste - 1 qt. can- used for plunger and bushing- all 567 and 645 engines   |
| -7            |             |      | <b>TAPS</b>   |
| -8            | 8296154     | 1    | <b>TAP..</b> Tapered pipe 1/4"- 18- pipe and tubing   |
| -9            | 8296155     | 1    | <b>TAP..</b> Tapered pipe 3/8"- 18- pipe and tubing   |
| -10           | 8296156     | 1    | <b>TAP..</b> Tapered pipe 1/2"- 18- pipe and tubing   |
| -11           | 8201455     | 1    | <b>MAGNIFYING GLASS..</b> Magnifying (3 Plus) without distortion- used to check cracks, scratches, etc. on injector spherical valve assembly, spacer, and spring cage |
| -12           | 40034177    | 1    | <b>DIGITAL CALIPERS..</b> Resolution is 0.01mm or 0.0005"   |

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| Part Number              | Asm - Ref. No. | Page | Part Number | Asm - Ref. No. | Page | Part Number | Asm - Ref. No. | Page | Part Number | Asm - Ref. No. | Page |
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| <b>Part Number Index</b> |                |      | 8050722     | -2             | 2-12 | 8074592     | -2             | 4-12 | 8147749     | -8             | 2-20 |
|                          |                |      | 8051833     | -4             | 1-27 | 8074593     | -6             | 4-12 | 8149435     | -9             | 2-7  |
| 100737                   | -13            | 1-16 | 8052915     | -1             | 1-35 | 8074594     | -3             | 4-12 | 8152395     | -4             | 4-18 |
| 116436                   | -8             | 1-40 | 8052916     | -1             | 1-37 | 8074595     | -7             | 4-12 |             | -7             | 1-4  |
| 131017                   | -3             | 1-15 |             | -6             | 1-36 | 8074597     | -8             | 4-12 | 8155975     | -3             | 2-16 |
|                          | -7             | 1-16 | 8052958     | -12            | 1-25 | 8075894     | -13            | 1-15 | 8155976     | -1             | 2-16 |
|                          | -14            | 1-15 | 8052959     | -10            | 1-39 | 8077317     | -5             | 2-26 | 8155977     | -2             | 2-16 |
| 138201                   | -8             | 1-2  | 8052977     | -8             | 2-2  | 8078268     | -1             | 4-14 | 8157120     | -6             | 4-6  |
| 138300                   | -9             | 1-2  | 8054871     | -2             | 2-14 | 8078269     | -2             | 4-14 | 8157121     | -9             | 4-6  |
| 138463                   | -7             | 2-9  | 8055831     | -8             | 1-50 | 8078273     | -7             | 4-14 | 8157122     | -4             | 4-6  |
| 220086                   | -11            | 1-15 | 8055837     | -4             | 1-5  | 8078281     | -2             | 1-4  | 8157177     | -7             | 3-5  |
|                          | -15            | 1-15 | 8058885     | -2             | 3-4  | 8078329     | -15            | 2-18 | 8157327     | -7             | 1-31 |
| 271548                   | -3             | 2-4  | 8058886     | -6             | 3-4  | 8078883     | -10            | 1-30 | 8158650     | -2             | 1-15 |
| 272563                   | -2             | 2-2  | 8058891     | -6             | 1-30 | 8078994     | -10            | 4-12 | 8159147     | -7             | 1-43 |
| 756460                   | -8             | 4-13 | 8060247     | -4             | 1-21 | 8078995     | -10            | 4-15 | 8159226     | -8             | 2-3  |
| 756461                   | -9             | 4-13 | 8060275     | -4             | 2-2  | 8078996     | -2             | 4-11 | 8159227     | -9             | 2-2  |
| 756475                   | -6             | 4-13 | 8060387     | -7             | 1-7  | 8078998     | -4             | 4-11 | 8159240     | -4             | 2-23 |
| 756476                   | -7             | 4-13 | 8061015     | -10            | 1-47 | 8078999     | -5             | 4-11 | 8159249     | -4             | 2-22 |
| 779429                   | -2             | 2-6  | 8062027     | -4             | 1-46 | 8079000     | -6             | 4-11 |             | -10            | 2-22 |
| 779431                   | -3             | 2-6  | 8062033     | -4             | 1-26 | 8079401     | -4             | 4-17 | 8159250     | -14            | 2-22 |
| 779432                   | -4             | 2-6  | 8062034     | -5             | 1-26 | 8080197     | -9             | 1-33 | 8159251     | -5             | 2-22 |
| 779433                   | -5             | 2-6  | 8062137     | -9             | 3-6  | 8080383     | -3             | 1-23 | 8159252     | -8             | 2-22 |
| 942440                   | -10            | 1-25 | 8062165     | -5             | 3-4  | 8080632     | -5             | 1-19 | 8159253     | -6             | 2-22 |
| 8017824                  | -5             | 1-42 | 8062873     | -3             | 1-35 | 8081034     | -2             | 1-12 |             | -13            | 2-22 |
| 8017825                  | -8             | 1-43 | 8062916     | -1             | 1-46 | 8081157     | -16            | 4-7  | 8159254     | -1             | 2-22 |
| 8024101                  | -10            | 3-3  | 8064804     | -2             | 1-23 | 8084163     | -8             | 1-30 | 8159255     | -19            | 2-22 |
| 8024102                  | -4             | 3-4  | 8064859     | -10            | 4-13 | 8084164     | -2             | 2-8  | 8160626     | -7             | 1-15 |
| 8031480                  | -10            | 3-5  | 8064951     | -3             | 4-10 | 8084868     | -1             | 1-48 |             | -15            | 1-16 |
| 8031481                  | -9             | 3-5  | 8065527     | -9             | 2-14 | 8084927     | -13            | 3-7  | 8160627     | -8             | 1-15 |
| 8031482                  | -8             | 3-5  | 8067122     | -5             | 2-14 | 8085255     | -10            | 2-6  |             | -16            | 1-16 |
| 8032123                  | -4             | 1-40 | 8067147     | -4             | 2-14 | 8085256     | -9             | 2-6  | 8160928     | -7             | 3-6  |
| 8032587                  | -4             | 1-19 | 8067337     | -1             | 4-9  | 8085259     | -10            | 2-7  | 8164036     | -7             | 2-2  |
| 8032710                  | -12            | 4-13 | 8067338     | -10            | 4-9  | 8087086     | -4             | 1-6  | 8164416     | -9             | 1-7  |
| 8033783                  | -1             | 1-18 | 8067644     | -1             | 1-34 | 8088245     | -5             | 4-8  | 8164417     | -10            | 1-7  |
| 8034054                  | -2             | 1-18 | 8067645     | -4             | 1-35 | 8093717     | -1             | 1-11 | 8164608     | -4             | 3-6  |
| 8034085                  | -2             | 1-11 | 8067646     | -5             | 1-35 | 8097539     | -13            | 4-11 | 8164914     | -7             | 1-33 |
| 8034087                  | -10            | 1-29 | 8068022     | -13            | 4-7  | 8097939     | -1             | 2-2  | 8165480     | -11            | 1-7  |
| 8034600                  | -1             | 1-12 | 8068023     | -14            | 4-7  | 8098075     | -3             | 2-8  | 8166464     | -4             | 2-27 |
| 8034638                  | -2             | 1-44 | 8068028     | -1             | 1-33 | 8099111     | -9             | 4-14 | 8166676     | -3             | 2-23 |
| 8035623                  | -9             | 1-15 | 8068029     | -17            | 4-7  | 8102249     | -13            | 3-4  | 8167952     | -21            | 2-22 |
| 8040325                  | -7             | 1-40 | 8068123     | -7             | 1-30 | 8107414     | -15            | 4-7  | 8167953     | -18            | 2-22 |
| 8040413                  | -1             | 1-28 | 8069928     | -1             | 1-22 | 8107539     | -7             | 1-42 | 8168577     | -1             | 4-7  |
| 8041183                  | -7             | 1-44 | 8069934     | -1             | 1-6  | 8107788     | -2             | 1-21 | 8171256     | -5             | 2-27 |
| 8042090                  | -14            | 4-11 | 8069965     | -5             | 1-7  | 8107834     | -6             | 3-7  | 8171633     | -3             | 1-28 |
| 8042773                  | -1             | 1-21 | 8069989     | -5             | 1-44 | 8113925     | -2             | 1-49 | 8172031     | -4             | 2-11 |
| 8042782                  | -14            | 2-18 | 8070872     | -1             | 1-23 | 8116358     | -8             | 1-31 | 8172032     | -5             | 2-11 |
| 8044484                  | -9             | 4-12 | 8070883     | -6             | 1-18 | 8121868     | -3             | 1-36 | 8172033     | -6             | 2-11 |
| 8044517                  | -14            | 4-6  | 8070903     | -3             | 1-18 | 8122000     | -6             | 4-8  | 8172034     | -7             | 2-11 |
| 8044534                  | -6             | 2-26 | 8070926     | -2             | 1-38 | 8122519     | -6             | 1-44 | 8172844     | -2             | 4-16 |
| 8045450                  | -1             | 4-2  | 8070932     | -2             | 1-35 | 8127528     | -7             | 2-12 | 8172845     | -3             | 4-16 |
| 8048288                  | -7             | 4-8  | 8070988     | -13            | 2-18 | 8127529     | -8             | 2-12 | 8172850     | -5             | 4-16 |
| 8048299                  | -2             | 3-7  | 8071625     | -2             | 1-28 | 8133046     | -11            | 4-9  | 8172851     | -6             | 4-16 |
| 8048301                  | -3             | 3-7  | 8071692     | -7             | 2-16 | 8140315     | -2             | 4-2  | 8172852     | -4             | 4-16 |
| 8048302                  | -4             | 3-7  | 8071720     | -4             | 1-28 | 8140761     | -7             | 1-8  | 8172855     | -7             | 4-16 |
| 8048303                  | -5             | 3-7  | 8072352     | -3             | 2-2  |             | -9             | 1-11 | 8172857     | -8             | 4-16 |
| 8048327                  | -3             | 4-8  |             | -10            | 1-12 |             | -10            | 1-10 | 8173332     | -8             | 4-6  |
| 8048353                  | -1             | 1-2  | 8072927     | -1             | 1-19 |             | -11            | 1-9  | 8173948     | -4             | 2-3  |
| 8049057                  | -5             | 1-36 | 8072929     | -6             | 1-35 | 8140868     | -8             | 2-9  | 8173996     | -4             | 1-22 |
| 8049131                  | -3             | 1-37 | 8072945     | -8             | 1-7  | 8140869     | -9             | 2-9  | 8174221     | -6             | 2-14 |
| 8049132                  | -2             | 1-37 | 8073108     | -3             | 1-22 | 8141248     | -9             | 4-10 | 8174285     | -13            | 2-29 |
| 8050688                  | -4             | 1-12 | 8074425     | -2             | 2-9  | 8141439     | -5             | 1-23 | 8174868     | -2             | 1-50 |
| 8050721                  | -1             | 2-12 | 8074566     | -4             | 4-8  | 8141619     | -4             | 2-8  | 8174878     | -6             | 2-16 |

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| 8174880            | -5                    | 2-16        | 8209343            | -8                    | 2-17        | 8225257            | -6                    | 1-29        | 8245259            | -5                    | 2-12        |
| 8176923            | -8                    | 1-33        | 8209576            | -10                   | 1-15        | 8225658            | -7                    | 1-50        | 8245511            | -3                    | 1-27        |
| 8177166            | -3                    | 1-38        |                    | -18                   | 1-16        | 8225659            | -6                    | 1-50        | 8245757            | -11                   | 3-3         |
| 8177167            | -1                    | 1-7         | 8209807            | -4                    | 1-50        | 8225660            | -5                    | 1-50        | 8245758            | -7                    | 3-4         |
| 8178937            | -8                    | 2-26        | 8210136            | -8                    | 1-25        | 8225989            | -2                    | 1-33        | 8245759            | -3                    | 3-4         |
| 8187659            | -4                    | 1-15        | 8210141            | -5                    | 2-5         |                    | -3                    | 4-7         | 8246474            | -1                    | 2-18        |
|                    | -8                    | 1-16        | 8210256            | -2                    | 1-47        | 8225990            | -5                    | 1-33        | 8248656            | -12                   | 3-5         |
|                    | -16                   | 1-15        | 8210556            | -11                   | 4-10        |                    | -6                    | 4-7         | 8249739            | -5                    | 1-12        |
| 8190189            | -3                    | 1-12        | 8210938            | -3                    | 1-47        | 8225991            | -4                    | 1-33        | 8250085            | -8                    | 1-8         |
| 8190311            | -6                    | 1-22        | 8211090            | -8                    | 1-11        |                    | -5                    | 4-7         |                    | -9                    | 1-10        |
| 8190835            | -12                   | 2-18        |                    | -10                   | 1-9         | 8225992            | -3                    | 1-33        |                    | -12                   | 1-11        |
| 8191591            | -3                    | 1-7         | 8211193            | -7                    | 2-13        |                    | -4                    | 4-7         | 8250241            | -2                    | 2-13        |
| 8191636            | -6                    | 3-5         | 8211907            | -4                    | 1-23        | 8226542            | -3                    | 2-9         | 8250704            | -9                    | 1-16        |
| 8191637            | -5                    | 3-5         | 8211959            | -6                    | 1-15        | 8226543            | -4                    | 2-9         | 8250706            | -11                   | 1-16        |
| 8193041            | -9                    | 4-15        |                    | -14                   | 1-16        | 8227001            | -6                    | 2-2         | 8250707            | -12                   | 1-16        |
| 8194036            | -9                    | 3-3         | 8212484            | -1                    | 1-39        | 8227077            | -15                   | 2-22        | 8250821            | -19                   | 1-16        |
|                    | -11                   | 1-29        |                    |                       | 1-49        | 8227078            | -16                   | 2-22        | 8252767            | -3                    | 2-15        |
| 8195349            | -1                    | 4-3         | 8212485            | -9                    | 2-17        | 8227079            | -20                   | 2-22        | 8252809            | -1                    | 2-27        |
| 8195350            | -2                    | 4-3         | 8213423            | -4                    | 1-16        | 8227321            | -3                    | 2-22        | 8254202            | -2                    | 3-6         |
| 8195351            | -3                    | 4-3         | 8213424            | -3                    | 1-16        | 8227463            | -2                    | 1-46        | 8254465            | -11                   | 3-4         |
| 8195352            | -4                    | 4-3         | 8213425            | -1                    | 1-16        | 8227624            | -3                    | 1-21        | 8254466            | -12                   | 3-4         |
| 8195353            | -5                    | 4-3         | 8213518            | -6                    | 1-21        | 8228024            | -2                    | 2-15        | 8255768            | -2                    | 3-5         |
| 8195354            | -6                    | 4-3         | 8213519            | -7                    | 1-21        | 8228025            | -4                    | 2-15        | 8255769            | -3                    | 3-5         |
| 8195355            | -7                    | 4-3         | 8213622            | -2                    | 4-7         | 8228031            | -8                    | 1-49        | 8255770            | -4                    | 3-5         |
| 8195356            | -8                    | 4-3         | 8213623            | -2                    | 2-3         | 8228215            | -7                    | 1-22        | 8257730            | -1                    | 1-25        |
| 8195928            | -4                    | 2-5         | 8213878            | -2                    | 3-3         | 8228303            | -2                    | 1-31        | 8257737            | -3                    | 1-25        |
| 8196862            | -5                    | 2-20        | 8214312            | -3                    | 3-3         | 8228304            | -6                    | 1-31        | 8257738            | -4                    | 1-25        |
| 8197044            | -6                    | 1-16        | 8214743            | -2                    | 1-22        | 8228305            | -3                    | 1-31        | 8257739            | -5                    | 1-25        |
| 8198632            | -1                    | 2-13        | 8214755            | -1                    | 3-3         | 8228346            | -9                    | 2-22        | 8258486            | -17                   | 3-7         |
| 8200947            | -5                    | 1-22        | 8214756            | -7                    | 3-2         | 8228348            | -12                   | 2-22        | 8259133            | -7                    | 2-8         |
| 8201448            | -6                    | 1-42        | 8214852            | -8                    | 1-44        | 8228886            | -6                    | 2-9         | 8259734            | -3                    | 1-48        |
| 8201455            | -11                   | 4-18        | 8215081            | -5                    | 1-18        | 8229101            | -11                   | 2-22        | 8260337            | -9                    | 2-18        |
| 8201791            | -8                    | 2-7         | 8215173            | -5                    | 2-2         | 8229173            | -14                   | 3-7         | 8260338            | -10                   | 2-18        |
| 8202702            | -11                   | 2-26        | 8215342            | -11                   | 4-14        | 8231538            | -8                    | 4-14        | 8260375            | -4                    | 2-7         |
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| 8208127            | -20                   | 1-16        | 8220496            | -6                    | 1-33        | 8243341            | -9                    | 2-26        | 8268439            | -12                   | 1-36        |
| 8208195            | -7                    | 2-23        | 8220552            | -1                    | 1-26        | 8243516            | -1                    | 1-45        | 8268641            | -6                    | 1-4         |
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| 9572744                | -1                        | 2-25        | 40021301               | -5                        | 4-10        | 40051635               | -34                       | 2-24        | 40100047               | -9                        | 2-31        |
| 9572745                | -2                        | 2-25        | 40021302               | -6                        | 4-10        | 40052055               | -4                        | 4-2         | 40100097               | -3                        | 2-19        |
| 9572746                | -3                        | 2-25        | 40021839               | -7                        | 1-41        | 40052125               | -1                        | 2-30        | 40103969               | -15                       | 2-30        |
| 9572747                | -4                        | 2-25        | 40022032               | -11                       | 2-11        | 40052393               | -5                        | 2-23        | 40109141               | -4                        | 1-34        |
| 9573454                | -23                       | 1-9         | 40022397               | -20                       | 2-24        | 40052639               | -8                        | 1-4         | 40109410               | -6                        | 2-7         |
| 9574910                | -3                        | 1-42        | 40022398               | -17                       | 2-24        | 40052640               | -9                        | 1-4         | 40112381               | -10                       | 2-31        |
| 9575501                | -10                       | 2-27        | 40022401               | -10                       | 2-24        | 40053037               | -5                        | 1-46        | 40118779               | -1                        | 4-10        |
| 9575502                | -9                        | 2-27        | 40022402               | -22                       | 2-24        | 40054405               | -37                       | 2-24        | 40118780               | -2                        | 4-10        |
| 9576500                | -14                       | 2-27        | 40024084               | -6                        | 1-14        | 40055201               | -4                        | 1-42        | 40118842               | -6                        | 1-23        |
| 9576512                | -6                        | 2-19        | 40024950               | -18                       | 2-24        | 40055362               | -11                       | 2-30        | 40120988               | -1                        | 4-15        |
|                        | -36                       | 2-24        | 40024951               | -15                       | 2-24        | 40055363               | -10                       | 2-30        | 40120989               | -3                        | 4-15        |
| 9579235                | -2                        | 1-45        | 40025165               | -1                        | 2-21        | 40055364               | -5                        | 2-30        | 40120990               | -4                        | 4-15        |
| 9579236                | -3                        | 1-45        | 40026007               | -8                        | 1-19        |                        | -12                       | 2-30        | 40121024               | -11                       | 1-40        |
| 9579237                | -4                        | 1-45        | 40028053               | -7                        | 2-24        | 40055365               | -6                        | 2-30        | 40122151               | -9                        | 2-25        |
| 9579238                | -5                        | 1-45        | 40028054               | -8                        | 2-24        |                        | -13                       | 2-30        | 40125502               | -11                       | 2-31        |
| 9580138                | -7                        | 2-29        | 40028057               | -6                        | 2-24        | 40055366               | -4                        | 2-30        | 40125504               | -2                        | 2-24        |
| 9581330                | -14                       | 2-29        | 40028076               | -5                        | 2-24        |                        | -14                       | 2-30        | 40125505               | -1                        | 2-24        |
| 9581394                | -32                       | 2-24        | 40029012               | -2                        | 3-8         | 40055368               | -9                        | 2-30        | 40125507               | -24                       | 1-9         |
| 9581395                | -33                       | 2-24        | 40029053               | -23                       | 2-24        | 40055908               | -2                        | 1-5         | 40125538               | -7                        | 3-9         |
| 9582953                | -5                        | 2-21        | 40031139               | -2                        | 2-19        | 40056595               | -7                        | 4-15        | 40125539               | -8                        | 3-9         |
| 9582954                | -6                        | 2-21        | 40033019               | -12                       | 1-4         | 40057412               | -8                        | 1-32        | 40125542               | -9                        | 3-9         |

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| 40125543               | -10                       | 3-9         |                        |                           |             |                        |                           |             |                        |                           |             |
| 40125544               | -11                       | 3-9         |                        |                           |             |                        |                           |             |                        |                           |             |

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