



MAINTENANCE INSTRUCTION M.I. 1097

Service Department
ELECTRO-MOTIVE DIVISION
GENERAL MOTORS CORPORATION
October, 2001

Grahm-White 994-100 Series Air Dryer System Operation and Maintenance

SAFETY PRECAUTIONS

Please refer to the EMD Safety Precautions in appendix to the Locomotive Service Manual whenever routine maintenance work is to be performed on any AC traction equipped locomotive.

The maintenance procedure as outlined in this instruction is specific to the Graham-White 994-100 Series of Air Dryers and is offered for planning purposes only. As written, this document reflects current Graham-White product design and service experience for application to EMD locomotives.

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SAFETY PRECAUTIONS

THIS PRODUCT MAY CONTAIN MATERIALS THAT WOULD PERTAIN TO ANY ONE OR ALL OF THE WARNINGS MENTIONED BELOW: IT IS RESPONSIBILITY OF THE INSTALLER AND OWNER TO PROVIDE THE APPROPRIATE ELECTRICAL AND MECHANICAL SERVICE FOR THE INSTALLATION AND OPERATION OF THIS PRODUCT.

WARNING

- ◆ Graham-White Manufacturing Company is relying on the results put forth by other suppliers and makes no warranty as to the accuracy of such data, either expressed or implied.
- ◆ This Service Manual contains information and Warnings which must be observed by the user. Failure to adhere to these recommendations could result in mechanical failure, property damage and serious injury or death.
- ◆ This is a compressed air device. Compressed air is extremely dangerous if not handled carefully. DO NOT attempt to service, repair or break any connections without first assuring that the entire pressurized device has been vented of all pressure.
- ◆ Dangerous voltages are exposed once electrical covers are removed. Maintenance should be carried out only by qualified personnel. This device is safe for operation only with electrical covers in place.
- ◆ This product contains material which may cause eye and possibly skin irritation. Avoid breathing dust and prolonged contact with skin of the desiccant material. NIOSH approved respirators recommended. Use with adequate ventilation. Wash thoroughly after handling. DO NOT swallow. Contact with moisture (water) can cause rise in temperature which may result in burn.
Other materials used with this product may cause temporary eye discomfort. Flush with water. Protective equipment as required by user should be utilized.
- ◆ All materials used in this product are common throughout the industry and have been for many years with no reported ill effects. However, this product may contain chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. This Warning is given in compliance with California Proposition 65, as detectable amounts of chemicals subject to Proposition 65 may be contained in this product.

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GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salem, VA 24153-1099

994-100 AIR DRYER SYSTEM OPERATION

BULLETIN: DO 994-100
EFFECTIVE: 06-16-00
REVISION: B, 03-16-01
ERN 011112
PAGE 1 of 2

The 994-100 Air Dryer System is a State-of-the-Art compressed air filtering/drying assembly. This drying system is a combination of some of the most advanced adsorption technology to date. Designed by the Graham-White Engineering Team, with technical support and input from our customers, this drying system will provide most rail industry applications with compressed air that is free of oil, dirt contamination, and moisture.

The 994-100 Air Dryer System utilizes a modular design incorporating a coalescing filter, a remote liquid drain, an auto-adjust purge valve, an inlet diverter/exhaust valve, an outlet shuttle/purge check valve, a control box, and twin desiccant towers. The dryer is installed in a mounting bracket, which is permanently attached to the vehicle underframe and air piping. This arrangement allows the dryer to be easily removed for servicing without disturbing the main pipe connections.

Contaminated air enters the dryer and flows into the inner core of the coalescing filter element. Solid particles from the air flow are trapped in the inner core and are removed during the annual filter element replacement. Water and oil aerosols pass through the filter element and are coalesced into liquid. This coalesced liquid, and any bulk liquid that passes through the filter, then drains down the outside of the element and into the inlet sump. During the first half of the dryer cycle, a drain valve routes the liquid from the inlet sump to the intermediate sump tank. During the second half of the dryer cycle, the connection between the inlet sump and the intermediate sump is blocked and the liquid in the intermediate sump is exhausted to atmosphere.

Air now making its way through the dryer contains only water vapor and oil vapors. These vapors are removed from the air while passing through the desiccant beds. This "wet" air is directed through a series of two desiccant filled chambers by the Inlet Diverter Valve. The air flows upward through the first chamber and downward through the second. The desiccant is contained in a remay fabric bag. The desiccant is held tightly compacted by a pneumatically actuated piston acting on a movable disc at the top of each chamber. Dry air from the second chamber flows through the Outlet Shuttle Valve supplying clean, dry air to the locomotive and train air systems.

As the compressed air flows through the desiccant beds, water vapor is adsorbed by the desiccant beads. Periodically the Inlet Diverter Valve switches the airflow through the opposite set of chambers. The desiccant that had been adsorbing water is now regenerated. The regenerating chambers are isolated from the compressed air flow by the Inlet Diverter and Outlet Shuttle Valves. The Exhaust Valve connected to the regenerating chambers is opened to reduce the pressure in the chambers to atmospheric pressure. A portion of the dried air is expanded through the Auto-Adjust Purge Valve. The expanded purge air-flows through one of the Purge Check Valves and then the desiccant chambers in the opposite direction from the inlet compressed air flow. As the dry purge air flows through the beds, it absorbs water from the desiccant beads and discharges it to atmosphere through the open Exhaust Valve.

At the end of the regenerating cycle, and prior to switching the Inlet Diverter Valve, the Exhaust Valve is closed and air from the Auto-Adjust Purge Valve gradually repressurizes the regenerated chambers. This repressurization reduces desiccant attrition by reducing the pressure differential between the inlet air and the desiccant bed.



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994-100 AIR DRYER SYSTEM OPERATION

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To accomplish complete regeneration of the desiccant, the volume of purge air passing through the bed must slightly exceed the volume of air that was dried. The additional volume of air is needed to overcome any inefficiency in the system. Since the purge air is greatly expanded the percentage of air used for purge is small. Graham-White's patented "Auto-Adjust Purge Valve" automatically meters the quantity of regeneration air to the correct portion required in response to changing compressed air flow rate and pressure. This reduces overall air usage.

Inlet Diverter, Outlet Shuttle, and Exhaust Valves are designed with soft seat seals that have metal to metal (or plastic to metal) seat backup. If the soft seals become damaged, the dryer will still function with only a small amount of air leakage through the damaged valve. On the loss of pilot air pressure, the Inlet Diverter Valve will remain in its last position and the Exhaust Valves will close. This design helps prevent main reservoir blow down in the event of the dryer control system failure. Exhaust Valves are spring loaded and automatically return to the closed position. This arrangement prevents loss of inlet air at low pressure during system pump-up.

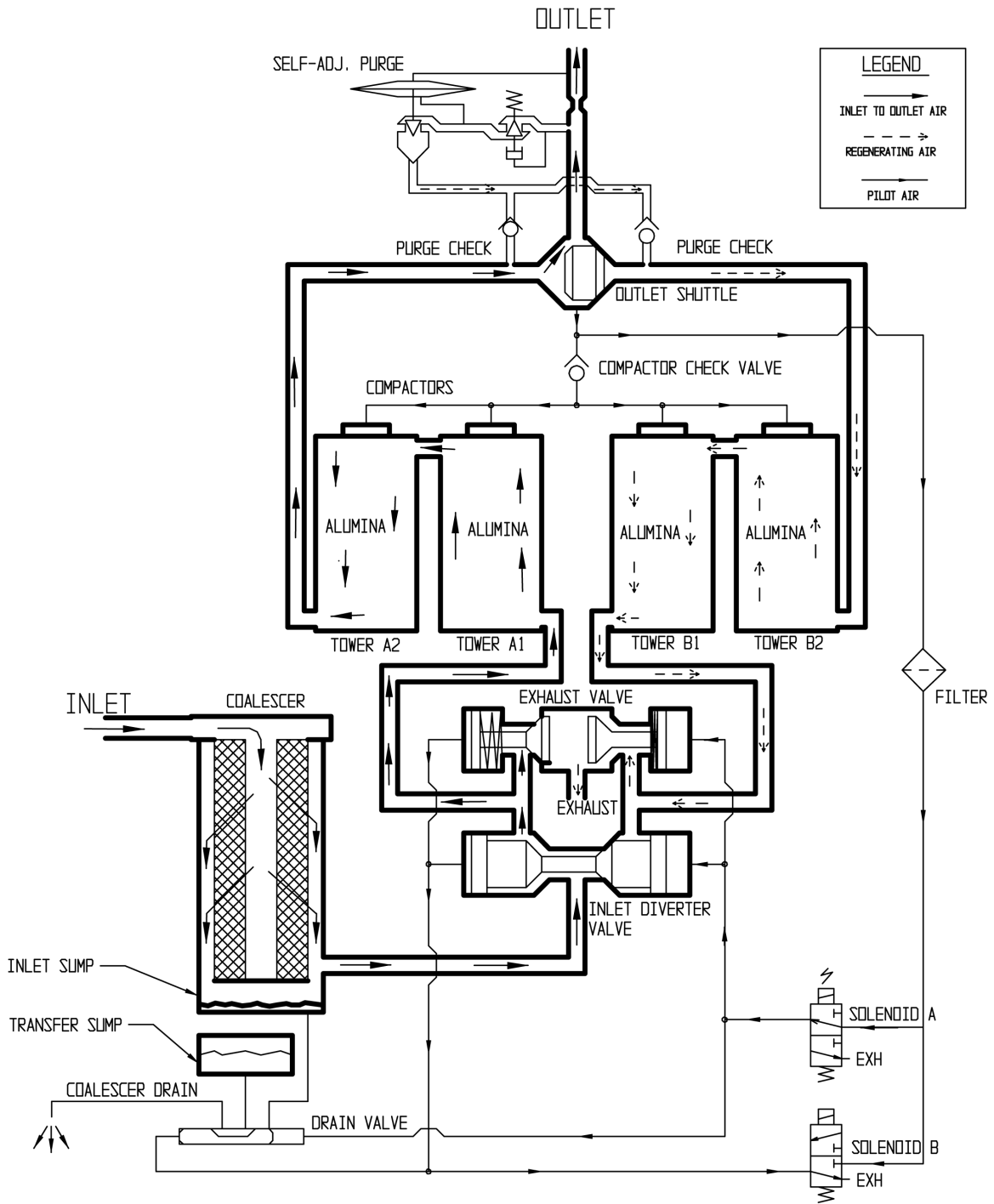
The Dryer Control Assembly consists of two 3-way solenoid valves, an electronic circuit to control the dryer timing sequence and a thermostatically controlled heater, relay circuit. The circuit operates on a nominal DC voltage of 45-138 volts. The circuit contains two timers which control the purge and repressurization timing for half a dryer cycle. A "binary flip-flop" circuit directs the timer output to first one solenoid and then the other for the complete dryer cycle. The timing is identical for both halves of the cycle.



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994 AIR DRYER SYSTEM AIR FLOW DIAGRAM

BULLETIN: AF 994 SERIES
EFFECTIVE: 02-14-97
REVISION: NONE

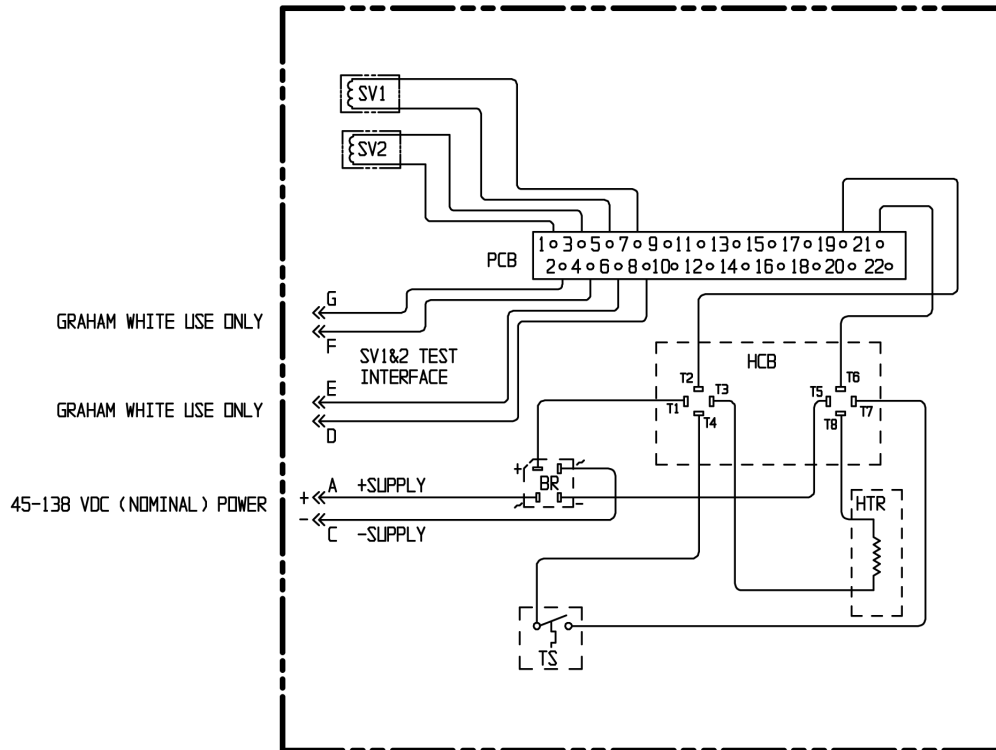




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994 AIR DRYER SYSTEM WIRING DIAGRAM

BULLETIN: WD 1015 SERIES
EFFECTIVE: 06-16-00
REVISION: C, 03-16-01
ERN 011112



- LEGEND:
- BR = BRIDGE RECTIFIER
 - SV1 = SOL VLV 1
 - SV2 = SOL VLV 2
 - TS = THERMOSTAT
 - HTR = HEATER
 - HCB = HEATER CONTROL BOARD
 - PCB = PRINTED CIRCUIT BOARD CARD GUIDE



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PRODUCT INFORMATION
FOR P/N 994-100 SERIES AIR DRYER

BULLETIN: PI 994-100
EFFECTIVE: 05/08/97
REVISION: C,02-17-00
Removed Section 3
ERN 000706 1 of 1

1. OPERATING REQUIREMENTS:

- ∞ INLET AIR TEMPERATURE: 100°F (NOMINAL)
- ∞ OPERATING PRESSURE: 75-150 PSIG (NOMINAL)
- ∞ AMBIENT TEMPERATURE: -40 TO 160°F
- ∞ VOLTAGE: 45-138 VDC
- ∞ CURRENT DRAW ON HEATER = 9.5 AMPS (APPOX)
- ∞ CURRENT DRAW ON SOLENOID VALVES = 1 AMP (APPOX)

2. INSTALLATION INFORMATION:

A. ORDERING REFERENCE:

994 SERIES AIR DRYERS ARE SOLD SEPARATELY FROM MOUNTING BRACKETS, MOUNTING HARDWARE, AND SOME ACCESSORIES. CONTACT G-W SALES DEPARTMENT FOR COMPLETE ORDERING INFORMATION.

B. TOOLS AND LUBRICATION REQUIRED

3/4" SOCKET
3" EXTENSION
15" EXTENSION
ADJUSTABLE WRENCH
TORQUE WRENCH FT-LB SCALE
DOW CORNING 55M GREASE OR EQUIVALENT



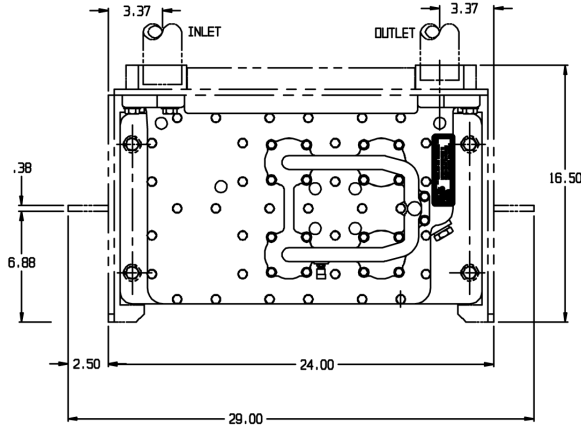
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994 AIR DRYER SYSTEM OUTLINE ASSEMBLY

(WITH 5994-180 MOUNTING BRACKET)

BULLETIN: DA 994 SERIES
EFFECTIVE: 02-14-97
REVISION: A, 08-14-98
ADDED PAGE 2
ERN 983305

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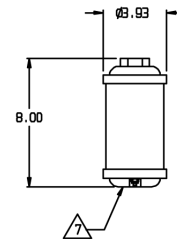
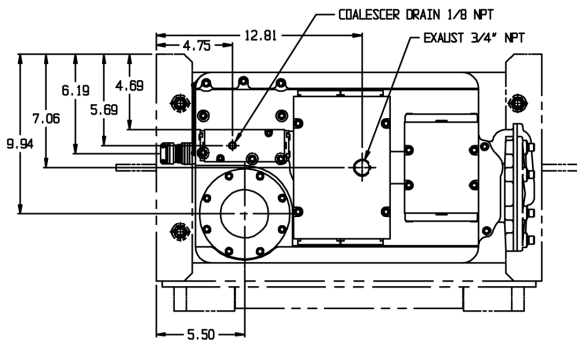
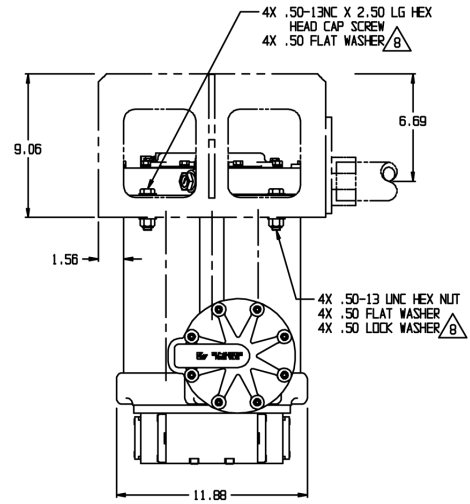
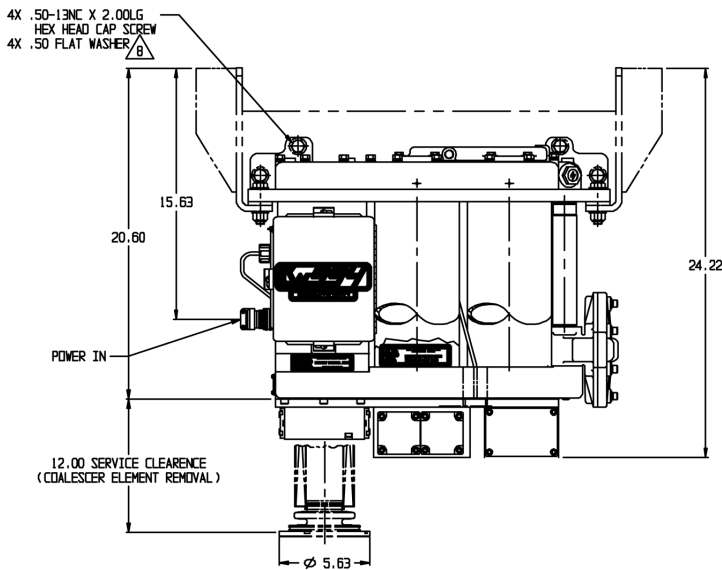


NOTES:

1. ALL DIMENSIONS ARE IN INCHES AND FOR REFERENCE ONLY
2. DRYER CONTROL VOLTAGE: 45-138 VDC
3. OPERATING PRESSURE: 75-150 PSI
4. WEIGHT: 155 LBS APPROX - DRYER ONLY
70 LBS APPROX - MOUNTING BRACKET
5. AIR FLOW DIAGRAM - SEE BULLETIN AF 994 SERIES
6. WIRING DIAGRAM - SEE BULLETIN WD 994 SERIES

A CUSTOMER WILL BE RESPONSIBLE FOR FITTINGS USED TO MOUNT MUFFLER

B MOUNTING BRACKET, DRYER, AND MOUNTING HARDWARE SOLD SEPARATELY. CONTACT G-W SALES DEPARTMENT FOR ORDERING INFORMATION



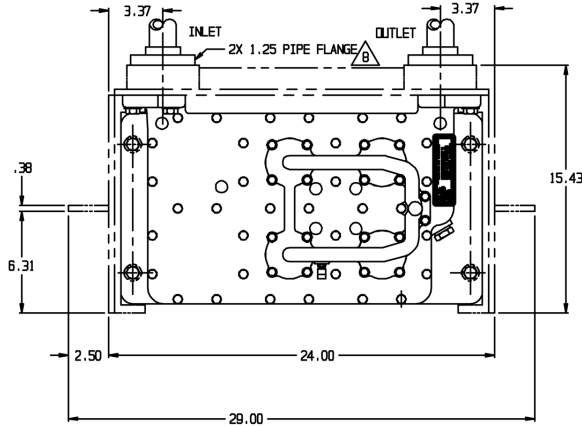


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994 AIR DRYER SYSTEM OUTLINE ASEMBLY (WITH 5994-386 MOUNTING BRACKET)

BULLETIN: DA 994 SERIES
EFFECTIVE: 02-14-97
REVISION: A, 08-14-98
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ERN 983305

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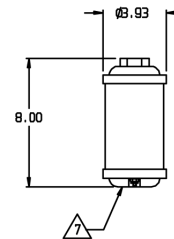
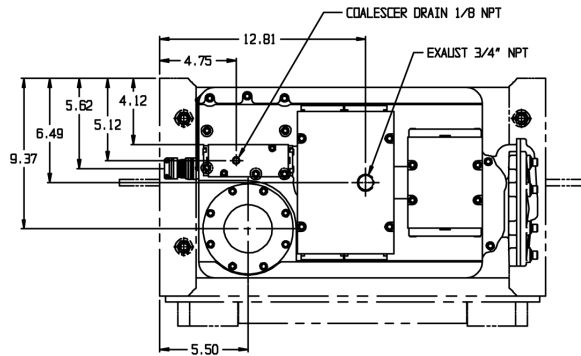
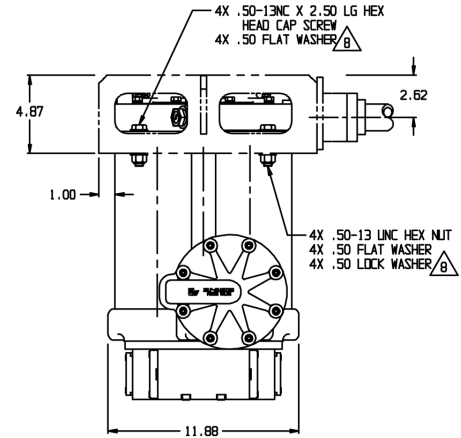
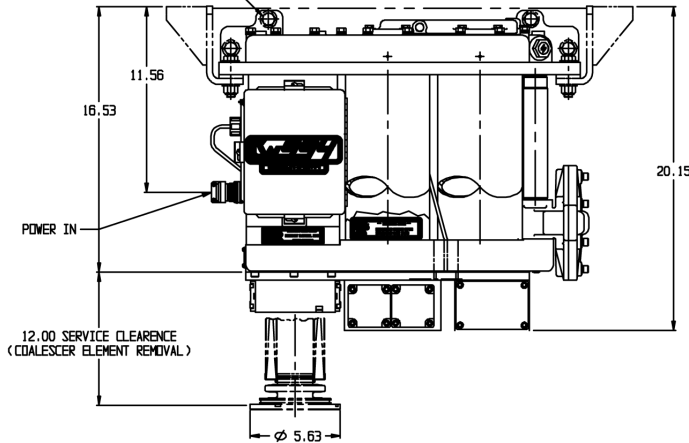
NOTES:

1. ALL DIMENSIONS ARE IN INCHES AND FOR REFERENCE ONLY
2. DRYER CONTROL VOLTAGE: 45-138 VDC
3. OPERATING PRESSURE: 75-150 PSI
4. WEIGHT: 155 LBS APPROX - DRYER ONLY
70 LBS APPROX - MOUNTING BRACKET
5. AIR FLOW DIAGRAM - SEE BULLETIN AF 994 SERIES
6. WIRING DIAGRAM - SEE BULLETIN WD 994 SERIES

⚠ CUSTOMER WILL BE RESPONSIBLE FOR FITTINGS USED TO MOUNT MUFFLER

⚠ MOUNTING BRACKET, DRYER, AND MOUNTING HARDWARE SOLD SEPARATELY. CONTACT G-W SALES DEPARTMENT FOR ORDERING INFORMATION

4X .50-13NC X 2.00LG
HEX HEAD CAP SCREW ⚠
4X .50 FLAT WASHER ⚠





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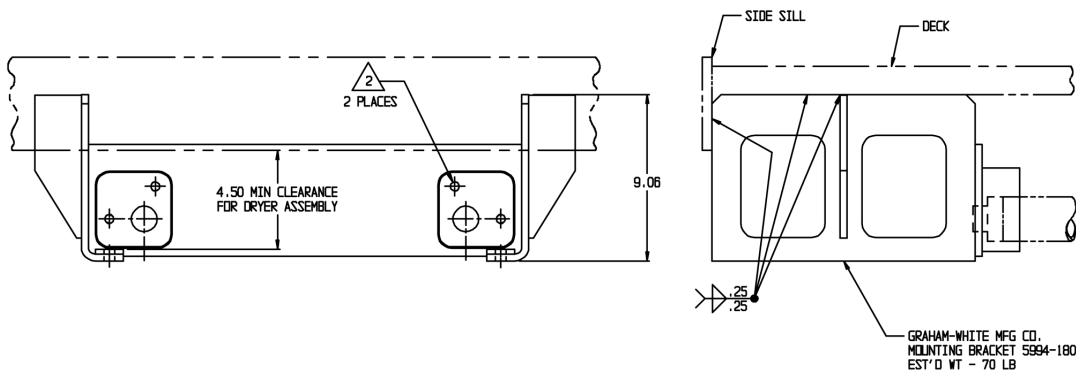
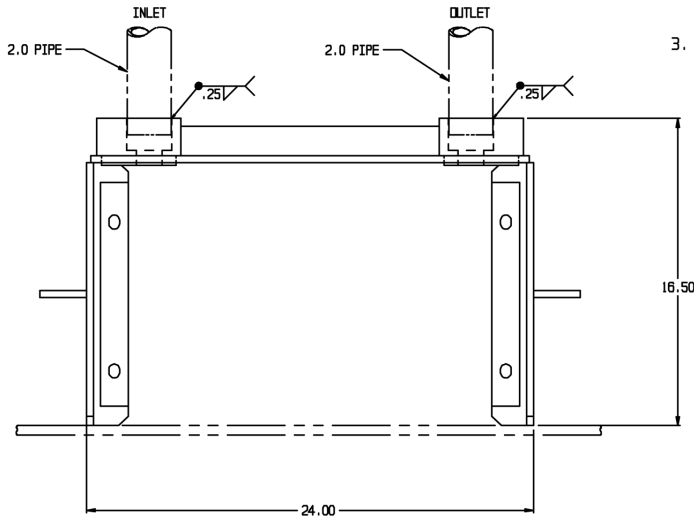
MOUNTING BRACKET P/N 5994-180

INSTALLATION DRAWING

BULLETIN: ID 5994-180
EFFECTIVE: 02-14-97
REVISION: A, 08-14-98
CHANGED PAGE
NUMBER
ERN 983305

NOTES:

1. DO NOT PAINT SEALING SURFACE. APPLY LIGHT FILM OF DOW CORNING 55M.
2. DO NOT ASSEMBLE AIR DRYER TO MTG BRACKET BEFORE UNDERFRAME IS TURNED TO UPRIGHT POSITION.
3. ALL DIMENSIONS ARE FOR REFERENCE UNLESS OTHERWISE INDICATED





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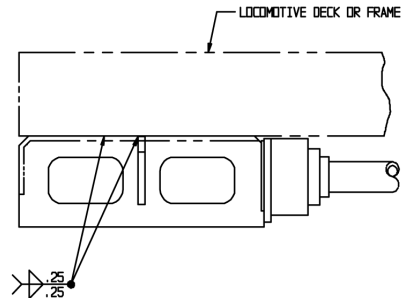
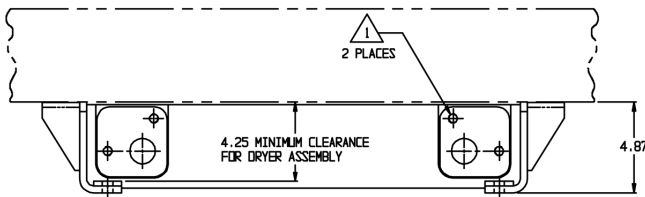
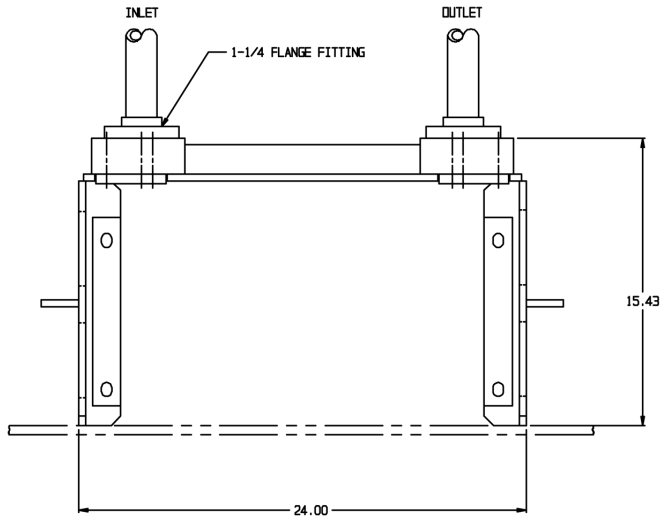
MOUNTING BRACKET P/N 5994-386

INSTALLATION DRAWING

BULLETIN: ID 5994-386
EFFECTIVE: 08-14-98
REVISION: NONE

NOTES:

- DO NOT PAINT SEALING SURFACE. APPLY LIGHT FILM OF DOW CORNING 55M.
- DO NOT ASSEMBLE AIR DRYER TO MTG BRACKET BEFORE UNDERFRAME IS TURNED TO UPRIGHT POSITION.
- ALL DIMENSIONS ARE FOR REFERENCE UNLESS OTHERWISE INDICATED
- ESTIMATED WEIGHT: 70 LBS





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994 AIR DRYER SYSTEM
P/N 994-100

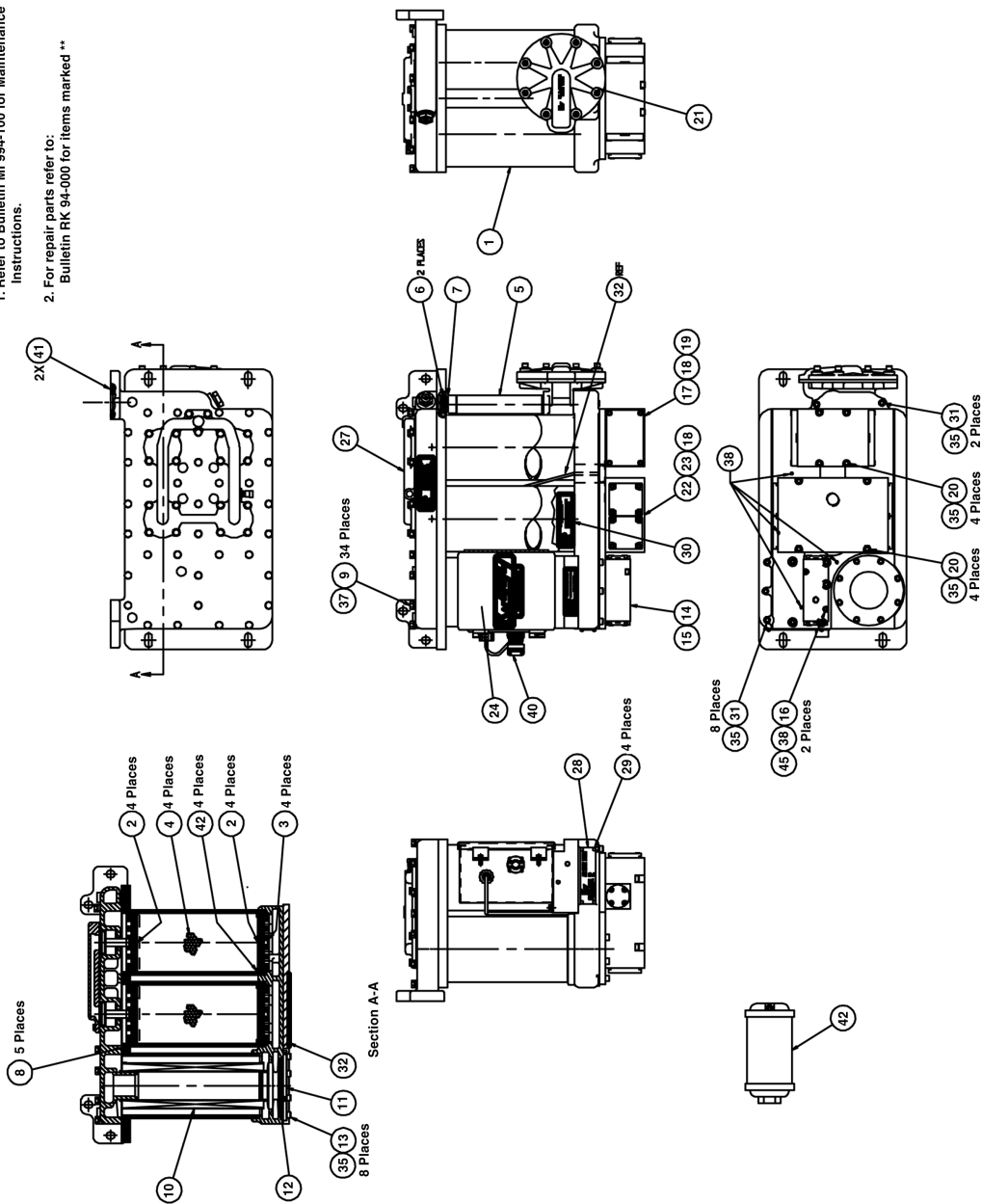
INSTALLATION DRAWING

BULLETIN: ID 994 SERIES
EFFECTIVE: 02-14-97
REVISION: A, 08-14-98
REMOVE DWGS
EDIT TEXT
ERN 983305

NOTES:

1. WELD MOUNTING BRACKET TO LOCOMOTIVE UNDERFRAME
AS PER APPROPRIATE INSTALLATION DRAWING
2. APPLY LIGHT FILM OF DOW-CORNING 55M TO RUBBER FACE SEALS.
3. LIFT AIR DRYER ONTO MOUNTING BRACKET AND PUSH
BACK FULLY AGAINST SEALING FACE OF
MOUNTING BRACKET.
4. TORQUE 1/2-13 MOUNTING BOLTS (QTY: 8) TO
61 - 81 FT-LBS
5. CUSTOMER WILL BE RESPONSIBLE FOR FITTINGS USED TO MOUNT MUFFLER
AND APPROPRIATE INLET AND OUTLET MOUNTS
6. ATTACH DRAIN LINES (MIN 3/4") AND/OR MUFFLER AS REQUIRED.
7. CONNECT BATTERY POWER PLUG TO VEAM CONNECTOR (ASSURE
CIRCUIT BREAKER IS OFF BEFORE MAKING CONNECTIONS).

- Notes:
 1. Refer to Bulletin MI 994-100 for Maintenance Instructions.
 2. For repair parts refer to: Bulletin RK 94-000 for items marked **



ITEM	QTY	PART NUMBER	DESCRIPTION
45	2	5304-018	HELECOIL, 1/4-20 X .375
44	2	2951-000	FASTON TAB, FEMALE, INSULATED
43	4	5994-384	4.500" INTERNAL RETAINING RING
42	1	5987-811	MUFFLER
41	2	5996-000	GASKET, FLANGE, 1-1/4 NPT
40	4	5994-384	PLUG, STRAIGHT, 7 PIN, .16S
39	4	1305-000	1/16" NPT PIPE PLUG
38	2	3154-028	LOCKWASHER, 1/4, HI-COLLAR
37	34	1672-000	LOCKWASHER, 5/16
36	26	1672-001	LOCKWASHER, 5/16", HI-COLLAR
35	1	5994-333	HEATER
34	10	5994-254	CAPSCREW, SOC HO.-312-18 X 2.50
33	1	5994-234	LABEL, CAUTION, PRESSURE
32	4	5994-233	DRIVE SCREW, ROUND HEAD, #8, .125
31	1	5994-217	NAMEPLATE
30	1	5994-218	TOP MANIFOLD ASSY
29	1	5994-355	984 CONTROL BOX ASSY
28	2	1443-002	O-RING, 27/64 ID
27	1	5994-075	INLET DIVERTER-EXHAUST VALVE ASSY
26	1	5994-138	PURGE VALVE ASSY
25	8	5994-376	CAPSCREW, SOC HO.-312-18 X 4.00
24	1	3154-017	O-RING, 7/8 ID
23	6	3108-000	O-RING, 1-1/4 ID
22	1	5994-171	OUTLET SHUTTLE VALVE ASSY
21	2	5994-377	CAPSCREW, SOC HO.-250-20 X 2.25
20	4	5994-240	O-RING, 5/16 ID
19	1	5994-078	DRAIN VALVE ASSY
18	8	5994-227	SCREW, CAP, SOC HO.-312-18 X 1.12
17	1	5994-318	O-RING, 4-1/4 ID
16	1	5994-030	CAP, COALESCE
15	1	5994-049	ELEMENT, COALESCE
14	34	5032-002	CAPSCREW, HEX HEAD, .312-18 X 2.50
13	5	5987-807	O-RING, 5-1/4 ID
12	7	5994-226	RETAINING RING
11	2	5662-028	O-RING, 1-1/4 ID
10	1	5994-212	TUBE, RISER
9	4	5994-330	DESICCANT BAG
8	3	5994-070	DISC, PERFORATED, COMPENSTOR
7	2	5994-213	MIST PAD
6	1	5994-196	HOUSING, DRYER

AIR DRYER SYSTEM
 P/N 994-100

PARTS LIST



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BULLETIN: PL 994-100
 EFFECTIVE: 06-16-00
 REVISION: B, 03-16-01
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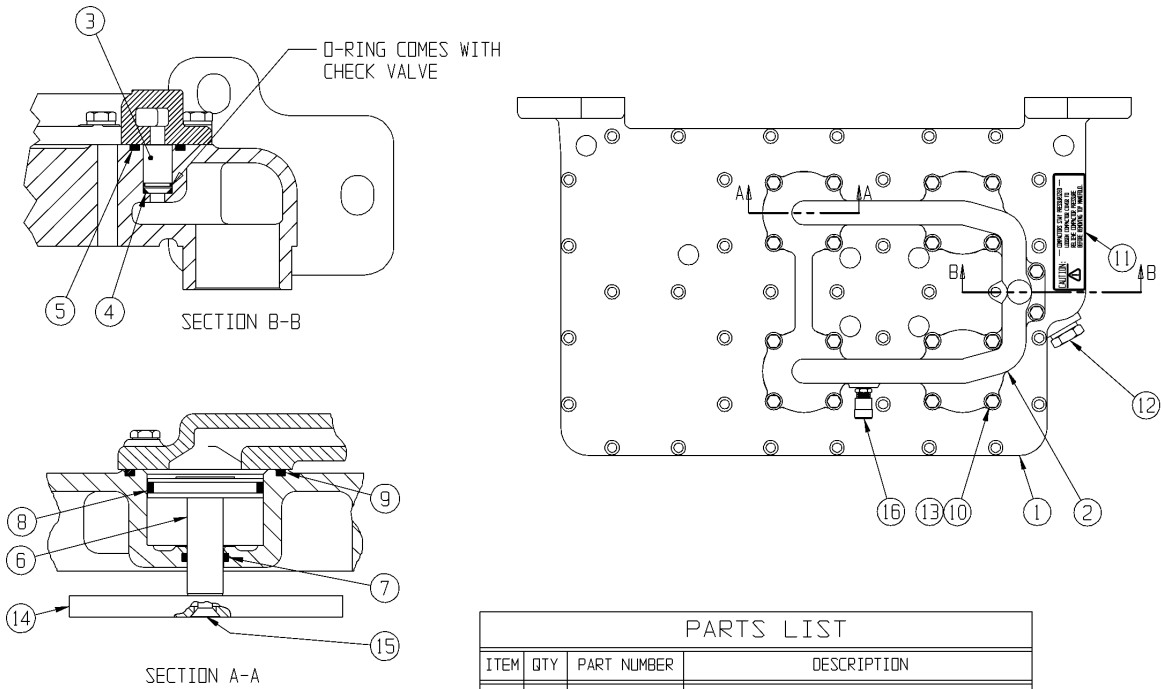
TOP MANIFOLD ASSEMBLY P/N 5994-218

PARTS LIST

BULLETIN: PL 5994-218
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

NOTES:

1. REFER TO BULLETIN MI 5994-218 FOR MAINTENANCE INSTRUCTIONS.
2. REFER TO BULLETIN RK 94-001 FOR REPAIR KIT (CONTAINS ITEMS MARKED ***).



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5994-147	MANIFOLD, TOP (MACHINING)
2	1	5994-146	COVER, COMPACTOR (MACHINING)
3	1	5994-195	CHECK VALVE, CARTRIDGE
4	1	***	O-RING
5	1	***	O-RING
6	4	5994-072	PISTON, COMPACTOR
7	4	***	O-RING
8	4	***	O-RING
9	4	***	O-RING
10	18	5615-012	HEX HEAD CAPSCREW, 1/4-20 X 1
11	1	5994-219	LABEL, WARNING, COMPACTOR PRESSURE
12	1	5633-143	HUMIDITY INDICATOR
13	18	1811-000	LOCKWASHER, 1/4
14	4	5994-070	DISC, PERFORATED, COMPENSATOR
15	4	5660-030	CAP SCREW, CSK HD, 1/4-20 X .75
16	1	5995-118	TANK VALVE - 1/8



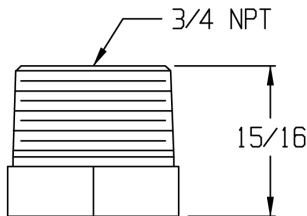
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HUMIDITY INDICATOR
P/N 5633-143
OUTLINE ASSEMBLY

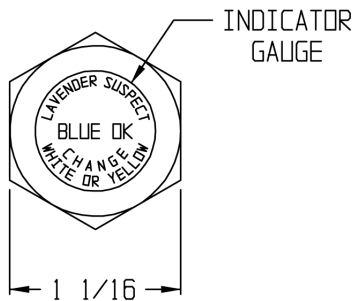
BULLETIN: DA 5633-143
EFFECTIVE: 4-26-93
REVISION: A, 04-11-97

WARNING

WHEN REMOVING HUMIDITY INDICATOR(S) FROM DRYER, FIRST ASSURE THAT THE ENTIRE PRESSURIZED DEVICE HAS BEEN VENTED OF ALL PRESSURE



THE HUMIDITY INDICATOR IS USED AS A VISUAL MONITOR SHOWING THE OPERATING CONDITION OF THE AIR DRYER.



IMPORTANT

BLUE INDICATOR - INDICATES DRYER HAS BEEN PERFORMING CORRECTLY

LAVENDER INDICATOR - DRYER IS SUSPECT

WHITE INDICATOR - POSSIBLE DAMAGED DRYER

YELLOW OR BROWN INDICATOR - DAMAGED DRYER

NOTE :

1. NET WEIGHT - 2 OZS APPROX
2. DIMS IN INCHES AND FOR REF ONLY
3. SCALE - 1/1
4. FOR REPAIR PARTS KIT, ORDER P/N 75-050, SEE BULLETIN RK 75-050
5. FOR MAINTENANCE INSTRUCTIONS SEE BULLETIN MI 5633-143



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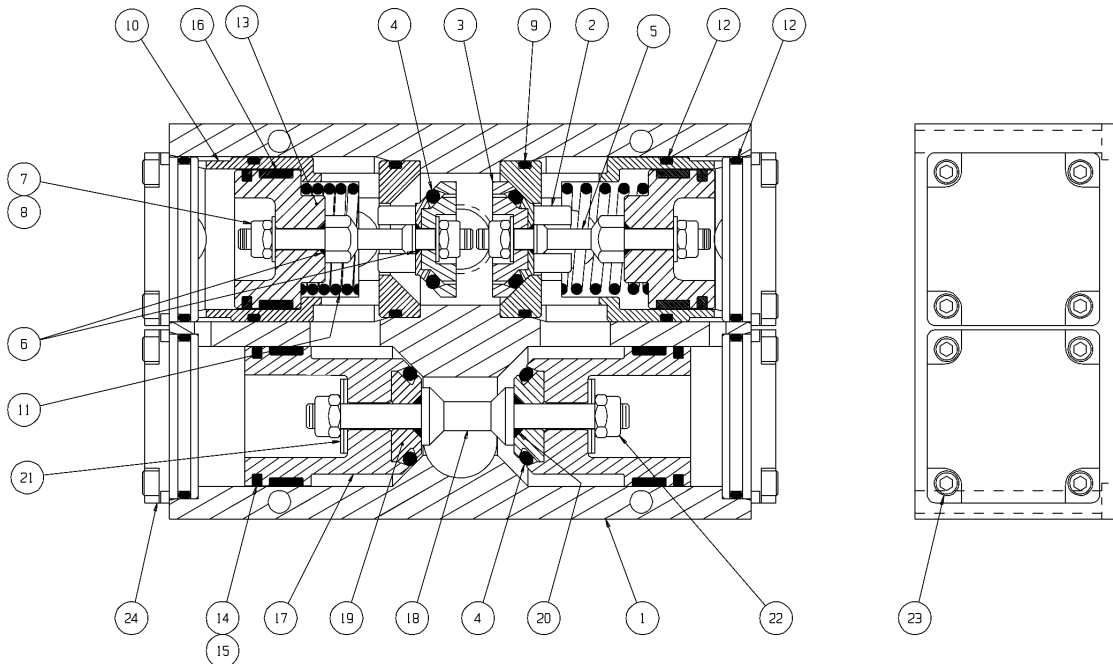
INLET DIVERTER/EXHAUST VALVE ASSY P/N 5994-075

PARTS LIST

BULLETIN: PL 5994-075
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

NOTES:

1. REFER TO BULLETIN MI 5994-075 FOR MAINTENANCE INSTRUCTIONS.
2. REFER TO BULLETIN RK 94-003 FOR REPAIR KIT (CONTAINS ITEMS MARKED ***).



PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5994-035	BODY, VALVE	13	2	5994-095	PISTON, VALVE, EXHAUST
2	2	5994-054	POPPET, VALVE, REAR	14	4	***	GLYDRING
3	2	5994-055	POPPET, VALVE, FRONT	15	4	***	O-RING
4	4	***	O-RING	16	4	***	SLYDRING
5	2	5994-096	STEM, VALVE, EXHAUST	17	2	5994-036	PISTON, DIVERTER
6	4	***	O-RING	18	1	5994-037	STEM, DIVERTER
7	4	***	LOCKNUT	19	2	***	RETAINER, O-RING
8	4	5994-216	WASHER, BELLEVILLE, 5/16 ID	20	2	***	O-RING
9	2	***	O-RING	21	4	5994-209	WASHER, BELLVILLE, 3/8 ID
10	2	5994-097	HOUSING, PISTON	22	2	***	LOCKNUT
11	2	***	COMPRESSION SPRING	23	16	1930-000	CAP SCREW, SOC-HD, .250-20 UNC x .75
12	6	***	O-RING	24	4	5994-048	CAP, VALVE



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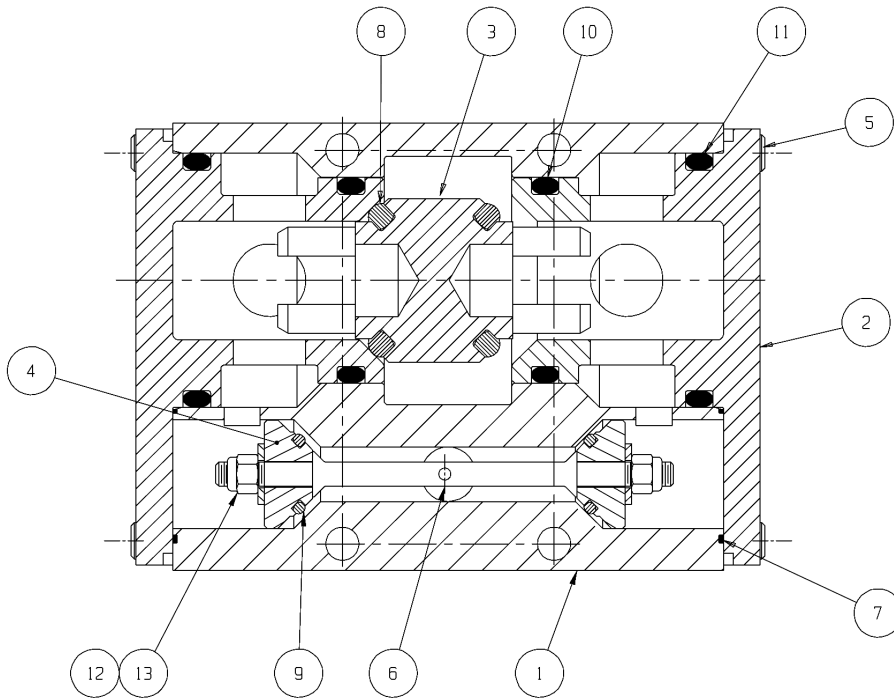
OUTLET SHUTTLE VALVE ASSY P/N 5994-171

PARTS LIST

BULLETIN: PL 5994-171
EFFECTIVE: 02-14-97
REVISION: C, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

NOTES:

1. REFER TO BULLETIN MI 5994-171 FOR MAINTENANCE INSTRUCTIONS.
2. REFER TO BULLETIN RK 94-005 FOR REPAIR KIT (CONTAINS ITEMS MARKED ***).



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5994-154	BODY, SHUTTLE VALVE
2	2	5994-059	COVER, SHUTTLE VALVE
3	1	5994-060	SHUTTLE, SHUTTLE VALVE
4	2	5994-061	POPPET, CHECK VALVE
5	8	5225-015	SCREW, CAP, SCH-.250-20 x.50 LG
6	1	5994-152	STEM, CHECK VALVE
7	2	***	O-RING
8	2	***	O-RING
9	2	***	O-RING
10	2	***	O-RING
11	2	***	O-RING
12	2	***	LOCKNUT
13	2	5994-175	WASHER, PLAIN, .250 - TYPE A



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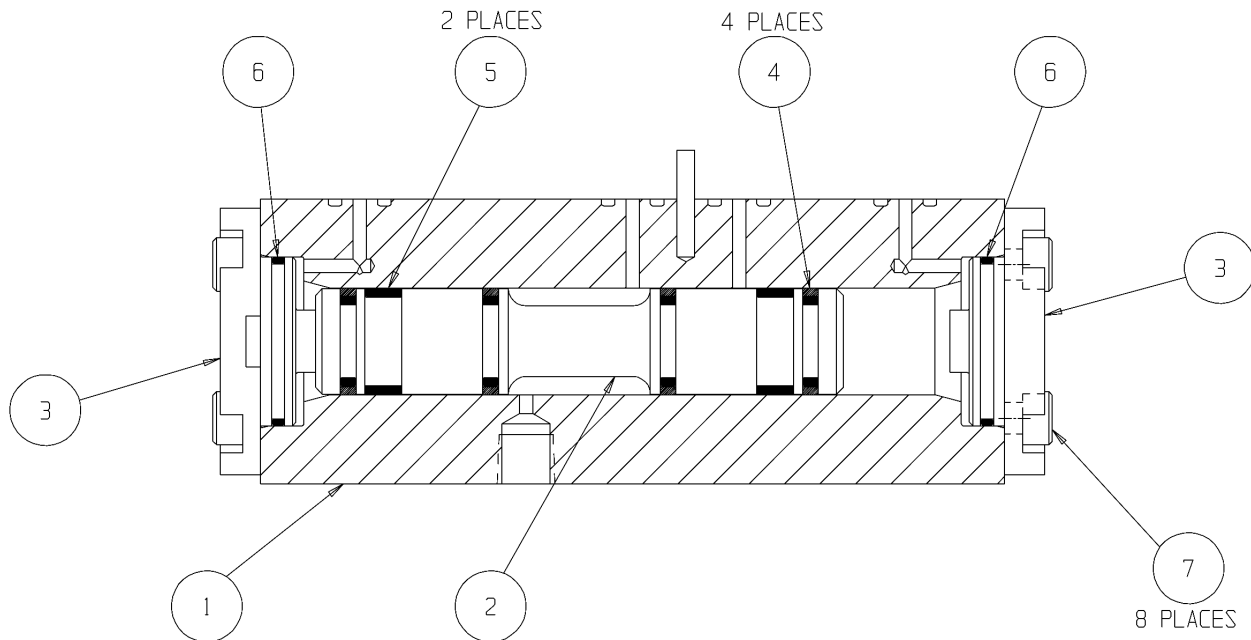
DRAIN VALVE ASSY P/N 5994-078

PARTS LIST

BULLETIN: PL 5994-078
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

NOTES:

1. REFER TO BULLETIN MI 5994-078 FOR MAINTENANCE INSTRUCTIONS.
2. REFER TO BULLETIN RK 94-006 FOR REPAIR KIT (CONTAINS ITEMS MARKED ***).



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5994-067	BODY, DRAIN VALVE
2	1	5994-066	SPOOL
3	2	5994-069	CAP
4	4	***	GLYDRING
5	2	***	SLYDRING
6	2	***	O-RING
7	8	5994-190	CAPSCREW, #10-24 X .62 LG



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BULLETIN:
EFFECTIVE:
REVISION:

- NOTES:
- ITEMS 9,10,18, & 19 UNASSEMBLED AND RECEIVED IN PARTS BAG.
 - REFER TO BULLETIN M/ 5994-138 FOR MAINTENANCE INSTRUCTIONS.
 - REFER TO BULLETIN RK 94-004 FOR REPAIR PARTS (CONTAINS PARTS MARKED ***).

ITEM	QTY	PART NUMBER	DESCRIPTION
23	1	***	O-RING, 1-19/64 ID
22	8	2852-000	SCREW, CAP, SOC HD, .312-18X1.5
21	1	***	O-RING
20	2	***	O-RING
19	1	***	O-RING
18	1	***	O-RING
17	8	1672-001	WASHER, 5/16, LOCK, HT-COLLAR
16	1	***	SEAL, PURGE VALVE PISTON
15	1	***	COMPRESSION SPRING
14	1	5994-141	GLAND, CHOKE STEM
13	1	5994-134	CAP, GLAND
12	1	5994-142	STEM, CHOKE
11	1	5994-168	PLUG, CHOKE STEM
10	1	5994-145	DRIFTFICE, CHOKE
9	1	5994-144	DRIFTFICE, METERING
8	1	5994-139	TUBE, METERING
7	8	5313-001	WASHER, FLAT
6	1	5994-085	SLEEVE, METERING
5	1	5994-088	DIAPHRAM
4	2	5994-087	PLATE, RETAINER
3	1	5994-086	RETAINER, DIAPHRAM
2	1	5994-155	COVER, DIAPHRAM
1	1	5994-148	BODY, VALVE

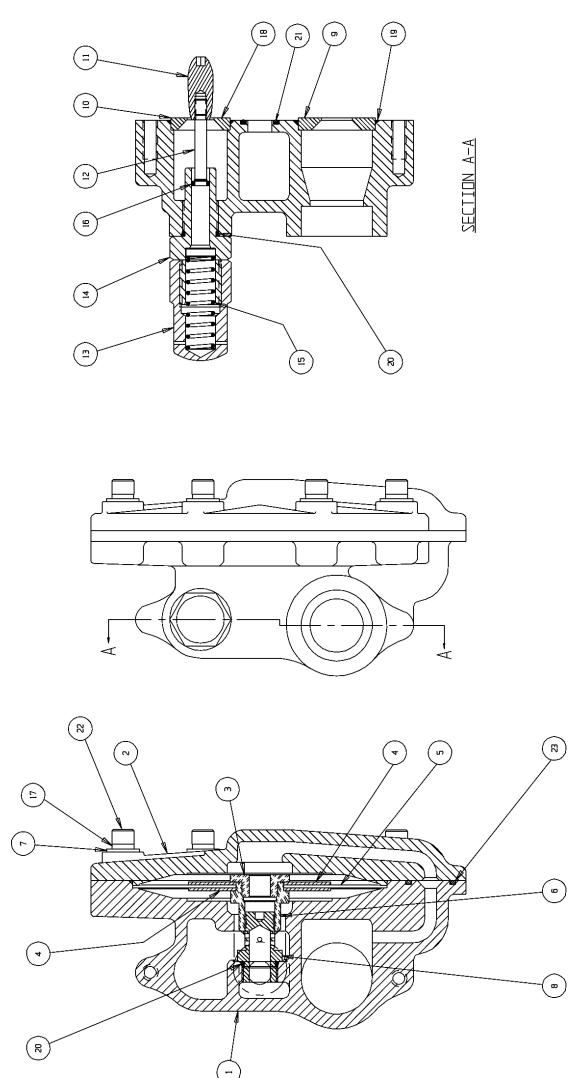
SELF ADJUSTING PURGE
VALVE ASSEMBLY
P/N 5994-138

PARTS LIST

BULLETIN: PL 5994-138
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

GRAHAM-WHITE MFG. CO.
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3-8





GRAHAM-WHITE MFG. CO.
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INSPECTION PROCEDURE
FOR P/N 994-100 SERIES AIR DRYER
SUGGESTED SERVICE REQUIREMENTS

BULLETIN: IP 994-100
EFFECTIVE: 2/14/97
REVISION: B, 02-17-00
ERN 000706
PAGE 1 of 2

- IMPORTANT: 1.) The 994-100 Air Dryer System with coalescer and auto-purge control operates on a continuous cycle, whether or not the compressor is pumping. The auto-purge control meters the amount of air being used for regeneration based on the system air pressure and airflow. The objective is to conserve the amount of air being used for regeneration while maintaining a high level of dryer performance.
- 2.) The electronic control circuit operates on a nominal voltage of 45-138 VDC. This power supply is continuous and should not be interrupted.
- 3.) Operational inspection of the air dryer system requires a minimum of 75 psig air pressure and a maximum of 150 psig.

Reference Bulletins: GS 994 Series
IM 994-100
MI 5633-143
OA 994 Series

Each 30-92 Days

1. Visually inspect humidity indicator. It is located on the top right hand side of the manifold housing. A blue color indicates dryer is functioning properly. Lavender, white yellow or brown color indicates possible dryer damage and further dryer inspection required. (See TG 994-100 - Trouble Shooting Guide).
2. The dryer goes through a complete cycle every 2 minutes and 10 seconds, 48 seconds regeneration, 17 seconds repressurization for each side. One cycle switches the dryer from right towers (2) to left towers (2) and back again. Approximately every minute, a short blast of air will discharge from the dryer exhaust. A slight, continuous exhausting of purge air follows this. The exhaust port is located under the dryer assembly. (see TG 994-100)
3. Approximately every minute, a short blast of air will come from one of the solenoid valve exhaust ports (2). The exhaust should alternate between the right and left solenoid every other cycle.
4. Once per cycle, a short blast of air and/or water will discharge from the coalescer sump drain valve. During the second half-cycle there should be no discharge blast.
5. The self-adjusting purge control valve regulates the amount of purge air used relative to the system air pressure and rate of airflow. At high pressures and flow rates the purge flow will be high.
6. The electronic control circuit, and thus the dryer, cycles continuously whether or not the locomotive compressor is pumping. If the dryer does not cycle as described above, further



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INSPECTION PROCEDURE
FOR P/N 994-100 SERIES AIR DRYER
SUGGESTED SERVICE REQUIREMENTS

BULLETIN: IP 994-100
EFFECTIVE: 2/14/97
REVISION: B, 02-17-00
ERN 000706
PAGE 2 of 2

investigation is required. (see TG 994-100)

7. Confirm that #1 main reservoir drain valve is operating correctly.

Yearly Inspection

1. Repeat 30-92-Day Inspection.
2. Remove coalescer cover from dryer housing and replace coalescer element. (MI 5994-049)
3. Inspect and check all mounting hardware for tightness. Tighten if needed.

Six Year Inspection

1. Overhaul dryer or return to Graham-White Manufacturing Co. for complete rebuild.



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
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994-100 AIR DRYER SYSTEM GENERAL SERVICING

BULLETIN: GS 994 SERIES
EFFECTIVE: 02-14-97
REVISION: NONE

PAGE 1 of 1

GENERAL SERVICING NOTES

- ∞ Maintenance should be carried out in a clean, well lit workshop where work is carried out on a wood bench and some form of protection such as a rubber mat must be provided to avoid damage to aluminum parts.
- ∞ Clean dryer and valves externally before beginning dismantling. Many parts have a fine surface finish - handle carefully when taking apart.
- ∞ Although component parts of identical valves are interchangeable, it is generally preferable to refit serviceable used parts in the valve from which they have been dismantled. Therefore, the component parts of each valve must be grouped together after dismantling, cleaning, etc.
- ∞ A cleaning fluid for use with aluminum is recommended. The use of strong caustic solutions must be avoided. Remove all electrical components before high temperature baths or steam cleaning.
- ∞ Use only GRAHAM-WHITE manufactured parts for replacement.

TOOLS AND LUBRICATION REQUIRED:

Flat head screwdriver

Phillips head screwdriver

Needle nose pliers

Wrenches: 9/16", 1/2", 11/32", 7/16", 3/8", 5/8", 1", 1 3/8" and 1-1/16"

Sockets: 1/2", 11/32", 7/16", 3/8", 9/16", 3/4" and 1-1/6"

3" EXTENSION, 15" EXTENSION

12-Point Sockets: 1/4", 5/16"

Hex keys: 3/16", 5/32" and 1/4"

Dow Corning 55M grease or equivalent

Dow Corning Silicon valve lubricate #111

Pipe sealant with Teflon, Loctite #592 or equivalent

Threadlocker, Loctite #222 or equivalent

Torque Wrench ft-lb scale

Torque Wrench in-lb scale



GRAHAM-WHITE MFG. CO.
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994-100 AIR DRYER SYSTEM
INSPECTION AND MAINTENANCE
SCHEDULE

BULLETIN: IM 994-100
EFFECTIVE: 06-16-00
REVISION: B; 03-16-01
ERN 011112
PAGE 1 of 1

INSPECTION AND MAINTENANCE SCHEDULE:

The following schedule is based on this device and its components being new or having been repaired, tested, installed and maintained in accordance with instructions issued by Graham-White.

These, and all other maintenance services included in this manual, should be performed to provide best dryer performance and reliability. More frequent maintenance may be needed for dryer in severe operating conditions.

Inspection and service should be performed any time a malfunction is suspected.

MAINTAIN PRODUCT P/N	INSPECT EVERY:			REFER TO BULLETIN NO.
	30-92 DAYS	1 YR	6 YR	
994-100 Air Dryer System	*X	X	X	IP 994-100
5633-143 Humidity Indicator	*X	X	X	IP 994-100
Mounting Hardware		X	X	II 994 SERIES
5994-049 Coalescer		X	X	MI 5994-049
5994-075 Inlet-Diverter Exhaust Assembly			X	MI 5994-075
5994-078 Drain Valve Assembly			X	MI 5994-078
Desiccant Renewal			X	MI 5994-100
5994-138 Purge Valve			X	MI 5994-138
5994-171 Outlet Shuttle Valve			X	MI 5994-171
5994-393 Heater Control Board			X	PL 5994-355
5994-385 Timer, 18-138 VDC			X	PL 5994-355
5994-355 Control Box Assembly			X	MI 5994-355
5994-218 Top Manifold Assembly			X	MI 5994-218
NOTE: * Operational Inspection of Air Dryer ** After Completely reassembling (6 yr. service) Overhaul Kit (Total Dryer System)				IP 994-100 IP 994-100 RK 94-009



<u>SYMPTOM</u>	<u>CORRECTION</u>
A. Humidity Indicator is not <u>blue</u> in color	<ol style="list-style-type: none">1. Make a visual inspection of dryer for external damage. Repair or replace damaged components as needed.2. Check dryer for cycling operation.3. If dryer cycling correctly, replace 5663-143 Humidity Indicator.4. If brown, remove dryer and return for service.
B. Dryer not cycling	<ol style="list-style-type: none">1. Make a visual inspection of dryer for external damage. Repair or replace damaged components as needed.2. Verify Power to dryer. Check voltage on pins A & C on connector.3. Make sure electrical plug is connected and tight. Reconnect or tighten as needed.4. If power verified, change circuit board. If dryer does not start to cycle, replace 5994-355 Electrical Control Box Assembly or remove dryer for service.
C. Excessive air discharge during regeneration	<ol style="list-style-type: none">1. Make a visual inspection of dryer for external damage. Repair or replace damaged components as needed.2. Replace 5994-171 Outlet Shuttle Valve Assembly. If excessive blowing continues, remove dryer for service.
D. Continuous discharge of main reservoir from precoalescer drain valve	<ol style="list-style-type: none">1. Make a visual inspection of dryer for external damage. Repair or replace damaged components as needed.2. Replace 5994-078 Coalescer Drain Assembly. If leak continues, remove dryer for service.
E. No regenerating air flow	<ol style="list-style-type: none">1. Make a visual inspection of dryer for external damage. Repair or replace damaged components as needed.2. Check for proper cycling. If not cycling go to B.



GRAHAM-WHITE MFG. CO.
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MAINTENANCE INSTRUCTIONS

P/N 5633-143

HUMIDITY INDICATOR

BULLETIN: MI 5633-143

EFFECTIVE: 4-26-93

REVISION: NONE

THE HUMIDITY INDICATOR IS USED AS A VISUAL MONITOR SHOWING THE OPERATING CONDITION OF THE AIR DRYER.

IMPORTANT

USUALLY ONLY EXCESSIVE OIL AEROSOLS OR PROLONGED SATURATION BY WATER WILL PERMANENTLY TURN THE BLUE PAPER WHITE. OIL AEROSOLS WILL COAT THE PAPER AND TURN IT A DARK GREEN OR SHADE OF ORANGE OR YELLOW, RENDERING IT INEFFECTIVE FOR THE SENSING OF WATER AEROSOLS.

IMPORTANT

DO NOT ALTER, MODIFY OR USE PARTS NOT OBTAINED IN KIT 75-050 FOR THIS PRODUCT.

THIS KIT IS DESIGNED TO REPLACE THE PAPER INDICATOR -



IN THE HUMIDITY INDICATOR -



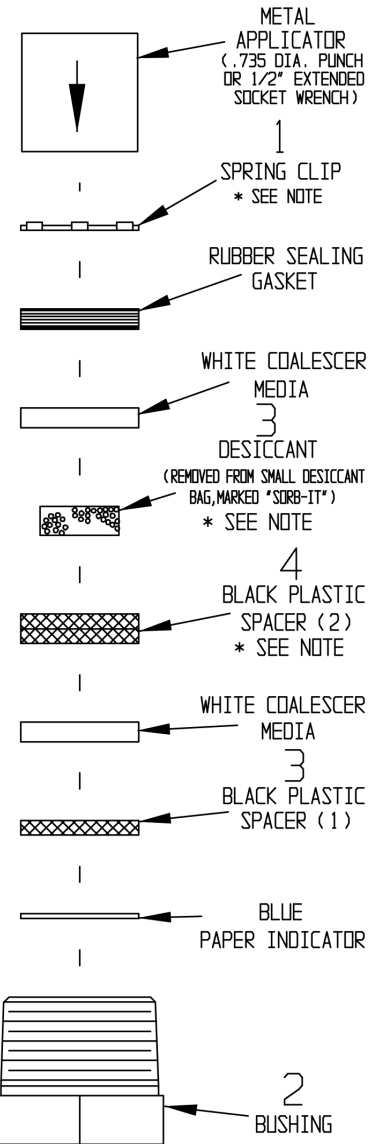
- No. 5633-143.

- 1.1 Remove spring clip (1), all old media and paper.
- 1.2 Clean inside of 3/4" bushing (2) with solvent that will remove oil.
- 1.3 Wipe off and dry.
- 1.4 An oil coalescer medium and humidity/oil adsorbing desiccant has been added to prolong the life of the blue paper. To be effective, IT MUST BE ASSEMBLED AS SHOWN AT RIGHT.

NOTE

* WHEN APPLYING LOOSE DESICCANT FROM "SORB-IT" BAG, FILL CAVITY LEVEL IN TWO SPACERS (4) ONLY, BEFORE INSERTING COALESCER MEDIA, RUBBER SEALING GASKET AND SPRING CLIP INTO BUSHING.

* BE SURE THE SPRING CLIP IS PRESSED INTO BUSHING FIRMLY AGAINST RUBBER GASKET - CONVEX SIDE FIRST. USE A METAL APPLICATOR (A 1/2" EXTENDED SOCKET WILL DO) TO TAP SPRING CLIP INTO PLACE.



FOR REPAIR PARTS KIT
ORDER P/N 75-050, SEE
BULLETIN RK 75-050



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COALESCER MAINTENANCE INSTRUCTIONS

BULLETIN: MI 5994-049
EFFECTIVE: 02-14-97
REVISION: B, 06-07-00
ADDED #6 AND KIT 94-000
ERN 002303

WARNING

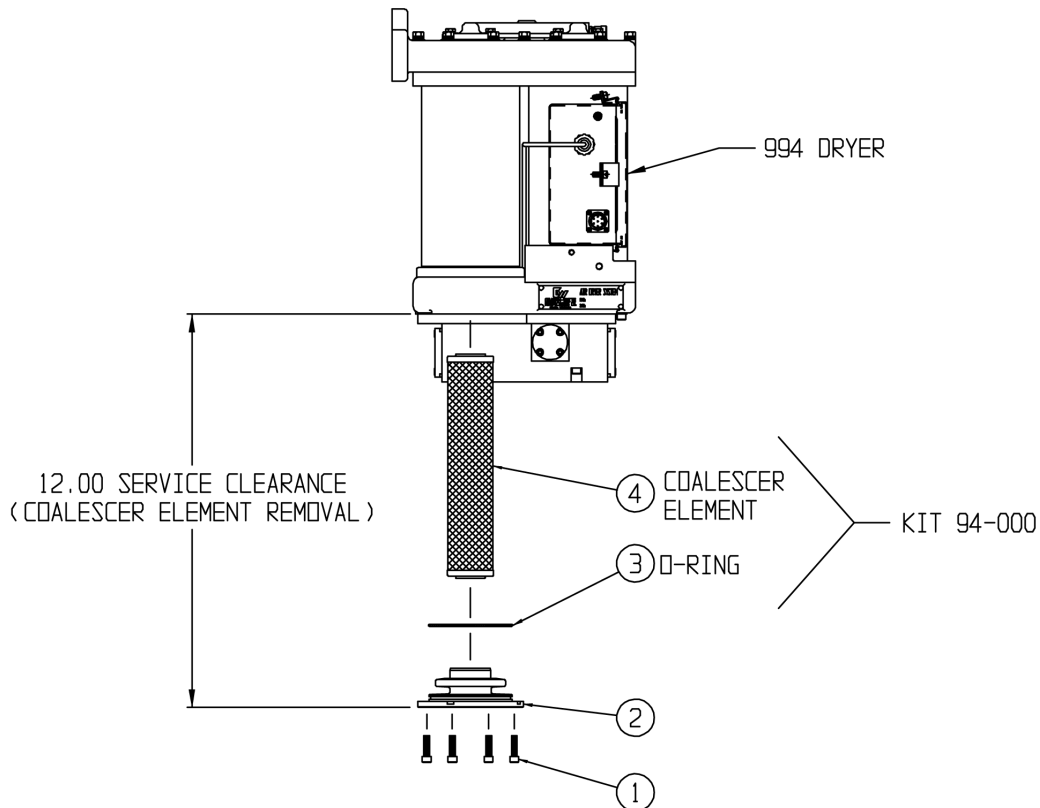
THIS IS A COMPRESSED AIR DEVICE. COMPRESSED AIR IS EXTREMELY DANGEROUS IF NOT HANDLED CAREFULLY. DO NOT ATTEMPT TO SERVICE, REPAIR, OR BREAK ANY CONNECTIONS WITHOUT FIRST ASSURING THAT THE ENTIRE PRESSURIZED DEVICE HAS BEEN VENTED OF ALL PRESSURE.

NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS SEE BULLETIN RK 94-000.

MAINTENANCE PROCEDURE:

1. REMOVE 8 CAP SCREWS FROM BOTTOM OF DRYER.
2. REMOVE COALESCER CAP.
3. REPLACE O-RING, ITEM 1. LUBRICATE WITH DOW CORNING 55M.
4. REPLACE COALESCER ELEMENT, ITEM 2.
5. REASSEMBLE O-RINGS, COALESCER CAP AND CAP SCREWS.
6. TIGHTEN CAP SCREWS TO 20-26 FT-LBS.





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MAINTENANCE INSTRUCTIONS

P/N 5994-355

CONTROL BOX ASSEMBLY

BULLETIN: MI 5994-355
EFFECTIVE: 06-16-00
REVISION: NONE
ERN 011112

WARNING

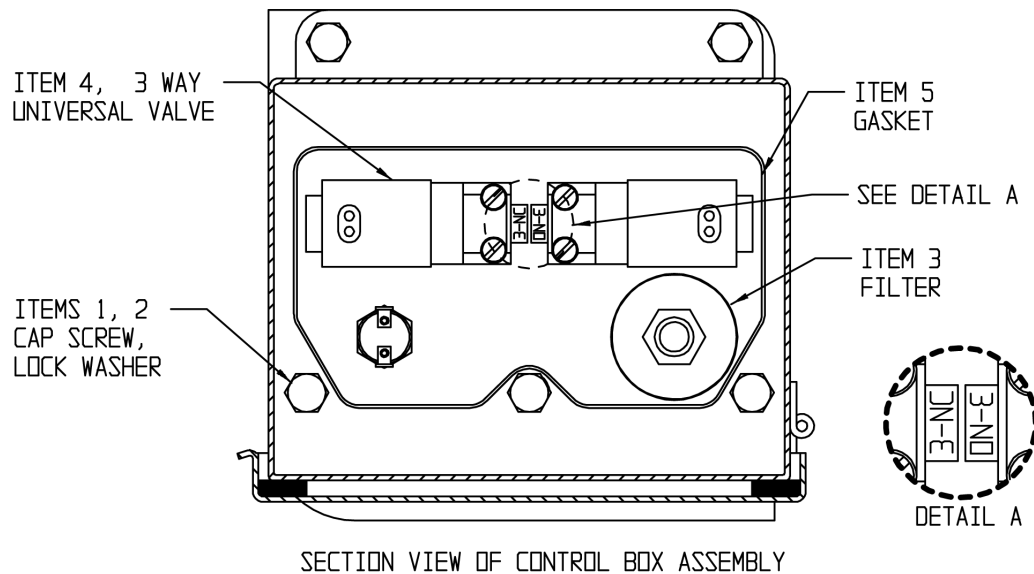
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NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS, SEE BULLETIN RK 94-010.

MAINTENANCE PROCEDURE:

1. DISABLE ELECTRICAL POWER SUPPLY TO DRYER, THEN DISCONNECT POWER CABLE FROM DRYER AT THE CONNECTOR.
2. REMOVE CONTROL BOX FROM DRYER BY REMOVING 8 CAP SCREWS (REFER TO BULLETIN PL 994-100).
3. LOOSEN SCREWS ON CONTROL BOX LATCHES AND OPEN COVER.
4. REMOVE CONTROL BOX FROM MANIFOLD BY REMOVING 5 CAP SCREWS AND LOCK WASHERS, ITEM 1,2.
5. REPLACE FILTER ASSEMBLY, ITEM 3.
6. REPLACE BOTH 3 WAY UNIVERSAL VALVES, ITEM 4, BY REMOVING CAP SCREWS. LUBRICATE BOTH SIDES OF NEW VALVE PLATES WITH DOW CORNING 55M. REFER TO DETAIL A FOR VALVE SETTINGS AND ORIENTATION.
7. CLEAN 3 WAY UNIVERSAL VALVE AND GASKET SURFACE WITH SOLVENT.
8. REPLACE GASKET, ITEM 5.
9. REASSEMBLE CONTROL BOX AND MANIFOLD AND REATTACH TO DRYER.
10. RECONNECT ELECTRICAL POWER SUPPLY.





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MAINTENANCE INSTRUCTIONS P/N 994-100

DESICCANT RENEWAL

BULLETIN: MI 994-100
EFFECTIVE: 02-14-97
REVISION: B, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

WARNING

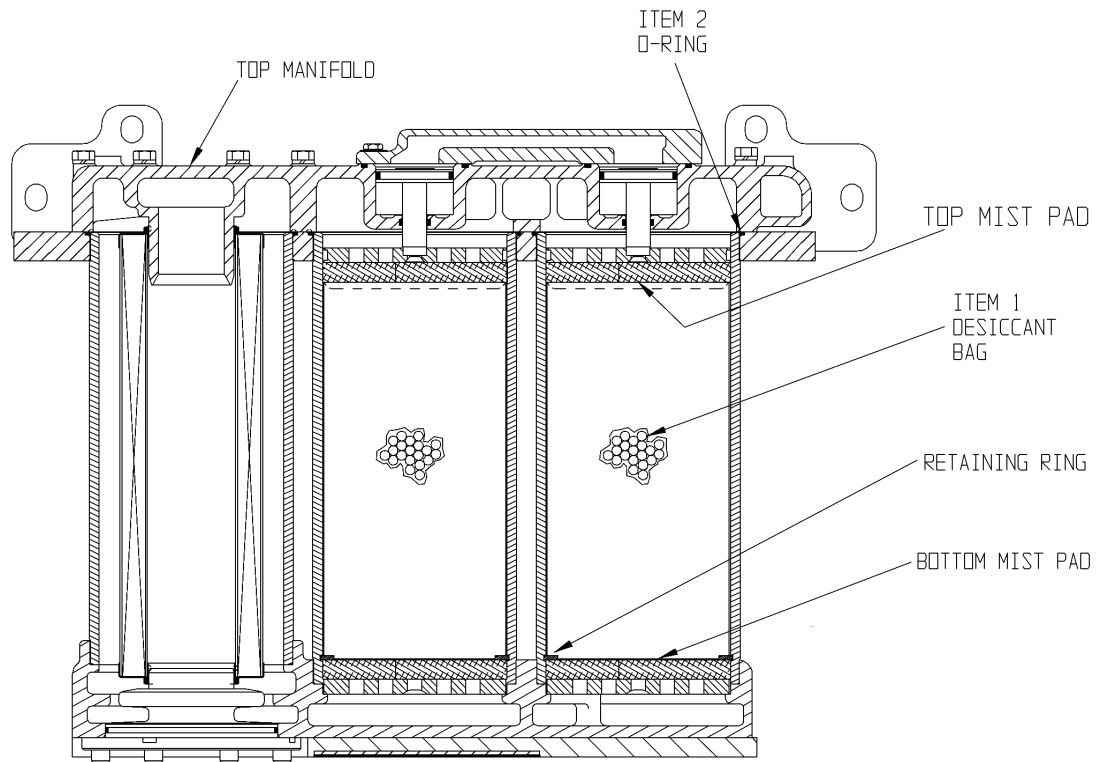
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NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS SEE BULLETIN RK 94-007.

MAINTENANCE PROCEDURE:

1. REMOVE 34 CAP SCREWS FROM TOP MAINFOLD.
2. REMOVE TOP MAINFOLD ASSEMBLY.
3. REMOVE TOP 4 MIST PADS AND CLEAN.
4. USING PULL STRAP, REMOVE 4 DESICCANT BAGS.
5. REMOVE 4 RETAINING RINGS AND BOTTOM 4 MIST PADS. CLEAN MIST PADS.
6. CLEAN INSIDE OF DRYER HOUSING.
7. REINSTALL 4 BOTTOM MIST PADS AND RETAINING RINGS.
8. REPLACE DESICCANT BAGS, ITEM 1.
9. REINSTALL TOP 4 MIST PADS.
10. REPLACE 5 O-RINGS, ITEM 2. LUBRICATE WITH DOW CORNING 55M.
11. REATTACH TOP MAINFOLD ASSEMBLY TO DRYER.



SECTION VIEW OF DRYER BODY



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MAINTENANCE INSTRUCTIONS

P/N 5994-218

TOP MANIFOLD ASSEMBLY

BULLETIN: MI 5994-218
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

WARNING

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NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS, SEE BULLETIN RK 94-001.

MAINTENANCE PROCEDURE:

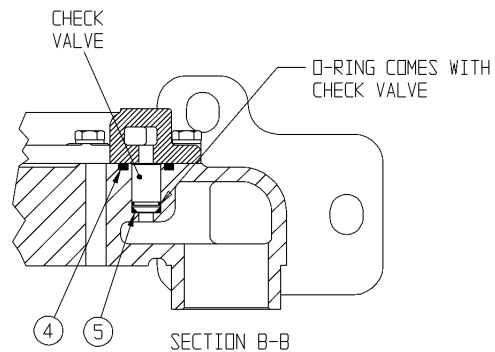
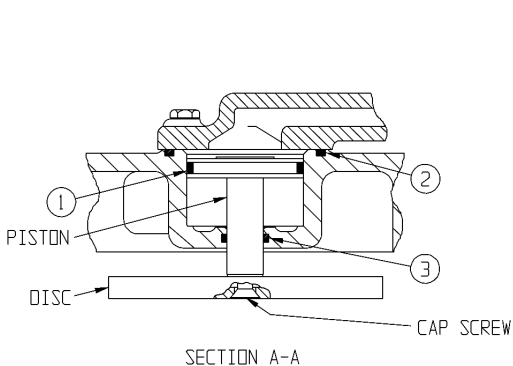
1. REMOVE COMPACTOR COVER FROM TOP MANIFOLD ASSEMBLY BY REMOVING 18 CAP SCREWS. COMPACTOR AIR WILL BE VENTED AT THIS POINT. (REFER TO BULLETIN PL 994-100)
2. REMOVE TOP MANIFOLD ASSEMBLY FROM DRYER BY REMOVING 34 CAP SCREWS. (REFER TO BULLETIN PL 994-100)

SECTION A-A

3. REMOVE 4 PISTONS AND DISCS BY REMOVING 4 CAP SCREWS FROM EACH.
4. INSPECT PISTONS FOR DAMAGE AND REPLACE IF REQUIRED.
5. REPLACE O-RINGS, ITEMS 1, 2 & 3 (4 OF EACH), LUBRICATE WITH DOW CORNING 55M.

SECTION B-B

6. REMOVE CHECK VALVE FROM TOP MANIFOLD AND INSPECT FOR DAMAGE, REPLACE IF REQUIRED.
7. REPLACE O-RINGS, ITEMS 4 & 5, LUBRICATE WITH DOW CORNING 55M.
8. REASSEMBLE MANIFOLD. TORQUE CAP SCREWS TO 12 FT-LBS





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BULLETIN:
EFFECTIVE:
REVISION:

WARNING

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NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH ODM CORNING 55M OR EQUIVALENT.
2. A THIN COAT OF ODM CORNING 55M LUBRICANT MAY BE USED IN THE INSTALLATION OF GLYDRINGS AND SLDRINGS.
3. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
4. FOR REPAIR PARTS SEE BULLETIN RK 94-003.

MAINTENANCE PROCEDURE:

1. REMOVE INLET DIVERTER/EXHAUST VALVE FROM DRYER BY REMOVING 4 CAP SCREW (REFER TO BULLETIN PL 994-100)

LOWER PORTION OF VALVE

2. REMOVE 4 CAP SCREWS FROM EACH VALVE CAP AND REMOVE BOTH VALVE CAPS.
3. REMOVE 2 LOCKNUTS, ITEM 1, AND 4 WASHERS.
4. REMOVE 2 PISTONS AND 2 RETAINERS, ITEM 2, FROM STEM.
5. REMOVE STEM AND INSPECT FOR DAMAGE. REPLACE IF REQUIRED.
6. REPLACE SEALS, ITEMS 3-8, 2 OF EACH. LUBRICATE WITH ODM CORNING 55M.
7. REASSEMBLE LOWER PORTION OF VALVE. TORQUE LOCKNUTS, ITEM 1, TO 15-75 FT-LBS AND CAP SCREWS TO 25 IN-LBS.

UPPER PORTION OF VALVE

8. REMOVE 4 CAP SCREWS FROM EACH VALVE CAP AND REMOVE BOTH VALVE CAPS.
9. REMOVE PISTONS, PISTON HOUSINGS, SPRINGS, ITEM 9, AND VALVE POPPETS.
10. REMOVE 4 LOCKNUTS, ITEM 10, AND 4 WASHERS FROM VALVE STEMS. INSPECT FOR DAMAGE. REPLACE VALVE STEMS IF REQUIRED.
11. REPLACE SEALS, ITEMS 3 & 12, 4 OF EACH, AND ITEMS 4-7, & 11, 2 OF EACH. LUBRICATE WITH ODM CORNING 55M.
12. REASSEMBLE UPPER PORTION OF VALVE REPLACING SPRINGS, ITEM 9, LOCKNUTS, ITEM 10, TO 105 IN-LBS AND CAP SCREWS TO 25 IN-LBS.
13. REASSEMBLE VALVE ASSEMBLY TO DRYER.

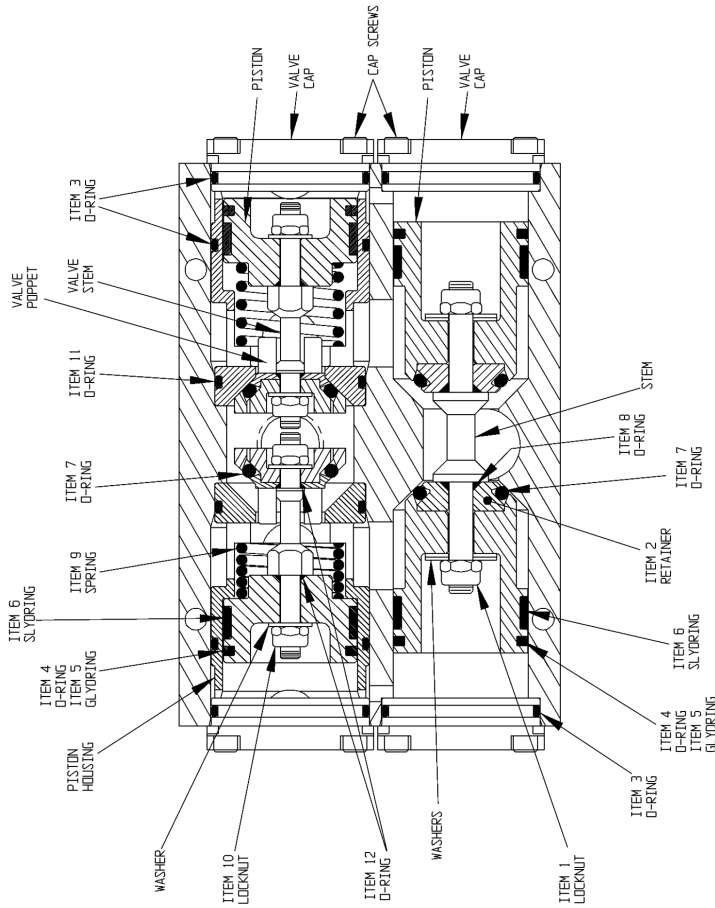
MAINTENANCE INSTRUCTIONS
P/N 5994-075

INLET DIVERTER/EXHAUST VALVE ASSEMBLY

BULLETIN: MI 5994-075
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099





GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

MAINTENANCE INSTRUCTIONS

P/N 5994-171

OUTLET SHUTTLE VALVE ASSEMBLY

BULLETIN: MI 5994-171
EFFECTIVE: 02-14-97
REVISION: B, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

WARNING

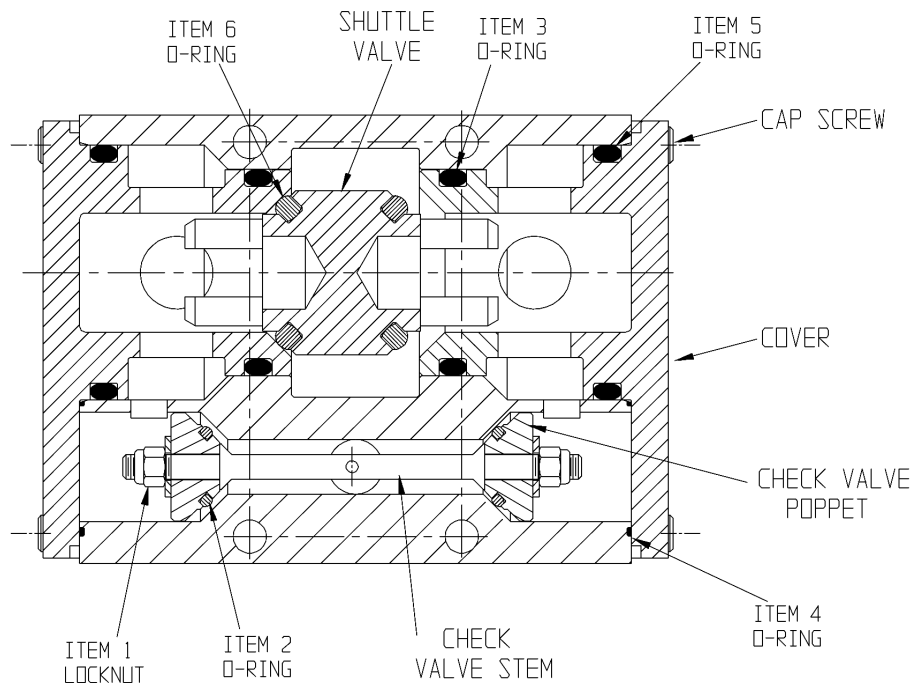
THIS IS A COMPRESSED AIR DEVICE. COMPRESSED AIR IS EXTREMELY DANGEROUS IF NOT HANDLED CAREFULLY. DO NOT ATTEMPT TO SERVICE, REPAIR, OR BREAK ANY CONNECTIONS WITHOUT FIRST ASSURING THAT THE ENTIRE PRESSURIZED DEVICE HAS BEEN VENTED OF ALL PRESSURE.

NOTES:

1. LUBRICATE ALL RUBBER PRODUCTS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS, SEE BULLETIN RK 94-005.

MAINTENANCE PROCEDURE:

1. REMOVE OUTLET SHUTTLE VALVE FROM DRYER BY REMOVING 4 CAP SCREWS (REFER TO BULLETIN PL 994-100).
2. REMOVE 8 CAP SCREWS FROM COVER.
3. REMOVE LOCKNUTS, ITEM 1, AND WASHERS FROM CHECK VALVE STEM.
4. REMOVE CHECK VALVE POPPETS FROM STEM AND INSPECT FOR DAMAGE, REPLACE IF REQUIRED.
5. REMOVE SHUTTLE VALVE AND INSPECT FOR DAMAGE, REPLACE IF REQUIRED.
6. REPLACE O-RINGS, ITEMS 2-6, 2 OF EACH. LUBRICATE ALL O-RINGS WITH DOW CORNING 55M.
7. REASSEMBLE VALVE, TORQUE 8 CAP SCREWS TO 40 IN-LBS.



SECTION VIEW OF OUTLET SHUTTLE VALVE



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

MAINTENANCE INSTRUCTIONS

P/N 5994-078

DRAIN VALVE ASSEMBLY

BULLETIN: MI 5994-078
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706

WARNING

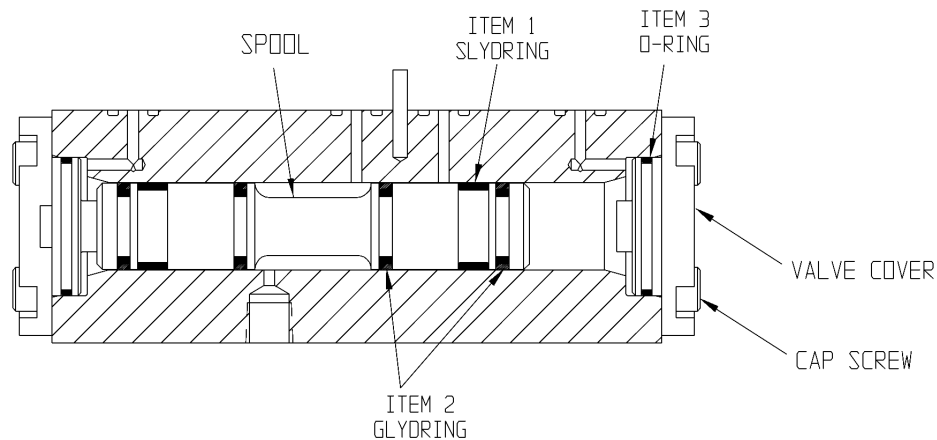
THIS IS A COMPRESSED AIR DEVICE. COMPRESSED AIR IS EXTREMELY DANGEROUS IF NOT HANDLED CAREFULLY. DO NOT ATTEMPT TO SERVICE, REPAIR, OR BREAK ANY CONNECTIONS WITHOUT FIRST ASSURING THAT THE ENTIRE PRESSURIZED DEVICE HAS BEEN VENTED OF ALL PRESSURE.

NOTES:

1. LUBRICATE ALL SEALS WITH DOW CORNING 55M OR EQUIVALENT.
2. GLYDRINGS AND SLYDRINGS ARE DESIGNED TO FUNCTION WITHOUT LUBRICATION, BUT A THIN COAT OF DOW CORNING 55M LUBRICANT MAY BE USED FOR INSTALLATION.
3. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
4. FOR REPAIR PARTS SEE BULLETIN RK 94-006.

MAINTENANCE PROCEDURE:

1. REMOVE DRAIN VALVE FROM DRYER BY REMOVING 2 CAP SCREWS (REFER TO BULLETIN PL 994-100).
2. REMOVE BOTH VALVE CAPS BY REMOVING 4 CAP SCREWS FROM EACH.
3. REMOVE SPOOL FROM VALVE BODY AND INSPECT FOR DAMAGE, REPLACE IF REQUIRED.
4. REPLACE KIT PARTS, ITEMS 1-3. LUBRICATE WITH DOW CORNING 55M.
5. REASSEMBLE VALVE, TORQUE CAP SCREWS TO 25 IN-LBS.



SECTION VIEW OF DRAIN VALVE



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

MAINTENANCE INSTRUCTIONS

P/N 5994-138

SELF ADJUSTING PURGE VALVE ASSEMBLY

BULLETIN: MI 5994-138
EFFECTIVE: 02-14-97
REVISION: A, 2-18-00
CLARIFIED ITEM NUMBERS
ERN 000706

WARNING

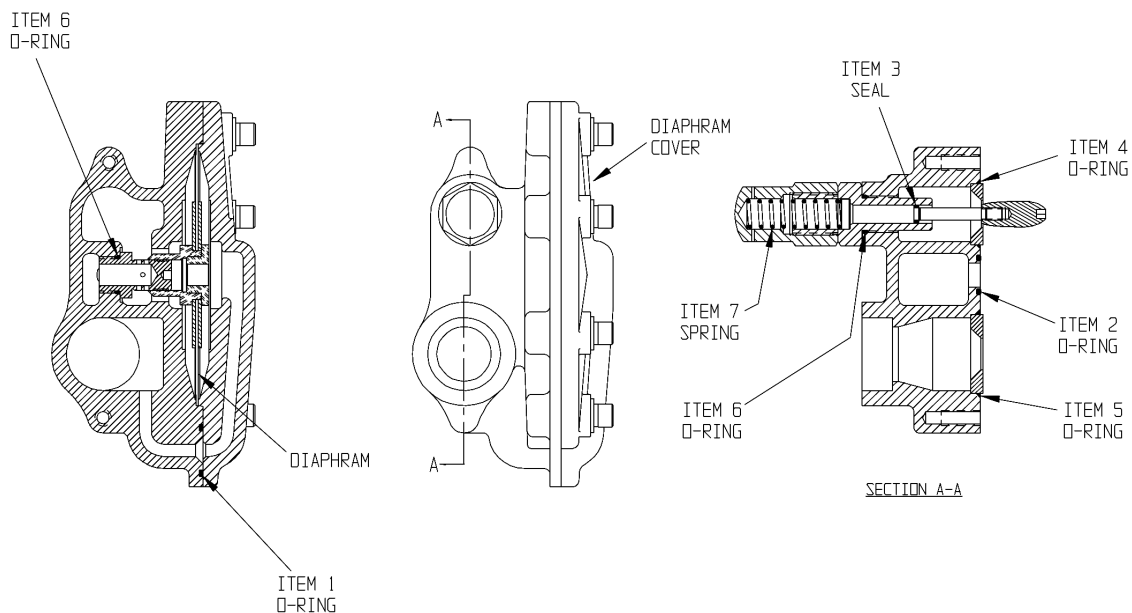
THIS IS A COMPRESSED AIR DEVICE. COMPRESSED AIR IS EXTREMELY DANGEROUS IF NOT HANDLED CAREFULLY. DO NOT ATTEMPT TO SERVICE, REPAIR, OR BREAK ANY CONNECTIONS WITHOUT FIRST ASSURING THAT THE ENTIRE PRESSURIZED DEVICE HAS BEEN VENTED OF ALL PRESSURE.

NOTES :

1. LUBRICATE ALL SEALS WITH DOW CORNING 55M OR EQUIVALENT.
2. DISCARD ALL REPLACED ITEMS IN SUITABLE CONTAINERS.
3. FOR REPAIR PARTS SEE BULLETIN RK 94-004.

MAINTENANCE PROCEDURE :

1. REMOVE PURGE VALVE FROM DRYER BY REMOVING RETAINING RING, RISER TUBE AND 2 CAP SCREWS (REFER TO BULLETIN PL 994-100).
2. REMOVE 8 CAP SCREWS, LOCK WASHERS AND FLAT WASHERS FROM DIAPHRAM COVER.
3. REPLACE ALL KIT PARTS, ITEMS 1-7. LURICATE ALL O-RINGS WITH DOW CORNING 55M.
4. INSPECT DIAPHRAM FOR DAMAGE, REPLACE IF REQUIRED.
5. REASSEMBLE VALVE.



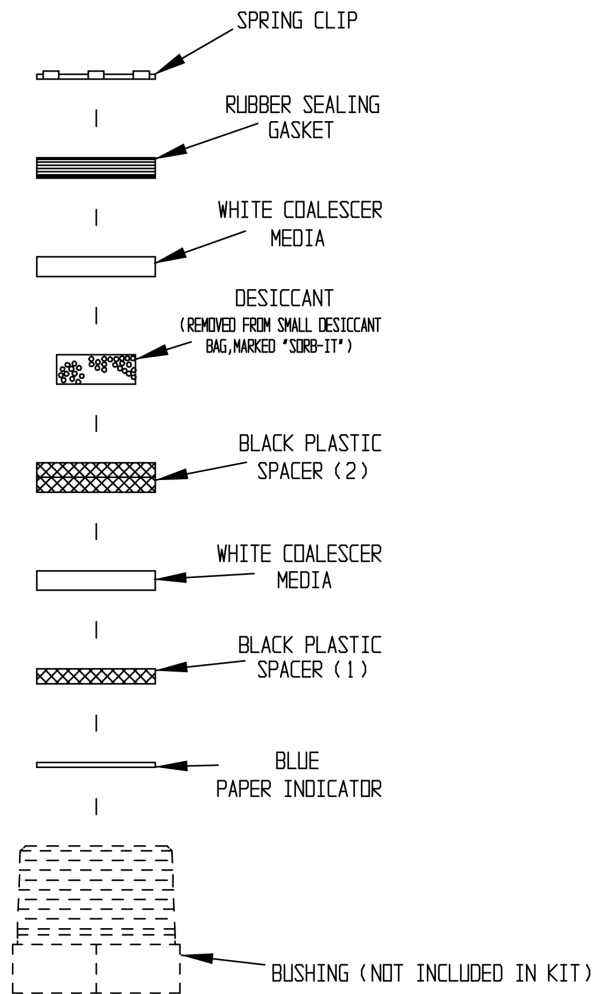


GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen, Va 24153-1099

REBUILD KIT, P/N 75-050 FOR HUMIDITY INDICATOR

P/N 5633-143

BULLETIN: RK 75-050
EFFECTIVE: 4-26-93
REVISION: NONE



NOTE -
FOR MAINTENANCE INSTRUCTIONS
REFER TO BULLETIN MI 5633-143

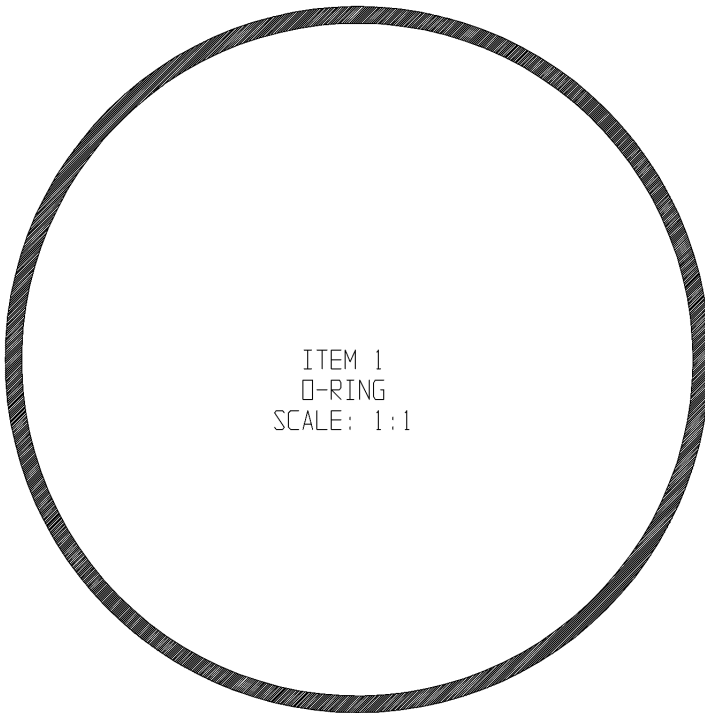
SCALE - 1:1



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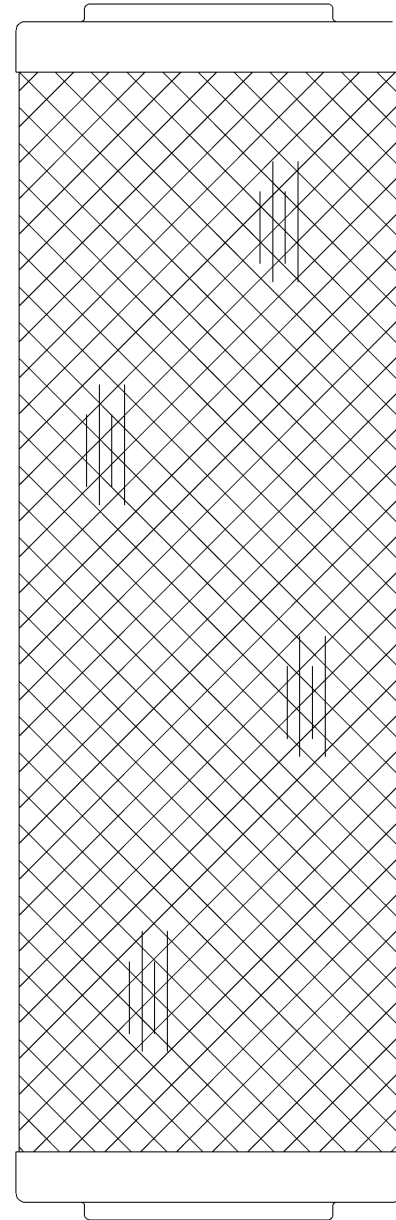
REPAIR KIT, P/N 94-000 FOR COALESCER

BULLETIN: RK 94-000
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



ITEM 1
O-RING
SCALE: 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-049



ITEM 4
COALESCER ELEMENT



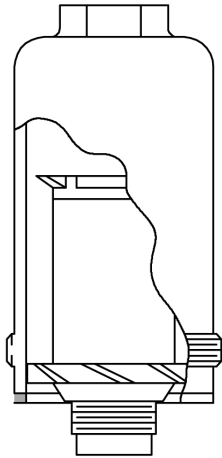
GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

REPAIR KIT, P/N 94-010
FOR CONTROL BOX ASSEMBLY

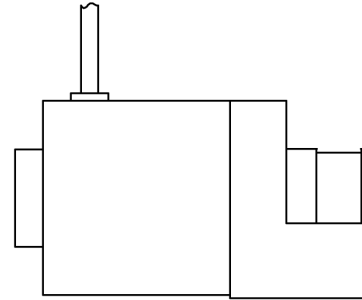
P/N 5994-355

BULLETIN: RK 94-010
EFFECTIVE: 06-16-00
REVISION: NONE
ERN 011112

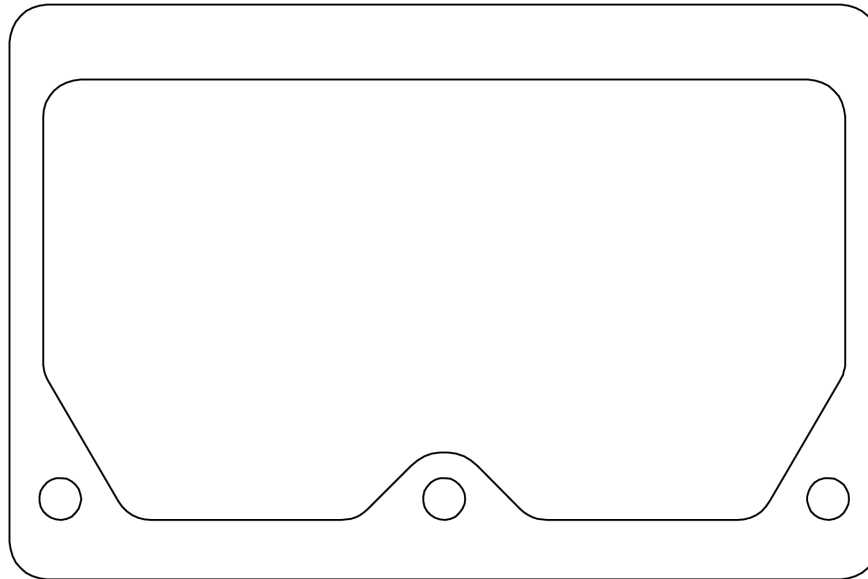
FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-355



ITEM 3, FILTER



ITEM 4, 3 WAY
UNIVERSAL VALVE (2)



ITEM 5, GASKET

SCALE: 1:1

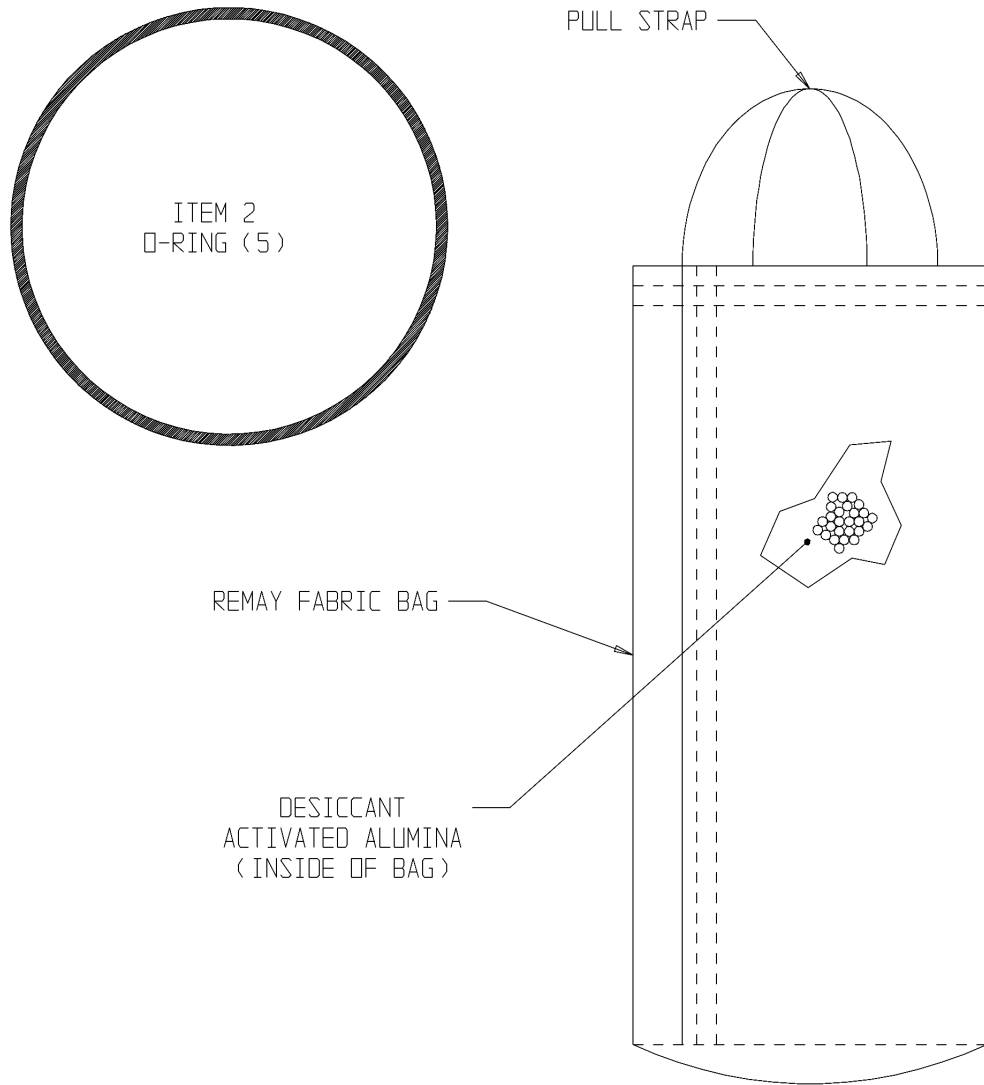


GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen, Va 24153-1099

REPAIR KIT, P/N 94-007 DESICCANT RENEWAL

FOR THE 994-100 DRYER

BULLETIN: RK 94-007
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



SCALE: 1:2

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 994-100

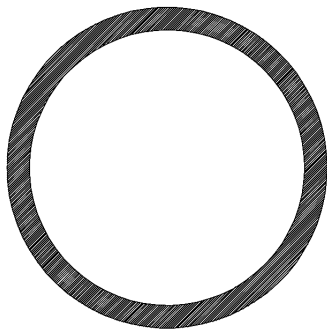


GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen, Va 24153-1099

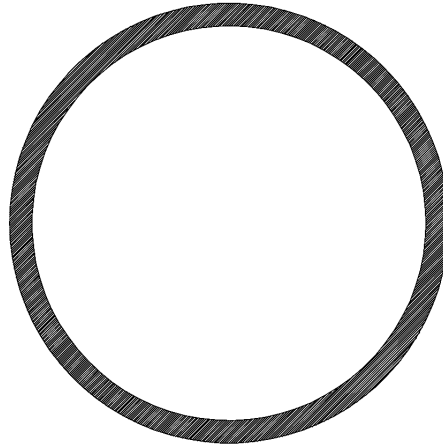
REPAIR KIT, P/N 94-001
FOR TOP MANIFOLD ASSEMBLY

P/N 5994-218

BULLETIN: RK 94-001
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



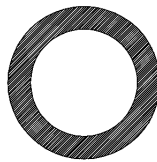
O-RING (4)
ITEM 1



O-RING (4)
ITEM 2



O-RING (4)
ITEM 3



O-RING
ITEM 4



O-RING
ITEM 5

SCALE 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-218

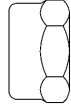


GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen, Va 24153-1099

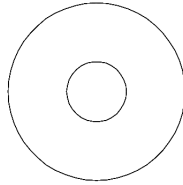
REPAIR KIT, P/N 94-003
FOR INLET DIVERTER/EXHAUST
VALVE ASSEMBLY

P/N 5994-075

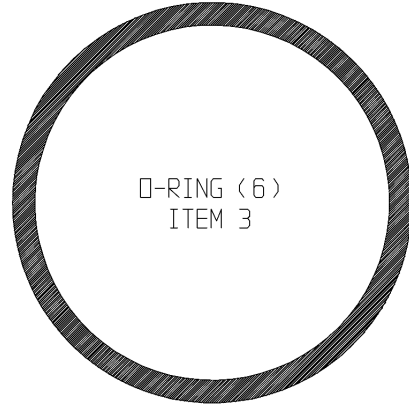
BULLETIN: RK 94-003
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



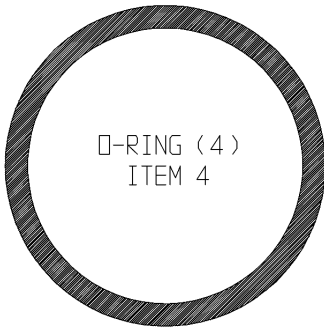
LOCKNUT (2)
ITEM 1



RETAINER (2)
ITEM 2



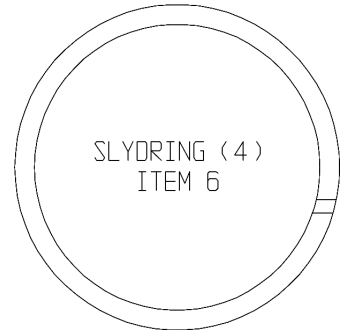
O-RING (6)
ITEM 3



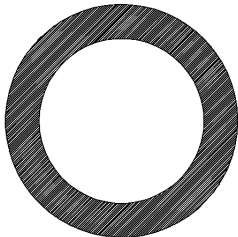
O-RING (4)
ITEM 4



GLYRING (4)
ITEM 5



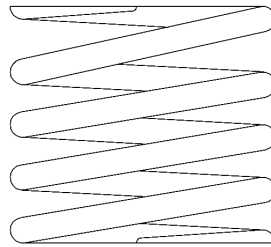
SLYDRING (4)
ITEM 6



O-RING (4)
ITEM 7



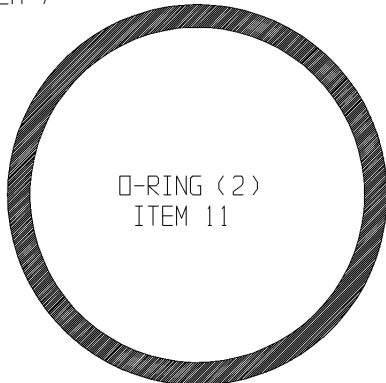
O-RING (2)
ITEM 8



SPRING (2)
ITEM 9



LOCKNUT (4)
ITEM 10



O-RING (2)
ITEM 11



O-RING (4)
ITEM 12

SCALE: 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-075



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen, Va 24153-1099

REPAIR KIT, P/N 94-005
FOR OUTLET SHUTTLE VALVE
ASSEMBLY

P/N 5994-171

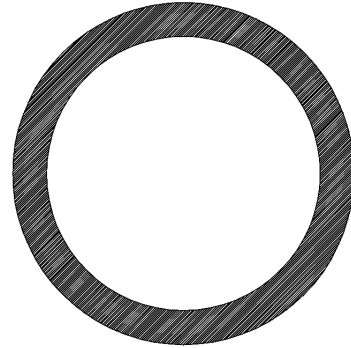
BULLETIN: RK 94-005
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



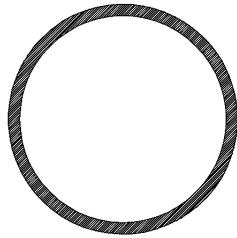
ITEM 1
LOCKNUT (2)



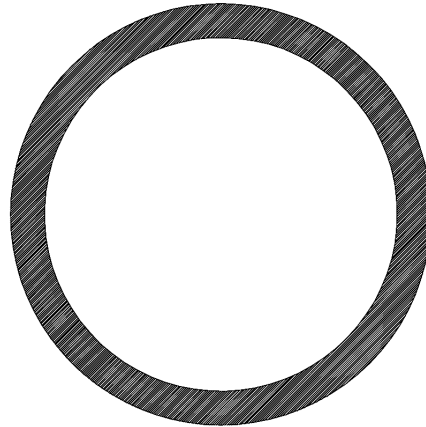
ITEM 2
O-RING (2)



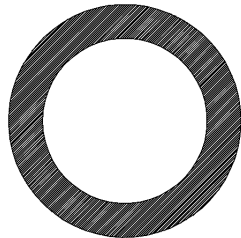
ITEM 3
O-RING (2)



ITEM 4
O-RING (2)



ITEM 5
O-RING (2)



ITEM 6
O-RING (2)

SCALE: 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-171

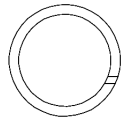


GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

REPAIR KIT, P/N 94-006
FOR DRAIN VALVE ASSEMBLY

P/N 5994-078

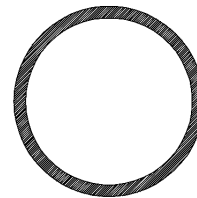
BULLETIN: RK 94-006
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



ITEM 1
SLYDRING (2)



ITEM 2
GLYDRING(4)



ITEM 3
O-RING (2)

SCALE: 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-078

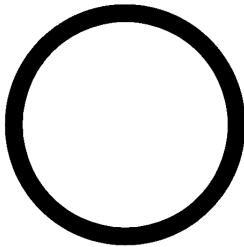


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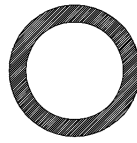
REPAIR KIT, P/N 94-004 FOR PURGE VALVE ASSEMBLY

P/N 5994-138

BULLETIN: RK 94-004
EFFECTIVE: 02-14-97
REVISION: A, 2-17-00
CLARIFIED ITEM NUMBERS
ERN 000706



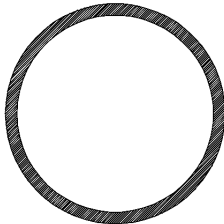
ITEM 1
O-RING



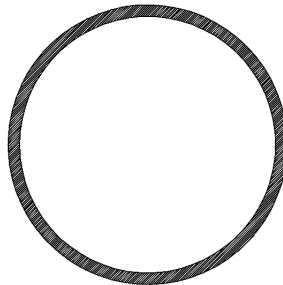
ITEM 2
O-RING



ITEM 3
SEAL



ITEM 4
O-RING



ITEM 5
O-RING



ITEM 6
O-RING
(2)



ITEM 7
SPRING

SCALE: 1:1

FOR MAINTENANCE INSTRUCTIONS
SEE BULLETIN MI 5994-138



GRAHAM-WHITE MFG. CO.
1242 Colorado Street
Salen ,Va 24153-1099

OVERHAUL KIT, P/N 94-009
FOR THE 994 AIR DRYER

BULLETIN: RK 94-009
EFFECTIVE: 06-16-00
REVISION: B, 03-16-01
ERN 011112

KIT INCLUDES:

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	94-000	REPAIR KIT (FOR COALESCER)	1
2	94-001	REPAIR KIT (FOR TOP MANIFOLD ASSEMBLY, P/N 5994-218)	1
3	94-003	REPAIR KIT (FOR INLET DIVERTER-EXHAUST VALVE ASSEMBLY, P/N 5994-075)	1
4	94-004	REPAIR KIT (FOR PURGE VALVE ASSEMBLY, P/N 5994-138)	1
5	94-005	REPAIR KIT (FOR OUTLET SHUTTLE VALVE ASSEMBLY, P/N 5994-171)	1
6	94-006	REPAIR KIT (FOR DRAIN VALVE ASSEMBLY, P/N 5994-078)	1
7	94-007	REPAIR KIT (FOR DESICCANT RENEWAL)	4
8	94-010	REPAIR KIT (FOR CONTROL BOX OVERHAUL, P/N 5994-355)	1
9	75-050	REPAIR KIT (FOR HUMIDITY INDICATOR, P/N 5663-143)	1

Document Number MM001001 (DE-LP)

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