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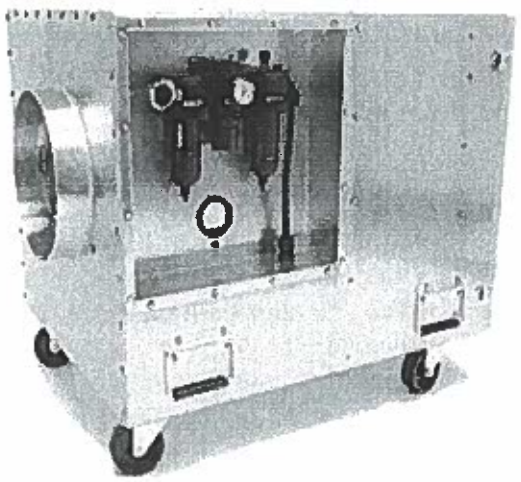


FORCED AIR 2000 PUEUMATIC PORTABLE HEPA FILTRATION UNIT

PART ORDER NUMBER: FA2000-P

OPERATING & MAINTENANCE MANUAL

DOCUMENT NUMBER: OPMM-001P-R1

Owners Manual

Force Air 2000 PNEUMATIC

AIR SUPPLY:

Your force air 2000 pneumatic requires 90 PSI of compressed air. The air consumption requirement is 65 cubic feet per minute. The air inlet line should have an I.D. no less the ½". The FA 200-P comes with a ½" plug fitting to attach to your air inlet line. This plug fitting attaches to the quick disconnect fitting attached to the F.R. L. on the discharge end of the machine.

OPERATION:

The FA 2000-P includes a filter, regulator and Lubricator (F.R.L.) unit attached to the machine. The Filter includes an automatic drain on the bottom of the metal bowl to remove the water that is trapped. The Filter contains 50 micron element, which should be changed out on 6 months after start up if it is to be used continuously. If the unit is used intermittently, then the element will not need to be changed as frequently.

The Regulator, located between the filter and the lubricator, has a pressure gauge attached to it. The regulator controls the air pressure going into the air motor. The regulator should be set at 90 PSI to get the motor to turn at 2000 RPMs and achieve the 1-1/2 HP.

The lubricator automatically lubricates the air motor for years of smooth performance. The lubricator is filled with oil before it is shipped from ACSI. The knob on top of the Lubricator is used to adjust the drop rate. The drop rate is 4-5 drops per minute, continuous operation and 10-12 drops per minute, intermittent operation. Please see the attached lubrication spec sheet on the type of oil that is recommended for the FA 2000-P.

DIMENSIONS:

- LENTH: 37.75"
- WIDTH: 26.5"
- HEIGHT: 31.25"
- WEIGHT: 160 LBS
- HOUSING: 0.063 ALUMINUM
- AIR FLOW (high) 1975 CFM
- AIR FLOW (low) 1000 CFM
- MOTOR: 1.75 HP, 2 SPEED

FILTER REPLACEMENT:

The conditions in the work area (particularly airborne fiber concentration) determine how often filters need replacement. Personnel responsible for changing filters must wear NIOSH approved respirators along with other required protective equipment. As the filters become loaded with dust, the airflow capacity of the FA 2000-P decreases. When the pressure gauge on the control panel exceeds 2 inches of the water column, the "primary" filter should be replaced as follows:

1. With the unit operating, open the intake grill door. Fold in the sides of the primary filter and dispose of it as asbestos waste. Put a new filter in its place, close the intake grill door and check the pressure gauge. If the pressure gauge still exceeds 2 inches of water column, the secondary filter should be replaced as follows:
2. With the unit operating, remove the primary filter as described in #1 and change the secondary filter. The used secondary filter should be disposed of as asbestos waste. Place the primary filter in its proper position, close the intake grill door and check the pressure gauge. If the pressure gauge still exceeds 2 inches of the water column, the HEPA filter should be replaced as follows:
3. Shut the unit down and DISCONNECT the air supply. Remove the primary and secondary filters. Remove the HEPA filter by loosening the four retention bracket nuts. Rotate the hold tabs out of the way and slide the HEPA filter out of the cabinet. Dispose of the HEPA filter as asbestos waste.

Inspect the gasket on the new HEPA filter Houston as well as on the FA 2000-P filter mounting surface; make sure there are no cracks, gaps or defects. Cracks, gaps or defects permit leakage of contaminated air though the unit. WORN OR DEFECTIVE GASKETS MUST BE REPLACED. Install a new HEPA filter with identical housing dimensions as the one being replaced. THE GASKET END OF THE HEPA IS PLACED INTO THE UNIT FIRST. When installing the HEPA filter, the mounting tabs must be fastened securely (to prevent air leaks) but not over-tightened. Install the secondary and primary filters and close the intake door grill. Whenever the HEPA filter is replaced, the primary and secondary filters should also be replaced.

RECOMMENDED FILTER CHANGE INTERVALS:

On an average basis, the filters should be changed at the following intervals (or more often if necessary):

Primary – 2 to 4 times each day or more in necessary
Secondary – Once each day or more if necessary
HEPA – Every 700 hours per EPA recommendations. Longer service lives have been obtained.

When the FA 2000-P is shut down at the end of a project, the filters should be left inside the unit and exhaust openings sealed with polyethylene and duct tape. This is done to prevent re-contaminating the area after final clean up.

FA2000P REPLACEMENT PARTS

ITEM	PART NUMBER	DESCRIPTION
1	76042401	MOTOR PNEUMATIC 1.8 HP
2	76000001	MOTOR FOOT MOUNT
3	75020002	FILTER REGULATOR LUBRICATOR
4	Call Dist.	FILTER-PREPAD 24 X 24 X 1
5	Call Dist.	FILTER-HEPA 24 X 24 X 11-1/2
6	Call Dist.	FILTER-RING 24 X 24 X 1
7	66020101	GAUGE-PRESSURE MINIHELIC II
8	32000106	HEPA CLIP KIT (1)
9	86300608	GALV CROWFOOT 1/2"MNPT X 2-LUG M
10	97000268	VALVE, BR MINI BALL 1/2" MPT X FPT
11	76252002	BLOWER
12	74500104	CASTER-4" SWIVEL W/O BRAKES
13	74500204	CASTER-4" SWIVEL W/ BRAKE
14	74100101	LINKLOCK-NO SPRING
15	74100201	LINKLOCK-KEEPER PLATE
16	74090520	4" GRAB HANDLE, BLACK

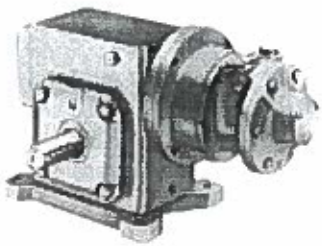
PART NO. 45-200 D170PL

AM SERIES LUBRICATED AIR MOTORS

OPERATION & MAINTENANCE MANUAL

Model 2AM Shown

Model 4AM Shown



Model 6AM Shown

Model 16AM Shown

Thank you for purchasing this Gast product. It is manufactured to the highest standards using quality materials. **This manual includes general safety instructions for operation under normal conditions and for operation in hazardous conditions.** Please follow all recommended maintenance, operational and safety instructions and you will receive years of trouble free service.

IMPORTANT: PLEASE READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND USING THIS MOTOR. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE MOTOR.

General information

Operating Pressure Limits:

Model	Pressure
1AM	100 PSI / 7 bar
1 UP	80 PSI / 5.6 bar
2 AM	100 PSI / 7 bar
4 AM	100 PSI / 7 bar
6 AM	100 PSI / 7 bar
8 AM	100 PSI / 7 bar
16 AM	100 PSI / 7 bar

Vane Life: Depends upon speed, operating pressure and motor maintenance. In normal operating conditions inspect vanes after 5,000 to 8,000 hours of operation.

Product Use Criteria:

- Normal conditions: Operate at temperatures up to 250°F (121°C).
- Hazardous conditions: Operate at temperatures up to 104°F (40°C).
- Protect unit from dirt and moisture.
- Use ONLY compressed air to drive motor.
- Air lines connected to motor should be the same size or the next size larger than the inlet port for efficient output and speed control.
- Protect all surrounding items from exhaust air.
- Bearings are grease packed.
- Use Gast #AD220 or a detergent SAE#10 automotive engine oil for lubricating.
- Motors are to be used in commercial installations only.
- **This symbol appears on labels of air motors that are designed for use in hazardous atmospheres. These air motors comply with the applicable standards and specifications and meet the requirements of the guidelines of the EC directive 94/9EC (ATEX 100a). They are intended to be used in zones 1 and 2 where explosive atmospheres are likely to occur.**
- Air supply, directional control valve and pressure regulator should be selected based upon the air consumption of the motor.

GAST
A Unit of IDEX Corporation

ISO 9001 & 14001 CERTIFIED

www.gastmfg.com

Your safety and the safety of others is extremely important.

We have provided many important safety messages in this manual and on your product. Always read and obey all safety messages.

This is the safety alert symbol. This symbol alerts you to hazards that can kill or hurt you and others. The safety alert symbol and the words "DANGER" and "WARNING" will precede all safety messages. These words mean:

DANGER

You will be killed or seriously injured if you don't follow instructions.

WARNING

You can be killed or seriously injured if you don't follow instructions.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the safety instructions are not followed.

CODE SYMBOLS

Hazard. Possible consequences: death or severe injuries.

Hazardous situation. Possible consequences: slight or mild injuries.

Dangerous situation. Possible consequences: damage to the drive or the environment.

Important instructions on protection against explosion.

Application tips and useful information.

Improper environment, installation and operation can result in severe personal injury and/or damage to property.

Qualified personnel must perform all work to assemble, install, operate, maintain and repair air motor.

Qualified personnel must follow:

- These instructions and the warning and information labels on the motor.
- All other drive configuration documents, startup instructions and circuit diagrams.
- The system specific legal regulations and requirements.
- The current applicable national and regional specifications regarding explosion protection, safety and accident prevention.

Complete the following checklist prior to starting installation in a hazardous area. All actions must be completed in accordance with ATEX 100a.

Checklist for installation in hazardous areas:

_____ Read air motor label to check that motor has been designed for use in a hazardous application:
- Hazardous zone
- Hazardous category
- Equipment group
- Temperature class
- Maximum surface temperatures

Example:
Model designation: 1UP-NRV-10
Year manufactured: 2003
Gast Mfg. Corp.
II 2GD c T5 *
Benton Harbor, MI USA
Telephone: 269.926.6171

* Legend:
II Equipment group II
2 Equipment category 2
G Gas atmospheres
D Dust atmospheres
c Constructional safety
T5 Max. surface temp. 212°F/100°C

_____ Check the site environment for potentially explosive oils, acids, gases, vapors or radiation

_____ Check the ambient temperature of the site and the ability to maintain proper ambient temperature.
Ambient range:
Normal conditions: 34°F/1°C to 250°F/121°C
Hazardous conditions: 34°F/1°C to 104°F/40°C

_____ Check the site to make sure that the air motor will be adequately ventilated and that there is no external heat input (e.g. couplings). The cooling air may not exceed 104°F/40°C.

_____ Check that products to be driven by the air motor meet ATEX approval.

_____ Check that the air motor is not damaged.

INSTALLATION

Correct installation is your responsibility. Make sure you have the proper installation conditions.

WARNING

Injury Hazard

Install proper guards around output shaft as needed.

Air stream from product may contain solid or liquid materials that can result in eye or skin damage.

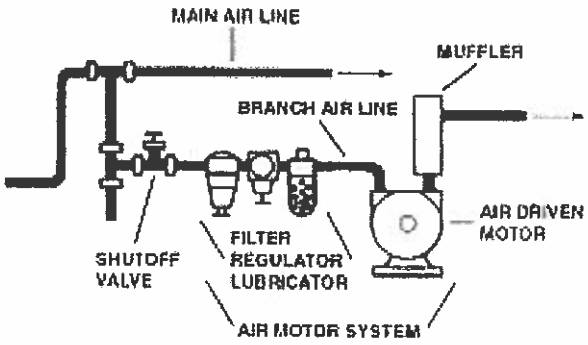
Wear eye protection when installing this product.

Failure to follow these instructions can result in serious injury or property damage.

Mounting

This product can be installed in any orientation. Mount the motor to a solid metal base plate that is mounted to a stable, rigid operating surface. Use shock mounts to reduce noise and vibration. Install a pressure regulator or simple shut-off valve to control motor.

Connection



Check the direction of the motor airflow. A single rotation motor will operate properly only in one direction. Single rotation motors require a sound absorber to be connected to the air port. Remove the plastic shipping plugs from the ports. Save plugs for future use during shutdown.

Install a 5-micron filter in the air line before the connection to the motor. Next install an air pressure regulator to control motor speed and torque.

An automatic air line lubricator should be installed in the air line as close as possible and no more than 18 inches (1/2 meter) from the air motor. Install the lubricator level with or above the air motor so that the oil mist will blow directly into or fall down into the motor.

Fill the oil reservoir to the proper level with Gast #AD220 or SAE 10W high detergent or non-detergent motor oil. For food processing applications, White Rex 425 food grade motor oil is FDA approved. Adjust lubricator to feed 1 drop of oil for every 50 CFM of air while the unit is running, or 1 drop of oil per continuous minute of run time. Do Not overfeed oil or exhaust air may become contaminated.

Clean the compressed air connection with low pressure air to remove any dirt from the line before connecting to the ports.

Use the proper sized fasteners. For the most efficient output and control of speed, use air lines that are the same size as the motor inlet port if the connection is less than 7 feet (2 meters). For longer connections, use the next pipe size larger than the motor intake port. Connect lines to motor in the proper direction.

A reversible motor will work equally well in both directions. Connect a 4-way valve with piping to both air ports of motor to make reversing possible. Connect the sound absorber on the exhaust air port or valve connection.

Do not add any thrust to the end or side of the shaft when making connections.

Do not use a hammer on the shaft or connections.

Lubricating the drive shaft will make assembly easier. Use a puller for removal of pulleys, couplings and pinions on the motor shaft. Check that the tension on the belt pulley matches the manufacturer's specifications. Do not exceed the maximum radial and axial forces on the shaft. If the motor shaft is connected to the part to be driven without a coupling, check that the radial offset and axial force effect will not cause problems.

Use only belts with < 10⁹ electrical leakage resistance to prevent static electrical problems.

Accessories

A muffler is shipped with the air motor (except 16AM) but is not installed. Consult your Gast Distributor/Representative for additional filter recommendations. Install a moisture trap and 5 micron filter in the air line ahead of motor.

Air consumption data at various speeds and pressures are available from your Gast Distributor/Representative or the factory.

OPERATION

WARNING

Injury Hazard

Air stream from product may contain solid or liquid material that can result in eye or skin damage.

Do Not use combustible gases to drive this motor.

Wear hearing protection. Sound level from motor may exceed 85db(A).

Failure to follow these instructions can result in eye injury or other serious injury.

Check all connections before starting motor. It is your responsibility to operate this product at recommended speeds, loads and room ambient temperatures. Do not run the motor at high speeds with no load. This will result in excessive internal heat that may cause motor damage.

The starting torque is less than the running torque. The starting torque will vary depending upon the position of the vanes when stopped in relation to the air intake port.

Use a pressure regulator and/or simple shut-off valve to regulate the motor's speed and torque. This will provide the required power and will conserve air. Open the air supply valve to the motor. Set the pressure or flow rate to the required speed or torque. Adjust the lubricator to feed one drop of oil for every 50-75 CFM (1.5-2 M³ per minute) of air moving through motor. Check the oil level daily. The gear reducer does not need lubrication.

Operate the motor for approximately 2 hours at the maximum desired load. Measure the surface temperature of the motor on the casting opposite the pipe ports. The maximum surface temperature listed on the motor is for normal environmental and installation conditions. For most air motors, the maximum surface temperature should not exceed 203°F/95°C. Do not continue to operate the motor if the measured surface temperature exceeds temperature listed on the motor. If your measured temperature does exceed listed value, consult with your Gast Distributor/Representative for a recommendation.

MAINTENANCE

WARNING

Injury Hazard

Disconnect air supply and vent all air lines.

Wear eye protection when flushing this product.

Air stream from product may contain solid or liquid material that can result in eye or skin damage.

Flush this product in a well ventilated area.

Do Not use kerosene or other combustible solvents to flush this product.

Failure to follow these instructions can result in eye injury or other serious injury.

It is your responsibility to regularly inspect and make necessary repairs to this product in order to maintain proper operation.

Lubrication

Use Gast #AD220 or a detergent SAE #10 automotive engine oil for lubricating. Lubricating is necessary to prevent rust on all moving parts. Excessive moisture in air line may cause rust or ice to form in the muffler when air expands as it passes through the motor. Install a moisture separator in the air line and an after cooler between compressor and air receiver to help prevent moisture problems.

Manual Lubrication

Shut the air motor down and oil after every 8 hours of operation. Add 10-20 drops of oil to the air motor intake port.

Automatic Lubrication

Adjust inline oiler to feed 1 drop of oil per minute for high speed or continuous duty usage. Do Not overfeed oil or exhaust air may become contaminated.

Check intake and exhaust filters after first 500 hours of operation. Clean filters and determine how frequently filters should be checked during future operation. This one procedure will help assure the motor's performance and service life.

Flushing

Flushing this product to remove excessive dirt, foreign particles, moisture or oil that occurs in the operating environment will help to maintain proper vane performance. Flush the motor if it is operating slowly or inefficiently.

Use only Gast #AH255B Flushing Solvent. DO NOT use kerosene or ANY other combustible solvents to flush this product.

1. Disconnect air line and muffler.
2. Add flushing solvent directly into motor. If using liquid solvent, pour several tablespoons directly into the intake port. If using Gast #AH255B, spray solvent for 5-10 seconds into intake port.
3. Rotate the shaft by hand in both directions for a few minutes.
4. **You must wear eye protection for this step.** Cover exhaust with a cloth and reconnect the air line.
5. Restart the motor at a low pressure of approximately 10 PSI/0.7 bar until there is no trace of solvent in the exhaust air.
6. Listen for changes in the sound of the motor. If motor sounds smooth, you are finished. If motor does not sound like it is running smoothly, installing a service kit will be required (See "Service Kit Installation").

Check that all external accessories such as relief valves or gauges are attached and are not damaged before operating product.

Cleaning sound absorber

1. Remove the sound absorber.
2. Clean the felt filter.
3. **You must wear eye protection for this step.** Lubricate motor with 3-4 drops of oil.
4. Check the air compressor.
5. Listen for changes in the sound of the motor. If motor sounds smooth, you are finished. If motor does not sound like it running smoothly, installing a service kit will be required (See "Service Kit Installation").

Shutdown

It is your responsibility to follow proper shutdown procedures to prevent product damage.

1. Turn off air intake supply.
2. Disconnect air supply and vent all air lines.
3. Disconnect air lines.
4. Remove air motor from connecting machinery.
5. Remove the muffler.
6. **Wear eye protection. Keep away from air stream.** Use clean, dry air to remove condensation from the inlet port of the motor.
7. Lubricate motor with a small amount of oil into the intake port. Rotate shaft by hand several times to distribute oil.
8. Plug or cap each port.
9. Coat output shaft with oil or grease.
10. Store motor in a dry environment.

WILKERSON®

Richland, MI 49083 Tel: (269) 629-5000

Installation & Service Instructions
84-013-000

Lubricator Model L18 and L28

ISSUED: November, 2006
Supersedes: July, 2004

Doc.#84013000, ECN# 060870, Rev. 3

ENGLISH

⚠ WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- **Disconnect electrical supply (when necessary) before installation, servicing, or conversion.**
- **Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.**
- **Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.**
- **Medium must be moisture-free if ambient temperature is below freezing.**
- **Service according to procedures listed in these instructions.**
- **Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.**
- **After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.**
- **Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.**

⚠ CAUTION

Polycarbonate bowls, being transparent and tough, are ideal for use with Filters and Lubricators. They are suitable for use in normal industrial environments, but should not be located in areas where they could be subjected to direct sunlight, an impact blow, nor temperatures outside of the rated range. As with most plastics, some chemicals can cause damage. Polycarbonate bowls should not be exposed to chlorinated hydrocarbons, ketones, esters and certain alcohols. They should not be used in air systems where compressors are lubricated with fire-resistant fluids such as phosphate ester and di-ester types.

Metal bowls are recommended where ambient and/or media conditions are not compatible with polycarbonate bowls. Metal bowls resist the action of most such solvents, but should not be used where strong acids or bases are present or in salt laden atmospheres. Consult the factory for specific recommendations where these conditions exist.

TO CLEAN POLYCARBONATE BOWLS USE MILD SOAP AND WATER ONLY! DO NOT use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which are damaging to this plastic.

Bowl guards are recommended for added protection of polycarbonate bowls where chemical attack may occur.

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from The Company, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by The Company and its subsidiaries at any time without notice.

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.

Safety Guide

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: www.wilkersoncorp.com

INSTALLATION

1. Refer to **WARNING** prior to installation.
2. Install as close to the point of use as possible.
3. Unit must be installed with the flow in the direction of the flow arrow on the body cover and with bowl down.
4. Avoid using reducing bushings, couplings, etc., whenever possible to install this product. These devices restrict air flow and can affect performance.
   NOTE: CONTAMINATES REMOVED FROM THE COMPRESSED AIR SYSTEM MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL STANDARDS.

OPERATION

1. **NOTE: Maximum pressure rating is 150 psig (10.3 bar) for plastic bowl/bowl guard assembly, and 250 psig (17.2 bar) for metal bowl with sight gauge. Temperature range is 32°F to 125°F (0°C to 52°C) for plastic bowl/bowl guard assembly, and 32°F to 150°F (0°C to 65.5°C) for metal bowl with sight gauge.**
2. Use only clean, light machine oil, preferably SAE 10 or lighter. DO NOT USE PHOSPHATE ESTER OR DIESTER BASED FLUIDS IN LUBRICATORS.
3. This lubricator may be filled under pressure by opening the top fill port slowly, allowing the pressure in the bowl to slowly vent to atmosphere. After the pressure has bled off, the fill plug may be removed completely and oil poured into the fill port. When the fill plug is removed, a small amount of air will be venting from the fill port. This is to serve as an audible signal denoting that the unit is in fact under pressure. If faster filling is desired, slowly remove the fill plug to vent the bowl pressure to atmosphere. Then remove the bowl/bowl guard assembly by pushing up on the bowl and turning clockwise. Fill the bowl, reposition the bowl O-ring seal on the bowl and reinstall the bowl. To reinstall the bowl, insert the bowl into the body, push up and turn counterclockwise until you feel the locating stops engage. Pull down on the bowl and turn clockwise to insure the bowl has been properly installed and locked. Now reinstall the fill plug. The unit is ready for use.
4. To adjust and set oil delivery rate, the unit must be pressurized and air must be flowing through the unit. Turn the transparent SIGHT DOME, located on the top of the unit counterclockwise to initiate oil delivery. The rate of oil delivery depends on air flow rate. If flow increases or decreases, the oil delivery rate will increase or decrease proportionately. Turning the SIGHT DOME clockwise to limit stop will stop all oil delivery.

MAINTENANCE

THIS UNIT MAY BE SERVICED WITHOUT REMOVING THE UNIT FROM THE COMPRESSED AIR LINE.

1. To clean the bowl, slowly open and remove the fill plug located on the top of the lubricator to vent bowl pressure to atmosphere. Push up on bowl assembly and turn clockwise to remove. Use a clean, dry cloth to wipe inside of bowl. Inspect the filter located in the bottom of the siphon tube assembly. Clean or replace the siphon tube assembly as required. To reinstall the bowl, insure that the bowl seal O-ring is properly installed on the bowl, insert the bowl into the body and push-up and turn counterclockwise until the locating stops engage. Pull down on the bowl and turn clockwise to insure the bowl has been properly installed and locked.
2. Before returning unit to service, insure that all seals have been reinstalled or replaced and bowl is locked in position with drain properly secured.

DRAINS

Manual Drain	**GRP-96-685**

ACCESSORIES

Joiner set	**GPA-96-601**
T-Bracket	**GPA-96-602**
T-Bracket with Joiner set	**GPA-96-603**
C-Bracket (18 Series)	**GPA-96-604**
C-Bracket (28 Series)	**GPA-96-605**
Force Fill Adapter	**LRP-96-704**