OPERATION, MAINTENANCE
and
REPLACEMENT PARTS

Oxweld
Trade-Mark

MP-11
(Series 2)
Stationary, Medium-Pressure

ACETYLENE GENERATOR

Listed Under Re-examination Service of Underwriters' Laboratories, Inc.

IMPORTANT!
Mixtures of acetylene and air in certain proportions (2.6% to 88% acetylene) are flammable and explosive when ignited.

Therefore, be sure you are familiar with the instructions for operating your OXWELD Generator before you charge it, or do any work on it whatever. If the instructions are not thoroughly understood, communicate with the nearest representative or office of Linde Air Products Company, and obtain further instructions before attempting the work.

Efficiency and safety require compliance with ALL instructions.

Acetylene generators should be installed and operated in accordance with the "Standards of the National Board of Fire Underwriters for the Installation and Operation of Gaz Systems for Welding and Cutting," NBFU Pamphlet No. 51.
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Operating Principles

Making Acetylene

Acetylene is a hydrocarbon gas made up of carbon and hydrogen bonded together. The gas cannot be seen, but it has a characteristic odor that is easily recognized after one has once smelled it.

Acetylene is produced from the reaction of calcium carbide with water. Calcium carbide, frequently called simply “carbide,” is a dark gray, stonelike material manufactured by smelting coke and lime in an electric furnace. The resultant product is crushed and carefully screened for size. It is important in acetylene generators to use only the size of carbide for which the generator was designed. This assures complete reaction due to proper passage of the carbide particles through water in the generating chamber. The correct carbide size is always indicated on the nameplate of OXWELD generators.

When carbide is dropped into water, acetylene gas is formed and bubbles up through the water. A whitish residue of hydrated or slaked lime remains in the water. The reaction gives off heat. In fact, when carbide is wet with an insufficient amount of water, the heat given off is sufficient to raise the temperature of the carbide enough to ignite an acetylene and air mixture. For this reason water must never be used to put out a fire involving carbide.

In OXWELD MP-11 Acetylene Generators, carbide is fed into a large amount of water and the heat given off simply raises the temperature of the water. It is very important that there be enough water in the generator to keep the temperature rise within reasonable and safe limits. That is why so much emphasis is placed upon the instructions to fill the generating chamber with fresh water to the NORMAL water level before charging with carbide. It is also the reason for the installation of the float which automatically locks the feed tube shut to prevent feeding of carbide if the water in the generating chamber drops below the REFILL level.

Carbide also will react with water vapor in the air, thereby giving off acetylene. For this reason UNION carbide is packed in sturdy airtight and watertight steel drums. Carbide should never be left exposed to the atmosphere any longer than absolutely necessary.

Both carbide and the slaked lime residue are somewhat caustic and tend to irritate a person’s skin and mucous membranes. Touching the carbide or lime or breathing the dust should be avoided as much as possible. It is advisable to wear a respirator and gloves when opening carbide drums or dumping carbide from the drums, or when working with lime residue.

Regulations and laws generally forbid the generation, distribution and use of free (undissolved) acetylene at pressures higher than 15 lb. per sq. inch. The reason for this is that acetylene, under certain conditions at pressures greater than 15 lb. per sq. in., may tend to break down explosively into its constituents, carbon and hydrogen.*

Testing laboratories have established standards which closely control the manufacture of acetylene generators. The Re-examination Service marker of the Underwriters’ Laboratories, Inc. on the OXWELD MP-11 Acetylene Generators shows that these generators meet the standards set up by this testing organization.

It is essential that all persons who operate or work on MP-11 Generators thoroughly understand and carefully follow the recommendations in the NBFU Pamphlet No. 51, “Standards of the National Board of Fire Underwriters for the Installation and Operation of Gas Systems for Welding and Cutting.”

Operation and Design Features

OPERATION

The OXWELD MP-11 acetylene generator represents a major advance in the design of generators for the production of medium-pressure acetylene. It makes possible the continuous operation of single-generator installations. (This is a distinct advantage over previous types of medium-pressure generators which operate on the batch-charging principle.) The MP-11 has a carbide capacity of 500 lbs., and a total hourly output rating of 1000 cu. ft. It will operate satisfactorily to deliver acetylene at rates of up to 2000 cu. ft./hr. if the aggregate hourly output load does not exceed 1000 cu. ft.

During MP-11 operation, carbide is fed from the generator hopper (Fig. 1) to the water in the generating chamber at a rate which is automatically proportioned to produce the generating rate desired. When acetylene generation has reduced the carbide supply to 150 lbs., the generator can be partially drained and refilled with water while it continues to operate. At no time during this refilling period is there less than 250 gallons of water in the generating chamber. After draining and refilling have been completed, a recharge of 350 lbs. of carbide can be transferred to the generator from the charging hopper. The charging hopper becomes part of the generator during the recharging period. This feature, plus the ability to partially drain and refill the generating chamber while generation takes place, makes possible the continuous operation of the MP-11.

When acetylene demand exceeds the rated capacity of a single MP-11, two or more of these generators can be operated simultaneously by GC-4 con-

* These statements do not apply to acetylene dissolved in a suitable solvent in steel cylinders which meet the specification of the Interstate Commerce Commission.
FIG. 1 - Schematic Drawing of OXWELD MP-11 Medium-Pressure Acetylene
Generator (Charging Hopper attached only during recharging)

**LEGEND**

1. Acetylene Filter
2. Agitator
3. Atmospheric Vent Line
4. Carbide Charging Valve
5. Carbide Contents Indicator
6. Charging Hopper
7. Charging-Hopper Pressure Gauge
8. Charging-Hopper Vent Valve
9. Feed-Control Unit
10. Feed Tube
11. Feed-Tube Handle
12. Feed Valve
13. Feed-Valve Handle
14. Float, Water Level Indicator and Feed Tube
15. Float, Water Shut-off Valve
16. Float-Operated Water Shut-off Valve
17. Generating Chamber
18. Generating-Chamber Pressure Gauge
19. Generating-Chamber Relief Valve
20. Generator Hopper
21. Humplock Cover
22. Hydraulic Back-Pressure Valve
23. Hydraulic Back-Pressure Valve
24. Line Pressure Gauge
25. Low-Level Water Fill Valve
26. Pressure Equilizing Line
27. "Refill" Level Reference Marker
28. Relief-Valve Trip Mechanism
29. Residue Drain Valve
30. Water Fill Valve
31. Water-Level Indicator
32. Water Shell
With GC-4 Control Units, the flow of acetylene from individual generators can be adjusted so that each carries an equal share of the load. See Form 9510, "Installation, Operation and Maintenance of GC-4 Control Units," for a description of these controls.

MP-11 SPECIFICATIONS

<table>
<thead>
<tr>
<th>Capacity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lbs. of Carbine:</td>
</tr>
<tr>
<td>Cu. Ft. Acetylene per Hr.:</td>
</tr>
<tr>
<td>Refill Charge (Lbs. of Carbine):</td>
</tr>
<tr>
<td>Carbid Size:</td>
</tr>
<tr>
<td>Water Capacity (Gals.):</td>
</tr>
<tr>
<td>Generator Delivery Pressure (Psi):</td>
</tr>
</tbody>
</table>

Overall Dimensions:
- Generator Diameter: 60 in.
- Height: Generator: 10 ft. 6 in.
  Charging Hopper (incl. lift handle): 3 ft. 4 in.

Weights:
- Generator (Dry): 1865 Lbs.
- Charging Hopper (Empty): 106 Lbs.
- Charging Ladder: 35 Lbs.

Water Supply:
- Recommended Pressure: 60 Psi
- Flow: 65 Gpm
- Minimum Pressure: 30 Psi
- Flow: 35 Gpm

DESIGN FEATURES (Refer to Figure 1.)

Water Shell

The water shell is of heavy-walled, completely steel-welded construction, insuring a strong, pressure-tight generating vessel. It rests on four flanged-pipe legs. This assures adequate ventilation under the generator. A residue agitator is provided at the bottom of the water shell for stirring up any sediment of residue so that it will be flushed out when the generator is drained to REFILL level for refilling with fresh water and carbide.

Two lugs are welded to the upper edge of the water shell to facilitate handling of the generator during shipment and installation. All gauges, indicators, control handles and manually-operated valves are conveniently located at the front of the water shell. This facilitates the inspection and control of generator operation. A handhole provides quick access to the generator interior; it is a convenient, good-sized opening for performing maintenance and inspection operations without having to remove the hopper cover.

The volume of water in the water shell, when filled to capacity, is 600 gallons; this volume is 250 gallons when the water is at the REFILL level.

External Pressure-Equalizing Line

The pressure-equalizing line provides an unrestricted passage through which acetylene enters the generator hopper to fill the space vacated by the discharged carbide. This makes for smooth carbide flow since full generator pressure exists on both sides of the carbide charge. The external location of the equalizing line cools the saturated acetylene and minimizes the amount of moisture carried into the hopper.

Water Filling

Water enters the generator through a directly-connected, manually-operated water fill valve. This valve is provided with a side port so that if there is any leakage through the valve, when it is closed, it will flow to the outside and be plainly visible.

A supplementary shutoff system has been provided to prevent overfilling if the manual valve is not closed at the right time. (It should be understood that this is a safety feature and should NOT, under any circumstances, be used as a means of shutting off the water instead of closing the manual valve.) A stainless-steel float rises with the water level and closes the automatic valve (Fig. 2) if the water rises above the NORMAL level. This shutoff valve will also close if the float should sink to a low level. In this way the generator is protected against overfilling even if the float should fail. Since this valve opens against the pressure in the water-supply line, it will automatically close if any part of the float-operating mechanism should become inoperative.

A swing check valve should be provided in the water fill line to prevent a back flow of acetylene into the water main in the event of water-pressure failure during the refilling operation.

Water-Level Indicator

The water-level indicator is a direct-acting index of the amount of water present in the generating chamber. It is operated by the rise and fall of a hollow stainless-steel sphere which floats on the surface of the water in the chamber. This float is mounted at one end of the arm which is attached to the side of the indicator shaft as shown in Figures 1 and 3. With this arrangement, any change in the position of the float, due to a change in the water level, causes the indicator shaft to rotate. A pointer at the end of the shaft indicates the water level on the indicator scale.

Carbide-Contents Indicator

This is a dependable arrangement for indicating the weight of carbide in the generator hopper. The hopper is supported at three points, one of which is the piston of a closed fluid-pressure system (Fig. 4). The pressure in this system is, therefore, directly proportional to the weight of carbide in the hopper. The pressure is transmitted through the fluid to the carbide-contents gauge. This direct-weighing system provides continuous and accurate readings of the amount of carbide in the hopper.
CARBIDE-CHARGING VALVE

The carbide filling port of the generator is a 3-in. plug valve. A tapered nipple at the top of this valve fits into the outlet of the carbide charging hopper (Fig. 5).

A plug-type vent valve is connected to the side of the tapered nipple. When the charging valve is closed after the hopper has emptied, this valve is opened to vent the pressure in the hopper before it is removed from the generator. (The vent valve handle is positioned so that the vent valve must be closed before the charging valve can be opened. Conversely, the charging valve must be closed before the vent valve can be opened.)

CHARGING HOPPER

The charging hopper is designed as a pressure vessel and becomes a part of the generator during recharging. It is equipped with an unloading valve at the bottom to retain the carbide while the hopper is being filled and placed atop the generator. A locking mechanism is provided to secure the charging hopper to the generator after the hopper is lowered into position on the generator. When the hopper is positioned on the generator, turning the locking ring to the closed position causes lugs on the inner surface of the locking ring to move over the projecting heads of the cap screws on the charging hopper outlet to hold the hopper in place on the generator. The design provides for interference of the handle of the locking ring with a bar projecting from the hopper vent valve handle. This assures that the locking ring will be turned to its closed position before the vent valve handle is raised to its closed position to allow the charging valve on the generator to be opened. Conversely, it assures that the charging valve will be closed and the vent valve will be opened to release the pressure in

FIG. 3 – Water Level Indicator

FIG. 4 – The Carbide Indicating System Provides One of the Three Supports for the Generator Hopper.
a rate which is proportional to the rate of generation required to supply the acetylene consumption. When all acetylene consumption stops, the diaphragm pulls the plug into the hopper outlet to stop further feeding of carbide. (When all acetylene consumption stops, the pressure within the generator may increase slightly beyond the generator pressure setting but will then remain at a constant value. This is caused by the time lag between the feed-valve closure and the pressure rise due to the acetylene subsequently produced from the last portion of carbide fed into the generating chamber.)

The valve-plug stem is equipped with a disk to prevent the flow of carbide if the ball socket or retaining screw should fail at any time. In such a case the plug will drop through the hopper outlet, and the disk will block the outlet from above. This will prevent the uncontrolled feeding of carbide into the generating chamber.

**Feed Valve**

The manual shut-off provided with this feed control is direct and positive. Rotating the feed-valve handle to the LOCK position moves the entire feed control upward until the valve plug is pulled into the hopper outlet. By means of this arrangement you do not have to close the valve against the force of the springs. Nor is it necessary to close the valve against the weight of the carbide; the feed-control cover keeps carbide off the control itself, and prevents carbide from clogging the sleeves which position the control mechanism.

The MP-11 requires no separate feed-valve cleaner. Operation of the manual shut-off (feed-valve handle) breaks up any slaked carbide around the feed valve. This assures unrestricted feeding of carbide after shutdown periods.

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**FIG. 5 - Carbide Charging Connection**

The hopper before the locking ring is turned to its open position to remove the hopper from the generator. Figure 6 shows the hopper in position for transferring the carbide charge to the generator. The hopper-to-generator connection is sealed gas tight by a molded rubber gasket. Transfer of carbide occurs when the charging-hopper unloading valve is opened. The hopper is equipped with an acetylene pressure gauge to indicate when the pressure has been vented enough to allow the hopper to be removed from the generator.

**Carbide Feed Control**

This mechanism automatically controls the feeding of carbide in proportion to consumption rates. The feed control is preset at the factory to maintain a generator pressure of 13 psi, and will maintain this pressure within very narrow limits (±1/2 psi).

Carbide in the hopper flows down toward the cylindrical hopper outlet (Fig. 7). Its passage through this outlet is controlled by the position of the valve plug which is connected to the feed-control diaphragm. Generator pressure is exerted against the bottom side of the diaphragm, and is opposed on the top side of the diaphragm by the feed-control springs. Pressure changes in the generating chamber, exerted against the diaphragm, cause the plug to move toward or away from the hopper outlet, thus adjusting the size of the outlet opening and the rate of carbide flow.

In operation, as acetylene is withdrawn from the generator the pressure within the generating chamber tends to decrease. The feed-control diaphragm then starts to move downward because the upward force exerted by the acetylene pressure is slightly less than the downward force of the springs. This downward movement of the diaphragm moves the valve plug away from the hopper outlet. Carbide then flows through the valve opening into the generating chamber to produce more acetylene. The rise of pressure produced by this generation forces the diaphragm upward until this upward thrust balances the downward force of the springs.

The valve plug is thus moved away from or back to the hopper outlet to control the feed of carbide at
Feed Tube

The feed tube is a rubber sleeve through which carbide is discharged into the generating chamber. It is clamped around the hopper outlet and extends downward into the generating chamber (Fig. 7).

The feed tube serves two purposes. Its first function is to keep moisture from reaching the feed-control valve. It prevents slaking of the carbide at the feed valve (that might cause the feed valve to stick). This is particularly important when the generator is not in use, but has carbide in the hopper and water in the generating chamber. In such a case the feed-tube control handle would be turned to CLOSE, pinching the feed tube shut against the metal plate located behind the tube. The handle can be kept in the CLOSE position by the latch on the generator shell. The feed tube's second function is to provide the generator with a low-water-level carbide feed shutoff. An arm attached to the feed-tube control rod (Fig. 1) is connected to the water-level-indicator float arm by a link chain. This arrangement will close the feed tube and prevent further feeding of carbide if the volume of water in the generator should decrease to approximately 180 gallons. Carbide feeding will not resume until water is added through the low-level water fill valve to raise the level to within the operating range.

Hydraulic Back-Pressure Valve

The MP-11 is equipped with a hydraulic back-pressure valve (or "hydraulic," as it is usually called) to prevent a back flow of gas into the generator from the service line. An acetylene filter is housed within the dome of the hydraulic (see page 9).

The back-pressure valve system is designed so that acetylene first enters a water reservoir located inside the generating chamber (Fig. 8). The gas then passes into the hydraulic through a check valve, with a tangential flow that minimizes the entrainment of water as the gas moves through it. This method of entrance, together with the baffle arrangement, enables operation at high rates without loss of water from the hydraulic.

As shown in Figure 8, the hydraulic is provided with a standpipe inside the baffle tube. This allows the water level to be checked while gas flows through the hydraulic. Checking is accomplished by opening the hydraulic drain valve and inserting the test plug in the self-closing, quick-connect hose coupler. Any water above the top of the standpipe will drain out through this test plug. If the water level is below the top of the standpipe, this condition will be indicated by a discharge of gas. The quick-connect hose coupler will remain open only as long as the test plug is held in it. It closes automatically as soon as the test plug is released.
Acetylene Filter

Some of the lime formed during the generation of acetylene tends to be carried along with the moisture in the acetylene. The amount carried along depends a great deal upon the rate of acetylene use. It is necessary to filter cut this lime to prevent its accumulation in the service lines, regulators or appliances.

The filter in MP-11 generators is mounted within the dome of the hydraulic back-pressure valve (Fig. 8). This location makes it easily accessible for inspection or replacement, while the seal of water in the hydraulic prevents air from entering the generator proper during these operations. The filter is an assembly of cattle hair disks mounted on a perforated pipe post which connects to the outlet of the hydraulic. The acetylene flows radially through the disks toward the center post. The central portion of the disks is compressed between end plates to furnish a finer pore medium that will entrap any fine particles which are not arrested by the looser portions at the outside edges of the disks. The filter will give satisfactory service for a considerable length of time.

Relief Valves

The MP-11 generator has two pressure relief valves, one serving the hydraulic and the other serving the generating chamber. The generator relief valve will prevent excessive pressures from building up inside the generator; the hydraulic relief valve will release any excessive pressure that may develop on the outlet side of the hydraulic back-pressure valve.

A sectional view of the relief valves is shown in Figure 9. The lower opening is the inlet; the side opening is the outlet, which is piped through a vent line to the outdoors. The spring inside the bonnet provides the force for holding the poppet closed against its seat. The amount of spring compression determines the pressure at which the valve will open automatically.

[Diagram of hydraulic back-pressure system and relief valve]
3. If ever an odor of acetylene is detected in the generator room, open the doors and windows and then locate the source of the odor and correct the cause of leakage at once. Use nothing but soapy water to locate leaks.

4. Do all charging, cleaning, adjusting and manipulating of the generator by daylight, as far as practicable.

5. Never allow the generator to be empty of water while there is carbide in the hopper.

6. Never fill the carbide hopper with carbide until after the generator has been filled with cool, clean, fresh water to the NORMAL level.

7. Never allow pieces of metal, paper, rags or other foreign materials to enter the charging hopper when it is being filled with carbide.

8. Keep the generator room clean. Do not allow rubbish to accumulate in corners or out-of-the-way places. Keep all passageways free from obstructions.

9. Be sure the packing glands on the water-indicator, residue agitator, and control-rod shafts are tight enough to prevent leakage, yet loose enough to permit the shafts to operate correctly.

10. Always follow the printed operating instructions in the order specified. Short cuts may result in unsafe operation.

**Periodic Inspection Procedure**

1. Every ninety days, inspect and clean the generator as directed in "Quarterly Inspection Procedure" of this instruction book.

2. Every year, thoroughly inspect and clean the generator as directed in "Annual Inspection Procedure" of this instruction book.

**Cold Weather Care** *

1. Protect the generator from freezing: The temperature of the generator room should never be allowed to go below 40 deg. F. Where artificial heat is necessary, the heating shall be by steam, hot water, or other indirect heating system. The furnace should be so located that no flame or fire is in or near the generator enclosure. Electric heaters should not be employed.

2. If water in any part of the generator should freeze (in the generating chamber, filter, swing check valve, hydraulic back-pressure valve, relief

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*For additional details refer to Form 3088, "Cold-Weather Care of Acetylene Generating and Distributing Equipment." This booklet is available through your LINDE representative.
valves, residue valve, water-filling valve, or in any of the piping or pipe fittings), thaw it with hot water only. Before putting the generator back in service, make a careful examination for any damage which the freezing may have caused. If there is any doubt as to the safe method of procedure after ice has formed in any part, communicate with a LINDE representative before attempting to thaw out or operate the generator or do any work on it whatever.

Repair Precautions

1. Do not attempt to operate an acetylene generator that is in need of repair.

2. All repairs involving welding, soldering or any other operation liable to produce flame, sparks, or heat, should be made outside of the generator room. Sections of the generator to be so repaired must be completely flooded with water to make sure that all traces of acetylene are expelled before the repair work is performed. First withdraw the generator from service as directed in Section E, page 19.

3. Repairs should be made in strict accordance with instructions given in this booklet, using only standard parts listed in the Replacement Parts section, pages 38 to 47.

Carbide Handling

1. When carbide containers are opened, use only a wooden mallet or a tool especially designed for opening carbide cans. Never strike the cover or containers with a metal tool.

2. Do not throw carbide with a scoop or shovel, or pour it at any greater distance than is necessary.

3. Do not poke or ram carbide into the charging hopper.

4. Do not allow carbide to come in contact with water or moisture outside the generator.

5. Do not allow carbide to remain in contact with the atmosphere longer than is absolutely necessary. Always replace and securely fasten covers on empty or partially full carbide containers, making sure that the screw cover is closed with the gasket in place. Empty containers should be free from particles of carbide before being closed. Never allow pieces of metal, paper, rags or other foreign materials to enter the charging hopper when it is being filled with carbide.

6. Never put a light of any kind into a carbide container.

7. If carbide or carbide dust is spilled on the outside of the generator or on the floor, sweep it up at once and throw it on the ground out-of-doors and clear of any building.
Single-Generator Installation
(See page 14 for multiple-generator installations.)

Initial Charging Instructions
When a generator installation is put into service for the first time, or when a generator is started again after being shut down for the quarterly or annual inspection, or for repair, the procedure followed is different in some respects from the recharging procedure. The instructions given here are for this "initial" charging.

Initial Charging
(Refer to Figure 1 for MP-11 operating components.)

1. Close the acetylene service valve.
2. Move the feed-valve handle to the LOCK position and secure it in this position with the latch.
3. Move the feed-tube handle to the CLOSE position and secure it in this position with the latch.
4. Make sure the generator drain valve is closed.
5. Close the charging valve on top of generator.
6. Open the water-filling valve. Leave it open. Water will not flow into the generator, however, since the automatic water-level float valve is closed.
7. Open the low-level water-filling valve.
8. Insert the manual water-filling plug connection and hold it in position, allowing water to flow into the generating chamber. Disengage the manual connection as soon as the pointer on the water-level indicator reaches the REFILL position; then close the low-level water-filling valve. The automatic water-level float valve will then be open and water will be flowing into the generator through the water-filling valve.
9. Close the water-filling valve as soon as the generating-chamber pressure gauge reads 13 psi.
10. Watch the pressure gauge for about fifteen minutes. If the pressure starts to drop after the generator is filled, this decrease may be due to the cooling effect of the cold water on the air in the generating chamber. In such a case, wait to see if the pressure levels off and holds at a lower value. If the pressure continues to drop during this period, it is an indication that there is a leak. Thoroughly soap test all joints and correct the leaks as instructed in the Maintenance Section of this book.
11. Release the air pressure. Pull outward on the link which connects the two relief valves, thus venting the air from the generator. When the generator pressure gauge indicates zero, return the link to its normal operating position.
12. Open the water fill valve again and continue to fill the generator. Close the valve as soon as the pointer on the water-level indicator reaches the NORMAL mark.
13. Repeat step 11.
14. Fill the hydraulic back-pressure valve. Open the drain valve at the bottom of the hydraulic, open the valve on the water supply to the filling hose, and insert the plug on the end of the filling hose into the drain outlet to add water. Then remove the filling plug and insert the test plug into the drain outlet to check for the discharge of excess water. Repeat the filling and checking until the check shows a discharge of excess water. Hold the test plug in place to drain this excess, then remove the test plug and close the drain valve.
15. Fill the charging hopper with carbide. Be sure the unloading valve at the bottom of the charging hopper is closed. Open the charging door and place the charging hopper in the hopper pit. Place the filling funnel in the hopper door opening and pour in 350 lb. of 1/4 in. x 1/12 in. UNION carbide. Never use any other size carbide, nor attempt to overfill the hopper, nor pack carbide into it. Swing the funnel back from the charging hopper. Clear any excess carbide or dust away from the charging door opening. Be sure the ring gasket on the charging door itself is clean. Wipe it off with a dry cloth if necessary.
16. Raise the charging hopper waist high; close the charging door and tighten the handwheel to clamp the door down securely.
17. Raise the charging hopper, move it to a position over the generator, and, with the locking ring open, lower it into position on the tapered nipple on the charging valve.
18. Close the locking ring and close the charging hopper vent valve.
19. Open the charging valve on top of the generator.
20. Open the charging-hopper unloading valve to allow carbide to flow down into the generator hopper.
21. Rotate the unloading-valve handle to "feel" whether or not there is any carbide left in the charging hopper. When the hopper is empty, close the unloading valve and lock the handle in position.
22. Close the charging valve on top of the generator.
23. Open the vent valve and open the locking ring.
24. Remove the charging hopper from the generator.
25. Turn the feed-tube handle to the OPEN position and secure it in this position with the latch.
26. Build the generator up to 5 lb. per sq. in. pressure. Turn the feed-valve handle from the LOCK position to the FEED position, pause at the FEED position several seconds, then return the handle to the LOCK position. Repeat the process of turning the feed-valve handle toward the FEED position, pausing at the FEED position several seconds and then returning it to the LOCK position until the generator pressure gauge shows 5 lb. per sq. in.

27. Vent the air-acylene mixture. Slowly pull outward on the link which connects the two relief valves, thus venting the air-acylene mixture from the generator. Do not pull the link all the way outward at once. When the generator pressure gauge indicates zero pause momentarily, and then return the link to its normal operating position.

28. Again build the generator up to 5 lb. per sq. in. pressure. Repeat the procedure in step 26.

29. Again vent the air-acylene mixture. Repeat the procedure in step 27.

30. Build the generator up to operating pressure. Repeat the procedure given in step 26 until the generator pressure gauge shows about 12-1/2 lb. per sq. in.; then move the feed-valve handle to the FEED position and leave it in that position.

31. Make sure that all joints on the generator are leak-tight and that there are no leaks in the service piping to which the generator is connected. Check the valves at all station outlets on the service piping to see that they are closed tightly.

32. Slowly open the service valve.

33. Purge air out of all the service piping system that may contain air. All new service piping or piping which was disconnected in any way (thus permitting entrance of air) should be purged.

   a. Open the main line shutoff valve, and be sure that all section shutoff valves and line-pressure regulators are open.

   b. At the far end of each branch of the system, connect blowpipes equipped with cutting nozzles or welding heads to one or more stations equipped with either regulators or hydraulic back-pressure valves.

   c. At each of these stations, open the station valve and the blowpipe acetylene valve. (Do not open the blowpipe oxygen valve.) Light the blowpipes as soon as the issuing gas will burn. The flames will gradually increase in size and depth of color (becoming a deeper yellow), as the acetylene concentration increases.

   d. After the character of appearance of the flames remains constant for at least ten minutes, close the blowpipe valves and the station valves.

An MP-11 generator will automatically supply acetylene at the preselected service pressure as long as carbide and water are supplied to the generator. The length of time that the generator will continue to operate without recharging will depend upon the rate of use at the service outlets. The carbide indicator on the generator indicates how much carbide is in the generator hopper.

Recharging

When the carbide content of the generator hopper is reduced to about 150 lb., the needle on the carbide indicator gauge will indicate REFILL on the gauge dial. Recharge the generator as instructed below:

1. Fill the charging hopper with carbide. Be sure the unloading valve at the bottom of the charging hopper is closed. Open the charging door and place the charging hopper in the hopper pit. Place the filling funnel in the hopper door opening and pour in 350 lb. of 1/4 in. x 1/12 in. UNION carbide. Never use any other size carbide, nor attempt to overfill the hopper, nor pack carbide into it. Swing the funnel back from the charging hopper. Clear any excess carbide or dust away from the charging door opening. Be sure the ring gasket on the charging door itself is clean. Wipe it off with a dry cloth if necessary. Raise the hopper waist high; close the charging door and tighten the handwheel to clamp the door down securely.

2. With the feed tube and feed valve open to maintain the pressure in the generator, open the drain valve and rotate the agitator, back and forth in half-turn sweeps, while the residue is draining from the generating chamber. Close the drain valve as soon as the pointer on the water-level indicator reaches the REFILL mark.

3. Fill the generator with water. Open the water-filling valve and allow water to flow into the generating chamber. Close the water-filling valve as soon as the pointer on the water-level indicator reaches the NORMAL mark.

4. Raise the charging hopper, move it to a position over the generator, and, with the locking ring open, lower it into position on the tapered nipple on the charging valve.

5. Close the locking ring and close the charging hopper vent valve.

6. Open the charging valve on top of the generator.

7. Open the charging-hopper unloading valve to allow carbide to flow down into the generator hopper.
8. Rotate the unloading-valve handle to "feel" whether or not there is any carbide left in the charging hopper. When the charging hopper is empty, close the unloading valve and lock the handle in position. (The carbide-contents indicator may not read FULL when the charging hopper is empty. This is due to the fact that the generator has been feeding carbide during the recharging operation.)

9. Close the charging valve on top of the generator.

10. Open the charging-hopper vent valve to release the acetylene pressure in the hopper. When the pressure gauge on the hopper indicates zero, open the locking ring.

11. Remove the charging hopper from the generator.

12. Check the water level in the generator hydraulic back-pressure valve. Open the drain valve at the bottom of the hydraulic and insert the test plug in the drain outlet. If water is discharged, hold the plug in place until the water discharge stops; then remove the test plug and close the drain valve. If acetylene is discharged, remove the test plug immediately; then open the valve on the water supply to the filling hose, and insert the plug (on the end of the filling hose) in the drain outlet to add water. Remove the filling plug and insert the test plug in the drain outlet to check for a discharge of excess water. Repeat the filling and checking until a check shows a discharge of excess water. Hold the test plug in place to drain this excess, then remove the test plug and close the drain valve.

**IMPORTANT:** Drain the residue and refill the generating chamber with fresh water in accordance with these instructions each time the generator is recharged. Keep the generating chamber filled to the NORMAL level when there is any carbide in the hopper — even when the generator is not in use.

**Short-Period Shutdown**

If the generator is being operated on a one- or two-shift basis and is to be left unattended overnight or over a week end, or if there is no demand for acetylene for an extended period due to interrupted operations, the following procedure should be followed in shutting down the generator:

1. Move the feed-valve handle to the LOCK position and secure it in this position with the latch.

2. Move the feed-tube handle to the CLOSE position and secure it in this position with the latch.

3. Close the service valve.

**Re-starting After a Short-Period Shutdown**

The following procedure should be followed after a short-period shutdown when the acetylene demand is resumed:

1. Make sure all outlet valves in the piping system are closed.

2. Move the feed-tube handle to the OPEN position.

3. Move the feed-valve handle to the FEED position.

4. Slowly open the service valve.

**Multiple-Generator Installation**

When acetylene demand exceeds the rated capacity of a single MP-11, two or more of these generators are operated simultaneously by GC-4 controls. With GC-4 Control Units, the flow of acetylene from individual generators can be adjusted so that each carries an equal share of the load. Refer to Form 9510 for operating instructions for GC-4 controlled generators. Form 9510 also contains installation and maintenance instructions for the control units.
Maintenance and Overhaul Instructions

If you encounter difficulties in operating an MP-11 generator, first consult the Trouble-Shooting Check List on pages 17 and 18. When the source of trouble is determined, carry out the specific maintenance and overhaul instructions which apply to the defective part or parts of the generator. If there is any doubt as to the correct procedure, consult the nearest office of Linde Air Products Company.

Extra parts such as rollpins, rubber cement or a new handhole-cover gasket may be needed during an inspection or even for minor adjustments. It will be helpful to have them ready before proceeding with an inspection or any maintenance work. (See Spare Parts List, pages 38 and 39.)

When a replacement part is needed for the generator, refer to the back of this book and locate the part on one of the parts illustrations. Refer to the "Complete Hardware List," page 47, for complete descriptions of hardware items. When placing an order for a replacement part, be sure to give the generator serial number, the part number, and the complete description of the part as given in the Replacement Parts section.

Some of the external maintenance operations may be performed after closing the service valve, locking the feed valve, closing the feed tube, and relieving the generator pressure; for example, adjusting the relief-valve interference, cleaning the charging-hopper vent valve and vent line, and checking the pressure gauges. Before starting any other inspection or maintenance, first withdraw the generator from service as instructed in Section E. Section G then gives the specific instructions for carrying out a definite maintenance job, at the same time indicating what preparatory work (Section F) is necessary. Finally, Sections H and I contain the procedures for replacing the hopper cover on the generating chamber and for returning the generator to service.

Before starting a given piece of maintenance work, carefully read the instructions (Section G) applying to the specific work. Pay special attention to the preparation which will be required. After making sure that the scope of the job is fully understood, proceed with the work.

Record the date and the name of the person performing the maintenance or overhauling of the generator. A "Generator Record," on page 36, is provided for this purpose. It is good practice to keep a record of the specific maintenance operations performed each time.

Section A. Lubrication Schedule

Daily. Lubricate the carbide charging valve. (Section G-15, page 30.)

Weekly. Lubricate all plug valves. (Section G-14, page 30.)

Section B. Quarterly Inspection Procedure

For a regular quarterly inspection, it will not be necessary to remove the generator hopper cover from the water shell. The entire inspection procedure, as outlined below, can be performed with just the handhole cover removed. Some cleaning of interior parts can be done through the handhole, using a wooden stick. Never use metal. If further cleaning or maintenance is indicated by this inspection, refer to the appropriate subsection in Section G for detailed instructions. These instructions will also indicate what additional preparations, if any, are necessary for each maintenance operation.

Thorough and careful inspection of each item ensures reliable and uninterrupted operation.

1. Withdraw the generator from service. (Section E, page 19.)

2. Inspect the filter and replace it if conditions warrant. (Section G-2, page 20.)

3. Remove the handhole cover. (Section G-1, page 20.)

4. Examine the carbide feed tube for cracks or tears.

5. Inspect the control rods and fittings. Clean and inspect the feed-tube shutoff system.

6. Check the operation of the water-level indicator. (Section G-7, page 25.)

7. Clean the pressure-equalizing line. (Section G-10, page 28.)

8. Replace the handhole cover. (Section G-1, page 20.)

9. Check for leakage at the automatic water-shutoff valve. (Section G-6, page 24.)

10. Check the operation of the relief-valve mechanism. (Section G-4, page 22.)

11. Inspect the charging-hopper gaskets. (Section G-12, page 29.)

12. Check the stuffing boxes. (Section G-18, page 33.)

13. Lubricate the plug valves. (Section G-14, page 30.)

14. Return the generator to service. (Section 1, page 34.)
Section C. Annual Inspection Procedure

Carefully inspect every item to insure continuous and reliable operation. Follow the specific instructions for maintenance work in Section G.

1. Withdraw the generator from service. (Section E, page 19.)
2. Remove the hopper cover. (Section F, page 19.)
3. Remove the hopper. (Section F, page 19.)
4. Remove the handhole cover. (Section G-1, page 20.)
5. Clean and examine the carbide feed control. (Section G-5, page 22.)
6. Inspect the control rods and fittings. Clean and inspect the feed-tube shut-off system. (Section G-8, page 25.)
7. Replace the feed-control atmospheric connection. (Section G-5, page 22.)
8. Replace the feed tube. (Section G-5, page 22.)
9. Examine the generating chamber. (Section G-16, page 31.)
10. Inspect the filter and replace it if necessary. (Section G-2, page 20.)
11. Wash out the hydraulic back-pressure valve, reservoir, and connecting piping. (Section G-3, page 22.)
12. Clean the pressure-equalizing line. (Section G-10, page 28.)
13. Clean the charging valve. (Section G-15, page 30.)
14. Check the generator-hopper gasket (main gasket). (Section H, page 33.)
15. Replace the hopper.
16. Replace the hopper cover. (Section H, page 33.)
17. Replace the handhole cover. (Section G-1, page 20.)
18. Clean the relief valves. (Section G-17, page 31.)
19. Clean the charging-hopper vent valve and vent line. (Section G-11, page 29.)
20. Check the operation of the relief-valve trip mechanism. (Section G-4, page 22.)
21. Inspect the charging-hopper gaskets. (Section G-12, page 29.)
22. Check the operation of the carbide indicator system. (Section G-8, page 26.)
23. Tighten or repack all stuffing boxes. (Section G-18, page 33.)
24. Lubricate the plug valves. (Section G-14, page 30.)
25. Inspect the pressure gauges. (Section G-13, page 30.)
26. Return the generator to service. (Section I, page 34.)
### Section D. Trouble-Shooting Checklist

The following chart will assist operators in locating generator difficulties, ascertaining the probable cause, and making proper adjustments.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CAUSE</th>
<th>REMEDY</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbide feed valve clogged.</td>
<td>Operate feed-valve handle to clean valve opening.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insufficient water in generating chamber; float interference holding feed tube shut.</td>
<td>Add water to bring water level to NORMAL.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Float filled with water.</td>
<td>Check drain valve for leakage.</td>
<td>Section G-14, page 30.</td>
</tr>
<tr>
<td></td>
<td>Feed-tube rod stuck.</td>
<td>Replace float.</td>
<td>Section G-8, page 25.</td>
</tr>
<tr>
<td></td>
<td>Feed-valve plug disconnected from diaphragm.</td>
<td>Replace packing.</td>
<td>Section G-18, page 33.</td>
</tr>
<tr>
<td>Generator feeds carbide indiscriminately; generator pressure is uncontrollable and relief valve vents.</td>
<td>Feed-control diaphragm ruptured.</td>
<td>Replace diaphragm.</td>
<td>Section G-5, page 22.</td>
</tr>
<tr>
<td></td>
<td>Feed-control atmospheric line clogged.</td>
<td>Replace atmospheric line.</td>
<td></td>
</tr>
<tr>
<td>Generator pressure is normal, but line pressure is low or variable.</td>
<td>Filter clogged.</td>
<td>Replace filter.</td>
<td>Section G-2, page 20.</td>
</tr>
<tr>
<td></td>
<td>Check drain valve for leakage.</td>
<td>Section G-14, page 30.</td>
<td></td>
</tr>
<tr>
<td>Control-rod stuffing box leaks acetylene.</td>
<td>Packing loose or worn.</td>
<td>Tighten or repack stuffing box.</td>
<td>Section G-18, page 33.</td>
</tr>
<tr>
<td>Charging hopper does not hold generator pressure.</td>
<td>Charging-door gasket worn.</td>
<td>Replace gasket.</td>
<td>Section G-12, page 29.</td>
</tr>
<tr>
<td></td>
<td>Hopper outlet gasket worn</td>
<td>Replace gasket.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leakage past unloading-valve shaft seal.</td>
<td>Replace packing.</td>
<td></td>
</tr>
<tr>
<td>Relief valve leaks.</td>
<td>Worn “O” ring.</td>
<td>Replace packing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dirt on seat.</td>
<td>Clean and inspect relief-valve poppet.</td>
<td>Section G-17, page 31.</td>
</tr>
<tr>
<td></td>
<td>Spring damaged.</td>
<td>Clean relief valve and install new spring.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improper adjustment.</td>
<td>Readjust relief valve.</td>
<td></td>
</tr>
<tr>
<td>Relief valves do not vent acetylene.</td>
<td>Vent pipe clogged.</td>
<td>Inspect relief-valve vent pipes to see that no obstructions have closed or restricted them.</td>
<td>Section G-19, page 33.</td>
</tr>
</tbody>
</table>

(Continued)
## Section D. Trouble-Shooting Checklist (Concluded)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CAUSE</th>
<th>REMEDY</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid pressure system clogged.</td>
<td>Add fluid to fluid pressure system. Check system for leaks.</td>
<td>Clean fluid pressure system.</td>
<td></td>
</tr>
<tr>
<td>Worn &quot;O&quot; ring.</td>
<td></td>
<td>Replace &quot;O&quot; ring.</td>
<td></td>
</tr>
<tr>
<td>Air in fluid pressure system.</td>
<td>Bleed air from fluid pressure system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect setting of adjusting screw.</td>
<td>Readjust to correct setting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generator becomes abnormally hot during operation.</td>
<td>Filling water too warm.</td>
<td>See that the water line supplying the generator does not parallel steam lines or hot air ducts. Always fill generator with cool, fresh, clean water.</td>
<td></td>
</tr>
<tr>
<td>Insufficient fresh water added to generating chamber.</td>
<td></td>
<td>Always drain generator to REFILL water level before refilling each time generator is recharged. Then fill the generating chamber with cool, clean, fresh water until the water level is at NORMAL.</td>
<td></td>
</tr>
<tr>
<td>Odor of acetylene is present in generator room.</td>
<td>Acetylene leak.</td>
<td>Immediately open doors and windows to obtain maximum ventilation. Do not make any sparks. Listen for hissing sound of escaping gas. Test all stuffing boxes, gasket joints, charging valve and pipe connections with soapy water until leak is found. Close service valve and turn feed-valve handle to LOCK position. Then make proper repairs.</td>
<td></td>
</tr>
<tr>
<td>Carbide spilled during recharging.</td>
<td></td>
<td>Always clean up spilled carbide.</td>
<td></td>
</tr>
<tr>
<td>Carbide cans left open.</td>
<td></td>
<td>Always replace and securely fasten covers on carbide containers. Be sure cover gasket is in place.</td>
<td></td>
</tr>
<tr>
<td>Residue valve, charging-hopper vent valve, or water-filling valve is difficult to operate.</td>
<td>Insufficient lubrication.</td>
<td>Add lubricant by turning down lubricant screw or putting in a fresh lubricant stick.</td>
<td>Section G-14, page 30.</td>
</tr>
<tr>
<td>Charging valve difficult to operate.</td>
<td></td>
<td>Apply grease to valve through grease port.</td>
<td>Section G-15, page 30.</td>
</tr>
<tr>
<td>Feed-valve handle, feed-tube handle or agitator handle difficult to operate.</td>
<td>Worn seals.</td>
<td>Repack stuffing boxes.</td>
<td>Section G-18, page 33.</td>
</tr>
</tbody>
</table>
Section E. Withdrawing a Generator From Service

1. If the generator hopper is not already empty, use up the remaining charge of carbide. This may be done by allowing the generator to exhaust itself in regular service, or by consuming the acetylene by lighting one or more blowpipes connected to station outlets equipped with either regulators or hydraulic back-pressure valves. Do not use up the acetylene under any circumstances by allowing it to discharge directly from station outlets. Likewise do not attempt to consume carbide at a rate which exceeds the generating capacity of the MP-11.

2. When the generator pressure begins to drop, close the generator service valve.

3. Make sure the carbide charge is exhausted. Turn the feed-valve handle to the LOCK position and then to the FEED position. Repeat this operation several times, pausing at the FEED position for several seconds each time, and watch the generator pressure gauge for an increase in pressure which would indicate further generation of acetylene.

4. Lock the feed valve. Turn the feed-valve handle to the LOCK position until the latch drops to hold it there.

5. Close the feed tube. Turn the feed-tube handle to the CLOSE position until the latch drops to hold it there.

6. Open the residue drain valve for several seconds and then close it.

7. Relieve the acetylene pressure by slowly pulling outward on the Interference link which connects the two relief valves. Do not pull the link all the way outward at once. When the generator pressure gauge indicates zero, pause momentarily, and then return the link to its normal position.

8. Make sure the generator room is adequately ventilated. Open windows and doors; however, do not allow water in the piping and generator to freeze.

9. Open the charging valve on top of the generator.

10. Open the drain valve and rotate the agitator, back and forth in half-turn sweeps, while the residue is draining from the generating chamber. Close the drain valve as soon as the pointer on the water level indicator reaches the REFILL mark.

11. Open the water-filling valve and allow water to flow into the generating chamber. Close the water-filling valve as soon as the pointer on the water-level indicator reaches the NORMAL mark.

12. Repeat the procedure of draining the generating chamber, while rotating the agitator, to the REFILL level. Then fill the chamber to the NORMAL level.

13. Drain the generating chamber until it is completely empty and close the drain valve.

14. Open the water-filling valve.

15. Open the low-level water-filling valve.

16. Insert the water-filling plug in the manual water-filling connection and hold the plug in position, allowing water to flow into the generating chamber. Disengage the manual connection as soon as the pointer on the water-level indicator reaches the REFILL position; then close the low-level water-filling valve.

17. Close the water-filling valve.*

NOTE: Draining the generating chamber after the acetylene pressure has been vented results in a slower discharge which is less efficient in removing the residue than the draining procedure employed when the generator is recharged. If any accumulation of residue is found on the bottom of the generator, when it is opened for inspection or repair, drain the generator completely and flush the residue out the drain pipe with a stream of water from a hose.

IMPORTANT: All repairs involving welding, soldering or any other operation liable to produce flame, sparks, or heat should be made outside the generator room. Sections of the generator to be so repaired must be completely flooded with water to make sure that all acetylene is expelled before the repair work is performed.

Section F. Removing the Generator Hopper From the Generating Chamber

After the generator has been withdrawn from service and purged as instructed in Section E, the generator hopper may be removed from the generating chamber.

Hopper Cover (Refer to Fig. 11)

Disconnect the lower section of the pressure-equalizing line at the union just above the generating chamber.

Disconnect the lower section of the charging-hopper vent line at the union which is just about level with the hopper flange.

*If the generator is to remain out of service for an extended period of time, close the charging valve. Make sure that the feed-tube handle is held in the CLOSE position and the feed-valve handle is held in the LOCK position.

If the water in the generator is likely to freeze, drain it and close the drain valve before closing the charging valve. After closing the charging valve, attach to the valve handle a tag with this warning: "This generator is empty of water. Before placing in operation, charge the generator as directed in the instructions for initial charging."

After an extended shutdown period, carefully inspect all parts subject to deterioration before charging with carbide.
Remove the relief-valve interference link from the generator. Unscrew the ball and socket joint at the upper end of the interference link and remove the operating levers from the two relief valves (Fig. 28). Place the link where it will be out of the way during maintenance operations.

Rig a sturdy sling by passing rope under the charging valve. Secure the rope firmly around the valve and provide a loop in the rope to extend directly over the charging connection.

Locate a block and tackle or hoist securely at some point above the generator hopper so that the latter can be lifted clear of the generating chamber and then swung out and down on the floor. Fasten the lifting hook of the block and tackle or chain hoist securely to the loop of the lifting sling.

Remove all the bolts which hold the hopper cover to the generating chamber around the gasketed flange joint.

Lift the hopper cover off the flange joint, about 1 inch. If the gasket adheres to the cover flange, carefully separate the gasket so that it will remain in place on the generator flange. Then raise the hopper cover and swing it clear from the generating chamber and carefully lower it to the floor. Move the hopper cover outside the generator room to work on any of its parts.

**Hopper Funnel**

To remove the hopper funnel, it is first necessary to disconnect the atmospheric vent line from the hollow foot of the feed control unit. Pass a rope through the two lifting rings on the funnel and fasten the rope to the lifting hook of a hoist or block and tackle. Turn the feed-tube handle to the OPEN position. Then slowly lift the funnel about a foot off its three supports. If the gasket adheres to the generator flange, carefully separate it from the generator flange. Reach into the space between the funnel and the water shell and disconnect the atmospheric vent line from the hollow foot of the feed control unit. Then swing the funnel clear from the generating chamber and carefully lower it. Invert the funnel before it reaches the floor, so that it comes to rest on the ring of gasket bolts instead of on the feed-tube backup plate.

Whenever maintenance work requires the removal of the hopper funnel, inspect all interior parts of the generator.

**Section G. Maintenance and Repair of Generator Parts**

**G-1. Handhole Cover**

The main purpose of the handhole located at the side of the generating chamber is to permit visual inspection of internal parts of the generator. The only parts which can be reached through the handhole for convenient servicing are the float arms (Sec. G-8) and the float-operated water valve (Sec. G-6).

**IMPORTANT:** Never remove the handhole cover without first thoroughly purging the generator as instructed in Section E. The cover may then be taken off the generator by removing the eight flange bolts.

After a particular inspection or maintenance operation has been completed, inspect the remaining interior parts of the generator. Examine the handhole-cover gasket for cut or worn spots which may cause a leak, and install a new gasket, if necessary. Replace the handhole cover and tighten all bolts evenly and securely.

**G-2. Filter Unit**

The filter is an assembly of large and small cattle hair disks mounted on a perforated pipe post which connects to the outlet of the hydraulic. The use of these disks enables the filter to entrap very fine particles of lime that might be carried with the acetylene. This filter will give satisfactory service for a considerable length of time.

The service line pressure gauge, mounted above the outlet of the hydraulic, serves to indicate when the filter should be removed for cleaning or replacement. The difference between the pressure indicated by this gauge and that indicated by the pressure gauge
on the water shell is the pressure drop through the hydraulic. However, before you accept the difference in gauge readings as a measure of the true pressure drop, the two gauges should be tested to see whether they are both calibrated equally or whether a correction figure must be used in determining the actual pressure drop. To make such a test, put the generator in service and have acetylene flowing through the service line. Then stop the flow of acetylene by closing the service line valve. Now compare the two gauges. If the gauge readings are identical at this time, then the pressure drop through the filter is the difference between the two gauge readings when acetylene is flowing through the service line. If the gauge readings differ under no-flow conditions, a correction figure must be used to determine the actual pressure drop through the filter under flow conditions.

The following example illustrates the method of determining the correction figure and the actual pressure drop through the filter:

**EXAMPLE**

**Under no-flow conditions:**

1. Generator Pressure Gauge reads...13 psi
2. Line Pressure Gauge reads...13-1/2 psi
3. Correction Figure (to be used against (2))...................... -1/2 psi

**Under flow conditions:**

1. Generator Pressure Gauge reads......13 psi
2. a) Line Pressure Gauge reads...................12-1/2 psi
   b) Correction Figure obtained above .............. - 1/2 psi
   c) Corrected Line Pressure Gauge reading............12 psi
3. Actual Pressure Drop.................................1 psi

When the actual pressure drop becomes approximately 1 psi, the filter should be removed and either cleaned or replaced. We recommend the purchase of a spare set of filter disks (Part No. 26R60). When the filter needs replacing, replace it with the spare set and allow the old filter to dry. When the filter disks are dry, brush off the dry line and use once again. This procedure can be used for a number of times until the hairs on the disks start to disintegrate.

Before inspecting or replacing the filter, prepare the generator in accordance with the following instructions:

1. Close the service valve.
2. Close the feed valve. Turn the feed-valve handle to the LOCK position until the latch drops to hold it there.
3. Close the feed tube. Turn the feed-tube handle to the CLOSE position until the latch drops to hold it there.
4. Relieve the acetylene pressure by slowly pulling outward on the interference link which connects the two relief valves. Do not pull the link all the way outward at once. When the generator pressure gauge indicates zero, pause momentarily, then return the link to its normal position.

The acetylene filter is located in the dome of the hydraulic back-pressure valve. Remove the eight bolts from the flange of the hydraulic and carefully lift the dome straight up. Do not tear the flange gasket. Invert the dome and fill it with water to displace any acetylene that may still be present. Then empty the dome and place it on the floor. Displace any acetylene remaining in the bottom part of the hydraulic by filling this part with water up to the flange.

To remove the filter, remove the pipe cap at the top of the filter mounting post, lift off the gasket and retainer disk, and remove the felt disks (Fig. 12); then lift off the bottom retainer disk and the gasket. With a damp cloth wipe any accumulated lime from the filter outlet. Also, remove the plug from the tee in the acetylene outlet, just outside of the hydraulic. Direct a stream of water into the filter outlet until the issuing water appears clean. Replace the plug, using a good grade of pipe compound. Replace the filter disks with new disks or with used disks that have been previously dried and cleaned. Examine the rubber gaskets and replace them with new ones if they are worn or deteriorated. Then reassemble the filter, replacing the components in the reverse order of their disassembly. The filter disks should be alternated, a large one and then a small one. The
disks will then have to be compressed so that the pipe cap can be replaced on the mounting post.

Examine the flange gasket for cut or worn spots which may cause a leak. Install a new gasket if necessary. With a damp cloth wipe the lime deposit from the inside of the hydraulic dome and replace the dome on the flange. Replace the flange bolts, tightening them evenly and securely.

Re-establish the normal operating level of the water in the hydraulic. Open the drain valve at the bottom of the hydraulic, insert the test connection into the quick-connect valve and drain the hydraulic until the flow of water stops. The hydraulic water level is now correct. Remove the test connection and close the drain valve.

If no further maintenance work is to be performed, return the generator to service as instructed in Section I.


To clean the hydraulic back-pressure valve, first withdraw the generator from service according to the instructions in Section E, page 19. Then remove the hydraulic dome and the filter (see G-2). Fill the bottom half and the dome of the hydraulic with water to displace any acetylene that may still be present.

Place a large pail or similar container under the hydraulic to catch the water as it drains from the valve. Unscrew the first coupling below the hydraulic and remove the complete standpipe, drain valve and quick-connect valve assembly (see Fig. 8).

Flush out the hydraulic bottom by directing a stream of clean water from a hose into the opening between the acetylene outlet and the flange. With a hooked wire or other suitable device, lift up the baffle tube as far as it will go and continue to flush until the discharge water is clean.

Remove the cap on the check valve in the acetylene inlet connection to the hydraulic. If no accumulation of lime is observed in the valve body, examine the check flap to see that it opens freely. Flush out this connection with a stream of clean water and replace the cap. If any accumulation of lime is observed in the valve body, it will be necessary to clean the reservoir and connecting piping. Remove the hydraulic by disconnecting the inlet and outlet unions and removing the mounting bolts. Remove the hopper cover and hopper funnel as instructed in Section F, page 19. From the inside of the generator, remove the reservoir (Part No. 25R36) and the connecting piping. With a wooden stick, remove any lime accumulation from the pipe and fittings and clean the reservoir by flushing with clean water. Flush the pipe and fitting with clean water and reassemble the parts.

Clean and replace the standpipe, drain valve and quick-connect valve assembly. Use stringy white lead or other suitable pipe compound on all male pipe threads. Install a new filter if necessary and assemble the dome to the hydraulic.

Re-establish the correct water level in the hydraulic. Open the valve in the water-supply line. Open the hydraulic drain valve and insert the fill connection into the quick-connect valve. Remove the fill connection and insert the test plug into the quick-connect valve to check for a discharge of excess water. Repeat this filling and checking until a check shows a discharge of excess water. Hold the test plug in place until all of the excess has drained; then remove the test plug and close the drain valve.

If no additional maintenance is to be performed, return the generator to service as instructed in Section I, page 34.

G-4. Relief-Valve Interference

Inspect the operation of the relief valve interference mechanism at the time the generator is being recharged. See that the mechanical linkage (Fig. 10) works properly when the handle of the charging valve is lifted to open the valve. Both relief valves should open at this time, but only for a moment before the interference spring pulls the linkage back to its original position.

Check the spring tension and action of the linkage members. Make sure that all connections are tight and that all movable parts work freely.

G-5. Carbide Feed Control

Before performing any maintenance work on the carbide feed control, prepare the generator in accordance with Section E, page 19. Then remove the hopper cover and hopper funnel as instructed in Section F, page 19.

Cleaning the Feed Control. Remove the hose clamp that holds the feed tube to the hopper outlet (Fig. 13). Remove the feed tube, clean it under a stream of clean water, and inspect it for cracks or worn spots. If the tube is in good condition, dry it and replace it on the hopper outlet fastening it securely with the hose clamp. If the tube is not in good condition replace it with a new one. Unscrew the two feet from the control unit. Turn the hopper funnel over and remove the feed control cover and feed control unit. Clean all lime from the cover, control unit and feed valve with a rag or soft wood stick—never use metal. (Avoid getting lime into the hollow leg of the feed-control unit.) Inspect the feed control diaphragm and replace it (see page 23) if it shows any sign of wear or cracking that may lead to rupture. Replace the feed tube, making sure it is completely dry. Use a new tube if necessary and fasten it to the hopper outlet with the hose clamp. If no further maintenance is to be performed, replace the hopper funnel and hopper cover and return the generator to service as instructed in Section I, page 34.

Replace the feed-control unit in the hopper funnel. Slip the feed-control legs into the hopper-funnel guides and lower the control until the diaphragm retaining ring rests on the two guides.
Replace the feed-control cover and reconnect the feet to the control unit. Raise the hopper funnel into position over the generator, making sure that the funnel is aligned properly. The three pads on the underside of the funnel rim should be directly over the three hopper supports. Then, through the space between the hopper funnel and water shell, reconnect the atmospheric vent line to the feed control. Make certain that the stirrups on the feed-control feet properly engage the two lugs on the feed-valve lifting rod. Replace the hopper funnel and hopper cover and, if no further maintenance is to be performed, return the generator to service as instructed in Section 1, page 34.

Adjusting the Feed Valve. Whenever the feed-control unit is removed from the generator hopper, or when installing a new feed-control unit, the following adjustment should be checked. Install the feed-control unit in the bottom of the hopper so that the retaining ring rests on the two guide bushings. In this position the plug will extend through the hopper outlet. Measure the distance between the lower edge of the hopper outlet and the edge of the plug formed by the intersection of the cylindrical and conical surfaces. (See the illustration above.) This distance should measure 1-1/16 inch. To make any required adjustments, first loosen the jam nut below the plug. Thread the plug up or down the stem until the correct distance of 1-1/16 inch is established between the hopper and plug surfaces, as indicated above. Then tighten the jam nut against the plug to hold this setting. The feed valve is now in proper adjustment.

Atmospheric Vent Line. To clean a clogged atmospheric vent line, first withdraw the generator from service. Remove the hopper cover and hopper funnel, unscrewing the fitting that connects the vent line to one foot of the carbide feed control (see Section F). Temporarily fasten this end of the line to one of the control rods with a piece of cord to prevent the line from swinging out of reach. Unscrew the plug from the pipe cross (Fig. 14) located in the generator relief-valve vent line a short distance past the relief valve. Directly below the opening in this pipe cross is the other end of the atmospheric vent line. Blow a stream of clean, dry air into this end of the vent line until all accumulations or obstructions are removed. Examine the vent hose and replace the hose if it shows any sign of deterioration. To replace the vent hose, unscrew the male hose fitting that holds the end of the vent line to a fitting below the pipe cross, and install a new vent hose assembly. If no further maintenance is to be performed, connect the other end of the vent line to the feed-control unit, and replace the generator hopper. Return the generator to service as instructed in Section 1, page 34.
from the feed control. Reach into the hopper funnel and remove the feed-control cover and feed control.

Unscrew the nut holding the diaphragm retaining plate and the eight bolts holding the diaphragm retaining ring (Fig. 15). Remove the defective diaphragm. Clean the internal surfaces of the feed control of any lime or dirt that may have accumulated there. Place a new diaphragm in position and carefully replace the retaining ring and retaining plate. Be sure that all parts are dry. Tighten the bolts and nut evenly and securely to prevent leaks. The diaphragm should be leak-tight when the space between the flanges is approximately 5/16 inch.

IMPORTANT: Do not disassemble the feed control any further than instructed above. The control springs are powerful and could cause injury if improperly released. The feed control is set at the factory to maintain a generator pressure of 13 psi and should not be adjusted in the field. If the feed control should develop any defect other than a ruptured diaphragm, return the entire control unit to the factory for repairs.

![Diagram of Feed-Control Diaphragm](image)

**FIG. 15 — Removing the Feed-Control Diaphragm**

**G-6. Float-Operated Water Valve**

To check for proper adjustment of the valve, raise the water level in the generator and see if the float-operated valve closes when the water rises to the line between NORMAL and HIGH on the water level indicator. If the valve does not close at this level, the valve must be adjusted. Before adjusting or starting other maintenance work on the valve, withdraw the generator from service according to the instructions in Section E, page 19.

Valve Adjustment. To adjust the float-operated valve, close the manual water-fill valve, remove the pipe plug from the tee leading into the float-operated valve, back out the retaining screw (which is located on the hexagonal section of the valve body), and with a screwdriver inserted through the tee, turn the valve plug in quarter-turn increments (Fig. 17). Turn the valve plug clockwise to lower the level at which the valve closes, counterclockwise to raise the level at which the valve closes. (The plug should be adjusted in multiples of a quarter-turn to keep the correct relation between the slats on the plug and the retaining screw.) Tighten the retaining screw and check to see that it prevents the valve plug from turning but will not prevent it from moving back and forth in the valve body. Then replace the pipe plug using a good grade of pipe compound. Open the manual water-fill valve and check the setting. Repeat the adjustment until the correct setting is obtained. Allow the generator to stand in this condition (with the manual water-fill valve open) for at least one hour. Further movement of the water-level indicator would indicate inadequate seating of the valve in its closed position, and will necessitate examination of the valve seat. If no further movement is observed, clean and inspect the sediment separator and check valve in the water-supply line. Return the generator to service as instructed in Section I, page 34.

Replacing the Valve Seat. The valve seat is a reinforced rubber disk located on the valve plug (Fig. 16). To replace or inspect the seat, it is necessary to remove the valve from the generator and pull the body and attached float arm assembly out of the opening in the water shell far enough to permit access to the outlet end of the valve body. To do this, remove the handhole cover (Sec. G-1), and fill the generator with water until the water level is just below the float-operated water valve. Then disconnect the water-supply line at the union located between the pipe cross and the sediment separator. Remove the pipe cross, nipple, water fill valve and tee. Back out the retaining screw (which is located on the hexagonal section of the valve body), and with a screwdriver unscrew the valve plug from the valve body. Remove the retaining ring and retaining washer from the plug, then lift off the seat. Clean the shoulder on the plug before putting a new seat in place. Reassemble the seat, retaining washer and retaining ring on the plug in the proper sequence. Make sure the seat is positioned properly on the shoulder of the plug.

To reassemble the plug in the valve, it is necessary to unscrew the valve body and pull the body and attached float arm assembly outward.

Check the valve linkage and pivots to see that all parts are in good condition and operate freely. Replace parts as necessary. Inspect the ball float and replace it if it shows any sign of damage that would cause it to leak. (The pivots are rollpins which may

*NOTE: On generators produced after March 1956, a metal deflector is attached to the water valve body. The deflector prevents any water spray from impinging on the feed tube during refilling. For earlier generators, the deflector may be installed in accordance with F-8775 "Instructions for Installing Water Deflector on the Float-Operated Water Valve."
be driven out. Use spark-proof tools. If it is necessary to remove the ball float or float arm, drive out the rollpin forming the fixed pivot in the valve body, and remove the parts through the handhole cover.) Screw the plug onto the stud several turns, and reassemble the valve on the generator. Make certain the valve body is positioned so that the slot milled in the end of the body which protrudes into the generating chamber is vertical. Reach through the handhole and raise and lower the float arm several times to make sure the linkage will close and open the float valve properly. Reassemble the piping in the reverse order from which it was removed. Replace the handhole cover and adjust the valve in accordance with procedure described above.

**G-7. Water-Level Indicator**

The water-level indicator is connected directly to one of the floats in the generating chamber. As the float rises and falls with the water level, its motion is transmitted to the indicator pointer through the indicator assembly.

If water seeps out around the indicator shaft, first attempt to stop the leak by tightening the stuffing-box nut. **CAUTION:** Avoid over-tightening of the stuffing-box nut. If a normal amount of tightening fails to stop the leakage, replace the packing material. (See Figure 33 in the Replacement Parts section of this book for the proper packing material to use.) Prepare the generator by withdrawing it from service as outlined in Section E. Then unscrew the stuffing-box nut as far as it will go (Fig. 18) and remove the old packing from the stuffing box. Be sure that all of the old packing rings are removed. Insert the new packing rings in the stuffing box, taking care to see that the packing is pushed on straight, and not at an angle. With the packing completely replaced, screw the stuffing-box nut back in place by hand.

Check the water-level indicator for leakage and ease of movement while the generator is being refilled. Add water and check to see that the pointer moves steadily to indicate the rising water level. At the same time, tighten the stuffing-box nut just enough to stop any leakage. If the pointer moves smoothly and there is no leakage, further tightening of the stuffing-box nut will be unnecessary at this time.

The accuracy of the water-level indicator can be checked very easily. With the generator withdrawn from service as described in Section E, remove the handhole cover (Sec. G-1). Fill the generating chamber with water until the water level reaches the top of the refill level reference marker, see Fig. 1 (the marker is a piece of angle iron which is welded to the back wall of the chamber). When the water reaches this marker, the water-level indicator should indicate REFILL. If the indicator pointer is not at REFILL, adjust the indicator float arm as instructed in Form 9506 "Installation Requirements and Instructions", Section IV, pages 21-23. The relationship between the REFILL and NORMAL water levels is fixed; therefore, the NORMAL water level will automatically be correct when the REFILL level has been established. After all maintenance work is completed, return the generator to service as described in Section I, page 34.

**G-8. Low-Water Carbide Shutoff**

The same float that operates the water-level indicator activates the low-water carbide shutoff. Before starting any maintenance work on this carbide interference system, withdraw the generator from service as instructed in Section E, page 19.

Replacing the Chain. Drain the water to LOW and remove the handhole cover (Sec. G-1). To disconnect the chain from the float arm, unboltd the water level indicator housing from the water shell, draw
the float arm forward through the water-shell opening, and disconnect the chain. To disconnect the other end of the chain from the feed-tube clamping lever, it is necessary to remove the generator hopper as instructed in Section F, page 19. After disconnecting the chain, fasten the replacement chain (48-in. long) to the same two points. Check to make sure that the feed-tube control rod operates freely (see Sec. G-18, page 33). The chain should be of such length that the feed tube is closed tightly between the feed tube clamp bar (Fig. 7, page 8) and the backing plate when the water level is between five and seven inches below the refill reference marker. If necessary, the chain length must be adjusted to obtain this setting. If no further maintenance is to be performed, replace the indicator housing, generator hopper and hand-hole cover, and return the generator to service as instructed in Section I, page 34.

Replacing the Float. Drain the water to LOW and remove the handhole cover and indicator housing. Disconnect the end of the interference chain from the float arm as instructed in the preceding paragraph. Then remove the pipe plug (Fig. 19) at the end of the water-indicator shaft and back out the setscrew located behind this plug. Unscrew the indicator housing from the float arm. Back the arm and float assembly farther into the generating chamber and withdraw it through the handhole.

Direct a stream of water on the float and float arm to wash off any lime accumulation. If necessary, use a wooden stick to remove caked lime—never use metal. To replace the float, drive out the rollpin from the threaded float hub and unscrew the float from the float arm. Screw the new float to the arm using a small amount of oil or cup grease on the threads. Then reinstall the float-and-arm assembly in the reverse order from which it was removed. Make sure that the float arm is properly aligned in the threaded socket in the indicator shaft. The bend in the float arm should point down, and the hole near the end of the float arm should line up with the setscrew in the indicator shaft. Turn the setscrew into the hole in the arm until the end of the setscrew is flush with the end of the indicator shaft. Replace the pipe plug at the end of the indicator shaft, applying pipe compound to the plug threads. Check to make sure that the feed-tube control rod operates freely (see Section G-18, page 33).

Replace the handhole cover and, if no further maintenance is to be performed, return the generator to service as instructed in Section I, page 34.

G-9. Carbide Indicator

If the carbide indicator gauge readings are inaccurate, or if the gauge pointer appears to be stuck or moves unevenly when carbide is being added to the generator, the indicator should be readjusted or repaired.

Adjusting the Carbide Indicator. If the generator hopper is not already empty, use up the remaining charge of carbide. This may be done by allowing the generator to exhaust itself in regular service, or by consuming the acetylene by lighting one or more blow-pipes connected to station outlets equipped with either regulators or hydraulic back-pressure valves. Do not use up the acetylene under any circumstances by allowing it to discharge directly from station outlets. Likewise do not attempt to consume carbide at a rate which exceeds the generating capacity of the MP-11. When the generator pressure begins to drop, close the generator service valve. The drop in pressure indicates the exhaustion of carbide in the hopper. To make sure all the carbide is consumed, turn the feed-valve handle to the LOCK position and then back to the FEED position. Repeat this operation several times and watch the generator pressure gauge for any increase in pressure, which would indicate an additional amount of carbide in the hopper which must be consumed.

Charge the generator with exactly 150 lb. of carbide, weighed on a scale or measured volumetrically. For the latter use, one cubic foot equals 72.5 lbs. and one gallon equals 9.7 lbs. (always take measurements when carbide is freshly poured and not after it has settled). Lock the feed-tube handle in the
CLOSED position, and make this 150 lb. charge following the procedure outlined under “Recharging” on page 13. (Note: The feed-valve handle should be in the FEED position. With the feed-valve in the FEED position, all the hopper weight is free to act on the carbide indicator system.)

Check the indicator for oil leaks around the gauge, adjusting screw housing, and plug connections, and make sure that all the connections are tight.

Before starting any adjustment, add oil to the system. To do this, loosen the bleeder screw and back out the adjusting screw. (The indicator gauge pointer will fall back due to the release of pressure in the system.) Examine the "O" ring on the adjusting screw and replace if it appears worn or damaged. Add oil (SAE 10-W, non-detergent oil) into the adjusting screw body until the oil level reaches the threaded section on the inside of the body. Screw the adjusting screw (with the bleeder screw loose) into the housing until about half of the threads on the adjusting screw have been covered. Oil should be coming out of the bleeder screw while this is being done. Then hold the adjusting screw and tighten the bleeder screw. At this point, the correct operating level of the piston can be set by slowly turning the adjusting screw in until the pointer on the indicator gauge starts to move up. This indicates that the piston is almost off the bottom of the indicator body. Turn in the adjusting screw an additional three turns which will bring the piston to its correct operating level.

After checking the piston level, the next step is to check the accuracy of the indicator gauge. The indicator gauge pointer should be at the REFILL mark. If it is not at REFILL, unscrew the indicator gauge cover and remove the glass. Using a gauge needle remover of proper size or two small screwdrivers, one on either side of the hub, carefully pull the pointer off the shaft, rotate it to REFILL, and press it back on the shaft in this position. Replace the glass and screw the cover down tightly. Leaving the feed-tube handle in the CLOSED position, place the feed-valve handle in the LOCK position (this action may move the pointer below REFILL due to the raising of the feed control and its supporting of some of the weight of the hopper, and should be disregarded).

If there is any doubt about the accuracy of the gauge, install a new one. Defective gauges should not be repaired by the customer. Put the generator back in service by filling the charging hopper with 350 lb. of carbide and transferring it to the generator hopper, following the procedure outlined under "Recharging" on page 13. (When the hopper contains a full load of carbide, the gauge may read a little below or above FULL but should not be a cause for concern since the generator is now set to accurately indicate the REFILL level.)

If the carbide weight indicator still does not operate satisfactorily, it will be necessary to check the piston and housing assembly.

Adding Oil. The hydraulic system contains a comparatively small amount of oil. If a very small leak is present, the carbide indicator system can be kept in operation by turning down the adjusting screw just enough to keep the piston at the correct level. (If the adjusting screw is turned in farther than is necessary to compensate for the decrease in volume of oil in the system caused by the leakage, the piston may be pushed too far up in the housing so that it will be working against the restraint of the hopper-to-water shell gasket. This condition will cause the indicator to read high.) Repair the leak as soon as conditions permit. However, if the leak cannot be repaired before it has depleted the supply of oil to such an extent that all of the available adjustment of the adjusting screw will have been used, oil can be added as described in "Adjusting the Carbide Indicator", fourth paragraph only. Any other maintenance will necessitate the complete readjustment of the indicator.

Repairing Leaks. Leaks which might develop in the system will seriously affect the performance of the system. Leaks around the gauge or adjusting screw can be repaired without removing the hopper cover; however, if a leak is detected around the plug and it cannot be corrected by tightening, it will be necessary to remove the plug and replace it. When doing this, the hopper cover must be removed and the system must be refilled with oil as outlined in "Refilling the Hydraulic System". To repair leakage around the gauge or adjusting screw body, relieve the pressure in the system by loosening the bleeder screw. If tightening the connection does not correct the leak, it will be necessary to replace the gauge or adjusting screw assembly. The male threads on each of these parts are tinned with solder so a leak-tight seal can readily be obtained. No attempt should be made to re-tin the threads on either part. When replacing the gauge or adjusting screw assembly, make sure the oil level in the indicator body never drops below the top of the threaded hole into which the replacement is to be screwed. When installing a new adjusting screw assembly, make sure the bleeder screw is loose before screwing the assembly into the indicator body.

After the leaks have been repaired, readjust the indicator in accordance with the instructions in "Adjusting the Carbide Indicator."

Checking the "O" Ring or Piston and Housing Assembly. Withdraw the generator from service as instructed in Section E, page 19, and remove the hopper as instructed in Section F, page 19.

Carefully remove the rubber boot that fits over the hydraulic piston. Wash the boot under a stream of clear water to remove any accumulation of lime. Examine the boot for cracks or worn spots and replace with a new one if necessary. Loosen the bleeder screw and remove the adjusting screw from its housing, fill the housing with oil and maintain a high oil.
level while slowly lifting the piston straight up (being careful not to mar the engaging surface of the piston), until it is clear of the piston housing.

Examine the piston for scratches or surface imperfections that may cause binding of the piston in the housing. Examine the piston housing to make sure it is smooth and free from projections. Also check to see if the housing is distorted or out of round. If the parts are in good condition, remove the "O" ring from the piston and replace it with a new one. Make sure the new "O" ring fits snugly and evenly in the recess of the piston. If either the housing or piston is distorted, both must be replaced since they are manufactured as matched assemblies and should not be inter-changed. To replace the housing, remove it from the indicator body. Wipe out the recess in the body to remove any grit or dirt. Place the "O" ring in the recess of the indicator body. Screw the piston housing into the body until a firm metal-to-metal seat is obtained against the top surface of the body. Do not overtighten the housing into the body as this may distort the housing and cause the piston to bind. When replacing the piston, add enough oil to bring the level up to the top of the piston housing. Slowly slide the piston into the cylinder until it bottoms on the indicator body. Replace the adjusting screw (with the bleeder screw loose) into the housing until about half of the threads on the adjusting screw have been covered. Hold the adjusting screw and tighten the bleeder screw. Screw the adjusting screw in until the piston raises 11/16 in. above the top surface of the water shell flange, and then replace the rubber boot. Wipe off all parts of the assembly so that they are free of oil. Check the system for the presence of air. Push down on top of the piston; a solid reaction indicates the absence of air. A spongy feeling indicates the presence of air and the indicator should be refilled with oil as outlined in the "Refilling the Hydraulic System" section.

Check the system for leaks by simulating the weight of the hopper on the piston. To do this, place a "C" clamp with one end over the piston and the other end under the indicator body. Tighten the clamp until the gauge reads FULL, and let it remain there for one-half hour. If the indicator gauge pointer drops more than one division below the FULL mark, oil leakage within the hydraulic system is indicated, and must be repaired. (The temperature of the indicating system must remain constant, since any drop in temperature will also cause the gauge pointer to drop below the FULL mark.)

If no further maintenance is to be performed, replace the hopper as instructed in Section H, page 33, and return the generator to service as instructed in Section I, page 34.

After returning the generator to service, the carbide indicator should be readjusted as instructed in "Adjusting the Carbide Indicator".

Refilling the Hydraulic System. If the indicator system has become contaminated with dirt, the system must be refilled. To do this:

Withdraw the generator from service as instructed in Section E, page 19, and remove the hopper as instructed in Section F, page 19.

Loosen the bleeder screw and remove the adjusting screw, gauge, rubber boot and piston from the indicator body. Unscrew the pipe plug from the end of the indicator body and let the oil drain out. To make sure the indicator body is free from grit and dirt, run a small tubing brush, dipped in benzene or white gasoline, through the indicator and then let it dry. Make sure it is free from lint and then screw the pipe plug into the indicator body finger-tight. Pour clean oil (SAE 10-W non-detergent oil) into the system through the gauge opening. To remove any possible air pockets, loosen the pipe plug until a small quantity of oil flows around it, and then immediately replace and tighten the plug. Do not allow the oil level to drop below the threaded portion of the gauge opening; add oil if necessary. (The pressure tube in the gauge is filled with oil at the factory, and under ordinary operating conditions, does not have to be refilled.) Screw the gauge into the indicator body. Add oil into the piston housing to bring the level up to the top of the housing. Slowly insert the piston into its housing until it bottoms. Replace the adjusting screw (with the bleeder screw loose) into the housing until about half of the threads on the adjusting screw have been covered. Hold the adjusting screw and tighten the bleeder screw. Screw the adjusting screw in until the piston raises 11/16 in. above the top surface of the water shell flange and then replace the rubber boot. Wipe off all parts of the assembly so that they are free of oil. Check the system for the presence of air. Push down on top of the piston; a solid reaction indicates the absence of air. A spongy reaction indicates the presence of air and the indicator should be refilled with oil as just outlined.

Check the system for leaks as instructed in "Checking the "O" Ring or Piston and Housing Assembly" above.

If no further maintenance is to be performed, replace the hopper as instructed in Section H, page 33, and return the generator to service as instructed in Section I, page 34.

After returning the generator to service, the carbide indicator should be readjusted as instructed in "Adjusting the Carbide Indicator".

G-10. External Pressure Equalizer

Withdraw the generator from service as instructed in Section E, page 19. Then disconnect the equalizer line at the unions leaving the generating chamber and entering the hopper cover (Fig. 21). Remove the length of pipe between the two unions and tap the pipe with a wooden mallet — never use metal — to clear the pipe of all accumulations or obstructions. Then blow clean, dry air through the pipe. Examine the equalizer-line connections at the generating chamber and hopper cover and clean out
any accumulations with a wooden stick. Reinstall
the pipe and tighten all connections. If no further
maintenance is to be performed, return the generator
to service as instructed in Section I, page 34.

G-11. Charging-Hopper Vent Valve and Vent Line

Remove the charging-hopper vent piping between
the charging-hopper fitting and the pipe union (Fig.
22). Disconnect all the pieces in this assembly and
tap each piece with a wooden mallet — never use
metal — to remove all accumulations and obstruc-
tions. Then blow clean, dry air through each piece.
(The horizontal run of vent piping from the generator
to the wall of the generator room should be discon-
nected and cleaned at this time.) Examine all con-
nections and fittings and clean out any remaining
lime deposits with a wooden stick.

Examine the condition of the strainer which is
located in the end of the pipe nipple which screws
into the tapered nipple (Fig. 5). If the openings are
clogged, clean them out with a wooden stick. If ne-
necessary, drive out the strainer by inserting a wooden
stick through the opposite end of the pipe and insert
a new strainer.

The charging-hopper vent valve should be dis-
assembled and cleaned at this time. Remove the two
nuts from the front of the valve and pull the cover
and plug assembly out of the valve body. Clean the
lubricant grooves with a wooden stick (Fig. 23) and
cloth, then clean the inside of the valve body with a
cloth. Turn the lubricant screw in a few turns to
make sure the lubricant passageways and check valve
in the stem end of the plug are clear. Reassemble
the valve. Turn down the lubricant screw to fill the
lubricant grooves (insert a fresh lubricant stick if
necessary). Open and close the valve several times
and advance the lubricant screw until the valve op-
erates smoothly.

Connect all pieces of the charging-hopper vent
line assembly and reinstall the assembly in its
original position. Apply pipe compound to all male
threads and tighten the connections securely.

G-12. Charging Hopper

Never perform any maintenance work on the
charging hopper while the hopper is connected to the
generating chamber. Before starting the maintenance
work, make sure the hopper is empty of carbide and
free of carbide dust.

Charging-Hopper Door Gasket. Inspect charg-
ing-hopper door gasket, fastened in the circular
groove of the door, for cracks, wear, distortion, and

FIG. 21 – Pressure-Equalizer Assembly

FIG. 22 – Vent-Line Assembly

FIG. 23 – Cleaning the Vent Valve
If the pointer rests on the pin when there is no pressure in the vessel, remove the bezel and glass from the gauge, and lift the pointer over to the other side of the pin. The pointer should rest below the pin at a distance equal to that between the pin and the first graduation line. If the pointer rests at any other position remove it carefully and replace it firmly on the shaft in the correct position. Then raise the pointer to the upper side of the pin and replace the glass and bezel. If the gauge has been damaged in any way to impair operation, a new one should be installed.

**G-14. Stick-Lubricated Valves**

Plug valves such as the residue valve, water-filling valve and charging-hopper vent valve depend upon a stick-type lubricant to assure easy operation of the valves and to maintain them tight against leakage. To insure the proper working of these valves, they should at all times be supplied with adequate lubrication. Lubricant is fed to the valve cock by occasionally turning the lubricant screw several turns (Fig. 26). Rotate the valve handle while turning in the lubricant screw, and stop when the valve turns easily. Further addition of lubricant at this time will NOT improve valve operation; the additional lubricant would be wasted, and might clog the lines. When the lubricant screw has been turned in all the way, remove the screw and add a fresh stick of lubricant.

**G-15. Charging Valve**

The charging valve is a grease-lubricated valve which must be lubricated frequently through a grease port on one end of the valve stem (Fig. 27). Annual cleanings are required to remove the grease-carbide dust accumulations in the valve grooves.

Before performing any maintenance work on the charging valve, withdraw the generator from service as instructed in Section E, page 19. To dismantle the valve, remove the handle, unscrew the back plate of the valve and push the valve plug out of the back of the valve. Use a wooden stick — **never use metal** — to clean the grooves in the valve plug, and with a cloth clean the remainder of the plug and body. Turn the lubricant screw in a few turns to make sure the

![FIG. 25 - Charging-Hopper Assembly - Unloading End](image)
plug passageways are clear. Reassemble the valve and tighten the back plate securely. Apply grease to the valve through the grease port, operating the valve handle until the valve turns smoothly. If no further maintenance is to be performed, return the generator to service as instructed in Section I, page 34.

G-16. Generating Chamber

Remove the cap from the check valve in the water supply line. If any accumulation of lime is observed in the valve body, remove the lime with a wooden stick—never use metal. Clean and examine the check flap to see that it opens freely. Flush out this connection with a stream of clean water and replace the cap. Unscrew the cap on the sediment separator in the water-filling line and remove any dirt or other foreign material from the screen. Replace the screen and the cap, using pipe compound on the cap threads.

Remove the plugs from the pipe cross leading from the residue drain valve to the main residue drain line. Open the residue drain line and break loose all caked lime, using a wooden stick. Replace the plugs and thoroughly flush all loose particles out through the drain line.

If either the hopper funnel or the generating chamber above the water line appear to be rusting and in need of paint, remove the hopper as instructed in Section F, page 19. Apply the paint as instructed in Section L, page 35. When the paint is thoroughly dry, replace the handhole cover, close the residue drain valve and refill the generating chamber with fresh water to the NORMAL level as shown on the water-level indicator. Examine the remaining parts inside the generator before replacing the hopper and returning the generator to service according to the instructions in Section I, page 34.

G-17. Relief Valves

During each recharging operation, a small amount of acetylene is vented through the relief valves. When this occurs, foreign particles may be deposited on the upper and lower “O” rings of the poppet (Fig. 28), and may eventually result in continuous acetylene leakage. If the relief valves become dirty or worn so as to cause leakage, they must be cleaned or repaired as instructed below. It is not necessary to drain the generator before cleaning the relief valves. Close the acetylene service valve, carbide feed valve and feed tube. Then release all pressure in the generator by manually operating the interference mechanism linked to the two relief valves.

To Disassemble:

Rotate the pressure-adjusting cap three or four times in a counter-clockwise direction to reduce spring pressure on the poppet. To turn the cap, insert a short piece of drill rod into the hole in the cap and use the rod as a handle.

Unscrew the bonnet assembly from the body and remove the spring from the bonnet. The spring can be spiraled out by turning it from the bottom, counter-clockwise.

Lift out the poppet and spacer.

*If it is necessary for a maintenance man to enter the generating chamber, an air line should bleed air into the chamber as long as the man is in it. The handhole should be open during this time. Make sure that a person entering the generating chamber does not have metal objects on his shoes or clothing that could cause a spark by contact with the generator wall or parts.

FIG. 26 – Turning Down the Lubricant Screw on the Water-Filling Valve

FIG. 27 – Applying Grease to the Carbide Charging Valve
Remove the operating lever by first removing the screw and washer which hold it in position and then sliding the lever off the lifting shaft.

Remove the operating shaft by first removing the screw and washer which hold it in position and then sliding the shaft out of the relief-valve body.

To Clean and Inspect:

For cleaning all parts, a clean damp cloth is all that you need. The cleaning and inspection must be thorough.

Disassemble the valve according to instructions above.

Body. Wipe away any foreign material from the inside of the body. Pay particular attention to the poppet seat and the bore for the operating shaft. Examine these two places as well as the threads for nicks and scratches. If they are marred or damaged, the whole valve should be replaced.

Operating Shaft. Remove the "O" ring from the shaft and clean both the ring and the shaft. Clean the "O" ring groove wall. Lubricate the groove and reset the "O" ring. Lubricate the outside of the "O" ring.

LUBRICATION

Use Standard Oil Company of Indiana No. L-4762 Grease or Freedom Valvoline Barium Grease #5. In case of emergency, a good grade of water-insoluble cup grease may be temporarily used.

If the shaft is damaged, a new one should be ordered along with mated "O" ring. If the ring is nicked or scratched, replace it with a new one.

Poppet. Remove the "O" rings from the poppet and clean both the rings and the poppet. Clean the "O" ring grooves well. Lubricate the groove of the upper "O" ring. After the rings have been placed back in their grooves, lubricate the outside of the upper "O" ring. Do NOT lubricate the lower groove or its "O" ring. If the poppet is excessively damaged a new one should be ordered along with new "O" rings. If the "O" rings are damaged, replace them.

Bonnet Assembly. Wipe the threads and the inside of the bonnet where the upper "O" ring of the poppet rubs. If the bonnet threads, shoulder or interior surfaces should be excessively nicked or damaged, the bonnet must be replaced.

Spring. If the spring has been damaged, it should be replaced.

To Reassemble:

Insert the shaft into the body so that the flat section of the shaft will be in a position to receive the poppet. NOTE: Be sure the "O" sealing ring is in place on the shaft. Secure the shaft in place with the washer and screw provided.

Replace the operating lever and secure it to the shaft with the washer and screw provided. Make sure the lever is indexed properly to fit up with the extensions on the interference link.

Place the spacer in the poppet.

Place the poppet in the body so that the lower "O" ring is resting snugly on the seat.

Replace the spring in the bonnet. Turn it a few times until the bonnet can be placed on the body without too much spring pressure against the poppet.

Screw the bonnet into the body of the valve.

Reconnect the interference link to the operating levers.

Open the acetylene service valve.

After the valve is adjusted (see below) test for leakage around the end of the shaft which protrudes from the body.
To Reset Relief Pressures:

To reset the generating chamber relief valve (RV-27):

1. Unlock the feed tube. Unlock the feed valve and slowly feed carbide into the generator. Insert a rod in the pressure-adjusting cap and turn it clockwise (increases opening pressure) or counter-clockwise (decreases opening pressure) until the valve just starts to relieve when 13 psi shows on the generator pressure gauge.

2. Close the carbide feed valve and reduce the generator pressure to about 10 psi by slowly opening the relief valves. Then open the carbide feed valve and slowly raise the pressure again to make sure the valve starts to relieve at 13 psi.

3. Then by turning the pressure-adjusting cap just one-half turn clockwise, the pressure setting will be increased to 15 psi. **THIS IS THE MAXIMUM PRESSURE ALLOWED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS.**

To set the back-pressure valve relief valve (RV-28):

1. Allow the pressure in the back-pressure valve to rise to 13 psi and adjust the relief valve until it just starts to relieve at this pressure. Check this setting as in step 2, above.

2. Carefully turn the pressure-adjusting cap two additional turns clockwise to increase the pressure setting to 20 psi (THE MAXIMUM PRESSURE ALLOWED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS).

**G-18. Generator Stuffing Boxes**

Occasionally the stuffing boxes on the water-level indicator, the feed-tube rod, the feed-valve rod and the agitator shaft require attention. If a leak is revealed by the application of soapy water solution around the shaft at the stuffing box, or if water seeps out around the indicator shaft or the agitator shaft, first attempt to stop the leak by turning down the stuffing-box nut.

If a leak cannot be stopped or if the shaft operating through it becomes difficult to turn, replace the packing material. Stuffing boxes should be repacked only after the generator has been removed from service (see Sec. E, page 19). To renew the packing in the water-level indicator or the agitator shaft stuffing box, it is also necessary to drain the residue. (Refer to Section G-7, page 25.)

To replace the packing in either the feed tube or feed valve stuffing box, first loosen the nut and pull out the gland. Pull out the old packing and repack the stuffing box as shown in Figure 29. Refer to the Spare Parts List at the back of this book for the proper packing to use. After the packing is in place, insert the gland and tighten the stuffing-box nut sufficiently to stop a leak but not so tight as to bind the shaft.

**FIG. 29 – Replacing the Packing in the Control-Rod Stuffing Box**

Recharge the generator as instructed under “Single Generator Installation” on page 12, or “Multiple-Generator Installation” in Form 9510.

**G-19. Vent Piping**

Remove the generator from service as instructed in Section E, page 19. Unscrew the relief-valve vent pipes at the relief-valve outlet connections. Remove the vent piping from between the valve outlets and the points where the piping passes to the outside through the wall of the generator room. Tap the disconnected pipe with a wooden block — never use metal — to shake down any dirt inside the pipe. Make sure the vent piping is free from obstruction. If necessary, flush out this piping by directing a stream of clean water into the pipe openings. After flushing, make sure the piping is thoroughly dry before reassembling it to the generator.

Inspect the relief-valve outlets and the vent pipe connections at the generator-room walls. Loosen and remove any accumulation of lime or scale with a wooden stick — never use metal. Replace the vent piping between these connections, using pipe compound on the male threads. Then restore the generator to service as instructed in Section I on page 34.

**Section H. Replacing the Generator Hopper**

When all maintenance work on the generator hopper and the generating chamber has been com-
pleted and the two assemblies have been carefully inspected to make sure they are ready for use, they may be assembled together.

Before replacing the hopper funnel, check the flange gasket for cracks, tears, distortion, and hardness due to old age. Remove the gasket bolts and gasket ring to check the gasket completely, and install a new gasket if necessary.

Locate the hoist in the spot originally used to remove the hopper. Put the lifting hook through the lifting point on the funnel.

Be sure the mating flanges of both the hopper and the generating chamber are clean. Check the hopper flange gasket to make sure it is clean too.

Lift the funnel up and swing it over into position above the generating chamber. Gently lower it and be certain that it is properly oriented with respect to the generating chamber. The two lugs on the feed-valve control rod must engage the stirrups on the feed-control feet. The metal plate forming the feed-tube backstop must be parallel with the feed-tube and feed-valve control rods. Connect the atmospheric vent line to the hollow foot of the feed control. Let the funnel rest on its three supports in the generating chamber. Place the feed-control cover in position inside the funnel.

Rig a sturdy sling for the hopper cover with rope running under and around the charging valve. Locate the hoist in the spot originally used to remove the cover. Put the lifting hook through the lifting point in the cover rigging.

Lift the cover and swing it over into position above the generating chamber. Gently lower it and be certain that it is properly oriented with respect to the generating chamber. Before taking all its weight off the rope, insert all the flange bolts so that the bolt holes in the flanges and gasket will be lined up. Then let the cover rest on the generating chamber and remove the lifting rig. Tighten all of the flange bolts evenly and securely.

Reconnect the pressure-equalizer line and the charging-hopper vent line.

Reconnect the interference link to the lifting shaft and to the relief valves. Lift the charging valve handle to check the operation of the interference mechanism.

Restore the generator to service as instructed in Section I, below.

Section I. Restoring the Generator to Service

When all maintenance work has been completed as instructed in the preceding sections, and the unit has been carefully inspected, replace the hopper, if it was removed, according to the instructions in Section II, above. Then return the generator to service according to the following instructions.

Check the operation of the relief-valve interference mechanism as instructed in Subsection G-4, page 22.

Charge and start the generator, following the instructions for "Single Generator Installation, Initial Charging," starting on page 12.

If the relief valves were disassembled for inspection or repair, be sure to reset and test the relief valves as instructed in Section G-17, page 31.

Test all stuffing boxes and all joints in the generator and in the service piping. Use nothing but soapy water to locate leaks. The entire system must be free from leaks before the generating equipment is placed in regular service.

Repaint the exterior of the generator to prevent rust and to maintain the appearance of the acetylene plant. (See Section L, page 35.)

Enter the date and the name of the person performing the maintenance or overhauling of the generator on the "Generator Record," page 36. It is good practice to keep a record of the specific maintenance operations performed each time.

Section J. Suggestions on Piping Maintenance

In doing certain maintenance work on the MP-11 generator, it will be necessary to disassemble piping and in some cases new piping may have to be made up to replace the old. It is imperative that all this piping work be handled in accordance with the best recognized practice. Leaks in acetylene piping cannot be allowed. A few general hints are given in this section with the thought that they may be of assistance in carrying out such work.

As a general rule when disassembling piping, detach it at union connections and disengage as few threaded joints as practicable. Use pipe wrenches of adequate size (but not oversize — not over 14 in.) and always support the adjoining pipe and prevent its turning and straining by using a supporting wrench. Avoid loosening of threaded joints other than the ones to be disengaged; however, if a connection is loosened unintentionally, disconnect it and remake it with pipe compound on the male threads.

Always be careful not to damage the mating surfaces of unions. It is recommended that metal-to-metal seat unions be used in acetylene service. Gasket-joint unions should not be used. Careless handling of tools or rough separation of the joint will frequently result in damage to these surfaces. When this occurs, replace the union.
When threaded joints are taken apart, be careful not to damage the threads by careless handling. Do not take a chance with a section of pipe having doubtful threads. Replace it with a new section of galvanized pipe of the same length as the original piece.

To make up new sections of pipe, first cut them to exact length. Cut clean, continuous threads using a sharp, accurate die and a liberal amount of cutting oil. Ream the pipe ends to remove any burrs.

Before reassembling any pipe be sure that it is in good condition, free from rust, corrosion and dirt accumulations. The application of an oil film on ground joint unions will help to prevent rust and greatly ease future service work.

Apply a liberal amount of pipe thread compound to the male thread of a joint to be made up. Carefully start screwing it in by hand and continue until it can no longer be turned. Then, supporting all the adjoining pipe to prevent its twisting or straining, pull the joint up tight with a pipe wrench of adequate size (not over 14-in.).

When the piping work has been completed, carefully clean off excess pipe thread compound. Thoroughly leak test the piping by means of soapy water when the generator is put back into operation.

Shortly after the generator maintenance work has been completed, paint all of the piping which had been disassembled.

Section K. Electrical Equipment

Lighting equipment contained in the generator room has been particularly selected and approved for use in this location. The continued safe usage of such equipment is dependent on regular inspection and prompt, adequate maintenance. The time required for such inspection and maintenance is minor compared with the hazard which may be introduced by improper care.

Glass enclosures for lights should remain completely assembled at all times except while being cleaned or repaired. Replace broken glass enclosures promptly. Open the switch controlling the lighting circuit before removing enclosures and leave it open until the enclosures have been replaced. Make sure that the gasket against which the glass enclosure seats is in good condition and in place.

Section L. Painting the Generator

Both the interior and the exterior of the generator should be kept well painted. Painting should be done regularly as part of the routine of inspection and maintenance. However, the exterior of the generator may be painted at any time to improve its appearance and prevent rust. Individual spots may be touched up as required, but a new paint job will improve the appearance.

If possible, select a time for painting when the generator will not be recharged for several hours. Do any necessary sweeping or cleaning in the generator room before starting to paint. Do no cleaning or other work which might raise dust while the paint is being applied or before it is perfectly dry.

The surface to be painted must be clean and dry. Remove any surface gloss, loose paint, dirt, lime or rust with a wooden stick and washing powder. Then rinse well and allow the surface to dry thoroughly. Never use metal scrapers, files, steel wool, sandpaper or anything else that might cause heat, flame or sparks within the generator room.

The primer and finish coats may be applied by brush or by spraying. Brush application produces a more desirable film, as a rule, than spray applications because of a more thorough coverage of all places where moisture may find entrance. For the exterior, use a good grade of aluminum paint* as a primer on bare metal spots. Allow sufficient time for the primer coat to dry before applying the finish coat. For the finish coat use a light-grey enamel** — be sure the coat is dry before applying additional coats.

Apply the aluminum paint to the entire interior surface of the generating chamber above the water line.

Decalcomanias. Decalcomanias (decals) for the generator recharging instructions and for testing the water level in the hydraulic back-pressure valve are available from the Linde Air Products Co. (See the Replacement Parts section at the end of this book.) Replace the decals that have been covered up by the paint, or are otherwise difficult to read.

---

* Thresher Varnish Company No. 12791 Metallic Silver Enamel.
** Sherwin-Williams Rex No. F6546 Gray Enamel, or equivalent.
# Section M. Generator Record

OXWELD MP-11 Stationary, Medium-Pressure, Acetylene Generator, . . . .500 lb. Carbide Capacity

## Installation Record

Generator Serial No.: .........................
Installed: Date ......................... By .........................
At .................................................................

## Inspection Record

<table>
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<th>By</th>
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</tbody>
</table>
**Operation and Maintenance Record**

It is suggested that a record also be kept of all maintenance or overhauling performed on the generator outside of the regular quarterly and annual inspections. This should include a record of all parts repaired or replaced, the date, and the name of the person performing the work. Such records may be simplified by referring to the section covering the particular work involved.

Data pertaining to the operation of the generator should be kept in a daily log for future reference. A suggested form for this log is shown below.

**ACETYLENE GENERATOR OPERATING LOG**

|------|----------|-----------------------|------|-------------------------------------------|------------------------------|-----------------------|---------|----------------------|

* CARBIDE RE-ORDER POINT: __________ LBS. CARBIDE

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37
Replacement Parts
for the
"Oxweld" MP-11 Acetylene Generator

How to Order Replacement Parts

1. All replacement parts are keyed on the drawings which follow. Two types of numbers are used on these drawings:
   A. Standard Part Numbers. These are usually formed by two pairs of digits with a letter between (for example: 01N21, 18V68). A few parts may have straight digits sequence (3369) or one letter followed by several digits (A-654221). Each standard part number is accompanied by a descriptive word or words.
   B. Hardware Symbols. These usually have several letters preceding one or two digits. (For example: M-LO-2, M-PP-S-3). Hardware symbols are usually accompanied on drawings by a one word description.

2. Order standard parts by part number and name, as shown on drawings. DO NOT ORDER BY PART NUMBER ALONE.

3. Some of the standard parts on the drawings are noted with the symbol #. These are "vendor items". This means that they are standard commercial parts made by and purchased from other manufacturers. It will save you time and money if you buy these parts from a local outlet or directly from the manufacturer. When ordering from these outside sources, use the manufacturer's part number or designation given on the "List of Vendor Items" on page 46. Of course, if you cannot obtain one of these items elsewhere, LINDE will furnish it on order.

4. For hardware, look up symbol in hardware list at back of book. You will find there a full description. "Hardware" items can usually be purchased locally.

5. When ordering, be sure to state quantity of each part needed.

6. Always state the series or serial number of the generator on which the parts are to be used. The serial number is stamped on the unit nameplate. The "series no." is the first digit of the serial number, wherever the serial number starts with a digit, followed by a letter. When the serial number starts with one or two letters, always give the complete number.

7. Indicate any special shipping instructions.

8. Order replacement parts from the LINDE district office nearest you.

NOTE: When ordering a replacement part, it is suggested that mating gaskets, "O"-rings, rollpins, fasteners, or any parts which may be damaged during the replacement process, be ordered with the replacement part.

Recommended List of Spare Parts
That Should Be Kept on Hand at All Times

This list of spare parts is not meant to be a complete list of all the parts which may be required during an overhaul. It does, however, include all the parts (rubber gaskets and the like) which should be replaced every time the generator is given a complete overhaul, and other parts which may be damaged in dismantling or reassembling the generator. Additional parts should be procured before the overhaul is started, if preliminary inspection indicates that extensive repairs will be needed.

<table>
<thead>
<tr>
<th>PART NO.</th>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>793-9</td>
<td>1</td>
<td>Door Gasket - Charging Hopper</td>
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<tr>
<td>25R46</td>
<td>1</td>
<td>Feed-Control Vent Hose Assembly</td>
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<tr>
<td>26R62</td>
<td>2</td>
<td>Hydraulic Filter Disk Assembly</td>
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<tr>
<td>10S09</td>
<td>1</td>
<td>Stick Lubricant for EMCO Nordstrom Valves (1 Carton)</td>
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<tr>
<td>15S87</td>
<td>1</td>
<td>Water-Foot Valve Seat</td>
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<td>69S88</td>
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<td>Gasket, Hopper to Water Shell</td>
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<td>70S03</td>
<td>2</td>
<td>&quot;O&quot; Ring, Relief-Valve Poppet Seal</td>
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<td>70S04</td>
<td>2</td>
<td>&quot;O&quot; Ring, Relief-Valve Seat</td>
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<td>70S05</td>
<td>2</td>
<td>&quot;O&quot; Ring, Relief-Valve Operating Shaft Seal</td>
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<td>Feed-Control Diaphragm</td>
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<td>Retaining Ring - Walles Truaco No. 75, Series 5100W, Stainless Steel</td>
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<td>70S28</td>
<td>3 Sets</td>
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<td>Feed-Tube Lever Sleeve</td>
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<td>1</td>
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<td>1 Lb.</td>
<td>Grease - Shell Oil Co. Retinax &quot;A&quot;</td>
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</table>

38
Supplementary Spare Parts List

This list consists of additional parts which are not necessary to have on hand during each complete overhaul, but which may, on rare occasions, need replacement. Each customer should decide how extensive a spare parts list he wishes to have.

<table>
<thead>
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<th>PART NO.</th>
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<td>1</td>
<td>Gasket, Stuffing Box</td>
</tr>
<tr>
<td>73S05</td>
<td>1</td>
<td>Gasket, Water-Level Indicator</td>
</tr>
<tr>
<td>73S08</td>
<td>1</td>
<td>Gasket, Water-Valve Piston Retainer</td>
</tr>
<tr>
<td>77S12</td>
<td>2</td>
<td>Hydraulic Filter Gasket</td>
</tr>
</tbody>
</table>

NOTE: These lists do not include hardware items which are readily available in most hardware stores.

Important

It is strongly recommended that immediate steps be taken to replenish the spare parts stock whenever withdrawals are made.

Decalcomanias (Decals)

It is good practice to have replacement decals on hand at all times, to continually provide attendants with instructions for safe generator operation.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>12S28</td>
<td>Efficiency and Safety Decalcomania</td>
</tr>
<tr>
<td>73S31</td>
<td>Hopper Cover Decalcomania</td>
</tr>
<tr>
<td>73S32</td>
<td>Recharging Instructions Decalcomania</td>
</tr>
<tr>
<td>73S33</td>
<td>Hydraulic Back-Pressure Valve Decalcomania</td>
</tr>
<tr>
<td>73S35</td>
<td>Feed Tube Decalcomania</td>
</tr>
<tr>
<td>73S36</td>
<td>Feed Valve Decalcomania</td>
</tr>
</tbody>
</table>

"Sparkproof" Monel Tools

These tools are especially made to reduce the possibility of creating sparks when repairing or making adjustments on internal parts of the generator. The tools are considered to be "spark-proof," in that they themselves will not spark. However, sparking can be caused by the careless use of these tools on materials such as steel, that will spark. Therefore, all instructions for complete purging of generators must be followed. Each tool is marked "MONEL."

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>51S49</td>
<td>8-in. Combination Pliers, Monel, Ampco Catalog No. P-31</td>
</tr>
<tr>
<td>51S51</td>
<td>8-in. Adjustable End Wrench, Monel, Ampco Catalog No. W-71</td>
</tr>
<tr>
<td>51S52</td>
<td>8-in. Screwdriver, Monel, Ampco Catalog No. S-50</td>
</tr>
</tbody>
</table>
FIG. 31 - Hopper Funnel and Feed Control Parts

FIG. 32 - Atmospheric Vent Line Details
FIG. 33 - Water-Level Indicator Details

FIG. 34 - Carbide Indicating System
FIG. 35 - Feed Control Handle Details (2)

FIG. 36 - Float-Operated Water Valve

FIG. 37 - Relief-Valve Interference Mechanism

FIG. 38 - Chain Details
FIG. 39 – Hydraulic Assembly – Part No. 25R09

FIG. 40 – Charging-Hopper Assembly (Accessory) – Part No. 25R07

# These parts may frequently be purchased locally. See Vendor Items List.
List of Vendor Items for
MP-11 - 500 lb. Generator

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>70S10</td>
<td>Diaphragm, Feed Control: Bendix-Westinghouse, Part No. 231472 Diaphragm</td>
</tr>
<tr>
<td>70S14</td>
<td>Roll Pin, Elastic Stop Nut Corp. .187-in. dia. x 3/4-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S17</td>
<td>Roll Pin, Elastic Stop Nut Corp. .187-in. dia. x 1-1/2-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S19</td>
<td>Roll Pin, Elastic Stop Nut Corp. .250-in. dia. x 2-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S21</td>
<td>Ring, Retaining: Walz Truarc No. 75 Series 5100W Stainless Steel Retaining Ring</td>
</tr>
<tr>
<td>70S22</td>
<td>Wire, .035 Dia. x 7-in. Lg. Stainless Steel Wire</td>
</tr>
<tr>
<td>70S25</td>
<td>Roll Pin, Elastic Stop Nut Corp. .187 dia. x 1-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S26</td>
<td>Roll Pin, Elastic Stop Nut Corp. .125 dia. x 5/8-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S27</td>
<td>Roll Pin, .125 dia. x 1/2-in. Lg. Stainless Steel Roll Pin</td>
</tr>
<tr>
<td>70S28</td>
<td>Packing, Operating Shaft: One Set of John Crane Super Seal No. 3 1-3/8-in. O.D. x 1-in. I.D. x 3/4-in. Lg. Set to consist of split rings</td>
</tr>
<tr>
<td>70S29</td>
<td>Packing, Water Level Shaft: One Set of John Super Seal No. 3 13/16-in. O.D. x 9/16-in. I.D. x 5/8-in. Lg. Set to consist of split rings</td>
</tr>
<tr>
<td>70S32</td>
<td>Packing, Carbide Charging Hopper: Unloading Valve Handle &quot;John Crane&quot; Asbestos Valve Stem Packing Style No. 815 Braided 1/8-in. dia. x 6-1/8-in. +1/8 Long</td>
</tr>
<tr>
<td>73S30</td>
<td>Chain, Water Level Indicator Float Arm No. 21011 Liberty: Size No. 1 Twist Link - Bright Machine Chain 48-in. long (minimum to the nearest full link)</td>
</tr>
<tr>
<td></td>
<td>Chain, American Co. #1 Brass Safety Chain approx. 18-in. lg. 3/8 Brass Hose Clamp 5/8 I.D.</td>
</tr>
<tr>
<td>7342-061</td>
<td>[ Clamp, Q5200-M565 Aero Seal All Stainless Steel Hose Clamp</td>
</tr>
<tr>
<td></td>
<td>Gasparks, Screw Machine Parts Co. No. 11 size &quot;J&quot; (1/4-28) crimped type</td>
</tr>
<tr>
<td></td>
<td>Morganmade Gasparks cadmium plated</td>
</tr>
<tr>
<td>7744-1012</td>
<td>Grease, 1 lb. Grease - Shell Oil Co. Retinax &quot;A&quot;</td>
</tr>
<tr>
<td></td>
<td>Grease Gun, Alemite 655G Push Type Grease Gun</td>
</tr>
<tr>
<td></td>
<td>Valve, 3-in. American Car and Foundry Co. figure D-450 Semi Steel screwed valve with Teflon Seal including adaptor with 1/8 Alemite #1610 Lubricate Fitting</td>
</tr>
<tr>
<td></td>
<td>Wrench, American Car and Foundry Co. Type F Valve Wrench</td>
</tr>
<tr>
<td>SYMBOL</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>C-H-2</td>
<td>1/4-in. Brass Hose Clamp</td>
</tr>
<tr>
<td>M-BU-P-8</td>
<td>3/4-in. x 3/8-in. Galvanized Outside Hex Bushing</td>
</tr>
<tr>
<td>M-BU-P-10</td>
<td>1-in. x 3/4-in. Galvanized Outside Hex Bushing</td>
</tr>
<tr>
<td>M-BU-P-14</td>
<td>1-1/4-in. x 1-in. Galvanized Outside Hex Bushing</td>
</tr>
<tr>
<td>M-CS-5</td>
<td>3/4-in. Galvanized Banded Iron Cross</td>
</tr>
<tr>
<td>M-C-P-6</td>
<td>1-in. Galvanized Pipe Cap</td>
</tr>
<tr>
<td>M-CU-CR-2</td>
<td>3/4-in. x 1/2-in. x 1-in. Crane No. 588 Galvanizing Boiler Coupling</td>
</tr>
<tr>
<td>M-E-U-M-R-C-4</td>
<td>3/4-in. Crane No. 592 Galvanized Railroad Male Union Elbow</td>
</tr>
<tr>
<td>M-E-U-M-R-C-5</td>
<td>1-in. Crane No. 592 Galvanized Railroad Male Union Elbow</td>
</tr>
<tr>
<td>M-EL-5</td>
<td>3/4-in. Galvanized Banded Elbow</td>
</tr>
<tr>
<td>M-EL-6</td>
<td>1-in. Galvanized 90-deg. Banded Elbow</td>
</tr>
<tr>
<td>M-EL-P-6</td>
<td>1-in. Galvanized St. Malleable Iron 45-deg. Banded Elbow</td>
</tr>
<tr>
<td>M-EL-P-8</td>
<td>1/2-in. Galvanized Banded Street Elbow</td>
</tr>
<tr>
<td>M-EL-S-2</td>
<td>1/4-in. Galvanized Street Elbow</td>
</tr>
<tr>
<td>M-EL-S-6</td>
<td>1-in. Galvanized Banded Street Elbow</td>
</tr>
<tr>
<td>εM-N-P-5</td>
<td>3/4-in. Galvanized Nipple</td>
</tr>
<tr>
<td>εM-N-P-6</td>
<td>1-in. Galvanized Nipple</td>
</tr>
<tr>
<td>M-N-P-C-3</td>
<td>3/8-in. Galvanized Close Nipple</td>
</tr>
<tr>
<td>M-N-P-C-5</td>
<td>3/4-in. Galvanized Close Nipple</td>
</tr>
<tr>
<td>M-N-P-C-6</td>
<td>1-in. Galvanized Close Nipple</td>
</tr>
<tr>
<td>M-N-P-C-9</td>
<td>2-in. Galvanized Std. Wrought St. Close Nipple</td>
</tr>
<tr>
<td>M-N-SH-6</td>
<td>1-in. 2-in. lg. Galvanized Short Nipple</td>
</tr>
<tr>
<td>M-PP-2</td>
<td>1/4-in. Galvanized Square Head Pipe Plug</td>
</tr>
<tr>
<td>M-PP-5</td>
<td>3/4-in. Galvanized Square Head Pipe Plug</td>
</tr>
<tr>
<td>M-PP-6</td>
<td>1-in. Galvanized Square Head Pipe Plug</td>
</tr>
<tr>
<td>M-R1-2</td>
<td>1-1/8-in. I.D. Std. Split Key Ring</td>
</tr>
<tr>
<td>M-TE-6</td>
<td>1-in. Galvanized Tee</td>
</tr>
<tr>
<td>M-TE-R-40-1</td>
<td>1-1/2-in. x 1-1/4-in. x 3/4-in. Galvanized Banded Reducing Tee</td>
</tr>
<tr>
<td>M-TE-R-47</td>
<td>2-in. x 2-in. x 1-1/2-in. Galvanized Banded Reducing Tee</td>
</tr>
<tr>
<td>M-TE-R-50-1</td>
<td>2-in. x 3/4-in. x 2-in. Galvanized Banded Reducing Tee</td>
</tr>
</tbody>
</table>

* Specify length when ordering.