L.P.G.

Basic L.P.G. System

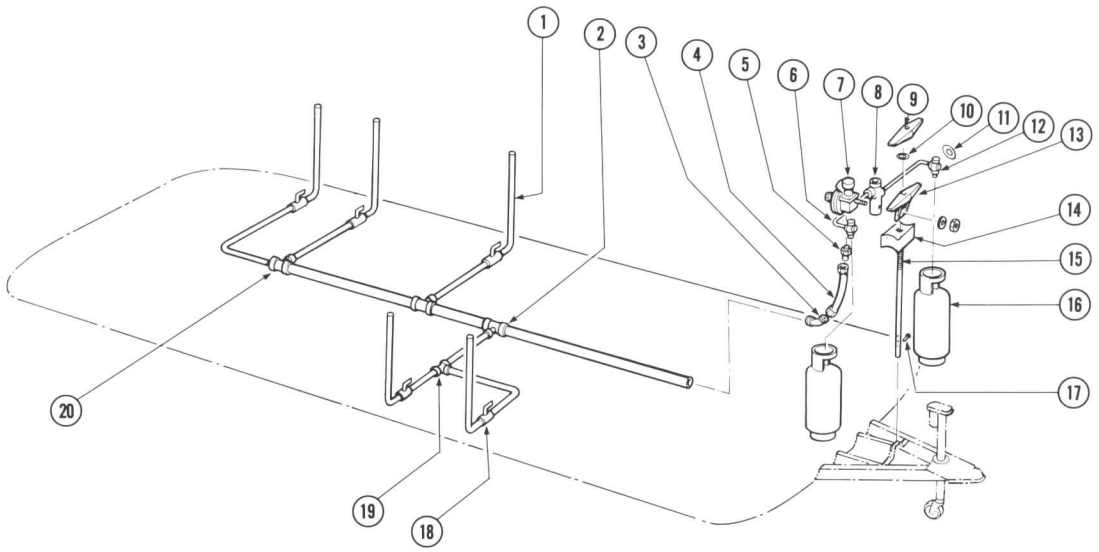
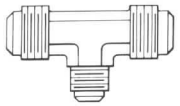


Fig. 1

No.	Part No.	Description
1	600059	Tubing, copper 1/4" O.D.
	600008	Tubing, copper 3/8" O.D.
	600004	Tubing, copper 5/8" O.D.
2	–	Tee (see page 7-3)
3	600082	Elbow union
4	600159	Flexible connector – 19" rubber (20 lb. tank)
	600158	Flexible connector – 24" (28 lb. & 30 lb. tank)
	600157	Flexible connector – 29" (40 lb. tank)
5	600365	Adapter
6	600167	Flexible connector – high pressure 20" pigtails
7	600085	Regulator, gas, Fisher, manual
	600009	Regulator, Fisher automatic
8	600469	Leak detector (Excella only)
9	400048	Handle
10	201335	Nylon washer
11	600726	Valve, shut off handle
12	–	L.P.G. Tank valve assembly
	375POL	Used with 20 lb. and 28 lb. tank
	3319LG w/6.0 DT	Used with 30 lb. tank
	7481-30A	Used with 30 lb. tank (c/level)
	7481-40A	Used with 40 lb. tank (c/level)
	600731	Used with 30 lb. (c/level with remote sending unit)
	600732	Used with 40 lb. (c/level with remote sending unit)
	600733	Used with 30 lb. (remote sending unit)
	600734	Used with 40 lb. (remote sending unit)
	600735	10% shut off valve
13	400046	Bracket, hold down, gas tank
14	100323	Tank spacer
15	400292	Rod
16	600359	L.P.G. Tank 20 lbs. – steel
	600077	L.P.G. Tank 28 lbs. – steel
	600102	L.P.G. Tank 30 lbs. – aluminum
	600344	L.P.G. Tank 40 lbs. – aluminum
17	310002	Pin, rod
18	600012	Shut off valve
19	–	Tee (see page 7-3)
20	–	Tee (see page 7-3)

L.P.G. System Fittings



Flare tube tee

600000 – 5/8 x 5/8 x 3/8
600003 – 3/8 x 3/8 x 3/8

Flare tube nut

600010 – 3/8 short
600098 – 3/8 inverted flare

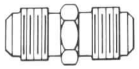
Flare tube nut

600001 – 5/8
600010 – 3/8
600036 – 1/2
600098 – inverted flare

Close nipple

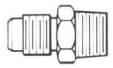
600293 – 1/2 close

Hexagon nipple



Flare union

600238 – 3/8 x 3/8

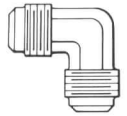


Adapter

600364 – 1/2 x 1/2
600365 – 5/8 x 1/2

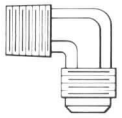
Adapter elbow

600096 – 5/8 x 1/2



Elbow

600459 – 3/8 NPT 3/8 flare



Flare elbow male

600048 – 5/8 x 1/2
600051 – 3/8 x 1/4
600082 – 5/8 union

Gas Rack Assembly (Excella)

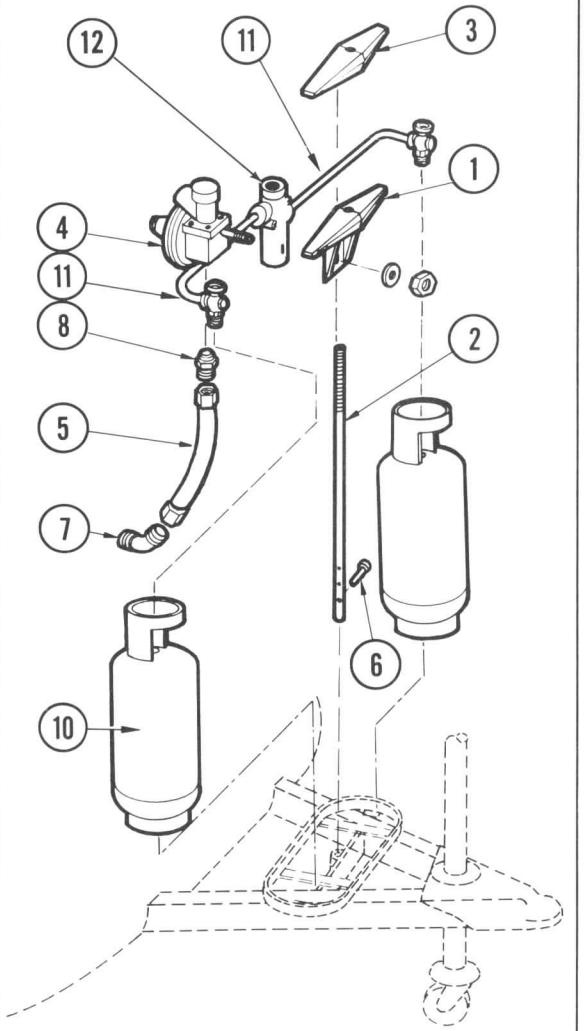


Fig. 2

No.	Part No.	Description
1	400046	Bracket, hold down, gas bottle
2	410173	Rod
	410168	Rod (40 lb tank only)
3	400048	Handle
4	600085	Regulator, gas, Fisher, manual,
	600009	Regulator, Fisher automatic
5	600159	Flexible connector – 19" rubber (20 lb. tank)
	600158	Flexible connector – 24" (28 lb. & 30 lb. tank)
	600157	Flexible connector – 29" (40 lb. tank)
6	310002	Pin, butane rod
7	600082	Elbow union, No. 55, 5/8"
	600000	5/8 x 5/8 x 3/8 tee
8	600365	Adaptor fitting
9	–	L.P.G. Tank valve assembly
	375POL	Used with 20 lb and 28 lb tank
	3319LG	Used with 30 lb tank
	7481-30A	Used with 30 lb tank (c/level)
	7481-40A	Used with 40 lb tank (c/level)
10	600359	L.P.G. Tank 20 lbs – (steel)
	600077	L.P.G. Tank 28 lbs – (steel)
	600102	L.P.G. Tank 30 lbs – Opt. (aluminum)
	600344	L.P.G. Tank 40 lbs – Opt. (aluminum)
11	600098	Flexible connector – high pressure 20" (pigtails)
12	600469	Leak detector

Gas Cylinder (Bottle) Rod Removal and Replacement

1. Close gas cylinder valves.
2. Remove pigtails (Item No. 11) from gas cylinder valves (left hand threads).
3. Remove wing nut (Item No. 3).
4. Remove cylinder.
5. Pull regulator, regulator mounting base and flexible connector upward and lay to one side.
6. Using a 3/16" drift punch, drive pin (Item No. 6) rearwards to allow rod to be removed (a heavy bar or hammer held against ring above pin on rear will lessen amount of drive force needed).
7. Replace by reversing above procedure. On L.Y. and Int'l. models be sure to properly position spacer block on rod about mid-way between top and bottom of the tanks.
8. Check for gas leaks.

Copper Tube Flaring

1. Tools required.
   a. Tubing cutter.
   b. Flaring tool.
   c. Close cutting tube cutter for cutting lines as close as 3/4" to wall or furniture.
2. After cutting tubing to proper length, use reamer (mounted on tubing cutter tool) to ream inside of tubing until smooth to insure a clean flare.
3. Put flare nut on tubing.
4. Insert tubing in proper size opening of flaring tool as stamped on clamping mandrel. Allow tubing to extend only 1/32" above mandrel. (If higher, flare will be too wide and bind on nut.) Fit tape mandrel over clamping mandrel and slowly tighten as far as possible.
5. Relieve pressure and remove tape mandrel. Open clamp and remove. Inside and outside of flare should be clean and smooth.

Soldered fittings are not permitted on L.P. gas and should never be used. Use flare fittings only.

L.P.G. System Pressure Check

Use a pressure gauge (Fisher, see Fig. No. 3)

This gauge is calibrated to read in "inches of water column pressure." It is a standard manometer reading and is colored red.

Take the test reading at one of the range burners.

1. Remove the burner assembly from the burner valve.
2. Insert the gauge hose onto the burner valve and turn valve on.
3. Test reading should be a minimum of 11 and a maximum of 12 inches of water column pressure. All appliances are made to operate at this pressure.
4. After any pressure adjustments (see paragraph 6E for procedure) shut off burner valve and remove tube from burner to allow pressure to bleed off. Then reinstall and check again as in step b.

Gas Regulator Removal and Replacement

1. Close valves on both gas cylinders.
2. Disconnect pigtails (Item No. 11) from gas regulator (Item No. 4).
3. Loosen flexible connector (Item No. 5) from bottom of gas regulator.
4. Remove 2 cap screws from cylinder hold-down bracket (Item No. 1).
5. Remove regulator.
6. Remove fitting (Item No. 8) from bottom of regulator.
7. Install No. 8 fitting in new regulator using teflon tape on threads.
8. Install new regulator on cylinder. Replace hold-down bracket (Item No. 1) with 2 cap screws.
9. Open valve of cylinders slightly to allow gas to blow out any possible dirt or foreign matter before reconnecting pigtails to new regulator.
10. Connect flexible line to bottom of new gas regulator.
11. Check for gas leaks.

Low Pressure Gauge

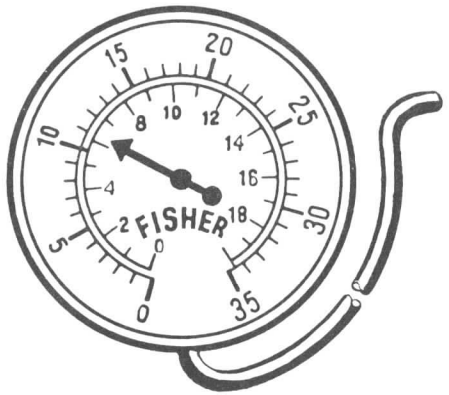


Fig. 3

L.P.G. System Testing for Leaks

1. The gas system can be leak checked by use of the automatic regulator.
2. If gas system has been in use, shut off valves at the cylinders and allow to remain off for 5 minutes. (This allows all safety valves to close.)
3. At the end of the waiting period, open gas cylinder valves until the indicator flag on the regulator shows white. Then close both cylinder valves.
4. Flag should remain white for a period of approximately 30 minutes. If it shows red in this period of time, it would indicate a drop in pressure which should be corrected.
5. Use the manometer as described in the pressure check procedure, page 6-8.
6. Should a leak be indicated, use a liquid leak detector such as "snoop" and check all connections, valves, and fittings. Apply liquid detector to areas to be checked and watch for bubbles. Check both inside and outside of trailer. (On the outside check; protect from wind when testing.)
7. As a safety measure, an occasional leak check should be made on all fittings with liquid detector as described above.

L.P.G. Regulator Valve Assembly (Manual)

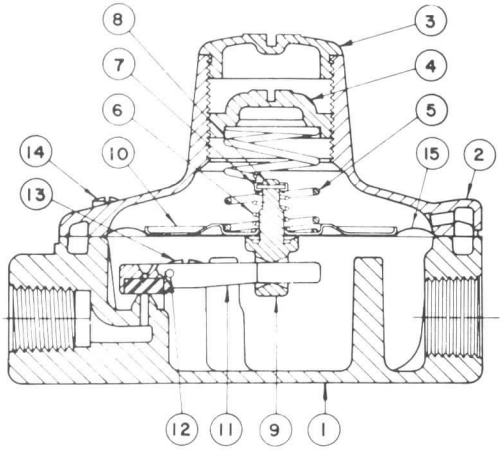


Fig. 4

No.	Part No.	Description
1	—	Body
	3D3771	¼" x ¼", .073" Orifice (Standard)
	T40005	¼" x ¼", .094" Orifice
	3B7824	¼" x 3/8", .073" Orifice (Standard)
	3B8927	¼" x 3/8", .094" Orifice
2	—	Spring case
	3E2944	For 912
	3B7826	For Y200
3	T10276	Closing Cap
4	T10277	Adjusting Screw
5	—	Spring
	1B7843	3 to 7" W.C.
	1B7844	5 to 10" W.C.
	1L5079	9.25" to 13.5", W.C. (Standard)
	1B7845	10" W.C. to 1 psi
6	1B7848	Relief Valve Spring
7	1B7834	Spring Seat
8	1B7835	Pin
9	—	Relief Valve Seat
	1C3650	For 912
	2B7830	For Y200
10	1B7838	Diaphragm Head
11	1E3003	Disc Holder & Disc
12	OU0914	Fulcrum Rod
13	1A3461	Screw
14	1B7839	Screw (6 req'd)
15	1B7837	Diaphragm
	OW0863	Vent Screen (912 only)

L.P.G. Regulator Valve Assembly (Automatic)

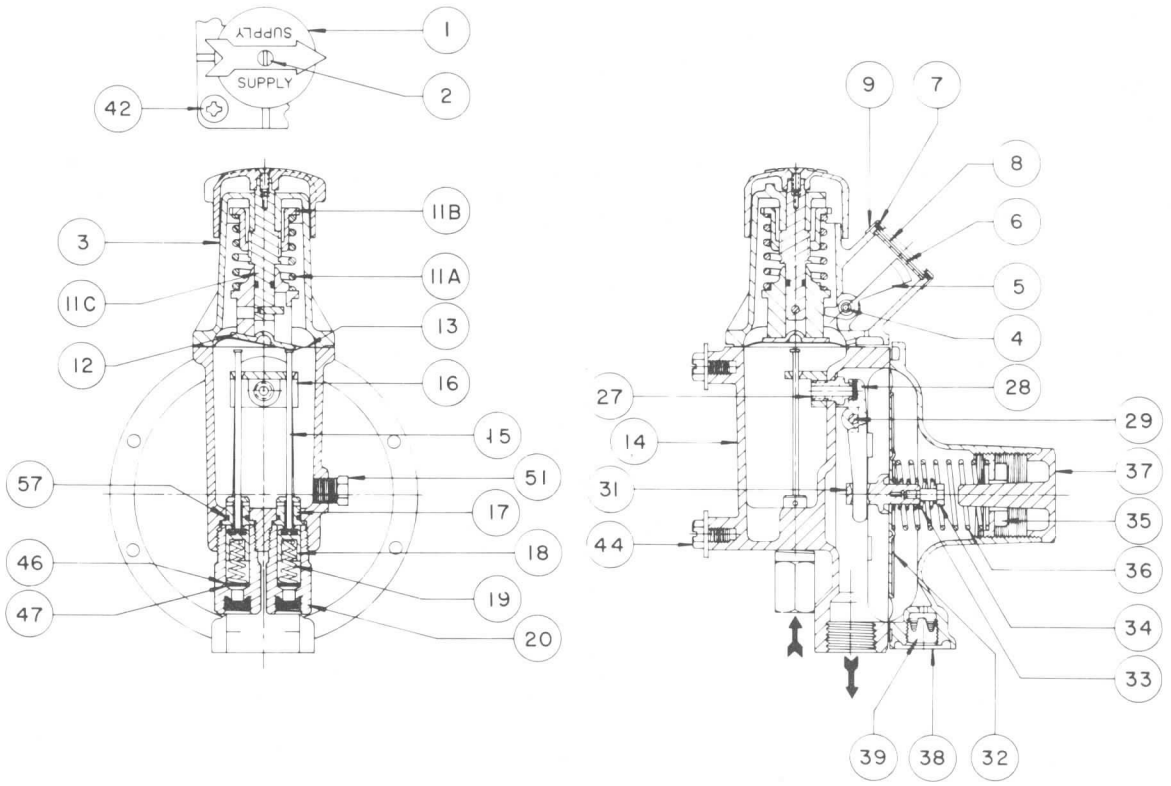


Fig. 5

No.	Part No.	Description
1	2F9963	Changeover knob
2	1B1864	Screw
3	4F9962	Indicator Bonnet
4	T10303	Indicator Pivot Pin
5	T11920	Indicator Flag
6	1C5184	Indicator Dial
7	1B8766	Indicator Dial Gasket
8	1B8768	Indicator Glass
9	1B8767	Dial Cap
11	1H1238	Spring-Cam-Stem Assembly
FOR TYPE 966 ONLY (No.'s 11A, 11B, 11C):		
11A	T10732	1st stage spring
11B	1F9964	Upper spring seat
11C	1F9967	Stem & Cam Assembly (Includes all 11C key nos.)
11C-1	1F9967	Stem
11C-2	T10722	Cam
11C-3	1F9972	Groove-Pin
11C-4	1D6825	O-Ring
12	1F9968	1st stage diaphragm head
13	1F9973	1st stage diaphragm body
14	T80079	Body – 3/8" outlet
15	1F9970	Pushpin (2 req'd)
16	1F9966	Pushpin Guide
17	T10272	1st stage orifice (2 req'd)
18	1C5172	Disc holder & disc (2 req'd)
19	1C5174	Inner valve spring (2 req'd)
20	1C5175	Inner fitting (2 req'd)
27	1C5185	2nd stage orifice
28	T11971	Disc holder & disc
29	1B7920	Valve pivot pin
31	2B8781	Relief valve seat
32	1C5360	Diaphragm & head assembly
33	1C5358	Relief valve spring
34	1F4942	Spring holder
35	T10071	Adjusting screw
36	0N0394	2nd stage spring
37	T10072	Closing Cap
38	T40101	Spring Case
39	0L0783	Screen
42	1H3666	Screw (4 req'd)
43	1B2856	Screw (6 req'd)
44	T10335	Screw (2 req'd)
46	0W0844	Inlet screen (2 req'd)
47	T10271	Inlet screen (2 req'd)
51	1D8293	Pipe Plug
54	Type 803/21	Remote Indicator
57	T10750	O-Ring (2 req'd)

Automatic Regulator Details

1. GENERAL DESCRIPTION

The type 966 is an automatic changeover regulator. It withdraws gas from one cylinder until it is empty, then automatically changes to the other cylinder, giving uninterrupted service to the user.

A red flag indicator on the regulator signals the change so that the empty cylinder may be replaced with a full one. It provides complete gas withdrawal service on multiple cylinder operation for loads up to 214,000 BTU/hr.

2. INSTALLATION

The outlet of the cylinder valve should be cleaned thoroughly to remove dirt or water. One method of doing this is by cracking the cylinder valve open for a short time to blow out the dirt. On new installations it is recommended that gas or air be blown through the pigtails before connecting. This will prevent dirt or foreign material from being carried into the regulator.

Install the regulator in an upright position as shown in Figure 5. Do not remove the vent screen because it prevents the vent from being clogged with insects. On new installations it is mandatory to inspect and leak test the trailer tubing before connecting it to the appliances or the regulator. Avoid excessive strain on the regulator when connecting the regulator outlet to the brass fitting.

After the system is installed, leak test with soapy water.

3. OPERATION (Fig. 5)

Place one of the two cylinders in "Supply" by rotating the change-over knob (1) either way as far as it will go. The arrow will denote "Supply" service side. Open both cylinder valves slowly.

Gas will now flow from both cylinders through the pigtails into the first stage regulator section of the assembly by way of the inlet fittings.

When a pressure of 6 psi is reached in the first stage regulator, the disc assembly in the inlet fitting will shut off gas from the reserve cylinder. Gas from the "Supply" cylinder will continue to enter the first stage body until approximately 15 psi is maintained. The second stage regulator section of the assembly reduces this pressure to the 11" water column (W.C.) needed for the appliances.

The "Supply" side of the first stage regulator will continue to supply gas at 15 psi as long as sufficient gas remains in the "Supply" cylinder. When pressure in the cylinder drops to about 6 psi, the reserve side of the first stage regulator will open and maintain 15 psi pressure to the second stage regulator, which continues to regulate at 11" W.C. At the time the "Supply" cylinder becomes exhausted, a red flag warning (B) appears at the indicator window.

4. EXCHANGE OF CYLINDERS

Before removing the empty cylinder, be sure to rotate the changeover knob cap (1) so that it will point to the other cylinder. Then close the valve on the empty cylinder to prevent air from entering the exhausted cylinder. Install a full cylinder in place and slowly open the cylinder valve. The new cylinder now becomes the reserve cylinder and the red warning flag will not be visible at the indicator window.

5. ADJUSTMENT (APPLIES TO MANUAL VALVE ALSO) (Fig. 5)

Each regulator is individually factory set to deliver 11" W.C. with 100 psi inlet pressure passing 30 CFH propane. This is only the test setting, however, and Type 966C has much greater capacity. If it becomes necessary to increase the outlet pressure, remove the closing cap (37) and turn the adjusting screw clockwise. Turn the adjusting screw counterclockwise to decrease the outlet pressure. Always replace the closing cap after adjustment is made.

6. MAINTENANCE (Fig. 5)

If the indicator flag (5) gives faulty indication of the cylinder condition, it is usually due to dirt or chips keeping one of the disc assemblies (18) from closing. This can be corrected by removing both inlet fittings (20) and thoroughly cleaning the orifice (17), disc assembly, spring (19) inlet screens (46 & 47) and the inside of the inlet fitting itself. Be careful not to lose the inlet screens. Examine the disc assemblies for damage or imbedded dirt particles, and replace if necessary. Also inspect the orifice seat for nicks or defects and replace if necessary.

To reassemble, first insert the fine inlet screen (47) and then the coarse inlet screen (46) into the inlet fitting. Replace the spring and disc assembly as shown in Figure 7. After replacing the orifice, making sure that the pushpin (15) protrudes through the orifice opening, the inlet fitting assembly can be screwed into the regulator body.

To inspect or replace the second stage disc holder assembly (28) or the internal relief valve, remove the closing cap (37) and back out the adjusting screw (35) to relieve spring tension. Remove the spring case screws (43), spring case (38) and slide the diaphragm assembly off the disc holder. The disc holder can be lifted out by unscrewing two screws (30). Unscrew the spring holder (34) and examine the relief valve seat (31) for foreign matter or nicks where it comes in contact with the diaphragm (32). If the diaphragm is damaged or badly indented, it must be replaced. The spring holder must be screwed in tightly against the relief valve seat when reassembling.

Gas Light Installation (8T)

When installing the light, note particularly the instructions about locating the wall bracket to allow for proper clearances.

1. Use copper tubing of 3/8" outside diameter for gas supply, and of sufficient length to run from lamp location on roadside roof locker end panel down to main gas line attachment at refrigerator.

2. Route tubing through a 1/2" rubber grommeted access hole drilled in the refrigerator roof vent just above the floor of the roof locker and down through the vent to the gas line attachment point.

3. Disconnect refrigerator gas line and insert a "T" fitting between gas line and refrigerator shut off valve. Connect gas lamp tubing to open fitting on the "T".

4. Working from inside the roof locker remove end panel attaching screws and remove end panel and cap assembly. Remove and discard existing end panel and replace it with a special fireproof end panel.

5. Locate the wall bracket and valve assembly "17" on fireproof end panel so that it will be flush with the bottom of the roof locker and at least 8" from the wall skin. These measurements should be made to the center of nozzle "20" and will provide the minimum clearances as required by A.G.A. or C.G.A. label.

6. Measure and drill an access hole sufficiently large to accommodate the gas line fitting on the rear of the wall bracket and nozzle assembly.

7. Fasten the wall bracket to the end panel with the screws provided in the envelope.

8. Reinstall the locker end panel and connect the gas line.

9. Attach the main body of the light to the wall bracket by engaging slot with the hook provided at the top of the wall bracket. Engage the locating tabs at the bottom of the wall bracket with the slots. Replace the light diffuser "7" and the diffuser holder "9". Slip the back edge of the holder "9" under the tabs and secure with screw "11".

Instructions for Installing New Mantle – 8T

1. Tie single knot in string at throat of mantle. Work fingers into throat of mantle to enlarge throat so that it will slip over burner nose and seat in groove. Distribute puckers in mantle evenly around burner nose. Pull ends of string snugly so that mantle and string are seated securely in burner nose groove. Tie duble knot and clip off excess string. Replace diffuser.

2. It is recommended that a new beret mantle be lighted at the bottom allowing fabric to burn completely before turning on gas.

CAUTION: Mantle has now become a chemical ash and must not be touched. It is misshapen and requires further burning to shrink to its final form.

3. Turn on and light gas and mantle will soon be properly shaped. Allow gas to burn for at least 5 minutes.

4. Before connecting lamp to gas supply be sure valve is in "OFF" position. Check all fittings and connections for leaks with a soap solution before lighting the lamp.

5. After mantle has been burned off, insert lighted match through opening in bottom of diffuser and hold near bottom of mantle. DO NOT TOUCH MANTLE FABRIC. Next, turn gas full on with valve handle. CAUTION – DO NOT TURN ON GAS BEFORE INSERTING MATCH. Note: When a lamp has first been connected, there may be air in the gas line. Several matches may be required before lamp will ignite.

6. Gas valve should never be turned on until after lighted match is inserted.

7. Should light pulsate after burning for awhile this would indicate undergassing or low pressure.

8. If light flames or carbon spots appear on mantle, follow this procedure: check inside of bunsen tube. Spiders and other insects sometimes enter through air openings when lamps have not been in use and we often find that a spider web in the bunsen causes the trouble. If light still carbons, this indicates overgassing.

9. When the portion of your gas light next to the wall becomes hot there is no cause for alarm. This is the nature of this type of appliance and while it feels hot to the touch it does not become hot enough to create a hazard.

Gas Light Assembly

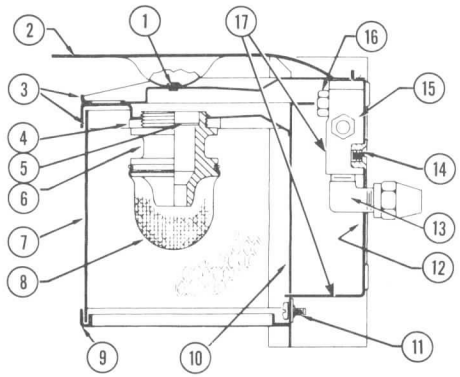


Fig. 6

No.	Part No.	Description
	600444	Complete assembly Model 8T
1	–	Rivet
2	–	Heat deflector
3	–	Bunsen
4	–	Asbestos seal
5	–	Screen (in burner nose)
6	–	Burner nose
7	–	Diffuser
8	–	Mantle
9	–	Diffuser holder
10	–	Reflector
11	–	Screw (for diffuser)
12	–	Label
13	–	Elbow
14	–	Valve screw
15	–	Valve and nozzle assembly
16	–	Nozzle
17	–	Wall bracket and nozzle assembly

Gas Light Trouble Shooting Tips

WHY MANTLES BLACKEN, ETC.

1. AIR SHUTTER: Must be wide open, if light is so equipped.

2. NOZZLE: The drilled hole is extremely delicate. Pins, wires and even oil from hands will disturb flow. Replace if in question. Never touch drilled hole.

3. BUNSEN: Make sure spider webs etc., are cleaned out of inside. This is most common cause of mantles blackening.

4. VALVE ASSEMBLY: Must be straight on wall bracket. Can be cocked when tightening tubing etc., causing nozzle to be aimed crooked. Gas flow from nozzle must be straight down the center of Bunsen.

5. BURNER NOSE: Be sure screen is in thread end. Never attach mantle to metal bunsen, but always to correct ceramic burner nose per the Tie-on or Preformed Mantle being used.

6. REGULATOR: L.P. gas must be 11 inches water column (6 ounces mercury) pressure. Have L.P. dealer adjust. Higher or lower pressures will cause improper function.

7. MANTLE: Never touch fabric before or during installation of preformed mantle, as it will cause mantle to break. Breezes, bugs and vibrations, will break mantles which are a delicate chemical ash. Always "Burn-off" the fabric chemical on any new mantle before turning on the gas and attempting to light.

8. USE 3/8" (O.D.) tubing if more than 10 ft. from L.P. supply tank.

9. USE propane (L.P.G.) only.

10. USE in "vented rooms" only.

L.P.G. Leak Detector (Excella)

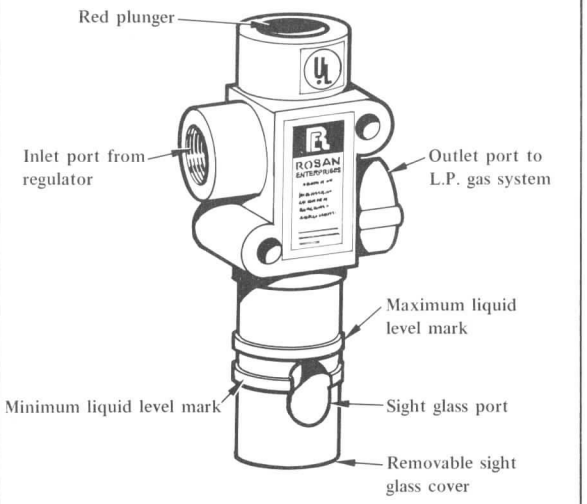


Fig. 7

No.	Part No.	Description
–	600469	Complete assembly

L.P.G. Leak Detector Operation

Gas lines should be checked periodically for leaks with the L.P.G. leak detector. Do not use open flame.

To operate L.P.G. leak detector, follow these instructions:

1. Close gas tank shut-off valves.
2. Open trailer door and windows for ventilation and shut off all gas appliances, including pilots.
3. Open one gas valve and light burner to deplete any gas pressure. Then close the valve.
4. While depressing leak detector red button, open the main tank valve. A stream of bubbles will be immediately visible. Continue to depress the plunger for 5 to 10 seconds. If bubbles are released, your system has a leak and you should conduct a soapy water test at all joints. Tighten if necessary and retest.

Maintenance

The model 116M requires no maintenance, other than, being sure that the liquid in the sight glass is kept between the marks on the sight glass cover.

The liquid in the sight glass, as received from the factory, is propylene glycol, inhibited with 1/2% dipotassium hydrogen phosphate PM3080 (Union Carbide Corporation). If swallowed, contact a physician immediately.

In a few leak detectors the glycol may have a slightly yellowish color. This is due to a little oil that gets into the detector during final testing at the factory and does not hinder the function of the detector.

Loss of fluid can occur in several ways:

1. The owner may forget to turn off a range burner while running a test. The gas flowing through the probe causes significant bubbling (in excess of 2-3 seconds) which blows the glycol up into the body of the detector. Some of it may get trapped in the outlet port threads. (This fluid won't return to the sight glass.)
2. An owner may push down on the red button while the gas system is in operation. The same result will be observed.

The solution to this loss can be to push down on the red button and allow the trapped fluid, near the probe, to return to the sight glass. If this doesn't fill the sight glass the sight glass cover must be removed and fluid replaced.

Looking down at the red button, turn the sight glass cover in a clockwise direction. A chain, or strap wrench is best for this job to avoid disfiguring the cover.

When the sight glass cover is removed, do not lose the RE30102-11 gasket. This gasket is made from Buna-N compound 4200-70. This rubber is listed by U.L. as acceptable for L.P. gas use. Do not substitute any other material or gasket configuration as this act could lead to a gas leak in the future. Use only gasket furnished by manufacturer.

In an emergency, water can be used in the sight glass. It will mix well with the glycol. The owner should be advised that the water will evaporate in time and could freeze if a trip to cold country is planned.

Re-installation of the sight glass cover is the reverse of the removal procedure. Be sure to tighten the sight glass cover and be sure the RE30102-11 gasket is in place.

Pressurize the gas system and check this joint to be sure that it does not leak using 'soapy water' or a suitable leak testing liquid.