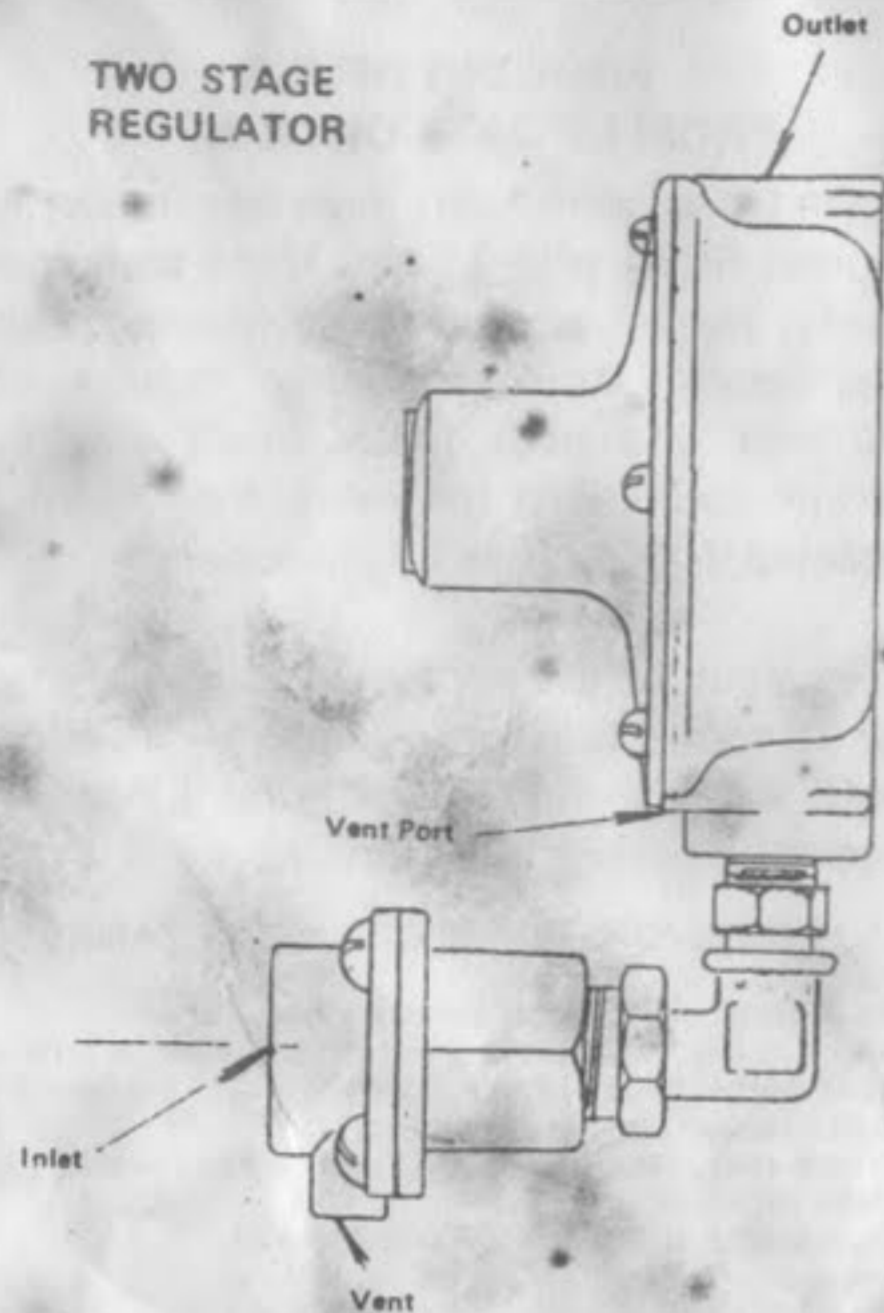


**TWO STAGE
REGULATOR**

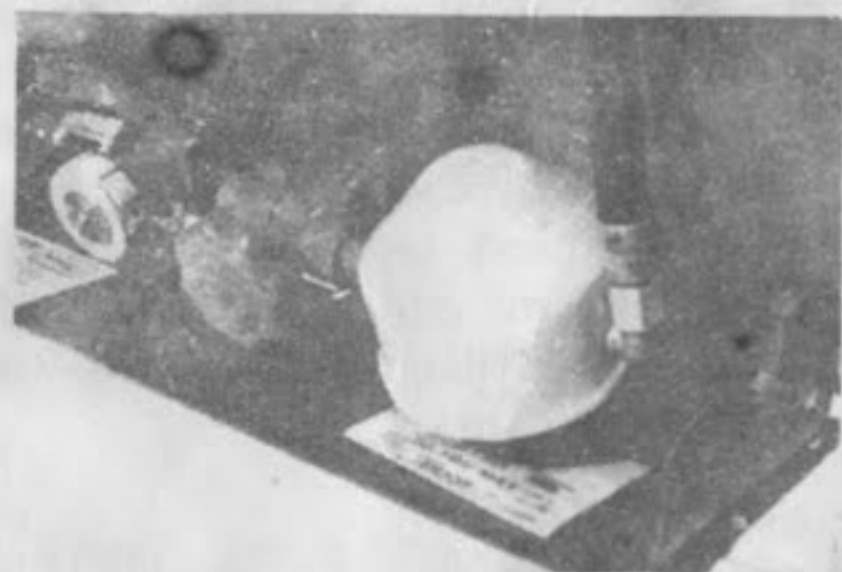


**ADVANTAGES OF
TWO-STAGE REGULATION**

Reduced Freeze-Up Problems — A two-stage regulator greatly reduces the possibility of freeze-ups because (1) larger orifice sizes can be used in the regulators, and (2) heat can be transferred through the walls of two regulators instead of just one.

Improved Regulation — The second stage regulator receives a relative uniform pressure from the first stage regulator. This helps the second stage regulator to maintain appliance pressure at a nearly constant 11" water capacity because it does not have to adjust to varying inlet pressures.

LP-Gas Regulator Enclosure



If your LP-gas system is not equipped with these safety options, contact Manchester for name of nearest dealer.

**SOME BASIC PRACTICES TO INSURE
SAFETY AND TROUBLE-FREE USE**

1. Never allow your tank to be filled above the legal liquid level capacity indicated by the liquid level gauge.
2. Do not use a wrench or pliers to close the POL service valve or liquid level gauge on your tank. These valves are designed to be closed leak-tight by hand. If wrenches are necessary to stop a leak, the valve probably needs repairs or replacement.
3. When tightening the POL nut (left hand) on the service valve, draw it up snug with a proper wrench — don't jam it. This is a machined male brass fitting which seats securely against a female seat in the POL valve — no pipe dope is necessary.
4. When using tank, open POL service valve all the way, then close ¼ turn. This will always enable you to determine whether valve is open or closed.
5. Check all tank and line connections periodically to be sure they are tight. When testing for leaks, use soapy water — not matches.
6. Make certain your tank is properly fastened in place.
7. On dual tank installation, turn tanks with open part of tank guard towards trailer (travel trailer installation). This protects valve and regulator against flying rocks and mud which may be thrown to the rear on gravel or dirt roads.
8. If you take your LP-gas tank to an LP-gas dealer for filling, transport it in the proper position in which it is used, with the valves closed. Secure the tank against falling or rolling.
9. Since LP-gas is non-corrosive, you need not worry about the inside of your tank. However, the outside should be kept from rusting by a periodical coat of good paint.
10. Practice safety at all times. If you have questions about the operation of your appliance or LP-gas system, contact your local LP-gas dealer.

MANCHESTER TANK & EQUIPMENT CO.

2880 Norton Ave., Lynwood, Calif. 90262
 2738 Lithonia Industrial Blvd., Lithonia, Ga. 30058
 P.O. Box 1338 Lubbock, Texas 79408
 No. 2 Lexington Park Dr., Elkhart, Indiana 46514

**HELPFUL INFORMATION ABOUT
LP-GAS AND LP-GAS CONTAINERS**



**SO YOU MAY ENJOY USING
THE WORLD'S MOST VERSATILE FUEL**

LP-gas (liquid petroleum gas) is a true gas compressed into liquid form for easy transportation and storage. It is also known as butane, propane or bottle gas. It is safe and economical, and because of its portability, provides modern living conveniences no matter where you travel.

BASIC FACTS ABOUT LP-GAS

| | PROPANE | BUTANE |
|-------------------------------|---------|---------|
| Pounds per gallon | 4.24 | 4.81 |
| Specific gravity of gas | 1.53 | 2.00 |
| Specific gravity of liquid | 0.51 | 0.58 |
| Cu. ft. gas per gallon liquid | 36.3 | 31.2 |
| Cu. ft. gas per pound | 8.55 | 6.50 |
| BTU per gallon | 91,600 | 102,032 |
| BTU per pound | 21,591 | 21,221 |
| BTU per cu. ft. | 2,516 | 3,280 |
| Dew point in degrees F | -44° | 32° |
| Vapor pressure at 0 F | 28 | 0 |
| Vapor pressure at 70 F | 120 | 16 |
| Vapor pressure at 100 F | 190 | 37 |
| Vapor pressure at 110 F | 220 | 46 |

Average LP-gas capacities (PROPANE)
 (allow 20% for vapor space)

| | Lbs of gas | B.T.U.'s |
|----------------------|------------|----------|
| 1 — 5 gal. DOT tank | 20 | 431,820 |
| 2 — 5 gal. DOT tanks | 40 | 863,640 |
| 1 — 7 gal. DOT tank | 28 | 604,548 |
| 1 — 10 gal. DOT tank | 40 | 863,640 |

11" OF WATER COLUMN
 6 - ¼ OZS. PER SQ. IN. PRESSURE

To find out how long your LP-gas supply will last, simply total the BTU demand of all your gas appliances and the BTU capacity of your containers at 80% full. Divide container BTU capacity by total appliance demand.

**CAUTION
USE LP-GAS TANKS
AND CYLINDERS IN PROPER POSITION**

Use vapor only. All LP-gas appliances for cooking, heating, lighting, water heating and refrigeration are designed to operate on LP-gas vapor only. Therefore, all LP-gas tanks and cylinders designed for vapor service must be transported, installed and used in the proper position. Do not transport, install or use a vertical cylinder (see Fig. No. 3) in a horizontal or upside down position. Never use a horizontal cylinder or tank (see Fig. No. 4) on its side or upside down. Liquid LP-gas could enter the system designed for vapor only, creating a hazardous condition.

Manchester LP-gas containers are permanently marked with either a "top tab" welded to the tank or stamped in the guard or bracket "Arrows Must Point Up" to identify proper position.

All LP-gas tanks and cylinders must be securely attached to the recreation vehicle thru utilization of all brackets provided.

FILLING YOUR LP-GAS CONTAINER

Caution! Overfilling is hazardous! Do not overfill your LP-gas container. Stop filling when liquid appears at the fixed liquid gauge. Most LP-gas containers are equipped with a fixed liquid level gauge (often called a 10% valve) which contacts the liquid level at 80% of container capacity allowing 20% for expansion.

LP-gas containers must not be filled over 80% of total capacity. Only qualified personnel should fill your container. If overfilled, excessive pressure could develop within the container causing the relief valve to open, relieving pressure to a safe level at which time it will automatically close.

The fixed liquid level gauge is used only to determine safe fill levels and does not indicate lower levels. LP-gas containers are available with visible gauges that monitor the amount of gas in the container at all times, reading from full to empty. If your tank is not equipped with a gauge your dealer may exchange it for one with a gauge for additional cost.

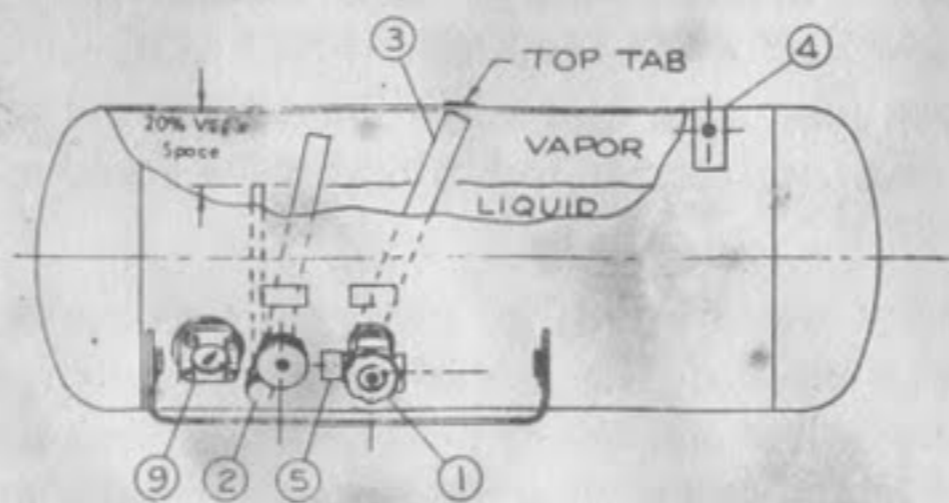


FIG. No. 1
ASME Horizontal Motor home tank

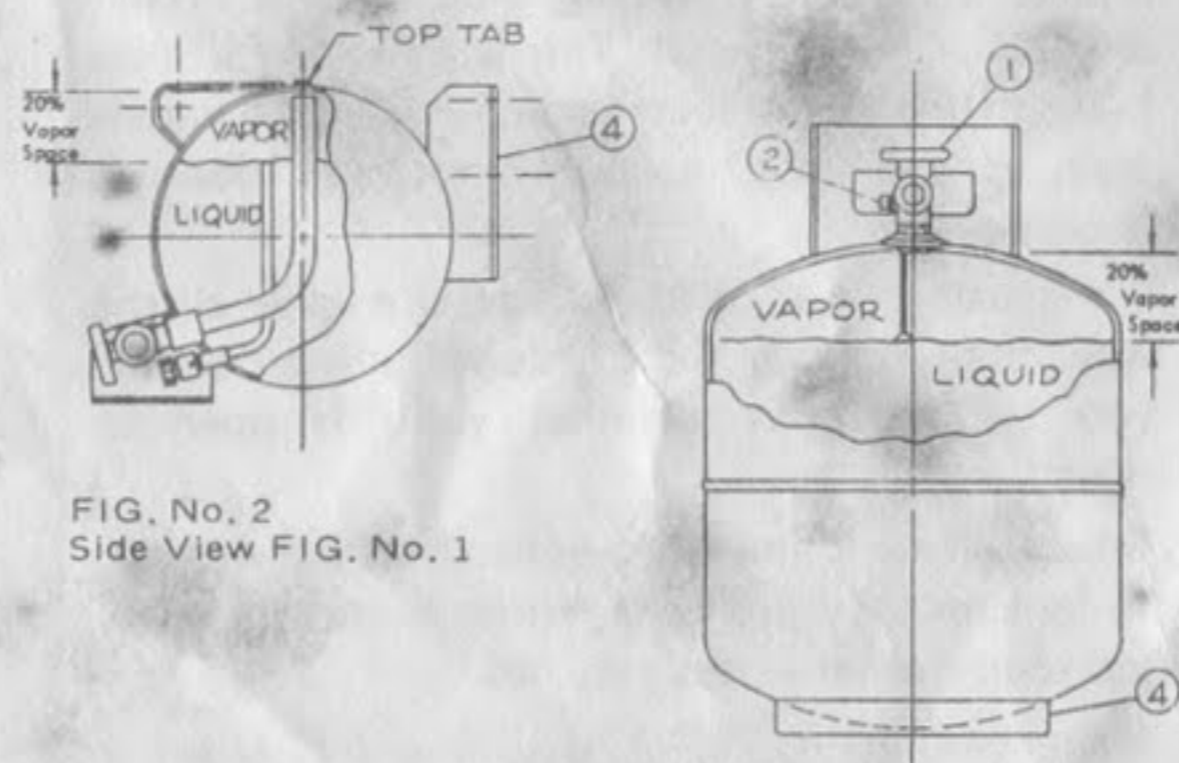


FIG. No. 2
Side View FIG. No. 1

FIG. NO. 3 Standard vertical
20 lb. DOT cylinder

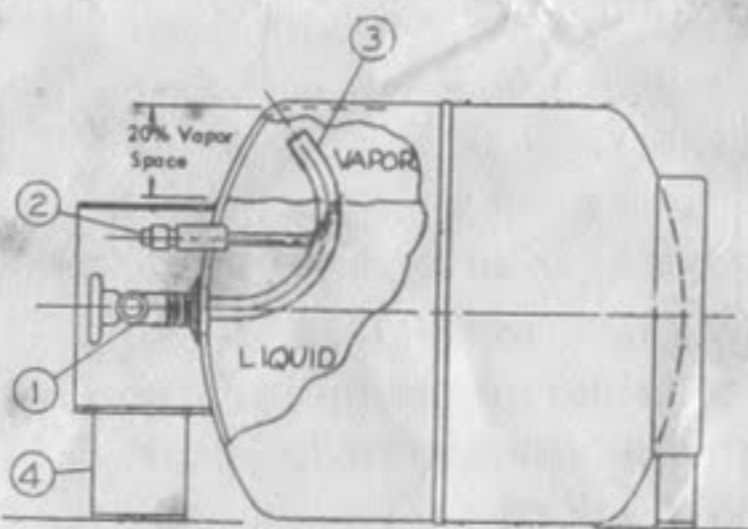


FIG. NO. 4 DOT 20 lb. cylinder
designed for horizontal use.

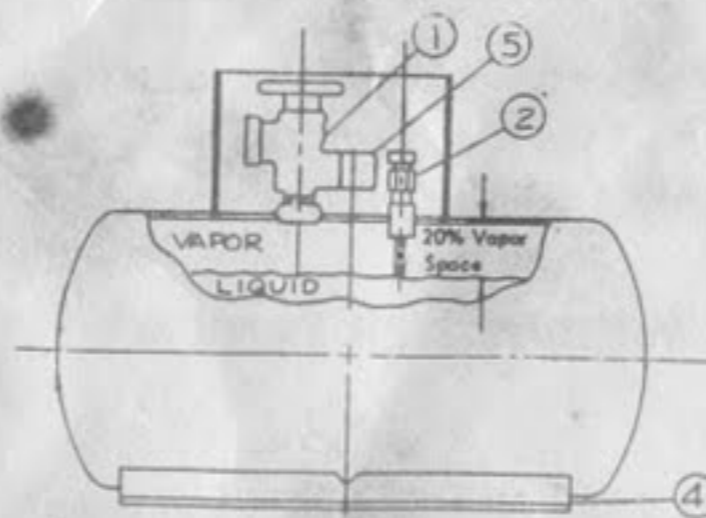


FIG. No. 5
ASME standard
horizontal tank.

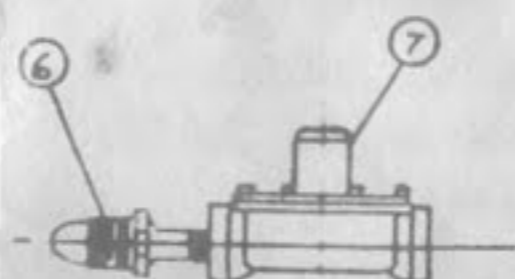


FIG. No. 6
Regulator

**PURGING OF AIR
FROM LP-GAS CONTAINERS**

Air in LP-gas containers must be removed prior to the initial filling with LP-gas. If the container is not properly purged, air in the container dilutes the LP-gas vapor. Appliances then require constant adjustment and pilot lights won't stay lit. This condition could exist for several months until all air is depleted, leaving pure LP-gas vapor.

Have your LP-gas container purged, using LP-gas vapor to insure satisfactory appliance performance. It only takes a minute and your LP-gas dealer is equipped to perform this service.

COMMON TERMS OF LP-GAS TANKS

1. POL-Vapor withdrawal service valve.
2. 20% Liquid Level Gauge — (Often called a 10% valve).
3. Vapor withdrawal tube — (Used on tanks where POL Valve is not located on top of tank).
4. Bottom ring, stand legs, or mounting brackets.
5. Safety relief valve.
6. POL Spud and Nut (left hand thread).
7. Low pressure regulator
8. Fill valve, Pol and/or 1 1/4 Acme.
9. Visible gauge.

DOT AND ASME TANKS

— Generally speaking, LP-gas tanks are built to the specifications of either the ASME or DOT pressure vessel code. Both are nationally safe codes, which are used extensively. Basically, the difference between the two codes is that valves, fittings and brackets may be located on the ends only on DOT tanks, while on the ASME tanks they may be located on ends as well as sides.

— All valves, fittings and gauges on Manchester tanks are listed by UL. Production and testing methods are the most modern available to assure top quality.

LP-GAS REGULATORS

LP-gas regulators reduce the pressure of LP-gas vapor from tank pressure to 6 1/2 oz. or 11" W.C. for use at the appliances. The regulator is the heart of the LP-gas system and although it seldom requires service, care should be taken to protect it from the elements which could cause it to malfunction. In addition, your LP-gas system should be kept free of moisture which could cause regulator freeze-up. Installation of a good regulator enclosure will protect your regulator and anhydrous methanal injected into your LP-gas container will help to prevent freeze-ups.

**CAUTION — ALWAYS BE SURE THAT THE
REGULATOR VENT IS POINTING DOWN OR
HORIZONTAL.**

INSTRUCTION MANUAL

Type R330 Series LP-Gas Regulators

WARNING

Install, use, and maintain this equipment per Fisher instructions and all applicable federal, state, local laws and codes, and NFPA 58 and 501C. Inspection and/or maintenance of the unit is recommended each time the container is refilled. Only personnel trained in the proper procedures, codes, etc. should install or service this equipment.

THINGS YOU SHOULD TELL THE USER OF THIS EQUIPMENT:

1. The vent openings on the regulators must remain unobstructed and frequent inspection of the vent openings is necessary.
2. The shutoff valve on the container(s) should be closed immediately if LP-gas can be smelled, appliance pilot lights fail to stay on, or any other abnormal situation occurs. A LP-gas dealer should check the system if troubles take place.

GENERAL

The R330 is an integral two-stage LP-gas regulator specifically intended for use on ASME tanks supplying 11" W.C. to appliances in motor homes. Contact the factory if the regulator is to be used on any service other than LP-gas.

Type R330/21 - Basic regulator, 1/4" FNPT inlet and 3/8" FNPT outlet.

Type R330/22 - Same as R330/21 except with a Type M318 M. POL inlet adaptor.

INSTALLATION

Make sure flow is in the correct direction—"Inlet" and "Outlet" connections are marked on the units. A hood, encasement, or vent protector should be used to protect vent openings from the elements. Extra protection is needed to prevent the vent openings from becoming clogged by mud and road splatter.

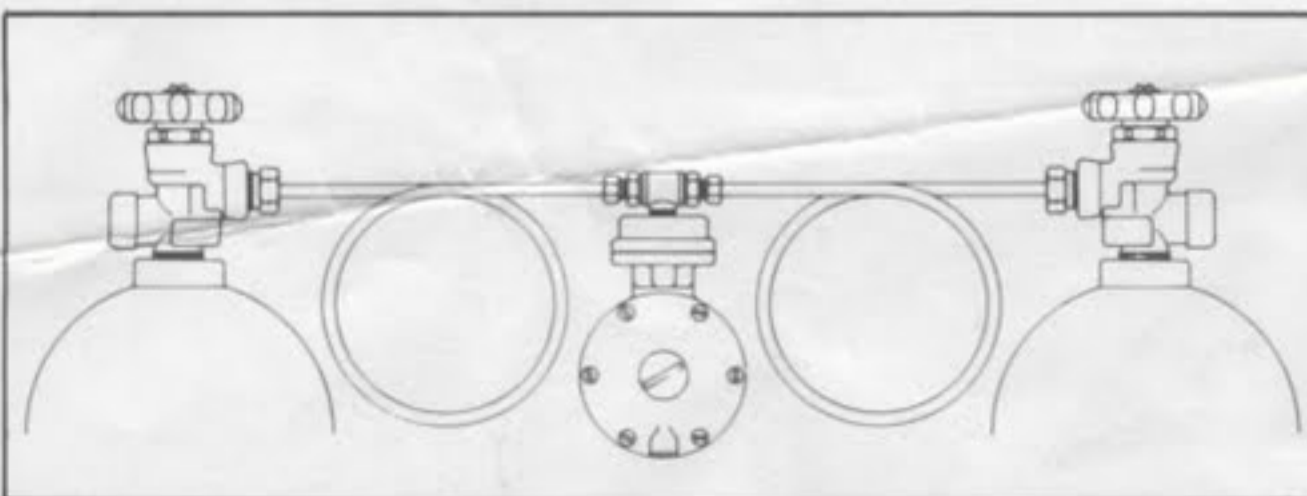


Figure 2—Type R330/41 Installation

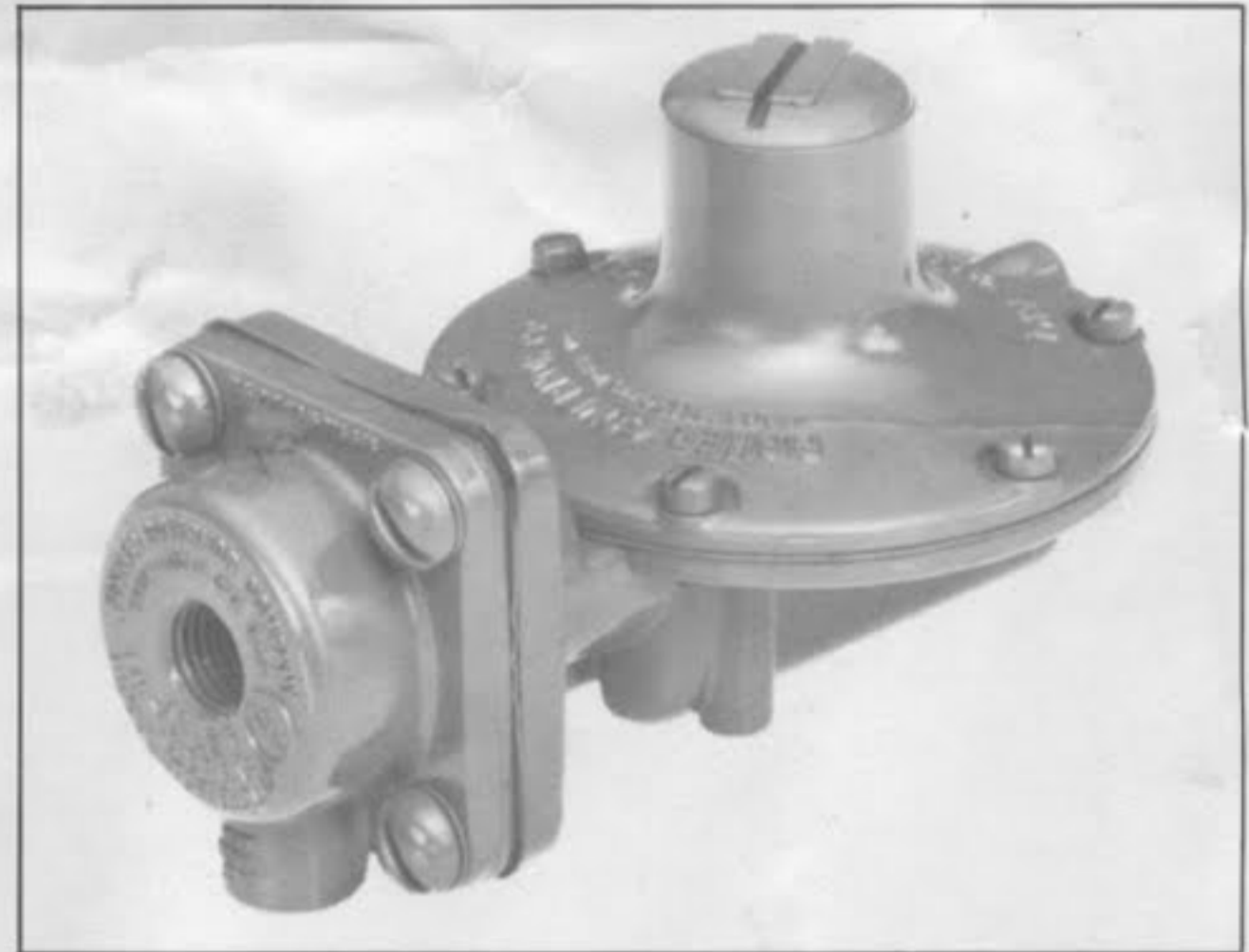


Figure 1—Type R330/21

PERIODIC INSPECTION

Visually inspect the regulator assembly each time the container is refilled. Make sure the vent openings on the units do not become plugged by mud, insects, ice, paint, etc. Horizontally mounted regulators should be examined on a regular basis for signs of corrosion by a trained LP-gas serviceman.

TYPE R330/41

Intended for domestic twin cylinder applications, a tee check or manual changeover is usually installed in the regulator's inlet, see Figure 2. Install the regulator high enough above the ground—at least 18"—so that rain splatter does not block or freeze the vents. Be sure both vents are pointed vertically down if the unit is installed without a protective cover.

LIMITED ONE-YEAR WARRANTY

FISHER warrants the product identified hereon to be free from defects in material and workmanship under normal use and service. If, within one year from the date the product is shipped from the factory, any part fails because of a manufacturing defect, FISHER will provide a free replacement part for any defective or malfunctioning part, FOB McKinney, Texas.

This warranty applies only when the product is used for consumer use within the United States and is installed and used in accordance with all applicable national, state and local codes, regulations and laws.

The owner's responsibility is for normal maintenance, servicer's travel and labor charges.

This warranty shall not apply if the product has been subjected to unreasonable use, negligence, accident in transit, alteration, improper installation or misapplication.

FISHER shall not be liable for any default or delay in performance under this warranty caused by any contingency beyond its control, including without limitation, war, government restrictions or restraint, strikes, fire, flood, or a short or reduced supply of raw material.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN SET FORTH ABOVE. ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THE EXPRESS WARRANTIES SET FORTH ABOVE. LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER THIS WARRANTY IS EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

FISHER CONTROLS COMPANY

McKinney Division

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