

CERTIFICATE OF APPROVAL No 5/6D/25

This is to certify that the patterns of the

Epex M7 (Lubricating Oil) Flowmeter

submitted by Engineering Products Pty Ltd,
418 Burnley Street,
Burnley, Victoria, 3121,

have been approved under the Weights and Measures (Patterns of Instruments) Regulations as being suitable for use for trade.

Date of Approval: 16 April 1975

The patterns are described in Technical Schedule No 5/6D/25, and in drawings and specifications lodged with the Commission.

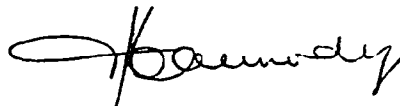
The approval is subject to review on or after 1 April 1980.

All instruments conforming to this approval shall be marked with the approval number "NSC No 5/6D/25".

Approval is granted on condition that:

1. The flow rate is limited to a maximum of 75 litres per minute.
2. The maximum system pressure is limited to 555 kPa.
3. The pump suction operates under a positive liquid head.
4. The liquids measured are limited to viscosities between 60 and 1400 mm²/s.

Signed



Executive Officer

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NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6D/25

Pattern: Epex M7 (Lubricating Oil) Flowmeter

Submitter: Engineering Products Pty Ltd,
418 Burnley Street,
Burnley, Victoria, 3121.

Date of Approval: 16 April 1975

Conditions of Approval:

1. The flow rate is to be limited to a maximum of 75 litres per minute.
2. The maximum system pressure is to be limited to 555 kPa.
3. The pump suction is to operate under a positive liquid head.
4. The liquids measured are to be limited to viscosities between 60 and 1400 mm²/s.
5. All instruments conforming to this approval shall be marked "NSC No 5/6D/25".

Description:

The pattern (see Figures 1 and 2) is a vehicle-mounted instrument for the delivery of liquid petroleum (lubricating oil) of viscosities between 60 and 1400 mm²/s at a maximum flow rate of 75 litres per minute and a maximum system pressure at no-flow of 555 kPa.

The flowmeter comprises the following:

1. Positive displacement pump mounted on the assembly at a point lower than the minimum height of the liquid in the supply tank. The pump by-pass is set so that the maximum non-flow pressure is 555 kPa.
2. Float switch (see Figures 3 and 4) -- the float mounted in the bottom of the tank operates a pneumatic valve to stop the pump motor when a low liquid level is reached, thus preventing air being metered due to an empty tank.

3. Liquid Controls M7 meter (see Figure 2).
4. Zero-start Veeder-Root 1558 indicator with the aperture over the first element widened to show two numbered graduation lines (see Figure 2). The first element indicates 10 litres for each revolution.
5. Preset stop and cut-off valve (see Figure 2).
6. Non-return valve.
7. Hose -- up to 20 metres of 1 1/4-inch bore Nylex hose mounted on a hose reel.
8. Anti-drain valve (see Figure 5) -- an anti-drain valve and swivel coupling is fitted on the end of the hose. The anti-drain valve retains a pressure of not less than 55 kPa (8 psi).
9. Nozzle -- any nozzle fitted with an anti-drain valve which retains a pressure of not less than 5 kPa (1 psi) and which is located downstream of the main nozzle valve, may be used.
10. Marking -- an instrument data plate sealed to the instrument is marked "approved for lubricating oil only".
11. Sealing -- the meter and the instrument data plate are sealed with a lead-plug seal (see Figure 2).

The approval includes the following:

1. The flowmeter as a fixed installation.
2. With a zero-start Veeder-Root 1624 indicator (see Figure 6).
3. With or without the preset stop and cut-off valve.

Special Tests:

1. The instrument should be tested with the liquid for which it will be used and which is marked on the instrument data plate.
2. Hose dilation

An indication of the hose-dilation quantity may be obtained by the following method:

With the pump stopped and the hose unwound from the reel, open the nozzle to reduce the hose pressure to the anti-drain valve retaining pressure of about 55 kPa (8 psi). Then zero the indicator, start the pump and, after allowing not less than 30 seconds for the hose to fully dilate, read the quantity on the indicator. This quantity is equal to the hose dilation and should not exceed 1,5 litres.

3. Variation of quantity in nozzle

If the integral anti-drain valve in the nozzle is not fitted or is not operating, the quantity of liquid contained in the nozzle and its fittings between the external anti-drain valve and the main nozzle valve will be an additional non flow-dependent error for which no allowance has been made in the calculation of minimum delivery.

The efficiency of the integral anti-drain valve may be determined by the following method:

Start the pump, open and close the main nozzle valve, stop the pump, through the drain plug reduce the hose pressure to less than 55 kPa and then open the nozzle main valve. There should be no significant draining from the nozzle if the integral anti-drain valve is satisfactory.

4. Non flow-dependent errors

(a) Hose dilation -- a hose-dilation error of up to 1,5 litres may be caused by the maximum pressure change of 500 kPa (70 psi), that is, the pressure change from anti-drain valve pressure to no-flow pump pressure; and

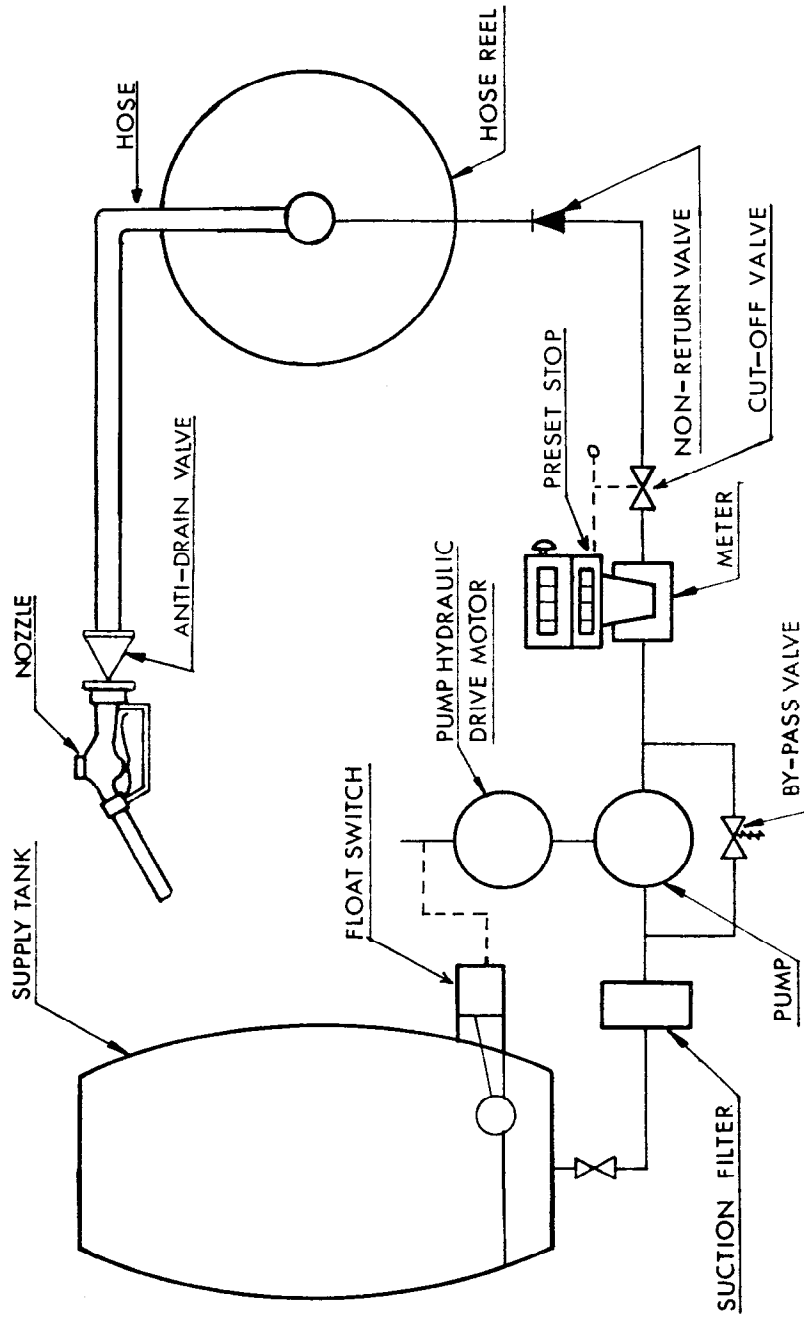
(b) an indication error of 0,2 litre.

The minimum delivery for which the relative error from all sources, including the 1,5-litre non flow-dependent error, would not exceed 1,5% is 140 litres.

5. Float switch

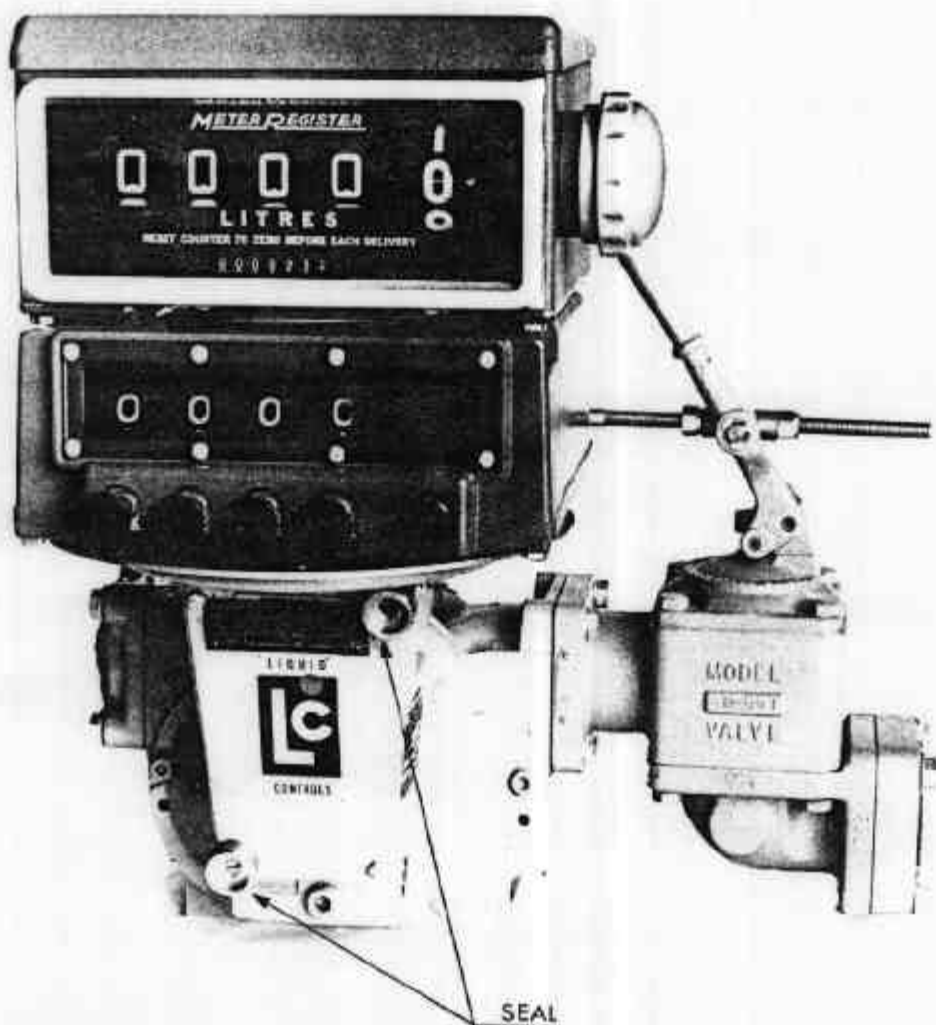
The operation of the float switch may be checked by commencing a delivery with only a small amount of liquid in the supply tank; the pump should be stopped during the delivery by the float switch being activated as the level of liquid falls. It will be necessary to switch the pump off, refill the supply tank, and restart the pump to finish the delivery into the proving measure.

FIGURE 5/6D/25 - 1



Liquid Controls M7 Flowmeter

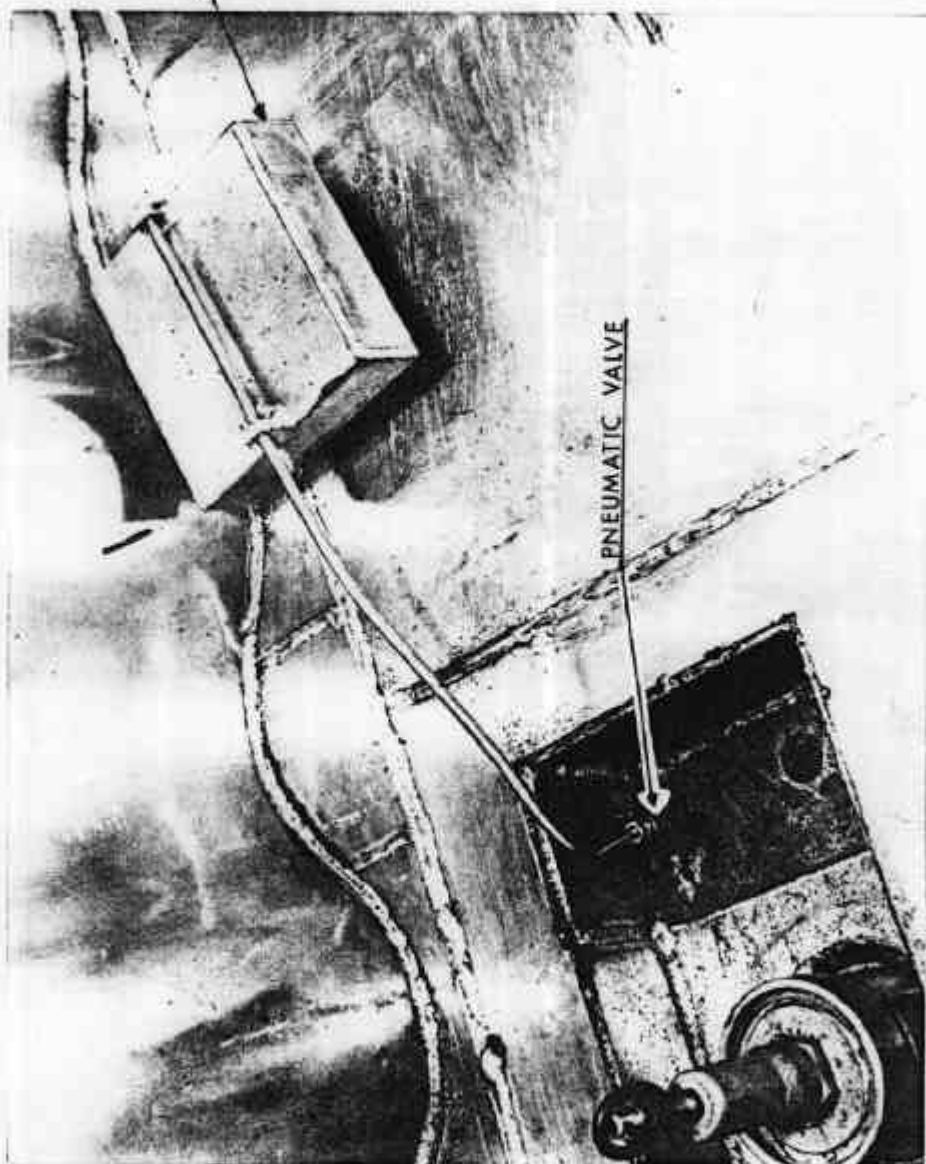
FIGURE 5/6D/25 - 2



Liquid Controls M7 Meter, Preset,
Cut-off Valve and VR 1558 Indicator

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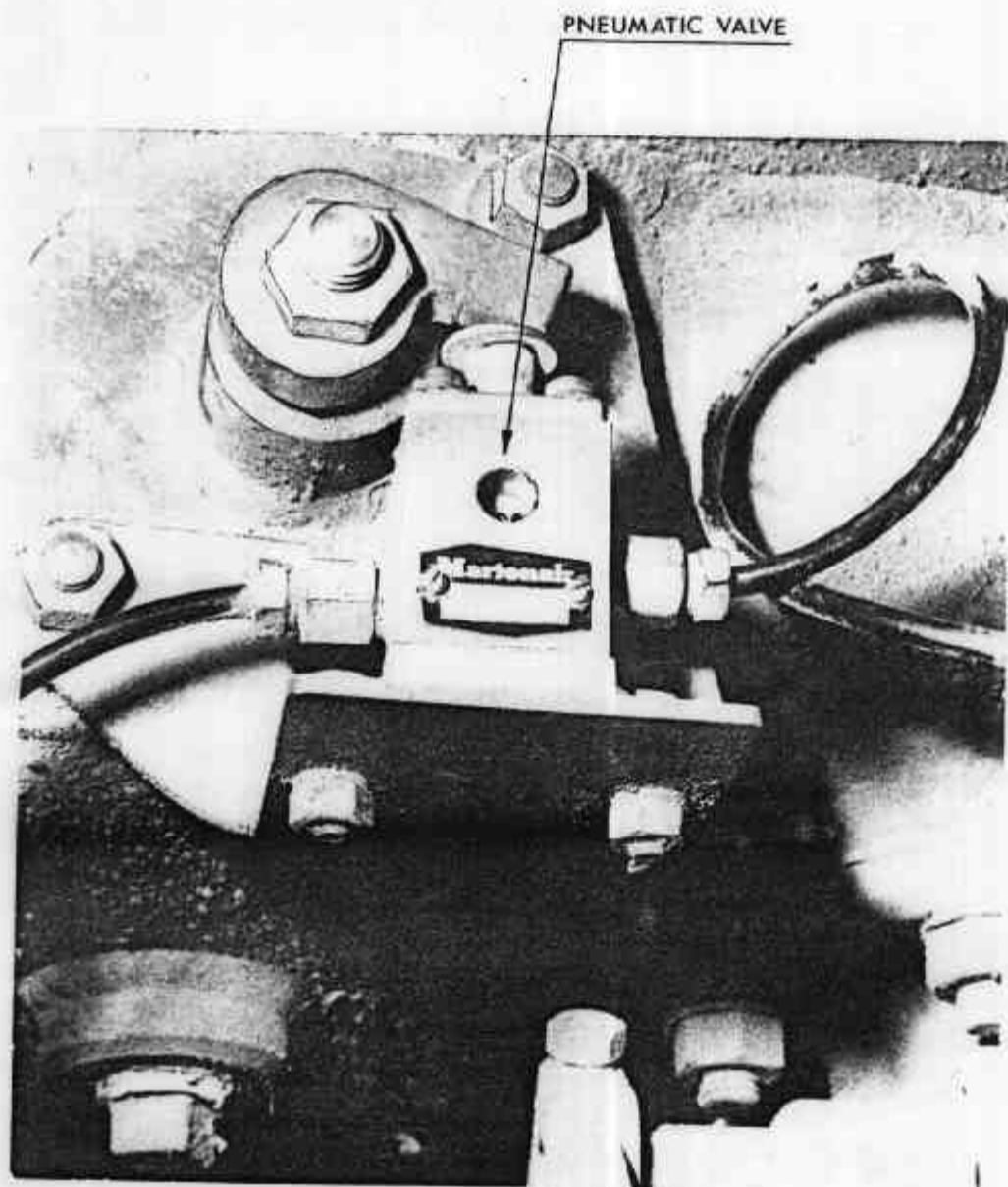
FIGURE 5/6D/25 - 3



Low-level Float Switch — Inside Tank

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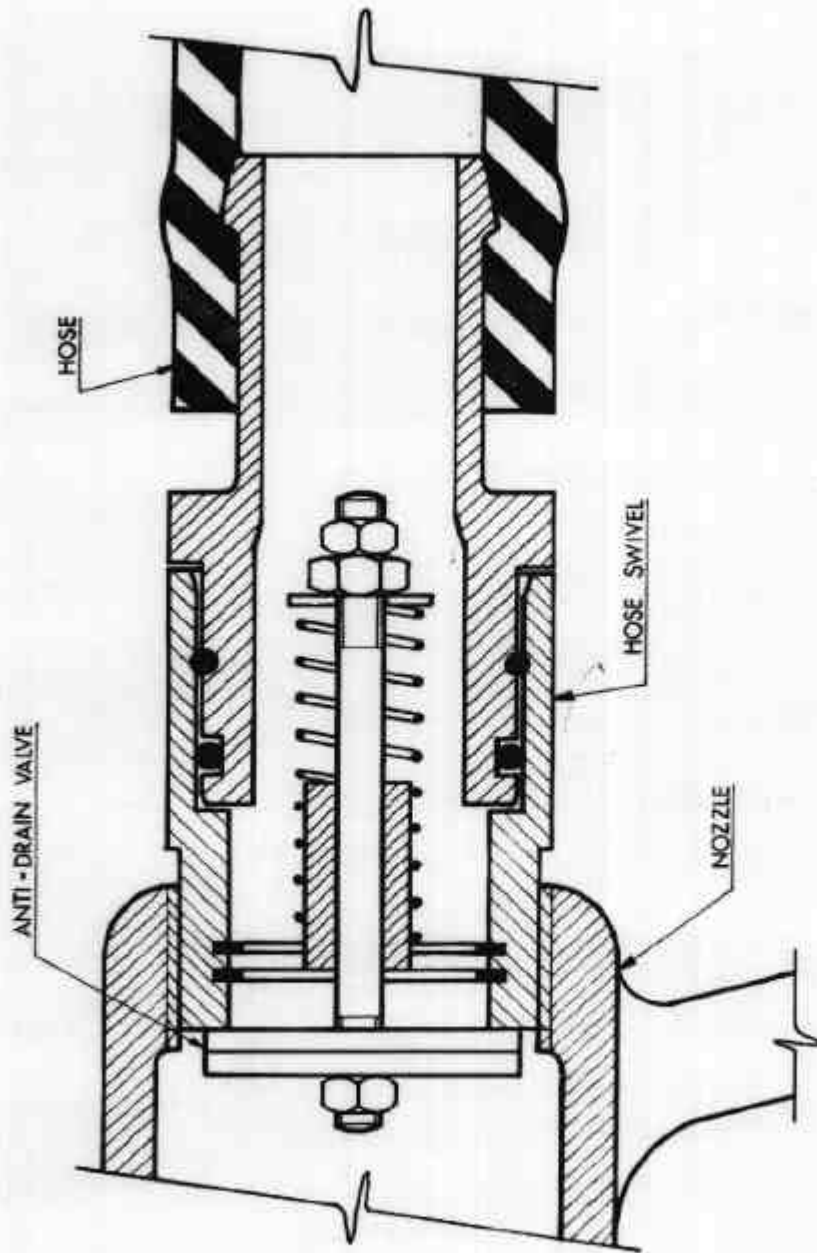
FIGURE 5/6D/25 - 4



Pneumatic Valve of Low-level Float Switch --
Outside Tank

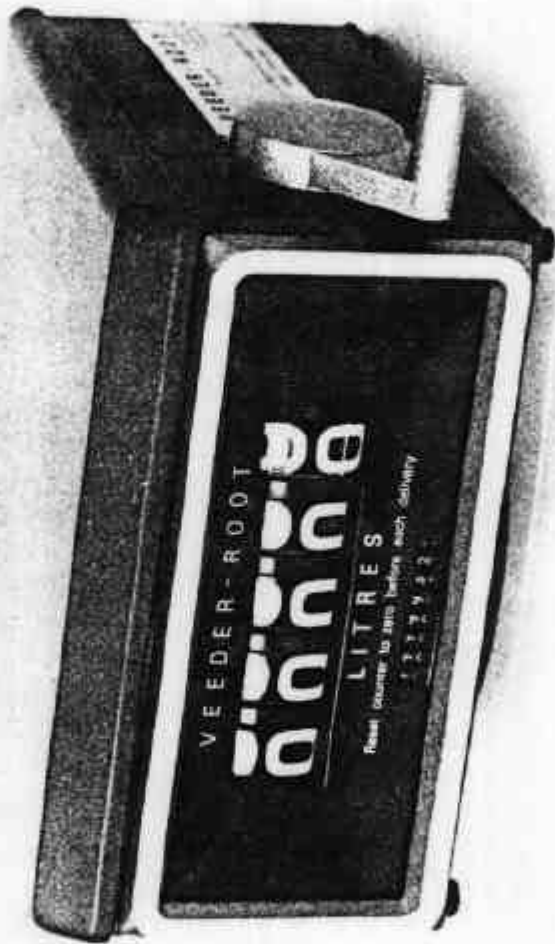
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FIGURE 5/6D/25 -- 5



Anti-drain Valve and Swivel Coupling -- Schematic Diagram

FIGURE 5/6D/25 - 6



Veeder-Root 1624 Indicator