



CANCELLED

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6B/24

Pattern: Epex M7 (Agents' Vehicle) 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 230 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 1 and 5 mm²/s only.
5. The liquid for which the instrument is calibrated is to be nominated on the instrument data plate.
6. All instruments conforming to this approval shall be marked "NSC No 5/6B/24".

Description:

The pattern (see Figure 1) is a vehicle-mounted instrument for the delivery of liquid petroleum of viscosity between 1 and 5 mm²/s at a maximum flow rate of 230 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 supply pipe from the tank to the pump slopes downward to the pump. The pump by-pass is set so that the maximum no-flow system pressure is 500 kPa.

2. Liquid Controls E.1-42100 gas separator (see Figure 2).
3. Liquid Controls M7 meter (see Figure 2).
4. Zero-start indicator and ticket printer (see Figures 2 and 3), which comprise a Veeder-Root 1558 indicator (UK) or 169100 or 169200 (USA) and Model KE 1630 ticket printer modified for single-handle reset by fitting a chain drive. The ticket printer has 1-litre increments and the indicator has 0,1-litre graduations; the right-hand indicator wheel has 100 graduations, of which each tenth graduation is numbered from 0 to 9.
5. Non-return valve (see Figure 4).
6. Hose — up to 20 metres of 1¼-inch bore Nylex hose mounted on a hose reel.
7. 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).
8. Nozzle — any nozzle, fitted with an integral 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.
9. Marking — an instrument data plate sealed to the instrument is marked "approved for heating oil only", "approved for kerosene only", or specifically with the name of a similar liquid petroleum product within the viscosity range of 1 and 5 mm²/s.
10. Sealing — the following parts of the system are sealed:
 - (a) meter, and
 - (b) the instrument data plate.

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 a zero-start Veeder-Root 1558 indicator. The aperture through which the right-hand indicator wheel is viewed is widened as illustrated in Figure 2.
4. With a zero-start Veeder-Root 7085 single-handle reset indicator and ticket printer (see Figure 7). The ticket printer has 1-litre increments and the right-hand wheel of the indicator indicates a quantity of 10 litres for each revolution.
5. With a preset stop and cut-off valve (see Figure 8).

Special Tests:

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

Minimum Delivery:

1. The non flow-dependent errors are up to:
 - (a) 1-litre rounding error for a ticket printer with 1-litre increments;
 - (b) 0,2-litre reading error for an indicator which has the right-hand wheel indicating 10 litres per revolution;
 - (c) 1,5-litre hose-dilation error; and
 - (d) 1,0-litre gas-purging error.
2. For a delivery other than that which empties the supply tank, the minimum delivery for which the relative error from all sources would not exceed 1,5% is:
 - (a) 210 litres when a ticket printer is fitted; and
 - (b) 150 litres when only an indicator is fitted.
3. For a delivery which empties the supply tank, the minimum delivery for which the relative error from all sources, including the

gas-purging error of 1 litre, would not exceed 2%* is:

- (a) 210 litres when a ticket printer is fitted; and
- (b) 160 litres when only an indicator is fitted.

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 pressure in the hose 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.

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:

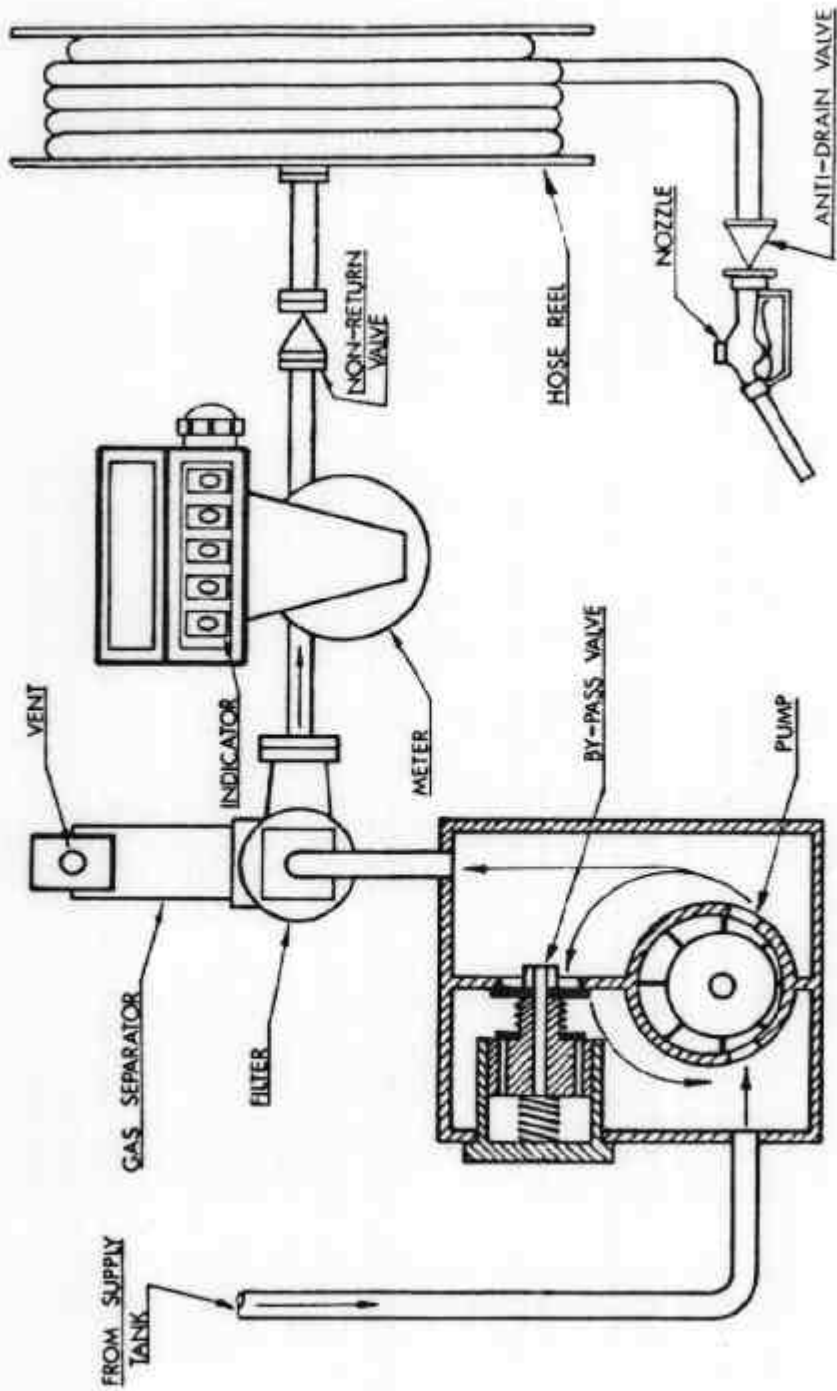
Start the pump, open and close the main nozzle valve, stop the pump, through the drain plug reduce the hose pressure to less than 55 kPa and then open the nozzle main valve. There should be no significant draining from the nozzle if the integral anti-drain valve is satisfactory.

Gas Purging:

The effect of gas on the quantity delivered should not exceed 1,0 litre when a delivery is interrupted due to the supply tank running dry, and the delivery continued by, for example, changing supply tanks. To test gas purging it will be necessary to allow the supply tank to empty during a test delivery, to stop the pump, and to refill or change the supply tank to allow the delivery into the proving measure to be completed.

* This includes the 0,5% error permitted for gas separation.

FIGURE 5/6B/24 - 1



15/5/75

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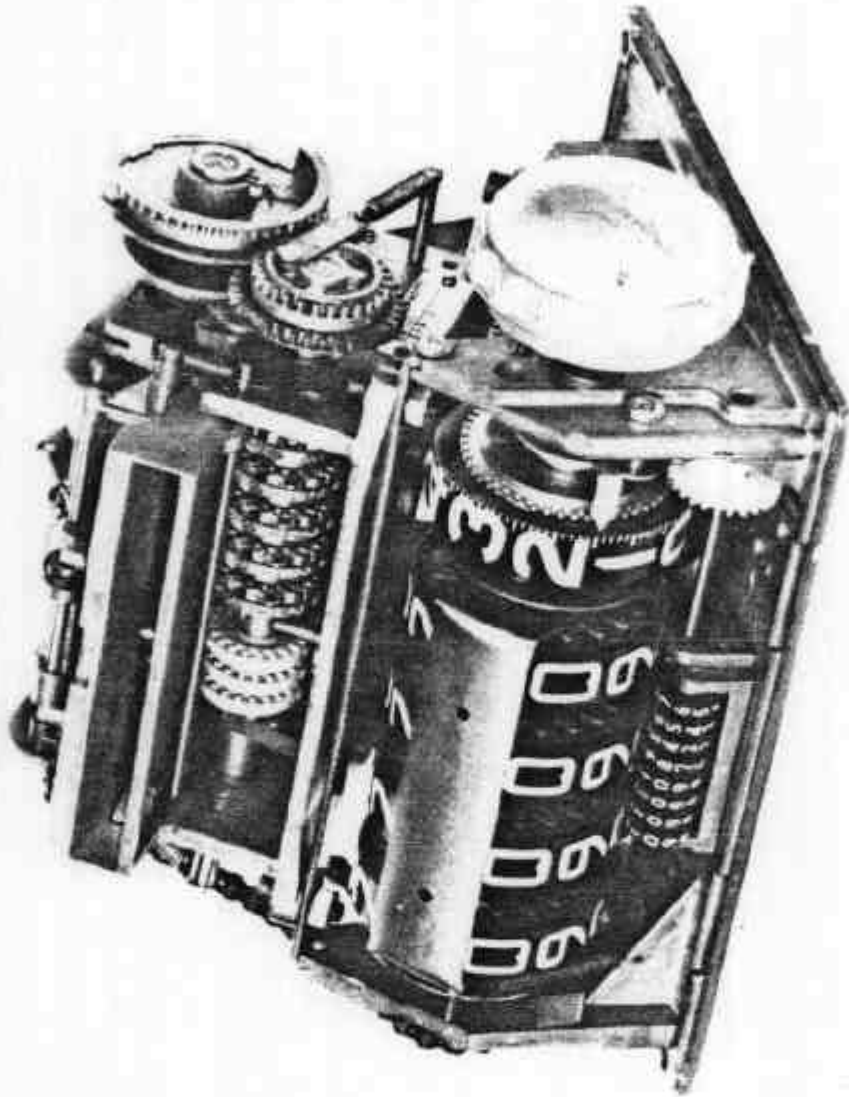
FIGURE 5/6B/24 - 2



Liquid Controls Meter, Gas Separator, Indicator and Ticket Printer

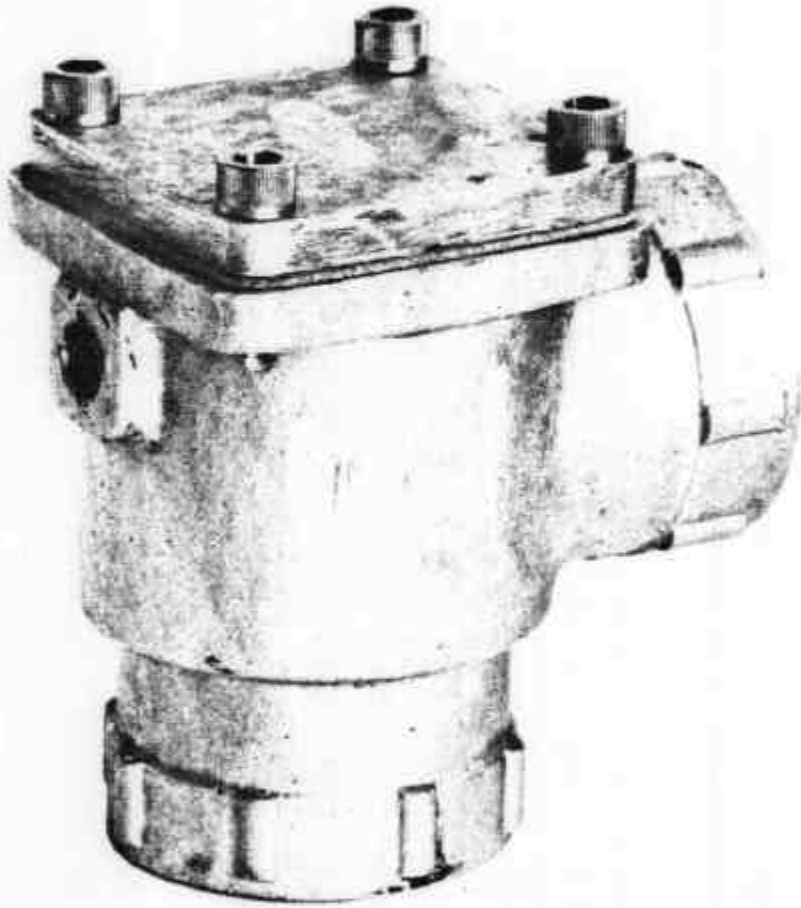
15/5/75

FIGURE 5/6B/24 - 3



Veeder-Root Indicator and Ticket Printer (modified for single-handle reset)

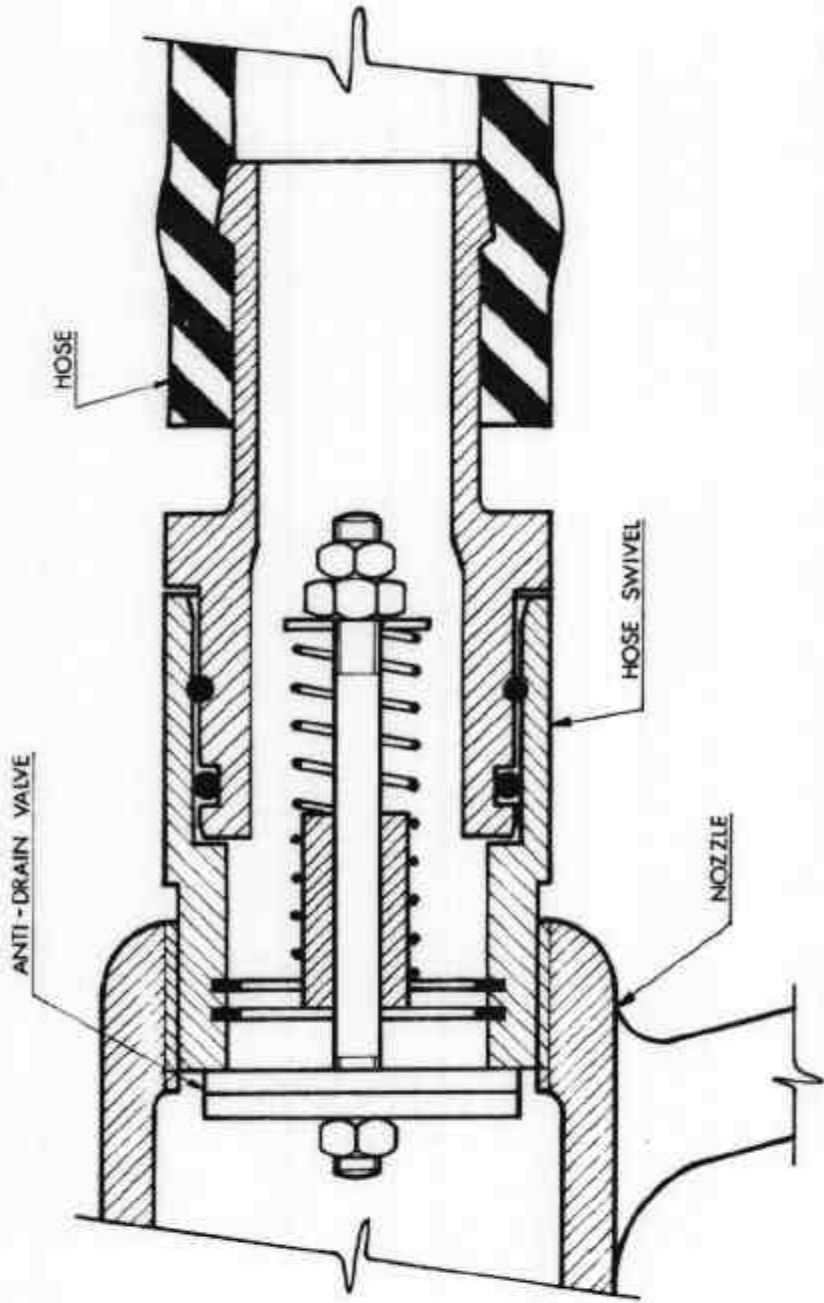
FIGURE 5/6B/24 - 4



Non-return Valve

15/5/75

FIGURE 5/6B/24 - 5



Anti-drain Valve and Swivel Coupling — Schematic Diagram



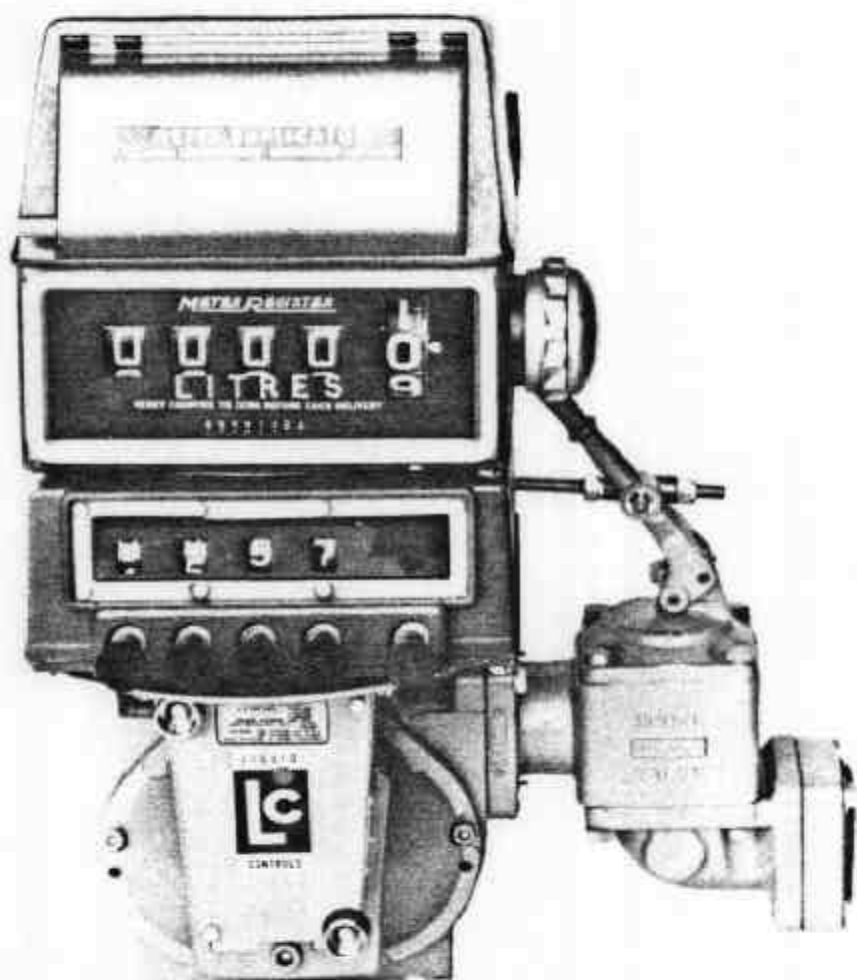
Veeder-Root 1624 Indicator

FIGURE 5/6B/24 - 7



Veeder-Root 7085 Ticket Printer and Indicator

FIGURE 5/6B/24 - 8



Preset Stop and Cut-off Valve

15/5/75