

CERTIFICATE OF APPROVAL No 5/6L/2

This is to certify that the patterns of the
Wayne Flowmeter (Pipeline) with "E" or "F" Series Meters
submitted by Wayne Pumps Australia Pty Ltd,
29 Anzac Highway,
Keswick, South Australia, 5035,

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

Date of Approval: 9 November 1977

The patterns are described in Technical Schedule No 5/6L/2, and in
drawings and specifications lodged with the Commission.

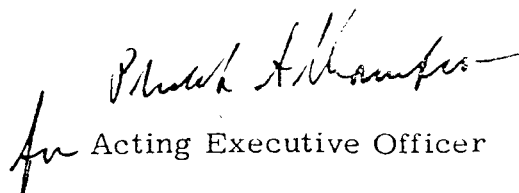
The approval is subject to review on or after 1 December 1979.

All instruments conforming to this approval shall be marked with the
approval number "NSC No 5/6L/2".

Approval is granted on condition that:

1. The maximum flow rate is a flow rate between 800 and 1600 L/min, "E"
Series meters and between 1125 and 2250 L/min "F" Series meters, when
the liquid for which the instrument is verified has a viscosity of more than
3 mPa.s at 20°C. The minimum flow rate is 20% of the maximum flow
rate achievable with a particular instrument.
2. The flow rate is a fixed flow rate $\pm 10\%$ between 600 and 1600 L/min
"E" Series meters and between 900 and 2250 L/min "F" Series meters
when the liquid for which the instrument is verified has a viscosity of
less than 3 mPa.s at 20°C. The minimum flow rate is 20% of the
maximum flow rate achievable with a particular instrument.
3. The viscosity of the liquid measured is between 0,4 and 200 mPa.s.
4. The liquid (commercial or technical name) for which the instrument is
verified is nominated on the instrument data plate.
5. The pump suction operates under a positive liquid head.
6. The supply tank is of sufficient capacity to ensure that the liquid in the
tank does not fall to a level at which air could be drawn into the pump,
or a device is fitted to prevent the level of the liquid falling to a level
at which air could be drawn into the pump.
7. The measured liquid does not have free gas entrained with or in it.

Signed


for Acting Executive Officer

12/6/78



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6L/2

Pattern: Wayne Flowmeter (Pipeline) with E or F Series Meters.

Submittor: Wayne Pumps Australia Pty. Ltd,
29 Anzac Highway,
Keswick, South Australia, 5035.

Date of Approval: 9 November 1977.

Conditions of Approval:

1. The maximum flow rate is: a flow rate between 800 and 1600 L/min "E" Series meters and between 1125 and 2250 L/min "F" series meters, when the liquid for which the instrument is verified has a viscosity of more than 3 mPa.s at 20°C. The minimum flowrate is 20% of the maximum flowrate achievable with a particular instrument.
2. The flow rate is a fixed flow rate, $\pm 10\%$, between 600 and 1600 L/min "E" Series meters and between 900 and 2250 L/min "F" Series meters when the liquid for which the instrument is verified has a viscosity of less than 3 mPa.s at 20°C. ~~The minimum flowrate is 20% of the maximum flowrate achievable with a particular instrument.~~
3. The viscosity of the liquid measured is between 0,4 and 200 mPa.s.
4. The liquid (commercial or technical name) for which the instrument is verified is nominated on the instrument data plate.
5. The pump suction operates under a positive liquid head.
6. The supply tank is of sufficient capacity to ensure that the liquid in the tank does not fall to a level at which air could be drawn into the pump, or a device is fitted to prevent the level of the liquid falling to a level at which air could be drawn into the pump.
7. The measured liquid does not have free gas entrained with or in it.

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All instruments conforming to this approval shall be marked "NSC No 5/6L/2".

Description:

The pattern (see Figure 1) is a flooded-suction pipeline flowmeter.

The flowmeter comprises the following:

1. Supply tank.
2. Pump - a positive or non-positive displacement pump, mounted lower than the minimum height of the liquid in the supply tank. The supply pipe from the tank has a continuous fall to the pump. Provision is made for a pressure gauge to be connected to the suction side of the pump. The pump is for the exclusive use of the flowmeter, that is, without alternative outputs; alternatively the flowmeter flow rate stays within the appropriate flow-rate range for all combinations of alternative uses of the output from the pump.
3. Non-return valve in the pipe between the pump and the meter or an arrangement of the components and piping to keep the system full of liquid at all times.
4. Gas purger - a gas purger and strainer may be fitted.*
5. A. O. Smith 75-mm "E" Series meter or 100-mm "F" Series meter (see Figures 2 and 3).
6. Veeder-Root 7085 zero-start single-handle reset indicator and ticket printer (see Figure 2). The ticket printer has 10-litre increments and the indicator has a 10-litre scale interval; the first element is marked with ten scale-mark lines numbered from 00 to 90. The aperture through which the first element is viewed is widened in

* The gas purger and strainer is not a part of the measuring instrument examined and approved by the Commission; its inclusion is approved by the Commission only on the basis that it may be used as a strainer and/or to minimize possible damage to the meter in the event of a breakdown or other incident permitting free gas in the supply pipe upstream of the meter.

in the direction of travel.

- 7. Outlet-control valve - located downstream from the meter with no intermediate offtake. It is followed by an anti-drain valve which retains a pressure of not less than 55 kPa, or incorporated in an arrangement of piping which ensures that the meter and delivery pipe do not drain.

When the liquid for which the meter is verified has a viscosity less than 3 mPa.s at 20°C, the outlet-control valve is not of a type which can be used as a flow-control device (throttling valve).

The anti-drain valve if fitted or, if not fitted the outlet-control valve, is the point at which the delivery occurs.

- 8. Sealing -
 - (a) the meter-calibration cover and the indicator attachment-mounting bolts are sealed with a sealing wire, the ends of which are terminated beneath a fixed lead-plug seal (see Figure 4); and
 - (b) a data plate marked:
 - (i) "verified for...x...", x being the name of the specific liquid for which the instrument is verified;* and

* The approval for each of the following liquids is based upon the liquid having a viscosity within the range specified for temperatures of 5°C to 40°C, taking into account the variations in the viscosity of each product which occur with the output from a single refinery or between different refineries and at different times throughout each year:

<u>Specific liquid</u> ¹	<u>Permitted viscosity range</u>
Petrols	0,4 to 0,7 mPa.s
Kerosene ²	0,6 to 2,2 mPa.s
Heating oil ³	1,1 to 4,0 mPa.s
Diesel fuel	1,7 to 8,3 mPa.s
..... ⁴	8,3 to 200 mPa.s

- Note: ¹ A known trade abbreviation of the name of the liquid is acceptable.
² "Kerosene" includes white spirits and aviation turbine fuel.
³ Petrol, kerosene and heating oil have a viscosity of less than 3 mPa.s at 20°C.
⁴ Name of liquid petroleum to be inserted.

(ii) "maximum flow rate...y...L/min", y being between 800 and 1600 L/min "E" Series meter or 1125 and 2250 L/min "F" Series meter, if the liquid for which the instrument is verified has a viscosity of more than 3 mPa.s at 20°C, or

(iii) "flow rate...z...L/min", z being a fixed flow rate between 600 and 1600 L/min "E" Series meter, or 900 and 2250 L/min "F" Series meter, if the liquid for which the instrument is verified has a viscosity of less than 3 mPa.s at 20°C,

is attached to the instrument either by the above sealing wire or by a lead-plug seal (see Figure 4).

The approval includes the following:

1. A Veeder-Root 1624 zero-start indicator with a scale interval of 10 litres; the first element is marked with ten scale-mark lines numbered from 00 to 90 (see Figure 3).
2. A Veeder-Root 7084 single-handle reset accumulative ticket printer and zero-start indicator. The ticket printer has 10-litre increments and the indicator has a 10-litre scale interval; the first element is marked with ten scale-mark lines numbered in increments of 10 from 00 to 90. The aperture through which the first element is viewed is widened in the direction of travel.
3. An A. O. Smith 343-30 preset counter* and preset-counter operated outlet-control valve (see Figures 5 and 6). The counter may cause the outlet-control valve to close in two stages. The preset-counter attachment bolts are sealed similarly to the indicator attachment bolts. The sealing is illustrated in Figure 4.

* The preset counter is not a part of the measuring instrument examined and approved by the Commission; its inclusion is approved by the Commission only on the basis that it facilitates the measurement of a set quantity of liquid and its use does not affect the performance of the measuring instrument.

4. Pulse-transmitter unit, Type PE-SX, D or E (see Figure 7), which provides quantity output pulses to peripheral devices which are not a part of the measuring instrument.*
These devices, which may only be provided with the authorisation of the Weights and Measures Authority of the State, may, for example, print or store and process the data, etc. The attachment bolts of the pulse generator are sealed similarly to the indicator attachment bolts. Provision is made to seal the outputs of the pulse-transmitter units to prevent the addition of peripheral equipment, or to seal peripheral equipment to the output.
The use of such peripheral equipment will not affect the operation of the flowmeter.
5. A rigid extension drive from the meter to the indicator and ticket printer, in which case, separate seals are provided for the meter and the indicator and ticket printer.

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. The test liquid should be at a temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
2. If a device is fitted to prevent the level of the liquid in the supply tank falling to the level of the pump, at least one delivery should occur during which the device stops the delivery. It will be necessary to refill the supply tank to finish the delivery into the proving measure. The effect on the quantity delivered should not exceed 1% of the minimum delivery.
3. Minimum delivery - the minimum delivery will be 2000 litres when an accumulative ticket printer is fitted, 1000 litres when a zero-start ticket printer is fitted, and 200 litres when only an indicator is fitted.
4. Flow rate -
 - (i) If the pump has alternative outputs, check that the meter flow rate stays within the approved flow-rate range for all combinations of alternative uses of the output from the pump, that is, 5 : 1 flow-rate range if the liquid has a viscosity above 3 mPa.s at 20°C , and the marked fixed flow rate $\pm 10\%$ if the liquid has a viscosity of less than 3 mPa.s at 20°C .

* The measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, control the measurement, and indicate the result of the measurement.

- (ii) If the liquid for which the meter is verified has a viscosity of less than 3 mPa.s at 20°C, check that the outlet-control valve is not able to be readily used to vary the flow rate.
- 5. Positive head - a pressure gauge fitted to the inlet side of the pump should indicate a positive head at all flow rates.
- 6. Test delivery - if the test delivery is less than 10 times the minimum delivery, inspectors should ensure that the non-flow-dependent error (reading error of the indicator or rounding error of the ticket printer) is minimised by making the delivery end at a graduation line.

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NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6L/2

CHANGE No 1

The description of the

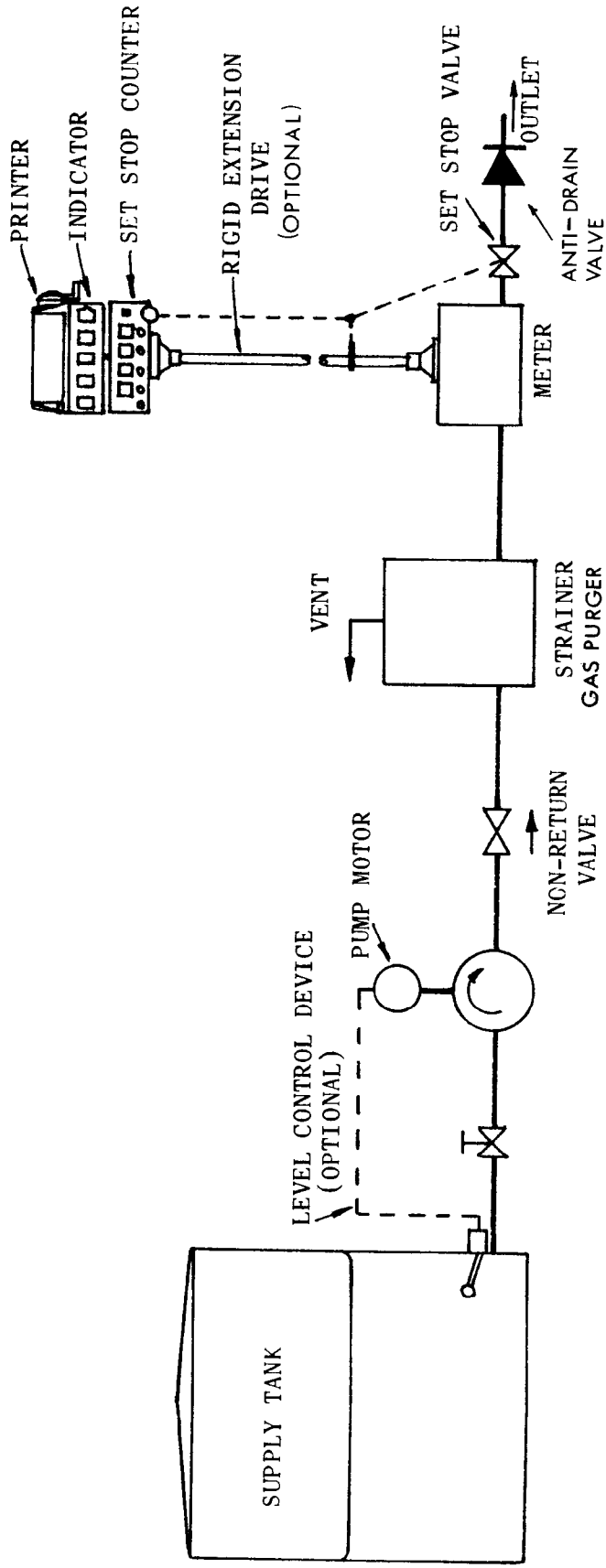
Wayne Flowmeter (Pipeline) with E or F Series Meters

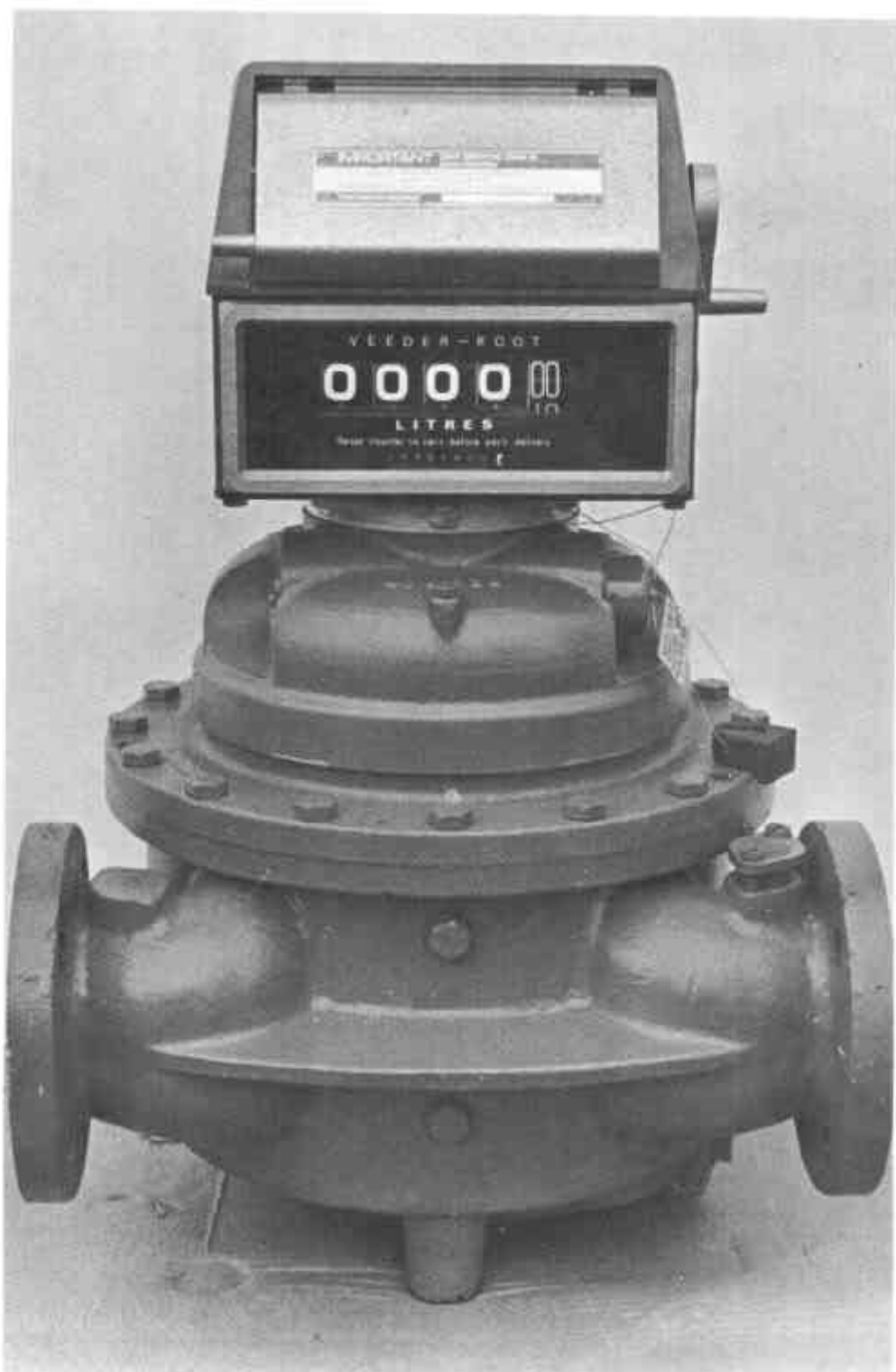
given in Technical Schedule No 5/6L/2 issued on 12/6/78
is altered as follows:

In paragraph 2, Conditions of Approval delete
the last sentence (The minimum flow rate, etc.).

11/4/80

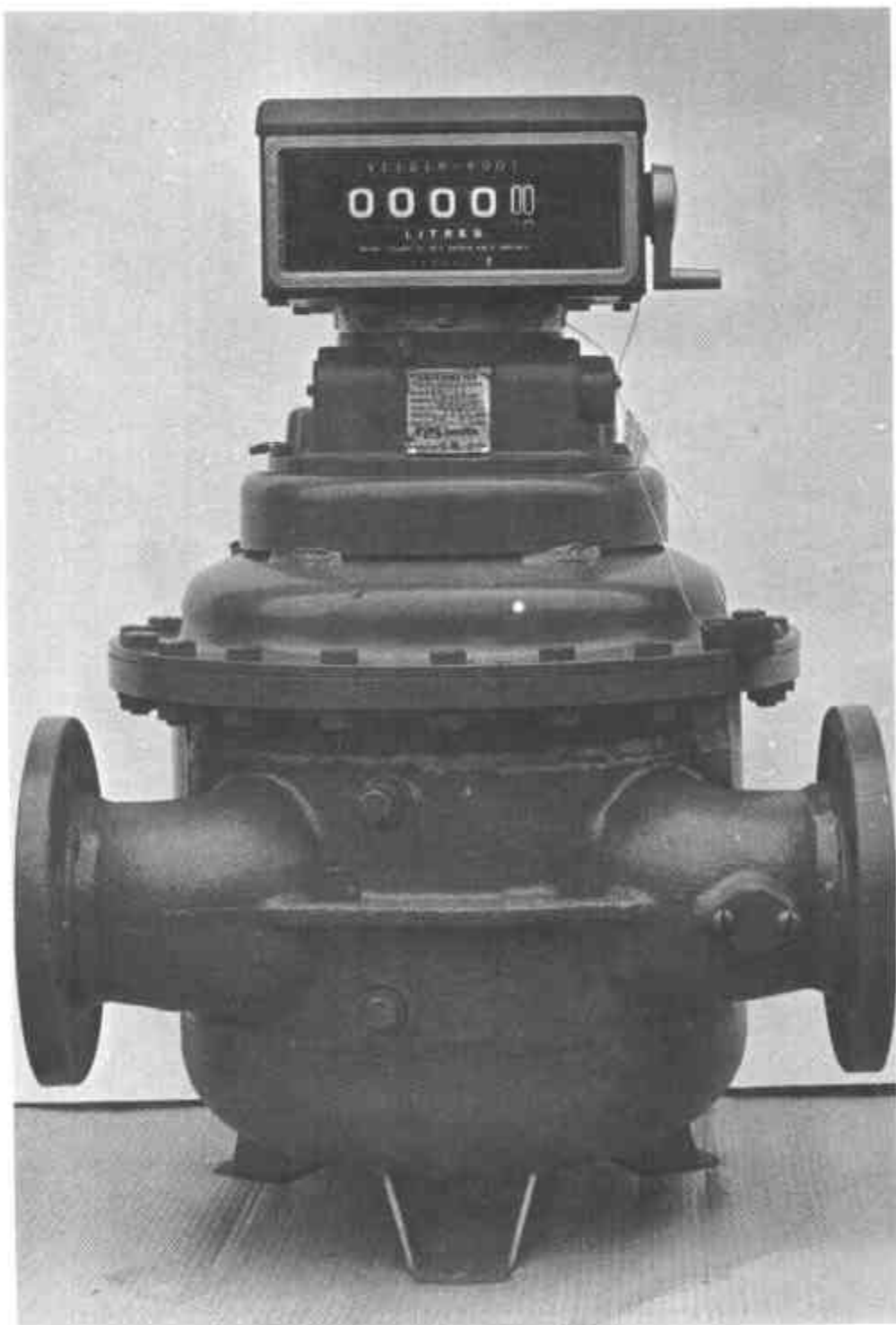
FIGURE 5/6L/2 - 1





Wayne 75-mm "E" Series Meter with
Veeder-Root 7085 Indicator and Ticket Printer

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Wayne 100-mm "F" Series Meter with
Veeder-Root 1624 Indicator

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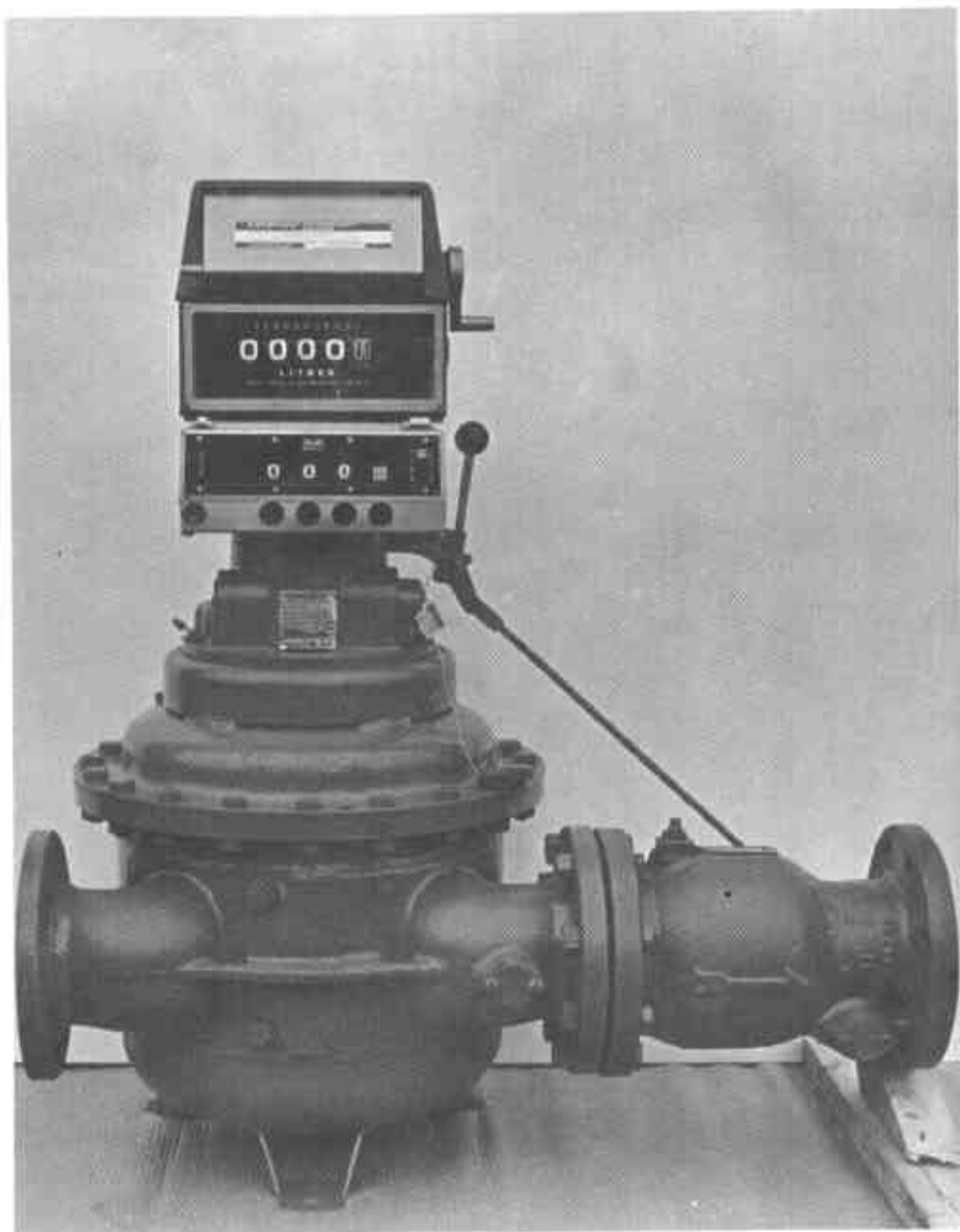
Meter and Data Plate Sealing

(Note: Data plate may be fixed in position by a set screw to prevent vibration and the sealing wire passed through it, or fixed by a lead-plug seal).

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Wayne 75-mm "E" Series Meter with Preset Counter
12/6/78 Veeder-Root 7085 Indicator and Ticket Printer and
Outlet Control Valve.



Wayne 100-mm "F" Series Meter with Preset Counter,
12/6/78 Veeder-Root 7085 Indicator and Ticket Printer and
Outlet Control Valve.

FIGURE 5/6L/2 - 7



PE-SX TRANSMITTER



'D' TRANSMITTER



'E' TRANSMITTER

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Pulse Transmitter - PE - SX, D, and E.
(Method of sealing not illustrated)