

# National Standards Commission



## Certificate of Approval

**No 5/6A/68A**

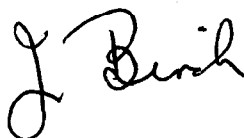
Issued under Regulation 9  
of the  
National Measurement (Patterns of Instruments) Regulations

This is to certify that an approval for use for trade has been granted in respect of the

Production Engineering Empec-80 Series Driveway Flowmeters

submitted by    Production Engineering (Aust) Pty Ltd  
                         270 Pacific Highway  
                         CROWS NEST    NSW    2065.

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.



### CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/9/92.

This approval expires in respect of new instruments on 1/9/93.

Instruments purporting to comply with this approval shall be marked NSC No 5/6A/68A and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the drawings and specifications lodged with the Commission and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with the Commission's Document 106.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

**Special:** for variant 2.

Only existing instruments shall be modified by variant 2; new instruments shall not be manufactured incorporating the modification described in the Technical Schedule dated 10/7/91.

### DESCRIPTIVE ADVICE

**Pattern:** approved 4/8/87

. Production Engineering Empec-80 series driveway flowmeters.

**Variant:** approved 4/8/87

1. Starpec series driveway flowmeters.

Technical Schedule No 5/6A/68A describes the pattern and variant 1.

**Variant:** approved 12/3/91

2. With increased values of unit price.

Technical Schedule No 5/6A/68A Variation No 1 describes variant 2.

FILING ADVICE

Certificate of Approval No 5/6A/68A dated 24/9/87 is superseded by this Certificate and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 5/6A/68A dated 10/7/91  
Technical Schedule No 5/6A/68A dated 24/9/87 (incl. Table 1)  
Technical Schedule No 5/6A/68A Variation No 1 dated 10/7/91  
Test Procedure No 5/6A/68A dated 24/9/87  
Figures 1 to 7 dated 24/9/87



# NATIONAL STANDARDS COMMISSION

## TECHNICAL SCHEDULE No 5/6A/68A

Pattern: Production Engineering Empec-80 Series Driveway Flowmeters

Submitter: Production Engineering Co Ltd  
Station Road  
Marton New Zealand

### 1. Description of Pattern

The Empec-80 series driveway flowmeters (Figures 1 to 3) are approved for the delivery of petrol at flow rates between 15 and 55 L/min. The Empec-80D is a dual flowmeter comprising two sets of the Empec-80 model hydraulics in one housing (Figure 4).

Both models are approved for use in either attendant-operated mode or with the Micro-M self-serve system (as described in the documentation of NSC approval No S231).

#### 1.1 Components

The component parts of each driveway flowmeter are listed in Table 1 and comprise:

- (a) An Avery-Hardoll model PP2142 positive displacement rotary pump incorporating a gas separator with integral float chamber and non-return valve.
- (b) A gas separator test valve.
- (c) An Avery-Hardoll model PM400 meter (Figure 5).
- (d) Solenoid valves - two electrically-operated solenoid valves are located downstream of the meter. The valves prevent liquid passing through the meter before the indicator has reset to zero, and stop liquid flow for preset deliveries. When the main valve is closed the flow rate is reduced to less than 15 L/min for up to 10 seconds; the smaller valve, when closed, stops liquid flow.
- (e) Any Commission-approved driveway flowmeter nozzle may be used.
- (f) A pump interlock - the starting lever prevents the spout of the nozzle being inserted into the hang-up without generating a signal which causes the pump motor to stop and the solenoid valve to close. After three to six seconds the slow-flow solenoid valve will reopen to prevent excessive hose pressure which can occur if the temperature of the liquid in the hose rises.  
  
When the nozzle is removed from the hang-up, the pump motor will start and the solenoid valve will close, preventing liquid flow until the indicator is reset to zero.
- (g) A Production Engineering model 42020 pulse generator - driven from the meter output shaft providing two separate pulse outputs to the indicator.

(h) Production Engineering model 42221 electronic driveway flowmeter indicator (Figure 6). The unit price is set on three thumb-wheel switches on the bottom of the indicator unit. The indicators are liquid-crystal reflective digital displays with three digits for unit price and five digits each for total price and volume. Each time the nozzle is removed from its hang-up, a display check is initiated.

Volume	up to 999.99 L in 0.01 L increments
Price	up to \$999.99 in 1c increments
Unit price	up to 99.9 c/L in 0.1c increments
Totaliser	up to 9999999 L in 1 L increments

A preset keyboard and liquid-crystal display are provided on the side of the indicator unit (Figure 6).

### 1.2 Markings

Instruments are marked with the following data, together in one location:

Manufacturer's name or mark	
Serial number	
Model number	
NSC approval number	NSC No 5/6A/68A
Maximum flow rate	..... L/min
Minimum flow rate	..... L/min
Liquid temperature range	5°C to 40°C
Maximum operating pressure	..... kPa
Approved for use with (product/s)	.....

### 1.3 Sealing

Provision is made for sealing the totaliser, the indicator, the meter calibration and the gas separator test valve.

### 1.4 Verification

Provision is made for a verification mark to be applied.

## 2. Description of Variant 1

Production Engineering models Starpec 6301 H(AH) and Starpec 6301 P(AH) (Figure 7) approved for delivering petrol or kerosene at flow rates between 15 and 50 L/min.

Both models are fitted with hose masts and the model 6301 P(AH) is fitted with a preset control valve and purchaser preset panel and display.

Their hydraulics are similar to those used in the Empec 80 driveway flowmeters approved as the pattern and they are fitted with Retron 80 electronic indicators (as described in the documentation of NSC approval No S101A).

TABLE 1

Components	Driveway Flowmeter Models			
	EMPEC-80	EMPEC-80D	6301H(AH)	6301P(AH)
Pump, gas separator - AH PP 2142	*	*	*	*
Gas separator test valve	*	*	*	*
Meter - AH PM 400	*	*	*	*
Solenoid valve(s) - Asco " " - Bestobel B20VX	*	*		*
Sight glass - 75003	*	*		
Hose " and hose mast	*	*	*	*
Pump interlock - starting lever	*	*		
Nozzle hang-up - switching linkage, 85208			*	*
Pulse-generator unit - 42020	*	*		
Electronic indicator - 42221 " " - Retron 80, TP80.045	*	*	*	*
Preset keyboard/display - 85013	*	*		*
Starpec frame - 85100			*	*

COMPONENT TABLE



## NATIONAL STANDARDS COMMISSION

### TEST PROCEDURE No 5/6A/68A

Instruments should be tested in accordance with any relevant tests specified in the Inspector's Handbook.

The results shall not exceed the maximum permissible errors as specified in Document 118, 2nd Edition October 1986.

1. On self-serve systems, check that removing a nozzle from its normal hang-up position initiates a request for authorisation.
2. On instruments fitted with preset facility, check that the preset amount requested equals the delivery value displayed and is within the maximum permissible errors of the actual amount delivered.



## National Standards Commission

TECHNICAL SCHEDULE No 5/6A/68A

VARIATION No 1

**Pattern:** Production Engineering Empec-80 Series Driveway Flowmeters.

**Submitter:** Production Engineering (Aust) Pty Ltd  
270 Pacific Highway  
CROWS NEST NSW 2065.

### 1. Description of Variant 2

Instruments of the pattern and variant 1 with the model 42221 electronic indicator modified by the fitting of new firmware to enable increased values of unit price.

**NOTE:** Only existing instruments shall be modified by this variant; new instruments shall not be manufactured incorporating this modification.

**Unit price** up to 129.9 c/L in 0.1 c increments, when the flowmeter is used in attendant-operated or locally-authorised applications.

up to 199.9 c/L in 0.1 c increments, when the flowmeter is used in remotely-authorised applications.

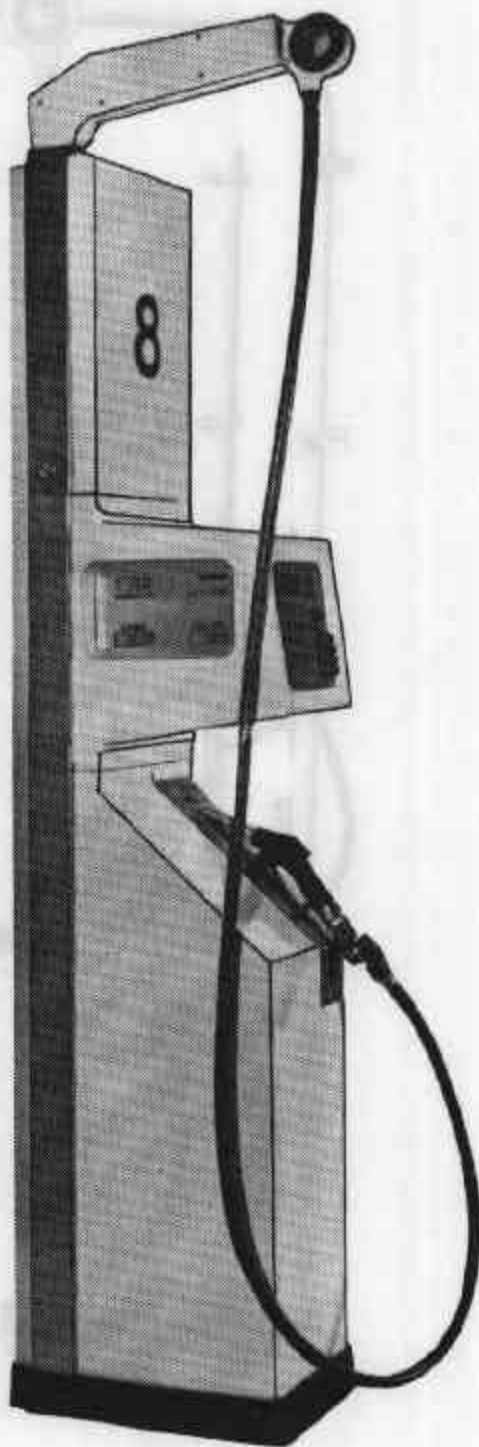
**Note:** A unit price value of 100.0 c/L is only available when the flowmeter is used in remotely-authorised applications.

The dollar digit display is enabled and disabled using a keyswitch located underneath the indicator housing.

When the flowmeter is used in remotely-authorised applications, a permanent notice shall be affixed in a prominent position on or adjacent to the control console indicating to the vendor that the auxiliary dollar digit display on each driveway flowmeter shall be correctly set using the keyswitch after each unit price change.



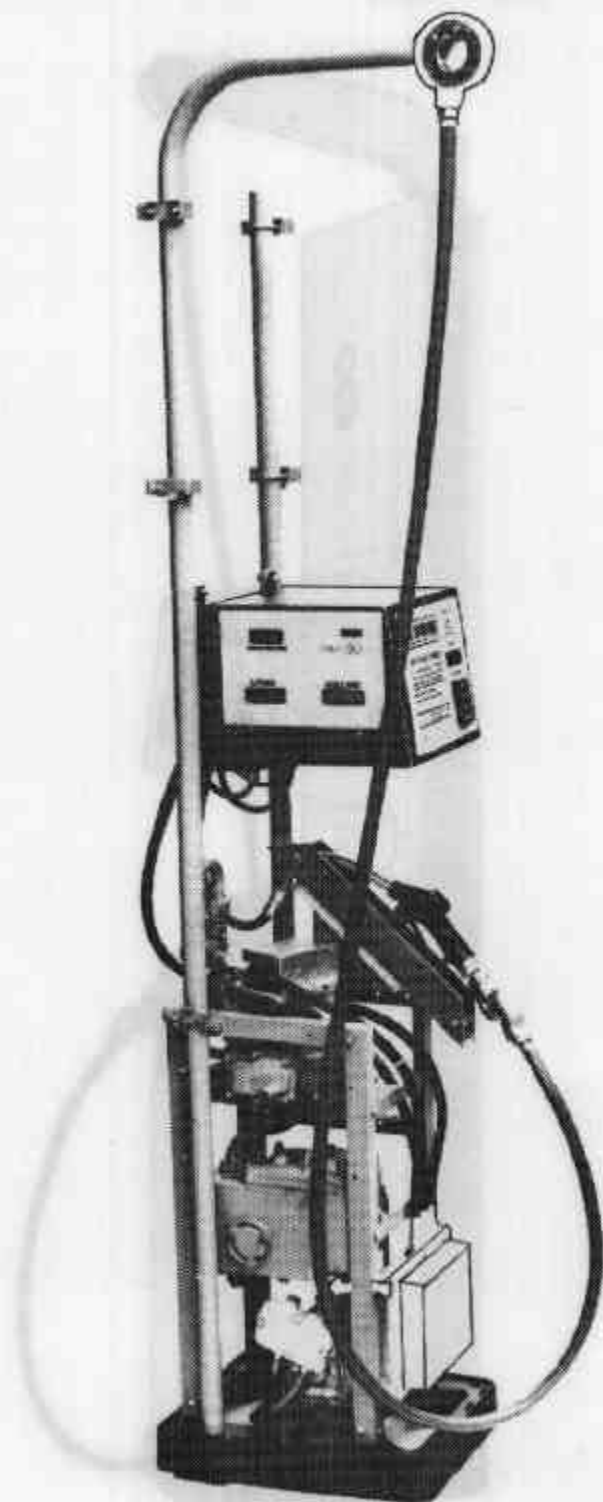
FIGURE 5/6A/68A - 1



Model Empec-80

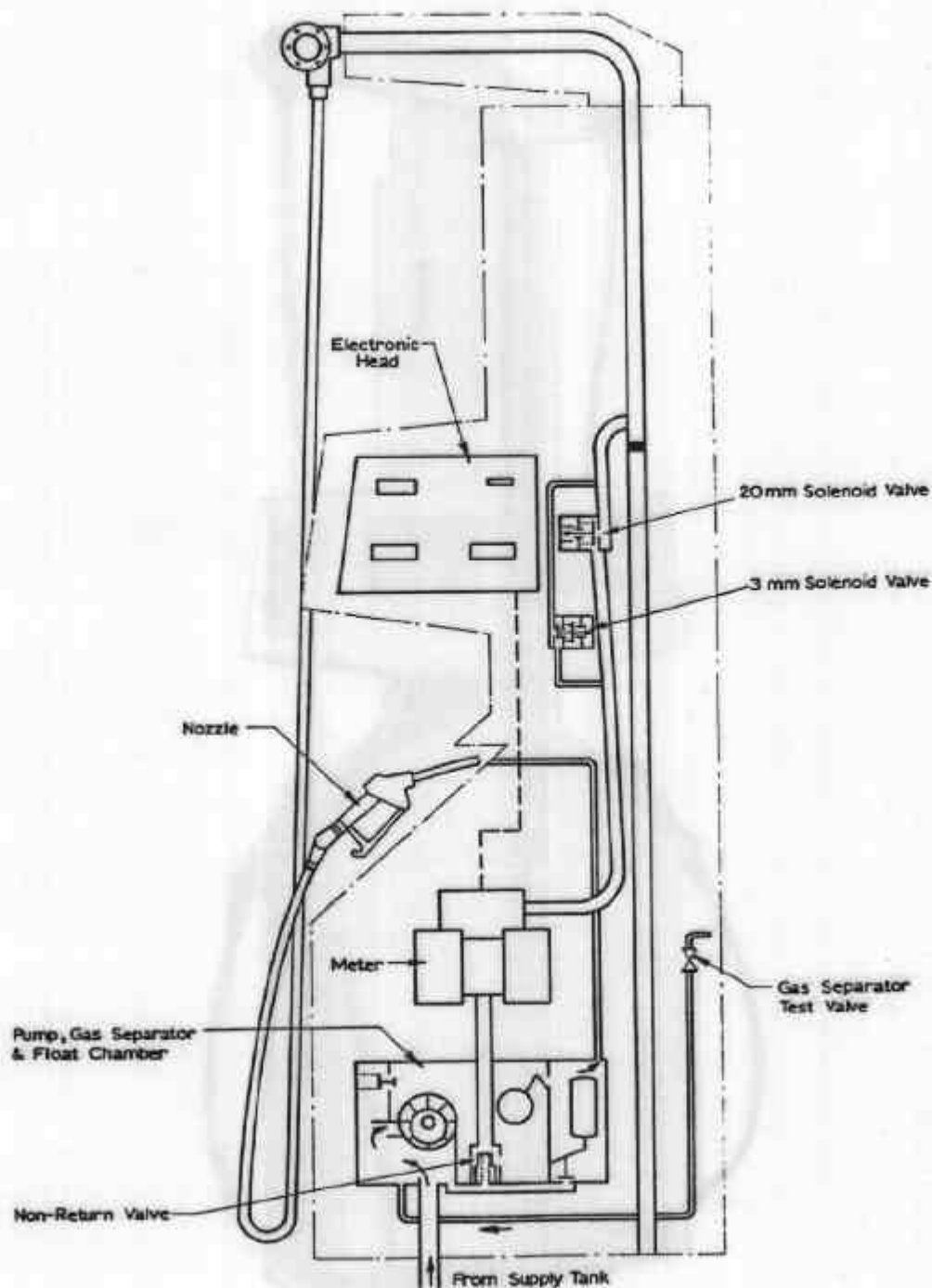
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FIGURE 5/6A/68A - 2



Model Empec-80

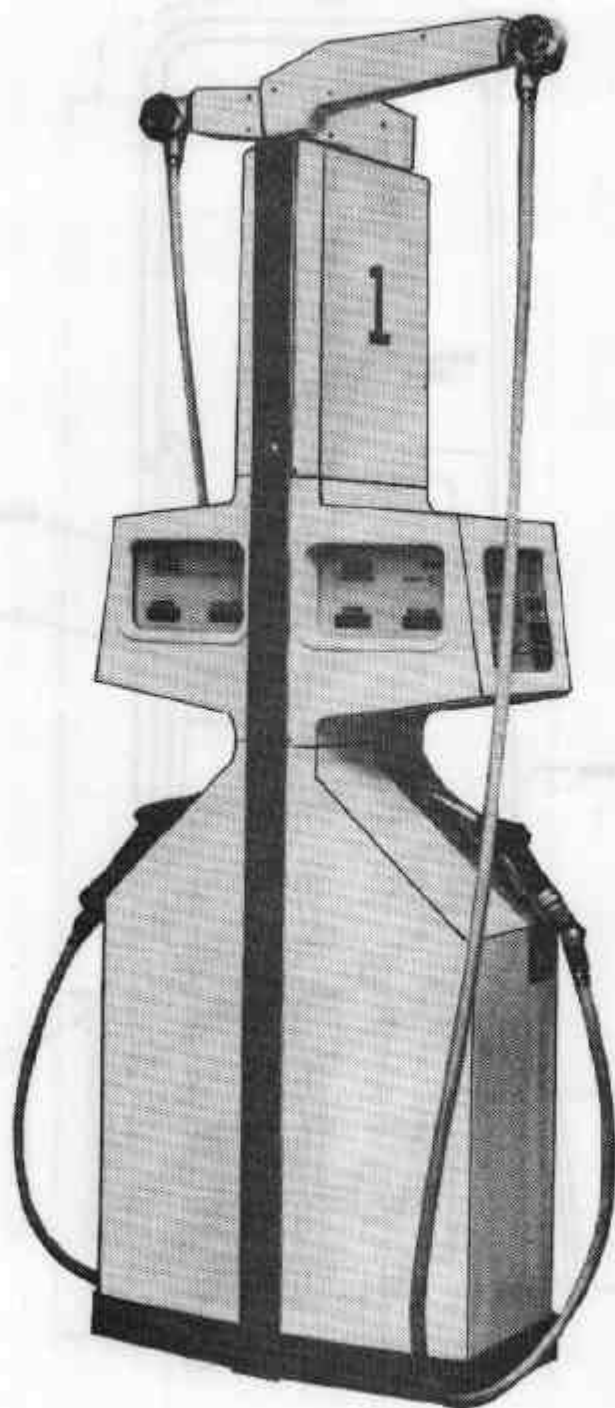
FIGURE 5/6A/68A - 3



Model Enpec-80 - Hydraulic Diagram

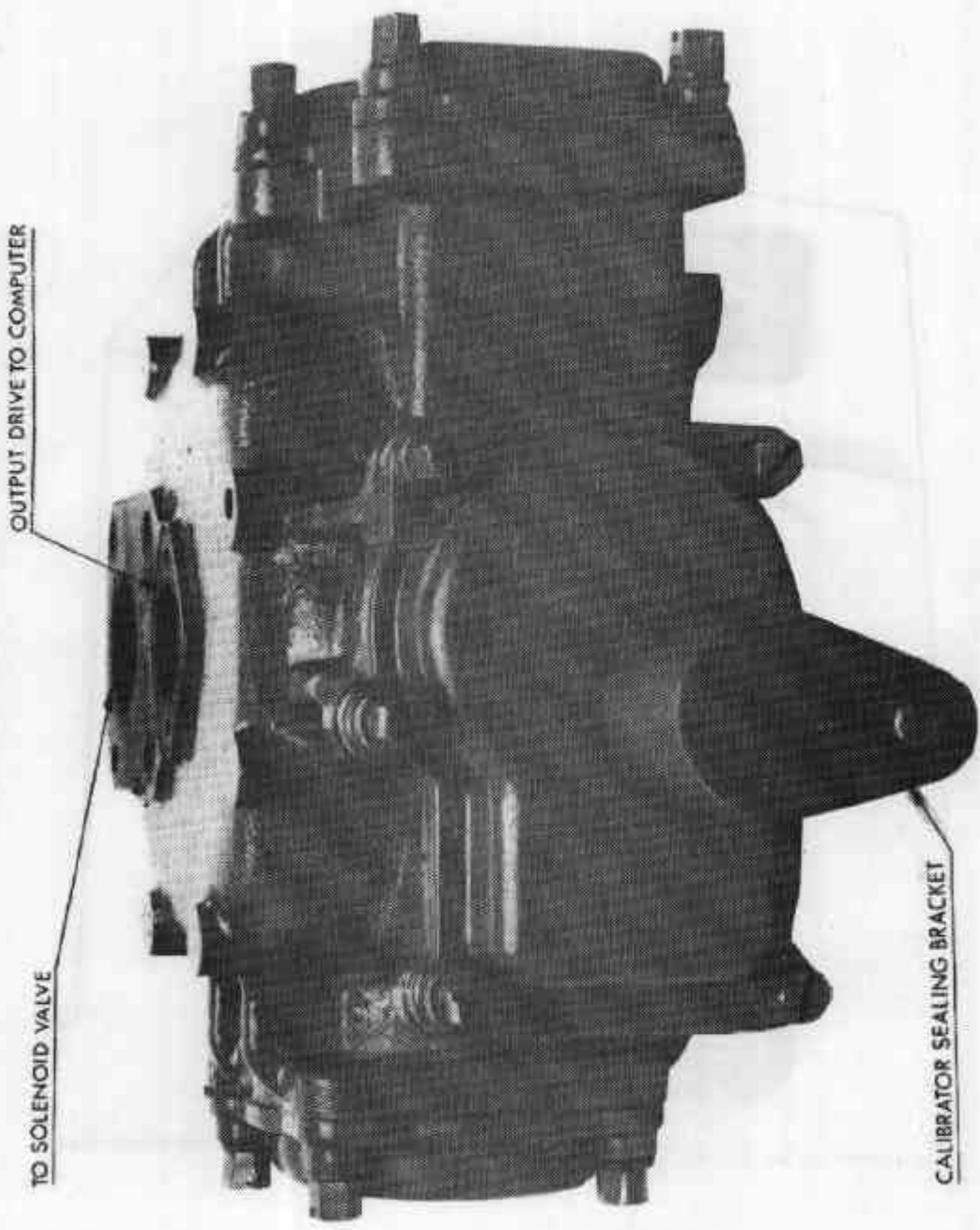
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FIGURE 5/6A/68A - 4



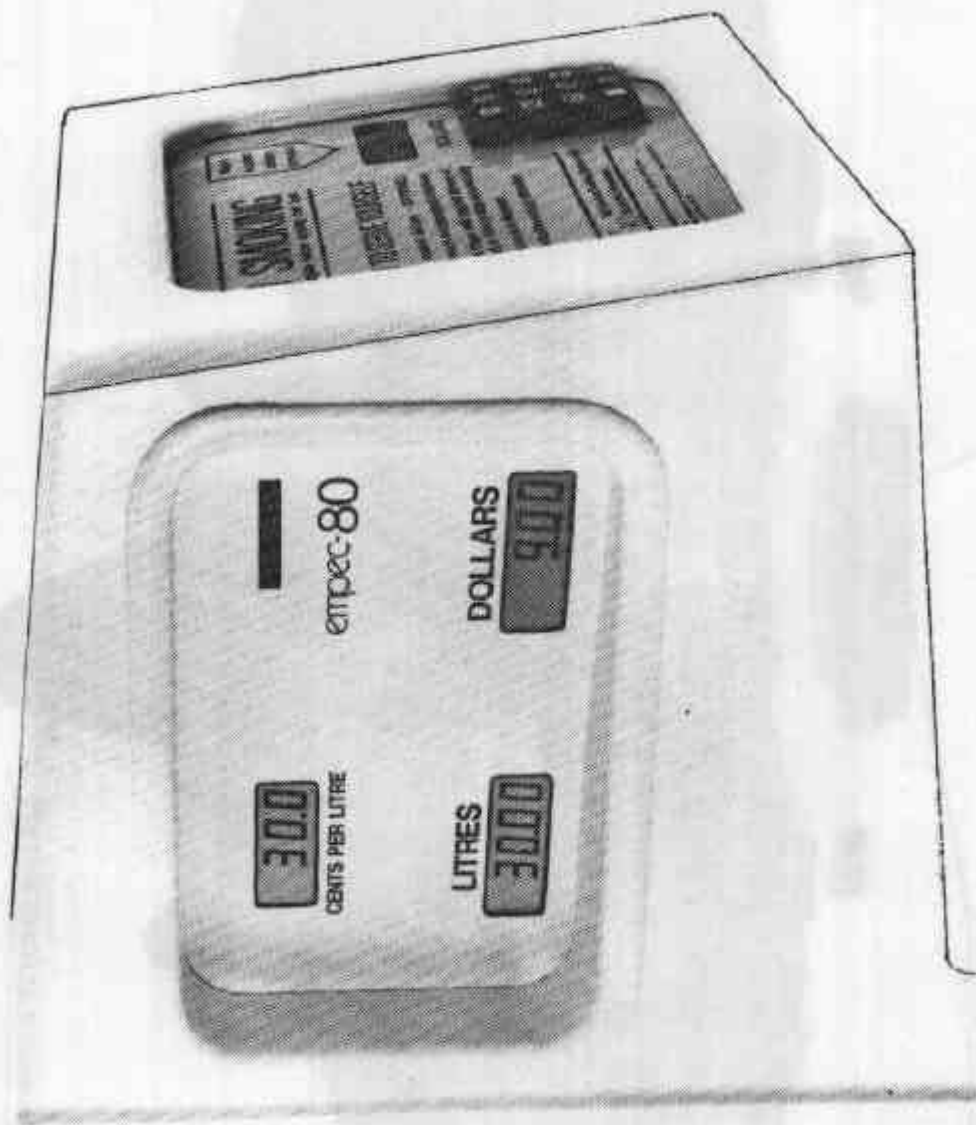
Model 1 Empec-80D

FIGURE 5/6A/68A -- 5



Avery-Hordoll PM 400 Meter

FIGURE 5/6A/68A - 6



Model 42221 Indicator Unit

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5/6A/68A  
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FIGURE 5/6A/68A - 7



Production Engineering Models 6301 H(AH) Or 6301 P(AH)