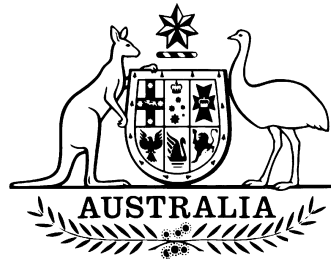


5/6A/86  
16 November 2001



## National Standards Commission

12 Lyonpark Road, North Ryde NSW

### Cancellation Certificate of Approval

**No 5/6A/86**

Issued under Regulation 60  
of the  
National Measurement Regulations 1999

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

Production Engineering Model 8601 Multi-product Driveway Flowmeter

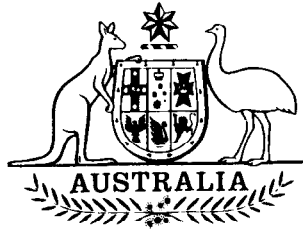
submitted by PEC (New Zealand) Ltd  
2 Station Road  
Marton New Zealand

has been cancelled in respect of new instruments as from 1 December 2001.

Signed by a person authorised under Regulation 60  
of the National Measurement Regulations 1999 to  
exercise the powers and functions of the Commission  
under this Regulation.



# National Standards Commission



## Certificate of Approval

**No 5/6A/86**

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

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

Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by        PEC (New Zealand) Ltd  
                          2 Station Road  
                          Marton        New Zealand.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

### CONDITIONS OF APPROVAL

This approval became subject to review on 1 June 1994, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 5/6A/86 and only by persons authorised by the submittor.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation 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.

Auxiliary devices used with this instrument shall be comply with the requirements of general Supplementary Certificate No S1/0/A.

#### DESCRIPTIVE ADVICE

**Pattern:** approved 15 May 1989

- Production Engineering model 8601 multi-product driveway flowmeter.

**Variant:** approved 15 May 1989

1. Other models and configurations as listed in Table 1.

**Variant:** approved 13 July 1989

2. For use with distillate.

Technical Schedule No 5/6A/86 describes the pattern and variants 1 and 2.

**Variant:** approved 22 February 1990

3. Various models of the 9000 series as listed in Table 2.

Technical Schedule No 5/6A/86 Variation No 1 describes variant 3.

**Variant:** approved 28 November 1990

4. With a submersible turbine pump hydraulic system.

Technical Schedule No 5/6A/86 Variation No 2 describes variant 4.

**VARIANT:** approved 16 June 1992

5. For use with certain Gilbarco control consoles.

Technical Schedule No 5/6A/86 Variation No 3 describes variant 5.

**VARIANT:** approved 27 August 1996

6. With pre-pressurisation facility.

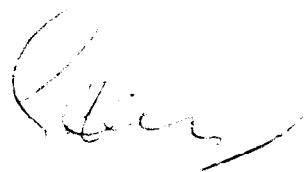
Technical Schedule No 5/6A/86 Variation No 4 describes variant 6.

#### FILING ADVICE

Certificate of Approval No 5/6A/86 dated 28 July 1992 is superseded by this Certificate and may be destroyed. The documentation for this approval now comprises:

- Certificate of Approval No 5/6A/86 dated 22 December 1996
- Technical Schedule No 5/6A/86 dated 28 August 1989 (incl. Test Procedure and Table 1)
- Technical Schedule No 5/6A/86 Variation No 1 dated 22 May 1990 (incl. Table 2)
- Technical Schedule No 5/6A/86 Variation No 2 dated 26 April 1991 (incl. Test Procedure Variation No 1)
- Technical Schedule No 5/6A/86 Variation No 3 dated 28 July 1992 (incl. Notification of Change)
- Technical Schedule No 5/6A/86 Variation No 4 dated 22 December 1996
- Figures 1 to 5 dated 28 August 1989
- Figure 6 dated 26 April 1991

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.





# NATIONAL STANDARDS COMMISSION

5/6A/86  
28/8/89

## TECHNICAL SCHEDULE No 5/6A/86

Pattern: Production Engineering Model 8601 Multi-product Driveway Flowmeter.

Submittor: Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

### 1. Description of Pattern

Production Engineering model 8601 multi-product driveway flowmeter (Figures 1 and 2, and Table 1) for dispensing various grades of petrol at maximum and minimum flowrates of 50 and 15 L/min respectively.

#### 1.1 Features

Each driveway flowmeter is equipped with six hoses (three per side) connected to Commission-approved ZVA nozzles, three Tatsuno model POS-0257 pump/gas separators and two Production Engineering model MHP price-computing indicators (one each side of the dispenser). Each side of the dispenser is marked with a dispenser number, and the indicators display:

Volume	To 999.99 L in 0.01 L increments
Unit price	To 999.9 c/L in 0.1c increments
Price	To \$999.99 in 1c increments
Total	To 9999999 L in 1 L increments or \$9999999 in \$1 increments
Preset	To \$99 in \$1 increments

The pattern is approved for use with super leaded petrol, super unleaded petrol and unleaded petrol only. A totalising indicator for each grade of petrol is incorporated at the side of the indicator cabinet and may be set to read either volume sold (litres) or amount sold (whole dollars). Fractional values from each transaction accumulate and are included in the totaliser count. The totalisers are not resettable.

Each grade of fuel is supplied by one pump and gas separation system and diverted to two sets of Tatsuno model MP-02515 meters and flow control valves (one for each nozzle) on each side of the dispenser (Figure 3 shows the hydraulic diagram of the pattern). A unit price display for each grade of fuel is located on the indicator display above each nozzle.

The indicator electronics control the switching of the pump motors. Control of the flow to each nozzle is achieved with a two-stage solenoid valve which is also under the control of the indicator electronics. Electronic encoders, which are mechanically coupled to the meters, communicate the volume of fluid measured to the indicator electronics. The optional preset facility uses the solenoid valves to slow down and cut off the flow.

The instrument may be fitted with a purchaser-operated preset control or the preset facility may be set via the vendor's console. Note: Instruments without preset facility cannot be used for PREPAY transactions

A manager's keyswitch, located on the side of the Indicator cabinet, may be used to access various management functions including operational modes and unit price setting.

### 1.2 Operational Modes

The Instrument may be used for locally or remotely-authorized operation; in the latter case, unit prices may be changed using the console i.e. central unit price setting. When used with a Production Engineering model EFPEC console (as described in NSC approval No S222), all set-up functions may be set from the console.

The Instrument may also be used in "Temporary Stand-alone Mode". This is an emergency mode, used when no deliveries can be made due to a console failure. All transaction details are at the driveway flowmeter (i.e. locally-authorized operation) and when the console fault is corrected, the driveway flowmeter automatically returns to remotely-authorized operation.

### 1.3 Markings

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

Manufacturer's name or mark	
Model number	
Serial number	
NSC approval number	5/6A/86
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 (products)	.....

### 1.4 Sealing and Verification Provision

Provision is made for the application of a verification mark. Provision is made for the meter calibration to be sealed.

## 2. Description of Variants

### 2.1 Variant 1

Various models of the 8000 and 7000 series as listed in Table 1. Figure 4 shows the model 7401.

### 2.2 Variant 2

Various models as listed in Table 1 (\*) for use with distillate, in which case a gas detection system is fitted. Figure 5 shows a typical system.

TABLE 1

Model	Configuration
8601, 8602(*), 7601, 7602(*)	6 Hose, 3 Product
8401, 8402(*), 7401, 7402(*)	4 Hose, 2 Product
8201, 8202(*), 7201, 7202(*)	2 Hose, 1 Product

\* - These models are approved for use with distillate.



TEST PROCEDURE No 5/6A/86

Instruments should be tested in conjunction with any tests specified in the documentation for the console (where used) and in accordance with any relevant tests specified in the Inspector's Handbook. The results should not exceed the maximum permissible errors specified in Document 118, 2nd Edition October 1986.

1. Check that removing a nozzle from its normal hang-up position initiates a request for authorisation or indication of delivery on remotely-authorised systems.  
  
(The EFPEC control console allows for both compulsory and automatic authorisation. When EFPEC is in automatic authorisation mode the driveway flowmeter does not request authorisation but gives an indication of the commencement of delivery.)
2. Check that selection/authorisation of a nozzle causes the following sequence:
  - (I) All other nozzles on that side of the flowmeter are disabled;
  - (II) The price and volume displays reset to zero and the unit price displays on the main indicator shows the unit price for the grade of fuel corresponding to the nozzle selected;
  - (III) The pump motor starts and a delivery may then be made.
3. 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.



5/6A/86  
22/5/90

# National Standards Commission

## TECHNICAL SCHEDULE No 5/6A/86

### VARIATION No 1

**Pattern:** Production Engineering Model 8601 Multi-product Driveway Flowmeter.

**Submitter:** Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

#### 1. Description of Variant 3

Various models of the Production Engineering 9000 series multi-product driveway flowmeters as listed in Table 2.

A gas detection system is mandatory where the flow rate exceeds 55 L/min, or for products other than petrol.

TABLE 2

MODEL	HOSES	MAXIMUM FLOW RATE	DISTILLATE	PRESET	PUMP UNITS
9101H	1	STD	NO	NO	1
9101P	1	STD	NO	YES	1
9102H	1	STD	YES	NO	1
9102P	1	STD	YES	YES	1
9121H	1	HIGH	NO	NO	1
9121P	1	HIGH	NO	YES	1
9122H	1	HIGH	YES	NO	1
9122P	1	HIGH	YES	YES	1
9201H	2	STD	NO	NO	1
9201P	2	STD	NO	YES	1
9202H	2	STD	YES	NO	1
9202P	2	STD	YES	YES	1
9221H	2	HIGH	NO	NO	2
9221P	2	HIGH	NO	YES	2
9222H	2	HIGH	YES	NO	2
9222P	2	HIGH	YES	YES	2

Note: Maximum flow rates - STD = 35 - 45 L/min

- HIGH = 65 L/min

Approved Models - 9000 Series





## National Standards Commission

TECHNICAL SCHEDULE No 5/6A/86

VARIATION No 2

**Pattern:** Production Engineering Model 8601 Multi-product Driveway Flowmeter.

**Submitter:** Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

### 1. Description of Variant 4

With a submersible turbine pump hydraulic system replacing the equivalent components (i.e. motor, pump, gas separator, and associated pipework) in any driveway flowmeter covered by this approval (Figure 6).

The replacement hydraulic system includes a Red Jacket model P75S3-3 or model P150S3-3 (or Gilbarco model T221X or model T122W) submersible turbine pump with a Red Jacket model 116-030-5PLD (or Gilbarco model OTO4966) leak detector.

More than one driveway flowmeter may be connected to the same submersible turbine pump hydraulic system.

TEST PROCEDURE No 5/6A/86

VARIATION No 1

Instruments shall be tested in conjunction with any tests specified in the approval documentation for the instrument to which the pattern is connected, as appropriate, and in accordance with any relevant tests specified in the Inspector's Handbook.

The maximum permissible errors applicable are those applicable to the system to which the instrument approved herein is fitted, as stated in the approval documentation for the system.

1. Operation of the leak detector is tested by the following procedure:

Note: This Test is optional i.e. it is not mandatory for verification/ certification.

- a) Connect a pressure gauge and valve to the test port of the impact valve under the driveway flowmeter. Ensure that the submerged turbine pump is not turned on during this operation by disabling at the STP control box.
- b) Start the test by closing the test valve. The line pressure should be zero as indicated on the pressure gauge. At the control box, enable the pump and dispense at least 15 L of fuel to remove any air introduced by installing the pressure gauge and valve.
- c) Turn off the pump and open the test valve so that a steady, unbroken stream of fuel is observed to flow from the test valve. Wait until flow ceases from the valve and the test gauge reads zero. Leave the test valve open.
- d) Start the pump by lifting the nozzle at the flowmeter but leaving the nozzle closed. A steady stream of fuel should be observed to flow from the test valve. The pressure on the gauge should not exceed 150 kPa during this step.

Attempt to deliver fuel from the nozzle. A flow rate of less than 11 L/min indicates correct operation of the leak detector.

- e) Close the test valve and nozzle with the pump still running. A rise in pressure on the test gauge should be noted after not more than 10 seconds.
- f) Disable the pump at the control box. Remove the test fixture and replace the plug in the test port. Enable the pump, and dispense at least 15 L of fuel from the flowmeter to remove any air introduced into the system.

2. The minimum flow rate test is performed by simultaneously running all hoses connected to a particular submerged turbine pump. Check that the slowest flow rate is not less than 15 L/min.

Note: This Test should be carried out on initial verification. Thereafter, it need not be done at every verification/certification but should be done periodically at the discretion of the relevant verifying authority.

3. For driveway flowmeters connected to a remote authorisation device, begin a delivery from any flowmeter. While this delivery is still in progress, attempt to make a delivery from a 2nd flowmeter connected to the same submerged turbine pump WITHOUT this flowmeter first being authorised; the 2nd delivery should not be possible.



5/6A/86  
28/7/92

## National Standards Commission

TECHNICAL SCHEDULE No 5/6A/86

VARIATION No 3

**Pattern:** Production Engineering Model 8601 Multi-product Driveway Flowmeter.

**Submitter:** Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

### 1. Description of Variant 5

Any driveway flowmeter of this approval fitted with a Production Engineering model MHP indicator now used with any of the Gilbarco control consoles listed below:

- Model T11-5 - up to 12 flowmeters - refer NSC approval No S207.
- Model T12AC - up to 12 flowmeters - refer NSC approval No S207.
- Model T24 - up to 24 flowmeters - refer NSC approval No S246.

### NOTIFICATION OF CHANGE

The following amendments are made to the documentation of this approval:

1. In Technical Schedule No 5/6A/86 dated 28/8/89, clause 1.1 Features is amended by adding the following to the 5th paragraph (referring to preset):

"Instruments fitted with a preset facility may have a 'P' suffix, e.g. the pattern, model 8601, becomes model 8601P."

2. In Technical Schedule No 5/6A/86 Variation No 2 dated 26/4/91;

- (a) Clause 1. Description of Variant 4 is amended by adding the following:

"Driveway flowmeters of the 6400, 7000 or 8000 series purporting to comply with this variant carry a \*\*5\* style model number, e.g. the pattern, model 8601, becomes model 8651."

(b) The TEST PROCEDURE Variation No 1 dated 26/4/91 is amended by replacing Test 3 with the following: (Note that Tests 1 and 2 were amended by Notification of Change No 3 dated 15/6/92.)

"3. For systems where more than one driveway flowmeter is connected to the same pump, begin a delivery from one flowmeter.

While this delivery is still in progress, attempt to make a delivery from a 2nd flowmeter connected to the same pump WITHOUT this flowmeter first being authorised (either locally or remotely) and WITHOUT the indicator reset cycle for this flowmeter first being initiated; the 2nd delivery should not be possible."

# National Standards Commission

TECHNICAL SCHEDULE No 5/6A/86

VARIATION No 4

**Pattern:** Production Engineering Model 8601 Multi-product Driveway Flowmeter.

**Submittor:** PEC (New Zealand) Ltd  
2 Station Road  
Marton New Zealand.

## 1. Description of Variant 6

With modified software controlling the sequence of pump and flow control valve operation to achieve pressurisation of the product, periodically prior to a delivery being started.

Instruments fitted with the modified software are inhibited from displaying the volume for the first 100 mL of any delivery.



# National Standards Commission

## NOTIFICATION OF CHANGE

### CERTIFICATE OF APPROVAL No 5/6A/86

#### CHANGE No 1

The following change is made to the approval documentation for the  
Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

In Test Procedure No 5/6A/86 dated 28 August 1989, the wording of clause 2. (ii) should be amended (by deleting the reference to the pump motor starting at this stage) so that it now reads:

"A delivery may then be made."

Signed

Executive Director

# National Standards Commission



## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6A/86

CHANGE No 2

The following changes are made to the approval documentation for the

Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by Production Engineering (Aust.) Pty Ltd  
Suite 403  
270 Pacific Highway  
Crows Nest NSW 2065.

In Technical Schedule No 5/6A/86 dated 22/5/90, the Maximum Flow Rates given in Table 2 should be amended, in part, to read:

"HIGH = 85 L/min"

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.

# National Standards Commission



## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6A/86

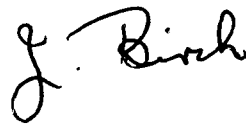
CHANGE No 3

The following change is made to the approval documentation for the

Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by Production Engineering (Aust.) Pty Ltd  
Suite 403  
207 Pacific Highway  
Crows Nest NSW 2065.

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



The Test Procedure issued as part of Technical Schedule 5/6A/86 Variation No 2 dated 26/4/91 is amended as follows:

(a) In Test 1, replace the 'Note' with the following:

"Note: This Test should be carried out on initial verification. Thereafter, it need not be done at every verification/certification but should be done periodically at the discretion of the relevant verifying authority."



(b) In Test 2, replace the first paragraph with the following:

- "2. The minimum flow rate test is performed by simultaneously running either all hoses on all driveway flowmeters connected to a particular submerged turbine pump (where the number of hoses is 6 or less) or by simultaneously running between  $\frac{2}{3}$  and  $\frac{3}{4}$  of all such hoses (where the number of hoses is more than 6). For the purpose of this test, where two or more pumps are connected in parallel, they shall be considered as one pump. Check that the lowest flow rate is not less than 15 L/min."

# National Standards Commission



## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6A/86

CHANGE No 4

The following change is made to the approval documentation for the

Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by PEC (New Zealand) Ltd  
(formerly Production Engineering (Aust.) Pty Ltd)  
2 Station Road  
Marton NEW ZEALAND

In Certificate of Approval No 5/6A/86 dated 28 July 1992, the Condition of Approval referring to the expiry of the approval should be amended to now read:

"This approval expires in respect of new instruments on 1 September 1995."

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



## National Standards Commission



### NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6A/86

CHANGE No 5

The following change is made to the approval documentation for the

Production Engineering Model 8601 Multi-product Driveway Flowmeter

submitted by   PEC (New Zealand) Ltd  
                  (formerly Production Engineering (Aust.) Pty Ltd)  
                  2 Station Road  
                  Marton   NEW ZEALAND

In Certificate of Approval No 5/6A/86 dated 28 July 1992, the Condition of Approval referring to the expiry of the approval (previously amended by Notification of Change No 4 dated 19 June 1995) should be amended to now read:

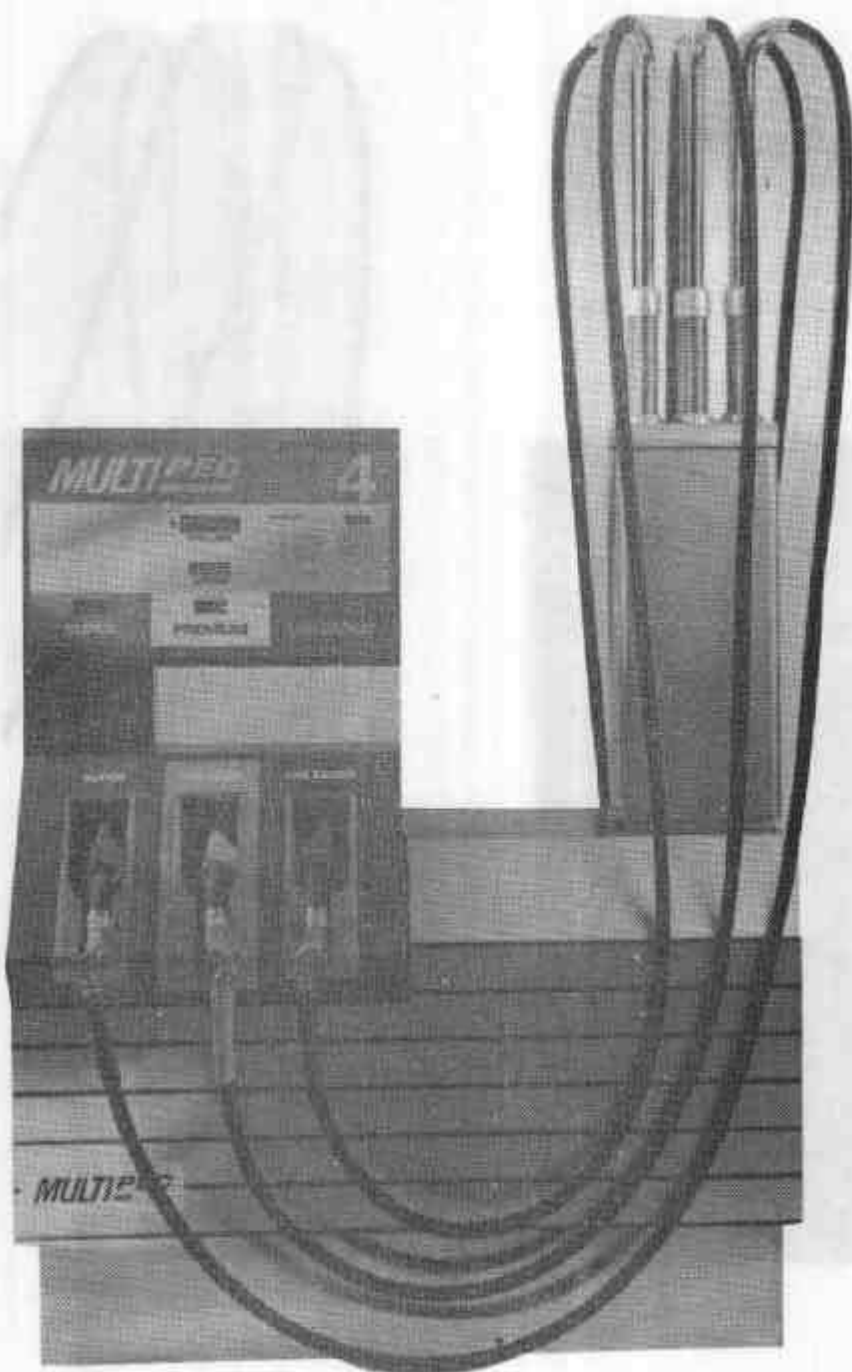
'This approval expires in respect of new instruments on 1 September 1996.'

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

A handwritten signature in black ink, appearing to read 'J. Benth.' The signature is written in a cursive style with a large initial 'J'.

5/6A/86  
28/8/89

Figure 5/6A/86 - 1



Production Engineering Model 8601

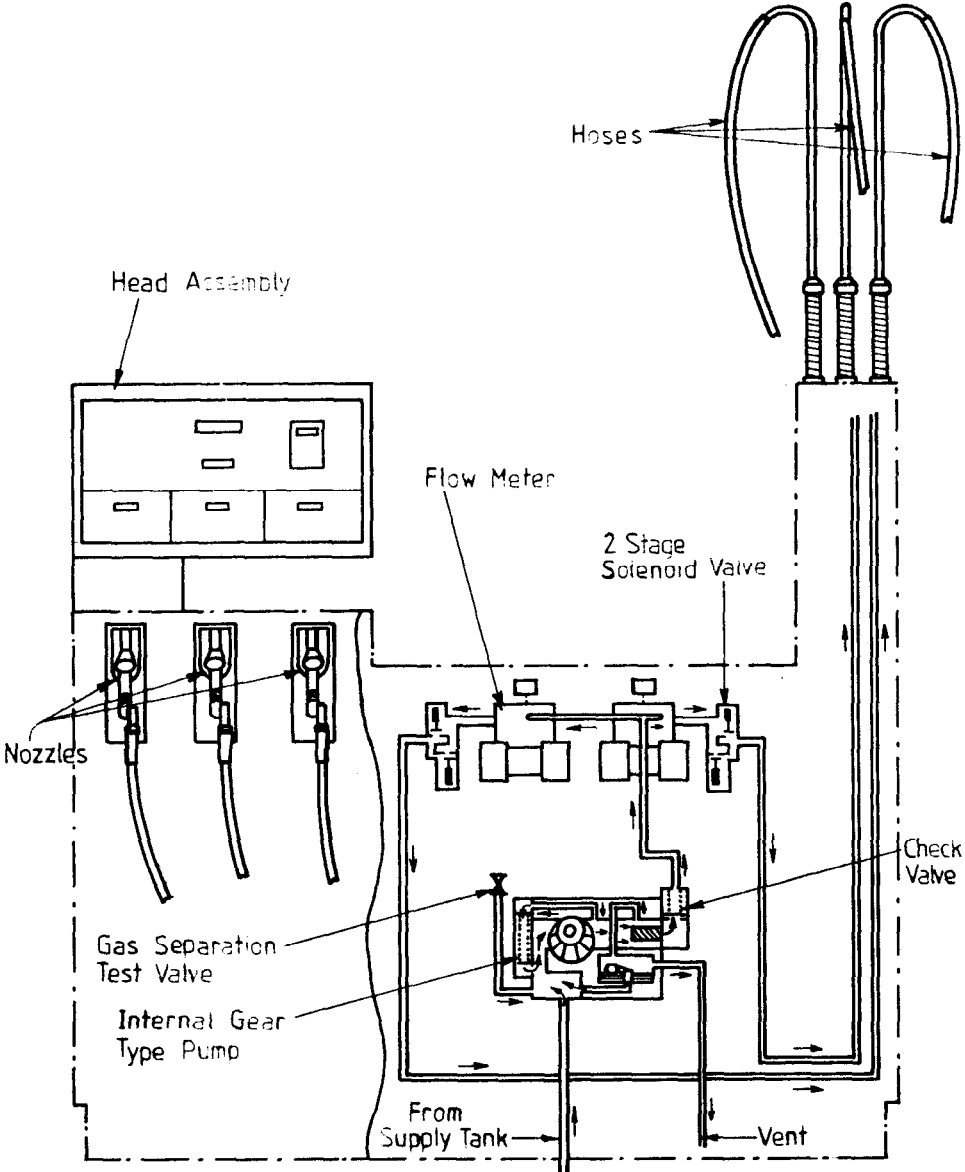
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Figure 5/6A/86 - 2



Model B601 With Covers Removed

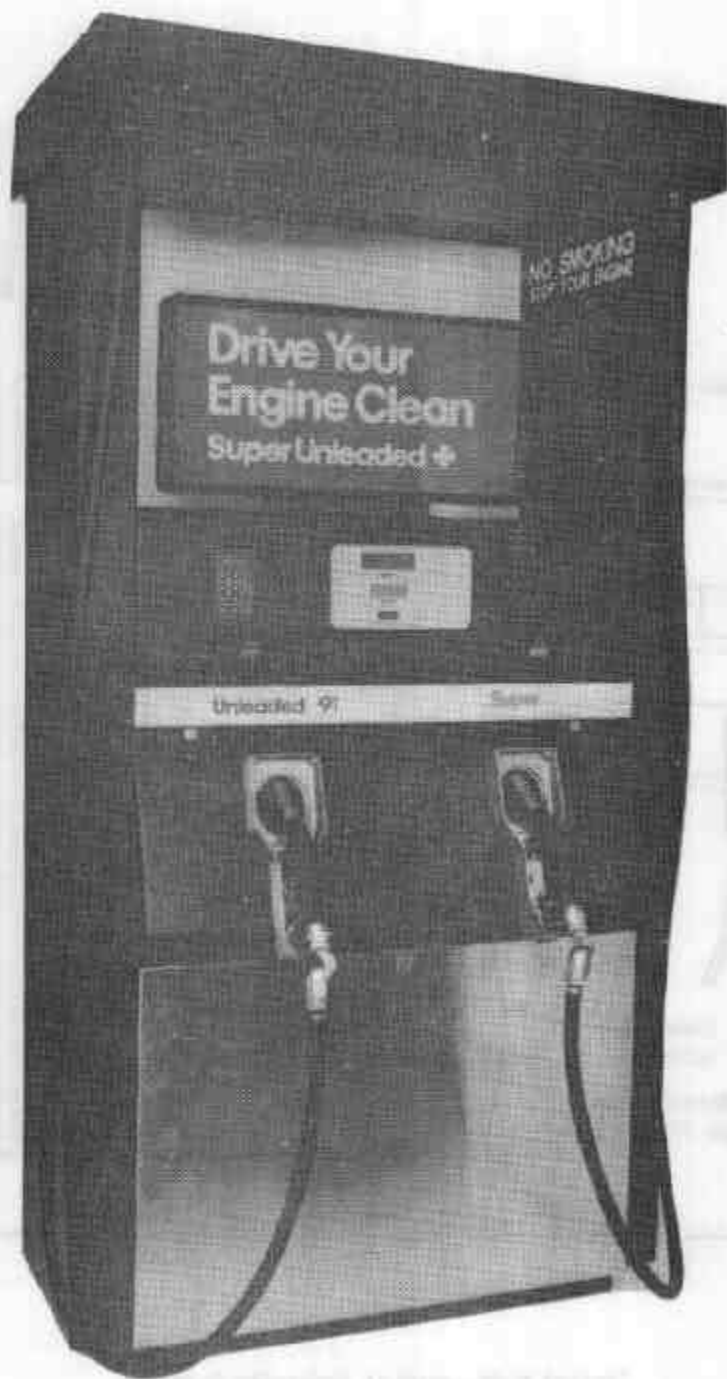
Figure 5/6A/86 - 3



Typical Multi-product Hydraulic System

5/6A/86  
28/8/89

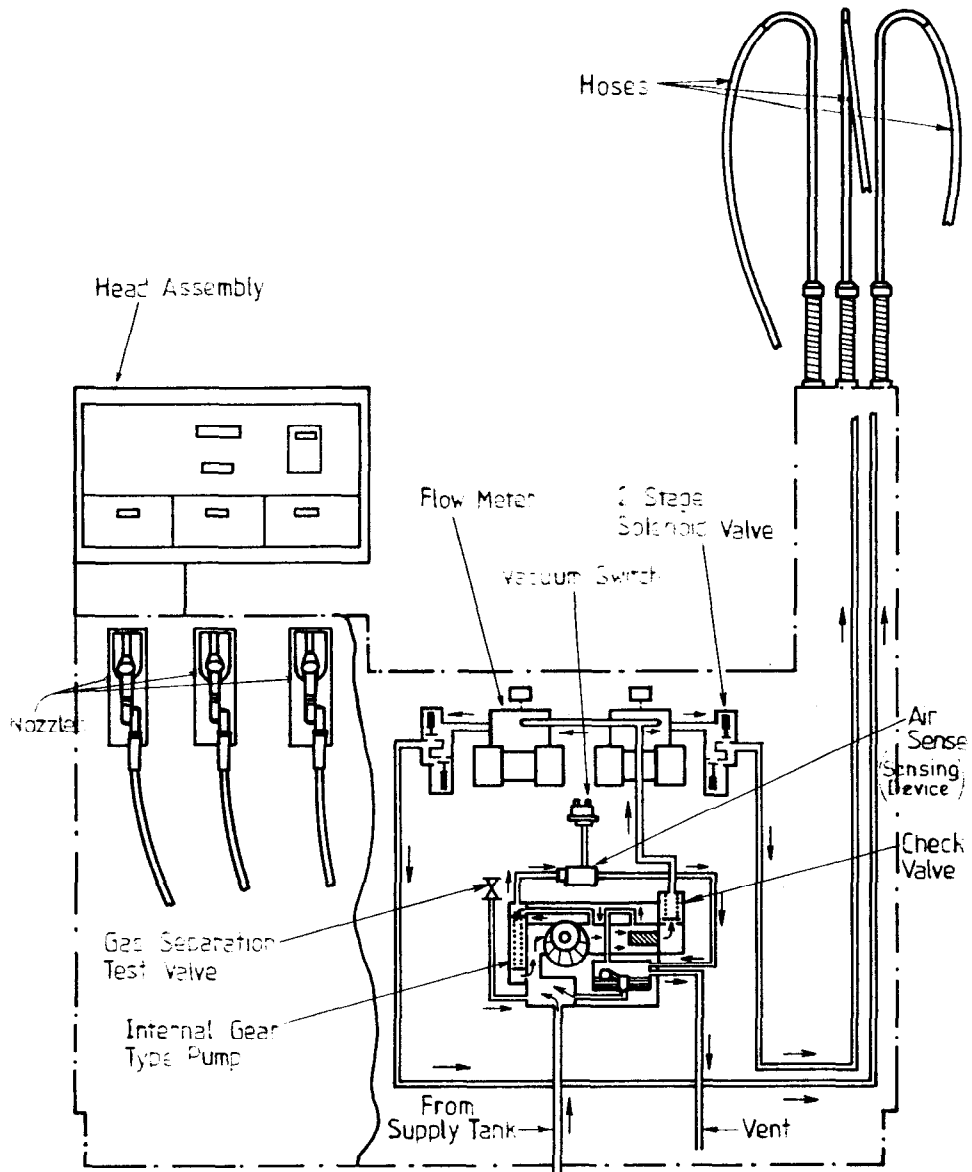
Figure 5/6A/86 - 4



Model 7401

5/6A/86  
28/8/89

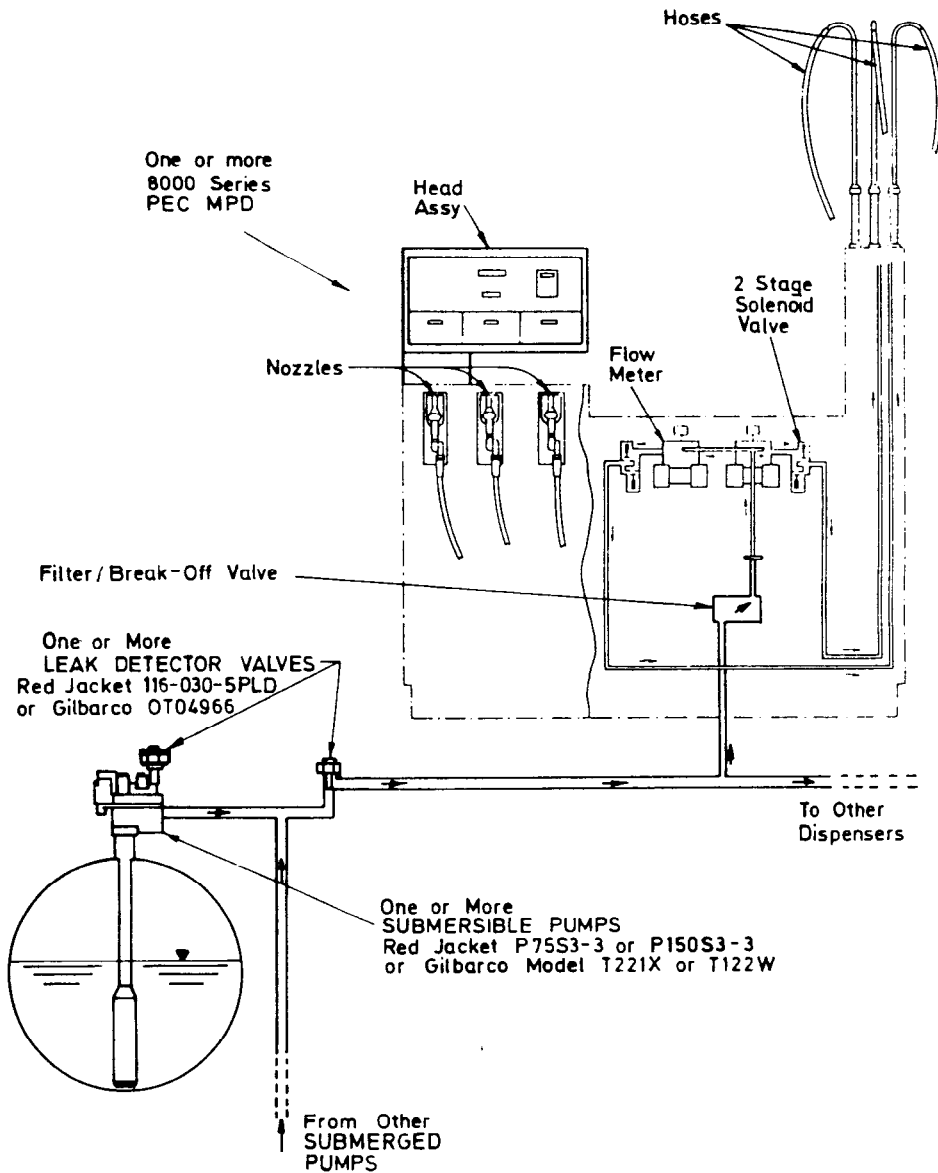
Figure 5/6A/86 - 5



Typical Distillate Multi-product Hydraulic System



FIGURE 5/6A/86 - 6



Typical System With a Submersible Turbine Pump