



Australian Government

**National Measurement
Institute**

12 Lyonpark Road, North Ryde NSW 2113

**Cancellation
Certificate of
Approval No 10/1/14**

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in Certificate of Approval
No 10/1/14 issued 12 August 1996 in respect of the

Gilbarco Model T079QD-1 LPG Driveway Flowmeter

submitted by Gilbarco Australia Limited
(formerly Gilbarco Aust. Ltd)
now of 20 Highgate Street
AUBURN NSW 2144

has been cancelled in respect of new instruments as from 1 December 2004.

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, appearing to be the initials "JHT" with a large, stylized flourish at the bottom.

National Standards Commission



Certificate of Approval

No 10/1/14

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

Gilbarco Model T079QD-1 LPG Driveway Flowmeter

submitted by Gilbarco Aust. Ltd
12-39 Talavera Road
North Ryde NSW 2113.

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 becomes subject to review on 1 January 2000, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 10/1/14 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 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 comply with the requirements of General Supplementary Certificate No S1/0/A.

Special:

The initial verification of each driveway flowmeter shall be carried out under the supervision of a government-licensed LPG installer or a person experienced in the design and installation of LPG systems.

DESCRIPTIVE ADVICE

Pattern: provisionally approved 5 December 1994
approved 28 June 1996

- A Gilbarco model T079QD-1 dual LPG driveway flowmeter for the delivery of liquefied petroleum gas.

Variants: provisionally approved 5 December 1994
approved 28 June 1996

1. Model T093KD single or T094KD dual Electroline LPG driveway flowmeters.
2. Model T079RD-1 dual or T093LD (or T093LD-1) single or T094LD (or T094LD-1) dual LPG driveway flowmeters.

Technical Schedule No 10/1/14 describes the pattern and variants 1 & 2.

Variants: approved 3 October 1997

3. With a 'dead man' switch fitted to any model driveway flowmeter of this approval.

Technical Schedule No 10/1/14 Variation No 1 describes variant 3.

FILING ADVICE

Certificate of Approval No 10/1/14 dated 12 August 1996 (which replaced Provisional Certificate of Approval No P10/1/14 30 December 1994) is superseded by this Certificate and may be destroyed.

The documentation for this approval now comprises:

Certificate of Approval No 10/1/14 dated 24 December 1997

Technical Schedule No 10/1/14 dated 30 December 1994 (incl. Test Procedure)

Technical Schedule No 10/1/14 Variation No 1 dated 24 December 1997

Figures 1 to 6 dated 30 December 1994

Figure 7 dated 24 December 1997



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. Smith', written in a cursive style.



National Standards Commission

TECHNICAL SCHEDULE No 10/1/14

Pattern: Gilbarco Model T079QD-1 LPG Driveway Flowmeter.

Submitter: Gilbarco Aust. Ltd
12-38 Talavera Road
North Ryde NSW 2113.

1. Description of Pattern

The pattern is a Gilbarco model T079QD-1 dual LPG driveway flowmeter (Figure 1) for the delivery of liquefied petroleum gas of density between 0.505 and 0.545 kg/L (at 15°C), at temperatures between -5°C and +45°C.

Instruments are approved for attendant-operated, or locally or remotely-authorized operation with maximum and minimum flow rates of 60 L/min and 10 L/min respectively. Instruments may be used with compatible control consoles which have been Commission-approved for use with the type of indicator fitted to the flowmeter.

1.1 Component Structure

Each driveway flowmeter comprises components as detailed below and as shown in Figures 2 and 3.

(i) Supply Tank

The supply tank may be located above or below ground.

(ii) Pump

The pump shall be positioned below the supply tank so that it is always in a state of flooded suction (suction head). Alternatively, the pump may be positioned above the supply tank, in which case the pump shall be specifically designed for use with LPG in suction lift installations.

There shall be no restrictive fittings within ten pipe diameters of the pump inlet. The inlet pipe to the pump is larger than the outlet from the pump. The external pump by-pass relief valve is installed in a line returning to the supply tank.

(iii) Meter

Two Silea model 707-1174M liquefied petroleum gas meters are used (Figure 4).

(iv) Vapour Detection/Elimination

The meter is protected from the measurement of vapour by correct installation and by a Silea vapour eliminator and an LPG Engineering model EVE-10D electronic vapour detection/elimination system. The system is vented via a vapour return line of not less than 20 mm in diameter to the vapour space in the supply tank. A liquid level (vapour detection) sensor, a thermometer pocket, a bleed valve, and provision for a pressure gauge are incorporated into the vapour eliminator.

The leads to the vapour sensor connection (on the side of the vapour eliminator) are encased in insulating material.

When vapour is detected, the flow control valve is automatically closed. Once vapour is no longer detected, the valve will re-open.

(v) Driveway Flowmeter Indicator

A Gilbarco model CD computing indicating module with a remote Gilbarco model DTO6460 I.S. pulse generator is used. The purchaser display shows:

Volume	000.00 L to 995.00 L in 0.01 L increments
Unit Price	0.1 c/L to 999.9 c/L in 0.1 c/L increments
Price	\$000.00 to \$995.00 in 1 c increments

The pulse generator is mounted on the meter and is driven directly by the meter output shaft.

Instruments are fitted with a manager's keypad and rotary mode switch located behind one side of the flowmeter indicator panel. The switch permits the following functions:

Stand alone	attendant-operated or locally-authorized
Self-serve	remotely-authorized
Setprice	for each grade of product
Total	in \$ or L for each hose
Allocation	for use by service personnel
Test	allows field test procedures

Upon lifting the nozzle, the pump motor will start immediately. After a delay to compress any vapour in the system, the reset cycle commences with a solenoid valve opening at the end of the cycle to allow delivery to commence.

(vi) Electronic Volume Conversion for Temperature Device

With an LPG Engineering automatic density measuring device for use only in conjunction with the LPG Engineering model EVE-10D vapour detection/elimination system.

The density device includes a density sensor and a temperature sensor which are incorporated with the liquid level (vapour detection) sensor in the vapour eliminator. The density sensor detects any change in the dielectric constant of the liquid flowing through the sensor and a signal is sent to the CD computing module to enable automatic volume conversion to be carried out for the appropriate density.

The volume convertor included in the CD module has been programmed with 4 conversion tables corresponding to ASTM IP Table 54 for densities between 0.505 and 0.545 kg/L. The particular table to be used is chosen automatically depending on the density of the liquid as measured by the density device, as follows:

- Table for 0.510 kg/L used for densities 0.505 to 0.515 kg/L;
- Table for 0.520 kg/L used for densities 0.515 to 0.525 kg/L;
- Table for 0.530 kg/L used for densities 0.525 to 0.535 kg/L; and
- Table for 0.540 kg/L used for densities 0.535 to 0.545 kg/L.

For testing purposes, the unconverted volume, the temperature and the density of the product may be displayed by setting the rotary mode switch in the CD module to STAND ALONE mode and entering a code number on the manager's keypad. The display shows the density value without units. The display will revert to the previous sale information if the code is entered again.

(vii) Vapour Indicator

An error code is displayed on the CD module indicator if the liquid level (vapour detection) sensor detects vapour.

(viii) Outlet Piping

The pipe connection from the meter to the hose is fitted with a flow control valve, an excess flow valve and a stop valve.

(ix) Hose

The dispenser is fitted with a hose of 20 mm bore, complying with the Standards Australia code for hoses in use with liquefied petroleum gases.

The hose is supported by a retrieval cable from the top of the column and is fitted with a hose break coupling which will break with a loss of no more than 15 ml of liquid in the event of an excessive pull on the nozzle.

(x) Nozzle

The nozzle used is either a Gilbarco model 102-ZVG 1.3, also known as an Elaflex (refer NSC approval No S158), or a Gasguard model LG1, or a Gogas model Sealmaster liquefied petroleum gas nozzle.

The nozzle can only be removed from the vehicle tank once the trigger has been released, at which time a small loss of liquid will be evident.

1.2 Markings

The instrument data plate permanently fixed to the external housing of the driveway flowmeter is marked with the following:

Manufacturer's name or mark	
Year of manufacture	
Serial number	
NSC approval number	NSC No 10/1/14
Maximum flow rate L/min
Minimum flow rate L/min
Liquid temperature range	-5°C to +40°C
Approved for LPG of density range	0.505 to 0.545 kg/L
Maximum operating pressure	2400 kPa

In addition, there shall be a notice stating that the density for which volume convertor is set may be displayed using the diagnostic display of the indicator.

1.3 Sealing

Access to the meter calibration ('K' factor) button and the memory integrated circuit, located behind the manager's keypad/rotary switch cover, are sealed.

1.4 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

2. Description of Variants

2.1 Variant 1

Model T093KD single or T094KD dual (Figure 5) Electroline LPG driveway flowmeters. The hoses are supported on hose masts.

2.1 Variant 2

Model T079RD-1 dual or T093LD (or T093LD-1) single or T094LD (T094LD-1) dual LPG driveway flowmeters which are fitted with Batchen model MkI or MkII two-piston LPG meters (Figure 6) which are approved for use with a maximum flow rate of 50 L/min.

Instruments with a '-1' suffix are in housings similar to that shown in Figure 1 while those without the suffix are in housings similar to that shown in Figure 5.

TEST PROCEDURE

Instruments should be tested in accordance with tests included in the approval documentation for the control console used (where fitted), and in accordance with all relevant tests specified in the Inspector's Handbook.

Maximum Permissible Errors at Verification/Certification

The maximum permissible errors applied during a verification test are:

$\pm 1.0\%$ with the volume conversion for temperature device deactivated; and
 $\pm 1.2\%$ with the volume conversion for temperature device activated.

TECHNICAL SCHEDULE No 10/1/14
VARIATION No 1

Pattern: Gilbarco Model T079QD-1 LPG Driveway Flowmeter

Submittor: Gilbarco Aust. Ltd
12-39 Talavera Road
North Ryde NSW 2113.

1. Description of Variant 3

With a 'dead man' switch fitted to any model driveway flowmeter of this approval.

Figure 7 shows a typical installation.

The 'dead man' switch controls the opening of the flow control valve during filling. When this switch is fitted, the solenoid valve will open at the end of the reset cycle (as described in clause **1.1 (v) Driveway Flowmeter Indicator** in Technical Schedule No 10/1/14 dated 30 December 1994) and then the 'dead man' switch is held closed to allow a delivery to proceed. Releasing the switch stops the delivery.



Australian Government

**National Measurement
Institute**

Bradfield Road, West Lindfield NSW 2070

Notification of Change

Certificate of Approval No 10/1/14

Change No 2

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

The following changes are made to the approval documentation for the

Gilbarco Model T079QD-1 LPG Driveway Flowmeter

submitted by Gilbarco Australia Limited
 20 Highgate Street
 AUBURN NSW 2144.

A. In Certificate of Approval 10/1/14 dated 24 December 1997, the FILING
 ADVICE should be amended by adding the following:

 “Notification of Change No 2 dated 13 October 2011”

B. In Technical Schedule No 10/1/14 dated 30 December 1994:

(i) clause **1. Description of Pattern**, should be amended to read, in part;

 “... of density between **0.510** kg/L and **0.570** kg/L (at 15°C), at
 temperatures between **5°C** and **+45°C**.”

(ii) clause **1.2 Markings**, should be amended by adding a footnote and to
 read, in part;

 “Liquid temperature range **5°C** and **+45°C**
 Approved for LPG of density range **0.510** kg/L to **0.570** kg/L (#)

(#) May alternatively be marked “510 kg/m³ to 570 kg/m³”

Note: Approval No 10/1/14 has been cancelled in respect of new instruments as
from 1 December 2004.

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, consisting of a series of loops and flourishes, positioned above a horizontal line.



Australian Government
Department of Industry and Science

**National
Measurement
Institute**

**Notification of Change
Certificate of Approval No 10/1/14
Change No 3**

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

The following changes are made to the approval documentation for the
Gilbarco Model T079QD-1 LPG Driveway Flowmeter

submitted by Gilbarco Australia Limited
 20 Highgate Street
 AUBURN NSW 2144

A. In Certificate of Approval 10/1/14 dated 24 December 1997, the FILING
 ADVICE should be amended by adding the following:

 'Notification of Change No 3 dated 24 August 2015'

B. In Technical Schedule No 10/1/14 dated 30 December 1994:

(i) clause **1. Description of Pattern**, should be amended to read, in part;

 '... of density between **0.500** kg/L and **0.590** kg/L ...'

(ii) clause **1.2 Markings**, should be amended by adding a footnote and to
 read, in part;

 'Approved for LPG of density range **0.500** kg/L to **0.590** kg/L (#)

 (#) May alternatively be marked '**500** kg/m³ to **590** kg/m³'

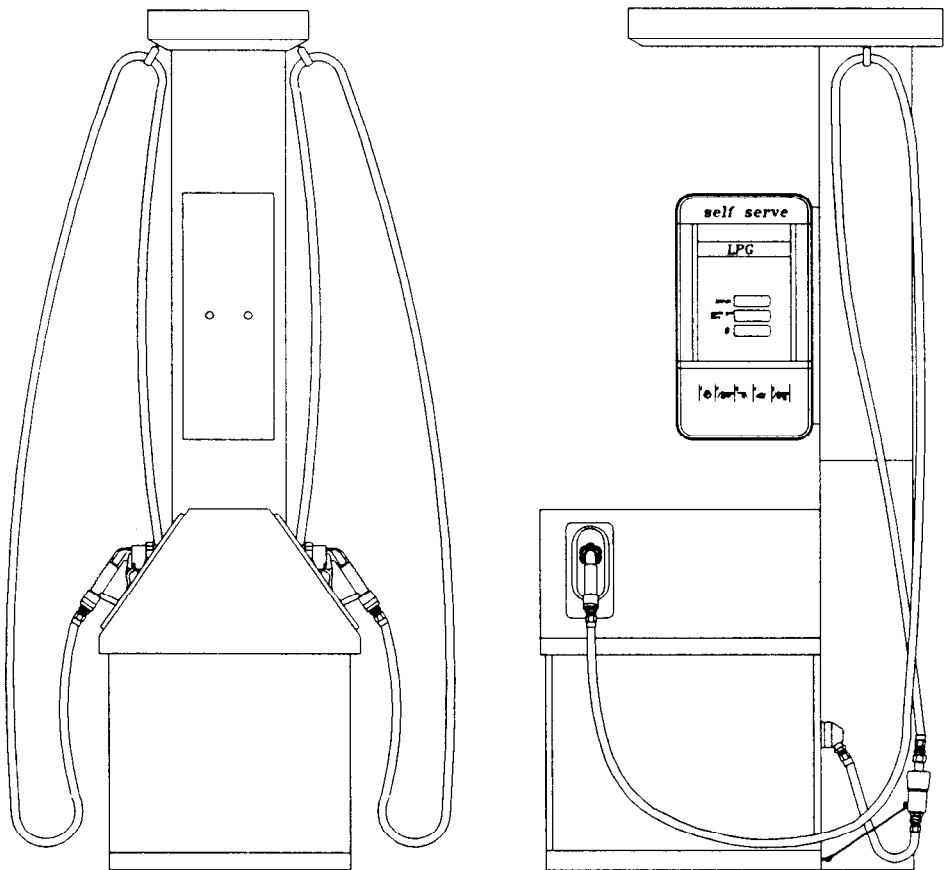
NOTE: Approval 10/1/14 was cancelled in respect of NEW instruments on
 1 December 2004. No NEW instruments conforming to the pattern or
 variants may be submitted for verification, however instruments
 manufactured before the cancellation date may continue in use.

Signed by a person authorised by the Chief Metrologist
to exercise their powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, appearing to read 'Dr A Rawlinson', with a horizontal line underneath.

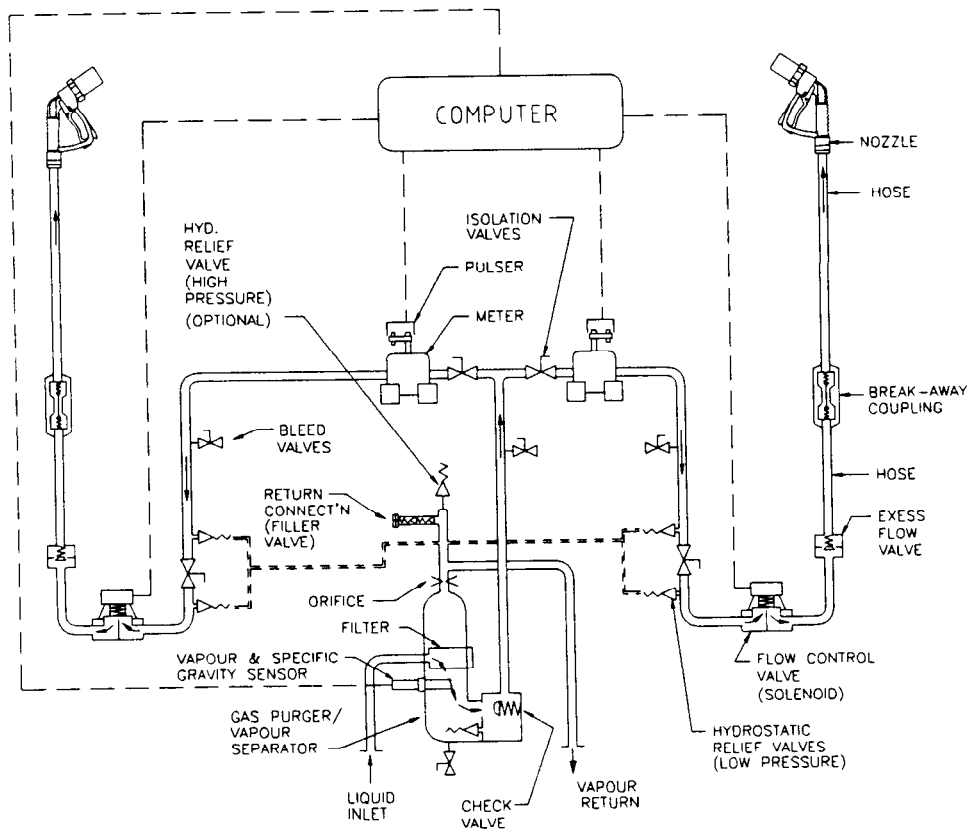
Dr A Rawlinson

FIGURE 10/1/14 - 1



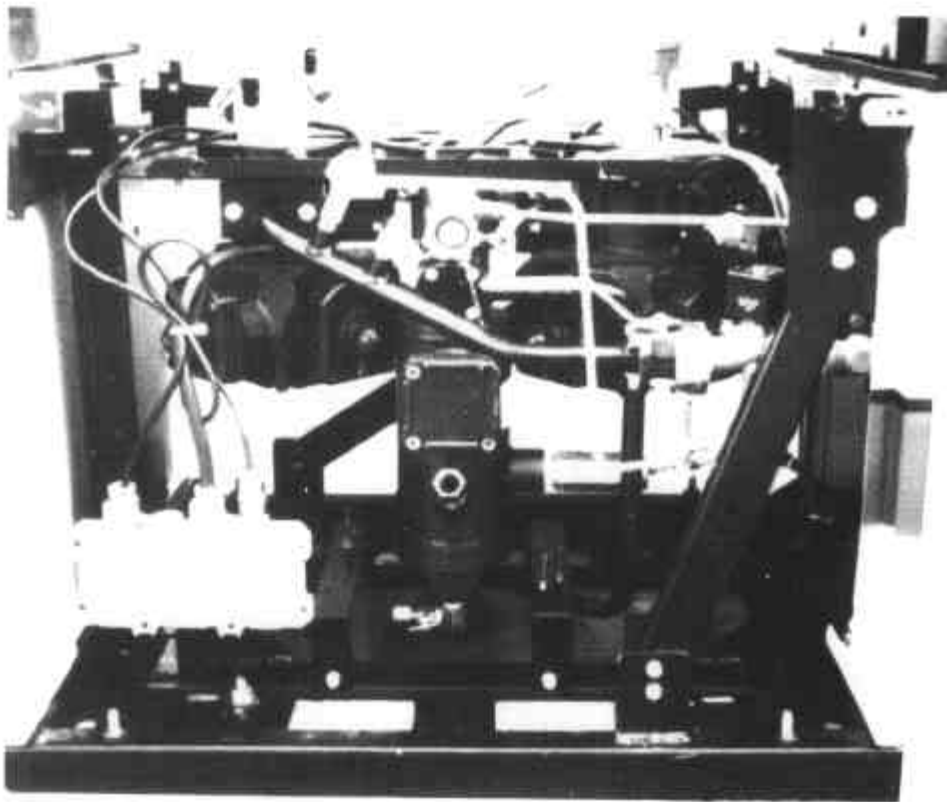
Gilbarco Model T079QD-1 LPG Driveway Flowmeter

FIGURE 10/1/14 - 2



Typical T079QD-1 Hydraulic Arrangement

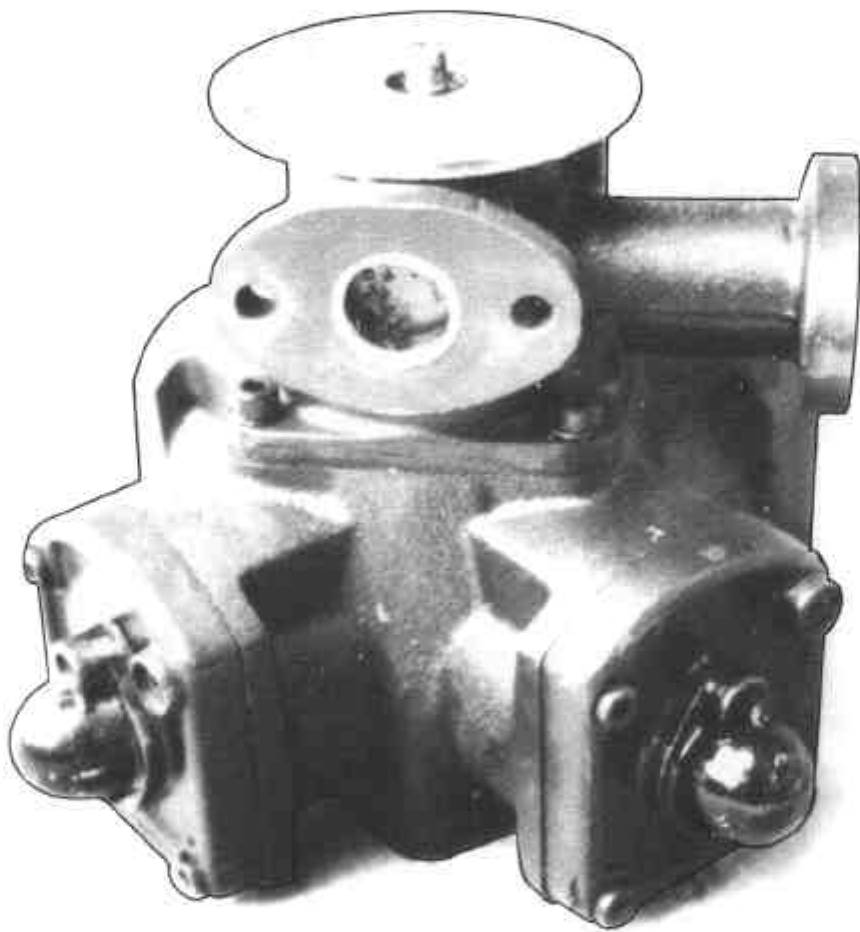
FIGURE 10/1/14 - 3



Showing Model T079QD-1 Hydraulic Components

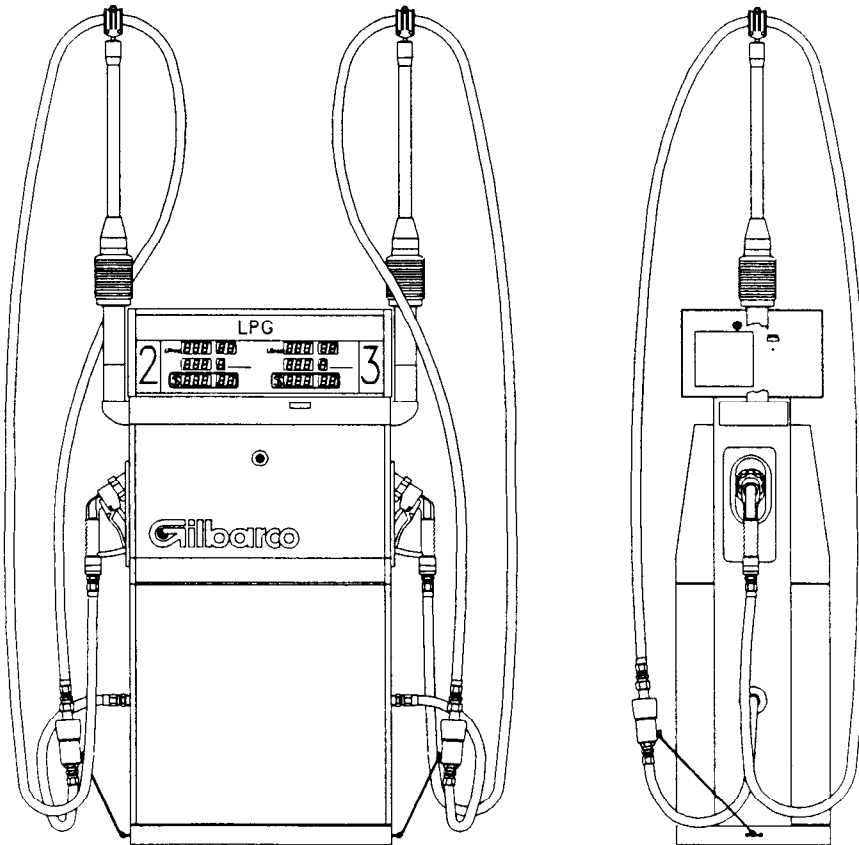
10/1/14
30 December 1994

FIGURE 10/1/14 - 4



Silea Model 707-1174M LPG Flowmeter

FIGURE 10/1/14 - 5



Model T094KD Dual LPG Flowmeter

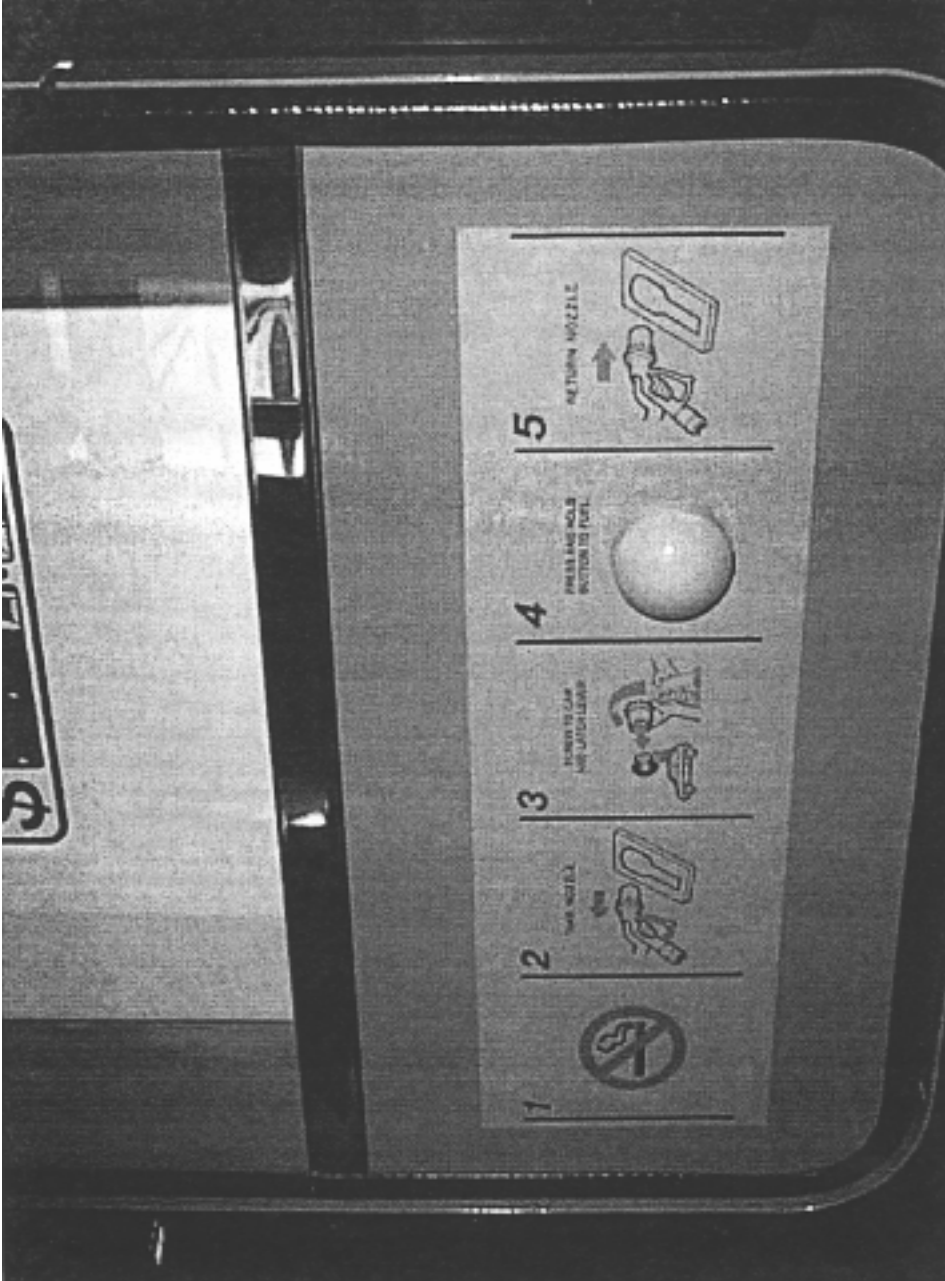
10/1/14
30 December 1994

FIGURE 10/1/14 - 6



Batchen Model Mki LPG Flowmeter

FIGURE 10/1/14 - 7



Typical 'Dead Man' Switch on Low Profile LPG Driveway Flowmeter