

10/1/23
17 February 2011



Australian Government
**National Measurement
Institute**

Bradfield Road, West Lindfield NSW 2070

Cancellation
Certificate of Approval
No 10/1/23

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 respect of the

Gilbarco Model T094PD LPG Fuel Dispenser for Motor Vehicles

submitted by Gilbarco Australia Limited
 20 Highgate Street
 Auburn NSW 2144

has been cancelled in respect of new instruments as from 1 April 2011.

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 a long horizontal stroke at the bottom.



Australian Government

**National Measurement
Institute**

Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 10/1/23

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

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

Gilbarco Model T094PD LPG Fuel Dispenser for Motor Vehicles

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

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.

This approval has been granted with reference to document NMI R 117-1, *Measuring Systems for Liquids Other than Water*, dated July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 December 2008, and then every 5 years thereafter. (Note: This approval was granted based on approval NSC 10/1/22 and therefore becomes due for review at the same time.)

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 10/1/23' 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 National Measurement Institute (NMI) 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 document NMI P 106.

The National Measurement Institute 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.

DESCRIPTIVE ADVICE

Pattern: approved 12 October 2007

- A Gilbarco model T094PD fuel dispenser for refuelling motor vehicles using liquefied petroleum gas (LPG).

Variants: approved 12 October 2007

1. With a 'Flexmast' hose mounting.
2. With a 'dead man' switch.
3. A model T093PD single fuel dispenser.
4. Any model of this approval in a 'lane oriented' housing.

Technical Schedule No 10/1/23 describes the pattern and variants 1 to 4.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 10/1/23 dated 15 October 2007

Technical Schedule No 10/1/23 dated 15 October 2007 (incl. Test Procedure)

Figures 1 to 5 dated 15 October 2007



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 'J. G. T.', written in a cursive style.

TECHNICAL SCHEDULE No 10/1/23

Pattern: Gilbarco Model T094PD LPG Fuel Dispenser for Motor Vehicles

Submittor: Gilbarco Australia Limited
20 Highgate Street
AUBURN NSW 2144

1. Description of Pattern

The Gilbarco model T094PD is a dual fuel dispenser for refuelling motor vehicles using liquefied petroleum gas (LPG). The dispenser is approved for use in attendant-operated mode or in attended self-service mode when interfaced to a compatible (#) approved fuel dispenser controller.

(#) "Compatible" is defined to mean that no additions/changes to hardware/software are required for satisfactory operation of the complete system including all checking facilities.

The model T094ND LPG dispenser (Figure 1) includes the following components or features:

- The system is protected from the measurement of vapour by two Silea constant bleed vapour eliminator and an LPG Measurement Technology electronic vapour detector and density/temperature measurement device.
- Two Batchen model Mk III two-piston liquefied petroleum gas (LPG) flowmeters each fitted with a Gilbarco model BR405799 pulse generator.
- A Gilbarco model Electroline electro-mechanical calculator/indicator configured for use with a density sending device enabling the volume conversion to 15°C.
- Two approved LPG nozzles

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

- Minimum measured quantity, V_{min} 2 L
- Maximum flow rate, Q_{max} 40 L/min
- Minimum flow rate, Q_{min} 8 L/min
- Maximum operating pressure (P_{max}) 2450 kPa
- Ambient temperature range -10°C to 55°C
- LPG density in the range 510 kg/m³ to 570 kg/m³ (at 15°C)
- Volume conversion to 15°C over a liquid temperature range of -5°C to 45°C

1.2 System Description

- (i) The supply tank may be located above or below ground.
- (ii) The pump may be positioned above the supply tank, in which case the pump shall be a multi-stage regenerative turbine LPG pump specially designed for use in **suction lift** installations.

Alternatively, the pump shall be positioned below the supply tank so that it is always in a state of flooded suction (**suction head** 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 pipe from the pump. The external pump by-pass relief valve is installed in a line returning to the vapour space of the supply tank.

A pump supplying LPG to several flowmeters shall be of sufficient capacity rating to ensure that when all flowmeters are in use the flow rate through each flowmeter is greater than Q_{min} .

- (iii) The flowmeter is protected from the measurement of vapour by a Silea vapour eliminator (Figure 2) and an LPG Measurement Technology model DSSG-98 or model DSSG-2000 LPG monitoring device. The gas elimination device allows a continues bleeding of LPG and any vapour back to the vapour space of the supply tank, via a vapour return line of not less than 20 mm in diameter.

In addition, a vapour detection sensor is incorporated which activates the flow control valve to stop the measurement when an excessive amount of vapour detected.

The gas elimination device also has provision for the insertion of a reference thermometer for verification of LPG temperature measurement.

- (iv) The measurement transducers are two Batchen model Mk III two-piston positive displacement LPG flowmeters (Figure 3) each fitted with a drive adaptor and a Gilbarco model BR405799 dual channel pulse generator to provide a pulse output of 250 pulses/litre.

The outlet of the meter is connected to a flow control valve with an optional pre-set valve. The flowmeter is suitable for use over a flow rate range of 8 to 50 L/min, but the dispenser is only approved for use up to a maximum of 40 L/min.

(v) A Gilbarco model Electroline electro-mechanical calculator/indicator (software version number V01) is used and incorporates:

(a) A management interface unit with a keypad and rotary mode switch for programming functions as follows;

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

(b) Price, volume, and unit price displays for each delivery.

Removing the nozzle from its normal hang-up position initiates a segment check of the price, volume and unit price displays. Then the price and volume displays reset to zero, and the unit price display shows the unit price.

Volume	000.00 L to 999.00 L in 0.01 L increments
Unit price	0.1 to 999.9 c/L in 0.1 c/L increments
Price	\$000.00 to \$995.00 in 1 c increments

(vi) The volume conversion for temperature function is performed by the calculator/indicator in conjunction with the LPG Measurement Technology model DSSG-98 or model DSSG-2000 LPG monitoring device. The device comprises a probe located in the vapour eliminator interfaced to a printed circuit board located inside the indicating head. The probe senses LPG density, measures the temperature of LPG, and detects if any vapour is present.

The LPG monitoring device incorporates the ASTM-IP-API Petroleum measurement Tables for light hydrocarbon, metric edition, Table 54 and Table 53 for volume conversion within the approval field of operation.

(vii) Each transfer device is a Gasguard model LG1 DN LPG nozzle, or any other compatible approved LPG nozzle that cannot be replaced in a hung-up position other than to the end of the delivery.

The nozzle is connected to a hose complying with the relevant Australian Standards for LPG. A Batchen model Sentry 20 break-away coupling and an excess flow valve may be fitted to the hose.

(viii) A recirculation line with a double check filler valve is provided at the dispenser for returning the LPG to the supply tank. The recirculation line is used for maintenance checking or calibration of the dispenser.

1.3 Sealing and Verification/Certification Provision

The meter has provision for sealing as shown in Figure 3. Access to the electronic meter calibration button, the integrated electronics, and the electronic unit for the LPG monitoring have provision for sealing (Figure 4).

Provision is made for a verification/certification mark to be applied.

1.4 Markings

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

Pattern approval sign	NMI 10/1/23
Manufacturer's identification mark or trade mark
Manufacturer's designation (model number)
Serial number
Year of manufacture
Maximum flow rate (Q_{max}) L/min
Minimum flow rate (Q_{min}) L/min
Maximum operating pressure (P_{max})	2450 kPa
Minimum pressure (P_{min}) 200 kPa above vapour pressure	(#)
Nature of the liquids to be measured	LPG
Approved for LPG density range	510 kg/m ³ to 570 kg/m ³ (at 15°C)
Maximum liquid temperature (T_{max}) °C
Minimum liquid temperature (T_{min}) °C
Accuracy class	class 1.0
Environmental class	class N

~~(#) Alternatively, the following wording may be used:~~

~~"LPG pressure (at the meter) is maintained at least 200 kPa above vapour pressure."~~

~~Note: The words "at the meter" may be deleted to save space.~~

The minimum measured quantity is marked on the calculator/indicator clearly visible to the user and is marked in the form "Minimum Delivery 2 L".

2. Description of Variants

2.1 Variant 1

With a 'Flexmast' hose mounting.

2.2 Variant 2

With a 'dead man' switch fitted to the LPG dispenser. Figure 5 shows alternative locations for the switch, in this case on a model T093PD single fuel dispenser.

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 testing procedure for commencement of a delivery) and then the 'dead man' switch is held closed to allow a delivery to proceed. Releasing the switch will stop the delivery.

2.3 Variant 3

The Gilbarco model T093PD is a single fuel dispenser having only one meter and one hose/nozzle (Figure 5).

2.4 Variant 4

Any model of this approval in a 'lane oriented' configuration, where the hose(s) are mounted on the front (and rear) panel(s) rather than on the end(s) as in the 'island oriented' configuration shown in Figure 1 for the pattern.

All 'lane oriented' models are identified by a '-1' suffix in the model number, e.g. the pattern, model T094PD, becomes a model T094PD-1.

TEST PROCEDURE

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 12 of the *National Measurement Regulations 1999*.

Calibration/Verification Procedure

(i) To change price

1. Rotate the manager's switch to 'SET PRICE'
2. The current unit price will begin to Blink
3. Enter the new unit price via the manager's keypad.
4. To exit rotate the manager's switch back to 'STAND ALONE' or 'SELF SERVE'.

(ii) To view temperature, density, unconverted volume

Enter '19' on the Manager function key pad (Figure 4). The instrument will display the following:

Litres display (L):	unconverted volume
Unit/price display(c/L):	temperature
Dollars Display:	density at 15°C

(iii) To view K-factor

1. Ensure all hoses are hung up.
2. Rotate the manager function switch to 'ALLOCATION'.
3. Remove, then replace JP-3 link from the processor printed circuit board (Figure 4).
4. On the manager's keypad, enter '12' followed by the '#' key.
5. To exit press the '#' key again.

(iv) To change K-factor

1. Follow **To view K-factor** steps 1 to 4 above.
2. Whilst the K-factor is displayed, press the SW-1 button on the probe printed circuit board (Figure 4) for approximately 1 second.
3. The dispenser will enter the K-factor set mode.



Australian Government

National Measurement
Institute

Bradfield Road, West Lindfield NSW 2070

Notification of Change

Certificate of Approval No 10/1/23

Change No 1

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 T094PD LPG Fuel Dispenser for Motor Vehicles

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

A. In Certificate of Approval 10/1/23 dated 15 October 2007, the FILING
 ADVICE should be amended by adding the following:

 “Notification of Change No 1 dated 13 October 2011”

B. In Technical Schedule No 10/1/23 dated 15 October 2007, clause
 1.4 Markings, should be amended by:

(i) removing “Minimum pressure ...(#)” and the “Nature of the liquids ...
 LPG” from the list of required markings; and

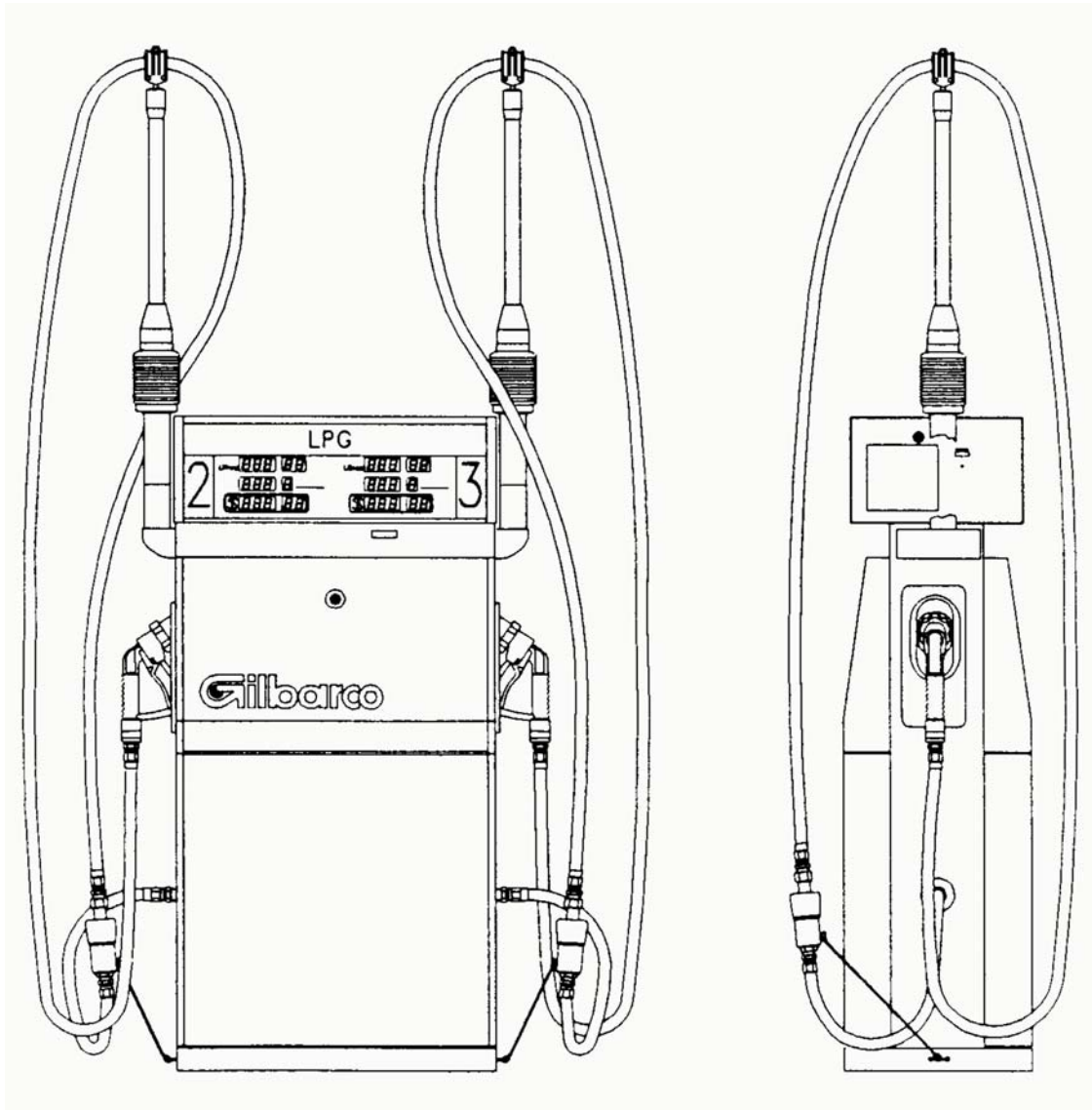
(ii) removing the footnote “(#) Alternatively, the following ... save space.”

**Note: Certificate of Approval No 10/1/23 has been cancelled in respect of
new instruments as from 1 April 2011.**

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 'R. J. ...', written over a horizontal line.

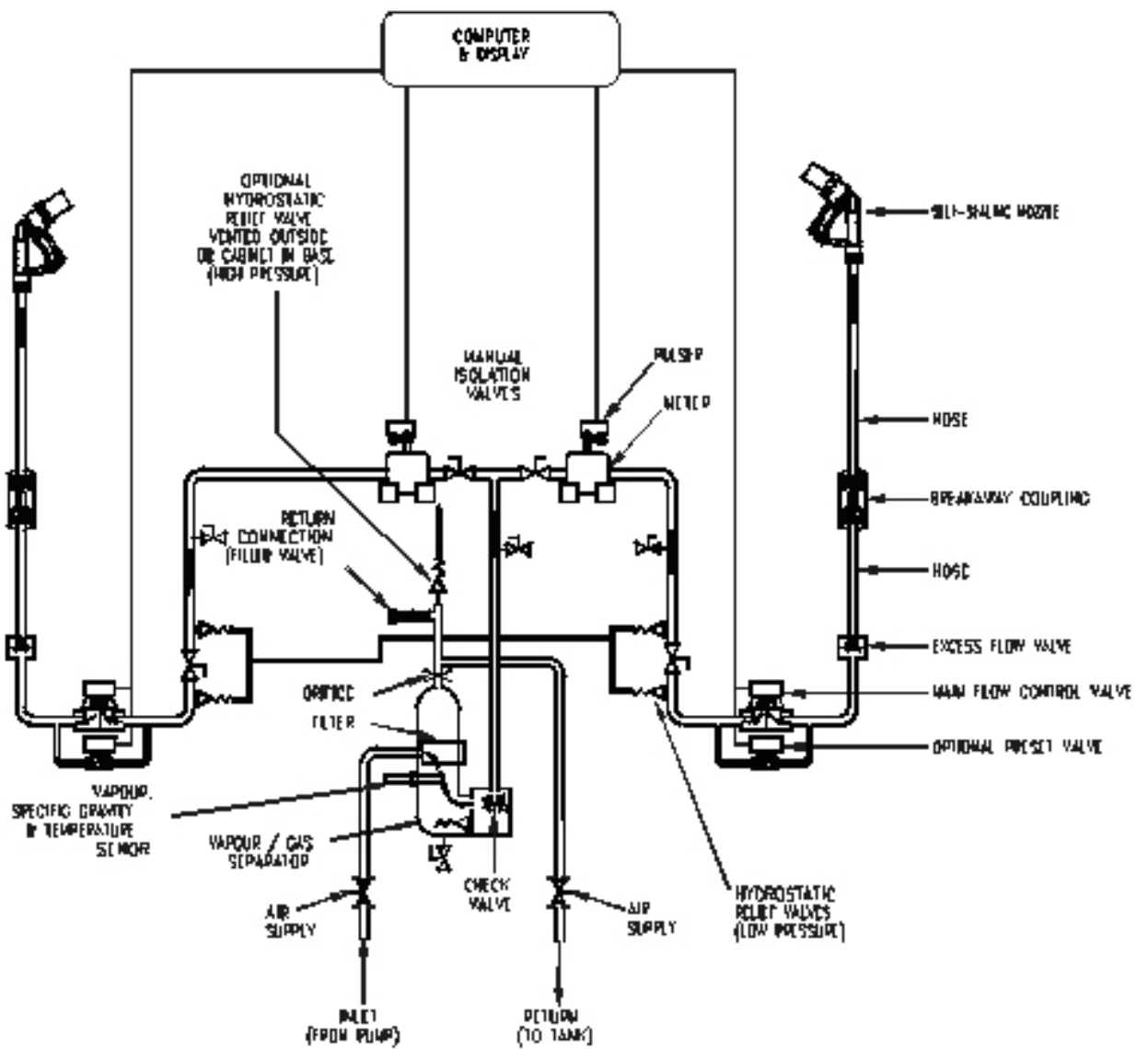
FIGURE 10/1/23 – 1



Gilbarco Model T094PD LPG Fuel Dispenser for Motor Vehicles

10/1/23
15 October 2006

FIGURE 10/1/23 – 2



Gilbarco Model T094PD LPG Hydraulics

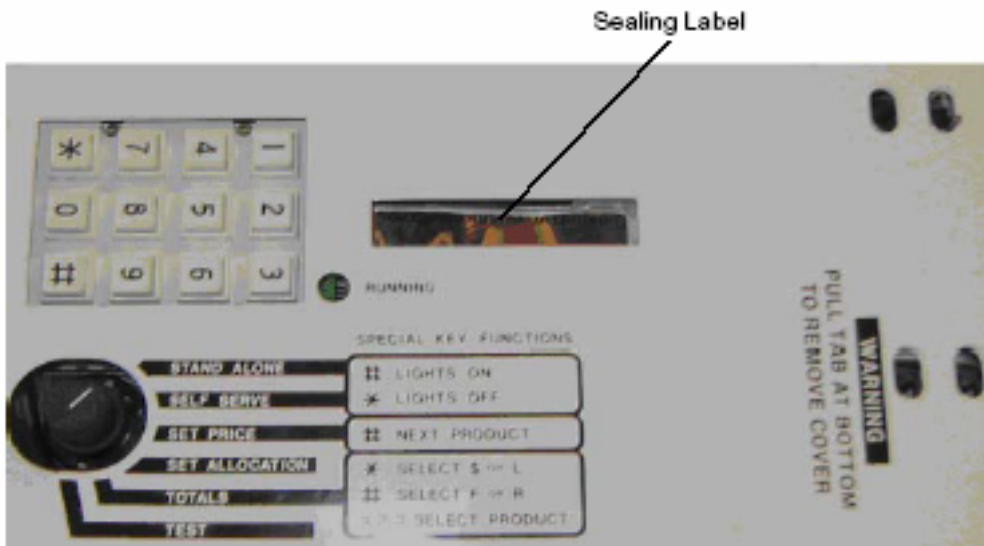
FIGURE 10/1/23 – 3



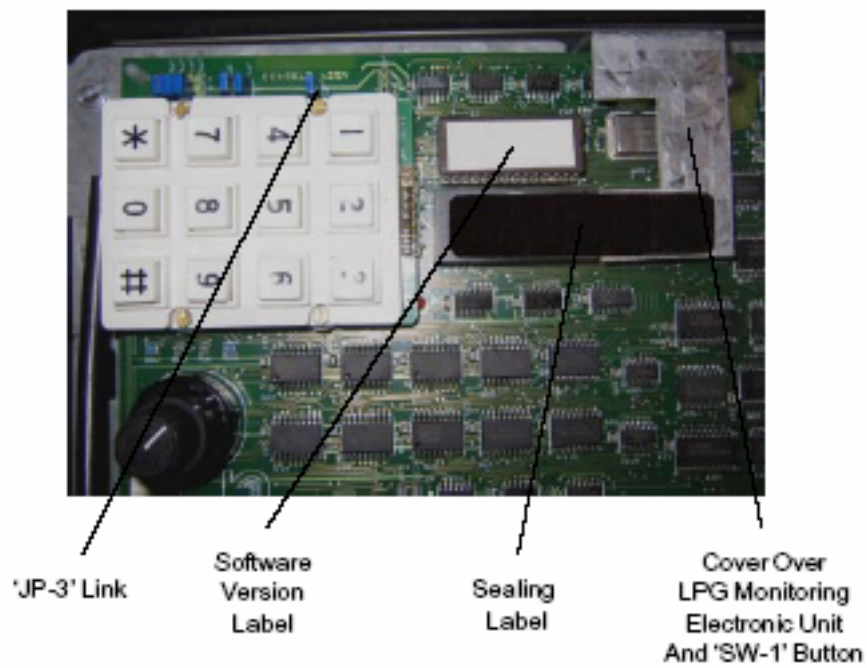
Batchen Model Mk III LPG Flowmeter (including sealing)

10/1/23
15 October 2006

FIGURE 10/1/23 – 4

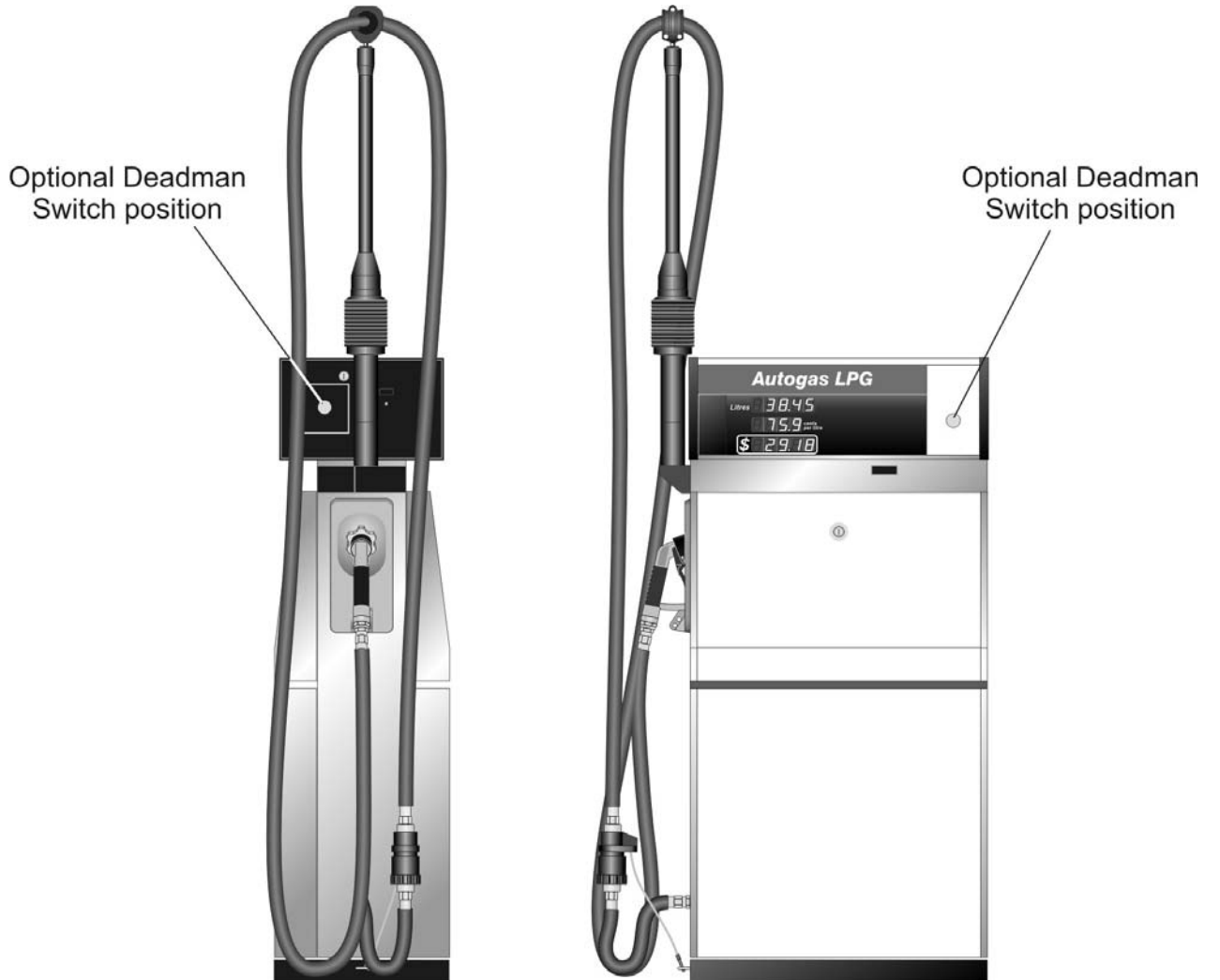


Processor PCB – Cover With Window To Show Sealing Label



Processor PCB – Cover Removed

FIGURE 10/1/23 – 5



Gilbarco Model T093PD LPG Fuel Dispenser for Motor Vehicles