

10/1/22  
17 February 2011



**Australian Government**  
**National Measurement  
Institute**

Bradfield Road, West Lindfield NSW 2070

**Cancellation**  
**Certificate of Approval**  
**No 10/1/22**

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 T094ND 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.

10/1/22  
12 March 2004



# Australian Government

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## National Standards Commission

12 Lyonpark Road, North Ryde NSW 2113 Australia

### Certificate of Approval

**No 10/1/22**

Issued 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 T094ND 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.

.../2

### CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 December 2008, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 10/1/22 and only by persons authorised by the submitter.

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 NSC P 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.

### DESCRIPTIVE ADVICE

**Pattern:** approved 28 November 2003

- A Gilbarco model T094ND dual fuel dispenser for refuelling motor vehicles using liquefied petroleum gas (LPG).

**Variants:** approved 28 November 2003

1. With a 'Flexmast' hose mounting.
2. With a 'dead man' switch.

**Variant:** approved 10 March 2004

3. A model T093ND single fuel dispenser.

Technical Schedule No 10/1/22 describes the pattern and variants 1 to 3.

### FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 10/1/22 dated 12 March 2004  
Technical Schedule No 10/1/22 dated 12 March 2004 (incl. Test Procedure)  
Figures 1 to 6 dated 12 March 2004

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.



## TECHNICAL SCHEDULE No 10/1/22

**Pattern:** Gilbarco Model T094ND LPG Fuel Dispenser for Motor Vehicles

**Submittor:** Gilbarco Australia Limited  
20 Highgate Street  
AUBURN NSW 2144

### 1. Description of Pattern

The Gilbarco model T094ND 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 (#) Commission-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 Silea model 707-1174M four 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 Commission-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/m<sup>3</sup> to 570 kg/m<sup>3</sup> (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 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 Silea model 707-1174M 4-piston positive displacement LPG flowmeters (Figure 3) each fitted with a Gilbarco model BR 405799 dual channel pulse generator. The pulse generator incorporates gears to produce, in conjunction with software of the calculator/indicator, a pulse output of 250 pulses/litre. The outlet of the meter is connected to a flow control valve. The flowmeter is suitable 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 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 DSSG-98 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 Commission-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 4. Access to the electronic meter calibration button, the integrated electronics, and the electronic unit for the LPG monitoring have provision for sealing (Figure 5).

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	NSC No 10/1/22
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
<del>Minimum pressure (<math>P_{min}</math>) 200 kPa above vapour pressure</del>	<del>(#)</del>
<del>Nature of the liquids to be measured</del>	<del>LPG</del>
Approved for LPG density range	510 kg/m <sup>3</sup> to 570 kg/m <sup>3</sup> (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 6 shows alternative locations for the switch, in this case on a model T093ND 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 T093ND is a single fuel dispenser having only one meter and one hose/nozzle (Figure 6).

#### TEST PROCEDURE

##### Maximum Permissible Errors at Verification/Certification

The maximum permissible errors applied during a verification test of the fuel dispenser using the liquid for which it is to be verified/certified, and from normal flow rate to the minimum flow rate specified in the Certificate of Approval or Technical Schedule are:

- ±0.6% for the calibration/adjustment of the meter; (\*1)
- ±1.0% for inservice inspection of the complete measuring system; and
- ±0.4% for the volume conversion for temperature device. (\*2)

Other applicable maximum permissible errors are:

- ±0.5°C for the temperature measuring device;
- ±10 kg/m<sup>3</sup> for the density detection device;
- ±2.0% for deliveries equal to the minimum measured quantity; and
- ±1.0% for gas elimination for LPG.

(\*1) It is forbidden to adjust the calibration of the meter to give an error other than as close as practically to zero.

##### 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 (\*2)

Enter '19' on the Manager function key pad (Figure 5). 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 5).
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 5) for approximately 1 second.
3. The dispenser will enter the K-factor set mode.



**Australian Government**  
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Bradfield Road, West Lindfield NSW 2070

**Notification of Change**  
**Certificate of Approval No 10/1/22**  
**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 T094ND LPG Fuel Dispenser for Motor Vehicles

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

- A.    In Certificate of Approval No 10/1/22 dated 12 March 2004, the FILING  
      ADVICE should be amended by adding the following:  
      “Notification of Change No 1 dated 30 October 2007”
  
- B.    In Technical Schedule No 10/1/22 dated 12 March 2004, clause  
      **1.2 System Description**, subclauses (iii) and (vi), all references to the  
      model DSSG-98 LPG monitoring device should be amended by adding the  
      following:  
      “... or model DSSG-2000 ...”

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.', is written over the signature line.



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Bradfield Road, West Lindfield NSW 2070

## **Notification of Change Certificate of Approval No 10/1/22 Change No 2**

Issued by the Chief Metrologist under Regulation 60  
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The following changes are made to the approval documentation for the

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

A.    In Certificate of Approval 10/1/22 dated 12 March 2004, the FILING  
      ADVICE should be amended by adding the following:

                                 “Notification of Change No 1 dated 30 October 2007  
                                 Notification of Change No 2 dated 13 October 2011”

B.    In Technical Schedule No 10/1/22 dated 12 March 2004, clause  
      **1.4 Markings**, should be amended by:

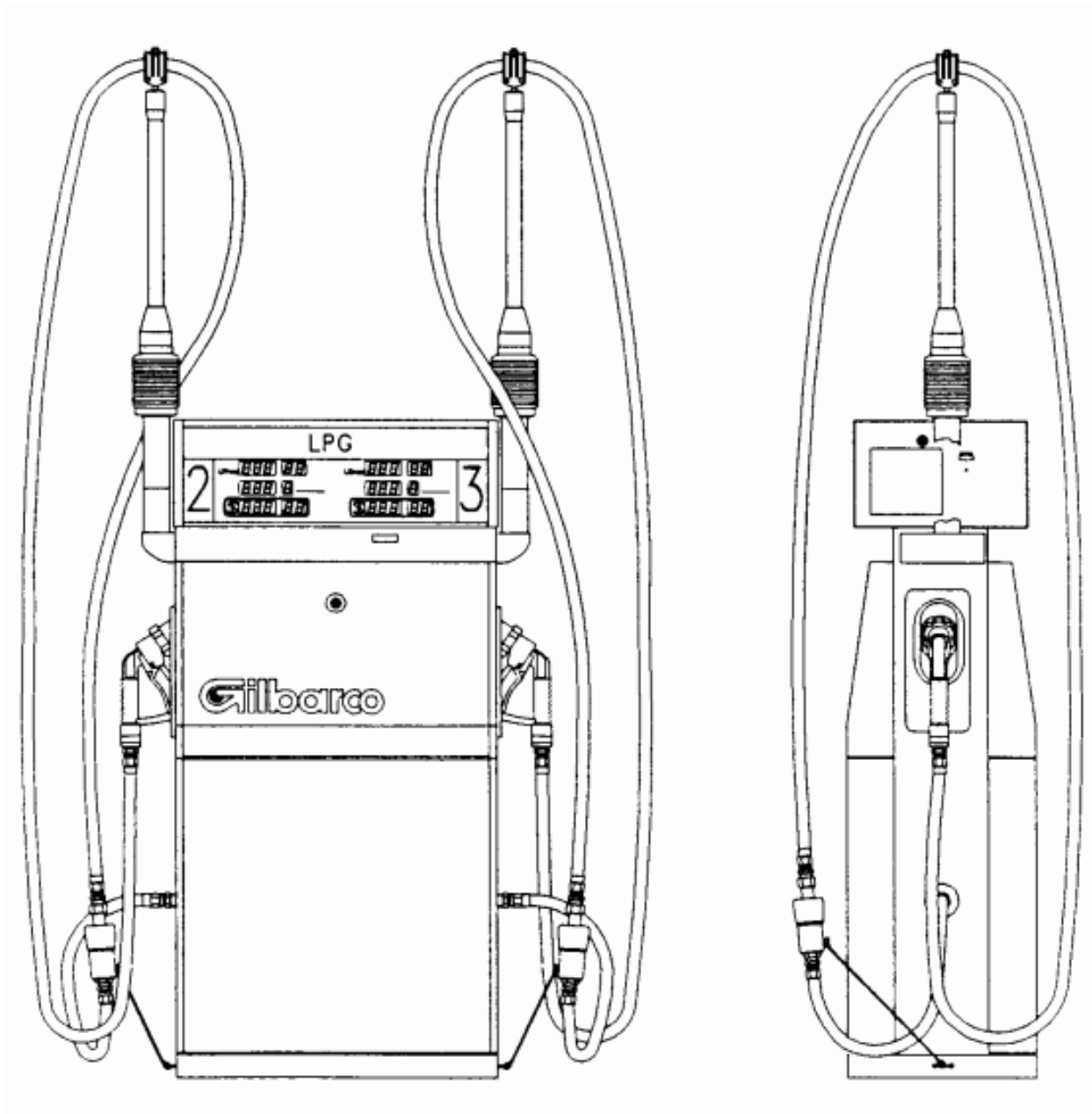
- (i)    removing “Minimum pressure ...(#)” and the “Nature of the liquids ...  
      LPG” from the list of required markings; and
- (ii)   removing the footnote “(#) Alternatively, the following ... save space.”

**Note: Certificate of Approval No 10/1/22 has been cancelled in respect of  
new instruments as from 1 April 2011.**

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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 to the right of the signature text.

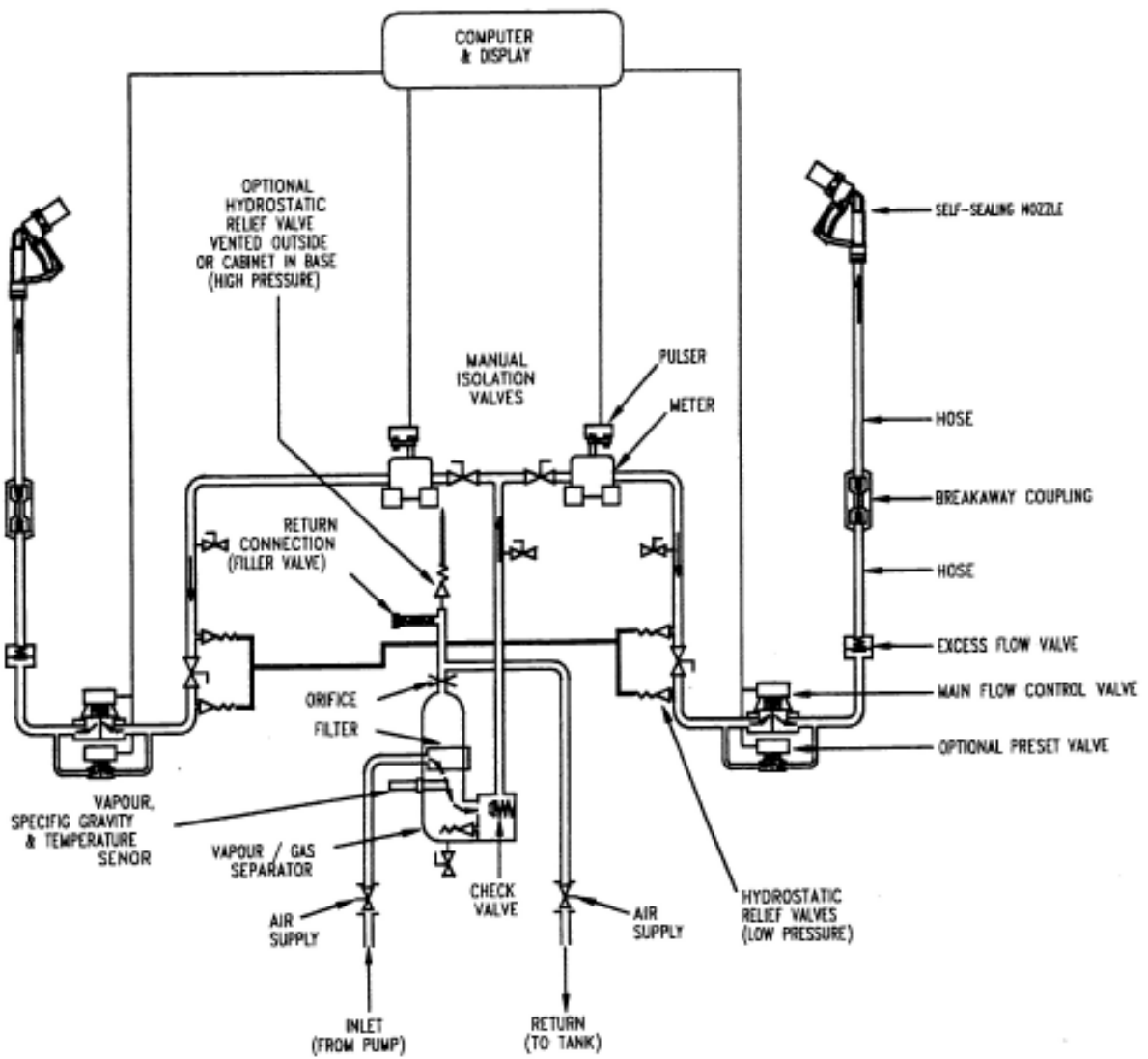
FIGURE 10/1/22 – 1



Gilbarco Model T094ND Dual LPG Fuel Dispenser for Motor Vehicles

10/1/22  
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FIGURE 10/1/22 – 2



Gilbarco T094ND LPG Hydraulics

10/1/22  
12 March 2004

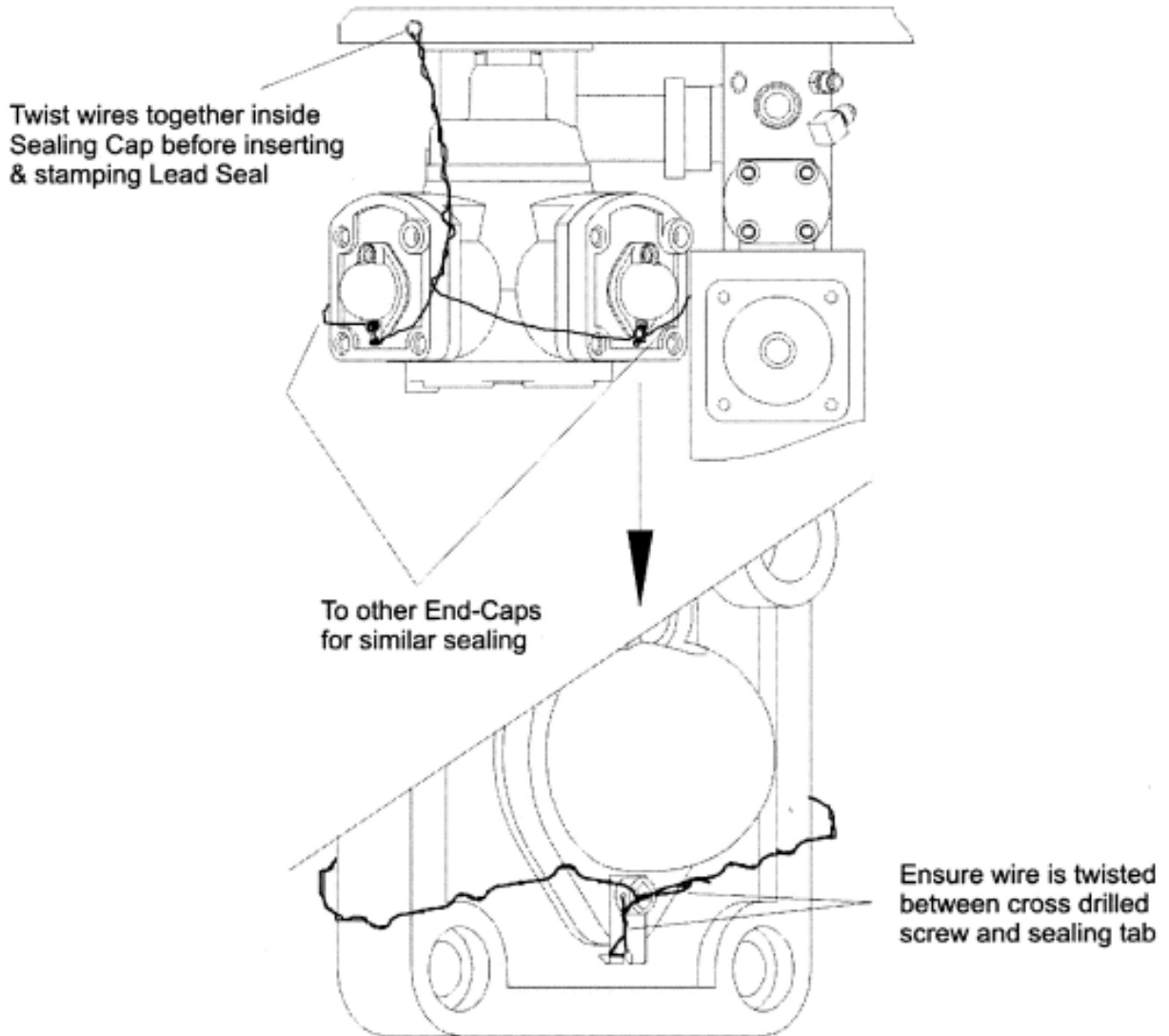
FIGURE 10/1/22 – 3



Silea Model 707-1174M LPG Flowmeter

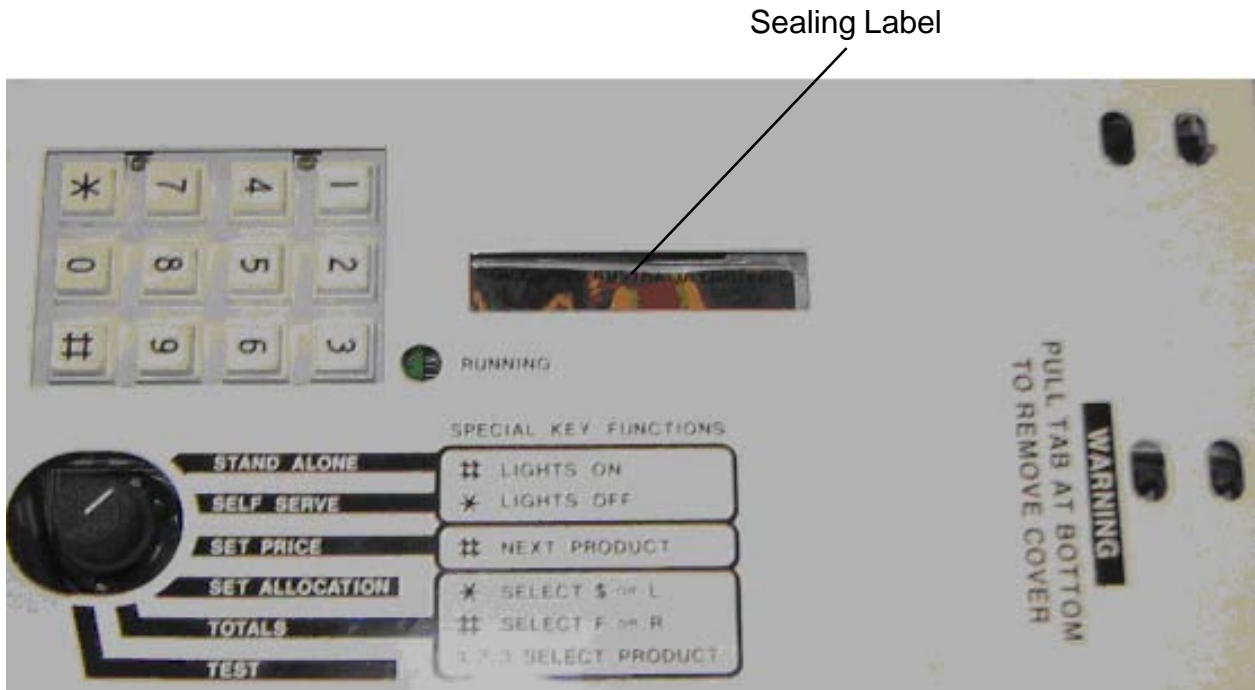
10/1/22  
12 March 2004

FIGURE 10/1/22 – 4

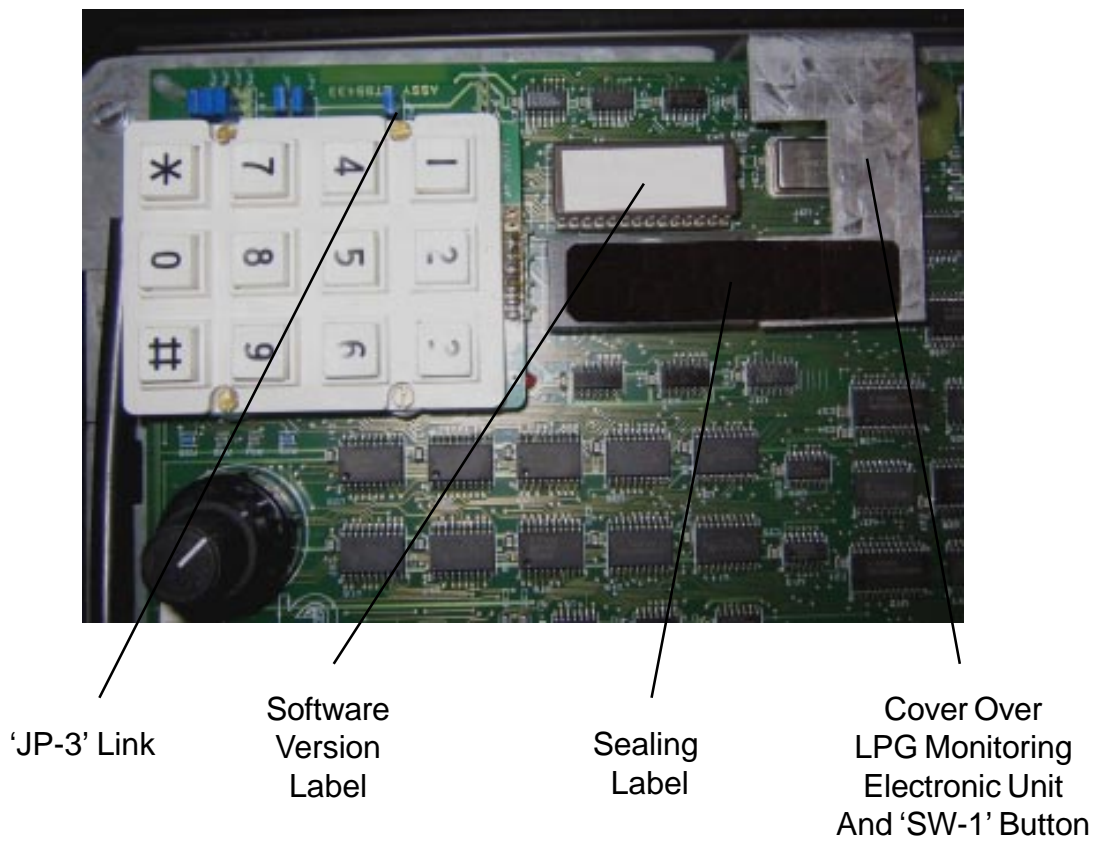


Meter Sealing

FIGURE 10/1/22 – 5



Processor PCB – Cover With Window To Show Sealing Label

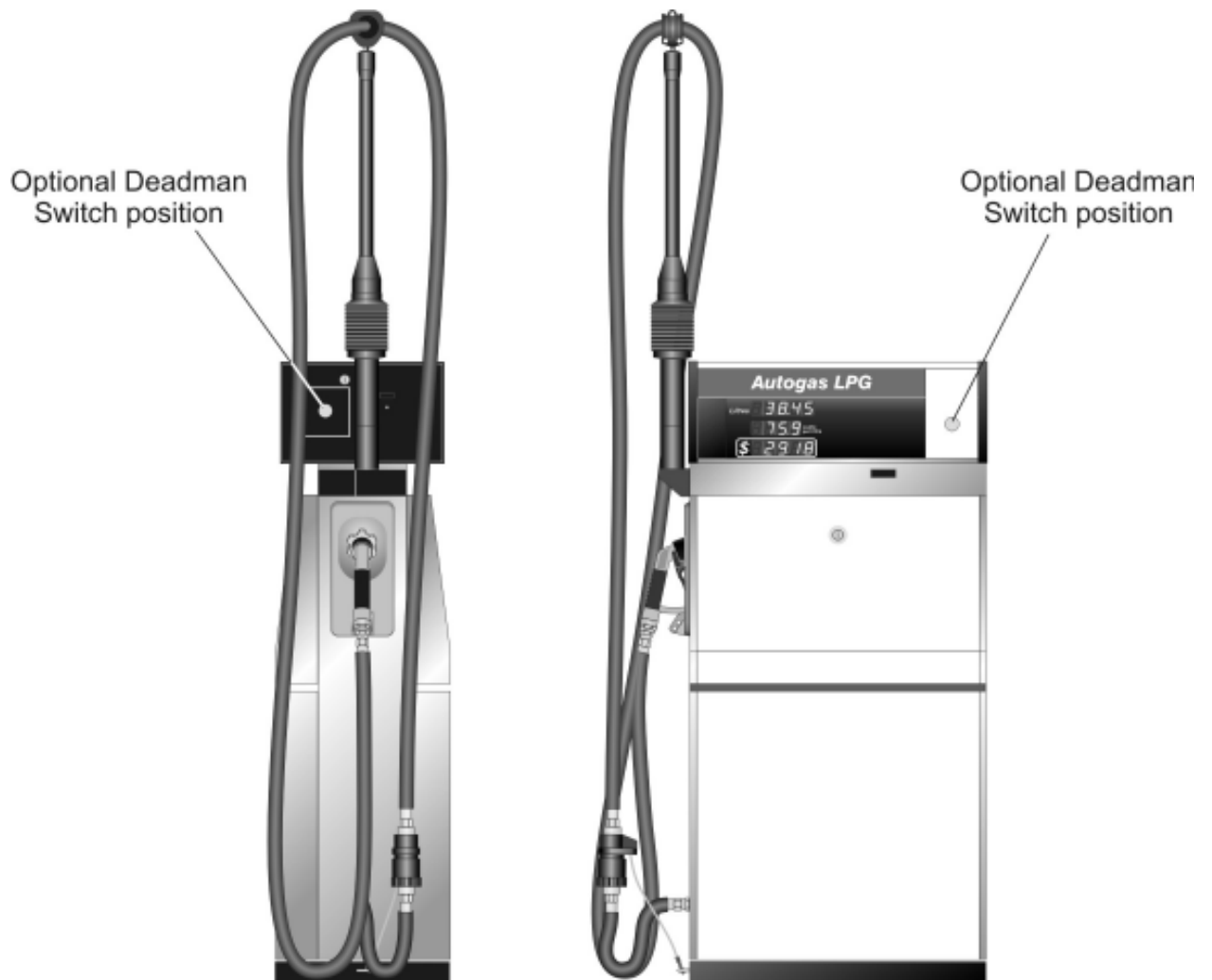


Processor PCB – Cover Removed



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FIGURE 10/1/22 – 6



Gilbarco Model T093ND Single LPG Fuel Dispenser  
Showing Alternative 'Dead Man' Switch Locations