



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

Bradfield Road, West Lindfield NSW 2070

**Notification of Change**  
**Certificate of Approval No 10/1/17**  
**Change No 2**

The following changes are made to the approval documentation for the  
Gilbarco Model T186Z2 Enterprise LPG Fuel Dispenser for Motor Vehicles

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

- A.    In Certificate of Approval No 10/1/17 dated 26 March 2003;
1.    The Condition of Approval referring to the review of the approval should be amended to read:  
      “This approval becomes subject to review on 1 February **2013**, and then every 5 years thereafter.”
  2.    The FILING ADVICE should be amended by adding the following:  
      “Notification of Change No 1 dated 22 May 2008”
- B.    In Certificate of Approval No 10/1/17 and its Technical Schedule both dated 26 March 2003, all references to the name of the submitter should be amended to read:  
      “Gilbarco Australia **Pty Ltd**”

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.

10/1/17  
26 March 2003



## National Standards Commission

12 Lyonpark Road, North Ryde NSW

### Certificate of Approval

**No 10/1/17**

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 T186Z2 Enterprise 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.

### CONDITIONS OF APPROVAL

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

Instruments purporting to comply with this approval shall be marked NSC No 10/1/17 and only by persons authorised by the submitter.

Instruments purporting to comply with this approval and currently marked NSC No P10/1/17 may be re-marked NSC No 10/1/17 but 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:** provisionally approved 10 August 2000  
approved 17 January 2003

- A Gilbarco model T186Z2 Enterprise dual fuel dispenser for refuelling motor vehicles using liquefied petroleum gas (LPG).


**Variants:** approved 17 January 2003

1. Model T187Z2 Enterprise dual fuel dispenser.
2. Model T186Z1 Enterprise and model T187Z1 Enterprise single fuel dispensers.
3. With a 'dead man' switch.

Technical Schedule No 10/1/17 describes the pattern and variants 1 to 3.

### FILING ADVICE

The documentation for this approval comprises:

 Certificate of Approval No 10/1/17 dated 26 March 2003  
Technical Schedule No 10/1/17 dated 26 March 2003 (incl. Test Procedure)  
Figures 1 to 8 dated 26 March 2003

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 10/1/17

**Pattern:** Gilbarco Model T186Z2 Enterprise LPG Fuel Dispenser for Motor Vehicles

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



## 1. Description of Pattern

The Gilbarco model T186Z2 Enterprise is 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.

The model T186Z2 Enterprise LPG dispenser (Figures 1, 2 and 7) is in a 'lane orientated' housing and includes the following components or features:

- Two Silea constant bleed vapour elimination devices.
- Two Silea model 707-1 174M liquefied petroleum gas (LPG) flowmeters each fitted with a Gilbarco model BR405799 pulse generator.
- A Gilbarco model Epsilon calculator (with two display units) configured for use with a density sending device enabling the volume conversion to 15°C.

### 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 depending on the type of pump used.
- (ii) The pump may be positioned above the supply tank, in which case the pump shall be an multi-stage regenerative turbine LPG pump specially designed for use in **suction lift** installations. Alternatively, the pump shall be positioned below the supply tank or a submersible (turbine) pump located within 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 and an LPG Measurement model DSSG98 LPG monitoring device. The gas elimination device allows a continuous 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 is detected.

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

- (iv) The measurement transducers are two Silea model 707-I 174M four-piston positive displacement LPG flowmeters (Figure 3) each fitted with a Gilbarco model BR405799 dual channel pulse generator. The shaft of the meter and the pulse generator rotates twice for a throughput of one litre. The pulse generator incorporates gears to produce, in conjunction with the software of the calculator/indicator, 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) The Gilbarco model Epsilon calculator/indicator modules (software version number 3384.4.0X) incorporate:
- (a) A Management Interface Unit with a keypad for programming functions;
  - (b) Price, volume and unit price displays for the delivery and a separate unit price display allocated for each nozzle; and
  - (c) An optional pre-set keypad and display.

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

The indicator displays the following maximum values:

Volume	To 9999.99 L	Unit price	To 999.9 c/L
Total price	To \$9999.99	Totaliser	To 9999999 L

The optional pre-set facility allows pre-set values to be entered either in dollar increments up to a maximum of \$99 or in litre increments up to a maximum of 99 litres.

During pressurisation the instruments suppresses the display for the first 100 mL of the delivery.

The calculator/indicator also incorporates a checking facility for the meter pulse output, density/temperature measurement and vapour detection devices.

- (vi) The volume conversion for temperature function is performed by the calculator/indicator in conjunction with the LPG Measurement model DSSG98 LPG monitoring device. The device comprises a probe located in the vapour eliminator interfaced to an integrated circuit board located in a separate unit. The probe senses LPG density, measures the temperature of the LPG, and detects if any vapour is present. The calculator/indicator incorporates the ASTM-IP-API Petroleum Measurement Tables for Light Hydrocarbon Liquids, metric edition, Table 54 and Table 53 for volume conversion within the approved field of operation.
- (vii) The transfer device is a Gasguard model LGI LPG nozzle, or any other compatible Commission-approved LPG nozzle that cannot be placed in a hung-up position other than to end the delivery. The nozzle is connected to a DAYCO model 7132 CGA hose, or any other compatible hose complying with the relevant standards for LPG. A breakaway coupling and an excess flow valve may be fitted to the hose.
- (viii) A non-resettable electro-mechanical volume totaliser is provided for each hose. The totaliser indicates the accumulative volume at 15°C dispensed by the instrument. The totaliser is located adjacent to the Management Interface Unit.

### 1.3 Markings

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

Pattern approval sign	NSC No 10/1/17
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
Nature of the liquids to be measured	LPG
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

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".

### 1.4 Sealing and Verification/Certification Provision

The meter has provision for sealing as shown in Figure 4. Access to the electronic meter calibration button and the integrated electronics have provision for sealing (Figure 5). The electronics unit for the LPG monitoring device has provision for sealing (Figure 5).

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

Provision is made for connecting a pressure gauge for measuring the pressure at the meter.

## **2. Description of Variants**

### **2.1 Variant 1**

The model T187Z2 Enterprise dual fuel dispenser (Figure 6 and 7) which is similar to the pattern but is in an alternate 'island orientated' housing and includes four display units.

Access to the electronic meter calibration button and the integrated electronics have provision for sealing (Figure 8).

### **2.2 Variant 2**

The model T186Z1 Enterprise and model T187Z1 Enterprise single fuel dispensers.

### **2.3 Variant 3**

With a 'dead man' switch fitted to the LPG dispenser (Figure 7).

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.

## **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; (\*)
- ±1.0% for inservice inspection of the complete measuring system; and
- ±0.4% for the volume conversion for temperature device. (#)

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;
- ±40 mL for deliveries equal to the minimum measured quantity; and
- ±1.0% for gas elimination for LPG.

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

(#) To display the temperature, density and volume at operating conditions, perform a delivery in normal mode and hang up the nozzle. Press the "key" button followed by "19" and then press the "key" button again until the desired display is obtained.

Details on the calibration procedure may be found in the Gilbarco Enterprise LPG service manual.



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

Bradfield Road, West Lindfield NSW 2070

**Notification of Change**  
**Certificate of Approval No 10/1/17**  
**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 T186Z2 Enterprise LPG Fuel Dispenser for Motor Vehicles

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

- A. In Certificate of Approval No 10/1/17 dated 26 March 2003, the FILING ADVICE should be amended by adding the following:  
“Notification of Change No 1 dated 30 October 2007”
- B. In Technical Schedule No 10/1/17 dated 26 March 2003, clause **1.2 System Description**, subclauses (iii) and (vi), all references to the model DSSG98 LPG monitoring device should be amended by adding the following:  
“... or model DSSG-2000 ...”

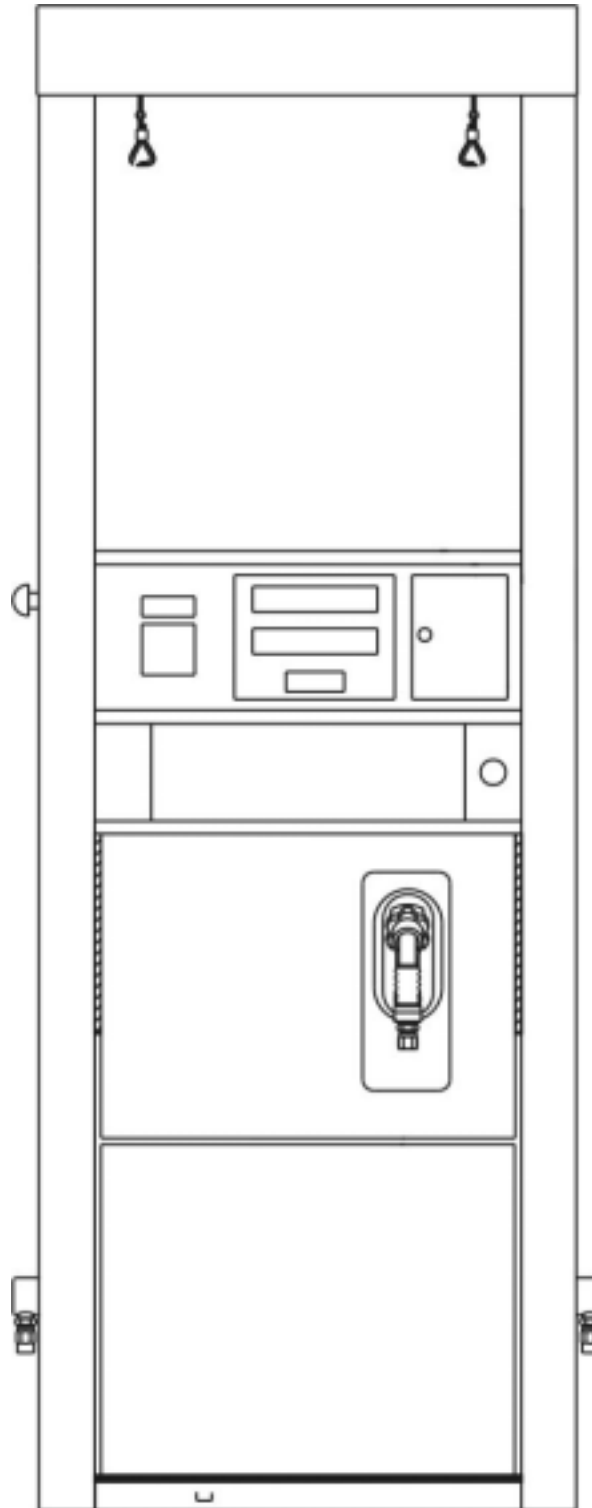
Signed by a person authorised by the Chief Metrologist  
to exercise his powers under Regulation 60 of the  
*National Measurement Regulations 1999*.

A handwritten signature in black ink, appearing to be 'J. G. T.', is written over the signature line.



10/1/17  
26 March 2003

FIGURE 10/1/17 - 1

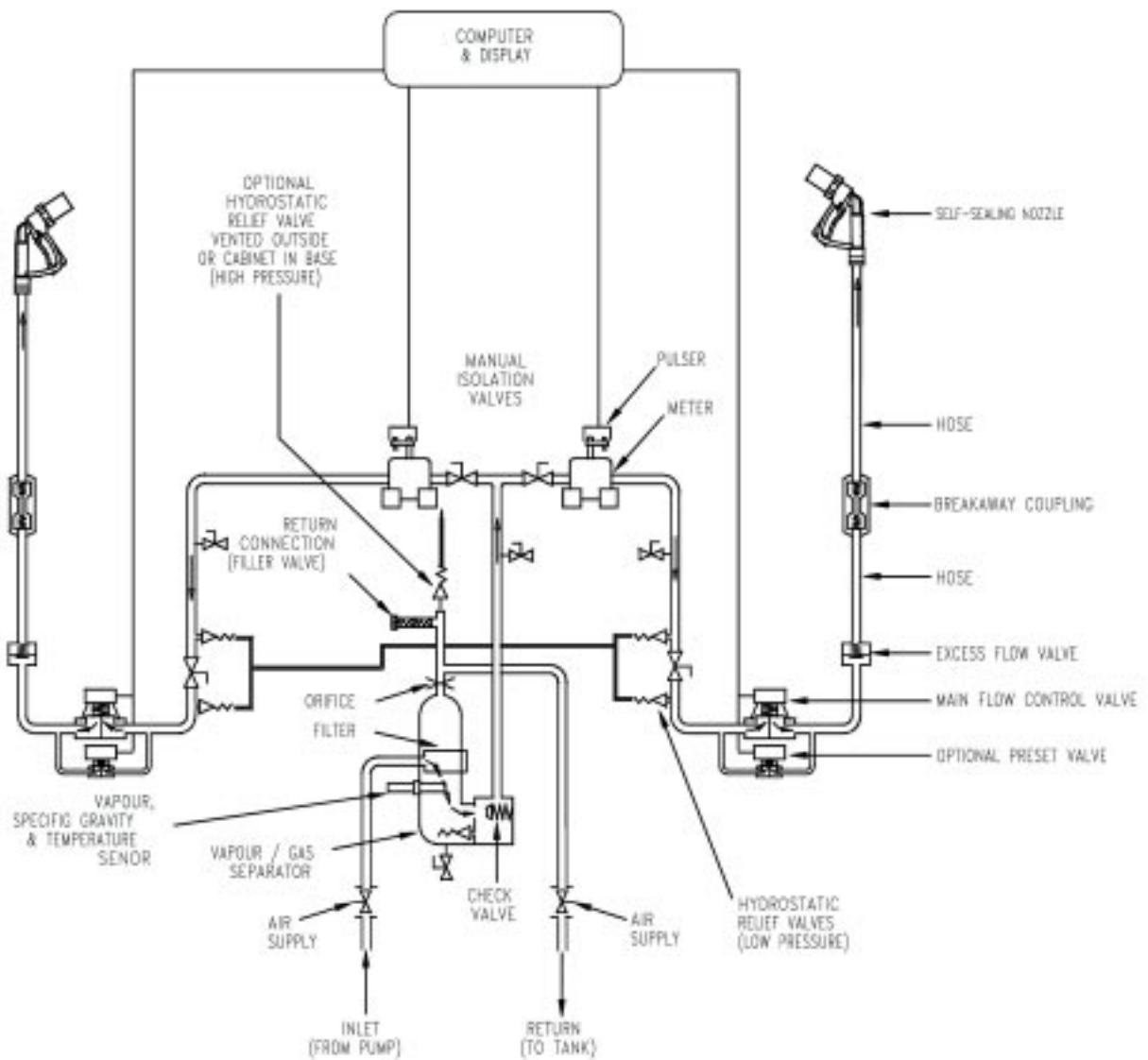


**FRONT**

Gilbarco Model T186Z2 Enterprise ('Lane Orientation') LPG Fuel Dispenser for Motor Vehicles

10/1/17  
26 March 2003

FIGURE 10/1/17 - 2



Gilbarco Enterprise LPG Hydraulics

10/1/17  
26 March 2003

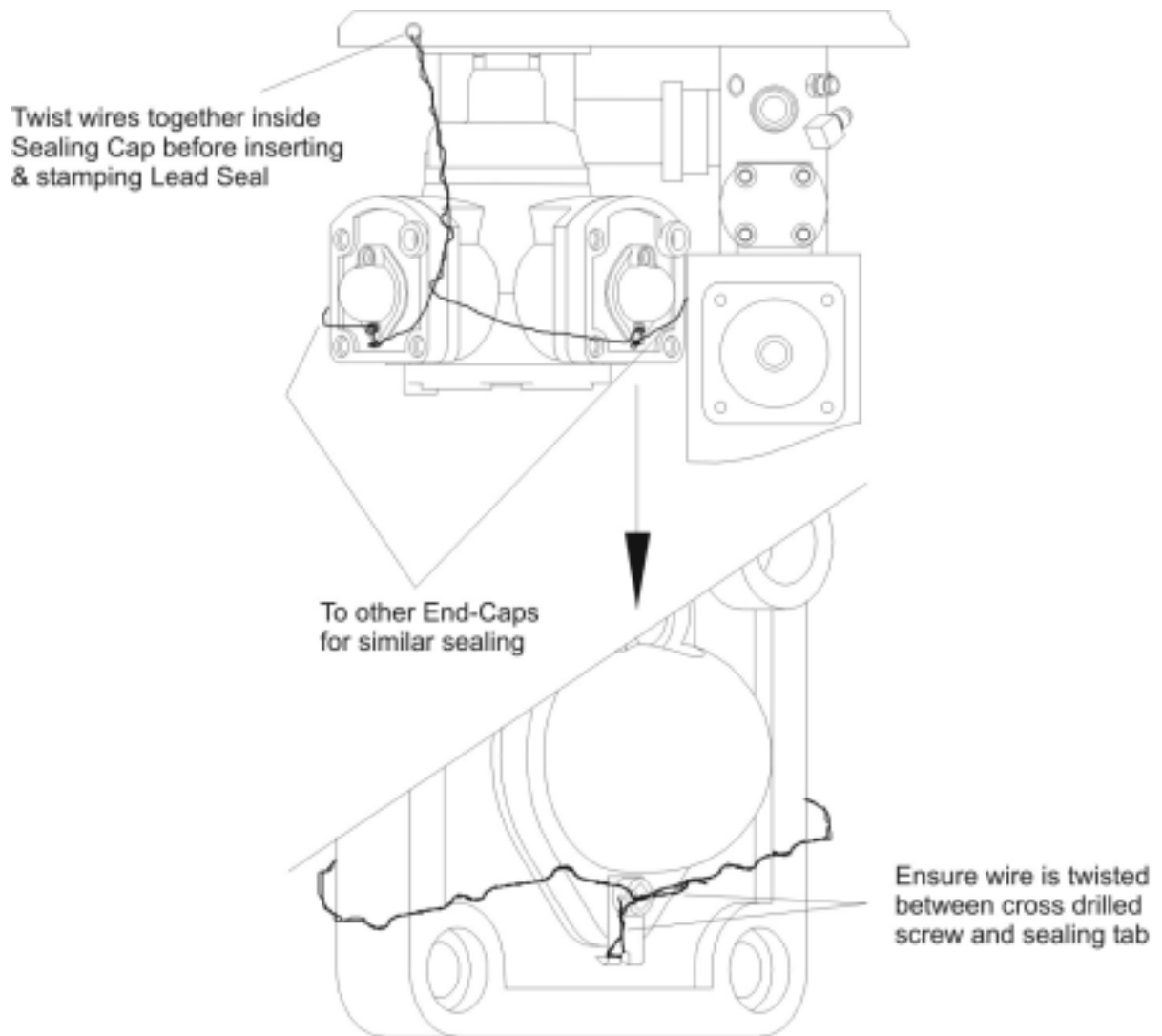
FIGURE 10/1/17 - 3



Silea Model 707-1 174M LPG Flowmeter

10/1/17  
26 March 2003

FIGURE 10/1/17 - 4



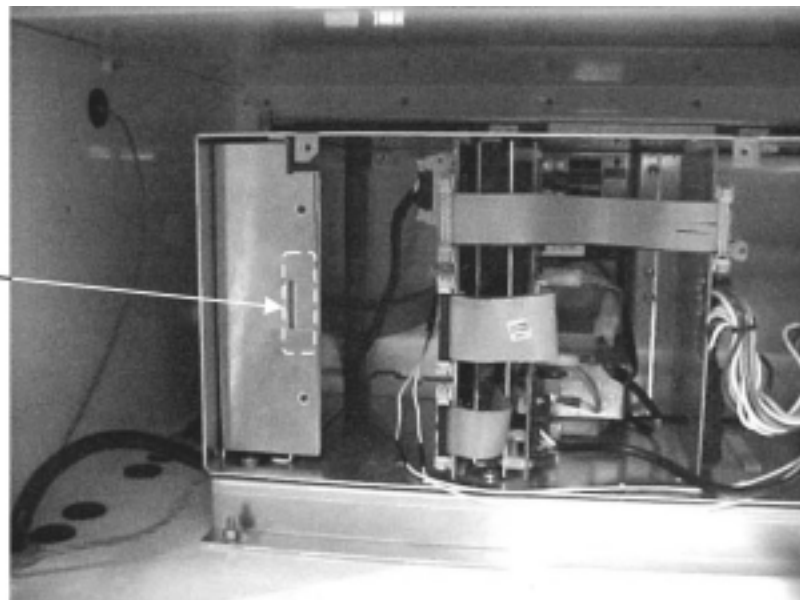
Meter Sealing

FIGURE 10/1/17 - 5



Sealing  
Position of  
Electronic  
Meter  
Calibration  
(‘Lane  
Orientation’)

Sealing  
Position of  
Electronics  
Unit for the  
LPG  
Monitoring  
Device

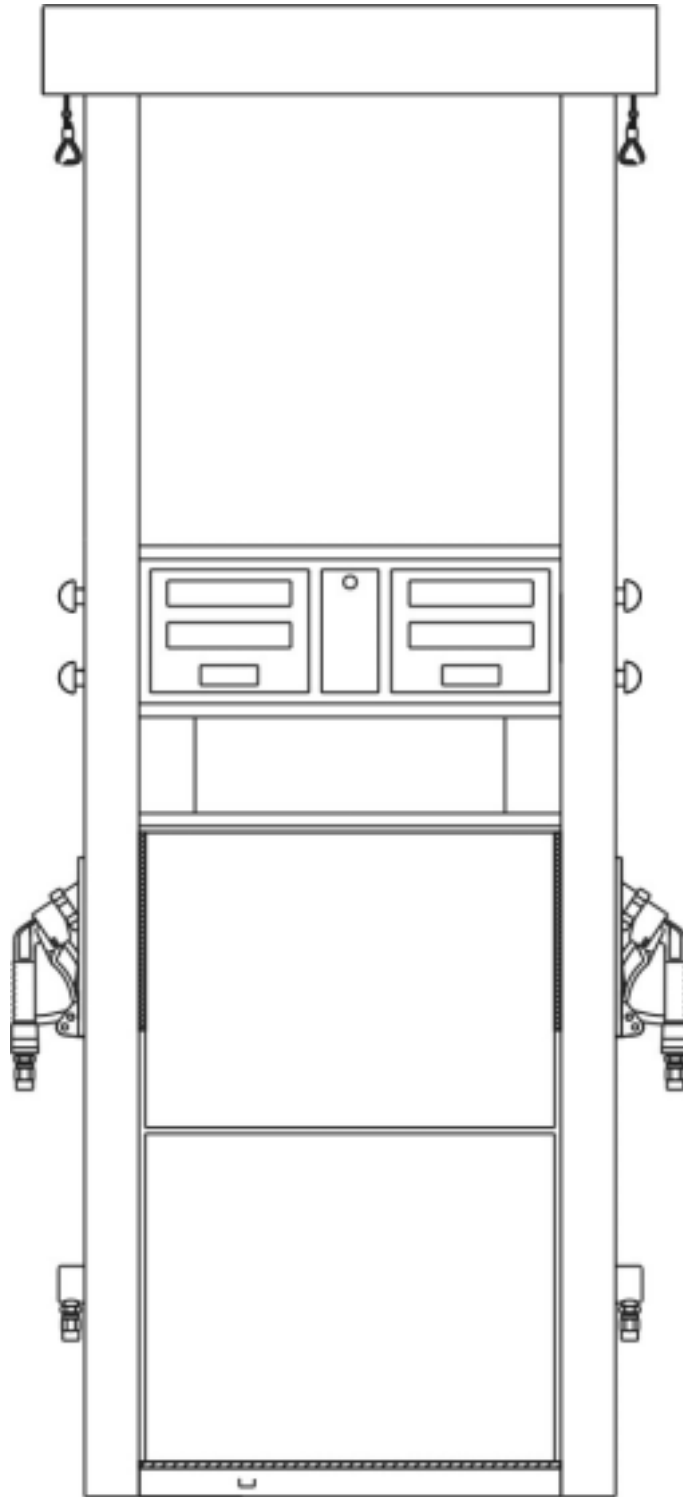


Computer Module inside  
Dispenser Customer Display Module  
- viewed from front of dispenser

Meter Calibration and Monitoring Device Electronics Unit Sealing

10/1/17  
26 March 2003

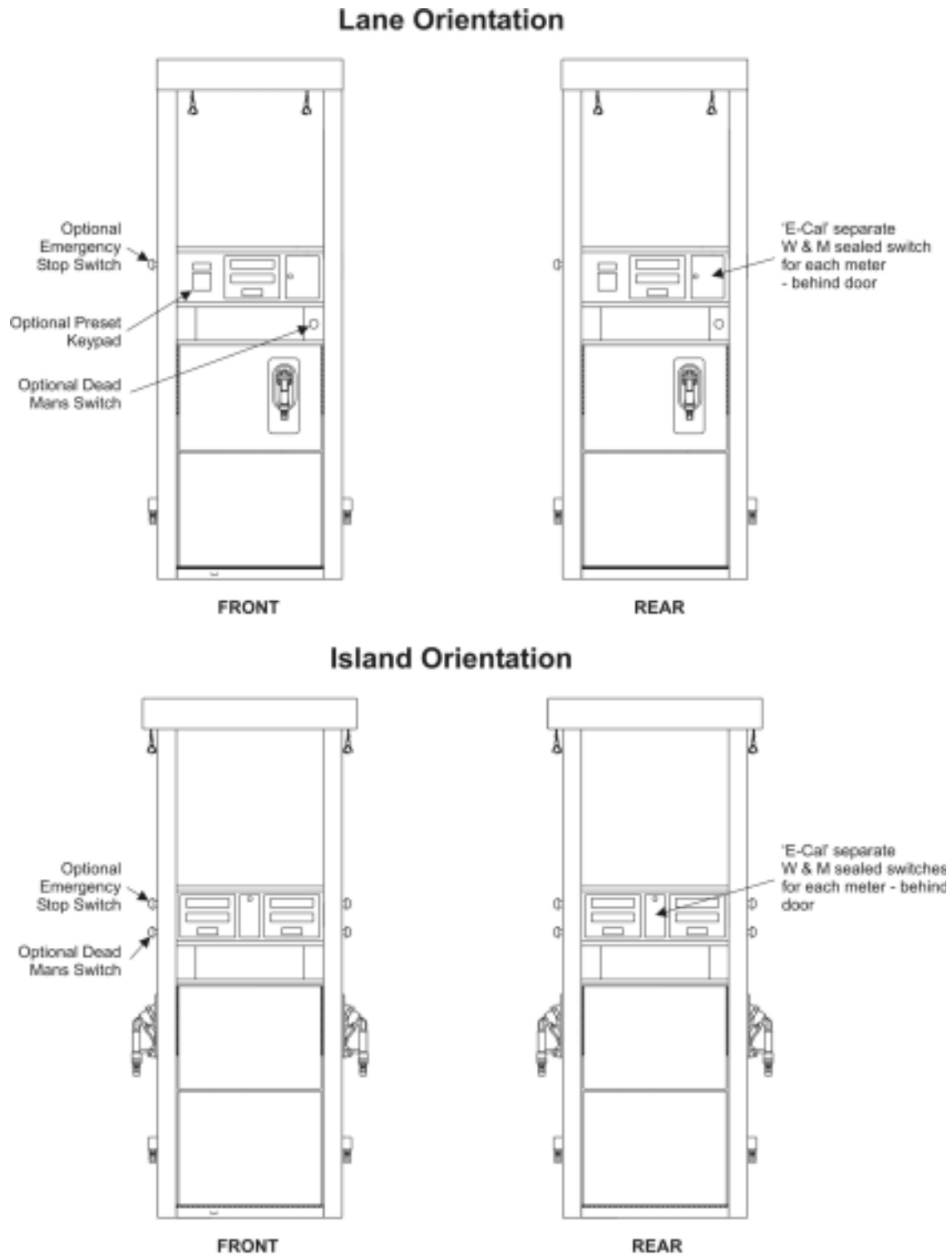
FIGURE 10/1/17 - 6



**FRONT**

Gilbarco Model T187Z2 Enterprise ('Island Orientation) LPG Dispenser

FIGURE 10/1/17 - 7



## Enterprise LPG Dispensers

'Lane' and 'Island' Orientation Layouts

10/1/17  
26 March 2003

FIGURE 10/1/17 - 8



Sealing Position of  
Electronic Meter Calibration  
(‘Lane Orientation’)

Meter Calibration Sealing ( ‘Island Orientated’) Housings