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Revolution Not Evolution

P7499

DIPTRONIC™

SUMP TRUCK OPERATION



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1.0 Overview

This manual is an operational guide to Diptronic in a single compartment sump truck.

It applies to software rev 04.00.03.

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Please note time zone differences between Sydney and Orlando. Suitable contact times would be 7am Orlando time which is equivalent to 9pm Sydney time. Alternatively, 5pm Orlando time is equivalent to 7am Sydney time.

2.0 The Diptronic radar system

The Diptronic System eliminates the need for manual dipsticks. This means there is no longer a need for personnel to climb to the top of the tank, eliminating associated injury risk. Also, the escape of VOC's is prevented, as dip hatches do not require opening.

The Diptronic is a top datum dipstick and like all dipsticks can not compensate for extremities, eg pipeline. Diptronic accurately measures from approximately 50mm above the bottom of the compartment up to the top datum point level. Those areas where Diptronic does not measure are commonly referred to as "dead zones" and are used in calibration sequences.

The simplest Diptronic System consists of a CPU (Central Processing Unit) and a sensor that houses the radar electronics. The sensor is mounted to the walkway or manhole cover on the top of the tank. It has a shaft and tube that extends into the tank.



The sensor monitors the level of jet fuel and water and sends this information back to the CPU where total volume and water and jet fuel volumes are displayed. A ticket printer may be used to print a tank contents docket using this information, or the CPU may be interrogated by a remote device.

For all Diptronic installations it is mandatory to disconnect the mil spec connectors from the CPU and isolate the power lead to the CPU before welding on a tanker.

All sensors must be mounted in the volumetric centre of the compartment.

To achieve the desired accuracy of Diptronic it is a Liquip requirement that all calibrations be carried out in 30 gallon increments. This applies to both manual and automatic calibration.

3.0 Diptronic maintenance

As there are no moving parts in the Diptronic system there is little maintenance required. The installation should be inspected every 12 months for any sort of damage or degradation that may effect safety of the system. Check the CPU, sensor and j/box gaskets have not perished. Check no CPU, sensor or j/box screws and connectors have come loose over time.

4.0 Normal operation

4.1 Following loading of jet fuel, water or mix into the truck compartment, the sensor will communicate with the CPU which will display the volume of water or jet or mix of both on the LCD display.

It will take a short time for the level to settle which will be indicated by the CPU changing from a 'PLEASE WAIT' to 'READY' state.

4.2 IT IS ESSENTIAL that the operator follows this sequence which informs the CPU of the start and finish of each transaction.



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Start: when ready to load (or unload) press the 'OK' + 'PRINT' buttons on the CPU simultaneously. This sets the 'start' values for the calculations.

Load or unload: the operator may take as long as necessary and start or stop if required without any effect.

Finish: when the particular load or unload is complete, the operator presses and holds the 'PRINT' button on the CPU. This sets the 'end of transaction' values.

4.3 Refer section 7.0 for information on storing or printing these volumes to a contents docket. Note, pressing the PRINT button will print a docket and send the same information to a remote PC via COM2 (refer section 9).



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5.0 Diptronic components

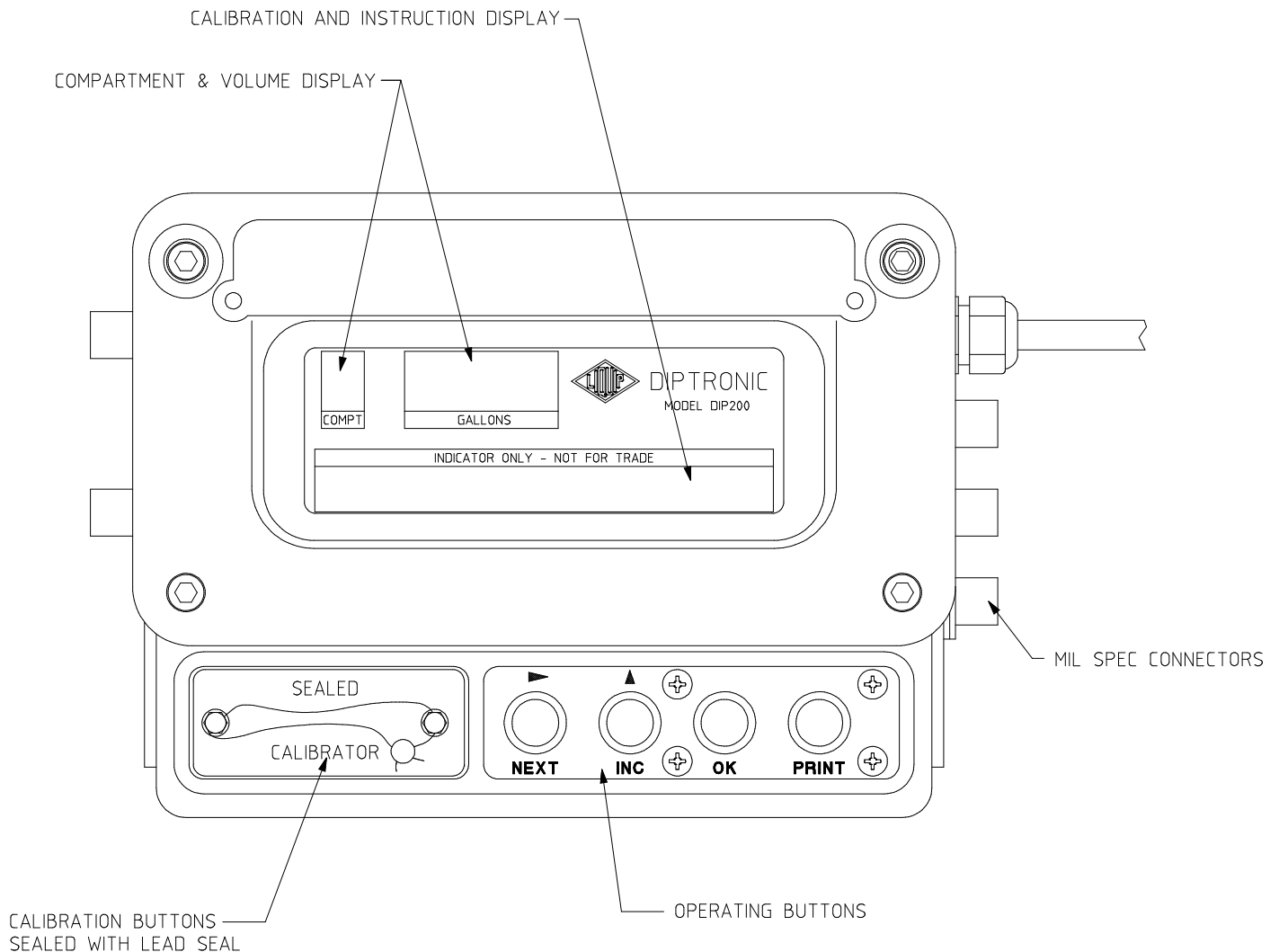
5.1 DIP2XX CPU

The CPU housing is constructed of cast aluminium with an EPDM seal. The display is at a 15-degree angle to improve viewing.

The CPU has up to six military specification connectors that connect to the sensor, printer and other communication devices.

The power cable is hard wired into the CPU via a water proof gland.

Fig 1 - Diptronic DIP2XX CPU.



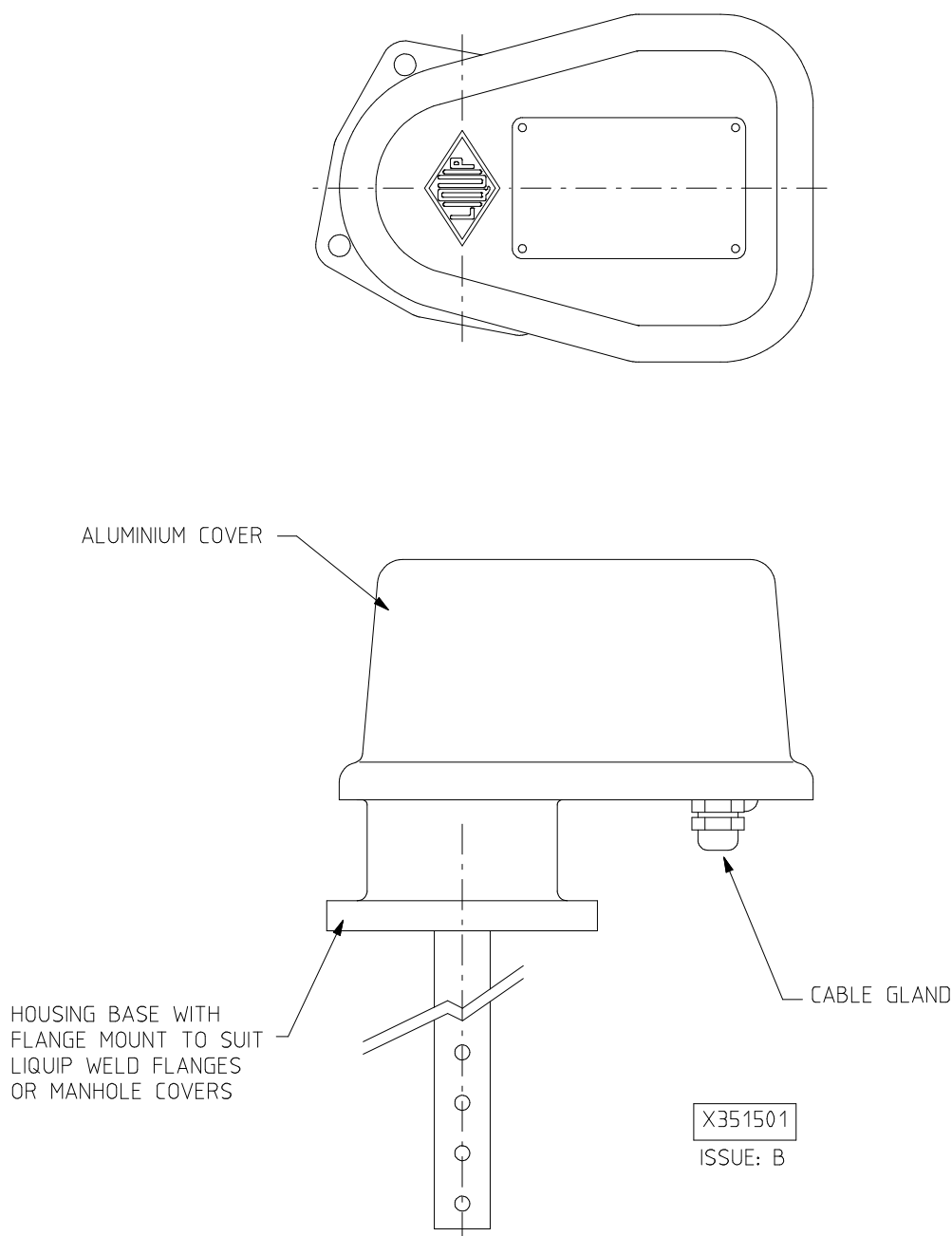


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5.2 DIP1XX sensor

The sensor is constructed of a cast aluminium cover and base with a stainless steel tube and internal rod. The electronics are fully potted in epoxy contained in an aluminium cup. The cup is mounted on the base and wires connect the terminals protruding from the epoxy surface through a waterproof gland. The squat sensor housing (DIP110) allows for mounting on manhole covers.

Fig 2 - Diptronic DIP1XX sensor.



6.0 Printer

A printer can be used to print the volume of product in a compartment.

With the battery isolation switch in the on position:

1. Power on the 24V ticket printer via the power switch on the back left hand side of the printer. The green POWER LED will illuminate.
2. Press the RELEASE button. The RELEASE LED will illuminate.
3. Slide paper into the printer as shown in figure 3. The PAPER OUT LED will turn off.
4. Press the FORWARD button once. The paper will advance forward and be held in place via the printer.

Note: refer section 7.0 for details on how to print a transaction docket via the printer.

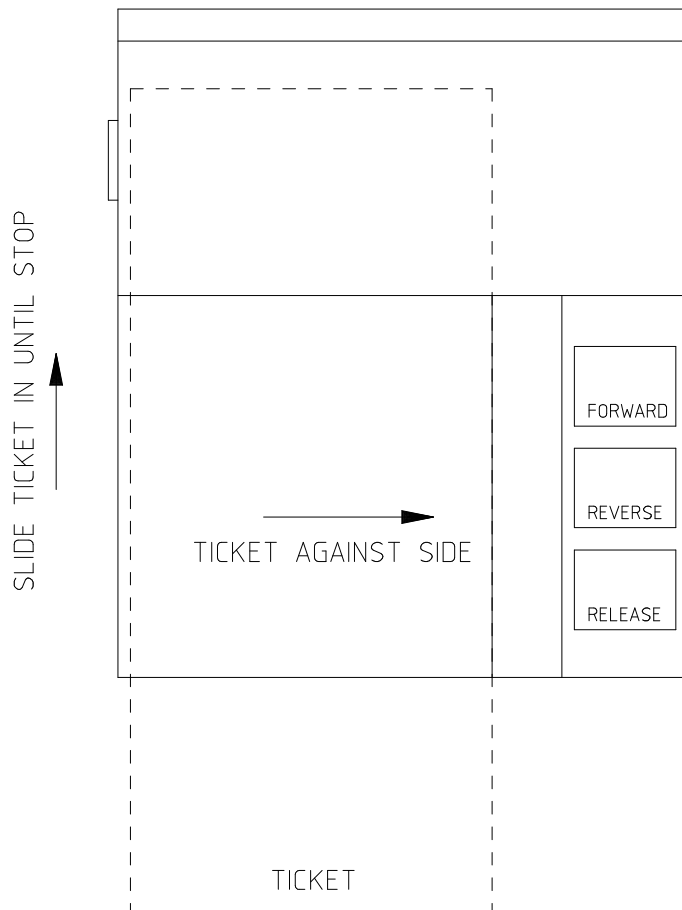


Fig 3 - Using the ticket printer.



7.0 Printing a transaction docket

In order to print a transaction docket the operator must log the start of transaction BEFORE movement of the product.

This is done by pressing OK + PRINT buttons and is confirmed with message "start of transaction".

After filling the vehicle tank with a jet/fuel mix allow a short time for the mix to settle and Diptronic to display a valid reading. This will be indicated by the display changing from 'PLEASE WAIT' to 'READY'. At this point it is possible to print a transaction docket.

Printing is activated by pressing PRINT button.

A typical transaction docket will show truck number, transaction number and date and time of transaction. Also shown will be the total volume (jet fuel plus water volume), water volume and jet fuel volume if present. Refer sample dockets.

Notes:

It is not mandatory to use the ticket printer to make a transaction.

Transaction history is saved in the CPU and can be accessed via a PC or other communication device.

Simultaneously to printing the CPU sends out the similar data packets via communication port COM2 to allow for capture of the docket by the remote equipment if required.



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8.0 Printing history of transactions

Printing is activated by pressing INC+PRINT buttons.

The printout consists of header block followed by summary of transactions in chronological order, the most recent first.

Printing can be terminated at any time by INC+PRINT buttons.



9.0 Calibration report ticket

To get a printout of all calibration and setup data press the NEXT and PRINT buttons at the same time.

If there is insufficient paper inserted in the ticket printer to print all the data, a warning message will be displayed prompting for more paper. If no paper is inserted within a 10sec period after the warning message is displayed the screen will return to the main display.

10.0 Hyper Terminal

Calibration and setup data can be saved to PC or other communication device via Hyper Terminal.

First disable the printer:

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press MENU until get	PRINTER SETUP? NO
4	Press INC then OK	PRINTER: TM-295
5	Press INC to select	PRINTER: OFF
6	Press OK	PRINTER: OFF
7	Press MENU	COM 1 ACK? YES
8	Press MENU	EXIT CALIBRATION? YES
9	Press OK	



Make sure the P6865 PC mil spec communication cable is connected to the AUX RS232 SPDS port. The free end of the cable should be connected to a PC or other device via a serial cable.

The pin outs of the harness are:

GREEN—GND
BLUE—RX
RED—TX

Setup Hyper Terminal to :

Baud—9600
Data bits—8
No parity
1 stop bit

In ASCII setup place a check next to append line feed & wrap lines.

Capture the transmitted data as necessary.

Enable ticket printer when finished using Hyper terminal:

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press MENU until get	PRINTER SETUP? NO
4	Press INC then OK	PRINTER: OFF
5	Press INC to select	PRINTER: TM-295
6	Press OK	PRINTER: TM-295
7	Press MENU	COM 1 ACK? YES
8	Press MENU	EXIT CALIBRATION? YES
9	Press OK	



Appendix 1.0 - Compartment level messages

Level messages L1 to L6 described below are automatically set by the CPU following completion of the automatic or manual calibration. Level messages are simply used as indicators on the LCD display.

L2 is used to indicate tank full with a 'MAX+' message. L2 is set to the last calibration step in gallons rounded down to the nearest 10 gallons.

L3 is set between SFL and L2. L3 is set at the same level as the probe actuation point. The probe actuation point is set 50 gallons under the internal roof level.

SFL (Safe Fill Level) is the maximum operating volume. The safe fill level should be set to allow for thermal expansion of the liquid in the tank without spillage.

L4 and L5 are internal messages that are not normally used. They should both be left at the default value of 1.

L6 indicates the lowest measurable level. Below this level the CPU will display 'MIN-'. The MIN- region is a volume undetectable by the radar system. It will be set to approximately 30 gallons, however, this may vary depending on the distance between the sensor end and tank floor.



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Appendix 2 - Sample transaction dockets

Sample transaction docket—water & layer of jet fuel

———— TRANSACTION DOCKET ————

ASIG/DIPTRONIC

TRUCK NO: 130174
TRANSACTION No: 001
DATE: 15/01/2007
TIME: 09:43

START

TOTAL VOLUME [G]: 01961
WATER VOLUME [G]: 01311
FUEL VOLUME [G]: 00650

END

TOTAL VOLUME [G]: MIN-
WATER VOLUME [G]: MIN-
FUEL VOLUME [G]: MIN-

DELIVERED

NETT TOTAL VOLUME [G]: 01961
NETT WATER VOLUME[G]: 01311
NETT FUEL VOLUME [G]: 00650

————END————

Sample transaction docket—water only

———— TRANSACTION DOCKET ————

ASIG/DIPTRONIC

TRUCK NO: 130174
TRANSACTION No: 002
DATE: 15/01/2007
TIME: 09:53

START

TOTAL VOLUME [G]: 01399
WATER VOLUME [G]: 01399
FUEL VOLUME [G]: MIN-

END

TOTAL VOLUME [G]: MIN-
WATER VOLUME [G]: MIN-
FUEL VOLUME [G]: MIN-

DELIVERED

NETT TOTAL VOLUME [G]: 01399
NETT WATER VOLUME[G]: 01399
NETT FUEL VOLUME [G]: MIN-

————END————



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Sample transaction docket—jet fuel only

——— TRANSACTION DOCKET ———

ASIG/DIPTRONIC

TRUCK NO: 130174
TRANSACTION No: 003
DATE: 15/01/2007
TIME: 10:13

START

TOTAL VOLUME [G]: 00987
WATER VOLUME [G]: MIN-
FUEL VOLUME [G]: 00987

END

TOTAL VOLUME [G]: MIN-
WATER VOLUME [G]: MIN-
FUEL VOLUME [G]: MIN-

DELIVERED

NETT TOTAL VOLUME [G]: 00987
NETT WATER VOLUME[G]: MIN-
NETT FUEL VOLUME [G]: 00987

———END———



Appendix 3 - History of transactions report

Up to 50 transactions are saved in memory in the CPU. A new transaction is saved every time the operator presses the PRINT button following setting the start of a new transaction.

Each saved transaction contains the start, end and nett volume for total, water & fuel.

The history report can be printed via the ticket printer by holding the INC & PRINT buttons. It can also be accessed via DipRecall or via PC or other device as described in section 9.0.

The history can only be reset via DipRecall or manually through the CPU menu structure, however, the sealed for calibration seal must be broken when doing manually.

To reset the history via breaking of the seal follow the steps below:

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press MENU	SYSTEM SETUP? NO
4	Press INC	SYSTEM SETUP? YES
5	Press OK	NO.OF COMPARTMENTS: 1
6	Press MENU until get	ERASE HISTORY? NO
7	Press INC	ERASE HISTORY? YES
8	Press OK	ERASE HISTORY? NO
9	Hold CAL & press OK	EXIT CALIBRATION? YES
10	Press OK to exit	
11	Reseal the CPU	



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