LPG Apollo

Set-up,Installation & Parts Manual

Apollo LPG Manual

Contents

Note

This is an Interim Manual intended to cover Apollo trial sites, and will be reviewed once trials are complete and design is finalised.

Note also that the Apollo units are base on PEC standards 1000 & 8000 Dispensers and therefore this manual should be used in conjunction with PEC Modular Pumps Installation & Service Manual 87386

First Issued 06/10/98
Modified 24/02/00
02/03/00, 26/09/01
04/10/01, 09/10/01
08/04/02, 16/05/02, 30/05/02, 06/09/02

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& d:\mydrawdt\apollo\input.idw

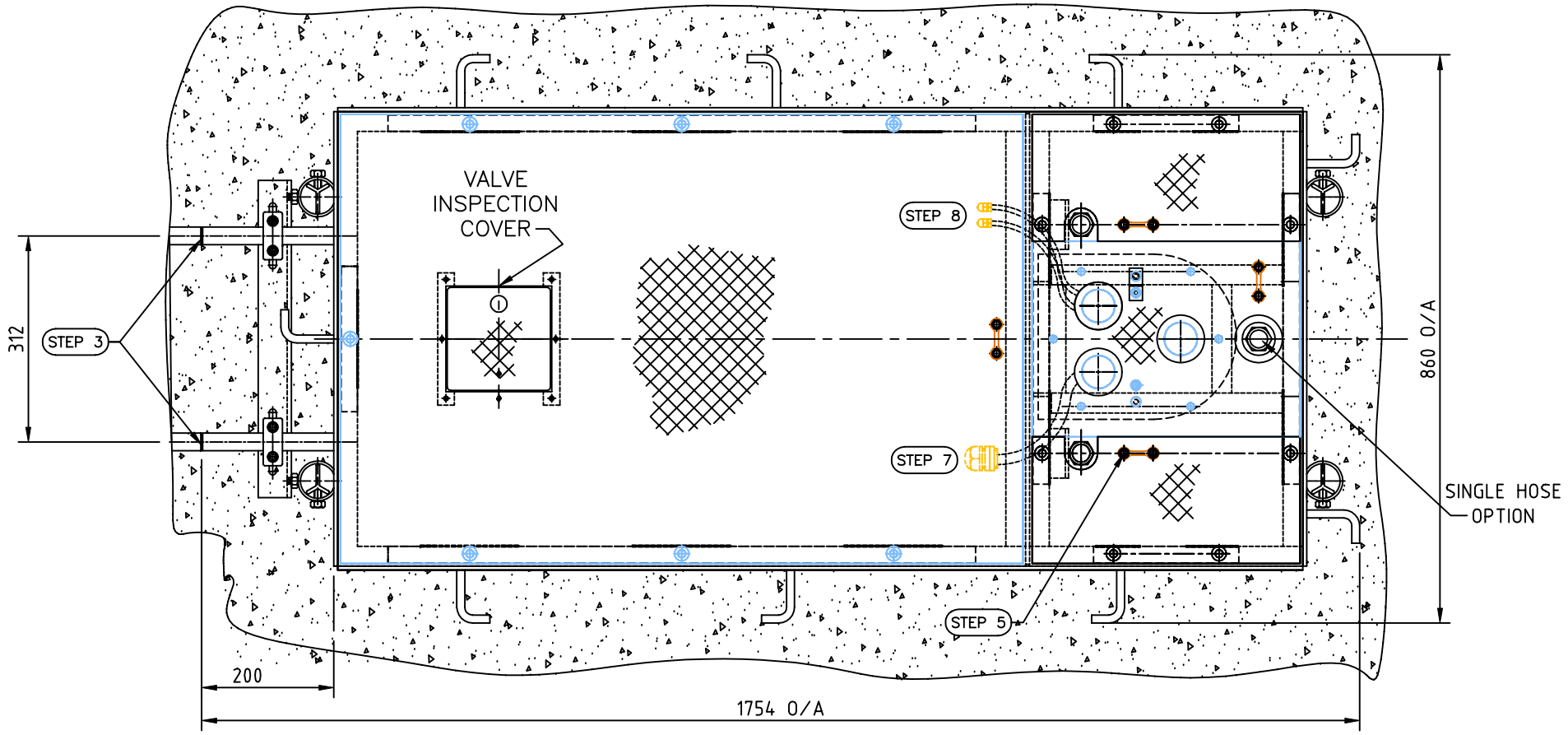
Brief Description of LPG Concept

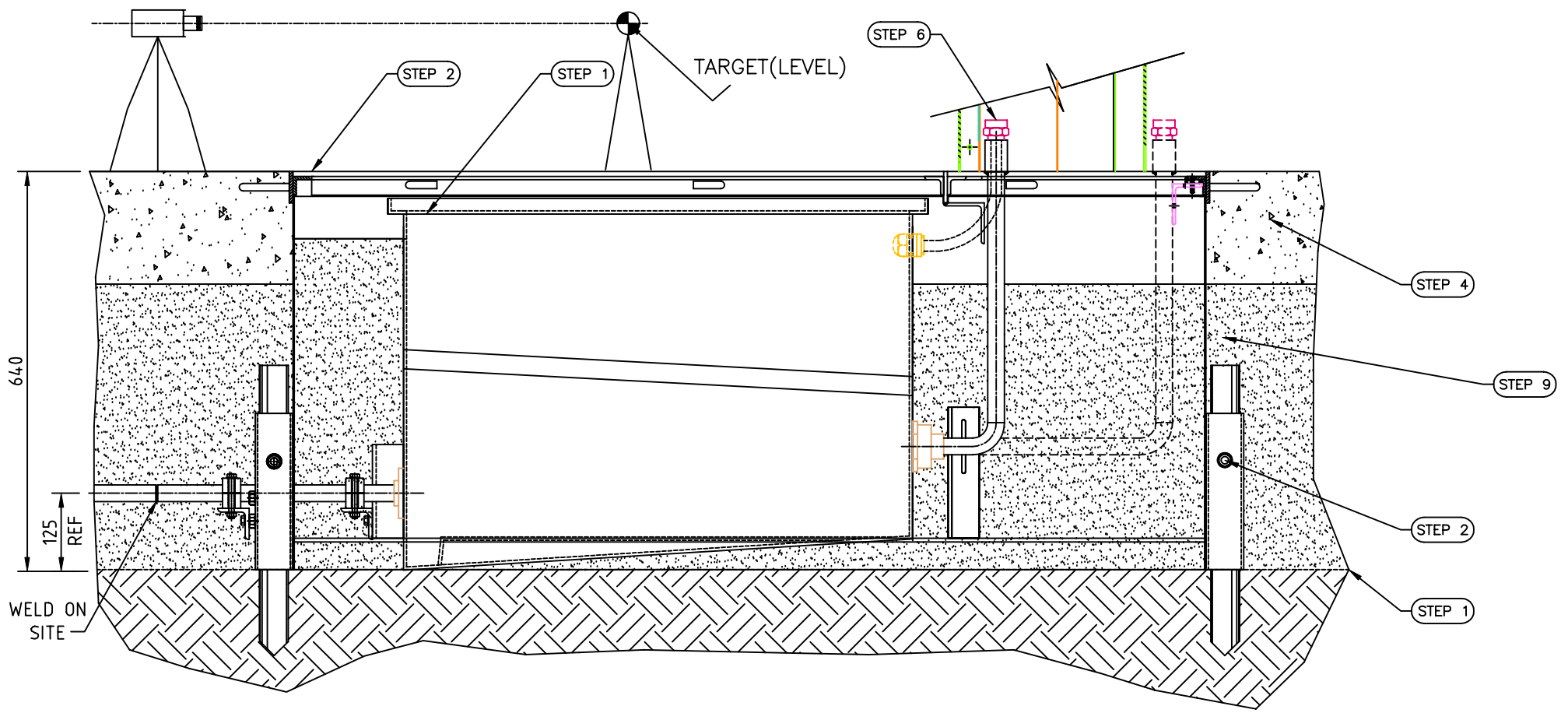
- Polyethylene enclosure housing LPG Metering Module assy. set into ground under Forecourt level. Refer Pg. 3.
- Metal Frame assy. which carries the main enclosure Cover,& supports Polyethylene Enclosure is set @ Forecourt level & positioned symmetrical to Sump Enclosure.
- Module Feed & Delivery lines enter and exit Enclosure through Bulkhead type seals.
- LPG unit vertical Column section is mounted directly onto Metal Frame & Cover Assy. at the leading end of Sump Enclosure. Onto this vertical Column section is mounted the Electronic Head Assy, 2 Nozzle Holster Assy & and the LPG Hose anchor/suspension & release arrangement. Hose release device allows hose to break away from it's column anchor point thus allowing the inline Dry Break to disconnect if a drive off should occur.
- External Power & Communications connections, all enter up through the Forecourt and into the Column. Connections are made within Head Assy. then back through Steel Wire Armor Cable to Sump Enclosure.
- Fixed Delivery line to Delivery Hose connection terminate just above Forecourt level. Hose Dry Break Lanyard may best be anchored to base of Column section if possible, alternatively it can be anchored to a bracket or similar at forecourt level.

Note:

Refer Drg.3 subject to change from site to site please have specifications checked before proceeding.

As of September 26, 2001 D J Batchen Mk 4





INSTALLATION PROCESS, UNDERGROUND HYDRAULICS MODULE

Step 1 Excavate to specified Dimension & Compact Sand Prior to Placing Module

Step 2 A) Loosen bolts holding star posts.
B) Hammer in star posts.
C) Lift module till level
D) Tight bolts onto star posts

Step 3 A) Prepare to weld pipes to module.
B) Place wet rags around pipe to prevent damage to plastic pipe support.
C) Weld pipes, Run cables & air line.

Step 4 Pour concrete

Step 5 Mount column & fit break glass assembly. breakaway coupling

Step 6 Connect hose and breakaway coupling

Step 7 Complete S.W.A Cable installation

Step 8 Complete Nozzle limit Switch and Comms cable installation

Step 9 Back fill the gaps with sand to avoid pockets for gas accumulation

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REV	DATE	ECN No.	DESCRIPTION	BY
B	18.09.01	011018VC01	NEW FRAME ADDED & REDRAWN	V.C.
A	17.09.01	010917AM01	OFFICIAL RELEASE	V.C.

MATERIAL

FINISH

ALL DIMENSIONS IN MILLIMETERS U.N.O.

	NAME	DATE
DRAWN	V.C.	17.08.01
CHECKED	A.M.	
APPROVED L.E.		

SCALE : 1: 7.5 REF. DWG.

COLUMN / FRAME
INSTALLATION DETAILS
APPOLLO Mk 4

CLIENT: P.E.C.

DRG. NUMBER : DJB 3061 REV. B

A3

AutoCAD FILENAME :

Input Processor Connections & Settings LPG Apollo 83841

***Note: For Ver. 3 Software with Prefix VP or VG fitted into Main Processor. Switch SW 3 has Swt. Position 2 set "on" for Fluid Float Swt. Control operation.
****Note: Set Swt position 1 "off" for standalone Temperature Probe.
* Note; Set position 1 "on" = Cents per Litre

Dip Switch Settings.
For Units Fitted with
LPG Measurement Technology
Density Probe & Software
VI 3.05& VA 3.06P or Greater.
(Float Switch Operation always Active)

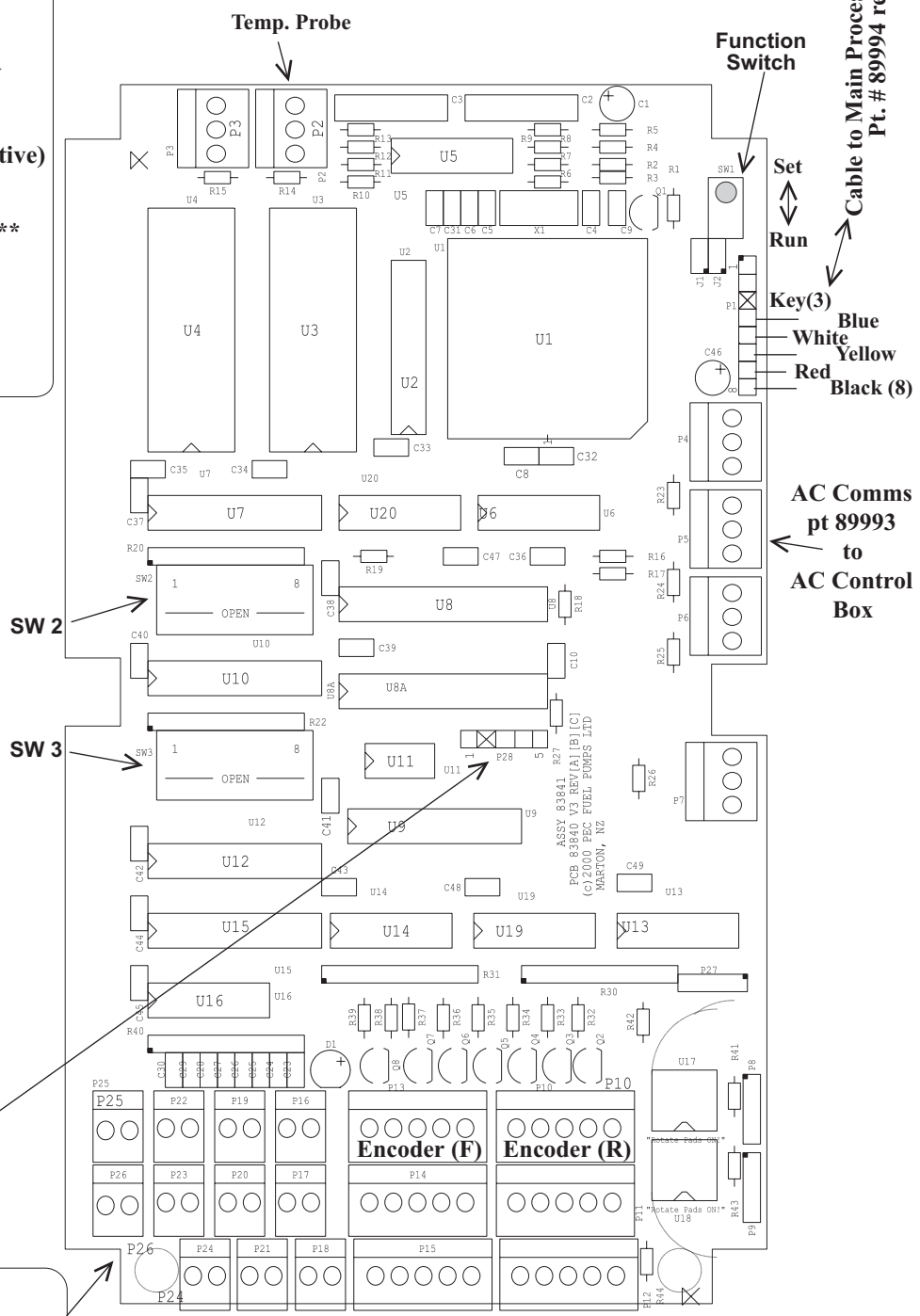
SW 2	SW 3
1 = on ****	1 = off *
2 = off	2 = off ***
3 = off	3 = off
4 = on	4 = off
5 = off	5 = off
6 = off	6 = off
7 = off	7 = off
8 = off	8 = off

Dip Switch Settings Std.

SW 2	SW 3
1 = off	1 = off *
2 = off	2 = off **
3 = off	3 = off
4 = on	4 = off
5 = off	5 = off
6 = off	6 = off
7 = off	7 = off
8 = off	8 = off

***Note: For Australian Units @ Cents Per Litre SW 3 has position 1 set "on"**

****Note For Units fitted with Software VI 1.121s or greater, SW 3 has swt. position 2 set "on" This allows for Float/Fluid Switch operation.**

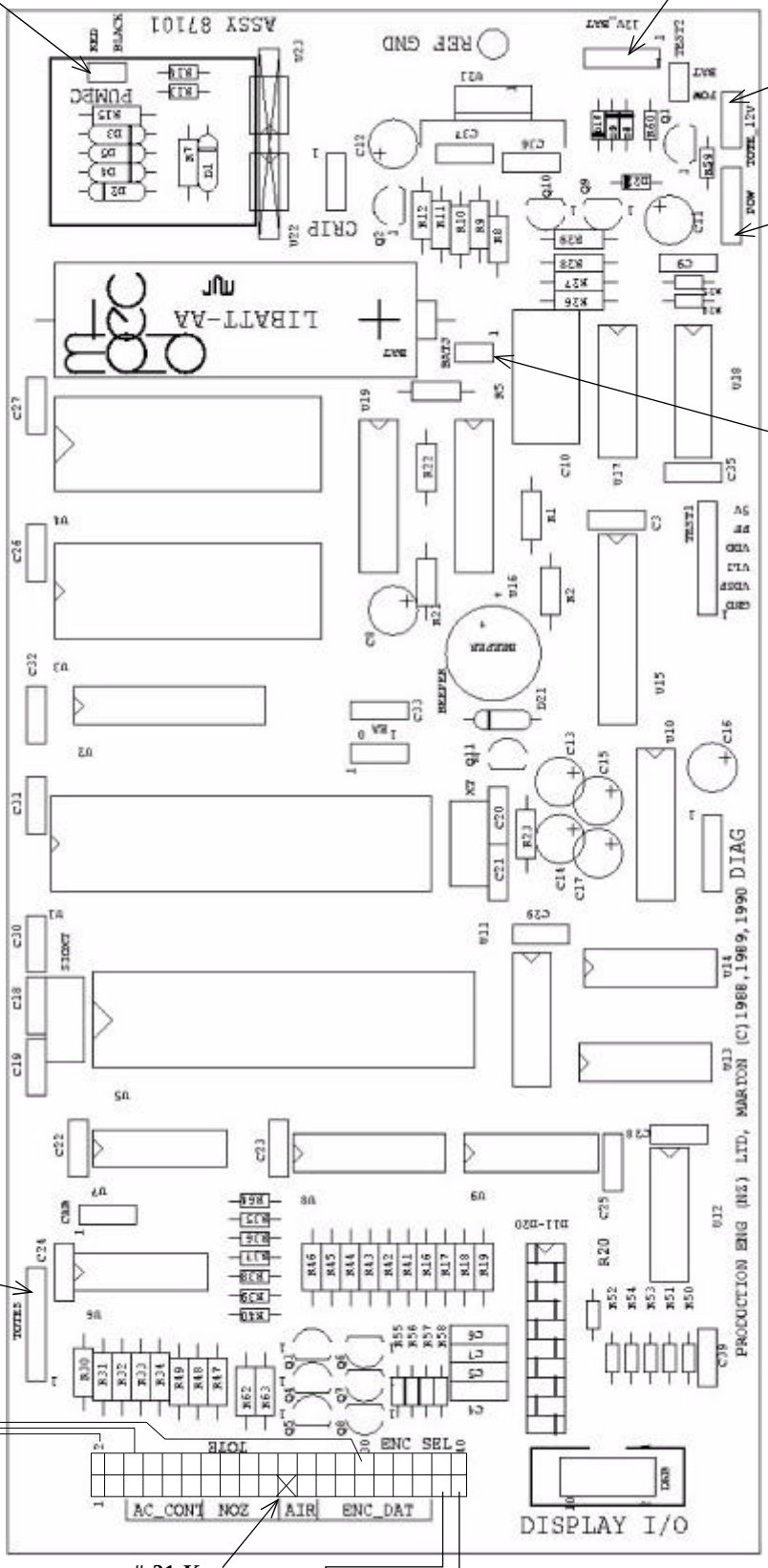


LPG Density Probe Cable
@ J3 & P28
Pos. 1 - Slate (Gray)
2 - Key
3 - Orange
4 - Red
5 - Black

Connections & Cables

P1 = Main Processor (Head) pt 89994
P2 = Temperature Probe Rear
P3 = Temperature Probe Front
P4 = AC Control pt 89721
P10 = Encoder Rear
P13 = Encoder Front
P16 - 18 = Float Switch (Sump) pt 89865
P19 = Nozzle Rear pt 89995
P22 = Nozzle Front pt 89995
P20,21,23,24,25,& 26 = Jumpers pt 87326

Mains Processor PCB Connections 87101



Pump Comms pt 83202 to Pumpcomms pg. 8

Battery 12 v

Tote Power pt 87338

Power pt 83210

Lithium Jumper position

Tote pt 87338

 # 30 Blue

 # 2 White

 # 6 Yellow

 # 21 Key

 # 37 Black

 # 39 Red

pt 89994 refer pg. 5

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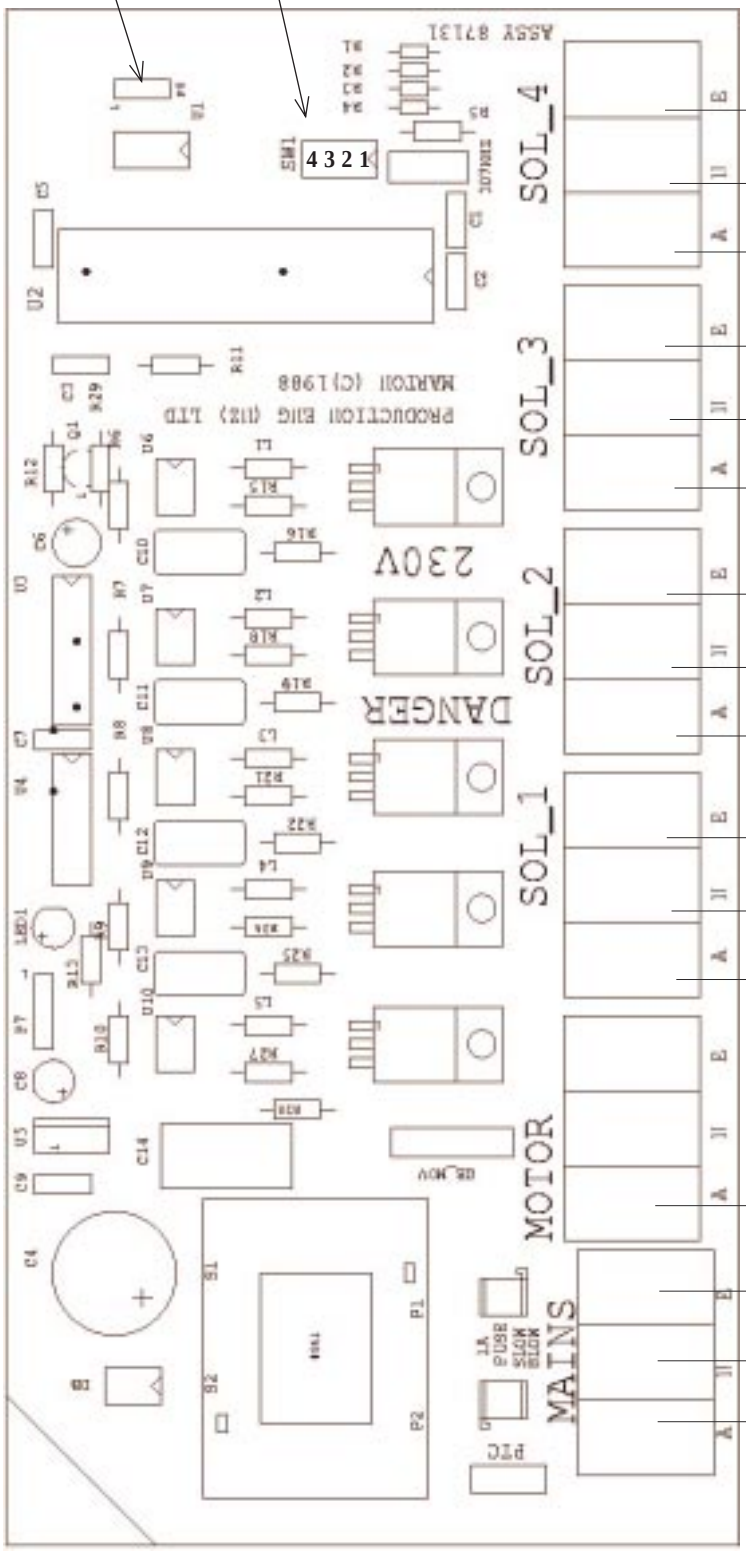
Cable Connected to P1 @ Input Processor PCB Refer Page 5

LPG AC Control Connections 87131

AC Com. pt 89721 to P1 pg.5 Input Pro.

Dip Switch Setting (Sw1) : @ 1 Off 2 - 4 On



Green
Blue **Main Valve Rear**
Red or Brown

Green
Blue **Finial Valve Rear**
Red or Brown

Green
Blue **Main Valve Front**
Red or Brown

Green
Blue **Finial Valve Front**
Red or Brown

(# 5 Switch Active)

(# 6 Earth) GN

(# 2 Negative)

(# 1 Active)

Steel Wire Armour Cable pt 89980 or 89814 From Head Cabinet

Refer also pg 8

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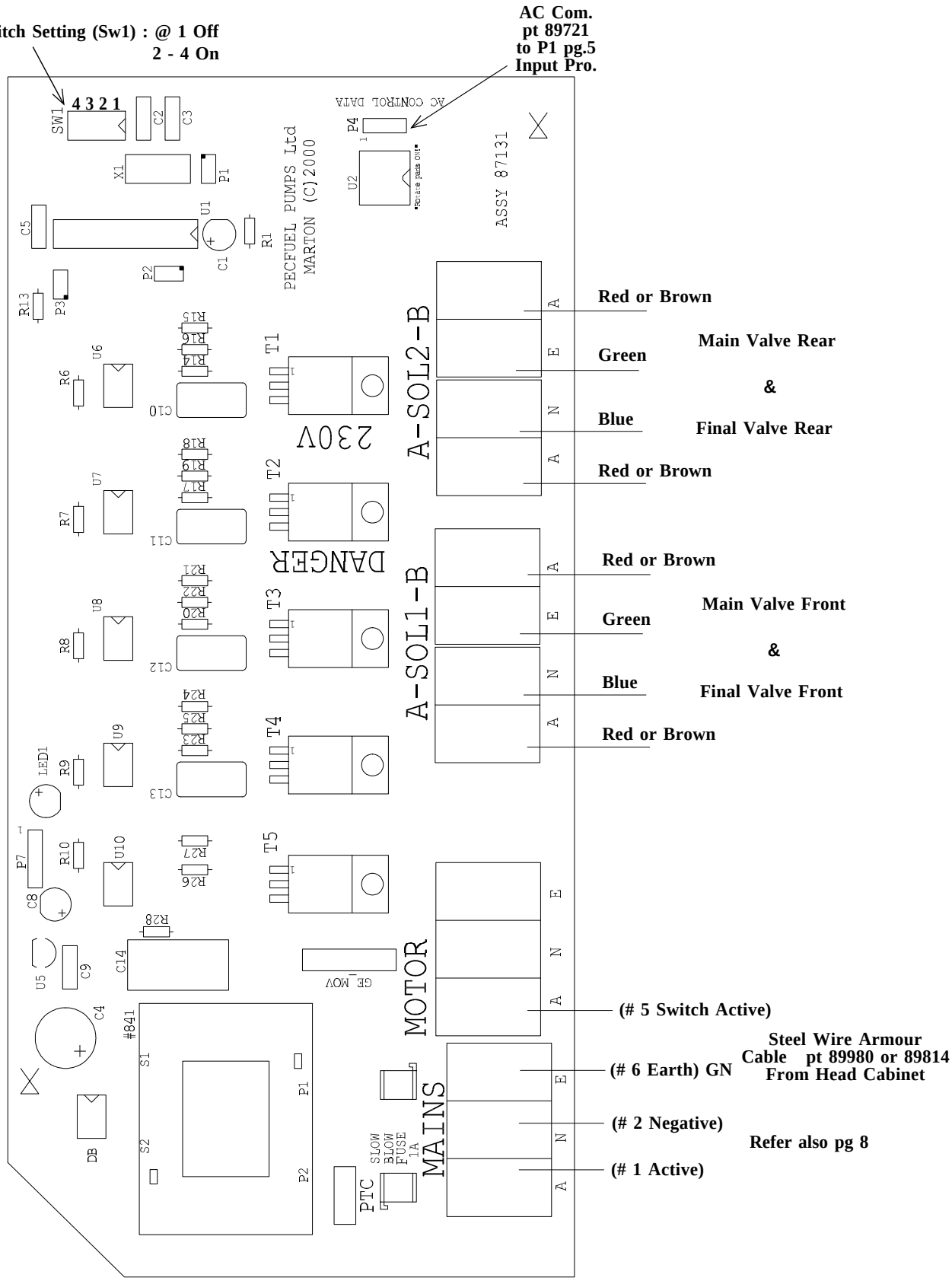
LPG AC Control Connections 87131 v3



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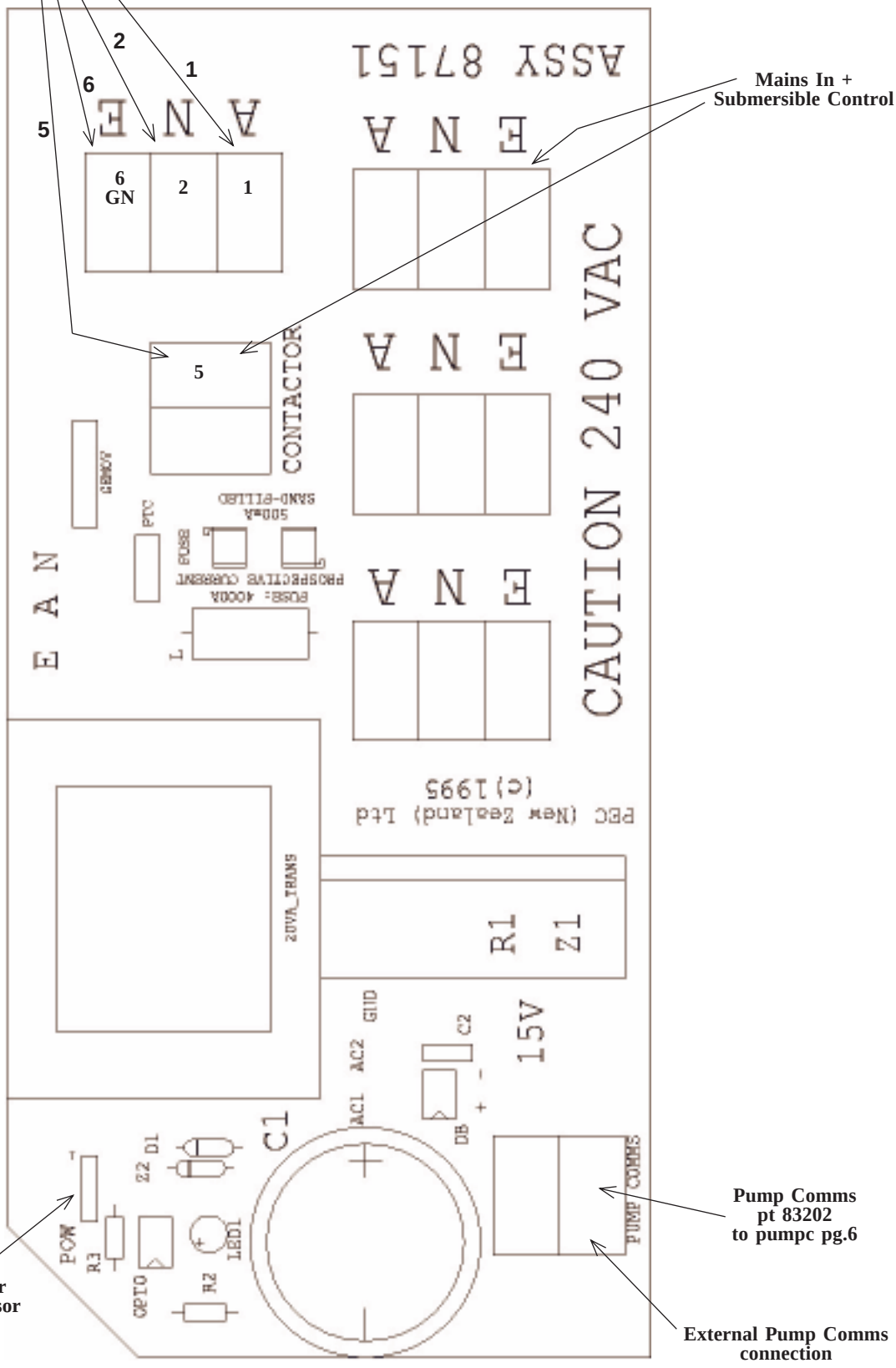
Steel Wire Armor Cable pt 89880 or 89814 to Mains/Motor pg 7

Power Supply PCB Connections 87151

Mains Out (Sump) + Submersible Control

Note: If not Steel Wire or Cores not numbered, then Nominate Colours to suit



Mains In + Submersible Control

Pump Comms pt 83202 to pumpc pg.6

Power Processor

External Pump Comms connection

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Page: 87151

Apollo LPG Set Up Procedure

1. Ensure Dip Switches & Cable connections are as per page 5 & 7
2. Power Up
   Displays front & rear should show following.
   @ $ FRONT = PN - A
   @ Litre Ft. = FN - _ _
   @ $ REAR = PN - b
   @ Litre Rr. = FN - _ _
   Note: If you get FUEL OFF displayed, then turn Managers switch over.
3. Set Hose Active
   Empty RAM by pressing Diagnostic switch and enter 10-Fill-Fill
   Hose F1 = Enter-22-Fill-1-Fill Hose R1 = Enter-23-Fill-1-Fill
4. Set product Price
   Product A = Enter-31-Fill-$ amount (eg 0.86)-Fill
5. Set Specific Gravity (Note this operation not required if LPG Density Probe fitted Refer Section on Input Processor Connection & Settings LPG Apollo 83841)
   Switch on Switch @ Input Processor PCB Assy
   Enter-82-Fill-545-Fill
6. Encoder Direction
   Enter 36-Fill-0-Fill
7. Set Encoder Constant
   Enter-34-Fill-2500-Fill
   Enter-35-Fill-2500-Fill
   Note Switch Input Processor Switch off after this operation
8. Pump Number (Comms. Connection)
   To connect to Console unit has to be numbered both front & rear
   To number Front Enter 20-Fill display = PF-00
   Enter (#) display = PF- (number entered)- enter Fill
   To number Rear Enter 21-Fill display = PF-00
   Enter (#) display = PF- (number entered)- enter Fill Switch Managers Switch to normal

Note (#) = Pump/Console number

Note To switch Dispenser to LOCAL mode (Non Console control)

With Managers Key on Enter 04-Fill middle display shows LOCAL enter Fill again Switch Managers Switch to normal and wait 1 Minute

9. Plug in Battery (12volt @ "**12v_BAT**") & (Lithium @ "**BATJ**")
10. Test (Diagnostics) Refer Pg. 12
11. Meter Calibration
    1 Connect Nozzle to Calibration Meter
    2 Run 20 Litres through test meter
    3 Hang up Nozzle
    4 Operate Input Processor PCB Switch
    5 Hose F1-press "37-Fill-2000-Fill-34-Fill and note new reading on bottom display, (eg 2498.)
    Switch off Input Switch
    6 Hose R1-press "38-Fill-2000-Fill-35-Fill and note new reading on bottom display, (eg 2498.)
    Switch off Input Switch
    7 Enter new readings on Setup and Test Record Sheet under Fuel Calibrations.
    8 Retest & Check

Single Hose Apollo LPG Set Up Procedure
Note: for Software VA 2.32p or > & VI 1.28s or > (13/11/01)

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3. Ensure Dip Switches & Cable connections are as per page 5 & 7 **SW2 =all Off & SW3 Refer Pg. 4**
4. Power Up
   Displays front & rear should show following.
   FRONT Pn - A
   FN - _ _
   REAR Pn - A
   FN - _ _
   Note: If you get FUEL OFF displayed, then turn Managers switch over.
4. Set Hose Active
   Empty RAM by pressing Diagnostic switch and enter 10-Fill-Fill
   Hose F1 = Enter-22-Fill-1-Fill
5. Set product Price
   Product A = Enter-31-Fill-$ amount(eg 0.86)-Fill
6. Set Specific Gravity
   Switch on Switch @ Input Processor PCB Assy (Swt. towards outside box = set – up)
   Enter-82-Fill-545-Fill
7. Encoder Direction
   Enter 36-Fill-0-Fill
8. Set Encoder Constant
   Enter-34-Fill-2500-Fill
   Note Switch Input Processor Switch off after this operation
9. Pump Number (Comms. Connection)
   To connect to Console unit has to be numbered both front & rear
   To number Front Enter 20-Fill display = PF-00
   Enter (#) display = PF- (number entered)- enter Fill

Note (#) = Pump/Console number
Note To switch Dispenser to LOCAL mode (Non Console control)
With Managers Key on Enter 04-Fill middle display shows LOCAL enter Fill again Switch Managers Switch to normal and wait 1 Minute

12. Plug in Battery 12v.BAT (Lith. Jumper @ BATJ)
13. Test (Diagnostics) Refer Pg 12
14. Meter Calibration
    1 Connect Nozzle to Calibration Meter
    2 Run 20 Litres through test meter
    3 Hang up Nozzle
    4 Operate Input Processor PCB Switch
    5 Hose F1-press “37-Fill-2000-Fill-34-Fill and note new reading on bottom display, (eg 2498.)

Switch off Input Switch (Need to wait 10 Seconds)

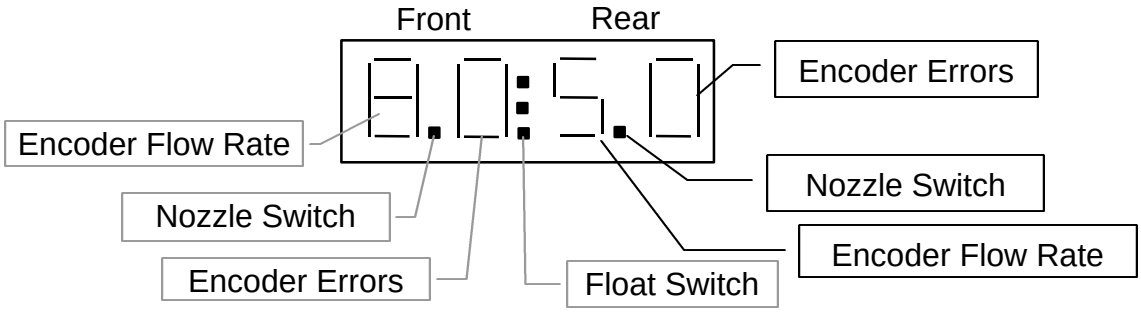
    6 Enter new readings on Setup and Test Record Sheet under Fuel Calibrations.

Pump stack test 30*

This test cheeks the operation of the pump motors (internal or submersible).
The motor can be switched on and off, as can the slow and fast flow rates.
The flow rate is displayed in the *Price per litre* display.

Switch Managers & Press Service Agent Button (Inside Door)
F1 & R1 *30*

Initially, the display appears as shown in the illustration. Decimal points between each set of two figures indicate whether nozzle switches are open. A central decimal point indicates Fluid in Sump, detected by the Float Switch. The first digit gives the rate of flow for the hose, in tens of litres per minute, and the second digit counts the number of encoder errors received.



Note Encoder errors can be any number
but must not change (eg change indicates error)

Diagnostic Testing of Motor & Valve Operation
This function can be used to turn Motor, Final & main stages of Solenoid valves idea for checking connection and correct operation etc.

Note Managers Switch must be on to access these functions & Diagnostic Switch pressed
Function 30 for Product 'A'

Once in any of the above Function press key once as listed below to activate and a second time to deactivate.
Note Numbers being activated show in 'Dollars Display"

Key	Function
1	Motor
2	Sol/Valve final stage (front)
3	Sol/Valve main stage (front)
4	Sol/Valve final stage (rear)
5	Sol/Valve main stage (rear)
82	SPG
83	Temp

On Dispensers equipped with an Input Processor Board.
Pressing 7 on the Keypad changes the Display so that each group of two digits shows the actual flow rate in Litres per minute, rounded down to the nearest litre. (The colon will disappear.) Pressing 8 changes the display a number between 0 and 9 to indicate a relative flow rate.

Lay Out For LPG Density Probe/Sensor

Later Models of D J Batchen LPG Meter Module units could be fitted with Density Probe as below.
Probe Cable is connected directly to controller PCB as shown in Fig. 2.
A five way Link Cable connects Probe controller PCB with PEC Fuel Pumps Input Processor PCB.
Software used in combination with Density Probe must be VI 3.05 (or later) for Input Processor & VA 3.06P (or later) for main Processor PCB.
Note: When Density Probe is fitted or retrofitted version 3 of Input Processor 83841 as shown on page “Input Processor Connections & Settings LPG Apollo 83841” Dip Switch setting are also shown on above mentioned page.

Fig 1

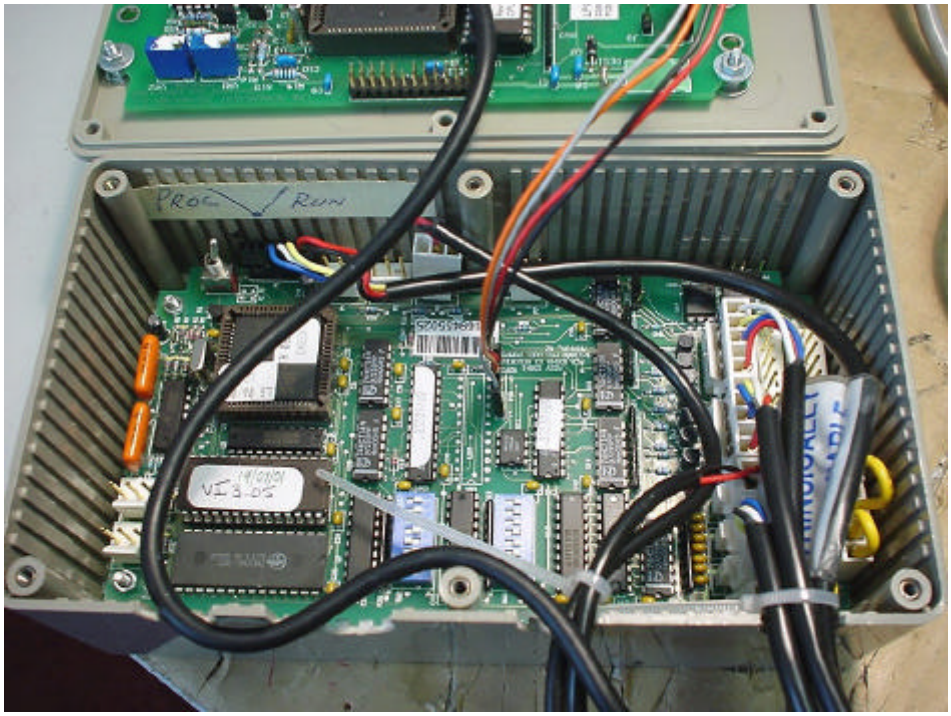
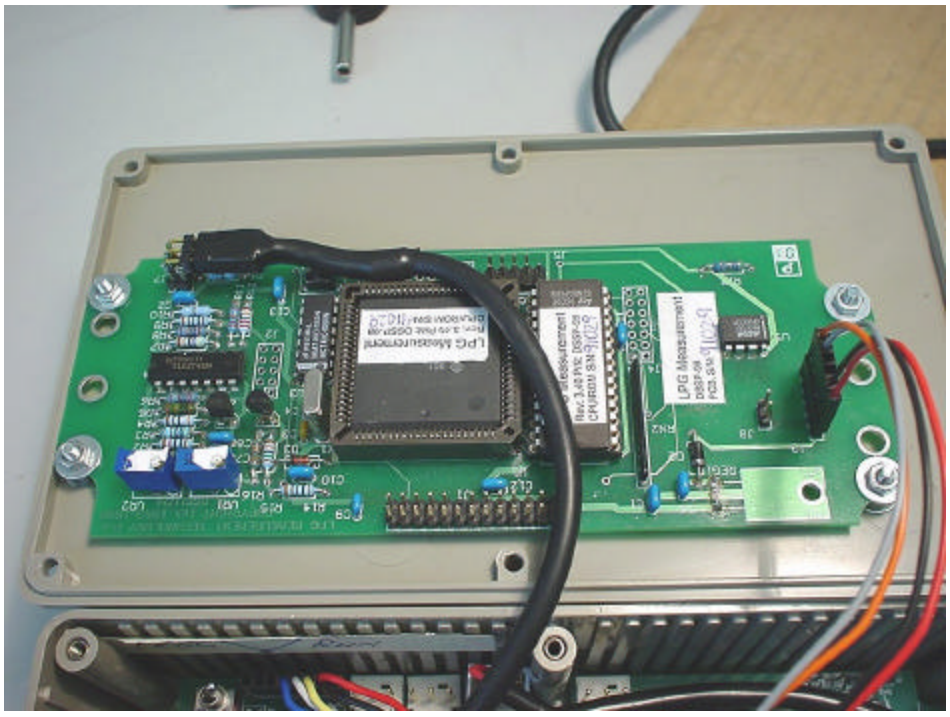


Fig 2



LPG set up functions

Several functions are used to electronically calibrate LPG pumps at the factory. These settings may not be modified unless the calibration switch on the Input Processor board (SW1) is switched on.
These calibration functions should never be changed on site.

Once the pump has been calibrated, the calibration switch is sealed to prevent tampering.

To aid in diagnosing a fault, the calibration settings can be viewed (but not changed). Simply switch manager Switch & press Diagnostic Button inside Head Cabinet, then key in the function number and press the FILL key. (Refer "Pump Stack Test" section)

LPG temperature compensation

As the volume of liquid LPG under pressure varies substantially with temperature and initial mixture, temperature compensation must be applied to maintain accuracy. Correction data is constantly read and the encoder constant (see function 34) is dynamically updated. The correction is based on a temperature reading from temperature probes or on a reading from an LPG Density Probe sensor.

Temperature probes

If the correction is to be based on temperature probes then an initial specific gravity figure must be entered(see function 82). A temperature correction factor table, based on ASTM-IP standards, is stored in the Input Processor board ROM. These values, together with the specific gravity value entered in function 82, are used to dynamically update the encoder constant used during LPG deliveries. The amount dispensed is thus compensated, so that the displays read the volume dispensed at 15ºC regardless of the actual liquid temperature.

LPG Density/Temperature Probe sensor

If an LPG sensor is used a constantly updated figure is read for the specific gravity, temperature and correction factor. The temperature compensated correction factor is then used to update the encoder constant.

Set Crush-up time 80

Crush-up is a process which occurs due to vaporisation of the fuel, and the subsequent re-pressurising of the system. The encoder rotates due to this pressurising and this is not considered part of the delivery.
This function determines the time the system will wait (between 1 and 9 seconds) before the slow flow valve opens and the encoder pulses are counted. The default setting is 3 seconds.
The pump displays stay in the "**00.00**" state for the preset time after the nozzle is lifted. After this time, the slow flow valve opens, and encoder pulses are counted.

Set Over-speed trip 81

This function determines the flow rate at which LPG or CNG delivery is shut down. This provides protection in the event of a hose rupture. If over-speed is detected, the solenoid valve and pump motor feed will shut down for the offending hose.
Over-speed trip may be set to occur between 50 and 99 Litres per minute. Default value is 80.

Set/Display specific gravity 82

The specific gravity (density) of LPG fuel can vary with changes in temperature and fuel mixture. The density can be measured with temperature probes or an LPG sensor.
Probe Operation: Density displayed at 15ºC in units of 0.1 kg/m ^{3}.
Display: Specific Gravity is displayed to the left of decimal point, with the first digit on the right side of decimal point representing the Probe status as follows.

"0" represents no fault.
"1" represents possible liquid density too high (but could be caused by Vapour bubbles)
"2" represents possible contaminated LPG or water in LPG

Temperature probes

If you are using temperature probes then the LPG specific gravity is entered using this function (82).The initial value is 000 and you must set the value between 500 and 575. Typical value for New Zealand is 535 kilograms per cubic meter. The pump will not operate unless a value is entered.

LPG Sensor

If the LPG sensor is fitted then this function displays the specific gravity figure and you cannot alter it.

Display LPG temperatures 83

Note: This function was previously named "Display probe temperatures".

This function displays the liquid temperature in degrees Celsius while the dispenser is idle. The display will also indicate if the temperature is over or under the operating range, or if there is a fault.
The temperature is obtained from either temperature probes or an LPG senor unit.

Temperature probes (Note Single Temperature Probe only used with Software having Suffix of "**S**")
If temperature probes are fitted then:
Probe 1 is for the front LPG Hose
Probe 2 is for the rear LPG Hose.
Press any number key to toggle between the two temperature probes.

LPG sensor If an LPG sensor is fitted then there is only one temperature display which is common to both hoses

Front Door Assy With & Without FST

Dome Nut 803520

Main Display PCB Assy 87126

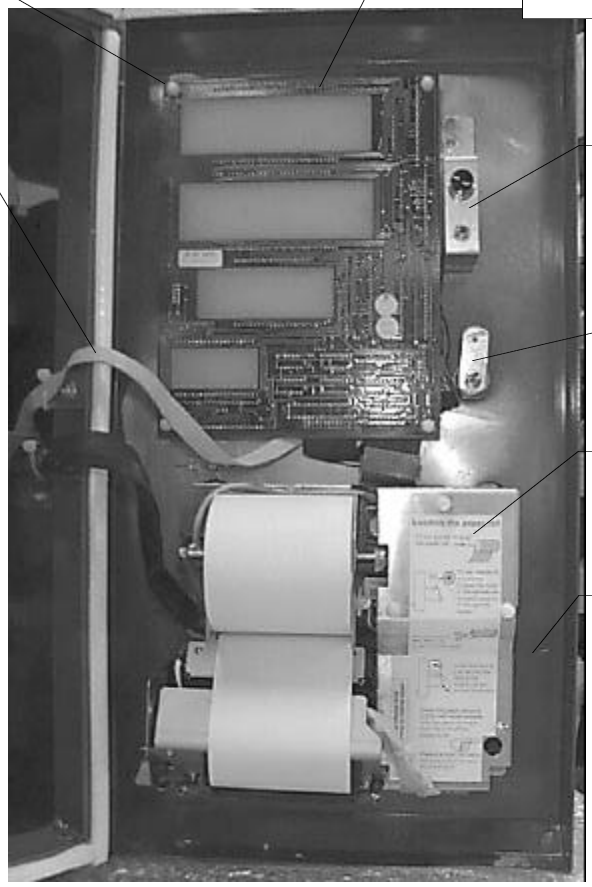
Manager & Diagnostic Switch Assy Pt 89864

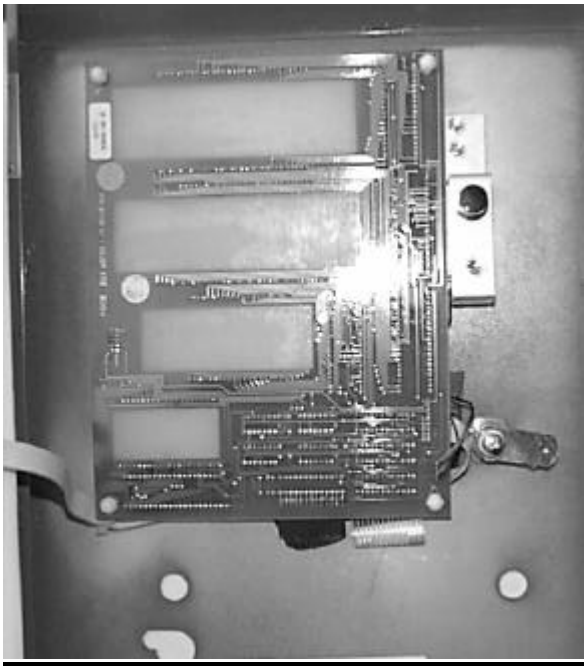
Cable 07202

Lock 825960

FST Assy

Apollo Door LPG Front pt 89841 complete

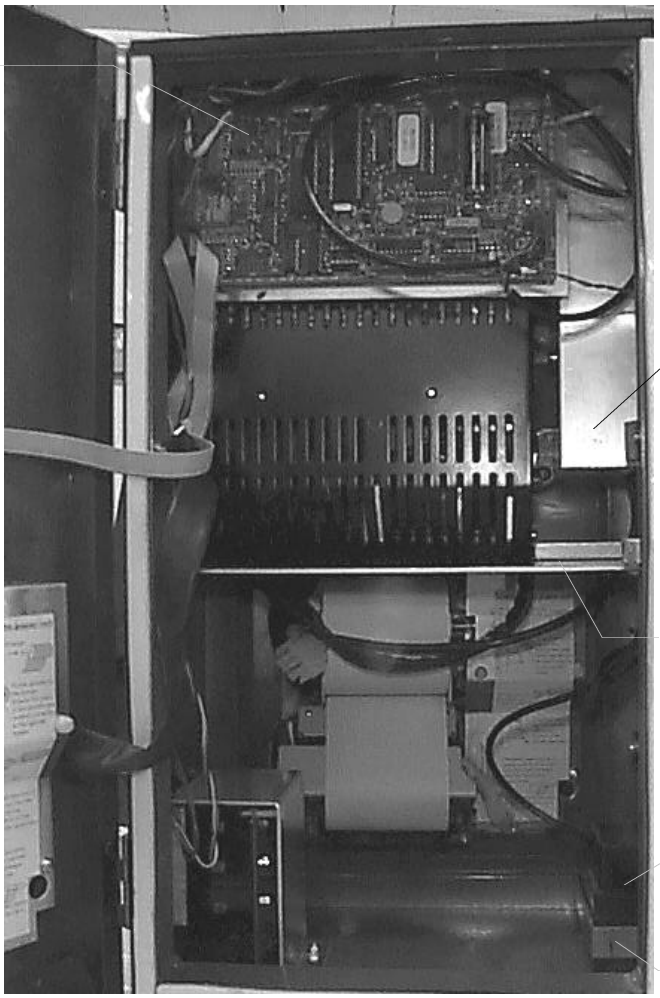


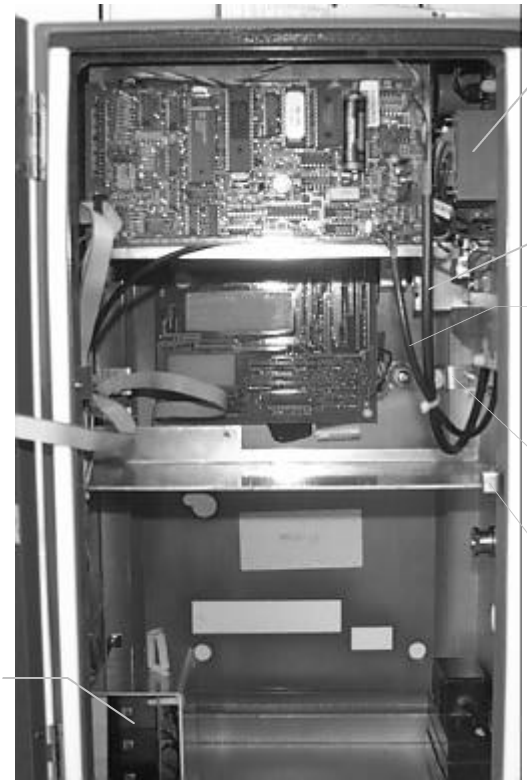


Front Door with FST Not Fitted

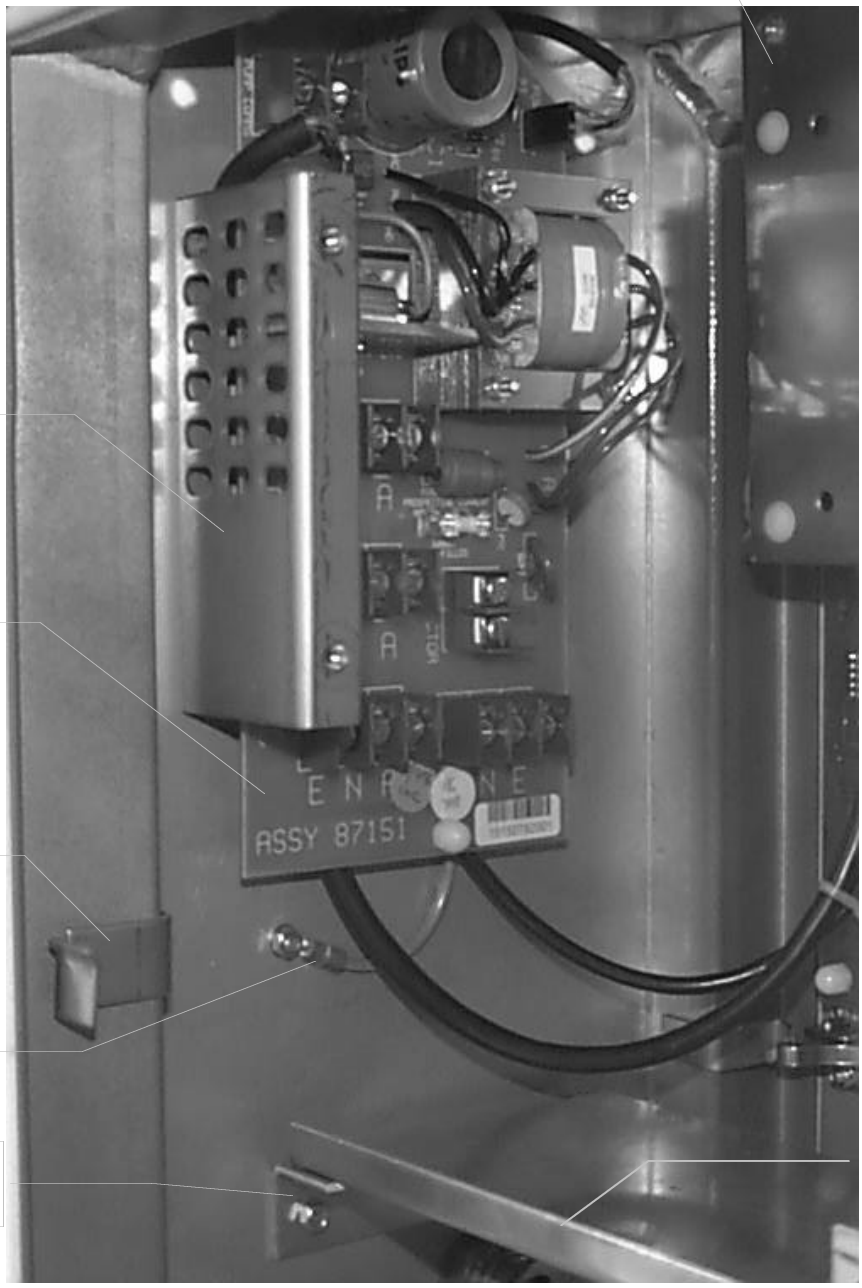
Graphic Panel
Cents per Litre 89975
Dollars per Litre 89970
Cents per Litre N/PST 89976

Apollo LPG Head Cabinet





Power Supply PCB Assy Inside Head Cabinet



Processor PCB Mtg. Plate Apollo 87754

PCB Cover Mtg. 83665

Pwr. Supply PCB Assy. 87151

Locking Latch Front pt 89753

Earth Lead Assy 87308

FST Mtg. Angle pt 89877

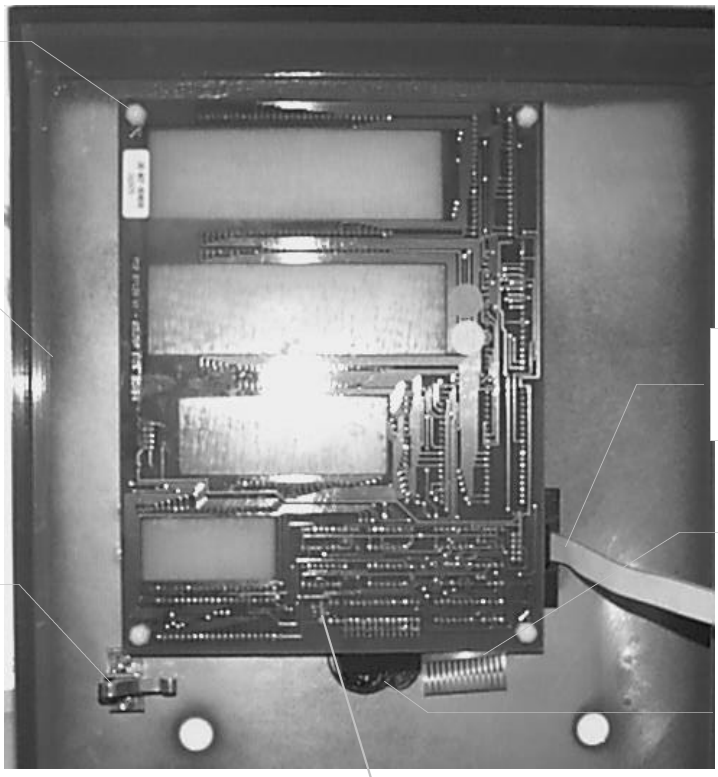
Mtg Angle Pt 89876

Assy With & Without FST

Main Display PCB Assy 87126

Apollo Rear Door Assy Pt 89842 Complete

Mini Spir Catch Pt 824810

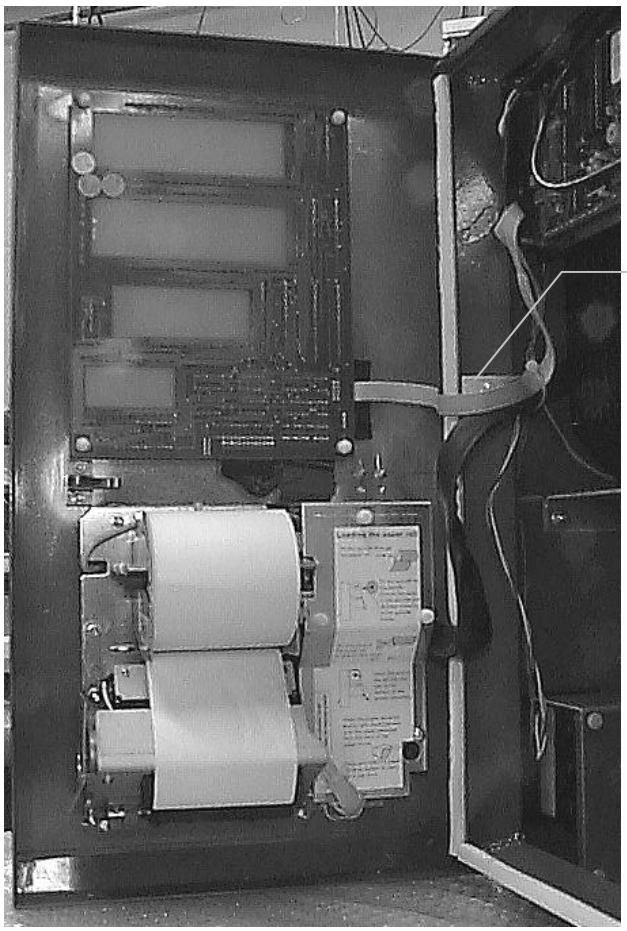


Cable Pro.- Display 07202

Membrane Key Pad 87195

Membrane Extn. Cable Assy pt 89863

Cut Link Track in Rear Door Only

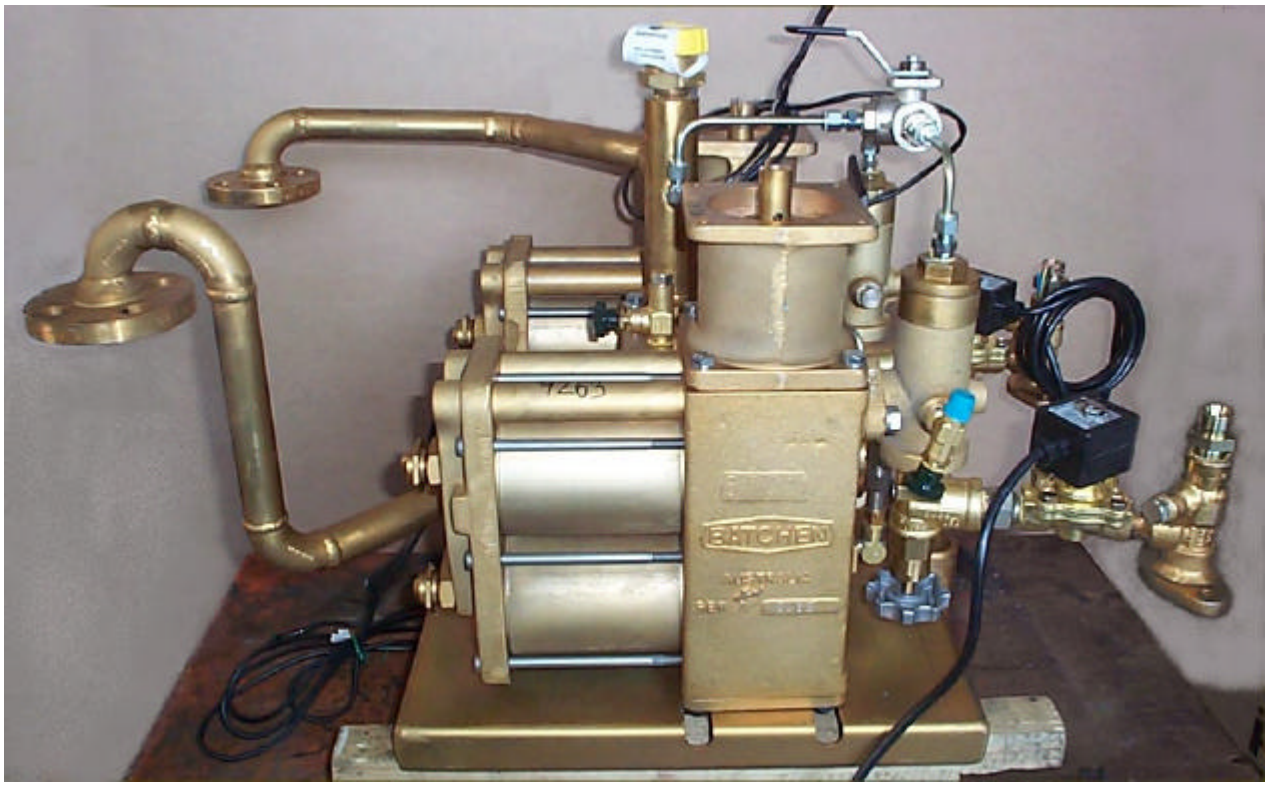


89750 Saddle Mtg. Brkt.

Mk 4 Batchen LPG Module Assy

Note: Basic Model only shown, may vary in different markets. eg could have Preset Valves & Hydraulic Accumulators etc.

More details on parts etc shown later in Manual pg. 30 - 34



Apollo LPG Column, Head & Hose Assy

PEC Fuel Pump Fluid/Float Switch operation.
in
Apollo Dispensers

Software required:

LPG Apollo requires: Input Processor Assy = VI 1.21S (or >) This also allows for Single Temperature Probe operation. Dip Switch # 2 @ SW3 set "ON"

Main Processor Assy = VA 2.30P (or >) (eg. VA 2.33P & VI 1.29S)

Apollo Std Petrol/Diesel Dispensers requires: Main Processor Assy = VA 2.30P (or >)

Hardware required:

LPG requires = Float Switch Assy. with Foam Extension added, & mounted as low as possible to base/floor of Underground Sump Enclosure. Dip Switch #2 @ SW3 set "ON"

Apollo Std Petrol/Diesel Dispensers requires = Float Switch Assy mounted as low as possible to base/floor of Underground Sump Enclosure.

Link must be in @ Position 10 on Display PCB Assy

Operation Description: (when Float is activated)

Dispenser with one side only operational (delivering)

Unused Side – Display shows "**FLUId"**

Side in uses – Dispenser shuts down immediately (including Valves & Motor) Display sit stationary showing sale value.

Dispenser will begin to Beep after a period of 1 Min. if Nozzle in not returned then Beep

Once Nozzle is returned, Displays will then Flash until Nozzle is again removed, at this point Displays will then show word "**FLUId"**

Refer to Resetting below.

Dispenser with both sides operational (delivering) (when Float is activated)

Both sides stop delivering immediately with Displays stationary displaying delivery values @ point when delivery stopped.

Again Dispenser will start to Beep if Nozzles not returned within a Minute period.

Once Nozzle is returned, Displays with Flash until Nozzle is removed, Displays with then show "**FLUId"**

In both above cases Sale value remains on Console until sale is actioned/completed. Dispenser will also show on Console as being Off Line

Dispenser Non operational (no delivery) (when Float is activated)

"**FLUId** will be displayed on both sides of Dispenser

Console Displays Dispenser as Off Line.

Refer to Resetting below.

Testing Float Switch Operation:

Testing can be conducted by manually lifting Float with wire Hook or similar. Display should show **FLUId** with Dispenser going into Fatal error (Shut Down) Dispenser will require a Power shut down for a period of **One Minute** to **Reset** Normal operation can then commence.

Resetting Dispenser Procedure

If **FLUId** is displayed @ Dispenser, Power to that unit should be immediately removed, with Isolating Switch locked out to avoid being turned back on accidentally. **Call Service Provider**

Sump Enclosure should then be checked, removing Fluid present & source of leak repaired

Reconnect Power for Operation, should not need to reprogram if back up Battery still connected.

If pump Beeps: Hang up Nozzle.

If Displays Flash: Lift Nozzle then return to display Error

If Pump Off Line: Check for Error @ Pump (see above)

file @ gme c:/docum/pec/apollo2/float-desc.doc
23/02/01
Update: 01/03/01
08/04/02

Errors

This chapter contains the full list of error codes, in numerical order.
Errors are normally indicated by the error code (number) being displayed. The error is displayed as **ERRxx**, where **xx** is the code number. Errors are also written to an error log. You can check logged errors using Function 02 as detailed in chapter 4.

Startup System Errors

Error codes (01..09) are reserved for startup errors. This type of error is detected before the displays are initialised, and is reported using beep codes (pump beeps once for error 01, twice for error 02, etc.)
Some of these codes can also be dynamically checked during normal operation, in which case they will be reported in the normal way (i.e., they will display the **ERR xx** message and stop all deliveries).
These errors are fatal errors (processor halted) and require the pump to be reset. Power down and wait for 5 seconds before switching on the pump.

00 Start up log

This is not really an error it contains the number of startups.

01 Processor Error

This is a sequential IRAM address test which is performed at startup. It tests the processor's 4 register banks, and halts the processor if an error is found.
This check is performed in the **init** module.

02 Internal Ram error

Error 02 is a sequential IRAM address test which is performed at startup. It covers all IRAM excluding the 4 register banks, and halts the processor if an error is found.
This check is performed in the **init** module.

03 Eprom Error

Error 03 indicates a checksum error. This may occur either at startup or dynamically during operation. In either case the processor is halted if an error is found.

04 External RAM Error

This is a walking bit test of the XRAM. This test is performed both at startup (entire XRAM checked) and dynamically (one address per call from main loop). In either case the processor is halted if an error is found.

05 Non Volatile Setup

Error 05 is a check of the non volatile variables. These are the set up variables which must remain unchanged during a power failure. They remain constant unless changed by a diagnostic function. They are checked (against their backup variables) both at startup (all non-vol variables checked) and dynamically (one byte checked each call from main loop). If an error is found, the non volatile variables are all reset to their default values and (if not found during startup) the system restarts.

06 Delivery variables lost

This is a startup check of the current/last delivery related variables. These variables are overwritten with each new delivery, but in case of power loss, must be present between deliveries.
Unlike the non-vol variables, during deliveries, these are continually changing and are therefore not checked dynamically. At startup, these are checked (for corruption of XRAM during power loss) against their backup variables. If an error is found, the non volatile variables are all reset to their default values.

07 Keyboard Error

This is a startup check of local or remote (input processor) DIP switch setting validity, and for the presence of the relevant keyboards. This error is non-fatal error which serves as an audible warning to reconfigure DIP switches or replace keyboards and restart the system.

08..09 Not used

Errors 08 and 09 are reserved.

Fatal Errors (excluding fatal startup errors)

Errors 10 through to 29 all cause the processor to stop. The errors are displayed but beeps are not sounded. The pump must be reset after one of these errors.

10..15 Pump Control State Errors (Pump A..F)

This indicates an attempt to enter an undefined side control state on a particular pump number.

16 Stack Error

The stack is continuously checked. If a stack overflow occurs, error 16 will be displayed.
This check is performed in the **dynchk** module.

17 Display Error

If a Display error is indicated, a translation error occurred when writing to one of the 7 segment LCD displays.

18 Variable Range Error

Error 18 indicates a global software parameter (ie pump, grade or price etc) is not within its normal range. This can be a result of corruption of the internal data RAM, which may cause unpredictable results.
This check is not limited to any particular module, but is used by any procedure that requires range checking.

19 Dollar Maths Error

At the end of a delivery, the delivery dollar calculations are performed (ie price per litre multiplied by litres equals dollars). Error 19 indicates an error occurred in the calculations. A likely cause for this would be a price change (or corruption of the price variable) during a delivery.

20 Litres Maths Error

At the end of a delivery, the delivery quantity accumulation calculation is made (ie, total number of encoder counts for the delivery time multiplied by the encoder constant equals the litres displayed). Error 20 indicates an error occurred in the accumulation.
If this is not the case, it is probable that the encoder is going too fast, such that the incoming encoder counts (which are accumulated under interrupt control) are not being "consumed" quickly enough by the maths routines to prevent a rollover.

21 Clock Error

A Clock Error indicates that the current time variable (which is used to time tag events) is not incrementing.

22 Motor Control Error

Error 22 indicates that an attempt was made to turn a motor on or off when it was already in that state (according to the software).

23 Solenoid Control Error

This indicates that an attempt was made to open or close a solenoid valve when it was already in that state (according to the software). It will also occur (except in diagnostic mode) if an attempt is made to turn on a solenoid valve when the corresponding motor is not on.

24 Power Fail

This error indicates the system entered its main initialisation procedure (which should only happen on power up or as a result of certain diagnostic functions), but the power fail flag does not show power failed.
This may occur in the event of a total power loss (including the lithium battery) such that the XRAM was corrupted, or if the power fail procedures are not functioning correctly.

25 Input Processor to main failure

This error will occur if the system expects an Input Processor to be present (i.e., it was auto-detected at power up) but is no longer receiving any comms response from it.
This would be caused by either a fatal error in the input processor, or a physical loss of connection on the serial link between the two processor boards.

26 Main to Input Processor failure

This error will occur if the system expects an Input Processor to be present (i.e., it was auto-detected at power up) and is receiving comms response from it, but the Input Processor is not receiving data from the main processor.

This would be caused by either a fatal error in the input processor, or a physical loss of connection on the serial link between the two processor boards.

27 Remote Parameters Failure

Error 27 will be displayed if the pump is not within the diagnostics functions and the remote rx_param block that was sent from the input microprocessor is different to the set stored by the you.

28 Display pointers corrupted

A constant check is dynamically made, of the display information. This error indicates an error has occurred which could cause incorrect information to be displayed on the LCDs.

29 Not used

These error codes are reserved.

Single Pump Number Fatal Errors

Errors 30 through to 59 do not cause a complete system crash, as they relate to a single pump number only. They cause the related pump to stop delivery, and its displays to flash. This continues until the nozzle is replaced and any nozzle on that pump number is removed again. The **ERRxx** message is then displayed on that pump number and all further processing of the pump ceases.
Note that all other pump numbers can continue unaffected. To use the affected pump again, the pump unit must be reset (powered off for at least 5 seconds).

30 LPG Temperature Probe 1 Error

This is caused by either an open circuit, short circuit or out of range error being detected on probe 1 by the input processor. This error is fatal only to the pump numbers associated with the LPG grade.

31 LPG Temperature Probe 2 Error

Error 31 is caused by either an open circuit, short circuit or out of range error being detected on probe 2 by the input processor. This error is fatal only to the pump numbers associated with the LPG grade.

Note Errors 32 – 37 apply to units fitted with software version lower than va 2.30p only
Units fitted with Software va 2.30p & greater & Float Switches fitted, Fatal Error as FLUId Ref. Pg 41

32 Grade 1 Front hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump A1)

During a Grade 1 delivery, Float was activated for more than 1 minute.

33 Grade 1 Rear hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump B1)

During a Grade 1 delivery, Float was activated for more than 1 minute

34 Grade 2 Front hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump C2)

During a Grade 2 delivery, Float was activated for more than 1 minute.

35 Grade 2 Rear hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump D2)

During a Grade 2 delivery, Float was activated for more than 1 minute.

36 Grade 3 Front hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump E3)

During a Grade 3 delivery, Float was activated for more than 1 minute

37 Grade 3 Rear hose Detected Fluid Present bottom of Hydraulic Sump Enclosure (Pump F3)

During a Grade 3 delivery, Float was activated for more than 1 minute

38 Grade 1 Front encoder error (Pump A1)

Grade 1 front encoder inputs out of sequence for more than 1 count in 512 (0.19% minimum error rate). This could be due to the encoder missing a count, the rotation being backwards, etc.

39 Grade 1 Rear encoder error (Pump B1)

The Grade 1 rear encoder inputs were out of sequence.

40 Grade 2 Front encoder error (Pump C2)

Grade 2 front encoder inputs out of sequence for more than 1 count in 512 (0.19% minimum error rate). This could be due to the encoder missing a count, the rotation being backwards, etc.

41 Grade 2 Rear encoder error

(Pump D2)

The Grade 2 rear encoder inputs were out of sequence.

42 Grade 3 Front encoder error
(Pump E3)

The Grade 3 front encoder inputs were out of sequence.

43 Grade 3 Rear encoder error
(Pump F3)

The Grade 3 rear encoder inputs were out of sequence.

44 Grade 1 Front encoder too fast
(Pump A1)

This error indicates an overflow of either encoder counts or encoder errors was detected for the Grade 1 front encoder.

45 Grade 1 Rear encoder too fast
(Pump B1)

There was an overflow of either encoder counts or encoder errors detected for the Grade 1 rear encoder.

46 Grade 2 Front encoder too fast
(Pump C2)

There was an overflow of either encoder counts or encoder errors detected for the Grade 2 front encoder.

47 Grade 2 Rear encoder too fast
(Pump D2)

There was an overflow of either encoder counts or encoder errors detected for the Grade 2 rear encoder.

48 Grade 3 Front encoder too fast
(Pump E3)

There was an overflow of either encoder counts or encoder errors detected for the Grade 3 front encoder.

49 Grade 3 Rear encoder too fast
(Pump F3)

There was an overflow of either encoder counts or encoder errors detected for the Grade 3 rear encoder.

50 Grade 1 Front encoder run on
(Pump A1)

Flow did not stop (the encoder was still rotating) at the end of a Grade 1 front hose delivery (i.e. after the "get dribble" state has timed out).
Possible fault could be leaking valves.

51 Grade 1 Rear encoder run on
(Pump B1)

Flow did not stop (the encoder was still rotating) at the end of a Grade 1 rear hose delivery.

52 Grade 2 Front encoder run on
(Pump C2)

Flow did not stop (the encoder was still rotating) at the end of a Grade 2 front hose delivery.

53 Grade 2 Rear encoder run on
(Pump D2)

Flow did not stop (the encoder was still rotating) at the end of a Grade 2 rear hose delivery.

54 Grade 3 Front encoder run on
(Pump E3)

Flow did not stop (the encoder was still rotating) at the end of a Grade 3 front hose delivery.

55 Grade 3 Rear encoder run on
(Pump F3)

Flow did not stop (the encoder was still rotating) at the end of a Grade 3 rear hose delivery.

56 LPG Overspeed

Flow rate detected during delivery exceeded overspeed trip setting. Note that this error on one LPG pump will display on both, regardless of whether the other is delivering or not.

57 Loss of encoder constant or LPG specific gravity setting

One of these values is corrupt, and has not yet been set back to a valid value (using the appropriate diagnostic function).

58 LPG Sensor failure

The LPG sensor has stopped providing or is providing incorrect information, to the input processor.

59 LPG system vapour present

During an LPG delivery vapour was sensed in the system for more than one minute.

Non Fatal System Errors

Errors 60 through to 89 do not cause any loss of system functionality. They are logged only (for service use).

Comms Channel A errors

60 Channel A Receiver Parity Error

This indicates a parity error was detected in one or more of the received message bytes.

61 Channel A Receiver Framing Error

Character was received for which no stop bit was detected.

62 Channel A Receiver Break Error

A steady low (space) signal has appeared at a receiver, indicating a break condition at the transmitting end, causing this error code. The formal definition is that an all zero character with no stop bit has been received.

63 Channel A Receiver Overrun Error

This indicates an overflow of the 3 byte FIFO buffer for a receiving channel. This means that the processor is not reading the incoming data fast enough to prevent overwriting this stack.

64 Channel A Receiver Checksum Error

This error indicates the message received had a checksum error.

65 Channel A Receiver Data Error

Error 65 indicates the polling message received from the Console is an invalid type, i.e., a new feature has been added to a console which is not yet supported, or the comms line has been corrupted (in which case a checksum error will probably also occur).

66 Channel A Receiver Overflow Error

The message received was too long for the buffer, causing this error. This may happen if no EOM character or sequence is detected.

67 Channel A Transmitter Overflow Error

The transmitter has tried to send a message which is too long. This means that the transmit buffer's last position was reached, but an EOM character or sequence was not present.

68 Channel A Receive Timeout Error

This indicates that the receiver is expecting a character from the Console, but has not received one for more than 1 second.

69 Channel A Transmit Timeout Error

This timeout error indicates that the transmitter is attempting to send a message to the Console, but there has been a delay of more than 1 second since the last character was transmitted.

Comms Channel B errors

70 Channel B Receiver Parity Error

Error 70 indicates a parity error was detected in one or more of the received message bytes.

71 Channel B Receiver Framing Error

A character was received for which no stop bit was detected.

72 Channel B Receiver Break Error

A steady low (space) signal has appeared at a receiver, indicating a break condition at the transmitting end. The formal definition is that an all zero character with no stop bit has been received.

73 Channel B Receiver Overrun Error

This indicates an overflow of the 3 byte FIFO buffer for a receiving channel. This means that the processor is not reading the incoming data fast enough to prevent overwriting this stack.

74 Channel B Receiver Checksum Error

The message received had a checksum error.

75 Channel B Receiver Data Error

This indicates that the polling message received from the Input Processor is an invalid type (or that the comms line has been corrupted, in which case a checksum error will probably also occur).

76 Channel B Receiver Overflow Error

The message received was too long for the buffer. This may happen if no EOM character or sequence is detected.

77 Channel B Transmitter Overflow Error

The transmitter has tried to send a message which is too long. This means that the transmit buffer's last position was reached, but an EOM character or sequence was not present.

78 Channel B Receive Timeout Error

This indicates that the receiver is expecting a character from the Input Processor, but has not received one for more than 1 second.

79 Channel B Transmit Timeout Error

This indicates that the transmitter is attempting to send a message to the Input Processor, but there has been a delay of greater than 1 second since the last character was transmitted.

General log only system errors

Errors 80 through 89 are general system errors. They are logged only; they do not cause the system to crash.

80 Grade 1 Front Preset Overrun

This indicates that the delivery on the Grade 1 Front hose did not stop at the preset or allocation limit. When this happens, the cutover point at which slow flow is entered automatically adjusts to compensate.
Note the difference from the encoder run-on error: encoder run-on is a continued flow after the end of delivery state has been reached, whereas preset overrun indicates that the end of delivery state was not reached in time to prevent excess fuel being delivered.

81 Grade 1 Rear Preset Overrun

This indicates that the delivery on the Grade 1 Rear hose did not stop at the preset or allocation limit.

82 Grade 2 Front Preset Overrun

This overrun error indicates that the delivery on the Grade 2 Front hose did not stop at the preset or allocation limit.

83 Grade 2 Rear Preset Overrun

Error 83 indicates that the delivery on the Grade 2 Rear hose did not stop at the preset or allocation limit.

84 Grade 3 Front Preset Overrun

This indicates that the delivery on the Grade 3 Front hose did not stop at the preset or allocation limit.

85 Grade 3 Rear Preset Overrun

This indicates that the delivery on the Grade 3 Rear hose did not stop at the preset or allocation limit.

86 Lost Reply (Console)

A Lost Reply error indicates that the pump comms are trying to reply to a poll from the Console, but did not succeed in sending a reply within 4 clock ticks (0.08s) of receiving the poll message.
This means that the main loop tasks (other than comms) are taking up too much processor time, so that the comms do not get serviced often enough.

87..99 Not used

These error codes are reserved.

Setup and Test Record

To Stay with Dispenser/pump

Main Processor Software Version:

Input Processor Software Version:

Site

Date:

Pump Serial number

Grade	1 =		2 =		3 =	
Pump / Hose	A	B	C	D	E	F
Set Hose active Function For Hose active set @ 1 (**)	22	23	42	43	62	63
Set Pump Number Function (**)	Front = 20 - Fill - Pump # -Fill (This Pump is Set @:)					
	Rear = 21 - Fill - Pump # -Fill (This Pump is Set @:)					
Set encoder constant function #	34	35	54	55	74	75
Factory setting * :	___	___	___	___	___	___
(***) Field calibration :	___	___	___	___	___	___
Set price function	31		51		71	
(**) The price is:	___		___		___	
Set encoder direction Default @ 0	36		56		76	
(***) The direction is:	___		___		___	

Note: Press 'FILL' last to activate each Function

LPG specific setting:	Function number	Set value to	Actual
(***) Specific Gravity	82	545	___
(***) Over Speed Trip	81	55	___
(***) Crush up Time	80	3	___

(**) = Set & View with Manager Swt & Diagnostic Button

(***) = Set with Input Calibration Swt ON & View with Manager Swt & Diagnostic Button

* These fields must have data in them for the pump to operate.

Defaults: Petrol 1.250 LPG 2.500

File @ GME
c:/mydrawdt/apollo/set-up.idw

PEC Fuel Pumps Ltd., P.O. Box 308, Marton, New Zealand

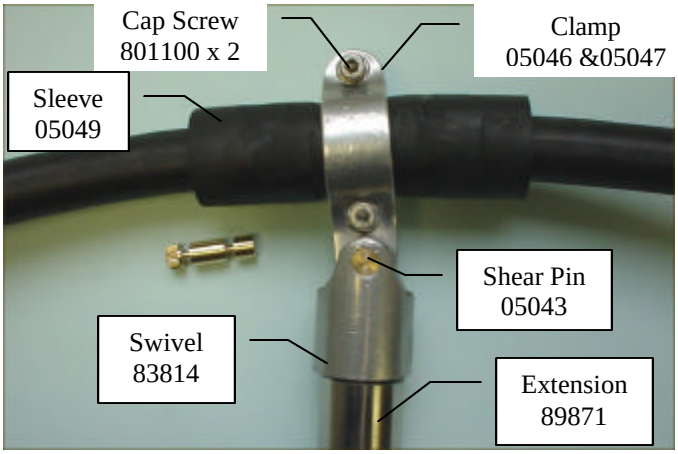
Part number :87373 R4

Hose Suspension/Clamping Instructions

Lubricate internal of Sleeve with appropriate grease	Lubricate external of hose & Fitting with same

Push Sleeve over Fitting as far as possible	Apply Air to entry hole in Sleeve & float Sleeve completely onto hose. Ensure a good seal around entry hole & Nozzle

Position Hose Assy into vice as shown. Apply air to float and pull Sleeve up Hose, to position Sleeve centre, up from Nozzle end, to a distance of (3.65m = Apollo LPG) & (3.75m = 8000)	Assy Clamp over Sleeve as shown, Loctite Screw into position to hold Swivel Body & insert Pin Safety Shear Pin Pt # = 05043



Hose Suspension/Clamping Instructions (Continued Pg. 2)

Items required as Retrofit Kit: (Per Hose Assy.)

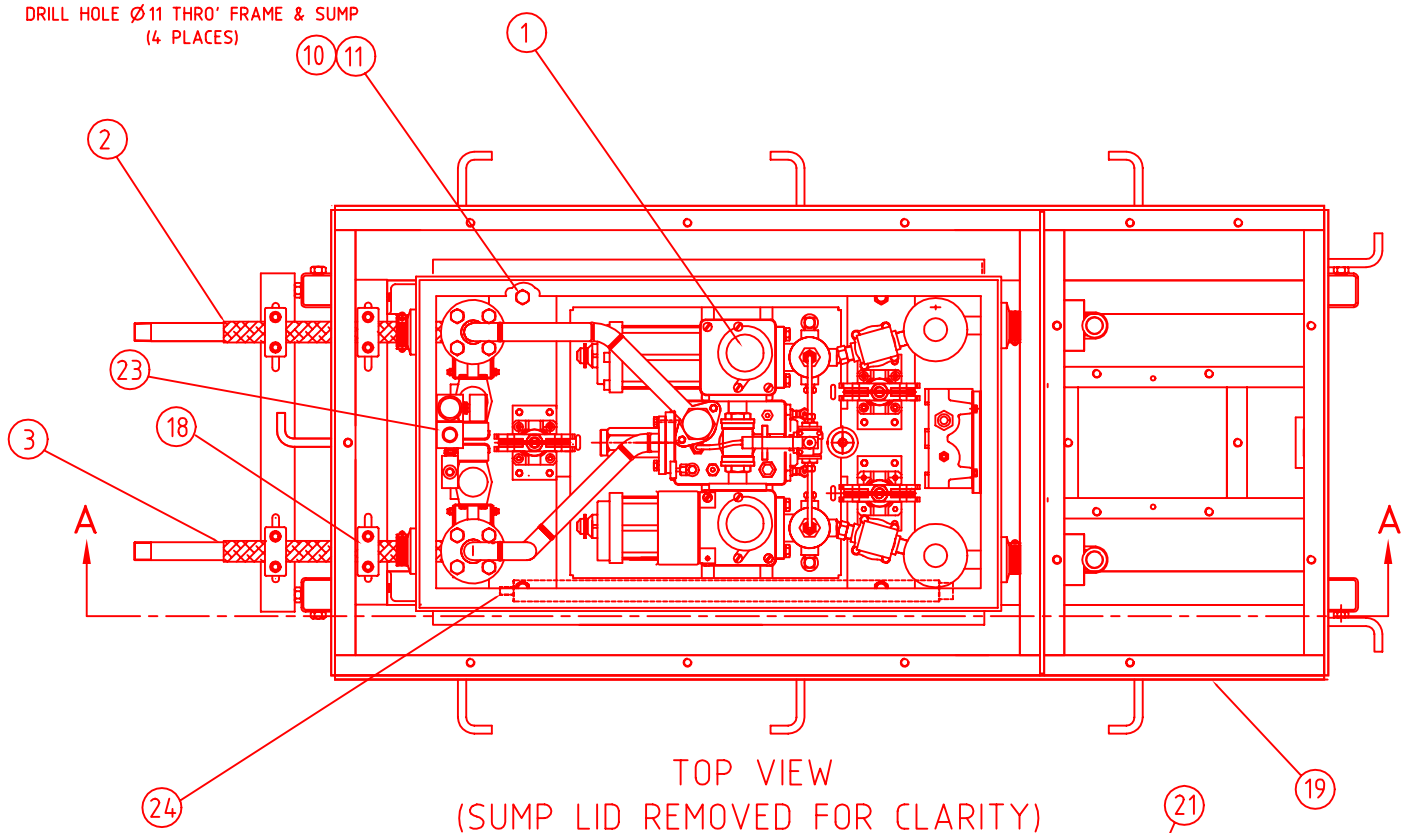
Hose Sleeve 05049
Hose Clamp LH 05046
Hose Clamp RH 05047
Swivel Body 83814
Cap Screw 801100 ¼ Whit x ¾ (2)
Shear Pin 05043
Washer 804460 M6 x 16
Cap Screw 800040 M4 x 25

Retrofit instructions:

- Remove Long Hose Assy. from Dispenser by breaking @ Sentry 20 Dry Breakaway, take to safe area bleed hose Assy & remove Nozzle.
- Assemble Sleeve 05049 as per instruction Pg. 1. Sleeve centre to be positioned up from Nozzle end of Hose Assy to a distance of 3.75m for Apollo LPG.
- Assemble Hose Clamp Assy. over Sleeve as shown in instructions.
- Replace Nozzle & reassemble Hose Assy. into Sentry 20 Dry breakaway @ Dispenser.
- Remove half -moon style Hose Cradle from Spring extension, discard both Cradle & Csk. Screw.
- Assemble Swivel Body 83814 onto Spring Extension using Loctite Stud Lock (or similar) to secure Cap Screw into position, ensure Cap Screw with washer are just loose enough to allow Swivel Body to rotate on Extension. (Allow time for Loctite to cure)
- Assemble Hose Clamps Assy. into Swivel Body & insert Shear Pin 05043 ensure end of Pin has engaged into opposite side of Body before driving Pin home. (this will eliminate Shear Pin breaking in the process)

Items required in conjunction with above:

Spring Cap 87924
Spring 87929
Spring Anchor Cap 87923
Grub Screw 801690 (2)
Cap Screw 800030 (3)



TOP VIEW
(SUMP LID REMOVED FOR CLARITY)

SECTION A-A

SECTION B-B

ITEM No	QTY	PART NUMBER	DESCRIPTION	DWG No
1	1	–	DUAL HYDRAULICS SUB ASSEMBLY	DJB 3095
2	1	–	ASSY VAPOUR RETURN PIPEWORK	DJB 3115
3	1	–	ASSY LIQUID INLET PIPEWORK	DJB 3117
4	1	–	ASSY SUMP & LID DUAL HYDRAULICS	DJB 3098
5	2	848-209-01	SPOOL EXCESS FLOW CONNECTION	DJB 3068
6	2	–	ASSY BASE FRAME PNUEMATIC – LIFTING	DJB3118
7	2	046-215-00	'O' RING 26.5 x 3.53 OVAL FLANGE	–
8	4	736-064-00	SCREW M8 x 30 HEX HEAD ZP	–
9	4	747-004-00	WASHER SPRING M8	–
10	4	736-071-00	SCREW M10 x 40 HEX HEAD S/S	–
11	4	758-009-00	NUT M10 S/S	–
12	4	736-088-00	SCREW M12 X 20 HEX HEAD	–
13	4	747-027-00	WASHER FLAT M12 GAL	–
14	2	736-076-00	SCREW M10 x 25 HEX HEAD ZP	–
15	2	747-012-00	WASHER FLAT M10 ZP	–
16	2	758-008-00	NUT M10 ZP	–
17	4	720-002-00	"U" BOLT 28mm ID x 1/3" BSW GALV	–
18	4	010-089-00	SUPORT INS 32 NB PIPE JAW SET	–
19	1	010-007-02	APOLLO MK 4 OUTER FRAME	DJB 3214
20				–
21	2	332-723-00	3/4" NPT EXCESS FLOW VALVE 20 GPM	–
22	1	FREE ISSUE	AC CONTROL BOX	–
23	1	600-102-00	FILTER LUBRICATOR / REGULATOR	–
24	1	010-084-01	UPPER GUIDE ROD	DJB 3054

REV	DATE	ECN No.	DESCRIPTION	BY
C	6.3.02	020218DG02	APOLLO MK 4 UPDATE, PARTS LIST & DUAL LIFTING ADDED TO DRG TITLE	DCG
B	26.11.01	011126AM02	MOD'S AS PER ECN	V.C.
A	17.09.01	011030DG01	OFFICIAL RELEASE	V.C.

BATCHEN
4–6 Raglan Road Auburn 2144, Australia
Ph:61–2–9644 7444 – Fax: 61–2–9645 1665
www.batchen.com.au

MATERIAL

FINISH

ALL DIMENSIONS IN MILLIMETERS U.N.O.

	NAME	DATE
DRAWN	V.C.	22.11.01
CHECKED	A.M.	
APPROVED L.E.		

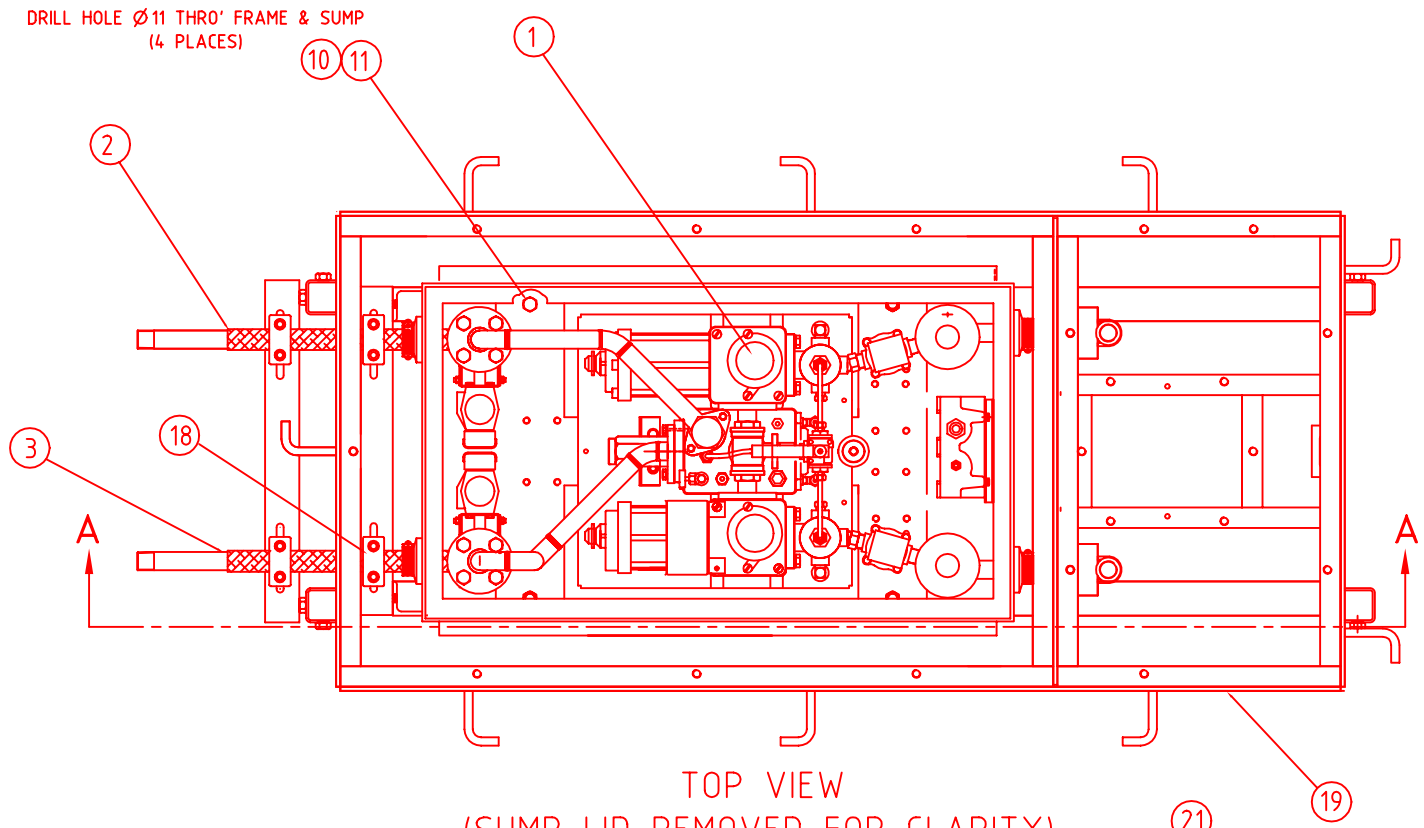
SCALE : 1: 7.5 REF. DWG.

APOLLO MK 4 UNDERGROUND SYSTEM
FINAL ASSEMBLY
DUAL WITH LIFTING

CLIENT: P.E.C.

DRG. NUMBER : DJB 3114 REV. C A3

AutoCAD FILENAME : .



ITEM No	QTY	PART NUMBER	DESCRIPTION	DWG No
1	1	–	DUAL HYDRAULICS SUB ASSEMBLY	DJB 3095
2	1	–	ASSY VAPOUR RETURN PIPEWORK	DJB 3115
3	1	–	ASSY LIQUID INLET PIPEWORK	DJB 3117
4	1	–	ASSY SUMP & LID DUAL HYDRAULICS	DJB 3098
5	2	848-209-01	SPOOL EXCESS FLOW CONNECTION	DJB 3068
6	2	–	ASSY BASE FRAME PNUEMATIC	DJB 3116
7	2	046-215-00	'O' RING 26.5 x 3.53 OVAL FLANGE	–
8	4	736-064-00	SCREW M8 x 30 HEX HEAD ZP	–
9	4	747-004-00	WASHER SPRING M8	–
10	4	736-071-00	SCREW M10 x 40 HEX HEAD S/S	–
11	4	758-009-00	NUT M10 S/S	–
12	4	736-088-00	SCREW M12 X 20 HEX HEAD	–
13	4	747-027-00	WASHER FLAT M12 GAL	–
14	2	736-076-00	SCREW M10 x 25 HEX HEAD ZP	–
15	2	747-012-00	WASHER FLAT M10 ZP	–
16	2	758-008-00	NUT M10 ZP	–
17	4	720-002-00	"U" BOLT 28mm ID x 1/4" BSW GALV	–
18	4	010-089-00	SUPORT INS 32 NB PIPE JAW SET	–
19	1	010-007-02	APOLLO MK 4 OUTER FRAME	DJB 3214
20	1	FREE ISSUE	AC CONTROL BOX	–
21	2	332-723-00	3/4" NPT EXCESS FLOW VALVE 20 GPM	–

REV	DATE	ECN No.	DESCRIPTION	BY
A	6.3.02	020306DG01	OFFICIAL RELEASE	V.C.

BATCHEN
4-6 Raglan Road Auburn 2144, Australia
Ph:61-2-9644 7444 – Fax: 61-2-9645 1665
www.batchen.com.au

MATERIAL

FINISH

	NAME	DATE
DRAWN	DCG	6-3-02
CHECKED		
APPROVED L.E.		

ALL DIMENSIONS IN MILLIMETERS U.N.O.

SCALE : 1: 7.5 REF. DWG.

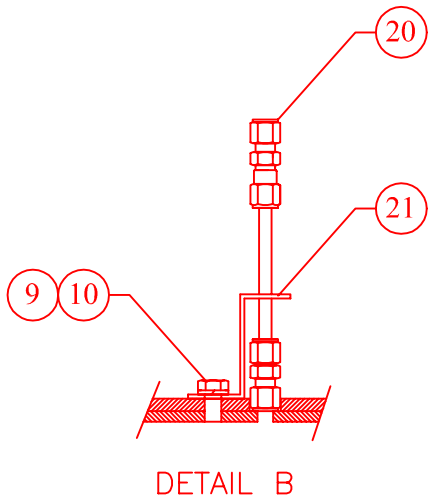
APOLLO MK 4 UNDERGROUND SYSTEM
FINAL ASSEMBLY
DUAL NON LIFTING

CLIENT: P.E.C.

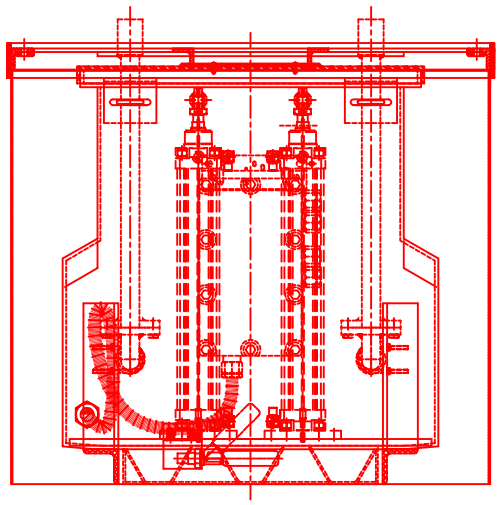
DRG. NUMBER : DJB 3217 REV. A

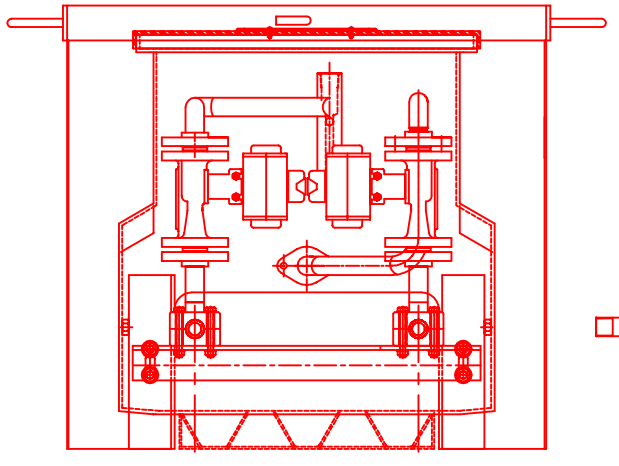
A3

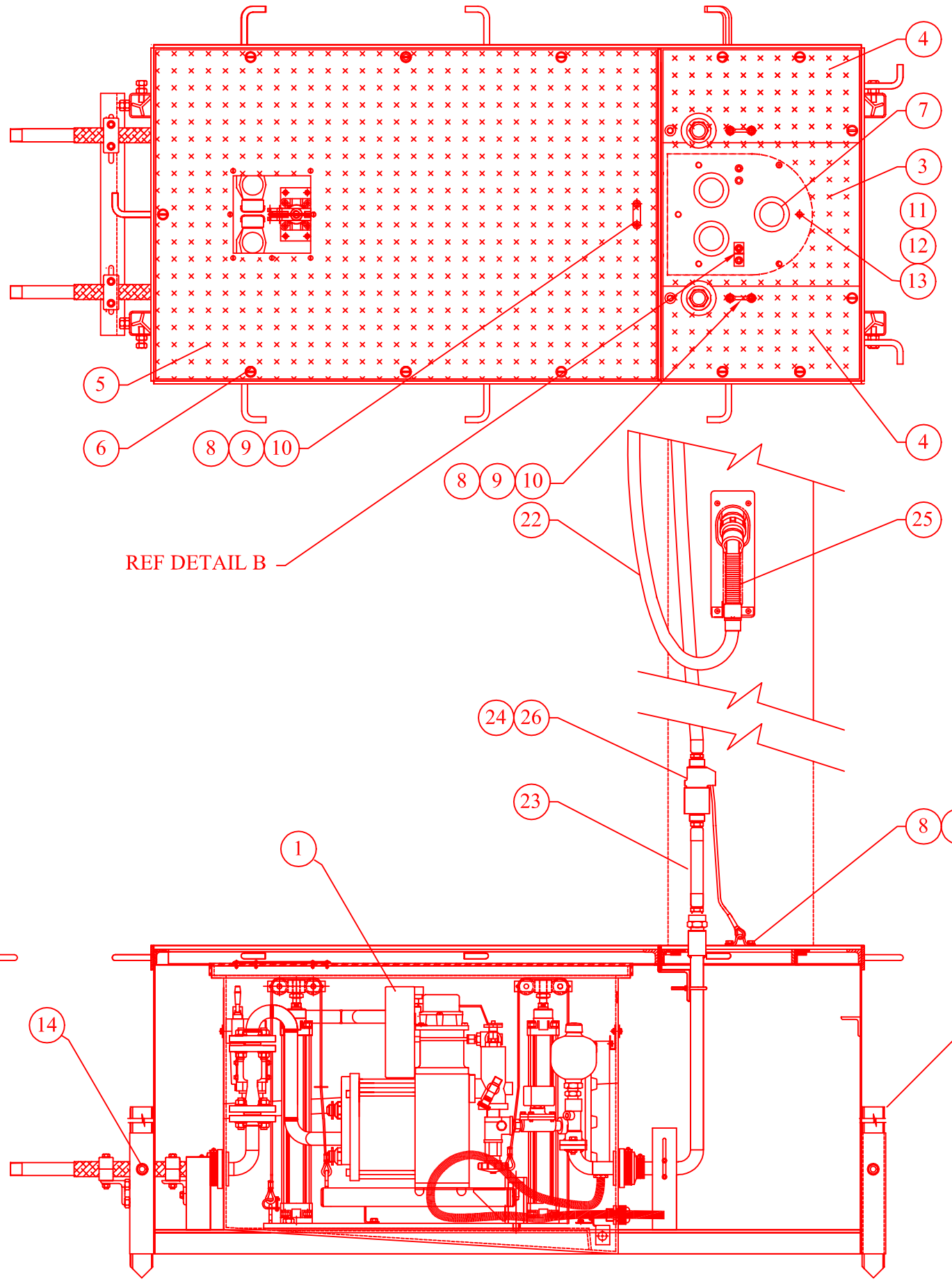
AutoCAD FILENAME :



DETAIL B







ITEM	QTY	PART No.	DESCRIPTION	DRG No.
01	1	-	FINAL ASSY DUAL W/- LIFTING	DJB 3114
02	4	053-300-00	STAR POST	
03	1	848-207-01	COLUMN CENTER DUAL APOLLO	DJB 3058
04	2	848-208-01	PLATE COLUMN OUTER DUAL	DJB 3059
05	1	848-211-01	PLATE TOP ALU. APOLLO	DJB 3075
06	15	736-276-00	SCREW M10 CAP CSK x 20 SLOT S.S	
07	5	830-023-01	GROMMETT MODIFIED APOLLO	DJB 2425
08	3	785-001-02	SADDLE HBC	
09	7	736-064-00	SCREW M8x30 HEX	
10	7	747-004-00	WASHER SPRING M8	
11	5	736-072-00	SCREW M10 x 50 HEX HD S.S	
12	5	747-020-00	WASHER FLAT M10 S.S	
13	5	747-105-00	WASHER SPRING M10 S.S	
14	4	736-098-00	SCREW M12 x 75 HEX HD ZP	

PACKING KIT

ITEM	QTY	PART No.	DESCRIPTION	DRG No.
20	1	854-300-01	BREAK GLASS KIT	DJB 2123
21	1	010-037-01	BREAK GLASS MOUNTING BRACKET	DJB 2402
22	2	810-519-01	ASSY 15 NB 7.0 M	DJB 880
23	2	810-516-01	ASSY 15 NB 0.37 M	DJB 880
24	2	870-010-01	ASSY - SENTRY 20 H.B.C MK II	-
25	2	011-000-02	GAS GUARD NOZZLE LG1 DNS 3/4"	-
26	2	070-003-01	LABEL	-

REV	DATE	ECN No.	DESCRIPTION	BY
C	8.3.02	020218DG02	APOLLO MK 4 UPDATE, ITEM 1 WAS FRAME OUTER, ITEM LIST PART & DRG NoS UPDATED	DCG
B	26.11.01	011126AM02	MOD'S AS PER ECN	V.C.
A	17.09.01	011030DG01	OFFICIAL RELEASE	V.C.

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MATERIAL

FINISH

ALL DIMENSIONS IN MILLIMETERS U.N.O.

	NAME	DATE
DRAWN	V.C.	31.10.01
CHECKED	A.M.	
APPROVED L.E.		

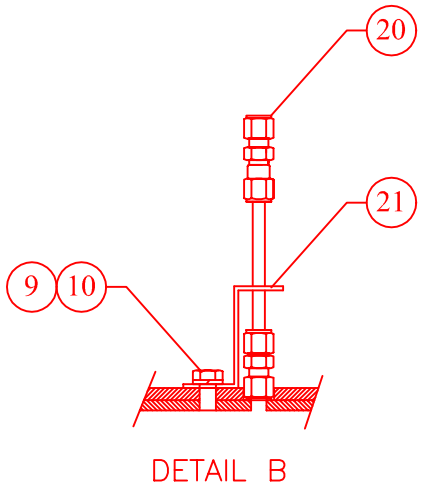
SCALE : 1: 7.5 REF. DWG.

APOLLO MK 4 UNDERGROUND SYTEM
DUAL N.P.S WITH LIFTING ARRANGMENT
GENERAL ASSY
P/N 905-009-01

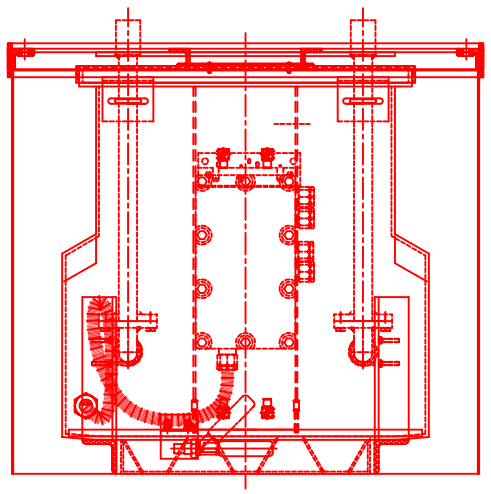
CLIENT: P.E.C.

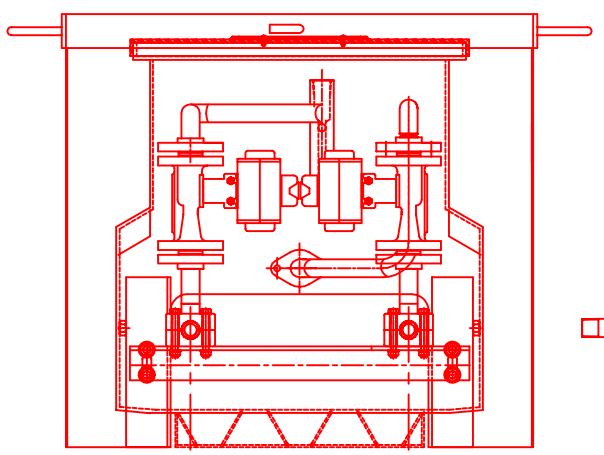
DRG. NUMBER : DJB 3097 REV. C A3

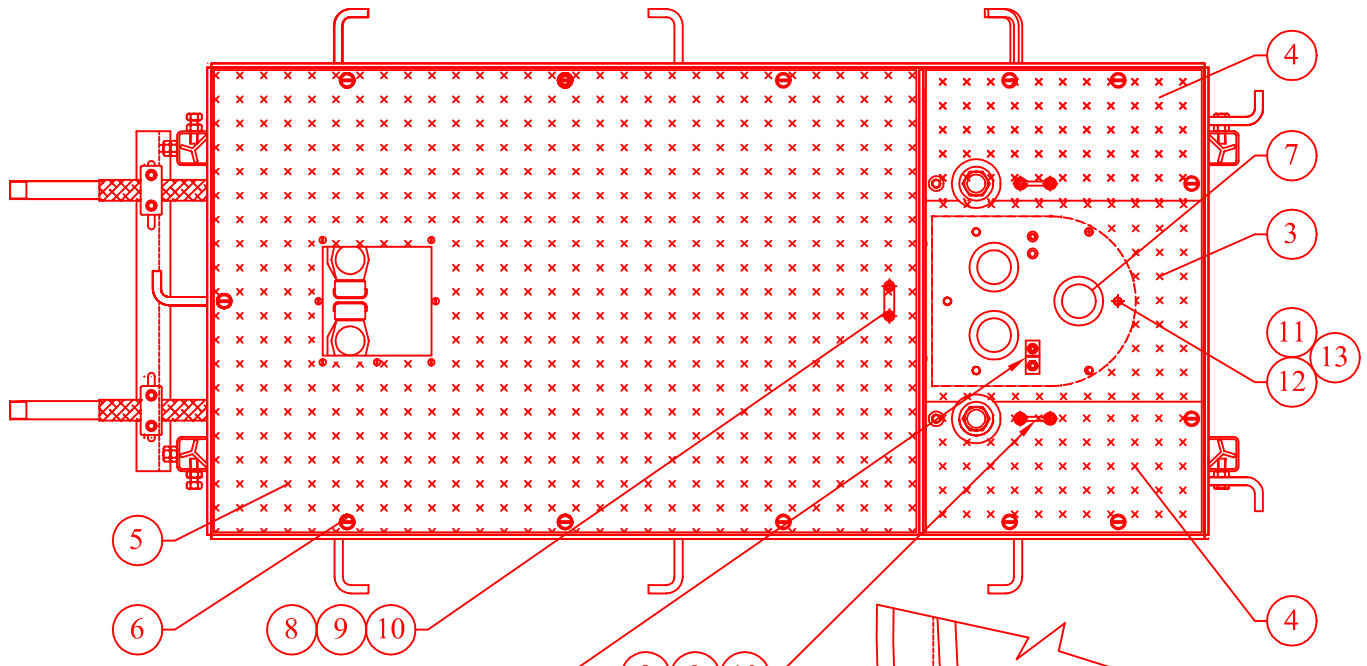
AutoCAD FILENAME : .



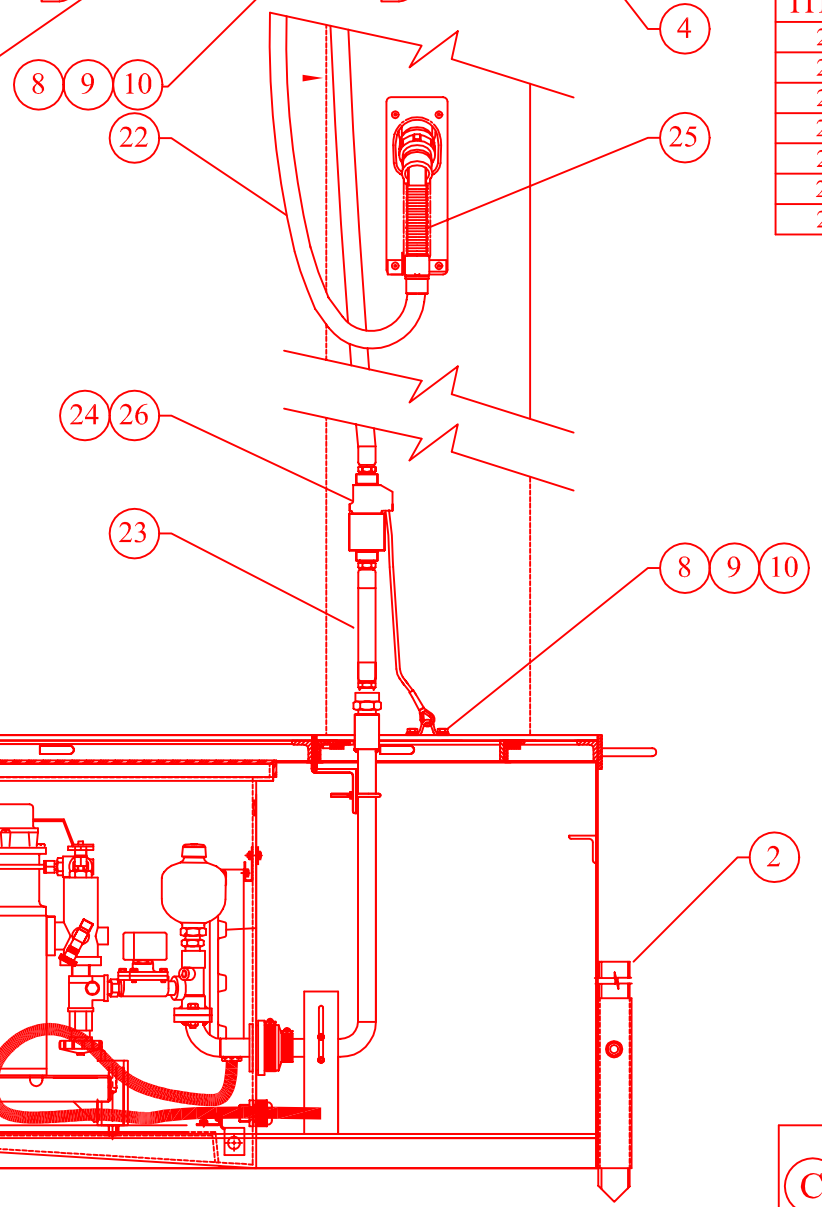
DETAIL B







REF DETAIL B



ITEM	QTY	PART No.	DESCRIPTION	DRG No.
01	1	-	FINAL ASSY DUAL NON- LIFTING	DJB 3217
02	4	053-300-00	STAR POST	
03	1	848-207-01	COLUMN CENTER DUAL APOLLO	DJB 3058
04	2	848-208-01	PLATE COLUMN OUTER DUAL	DJB 3059
05	1	848-211-01	PLATE TOP ALU. APOLLO	DJB 3075
06	15	736-276-00	SCREW M10 CAP CSK x 20 SLOT S.S	
07	5	830-023-01	GROMMETT MODIFIED APOLLO	DJB 2425
08	3	785-001-02	SADDLE HBC	
09	7	736-064-00	SCREW M8x30 HEX	
10	7	747-004-00	WASHER SPRING M8	
11	5	736-072-00	SCREW M10 x 50 HEX HD S.S	
12	5	747-020-00	WASHER FLAT M10 S.S	
13	4	736-098-00	SCREW M12 x 75 HEX HD ZP	

PART PACKING KIT -- PART No 800-154-01

ITEM	QTY	PART No.	DESCRIPTION	DRG No.
20	1	854-300-01	BREAK GLASS KIT	DJB 2123
21	4	010-037-01	BREAK GLASS MOUNTING BRACKET	DJB 2402
22	2	810-519-01	ASSY 15 NB 7.0 M	DJB 880
23	2	810-516-01	ASSY 15 NB 0.37 M	DJB 880
24	2	870-010-01	ASSY - SENTRY 20 H.B.C MK II	-
25	2	011-000-02	GAS GUARD NOZZLE LG1 DNS 3/4"	-
26	2	070-003-01	LABEL	-

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MATERIAL

FINISH

ALL DIMENSIONS IN MILLIMETERS U.N.O.

	NAME	DATE
DRAWN	DCG	8-3-02
CHECKED		
APPROVED L.E.		

SCALE : 1: 7.5 REF. DWG.

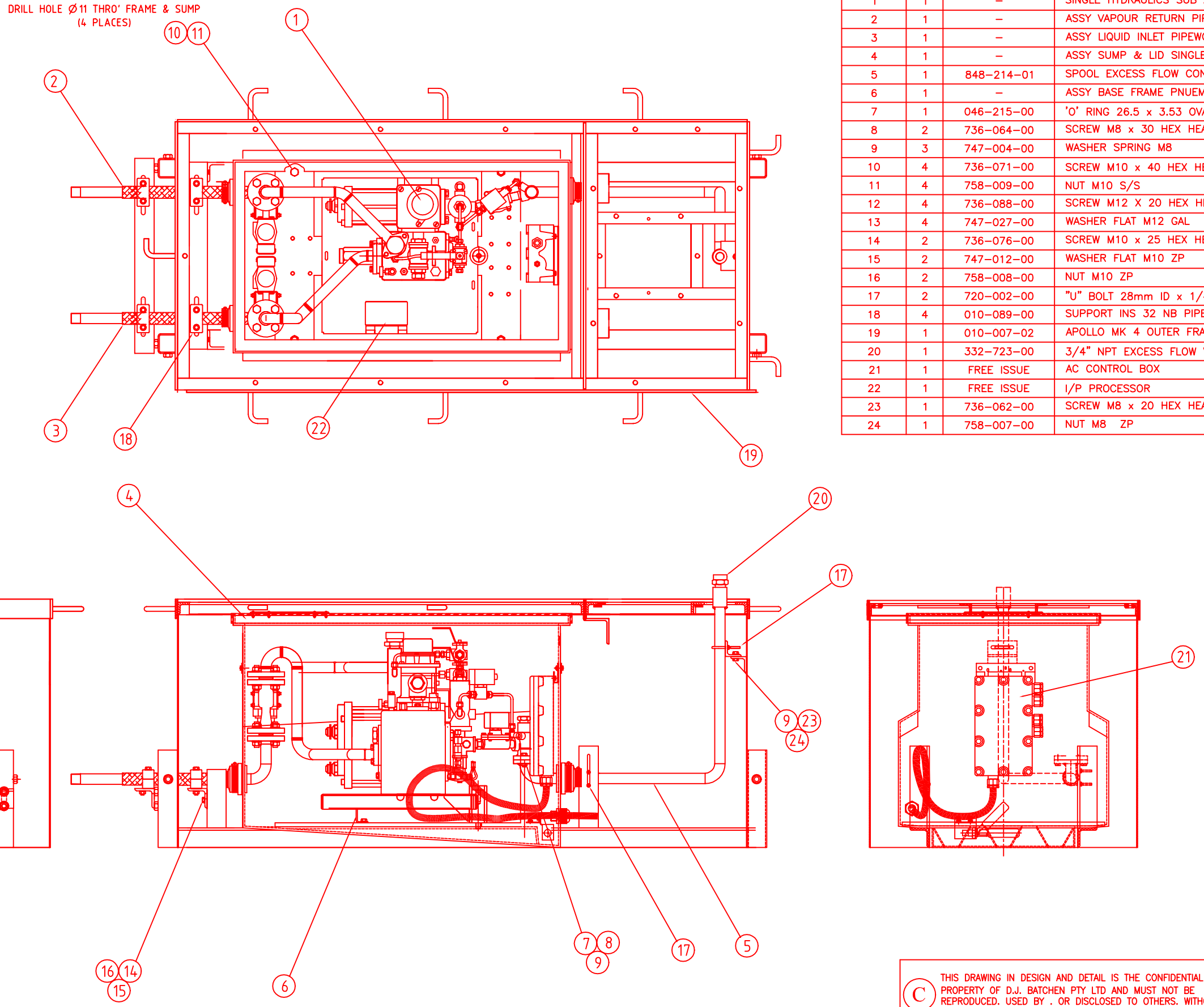
APOLLO MK 4 UNDERGROUND SYTEM
DUAL N.P.S NON-LIFTING ARRANGMENT
GENERAL ASSY
P/N 905-011-01

CLIENT: P.E.C.

DRG. NUMBER : DJB 3221 REV. A A3

REV	DATE	ECN No.	DESCRIPTION	BY
A	8.3.02	020306DG01	OFFICIAL RELEASE	DCG

AutoCAD FILENAME :



ITEM No	QTY	PART NUMBER	DESCRIPTION	DWG No
1	1	–	SINGLE HYDRAULICS SUB ASSEMBLY	DJB 3218
2	1	–	ASSY VAPOUR RETURN PIPEWORK	DJB 3115
3	1	–	ASSY LIQUID INLET PIPEWORK	DJB 3117
4	1	–	ASSY SUMP & LID SINGLE HYDRAULICS	DJB 3206
5	1	848–214–01	SPOOL EXCESS FLOW CONNECTION	DJB 3162
6	1	–	ASSY BASE FRAME PNUEMATIC	DJB 3116
7	1	046–215–00	'O' RING 26.5 x 3.53 OVAL FLANGE	–
8	2	736–064–00	SCREW M8 x 30 HEX HEAD ZP	–
9	3	747–004–00	WASHER SPRING M8	–
10	4	736–071–00	SCREW M10 x 40 HEX HEAD S/S	–
11	4	758–009–00	NUT M10 S/S	–
12	4	736–088–00	SCREW M12 X 20 HEX HEAD	–
13	4	747–027–00	WASHER FLAT M12 GAL	–
14	2	736–076–00	SCREW M10 x 25 HEX HEAD ZP	–
15	2	747–012–00	WASHER FLAT M10 ZP	–
16	2	758–008–00	NUT M10 ZP	–
17	2	720–002–00	"U" BOLT 28mm ID x 1/4" BSW GALV	–
18	4	010–089–00	SUPPORT INS 32 NB PIPE JAW SET	–
19	1	010–007–02	APOLLO MK 4 OUTER FRAME	DJB 3214
20	1	332–723–00	3/4" NPT EXCESS FLOW VALVE 20 GPM	–
21	1	FREE ISSUE	AC CONTROL BOX	–
22	1	FREE ISSUE	I/P PROCESSOR	–
23	1	736–062–00	SCREW M8 x 20 HEX HEAD ZP	–
24	1	758–007–00	NUT M8 ZP	–

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www.batchen.com.au

MATERIAL

FINISH

	NAME	DATE
DRAWN	DCG	7–3–02
CHECKED		
APPROVED L.E.		

ALL DIMENSIONS IN MILLIMETERS U.N.O.

SCALE : 1: 7.5 REF. DWG.

APOLLO MK 4 UNDERGROUND SYSTEM
FINAL ASSEMBLY
SINGLE NON LIFTING

CLIENT: P.E.C.

DRG. NUMBER : DJB 3220 REV. A

A3

REV	DATE	ECN No.	DESCRIPTION	BY
A	7.3.02	020218DG01	OFFICIAL RELEASE	DCG

AutoCAD FILENAME :