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1.1 Introduction

1.1.1 About This Manual

This manual introduces the installation and operating procedures for the KRAUS Automatic Temperature Compensation system.

In an effort to help our customers take full advantage of our state-of-the-art products, we have provided this handbook to aid in initial set up and later to be used as a reference guide should the need arise.

The three divided sections are:

1. INFORMATION

Gives general information on system functions as well as cautionary advice.

2. INSTALLATION

Gives all information needed to successfully install and operate the system, as well as technical illustrations to aid in understanding text.

3. TECHNICAL DATA

Gives information on products that make up the system, in the form of drawings, manufacturer's literature, and references to related systems and products.

These three sections are set up in such a way that information is easily understood and instantly available to those who need it, whether they are an engineer, technician or supply manager.

Due to different environmental conditions this manual may be subject to, it has been designed to fit neatly in a protective three holed binder. This also serves the function of containing information from other related products in one convenient package.

1.1 Introduction

1.1.2 Helpful Hints and Warnings

Throughout this manual, in the left hand margin, there will be indicators, with text, to give various hints and warnings. The following are examples of what you will see, and their meanings:

SUGGESTION

Gives a hint on how to best use the equipment or advice on proper procedures.

ATTENTION

Gives notice to an important aspect of system operation.

CAUTION

Gives a warning to prevent damage to equipment or cause human injury.

Kraus Industries Ltd. Assumes no responsibility for personal injury or equipment damage caused by non-observance of the safety warnings.

1.1.3 Service and Product Support

Should you experience any difficulties in system operation, customer assistance is available.

The procedure to receive such assistance is as follows:

1. Document the following information:

- System Disfunctions
- Corrective Measures Taken
- Model Number
- Serial Number
- Purchase Order Number
- Date of Installation
- Equipment Location (ie. City, Address, etc...)

2. Call or Fax our Product Service line at:

Company Service number	1 204 988 1234
Company Fax number	1 204 654 2881

One of our qualified personnel will provide assistance in getting your system operational.

1.2 Product Information

1.2.1 System Components

The following is a list of operating components used in this installation, along with a brief explanation of their operation:

ATC Board

Takes the signals from the temperature probe and flow meter, compensates for temperature deviation from 15 ^{o}C, then sends the compensated signal back to the main processor board.

Modular Adapter Board

Diverts the signal from the pulser to the ATC board, then returns the compensated signal from the ATC board to the main processor board. Also supplies a +5VDC and handle switch signals to the ATC Board and display.

Intrinsic Safety (I.S.) Barrier

Energy limits the temperature probe signal, then sends the same signal on to the ATC board.

Temperature Probes

Converts temperature of the product to a corresponding voltage signal that is sent to the ATC board, via the I.S. Barrier.

ATC Display Board

Gives a visual display of product temperature, flow rate and uncompensated volume. Also indicates error conditions.

2.1 Pre-Installation

2.1.1 Site Preparation

CAUTION

The following precautions should be taken into consideration before installation of this product. Failure to do so could result in serious personal injury.

- Extreme caution should be used to ensure that no ignition sources exist.
- The dispensing area should be roped off or isolated from public use.
- Dispenser station operator should be made aware of the work that needs to be completed to prevent accidental “turn on” of the pump.
- Any main electrical disconnection should be labeled or locked to prevent accidental power up.

2.1.2 Installation Requirements

CAUTION

The following points should be taken into consideration before installation of this product:

- Any electrical installation should be carried out by a registered electrician.
- Any gas dispensing connections should be made by qualified and experienced personnel.
- Installation must be performed in accordance with the relevant standards, laws and by-laws governing the type of application.

2.1 Pre-Installation 2.1.3 Unit Configuration

The GTC 200-2B must be configured for installation. This is done with DIP switches on the ATC circuit board. (See Figure 10)

These options can be changed by setting the eight switches in accordance with the tables below:

Table 1 ATC board DIP Switch Settings GTC 200-2B

SWITCH #	OPTION	SWITCH STATUS
1	Selects whether product 1 is gasoline or diesel	OFF = GASOLINE
2	Selects whether product 2 is gasoline or diesel	OFF = GASOLINE
3	Selects whether product 3 is gasoline or diesel	OFF (N/A)
4	Selects whether product 4 is gasoline or diesel	OFF (N/A)
5	Selects whether Blender is used	ON
6	Selects whether or not dispenser is 2 Product Highline	OFF
7	Selects whether or not the unit is installed in a modular or MPD pump	OFF = MODULAR OR MPD
8	Selects whether ATC is ON or OFF	ON = ATC ON

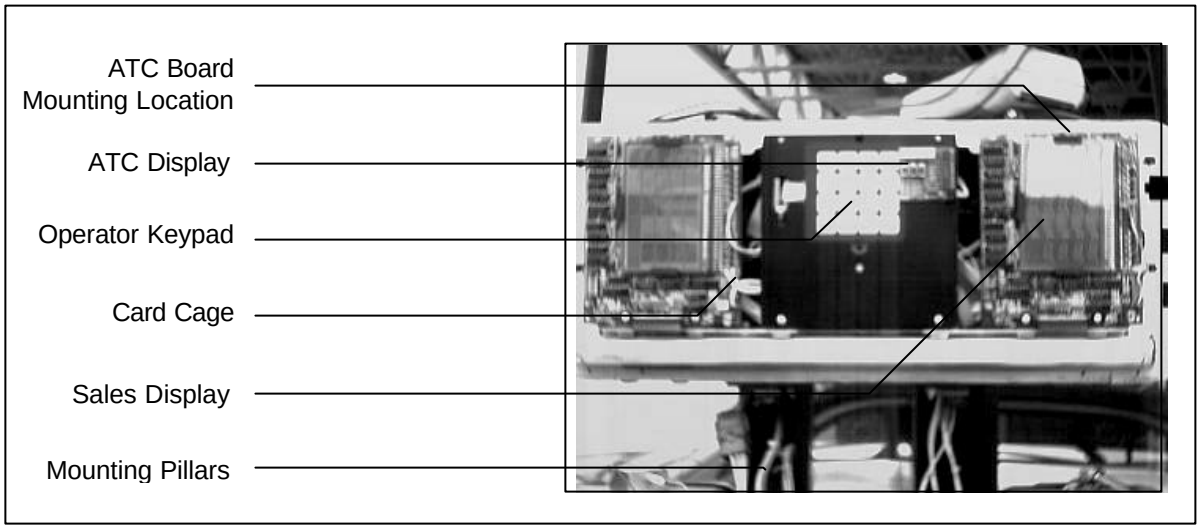
2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

SUGGESTION

Complete component installation diagrams are located in Technical Data Section 3.1.2

1. Open front panel of display, on top of pump, to expose main control boards. (See Figure 1)



Salesmaker Model Shown

2. If possible, disconnect electrical power supply at main breaker *or* remove fuse located inside the display unit.

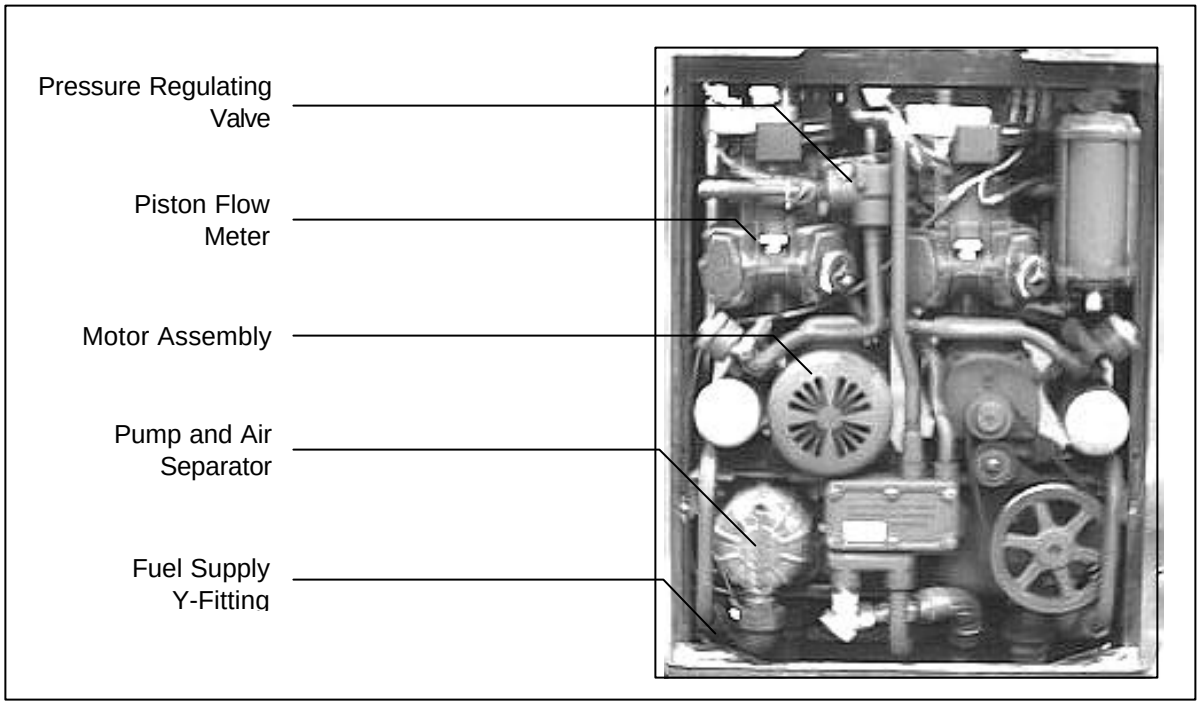
2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.1 Thermal Test Well Connection

(In the case of having a Pressure Regulating Valve)

1. Remove the two lower panels to expose the main pump assembly. (See Figure 2)



Salesmaker Model Shown

2. Locate the pressure regulating valve before each meter. (See Figure 2)

3. Remove the valves from each section.

CAUTION

Due to the presence of combustible gasses, DO NOT drill probe holes or solder fittings while the pipe is connected to the pump assembly.

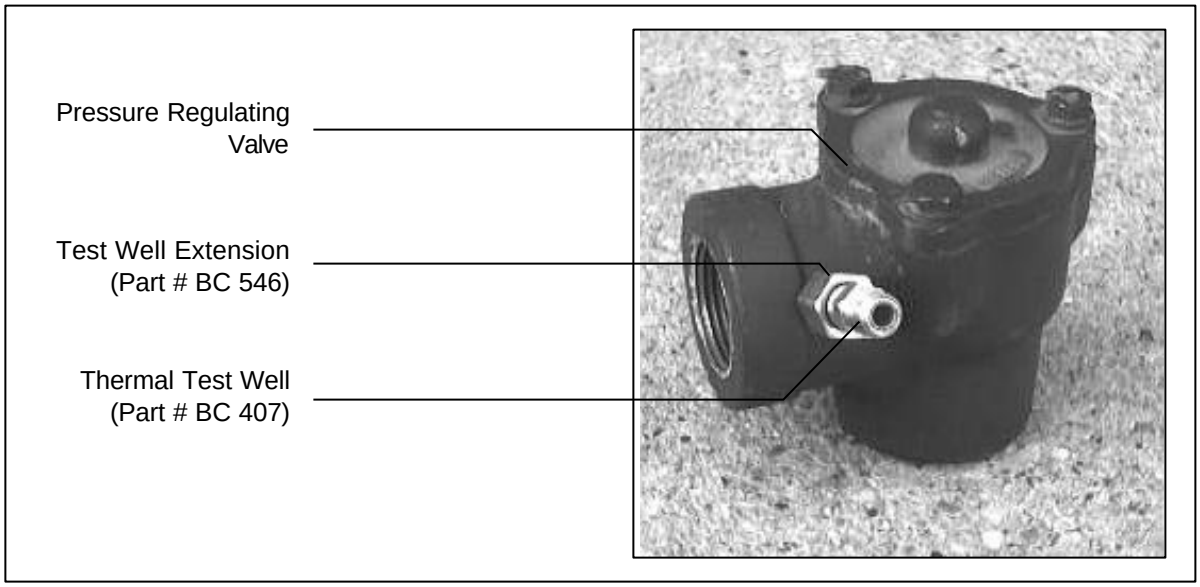
2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.1 Thermal Test Well Connection

(In the case of having a Pressure Regulating Valve)

4. With the valve mounted securely, drill 1 hole of size Q or 21/64”, in the leg that leads to the meter, and tap for 1/8” NPT. (See Figure 3)



The following guidelines should also be followed for installing the test well:

- The hole should be drilled so that the extension will be at an angle within 45^{o} of vertical when the extension is installed and assembly is reconnected. This is so that it will hold thermally conductive fluid for measuring purposes.
- The fitting should provide easy access for insertion of a thermometer.
- The fitting should be placed in an appropriate position so as not to not hinder reinstallation of the assembly.

5. Install the 1/8” NPT test well extension fitting (Part # BC 546) into the newly drilled hole. The inside will be drilled out larger to accommodate the test well (Part # BC 407). (See Figure 3)

2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.1 Thermal Test Well Connection

(In the case of having a Pressure Regulating Valve)

ATTENTION

If connection is less than 5 threads, then soldering is required. Any other connections must be made using thread sealing compound suitable for use with gasoline.

6. Install the test well (Part # BC 407) into the extension fitting (Part # BC 546) and, after tightening, cover with a PVC thermal well cap. (Part # 213-P-2) (See Figure 3)

7. Re-connect the completed assembly.

8. Repeat procedure for each test well to be installed.

ATTENTION

Pressure regulating valve assembly operates as a check valve in forward flow cases, and therefore does not alter the temperature of product being measured.

2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.2 Thermal Test Well Connection

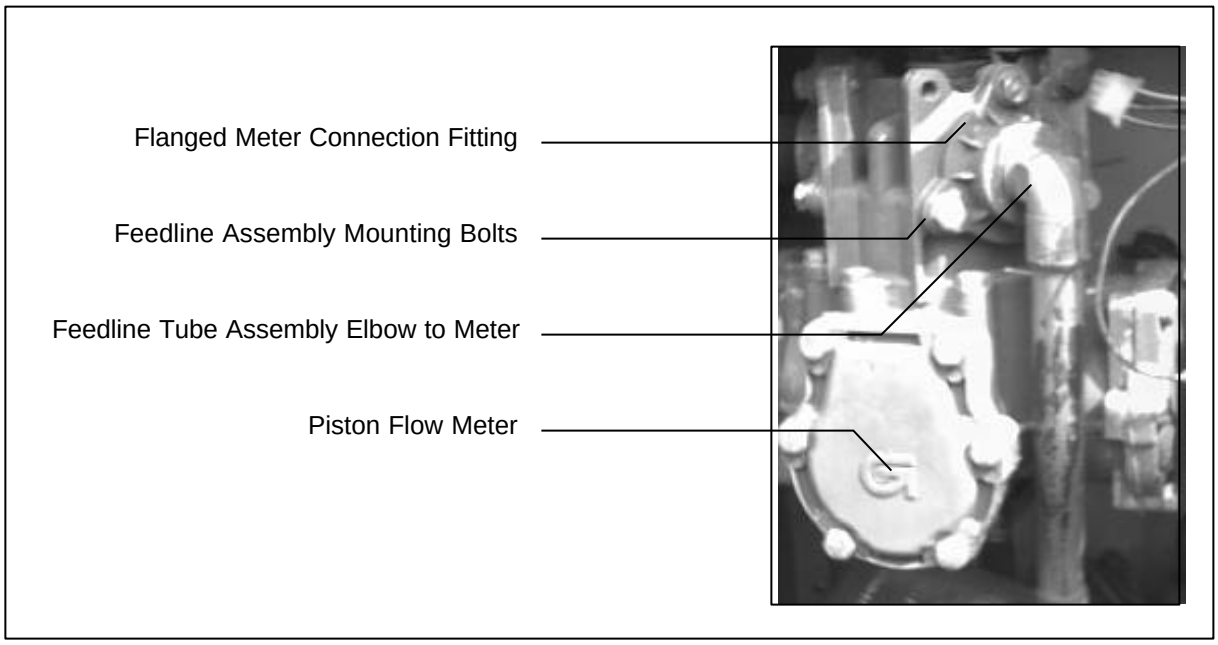
(In the case of having Feedline Tube Assemblies)

1. Remove the two lower panels to expose the main pump assembly.

2. Locate the feedline tube assemblies connected to each meter. (See Figures 4 and 5)

   In order to connect test wells, each complete assembly must be removed as follows:

3. Disconnect the bolts that mount the flanged fitting end of the assembly to the meter, being careful not to damage the O-ring seal between the flange and meter inlet. (See Figure 4)



4. Disconnect the tubing from the tee fittings on the solenoid valve assembly. (See Figure 5)

5. Disconnect the bolts mounting the solenoid valve assembly to the pressure regulator. (See Figure 5)

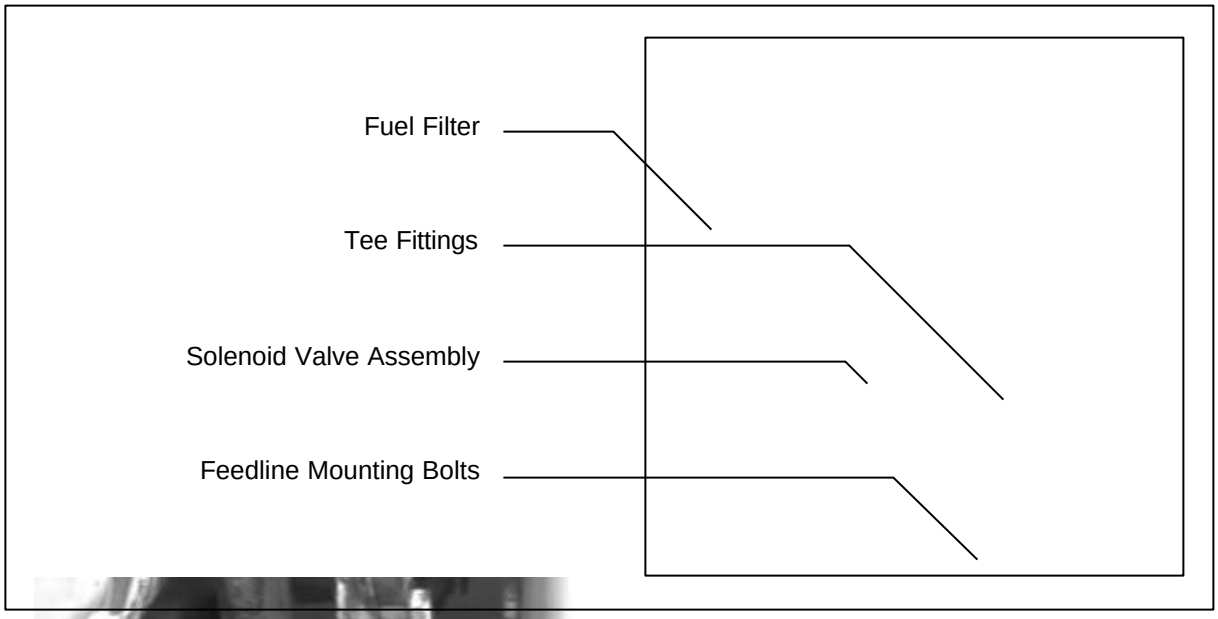
2.2 Component Installation

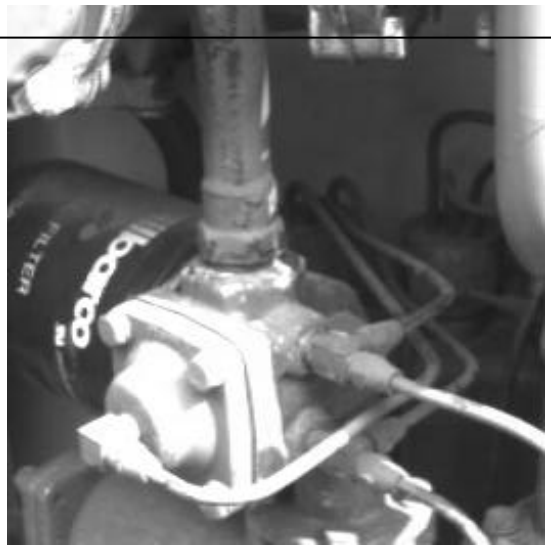
2.2.1 Thermal Test Well and Temperature Probe

2.2.1.2 Thermal Test Well Connection

(In the case of having Feedline Tube Assemblies)

6. Remove feedline tube assembly and repeat procedure for each one in the enclosure.





CAUTION

Due to the presence of combustible gasses, DO NOT drill probe holes or solder fittings to parts directly connected to the pump.

With the feedline assemblies removed:

7. Remove the flanged fitting from the assembly in order that the sealant is not destroyed due to soldering.

2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.2 Thermal Test Well Connection

(In the case of having Feedline Tube Assemblies)

8. With the pipe section mounted securely, drill 1 hole of size Q or 21/64", in the middle of the elbow that is located just before the meter, and tap for 1/8" NPT. (See Figure 6)

   The following guidelines should also be followed for installing the test well:

   - The hole should be drilled so that the extension will be at an angle within 45° of vertical when the extension is installed and assembly is reconnected. This is so that it will hold thermally conductive fluid for measuring purposes.
   - The fitting should provide easy access for insertion of a thermometer.
   - The fitting should be placed in an appropriate position so as not to not hinder reinstallation of the assembly.

9. Install and silver solder the 1/8" NPT test well extension fitting (Part # BC 546) into the newly drilled hole. The inside will be drilled out larger to accommodate the test well (Part # BC 407). (See Figure 6)

ATTENTION

If connection is less than 5 threads, then soldering is required. Any other connections must be made using thread sealing compound suitable for use with gasoline.

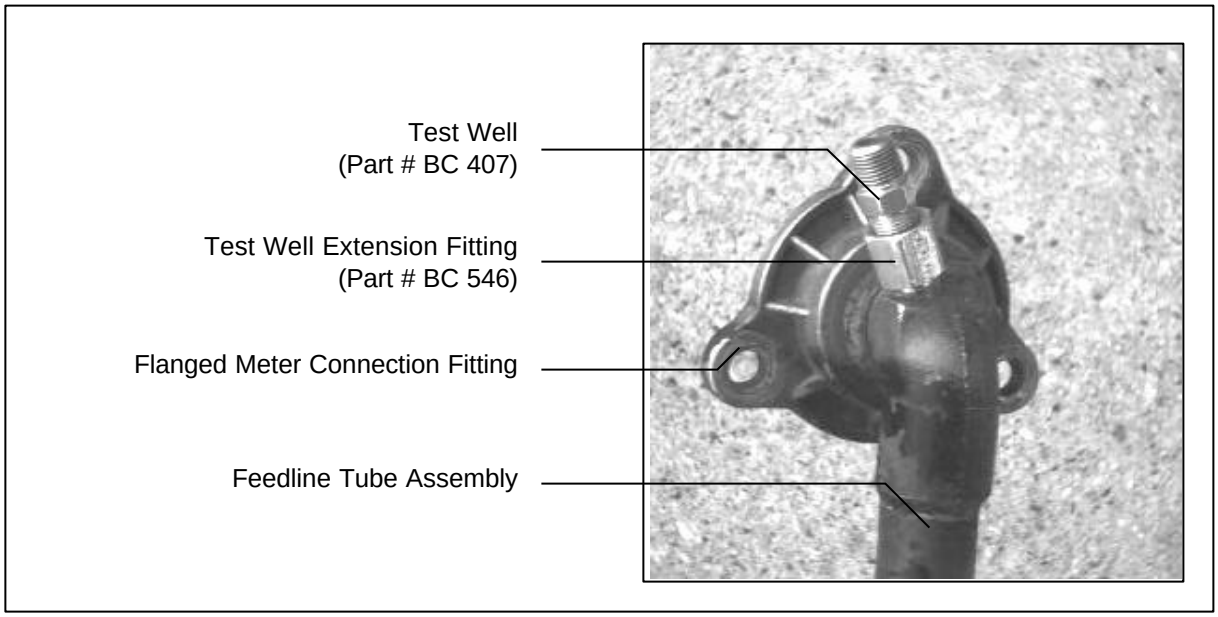
10. Install the test well (Part # BC 407) into the extension fitting (Part # BC 546) and, after tightening, cover with a PVC thermal well cap. (Part # 213-P-2) (See Figure 6)

2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.2 Thermal Test Well Connection

(In the case of having Feedline Tube Assemblies)



11. Re-connect the feedline tube assemblies, by following steps 3 to 7 in reverse order . (Apply new thread sealing when reattaching the flanged fitting and elbow)

2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

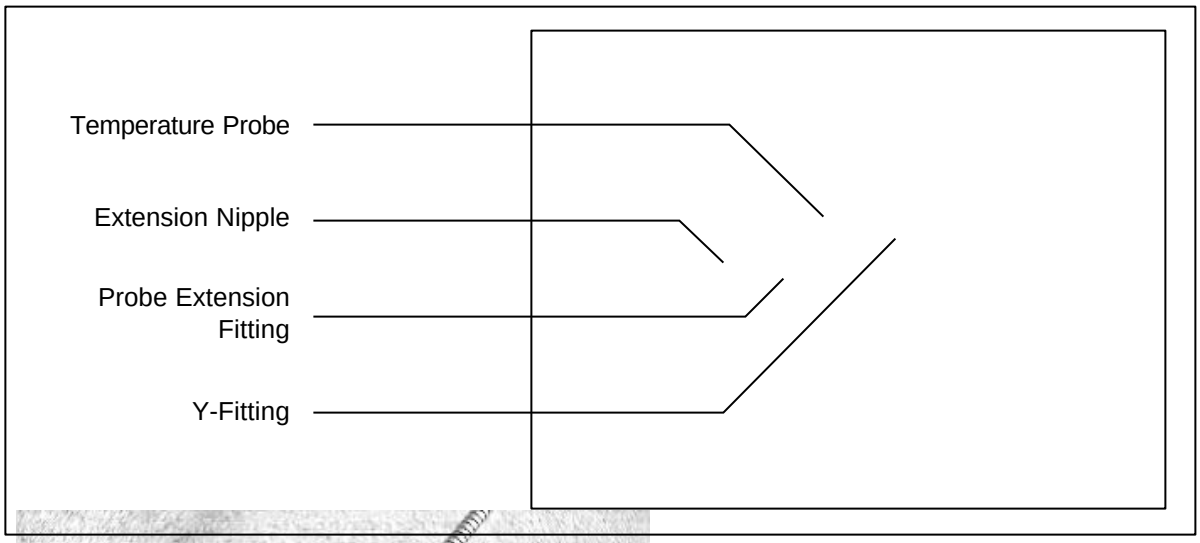
2.2.1.3 Temperature Probe Connection

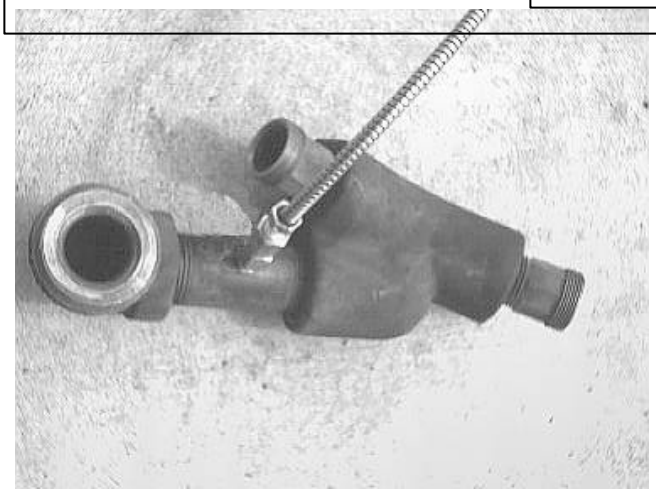
(In the case of a Suction Unit)

1. Locate fuel supply inlet Y-fitting at the bottom of the pump assembly. (See Figure 2)

2. Remove Y-fitting and pipe extension nipple.

3. With the pipe section mounted securely, drill 1 hole of size Q or 21/64", in the extension nipple, and tap for 1/8" NPT. (See Figure 7)





4. Install extension fitting (Part # BC 546) into hole, using sealing compound suitable for use with gasoline.

5. Install the temperature probe into the extension fitting.

SUGGESTION

The temperature probe end should ideally be placed in the center of fuel flow inside the piping, two extension fittings are supplied in order to adjust the position of the probe.

6. Re-install the pipe section into the pump assembly.

Repeat procedure for each temperature probe

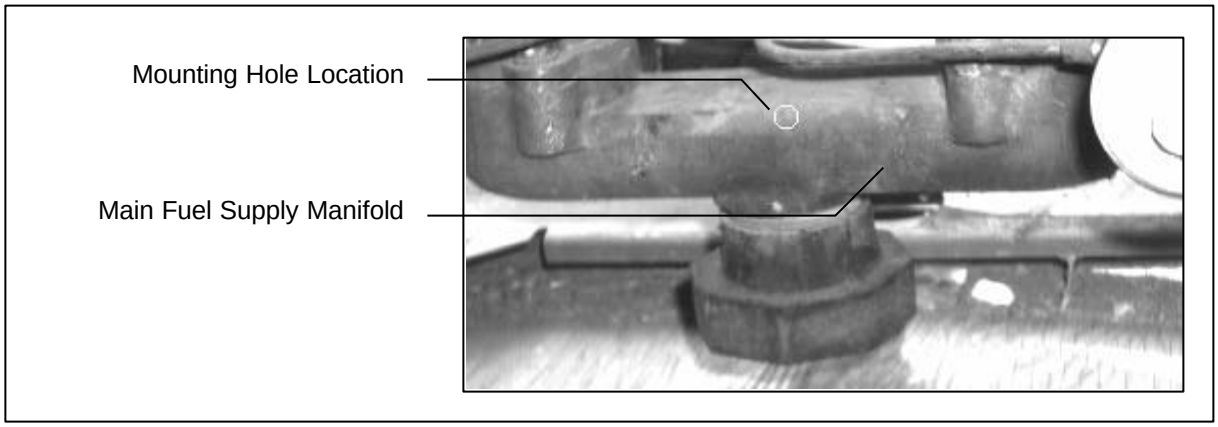
2.2 Component Installation

2.2.1 Thermal Test Well and Temperature Probe

2.2.1.4 Temperature Probe Connection

(In the case of a Manifold Assembly)

1. Locate the fuel supply manifold at the bottom of the pump assembly, inside the main enclosure. (See Fig 8)
2. Remove manifold.
3. With the manifold mounted securely, drill one hole of size Q or 21/64" in the center of the manifold body, or in a location where the probe is common to both meters. (See Figure 8 for hole location)



SUGGESTION

The hole should be placed so that with the probe installed, the manifold can be re-connected without the probe interfering with the front panel of the enclosure.

4. Tap the hole for 1/8" NPT, and install temperature probe extension fitting using thread sealing compound suitable for use with gasoline.

SUGGESTION

The temperature probe end should ideally be placed in the center of fuel flow inside the manifold, two extension fittings are supplied in order to adjust the position of the probe.

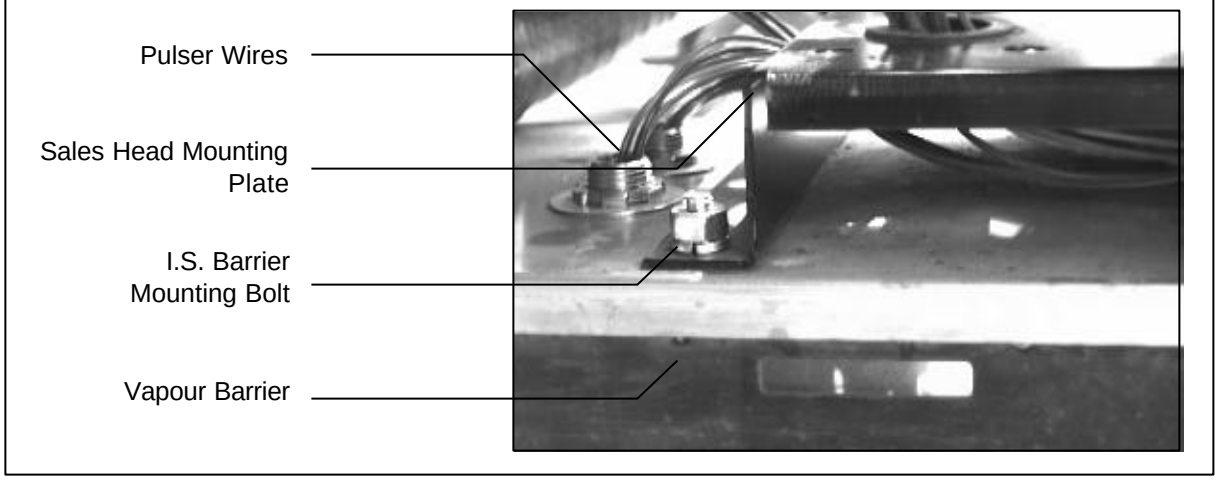
5. Install temperature probe inside the extension fitting, also using thread sealing compound suitable for use with gasoline.
6. Re-connect manifold to pump assembly.

2.2 Component Installation

2.2.2 Intrinsic Safety Barrier Mounting

1. Once the temperature probes have been installed, remove panels between sales display head and vapour barrier.

2. Use the I.S. Barrier bolt to replace one of the bolts on the pillar mounting plate on the vapour barrier as shown in Figure 9.



3. Connect corresponding probe plugs to I.S. Barrier via attached DIN jacks.

4. Crimp the wires from I.S. Barrier to the 5 Pin 3 wire harness that will connect to the ATC Board. (Part # W172) Wires will correspond by colour.

5. Connect the ground wire (Green #20 AWG) from the I.S. Barrier to the I.S. ground screw of the Pump Head Unit.

CAUTION

Ground wire connection is critical for safe operation of the equipment.

6. Run the crimp wired harness up and through to the Sales Display Head control panel to the site where the ATC board will be mounted. (See Figs. 1 and 10)

2.2 Component Installation

2.2.3 Blender Adapter Board Connection

Refer to Figure 14 for Connection Detail

1. Tilt the Operator Keypad down to expose the pump card cage. (See Figure 1)

2. Detach the 40 Pin harness from the Hydraulic Interface Board (P101) in the Card Cage.

3. Attach the Blender Adapter Board (Part #SKIL-439) to the Hydraulic Interface Board on the connector to which the harness was attached (P101).

ATTENTION

Be sure connecting pins are centered and not offset.

---

4. Re-attach harness in 40 pin receptacle on Modular Adapter board (P101).

5. Detach 10 Pin ribbon cable from P203 on Logic Board and plug into J203 on the Adapter Board.

6. Attach 10 Pin ribbon cable (Part # W178) from Adapter Board (P203) to Logic Board (P203).

2.2 Component Installation

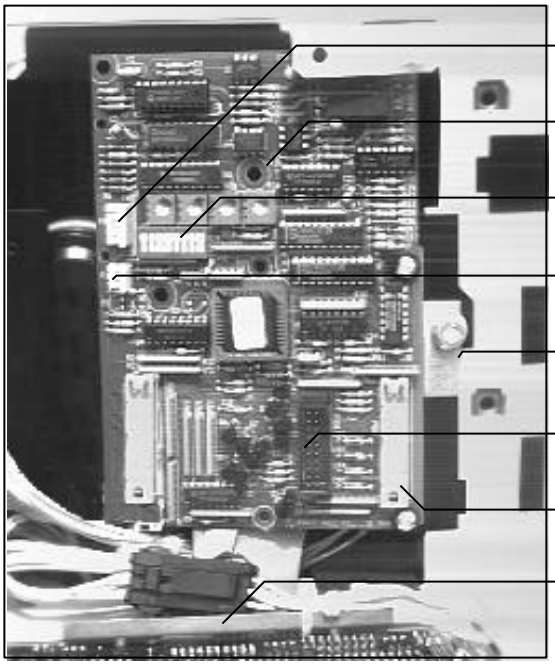
2.2.4 ATC Board Installation

1. Open front panel of display. (See Figure 1)

2. Tilt the right hand sales display board by loosening plastic locks on top and pulling down. (Board will have a hinge on the bottom) (See Figure 9)

3. Locate and loosen the mounting bolt on the right hand side of the mounting plate. Insert bracket end of ATC board between the nut and the mounting plate, then tighten, making sure tab is against the plate siding.(See Figure 9)

4. Connect the wire harness from the I.S. Barrier to the connector P5 on the ATC board.



5. Connect the 20 pin ribbon cable (Part # W179) to the connector P106 on the ATC board, and run to connector P106 on the Modular Adapter Board, already attached to the Hydraulic Interface Board in the Card Cage.

6. Connect the 26 pin ribbon cable (Part #W180) to the connector P801 on the ATC board, and run to connector P801 on the Modular Adapter Board, already attached to the Hydraulic Interface Board in the Card Cage.

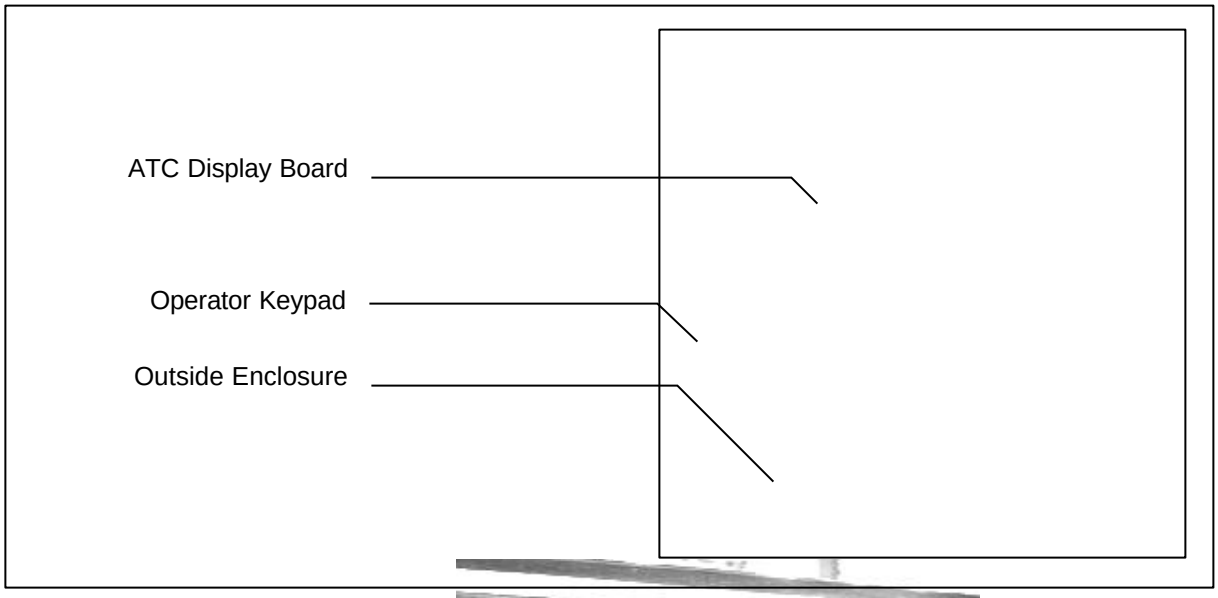
7. Place seal cover (BC 1239) over DIP switch section by inserting tab through hole, then twist tie cover to board with some wire. (See Figure 10 for hole location)

2.2 Component Installation

2.2.5 ATC Display Board Installation

1. Remove backing paper to expose adhesive strips.

2. Position the display board in the upper right hand corner of operator keypad, and adhere firmly to the metal plate, making sure the display is visible when enclosure is replaced. (See Figs. 1 and 11)



3. Attach the wire harness (Part # W151) from ATC Display to connector P3 on middle left hand side of the ATC Board.

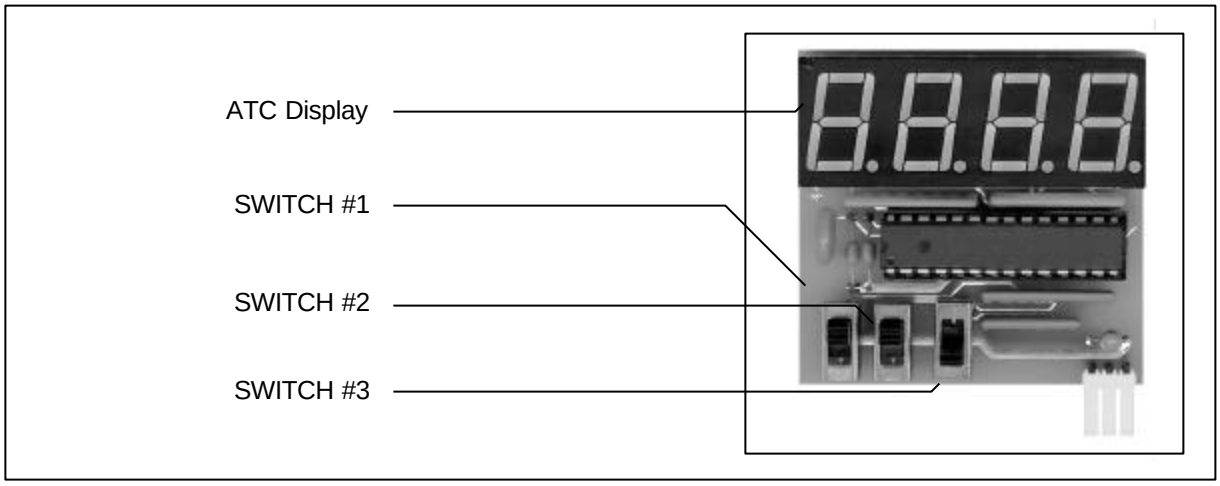
2.2 Component Installation

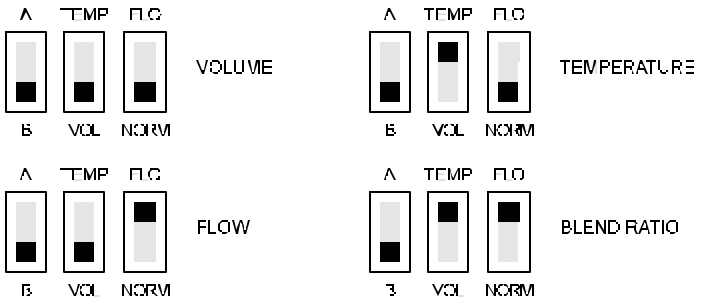
2.2.6 ATC Display Board Functions

The three switches on the board (See Figures 12 and 13) determine what information is displayed.

SWITCH 1	A/B	Selects the temperature and uncompensated volume reading for either **A side** or **B side**.
SWITCH 2	TEMP/VOL	Selects between the product **temperature** and uncorrected **volume** of product. (In normal mode)
SWITCH 3	FLOW/NORM	Selects between having the **flowrate** or the **temperature and volume** (as above) of a product displayed**.** Also displays Blend Ratio when used in conjunction with TEMP/VOL switch.

Note: The **NORM** position may be labelled **BLEND**.




A
TEMP
D.O
VOLUME
B
VOL
NORM
A
TEMP
D.O
TEMPERATURE
B
VOL
NORM
A
TEMP
D.O
FLOW
B
VOL
NORM
A
TEMP
D.O
BLEND RATIO
B
VOL
NORM

2.2.7 ATC Display Board Messages

Error Messages

PULS	Pulser Error
Prob	Probe Error
A-d	A/D Converter Error

Status Messages

Will show for 1 second when handle switch is turned on. Must be in normal mode.

With **TEMP** switch selected:

re1.0 Software Revision Number

With **VOL** switch selected:

gas	Shows product type is gasoline
desl	Shows product type is diesel
OFF	ATC Switch Off

2.3 Post Installation

2.3.1 Post Installation Check

If components have been installed as per the previous instructions, and pump has been re-assembled, power can be restored.

The following operations should now be verified:

- Sales displays are operational. (The pulser error code may be flashing on the price display)
- ATC display is operational. (Display may be blank until handle switches are thrown) If display is not operation, check to see if power is being sent from the Main Processing board in the card cage to the ATC Board by measuring for +5 VDC on the 3 Pin ATC display harness. Power can be measured across pins 1 & 3 of P3.

ATTENTION

If error messages are flashing on the price displays, reset them with the handle switches.

2.3 Post Installation 2.3.2 Probe Connection Verification

With the dispenser ready to be tested:

i Make sure power is applied to the unit.

ii Ensure ATC is ON (DIP switch #8 is ON)

iii Initialize the system as per the Gilbarco pump requirements.

iv Set the ATC display to show volume for the side being tested.

v Run a delivery into a test can.

The ratio of the net volume on the dispenser and the gross volume on the ATC display should be the correct VCF (Volume Correction Factor) for the temperature displayed and the product selected.

vi Now unplug the temperature probe for the product being delivered.

The pump should stop, and the ATC display should indicate a temperature probe failure.

vii Repeat the test procedure for each hose.

2.3 Post Installation

2.3.3 Enabling ATC Function

When the meters are calibrated in a pump with ATC enabled, it will be necessary to use the gross volume reading from the mechanical counter or ATC display. The temperature compensated volume on the pump display **cannot** be used for this purpose.

Also, the plate with the AV number must be applied to the side of the dispenser.

ATTENTION

Before the dispenser can be used in trade, in the ATC mode, it must be inspected by Weights and Measures Canada.

The ATC function must be disabled with the appropriate DIP switch until the pump is inspected. (See Table 1)

Once the inspector approves the pump, the DIP switch can be set for ATC and the BC256B "VOLUME CORRECTED TO 15 ^{o}C" labels should be applied to the faceplates, adjacent to the volume displays.

Failure to do so could result in the station being closed down by Weights and Measures inspectors.

3.1 Components 3.1.1 List of Components

The following is an itemized account of components supplied to complete an ATC installation for the GTC 200-2B:

Table 2 List of Components
GILBARCO Modular Blender ATC Kit GTC 200-2B

QTY	PART #	DESCRIPTION
1	212AY07	MODULAR HIGHLINE/SALESMAKER ATC MAIN BOARD AND BRACKET ASSEMBLY
1	SKIL-439	BLENDER ADAPTER BOARD
1	BC1239	SEAL COVER
1	218AY00	DUAL INTRINSIC SAFETY BARRIER
1	212AY05	DUAL PROBE CONNECTOR ASSEMBLY
1	W172	5 PIN, 3 WIRE HARNESS FOR I.S. BARRIER
2	W199	TEMPERATURE PROBE
4	BC407	THERMOWELL
4	120B 02 X 02	EXTENSION FITTING
4	213P-2	PVC THERMOWELL CAP
1	W178	10 PIN RIBBON CABLE
1	W179	20 PIN RIBBON CABLE
1	W180	26 PIN RIBBON CABLE
1	SKIL-432	ATC DISPLAY BOARD
4	BC256B	BLACK “VOLUME CORRECTED TO 15^{o}C” LABEL
1	BC1058	SERIALIZED NAMEPLATE
6		18-22 AWG CRIMP SPLICES
1	W151	3 WIRE ATC DISPLAY WIRING HARNESS
4	BC546	120-B 1/8” NPT ADAPTER DRILLED OUT TO 17/64” I.D.
1	212KT07.INS	GTC 200-2B INSTALLATION MANUAL

3.1 Components

3.1.2 Connection Diagram

The following diagram shows connections for the GTC 200-2B. Refer to preceding parts listing for description of components.