1.1 Introduction

1.1.1 About This Manual

This manual introduces the functions and operations, as well as installation and maintenance 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.

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
- System Model and Serial Numbers
- Purchase Order Information
- 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 function:

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.

Intrinsic Safety (I.S.) Barrier

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

Thermistor Temperature Probes

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

Thermal Test Well

Provides a mechanical-thermal connection to accommodate a remote temperature probe, for calibration purposes, to give a true reading of product temperature.

2.1 System Set Up

2.1.1 Site Preparation

- 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.

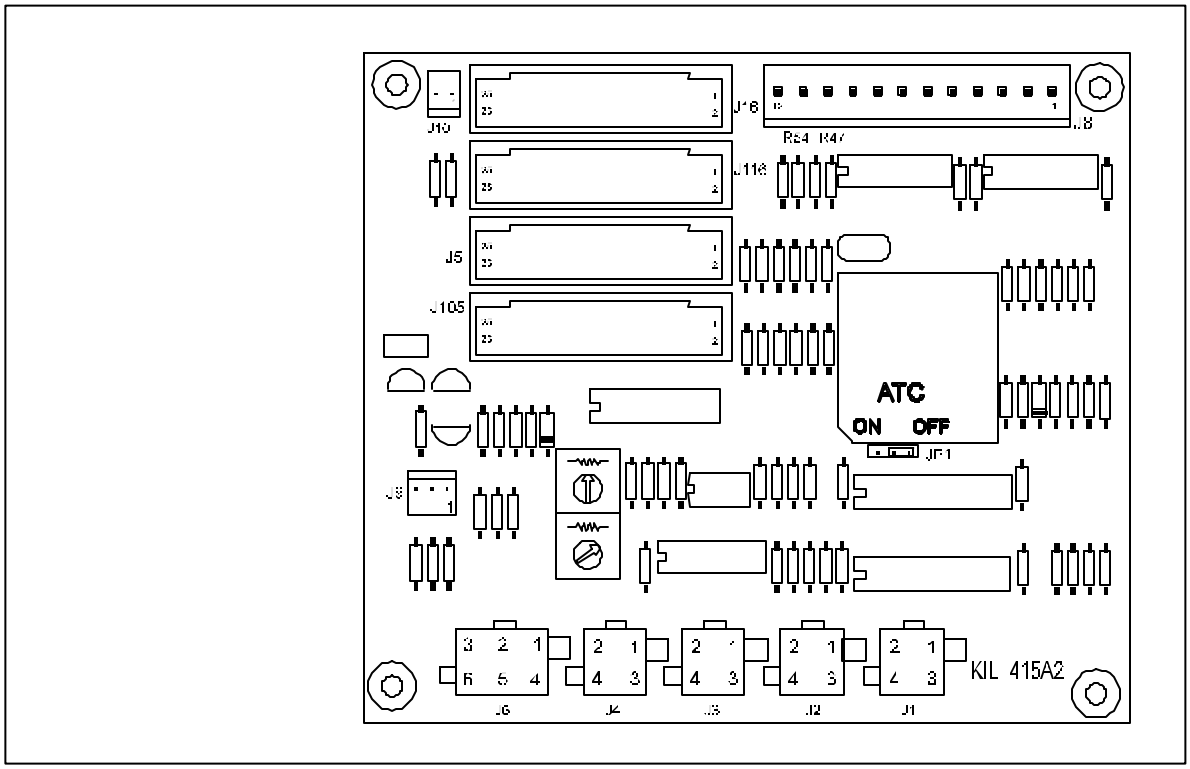
2.1.2 Installation Requirements

To complete the installation, the following points should be taken into consideration:

- Any electrical installation should be carried out by a registered electrician.
- Any fuel 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 System Set Up 2.1.3 Unit Configuration

The TBL100 has one jumper located in the right hand, center part of the board (as in shown in Figure 1). This is to enable/disable the ATC function for the dispenser.



2.1.4.1 Test Well and Temperature Probes

1. In the case of a Dispenser

CAUTION

Before components can be installed, power MUST be shut off to the dispenser.

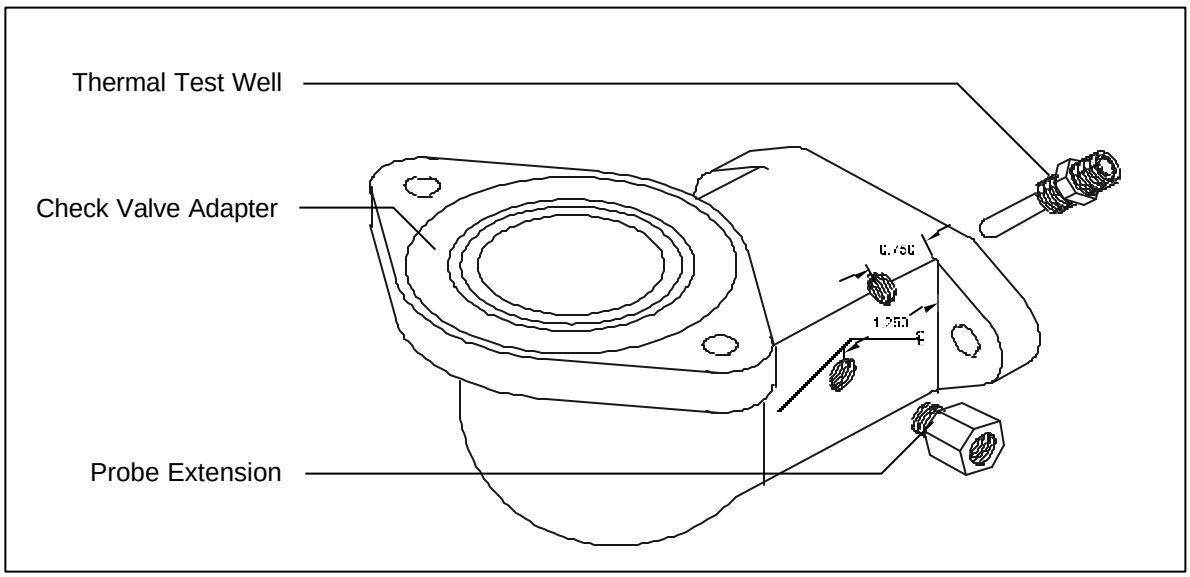
i Remove the lower panels.

ii Locate and remove the check valve adapter casting for each product (See Figure 2).

iii Drill and tap the casting for the test well and the probe extension fitting, as shown in Figure 2. (Drill the test well hole at a 45 degree angle as shown; drill size Q - .332" and tap size 1/8" NPT, male thread).

iv Install the probe into the extension fitting, and place cap on thermal test well.

Figure 2 Probe and Test Well Installation



ATTENTION

Any connections must be made using thread sealing compound suitable for use with gasoline.

2.1.4.2 Test Well and Temperature Probes (Cont'd)

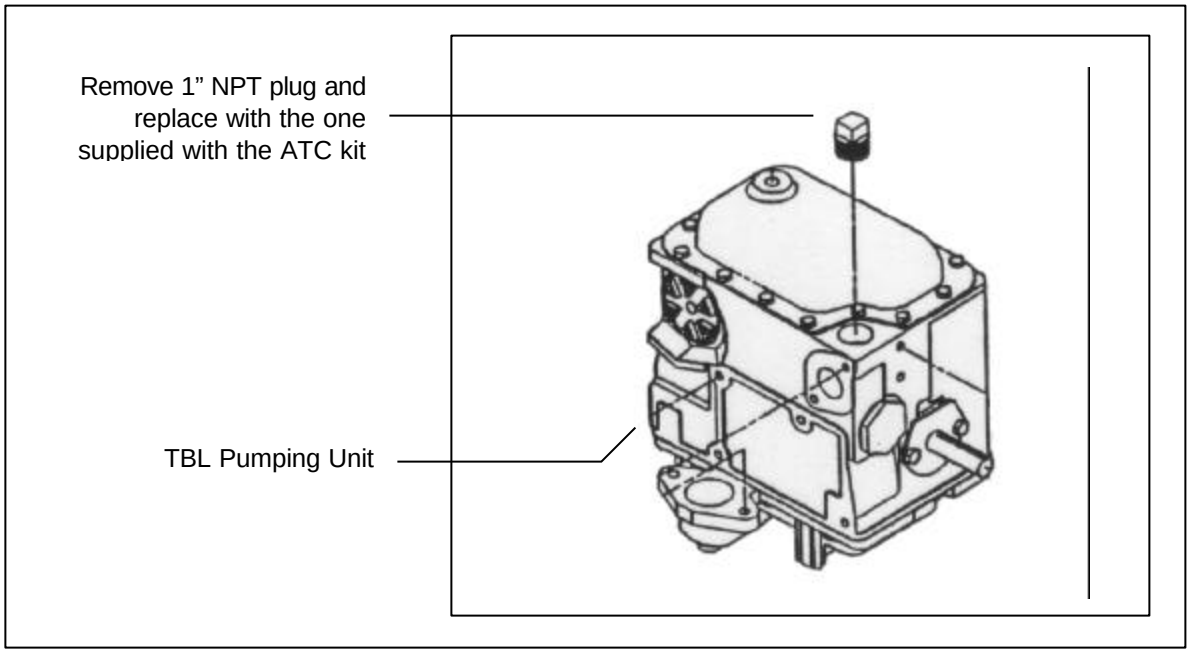
2. *In the case of a Suction Unit*

i Remove the lower panels.

ii Remove the 1" NPT plug from the pumping unit, next to the discharge outlet. (See Figure 3)

iii Replace with the plug supplied with the kit with the integral test well and 1/8" NPT threaded hole.

iv Install the probe into the plug.



ATTENTION

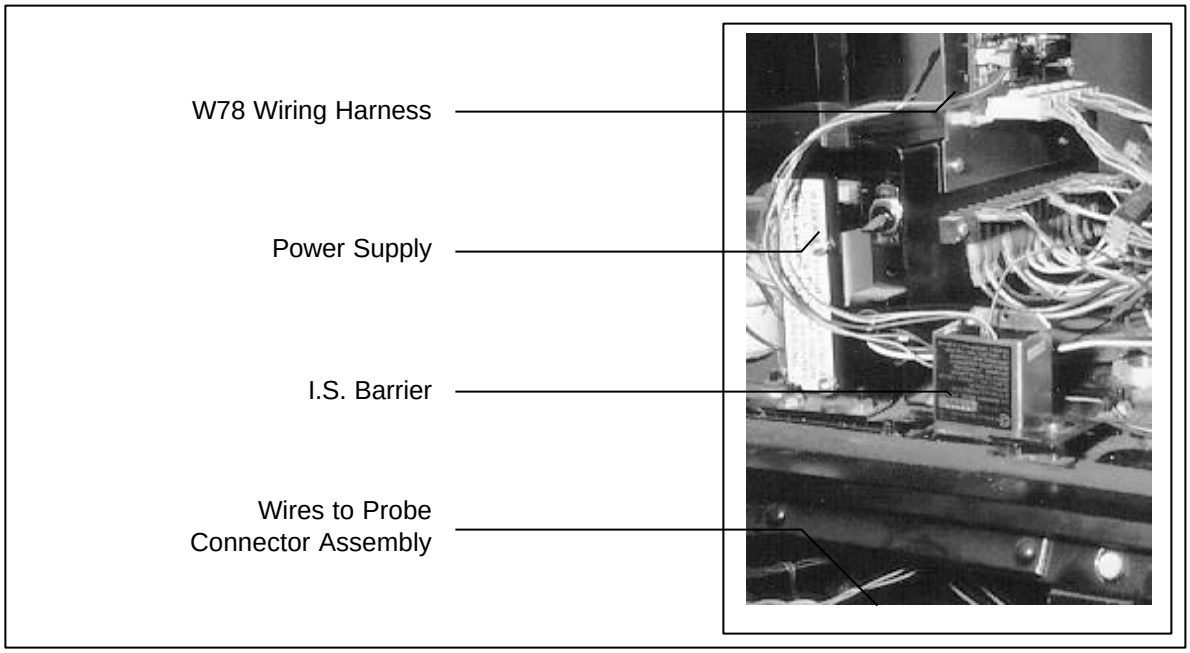
Any connections must be made using thread sealing compound suitable for use with gasoline.

i Open the front display panel.

ii Drill one 5/16" hole through the vapor barrier over pulser assembly A1 as shown in Figure 4.

ATTENTION

Place the hole with enough clearance so as not to obstruct any other devices.



ATTENTION

It is recommended that an angle air drill be used if there is concern that hazardous atmospheres may be present. Use grease on the tip of the bit to prevent sparking and increase bit life.

2.1.4.2 I.S. Barrier Installation (Cont'd)

iii Insert the barrier into the hole and tighten using the washer and hex nut provided.

iv Connect the green 20 AWG wire (intrinsic safety ground) coming out of the top of the barrier (epoxy side), to the grounding stud beside the card cage.

v Connect the yellow, green and red wires coming from the dual I.S. barrier (for products one and two) to the wires on the W78 harness, making sure colours are matched, **using crimp on wire nuts or butt connectors only.**

ATTENTION

Connections made using crimp on wire nuts or butt connectors is a Weights and Measures requirement to make the connection tamper resistant.

2.1 System Set Up

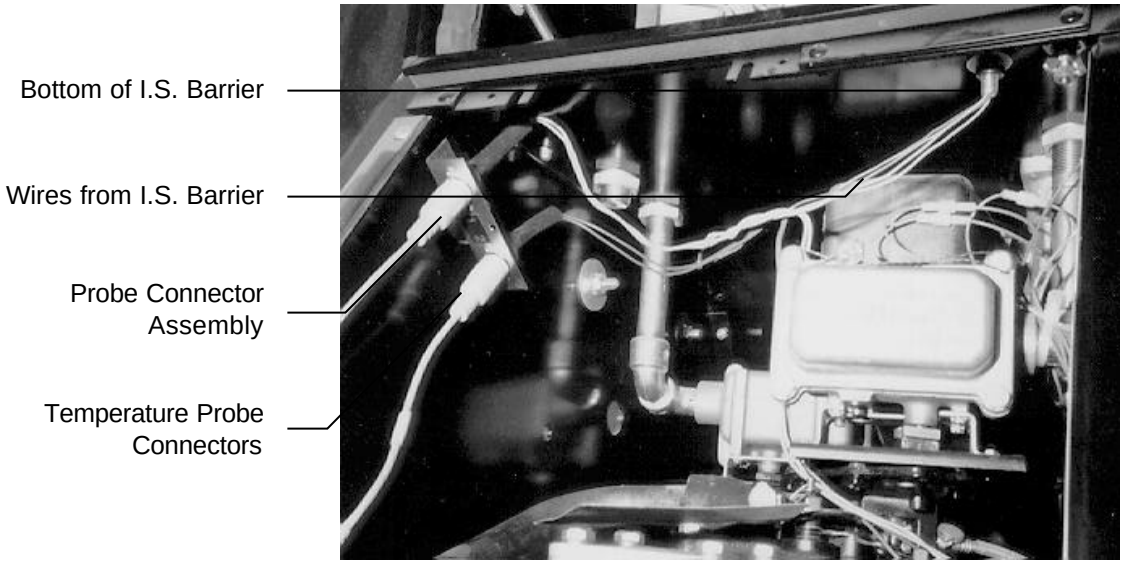
2.1.4.3 Probe Connector Assembly Installation

Refer to Figure 5

i Attach the probe connector assembly bracket to existing 5/16” bolt located on the left side panel of the dispenser, and tighten.

ii Using the crimp-on wire connectors (provided), attach the two yellow wires from the probe connector assembly to the two yellow wires from the I.S. barrier. Repeat for the two green coloured wires.

iii Connect the DIN plugs from two temperature probes to the jacks on the probe connector assembly.



2.1.4.4 Installation of the TBL100 ATC Board

Refer to Figures 6 and 7 on the following pages

i Remove the plugs from J11, J12, J21, J22 and J15 on the mother board and plug them into J1, J2, J3, J4 and J6 respectively on the TBL100 ATC board. It is recommended that these plugs are also labelled.

ii Remove the plugs from J5 and J16 on the mother board. Plug them into J105 and J116 respectively on the TBL100 board.

iii Connect the W129-12 wire harness from J8 on the TBL100 to J11, J12, J21, J22 and J15 on the motherboard, as shown in Figure 6.

iv Connect one of the W180-26 wire ribbon cables (supplied) between J5 on the TBL100 and J5 on the motherboard (cable ends will be polarized to match pin jacks) . Repeat for J16.

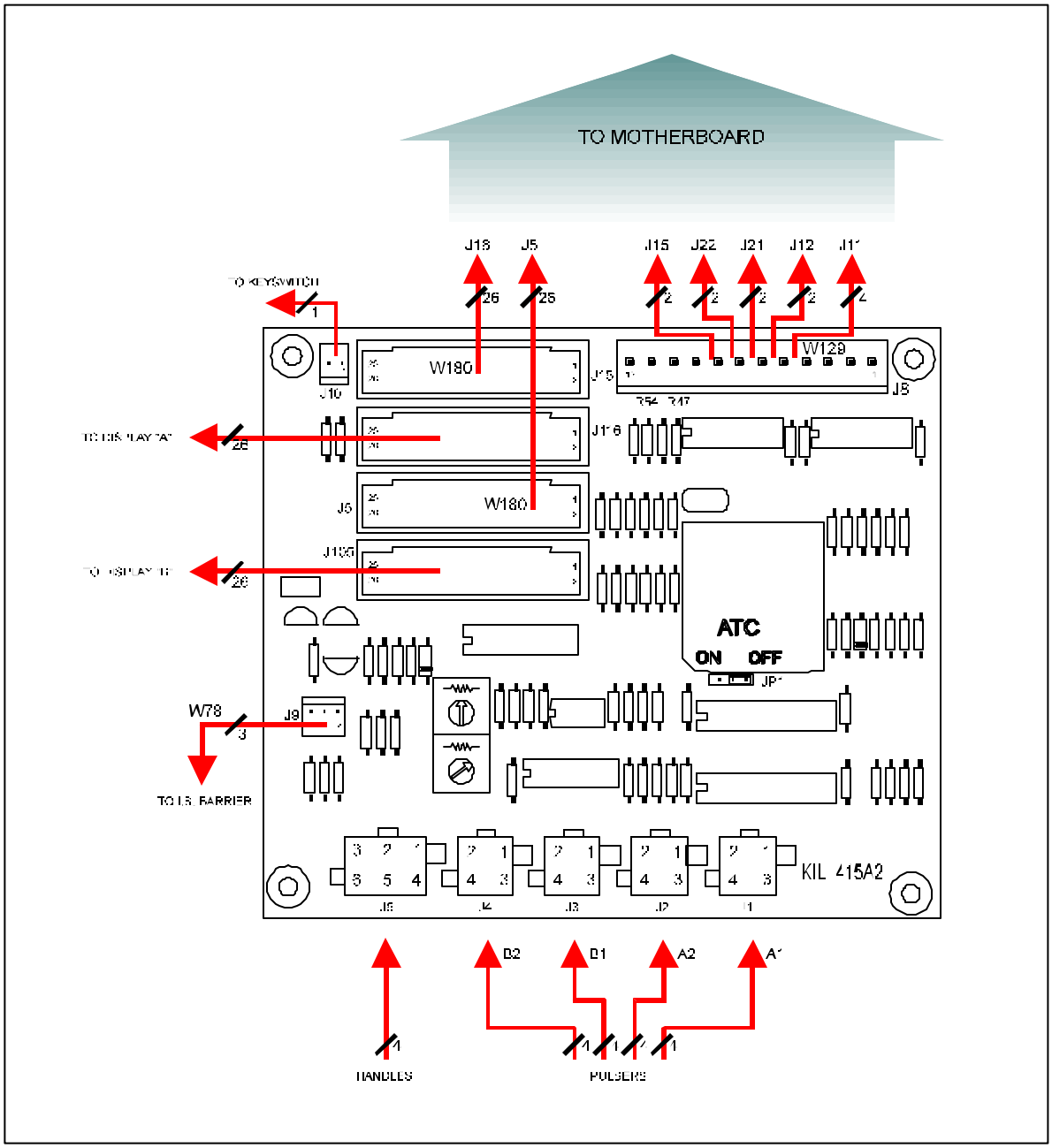
v Connect the 3 pin plug (W78) from the I.S. barriers to J9 on the TBL100 ATC board.

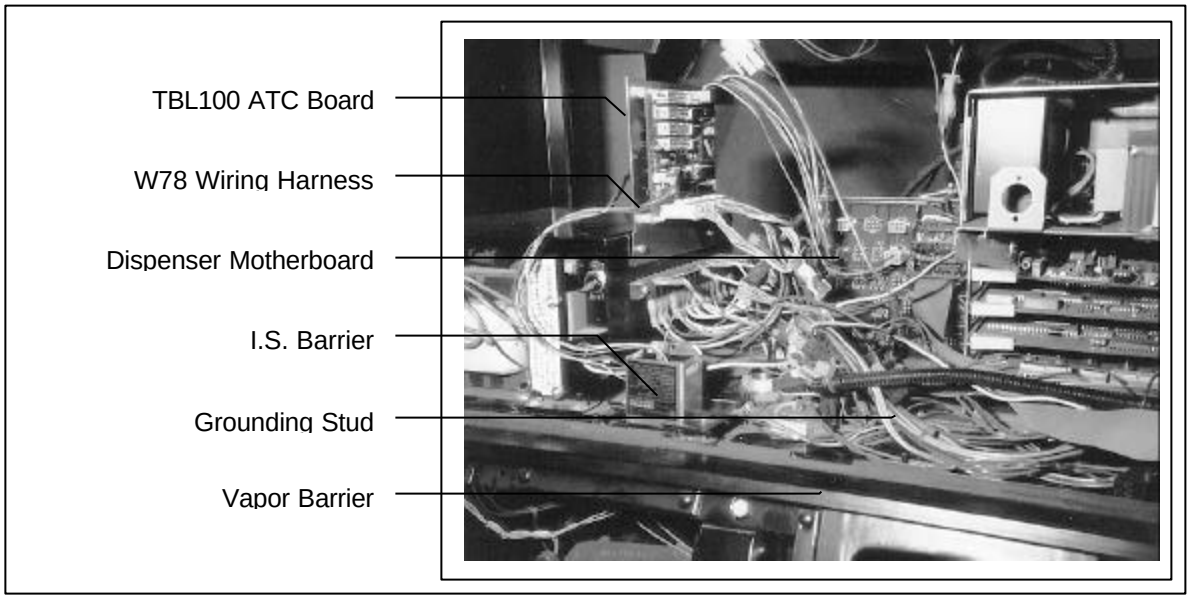
vi Replace the existing pump keyswitch with the new one provided.

vii Connect the 2 pin plug (one wire) from the new keyswitch to J10 on the ATC board. Connect the other plugs as per the original keyswitch.

viii Bolt the TBL100 unit to the side of the power suply using the 10-32 nuts, bolts and lockwashers provided, as shown in Figure 7.

The following diagram shows the wiring connections for the TBL100 ATC board:




TBL100 ATC Board
W78 Wiring Harness
Dispenser Motherboard
I.S. Barrier
Grounding Stud
Vapor Barrier

2.2 Calibration

2.2.1 Probe Connection Verification

With the dispenser ready to be tested:

i Apply power to the unit, and initialize the system as per the Tokheim instructions.

ii To display the temperature, uncorrected volume, flowrate, and compensation type (gas or diesel), turn the keyswitch to the ATC display position.

iii Run a delivery into a test can.

- *The ratio of the net volume on the normal dispenser display to the gross volume on the ATC display should be the correct VCF for the temperature displayed and the product selected.*

iv Unplug the probe for the product being tested.

*The pump should stop, and the ATC display should read "***Probe1***" or "***Probe2***" in the ppu readout to indicate temperature probe failure.*

v Repeat the test procedure for each hose. Always ensure that the correct probe is being used to compensate each product.

*If you are testing with product one and unplug probe one, the pump should stop and the ATC display will indicate "***Probe1***". If the pump, for example, does not stop when probe one is unplugged but does when probe two is unplugged, then the probes are mixed up.*

2.2 Calibration

2.2.2 Calibration Procedure

The ATC function must be disabled by placing the ATC jumper plug in the appropriate position until the pump is inspected. (See Figure 1)

ATTENTION

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

Once the inspector approves the pump, the BC1181 seal plate may be installed over the TBL100 so that the inspector can seal the unit.

The BC256B "VOLUME CORRECTED TO 15° C" labels must also be applied to the faceplates adjacent to the volume displays, and the nameplate with the AV number must be applied to the side of the dispenser. **Failure to do so could result in the station being closed down by Weights and Measures inspectors.**

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

3.1 Components

3.1.1 List of Components - TBL100 Series ATC

The following is an itemized account of components supplied to complete the TBL100 ATC installation:

Table 1 List of Components
TBL100 Series - ATC

QTY	PART #	DESCRIPTION
1	202AY00	TBL100 ATC BOARD AND BRACKET ASSEMBLY
1	W129	ATC HARNESS
1	W78	TEMPERATURE PROBE HARNESS
2	W180	26 PIN RIBBON CABLE
1	218AY00	DUAL INTRINSIC SAFETY BARRIER
1	212AY05	DUAL PROBE CONNECTOR ASSEMBLY
2	W199	PROBE ASSEMBLY
2	BC407	THERMOWELL
2	BC546	120-B 1/8” NPT ADAPTER DRILLED TO 17/64” I.D.
2	213P-2	PVC THERMOWELL CAP
2	BC256B	BLACK “VOLUME CORRECTED TO 15^{o}C” LABEL
10		18-22 AWG CRIMP SPLICES
1	W168	KEYSWITCH ASSEMBLY
1	BC1181	SERIALIZED AV-2294 NAMEPLATE
1		5/16” HEX NUT
1		5/16” FLAT WASHER
2		10-32 X 1/4” ROUND HEAD MACHINE SCREWS
2		10-32 HEX NUTS
2		#10 LOCKWASHERS
1	202AY00 R00	TBL100 INSTALLATION MANUAL