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Operator Programming Guide

Model TMS - 800F Interconnect Box

Installation Manual

Read This Book

This book has important information for safe installation and operation of this equipment. Read and understand this book before applying power. Keep this book and tell all service personnel to read this book. **If you do not follow the instructions, you can cause damage to the equipment, injury, or death.**

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INSTALLATION INSTRUCTIONS

Model TMS-800F
Prepay-Postpay System
Operator and Installation Manual

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Installation of all TMS fuel control systems must comply with the requirements of the National Electrical Code (NFPA no.70), the Flammable and Combustible Liquid Code (NFPA no.30), and all federal, state, local, and applicable safety codes.

WIRING SPECIFICATIONS

WARNING:

Installation must comply with the National Electrical Code, with Federal, State, and local codes, and with all other applicable safety codes.

WARNING:

High voltages are present in this equipment. Disconnect all power before installing to prevent personal injury or equipment damage.

WARNING:

Do not install control console or relay control box in a volatile, combustible or explosive atmosphere. The console and relay control box must be protected from severe vibration, extreme temperatures and excessive humidity. The control console should be placed in a position from which the operator has a clear view of the entire fueling area.

NOTE:

Use the following table to determine if the dispensing device field wiring junction box is of sufficient internal volume.

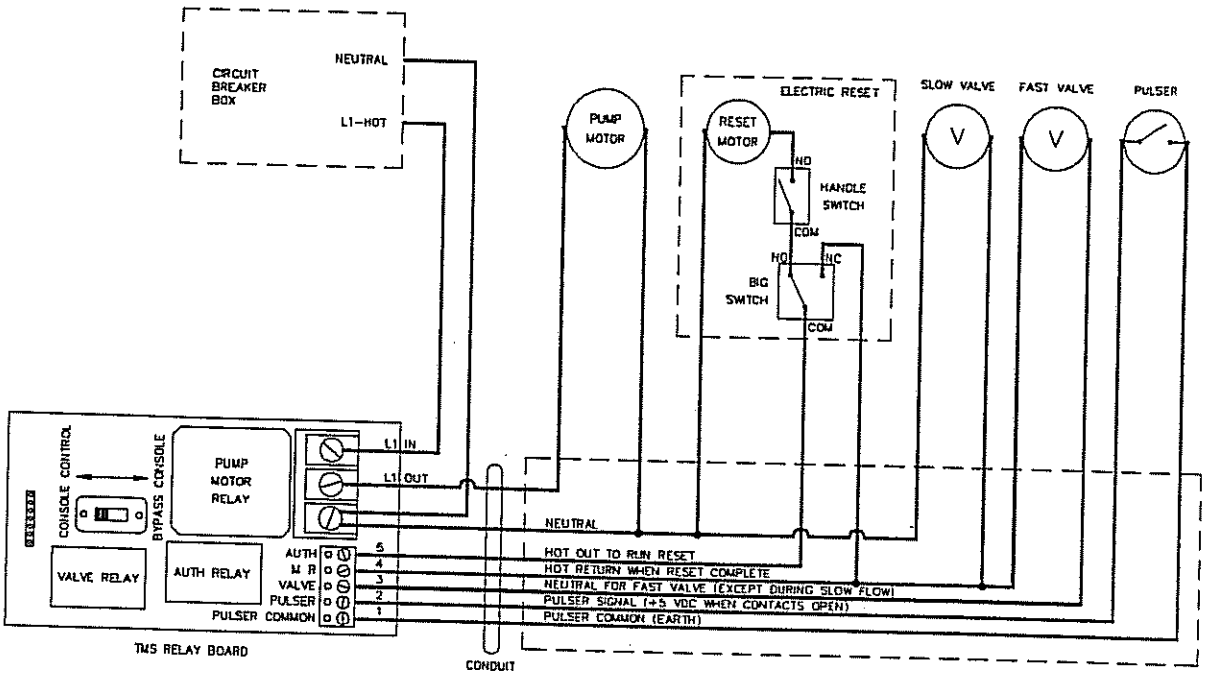
Size of Conductor AWG (mm^2)		Free Space Within Box For Each Conductor, Cubic Inches (cm^3)	
		Box With Hubs	Box Without Hubs
16 or smaller	(1.3 or less)	1.3 (21.3)	1.5 (24.6)
14	(2.1)	1.8 (29.5)	2.0 (32.8)
12	(3.3)	2.0 (32.8)	2.25 (36.9)
10	(5.3)	2.2 (36.1)	2.4 (41.0)
8	(8.3)	2.7 (44.2)	3.0 (49.2)

A conductor passing through the box is counted as one conductor, and each conductor terminating in a box is also counted as one conductor.

FIELD CONNECTION, MAXIMUM RATING

Valve	125 VAC, 3 Amp Max.
Authorize	125 VAC, 5 Amp Max.
L1 Out	240 VAC, 20 Amp Max.
L1 In	240 VAC, 20 Amp Max.
Motor Return	125 VAC, 3 Amp Max.
Pulser	20 VDC, 50 mA Max.

TYPICAL TMS/PUMP WIRING DIAGRAM



FUNCTION DEFINITION OF THE 5-PIN WIRING CONNECTOR ON THE TMS-23 RELAY BOARD

1. **PULSER COMMON** - This terminal is connected directly to earth in the tms power supply.
2. **PULSER SIGNAL** - This terminal is connected to a resistor network in the console. When the pulser contacts are open the voltage will be +6 VDC referenced to earth. Pulser wires must not be connected to any other wires, terminals, or switches.
3. **VALVE** - This terminal is connected to Neutral through the fast flow relay.
4. **MR** (in use) - This terminal is the VAC "Hot" return after the reset cycles.
5. **AUTH** - This terminal is the Authorize; it provides 115 VAC "Hot" to the reset motor. This terminal also detects the call signal when the handle at the pump is switched "on".

WARNING !! CAUTION !!

- If the **MR** or **AUTH** wire is connected to Neutral or earth ground, the relay board will be damaged (these are 115 VAC "Hot" wires).
- If the **Pulser Common** or **Valve** wire is connected to a VAC "Hot" wire, the relay board will be damaged.
- If the **Pulser Signal** wire is connected to a VAC "Hot" wire, the console will be damaged.
- Mis-wiring the power supply input or output wires will result in resistor burn-out on the power supply (see page 14).
- The valves must be connected to MR for 115 VAC "Hot". Do not connect valves to L1 out.
- Do not attempt to operate preset or prepay sales unless the pump is properly equipped with fast and slow flow valves as shown.
- If the console display window shows PPPPPP.PP when the key is turned on it means no power is being supplied to the console; do not leave the key on because it will discharge the battery.

INSTALLATION GUIDE FOR TMS-800F

1. Select the proper wiring diagram from the enclosed drawings.
2. Disconnect the cable from the console for wiring and pump tests.
3. Mount the relay interconnect box near the wire trough or conduit from the pumps.
4. For each hose:
   a. Connect the pump control wires to the interconnect relay board.
   b. Recheck the wiring for proper hook-up, opens, shorts, etc.
   c. With the circuit breaker off, connect power to the relay board from the circuit breaker.
   d. Place the console/bypass slide switch on the relay board in the bypass position.
   e. Turn on the circuit breaker. Confirm that the hose will reset and dispense product.
   f. Place the console/bypass slide switch in the console position; confirm that the hose will not reset or dispense.
5. Connect the console cable to the console.
6. Connect power from a DEDICATED BREAKER to the console power supply in the relay box.
7. Turn the console key on; console should display "00" in the Mode and Amount windows.
8. Enter the product prices and test each hose for proper operation (see the OPERATOR'S GUIDE).

After all installation and testing is complete, perform a "ram clear" on the console; this clears the memory of all programming and accumulating totals, and gets rid of any "glitches" that may have been picked up (if the console is equipped with a manager's key, it must be "on" for this procedure).

a. Turn the power key "off".

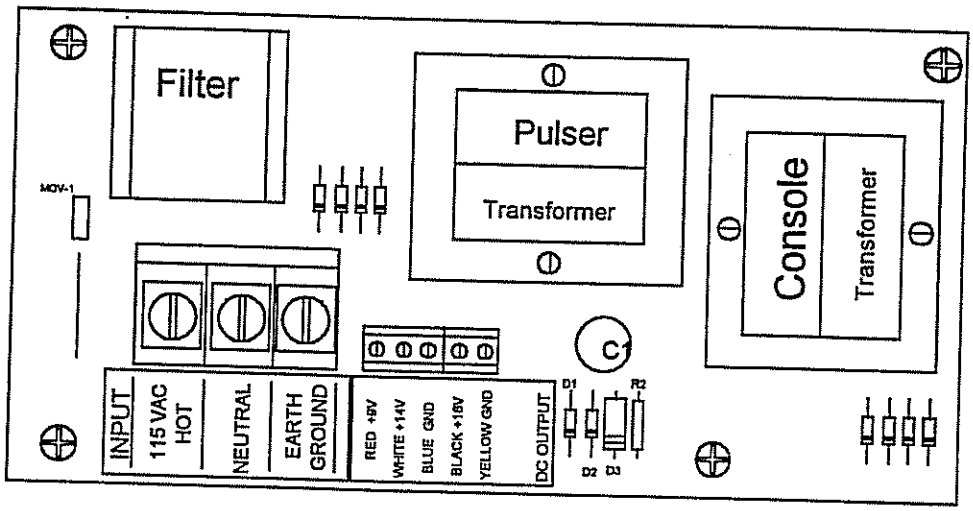
b. Press and hold "0" on the keypad while turning the power key "on".

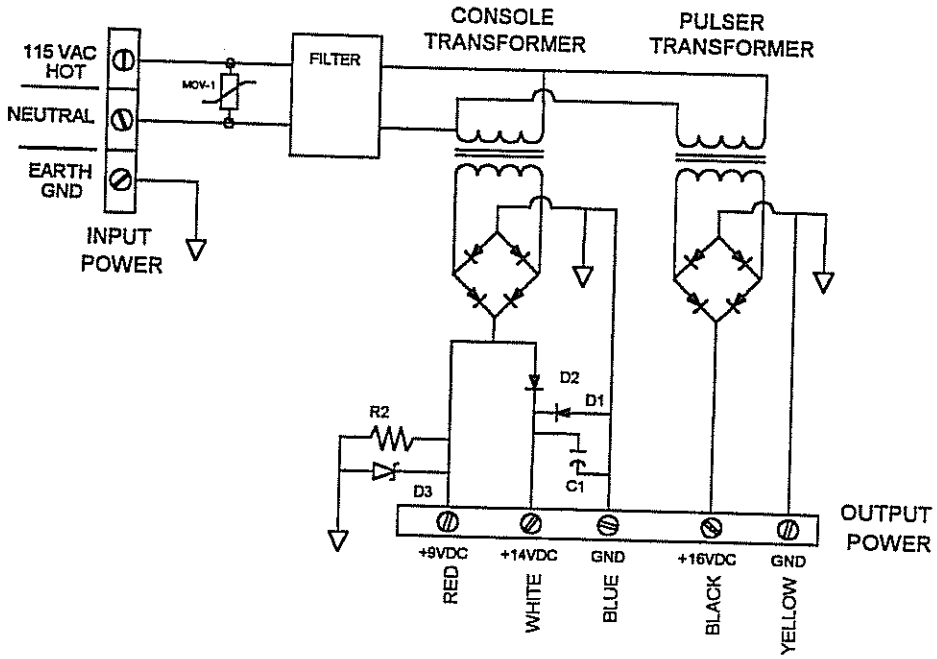
c. Continue holding "0" until "00" appears in the Mode and Amount windows. This takes about 12 seconds for an 800F Standard console, and about 3 seconds for a Plus or an MPC console.

d. Program the console according to instructions in the OPERATOR'S GUIDE.

800F POWER SUPPLY

The 800F Power Supply is mounted in the relay box next to the door hinge. The black 3-terminal input strip should be connected to the main power distribution box with a dedicated breaker and 3 dedicated wires for VAC "hot", neutral, and earth ground. Output voltages are unfiltered and may vary 20% without affecting equipment.





PULSERS

TMS systems that control mechanical pumps and dispensers are designed to operate with **contact closure type pulsers**; 5 VDC is supplied to the pulsing circuits by the TMS system. For retail applications, these systems must be used with pulsers that transmit **1 pulse per penny** of product dispensed.

> **TMS equipment will not work with Gilbarco pulsers on mechanical dispensers. Gilbarco mechanical dispensers must be equipped with pulsers as described below to work properly with TMS controllers.**

There are a number of acceptable pulsers on the market. **Veeder-Root Series 1871** and **Series 7697 Pulse Transmitters** are widely used with TMS systems, as are **Western Electronics Model 400-B and Model 500 pulsers**.

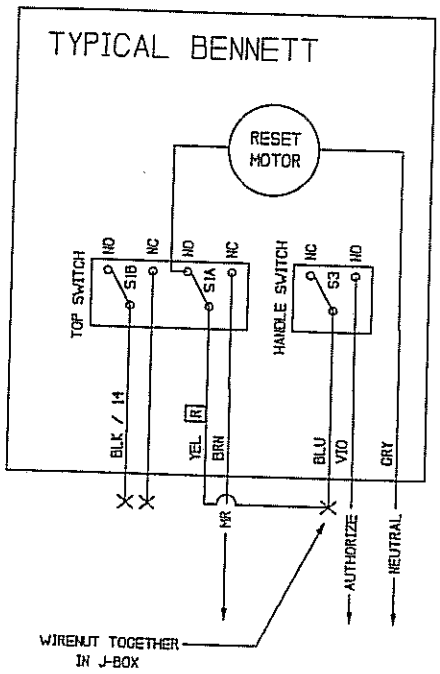
Regardless of the pulser used, the two most important points are:

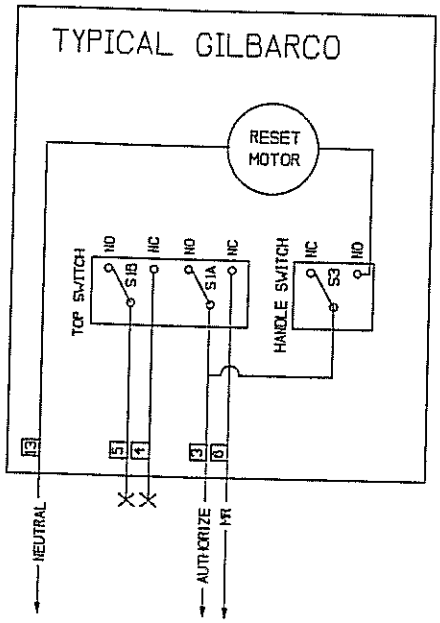
- it must transmit **1 pulse per penny** of product dispensed;
- there must be **no voltage across the output leads** other than the 5 VDC supplied by the TMS system.

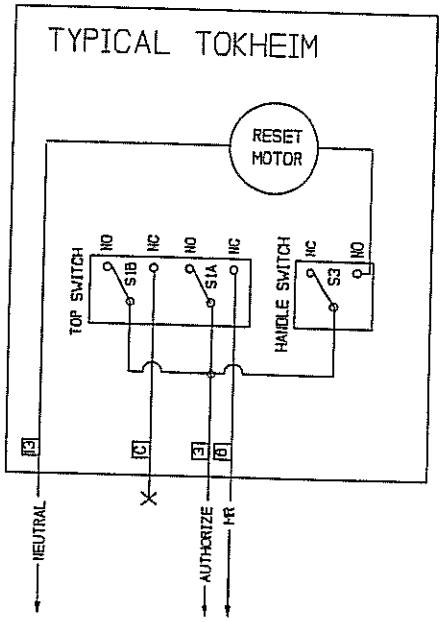
The 800F Standard console has been tested without error at a pulse rate of 3600 pulses per minute. The 800F Plus and MPC consoles have been tested without error at 8500 pulses per minute.

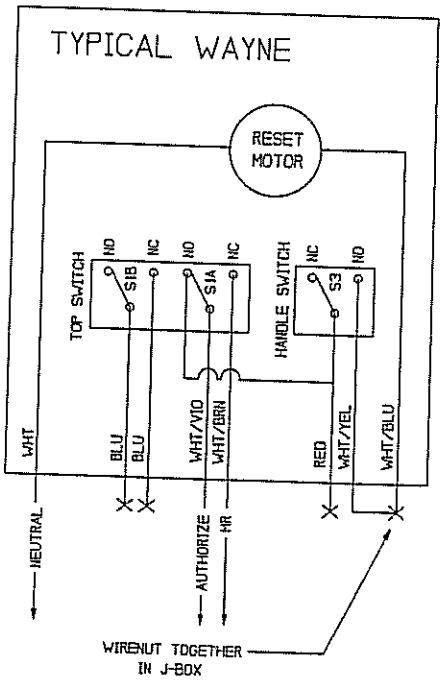
TYPICAL ELECTRIC RESET WIRING DIAGRAMS

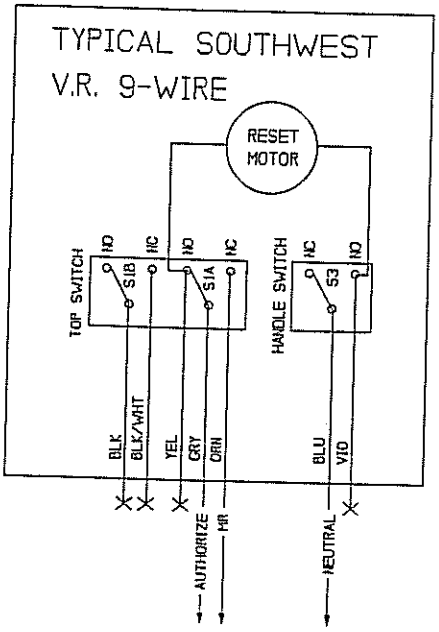
These diagrams are intended only as a guide in installation. Older, newer, or rebuilt resets may have different wire markings or color codes. Wire color and numbers may vary for different models.

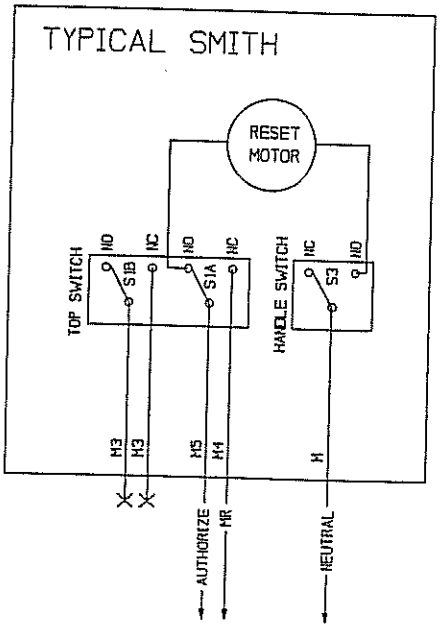








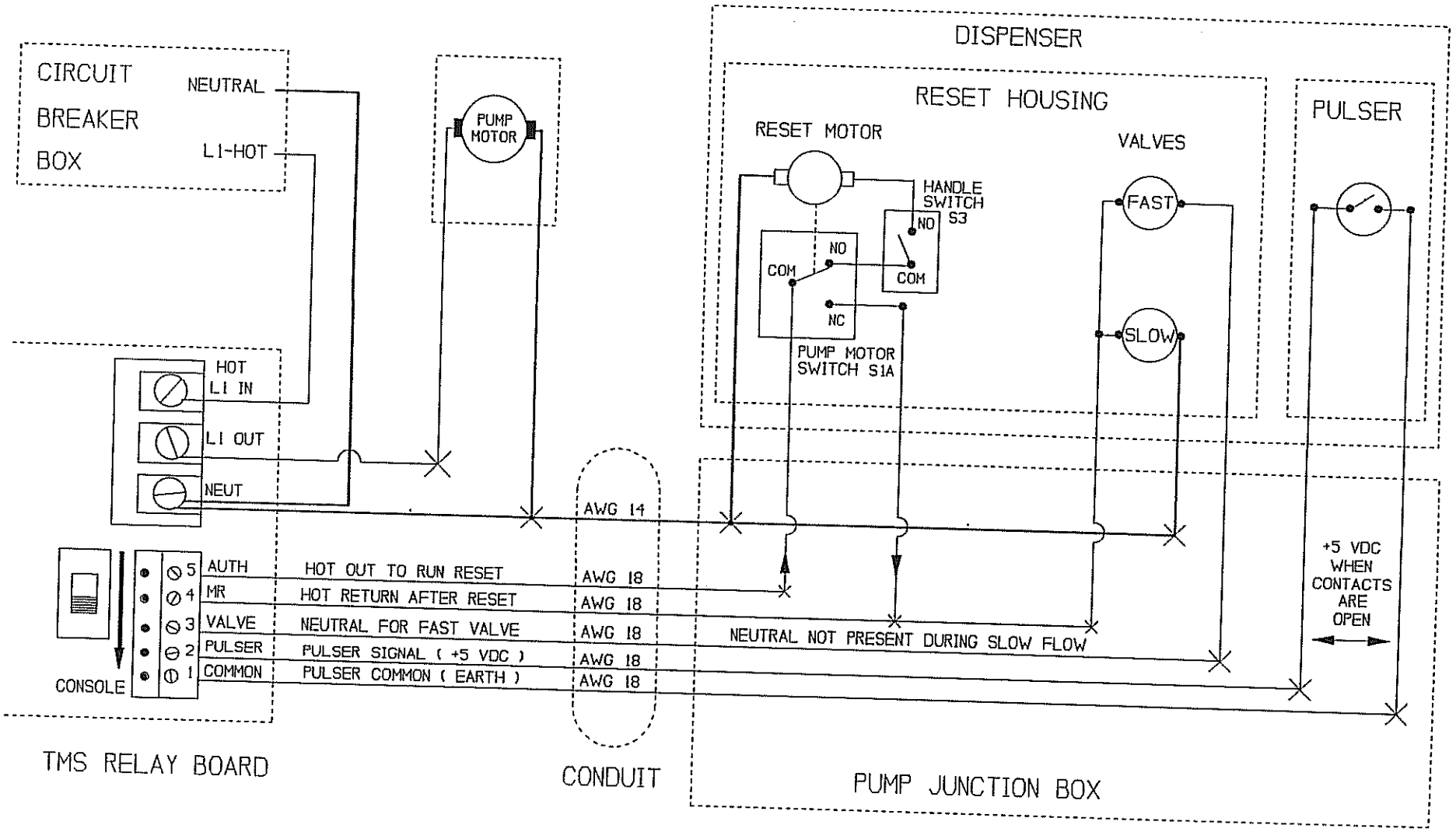




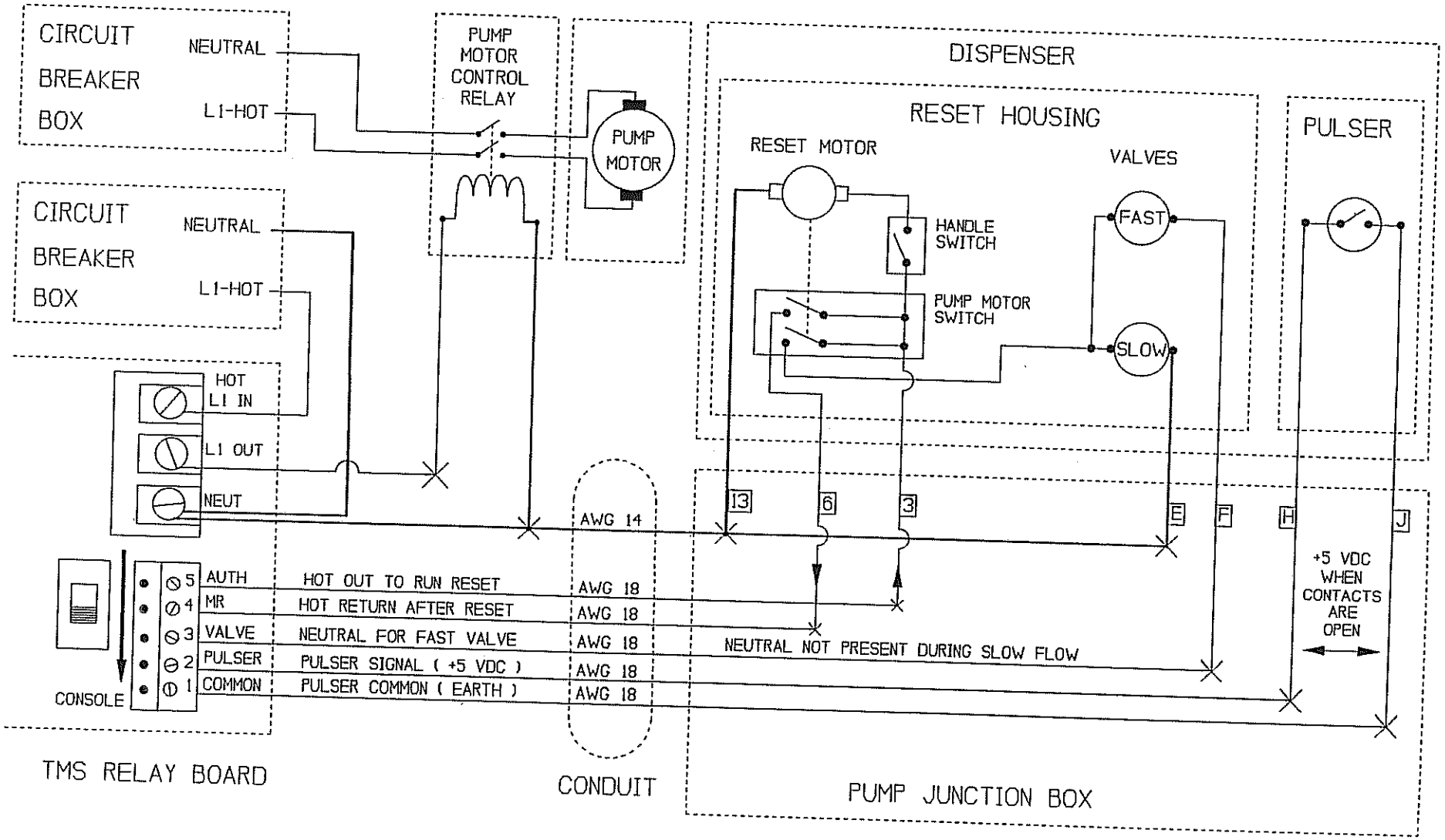
AUTHORIZE - provides the 115 VAC HOT to the reset motor; it is also used to detect the call signal.

MR - this wire is the 115 VAC HOT return after the reset cycles.

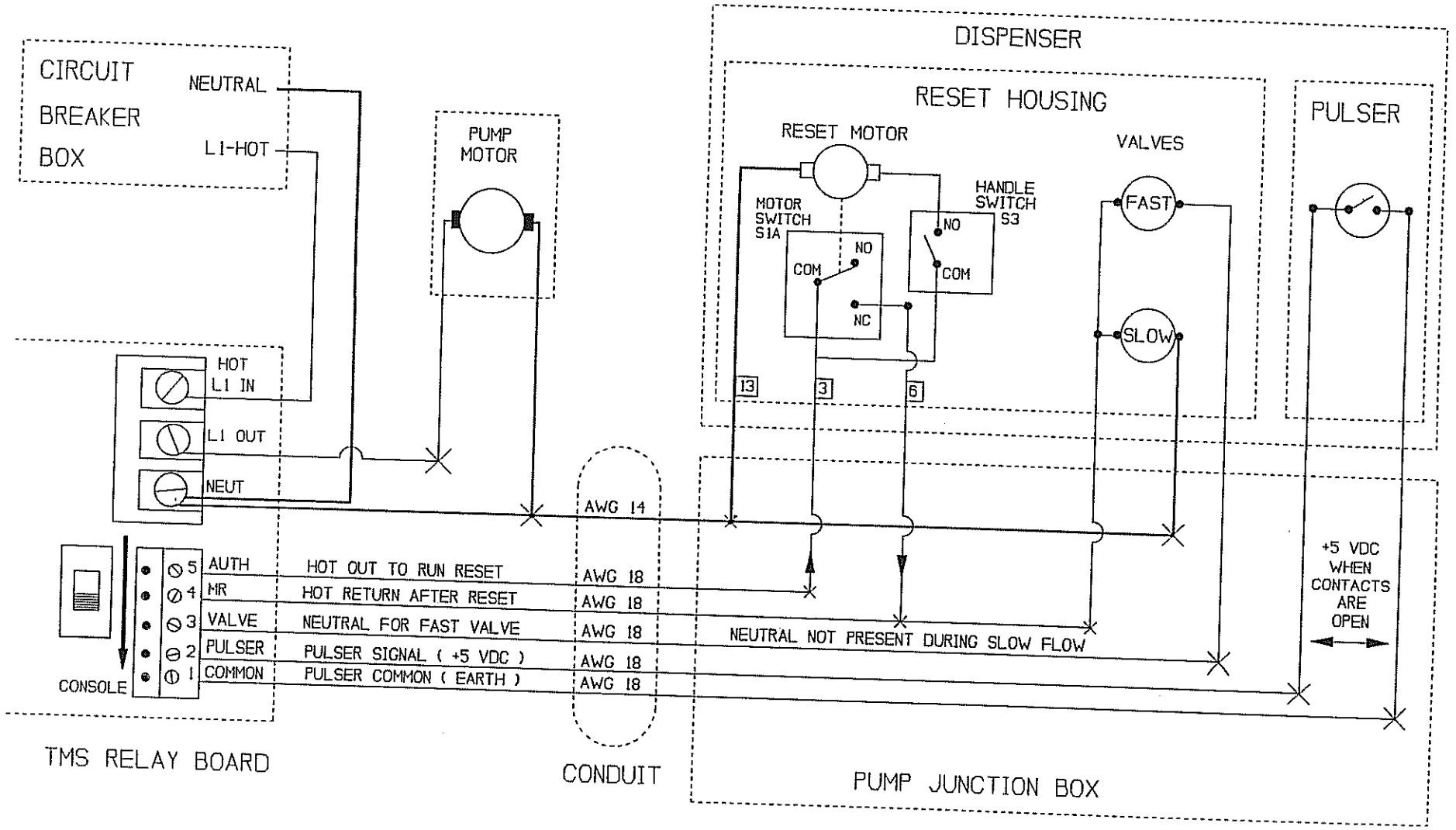
WIRING DIAGRAM FOR TYPICAL VEEDER-ROOT RESET



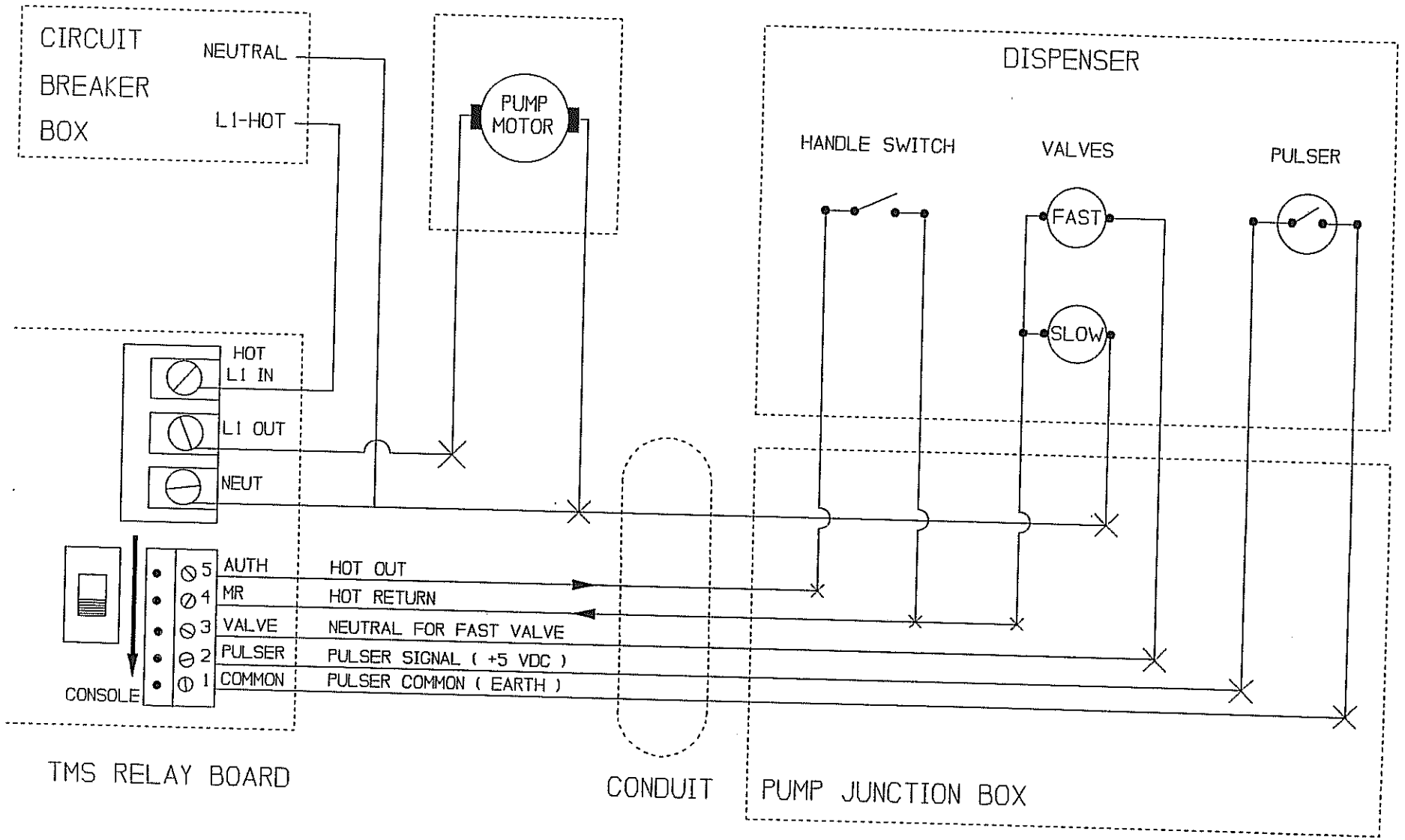
WIRING DIAGRAM FOR TYPICAL TOKHEIM RESET



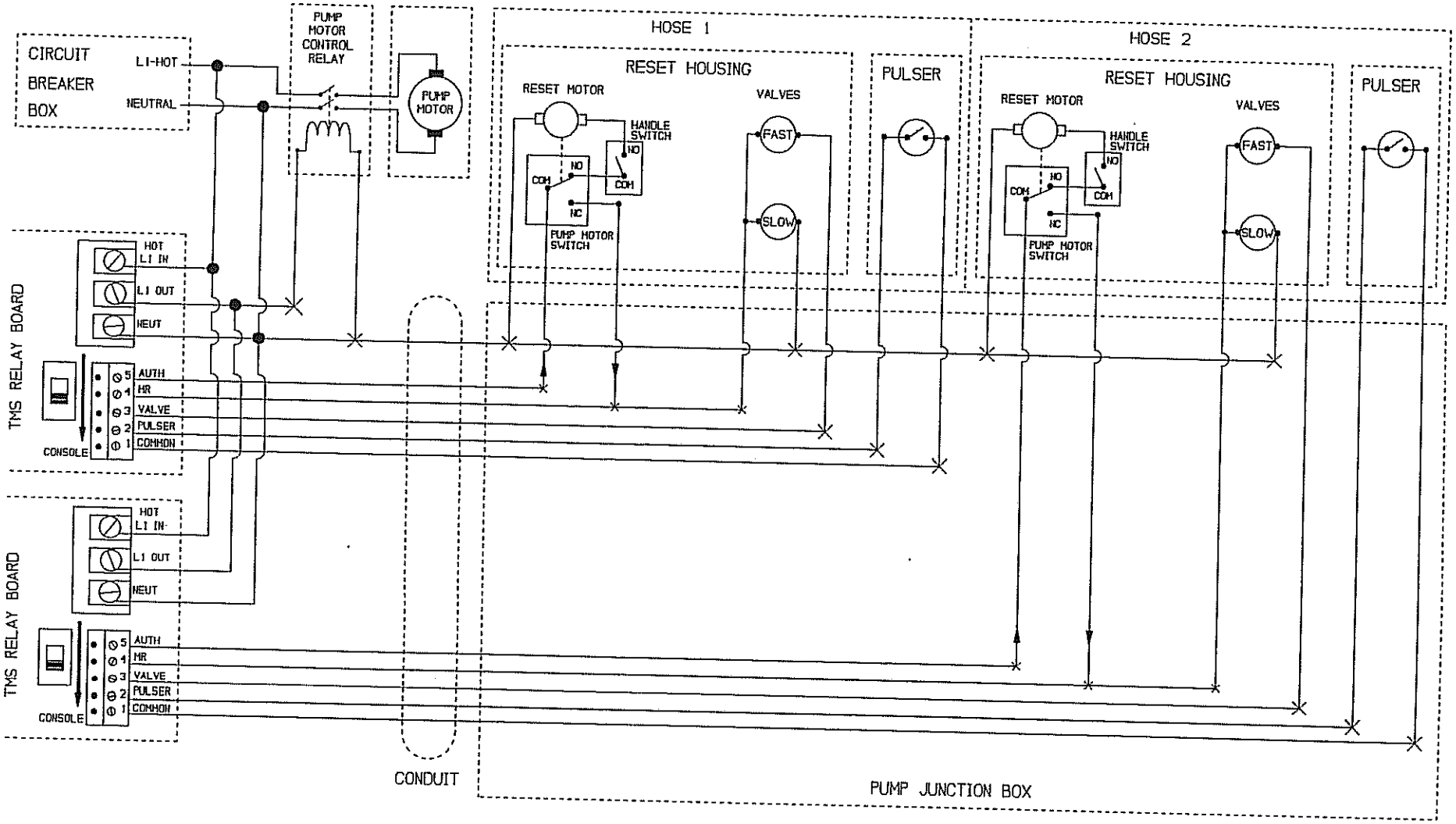
WIRING DIAGRAM FOR TYPICAL GILBARCO RESET



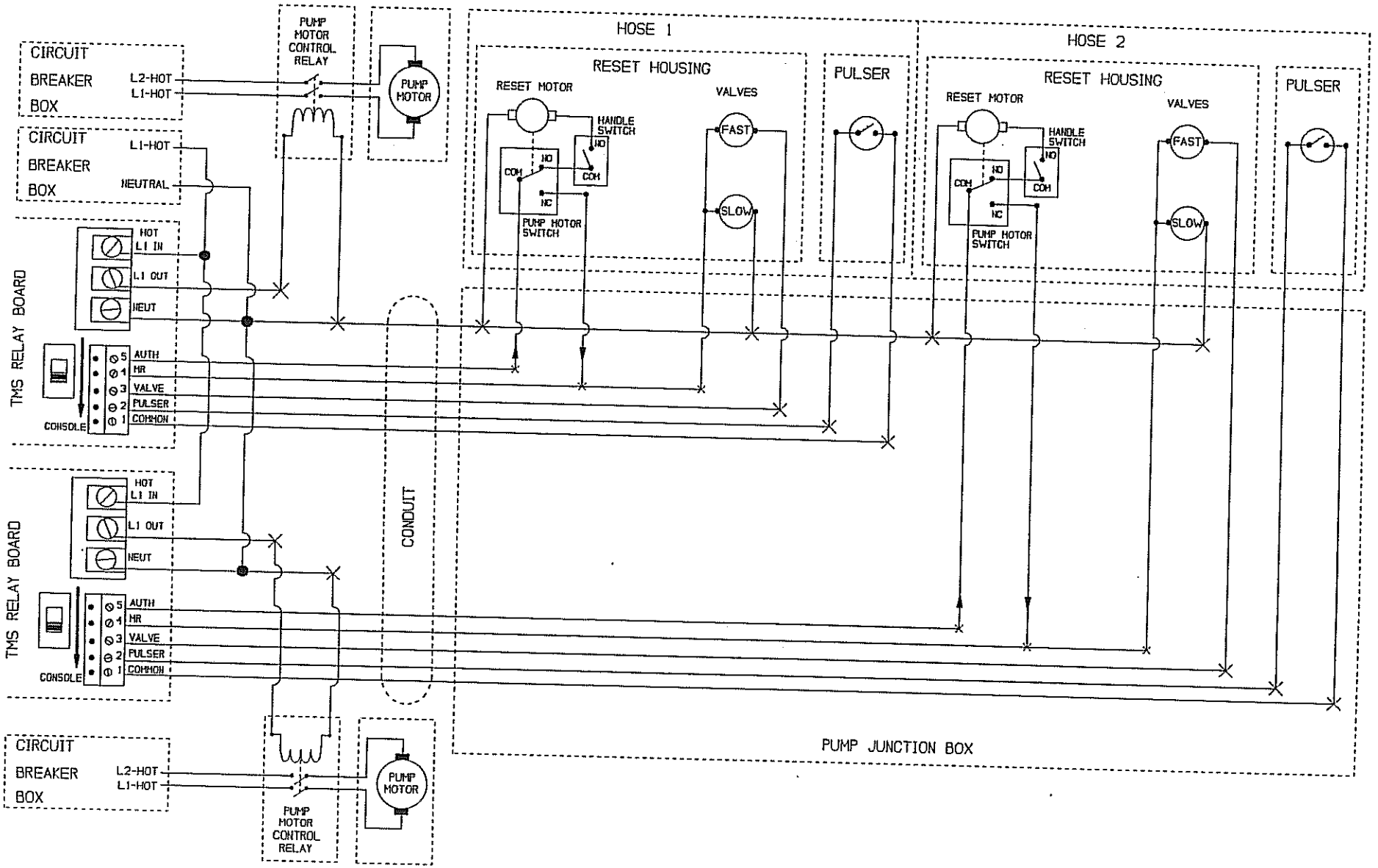
WIRING DIAGRAM FOR TYPICAL MANUAL RESET



WIRING DIAGRAM FOR TYPICAL V-R RESET DUAL HOSE, ONE PRODUCT

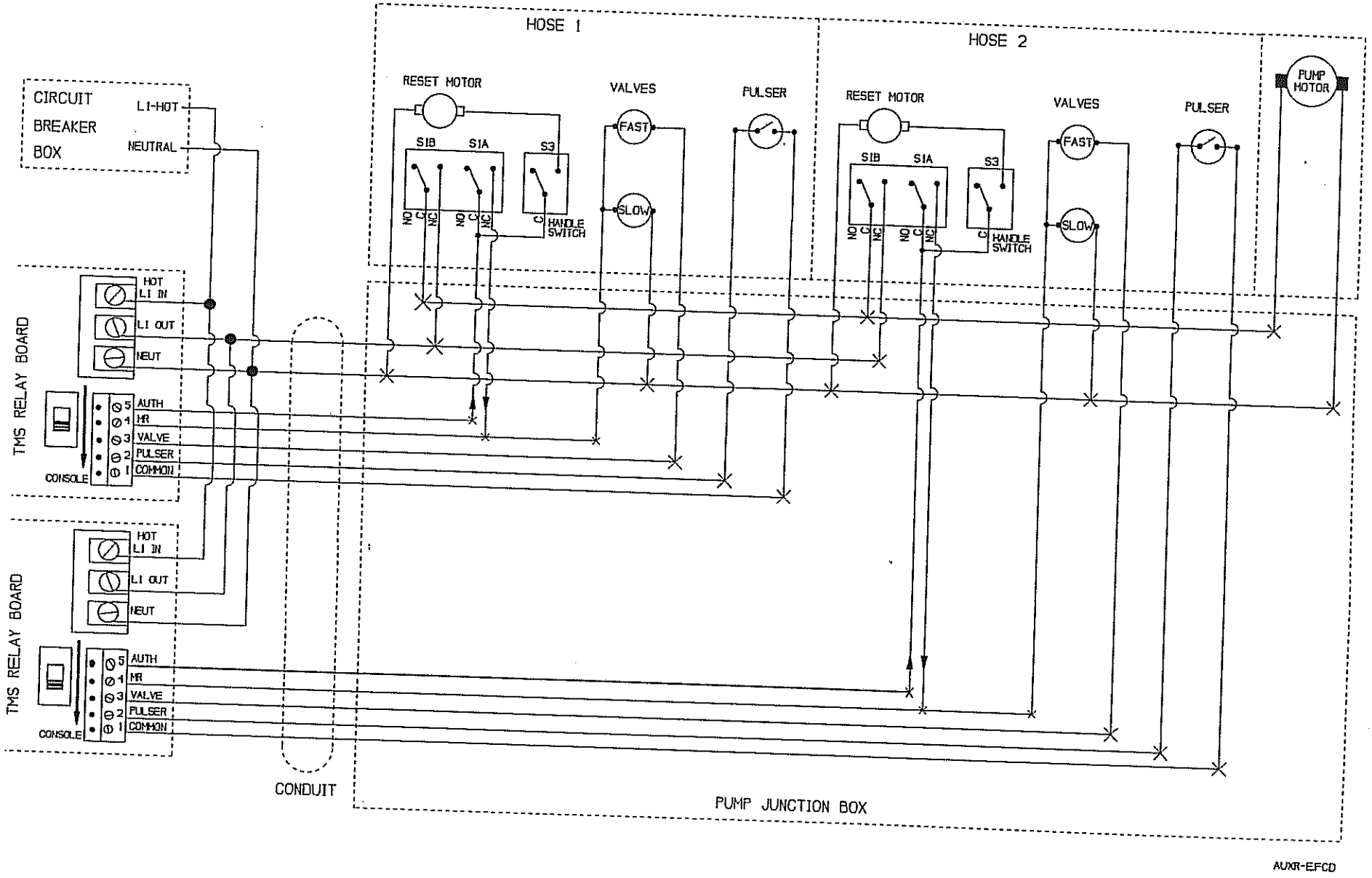


WIRING DIAGRAM FOR TYPICAL V-R RESET TWO HOSE, TWO PRODUCT



SPECIAL WIRING FOR DUAL HOSE, SINGLE PRODUCT SUCTION PUMP

Some dual hose, single product suction pumps made by Gilbarco and other manufacturers have oversized (3/4 hp) pumping motors. The high starting current on these motors, especially when the supply voltage is low, may cause the TMS relay contacts to stick. Wiring as shown below will prevent the motor from running continuously. The only difference between this and other TMS wiring diagrams is that the "L1 OUT" wire goes through a switch in the electric reset on its way to the pumping motor.



TMS-800F SERVICE PRACTICE

TMS-800F systems are designed to be serviced by unit exchange.

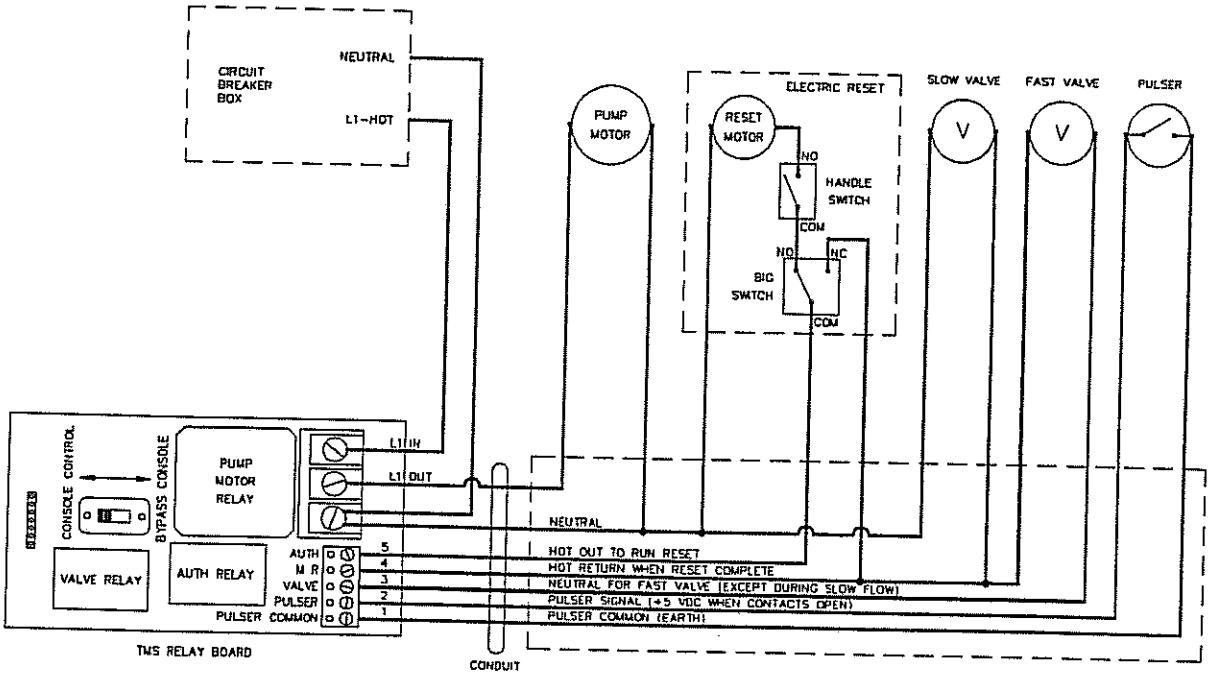
The exchange units are: **console, relay board, and power supply board.**

All service and installation vehicles are expected to carry exchange units.

During the warranty period these units may be returned to Triangle MicroSystems, Inc., freight prepaid. They will be repaired and returned freight prepaid at no charge.

THE TMS WARRANTY DOES NOT COVER TRAVEL AND LABOR CHARGES.

TYPICAL TMS/PUMP WIRING DIAGRAM



SERVICE AND OPERATING CONSIDERATIONS

STATIC ELECTRICITY

Occasionally cashiers will stand on throw rugs or carpets which can cause static shocks when they touch the TMS-800F console. This is caused by rubber sole shoes on carpets (not the console). It can be corrected by spraying the carpet with anti-static spray (available at most carpet stores) or by removing the carpet.

BALLPOINT PEN ON KEYBOARD

The keyboard should not be punched with a ballpoint pen or pencil. This can cause a permanent dent in the overlay and eventually cause the "AUTH" key to stay on. This requires an overlay replacement.

A CHARGE WILL APPLY TO REPLACE DAMAGED OVERLAYS.

CONSOLE CABLE CONNECTOR

The cable connector can be broken if the cable is pulled out of the console at one end and then twisted out.

This connector should be pulled out straight (both ends equally).

A CHARGE WILL APPLY TO REPAIR CABLES WITH BROKEN CONNECTORS!

RELAY BOARD CONNECTOR

When disconnecting the cable connector from the relay board in the relay box, please pull on the connector (**not** the wires). **Pulling the wires can cause failure.**

WESTERN ELECTRONIC PULSER

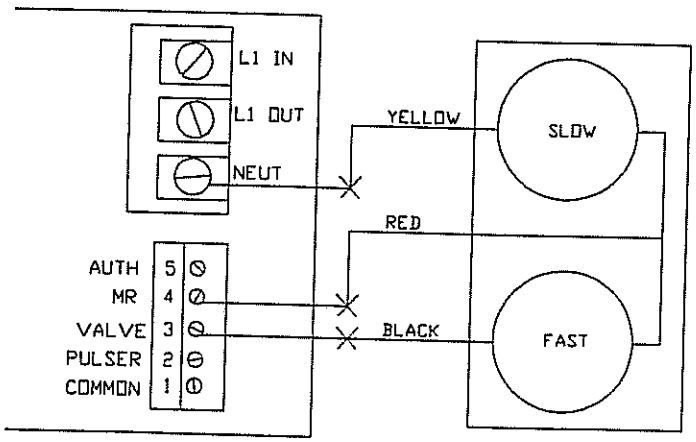
Many tms distributors use Western Electronic pulsers with TMS-800F-1 control systems. These pulsers seem to work well and are easy to install.

If you use the Western pulser, make the 115 VAC power connection to neutral and MR. DO NOT connect to the "AUTH" wire; this may cause a false "CALL" indication to the console.

SERVICE AND OPERATING CONSIDERATIONS

TWO-WAY VALVES (VEEDER-ROOT OR SKINNER)

Use the following diagram for wiring two-way (double-action) valves to the TMS-800F control system:



TMS RELAY BOARD

INSTALLER DAMAGED CONSOLE WHEN REPLACING VEEDER-ROOT EQUIPMENT

Some tms consoles have been damaged during installations replacing Veeder-Root equipment. Veeder-Root has 115 VAC on the pulser leads (connected in the pump junction box).

Notice the tms diagram has no AC connection to the pulser leads. Check the pulser leads before applying power.

THIS TYPE OF DAMAGE IS NOT COVERED UNDER WARRANTY !

INSTALLER DAMAGED RELAY BOARD

Relay boards are sometimes damaged by installers making connections to shorted wires.

This damage can be avoided by checking the wires before energizing. Another way to avoid this problem is to temporarily connect the "AUTH" wire directly to the "L1 in" wire for pump checkout. With this connection, a shorted wire will trip the breaker without damaging anything.

If a relay board is accidentally damaged, it can be repaired by soldering a jumper to replace the burned printed circuit conductor.

TMS-8OOF TEST FOR CASHIER

1. How does cashier authorize **FILL-UP SALE** on pump #1?
2. How does cashier authorize $2.00 **PRE-PAID SALE** on pump #1?
3. How does cashier get **VOLUME** on pre-pay, fill-up, previous sale?
4. How does cashier enter **PRICE OF GAS** on each pump?
5. How does cashier recall **PREVIOUS SALE** on a pump?
6. How does cashier see **CHANGE DUE** when pre-pay sale is incomplete?
7. How does cashier **CLEAR (mark paid)** an incomplete pre-pay sale?
8. How does cashier **DE-AUTHORIZE** a pump?
9. How does cashier **DE-AUTHORIZE** all pumps?
10. If station **POWER FAILS**, what happens if no delivery is in progress?
11. If station **POWER FAILS**, what happens if a delivery is in progress?

ANSWERS

1. Press **SEL**, press **PUMP NUMBER**, press **AUTH.** When customer hangs up, collect light will blink. Press **SEL**, press **PUMP NUMBER** to see $-amount. If desired, press **VOL** to see volume. Collect money and press **PAID** to complete sale.
2. Press **SEL**, press **PUMP NUMBER**, key in **AMOUNT OF SALE**, collect money, press **PAID**, press **AUTH.**
3. On pre-pay, press **VOL** after amount is keyed in and **PAID** is pressed. On fill-up, press **VOL** after customer hangs up, but before **PAID** is pressed. On previous sale, recall previous sale.
4. Hold down **SEL** while pressing **2**, then **PUMP NUMBER**. Key in **PRICE OF GAS.**
5. Hold down **SEL** while pressing **1**, then **PUMP NUMBER.**
6. With pump selected, press **"0"** to show change when customer hangs up before getting full amount pre-paid.
7. With pump selected, press **PAID.**
8. With pump selected, press **PUMP STOP.**
9. Press **EM OFF.**
10. Console will show **PPPPPP.PP** on display. Switch **KEY OFF** until power is restored.
11. Console will blink "COLLECT" for all pumps where delivery was in progress. Cashier should complete sale normally, then switch **KEY OFF** until power is restored.

WARRANTY AND SERVICE INFORMATION

WARRANTY AND LIMITATIONS OF REMEDIES

TMS warrants that new equipment manufactured by TMS shall be free of defective parts and workmanship for a period of two (2) years, commencing on the day of invoice from TMS. TMS salesmen, distributors, representatives, or agents may have made oral statements about the equipment described herein. Such statements do not constitute warranties, shall not be relied on by the buyer and are not part of this contract of sale. **EXCEPT AS SET FORTH ABOVE, TMS MAKES NO WARRANTY, EXPRESS OR IMPLIED, TO BUYER OR ANY OTHER PERSON AS TO THE EQUIPMENT'S FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, DESIGN, CONDITION, OR ANY OTHER ASPECT OF THE EQUIPMENT WHICH IS THE SUBJECT OF THIS CONTRACT OF SALE, ITS COMPONENTS, WORKMANSHIP AND MATERIALS; BUYER TAKES AND ACCEPTS THE EQUIPMENT AS IS**. By reason of his acceptance of delivery of the equipment, Buyer agrees that the equipment is in proper operating order, conforms to the Buyers specifications and the terms and conditions of the contract of sale, and has accepted the equipment in its condition on delivery as the equipment described herein.

Buyer's remedies for damages due to breach of the warranty set forth herein shall be limited to repair or replacement of non-conforming goods or parts within the aforesaid time period of two (2) years. **LABOR, TRANSPORTATION, AND TRAVEL ARE NOT COVERED BY THE WARRANTY.** The parties agree that the Buyer's sole and exclusive remedy against TMS shall be for the repair or replacement of defective parts or goods as provided herein. Buyer agrees that no other remedy, including but not limited to incidental or consequential damages for lost profits, lost sales, injury to persons or property, or any other incidental or consequential loss, shall be available to it. TMS further disclaims liability for any loss, damage or injury to any person as a result of any defects, latent or otherwise, in the equipment whether arising from TMS negligence, application of the law of strict liability, or breach of warranty.

This warranty is automatically void and of no effect in the event of defect, damage, injury or failure of the equipment due to any of the following causes: Acts of God; improper installation; failure to maintain the equipment in accordance with TMS instructions; use of the equipment in any manner other than the use for which TMS has designed and intended the equipment; attempt to install, repair or replace the equipment by any person other than a TMS authorized employee or agent; modifications or changes to the equipment of any kind or nature; excessive or improper usage and electrical burnouts or surges.

This writing contains the final expression of the parties' warranty agreement and is a complete and exclusive statement of the terms of the agreement. Parol evidence shall not be admissible to supplement, modify or add to the terms hereof for any purpose.

WARRANTY PERIOD

New components manufactured by TMS are guaranteed as outlined in the WARRANTY AND LIMITATIONS section for a period of two years. This guarantee consists of a 12-month FACTORY SERVICE WARRANTY plus a 12-month grace period allowed to distributors to cover shelf time, exchanges with their customers for repairs, etc. **The warranty period starts from the date of shipment from TMS**.

Remanufactured components from TMS are guaranteed for a period of one year, beginning from the date of shipment from TMS.

Every new or remanufactured TMS component has a date code that reflects the date of shipment from the factory; this date code is used to determine the warranty period. **Any TMS product returned for service without a date code or with a date code which has been altered for any reason will be considered out of warranty**.

This warranty period does not apply to printers and accessories, or other items which are not manufactured by TMS; those components are warranted for 90 days.

ABOUT OUR WARRANTY

The TMS FACTORY SERVICE WARRANTY is specifically limited to parts and equipment; **it <u>does not</u> cover service travel and labor charges.**

The warranty does not apply to parts and equipment which have been damaged by accident, lightning, physical abuse, mis-wiring, misapplication, or improper operation.

Our service policy is to repair and return warranted equipment, or to exchange for re-manufactured components. **We <u>do not</u> send out new parts and take back old or used ones at no charge.**

WARRANTY REPAIR POLICY

During the warranty period, defective TMS components may be returned freight-prepaid to Triangle MicroSystems, Inc. TMS will repair or replace, solely at our discretion, at no charge, and return via ground shipment freight-prepaid, such components that are judged to be defective in materials or workmanship. **Please note that a repair under warranty does not extend or renew the original warranty period.**

WARRANTY EXCHANGE POLICY

In some cases, we are willing to ship a replacement component in advance for warranty exchange. In this event, the component will have the same date code as the unit it will replace. **Any request for advance shipment of a warranty exchange component must be accompanied by the date code on the defective unit to be returned for credit.** If the replacement component that we ship has a new warranty, we will issue credit **only for the unused portion of the warranty** on the component returned to us.

Advance shipment of a warranty exchange console will include a $50.00 cosmetic charge to cover the cost of cleaning, replacing the overlay, etc.

NON-WARRANTY REPAIR POLICY

When we receive an out-of-warranty component for service, we may routinely offer to exchange it for a remanufactured, re-warranted unit.

NON-WARRANTY EXCHANGE POLICY

As stated above, we may routinely offer to exchange out-of-warranty parts for remanufactured, re-warranted units. In many cases, we are willing to ship remanufactured components with the understanding that out-of-warranty parts will be returned as a core at a later date. You will be billed for the price of the remanufactured equipment and the core **MUST** be received within 30 days. These cores **must be returned within 30 days**; otherwise, customer will be billed the Core charge.

ABOUT EXCHANGES

When returning a component to TMS for credit against an exchange unit that we have sent to you in advance, **please reference the RA number** (Return Authorization) printed on the packing slip that comes with the exchange unit. This helps us to identify the item and to expedite the credit. When no RA number is referenced, there is a possibility that the part will be repaired or exchanged and returned to you, since we may not know that it is a credit return. Please help us to avoid this unnecessary situation.