

# Installation Manual

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## M<sub>2</sub>E Mechanical Pump Conversion Board

### **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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# I. Dangers, Warnings and Precautions

FOR THE SAFE INSTALLATION, MAINTENANCE, AND OPERATION OF THE VVR-100 AND RELATED EQUIPMENT, READ AND UNDERSTAND ALL WARNINGS AND CAUTIONS.

**"DANGER":** means: If you do not follow the instructions, severe injury or death will occur.

**"WARNING":** means: If you do not follow the instructions, severe injury or death can occur.

**"CAUTION":** means: If you do not follow the instructions, damage can occur to the equipment.

**"DANGER" :** Disconnect all power to this equipment and associated dispensers equipment during installation, service or any maintenance. Failure to do so can cause injury or damage equipment.

**"WARNING":** Maintenance and repairs must be done by QUALIFIED/TRAINED personnel.

**"WARNING":** To prevent electric shock, keep the electrical parts of the console dry.

**"WARNING":** You must have training in the installation and service of fuel dispensing equipment before working on this system.

**"WARNING":** Make sure this equipment is correctly grounded. Failure to do so can cause injury or damage equipment.

**"CAUTION":** Electronic components are static sensitive. Use proper static precautions (static straps) before working on the equipment.

**"WARNING":** Failure to properly ground all equipment can cause injury or damage equipment.

**"WARNING":** Installation must comply with National Code (NFPA #70), Automotive and Marine Service Code (NFPA #30A), Federal, State and local codes.

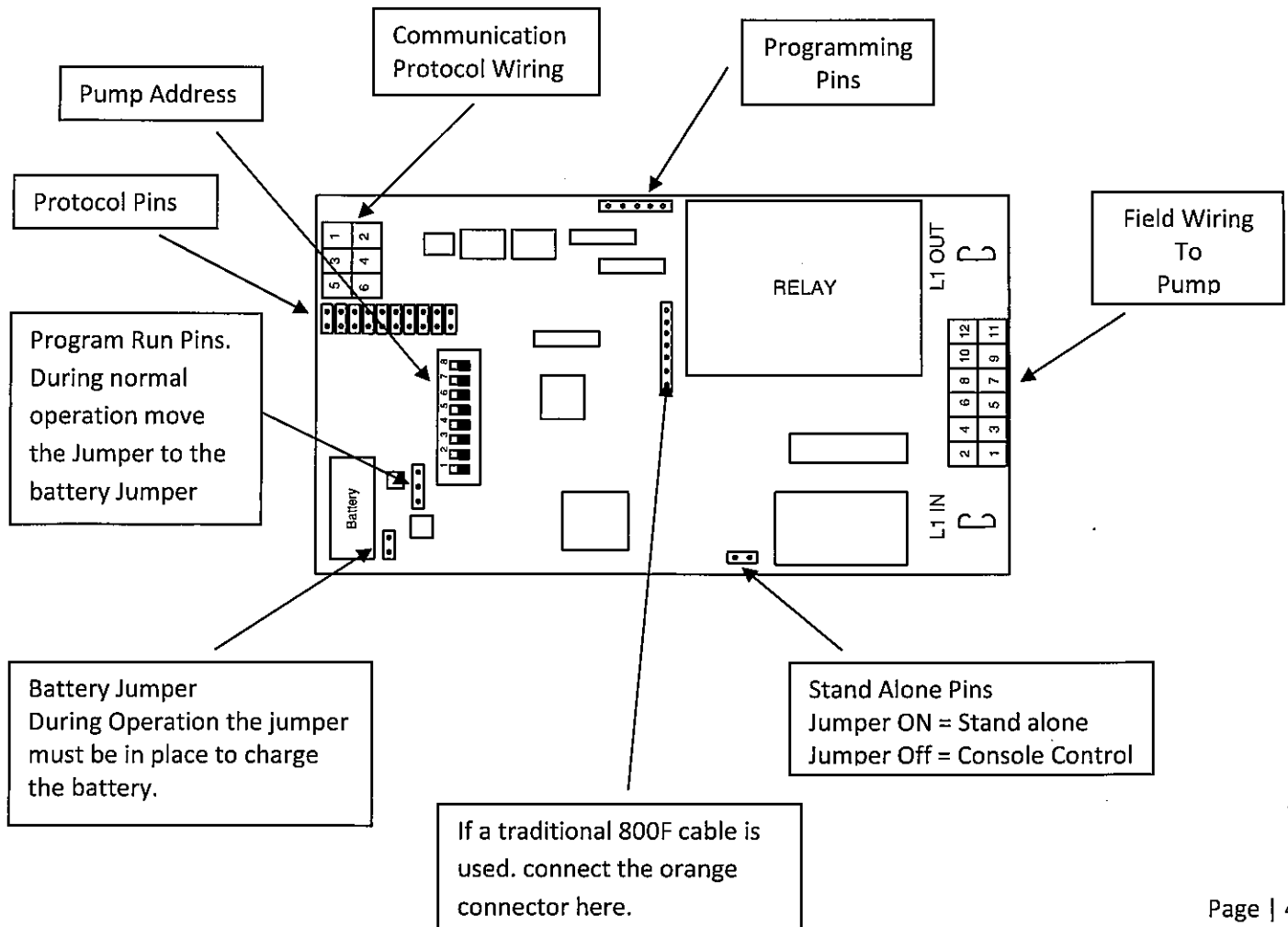
**"CAUTION":** Each dispenser must have a 12 gauge or larger green stranded ground wire connected from the grounding lug of the junction box to the main electrical service panel ground. (National Electrical Code, Article 514-7). It is unacceptable to rely on the conduit for this grounding requirement.

## II. M2E Wiring and Setup Instructions

### A. M2E Setup

The M2E is programmed at the factory with the required dispenser protocol. Bennett current loop, Bennett 485, Gilbarco, Tokheim, and Wayne are all programming options. The various dispenser protocols are set on the M2E board using jumpers. Details on jumper positions and the ability to program M2Es in the field will be available to dealers in the near future.

The M2E (Mechanical to Electronic) connects to all VR computers and converts the mechanical/electrical signals into an electronic protocol that can be read by modern day controllers such as the TMS EZ, Ruby, Gilbarco Passport, and Wayne Fusion POS systems. Virtually any POS system that controls Wayne, Gilbarco, Bennett and Tokheim electronic dispensers can interface with the M2E. The M2E converts mechanical pulses into an electronic output and back again to seamlessly control any mechanical pump with an electronic pump controller. Currently, the Veeder Root computer must transmit money pulses into the M2E, but the appropriate pulser (100 pulses per dollar) must be used in conjunction the Veeder Root computer to facilitate money pulses.

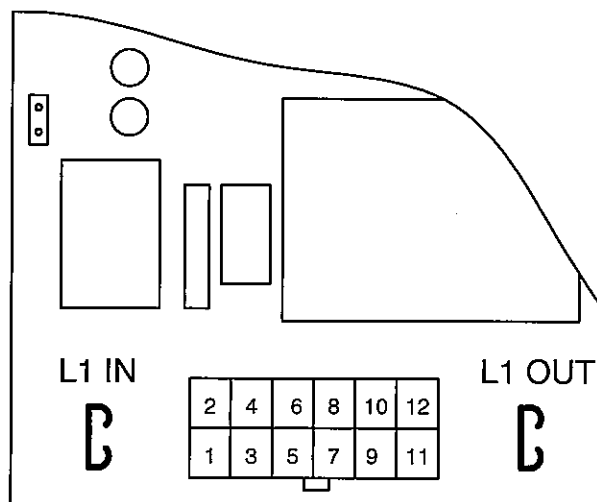


**B. Breaker Panel Connections**

L1 – IN Red wire to AC Hot wire from breaker panel.

L1 - OUT Red wire to switched AC Hot to pump motor hot, or AC hot of STP relay coil.

**C. Field Wiring to the Pump**

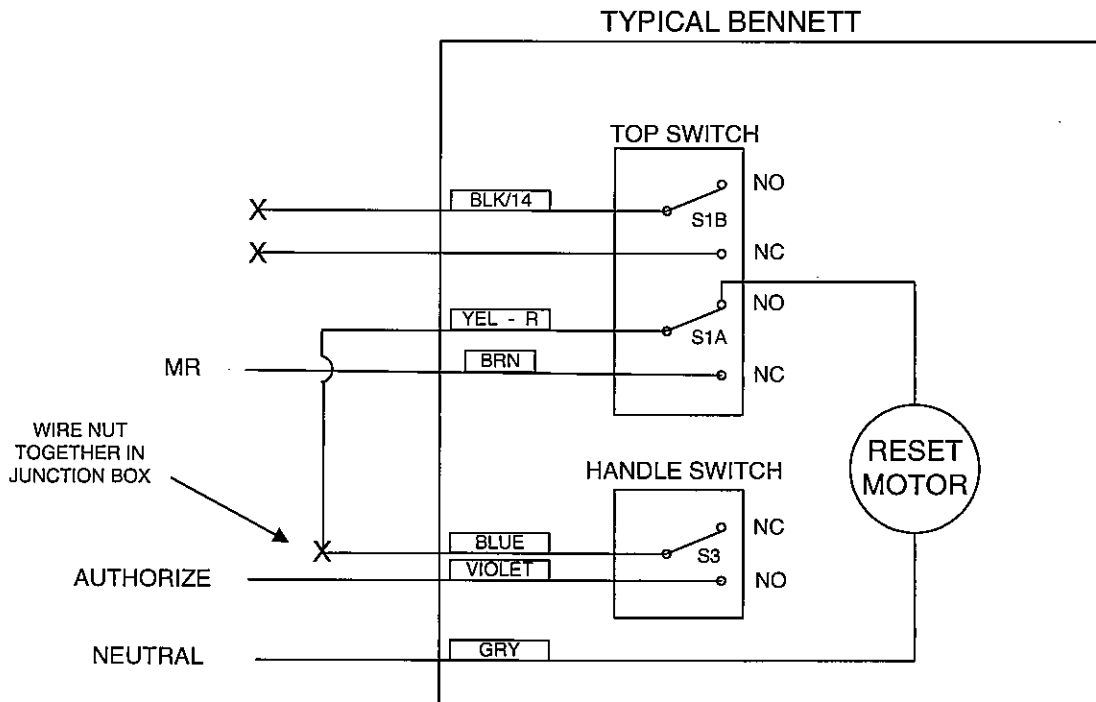
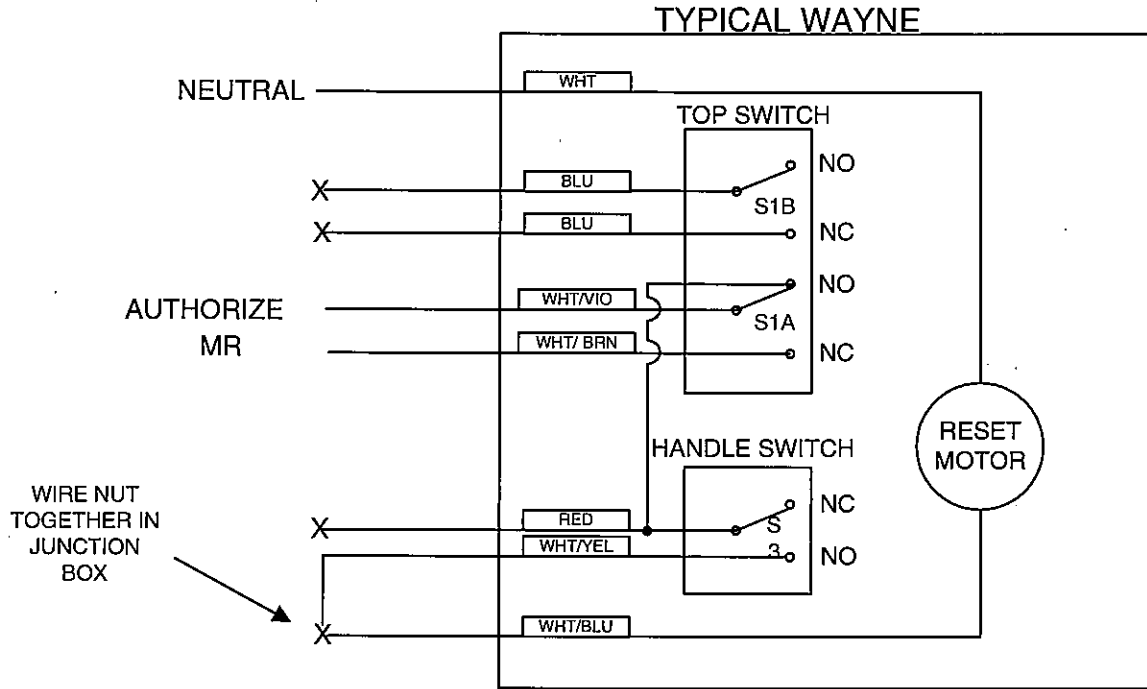


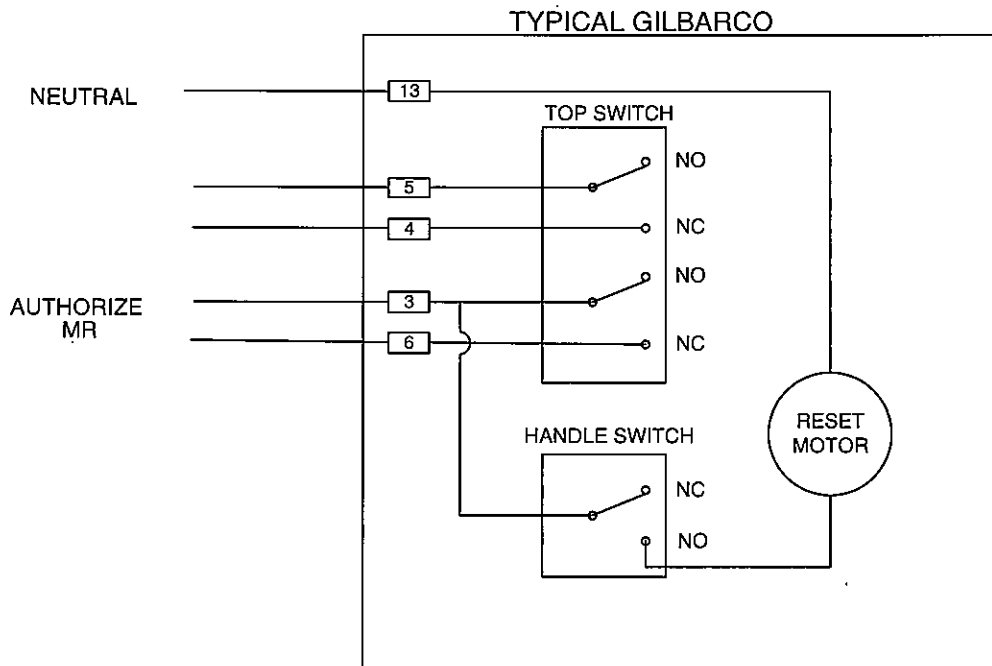
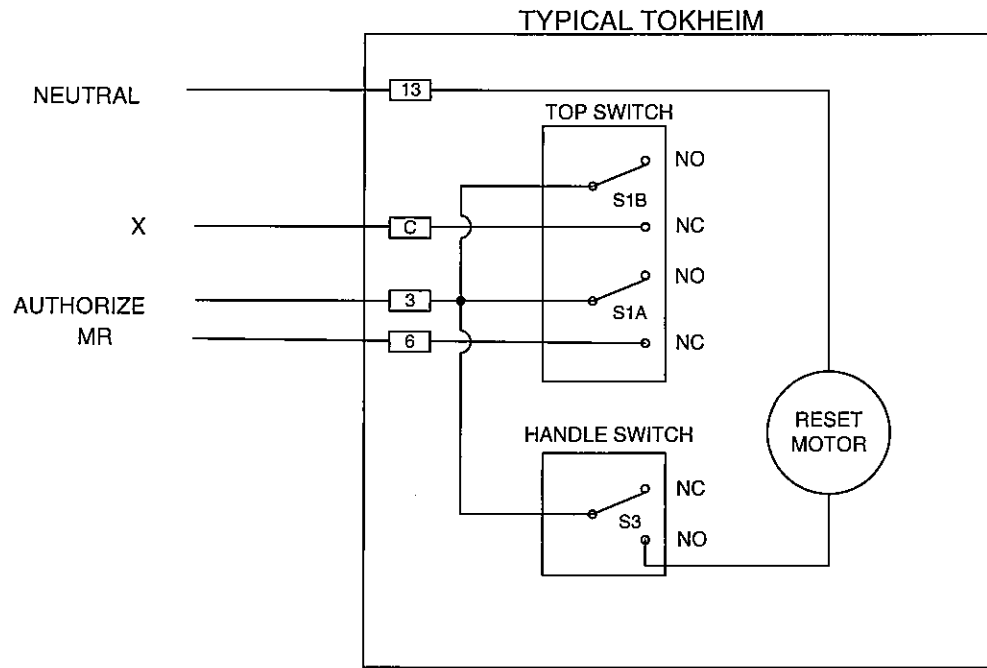
1. WHITE – (+12-16v dc) Output, from TMS-78 power supply.
2. BLUE - (- dc com) Output, from TMS-78 power supply.
3. ORANGE – (+ Pulse) To pulser positive.
4. GREY - Authorize. 110 VAC Hot to reset handle switch.
5. BROWN – Pulse com. Wire to pulse negative.
6. Violet - Fast Valve Neutral wire, to fast valve Neut.
7. Not Used
8. YELLOW - Motor Return 110 VAC after reset is complete.
9. Not Used
10. WHITE - AC Neutral to Breaker Panel Neutral Bar.
11. Not Used
12. Not Used

**D. Program Pins**

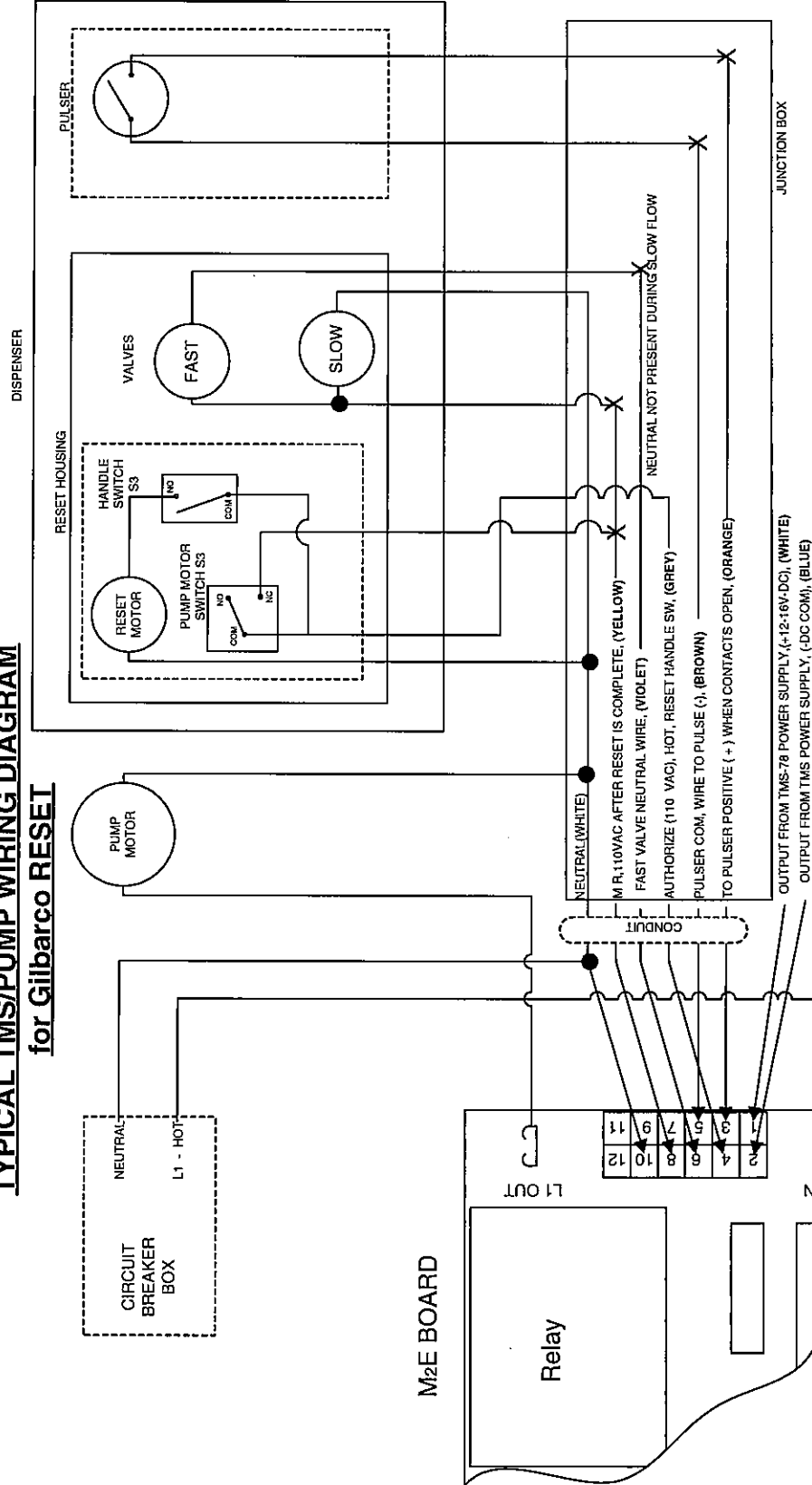
Used at the factory or in the field to change the internal pump protocol

**E. M2E to Mechanical Pump connections**



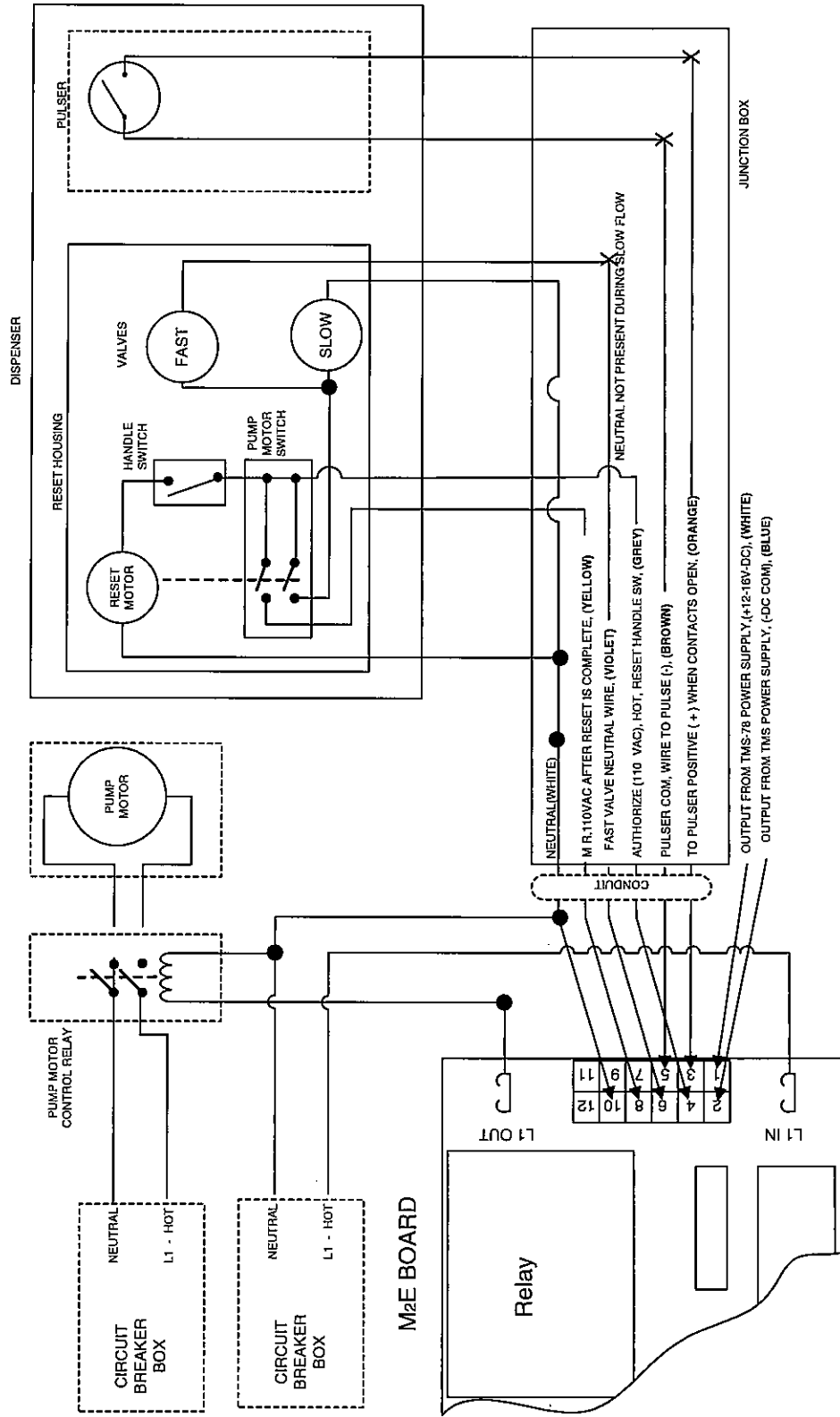


# TYPICAL TMS/PUMP WIRING DIAGRAM for Gilbarco RESET

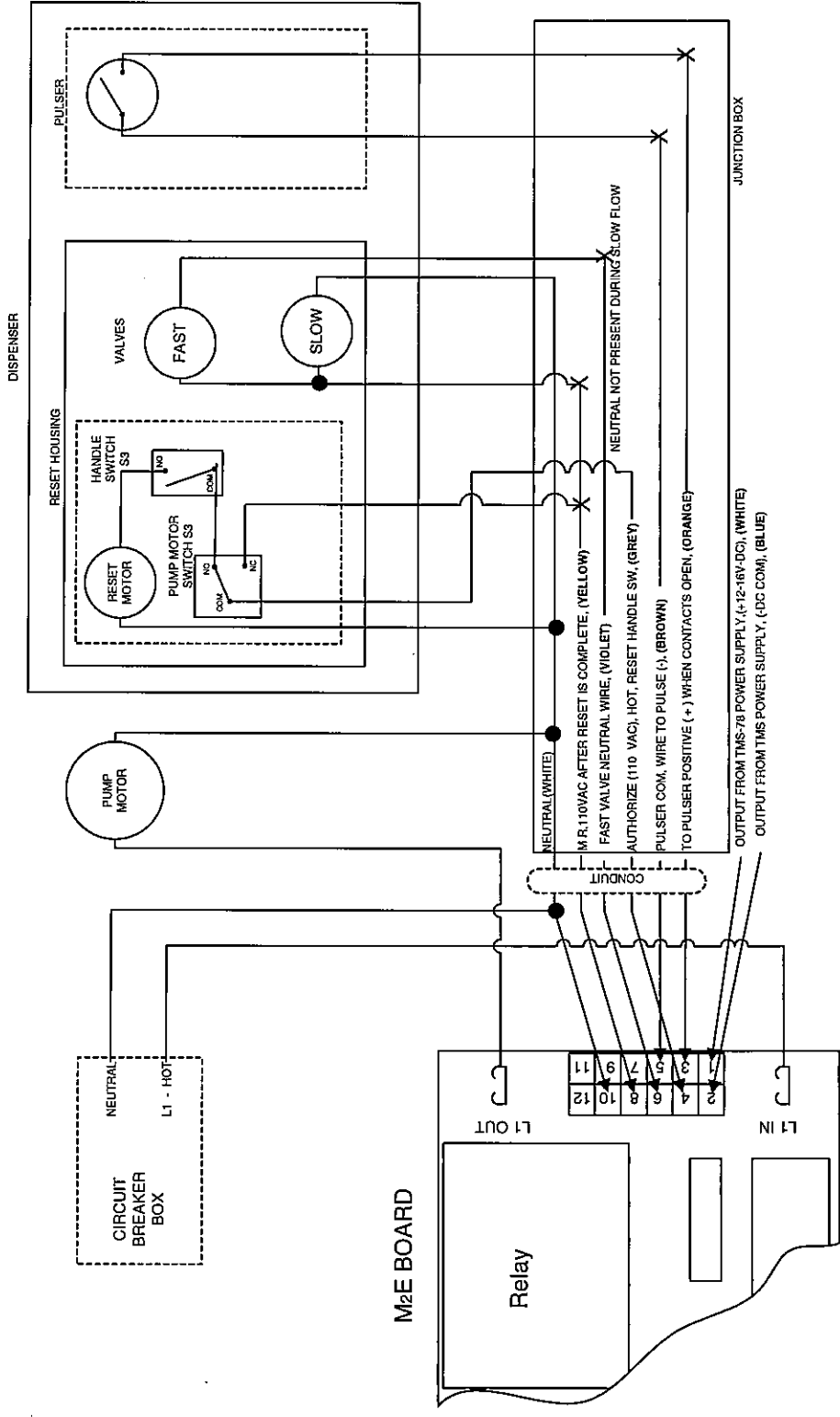




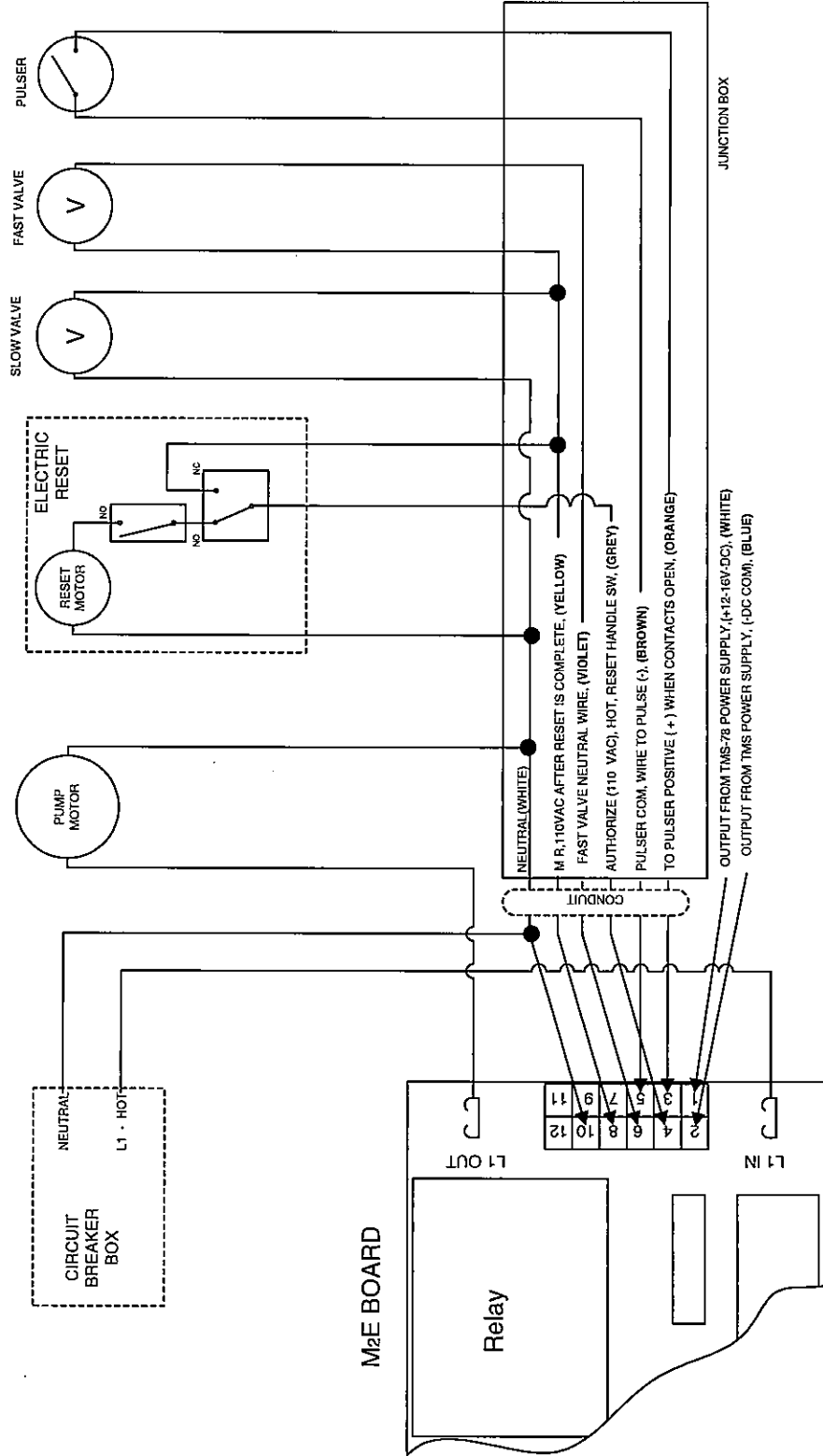
# TYPICAL TMS/PUMP WIRING DIAGRAM for TOKHEIM RESET



# TYPICAL TMS/PUMP WIRING DIAGRAM for VEEDER ROOT RESET

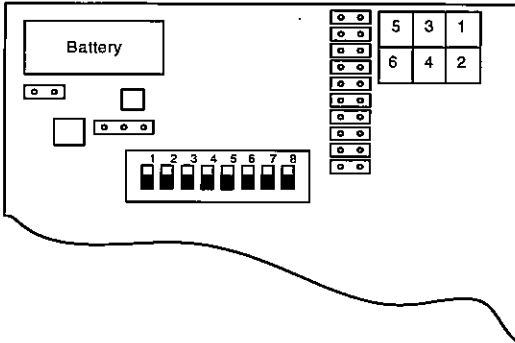


# TYPICAL TMS/PUMP WIRING DIAGRAM



**F. M2E to Controller connections**

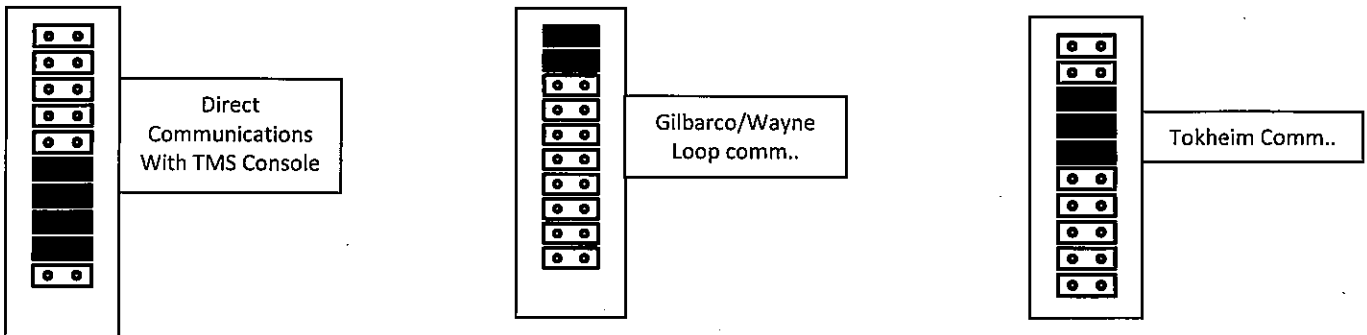
Connection to the controller is made via a 6 position connector on the M2E. For sites with controllers connecting to electronic pumps via an electronic IC box (D, 100, 5000, Fusion, PIB, 515, or any TMS MPC, EZ or EZS IC box), the M2E will wire into that box. Bennett Loop and 485, Gilbarco and Wayne are all 2-wire loops. Tokheim uses 3-wires, and TMS-Direct (Mechl only sites with no electronic IC Box) uses 4-wires.

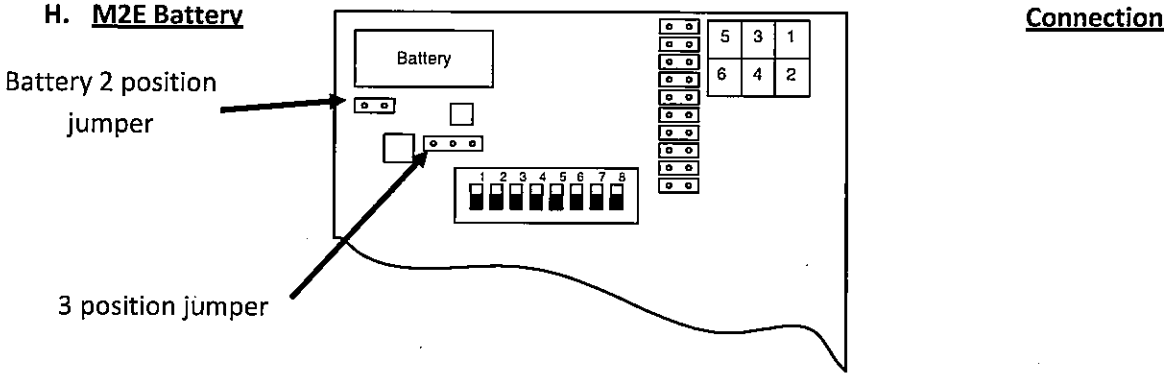


Type	Wire Color	Wayne/Gilbarco Electronics	Tokheim	485 Comm.	TMS Direct
1	Orange	+ Data	TTD	Direct TX+	-
2	Brown	- Data	TTC	Direct TX-	-
3	Purple	-	DCC	-	Direct RX +
4	Grey	-	-	-	Direct RX -
5	Not Used	-	-	-	-
6	Not Used	-	-	-	-

**G. Protocol Pin Positions**

If specified at the time of ordering the M2E the jumpers will be set at the factory. The settings are shown below.

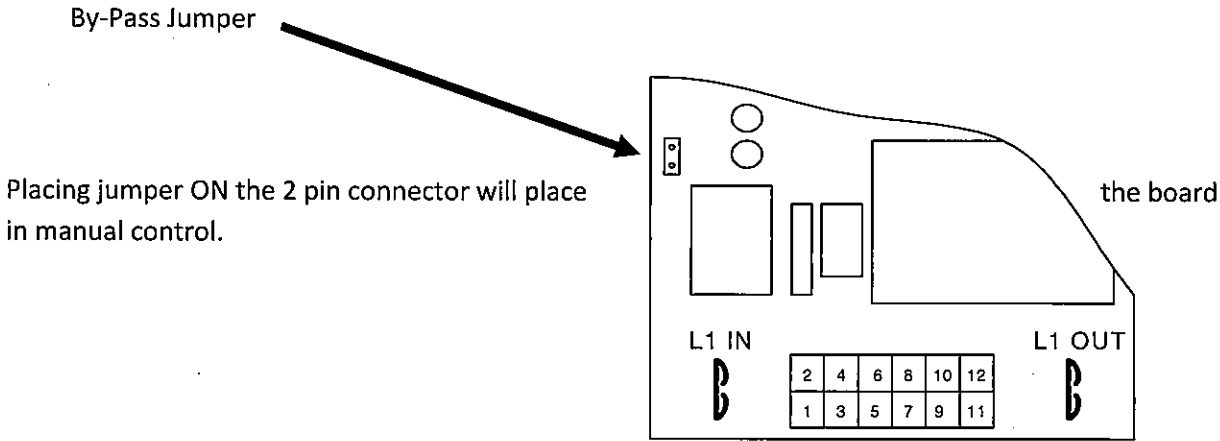




A 9-volt rechargeable battery is used to maintain communication to a controller in the event of power failure. The battery should be connected via the 2-position jumper at all times unless power to the TMS-78 power supply is deliberately turned off for an indefinite amount of time. Upon startup, move the jumper from the 3-pos. Prog. / Run jumper to the 2 pos. Battery Jumper.

**I. Setting the M2E to Manual Mode (No console control, always armed)**

Console vs. manual operation is set using a 2-pos. jumper. The M2E is shipped to operate in console control. Add a jumper (not included) to put the board in manual mode. Inserting the jumper makes the AUTH wire HOT at all times and there is no console control



**J. Addressing the M2E pump ID.**

Board Address is set using the 8-pos. dipswitch.

A ZERO indicates Dipswitch is OFF, a ONE indicates Dipswitch is ON. The board below is addressed as pump fueling position 1. Use the chart below to set the ID. The ID set determines communication to the controller.

addr	12345678	Addr	12345678
1	10000000	17	10001000
2	01000000	18	01001000
3	11000000	19	11001000
4	00100000	20	00101010
5	10100000	21	10101000
6	01100000	22	01101000
7	11100000	23	11101000
8	00010000	24	00011000
9	10010000	25	10011000
10	01010000	26	01011000
11	11010000	27	11011000
12	00110000	28	00111000
13	10110000	29	10111010
14	01110000	30	01111000
15	11110000	31	11111000
16	00001000	32	00000100

8 Position Dipswitch

