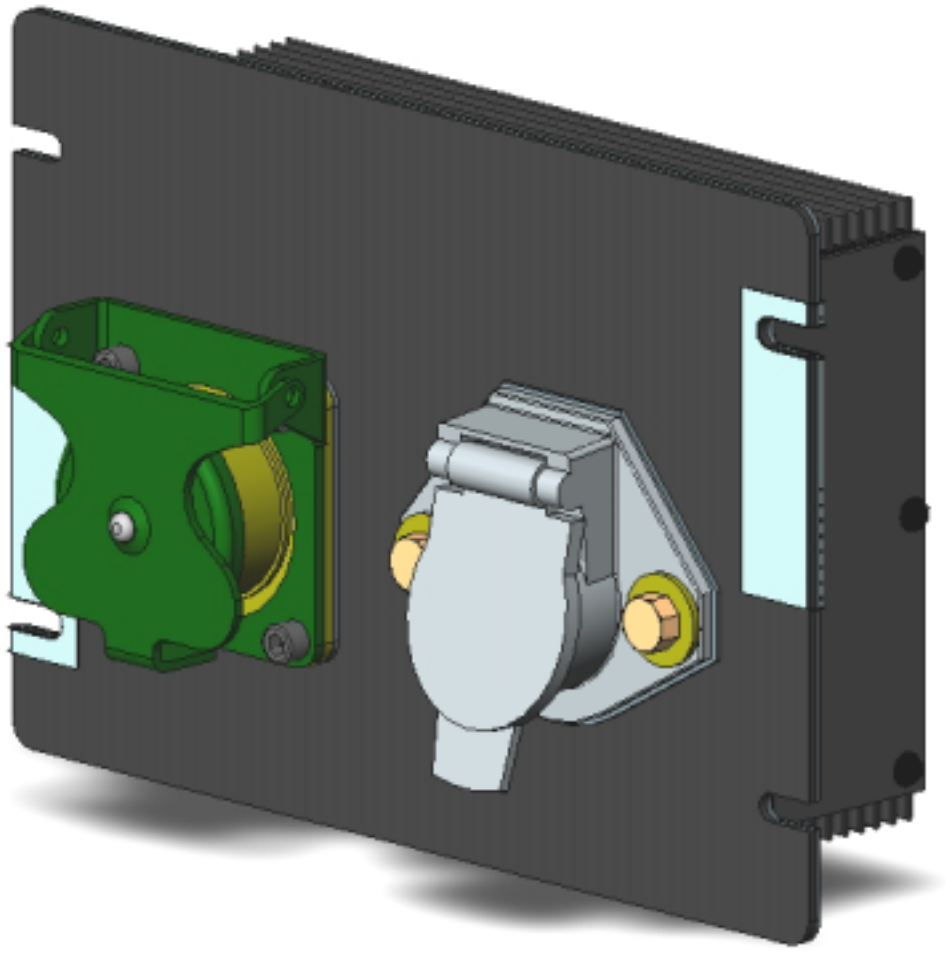
Weldon FTM-2412
M871A3 Semitrailer Nose Box w/ Converter



Manual 0Z90-1511-00 Rev 0, 20-JUN-2002

Notice

To ensure proper and reliable function, this product must be installed and serviced according to the direction of this manual. Poor grounding of this Module to the chassis may cause unstable voltage regulation to the ABS system. Ground potential of this Module and the ABS controller should be within 1V.

This module is designed to operate semi-trailers using 12V ABS systems and LED or other multi-voltage capable DOT (service) lighting. Internal wiring connections for the commercial DOT lighting are common between the military and commercial input connectors. The trailer's DOT lighting MUST be compatible with operating voltage of the tow vehicle.

There are no fuses within the module. Fuses or breakers within the tow vehicle must protect all circuits. The 12V ABS converter has internal protection circuitry that protects the converter in the event of a short or over current condition on the ABS power line.

General Description

The Weldon FTM-2412 Module is designed specifically for military semi-trailer operation with both military and commercial tow vehicles. The module provides for both military 12-pin and commercial 7-pin tow vehicle connections. The module contains a solid-state voltage regulator that supplies a fixed voltage to the trailer ABS system regardless of the tow vehicle's system voltage. An electromechanical relay is utilized to automatically separate the clearance/side-marker circuit from the tail/license lamp circuit when the commercial (J560) input connector is powered. When using a military tractor, the relay reverts to its normally-closed position to parallel these two trailer circuits.

Installation

1. The module shall be mounted to a rigid, electrically grounded member of the trailer using an appropriate grade of electrically conductive mounting bolts. See Figure 2 for mounting dimensions.
2. The back of the module shall be recessed into the trailer to provide protection to the gasketed side plates and the rear electrical connection.
3. A 12" service loop in the main trailer harness is recommended to allow removal of the module for service.
4. Application of electrical grease is recommended on each of the connectors to reduce oxidation of the contacts and provide a more reliable circuit.

Specifications

Operating Voltage (converter):	18-45VDC*
Operating Temperature:	-55 +105C
Output Over-Current Trip Point:	>5A
Storage Temperature:	-65 +125C
Weight:	3.3kg (7.25lbs)

**This is the operating voltage needed to maintain 12V output from converter module to power ABS. All other circuits are pass-through and do not have an operational voltage parameter.*

Service

When servicing the module, always insure that service brake is set on the tow vehicle.

Aviod disassembling the FTM-2412. If the module is opened, it will be necessary to replace the gaskets to prevent corrosion of internal components.

If the module is removed from the trailer for troubleshooting, it is necessary that a ground wire be attached from the module chassis to the trailer chassis for proper opertion.

When replacing the converter PCB assembly it is necessary to carefully remove the heat sink clips (2) and retaining hardware before attempting to remove the board. When installing a new unit, make sure that thermal pads are under the tabs of the two T0-220 transistors. These tabs must be isolated from the heat sink for proper operation. Install the mounting screw through the inductor and bracket before reinsalling the heat sink clips.

Circuit Diagram

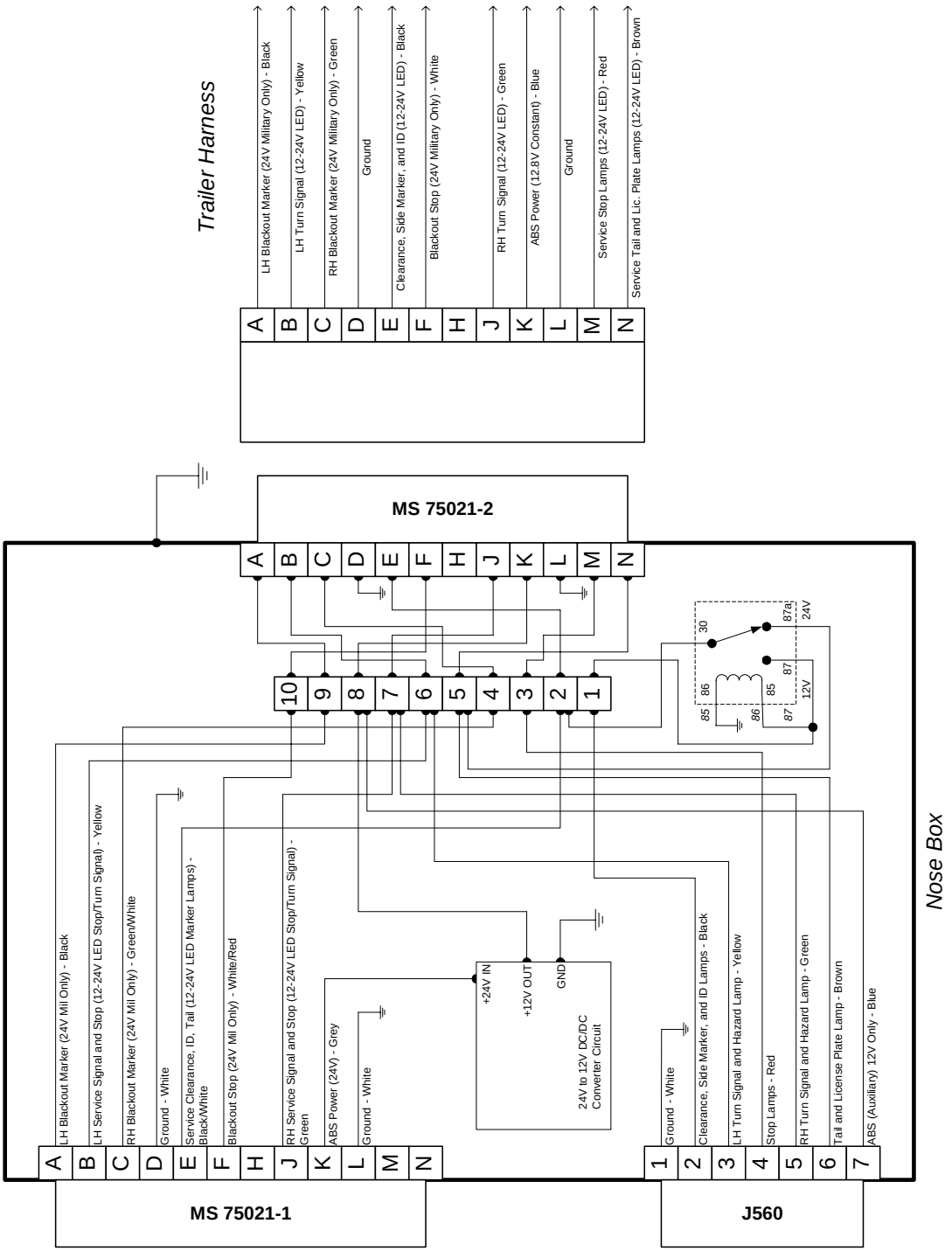


Figure 1 - Module Electrical Diagram

Mechanical Overview

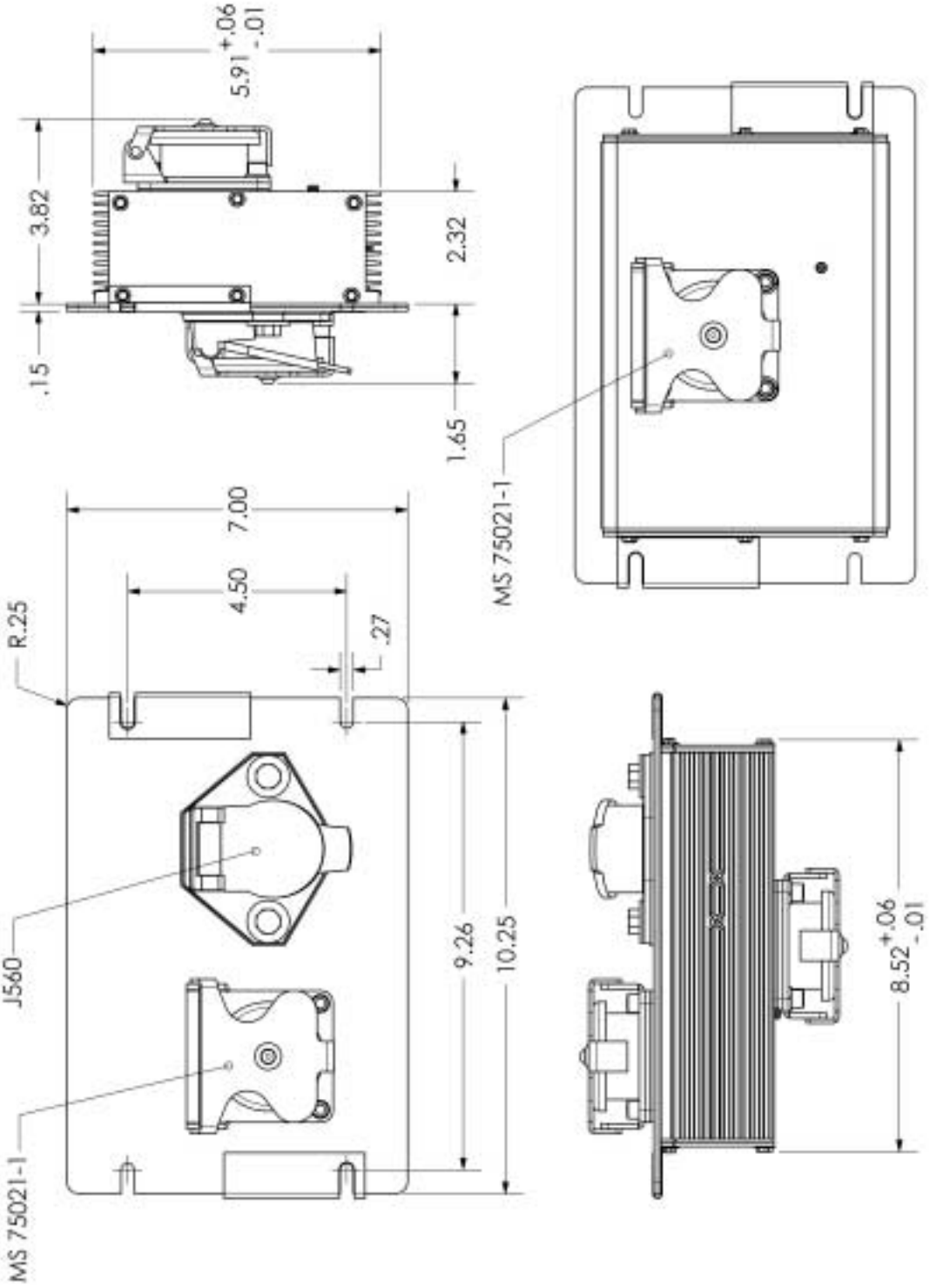


Figure 2 – Package Dimensions

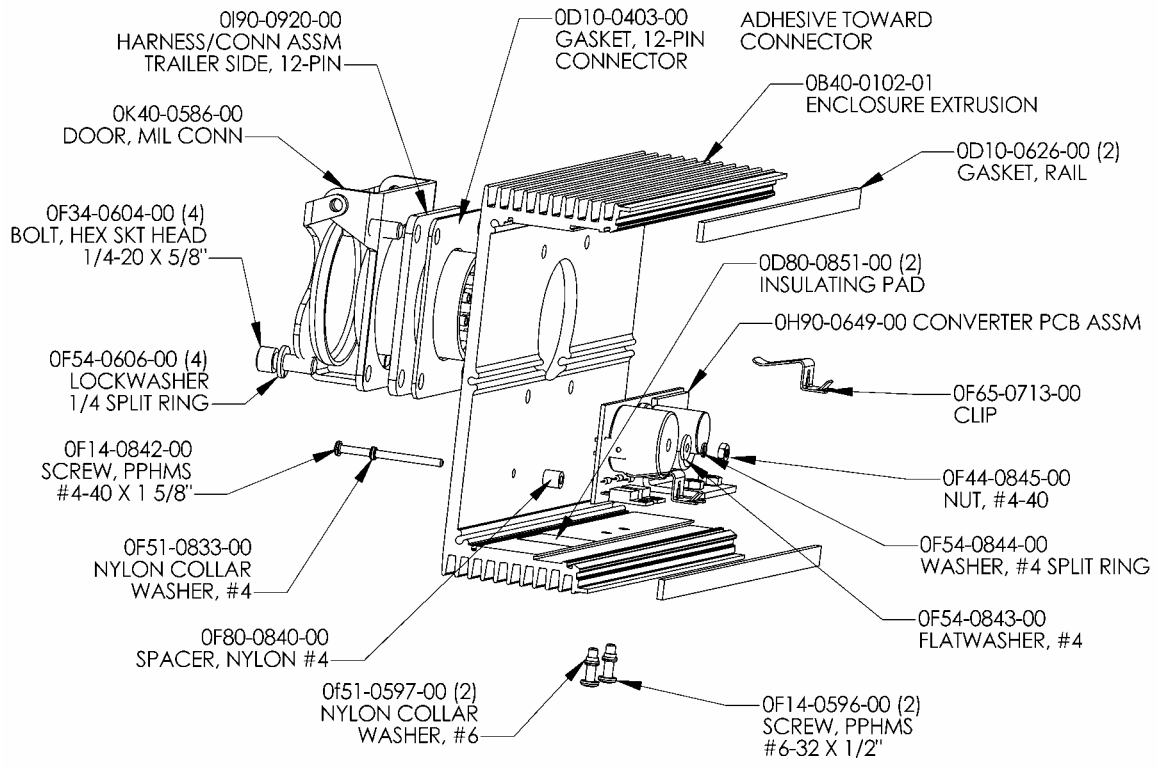


Figure 3 – 0N10-1038-00 Rear Module Sub-Assembly w/ Trialer Connector and Converter Module

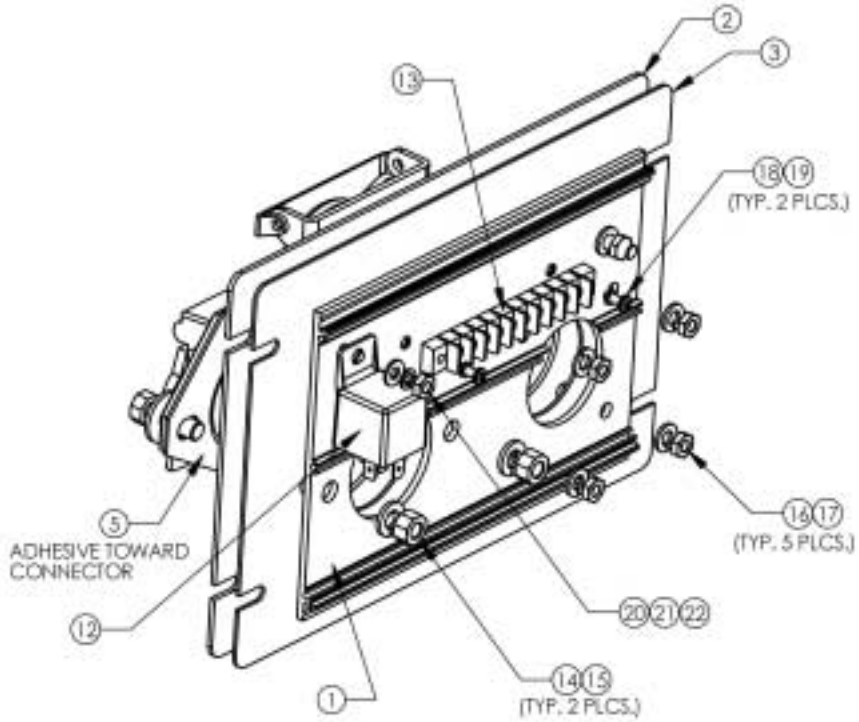


Figure 4 – 0N10-1037-00 Module Face Plate Sub-Assembly, Back side

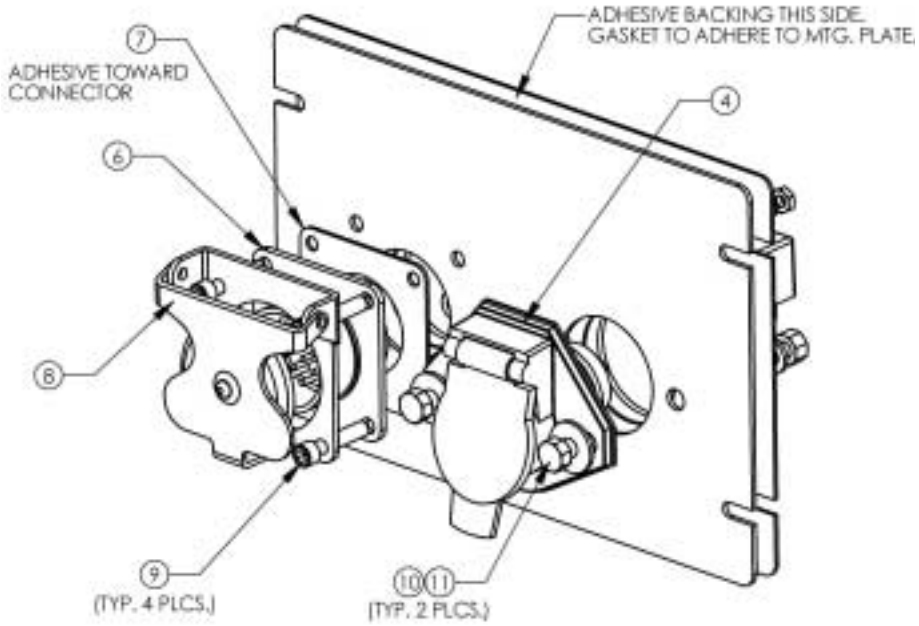


Figure 5 – 0N10-1037-00 Module Face Plate Sub-Assembly, Back side

Table 1: 0N10-1037-00 Face Plate Assembly Bill of Material

Item	Part Number	Description	Qty.
1	0B40-0105-01	Base Extrusion, 24-12 Converter	1
2	0J10-0877-00	Mounting Plate	1
3	0D10-0878-00	Gasket, Mounting Plate	1
4	0L90-0922-00	Connector/Harness, 7 Pos. Trailer Receptacle w/Pins	1
5	0D10-0883-00	Gasket, 7 Pin Trailer Receptacle	1
6	0L90-0921-00	Connector/Harness, 12 Pos. Trailer Receptacle w/Pins	1
7	0D10-0403-00	Gasket, Mounting, 12 Pos. Trailer Receptacle	1
8	0K40-0586-00	Door, Connector, Use With 12 Pos. Trailer Receptacle	1
9	0F34-0603-00	Bolt, Hex Socket Hd. 1/4-20 x 1" Stl. w/ASTM B633-85 Finish	4
10	0F34-0598-00	Bolt, Hex Hd. 5/16-18 x 1" Stl. w/ASTM B633-85 Finish	2
11	0F54-0601-00	Washer, 5/16 Flat, Stl. W/ASTM B633-85 Finish	2
12	0440-0841-00	Relay, SPST, 30A, 12V Coil	1
13	0K29-0906-00	Terminal Block, 10 Pos. w/Barriers, Flange Mt., Non-Feed Thru	1
14	0F44-0599-00	Nut, 5/16-18, Hex, Stl w/ASTM B633-85 Finish	2
15	0F54-0602-00	Washer, 5/16 Split Ring, Stl. W/ASTM B633-85 Finish	2
16	0F44-0605-00	Nut, 1/4-20, Hex, Stl w/ASTM B633-85 Finish	5
17	0F54-0606-00	Washer, 1/4" Split Ring, Stl w/ASTM B633-85 Finish	5
18	0F14-0596-00	Screw, #6-32 x 1/2" PPHMS, Stl w/ASTM B633-85 Finish	2
19	0F54-0608-00	Washer, #6 Int. Star, Stl w/ASTM B633-85 Finish	2
20	0F44-0911-00	Nut, #10-24, Hex, Stl w/ASTM B633-85 Finish	1
21	0F54-0913-00	Washer, #10 Split Ring, Stl w/ASTM B633-85 Finish	1
22	0F54-0912-00	Washer, #10 Flat, Stl w/ASTM B633-85 Finish	1

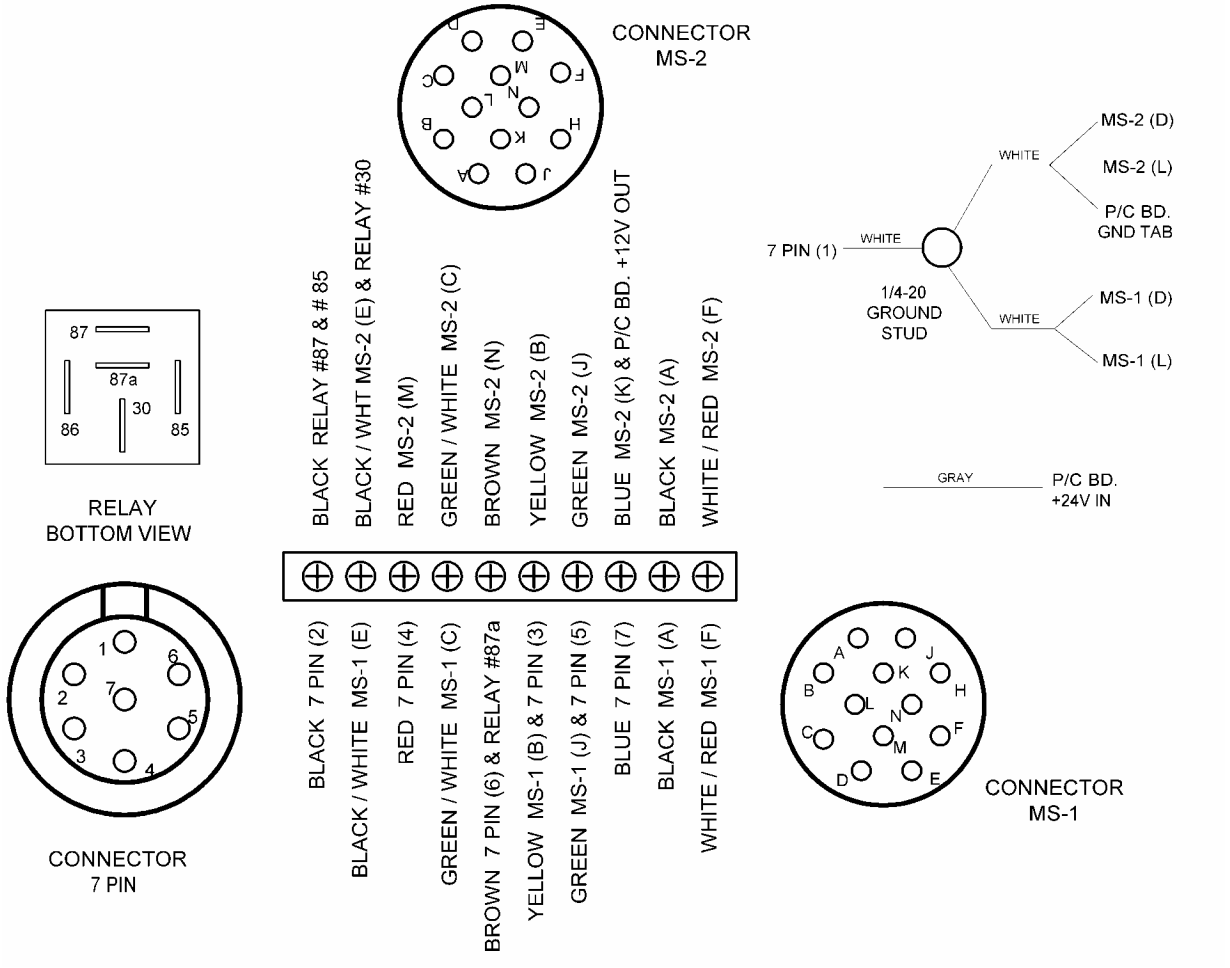


Figure 6 – 0T40-0989-00 Internal Wiring Description

Troubleshooting

Problem	Action
ABS Fault w/ 24V Tow Vehicle	Do not remove the FTM-2412 from the trailer for these tests unless instructed. With tractor connected to military connector of trailer, tractor power on, and service brake applied: Check converter regulation by measuring the voltage across pin 7 (12V converter output for ABS) and pin 1 (ground) of the J560 commercial connector. The J560 connector is used as a convenient measurement point when the 24-pin military harness is applied. The reading from pin 7 to pin 1 of the J560 should be ~12V. If 12V is measured, then the converter is working properly. Now check from pin 1 to the trailer chassis ground (not the converter box itself). If the voltage is >1V then there is not a good ground between the converter box and the ABS chassis ground. Remove the FTM-2412, clean the ground straps and the chassis connection points. Reassemble and retest. If no voltage or low voltage is measured across pins 1 and 7 of the J560 connector, check the following: 1. There is 24V supply from the tow vehicle on pin K of the military connector. 2. That there is not a short on the ABS power circuit of the trailer harness. If there is a good 24V supply into the converter and the ABS power circuit is not shorted then the converter board should be replaced. If 24V is measured across pins 1 and 7 of the J560 connector, check the converter to trailer chassis ground as described above. If the ground is good and 24V is still present on the ABS power then the converter board should be replaced.
ABS Fault w/ 12V Tow Vehicle	This is a pass-through circuit in the FTM-2412 for the J560 ABS power. The ABS controller will see the voltage from the 12V tow vehicle as applied to pin 7 of the J560 connector. Continuity through the FTM-2412 may be confirmed by measuring from pin 7 to pin K of the 24-pin connector on the trailer harness side. If continuity does not exist, check for corrosion on the connector terminals. If still no continuity, there is a bad internal connection and the FTM-2412 must be serviced.
No Clearance, Side Marker or ID Lights	These are pass-through circuits within the FTM-2412. Check that lamp(s) are functional before troubleshooting wiring or converter box. Check that voltage is available on the appropriate wires from the tow vehicle. Check that the trailer has a solid ground with the tow vehicle. Check continuity of the pass-through circuits in the FTM-2412 per the diagram shown in Figure 1 of this manual. Check for corrosion or oxidation of connector pins on the module and the connecting harnesses (tow vehicle and trailer). If 24V is on tow vehicle harness Pin-E but is not measured on trailer harness Pin-N then the FTM-2412 internal relay is bad and should be replaced.
Trailer Lights are Dim	Service lamps must be capable of 12-24V operation. If a 24V lamp is used it will be very dim on a 12V tow vehicle. Check for corrosion on connector pins and clean if necessary. Check that there is a solid ground connection between the trailer and the two vehicle.