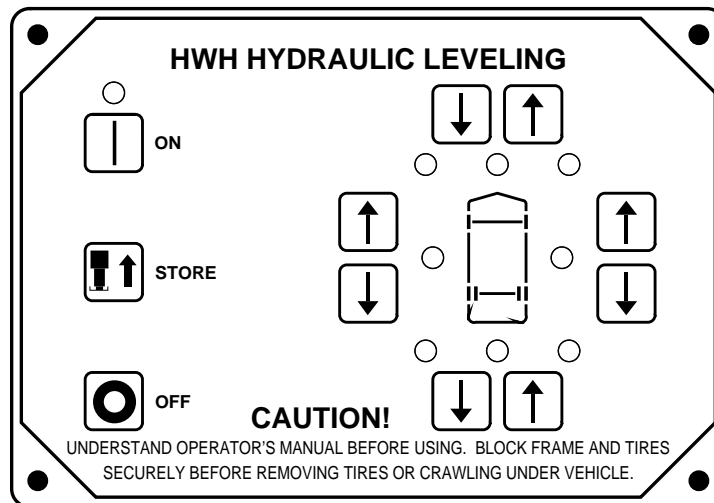




OPERATOR'S MANUAL

HWH TOUCH PANEL-CONTROLLED LEVELING SYSTEM 310 SERIES TRAVEL TRAILER

FEATURING:
TOUCH PANEL CONTROL
HYDRAULIC LEVELING
STRAIGHT-ACTING FRONT JACKS
FRONT JACK EQUALIZATION



HWH CORPORATION
(ON I-80, EXIT 267 SOUTH)
2096 MOSCOW ROAD
MOSCOW, IOWA 52760
(800) 321-3494 / (563) 724-3396
INTERNET: <http://www.hwhcorp.com>

AP10046 - US
AP10271 - Europe

ML10046/MP05.3001/TH-TT
16MAR01

OPERATOR'S MANUAL

CAUTION !

READ THE ENTIRE OPERATOR'S MANUAL BEFORE OPERATING.

BLOCK FRAME AND TIRES SECURELY BEFORE CRAWLING UNDER VEHICLE. DO NOT USE LEVELING JACKS OR AIR SUSPENSION TO SUPPORT VEHICLE WHILE UNDER VEHICLE OR CHANGING TIRES. VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

KEEP ALL PEOPLE CLEAR OF VEHICLE WHILE LEVELING SYSTEM IS IN USE.

WHILE HITCHING OR UNHITCHING, AVOID AREAS WHERE BODY MAY BE CRUSHED BY SUDDEN DROPPING OR SLIDING OF THE TRAILER.

DO NOT LIFT TOW VEHICLE WITH LEVELING SYSTEM.

THE JACKS MAY ABRUPTLY SWING UP WHEN THE FOOT CLEARS THE GROUND OR WHEN JACK REACHES FULL EXTENSION.

NEVER PLACE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. OIL MAY PENETRATE SKIN CAUSING INJURY OR DEATH.

WEAR SAFETY GLASSES WHEN INSPECTING OR SERVICING THE SYSTEM TO PROTECT EYES FROM DIRT, METAL CHIPS, OIL LEAKS, ETC. FOLLOW ALL OTHER APPLICABLE SHOP SAFETY PRACTICES.

IMPORTANT: IF VEHICLE IS EQUIPPED WITH A ROOM EXTENSION, READ ROOM EXTENSION SECTION BEFORE OPERATING LEVELING SYSTEM.

HOW TO OBTAIN WARRANTY SERVICE

THIS IS NOT TO BE INTERPRETED AS A STATEMENT OF WARRANTY

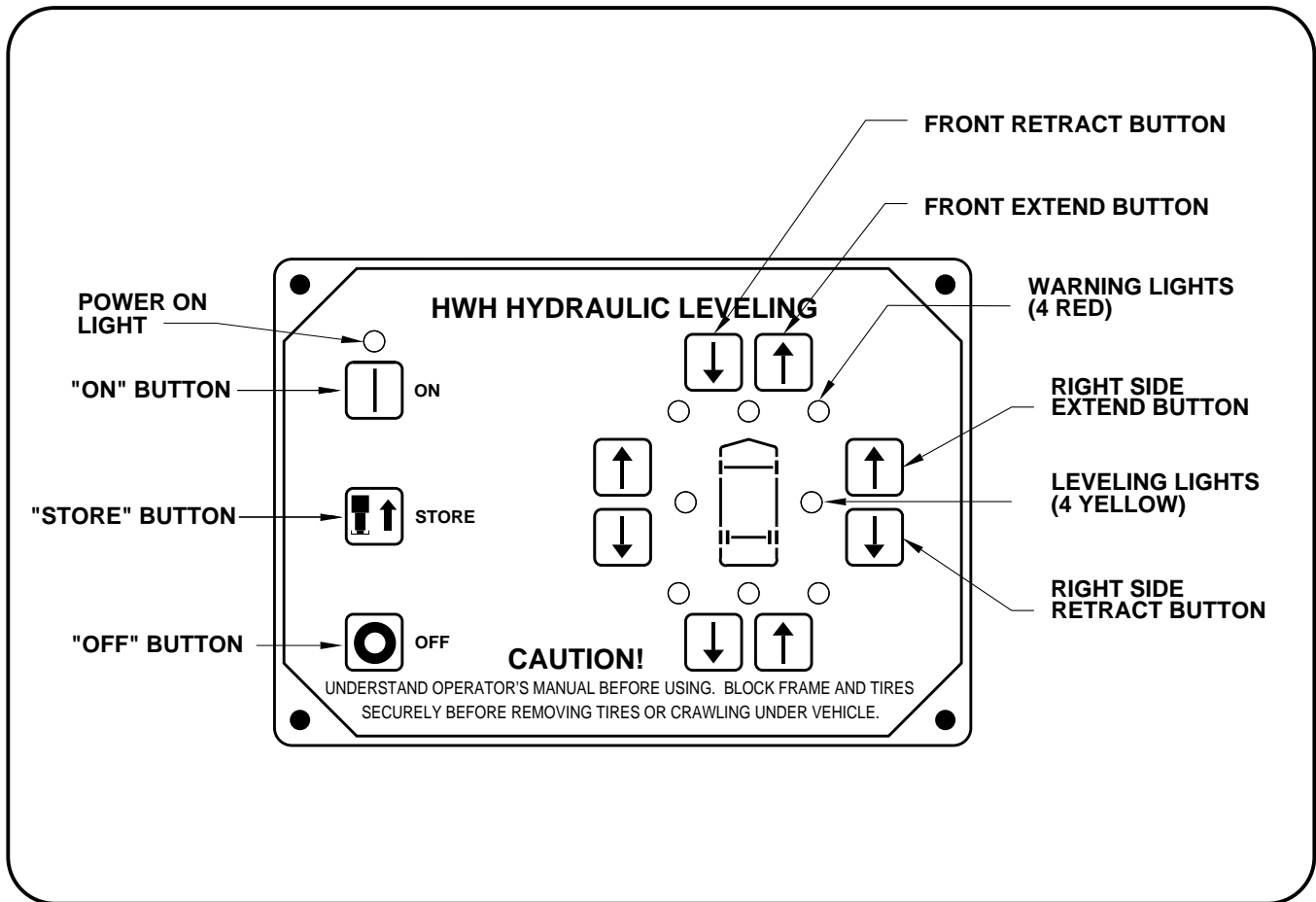
HWH CORPORATION strives to maintain the highest level of customer satisfaction. Therefore, if you discover a defect or problem, please do the following:

FIRST: Notify the dealership where you purchased the vehicle or had the leveling system installed. Dealership management people are in the best position to resolve the problem quickly. If the dealer has difficulty solving the problem, he should immediately contact the Customer Service Department, at HWH CORPORATION.

SECOND: If your dealer cannot or will not solve the problem, notify the Customer Service Department:
HWH CORPORATION 2096 Moscow Rd. Moscow IA. 52760
(563) 724-3396 OR (800) 321-3494. Give your name and address, coach manufacturer and model year, date the coach was purchased, or the date of system installation,

description of the problem, and where you can be reached during business hours (8:00 a.m. till 5:00 p.m. c.s.t.). HWH CORPORATION personnel will contact you to determine whether or not your claim is valid. If it is, HWH CORPORATION will authorize repair or replacement of the defective part, either by appointment at the factory or by the authorization of an independent service facility, to be determined by HWH CORPORATION. All warranty repairs must be performed by an independent service facility authorized by HWH CORPORATION, or at the HWH CORPORATION factory, unless prior written approval has been obtained from proper HWH CORPORATION personnel.

CONTROL IDENTIFICATION



CONTROL FUNCTIONS

CONTROL BUTTONS

"ON" BUTTON: This is the "ON" button for the leveling system. It provides control power to operate the electrical relay on the pump, the leveling lights and the 4 red warning lights.

"OFF" BUTTON: This button turns off control power to the leveling system.

"STORE" BUTTON: This button will retract all four jacks at the same time. It is to be used only after the trailer has been hitched to the tow vehicle.

EXTEND BUTTONS (UP ARROWS): These buttons will extend their respective jacks and raise the trailer.

RETRACT BUTTONS (DOWN ARROWS): These buttons will retract their respective jacks and lower the trailer.

NOTE: Side arrows operate the rear jacks only.

INDICATOR LIGHTS

POWER ON LIGHT: This light indicates the system is on.

LEVELING LIGHTS: If a yellow LEVELING LIGHT is on, that indicates a side or end of the trailer is low. Extend the appropriate jack pairs to put out the yellow light. One or two yellow leveling light can be on at the same time. The trailer is level when all yellow lights are out.

WARNING LIGHTS: Travel trailers must have straight-acting jacks on the front of the trailer. Either straight-acting or kick-down style jacks may be used on the rear. The respective red WARNING LIGHT will be on if a straight-acting jack is extended two inches or more, or if a kick-down style jack is in the vertical position, provided the system is on.

OPERATING PROCEDURES

ROOM EXTENSION PROCEDURES

IMPORTANT: If the vehicle is equipped with a room extension read this section carefully.

If the vehicle is equipped with kick-down jacks, the wheels **MUST** be blocked securely. Do **NOT** operate any room extension until the leveling and stabilizing procedure is complete. Do **NOT** retract the leveling system until all room extensions are retracted. **NEVER** operate the leveling system when any room extensions are extended.

Refer to the vehicle owner's manual for proper operation of room extensions.

IMPORTANT: Do not use a room extension support when the vehicle is supported by the leveling system.

SET UP PROCEDURE

1. Trailer must be unhitched from the tow vehicle before leveling. The HWH front jacks may be used to lift the trailer for unhitching. If auxiliary jacks are used to unhitch the trailer, they should be retracted before the leveling system is used for leveling.

NOTE: Refer to the trailer manufacturer owner's manual for unhitching.

If parking on soft ground or asphalt paving, wood blocks or pads should be placed under the jacks.

IMPORTANT: Overheating and excessive current drain will result if raise arrows are operated for an extended period of time.

2. The touch panel must be on for the system to function.

3. Lower the front of the trailer until the front yellow level indicator lights come on. This is done by pushing the front RETRACT button. The red jacks down warning lights will light when the jacks are extended 2 inches or more.

NOTE: For trailers equipped with rear kick-down style jacks, push the rear EXTEND button (up arrow) at this time to place the rear jacks in the vertical position. The WARNING lights for the rear jacks will come on when the jacks are vertical.

4. A lit yellow LEVEL light indicates that the side, end or corner of the trailer is low. Pushing the up arrow for corresponding yellow level lights will extend that jack or jack pair to level the vehicle. Extend jacks as needed to put out all the yellow lights. Always give a side yellow level light priority when leveling the trailer. If the ground is too uneven, the jacks may not have enough stroke to level the trailer. The trailer may have to be moved.

5. After the trailer is level, the jacks not used for leveling may be extended until they touch the ground. This provides additional stability against wind and activity in the trailer.

6. Push the "OFF" button on the touch panel to turn the system off.

PREPARATION FOR TRAVEL

1. Push the "ON" button.

2. Push and hold the rear RETRACT button until the rear WARNING lights are out.

3. Hitch the trailer to the tow vehicle using the procedure supplied by the trailer manufacturer.

4. When the vehicle is securely hitched to the tow vehicle, push and hold the "STORE" button. All four jacks will retract. After all four jacks are fully retracted, release the "STORE" button.

CAUTION: ONLY USE THE "STORE" BUTTON IF THE TRAILER IS HITCHED TO A TOW VEHICLE.

5. Press the "OFF" button to turn the system off.

6. Visually inspect all of the jacks to make sure they are fully retracted before moving the trailer.

OPERATING PROCEDURES

MANUAL JACK RETRACTION

IMPORTANT: Retract all room extensions before using the valve release "T" handles.

NOTE: Use the valve release "T" handles for retracting only if the "STORE" button on the control panel will not retract the jacks for travel.

CAUTION: KEEP AWAY FROM THE WHEELS, DO NOT CRAWL UNDER THE VEHICLE, KEEP A SAFE DISTANCE IN FRONT AND REAR OF VEHICLE. THE VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING AS THE VALVE RELEASE IS OPERATED.

1. Locate the 4 valve release "T" handles on the solenoid valves. The solenoid valves are located on the pump/valve assembly. (See Electrical Connection Diagram - Hydraulic Manifold)

2. Allow clearance for vehicle to lower.

3. Open the LOCK valve. Slowly turn the "T" handles counter clockwise. The handles may turn easily at first, but as an internal spring is compressed, turning may become more difficult. The valves need only to be opened enough to retract the jack.

4. Retract the rear jacks.

5. Hitch the trailer to the tow vehicle while retracting the two front jacks. Either valve will retract both front jacks.

6. Check that all four jacks are now retracted.

7. Close the valves by turning the release handles clockwise.

Once the internal spring tension has been released, the handles will turn free for several turns. Once the "T" handles are snug, DO NOT tighten the handles past this point as internal damage may occur to the solenoid.

8. The system should now be repaired before using again.

MAINTENANCE

OIL LEVEL

It is important that the four leveling units are fully retracted before checking the hydraulic oil level. To check the oil supply, remove the breather cap from the top of the hydraulic oil reservoir. The oil level should be approximately one inch below the top of the reservoir when adequately filled.

FLUID: HWH Specialty Hydraulic Oil is recommended. In an emergency Dexron automatic transmission fluid can be used.
NOTE: Dexron automatic transmission fluid contains red dye and can cause staining should a leak occur. **DO NOT USE** brake fluid or hydraulic jack fluid. Use of these can damage seals.

UNUSUAL CONDITIONS

In general, to insure the smooth operation of the leveling system, it is a good idea to occasionally check the individual leveling units to prevent problems. This is especially true under the unusual conditions stated in the following:

If driving conditions are unusually muddy, the units may become caked or clogged with mud. This condition may hamper the proper operation of the leveling system. This problem may be prevented or remedied by cleaning off each leveling unit if they become excessively muddy.

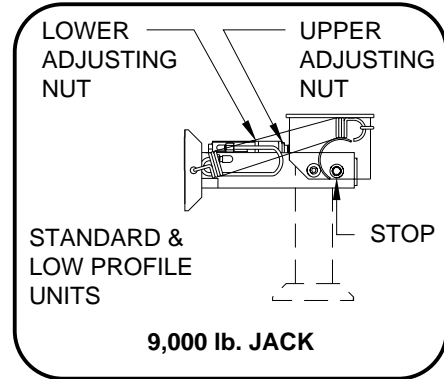
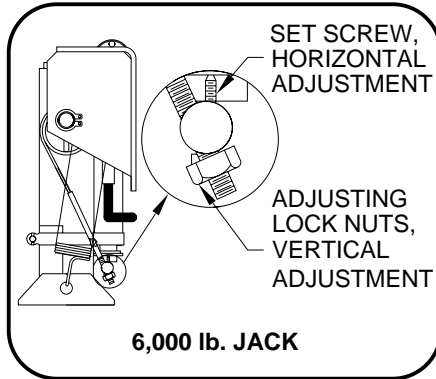
In wet or icy weather leveling units may become encrusted with ice. This may cause the leveling system to function improperly. To eliminate this problem, periodically check the leveling units and break loose any ice which may be causing improper operation.

Do not move the trailer while the leveling units are still in contact with the ground. Visually check to see if the leveling units have returned to the STORE/TRAVEL position before moving the trailer.

NOTE: All major components of the system can be replaced with rebuilt units or can be sent to HWH CORPORATION to be rebuilt, when the system is out of warranty.

MAINTENANCE

SYSTEM ADJUSTMENT



JACK ADJUSTMENT

There are two basic adjustments which are made at the time of installation. However, when adjustment of a leveling unit is needed, the following procedures are recommended.

1. 6,000 lb. JACKS: Always make vertical adjustment first. If the vertical adjustment is changed at anytime, be sure to check the horizontal adjustment. Vertical position is changed by adjusting the lock nuts on the actuator cable. If the jack stopped short of vertical, tighten the lock nuts. If the jack goes past vertical, back the lock nuts off. Be sure to adjust each nut the same number of turns.

Horizontal stop is adjusted by turning the set screws located just inside the cable locknuts. The jack can be adjusted down to provide clearance for objects which may interfere with the operation of the jacks. The horizontal stop must be adjusted to provide clearance between the hat bracket and mounting

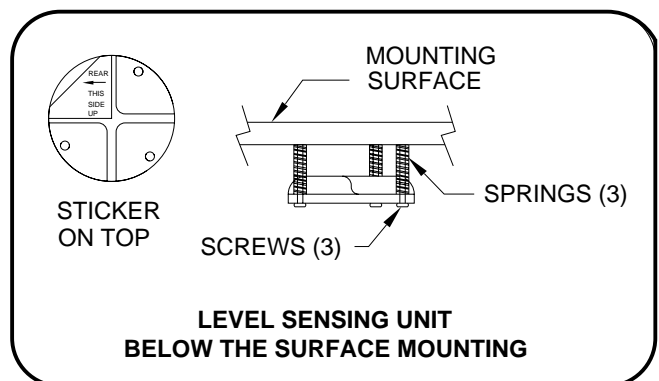
bolts; and the actuator and hose fittings, when the jack is in the STORE POSITION. The jack must be able to fully extend in the horizontal position without interfering with suspension components, tanks, etc.

2. 9,000 lb. JACKS: Each jack should be checked to be sure that it is vertical when it swings down. To do this, retract all jacks, then extend each jack until it is close to, but not touching the ground. If the jack stopped short of being vertical, it can be adjusted by loosening the lower adjusting nut and tightening the upper nut.

The horizontal stop can be adjusted up or down in the slot to provide clearance for objects which may interfere with operation of the jack. The stop must be adjusted so that the jack can be fully extended in the horizontal position without interfering with suspension components, tanks, etc.

LEVEL SENSING UNIT ADJUSTMENT

Level the vehicle by placing a circular bubble level in the center of the freezer floor or location within the vehicle that is to be level. With the vehicle level, adjust the sensing unit until all yellow lights are off. This is done by drawing up the corresponding screw if the sensing unit is mounted below the surface, as shown, or backing out the corresponding screw if the sensing unit is mounted above the surface. Bump the sensing unit to see that it has settled down in the level position.



TROUBLE SHOOTING LEVELING SYSTEM

The following is a list of problems, and possible solutions, which might occur to the leveling system.

NOTE: Only qualified technicians should install or repair leveling systems on vehicles. A knowledge of hydraulics, welding, the vehicle's suspension and electrical system, as well as an understanding of the leveling system's hydraulics and electronics is required.

1. JACK RETRACTS AFTER COACH IS LEVEL.

- A. Hose or jack has external leak.
- B. Fluid is leaking back to reservoir through solenoid valve.

2. LEVELING JACKS WILL NOT RETRACT COMPLETELY.

- A. Actuator rod bent or scored (rod will not move freely).
- B. Main rod bent or scored.
- C. Springs weak or broken.
- D. Hydraulic line pinched.

3. UNIT IS EXTENDED BUT NOT VERTICAL.

- A. Actuator rod bent.
- B. Actuator not functioning properly.

4. PANEL ON, BUT NO POWER TO PUMP.

- A. Blown fuse, bad control box.
- B. Pump solenoid not functioning.
- C. 12 Volts from main power source not present.
- D. Faulty wire or electrical connection.
- E. Pump not grounded.

5. HYDRAULIC PUMP ACTIVATES, BUT THE JACKS WILL NOT EXTEND.

- A. Bad shuttle valve.
- B. Oil supply low in reservoir.
- C. Pump is not developing pressure.
- D. Broken hydraulic line.

6. LEVELING LIGHTS (YELLOW) NOT FUNCTIONING PROPERLY.

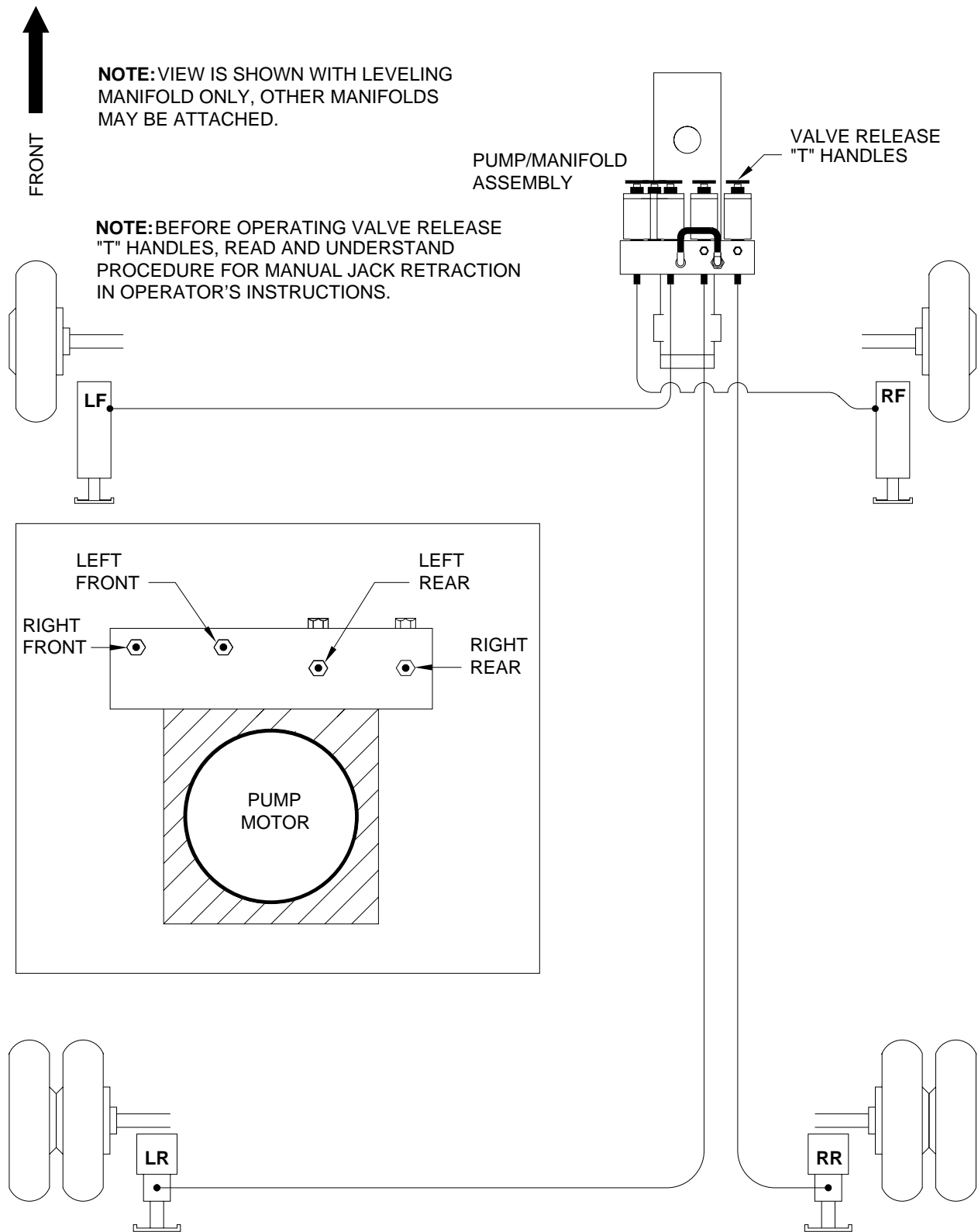
- A. Yellow lights will not go out when coach is level: adjust sensing unit.
- B. If more than two yellow lights are on replace sensing unit.
- C. Check control box.

7. WARNING LIGHTS (RED) NOT FUNCTIONING PROPERLY.

- A. Light will not come on: check for broken wire at warning switch on the jack.
- B. Lights will not go out bad warning switch or wires are shorted to ground.
- C. Check control box.

HYDRAULIC CONNECTION DIAGRAM

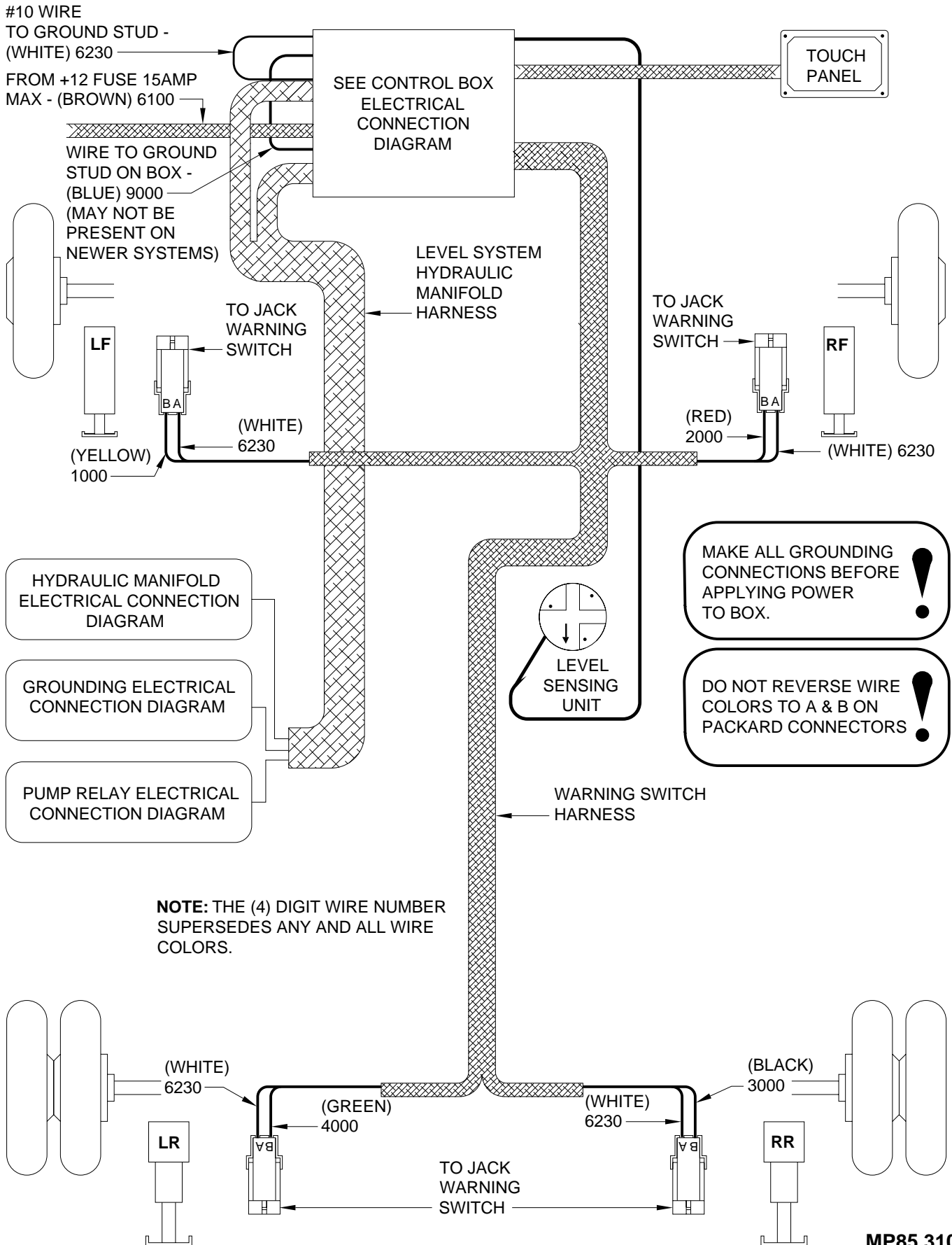
310 SERIES LEVELING SYSTEM WITH FRONT JACK EQUALIZATION TRAVEL TRAILER



ELECTRICAL CONNECTION DIAGRAM

310 SERIES LEVELING SYSTEM

TRAVEL TRAILER



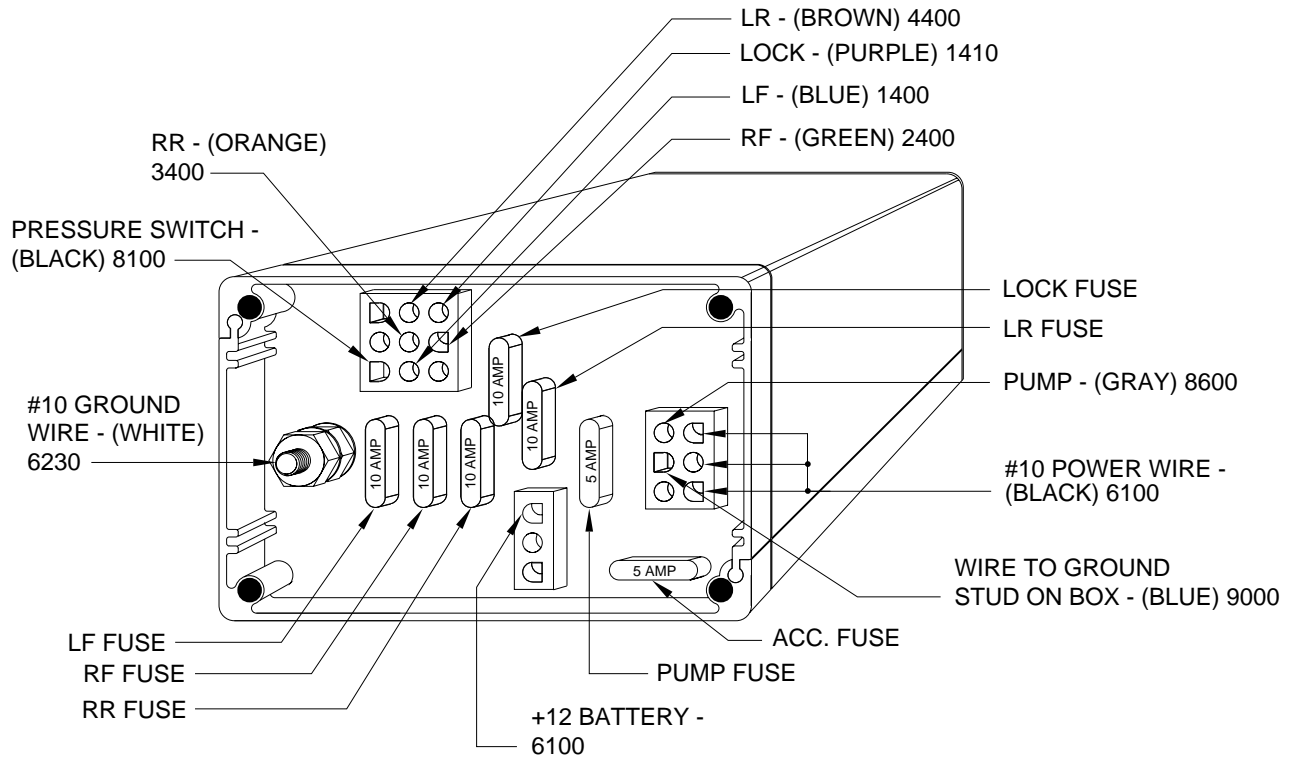
MAKE ALL GROUNDING CONNECTIONS BEFORE APPLYING POWER TO BOX.

DO NOT REVERSE WIRE COLORS TO A & B ON PACKARD CONNECTORS.

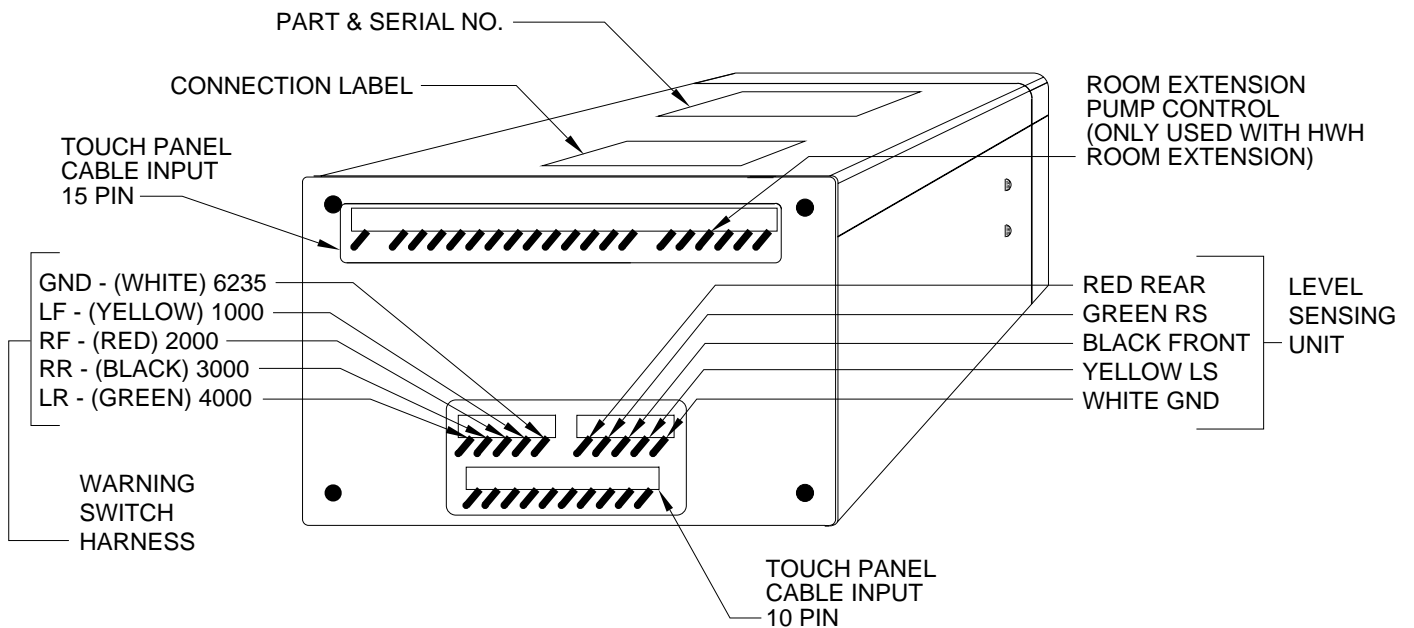
ELECTRICAL CONNECTION DIAGRAM

310 SERIES CONTROL BOX

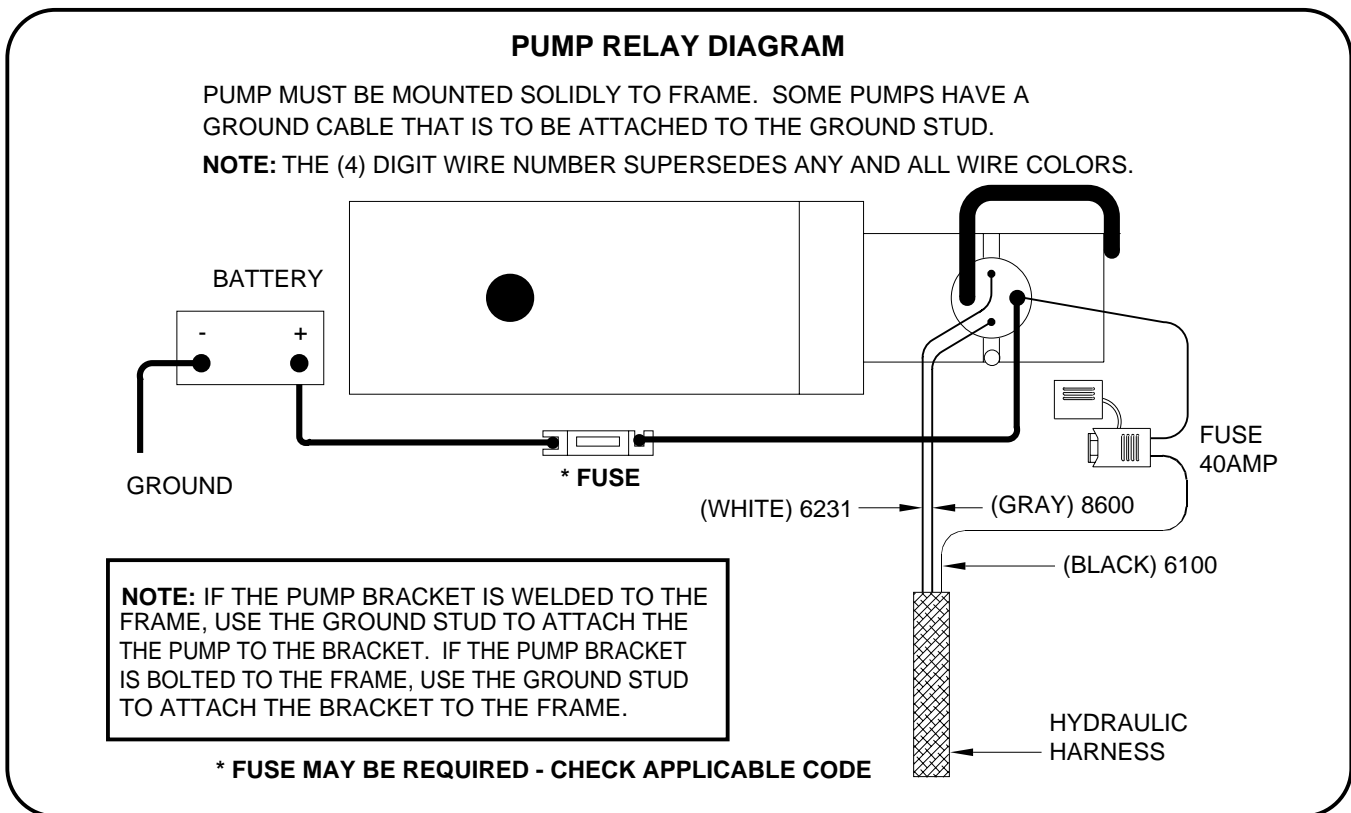
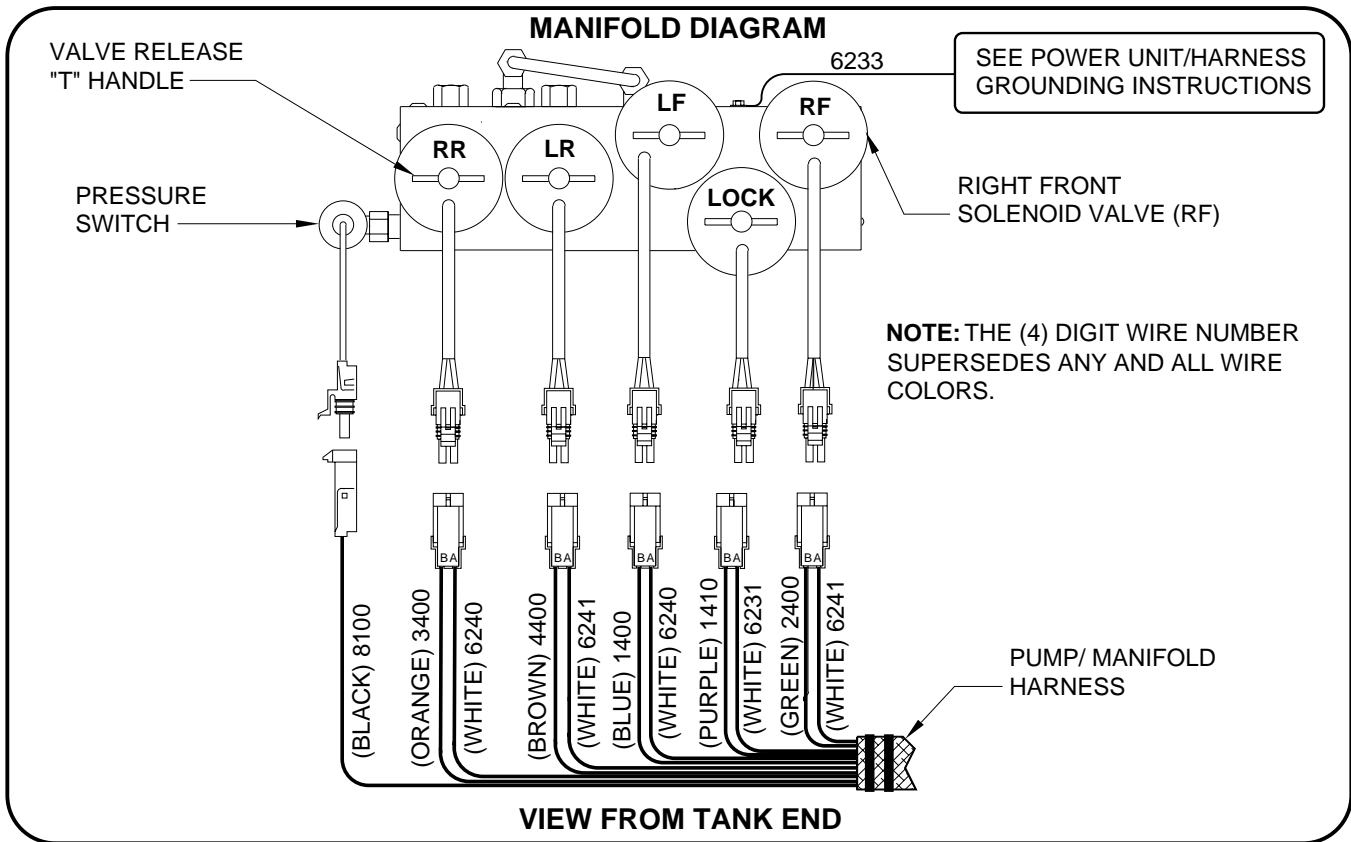
FIFTH WHEEL AND TRAVEL TRAILER



NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.



ELECTRICAL CONNECTION DIAGRAM 310 SERIES LEVELING SYSTEM HYDRAULIC MANIFOLD-PUMP RELAY FIFTH WHEEL AND TRAVEL TRAILER



POWER UNIT/HARNESS GROUNDING INSTRUCTIONS

310 SERIES LEVELING SYSTEM

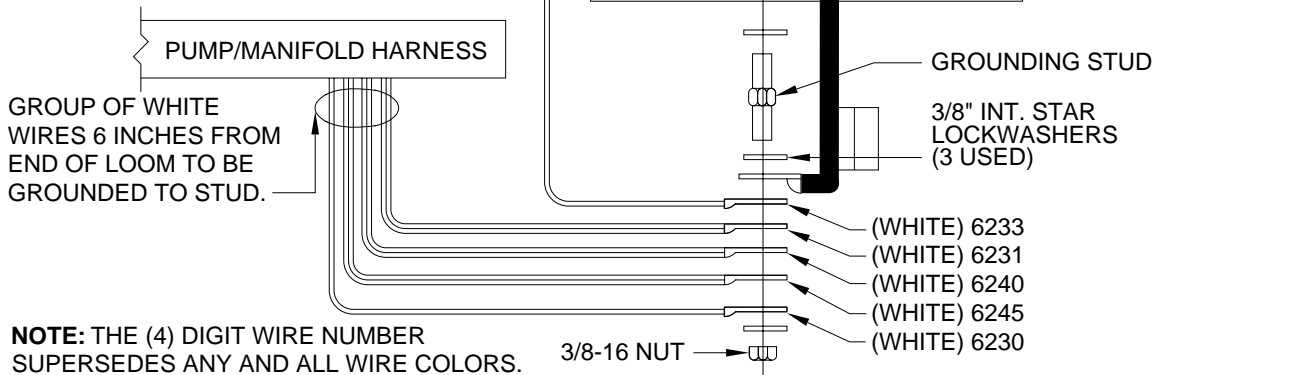
FIFTH WHEEL AND TRAVEL TRAILER

WELDED PUMP MOUNT

Use grounding stud and 3/8" internal star lockwashers as shown.

IMPORTANT: STAR LOCKWASHER MUST BE USED BETWEEN GROUNDING SURFACE AND WIRE TERMINALS

MANIFOLD GROUND
SEE HYDRAULIC MANIFOLD/
PUMP RELAY ELECTRICAL
CONNECTION DIAGRAM



PUMP MOUNTED REMOTE FROM FRAME

USE GROUNDING STUD AND 3/8" INTERNAL STAR LOCKWASHERS AS SHOWN.

IMPORTANT: STAR LOCKWASHER MUST BE USED BETWEEN GROUNDING SURFACE AND WIRE TERMINALS

NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.

