



OPERATOR'S MANUAL

HWH COMPUTER-CONTROLLED LEVELING SYSTEM 680 SERIES

SPACEMAKER ROOM EXTENSION SYSTEM

FEATURING:

TOUCH PANEL CONTROL

FOUR POINT AIR LEVELING (WITH TAG AXLE)

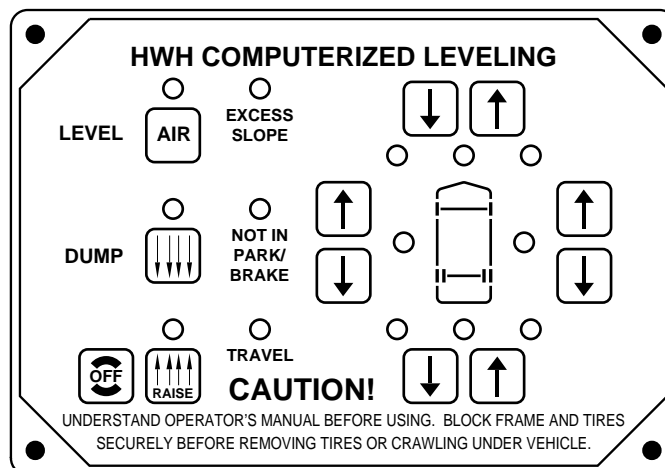
ONE "VERTICAL ARM" ROOM EXTENSION

(WITH SYNCHRONIZING CYLINDER

ROOM LOCKING MECHANISMS AND AIR SEAL)

ONE SINGLE CYLINDER ROOM EXTENSION

(WITH ROOM LOCKING MECHANISMS AND AIR SEAL)



**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>

OPERATOR'S MANUAL

HWH LEVELING SYSTEM AIR LEVELING ONLY

CAUTION !

READ THE ENTIRE OPERATOR 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 AND ROOM EXTENSION ARE BEING OPERATED.

DO NOT OPERATE LEVELING SYSTEM OR USE THE RAISE OR DUMP BUTTONS WHEN TRAVELING AT SPEEDS IN EXCESS OF 5 MPH.

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 COACH 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

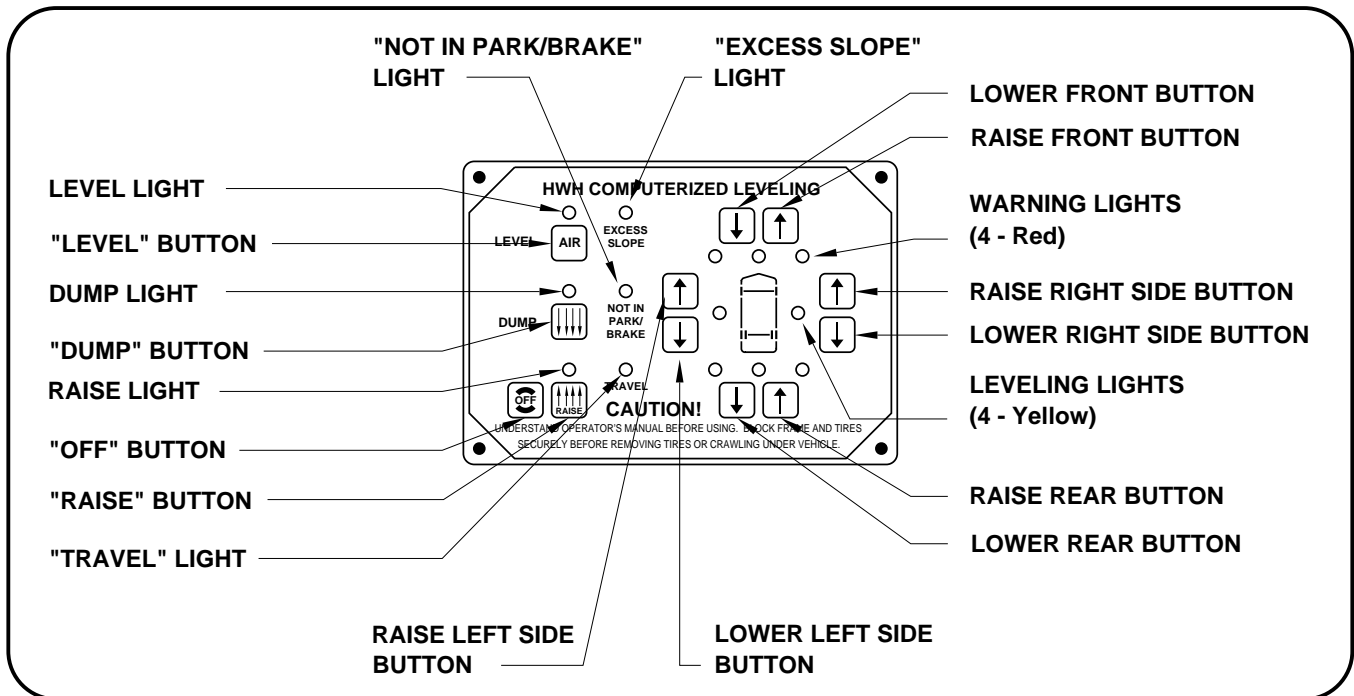
HWH CORPORATION strives to maintain the highest level of customer satisfaction. Therefore, if you discover a defect or problem, please do the following:

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

"LEVEL" BUTTON: This button is the system on button and automatic operation button.

"OFF" BUTTON: This button will turn the system OFF, but does NOT control power to the "DUMP" or "RAISE" buttons.

"RAISE" BUTTON: This button will raise the whole vehicle by adding air to the suspension system.

"DUMP" BUTTON: This button will lower the whole vehicle by exhausting air from the suspension system.

UP ARROWS (RAISE BUTTONS): These momentary buttons are used for manually operating the air leveling systems. Sides or ends of the vehicle will raise while these buttons are pushed.

DOWN ARROWS (LOWER BUTTONS): These momentary buttons are used to manually operate the air leveling systems. Sides or ends of the vehicle will lower while these buttons are pushed.

INDICATOR LIGHTS

LEVEL LIGHT: This light will be on when the system is on, and flash during automatic leveling.

DUMP LIGHT: This light will flash when the "DUMP" button is being pushed.

RAISE LIGHT: This light will flash when the "RAISE" button is being pushed.

"EXCESS SLOPE" LIGHT: This light will be on if the leveling system can NOT level the coach.

"TRAVEL" LIGHT: This light will be on if the leveling system is off and the ignition is in the "ON" position. See "PREPARATION FOR TRAVEL".

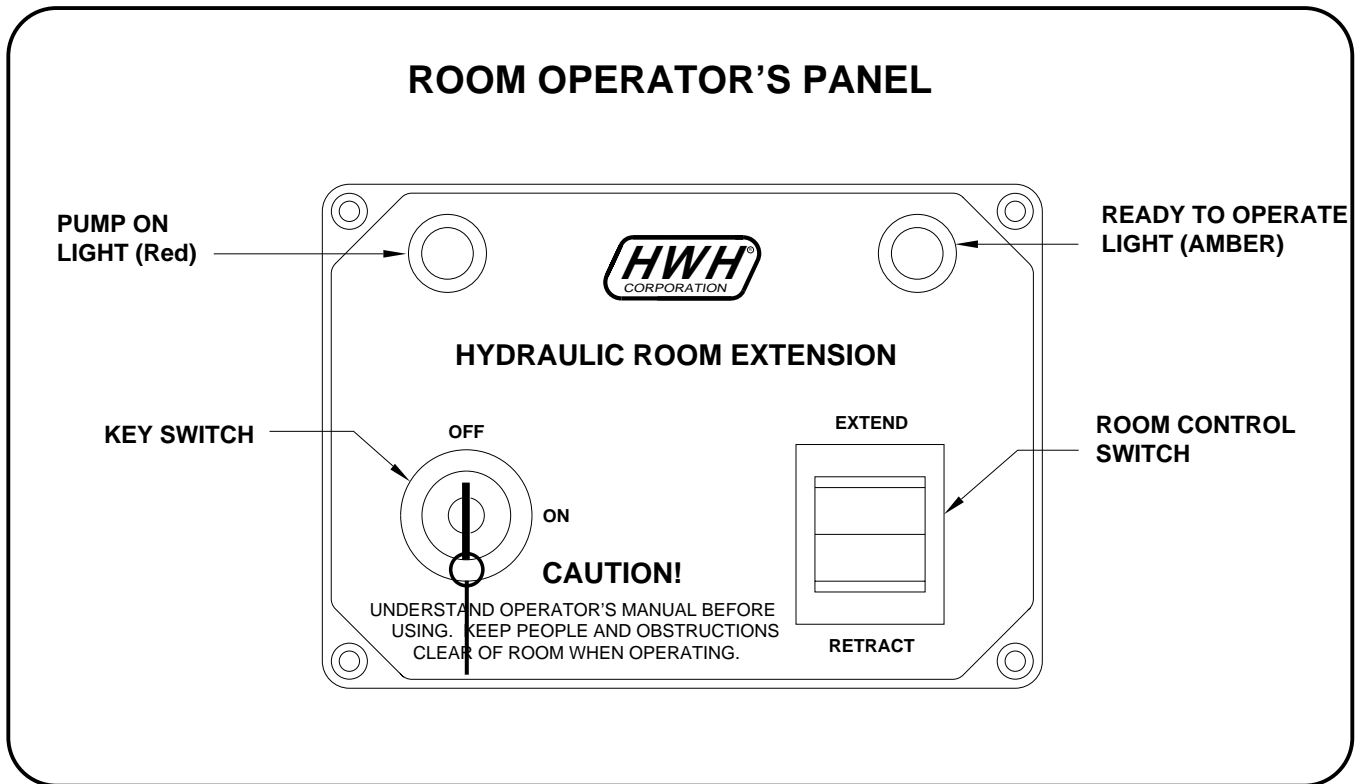
WARNING LIGHTS: These lights will function only with the ignition key in the "ON" position. They will be on if the system is on.

LEVELING LIGHTS: One or two yellow lights can be on indicating the side, end or corner of the coach is low.

"NOT IN PARK/BRAKE" LIGHT: This light will be on if the "AIR" button is pushed and the park brake is not set if the ignition switch is in the "ON" position.

MASTER WARNING LIGHTS: This light and/or buzzer will be on if the ignition is on and an air bag has low air pressure.

CONTROL IDENTIFICATION



CONTROL FUNCTIONS

KEY SWITCH: Controls power to the room extension and the READY TO OPERATE light.

ROOM CONTROL SWITCH: This is a momentary switch. Push EXTEND to extend the room. Push RETRACT to retract the room.

READY TO OPERATE LIGHT: This light indicates the room is ready to be extended or retracted.

PUMP ON LIGHT: This light will be on if the pump is running.

OPERATING PROCEDURES

GENERAL INSTRUCTIONS

Press the "OFF" button at any time to stop the operation of the system.

NOTE: If the ignition switch is "ON" the vehicle's air suspension may return to travel height.

If the ignition is in the "ON" position and the hand/auto brake is not set, the "NOT IN PARK" light will come on and the system will not operate when the "AIR" button is pressed. The "NOT IN PARK" light will remain on only while the "AIR" button is pressed.

The "DUMP" and "RAISE" buttons will function with the system and park brake off. (See "AIR DUMP AND RAISE FUNCTIONS")

The master AIR BAG warning indicators will come on if a bag has low air pressure and the ignition is "ON" or in "ACC". The system does not have to be on.

CAUTION: DO NOT MOVE THE COACH WHEN THE AIR BAG WARNING LIGHTS ARE ON.

PREPARATION FOR TRAVEL

Start the vehicle's engine and allow air pressure to build to the recommended level for traveling.

Before traveling, the red AIR BAG warning lights must be off and the "TRAVEL" light must be on.

CAUTION: IT IS THE OPERATOR'S RESPONSIBILITY TO MAKE SURE THE VEHICLE IS AT THE PROPER RIDE HEIGHT BEFORE TRAVELING.

AIR OPERATION

AUTOMATIC AIR LEVELING

1. Set the hand/auto brake in the recommended position for parking. Leave the engine running to provide air for leveling.

NOTE: If the ignition switch is not in the "ON" position, the leveling system cannot be turned on. Once the system has been turned on, the ignition key can be turned off.

2. Press the "AIR" button once to enter the air mode. The AIR indicator light and the four AIR BAG warning lights will glow steady.

3. Press the "AIR" button a second time. The AIR indicator light will start flashing and the air leveling will begin.

4. When all four yellow LEVEL SENSING lights are out the leveling is complete. The AIR indicator light will stop flashing

and turn steady red. The processor is now in a SLEEP MODE for 30 minutes. The vehicle's engine may now be turned off.

After 30 minutes the processor will recheck the vehicle level, make any corrections required, and return to the SLEEP MODE. This will continue until the system is turned off by pushing the "OFF" button or the transmission is taken out of the parking position and the park brake is released.

After 15 minutes if the system is unable to level the vehicle, one or two yellow "LEVELING SENSING" indicator lights will remain on and the "EXCESS SLOPE" light will come on. The system will remain on but will not go into the sleep mode.

MANUAL AIR LEVELING

1. Place the hand/auto brake in the recommended position for parking. The engine should be running to provide air for leveling.

2. Press the "AIR" button. The "AIR" indicator light will glow steady.

3. Individual RAISE and LOWER buttons (UP and DOWN ARROWS) will add or dump air from suspension air bags to raise or lower coach for leveling. These are momentary buttons. The function will stop when the button is released.

NOTE: The "RAISE" and "DUMP" buttons can be used at this time but the system will shut off after the button is released.

The yellow LEVEL lights indicate a side, end, or corner is low. Level the coach from side to side first. Lower the opposite side or end of the coach to achieve leveling. If a level position cannot be achieved by dumping air, raise the coach according to lit yellow "LEVEL" lights.

IMPORTANT: Always give preference to any side light before leveling the coach front to rear.

4. Turn ignition switch "OFF". Turn the system off.

OPERATING PROCEDURES

AIR OPERATION (CONTINUED) "DUMP" AND "RAISE" FUNCTIONS

The "DUMP" and "RAISE" functions are provided for operator convenience for purposes such as dumping the air suspension when parked.

Leave the engine running if the "RAISE" function is to be used. The park brake does not have to be set to use the "DUMP" or "RAISE" buttons.

IMPORTANT: If the ignition is ON and the park brake is OFF, the "DUMP" and "RAISE" features will latch in and remain on. If the vehicle exceeds 10 MPH, the "DUMP" or "RAISE" functions will automatically turn off and the system will return to the TRAVEL MODE. If the park brake is set, the "TRAVEL MODE" button must be pushed before the vehicle can return to ride height.

CAUTION: REREAD CAUTIONS ON THE FIRST PAGE OF THIS MANUAL. THE VEHICLE MAY DROP OR RAISE AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

DO NOT OPERATE THE VEHICLE UNLESS THE AIR SUSPENSION IS AT THE PROPER HEIGHT FOR TRAVEL.

The "RAISE" and "DUMP" buttons can be used at any time the network is active. The park brake does not have to be on.

If the ignition is in the "ON" position and the park brake is off, the "RAISE" or "DUMP" buttons will latch in. The vehicle will raise or lower completely and stay in that position. The vehicle can not return to ride height until the "TRAVEL MODE" button or the "EMERGENCY STOP" button is pushed or the vehicle exceeds 10 M.P.H, putting the system in the TRAVEL MODE.

If the ignition is in the "OFF" position the "RAISE" and "DUMP" buttons will not latch in. The vehicle will remain in the position it was when the button was released. The vehicle can return to ride height when the ignition is turned to "ON" if the park brake is released or the "TRAVEL MODE" button is pushed.

DO NOT operate the vehicle for extended distances unless the air suspension is at the proper height for travel. The vehicle can not return to ride height until the "EMERGENCY STOP" button is pushed or the vehicle exceeds 10 MPH, putting the system in the TRAVEL MODE.

CAUTION: IT IS THE OPERATOR'S RESPONSIBILITY TO CHECK THAT THE VEHICLE IS AT PROPER RIDE HEIGHT BEFORE TRAVELING.

TAG AXLE DUMP

The tag axle dump switch is supplied by Foretravel.

IMPORTANT: Refer to Foretravel for proper use of the Tag Dump feature.

The tag dump switch will work only with the ignition switch in the "ON" position and the leveling system panel off.

NOTE: If the Tag Dump switch is in the dump position and the Ignition key is turned on (with the leveling system panel off) the tag axle air bags will go into the dump mode.

OPERATING PROCEDURES

ROOM EXTEND PROCEDURE

IMPORTANT: it is recommended that the vehicle is level and stable before extending a room.

IMPORTANT: MAKE SURE A WINDOW OR DOOR IS OPEN BEFORE OPERATING THE ROOM.

1. The ignition key must be on and the park brake must be set for the room to be operated.

CAUTION: KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

NOTE: Make sure there is adequate clearance to fully extend the room.

2. Insert the KEY into the KEY SWITCH on the room extension operator's panel and turn it to the "ON" position. The room air seal will deflate. When the amber light is on the room can be operated.

3. To extend the room, push and hold the ROOM CONTROL SWITCH in the EXTEND position. The red "Pump On" light will come on. After the room locks have retracted, the room will start to extend. When the room is fully extended, the pump will automatically shut off. The "PUMP ON" light will turn off. DO NOT release the ROOM CONTROL SWITCH, until the "PUMP ON" light goes out.

IMPORTANT: IF EITHER SIDE OF THE ROOM STOPS MOVING, RELEASE THE ROOM CONTROL SWITCH IMMEDIATELY. DO NOT REVERSE DIRECTION OF THE ROOM UNTIL THE ROOM IS FULLY EXTENDED.

NOTE: Releasing the ROOM CONTROL SWITCH will halt the operation of the room.

4. Turn the KEY SWITCH to the "OFF" position. The room air seal will inflate. Remove the key.

5. Turn off the ignition switch.

IMPORTANT: These rooms are equipped with hydraulic room locking cylinders. The room can NOT be extended with the locks in place. DO NOT attempt to extend the room if the room locking cylinders are in the locking position.

ROOM RETRACT PROCEDURE

CAUTION: KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

IMPORTANT: MAKE SURE A WINDOW OR DOOR IS OPEN BEFORE OPERATING THE ROOM.

1. The ignition key must be on and the park brake must be set for the room to be operated.

IMPORTANT: it is recommended that the vehicle is level and stable before retracting a room.

2. Insert the KEY into the KEY SWITCH on the room extension operator's panel and turn it to the "ON" position. The room air seal will deflate. When the amber light is on the room can be operated.

3. To retract the room, push and hold the ROOM CONTROL SWITCH in the RETRACT position. The red "Pump On" light will come on. When the room is fully retracted, the room locks will extend and the pump will automatically shut off. The "Pump On" light will turn off. DO NOT release the ROOM CONTROL SWITCH, until the "PUMP ON" light goes out.

IMPORTANT: IF EITHER SIDE OF THE ROOM STOPS MOVING, RELEASE THE ROOM CONTROL SWITCH IMMEDIATELY. DO NOT REVERSE DIRECTION OF THE ROOM UNTIL THE ROOM IS FULLY RETRACTED.

NOTE: Releasing the ROOM CONTROL SWITCH will halt the operation of the room and locks. It will take time for the locks to fully engage after the room is retracted.

4. Turn the KEY SWITCH to the "OFF" position. The room air seal will inflate. Remove the key.

CAUTION: IT IS THE OPERATOR'S RESPONSIBILITY TO MAKE SURE ROOMS ARE FULLY RETRACTED BEFORE MOVING THE VEHICLE.

IN THE EVENT OF THE FAILURE OF THE ROOM TO RETRACT, CONTACT HWH CORPORATION CUSTOMER SERVICE AT 1-800-321-3494 FOR ASSISTANCE.

OPERATING PROCEDURES

FORETRAVEL ROOM EXTENSION SEQUENCE ROOM EXTEND SEQUENCE

IMPORTANT: MAKE SURE A WINDOW OR DOOR IS OPEN BEFORE EXTENDING THE ROOM.

1. Ignition key must be in the "ON" position.
 2. Park brake must be set.
 3. Turn the room extension control panel key to "ON".
 4. Any time the room extension key and ignition key is on, there is a +12 signal to the air seal valve. The valve will open and the air will exhaust from the seal.
 5. After a 40 second delay, a ground signal will turn the amber indicator light on the room extension panel on. The room extension will not operate until the light is on.
 6. Push the Room Extension Control Switch to "EXTEND". This will send a +12 signal for the pump relay and the room extension solenoid valves from the control box. A +12 signal turns the room control panel red pump on light ON when the pump is running.
- NOTE:** The room control switch must be held in the "EXTEND" position during the extend sequence. If the room control switch is released before the sequence is complete, the sequence will start over from Step 6 when the switch is pushed to extend again.
7. A +12 signal will open the room unlock valve. This valve will stay open during the complete extend sequence.
 8. When the room lock pins are fully retracted, the room unlock limit switch arrangement will send a ground signal to the control box. The manifold pressure switch will send a ground signal to the control box when pump pressure reaches 3000 psi. The sequence will not continue until both signals are received by the control box.

NOTE: The room and lock limit switches are not connected directly to the control box. The individual switches are connected to a central limit switch indicator box for each room. When the appropriate limit switches complete a +12 circuit for the limit switch box, the limit switch box supplies a ground signal to the control box so the sequence can continue.

9. When both the room unlock limit switches and the manifold pressure switch signals are received by the control box, a +12 signal will open the room extend solenoid valve.
 10. When the room is fully extended, the room out limit switch arrangement sends a ground signal to the control box. The manifold pressure switch sends a ground signal to the control box when the pump pressure reaches 3000 psi. The sequence will continue when both signals are received by the control box.
 11. When both the room out limit switches and the manifold pressure switch signals are received by the control box, the +12 signal to the room extend valve is turned off. The extend sequence is finished and the pump will shut off. The room control switch may be released.
 12. The red pump on light will go out.
- NOTE:** The unlock valve will stay open for 10 seconds after the pump shuts off, even if the room control switch is released.
13. The air seal will inflate when the room control key switch is turned off or if the ignition switch is turned off. The amber light on the room control panel will go out.

OPERATING PROCEDURES

FORETRAVEL ROOM EXTENSION SEQUENCE ROOM RETRACT SEQUENCE

IMPORTANT: MAKE SURE A WINDOW OR DOOR IS OPEN BEFORE RETRACTING THE ROOM.

1. Ignition key must be in the "ON" position.
2. Park brake must be set.
3. Turn the room extension control panel key to "ON".
4. Any time the room extension key and ignition key is on, there is a +12 signal to the air seal valve. The valve will open and the air will exhaust from the seal.
5. After a 40 second delay, a ground signal will turn the amber indicator light on the room extension panel on. The room extension will not operate until the light is on.
6. Push the Room Extension Control Switch to "RETRACT". This will send a +12 signal for the pump relay and the room extension solenoid valves from the control box. A +12 signal turns the room control panel red pump on light ON when the pump is running.

NOTE: The room control switch must be held in the "RETRACT" position during the retract sequence. If the room control switch is released before the sequence is complete, the sequence will start over from Step 6 when the switch is pushed to retract again.

7. A +12 signal will open the room unlock valve. This valve will stay open during the complete retract sequence.

NOTE: Even though the room does not lock in the extended position, the system checks to make sure the locks are fully retracted before proceeding.

8. When the room lock pins are fully retracted, the room unlock limit switch arrangement will send a ground signal to the control box. The manifold pressure switch will send a ground signal to the control box when pump pressure reaches 3000 psi. The sequence will not continue until both signals are received by the control box.

NOTE: The room and lock limit switches are not connected directly to the control box. The individual switches are connected to a central limit switch indicator box for each room. When the appropriate limit switches complete a +12 circuit for the limit switch box, the limit switch box supplies a ground signal to the control box so the sequence can continue.

9. When both the room lock limit switches and the manifold pressure switch signals are received by the control box, a +12 signal will open the room retract solenoid valve.

10. When the room is fully retracted, the room in limit switch arrangement sends a ground signal to the control box. The manifold pressure switch sends a ground signal to the control box when the pump pressure reaches 3000 psi. The sequence will continue when both signals are received by the control box.

11. When both the room in limit switches and the manifold pressure switch signals are received by the control box, the +12 signal to the room unlock valve is turned off and the unlock valve closes.

12. A +12 signal opens the room lock valve.

13. When the room lock pins are fully extended, the room lock limit switch arrangement sends a ground signal to the control box. The manifold pressure switch sends a ground signal to the control box when pump pressure reaches 3000 psi.

14. When both the room lock limit switches and the manifold pressure switch signals are received by the control box, the pump will shut off. The red pump on light will shut off and the sequence is complete. The room control switch may be released.

15. The air seal will inflate when the room control key switch is turned off or if the ignition switch is turned off. The amber light on the room control panel will go out.

MAINTENANCE

OPERATIONAL CHECK

Review the operator's manual and check that all functions and lights work correctly.

"NOT IN PARK/BRAKE" Check: Set hand/auto park brake. Set the transmission in the recommended position for parking the vehicle. Turn the ignition on. Push the "AIR" button on the touch panel. Release the hand/auto park brake.

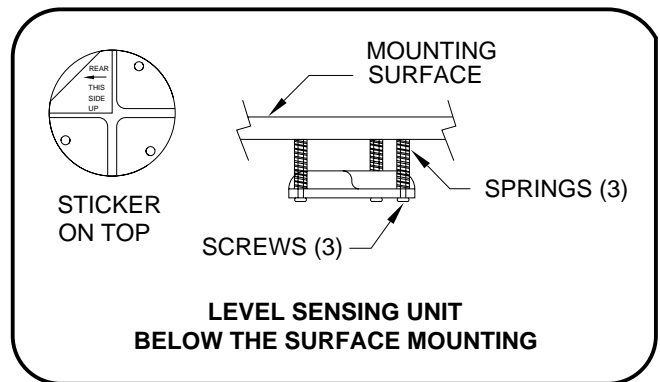
CAUTION: THE VEHICLE MAY MOVE FORWARD OR BACKWARD WHEN THE PARK IS RELEASED.

Check that the "NOT IN PARK/BRAKE" light comes ON. Reapply the park brake. The "NOT IN PARK/BRAKE" light should go out.

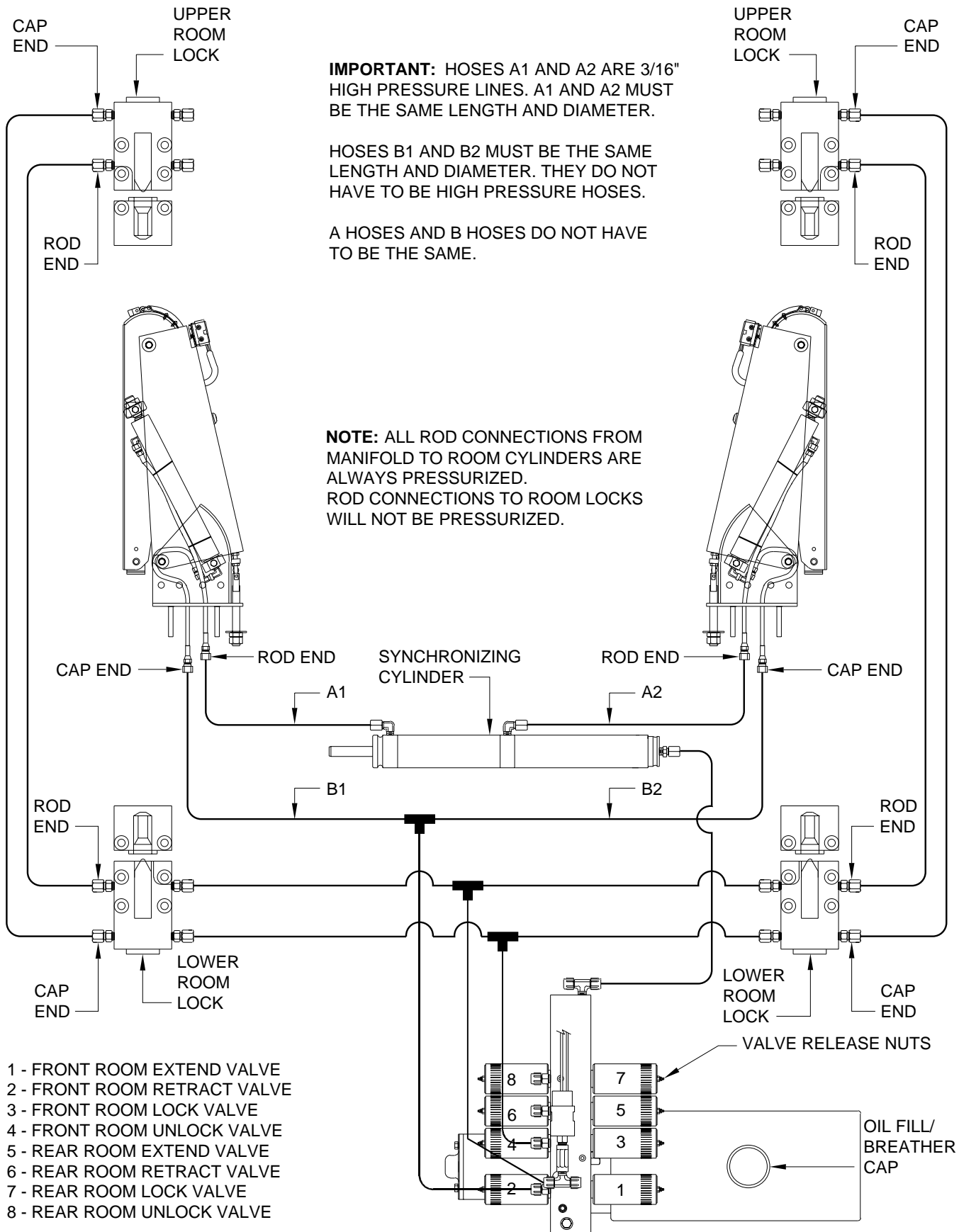
NOTE : IF ANY CHECKS REVEAL ANY PROBLEMS OR IF THERE ARE OTHER PROBLEMS OR QUESTIONS, CONSULT A QUALIFIED RV REPAIR CENTER, YOUR VEHICLE OR COACH MANUFACTURER OR HWH CORPORATION FOR SERVICE OR ASSISTANCE.

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.



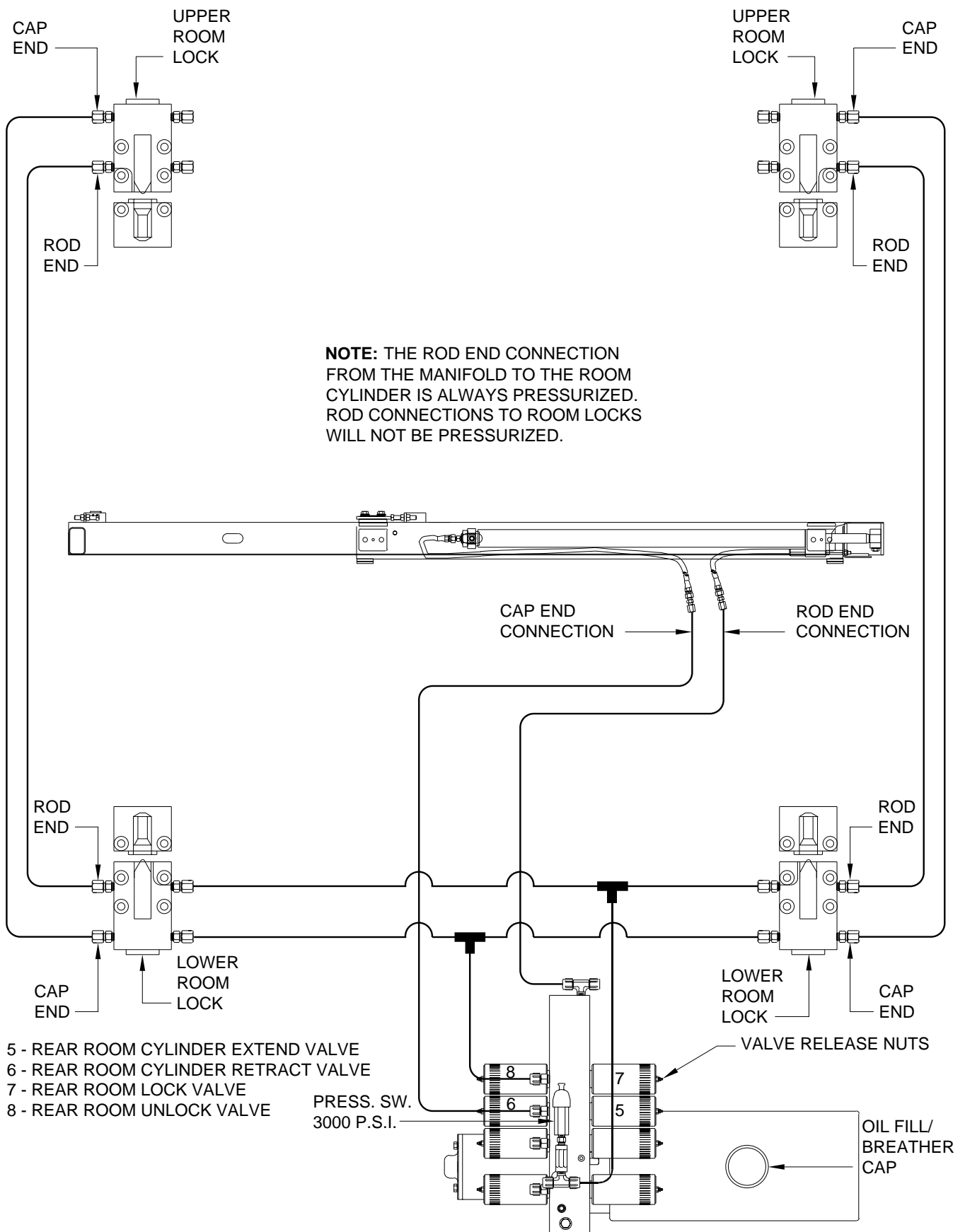
HYDRAULIC LINE CONNECTION DIAGRAM FRONT VERTICAL ARM ROOM EXTENSION - 4 ROOM LOCKS (WITH SYNCHRONIZING CYLINDER)



- 1 - FRONT ROOM EXTEND VALVE
- 2 - FRONT ROOM RETRACT VALVE
- 3 - FRONT ROOM LOCK VALVE
- 4 - FRONT ROOM UNLOCK VALVE
- 5 - REAR ROOM EXTEND VALVE
- 6 - REAR ROOM RETRACT VALVE
- 7 - REAR ROOM LOCK VALVE
- 8 - REAR ROOM UNLOCK VALVE

HYDRAULIC LINE CONNECTION DIAGRAM

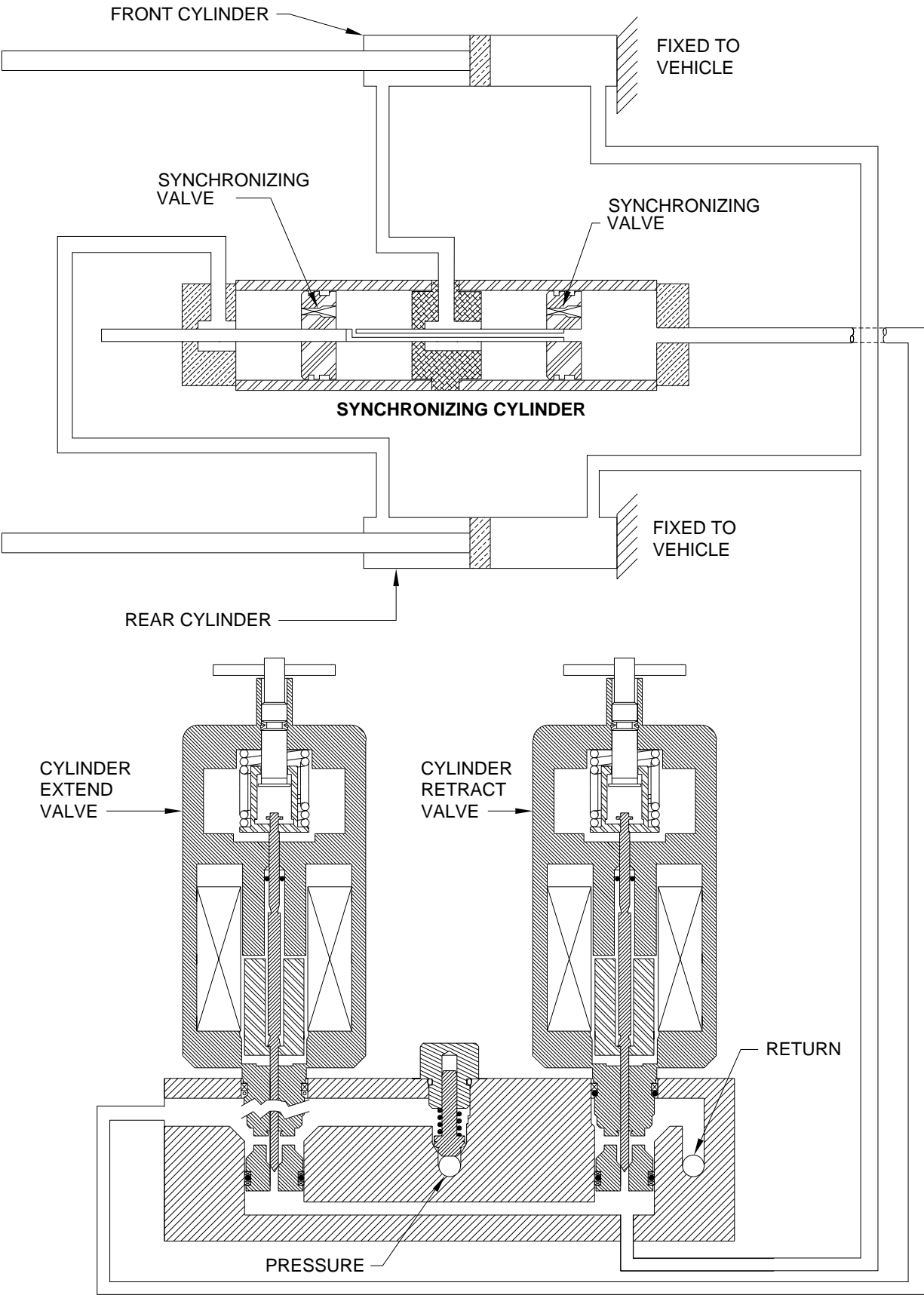
REAR SINGLE CYLINDER "GUIDED" ROOM EXTENSION - 4 ROOM LOCKS BEDROOM SLIDE



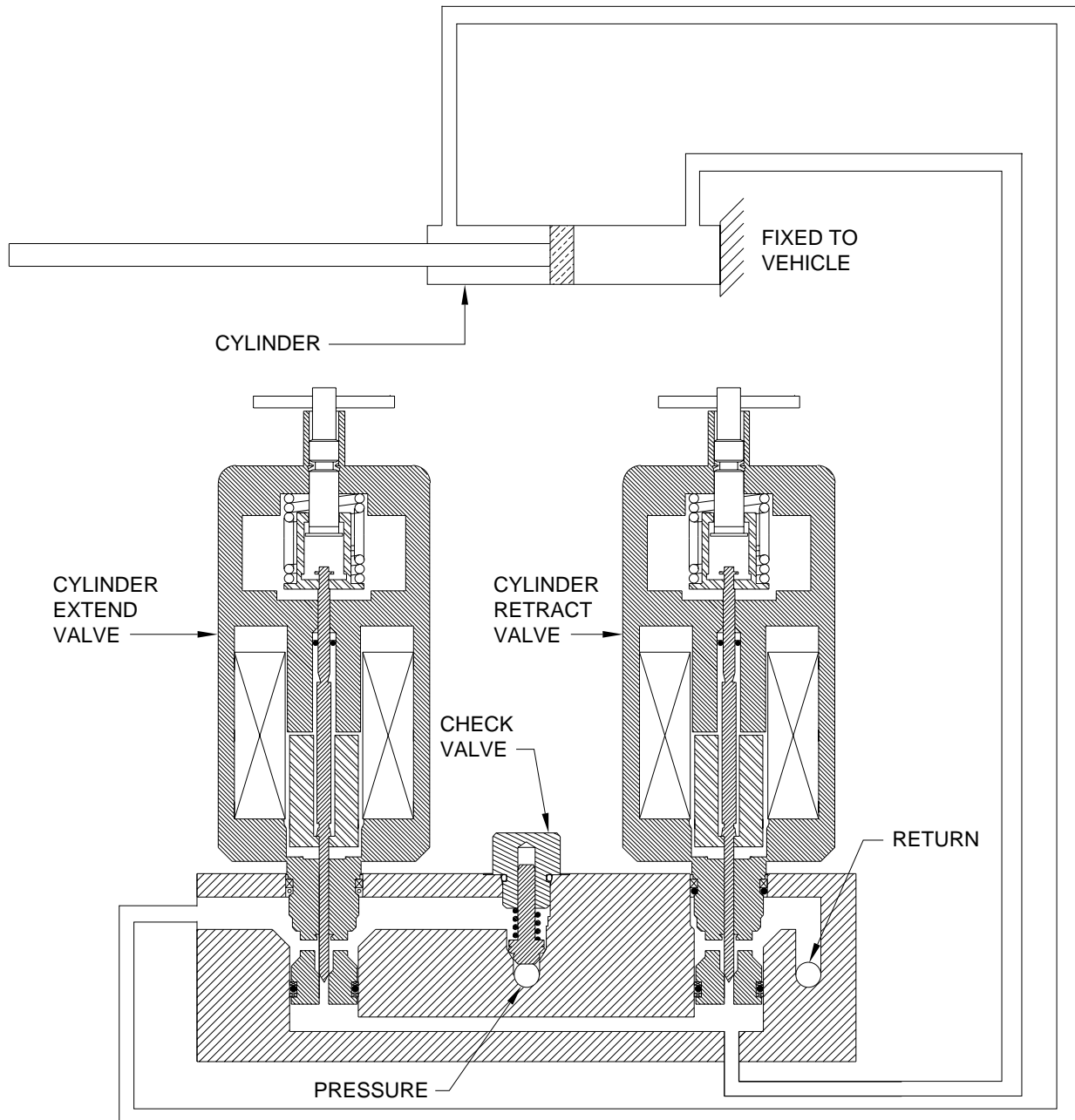
CYLINDER EXTEND - ROOM EXTEND
CYLINDER RETRACT - ROOM RETRACT

MP65.942P
29APR02

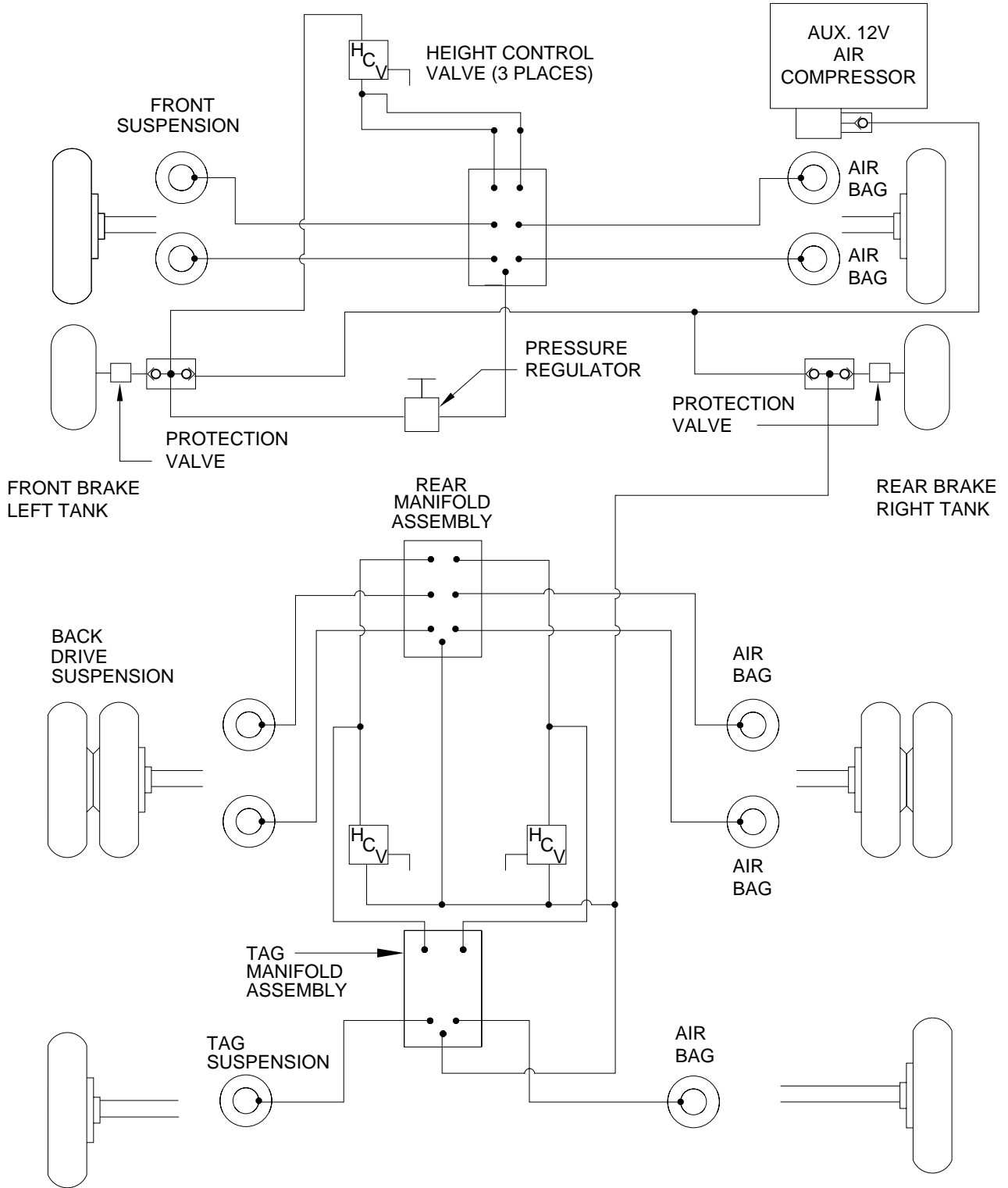
**HYDRAULIC FLOW DIAGRAM
VERTICAL ARM OR DUAL CYLINDER ROOM EXTENSION
WITH SYNCHRONIZING CYLINDER
STATIONARY POSITION**



HYDRAULIC FLOW DIAGRAM SINGLE CYLINDER ROOM EXTENSION STATIONARY POSITION



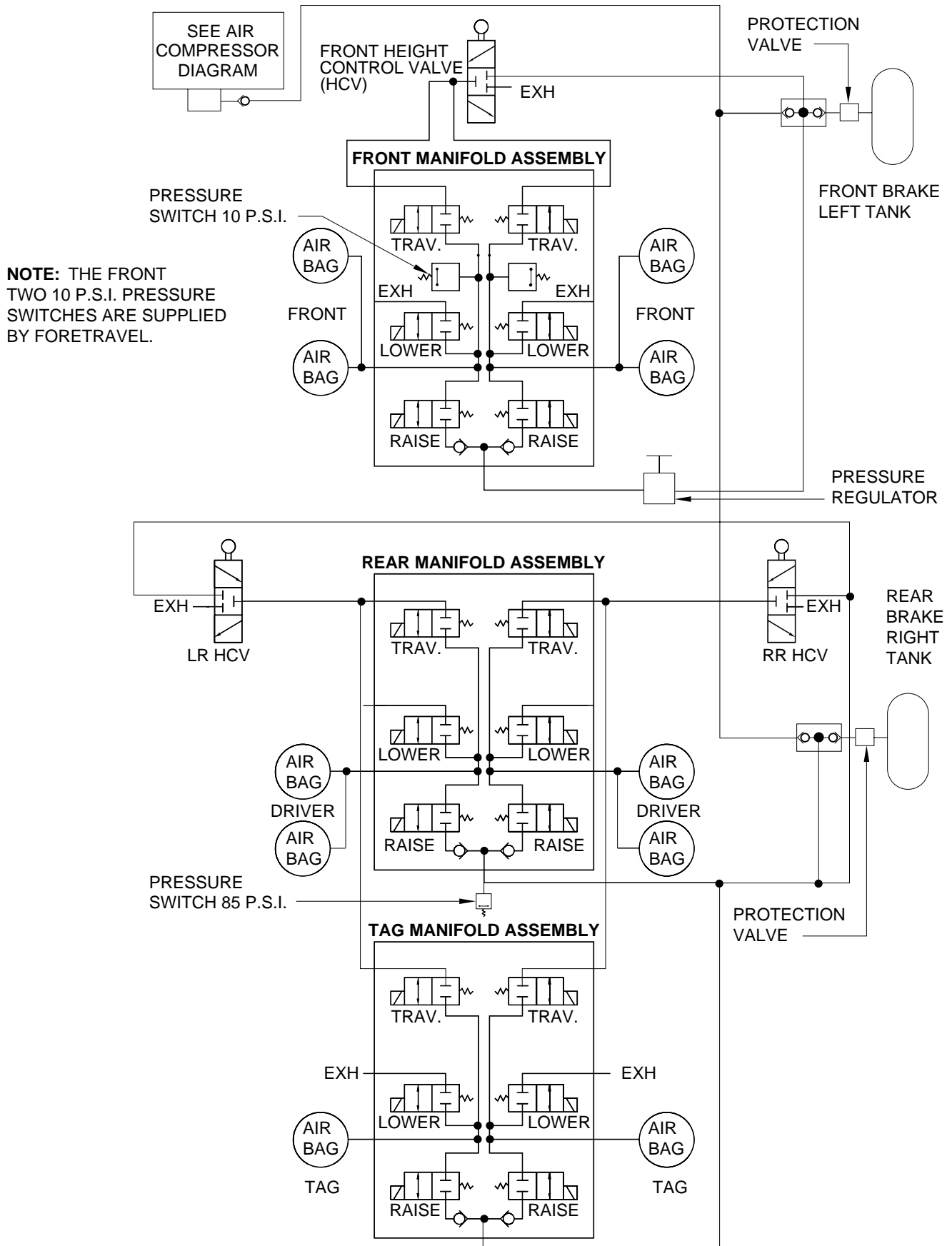
AIR LINE CONNECTION DIAGRAM FORETRAVEL WITH TAG AXLE



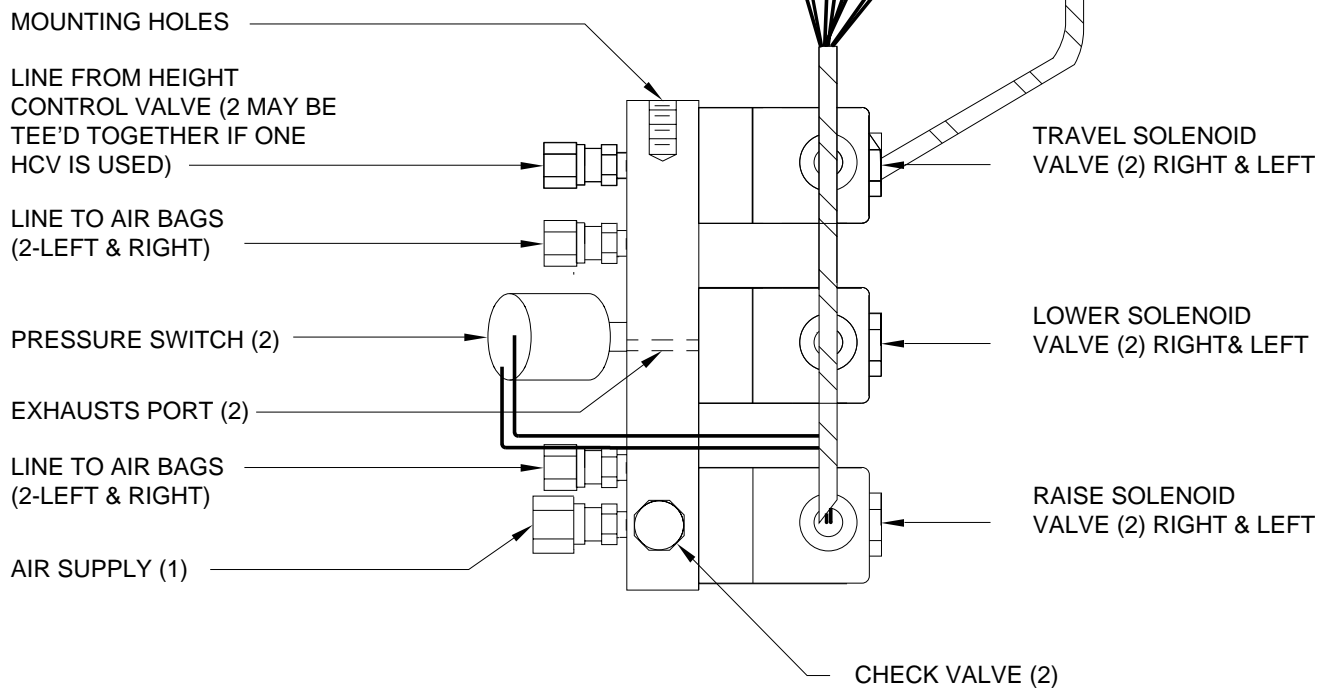
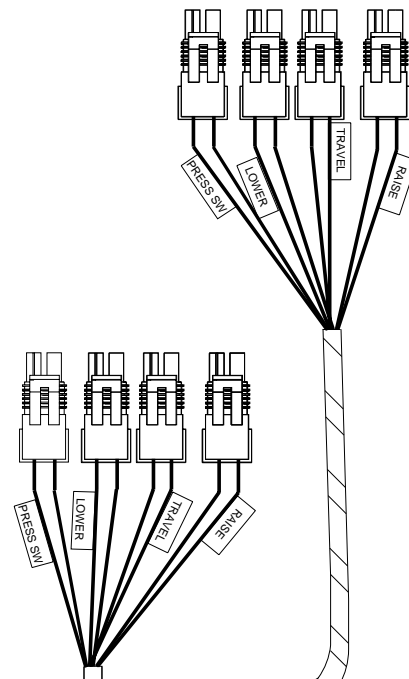
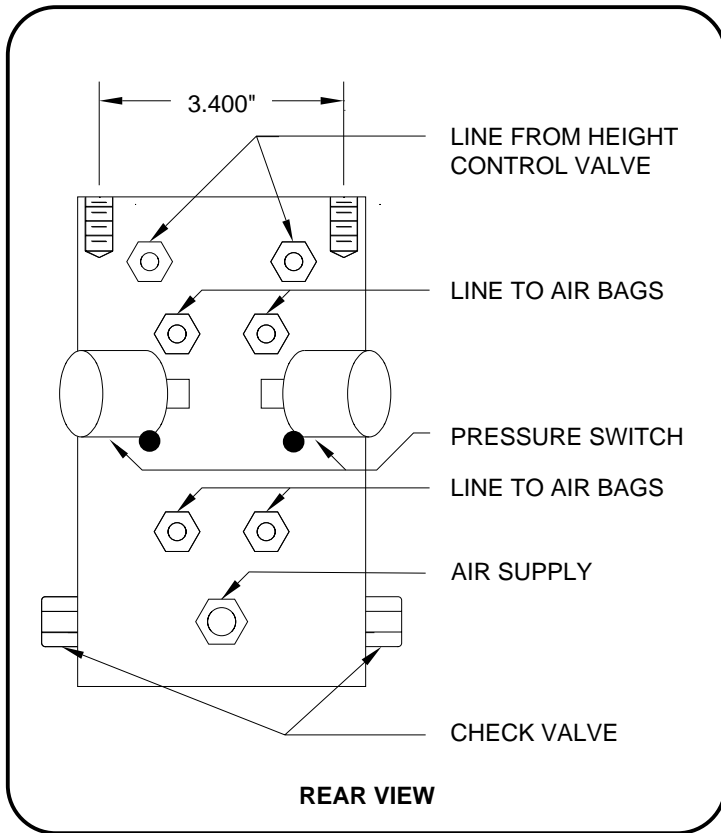
AIR LEVEL SCHEMATIC - FORETRAVEL

4 - POINT LEVELING WITH TAG AXLE

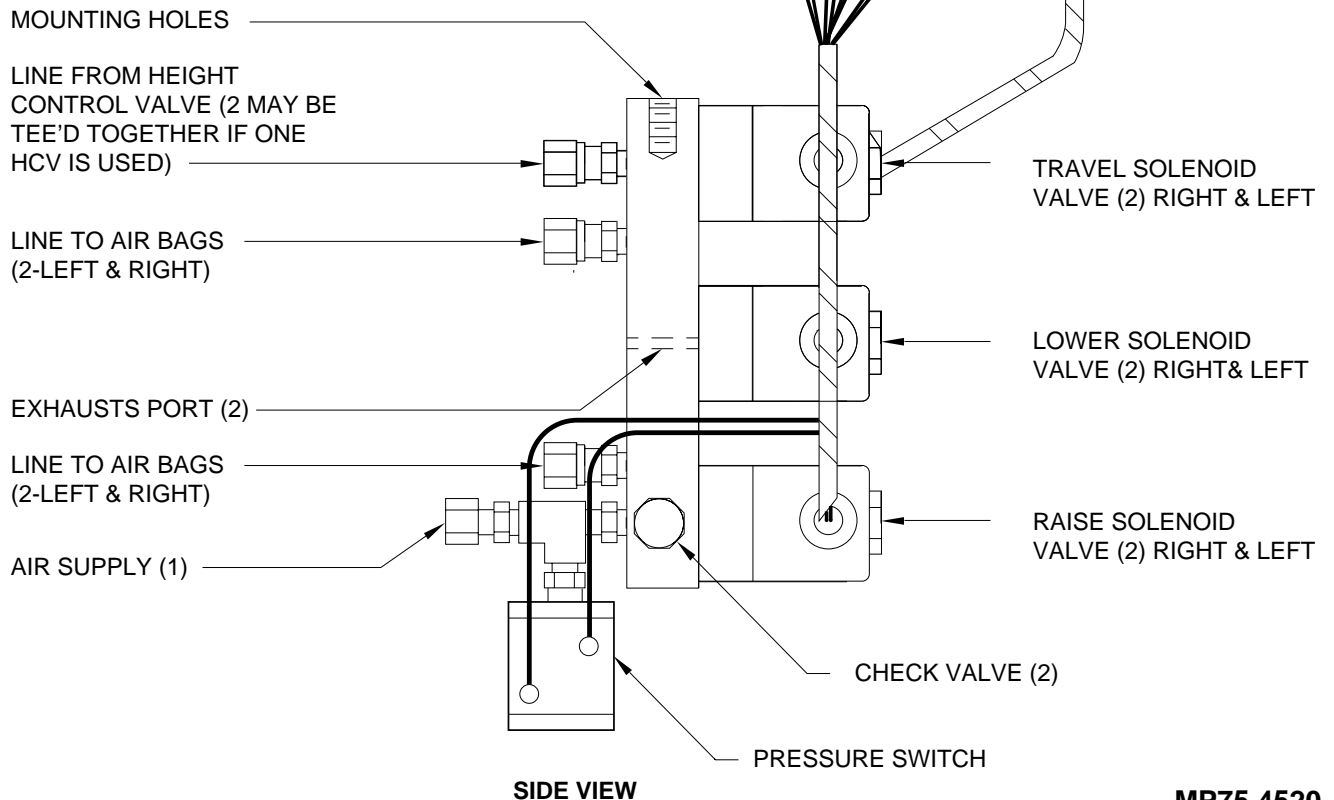
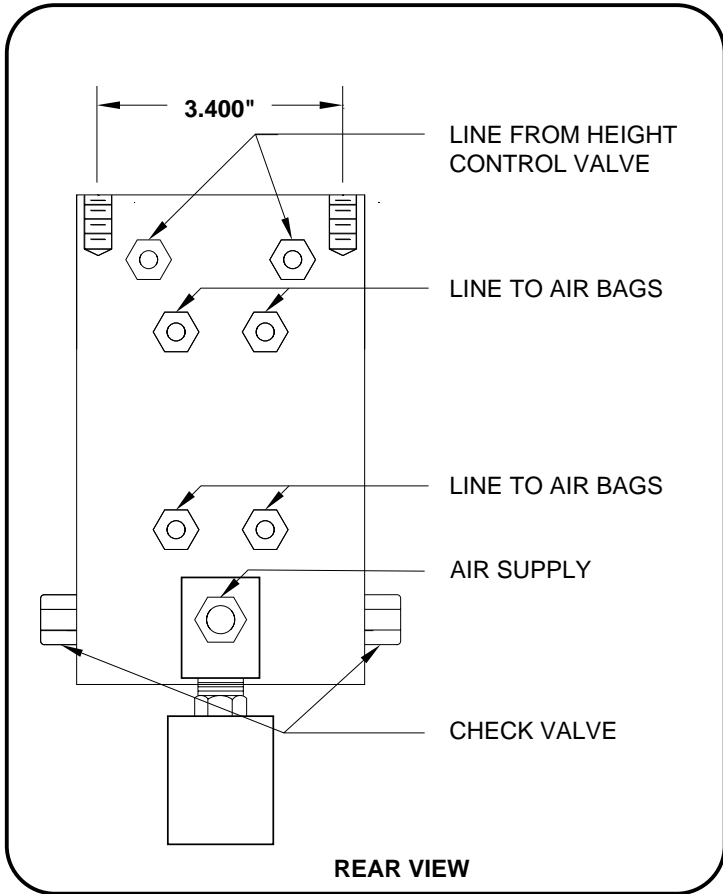
PRESSURE SWITCHES FRONT AND DRIVE AXLE



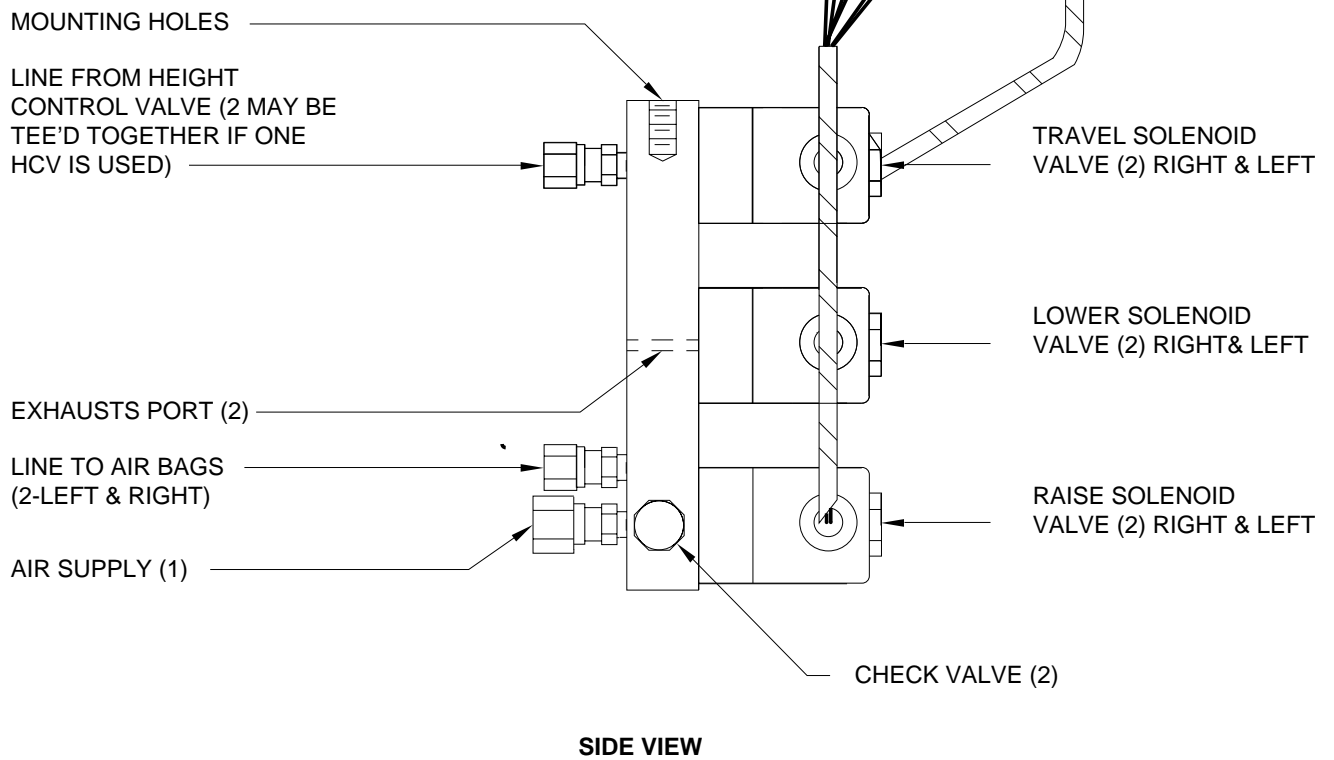
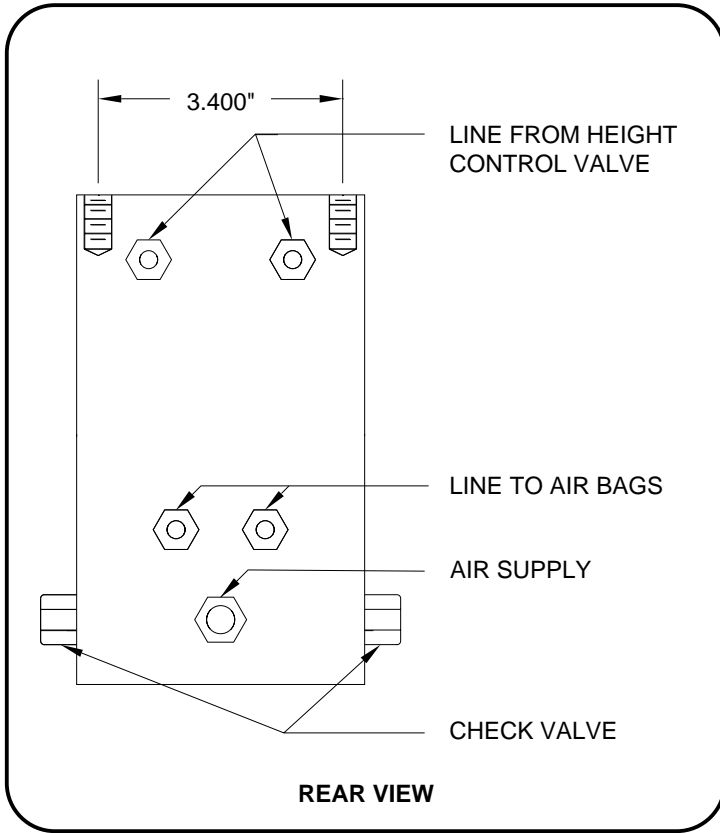
AIR SOLENOID MANIFOLD 6 VALVE WITH TWO PRESSURE SWITCHES



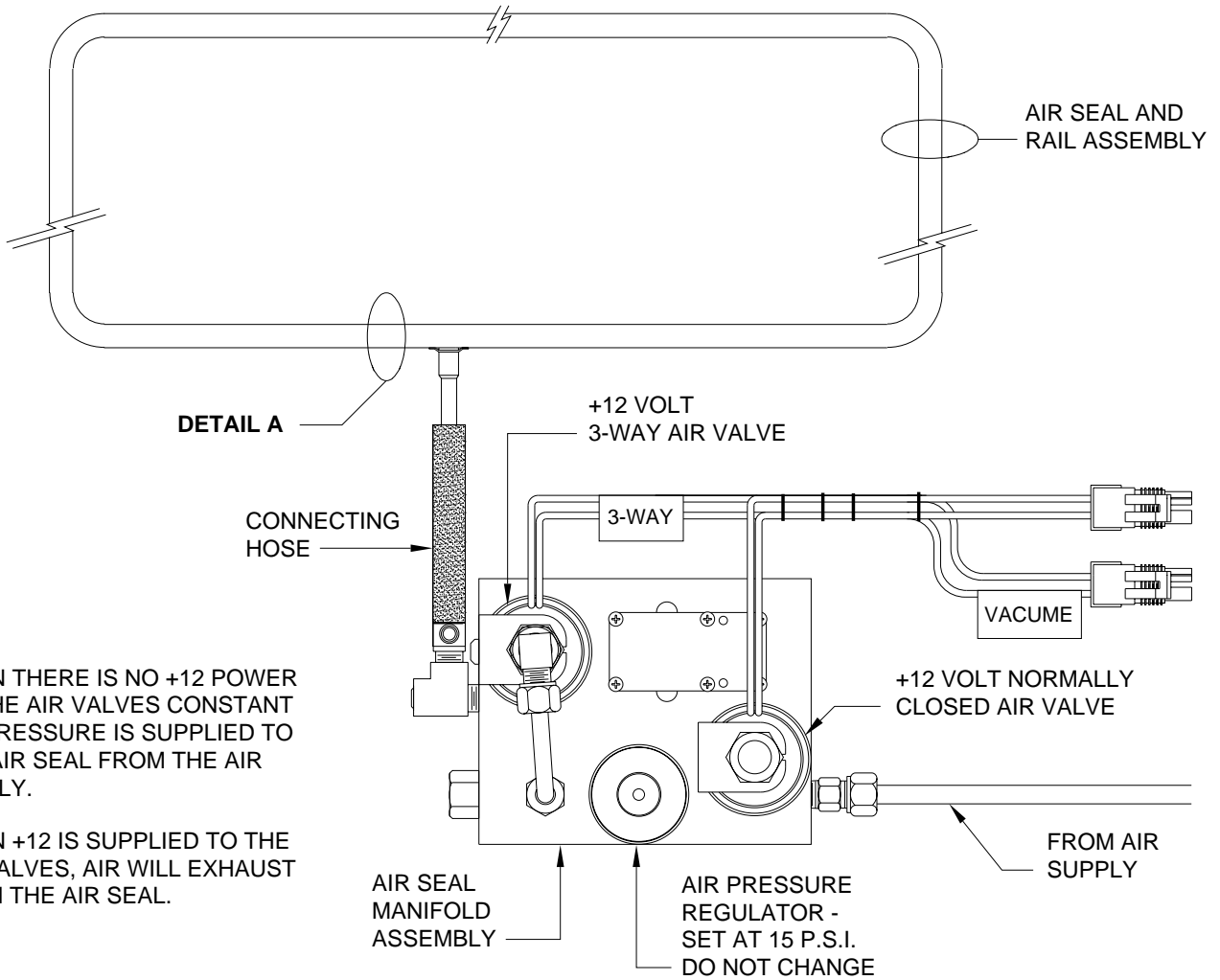
AIR SOLENOID MANIFOLD 6 VALVE WITH ONE PRESSURE SWITCH



AIR SOLENOID MANIFOLD 6 VALVE

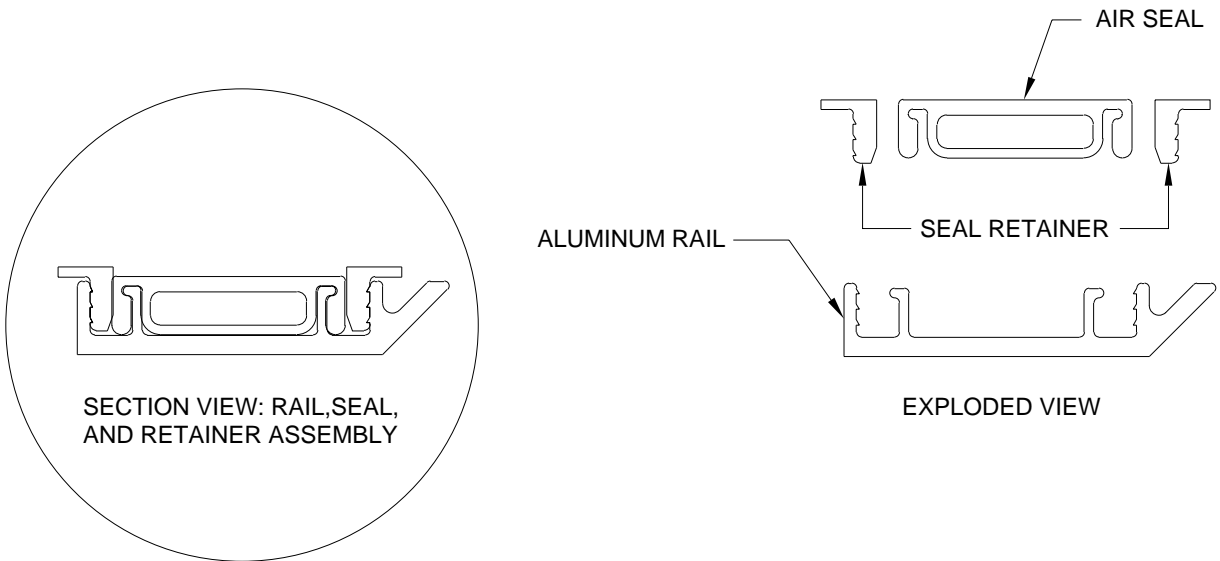


AIR SEAL CONNECTION DIAGRAM



WHEN THERE IS NO +12 POWER TO THE AIR VALVES CONSTANT AIR PRESSURE IS SUPPLIED TO THE AIR SEAL FROM THE AIR SUPPLY.

WHEN +12 IS SUPPLIED TO THE AIR VALVES, AIR WILL EXHAUST FROM THE AIR SEAL.



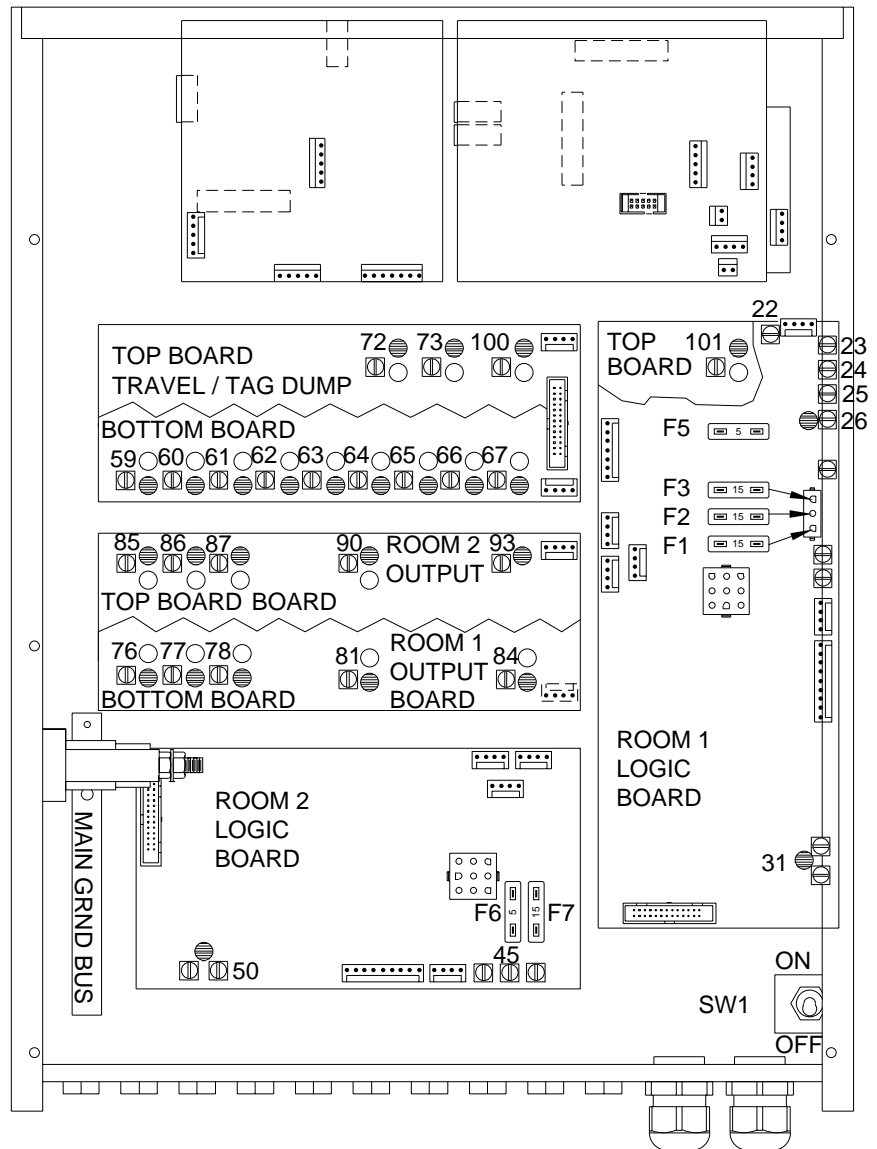
DETAIL A

CONTROL BOX CONNECTION DIAGRAM

NOTE: YELLOW LED'S "○" INDICATE ENERGIZED COIL ON OUTPUT RELAYS. RED LED'S "●" INDICATE OUTPUT FROM OUTPUT RELAYS THROUGH FUSE. SINGLE RED LED'S INDICATE EITHER ACTIVE OUTPUT OR INPUT.

<u>TERMINAL NUMBER</u>	<u>FUSE VALUE</u>	<u>DESCRIPTION</u>
22	N.A.	SPEED SWITCH
23	N.A.	LF PSW INPUT
24	N.A.	REAR PSW INPUT
25	N.A.	RF PSW INPUT
26&45	5A	PUMP OUTPUT
31&50	N.A.	PSW INPUT
59	5A	LF LOWER SOL.
60	5A	LF RAISE SOL.
61	5A	RR RAISE SOL.
62	5A	LR RAISE SOL.
63	5A	LR LOWER SOL.
64	5A	RR LOWER SOL.
65	5A	AIR COMP CONTRL.
66	5A	RF LOWER SOL.
67	5A	RF RAISE SOL.
72	5A	LR TAG LOWER
73	5A	RR TAG LOWER
76	10A	UNLOCK SOL.
77	10A	EXTEND SOL.
78	10A	RETRACT SOL.
81	10A	LOCK SOL.
84	5A	AIR SEAL
85	10A	UNLOCK SOL.
86	10A	EXTEND SOL.
87	10A	RETRACT SOL.
90	10A	LOCK SOL.
93	5A	AIR SEAL
100	N.A.	TAG TRAVEL
101	7.5A	TRAVEL SOL.

TOP VIEW



FUSE DESIGNATION

- F1 - ACCESSORY (IGN) (15A) ROOM 1
- F2 - IGNITION (15A)
- F3 - BATTERY (15A)
- F5 - PUMP RELAY (5A) ROOM 1
- F6 - PUMP RELAY (5A) ROOM 2
- F7 - ACCESSORY (IGN) (15A) ROOM 2

NOTE: SW1 IS SET TO OFF POSITION TO ENABLE NEUTRAL HOLD FUNCTION.

CONTROL BOX CONNECTION DIAGRAM

AIR LEVELING

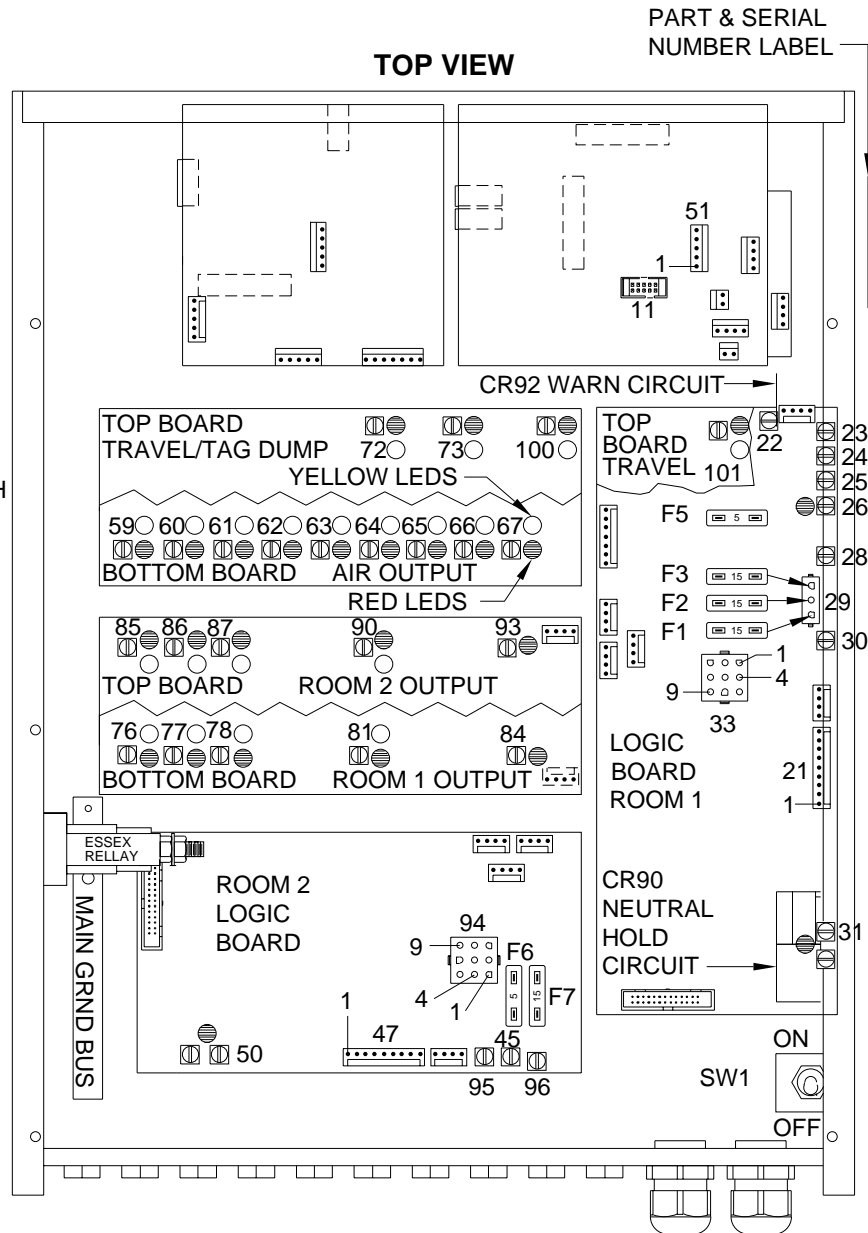
(WITH TWO ROOM EXTENSIONS AND TAG DUMP)

PAGE 1 OF 3

WARNING/PRESSURE SWITCH PIN DESIGNATION

- 11 - TOUCH PANEL INTERFACE CABLE
- 21 - ROOM 1 LIMIT SWITCH HARNESS
 - PIN 1 NOT USED
 - PIN 2 NOT USED
 - PIN 3 NOT USED
 - PIN 4 LOCK EXT - (BLACK) 5758
 - PIN 5 ROOM IN - (BLACK) 5752
 - PIN 6 ROOM OUT - (BLACK) 5750
 - PIN 7 NOT USED
 - PIN 8 LOCK RET - (BLACK) 5754
 - PIN 9 GROUND - (WHITE) 6230
- 22 - SPEED SWITCH - 9900
- 23 - LF PRESSURE SWITCH - 1210
- 24 - REAR PRESSURE SWITCH - 3215
- 25 - RF PRESSURE SWITCH - 2210
- 26 & 45 - HYD. PUMP CONTROL - 8600
- 28 & 95 - PARK BRAKE INPUT - 9000
- 29 - POWER HARNESS
- 30 & 96- +12 OUTPUT FOR LIMIT SWITCH INDICATOR BOX - 6120
- 31 & 50 - SYS. PRESS. SW. INPUT - 8100
- 33 - ROOM 1 CONTROL PANEL
 - PIN 1 - +12 IGNITION - 6125
 - PIN 2 - PUMP ON LIGHT - 7530
 - PIN 5 - READY TO OP. LIGHT - 7610
- 47 - ROOM 2 LIMIT SWITCH HARNESS
 - PIN 1 - NOT USED
 - PIN 2 - NOT USED
 - PIN 3 - NOT USED
 - PIN 4 - LOCK EXTEND - 5758
 - PIN 5 - ROOM IN - 5752
 - PIN 6 - ROOM OUT - 5750
 - PIN 7 - NOT USED
 - PIN 8 - LOCK RETRACT - 5754
 - PIN 9 - GROUND - 6230
- 51 - SENSING UNIT
 - PIN 1 - RED (REAR)
 - PIN 2 - GREEN (RIGHT SIDE)
 - PIN 3 - BLACK (FRONT)
 - PIN 4 - YELLOW (LEFT SIDE)
 - PIN 5 - WHITE (GROUND)
- 94 - ROOM 2 CONTROL PANEL
 - PIN 1 - +12 IGNITION - 6125
 - PIN 3 - PUMP ON LIGHT - 7530
 - PIN 5 - READY TO OP. LIGHT - 7610

NOTE: YELLOW LED'S "○" INDICATE ENERGIZED COIL ON OUTPUT RELAYS. RED LED'S "●" INDICATE OUTPUT FROM OUTPUT RELAYS THROUGH FUSE. SINGLE RED LED'S INDICATE EITHER ACTIVE OUTPUT OR INPUT.



FUSE DESIGNATION

- F1 - SW. IGNITION (15A) ROOM 1
- F2 - IGNITION (15A) +24V
- F3 - BATTERY (15A) +12V
- F5 - PUMP RELAY (5A) ROOM 1
- F6 - PUMP RELAY (5A) ROOM 2
- F7 - SW. IGNITION (15A) ROOM 2

NOTE: SW1 IS SET TO OFF POSITION TO ENABLE NEUTRAL HOLD FUNCTION.

CONTROL BOX CONNECTION DIAGRAM

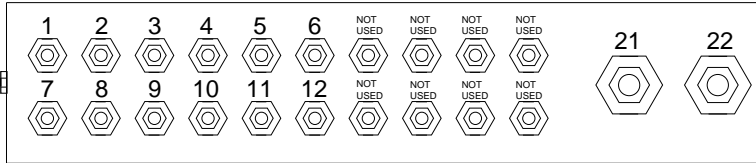
AIR LEVELING

(WITH TWO ROOM EXTENSIONS AND TAG AXLE)

PAGE 2 OF 3

ENTRY POINT

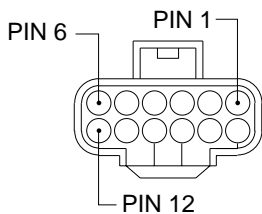
GROUND STUD FOR FRONT AND REAR AIR HARNESS ONLY →



NOTE: THE FOUR DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.

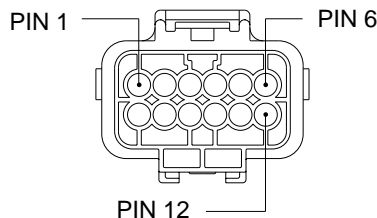
		ENTRY POINT	TERMINAL CONNECTOR NUMBER	FUSE
FRONT AIR LEVEL HARNESS	LF RAISE SOLENOID - (GREEN) 1500	22	60	5A
	LF LOWER SOLENOID - (RED) 1600	22	59	5A
	LF PRESSURE SWITCH - (BLACK) 1210	22	23	N.A.
	TRAVEL - (GRAY) 1700	22	75	7.5A
	RF PRESSURE SWITCH - (ORANGE) 2210	22	25	N.A.
	RF LOWER - (BLUE) 2600	22	66	5A
	RF RAISE - (YELLOW) 2500	22	67	5A
	COMPRESSOR CONTROL - (BROWN) 9700	22	65	5A
	SPEED SWITCH - (RED) 9900	22	22	N.A.
REAR AND TAG AIR LEVEL HARNESS	SYSTEM AIR PRESSURE SWITCH - (YELLOW) 3215	21	24	NA
	RR RAISE - (ORANGE) 3500	21	61	5A
	LR RAISE - (GREEN) 4500	21	62	5A
	LR LOWER - (PURPLE) 4600	21	63	5A
	RR LOWER - (BROWN) 3600	21	64	5A
	LR TAG LOWER - (PURPLE) 4601	21	72	5A
	RR TAG LOWER - (BROWN) 3601	21	73	5A
	TAG TRAVEL - (GRAY) 3701	21	100	NA
	TRAVEL - (GRAY) 3700	21	101	7.5A
	TAG LIFT - (RED) 3800	21	POS 86 OF CR91	NA
TAG DUMP SWITCH HARNESS	+12 FOR TAG DUMP SWITCH - 1700	21	101	7.5A
	TAG DUMP - 3800	21	POS 86 OF CR91	NA
	TAG TRAVEL - 3701	21	100	NA

FRONT AIR HARNESS CONNECTOR (ENTRY POINT 22)



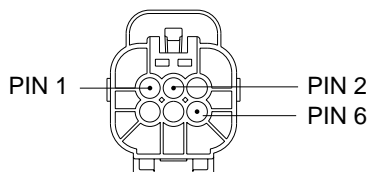
- PIN 1 - COMPRESSOR - (BROWN) 9700
- PIN 2 - LF RAISE - (GREEN) 1500
- PIN 3 - LF LOWER - (RED) 1600
- PIN 4 - TRAVEL - (GRAY) 1700
- PIN 5 - NO CONNECTION
- PIN 6 - LF PRESS SW - (BLACK) 1210
- PIN 7 - SPEED SW - (RED) 9900
- PIN 8 - RF RAISE - (YELLOW) 2500
- PIN 9 - RF LOWER - (BLUE) 2600
- PIN 10 - NO CONNECTION
- PIN 11 - NO CONNECTION
- PIN 12 - RF PRESS SW - (ORANGE) 2210

REAR AIR HARNESS CONNECTOR (ENTRY POINT 21)



- PIN 1 - LR RAISE - (GREEN) 4500
- PIN 2 - RR RAISE - (ORANGE) 3500
- PIN 3 - LR LOWER - (PURPLE) 4600
- PIN 4 - RR LOWER - (BROWN) 3600
- PIN 5 - REAR TRAVEL - (GRAY) 3700
- PIN 6 - SYSTEM PRESS. SW. - (YELLOW) 3215
- PIN 7 - NO CONNECTION
- PIN 8 - NO CONNECTION
- PIN 9 - TAG LIFT - (RED) 3800
- PIN 10 - TAG TRAVEL - (GRAY) 3701
- PIN 11 - RR TAG LOWER - (ORANGE) 3601
- PIN 12 - LR TAG LOWER - (PURPLE) 4601

TAG DUMP SWITCH CONNECTOR (ENTRY POINT 21)

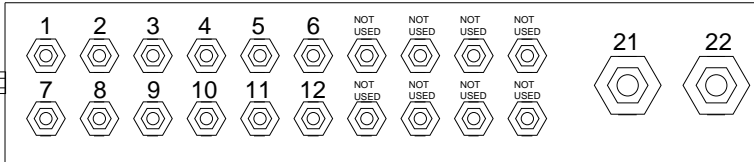


- PIN 1 - TAG TRAVEL - 3701
- PIN 2 - +12 FOR TAG DUMP SWITCH - 1700
- PIN 3 - TAG DUMP - 3800
- PIN 4 - NO CONNECTION
- PIN 5 - NO CONNECTION
- PIN 6 - NO CONNECTION

CONTROL BOX CONNECTION DIAGRAM AIR LEVELING (WITH TWO ROOM EXTENSIONS AND TAG AXLE)

PAGE 3 OF 3
ENTRY POINT

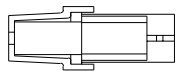
GROUND STUD FOR
FRONT AND REAR AIR
HARNESS ONLY →



	ENTRY POINT	TERMINAL CONNECTOR NUMBER	FUSE	
FRONT ROOM MANIFOLD HARNESS	ROOM 1 UNLOCK SOLENOID - 5300	76	10A	
	ROOM 1 EXTEND SOLENOID - 5000	77	10A	
	ROOM 1 RETRACT SOLENOID - 5100	78	10A	
	ROOM 1 LOCK SOLENOID - 5200	81	10A	
	ROOM 1 AIR SEAL CONTROL - 5600	84	5A	
	SYSTEM PRESSURE SWITCH - 8100	50	N.A.	
	PUMP RELAY CONTROL - 8600	45	5A	
	PUMP RELAY GROUND - 6230	12	MAIN GRND BUS	N.A.
	SYSTEM GROUND - 6230	21	MAIN GRND BUS	N.A.
	+12V BATTERY FROM PUMP RELAY - 6100	21	ESSEX RELAY	40A
	REAR ROOM MANIFOLD HARNESS	ROOM 2 UNLOCK SOLENOID VALVE - 5300	85	10A
ROOM 2 EXTEND SOLENOID VALVE - 5000		86	10A	
ROOM 2 RETRACT SOLENOID VALVE - 5100		87	10A	
ROOM 2 LOCK SOLENOID VALVE - 5200		90	10A	
ROOM 2 AIR SEAL CONTROL - 5600		93	5A	

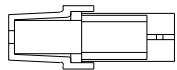
NOTE: ALL WHITE WIRES ENTERING THE CONTROL BOX CONNECT TO THE MAIN GROUND BUSS IN THE CONTROL BOX.

WARNING INDICATOR CONNECTOR (ENTRY POINT 22)



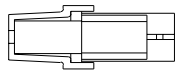
PARK BRAKE CONNECTOR - 9000
ENTRY POINT 22

TO TERMINAL 28 & 95



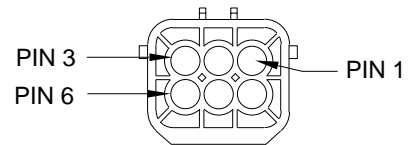
+12 FOR LIMIT SWITCH INDICATOR BOX - 6120
ENTRY POINT 22

TO TERMINAL 30



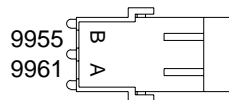
+12 FOR LIMIT SWITCH INDICATOR BOX - 6120
ENTRY POINT 22

TO TERMINAL 96



PIN 3 - CONTROL RE 2 WRN LIGHT - 7526
PIN 4 - +12 RE/WRN LIGHT - 6111
PIN 5 - CONTROL MASTER WRN LIGHT - 7699
PIN 6 - CONTROL RE 1 WRN LIGHT - 7525
PIN 1 & 2 - NO CONNECTION

TRANSMISSION NEUTRAL HOLD (ENTRY POINT 22)



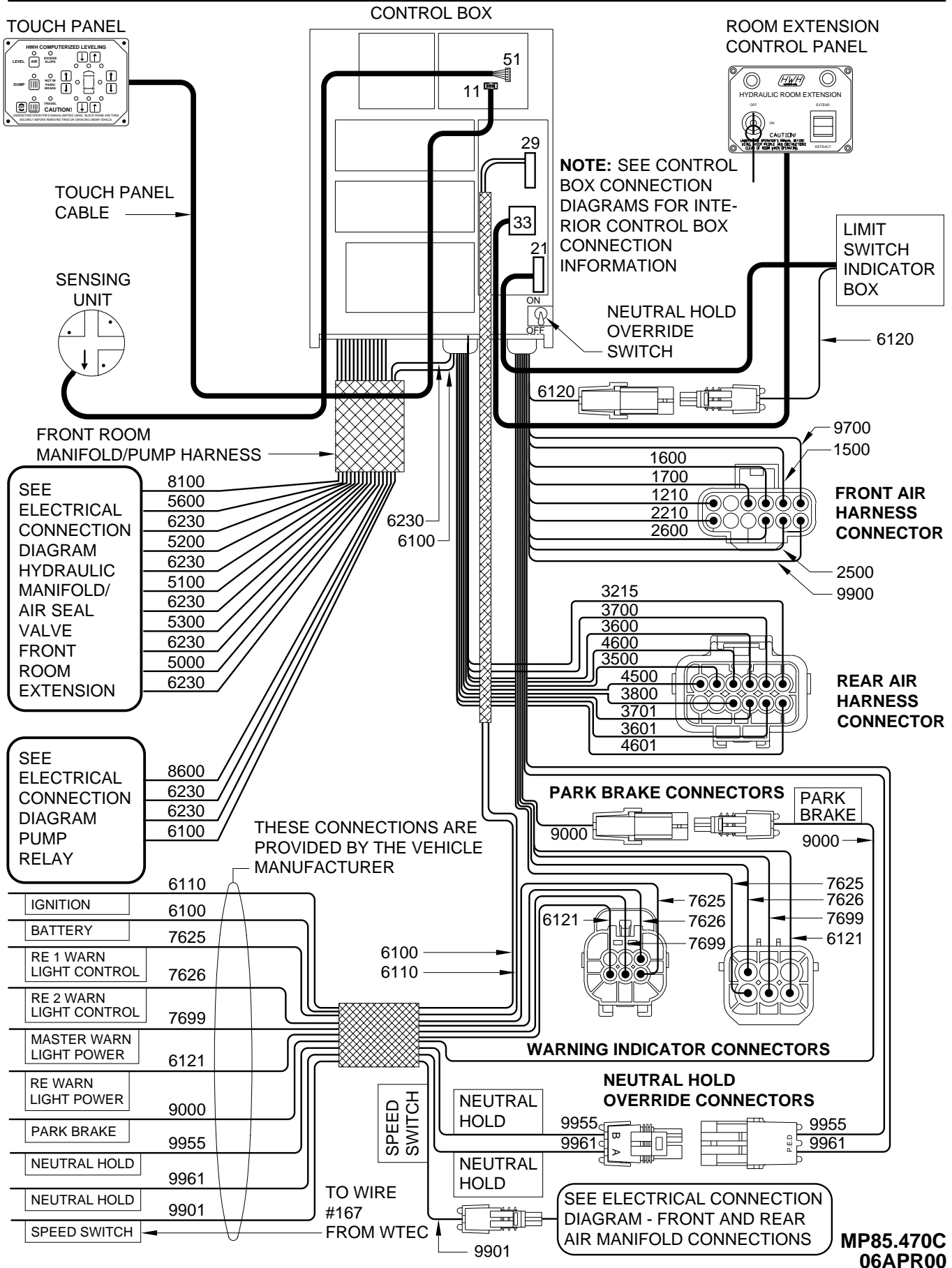
← PIN V-11 OF WTEC III CONTROLLER
← PIN V-31 OF WTEC III CONTROLLER

WIRE NUMBER GLOSSARY

WIRE NUMBER	COLOR	DESCRIPTION
NA	RED	SWITCHED +12V FROM LIMIT SW.INDICATOR BOX FOR ROOM AND LOCK LIMIT SWITCHES
NA	WHITE	GROUND FROM LIMIT SWITCH INDICATOR BOX TO ROOM IN LIMIT SWITCHES
NA	GREEN	SWITCHED +12V FROM ROOM IN LIMIT SWITCH TO LIMIT SWITCH INDICATOR BOX
NA	BLACK	SWITCHED +12V FROM ROOM UNLOCK LIMIT SWITCH TO LIMIT SWITCH INDICATOR BOX
NA	YELLOW	SWITCHED +12V FROM ROOM LOCK OR ROOM OUT LIMIT SW. TO LIMIT SW. IND. BOX
1210	BLACK	SWITCHED GROUND FROM LEFT FRONT AIR PRESSURE SWITCH TO CONTROL BOX
1500	BLACK	SWITCHED +12V TO OPERATE LEFT FRONT RAISE AIR SOLENOID VALVE
1600	BLACK	SWITCHED +12V TO OPERATE LEFT FRONT LOWER AIR SOLENOID VALVE
1700	BLACK	SWITCHED +12V TO OPERATE FRONT TRAVEL VALVES AND +12V FOR TAG DUMP SWITCH
2210	BLACK	SWITCHED GROUND FROM RIGHT FRONT AIR PRESSURE SWITCH TO CONTROL BOX
2500	BLACK	SWITCHED +12V TO OPERATE RIGHT FRONT RAISE AIR SOLENOID VALVE
2600	BLACK	SWITCHED +12V TO OPERATE RIGHT FRONT LOWER AIR SOLENOID VALVE
3215	BLACK	SWITCHED GROUND FROM REAR AIR PRESSURE SWITCH TO CONTROL BOX
3500	BLACK	SWITCHED +12V TO OPERATE RIGHT REAR AND RIGHT REAR TAG RAISE AIR SOL. VALVES
3600	BLACK	SWITCHED +12V TO OPERATE RIGHT REAR LOWER AIR SOLENOID VALVE
3601	BLACK	SWITCHED +12V TO OPERATE RIGHT REAR TAG LOWER AIR SOLENOID VALVE
3700	BLACK	SWITCHED +12V TO OPERATE REAR TRAVEL AIR SOLENOID VALVES
3701	BLACK	SWITCHED +12V FROM TAG DUMP SW. TO OPERATE TAG TRAVEL AIR SOLENOID VALVES
3800	BLACK	SWITCHED +12V FROM TAG DUMP SWITCH FOR TAG DUMP AND TAG LIFT
4500	BLACK	SWITCHED +12V TO OPERATE LEFT REAR AND LEFT REAR TAG RAISE AIR SOL. VALVES
4600	BLACK	SWITCHED +12V TO OPERATE LEFT REAR LOWER AIR SOLENOID VALVE
4601	BLACK	SWITCHED +12V TO OPERATE LEFT REAR TAG LOWER AIR SOLENOID VALVE
5000	BLACK	SWITCHED +12V TO OPERATE EXTEND VALVE
5100	BLACK	SWITCHED +12V TO OPERATE ROOM RETRACT VALVE
5200	BLACK	SWITCHED +12V TO OPERATE ROOM LOCK VALVE
5300	BLACK	SWITCHED +12V TO OPERATE ROOM UNLOCK VALVE
5600	BLACK	SWITCHED +12V TO OPERATE AIR SEAL VALVE OR MANIFOLD
5750	BLACK	SWITCHED GRND FROM LIMIT SW. BOX TO CNTRL BOX FOR ROOM OUT LIMIT SWITCHES
5752	BLACK	SWITCHED GRND FROM LIMIT SW. BOX TO CNTRL BOX FOR ROOM IN LIMIT SWITCHES
5754	BLACK	SWITCHED GRND FROM LIMIT SW. BOX TO CNTRL BOX FOR ROOM UNLOCK LIMIT SW.
5758	BLACK	SWITCHED GRND FROM LIMIT SW. BOX TO CNTRL BOX FOR ROOM LOCK LIMIT SWITCHES
6100	RED	+12 VOLT FROM BATTERY
6110	RED	+12 VOLT FROM IGNITION THROUGH CONTROL BOX
6120	RED	+12 VOLT FROM CONTROL BOX FOR LIMIT SWITCH BOXES - IGNITION CONTROLLED
6121	RED	+12 VOLT FROM CONTROL BOX FOR ROOM 1&2 WARNING LIGHTS -IGNITION CONTROLLED
6125	RED	+12 VOLT FROM CONTROL BOX TO ROOM EXT. OPERATOR PANEL - IGN CONTROLLED
6230	WHITE	GROUND
6825	BLACK	SWITCHED +12V FROM ROOM EXTENSION OPERATOR PANEL TO CONTROL BOX
7501	BLACK	SWITCHED +12V FROM ROOM EXTENSION PANEL TO CONTROL BOX TO EXTEND ROOM
7502	BLACK	SWITCHED +12V FROM ROOM EXTENSION PANEL TO CONTROL BOX TO RETRACT ROOM
7503	BLACK	SWITCHED +12V FROM ROOM EXTENSION PANEL TO CONTROL BOX TO OPERATE PUMP
7530	BLACK	SWITCHED +12V FROM CONTROL BOX TO ROOM EXTENSION PANEL FOR PUMP ON LIGHT
7610	BLACK	SWITCHED GRND FROM CNTRL BOX TO ROOM EXT. PANEL FOR READY TO OPER. LIGHT
7625	BLACK	SWITCHED GROUND FROM CONTROL BOX TO CONTROL ROOM 1 WARNING LIGHT
7626	BLACK	SWITCHED GROUND FROM CONTROL BOX TO CONTROL ROOM 2 WARNING LIGHT
7699	BLACK	SWITCHED +12V FROM CONTROL BOX TO CONTROL MASTER WARNING LIGHT
8100	BLACK	SWITCHED GROUND FROM PRESS. SW. ON HYDRAULIC MANIFOLD TO CONTROL BOX
8600	BLACK	SWITCHED +12V FROM CONTROL BOX TO CONTROL PUMP RELAY
9000	BLACK	SWITCHED GND FROM PARK BRAKE SWITCH TO CONTROL BOX
9700	BLACK	SWITCHED +12V TO CONTROL AIR COMPRESSOR
9900	BLACK	TRANSMISSION SPEED SWITCH +12V FROM TRANSMISSION WHEN AT LOW SPEED
9901	BLACK	SPEED SWITCH SIGNAL FROM WTEC WIRE #167 TO SEED SWITCH RELAY
9955	BLACK	TRANSMISSION NEUTRAL HOLD B - COMPLETES CIRCUIT WITH 9961
9961	BLACK	TRANSMISSION NEUTRAL HOLD A - COMPLETES CIRCUIT WITH 9955

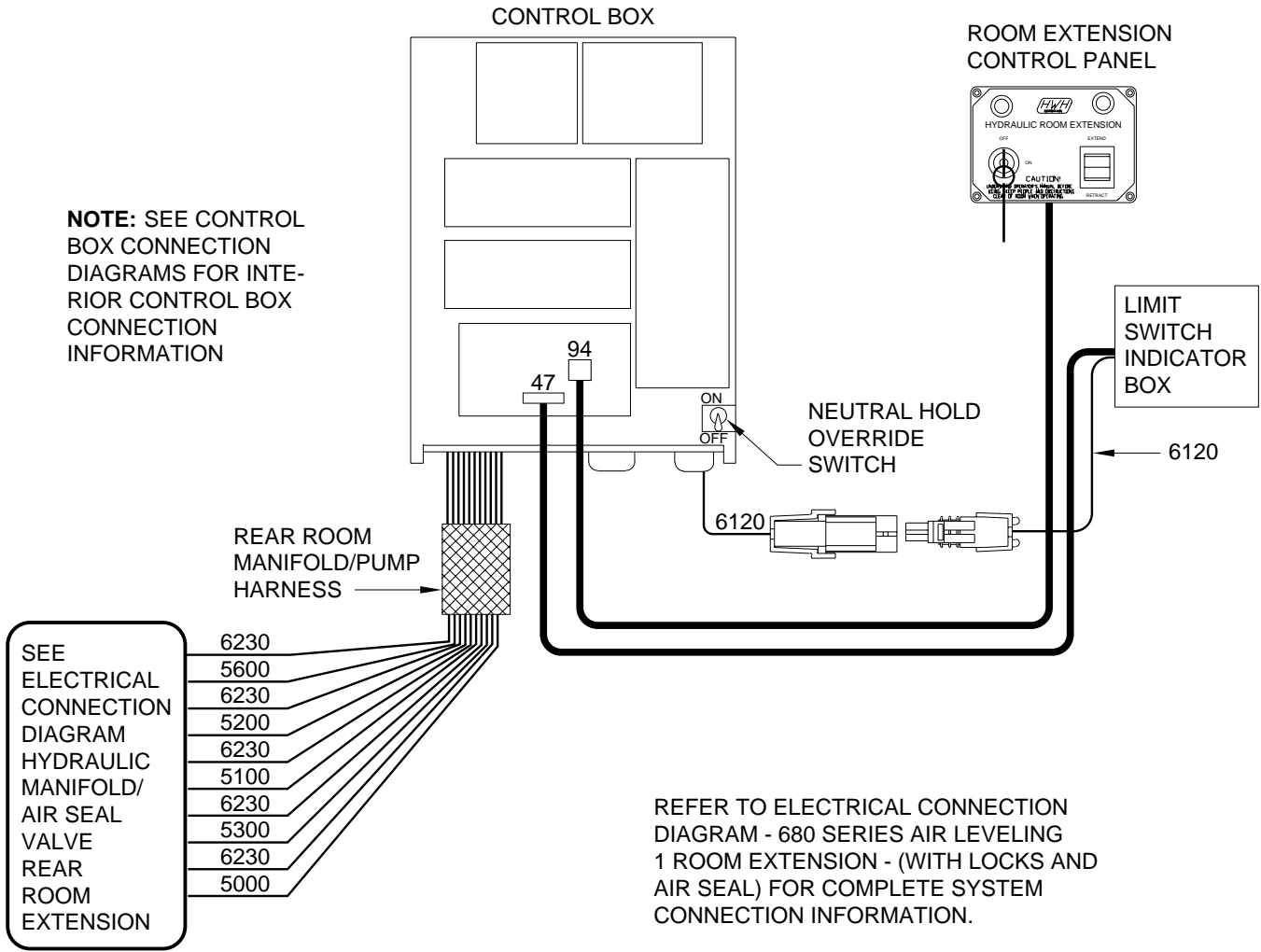
ELECTRICAL CONNECTION DIAGRAM

680 SERIES AIR LEVELING 1 ROOM EXTENSION (WITH LOCKS AND AIR SEAL)

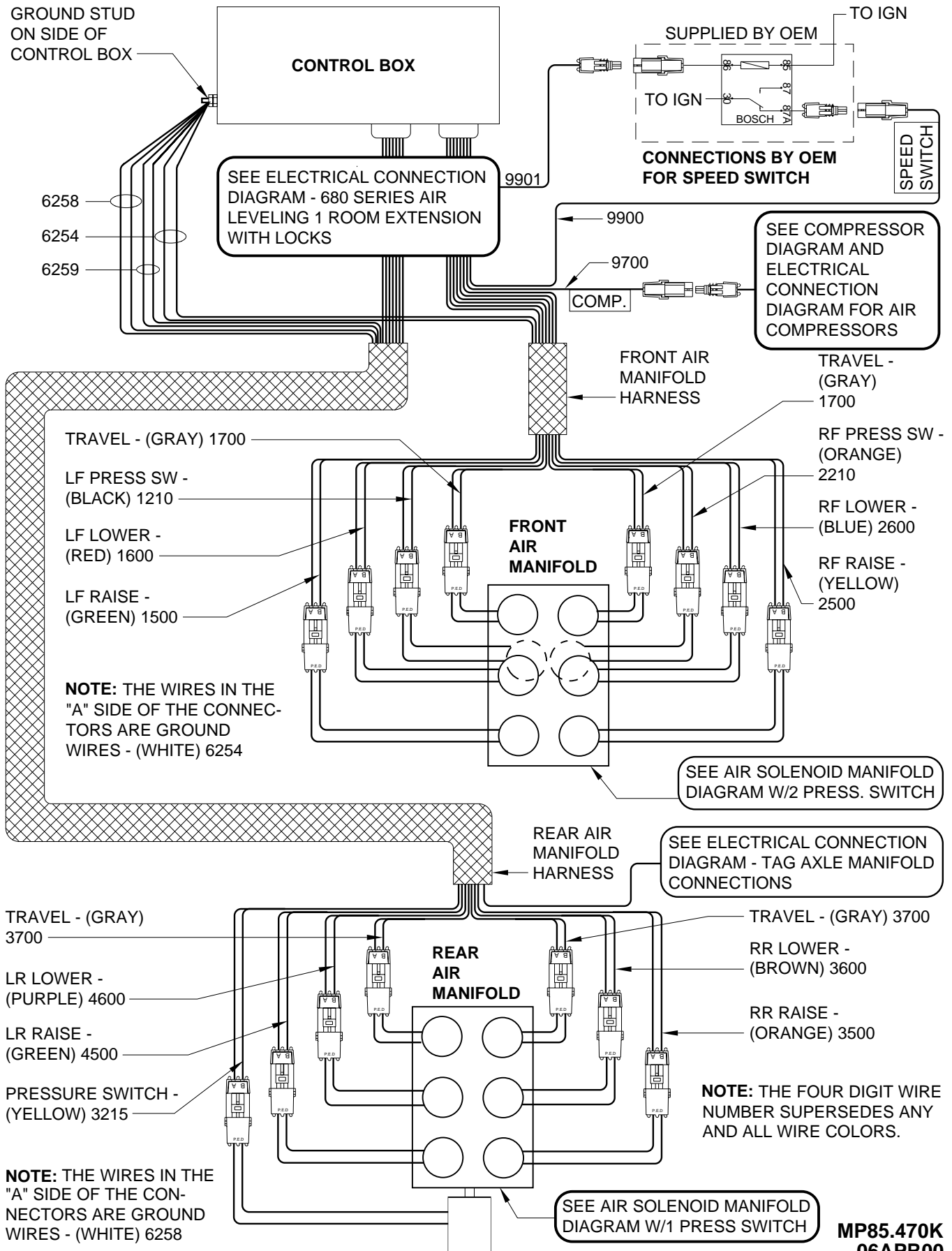


ELECTRICAL CONNECTION DIAGRAM

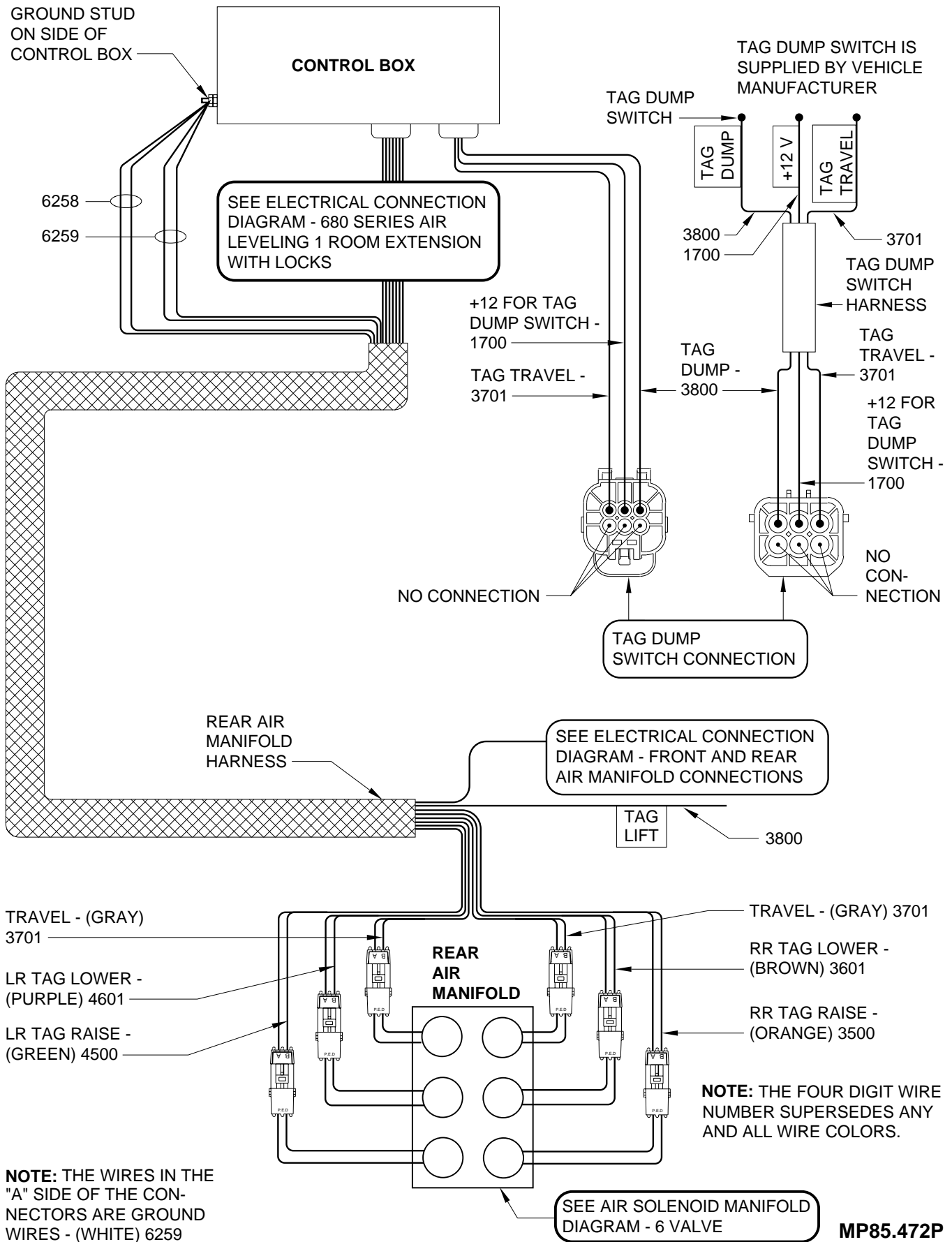
680 SERIES AIR LEVELING SECOND ROOM EXTENSION (WITH LOCKS AND AIR SEAL)



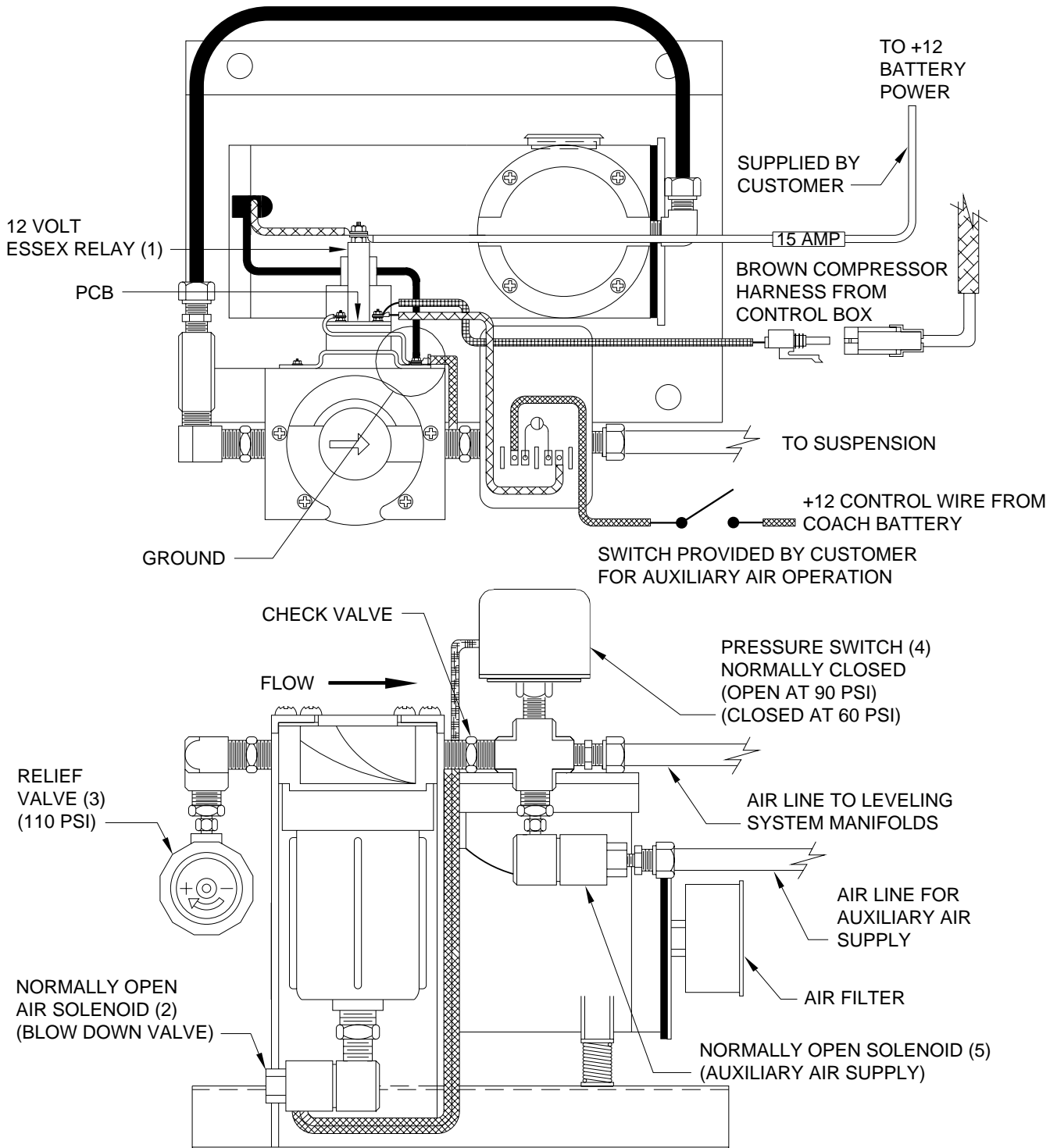
ELECTRICAL CONNECTION DIAGRAM FRONT AND REAR AIR MANIFOLD CONNECTIONS (WITH TAG AXLE)



ELECTRICAL CONNECTION DIAGRAM TAG AXLE MANIFOLD CONNECTIONS AND TAG DUMP CONNECTIONS

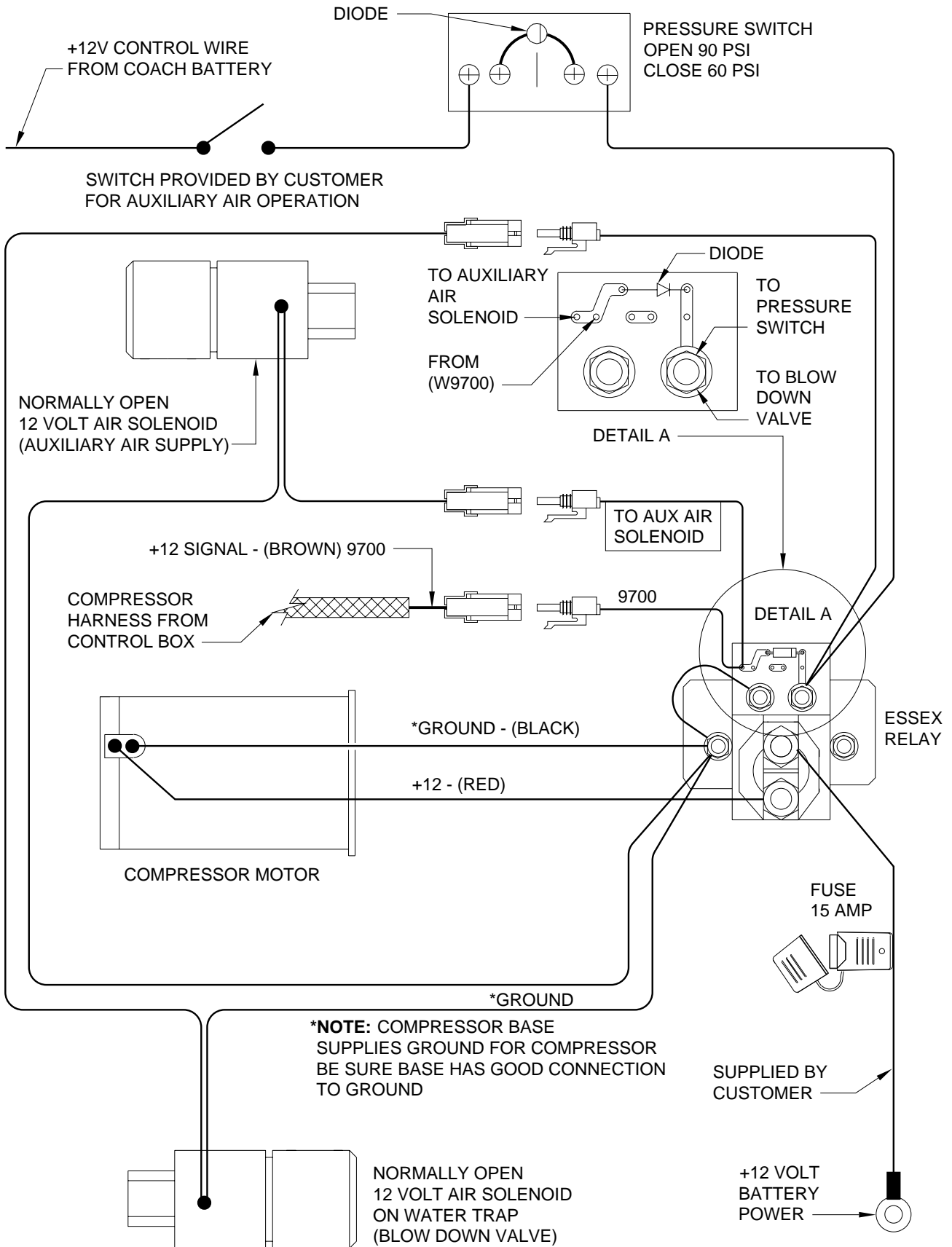


COMPRESSOR DIAGRAM

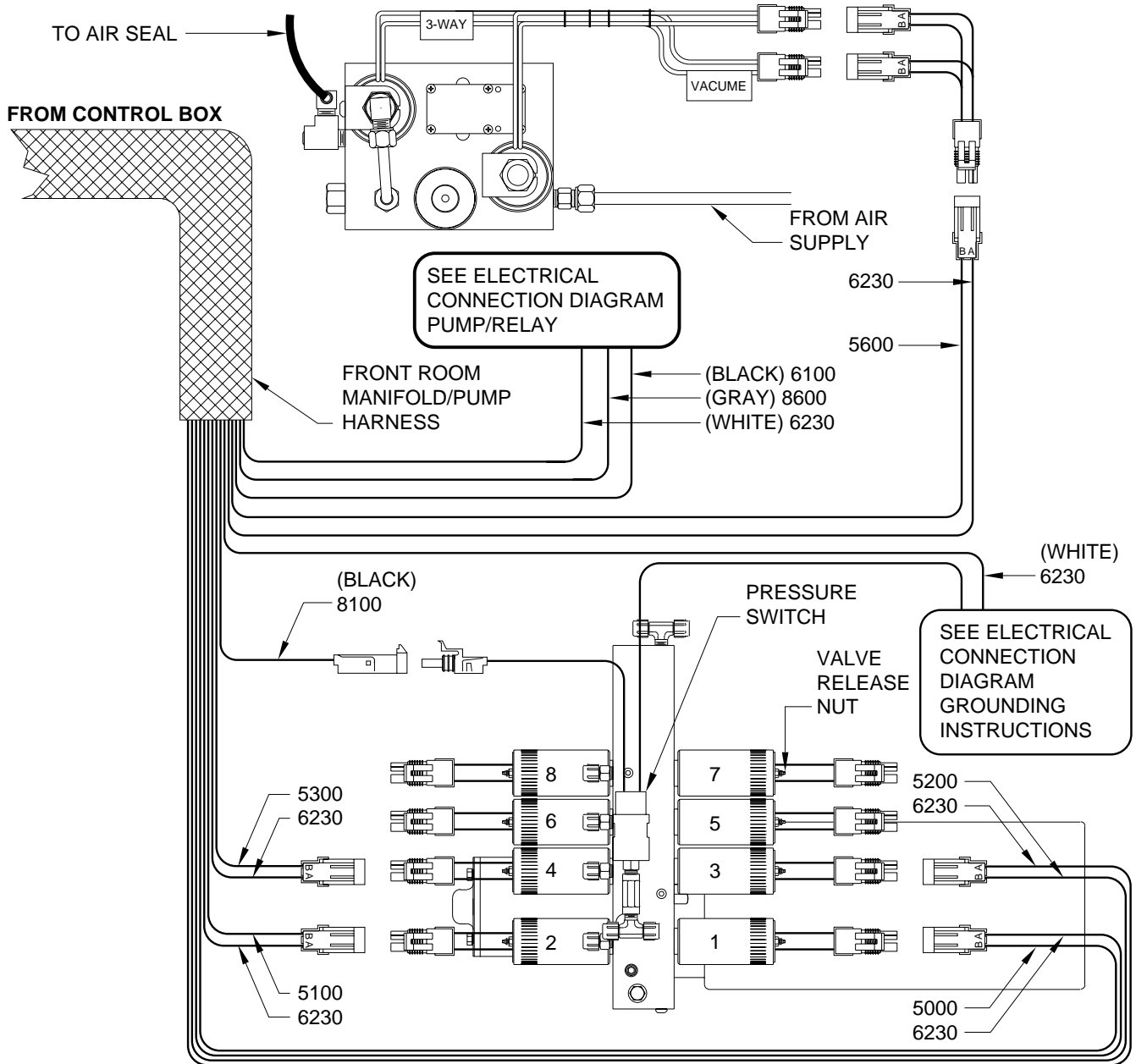


The control box sends a +12 signal to the 12 volt relay (1) whenever a raise function is needed in automatic or in manual leveling. The compressor will run and the normally open air solenoids (2) and (5) will close allowing the compressor to build pressure. When the pressure builds to 110 psi the relief valve (3) will open and the compressor will continue to run. The pressure switch (4) will not affect the operation of the leveling system. During auxiliary operation of the compressor, the switch provided by the customer sends a +12 signal to the pressure switch (4). When system pressure drops to 60 psi, the pressure switch (4) will close. A +12 signal will turn the relay (1) on starting the compressor motor. The normally open solenoid (2) (blow down valve) will close. The normally open solenoid (5) (auxiliary air supply) will remain open to supply air to the system. When the pressure switch (4) reaches 90 psi, the compressor will shut off.

ELECTRICAL CONNECTION DIAGRAM FOR AIR COMPRESSORS (WITH AUXILIARY SYSTEM PRESSURE SWITCH)

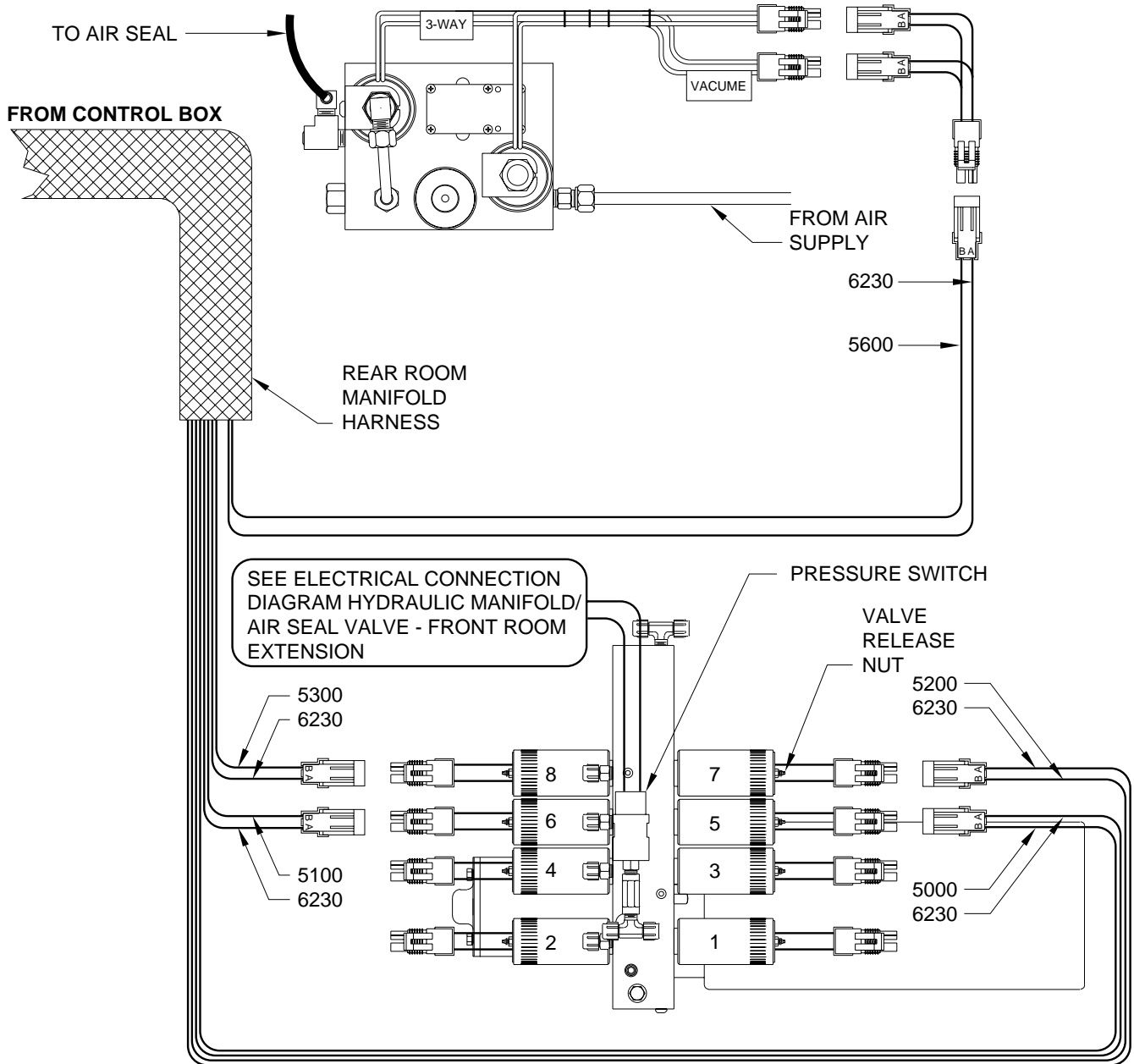


ELECTRICAL CONNECTION DIAGRAM HYDRAULIC MANIFOLD/AIR SEAL VALVE FRONT ROOM EXTENSION



- 1 - FRONT ROOM EXTEND VALVE - 5000
- 2 - FRONT ROOM RETRACT VALVE - 5100
- 3 - FRONT ROOM LOCK VALVE - 5200
- 4 - FRONT ROOM UNLOCK VALVE - 5300
- 5 - REAR ROOM EXTEND VALVE
- 6 - REAR ROOM RETRACT VALVE
- 7 - REAR ROOM LOCK VALVE
- 8 - REAR ROOM UNLOCK VALVE

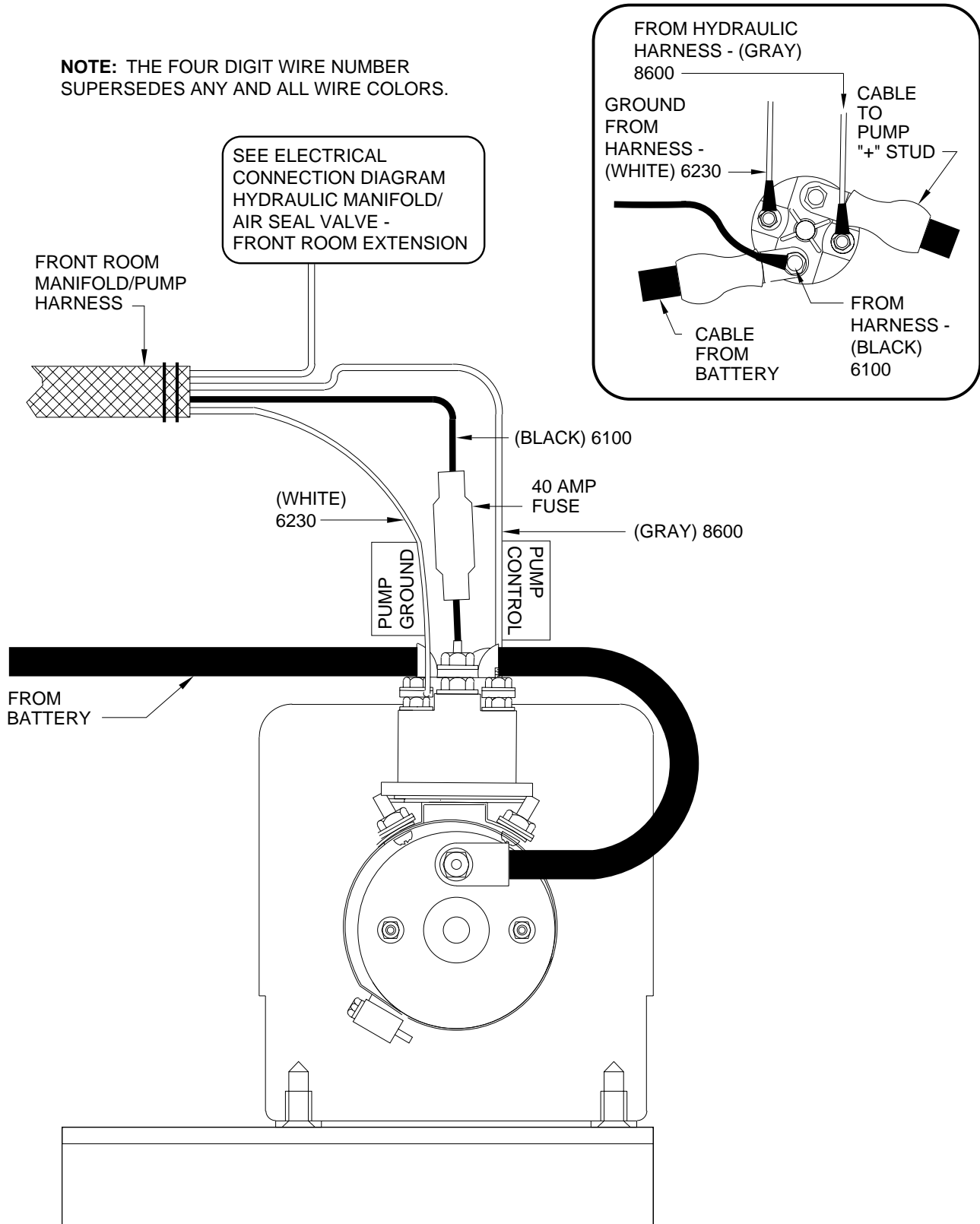
ELECTRICAL CONNECTION DIAGRAM HYDRAULIC MANIFOLD/AIR SEAL VALVE REAR ROOM EXTENSION



- 1 - FRONT ROOM EXTEND VALVE
- 2 - FRONT ROOM RETRACT VALVE
- 3 - FRONT ROOM LOCK VALVE
- 4 - FRONT ROOM UNLOCK VALVE
- 5 - REAR ROOM EXTEND VALVE - 5000
- 6 - REAR ROOM RETRACT VALVE - 5100
- 7 - REAR ROOM LOCK VALVE - 5200
- 8 - REAR ROOM UNLOCK VALVE - 5300

ELECTRICAL CONNECTION DIAGRAM PUMP RELAY

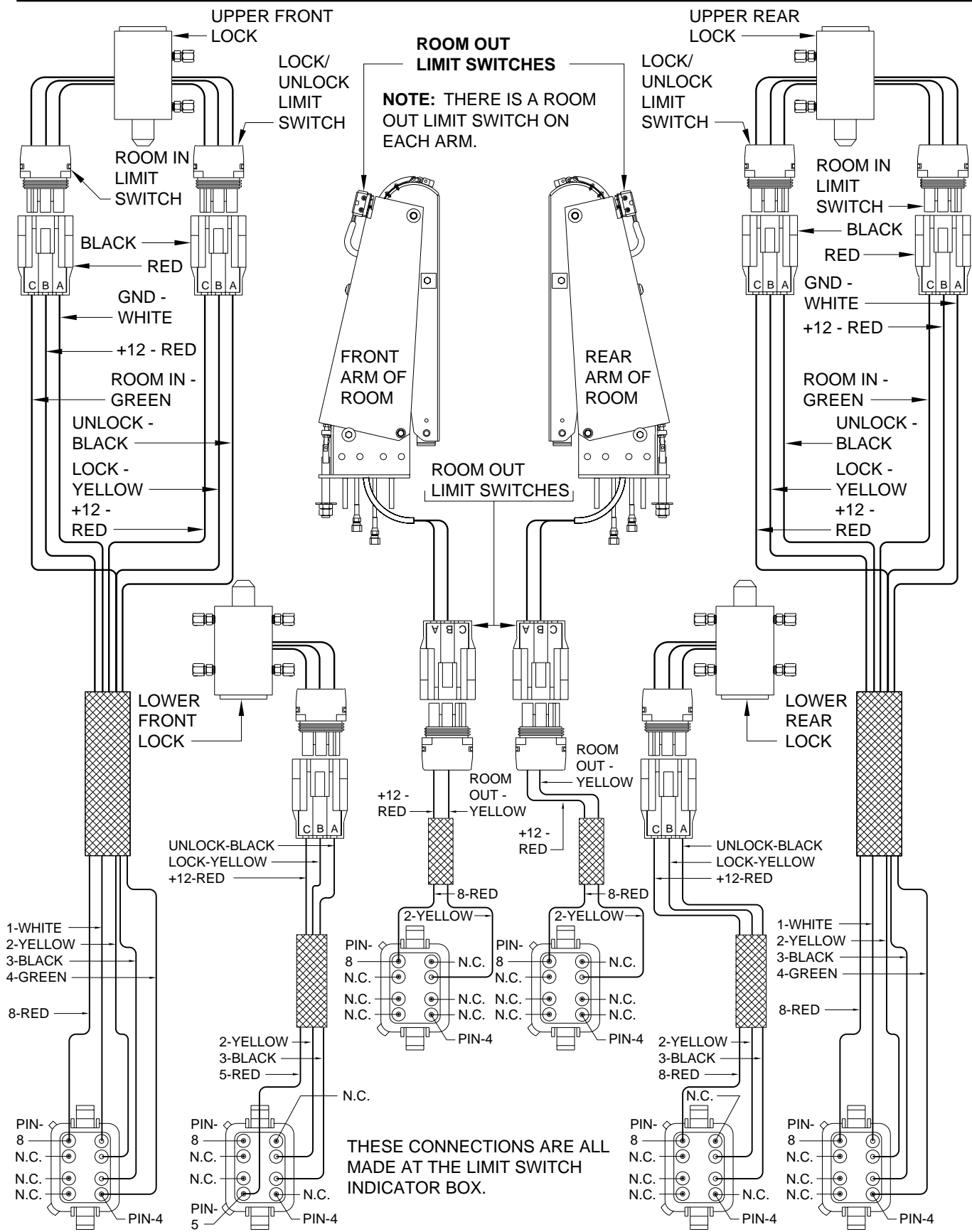
NOTE: THE FOUR DIGIT WIRE NUMBER
SUPERSEDES ANY AND ALL WIRE COLORS.



ELECTRICAL CONNECTION DIAGRAM

"VERTICAL ARM" ROOM EXTENSION

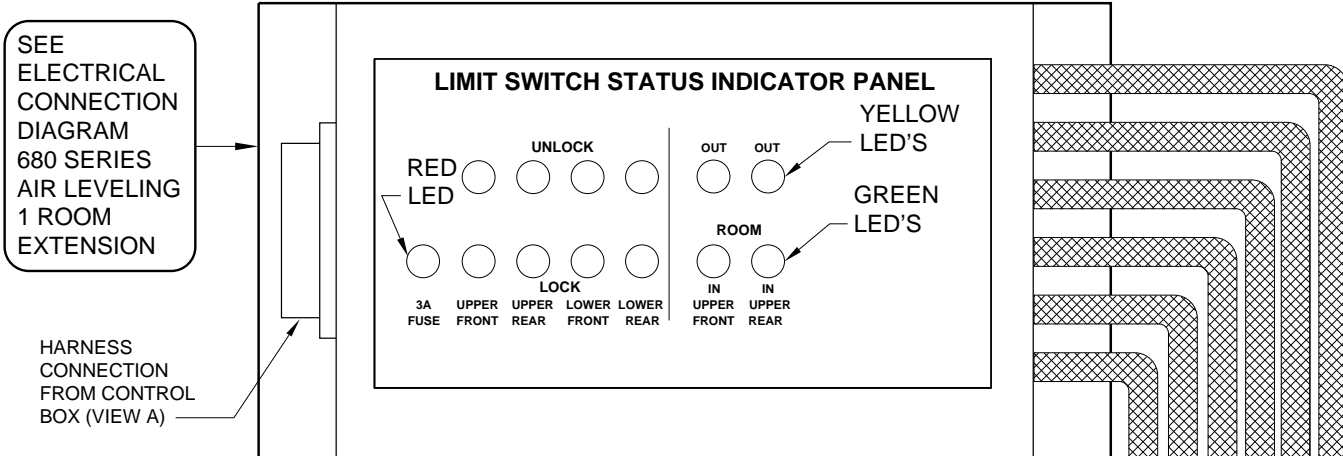
ROOM IN/OUT LIMIT SWITCHES - LOCK/UNLOCK LIMIT SWITCHES



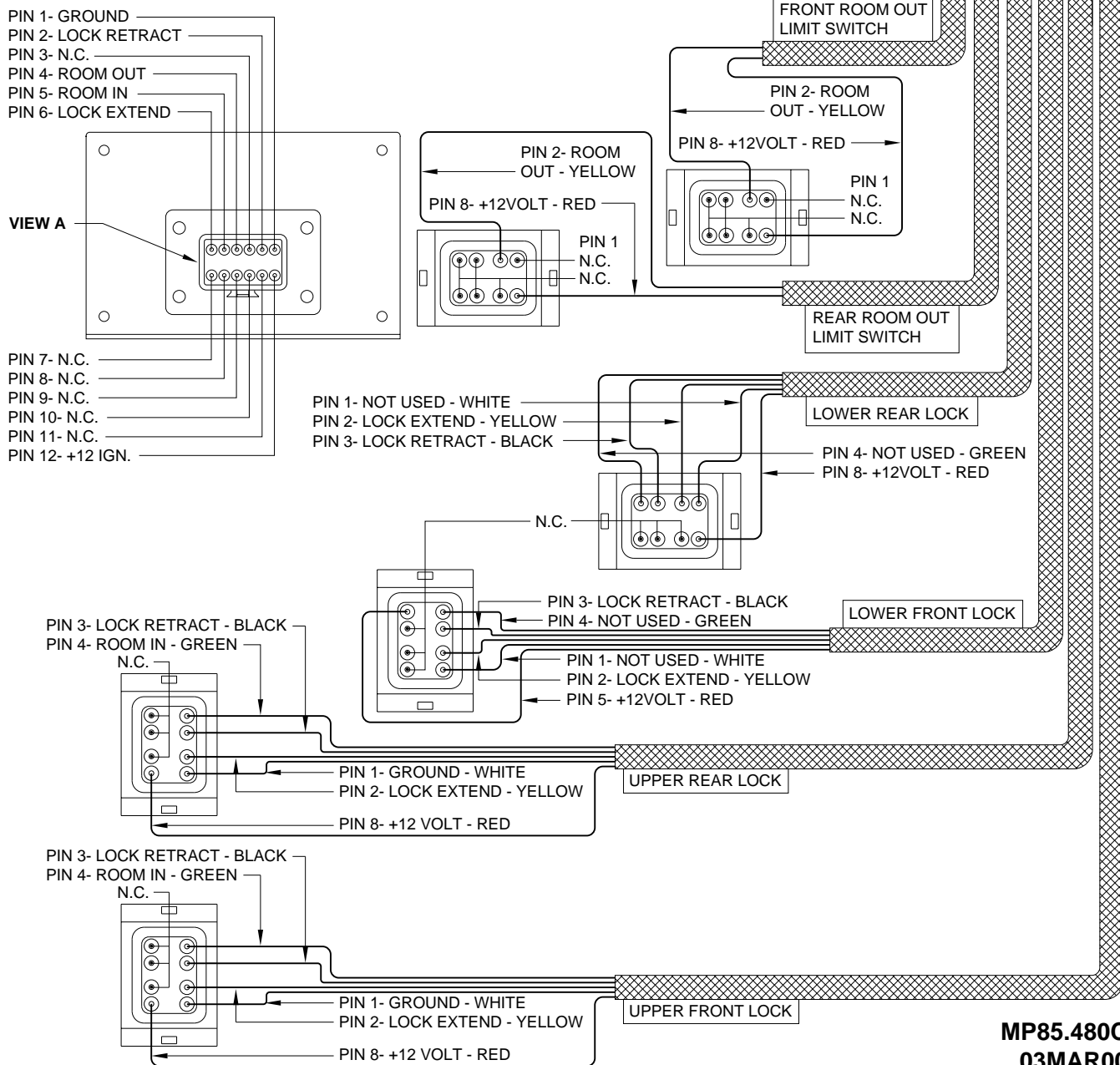
ELECTRICAL CONNECTION DIAGRAM

LIMIT SWITCH INDICATOR BOX

FRONT ROOM



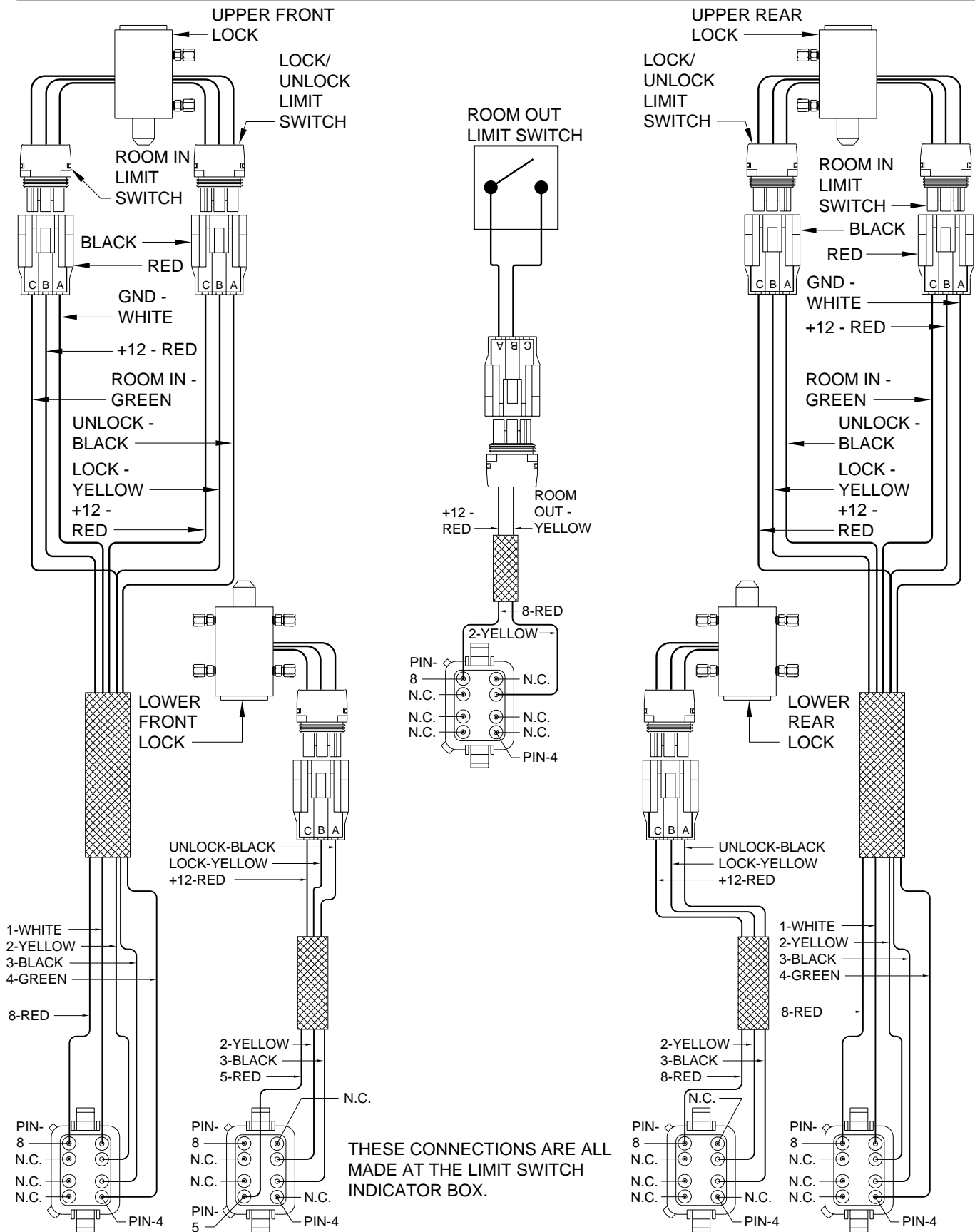
NOTE: THE LED'S WILL COME ON WHEN A LIMIT SWITCH IS MADE.



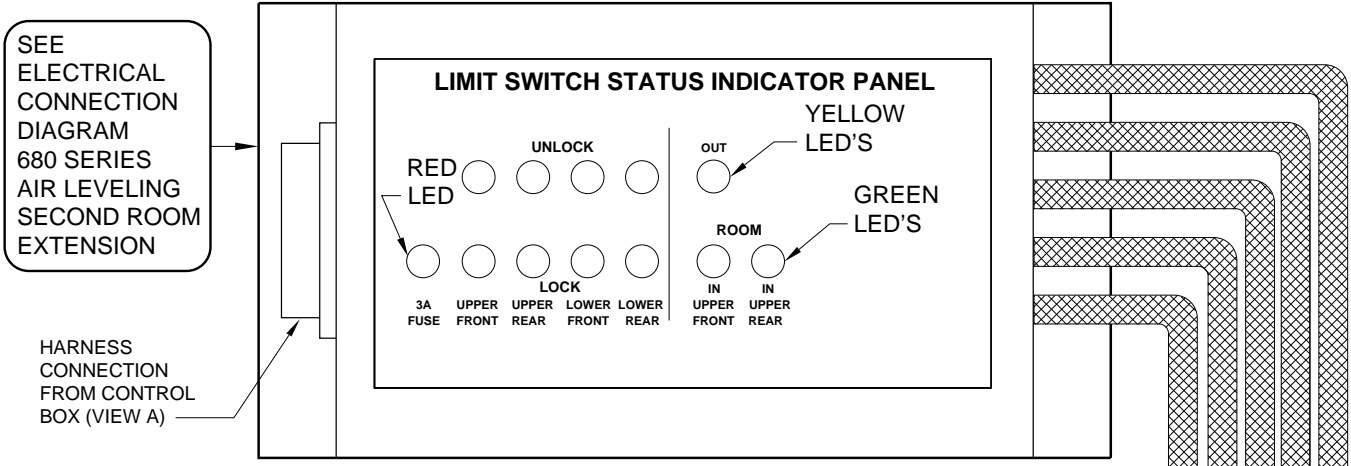
ELECTRICAL CONNECTION DIAGRAM

SINGLE CYLINDER ROOM EXTENSION

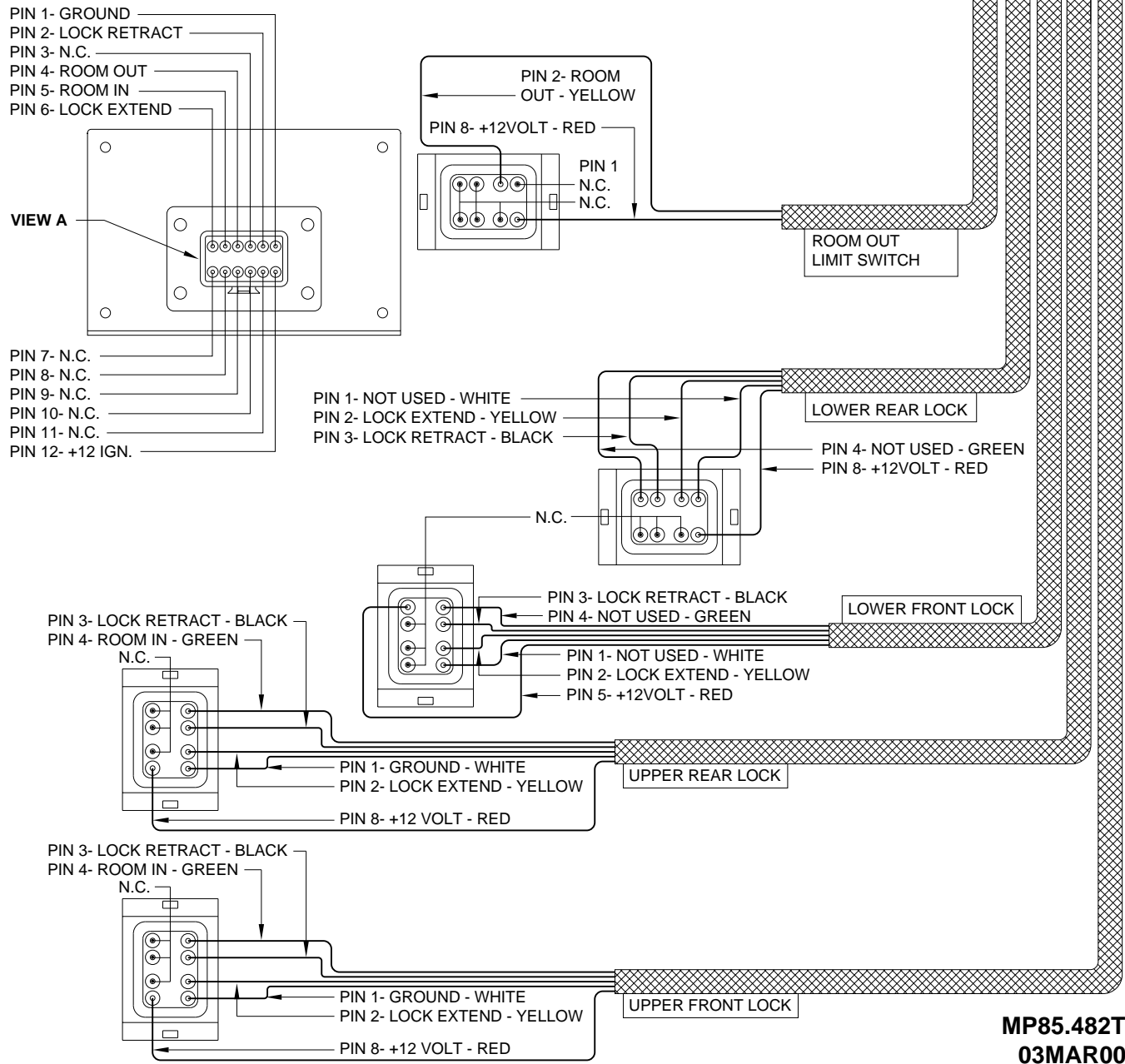
ROOM IN/OUT LIMIT SWITCH - LOCK/UNLOCK LIMIT SWITCHES



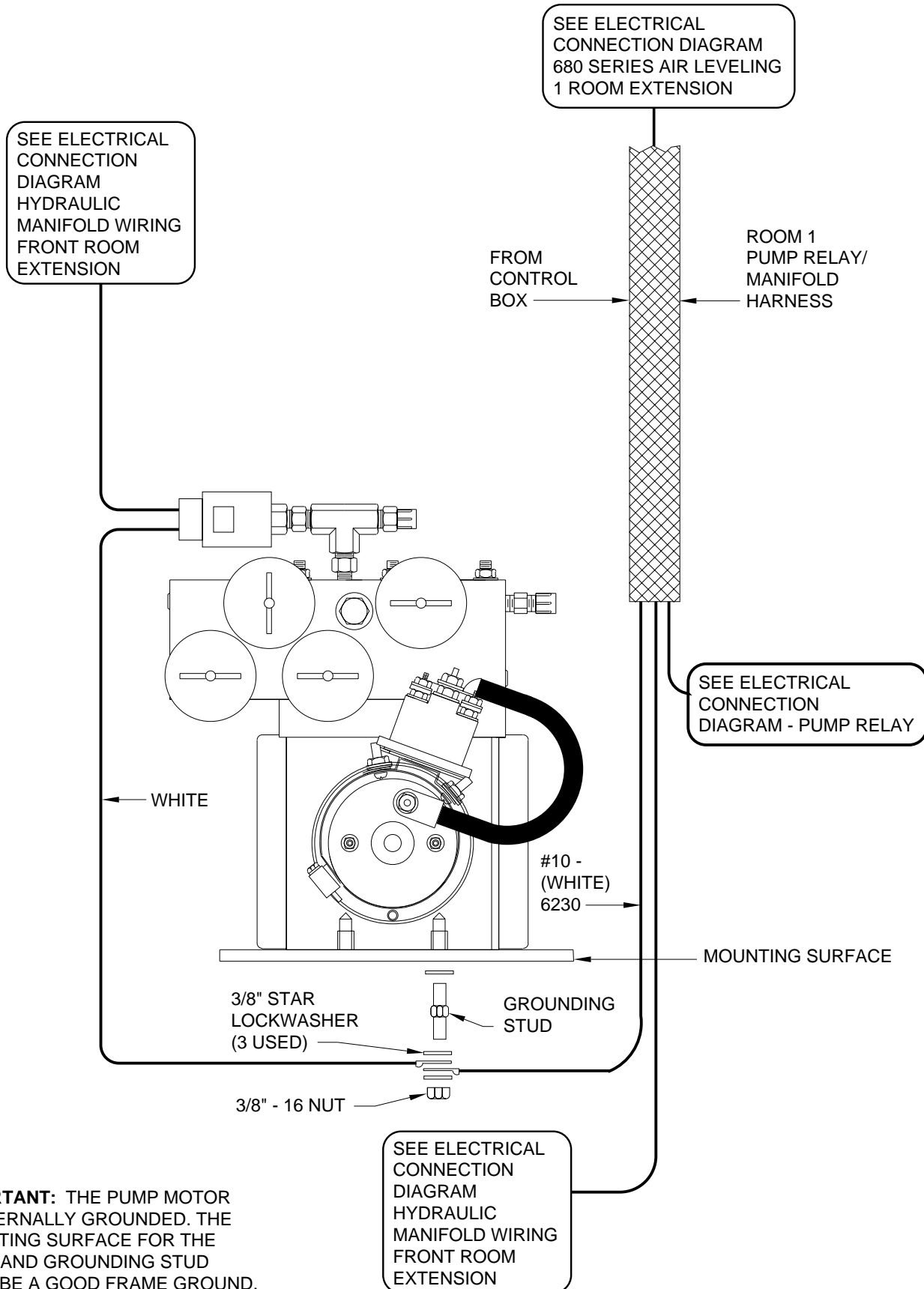
ELECTRICAL CONNECTION DIAGRAM LIMIT SWITCH INDICATOR BOX REAR ROOM



NOTE: THE LED'S WILL COME ON WHEN A LIMIT SWITCH IS MADE.

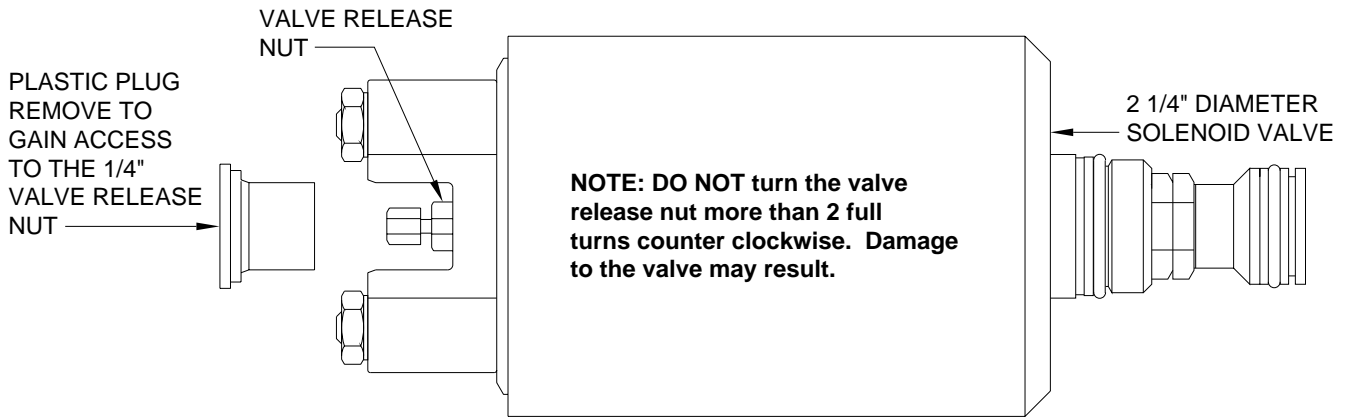
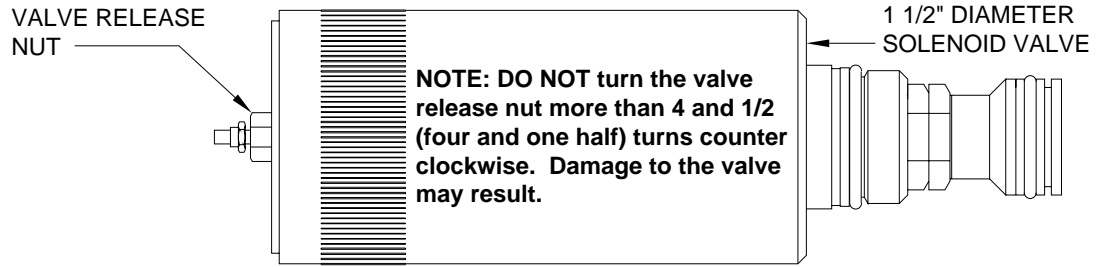


ELECTRICAL CONNECTION DIAGRAM GROUNDING INSTRUCTIONS

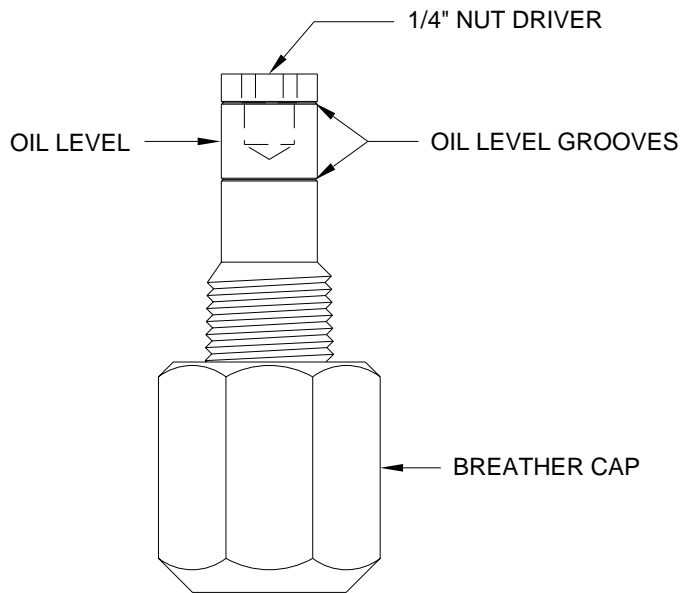


IMPORTANT: THE PUMP MOTOR IS INTERNALLY GROUNDED. THE MOUNTING SURFACE FOR THE PUMP AND GROUNDING STUD MUST BE A GOOD FRAME GROUND.

BREATHER CAP - DIPSTICK - 1/4" NUT DRIVER



NOTE: THE BREATHER CAP IS LOCATED ON THE TOP SIDE OF THE POWER UNIT RESERVOIR.



IMPORTANT: PRIOR TO REMOVING THE BREATHER CAP, EITHER TO CHECK THE OIL LEVEL OR TO USE THE 1/4" NUT DRIVER, CLEAN ANY DEBRIS FROM THE TOP OF THE RESERVOIR. BEFORE RETURNING THE BREATHER CAP TO THE RESERVOIR, REMOVE ANY PAINT CHIPS OR OTHER DEBRIS FROM THE DIPSTICK INCLUDING DEBRIS INSIDE THE 1/4" NUT DRIVER.