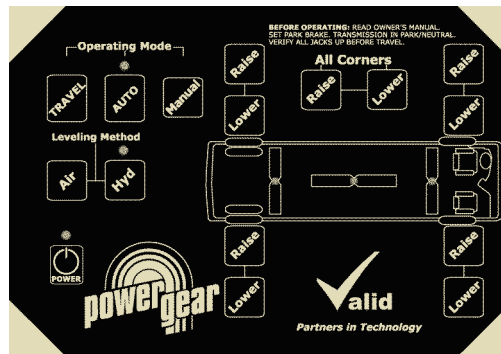




4 Leg Air +Hydraulic Leveling System

Installation / Parts and Trouble Shooting Guide



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800-334-4712
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FIRMWARE VERSIONS:
CONTROLLER 2.2
FRONT SENSOR 2.8
REAR SENSOR 2.12
PNEUMATIC I/O MODULE 2.6

82-L0370
Rev 2

- 
- **DO NOT USE THE VEHICLE'S SUSPENSION TO SUPPORT THE VEHICLE FOR SERVICING OR INSPECTION. INSTEAD, INSTALL ADEQUATE BLOCKING BEFORE WORKING UNDER ANY VEHICLE. THE SYSTEM IS DESIGNED AS A 'LEVELING' SYSTEM ONLY.**
 - **KEEP PEOPLE CLEAR OF COACH WHILE LEVELING SYSTEM IS IN USE.**
 - **NEVER LIFT THE WHEELS OFF THE GROUND TO LEVEL THE COACH. DOING SO MAY CREATE AN UNSTABLE CONDITION.**
 - **NEVER EXPOSE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. HIGH PRESSURE OIL LEAKS MAY CUT AND PENETRATE THE SKIN CAUSING SERIOUS INJURY.**

CAUTION - PARK THE COACH ON A REASONABLY SOLID SURFACE OR THE JACKS MAY SINK INTO GROUND. ON SOFT SURFACES, USE LOAD DISTRIBUTION PADS UNDER EACH JACK.

CAUTION - CHECK THAT POTENTIAL JACK CONTACT LOCATIONS ARE CLEAR OF OBSTRUCTIONS OR DEPRESSIONS BEFORE OPERATION.

CAUTION - READ AND UNDERSTAND THE ENTIRE OPERATOR'S MANUAL BEFORE USING OR SERVICING YOUR AIR + HYDRAULIC LEVELING SYSTEM.

CAUTION - ENSURE THAT THE AREA AROUND THE VEHICLE IS CLEAR OF OBSTRUCTIONS BEFORE OPERATING THE LEVELING SYSTEM.

CAUTION - YOUR LEVELING SYSTEM SHOULD BE SERVICED ONLY BY QUALIFIED PERSONNEL.

CAUTION -LEAKS IN A VEHICLE'S AIR SYSTEM CAN CAUSE THE VEHICLE TO LOWER OVER TIME REGARDLESS OF WHETHER THE LEVELING SYSTEM IS OPERATIONAL.

Installation of the Leveling System can be broken into 4 basic steps:

1. Mounting the sensors and harnesses.
2. Mounting the valve manifolds, and hydraulic components.
3. Installing the control panel in the vehicle's dash.
4. Programming the level position

Before beginning the installation, ensure that all you have all the required parts and that there is adequate blocking beneath the vehicle you are about to work on.

Level Sensor Modules

The two level sensing modules must be mounted in the front and the rear. They are mounted differently at each end.

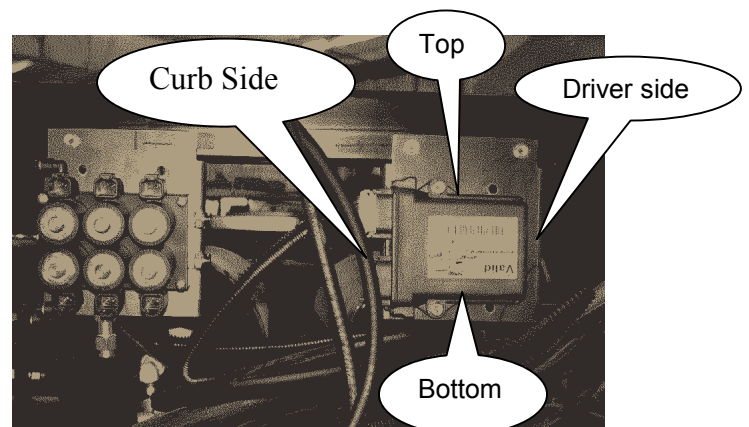
A. To install the front level sensor:

1. Mount it as far forward under the coach as possible.

Allow for the connectors to exit the sensor on the right-hand side of the unit with respect to the coach.

The front sensor is mounted in the following orientation:

- Left and Right arrows pointing directly left and right, respectively.
- Up and Down arrows pointing to the sky and ground, respectively.



Front level sensors, mounted

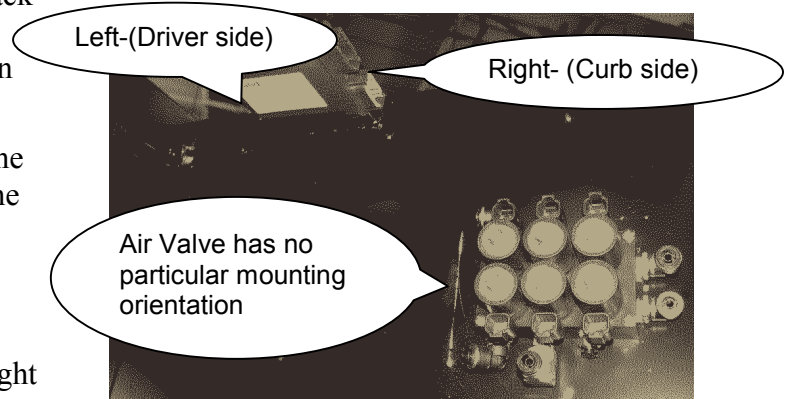
B. To install the rear level sensor:

1. Mount it on the chassis as close as possible to the centerline of the steering and driving axle, and as far back as possible. To avoid high temperatures, do not place it in the engine compartment.

Allow for the connectors to exit the sensor on the right-hand side of the unit with respect to the coach.

The rear sensor is mounted in the following orientation:

- Left (Driver's side) and Right (Curb side) arrows pointing directly left and right, respectively.
- Rear and Front arrows pointing to the rear and front of the vehicle, respectively.



Rear level sensor, mounted

Connecting the sensors:



The sensor connections are indicated on the enclosed Leveling System 4-Axis Schematic.

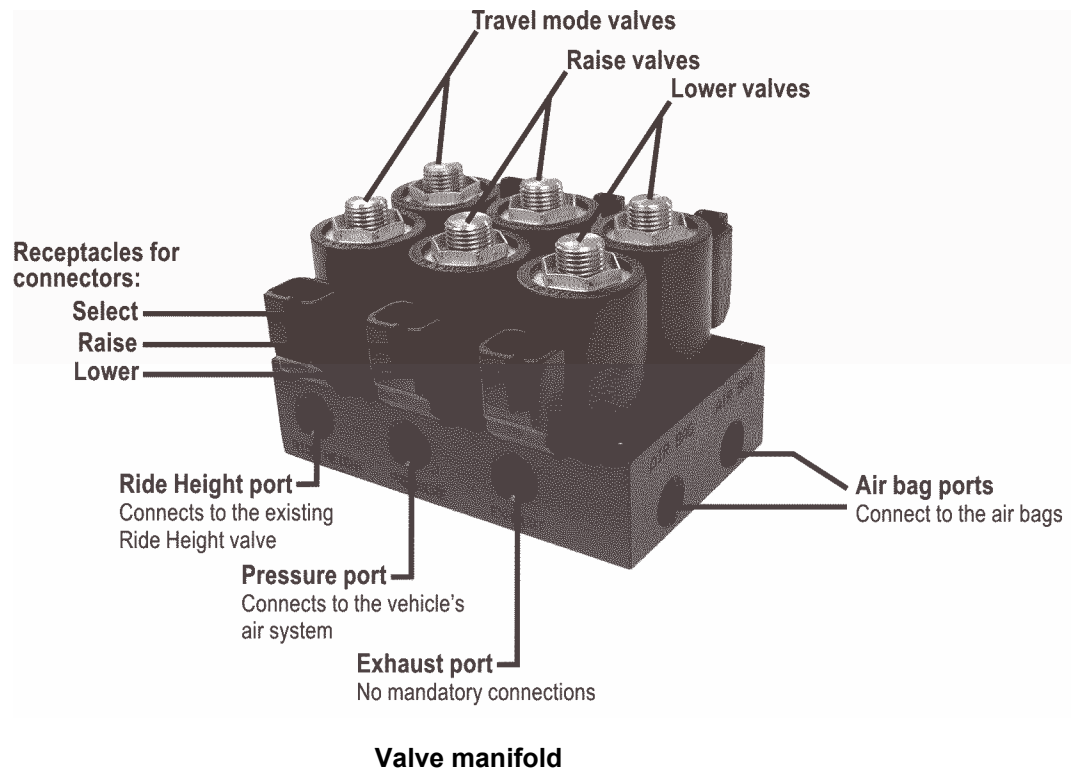
Valve Manifolds and Connectors

Valve manifolds

There are two valve manifolds that need to be installed as part of the Leveling System.

Each manifold can be thought of as being split down the middle, where each set of valves controls each lateral half of the vehicle. It doesn't matter which side of the manifold is which, but it is important to be consistent once you have made your decision.

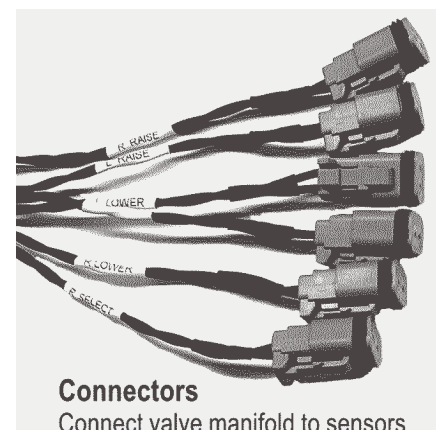
For example: Connect all 'R' labeled connectors to the same (right-hand) side of the manifold.



Connectors

There are three connectors for each side of the valve manifold: Select, Raise, and Lower. These connectors run to the level sensors, allowing the valves to respond to the level information received by the sensors.

- The **Select** connectors correspond to the Travel valves and the Ride Height port(s). They allow the manufacturer's Ride Height valve to take control when the vehicle moves at a speed higher than the designated speed limit (as set in the initial configuration—see page **Error! Bookmark not defined.**).
- The **Raise** connectors correspond to the Raise valves and the Pressure port.
- The **Lower** connectors correspond to the Lower valves and the Exhaust port.



Connector harness

Installation and connection

To mount the valve manifolds:

Mount each manifold in a suitable place on the chassis. You may wish to place them relatively close to each sensor to ensure that your connector cables will reach.

To connect the ports:

On each manifold, connect the ports as follows:

- Ride Height port(s): to the manufacturer-installed Ride Height valve(s).
- Pressure port: to the vehicle's air system.

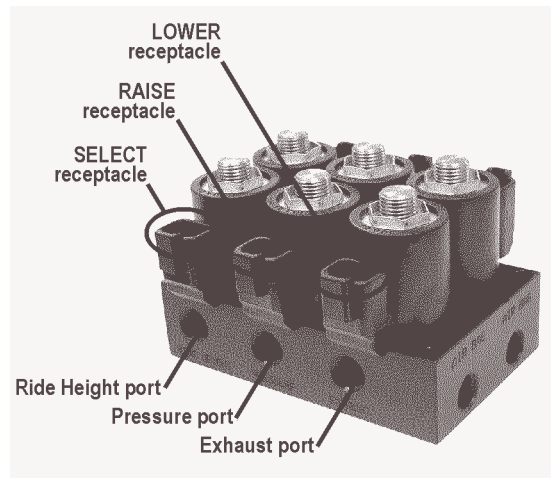


- Airbag ports: to the coach's airbags.
- Exhaust port: There is no connection requirement for this port.

To connect the connectors to the receptacles:

Noting the labels on each of the connector cables, insert the connectors into the receptacles as follows on each manifold:

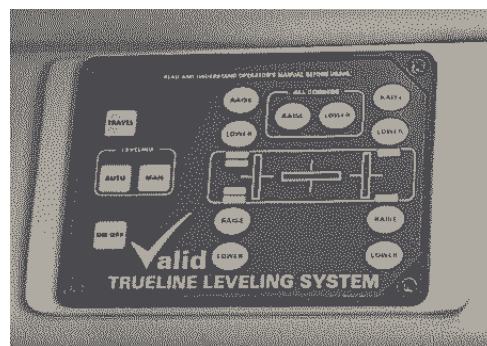
- R Select into right-hand Select receptacle.
- L Select into left-hand Select receptacle.
- R-Raise into right-hand Raise receptacle.
- L-Raise into left-hand Raise receptacle.
- R-Lower into right-hand Lower receptacle.
- L-Lower into left-hand Lower receptacle.



Controller Installation



2. Cut a hole in the dash to accommodate the leveling control panel.
3. Route all necessary cabling to the dash access point. Ensure that there is enough cable to connect the control panel before inserting the panel into the cutout.



Mounted control panel

Mount the control panel so the image of the vehicle on the controller is oriented the same as the actual vehicle. This will make it easier for the operator to visualize the operation of the system.

Once all cable harnesses are connected to their corresponding port on the controller, fasten the control panel into the dash.

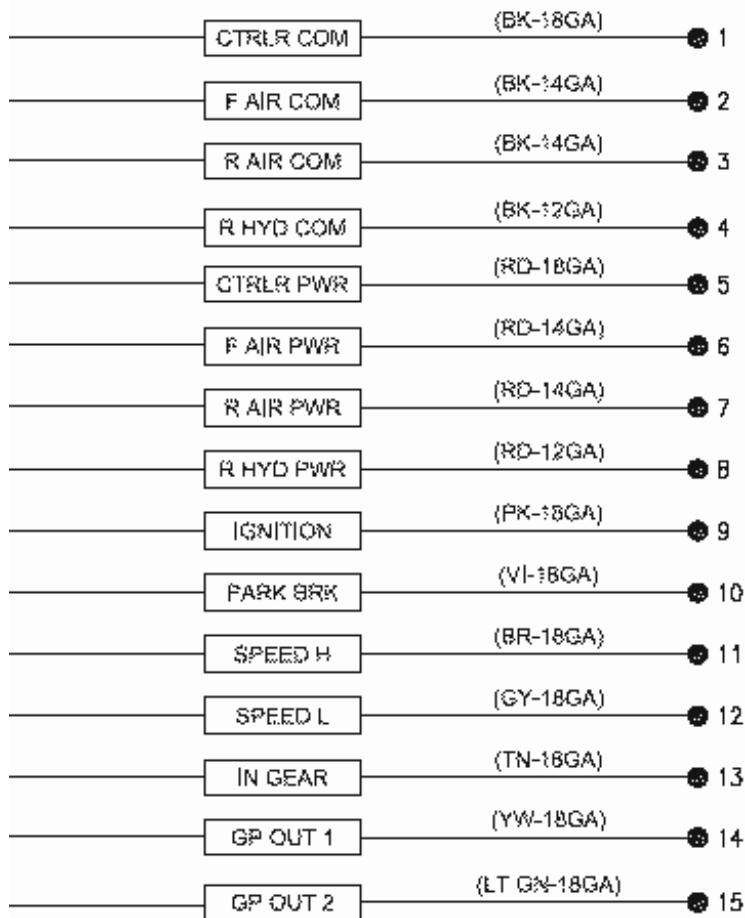
See the following paragraphs for information on connecting the vehicle speed signal to the dash harness.

Vehicle Speed Signal Requirements

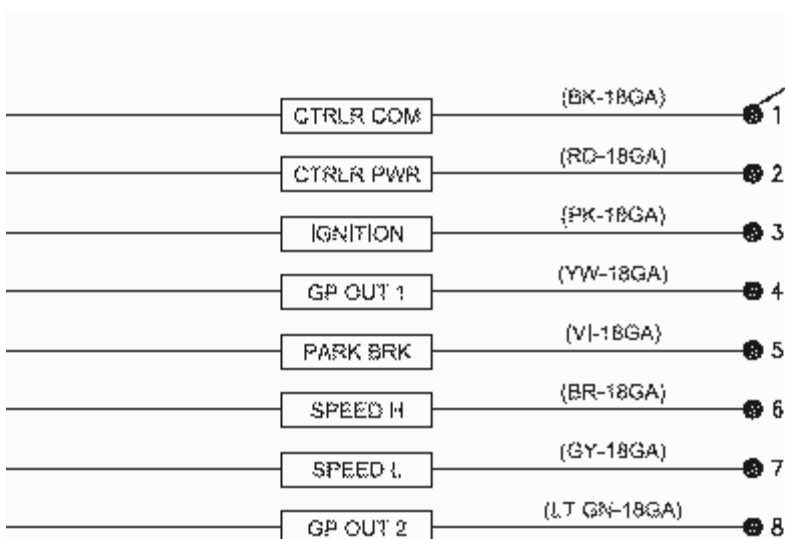
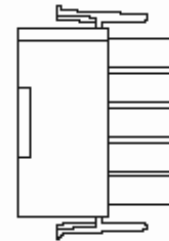
The leveling system requires a standard square wave signal representing the vehicle speed. The signal must have a peak-to-peak voltage between 8 and 30 volts and a maximum frequency of 2 kHz.

The leveling system is pre-calibrated for a speed signal input of 30,000 pulses per mile (500 Hz at 60 MPH). Typically, this signal will originate from the vehicle's transmission. However, to determine an appropriate source for this signal you should contact your dealer.

Wiring Harness Information

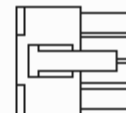


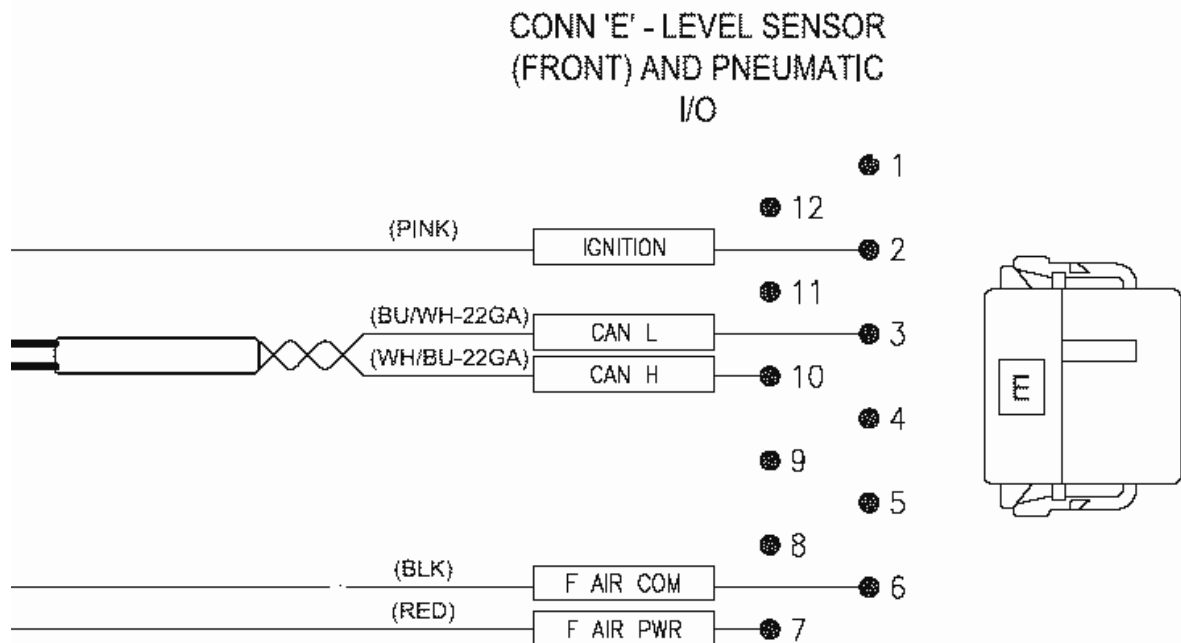
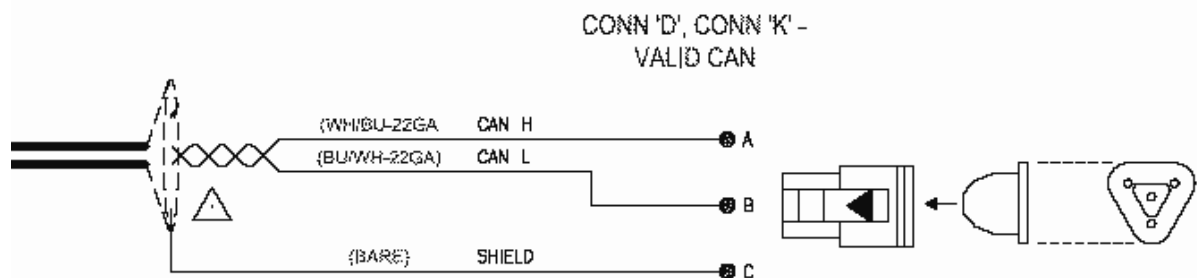
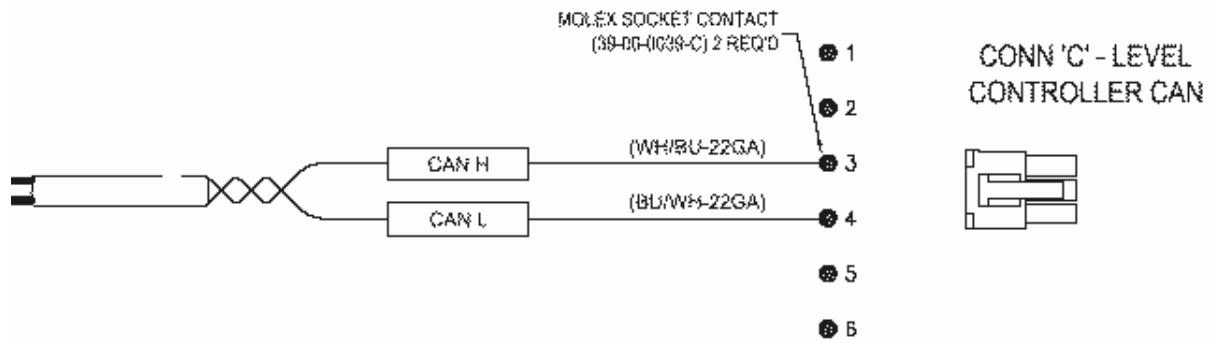
CONN 'A' - VEHICLE
INTERFACE



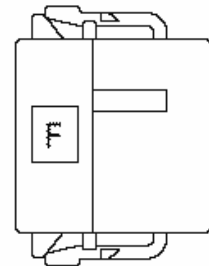
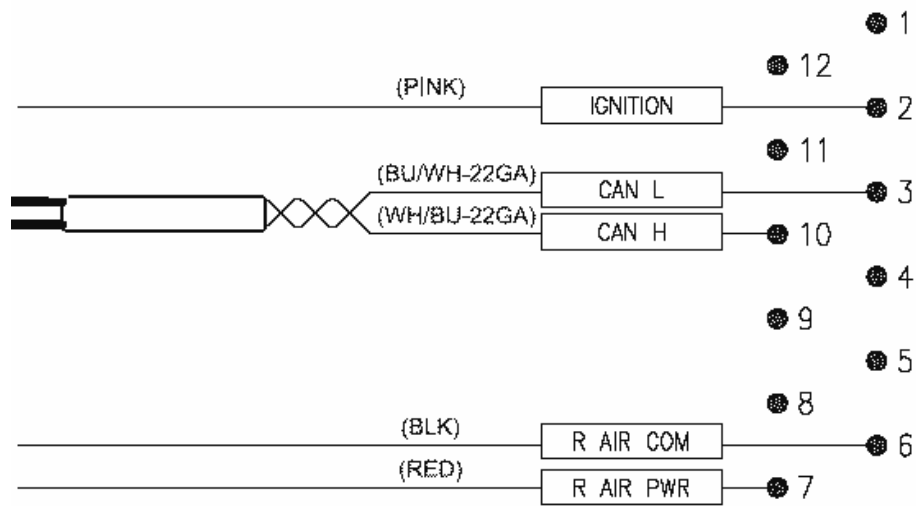
MOLEX SOCKET CONTACT
(39-00-0039-C) 8 REQ'D

CONN 'B' - LEVEL
CONTROLLER POWER



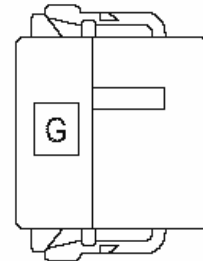
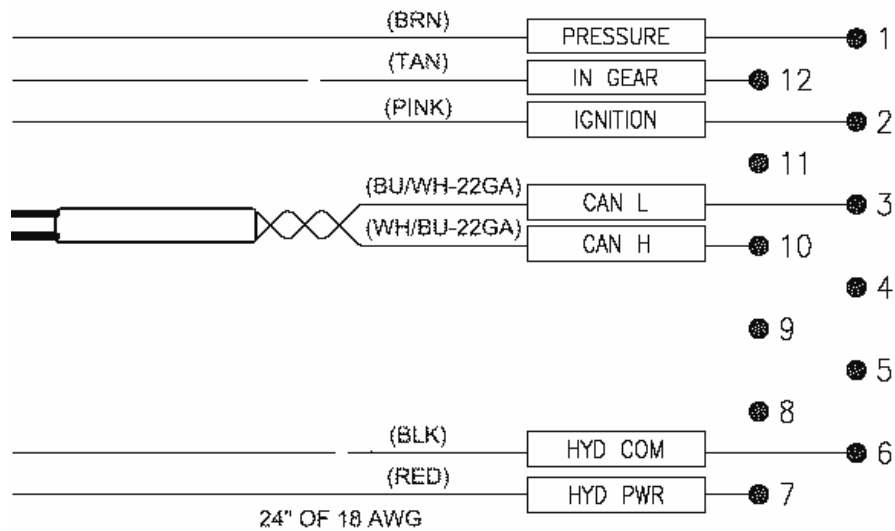


CONN 'F' - PNEUMATIC I/O (REAR)

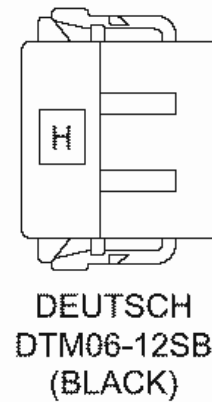
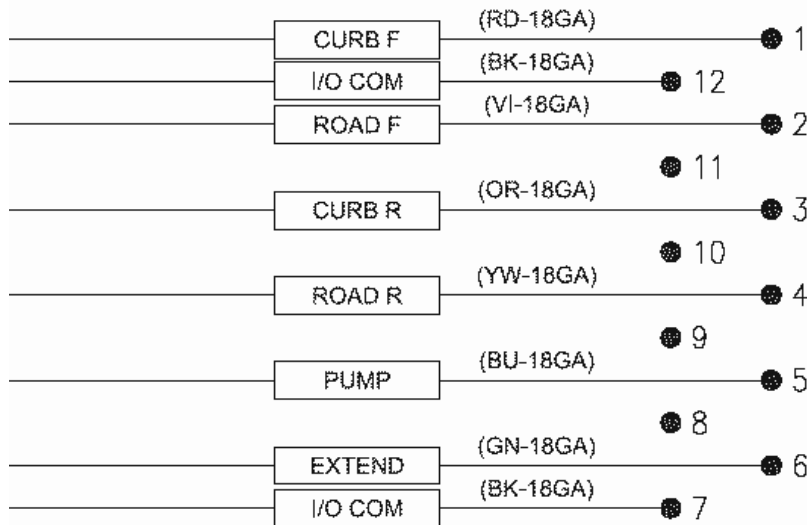


(GREY)

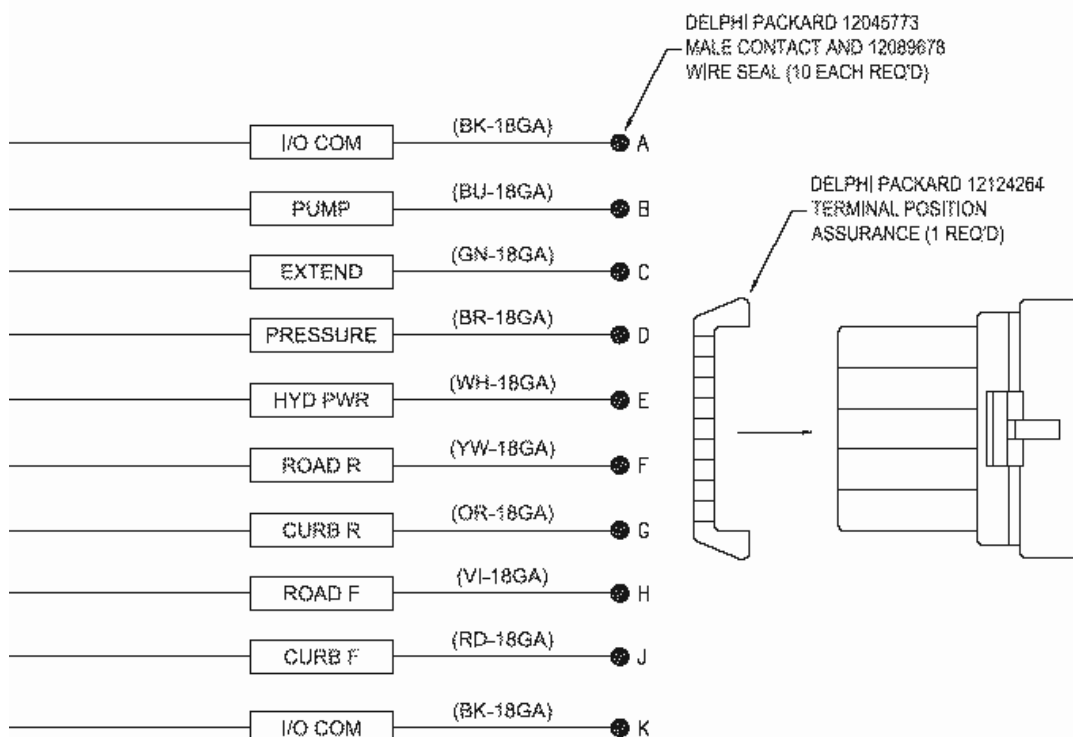
CONN 'G' - LEVEL SENSOR (REAR) AND HYD I/O



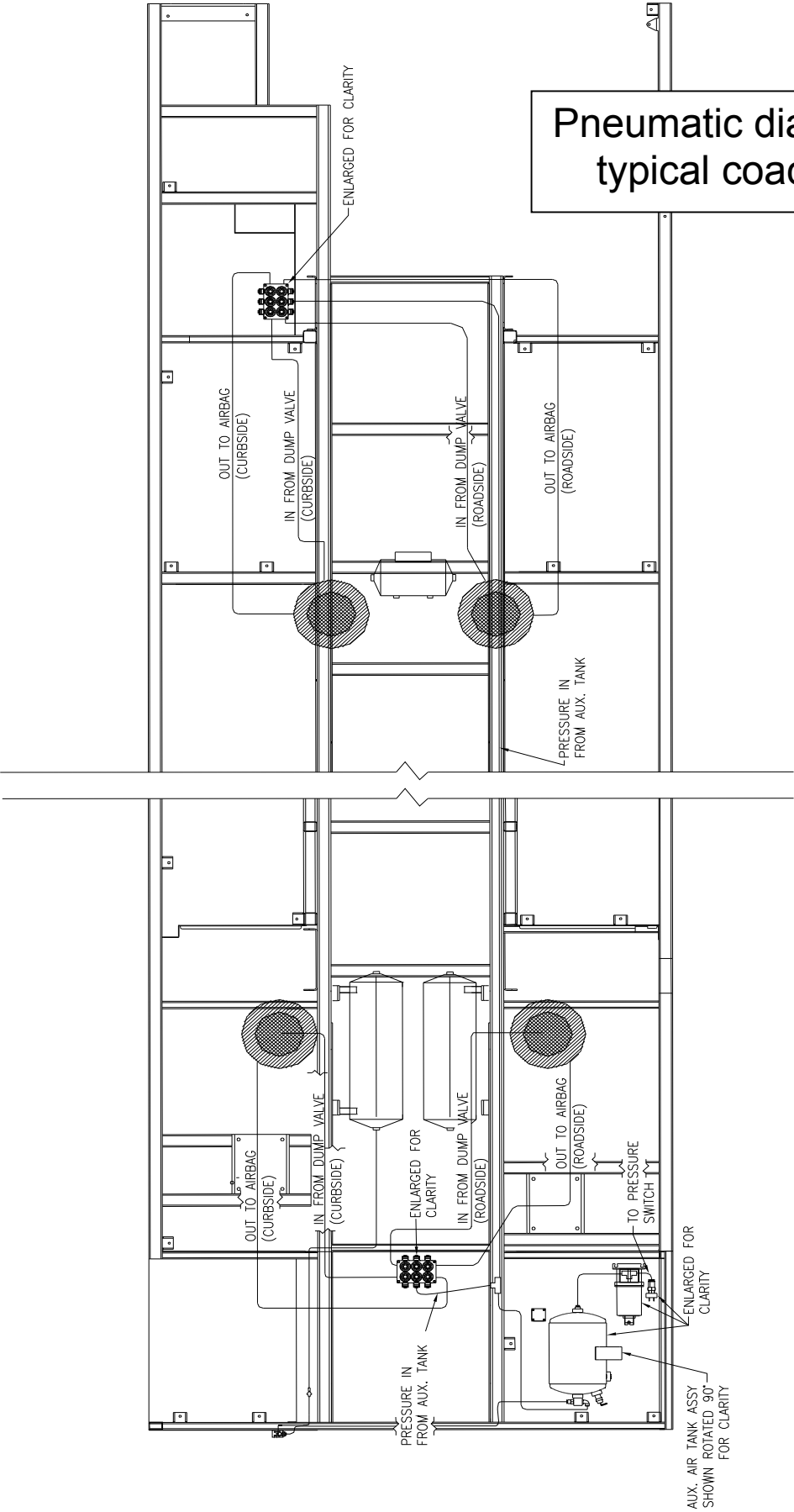
CONN 'H' - LEVEL SENSOR (REAR) AND HYD I/O



Pump connections



Pneumatic diagram for a typical coach layout





The Power Gear Air + Hydraulic Leveling System has a number of diagnostic features that provide information on the functioning of the system.

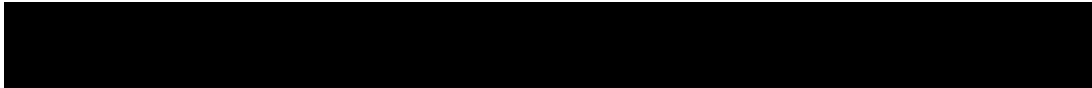
There are two types of diagnostic functions:

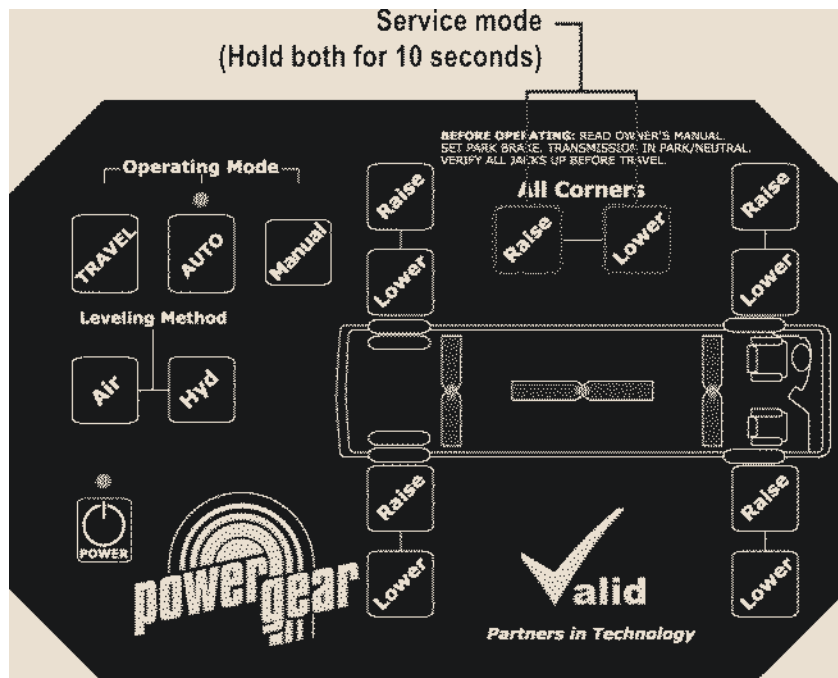
- Test diagnostics – these allow you to test the system for normal functionality.
- Fault diagnostics – these alert you to problems detected in the system.

Test Diagnostics

There are two test diagnostics available, to check the functionality of the indicator lamps and the GP outputs. Both tests require the system to be in service mode.

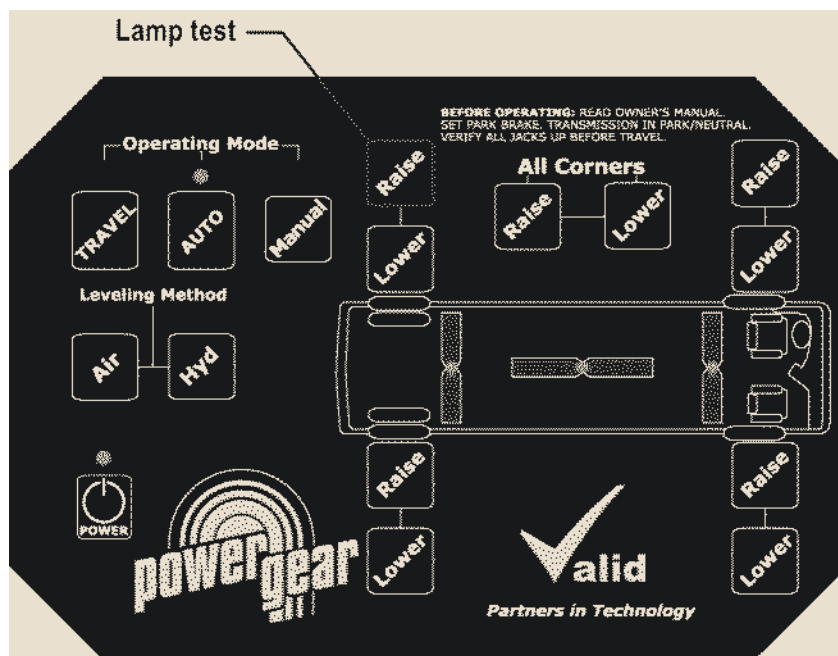
To place the unit into service mode:

1. Ensure the system is powered off.
 2. Press **POWER** to turn the system on.
 3. Press and hold **ALL CORNERS RAISE** and **ALL CORNERS LOWER** simultaneously for approximately 10 seconds until the **AUTO** and **MANUAL** indicators flash alternately and an alternating tone is sounded.
 4. Release **ALL CORNERS RAISE** and **ALL CORNERS LOWER**. You are now ready to proceed with one of the test diagnostics.
- 



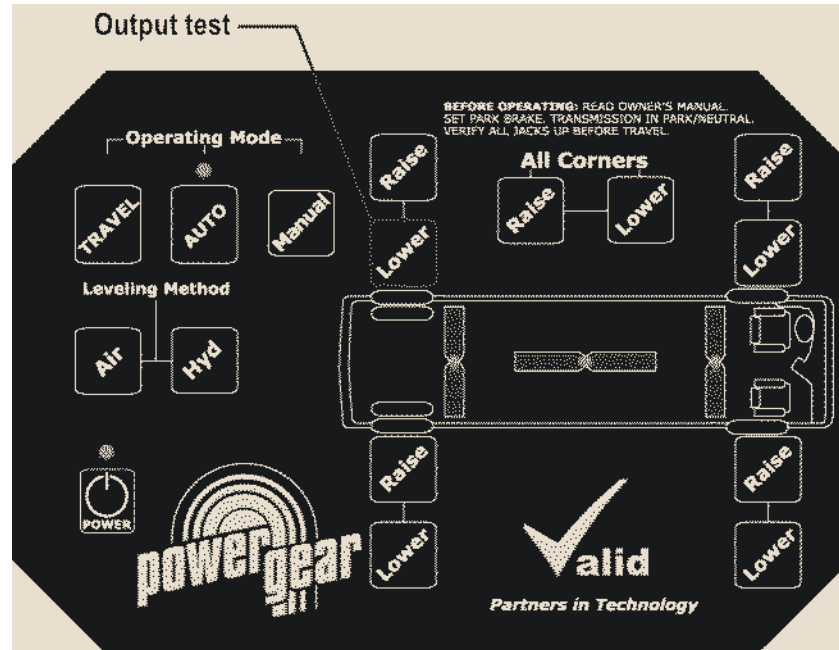
Lamp Test

Enter service mode and press the 'Lamp Test' function button (Rear Left **RAISE**). The system will then cycle through all of the indicators, illuminating them one at a time. Visually verify that each of the indicators illuminates.



Output Test

Enter service mode and press the 'Output Test' function button (Rear Left **LOWER**). The system will then cycle the two GP (general purpose) outputs for a few seconds. Electrically verify that each of the outputs activates.



Fault Diagnostics

Fault diagnostics provide information about problems detected in the leveling system; such as a loss of communication, or a short or open circuit.

If there is a fault in the system, the **FAULT** indicator light will illuminate, along with one or more LEDs in the level indication displays.

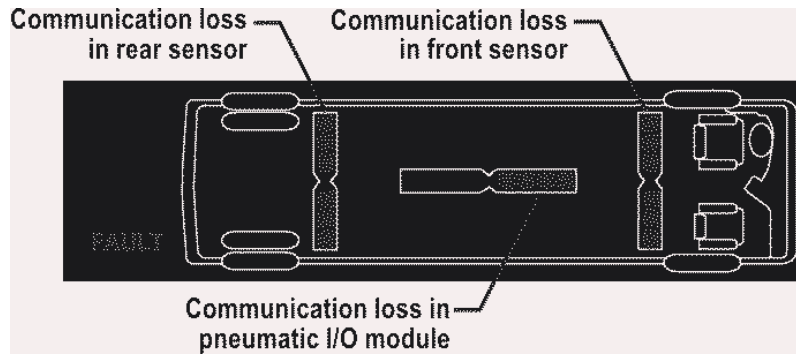
The following table describes the various fault LED configurations and what they mean.

Fault indicator + front axle lit up (all red, not the green LED).	A loss of communication in the front sensor.	A
Fault indicator + rear axle lit up (all red, not the green LED).	A loss of communication in the rear sensor.	A
Fault indicator + front half of longitudinal bar lit up.	Loss of communication in the pneumatic I/O module.	A
Fault indicator + lowest LED on right/left side in front/rear axle. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the Travel valve for the right/left side on the front/rear axle.	B
Fault indicator + middle LED on right/left side in front/rear axle. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the Lower valve for the right/left side on the front/rear axle.	B
Fault indicator + upper LED on right/left side in front/rear axle. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the Raise valve for the right/left side on the front/rear axle.	B
Fault indicator + 2 nd LED from left on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the front curbside hydraulic valve.	C
Fault indicator + 3 rd LED from left on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the front roadside hydraulic valve.	C
Fault indicator + 4 th LED from left on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the rear curbside hydraulic valve.	C

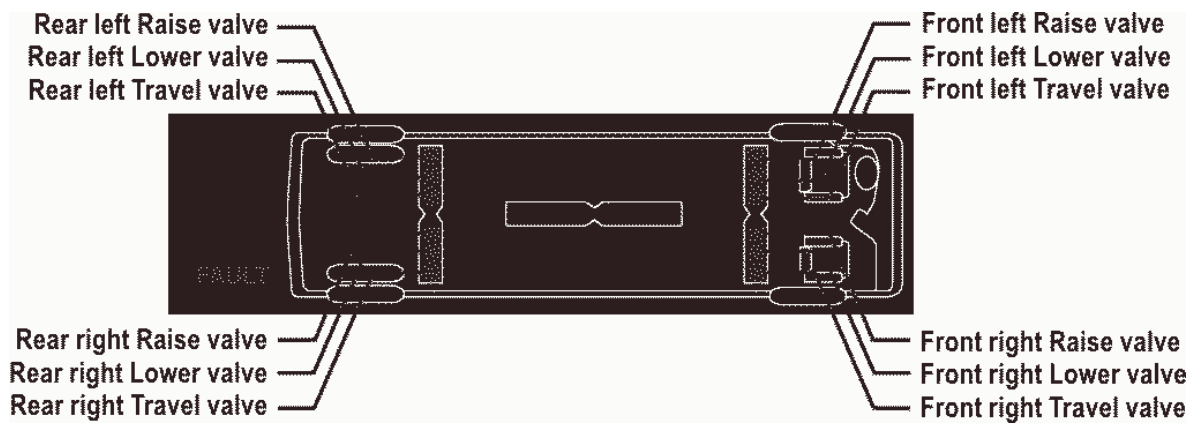
Fault indicator + 4 th LED from right on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the rear roadside hydraulic valve.	C
Fault indicator + 3 rd LED from right on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the pump solenoid.	C
Fault indicator + 2 nd LED from right on longitudinal bar. Flashing LED = open circuit Solid LED = short circuit	A short/open circuit in the hydraulic extend valve.	C
Fault indicator + 1 st LED on left on longitudinal bar.	Flashing LED = rear sensor accelerometer failure. The accelerometer is not producing output data. Solid LED = excess pressure switch transitions. The pressure switch cycled on and off more than 4 times within 60 seconds.	D
Fault indicator + 1 st LED on right on longitudinal bar.	Flashing LED = front sensor accelerometer failure. The accelerometer is not producing output data. Solid LED = hydraulic pump timeout. While in travel mode, the pump was operating for more than 90 seconds.	D

Fault Diagrams

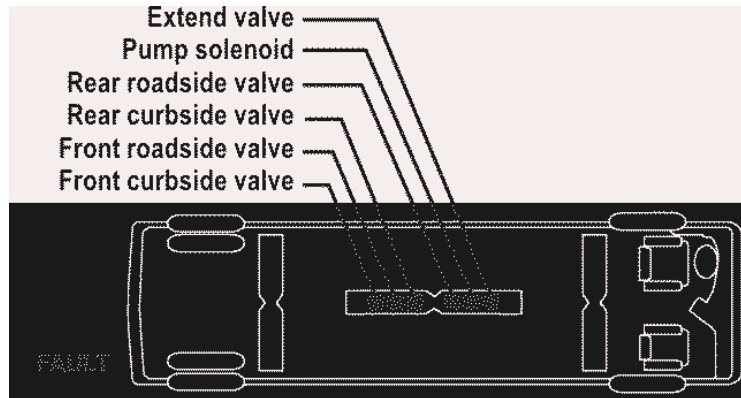
A. Communication loss:



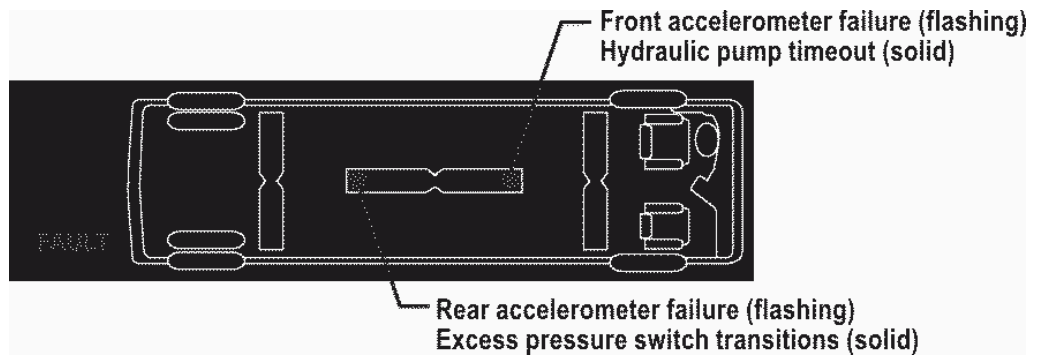
B. Short/open circuits in pneumatic valves (flashing = open circuit, solid = short circuit)



C. Short/open circuits in hydraulic valves
(flashing = open circuit, solid = short circuit)



D. Accelerometer failure/misc.



Trouble Shooting Chart (Air/Hydraulic)

Trouble with selecting leveling functions

Unable to enter "air auto level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on • Check that hydraulic jacks are fully stored
Unable to enter "hydraulic auto level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on and vehicle is in neutral (or park) • Check that hydraulic jacks are fully stored
Unable to enter "air manual level" mode	• Check that vehicle is traveling slower than 10 mph
Unable to enter "hydraulic manual level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on and vehicle is in neutral (or park)

Diagnosing Fault Codes

Loss of communication with sensor or I/O module	• Check fuse for sensor or I/O module • Check power to sensor or I/O module (refer to schematic) • Check integrity of harness to sensor or I/O module • Check condition of sensor or I/O module
Failure of valve (open circuit)	• Check for low battery voltage • Check valve solenoid for open circuit • Check integrity of harness to sensor or I/O module controlling valve • Check condition of sensor or I/O module
Failure of valve (short circuit)	• Check for low battery voltage • Check valve solenoid for short circuit • Check integrity of harness to sensor or I/O module controlling valve • Check condition of sensor or I/O module
Accelerometer Fault	• Reset system. If problem persists, replace sensor

Trouble Shooting Chart (Hydraulic Only)

Trouble with selecting leveling functions

Unable to enter "hydraulic auto level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on and vehicle is in neutral (or park) • Check that hydraulic jacks are fully stored
Unable to enter "hydraulic manual level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on and vehicle is in neutral (or park)

Diagnosing Fault Codes

Loss of communication with sensor	• Check fuse for sensor • Check power to sensor (refer to schematic) • Check integrity of harness to sensor • Check condition of sensor
Failure of valve (open circuit)	• Check for low battery voltage • Check valve solenoid for open circuit • Check power to sensor (refer to schematic) • Check integrity of harness to sensor controlling valve • Check condition of sensor
Failure of valve (short circuit)	• Check for low battery voltage • Check valve solenoid for short circuit • Check integrity of harness to sensor controlling valve • Check condition of sensor
Accelerometer Fault	• Reset system. If problem persists, replace sensor

Trouble Shooting Chart (Air Only)

Trouble with selecting leveling functions

Unable to enter "air auto level" mode	• Check that vehicle is stopped and park brake is on • Check that ignition is on
Unable to enter "air manual level" mode	• Check that vehicle is traveling slower than 10 mph

Diagnosing Fault Codes

Loss of communication with sensor	• Check fuse for sensor • Check power to sensor (refer to schematic) • Check integrity of harness to sensor • Check condition of sensor
Failure of valve (open circuit)	• Check for low battery voltage • Check valve solenoid for open circuit • Check integrity of harness to sensor controlling valve • Check condition of sensor
Failure of valve (short circuit)	• Check for low battery voltage • Check valve solenoid for short circuit • Check integrity of harness to sensor controlling valve • Check condition of sensor
Accelerometer Fault	• Reset system. If problem persists, replace sensor

If there is a problem with your Air + Hydraulic Leveling System, there are procedures that can be followed to minimize potential damage until you can reach a service depot. These include initiating a travel override, forcing valves on or off, and resetting the system.

Travel Override

To initiate a travel override if a loss of communication is detected:

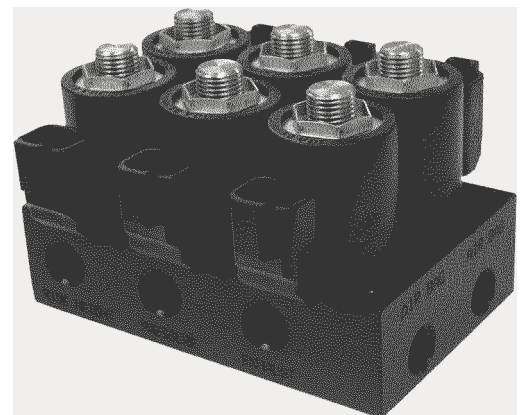
If the leveling controller experiences a loss of communication from one of the sensors, you may initiate a travel override procedure.

1. Ensure that the ignition is on.
2. Cycle the power to the affected sensor (for example, by pulling out and reinserting the fuse).

Once the power has been interrupted and restored, the leveling system will check for communication for 30 seconds. If no communication is detected after 30 seconds, the system then activates the Travel valve for whatever end had lost communication.

Forcing Pneumatic Leveling Valves

Some diagnostic procedures or manual override conditions may require a valve to be either definitely “ON” or “OFF”. It is possible to put the leveling system into a ‘forced’ condition, where you can force one or more pneumatic valves on. When valves have been forced on, you may not use the system in any other mode.



Valve manifold

There are two valve manifolds in the vehicle – one at the front and one at the back, corresponding to the two mounted sensors. Within each manifold, there are two valves for raising, two for lowering, and two for travel mode. Each valve within the pairs relates to one side of the vehicle. Thus, each manifold has a right raise valve, left raise valve, right lower valve, left lower valve, right travel valve, and left travel valve.

Any of these valves can be forced on using the procedure described below.

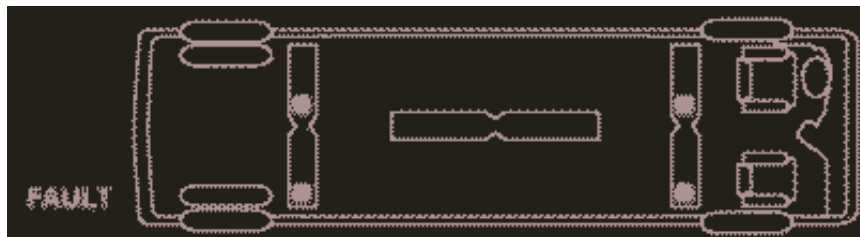
To go into forced mode and force a valve on:

1. Press **POWER** to turn the leveling controller on.
2. Press and hold **ALL CORNERS RAISE** and **ALL CORNERS LOWER** simultaneously for approximately 10 seconds until the **AUTO** and **MANUAL** indicators flash alternately and an alternating tone is sounded.
3. Release **ALL CORNERS RAISE** and **ALL CORNERS LOWER**.
4. Press the rear right **LOWER** button. The **FAULT** light will begin to flash.
5. Press the **RAISE** or **LOWER** button for any corner that you wish to force the valve on. The LED corresponding to your choice will illuminate.

*For example, to force on the rear right Lower valve, press the rear right **LOWER** button.*

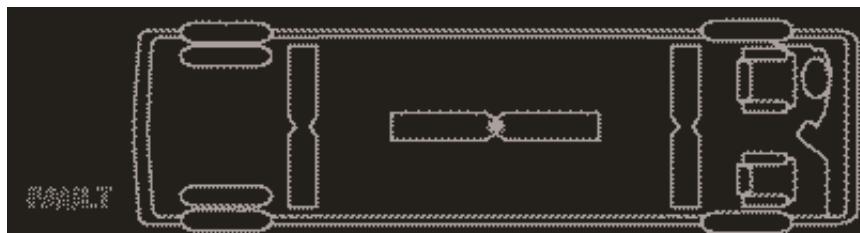
OR

To force Travel mode, press the **TRAVEL** button. All four Travel LEDs will illuminate, as shown in the figure below.



Forced travel mode

To force all valves to the off state, press the **ALL CORNERS RAISE** button. This will illuminate the green LED in the centre of the display.



All valves forced off

In forced mode, you may force valves on or off. If **at least one** valve is forced, the system is in forced mode. If **no** valves are forced, the system will exit forced mode.

To 'unforce' valves while in the forced condition, and/or exit the forced condition:

Press the appropriate **RAISE** or **LOWER** button to force off individual valves. Valves can be forced on and off by simply toggling the associated **RAISE** and **LOWER** buttons.

*For example: If you have forced on the front right Lower valve, press Front Right **LOWER** again to force off that valve. If that is the **only** valve that was forced on, turning it off will cause the system to exit the forced condition and return to its standard operating mode.*

If you have forced on several valves and wish to 'unforce' them all and exit the forced condition, press the **ALL CORNERS LOWER** button.



Resetting the Leveling System

In rare cases, you may be required to perform a full reset of your leveling system. Note that this will not reset any forced valves. Please do not reset your system unless directed by qualified service personnel.

To reset the leveling system:

1. Press **POWER** to turn on the leveling controller.
2. Press and hold **POWER** until an alternating tone is heard. The system will turn itself off after this.

Zero Set

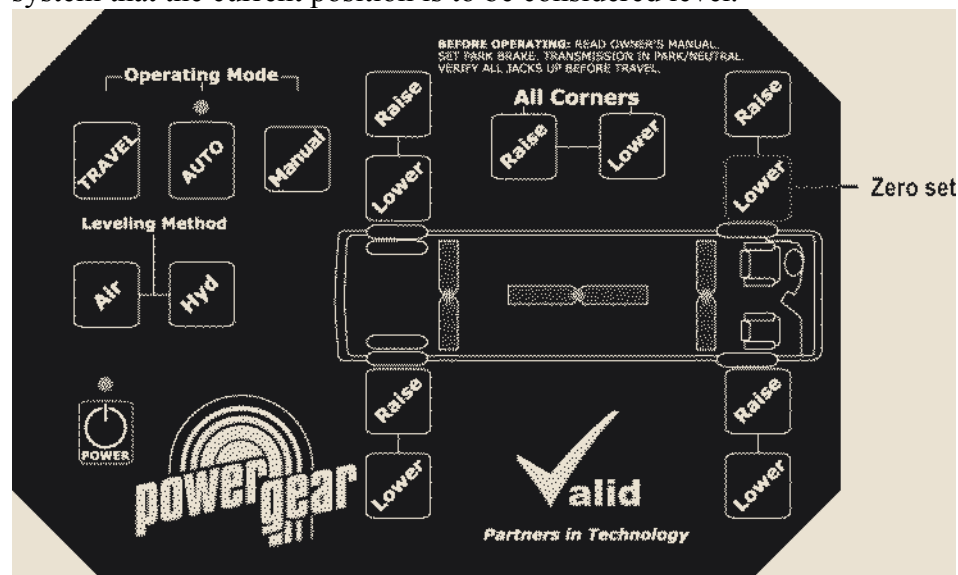
The Zero Set function resets the system's level reference to the current vehicle position. While it is necessary to do this step as part of the initial configuration of the leveling system, you may also perform this function any time you wish to re-zero the vehicle's level settings.

To set to zero:

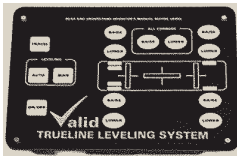
1. Ensure that the vehicle is level and on a relatively flat and level surface.
2. Manually level the coach.

Note that the control panel's level display will not be accurate at this time, so use a leveling tool to determine where level is. You may wish to measure level in more than one place if you have several leveling tools. Otherwise, choose a key location in the coach such as a table or stove top.

3. To adjust the corners of the vehicle, press and hold **MANUAL**.
4. While holding **MANUAL**, press the appropriate **RAISE** or **LOWER** buttons to raise and/or lower corners.
5. Once the vehicle is manually leveled, go into service mode, do this by first ensuring that the system is powered off.
6. Press **POWER** to turn the system on.
7. Press and hold **ALL CORNERS RAISE** and **ALL CORNERS LOWER** simultaneously for approximately 10 seconds until the **AUTO** and **MANUAL** indicators flash alternately and an alternating tone is sounded.
 - a. Press Front Left **LOWER** to select the Zero Set function. This tells the leveling system that the current position is to be considered level.

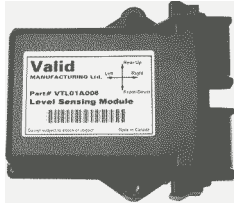


Parts List



Leveling controller

140-1194



Leveling sensor

140-1191 front

140-1192 rear



Receptacle 'T' J1939

140-1190



Resistor, termination plug

DT06-3S-P006



Harness, sensor to valve

Call for harness part numbers.

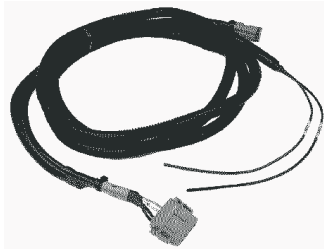


Harness, controller to dash

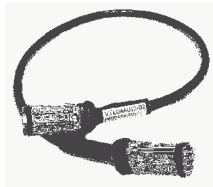
Call for harness part numbers



Harness, controller to CAN
Call for harness part numbers



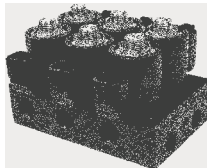
Harness, sensor to CAN
Call for harness part numbers



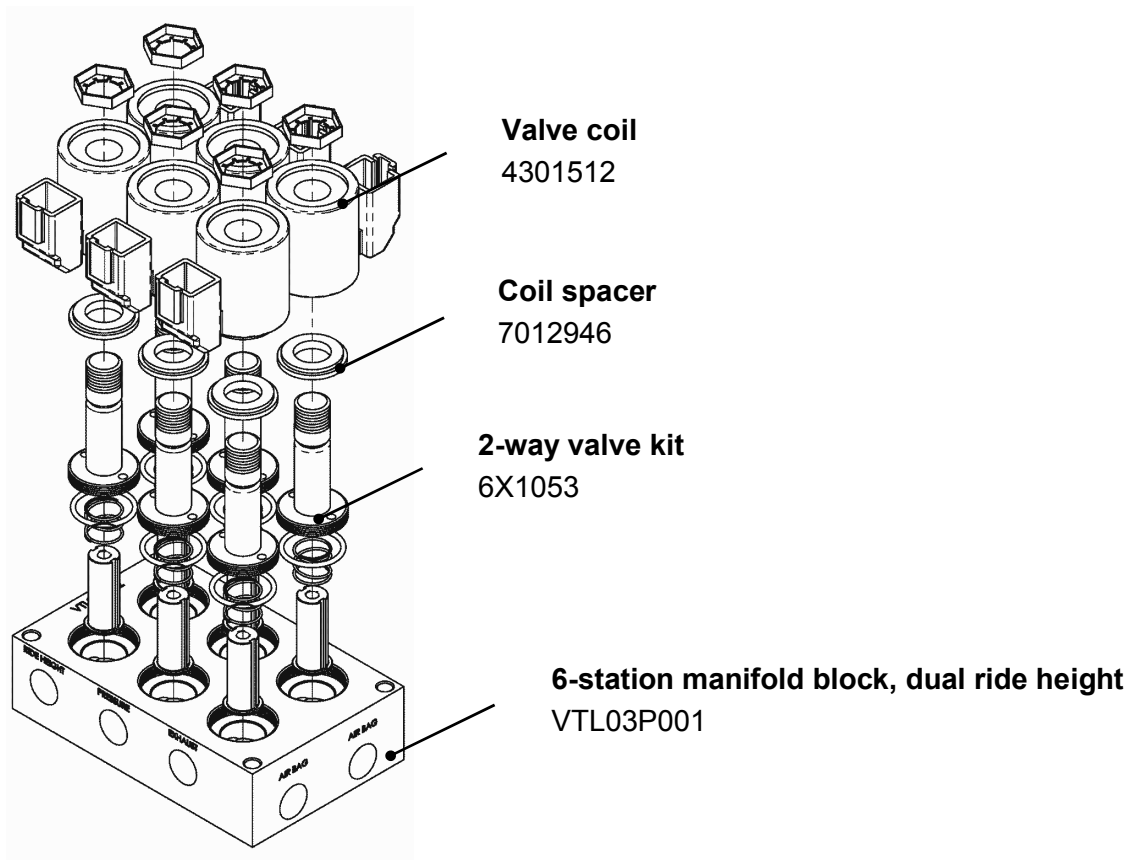
Harness, CAN
Call for harness part numbers



Harness, CAN, grounded
Call for harness part numebers



6-station air manifold, dual ride height
VTL03A001

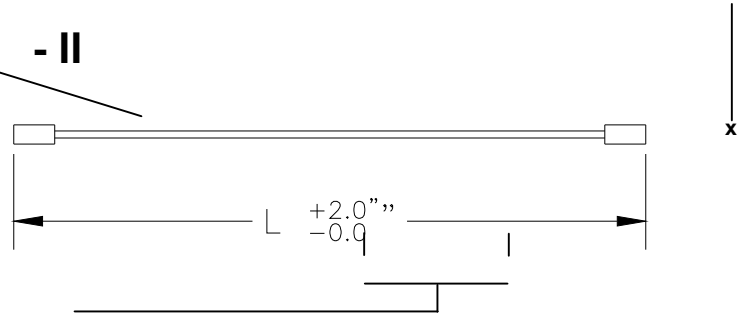


HOSES AND FITTINGS

Hose

080-XX XXX - II

Hose fitting at each end	
Letter	Definition
A	#4 37 deg female swivel end, 7/16-20 thread per S.A.E. J514/J.I.C
B	#6 37 deg female swivel end, 9/16-18 thread per S.A.E. J514/J.I.C
C	90 deg short bend tube, #4 37 deg female swivel 7/16-20 thread per S.A.E. J514/J.I.C
D	90 deg short bend tube, #6 37 deg female swivel 9/16-18 thread per S.A.E. J514/J.I.C
E	45 deg short bent tube, #4 37 deg female swivel 7/16-20 thread per S.A.E. J514/J.I.C
F	#4 37 deg male rigid end 7/16-20 thread per S.A.E. J514/J.I.C
G	#6 37 deg male rigid end 9/16-18 thread per S.A.E. J514/J.I.C



Example: Hose assembly # 080-AA264-II is 264 inches long, with #4 37 deg female swivel end fittings on both ends.

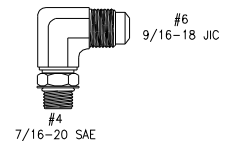
Fittings:

070-1261

070-1267

070-1268

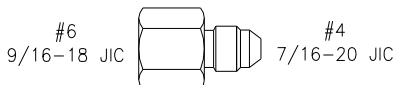
070-1269



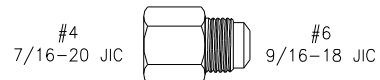
070-1262

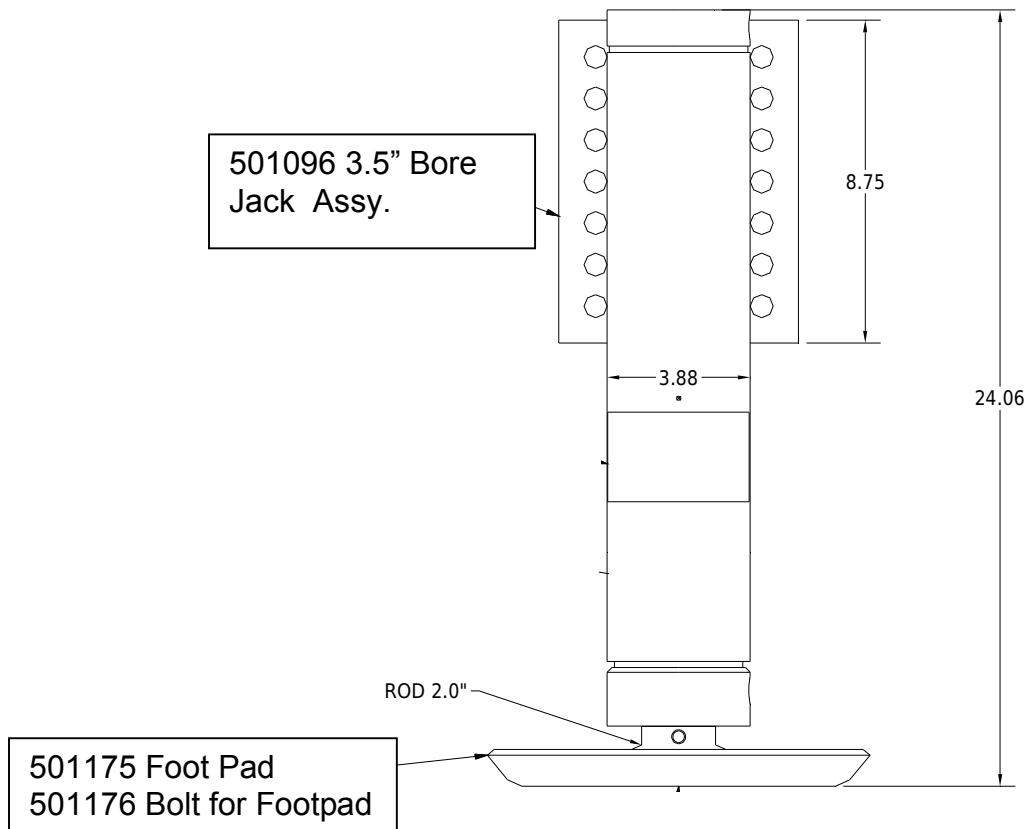
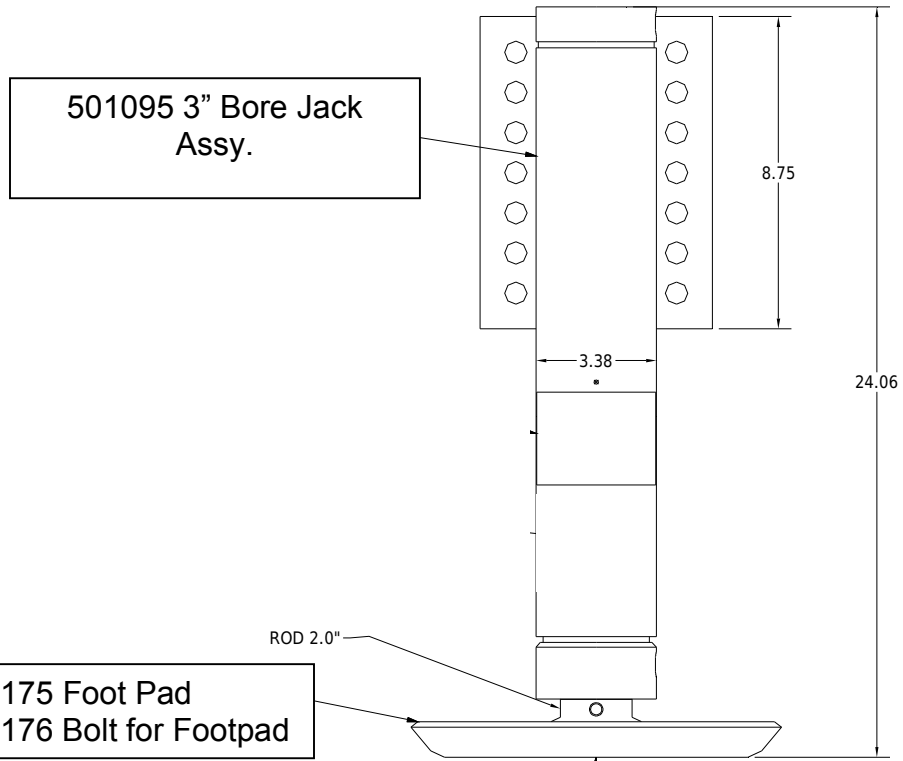
Reducers:

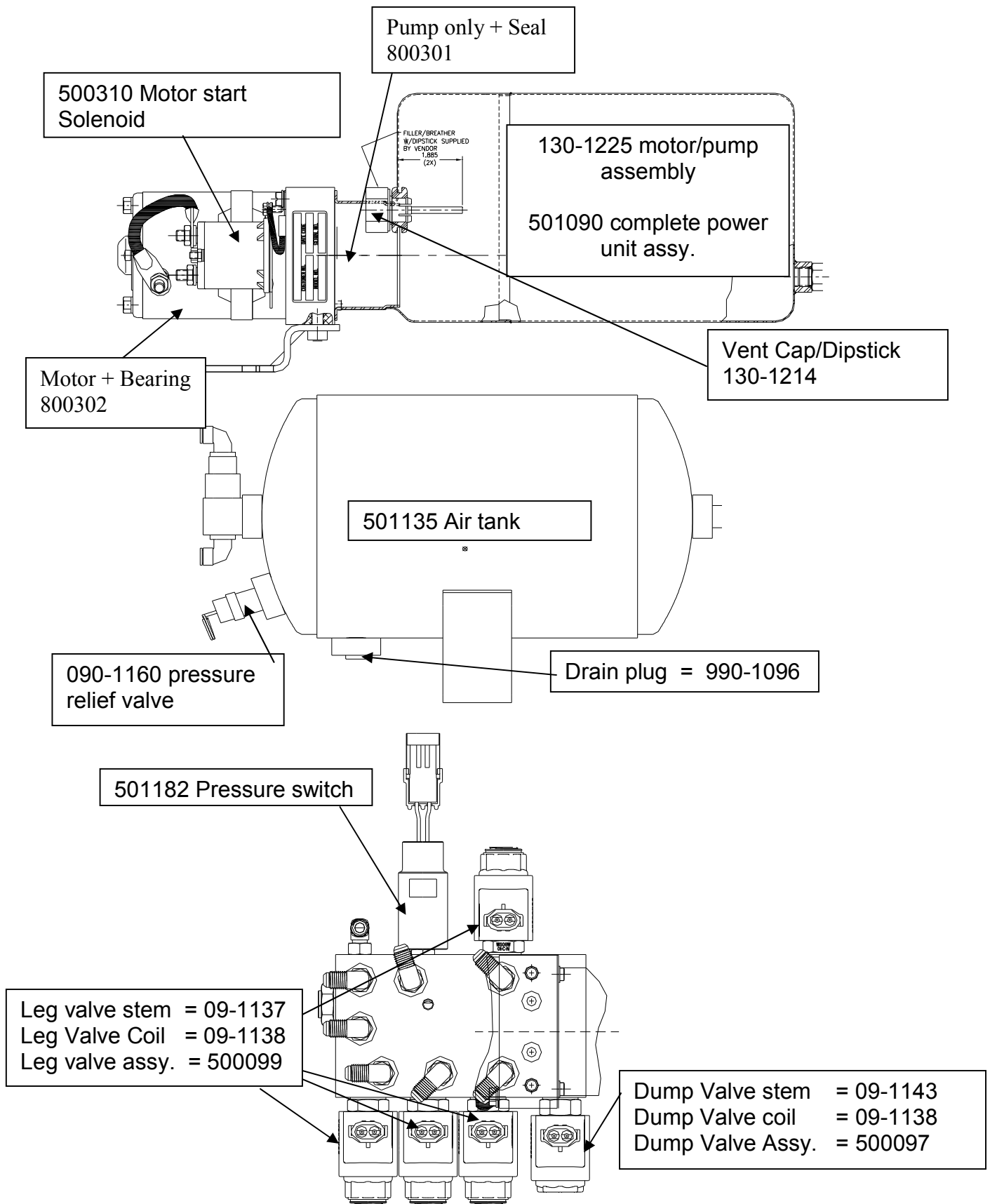
070-1258



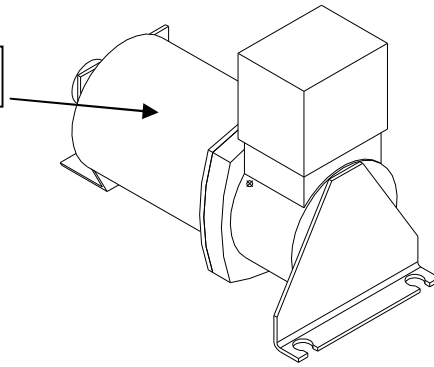
070-1263







130-1250 Air Pump Assy.



RECOMMENDED HYDRAULIC FLUIDS FOR YOUR POWER GEAR LEVELING SYSTEM

The fluids listed here are acceptable to use in your pump assembly. Contact coach manufacturer or selling dealer for information about what specific fluid was installed in your system. Please consult factory before using any other fluids.

In most applications,

- Type A automatic transmission fluid (ATF, Dexron III, etc.,) will work satisfactorily.
- Mercon V is also recommended as an alternative fluid for Power Gear leveling systems operating in environments with large temperature swings

Operating in cold temperatures (less than -10° F) may cause the jacks to extend and retract slowly. For cold weather operation, fluid specially-formulated for low temperatures may be desirable,

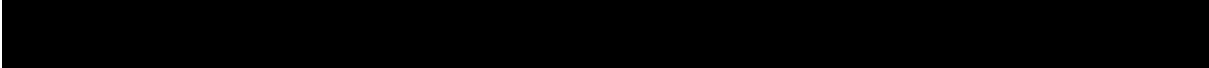
- Mobil DTE 11M, Texaco Rando HDZ-15HVI, Kendall Hyden Glacial Blu, or any Mil. Spec. H5606 hydraulic fluids are recommended for cold weather operation.

PREVENTATIVE MAINTENANCE PROCEDURES

WARNING:

Your coach should be supported at both front and rear axles with jack stands before working underneath, failure to do so may result in personal injury or death.

1. **Check the fluid level every month.** Fill the reservoir with the jacks in the fully **retracted** position. On vertical pump assemblies, the fluid should be within 1/4 inch of the fill port lip and checked only with all jacks retracted. On horizontal pump assemblies, the fluid level should be approximately 1.75" on the dipstick and checked only with all jacks retracted.
2. **Change fluid every 24 months.**
3. **Inspect and clean all hydraulic pump electrical connections every 12 months.**
4. **Remove dirt and road debris from jacks as needed.**
5. If jacks are down for extended periods, it is recommended to **spray exposed chrome rods with a silicone lubricant** every seven days for protection. If your coach is located in a salty environment (within 60 miles of coastal areas), it is recommended to spray the rods every 2 to 3 days.
6. **Drain water from the auxiliary air tank** every 3 months. Relieve all pressure from air tank by pulling the pressure relief valve ring until pressure is eliminated, then remove the plug at the tank bottom. When the water has drained out, reinstall the plug. Some manufacturers may install a petcock valve, which eliminates the necessity to relieve the air pressure from the system before opening the petcock.



Accelerometer

Traditionally, a sensor used to measure acceleration. DC-coupled accelerometers can be used to measure the acceleration due to gravity, which allows them to be used as an inclinometer to measure tilt.

Auto mode

The leveling mode that should be used by default when the vehicle is at a stop. This mode is the easiest to use and is suitable for most situations.

Controller

The controller is the interface between the operator and the leveling system. It allows the operator to enter commands using keys, and displays information with LEDs.

EEPROM

Electrically Erasable Programmable Read-Only Memory. A memory chip that can be recorded or erased electrically, but that does not lose its content when electrical power is removed.

GP output

General purpose output. The Leveling System has two GP outputs, which can be optionally used as the operator wishes.

Manual mode

Manual leveling mode allows you to raise or lower each corner of the vehicle individually, to the level you want. Manual leveling mode can be used if you wish to have control over the leveling process. It can also be used at low traveling speeds when an uneven surface must be negotiated.

Ride height

Ride height is a manufacturer-assigned height between a vehicle's axle and the chassis. On the valve manifold, there are two ride height inlet ports (left and right) that connect to the left and right travel valves, respectively.

Service mode

The mode that the control panel must be in before certain features can be accessed, including initial configuration, diagnostic functions, and forcing valves. This mode is entered by turning the controller on and then holding down **AUTO** until an alternating tone is heard.

Travel mode

The leveling mode that is used when the vehicle is in motion. By default, this mode will initiate when the vehicle is moving at a speed higher than the designated speed limit (set in the initial configuration of the system), but it is best for the operator to enter this mode before the vehicle begins moving.

Twist

Occurs at the four points in a vehicle's suspension, and puts stress on the chassis and vehicle frame.

Valve manifold

The 2 valve manifolds are the 'action' components of the leveling system. They control the intake and release of air to the air springs depending on the information they receive from the sensors. They feature durable components that include IP67 rated electrical connectors, 1-piece molded coil and an anodized body.

**POWER GEAR
LIMITED WARRANTY**

Power Gear warrants to the original retail purchaser that the product will be free from defects in material and workmanship for a period of (2) years following the retail sales date. Power Gear will, at its option, repair or replace any part covered by this limited warranty which, following examination by Power Gear or its authorized distributors or dealers, is found to be defective under normal use and service. No claims under this warranty will be valid unless Power Gear or its authorized distributor or dealer is notified in writing of such claim prior to the expiration of the warranty period. Warranty is transferable pending documentation of original sale date of product.

THIS WARRANTY SHALL NOT APPLY TO:

- Failure due to normal wear and tear, accident, misuse, abuse, or negligence.
- Products which are modified or altered in a manner not authorized by Power Gear in writing.
- Failure due to misapplication of product.
- Telephone or other communication expenses.
- Living or travel expenses.
- Overtime labor.
- Failures created by improper installation of the product's slide out system or slide out room to include final adjustments made at the plant for proper room extension/retraction; sealing interface between slide out rooms and side walls; synchronization of inner rails; or improper wiring or ground problems.
- Failures created by improper installation of leveling systems, including final adjustments made at the plant, or low fluid level, wiring or ground problems.
- Replacement of normal maintenance items.

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For service contact your nearest Power Gear authorized warranty service facility or call 1-800-334-4712. Warranty service can be performed only by a Power Gear authorized service facility. This warranty will not apply to service at any other facility. At the time of requesting warranty service, evidence of original purchase date must be presented.

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Mishawaka, IN 46544
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www.powergearus.com



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