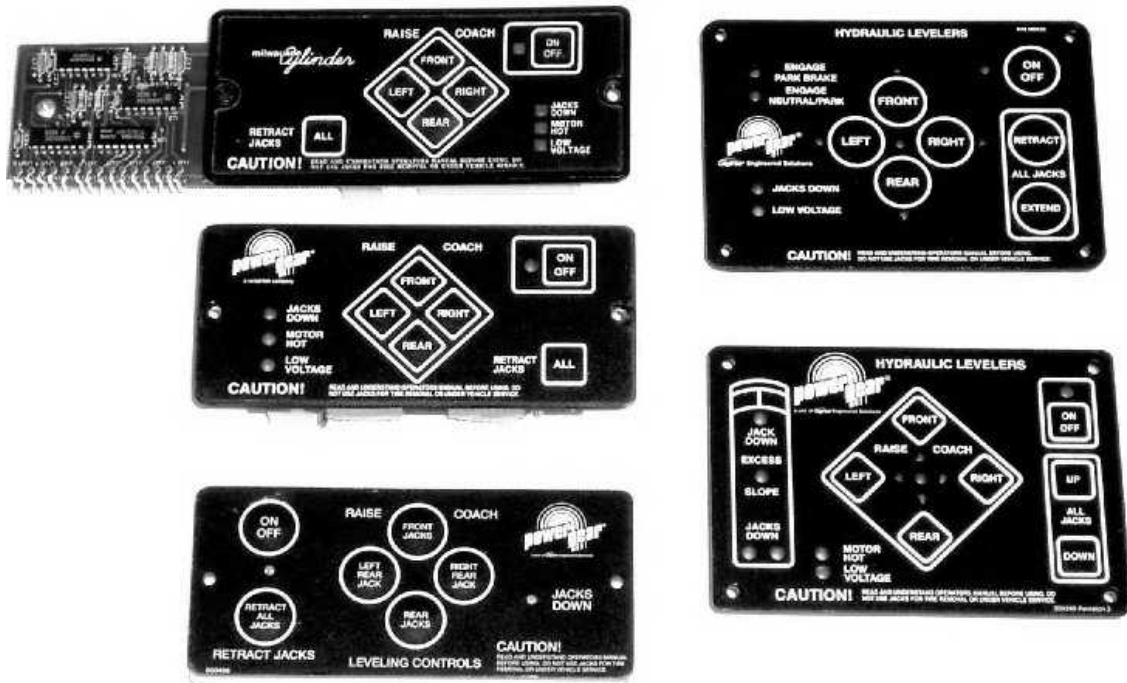




# HYDRAULIC LEVELING SYSTEMS OPERATIONS MANUAL

(For systems with touch pad part number 500089, 500105, 500210, 500456, 500535 or no number at all)



Visit us on the web at [www.powergearus.com](http://www.powergearus.com)

82-L0040-01  
Rev. 1

## **WARNING**

- **DO NOT USE THE POWER GEAR HYDRAULIC LEVELING SYSTEM (OR AIR SUSPENSION) TO SUPPORT VEHICLE WHILE UNDER COACH OR CHANGING TIRES. THE HYDRAULIC LEVELING SYSTEM IS DESIGNED AS A 'LEVELING' SYSTEM ONLY. TIRE REPAIRS SHOULD BE PERFORMED BY A TRAINED PROFESSIONAL. ATTEMPTS TO CHANGE TIRES WHILE SUPPORTING THE VEHICLE WITH THE HYDRAULIC SYSTEM COULD RESULT IN DAMAGE TO THE MOTOR HOME AND/OR CAUSE SERIOUS INJURY OR EVEN DEATH.**
- **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.

### **BEFORE YOU OPERATE THE SYSTEM:**

The leveling system shall only be operated under the following conditions:

1. The coach is parked on a reasonably level surface.
2. The coach "PARKING BRAKE" is engaged.
3. The coach transmission should be in the neutral or park position.
4. The ignition is in the run position, or engine is running.

## **SYSTEM DESCRIPTION**

**Please read and study the operating manual before you operate the leveling system.**

**SYSTEM DESCRIPTION** - The Power Gear electro-hydraulic leveling system consists of the following major components:

- (A)** Spring return jacks rated at a lifting capacity appropriate for your coach. Each jack has a large 10" diameter (78.5 square inch) shoe for maximum surface area on soft surfaces.
- (B)** Each jack is powered from a central 12VDC motor/pump assembly, which also includes the hydraulic oil reservoir tank, control valve manifold, and solenoid valves.
- (C)** The control system located in the coach controls the system. There are 2 different control systems possible:
  - A Manual control with bubble level.
  - A Semi-automatic control, with internal leveling sensor

## **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 may 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.

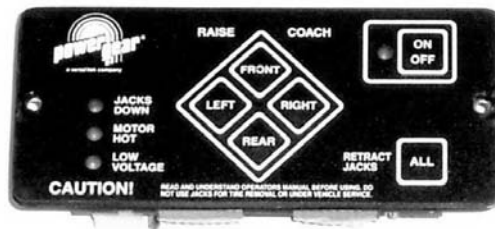
## **PREVENTATIVE MAINTENANCE PROCEDURES**

### **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.**

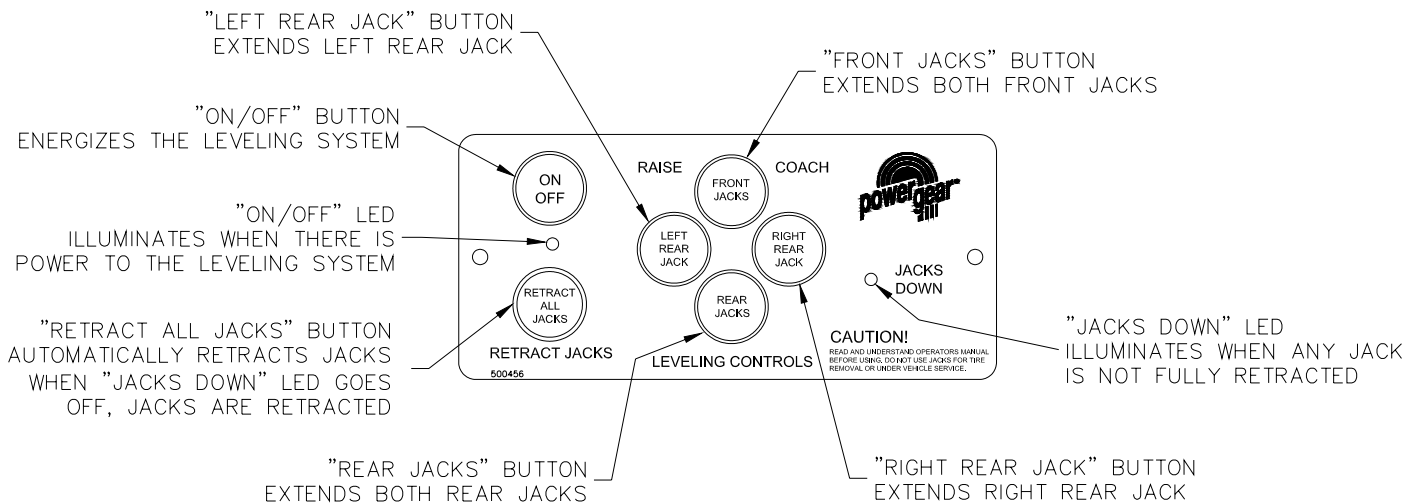
1. **Check the fluid level every month.** Fill the reservoir with the jacks in the fully **retracted** position. On 1998 - PRESENT model year coaches, the fluid should be within 1/4 inch of the fill port lip and checked only with all jacks retracted. On pre-1998 model year coaches the fluid level should be approximately 1/8 inch 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. Jacks equipped with grease fittings at the **bottom of the cylinder should be greased with a light weight lithium grease** using a hand pump style grease gun only. 2 or 3 pumps should be sufficient for 20-30 uses.

# MANUAL SYSTEM LEVELING PROCEDURES FOR COACHES WITH THE FOLLOWING TOUCH PADS



## SELECTING A SITE

When the coach is parked on an excessive slope the leveling requirements may exceed the jack lift stroke capability. If the coach is parked on an excessive slope, the coach should be moved to a more level surface before the leveling system is deployed.



1. Push "ON/OFF" pad on control panel. The system is now operational and the "ON/OFF" light will be lit. If "ON/OFF" light is not lit, see "BEFORE YOU OPERATE THE SYSTEM" conditions on page L4.
2. Push "FRONT JACKS" button until the front of the coach rises at least 3 ". This is important and necessary to allow the coach to pivot when leveling side to side. If there is insufficient jack stroke to lift the front of the coach at least 3 inches the coach will have to be moved to an area with less front to back slope.
3. Push "REAR JACKS" button until jacks contact the ground.
4. If bubble is towards front of coach push "REAR JACKS" button, If bubble is towards rear of coach push "FRONT JACKS" button. Keep button depressed until bubble is centered in vial from front to back, then release.
5. If bubble is towards left of coach push "RIGHT JACKS" button, If bubble is towards right of coach push "LEFT JACKS" button. Keep button depressed until bubble is centered in vial, then release.

**NOTE: The right and left rear jacks are used to level the coach side to side. Pushing the "LEFT REAR JACKS" pad on the control panel will extend the left rear jack. Pushing the "RIGHT REAR JACKS" pad on the control panel will extend the right rear jack. The front jacks are designed to provide a pivot point for the chassis, thus there is no individual control of the right or left front jacks on 4 jack systems.**

6. Repeat steps 2 through 5 if needed.
7. Turn power off to leveling system by pushing "ON/OFF" pad.
8. Visually inspect jacks to ensure all pads are touching ground. Should one of the rear jacks not be touching the ground, press the corresponding left or right rear jack buttons to lower the appropriate jack to the ground. Never lift all the wheels off the ground to level the coach

## **JACK RETRACT PROCEDURES**

1. Energize the system by pushing "ON/OFF" pad on control panel. The "ON/OFF" light will be lit.
2. Push the "RETRACT ALL JACKS" pad. All the jacks will start to retract and return to the full retract position. When all jacks return to full retract position the "JACKS DOWN" light will go out. On older controls you have to push and hold the "RETRACT ALL JACKS" pad.

**NOTE:** If you wish to stop the jacks from retracting, turn the system off and back on again by pushing the on/off pad twice. You can then re-level the coach by following steps 1-5 again.

3. When the "JACKS DOWN" light goes out push the "ON/OFF" pad on the control panel to de-energize the system. After a brief visual inspection around the coach to verify the jacks are fully retracted, you may proceed to travel.

## **AUTOMATIC SAFETY SHUTOFF FEATURE**

If the touch panel is left on and inactive for four minutes it will shut off automatically. To reset the system the coach ignition must be turned off, then back on and the "ON/OFF" pad must again be pushed.

## **DRIVE AWAY PROTECTION SYSTEM**

If the ignition is in the "RUN" position, jacks are down, and the operator takes the transmission out of park or neutral or releases the parking brake, the "JACKS DOWN" indicator will light and the alarm beeper will activate. The system will then automatically retract the jacks until the jacks are fully retracted or the operator resets the parking brake and/or places the transmission back into park or neutral.

## SEMI AUTO SYSTEM LEVELING PROCEDURES FOR COACHES WITH THE FOLLOWING TOUCH PADS



### **SELECTING A SITE**

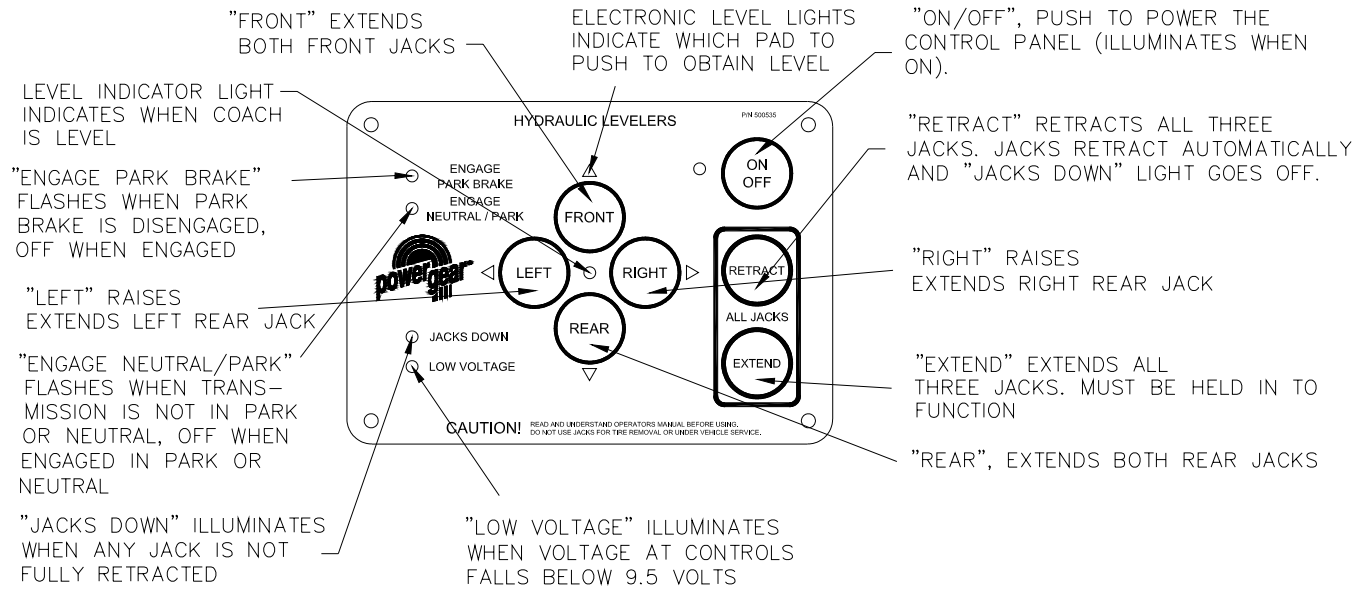
When the coach is parked on an excessive slope the leveling requirements may exceed the jack lift stroke capability. If the coach is parked on an excessive slope, the coach should be moved to a more level surface before the leveling system is deployed.

### **EXCESS SLOPE**

Systems produced before 1999 have an "excess slope" feature. When the control panel "EXCESS SLOPE" light flashes, the coach is parked on an excess slope and the coach should be moved to a more level surface before the leveling system is deployed.

The "EXCESS SLOPE" light and the Electronic level lights can assist in choosing a suitable site for your leveling system. By pushing the "ON/OFF" pad while the engine is running, the level sensor will monitor the ground conditions as you drive. By watching the "EXCESS SLOPE" light, you can determine whether or not the jacks are capable of leveling at that particular site.





1. Push "ON/OFF" pad on control panel. The system is now operational and the Electronic Level lights will be active.
2. Check to see that the "EXCESS SLOPE" indicator is not flashing. If the indicator is flashing the coach should be moved to a more level location so leveling can be accomplished efficiently and safely.
3. Push and hold the "EXTEND" ALL JACKS pad until all of the jacks contact the ground. IMPORTANT: Push the "Front" button to raise the front of the coach an additional 3". This is necessary to allow the coach to pivot when leveling side to side.

**NOTE:** If your coach is equipped with a latching control, press the "EXTEND" ALL JACKS button only once. The jacks now will extend automatically until all of the jacks contact the ground.

**NOTE:** The "JACKS DOWN" light only indicates that one or more jacks are not fully retracted, and should not be used as a guide in this step.

4. Observe the "FRONT" and "REAR" electronic level lights (arrows). Push and hold the corresponding pad until the light goes out.
5. Observe the "LEFT" and the "RIGHT" electronic level lights (arrows). Push and hold the corresponding pad until the light goes out.
6. Observe the round level indicator light (green). At this point it should be lit, indicating that the coach is level. If not, repeat steps 4 and 5.
7. If further adjustments are necessary, simply push the appropriate pad to override the system and level the coach to YOUR LIKING.

8. Visually check that all jacks are firmly on the ground. Should one of the rear jacks not be touching the ground, press the corresponding left or right rear jack buttons to lower the appropriate jack to the ground. Never lift all the wheels off the ground to level the coach

## **JACK RETRACT PROCEDURES**

1. Energize the system by pushing the “ON/OFF” pad on the control panel. The “ON/OFF” pad, the level indicator light, and the “JACKS DOWN” lights will be illuminated.
2. Push the “ALL” retract button, then release. The jacks will all start to retract and return to their fully retracted positions automatically. When all jacks have returned to their fully retracted positions, the “JACKS DOWN” lights will go out.

**NOTE:** If you wish to stop the jacks from retracting, turn the system off and back on again by pushing the on/off pad twice. You can then re-level the coach by following steps 1-5 again.

3. When the “JACKS DOWN” lights go out, push the “ON/OFF” pad to shut off the system. After a visual inspection around the coach to confirm that all jacks are retracted, you may proceed to travel.

## **AUTOMATIC SAFETY SHUTOFF FEATURE**

If the touch panel is left on and inactive for four minutes it will shut off automatically. To reset the system the coach ignition must be turned off, then back on and the “ON/OFF” pad must again be pushed.

## **DRIVE AWAY PROTECTION SYSTEM**

If the ignition is in the “RUN” position, jacks are down, and the operator takes the transmission out of park or neutral or releases the parking brake, the “JACKS DOWN” indicator will light and the alarm beeper will activate. The system will then automatically retract the jacks until the jacks are fully retracted or the operator resets the parking brake and/or place the transmission back into park or neutral.

## Trouble shooting guide

The following information will guide you to repairs that may be made on site. For problems not covered here, contact your service center or our website for more extensive trouble shooting information in the service manual for your system.

<b>SYSTEM WILL NOT TURN ON, INDICATOR LIGHT DOES NOT LIGHT</b>		
<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
COACH IGNITION NOT IN RUN POSITION		TURN IGNITION TO RUN POSITION
TRANSMISSION NOT IN PARK OR NEUTRAL		PLACE TRANSMISSION IN PARK OR NEUTRAL
PARKING BRAKE NOT SET		SET BRAKE
CONTROL HAS BEEN LEFT ON FOR MORE THAN FOUR MINUTES, AUTO SHUT OFF		PUSH ON/OFF BUTTON TWICE
<b>JACKS WILL NOT EXTEND, PUMP IS NOT RUNNING</b>		
<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
(OLD CONTROL) FUSE BLOWN		REPLACE FUSE XF1 ON TOUCH PAD
<b>JACKS WILL NOT EXTEND, PUMP IS RUNNING</b>		
<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
FLUID LEVEL LOW; PUMP CAVITATING		FILL TANK TO PROPER LEVEL WITH AUTOMATIC TRANSMISSION FLUID SEE TIP SHEET 140
PUMP HARNESS FUSE BLOWN		CHECK FOR +12 VDC AT THE RED WIRE FOR EACH SOLENOID VALVE. IF NONE, LOCATE FUSE ON HARNESS WITHIN 18" OF PUMP IN THE CORROGATED HARNESS. REPLACE FUSE WITH 10 AMP MINI FUSE
ALL CONTROL FUSES BLOWN		CHECK FOR LOW VOLTAGE TO THE CONTROLLER, SHORTS IN THE WIRING. REPLACE FUSES

**ONLY FRONT JACKS WILL NOT EXTEND, PUMP IS RUNNING**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
FUSE BLOWN		CONTROL 500089, 500105, 500210: REPLACE FUSE XF5 ON TOUCH PAD : CONTROL 500456, 500645, 500647 REPLACE "FRONT LEG " FUSE

**ANY ONE OF THE REAR JACKS WILL NOT EXTEND, PUMP IS RUNNING**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
FUSE BLOWN		CONTROL 500089, 500105, 500210: REPLACE FUSE XF3 ON TOUCH PAD FOR ROAD SIDE JACK REPLACE FUSE XF4 FOR CURB SIDE JACK
		CONTROL 500456, 500645, 500647: REPLACE 'LEFT REAR JACK' OR 'RIGHT REAR JACK' FUSE ON CONTROL BOX

**ALL JACKS WILL NOT RETRACT OR WILL NOT RETRACT FULLY**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
DUMP VALVE FUSE BLOWN		CONTROL 500089, 500105, 500210: REPLACE FUSE XF2 ON TOUCH PAD
		CONTROL 500456, 500645, 500647: REPLACE 'DUMP VALVE' FUSE ON CONTROL BOX
SYSTEM OVERFILLED WITH FLUID		DRAIN FLUID TO RECOMMENDED LEVEL-SEE TIP 140
PUMP HARNESS FUSE BLOWN		LOCATE FUSE ON HARNESS WITHIN 18" OF PUMP IN THE CORROGATED HARNESS. REPLACE FUSE WITH 10 AMP MINI FUSE

**ANY ONE OR TWO JACKS WILL NOT RETRACT AT ALL**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
BROKEN JACK SPRING (S)		REPLACE JACK SPRING SEE TIP SHEET 34
FUSE ON CONTROL PANEL BLOWN		CONTROL 500089, 500105, 500210: REPLACE FUSE XF3 FOR ROAD SIDE JACK
		REPLACE FUSE XF4 FOR CURB SIDE JACK
		REPLACE FUSE XF5 FOR FRONT JACK (S) ON TOUCH PAD
		CONTROL 500456, 500645, 500647: REPLACE 'FRONT LEGS', 'LEFT REAR LEG' OR 'RIGHT REAR JACK' FUSE ON CONTROL BOX
JACK ROD GUIDE IS RUSTED OR DIRTY		CLEAN CHROME ROD, GREASE ROD GUIDE IF EQUIPPED WITH GREASE FITTINGS. OTHERWISE LUBRICATE WITH SILICONE FLUID. IT MAY BE NECESSARY TO RESEAL JACK OR REPLACE.

**ANY JACK RETRACTS VERY SLOWLY**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
JACK ROD GUIDE IS RUSTED OR DIRTY		CLEAN CHROME ROD, GREASE ROD GUIDE IF EQUIPPED WITH GREASE FITTINGS. OTHERWISE LUBRICATE WITH SILICONE FLUID. IT MAY BE NECESSARY TO RESEAL JACK OR REPLACE.

**ANY JACK RETRACTS WITH NO POWER, WITH POSSIBLE  
POPPING SOUND**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
AIR IN SYSTEM		CHECK FOR COILS IN HOSE. REMOVE THE COIL IF PRESENT THEN EXTEND ALL JACKS TO FULL EXTENSION, THEN RETRACT FULLY, REPEAT 4 CYCLES WAITING A FEW MINUTES BETWEEN CYCLES, CHECK FLUID LEVEL IN BETWEEN CYCLES
CONTAMINATED FLUID		REPLACE FLUID, SEE PAGE A3, TIP SHEET 140 AND 141.
JACK LEGS CREATE POPPING SOUND		EXTEND JACK LEGS, CLEAN ROD, LUBRICATE WITH LIGHT WEIGHT GREASE IF EQUIPPED WITH GREASE FITTINGS OR LUBRICATE WITH SILICONE SPRAY
		DUE TO CHANGES IN TEMPERATURE, EXPANDING AND CONTRACTING OF FLUID WILL MAGNIFY THE PROBLEM OF POPPING JACKS, TO HELP MINIMIZE THIS REPLACE FLUID WITH MERCON V FLUID

**PANEL JACKS DOWN LIGHT WILL NOT GO OFF  
WITH JACKS RETRACTED**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
LOW FLUID LEVEL		FILL TANK WITH AUTOMATIC TRANSMISSION FLUID SEE PAGE A3 AND TIP SHEET 140

**PANEL JACKS DOWN LIGHT AND ALARM WILL GO ON WHILE  
DRIVING, JACKS RETRACTED**

<b>PROBABLE CAUSE</b>		<b>CORRECTIVE ACTION</b>
LOW FLUID LEVEL		FILL TANK WITH AUTOMATIC TRANSMISSION FLUID SEE TIP SHEET 140

# **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 slideout system or slideout room to include final adjustments made at the plant for proper room extension/retraction; sealing interface between slideout 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.

There is no other express warranty other than the foregoing warranty. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL POWER GEAR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. Some states do not allow the limitations of implied warranties, or the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

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.

**Power Gear**  
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