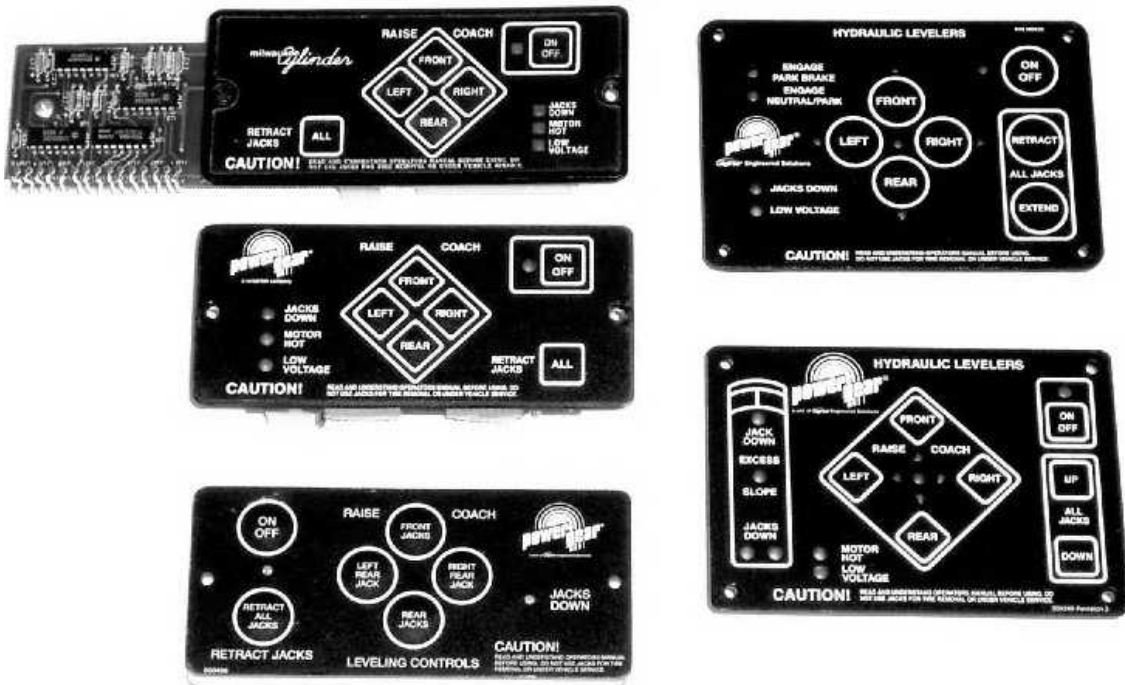




HYDRAULIC LEVELING SYSTEMS OPERATIONS MANUAL

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



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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 12V DC 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.

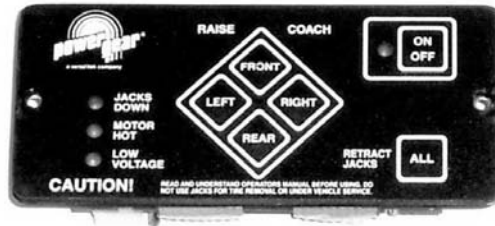
PREVENTATIVE MAINTENANCE PROCEDURES

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.

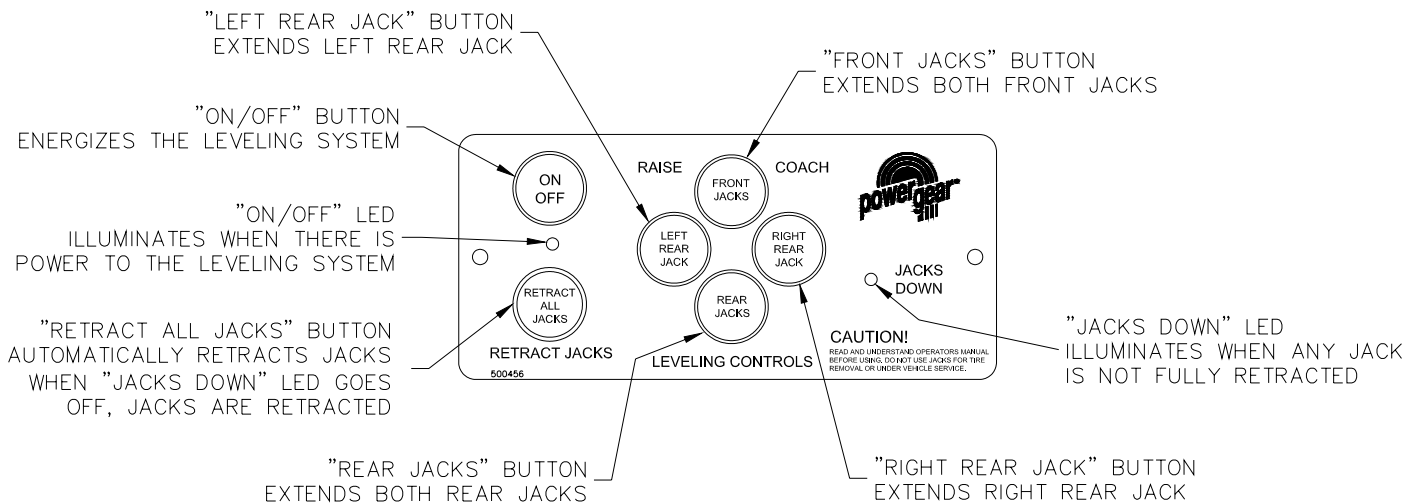
1. **Check the fluid level every month.** Fill the reservoir with the jacks in the fully **retracted** position. On 1998 - PRESENT model year coaches, the fluid should be within 1/4 inch of the fill port lip and checked only with all jacks retracted. On pre-1998 model year coaches the fluid level should 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



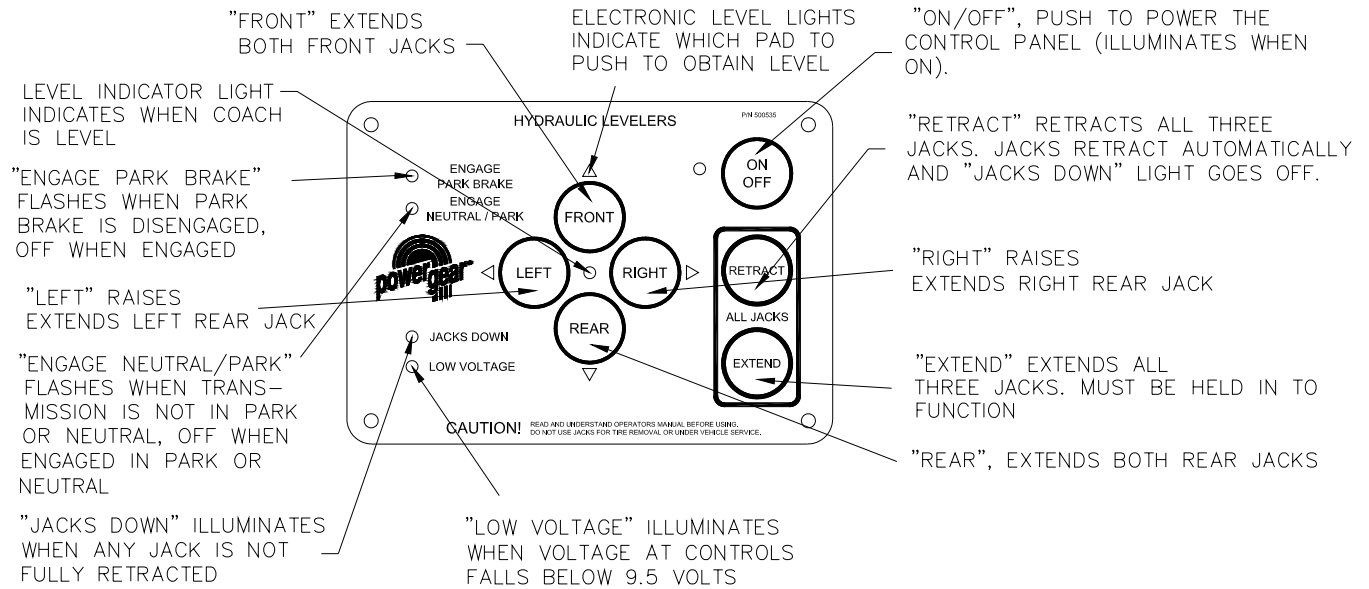
SELECTING A SITE

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.

Troubleshooting 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 troubleshooting information in the service manual for your system.

| SYSTEM WILL NOT TURN ON, INDICATOR LIGHT DOES NOT LIGHT | | |
|--|--|---|
| PROBABLE CAUSE | | CORRECTIVE ACTION |
| | | |
| 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 |
| JACKS WILL NOT EXTEND, PUMP IS NOT RUNNING | | |
| PROBABLE CAUSE | | CORRECTIVE ACTION |
| | | |
| (OLD CONTROL) FUSE BLOWN | | REPLACE FUSE XF1 ON TOUCH PAD |
| | | |
| JACKS WILL NOT EXTEND, PUMP IS RUNNING | | |
| PROBABLE CAUSE | | CORRECTIVE ACTION |
| | | |
| FLUID LEVEL LOW; PUMP CAVITATING | | FILL TANK TO PROPER LEVEL WITH AUTOMATIC TRANSMISSION FLUID SEE TIP SHEET 140 |
| PUMP HARNESS FUSE BLOWN | | CHECK FOR +12V DC 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

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------|--|--|
| 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

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------|--|--|
| 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

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|------------------------------|--|---|
| 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

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------------------|--|--|
| | | |
| 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

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------------------|--|--|
| | | |
| 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**

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|--------------------------------|--|--|
| 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**

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------|--|---|
| 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**

| PROBABLE CAUSE | | CORRECTIVE ACTION |
|-----------------------|--|---|
| LOW FLUID LEVEL | | FILL TANK WITH AUTOMATIC TRANSMISSION FLUID SEE TIP SHEET 140 |