



LIPPERT COMPONENTS

HYDRAULIC LANDING GEAR HLG OPERATION AND SERVICE MANUAL

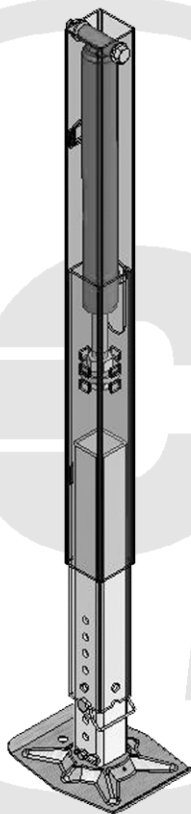




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SYSTEM

WARNING

FAILURE TO ACT IN ACCORDANCE WITH THE FOLLOWING MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

THE USE OF THE *LIPPERT HYDRAULIC LANDING GEAR* TO SUPPORT THE COACH FOR ANY REASON OTHER THAN WHICH IT IS INTENDED IS PROHIBITED BY LIPPERT'S LIMITED WARRANTY. THE LIPPERT LEVELING SYSTEM IS DESIGNED AS A "LEVELING" SYSTEM ONLY AND SHOULD NOT BE USED TO PROVIDE SERVICE FOR ANY REASON UNDER THE COACH SUCH AS CHANGING TIRES OR SERVICING THE LEVELING SYSTEM.

LIPPERT COMPONENTS, INC. RECOMMENDS THAT A TRAINED PROFESSIONAL BE EMPLOYED TO CHANGE THE TIRE ON THE COACH. ANY ATTEMPTS TO CHANGE TIRES OR PERFORM OTHER SERVICE WHILE COACH IS SUPPORTED BY THE *LIPPERT HYDRAULIC LANDING GEAR* COULD RESULT IN DAMAGE TO THE COACH AND/OR CAUSE SERIOUS PERSONAL INJURY OR DEATH.

WARNING! – BE SURE TO PARK THE COACH ON SOLID, LEVEL GROUND.

WARNING! – CLEAR ALL JACK LANDING LOCATIONS OF DEBRIS AND OBSTRUCTIONS. LOCATIONS SHOULD ALSO BE FREE OF DEPRESSIONS.

WARNING! – WHEN PARKING THE COACH ON EXTREMELY SOFT SURFACES, UTILIZE LOAD DISTRIBUTION PADS UNDER EACH JACK.

WARNING! - PEOPLE AND PETS SHOULD BE CLEAR OF COACH WHILE OPERATING LEVELING SYSTEM.

WARNING! – BE SURE TO KEEP HANDS AND OTHER BODY PARTS CLEAR OF FLUID LEAKS. OIL LEAKS IN THE LIPPERT *HYDRAULIC LANDING GEAR* MAY BE UNDER HIGH PRESSURE AND CAN CAUSE SERIOUS SKIN PENETRATING INJURIES.

WARNING! - NEVER LIFT THE COACH COMPLETELY OFF THE GROUND. LIFTING THE COACH SO THE WHEELS ARE NOT TOUCHING GROUND WILL CREATE AN UNSTABLE AND UNSAFE CONDITION.

PRIOR TO OPERATION

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

1. The unit is parked on a reasonably level surface.
2. The towing vehicle is disengaged from the unit.
3. Be sure all person, pets and property are clear of the coach while Lippert Leveling System is in operation.

SYSTEM DESCRIPTION

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

The *Lippert Hydraulic Landing Gear* is an electric/hydraulic system. A 12V DC electric motor drives a hydraulic pump that moves fluid through a system of hoses, fittings and jacks to level and stabilize the coach.

There are no serviceable parts within the electric motor. If the motor fails, it must be replaced.

Disassembly of the motor voids the warranty.

Mechanical portions of the *Lippert Hydraulic Landing Gear* are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

COMPONENT DESCRIPTION The *Lippert Hydraulic Landing Gear* consists of the following major components:

Lippert Landing Gear are rated at a lifting capacity appropriate for your coach.

Each Landing Gear is powered from a central 12VDC motor/pump assembly, which also includes the hydraulic oil reservoir tank, control valve manifold, and solenoid valves.

The *Lippert Hydraulic Landing Gear* is controlled electronically from the switch near the pump.

PREVENTATIVE MAINTENANCE PROCEDURES

The *Lippert Hydraulic Landing Gear* has been designed to require very little maintenance. To ensure the long life of your slideout system, read and follow these few simple procedures.

1. Change fluid every 36 months.
 - a) Check fluid only when jacks are fully retracted.
 - b) Always fill the reservoir with the jacks in the fully **retracted** position. Filling reservoir when jacks are extended will cause reservoir to overflow into its compartment when jacks are retracted.
 - c) When checking fluid level, fluid should be within $\frac{1}{4}$ " of fill spout lip.
2. Check the fluid level every month.
3. Inspect and clean all Pump Unit electrical connections every 12 months.
4. Remove dirt and road debris from Landing Gear as needed.

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.

5. If jacks are down for extended periods, it is recommended to spray exposed Landing Gear rod with a silicone lubricant every seven days for protection. If your coach is located in a salty environment, it is recommended to spray the rods every 2 to 3 days.

**IF YOU HAVE ANY PROBLEMS OR QUESTIONS CONSULT YOUR LOCAL AUTHORIZED DEALER OR CALL LIPPERT AT:
(866) 524-7821.**

COMPONENTS

WARNING!

DO NOT WORK ON YOUR SLIDEOUT SYSTEM UNLESS THE BATTERY IS DISCONNECTED. FAILURE TO ACT IN ACCORDANCE WITH THE FOLLOWING MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

The *Lippert Hydraulic Landing Gear* has been static tested to over 6,000 continuous cycles without any noticeable wear to rotating or sliding parts. It is recommended that when operating in harsh environments and conditions (road salt, ice build-up, etc.) the moving parts be kept clean and can be washed with mild soap and water. No grease or lubrication is necessary and in some situations may be detrimental to the environment and long-term dependability of the system.

MECHANICAL

Although the system is designed to be almost maintenance-free, actuate the Landing Gear once or twice a week to keep the seals and internal moving parts lubricated.

Check for any visible signs of “leaking” before and after movement of the system and the coach.

When the Landing Gear is down, visually inspect the Inner and Outer Assemblies. Refer to Fig. 3, pg. 10-11, for location of inner assemblies. Check for excess build-up of dirt or other foreign material; remove any debris that may be present.

If the system squeaks or makes any noises it is permissible to apply a coat of lightweight oil or silicone lubricant spray to the hydraulic rod but remove any excess oil so dirt and debris do not build-up. **DO NOT USE GREASE.**

ELECTRICAL

For optimum performance, the slideout system requires full battery current and voltage. The battery must be maintained at full capacity. Other than good battery maintenance, check the terminals and other connections at the battery, the control switch and the pump motor for corrosion and loose or damaged terminals. Check motor leads under the coach chassis. Since these connections are subject to damage from road debris, be sure they are in good condition.

Note: The *Lippert Hydraulic Landing Gear* is designed to operate as a negative ground system. A negative ground system utilizes the chassis frame as the ground source. An independent ground wire back to the battery is not needed. It is important the electrical components have good wire to chassis contact. Over 90% of unit electrical problems can be attributed to bad ground connections.

Note: For long-term storage: It is recommended that the room be closed (retracted) and if your unit is equipped with the IRC room control, it is recommended all of the control knobs be kept in the closed position.

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AUXILIARY OPERATION

The *Lippert Hydraulic Landing Gear* can be run with auxiliary power devices like electric drills, ratchet wrenches or cordless screwdrivers. In the event of electrical or system failure, this manual method of extending and retracting the jacks can be used. A standard handheld drill is all that is required. See the instructions below.



1. Remove protective label. (See Fig 1).
2. Using a standard hex bit, insert into auxiliary drive device, i.e. cordless drill or screwdriver or ratchet wrench.



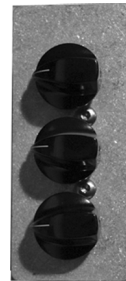
3. Insert hex bit into coupler found under protective label, Fig. 2
4. Run drill forward or clockwise to extend slideout room and in reverse or counterclockwise to retract slideout room.



Fittings – “T” – “90°” – Straight – “45°”



Pump Assembly – Base
12V Motor, Pump, Reservoir



Front View



Top View

Manual Triple Room Control Assembly
(also available in 2 & 4 room models)

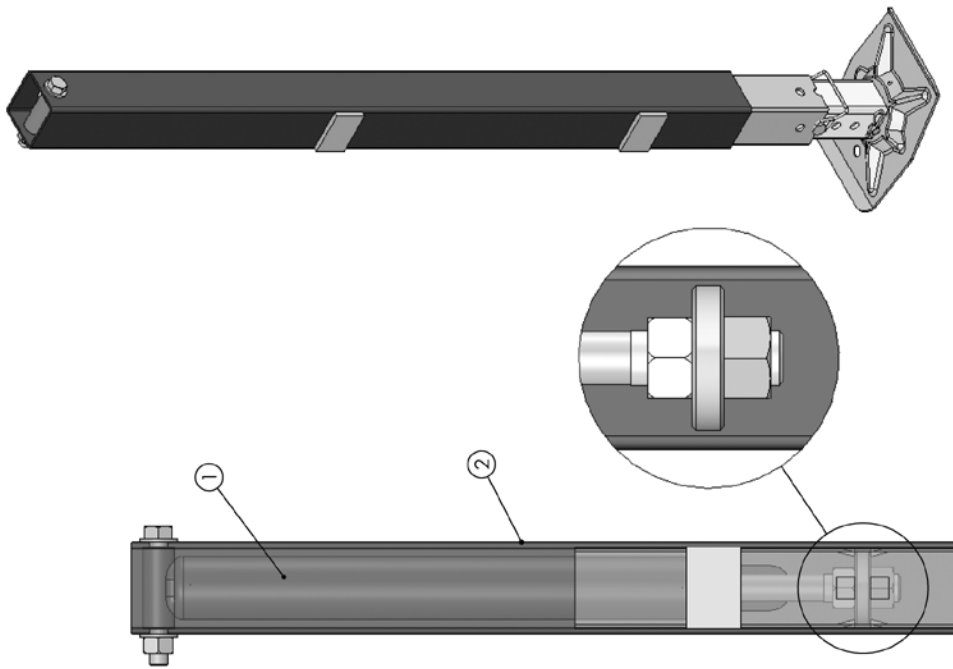
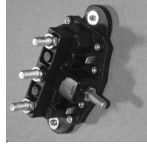


Fig. 3



Valve Blocks
 Restricted Flow Unrestricted Flow



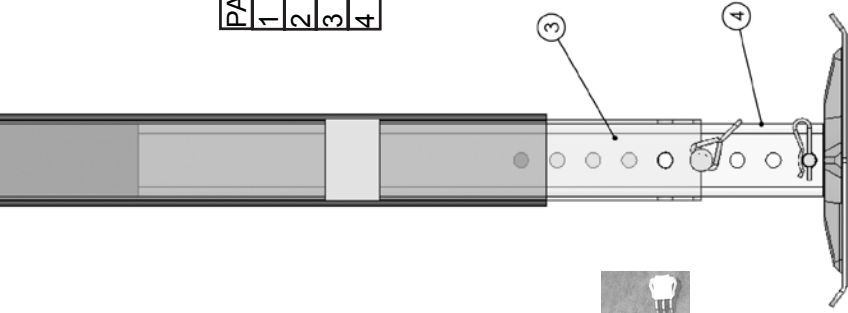
Trombeta



Valve Assembly



Switch Harness



PART #	DESCRIPTION	QTY
1	CYLINDER	1
2	OUTER ASSY	1
3	INNER ASSY	1
4	FOOT ASSY	1

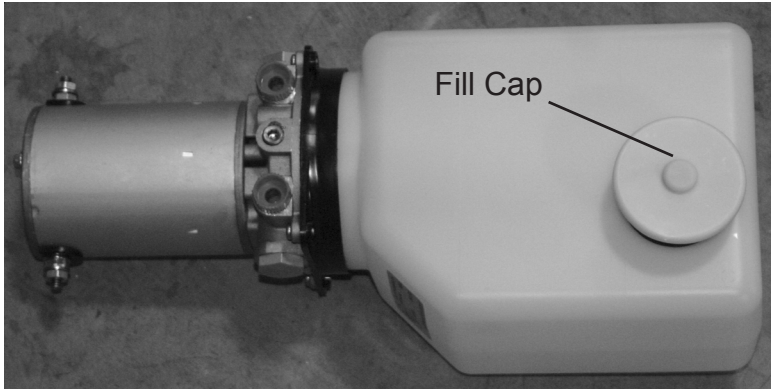


HYDRAULIC LANDING GEAR

LIPERT COMPONENTS, INC.

SERVICE

FLUID FILLING PROCEDURE



The *Lippert Hydraulic Landing Gear* uses automatic transmission fluid (ATF). Any ATF can be used. A full synthetic or synthetic blend works best such as Dexron III or Mercon 5. For best operation, fill system within $\frac{1}{2}$ " of the top when all slideouts are completely retracted. The see through reservoir makes it easy to check oil level. It is recommended that the oil level be checked prior to operating the system. Make sure the breather cap is free of contamination before removing, replacing or installing. In colder temperatures (less than 10° F) the jacks may extend and retract slowly due to the fluid's molecular nature. For cold weather operation, fluid specially formulated for low temperatures may be desirable.

Please consult factory before using any other fluids.

FILLING DIRECTIONS

Remove Breather/Fill Cap

Pour ATF into Breather/Fill opening.

Note: Do not allow any contamination into reservoir during fill process.

Note: Standard reservoir holds approximately 2 quarts (1.89 liters) of ATF.

Fill to within $\frac{1}{2}$ " of top.

Replace Breather/Fill cap when finished.

Note: System is self-purging. By simply cycling the system 2-3 times, any air in the system will be forced back to the reservoir and out of the Breather/Fill cap.

TROUBLESHOOTING

The *Lippert Hydraulic Landing Gear* is a feature that allows the owner more options and flexibility for quickly and effectively leveling the unit. It is a totally integrated system with your unit's chassis and electronics.

Every unit has it's own personality and what may work to fix one unit may not work on another even if the symptoms appear to be the same.

When something restricts mechanized travel, system performances will be unpredictable. It is very important that Landing Gear be free of contamination and allowed to travel freely the full distance. Dirt, sand, mud and other contaminants build-up during travel and can be potentially damaging to the performance of the system.

When beginning to troubleshoot the system, make sure the battery is fully charged, there are no visible signs of external damage to the Landing Gear, motor or hoses and that the motor is wired properly and all connections are secure.

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TROUBLESHOOTING - CHART

JACKS WILL NOT EXTEND TO GROUND, PUMP IS RUNNING

PROBABLE CAUSE	CORRECTIVE ACTION
Little or no fluid in reservoir Leg valve is inoperative Electronic signal is lost between switch and leg valves	Fill reservoir with DEXRON III ATF. See pg. 6 Clean, repair or replace Trace wires for voltage drop or loss of signal Repair or replace necessary wires or replace switch.

ANY ONE OR TWO JACKS WILL NOT RETRACT

PROBABLE CAUSE	CORRECTIVE ACTION
Hose damaged or unconnected Return valve inoperative Electronic signal is lost between switch and solenoid	Replace with new hose or reconnect hose Replace inoperative return valve Attempt to retract jacks in MANUAL mode. If successful, replace control pad; if not, test for voltage drop between switch and leg valve Repair bad wiring or replace defective board or valve.

TROUBLESHOOTING – POWER UNIT

Before attempting to troubleshoot the Power Unit, make sure an adequate power source is available. The unit batteries should be fully charged or the unit should be plugged into to A/C service with batteries installed. Do not attempt to troubleshoot the Power Unit without assuring a full 12V DC charge.

The following tests require only a DC voltmeter (or DC test light) and a jumper lead.

Step 1 - Attach voltmeter (or test light) leads to the negative and positive terminals on motor solenoid (See Fig. 7). Does the meter indicate 12V DC? If **YES**, see **Step 2**; if **NO** see **Step 3**.

Step 2 - If **YES**, at the motor, check the incoming leads to 12V DC (if necessary, disconnect leads at wire splices). Does meter indicate 12V DC? If **YES**, Power Unit needs to be replaced. The motor is not field serviceable. **DO NOT ATTEMPT TO REPAIR**. If **NO**, Inspect all wires and connections between the wall switch and the motor. Repair connections as necessary. Recheck as in **Step 1**.

Step 3 - If **NO**, Inspect all connections between battery and solenoid. Inspect 30A Auto-reset Circuit Breaker (See Fig. 7 for location). Recheck as above in **Step 1**.

Since there are no field serviceable parts in the motor of the Power Unit, electrical troubleshooting and service is limited to replacing only those components as previously outlined.

Thorough inspection of wiring and connections is the only other electrical service that can be performed.

WIRING DIAGRAM

Fig. 9

