HYDRAULIC CYLINDER TEST

TI-050

HYDRAULICS

In the event that a coach equipped with hydraulic slide-outs begins to experience room drift, whether the room drifts out after retract, or drifting in after extension, a test of the hydraulic cylinders should be performed.

Hydraulic Landing Gear (HLG), Rear Stab Jacks or Leveling Jacks

1. Retract jack in question. If retracting HLG, both jacks will retract. If retracting leveling jack, all jacks will retract.
2. Once jack is fully retracted, remove the extend hose (hose located at the top of the jack). If testing ROAD SIDE HLG or REAR STAB JACKS, the hose will be mounted to a red restricted flow valve block.

⚠ CAUTION

Do not attempt to EXTEND jack. The system will experience RAPID FLUID LOSS.

3. When the hose is removed, push the RETRACT button again.
   - **A.** If fluid comes from the jack while the retract button is being pressed, the hydraulic cylinder is bypassing the internal seal and must be replaced. (See TI-120 for this procedure.)
   - **B.** If no fluid comes from the cylinder during this retract procedure, the cylinder is good.
   - **C.** If no fluid comes from the JACK but does come from the HOSE, test the opposite jack (HLG and Rear Stabs only).

⚠ CAUTION

Be sure to reconnect and tighten EXTEND hose. System will experience rapid fluid loss if hose is not reconnected.

Hydraulic Slide-out Cylinder - Retract Test

1. Retract (close) all slide-outs (rooms) completely.
2. Disconnect all rooms from system (if coach is equipped with IRC, close all but one room).
3. Loosen hose from "E" (extend) port on the manifold of the Power Unit.

⚠ CAUTION

Do not attempt to run room out with the "E" port hose loose. The system will experience rapid fluid loss.

4. Plug opening on manifold to prevent drawing air into the system.
5. Energize the Pump Unit to retract (close) room.
6. When room is fully retracted, continue to run the room in and watch for fluid flow from hose/port "E." Fluid flow greater than a few drops will indicate internal cylinder leaking (bypassing of piston seal). If greater than a few drops leak from hose fitting, piston seal is bad and will need to be replaced. If there is no fluid flow, reconnect hose to "E" port and tighten.
7. Repeat steps 2 through 6 for each slide-out until all slide-outs have been tested. Energize the Pump Unit to retract (close) room.

⚠ CAUTION

Be sure to reconnect and tighten hose at the "E" port before attempting to extend (open) the room or the system will experience rapid fluid loss.

Hydraulic Slide-out Cylinder - Extend test

1. Extend (open) all slide-outs (rooms) completely.
2. Disconnect all rooms from system (if coach is equipped with IRC, **open all but one room).**
3. Loosen hose from "R" (retract) port on the manifold of the Power Unit. Individual slide-outs can be tested if the unit is equipped with an IRC block. Close all valves in IRC except the one to be tested.

⚠ CAUTION

Do not attempt to run room in with the "R" port hose loose. The system will experience rapid fluid loss.

4. Plug opening on manifold to prevent drawing air into the system.
5. Energize the Pump Unit to extend (open) room.
6. Continue to run the room out and watch for fluid flow from hose/port "R" (or IRC block if coach is equipped with IRC). Fluid flow greater than a few drops will indicate internal cylinder leaking (bypassing of piston seal). If greater than a few drops leak from hose fitting, piston seal is bad and will need to be replaced. If there is no fluid flow, reconnect hose to "R" port and tighten.
7. Repeat steps 2 through 6 for each slide-out until all slide-outs have been tested.

⚠ CAUTION

Be sure to reconnect and tighten hose at the "R" port before attempting to retract (close) the room or the system will experience rapid fluid loss.

Cylinder Check - IRC (Individual Room Control)

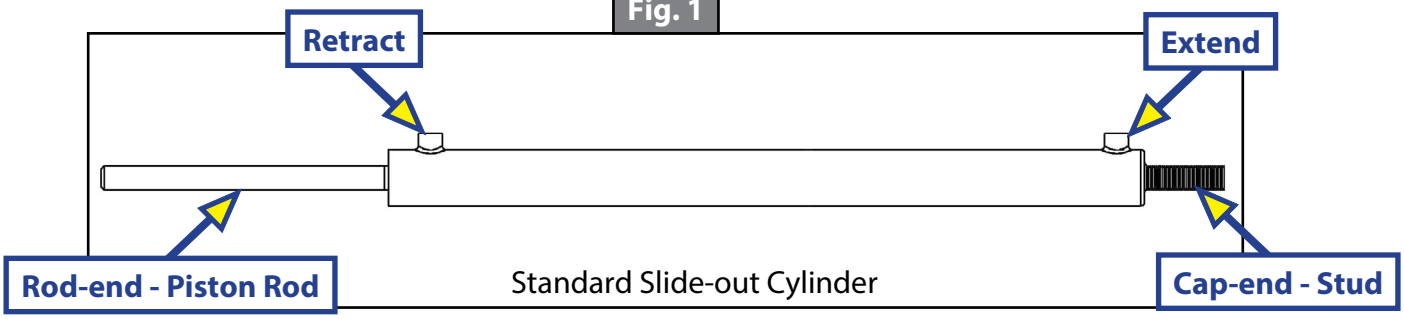
Tools Required

- Two (2) hydraulic pressure gauges rated @3000 psi min.
- Standard set of open end wrenches
- Eye Protection

1. Retract all slide-outs. Check the fluid level in the reservoir. An empty or near empty reservoir is an indication of an external leak. Check for any external leaks around the coach and inspect all hoses. Note any leaks, hose bulging or ballooning. Check for any contaminants in the bottom of the reservoir.

2. Verify extend and retract hydraulic lines are installed in the correct port (Fig. 1).

Fig. 1



3. Verify the slide-outs are fully extended or fully retracted causing seal to compress. Briefly press the extend or retract button again, depending on the disposition of the slide-out, to confirm full extend or retract.

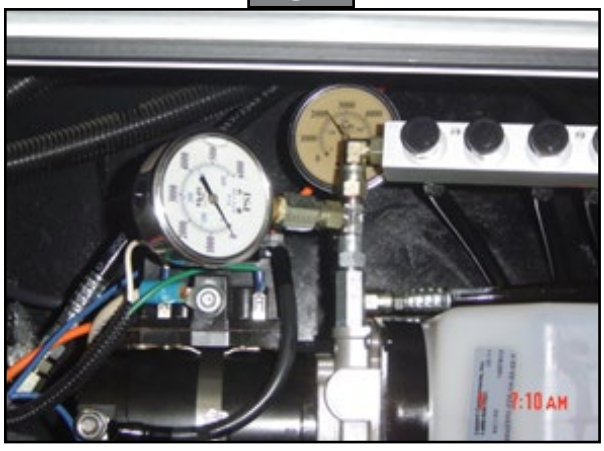
4. Check the system for internal leaks or “bypassing." Hydraulic pressure gauges should be rated for at least 3000 psi minimum. Install a pressure gauge using a female swivel “T” on the extend and retract fittings of the hydraulic pump (Fig. 2).

NOTE: Fig. 2 shows the retract side pressurized. Fig. 3 shows the extend side pressurized. The opposite side should have no pressure as indicated by the valves. Maintain constant ambient temperature throughout test.

Fig. 2

Pump in retract

Fig. 3



Pump in extend

5. Retract the slide-outs and record the pressure reading on the gauge. An internal bypass generally is indicated by a significant drop in pressure on the retract side gauge and the slide-out(s) may drift. If the loss of pressure on the retract side results in an increase in the pressure on the extend side, the piston seal inside the slide-out cylinders have failed and the cylinders are bypassing. Individual slide-outs can be tested if the unit is equipped with an IRC block. Close all valves in IRC except the one to be tested. Follow the procedure found on Page 1 to isolate and test the first cylinder. Repeat this process until the bypassing cylinder is found.

⚠ CAUTION

Hydraulic lines will be under pressure. Contact with fluid under pressure can cause bodily injury. Be sure to wear eye protection. To avoid rapid fluid loss when opening a fluid line, make certain the pressure is removed. Prior to opening the extend side of the system, retract the slide-out rooms. Prior to opening the retract side of the system, extend the slide-out rooms.

6. If the retract side gauge drops pressure but the extend side does not, the pump has failed.
7. To remove and replace a cylinder, please follow the procedure found in TI-120.
8. Installing a new cylinder will introduce a small amount of air into the system. Extend all slide-outs completely, holding the switch for 1-2 seconds at the end of the extend function. Immediately retract all slide-outs and hold the switch in retract 1-2 seconds at the end of the cycle. Check the reservoir for foam or bubbles. This indicates air has been purged from the system. Wait 15-20 minutes before cycling the slide-outs again to prevent reintroducing the air from the reservoir back into the system and to keep the pump motor from overheating. TI - 119 can also be noted for a purge procedure.
9. Once the system leak has been resolved, pressurize the system to perform a leak test overnight, or over the next several hours.

NOTE: Ambient temperature **MUST** be maintained for the duration of the overnight test to check the effect of pressure on the system. If no leak is detected at the conclusion of the test, the repair is complete.

10. If the system still has a pressure leak, the system may be contaminated and would need a flush and fill procedure performed. See procedure on Page 5.

Flush and Fill Procedure

1. Extend all systems.
2. Locate all of the slide-out cylinders.
3. Go to furthest cylinder from pump.
4. Remove retract line on cylinder furthest from pump.
5. Place into jug of clean fluid.
6. Attach 4' utility hose to cylinder.
7. Put hose in another jug.
8. Retract all systems.
9. Remove utility hose.
10. Reattach line.
11. Go to extend side and repeat steps.
12. Remove clean fluid out of one jug with hose removed from cylinder.
13. Place utility hose into another jug and drain the contaminated fluid into a clean container.

Fluid Requirements - For Keystone Units Only

Keystone RV utilizes a 32 wt. hydraulic fluid. In the event of low fluid, the use of 32 wt. hydraulic fluid only is the recommended fluid for replacement.