

CYLINDER REPAIR/REPLACEMENT - 1000-1600 LB G[®]SERIES

NOTICE: Tommy Gate ISO Grade 32 hydraulic fluid or ISO Grade 32 equivalent is recommended. See page 4 for more details.

Preparing the Gate

1. **PARK** the vehicle on a level surface and set the parking brake.
Note: Keep body parts clear of moving parts during liftgate operation.
2. **REMOVE** the box cover fasteners (Figure 1).
3. **REMOVE** the box cover.
4. **ACTIVATE** the control.
 - A) **Push** the hidden "POWER ON" switch. The amber "POWER ON" LED will illuminate.
 - B) **Push** the hidden "LIFTGATE ACTIVATED" switch twice within one (1) second. The red "LIFTGATE ACTIVATED" LED will illuminate. With both lights on, the liftgate can be raised or lowered. If not used for 90 seconds, the control will automatically shut off.
5. **LOWER** the liftgate until the arms are parallel with the truck bed (Figure 1)
 The arms must be parallel with the truck bed to remove the master link.
6. **BLOCK** the liftgate under the false floor.
7. **PUSH** down on the toggle switch until all the pressure in the hydraulic system is relieved.
8. **DISCONNECT** the 4ga ground cable from the battery, if previously installed.
9. **DISCONNECT** the 4ga power cable from the battery, or manually **TRIP** the circuit breaker.
10. **REMOVE** the three screws holding the control to the upright, (recessed controls only).
11. **REMOVE** the control from the upright and allow it to hang by the control wire (recessed controls only).

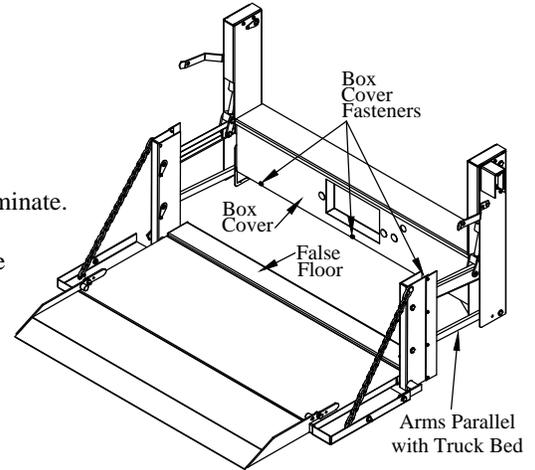


Figure 1: Box cover and fasteners.

Removing the Cylinder

1. **DISCONNECT** the hydraulic hose from the tee on the power unit housing (Figure 2).
 - A) **Place** a rag underneath the tee to absorb any hydraulic oil that leaks when hose is loosened.

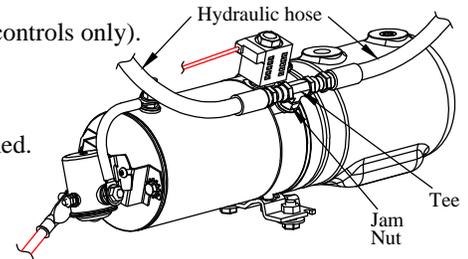


Figure 2: Hydraulic hose and Tee.

WARNING:

If the following steps are not performed, warranty will not be awarded for pulled threads.

- B) **Loosen** the tee jam nut. While attempting to loosen the jam nut with an open end wrench, hold the tee in place using another open end wrench.
- C) **Loosen** the hose connected to the tee. While attempting to loosen the hose with an open end wrench, hold the tee in place with another open end wrench.
- D) **Place** the end of the disconnected hose over a bucket to drain the remaining hydraulic fluid from the cylinder.

2. **REMOVE** the master link assembly (Figure 3).

Note: New snap rings and shim(s) for the master link are provided in the kit.

- A) **Remove** the two snap rings from the master link assembly.
 - B) **Remove** the master link side plate.
 - C) **Remove** the shim(s).
 - D) **Remove** the master link.
3. **REMOVE** the upright cap screw(s) from the uprights (Figure 4).
 4. **REMOVE** the upright cap (Figure 4). Upright cap design may vary.
 5. **REMOVE** the cylinder pin (Figure 4).
 - A) **Remove** the snap ring from the cylinder pin.
 - B) **Remove** the pin keeper screw.
 - C) **Remove** the cylinder pin.

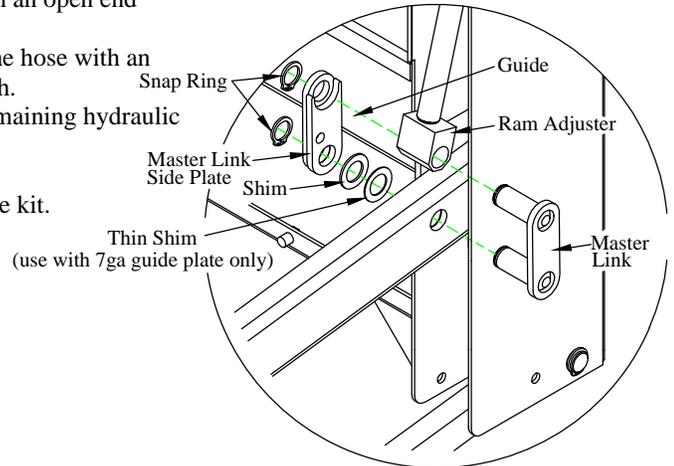


Figure 3: Master link assembly.

Note: Sketch or photograph how the hose is routed as this is how you will route the hose later.

6. **REMOVE** the cylinder and hydraulic hose by pulling them out the top of the upright.
7. **REMOVE** the hose from the cylinder (only if replacing the complete cylinder) (Figure 5).
 - A) **Hold** the flow control in place with an open end wrench.
 - B) **Loosen** the hose with another open end wrench.
8. **VERIFY** that the hose and O-ring are in good condition and free of cuts or wear marks (Figure 5).
 If the hose and O-ring are in good condition proceed to the next step. If not call Tommy Gate.

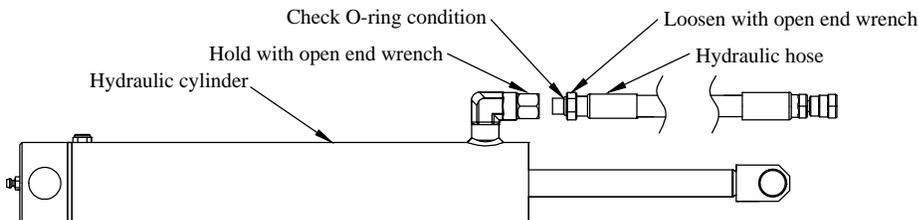


Figure 5: Hydraulic hose and cylinder.

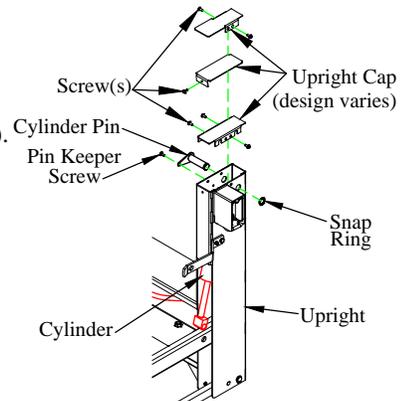


Figure 4: Upright cap and cylinder pin.

Disassembling the Cylinder

Note: If you are replacing the complete cylinder, proceed to Installing the Cylinder.

1. **REMOVE** the vent plug (Figure 6).
A new vent plug is supplied with the repair kit.
2. **PULL** the cylinder shaft out about 2/3 of the length of the shaft.
Hydraulic oil will come out the elbow when you extend the cylinder.
3. **REMOVE** the 1-7/8" snap ring (relaxed measures 2-1/16") (Figure 6).
If the snap ring is 1-3/4" (relaxed measures 1-15/16"), the cylinder can not be rebuilt.
4. **PULL** the cylinder shaft out the end of the cylinder tube.
5. **INSPECT** the cylinder tube.
 - A) **Check** for any scoring.
 - B) **Check** for burrs on the snap ring groove, vent plug hole, and cylinder elbow port.
6. **DEBURR** the inside of the cylinder tube, if necessary, with a 240 grit flapper wheel or sand paper.
7. **CLEAN** the cylinder tube of all debris.

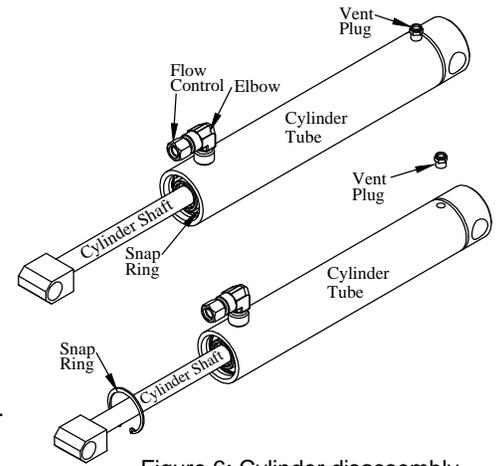


Figure 6: Cylinder disassembly.

Rebuilding the Cylinder

Note: If you are replacing the cylinder shaft, proceed to Installing the Cylinder Shaft.

1. **STRIKE** the ram adjuster with a hammer. This will break the Loctite free.
2. **REMOVE** the nut with an impact while holding the ram adjuster in a vice (Figure 7).
The shaft will turn in both the nut and ram adjuster, but the nut should come off.
3. **DISCARD** the old nut.
4. **REMOVE** and **DISCARD** the piston, washer, and guide bushing.
Note: Proceed carefully, damage to the shaft will cause the cylinder to leak.
5. **HOLD** the shaft in a vice, using the cardboard tube provided as a protective barrier.
6. **REMOVE** and **SAVE** the ram adjuster.
7. **INSPECT** the cylinder shaft for nicks or scarring.
8. **CHECK** the cylinder shaft threads for damage.
9. **CLEAN** the cylinder shaft of all debris.
10. **VERIFY** that the cylinder tube is debris free.
11. **LUBRICATE** the inside of the guide bushing with ISO Grade 32 hydraulic oil.
12. **LUBRICATE** the cylinder shaft with ISO Grade 32 hydraulic oil.
13. **INSTALL** the guide bushing on the cylinder shaft as shown in (Figure 7).
A twisting motion will aid installation.
14. **INSTALL** the washer, piston, and nut in the order and position shown in (Figure 7).
A twisting motion is required to avoid o-ring damage.
15. **CLEAN** the cylinder shaft threads for the ram adjuster of oil.
Use compressed air or a clean, dry rag.
16. **APPLY** blue Loctite threadlocker (or equal) to the threads for the ram adjuster.
17. **INSTALL** the ram adjuster on the cylinder shaft.
18. **TIGHTEN** the nut to 80 ft-lb while holding the ram adjuster in a vice.

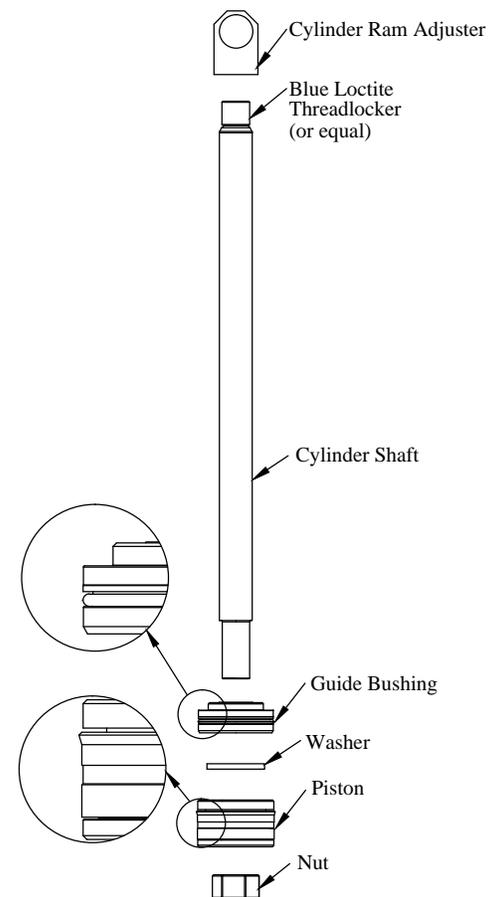


Figure 7: Cylinder shaft assembly.

Installing the Cylinder Shaft

1. **INSTALL** the new vent plug in the cylinder tube.
Do not over tighten the vent plug, it could come in contact with the cylinder piston.
2. **LUBRICATE** the piston, guide bushing, and the inside of the cylinder tube with ISO grade 32 hydraulic oil.
3. **INSTALL** the piston into the cylinder tube (Figure 8).
4. **INSTALL** the guide bushing into the cylinder tube (Figure 8).
5. **INSTALL** the snap ring in the snap ring groove.

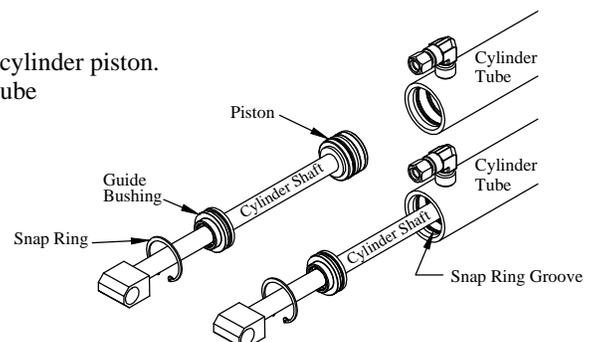


Figure 8: Cylinder assembly.

Installing the Cylinder

1. **LUBRICATE** the hose O-ring, if previously disconnected (Figure 5).
2. **ATTACH** the hose to the cylinder, if previously disconnected (Figure 5).
 - A) **Hold** the flow control in place with an open end wrench.
 - B) **Tighten** the hose with another open end wrench.
3. **PULL** on the ram adjuster extending the cylinder to approximately 6" (Figure 9).
4. **VERIFY** that the plastic grommet is still positioned in the hole in the inside of the upright (Figure 9).

Note: The elbow on the cylinder should be installed facing the front of the vehicle.

5. **ROTATE** the cylinder shaft in the cylinder so that the widest portion of the ram adjuster is facing to the outside of the liftgate (Figure 9).
6. **LOWER** the cylinder and hydraulic hose through the top of the upright, guiding the hose end through the grommet in the upright (Figure 9).
7. **VERIFY** that the control wire is routed over the top of the cylinder (recessed controls only).
8. **INSTALL** the cylinder pin (Figure 4).
 - A) **Insert** the 7/8" x 3-1/8" cylinder pin through the upright into the cylinder.
 - B) **Install** the 1/4-20 screw through the pin keeper and into the upright.
 - C) **Install** the 7/8" external snap ring in the groove in the end of the cylinder pin.
9. **INSTALL** the master link assembly (Figure 3).

- A) **Apply** grease to the master link pin(s). Do not grease pin for composite bushing! (certain models)
- B) **Insert** the master link with one pin through the arm and one pin through the ram adjuster.
- C) **Install** the new shim provided over the lower pin of the master link.
- D) **Install** the new thin shim provided over the lower pin of the master link (use with 7GA, 0.179" thick guide plate only).
- E) **Install** the master link side plate with the guide facing up and toward the ram adjuster.
- F) **Install** the two new 3/4" external snap rings provided in the grooves in the ends of the master link pins.

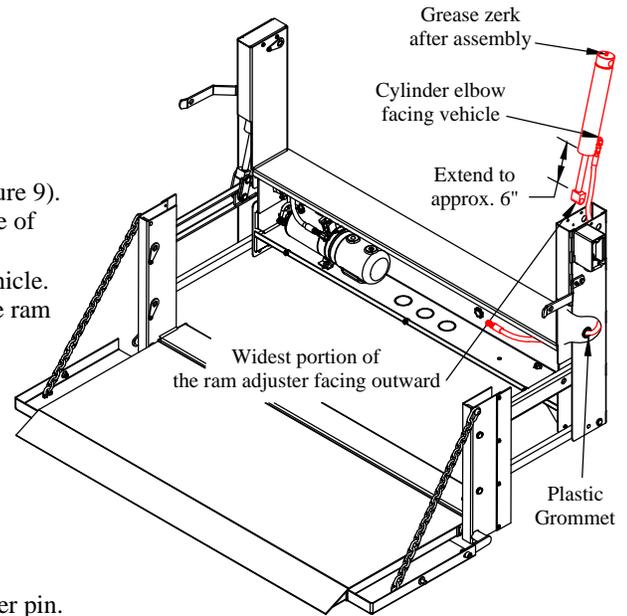


Figure 9: Install the cylinder and hose.

WARNING:

Do not twist the hydraulic hose when installing or the hose may fail prematurely.

10. **CONNECT** the hydraulic hose to the tee on the power unit housing (Figure 10).

WARNING:

If the following steps are not performed, warranty will not be awarded for pulled threads.

- A) **Connect** the hose end to the tee on the power unit.
- B) **Tighten** the tee jam nut. While attempting to tighten the jam nut with an open end wrench, hold the tee in place using another open end wrench.

Note: DO NOT OVER TIGHTEN.

- C) **Tighten** the hose connected to the tee. While attempting to tighten the hose with an open end wrench, hold the tee in place with another open end wrench.
11. **ATTACH** the control to the upright with the three (3) screws, if previously removed.
12. **GREASE** the zerk on the top of the cylinder (Figure 9).
13. **INSTALL** the upright cap and 1/4-20 x 1/2" screw(s) (Figure 4).
14. **CHECK** to make sure all connections are tight.
15. **RECONNECT** the 4ga. power cable to the battery or **RESET** the circuit breaker.
16. **RECONNECT** the ground cable.

Note: Keep body parts clear of moving parts during liftgate operation.

17. **TEST** the gate operation.
18. **CHECK** and add oil to the hydraulic reservoir.

The oil should be 3/4 full when both cylinders are completely extended.
19. **INSPECT** all hydraulic lines and fittings for leaks.
20. **REINSTALL** and tighten the box cover fasteners (Figure 1).
21. **PLACE** provided "NOTICE" in the operator/service manual.

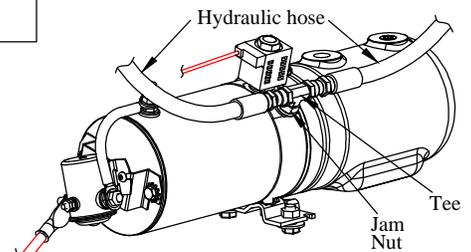


Figure 10: Connect the hydraulic hose.

NOTICE

**TOMMY GATE ISO GRADE 32 HYDRAULIC FLUID
OR ISO GRADE 32 EQUIVALENT
RECOMMENDED.**

**WITH THE USE OF AUTOMATIC TRANSMISSION
FLUID (ATF) OR TOMMY GATE WINTER GRADE
HYDRAULIC FLUID THE CYLINDERS MAY BEGIN
TO MAKE NOISE. WHILE THERE WILL BE NO
DAMAGE TO THE HYDRAULIC SYSTEM, IT MAY
BECOME A NUISANCE. AN OIL ADDITIVE CAN BE
USED TO ELIMINATE THE PROBLEM.**

**DO NOT USE AN ADDITIVE THAT IS NOT
APPROVED BY TOMMY GATE.**

THE FOLLOWING ADDITIVES ARE APPROVED:

- 1) Caterpillar part# 1U-9891