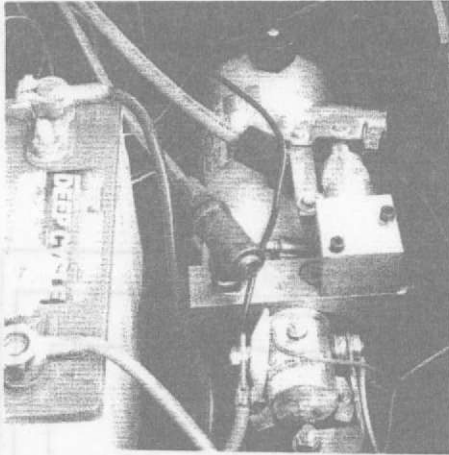


7. HYDRAULIC LIFTING SYSTEM



7.1 Electric/Hydraulic Power Lifting Unit

This unit is located on the "A" frame at the front of the chassis. It consists of the following elements: 1. Electric Motor; 2. Solenoid start switch; 3. Filler breather port; 4. Reservoir; 5. Relief valve; 6. Manual release knob; 7. 3/8 NPTF pressure port; 8. Electric release valve. This complete unit is factory adjusted and pre-set for smooth and efficient operation. It should require no further adjustment. However, for your information, here are some facts about the unit which may prove useful in the future.

7.2 Electric Motor

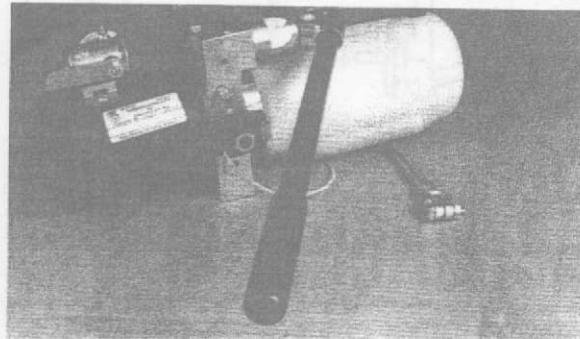
A standard D-C Prestolite starter motor operates the hydraulic pump. While it should seldom need servicing or replacement, an automotive supply house can supply a replacement in an emergency.

7.3 Raising Solenoid

Engaged by raising control switch, the solenoid completes the circuit to supply power to the pump.

7.4 Hydraulic Pump

The hydraulic pump is close-coupled to the electric motor. It is capable of producing pressure up to 3,000 PSI; however, the raising mechanism of your Towlite trailer requires much less for efficient operation. This unit includes a by-pass valve that operates when the hydraulic lifting cylinder has reached its maximum thrust. The by-pass is a built-in safety device to prevent damage. A harmless "squeal" will be detected when it is activated to indicate the top section is fully raised into position.



The manual lift system is offered as an option. The back-up system is designed as a manual way of raising your trailer in case of dead battery. It will take approximately 140 strokes of the pump at a force of 40 foot pounds. Caution should be taken that you do not over exert, especially if you have poor health

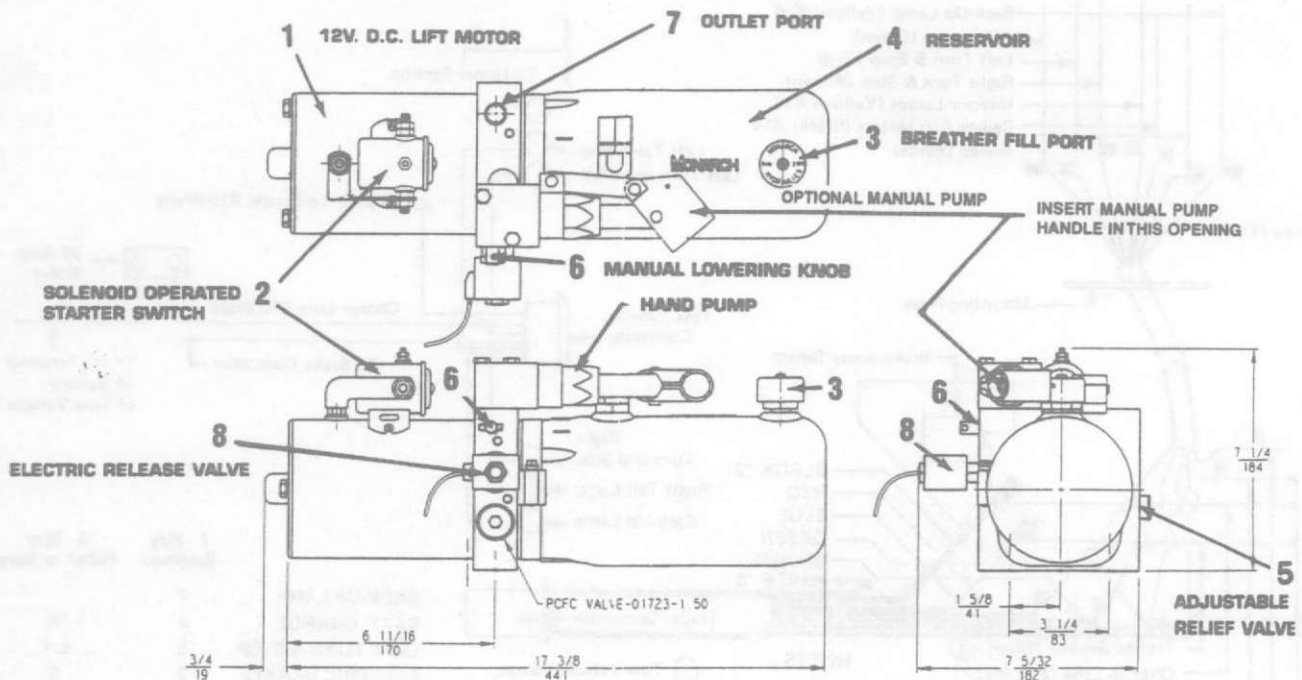


Figure 3

7.5 Lowering Solenoid Valve

The valve is engaged by depressing the up/down lift control switch at the entrance door or by turning manual lowering knob counter clockwise located on the lowering valve (see figure 3.) This valve has been pre-set at the factory for a lowering time of 12 seconds.

7.6 Safety Bar

When raising top section to the raised position, make sure safety bar engages. This can be accomplished by moving telescoping switch to the down position. If the top section does not lower, then the safety bar is latched. Lift telescoping switch to pressurize hydraulic cylinder. Red warning light will indicate when safety bar is not properly engaged.

7.7 Hydraulic Cylinder

The cylinder that raises your TowLite is located in a transverse position and mounted in the center of the frame assembly. The unit is readily accessible from the trailer underside. As with the pump and other elements of the lifting system, it is rated well beyond maximum requirements to insure dependable performance.

7.8 Cable Lifting Assembly

Aircraft-type cables operate from the hydraulic cylinder and perform the actual raising of the upper section.

The upper section of your TowLite is also equipped with nylon glide assemblies and the bottom section with matching nylon guides to keep the upper and lower sections in proper alignment at all times.

7.9 Trouble Shooting TowLite Lift Mechanism

1. Top Will Not Raise - Lift Motor Will Not Run

- A. **Low or Dead Battery** - Attach jumper cable from a charged battery to the trailer battery. (Positive post to positive post - Negative post to chassis ground). If the motor now runs check to be sure you are getting ample charge from the connector system and to the tow vehicle charge line.
- B. **Blown Fuse** - Replace blown fuse located in the circuit panel of the convertor system. Check for short in wire between fuse and motor solenoid.
- C. **Loose Wire Connection** - Tighten all connections at the battery and motor terminals. Check to be sure that the wire and the terminal connection is crimped properly.
- D. **Defective Toggle Switch** - Remove the panel housing of the toggle switch, lift the toggle switch to the raising position and with a 12 volt test lamp test for 12 volt current supply between the yellow wire and ground. If the light does not light and you have voltage at the black wire, replace the toggle switch.
- E. **Defective Motor Solenoid** - Using a jumper wire, jump between the battery terminal of the solenoid and the switch control terminal. The solenoid should click indicating a response from the magnet. If it does not click be sure that the solenoid is properly grounded to the motor chassis. Next with a heavier jumper wire jump between the two larger terminals of the solenoid. If the motor runs the solenoid is defective, replace it.

- F. **Worn Motor Brushes** - Remove end cap from motor and inspect the brush assemblies. Clean and lubricate brushes and if necessary place brushes.

2. Top Will Not Raise - Lift Motor Runs

- A. **Low On ATF Fluid** - Check to be sure fluid level is within 1 inch from the top of the reservoir with the trailer in the lowered position.
- B. **Lowering Valve Stuck In Open Position Or Needs Adjusting** (see 7.5) - Check to be sure that the manual lowering valve lever is in neutral position and is not in a partially open position. Lift the toggle switch to run the motor and simultaneously turning manual lowering knob counter clockwise in an attempt to raise and lower the trailer at the same time. This will force the fluid through the lowering valve at high pressure and clean out any debris that may have lodged in the valve.
- C. **Air In Pump Chamber** - Air in the pump chamber will result when running the pump when the fluid level is not at its filled position as the trailer is lowered. This will result in a gravelly sound when the pump is running. Lower the trailer and keep the switch in the lowering position for 60 seconds so that the air can bubble out of the pump into the reservoir, then add fluid to the proper level.

3. Safety Bar Will Not Release

- A. **Locked in Safety Position** - To remove pressure off of safety bar, lift toggle switch to raise the top section. Pull on safety release cable and depress lift switch. If trailer top does not raise to release safety bar, then follow steps under trouble shooting "Top Will Not Raise."
- B. **Dirt on Top of Safety Bar** - From the underside of the trailer, inspect the safety release bar which lies on top of the cylinder rod assembly. Remove any dirt which may have been lodged on top of the safety bar.
- C. **Broken Release Cable** - A replacement cable will have to be strung through the safety release housing and attached to the safety release bar.

4. Lowering Valve Inoperative

- A. **Low or Dead Battery** - Follow instructions for item 1.A
- B. **Blown Fuse** - Follow instructions for item 1.B
- C. **Loose Wire Connection** - Follow instructions for item 1.C
- D. **Defective Toggle Switch** - Follow instructions for item 1.D except test the red wire to ground.
- E. **Dirt in lowering Valve** - Follow instructions for item 2.B
- F. **Lowering Valve Adjustment** - To adjust lowering valve remove two screws on the plate on top of the valve. Remove the plate using two 5/16 open end wrenches, hold the valve stem with one wrench and turn the cap screw in the end of the valve stem counter clockwise to increase the lowering speed of the top section. Turn cap screw clockwise to reduce the speed.

7.10 Servicing Hydraulic Lifting System

The hydraulic lifting system has been fully tested by TowLite and proven over 24 years of actual use. Here are a few helpful hints in the unlikely event you encounter a problem with your TowLite trailer:

1. If top section will not raise, first check the steps in raising procedure.
2. If the pump motor will not run, check the battery connections for tightness. (Be sure there is a good ground to motor mechanism.) Turn on trailer lights to see if you have power. If lights go out when you operate the toggle switch for the motor, the battery is low and in need of charge. Also check to be sure the raising solenoid is operating properly.
3. If motor runs, but pump does not raise trailer, check the fluid level in the pump reservoir. Fluid level should be approximately 1 inch from the top when trailer is in the "down" position. If low, add necessary amount. Use only type A or DEXRON II automatic transmission fluid. Be sure it is clean and avoid over filling. If fluid level is extremely low, check for leaks around the pump, at lifting cylinder, and the connecting hose.
4. If top section appears to be out of level when raised, check by measuring from the bottom edge of the trailer body. Distance should be the same on all four corners. If it is uneven, it is probably due to normal stretch of the cables and should be corrected as follows:

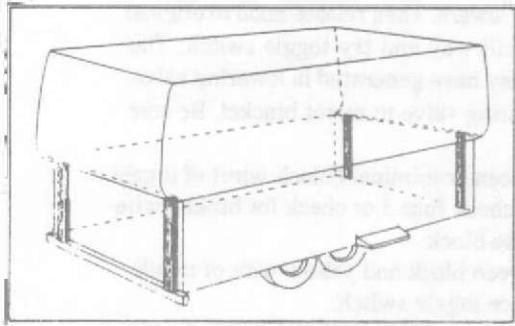


Figure 4

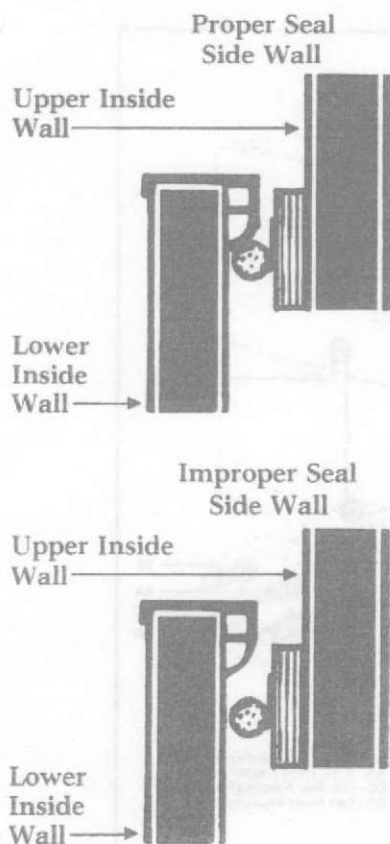
Check the leveling adjustment points for simple front and back realignment, adjust the proper adjusting nut located on the underside of trailer. All front to back adjustments should be made with the trailer upper section supported so that tension is removed from cables - accomplished by lowering the upper section onto four 2" x 4" boards of the same length to brace between the section and frame member.

For example, if the front section is lower than the rear, you will correct this condition as follows:

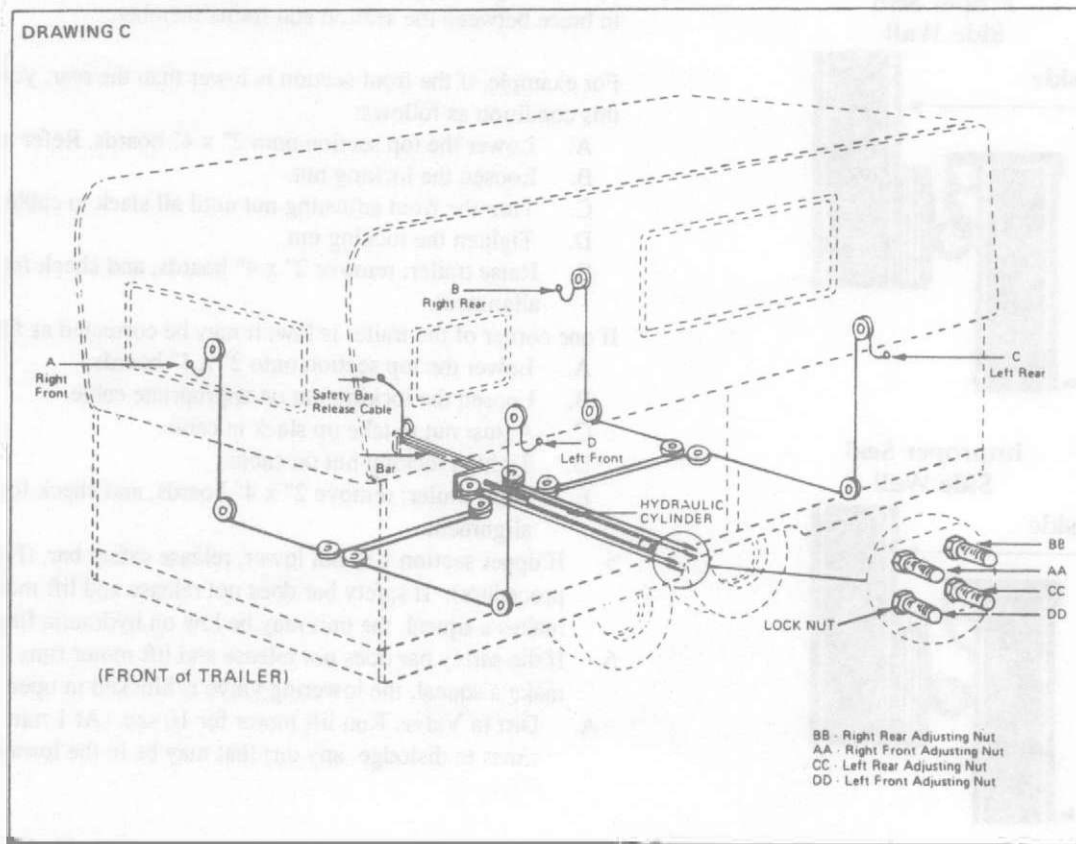
- A. Lower the top section onto 2" x 4" boards. Refer to Fig. 4
- B. Loosen the locking nut.
- C. Turn the front adjusting nut until all slack in cable is taken up.
- D. Tighten the locking nut.
- E. Raise trailer; remove 2" x 4" boards, and check for proper alignment.

If one corner of the trailer is low, it may be corrected as follows:

- A. Lower the top section onto 2" x 4" boards.
 - B. Loosen the locking nut on appropriate cable.
 - C. Adjust nut to take up slack in cable.
 - D. Tighten locking nut on cable.
 - E. Raise trailer; remove 2" x 4" boards, and check for proper alignment.
5. If upper section will not lower, release safety bar. (Follow lowering procedure). If safety bar does not release and lift motor runs and makes a squeal, the unit may be low on hydraulic fluid.
 6. If the safety bar does not release and lift motor runs and does not make a squeal, the lowering valve is blocked in open position.
 - A. Dirt in Valve: Run lift motor for 10 sec. (At 1 min. intervals) 4 times to dislodge any dirt that may be in the lowering valve.



- B. Manual Release Valve Open: Be sure manual release lever is in neutral and not in partially opened positions.
 - C. Check Toggle Switch: With switch in center (off) position or in raising (up) position there should be no 12 volt supplied to the terminal to which the yellow wire is attached. Twelve volt should be supplied to this terminal only when switch is in lowering (down) position. (Drawing "A" 12 volt schematic lower section 6.12). If toggle switch does not follow this pattern replace switch. For temporary operation: To raise trailer off of safety release, use a screw driver to short between black and white wire. To lower, short between black and yellow wire.
7. If safety bar releases and trailer will not lower:
- A. Check all cables to be sure that the cable is in the pulley grooves.
 - B. Lower trailer with manual valve. Turn manual lowering knob counter clockwise until trailer lowers. Then release knob to original position. Then raise trailer half way and try toggle switch. This releases high pressure that may have generated in lowering valve.
 - C. Check ground wire from lowering valve to motor bracket. Be sure terminals are tight.
 - D. With 12 volt test light, check center terminal (Black wire) of toggle switch to ground. If no light, check fuse 3 or check for broken wire between toggle switch and fuse block.
 - E. Using screwdriver, short between black and yellow wire of toggle switch. If valve operates-replace toggle switch.
 - F. Check connection at black lead wire of lowering valve to red wire of toggle switch for broken wire or loose terminal.
 - G. Replace lowering valve.



8. PLUMBING

8.1 Fresh Water Tank

Fresh water is provided from one of two sources:

1. City water, provided under pressure when the trailer is hooked up to a park or city water supply.
2. Water stored in an on-board water tank supplied by a pump operating automatically from your 12-volt electrical system.

A tank for your water supply is standard equipment. This tank is located at the front end and is filled through a fitting on the outside wall of the trailer.

8.2 External Water Supply

When camped in a park or near a city water supply, connect to your trailer as follows:

1. Turn water pump off.
2. Remove protective cap over city water inlet.
3. Connect water hose to your trailer inlet and to the city water supply line.
4. Turn external water supply source valve on.
5. Let the water run a few minutes with your supply line attached to clean the lines.

Note: Both the on-board pump and on-board fresh water tank are now isolated from the water pressure in the system. Do not turn pump on until line is disconnected to avoid damaging the water pump.

Use the following procedure to disconnect the city water supply:

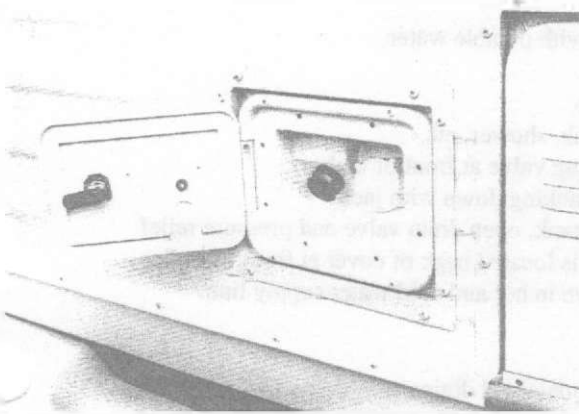
1. Turn external water supply source valve off.
2. Disconnect the water supply hose from your trailer inlet connection and replace inlet protective cap. If the on board tank is to be filled, go to step (13). If not, store the supply hose.
3. Fill the fresh water on-board tank from the city water source, then remove and store the hose.

8.3 Filling Fresh Water Supply

The on-board fresh water supply in your trailer provides fresh water automatically to all systems whenever a faucet is opened. Water is provided by a 12-volt automatic self priming water pump which functions any time power is available and the pump switch is on.

Fill the water tank by inserting a standard hose in to exterior water fill. After fresh water tank is filled remove hose and close water fill door. Turn the water pump on to supply system.

Avoid leaving water in tank when it is not in use. Turn the water pump off before draining water tank. For prolonged storage and during the winter months, this tank should be drained completely by opening valves at tank. Note: The water system should be sanitized, flushed and drained before using.



8.4 Sanitizing Potable Water System

To assure complete sanitation of your potable water system, it is recommended that the following procedures be followed on a new system, one that has not been used for a period of time, or one that may have become contaminated:

1. Prepare a chlorine solution using one gallon of water and 1/4 cup of Clorox or Purex household bleach 15% sodium hypochlorite solution. Pour one gallon of solution into tank for each 15 gallon of tank capacity.
2. Complete filling of tank with fresh water. Open each faucet and drain cock until all air has been released from the pipes and entire system is filled.
3. Allow to stand for three hours.
4. Drain and flush with potable fresh water.
5. To remove any excessive chlorine taste or odor which might remain, prepare a solution of one quart vinegar to five gallons water and allow this solution to agitate in tank for several days by vehicle motion.
6. Drain tank and again flush with potable water.

8.5 Winterizing Water System

1. Open all interior valves, sink, shower, etc.
2. Drain supply tank by opening valve at front of tank.
3. Lower front of trailer by cranking down with jack.
4. If equipped with hot water tank, open drain valve and pressure relief valve at front of tank. This is located back of cover at front of trailer under pilot light. Open valve in hot and cold water supply line.

8.6 Waste Water System

Your TowLite trailer has a self-contained drainage system in which waste water and sewage go directly to separate holding and sewage tanks. All of the plumbing fixtures in the trailer are usable even when the drain is capped.

Waste water and sewage enter the holding tanks to be retained until the tanks can be emptied into a disposal area.

8.7 Toilet

Your TowLite is equipped with a mechanical seal type toilet. The instruction booklet accompanying these units should be reviewed carefully before use.

8.8 Shower

For your protection, this faucet is equipped with a vacuum breaker (back flow preventer) to prevent contamination of your potable water supply. The water in the hand shower hose will drain through this vacuum breaker when the faucet is turned off. **THIS IS NOT A LEAK.** This is inherent in the design of the vacuum breaker, and is evident that it is functioning properly.



8.9 Waste Water Draining

If your campsite is equipped with drain facilities or dumping station, drain your body waste holding tank and waste water tank as follows:

1. Pull the flexible hose from its storage compartment.
 2. Remove the termination cap.
 3. Install the drain hose on the termination fitting and place the other end well into dumping station fitting.
 4. Pull out the large slide-ez valve lever.
 5. Allow body waste tank sufficient time to completely drain.
 6. Pull out the small slide-ez valve lever.
 7. Allow waste water tank sufficient time to completely drain, also this will help rinse sewage that might collect to flexible hose when the rinse waste tank was drained.
 8. Flush both tanks with clean water and allow to drain.
 9. Push in both large and small slide-ez valve levers to closed position.
 10. Remove flexible hose from termination fitting and rinse out hose with fresh water, then remove hose from dumping station.
 11. Replace termination cap to trailer and dumping station cover.
 12. Stow sewer flexible hose to rear bumper storage.
- Note: All drain caps must be in place while in transit.

Note: Do not pull either slide-ez valve levers open when the termination cap is in the secured position.

8.10 Deodorizing Waste Tank

Keep your holding tanks clean using any cleaner approved for recreational vehicle sanitation systems.

Add a special deodorizer or chemical additive approved for recreational vehicle systems to sanitize and improve the tank action.

8.11 Winterizing Waste Water System

Toilet - Drain, and depress pedal until antifreeze appears in bowl.

Holding Tanks - Drain and rinse. Close valves.

Slide-Ez Valves - Examine the shaft on the slide-ez valve and apply metal lubricant if needed.

8.12 Faucet Maintenance

Utopia's patented design eliminates washer wear—the common cause of leaking. Should your faucet have or develop a leak, it is caused either by debris which has become lodged in your water line causing improper seating of the stem tip; or as a result of the handle stop being misaligned.

To eliminate a faucet leak, follow these steps carefully:

1. Turn faucet on and off several times to flush out any debris which may be in the line preventing the stem tip from seating properly. In many cases this will completely eliminate a leak or drip. If problem persists, continue with the following steps.
2. Unsnap the "Hot" or "Cold" button (A) on the handle.
3. Remove the screw (B), with a phillips head screwdriver, turning the screw counter clockwise.
4. Lift off the handle (C).

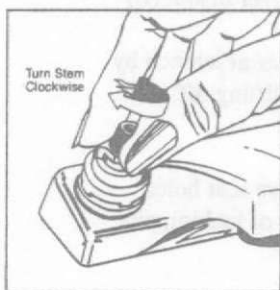
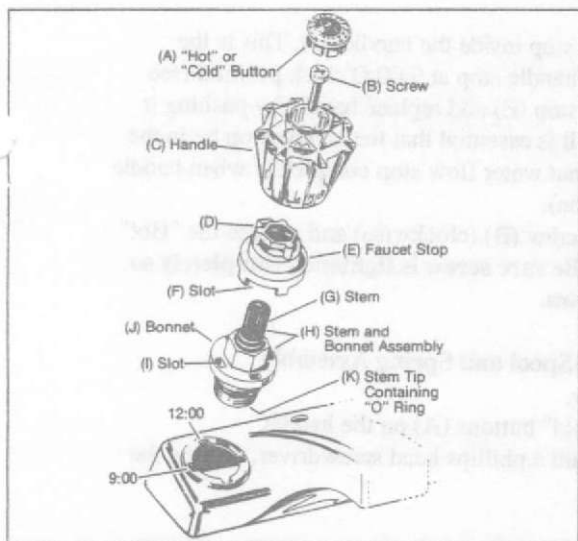


Figure 1

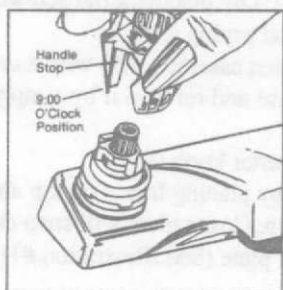
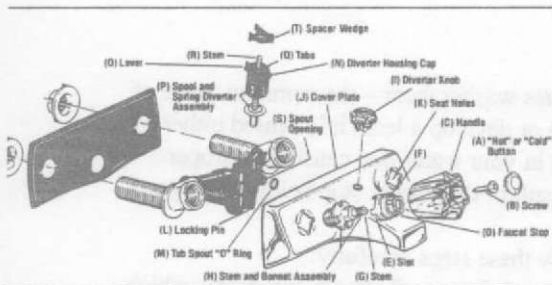


Figure 2

5. Turn stem (G) clockwise until it is fully closed (see figure 1). If leak is eliminated, proceed to steps 16 and 17 for proper replacement of handle. If problem persists, continue with the following steps.
6. Turn off the water supply.
7. Remove the faucet stop (E) by placing a flat screwdriver in slot (F) on the side of the stop and pry it up.
8. Loosen the stem and bonnet assembly (H) with a crescent wrench by turning it counterclockwise and remove it by simply lifting it off with your fingers.
9. If there is foreign debris in the faucet, remove it by flushing or picking it out.
10. Check stem tip and "O" ring (K) for possible damage. If "O" ring is damaged or dislodged, the stem and bonnet assembly must be replaced (see back page for ordering replacement parts).
11. To re-assemble, turn the stem (G) counterclockwise to a full open position.
12. Screw in the stem and bonnet assembly (H) fingertight.
13. Snug up the stem and bonnet assembly (H) with a crescent wrench. You will notice four slots 11! on the top of the bonnet (J) Turn the stem and bonnet assembly (H) until these slots show white rather than chrome. Do not over tighten.
14. Turn the stem (G) clockwise to a fully closed position (see figure 1).
15. Place the faucet stop (E) in the slots (I) with raised part (D) at the 12:00 O'clock position. This should snap into place. If it does not, you do not have the slots properly aligned as instructed in step 13. Re-align.
16. Notice the raised molded stop inside the handle (C). This is the handle stop. Position the handle stop at 9:00 O'clock position (see figure 21 over the faucet stop (E) and replace handle by pushing it down over the stem (G) (It is essential that the handle stop be in the down position to insure that water flow stop completely when handle is turned to the off position).
17. Replace and tighten the screw (B) (clockwise) and replace the "Hot" and "Cold" button. (A). **Be sure screw is tightened completely so handle is completely down.**



Replacing L10228B Diverter Spool and Spring Assembly

1. Turn off the water supply.
2. Unsnap the "hot" and "cold" buttons (A) on the handle.
3. Remove the screw (B) with a phillips head screwdriver, turning the screw counterclockwise.
4. Lift off the handle (C).
5. Remove the faucet stop (D) by placing a flat screwdriver in slot (E) on the side of the stop and prying it up.
6. Loosen the stem and bonnet assembly (H) with a crescent wrench by turning it counterclockwise and remove it by simply lifting off with your fingers.
7. Unscrew and remove diverter knob (I).
8. Remove cover plate (U) by placing hands on top above seat holes (K) and press firmly down. Cover plate will snap out of locking pin (L) on bottom. Lift cover plate (See Illustration #1)

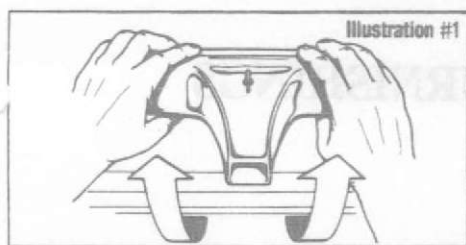


Illustration #1

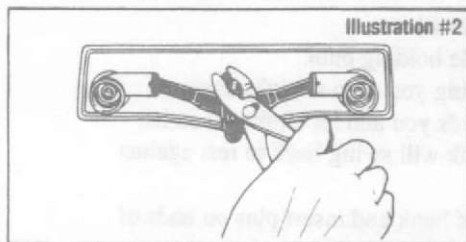


Illustration #2

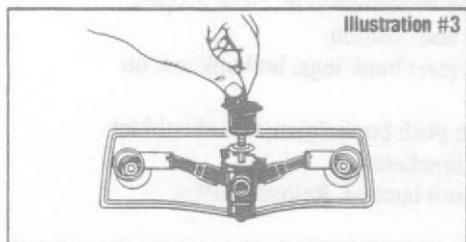


Illustration #3

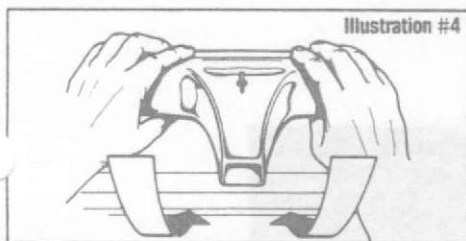


Illustration #4



Illustration #5

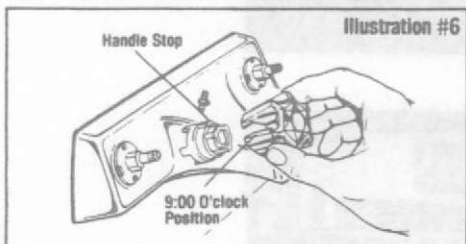


Illustration #6

9. Remove and discard the tub spout "O" ring (M). This may have remained inside the cover plate. Replace with new one from kit on spout opening (S).
10. Loosen spacer wedge (T) by slipping a screwdriver between it and diverter housing cap. Lift spacer wedge off.
11. Place a pair of pliers across top of diverter housing cap (N) so that it engages the key or lever (O) which extends above the cap. Turn cap to the left until tabs open. (See Illustration #2)
12. Pry cap up with screwdriver and remove entire spool and spring diverter assembly (P).
13. Using new spool and spring diverter assembly (P) in kit, slip unit into center body with lever (O) towards the wall. (See Illustration -3).
14. Using pliers as described in step number 11 above, turn to the right while pushing gently downward until tabs (Q) are locked in place.
15. Replace spacer wedge, (T) tall levers point towards wall.
16. Tip cover plate (U) upward punching stem (R) through opening on top.
Making sure that the "O" ring (M) is securely in place on center body spout opening (S), gently replace cover plate so that hot and cold openings line up. Press shield downward until you hear locking pin (L) snap into place. (See Illustration #4)
17. With stem and bonnet assembly (H) in hand, turn the stem (G) counter-clockwise to a full open position.
18. Screw in the stem and bonnet assembly (H) finger-tight.
19. Snug up the stem and bonnet assembly (H) with a crescent wrench. You will notice four slots on the top of the bonnet. Turn the stem and bonnet assembly (H) until these slots show white rather than chrome. **Do not overtighten.**
20. Turn the stem (G) clockwise to fully closed position. (See Illustration #5)
21. Place the faucet stop (D) in the slots with raised part at 12:00 O'clock position. This should snap into place (See Illustration #6). If it does not, you do not have the slots properly aligned as instructed in Step 17. Realign.
22. Notice the raised molded stop inside the handle (C). This is the handle stop. Position the handle stop at 9:00 O'clock position (See Illustration #6) over the faucet stop (D) and replace handle by pushing it down over the stem (G). **(It is essential that the handle stop be in the correct position to insure that water flow will stop completely when handle is turned to the off position).**
23. Replace and tighten the screw (B) (clockwise) and replace the "hot" and "cold" buttons (A). Be sure screw is tightened completely so handle is completely down.
24. Replace diverter knob (I).
25. Turn on water supply. Faucet is now ready for use.

For additional SERVICE INFORMATION, call or write:

BPC. Division of Bristol Corporation
P.O. Box 278
Bristol, Indiana 46507
Toll Free: 1-800-272-4778
1-800-543-4778 (Indiana)
Attn: Field Service Manager