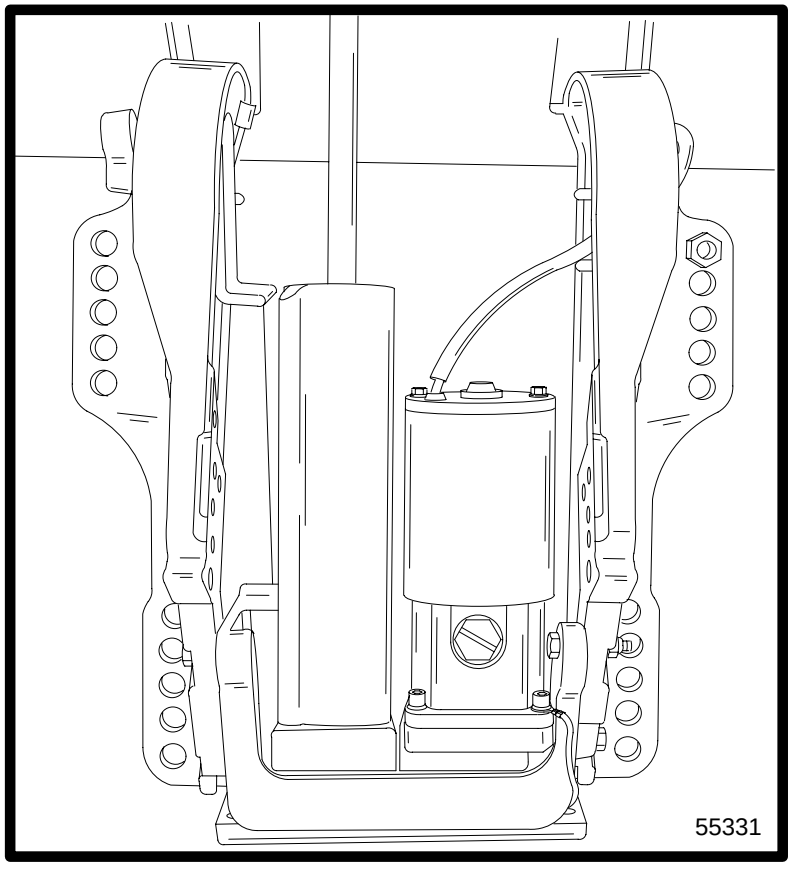
# MID-SECTION




5

E

## POWER TRIM (DESIGN 4)

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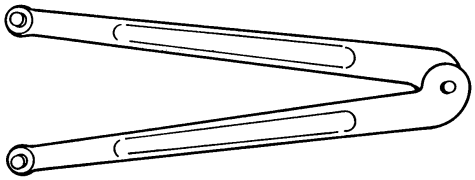
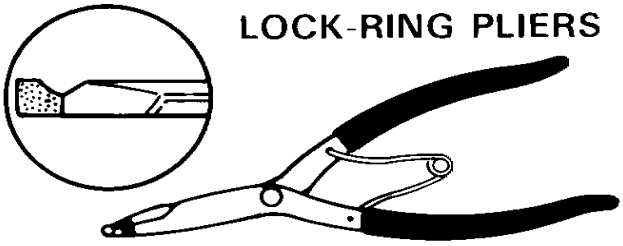
# Special Tools

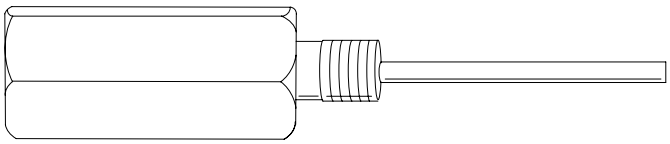
1. Spanner Wrench P/N 91-74951



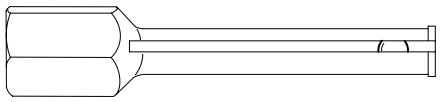
2. Lock-Ring Pliers P/N 91-822778A3



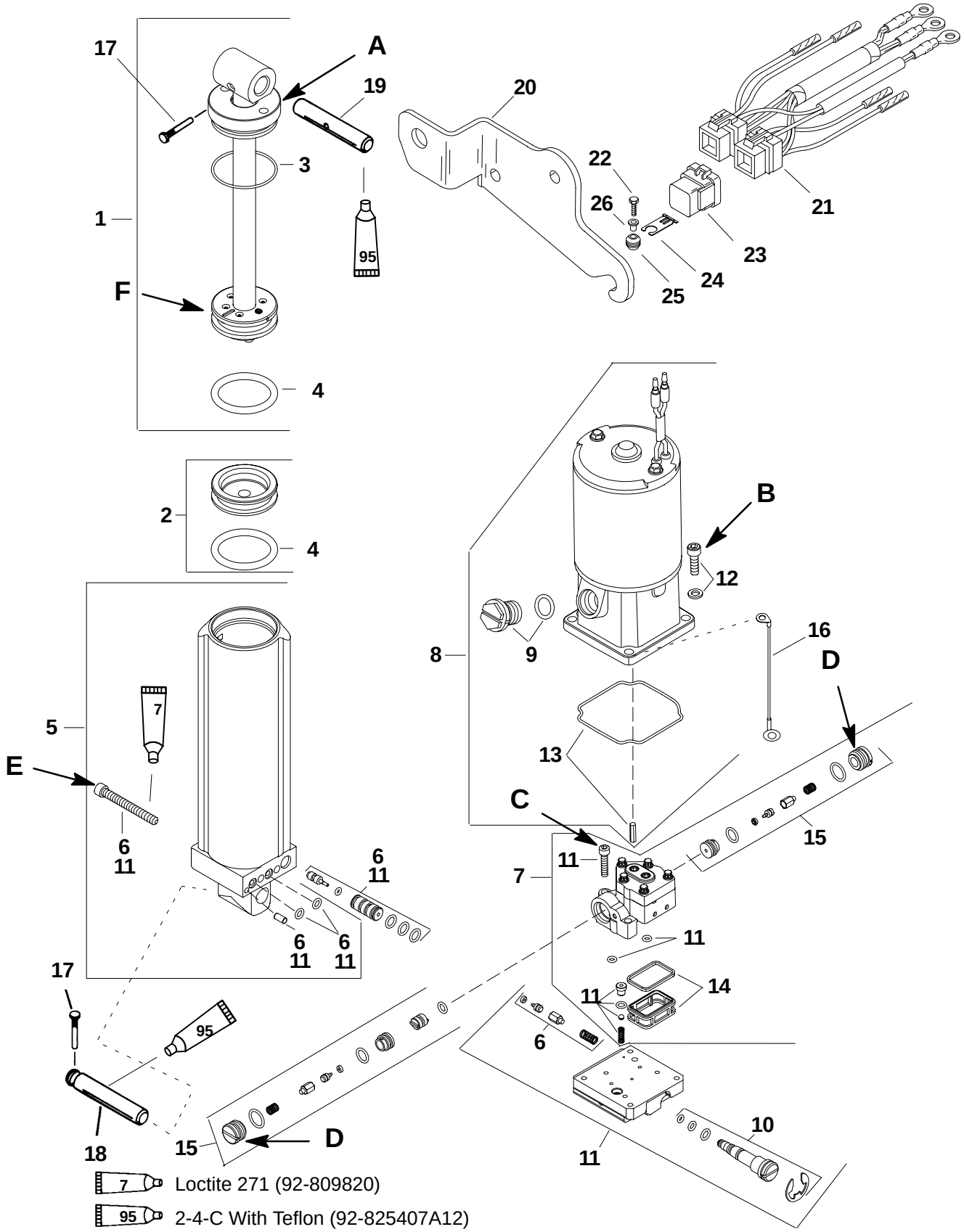

3. Expanding Rod P/N CG 41-11



4. Collet P/N CG 41-14



# POWER TRIM COMPONENTS




***NOTE:*** *Lubricate all O-rings using Quicksilver Power Trim and Steering Fluid. If not available, use automotive (ATF) automatic transmission fluid.*

***NOTE:*** *It is recommended that all o-rings be replaced when servicing tilt system.*

# POWER TRIM COMPONENTS

| REF. NO. | QTY. | DESCRIPTION | TORQUE | | |
|---|---|---|---|---|---|
| | | | lb. in. | lb. ft. | N·m |
| – | 1 | POWER TRIM PUMP | | | |
| 1 | 1 | SHOCK ROD KIT | | 45 | 61 |
| 2 | 1 | MEMORY PISTON ASSEMBLY | | | |
| 3 | 1 | O RING REBUILD KIT | | | |
| 4 | 2 | O RING | | | |
| 5 | 1 | CYLINDER ASSEMBLY | | | |
| 6 | 1 | TRIM LIMIT VALVE KIT | | | |
| 7 | 1 | PUMP ASSEMBLY | | | |
| 8 | 1 | MOTOR KIT | | | |
| 9 | 1 | RESERVOIR PLUG | Drive Tight | | |
| 10 | 1 | MANUAL RELEASE ASSEMBLY | Drive Tight | | |
| 11 | 1 | MANIFOLD KIT | | | |
| 12 | 1 | SCREW KIT (MOTOR) | 80 | | 9.0 |
| 13 | 1 | DRIVE SHAFT | | | |
| 14 | 1 | FILTER KIT | | | |
| 15 | 1 | P.O. CHECK ASSEMBLY KIT | 120 | | 13.5 |
| 16 | 1 | CABLE | | | |
| – | 1 | O RING KIT (COMPLETE TRIM) | | | |
| 17 | 2 | GROOVE PIN | | | |
| 18 | 1 | ANCHOR PIN | | | |
| 19 | 1 | PIN | | | |
| 20 | 1 | BRACKET | | | |
| 21 | 1 | HARNESS-Trim | | | |
| 22 | 2 | SCREW (M6 x 25) | | | |
| 23 | 2 | RELAY | | | |
| 24 | 2 | BRACKET | | | |
| 25 | 2 | GROMMET | | | |
| 26 | 2 | BUSHING | | | |

**A –** Torque cylinder cap to 45 lb. ft. (61 N·m)

**B –** Torque screws to 80 lb. in. (9.0 N·m)

**C –** Torque screws to 70 lb. in. (7.9 N·m)

**D –** Torque plugs to 120 lb. in. (13.5 N·m)

**E –** Torque screws to 100 lb. in. (11 N·m)

**F –** Torque shock piston to 90 lb. ft. (122 N·m)

# Theory Of Operation

The Power Trim system consists of an electric motor, pressurized fluid reservoir, pump and trim cylinder.

The remote control (or trim panel) is equipped with a switch that is used for trimming the outboard “up” and “down”, and for tilting the outboard for shallow water operation (at slow speed), or for “trailering”. The outboard can be trimmed “up” or “down” while engine is under power or when engine is not running.

# Adjustments

## Trimming Characteristics

***NOTE:*** *Because varying hull designs react differently in various degrees of rough water, it is recommended to experiment with trim positions to determine whether trimming “up” or “down” will improve the ride in rough water.*

When trimming your outboard from a mid-trim position (trim tab in neutral, straight fore-and-aft position), you can expect the following results:

#### TRIMMING OUTBOARD “UP” (“OUT”)

**⚠ WARNING**

**Excessive trim “out” may reduce the stability of some high speed hulls. To correct instability at high speed, reduce the power gradually and trim the motor “In” slightly before resuming high speed operation. (Rapid reduction in power will cause a sudden change of steering torque and may cause additional momentary boat instability.)**

- Will lift bow of boat, generally increasing top speed.
- Transfers steering torque harder to left on installations below 23 in. transom height.
- Increases clearance over submerged objects.
- In excess, can cause porpoising and/or ventilation.
- In excess, can cause insufficient water supply to water pump resulting in serious water pump and/or powerhead overheating damage.

**⚠ WARNING**

**Excessive engine trim angle will result in insufficient water supply to water pump causing water pump and/or powerhead overheating damage. Make sure that water level is above gear housing water intake holes whenever engine is running.**

Operating “Up” circuit will actuate the “up” relay (located under engine cowl) and close the electric motor circuit. The electric motor will drive the pump, thus forcing automatic transmission fluid through internal passageways into the “up” side of the trim cylinder.

The trim cylinder/trim rod will position the engine at the desired trim angle within the 20° maximum trim range. The power trim system is designed so the engine cannot be trimmed beyond the 20° maximum trim angle as long as engine RPM is above approximately 2000 RPM.

The engine can be raised beyond the 20° maximum trim angle for shallow water operation, etc., by keeping the engine RPM below 2000 RPM. If engine RPM increases above 2000 RPM, the thrust created by the propeller (if deep enough in the water) will cause the trim system to automatically lower the engine back to the 20° maximum trim angle.

#### TRIMMING OUTBOARD “DOWN” (“IN”)

**⚠ WARNING**

**Excessive speed at minimum trim “In” may cause undesirable and/or unsafe steering conditions. Each boat should be tested for handling characteristics after any adjustment is made to the tilt angle (tilt pin relocation).**

- Will help planing off, particularly with a heavy load.
- Usually improves ride in choppy water.
- In excess, can cause boat to veer to the left or right (bow steer).
- Transfers steering torque harder to right (or less to the left).
- Improves planing speed acceleration (by moving tilt pin one hole closer to transom).

Operating “Down” circuit will actuate the “down” relay (located under engine cowl) and close the electric motor circuit (motor will run in opposite direction of the “Up” circuit). The electric motor will drive the pump, thus forcing automatic transmission fluid through internal passageways into the “down” side of the trim cylinder. The trim rod will move the engine downward to the desired angle.

## Trailering Outboard

**⚠ WARNING**

**Excessive engine trim angle will result in insufficient water supply to water pump causing water pump and/or powerhead overheating damage. Make sure that water level is above gear housing water intake holes whenever engine is running.**

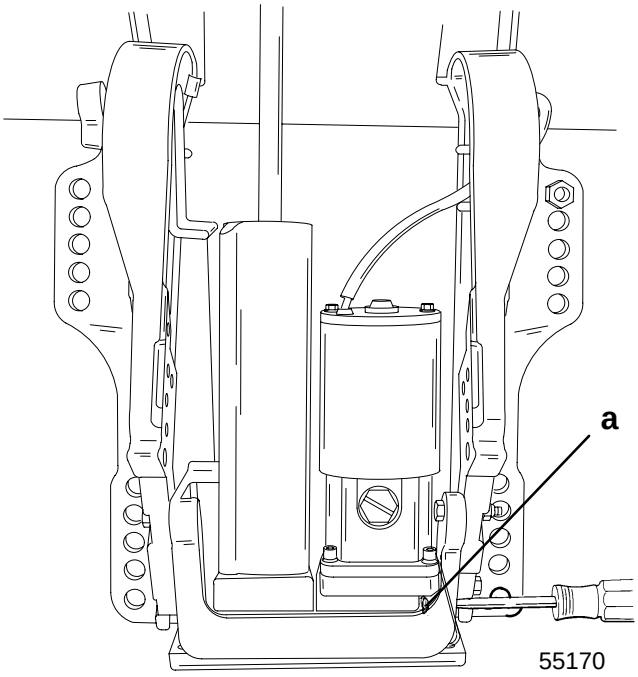
While operating “up” circuit, the cylinder rod will continue to tilt the outboard to a full “up” position for trailering.

## Tilting Outboard Up and Down Manually

**⚠ WARNING**

**Before loosening the manual release valve, make sure all persons are clear of engine as engine will drop to full “down” position when valve is loosened.**

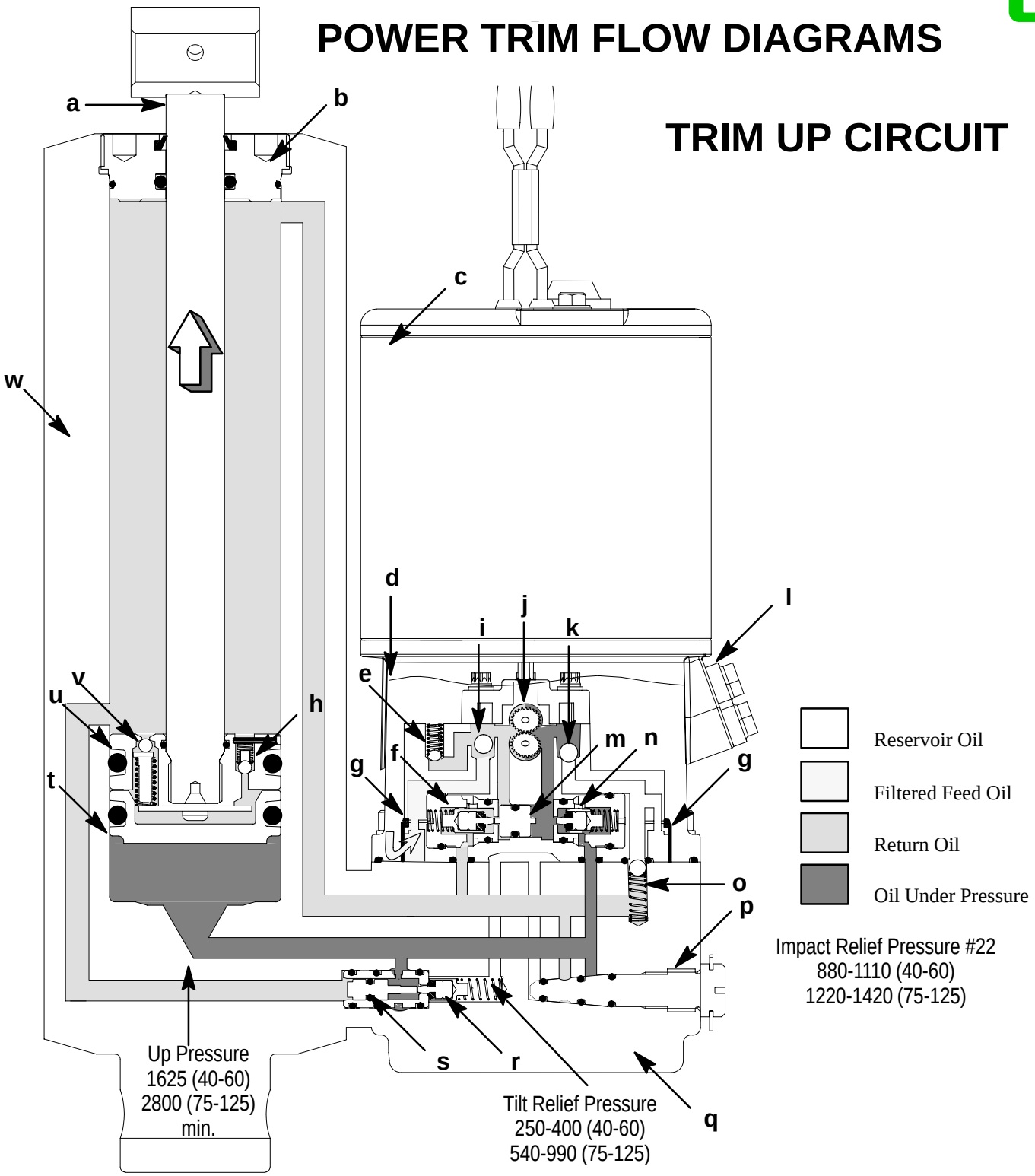
With power trim installed, the outboard can be raised or lowered manually by opening the manual release valve 3 to 4 turns (counterclockwise).




a - Manual Release Valve

# POWER TRIM FLOW DIAGRAMS

## TRIM UP CIRCUIT




a - Piston Rod
b - End Cap
c - Electric Motor
d - Reservoir Oil
e - Down Pressure Regulating Valve
f - Down Pressure Operated Valve
g - Filter (2 shown for clarity)
h - Shock Return Valve
i - Up Circuit Suction Port
j - Oil Pump
k - Down Circuit Suction Port
l - Oil Fill Cap

m - Shuttle Valve
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s - Tilt Relief Piston
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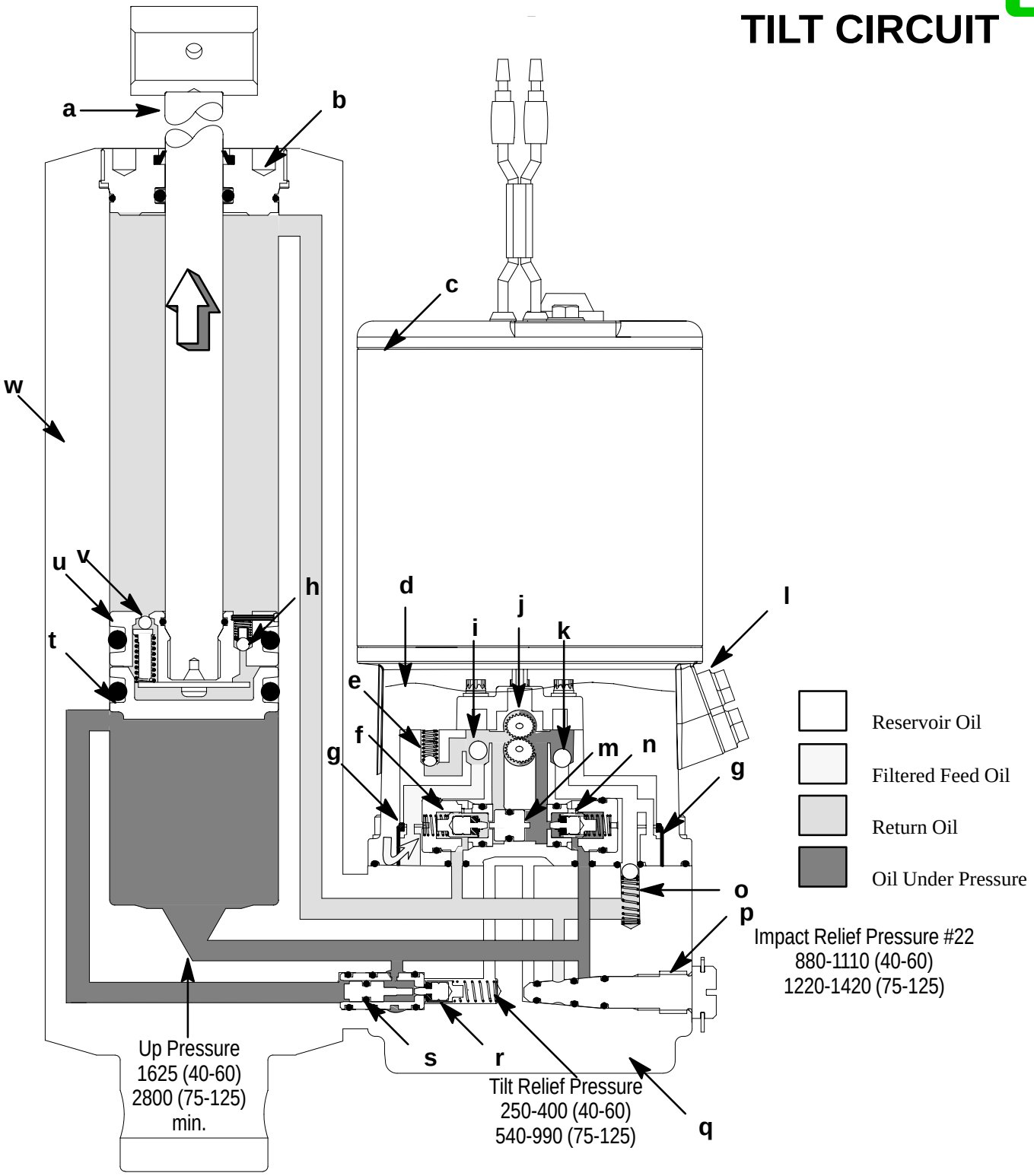
v - Impact Relief Valve
w - Cylinder

## Trim Up

When the trim switch is activated in the “up” position, the electric motor (c) begins to rotate the pump gears (j), the oil pump draws a small amount of oil through the filter (g) and through the up circuit suction port (i). The oil pump gear (j) rotation forces oil into the passages for the up circuit. Oil, under pressure, will slide the shuttle valve (m) against the down circuit pressure operated valve (f). The shuttle valve will mechanically open the down pressure operated valve, allowing oil from the down cavity of the trim cylinder, to flow into the oil pump. This returning oil, from the down cavity, will supply most of the oil required for the up circuit. Oil in the up circuit is blocked from returning into the reservoir by the ball inside the down circuit suction port (k). The pressure of the oil will force the up circuit pressure operated valve (n) to open, allowing the oil to enter the passages inside the manifold (q) leading to the trim cylinder (w) up cavity. Oil is blocked from all other passages by the closed manual tilt valve (p). Oil under pressure will enter the trim cylinder below the memory piston (t). With an increasing amount of oil entering the cylinder, the memory piston contacts the shock piston (u) and forces the piston rod (a) up and out, raising the outboard motor. Oil on the top of the shock piston exits through a passage running down along the side of the cylinder and enters the manifold passages. The oil is drawn back into the pump (j) through the open down pressure operated valve (f) and enters the pump as supply for the up circuit.

# TILT CIRCUIT

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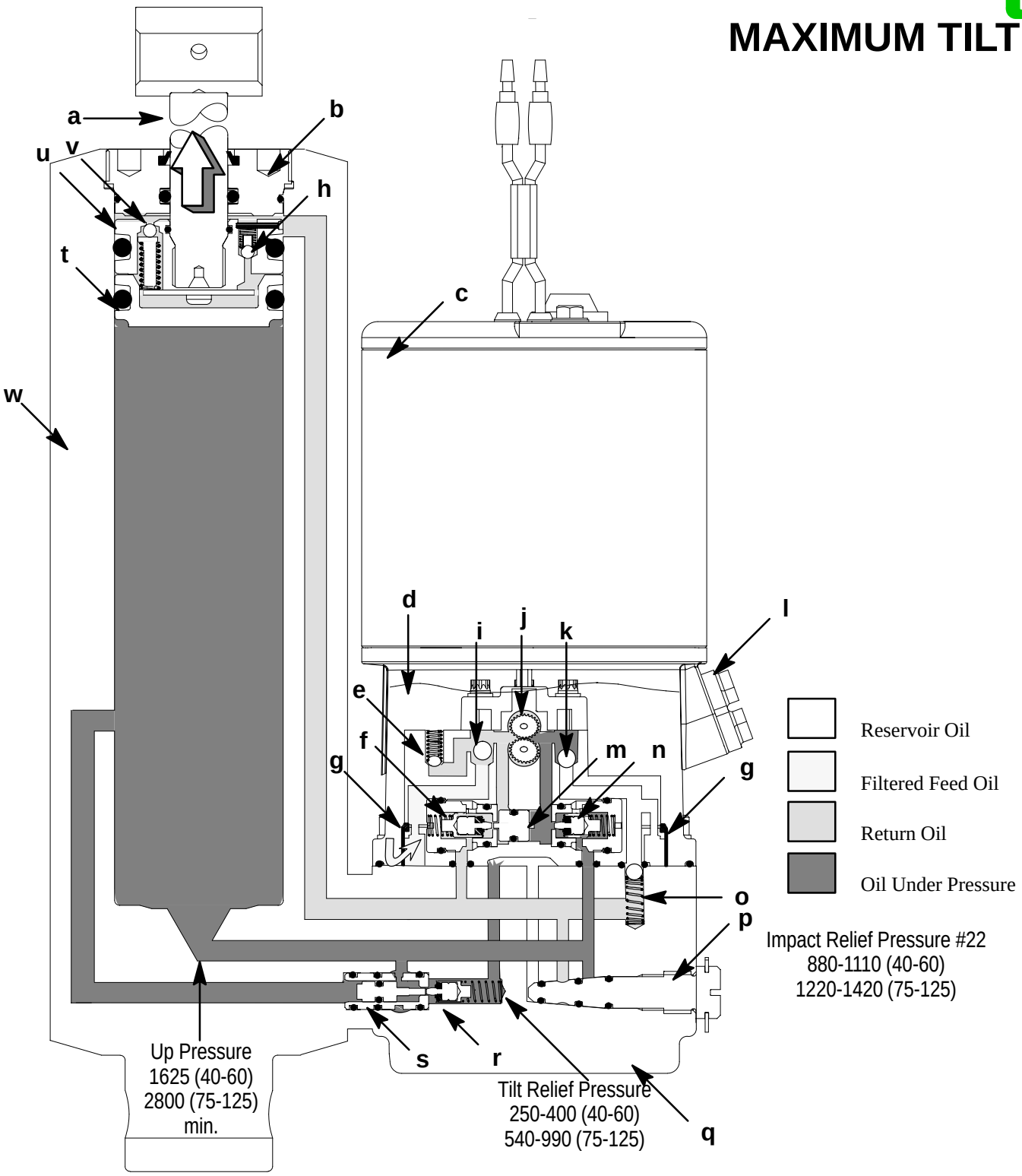
## Tilt Up

In the “up” mode, as the piston rod (a) extends from the cylinder (w), the memory piston (t) clears or uncovers the pressure relief passage. Oil from the up cavity will enter this passage and, if required, causes the tilt relief piston (s) to open the tilt pressure relief valve (r). This valve lowers the amount of pressure available to lift the outboard motor. With the engine in forward gear, and at high engine rpm, the oil pressure available will not be able to overcome the propeller thrust, limiting the trim range to below the pressure relief orifice. When the engine rpm’s fall or if engine is not in forward gear, the oil pressure is available to extend the piston rod (a) up into the tilt range.

# MAXIMUM TILT

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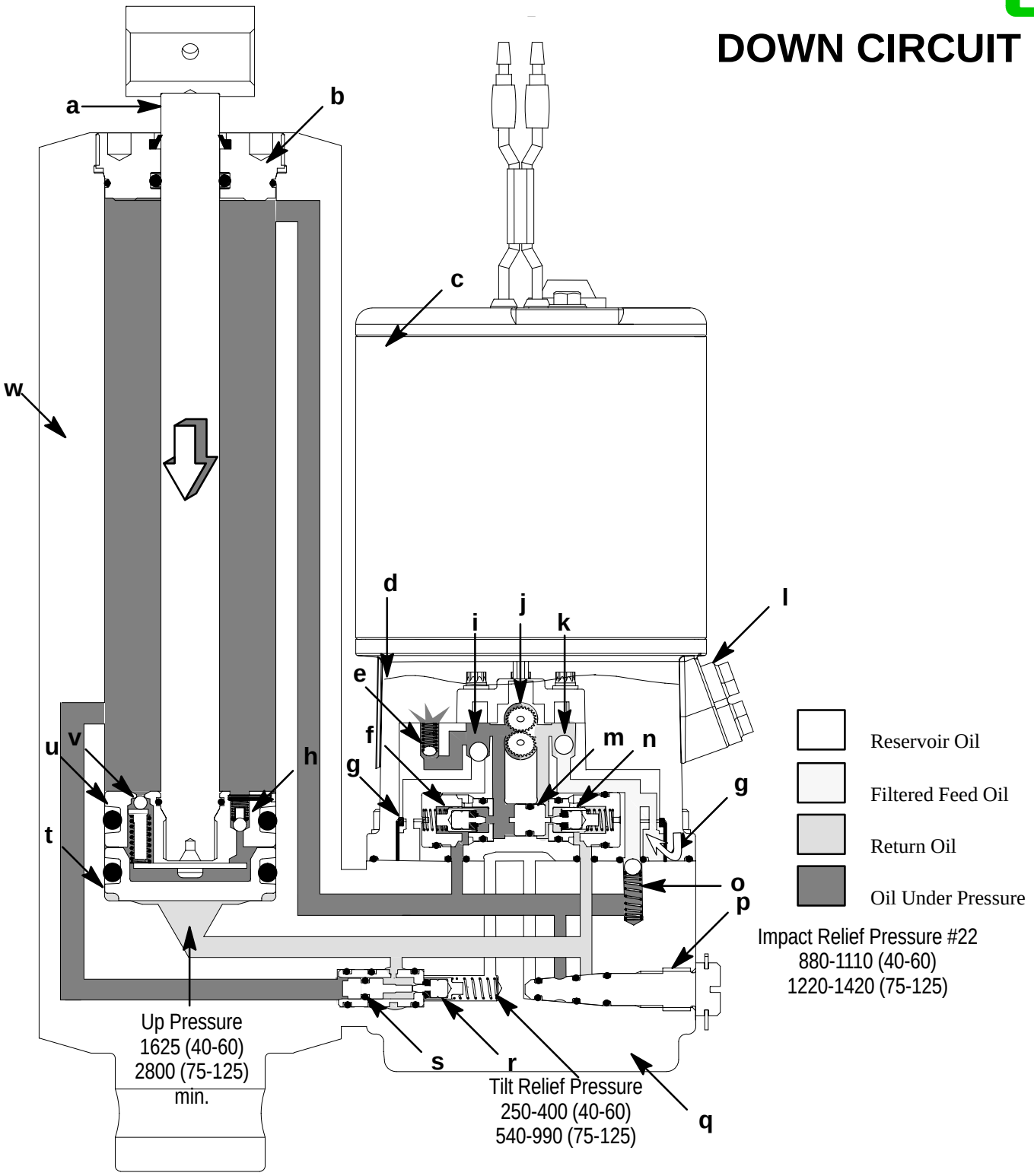
u - Shock Piston
v - Impact Relief Valve
w - Cylinder

## Maximum Tilt

With the piston rod at maximum travel, and due to no rod movement, the pressure inside of the trim cylinder (w) will increase to the pressure required to move the tilt relief piston (s). The tilt relief piston's "pin" opens the tilt relief valve (r). Up pressure flows into the trim relief passage, and returns back into the reservoir.

# DOWN CIRCUIT

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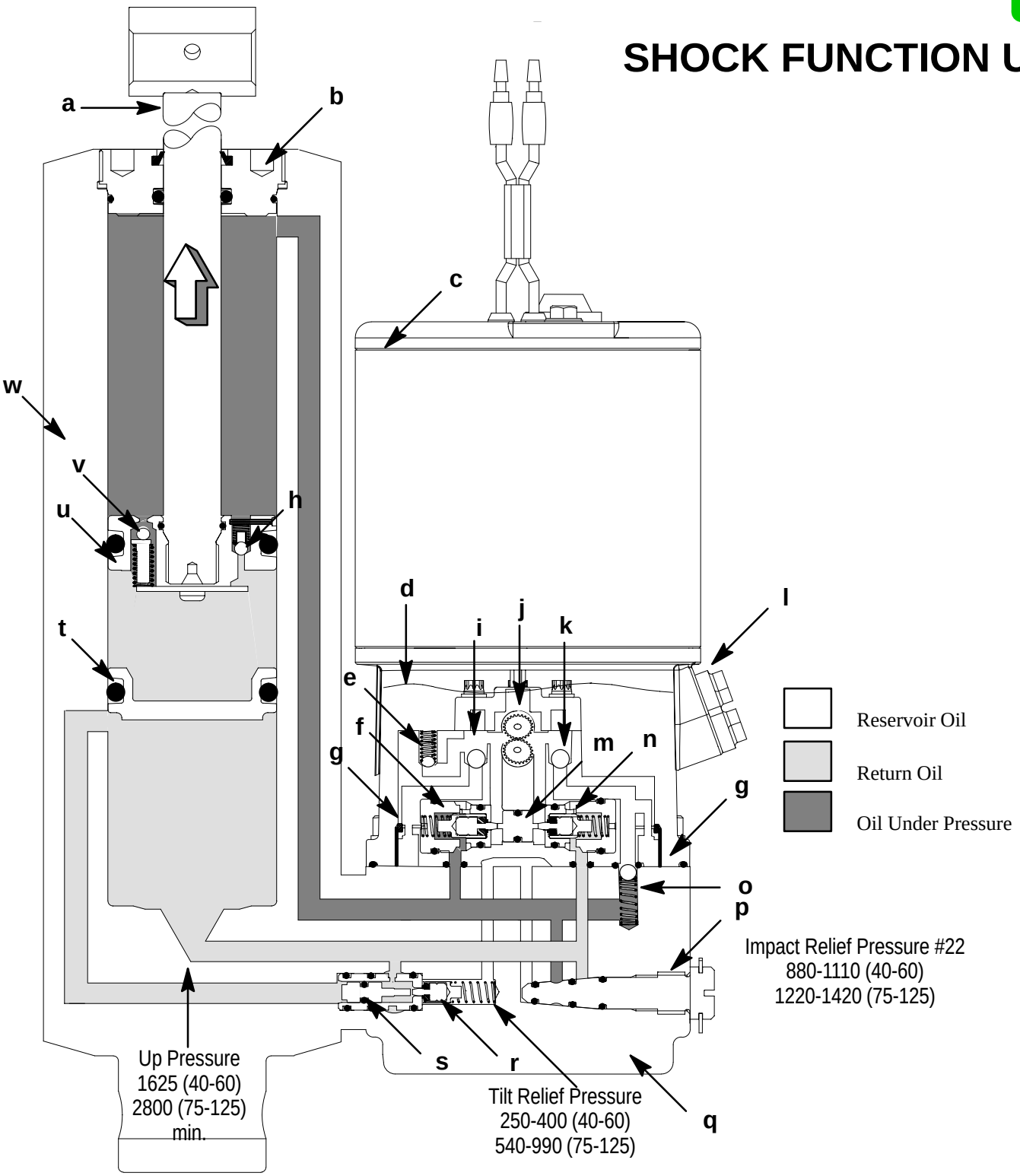
u - Shock Piston
v - Impact Relief Valve
w - Cylinder

## Down Mode

When the trim switch is activated in the “down” position, the electric motor (c) will rotate the pump (j) in the opposite direction. With the pump gears rotating backwards, the flow of oil is reversed. Oil is drawn through the filter (g), through the down circuit suction port (k) and into the oil pump (j). The pump forces pressurized oil into the down passages, oil will slide the shuttle valve (m) into the up circuit pressure operated valve (n). The shuttle valve will mechanically open the up circuit pressure operated valve and allow oil, from the up cavity of the trim cylinder (w), to return into the oil pump. This returning oil, from the up cavity, will supply the oil required for the down circuit. The oil is blocked from returning into the reservoir by the ball inside the up circuit suction port (i). Oil, under pressure, opens the down pressure operated valve (f) and enters the down passages inside of the manifold (q). The manifold passage connects into the trim cylinder passage leading to the top of the cylinder. The cavity, inside the cylinder, above the shock piston (u) is the down cavity. As the down cavity fills with oil, the piston rod (a) retracts into the cylinder, lowering the outboard motor. Oil from the up cavity exits in the cylinder and is drawn back into the pump through the open up pressure operated valve (n). When the piston rod reaches full travel, the oil pressure inside the down circuit will rise until the down pressure relief valve (e) opens, bypassing oil back into the reservoir. When the trim button is released, and the oil pump stops supplying pressure, both of the pressure operated valves (f & n) will close and; if open, the down pressure regulating valve (e) will close. The closed valves will lock the fluid on either side of the shock piston (u) & memory piston (t), holding the outboard motor in position.

# SHOCK FUNCTION UP

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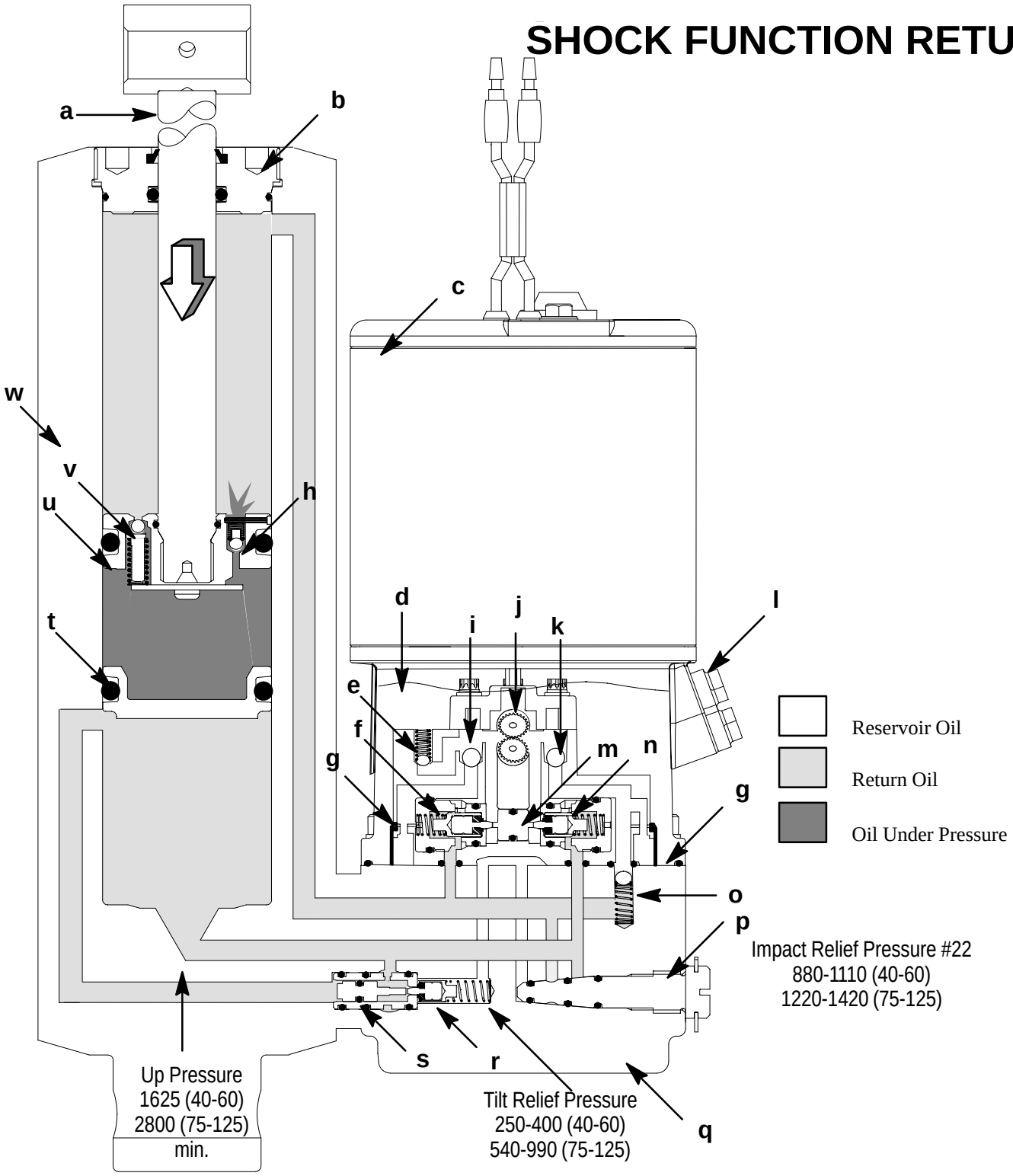
u - Shock Piston
v - Impact Relief Valve
w - Cylinder

## Shock Function Up

Oil inside the down cavity is locked in a static position by the closed pressure operated valve (f), the manual release valve (p) and the manifold reverse suction valve (o). If the outboard strikes an underwater object while in forward gear the piston rod (a) will try to rapidly extend from the cylinder (w), the pressure increases inside the trim cylinder down cavity and connecting passages. When the pressure increases to the level required, the impact relief valves (v), located inside the shock piston (u), will open and allow the fluid to pass through the shock piston. As the fluid passes through the piston, the piston rod (a) will extend from the trim cylinder. The memory piston (t) is held in position by vacuum, created by the oil in the up cavity being locked in a static position. Therefore; oil passing through the shock piston is trapped between the memory piston (t) and shock piston (u).

# SHOCK FUNCTION RETURN

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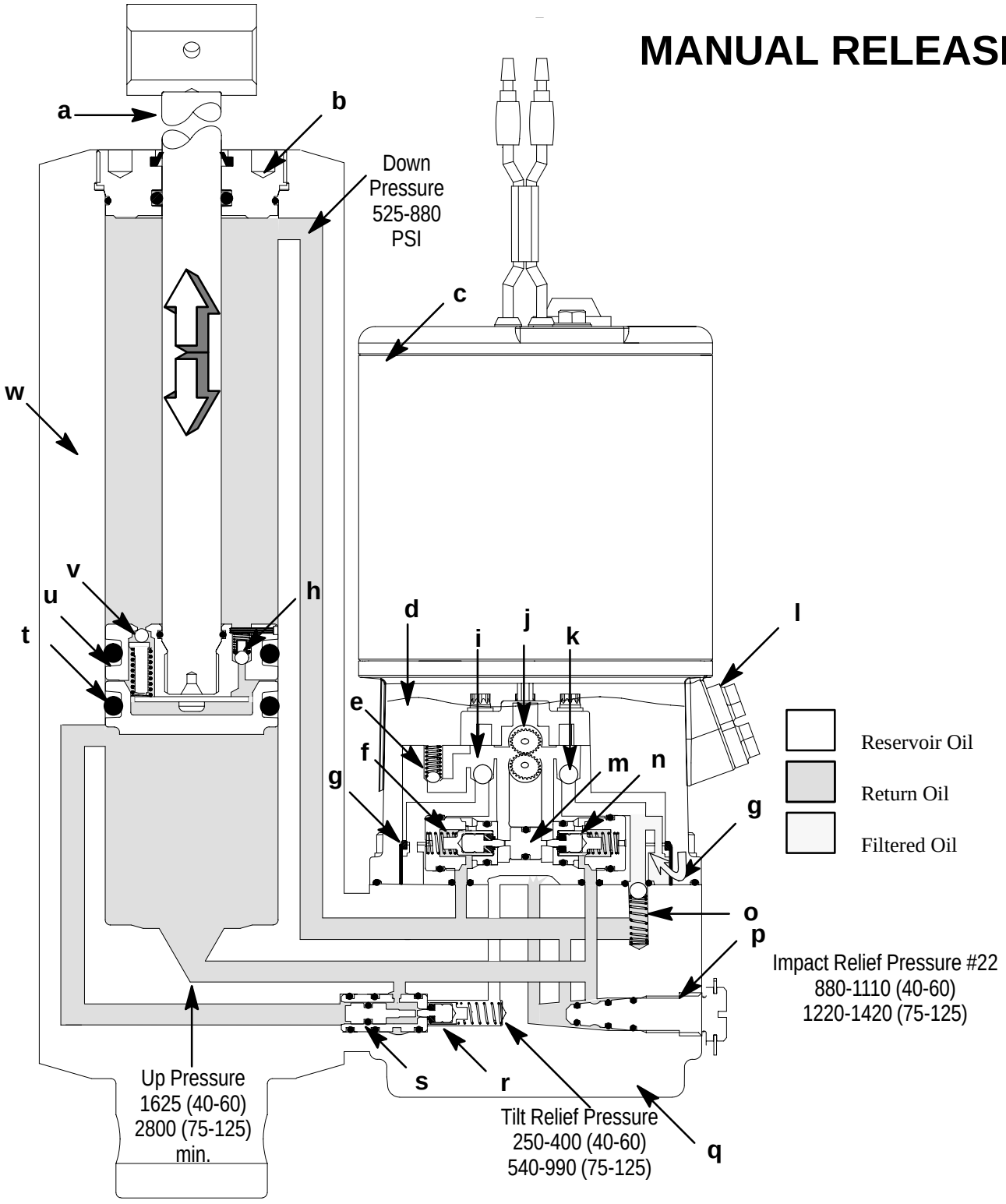
## Shock Function Return

After the engine clears the under water object, the weight of the engine will increase the oil pressure between the memory piston (t) and shock piston (u) to the level required to open the shock return valve (h), inside the shock piston, allowing the oil to bleed back through the shock piston into the down cavity. If required, additional oil will enter the down cavity through the manifold reverse suction valve (o). This will return the engine back against the memory piston (t) and into the original running position.

# MANUAL RELEASE

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## Manual Tilt

To manually tilt the outboard engine, the owner will need to back out the manual release valve (p) 3-4 turns. With the valve backed out, the internal passages inside the manifold are connected together. These passages connect both the cylinder down and up cavities together, along with the reservoir, allowing the engine to be raised or lowered. Piston rod (a) movement will continue until the manual release valve (p) is closed, locking the fluid inside of the cylinder and manifold.

# Troubleshooting

Support outboard with tilt lock pin when servicing power trim system.

**IMPORTANT: After debris or failed components have been found (during troubleshooting procedure) it is recommended that unit be disassembled completely and ALL O-rings be replaced. Check ball valve components and castings must be cleaned using engine cleaner and compressed air or replaced prior to re-assembly.**

**IMPORTANT: Power trim system is pressurized. Outboard must be in the full "UP" position (trim rod fully extended) prior to fill/drain plug or manual release valve removal.**

Refer to instructions following if disassembly is required when servicing.

Follow preliminary checks before proceeding to troubleshooting flow diagrams (following).

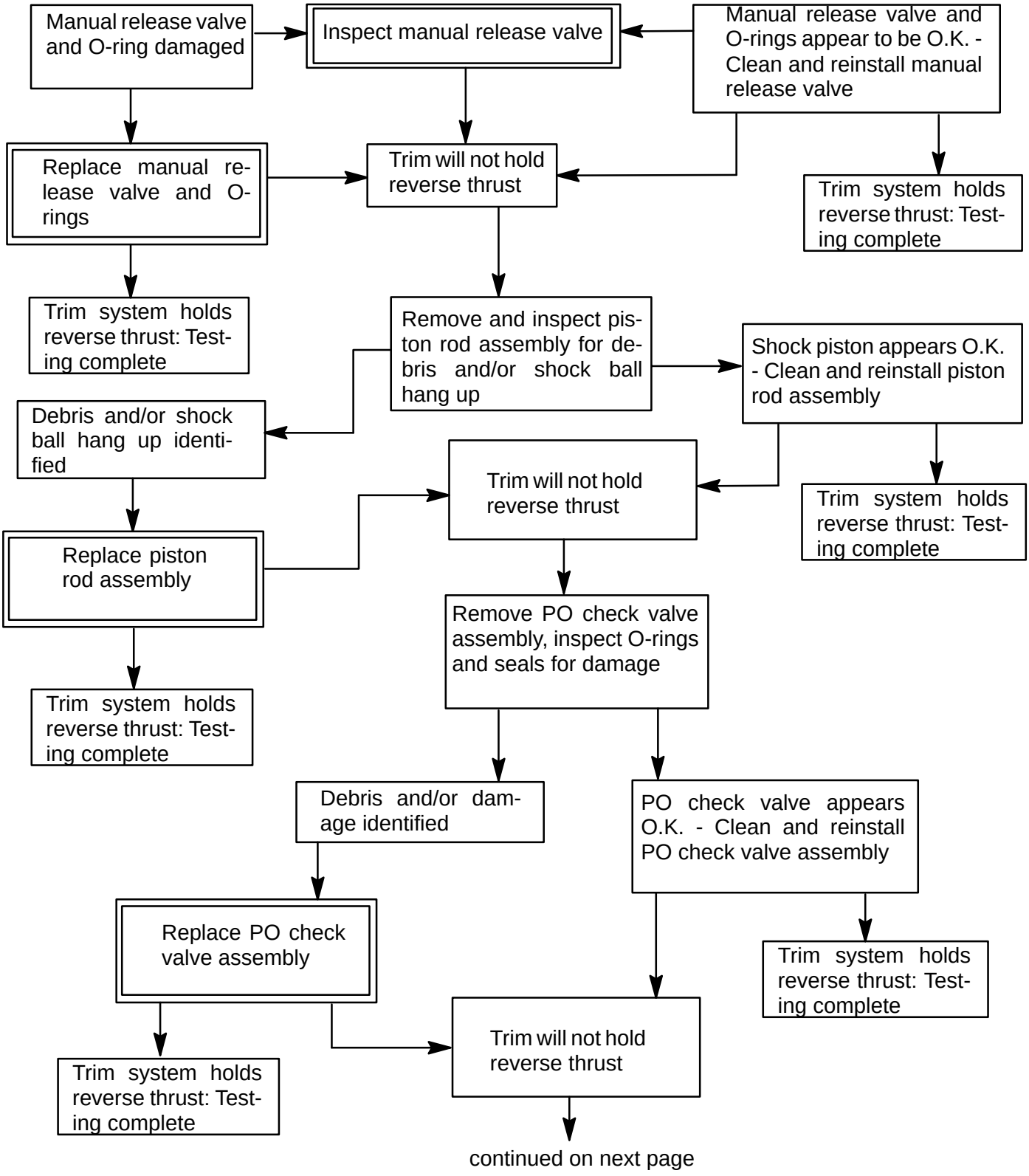
## Preliminary Checks

**IMPORTANT: Operate Power Trim system after each check to see if problem has been corrected. If problem has not been corrected, proceed to next check.**

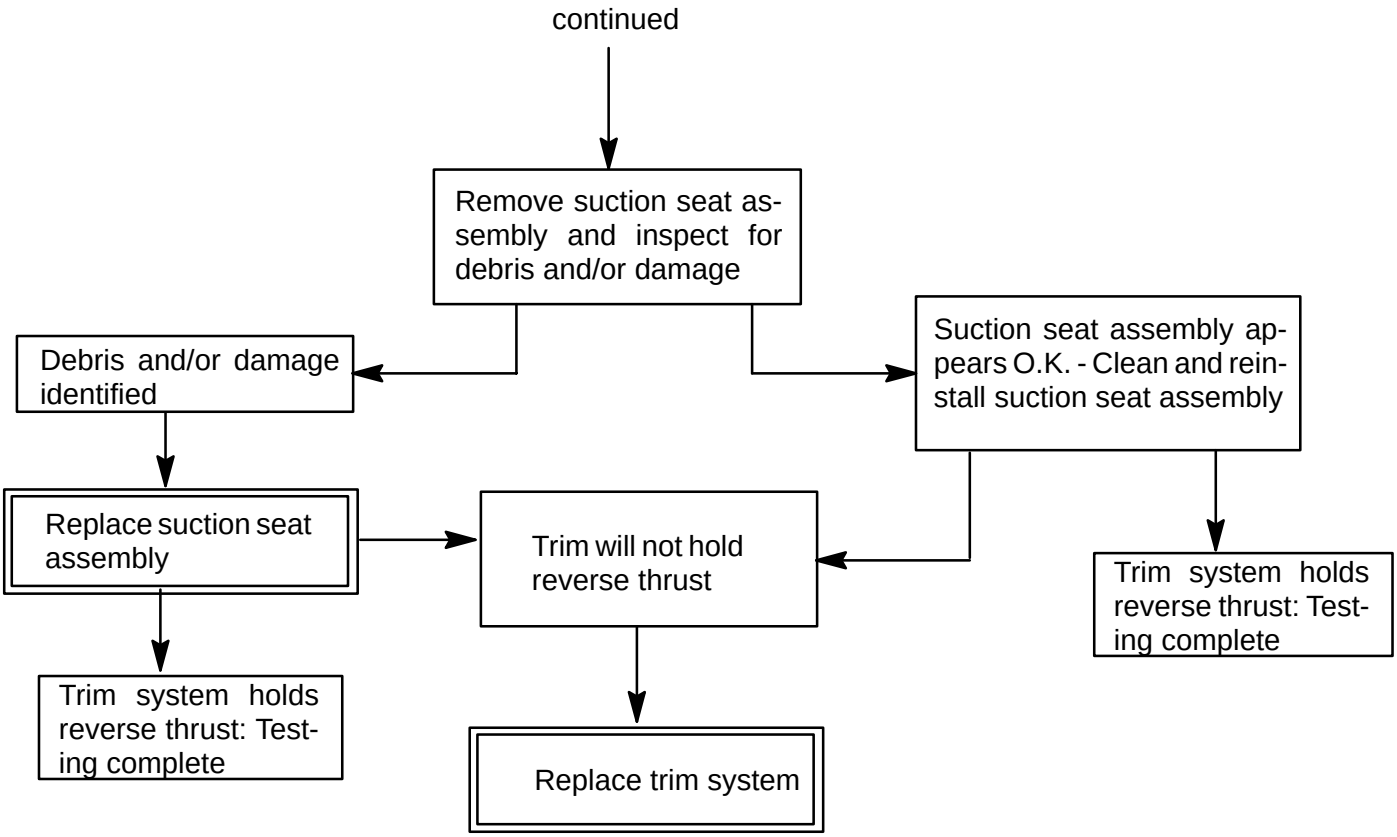
1. Check that manual release valve is tightened to full right (clockwise) position.
2. Check trim pump fluid level with outboard in full "UP" position and fill if necessary. Refer to "Bleeding Power Trim Unit".
3. Check for external leaks in Power Trim system. Replace defective part(s) if leak is found.
4. Outboard not holding tilted position (falls down to trim position) indicates debris or defective components in trim assembly. Clean or replace components as required.

# Hydraulic System Troubleshooting Flow Chart

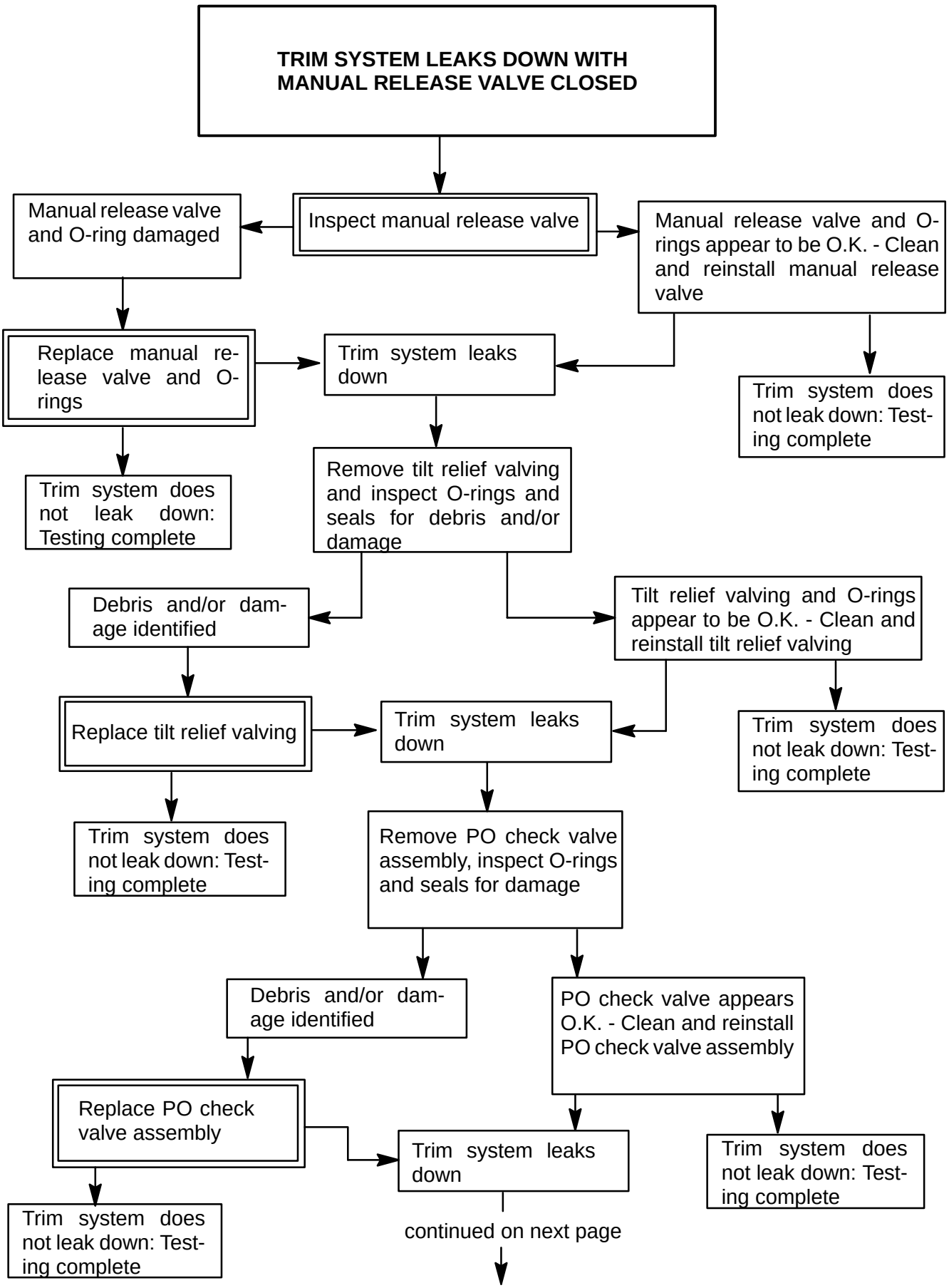
**OUTBOARD WILL NOT HOLD TILTED POSITION DURING REVERSE AND/OR TRAILS OUT DURING HIGH SPEED DECELERATION**



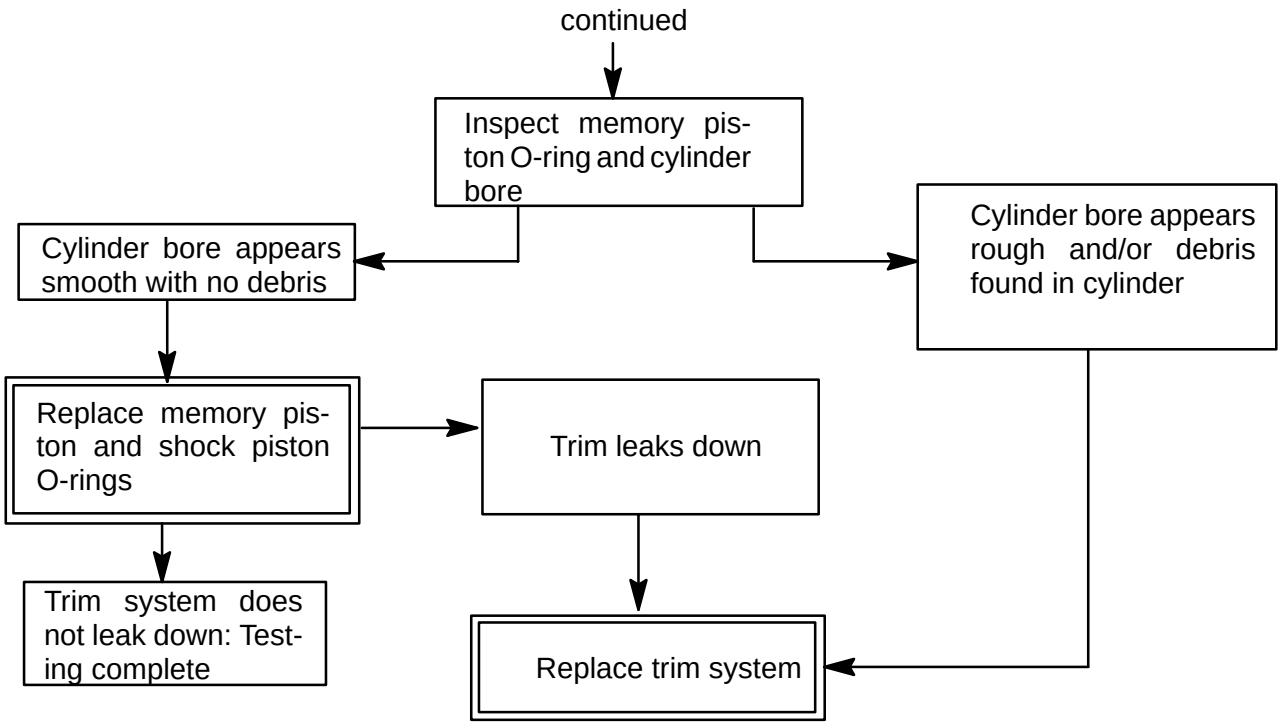
# Hydraulic System Troubleshooting Flow Chart



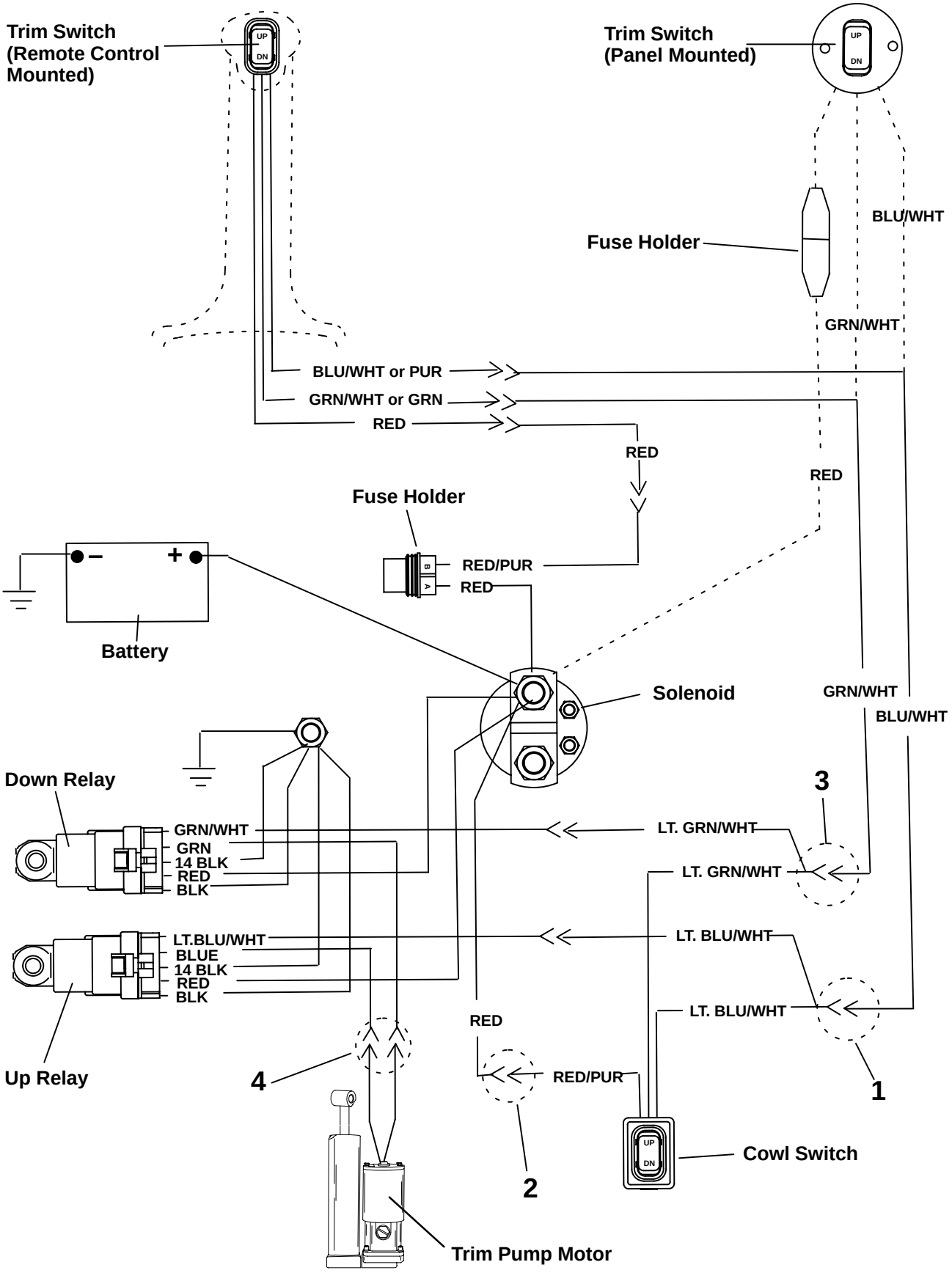
# Hydraulic System Troubleshooting Flow Chart



# Hydraulic System Troubleshooting Flow Chart



# Troubleshooting the Power Trim Electrical System



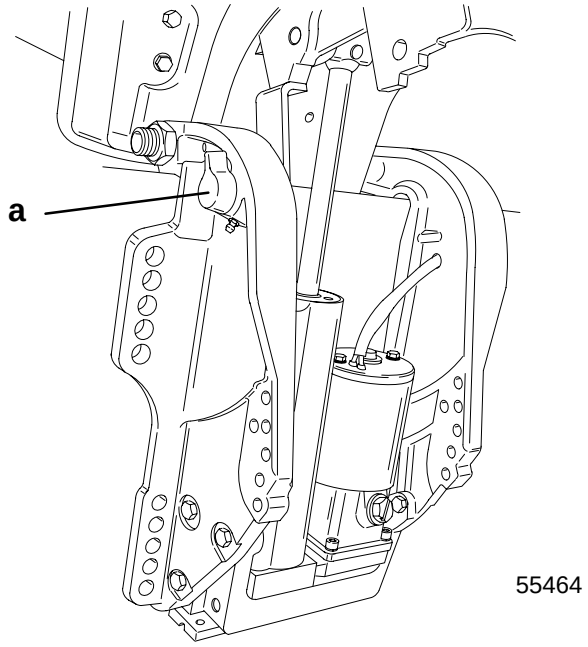
## Troubleshooting the Power Trim Electrical System

Refer to wiring diagram on preceding page for location of wire connections.

| Problem | Possible Cause | Remedy |
|---|---|---|
| Trim Switch “UP” is inoperative, but the Cowl Switch “UP” does operate. | 1. Open wire between Wire Connection (1) and Trim Switch.<br>2. Faulty Trim Switch. | 1. Check for an open connection or cut wire.<br>2. Replace. |
| Cowl Switch “UP” is inoperative, but the Trim Switch “UP” does operate. | 1. Open wire between Wire Connection (2) and Solenoid.<br>2. Faulty Cowl Switch. | 1. Check for an open connection or cut wire.<br>2. Replace. |
| Trim Switch “UP” and Cowl Switch “UP” are both inoperative. | 1. Open wire between Wire Connection (1) and the Up Relay.<br>2. Open BLK wire between ground and UP Relay.<br>3. Open RED wire between Solenoid and Up Relay.<br>4. Faulty Up Relay . | 1. Check for an open connection.<br>2. Check for an open connection.<br>3. Check for an open connection.<br>4. Replace. |
| Trim Switch “DOWN” is inoperative, but the Cowl Switch “DOWN” does operate. | 1. Open wire between Wire Connection (3) and Trim Switch.<br>2. Faulty Trim Switch. | 1. Check for an open connection or cut wire.<br>2. Replace. |
| Cowl Switch “DOWN” is inoperative, but the Trim Switch “DOWN” does operate. | 1. Open wire between Wire Connection (2) and Solenoid.<br>2. Faulty Cowl Switch. | 1. Check for an open connection or cut wire.<br>2. Replace. |
| Trim Switch “DOWN” and Cowl Switch “DOWN” are both inoperative. | 1. Open wire between Wire Connection (3) and the Up Relay.<br>2. Open BLK wire between ground and Down Relay.<br>3. Open RED wire between Solenoid and Down Relay.<br>4. Faulty Down Relay | 1. Check for an open connection.<br>2. Check for an open connection.<br>3. Check for an open connection.<br>4. Replace. |
| Trim Switch “UP” and “DOWN” are both inoperative, but the Cowl Switch does operate. | 1. 20 AMP Fuse blown.<br>2. Faulty trim switch.<br>3. Wire is open between fuse holder and solenoid.<br>4. Wire is open between fuse holder and trim switch. | 1. Replace fuse. Locate the cause of the blown fuse. Check electrical wiring for a shorted circuit.<br>2. Replace<br>3. Check for an open connection or cut wire.<br>4. Check for a loose or corroded connection. |
| Trim Switch and Cowl Switch are both inoperative. | 1. One of the Trim Pump Motor wires is open between the motor and the Relays.<br>2. Faulty trim pump motor. | 1. Check wire connections (4) for loose or corroded condition.<br>2. If voltage is present at connections (4) when the appropriate trim button is pressed, then motor is faulty. Replace motor. |
| Trim system operates (motor runs) without pressing the switches. | 1. The Trim or Cowl switch is shorted. | 1. Replace. |

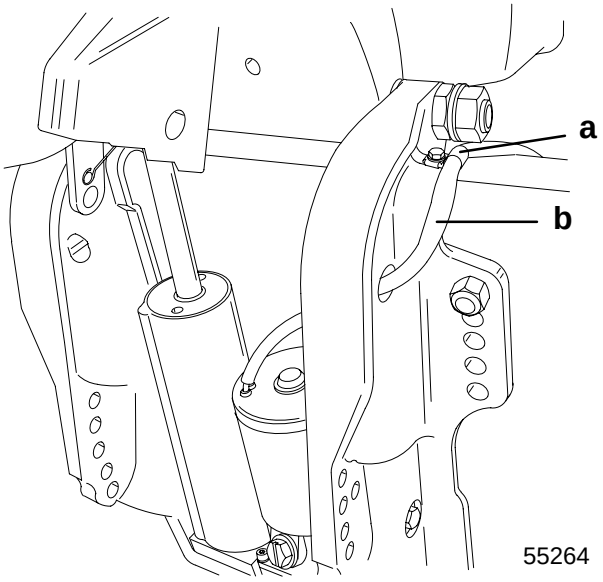
# Power Trim System Removal

1. Tilt outboard to the full up position and support with tilt lock pin.



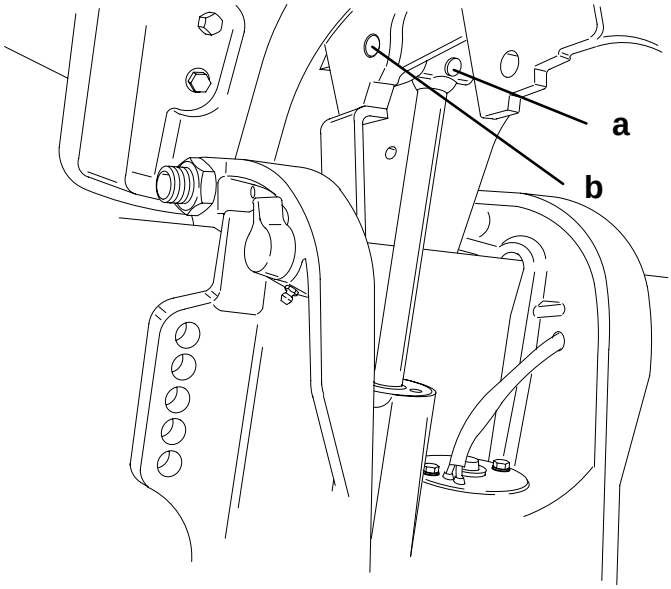

a - Tilt Lock Pin

2. Disconnect the power trim wire harness and remove clamp.



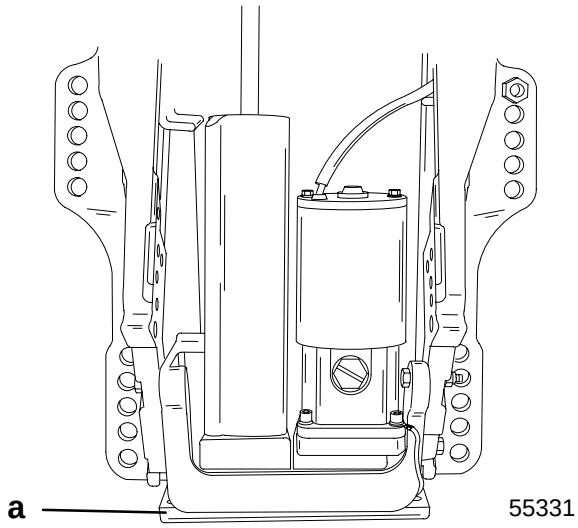

a - Power Trim Wire Harness Clamp
b - Harness

3. Remove the trilobe pin.
4. Drive out the upper pivot pin.



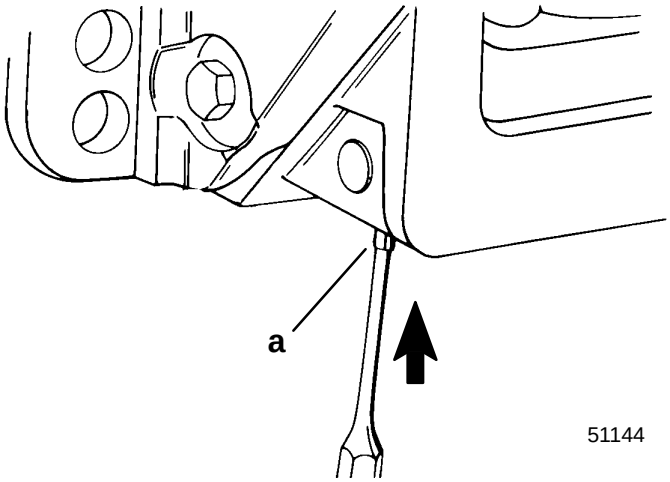

a - Trilobe Pin
b - Upper Pivot Pin

5. Remove the sacrificial anode.



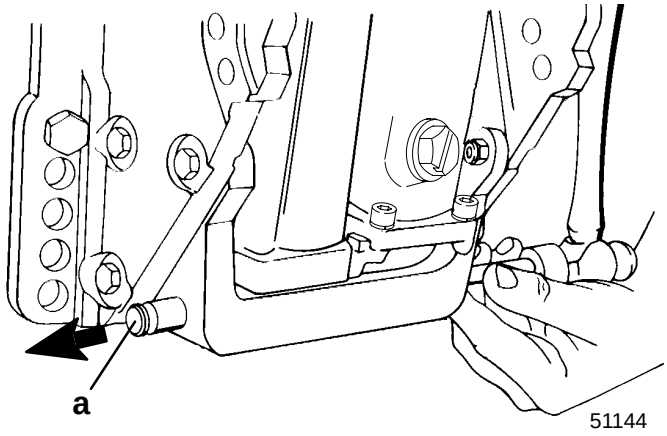

a - Sacrificial Anode

6. Use suitable punch to remove (Drive Up) lower pin. Retain dowel pin.




a - Dowel Pin

7. Use suitable punch to drive out lower pivot pin.

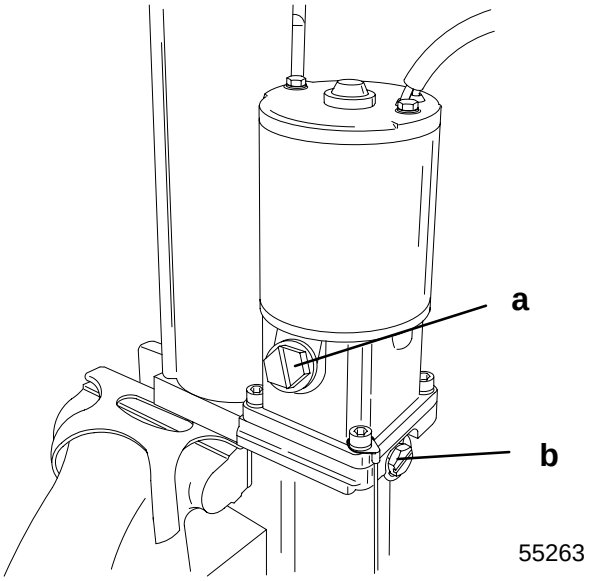



a - Lower Pivot Pin

# Power Trim Disassembly

**IMPORTANT: Power trim system is pressurized. Trim rod must be in the full "UP" position (fully extended) prior to fill/drain plug, or manual release valve removal.**

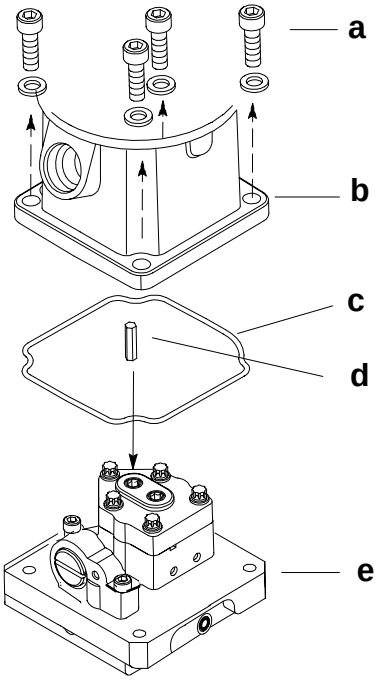
1. Remove reservoir cap.
2. Remove manual release valve assembly to drain oil.




a - Reservoir Cap
b - Manual Release Valve

## Trim Motor Removal

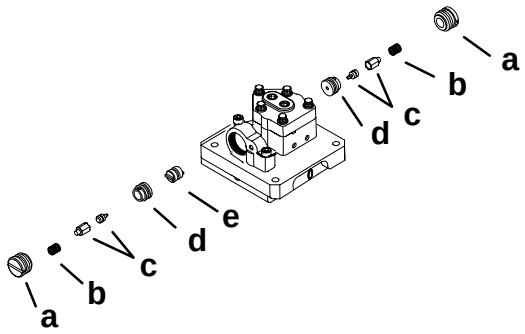
1. Secure power trim assembly in a soft jaw vise.
2. Remove four (4) screws to remove motor/reservoir. Remove reservoir seal and coupler.




a - Screw (4)
b - Reservoir
c - Reservoir Seal
d - Coupler
e - Manifold Assembly

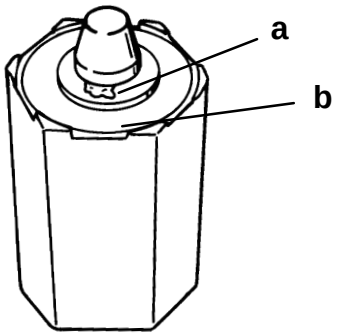
## Pump and Components Removal

1. Remove pressure operated plugs on pump. Remove spring and check valve/poppet (both sides). Use special tool CG 41-11 and special tool CG 41-14 with 5/16″ end to remove spool.



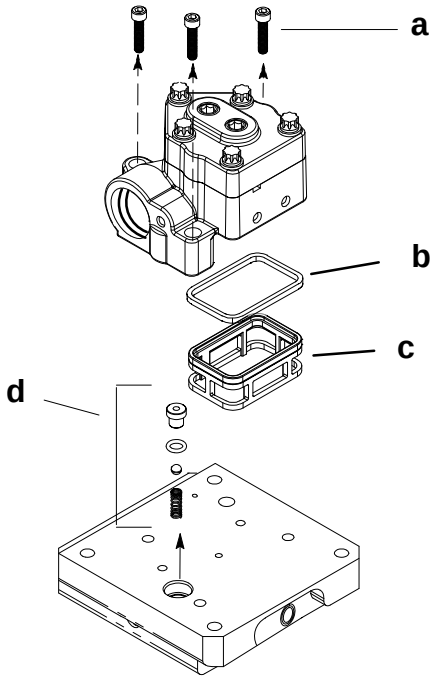

a - Plug (2)
b - Spring (2)
c - Check Valve/Poppet (2)
d - Seat (2)
e - Spool

**IMPORTANT: Inspect poppet assembly for debris in the area shown. If debris is found on poppet, replace poppet.**




a - Debris Under Valve Tip
b - Rubber Seat

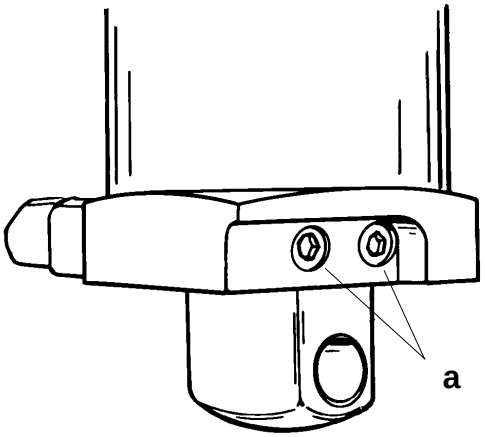
2. Remove three (3) screws to remove pump. Remove filter and filter seal under pump. Remove suction seat assembly.




a - Screws (3)
b - Filter Seal
c - Filter
d - Suction Seat Assembly

## Manifold Removal

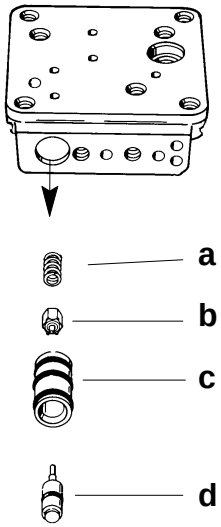
1. Remove two (2) screws to remove manifold from cylinder.




51146

a - Screw (2)

2. Remove tilt relief components.

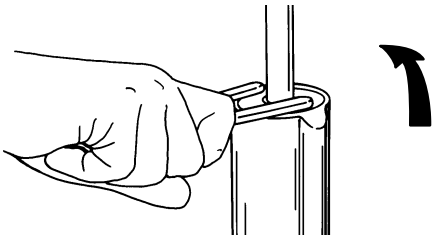



51008

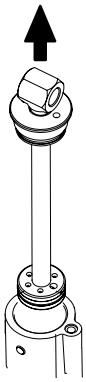
a - Spring
b - Poppet
c - Spool Housing
d - Trim Limit Spool

## Shock Rod Removal

1. Unscrew end cap assembly from cylinder using spanner wrench [1/4 in. x 5/16 in. (6.4mm x 8mm) long pegs].

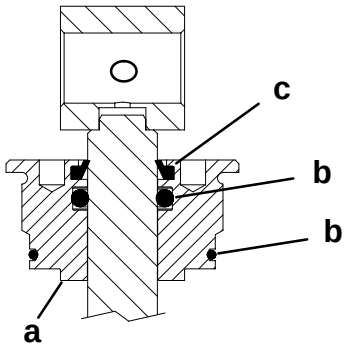


2. Remove shock rod assembly from cylinder.



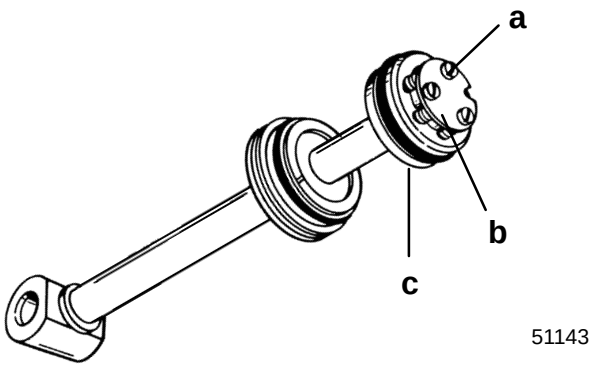
# Shock Rod Disassembly

***NOTE:*** *The only serviceable items on the shock rod assembly are the O-rings and wiper ring. If shock rod requires any other repair, replace shock rod assembly.*



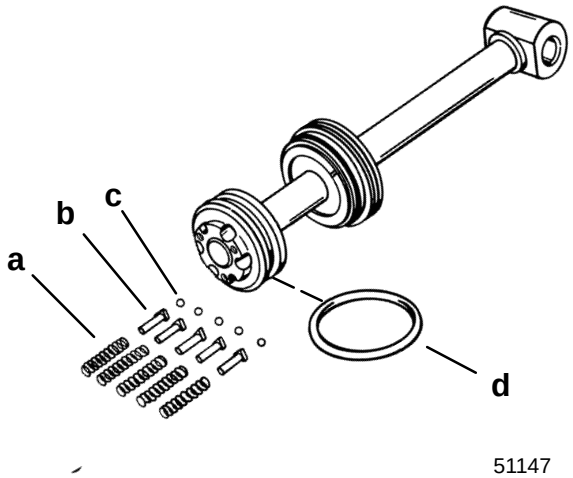

a - End Cap
b - O-ring
c - Wiper Ring

1. Place shock rod assembly on clean work surface.
2. Remove three (3) screws and remove plate from shock rod piston.




a - Screw (3)
b - Plate
c - Shock Rod Piston

3. Remove check ball components from shock rod piston.
4. Remove o-ring from shock rod piston.

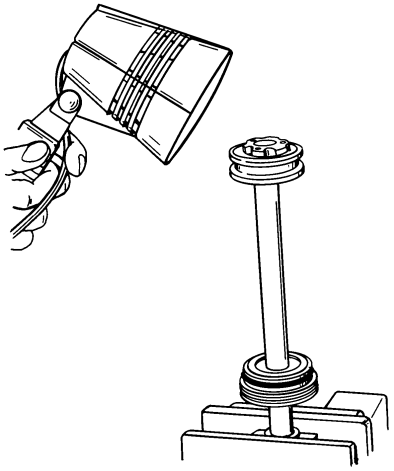



a - Spring (5)
b - Seat (5)
c - Ball (5)
d - O-ring

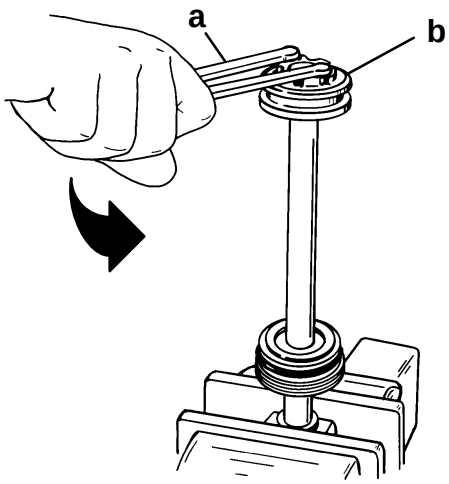
## ⚠ CAUTION

**When removing shock piston, spanner wrench must have 1/4 in. x 5/16 in. long pegs to avoid damage to shock piston.**

5. Place shock rod into soft jawed vise and apply heat to loosen piston using torch lamp (P/N 91-63209).
6. Loosen shock rod piston using spanner wrench [1/4 in. x 5/16 in. (6.4mm x 8mm) long pegs].
7. Allow shock rod piston to cool. Remove from shock rod.



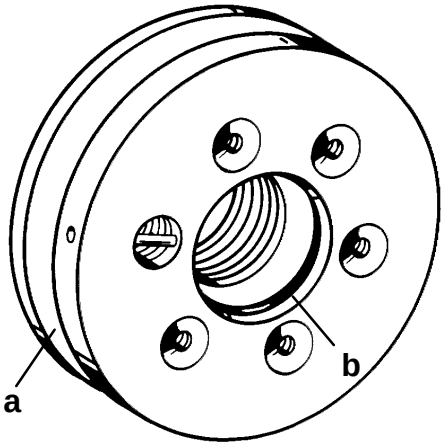
51146




51146

a - Spanner Wrench
b - Shock Rod Piston

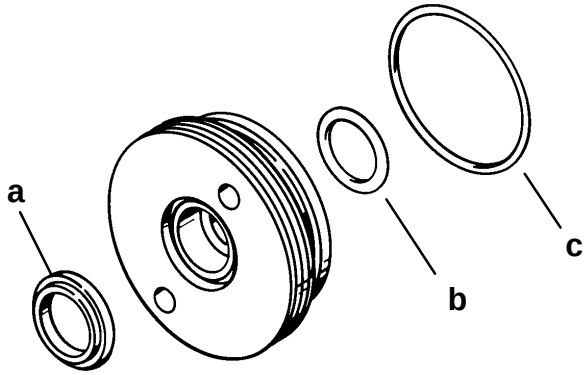
8. Inspect check valve for debris; clean debris from check valve if found. If debris cannot be cleaned from check valve, replace shock piston as an assembly.
9. Clean shock and components with compressed air.
10. Remove inner o-ring from shock rod piston.




51199

a - Shock Piston
b - O-ring

11. Remove cylinder end cap assembly from shock rod.
12. Inspect shock. If wiper (located in cap) has failed to keep rod clean, replace wiper.
13. Place end cap on clean work surface.
14. Remove rod wiper, inner o-ring, and outer o-ring.

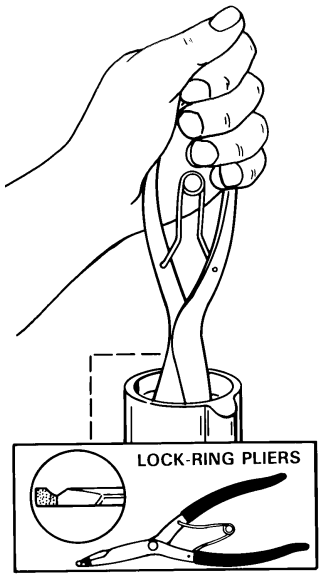



51145

a - Rod Wiper
b - Inner O-ring
c - Outer O-ring

## Memory Piston Removal

1. Remove memory piston from cylinder using one of two methods:
   a. Using lock ring pliers (Craftsman P/N 4735) or suitable tool.



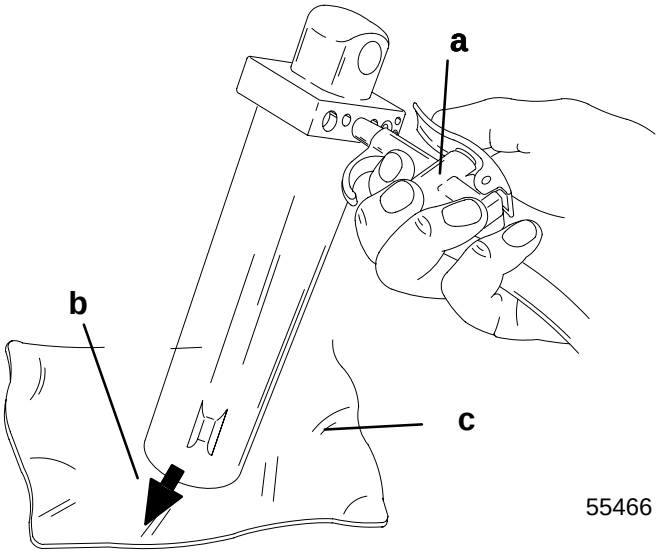

51144

   b. Blowing compressed air into manual release valve hole using adaptor (P/N 91-822778A3).

**⚠ WARNING**

**Memory piston cup may be expelled at a high velocity when air pressure is applied. Failure to place cylinder as shown below could result in personal injury.**

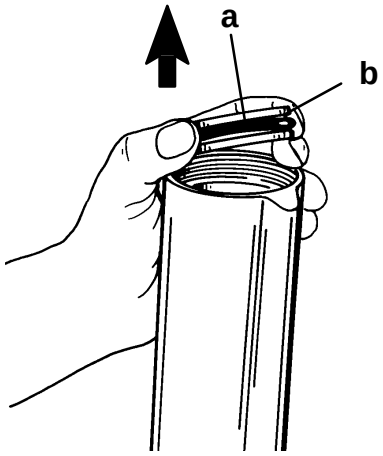
***NOTE:*** *Point cylinder opening down and away. Use a shop rag or towel to avoid damage to the memory piston.*




55466

a - Adaptor/Air Hose
b - Memory Piston Exit
c - Shop Rag

2. Remove o-ring from memory piston.




51144

a - O-Ring
b - Memory Piston

# Cleaning/Inspection/Repair

**IMPORTANT: Components must be dirt and lint free. Slightest amount of debris in Power Trim system could cause system to malfunction.**

Clean shock rod and components with parts cleaner and dry with compressed air.

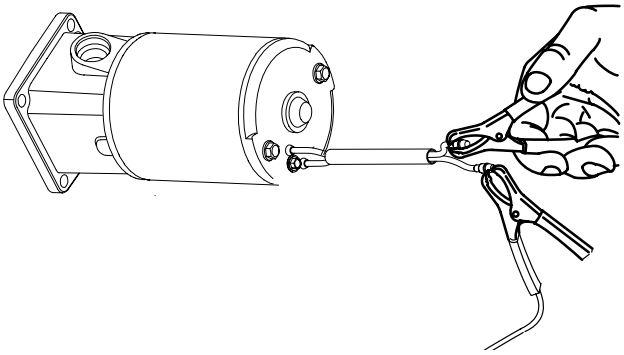
It is recommended that all O-rings in trim system be replaced. Use O-Ring Kit 25-827668A1.

Lubricate all o-rings with Quicksilver Power Trim Fluid (92-90100A12). If not available, use automotive (ATF) automatic transmission fluid.

## Trim Motor Electrical Tests

1. Connect a 12 volt supply to motor leads. If motor fails to run, replace pump motor.

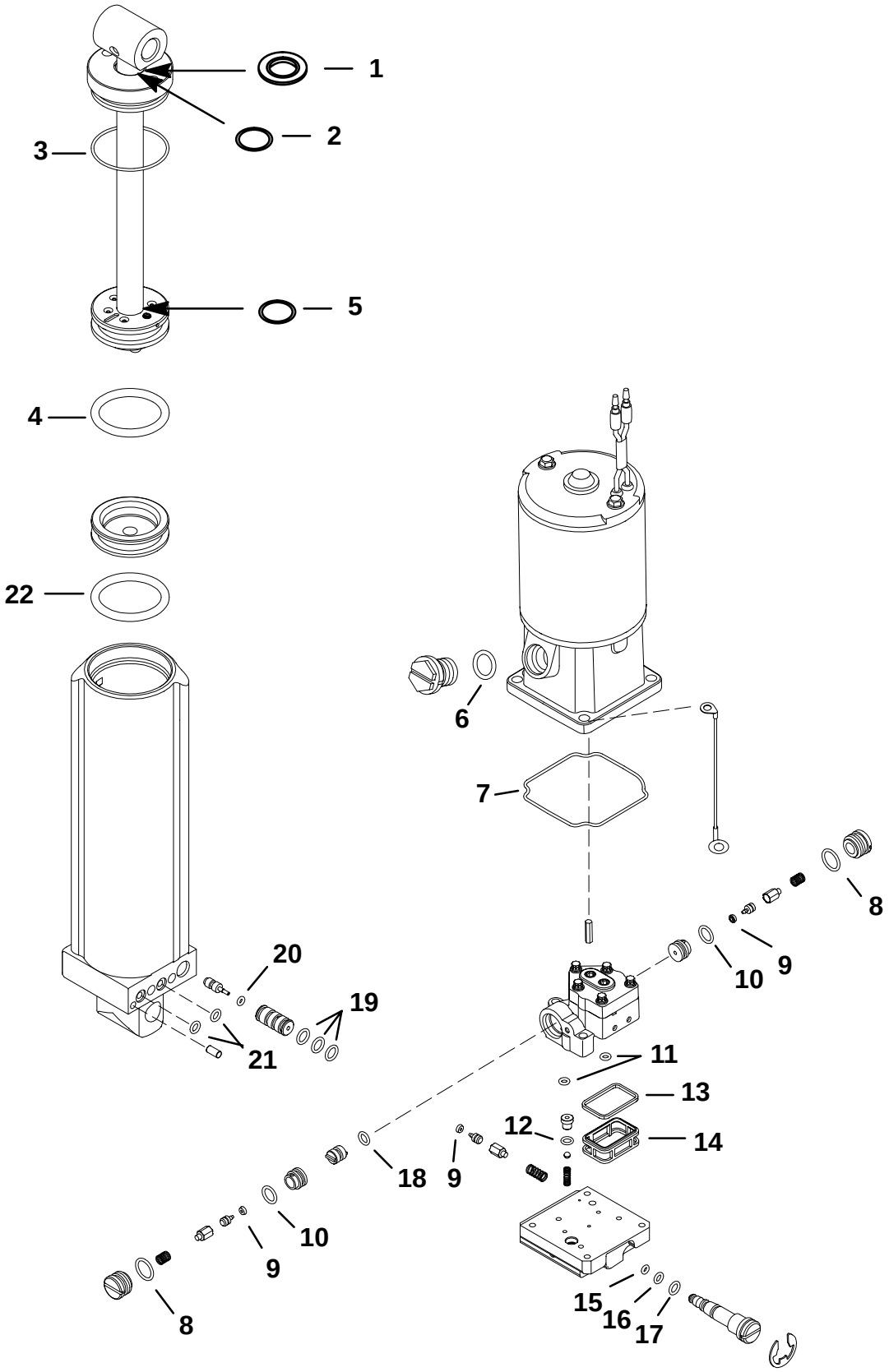
**IMPORTANT: Trim Motor is not serviceable. If motor fails to run, replace motor assembly.**



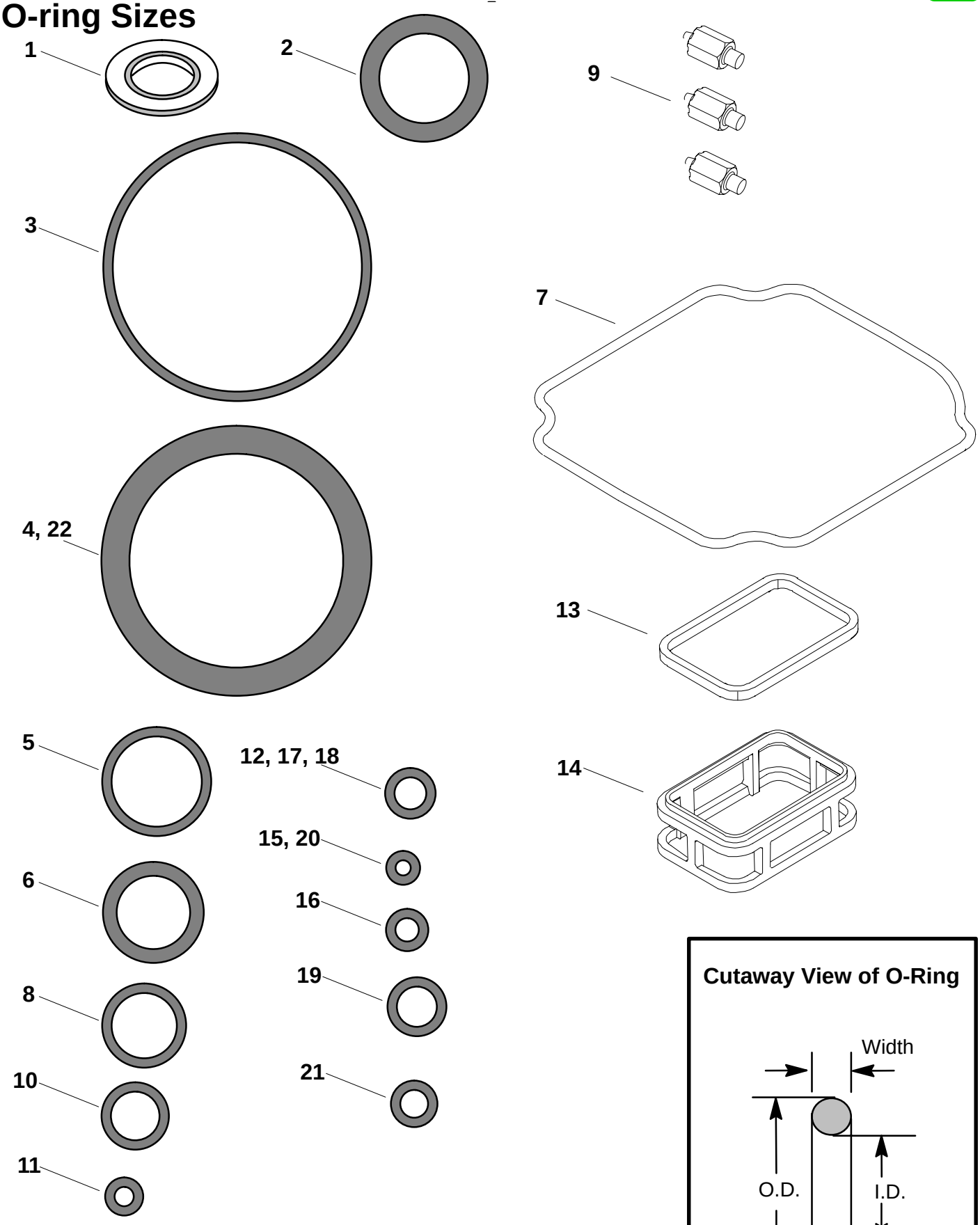
# Reassembly

## O-Ring and Seal Placement

O-Rings and Seals are part of O-Ring Kit 25-809880A1.



# O-ring Sizes




**O-RINGS SHOWN ARE ACTUAL SIZE**

**Cutaway View of O-Ring**

# O-ring Description and Sizes

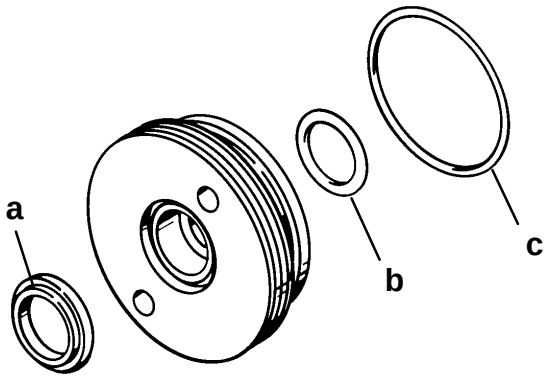
| O-Ring | Description | O-Ring I.D. | O-Ring O.D. | O-Ring Width |
|---|---|---|---|---|
| **1** | Wiper Ring | | | |
| **2** | Cyl. Cap, Inner | 0.671 in. (17.04 mm) | 0.949 in. (24.10 mm) | 0.139 in. (3.53 mm) |
| **3** | Cyl. Cap | 1.864 in. (47.34 mm) | 2.004 in. (50.90 mm) | 0.07 in. (1.78 mm) |
| **4** | Shock Piston | 1.6 in. (40.64 mm) | 2.02 in. (53.086 mm) | 0.21 in. (5.334 mm) |
| **5** | Piston Bolt | 0.676 in. (17.17 mm) | .816 in. (20.726 mm) | 0.07 in. (1.78 mm) |
| **6** | Reservoir Plug | 0.549 in. (13.94 mm) | 0.755 in. (19.17 mm) | 0.103 in. (2.616 mm) |
| **7** | Motor Seal | | | |
| **8 (2)** | P.O. Check Plug | 0.489 in. (12.42 mm) | 0.629 in. (15.97 mm) | 0.07 in. (1.78 mm) |
| **9 (3)** | Poppet Assy. | | | |
| **10 (2)** | P.O. Check Seat | 0.364 in. (9.25 mm) | 0.504 in. (12.80 mm) | 0.07 in. (1.78 mm) |
| **11 (2)** | Pump Port | 0.145 in. (3.683 mm) | 0.285 in. (7.239 mm) | 0.07 in. (1.78 mm) |
| **12** | Suction Seat | 0.239 in. (6.07 mm) | 0.379 in. (9.626 mm) | 0.07 in. (1.78 mm) |
| **13** | Filter Seal | | | |
| **14** | Filter | | | |
| **15** | Manual Release | 0.114 in. (2.90 mm) | 0.254 in. (6.451 mm) | 0.07 in. (1.78 mm) |
| **16** | Manual Release | 0.176 in. (4.47 mm) | 0.316 in. (8.026 mm) | 0.07 in. (1.78 mm) |
| **17** | Manual Release | 0.239 in. (6.07 mm) | 0.379 in. (9.626 mm) | 0.07 in. (1.78 mm) |
| **18** | Spool | 0.239 in. (6.07 mm) | 0.379 in. (9.626 mm) | 0.07 in. (1.78 mm) |
| **19 (3)** | Spool Housing | 0.301 in. (7.645 mm) | 0.441 in. (11.20 mm) | 0.07 in. (1.78 mm) |
| **20** | Trim Limit Spool | 0.114 in. (2.895 mm) | 0.254 in. (6.451 mm) | 0.07 in. (1.78 mm) |
| **21 (2)** | Manifold | 0.208 in. (5.283 mm) | 0.348 in. (8.839 mm) | 0.07 in. (1.78 mm) |
| **22** | Memory Piston | 1.6 in. (40.64 mm) | 2.02 in. (53.086 mm) | 0.21 in. (5.334 mm) |

# Power Trim Reassembly

**IMPORTANT: Lubricate all o-rings with Quicksilver Power Trim Fluid (92-90100A12). If not available, use automotive (ATF) automatic transmission fluid.**

## Shock Rod Reassembly

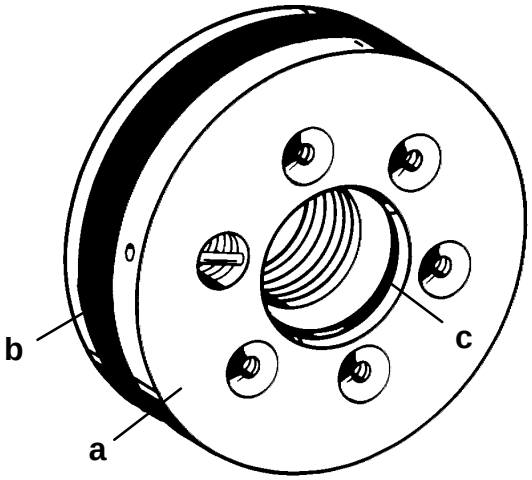
1. Install lubricated o-rings to end cap.
2. Install rod wiper.




51145

a - Rod Wiper
b - Inner O-ring
c - Outer O-ring

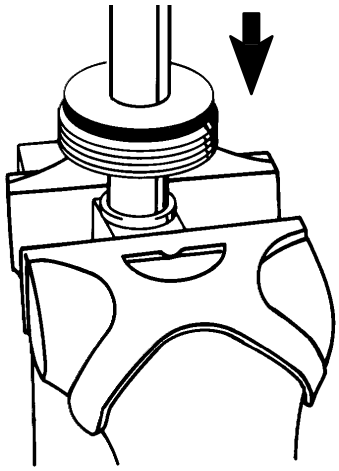
3. Install lubricated o-rings to shock piston.




51199

a - Shock Piston
b - O-ring
c - O-ring

4. Clamp shock rod in soft jawed vise.
5. Position cylinder end cap onto rod as shown.

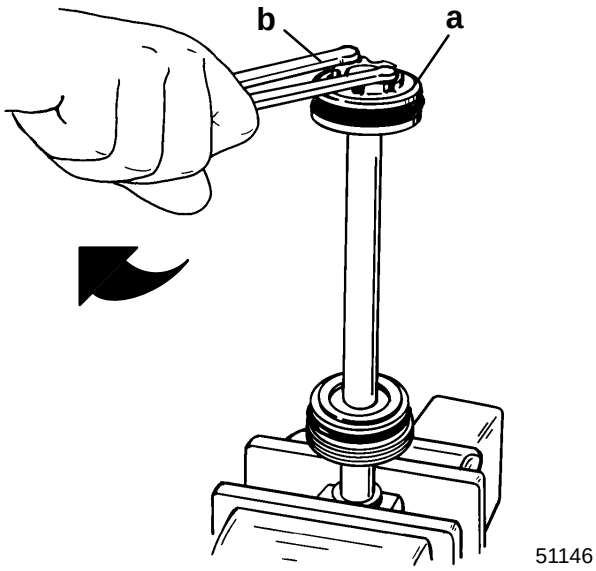


51146

**⚠ CAUTION**

**When installing shock rod piston, spanner wrench must have1/4 in. x 5/16 in. (6.4mm x8mm) long pegs to avoid damage to shock rod piston.**

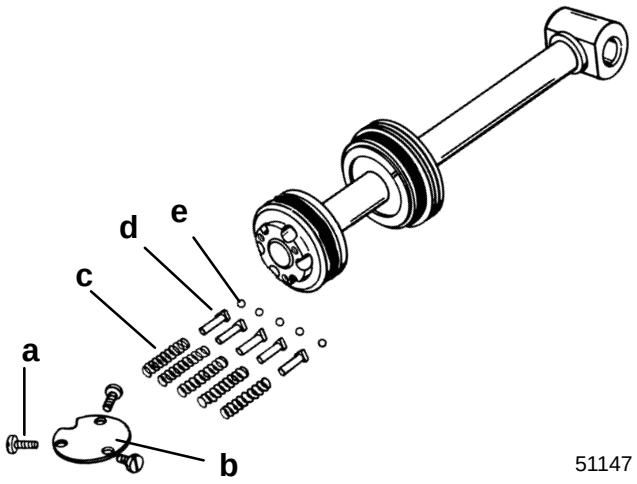
6. Apply Loctite Grade “A” (271) to threads on shock rod.
7. Install shock rod piston.
8. Tighten shock rod piston securely using spanner wrench (1/4 in. x 5/16 in. long pegs). If a torquing type spanner tool is used to tighten shock piston, then torque to 90 lb. ft. (122 N·m).




51146

a - Shock Rod Piston - Torque to 90 lb. ft. (122 N·m)
b - Spanner Wrench

9. Remove shock rod assembly from vise.
10. Install ball, seat, and spring (five sets) to shock rod piston.
11. Secure components with plate. Torque screws to 35 lb. in. (4.0 Nm).

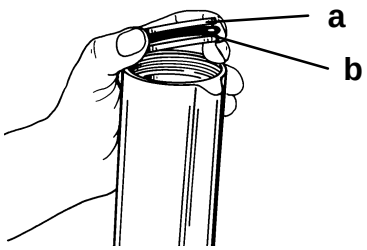


51147

a - Screws (3) Torque to 35 lb. in. (4.0 N·m)
b - Plate
c - Springs (5)
d - Seats (5)
e - Balls (5)

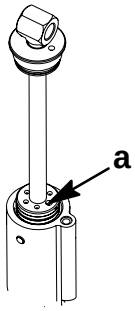
## Shock Rod Installation

1. Place trim cylinder in soft jawed vice.
2. Install lubricated O-ring to memory piston and place into cylinder. Push memory piston all the way to bottom.




a - Memory Piston
b - O-ring

3. Fill cylinder three inches (76.2mm) from top of cylinder using Quicksilver Power Trim and Steering Fluid. If not available, use automotive (ATF) automatic transmission fluid.
4. Install shock rod into cylinder until power trim fluid flows through oil blow off ball passage. Fill remaining cylinder to just below the cylinder threads.

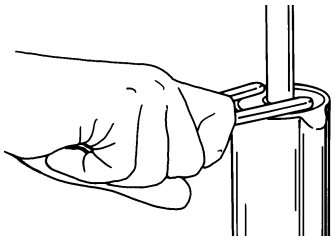



a - Oil Blow Off Ball Passage

**⚠ CAUTION**

**End cap must not make contact with shock rod piston when tightening. Shock rod piston must be positioned in cylinder deep enough to avoid contact.**

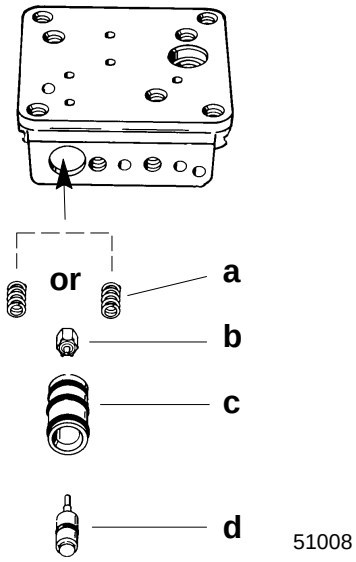
5. Tighten end cap securely using spanner wrench [1/4 in. x 5/16 in. (6.4mm x 8mm) long pegs]. If a torquing type spanner tool is used to tighten end cap, then torque to 45 lb. ft. (61.0 N·m).



## Trim Limit Assembly Installation

1. Lubricate all O-rings. Install spring, poppet spool housing and trim limit spool into manifold.

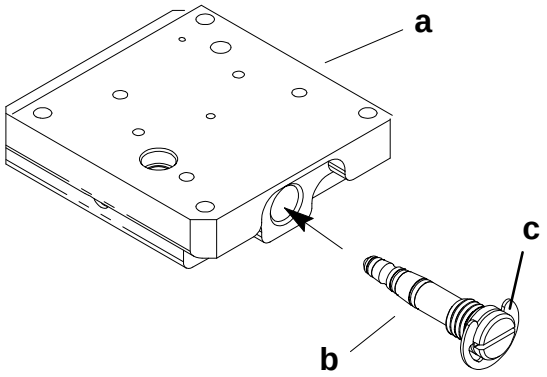
***NOTE:*** *There are two different size springs used in this manifold. The heavy spring is used on 75 to 125 HP engines. The light spring is used on 40 to 60 HP engines.*




a - Spring
b - Poppet
c - Spool Housing
d - Trim Limit Spool

## Manual Release Valve Installation

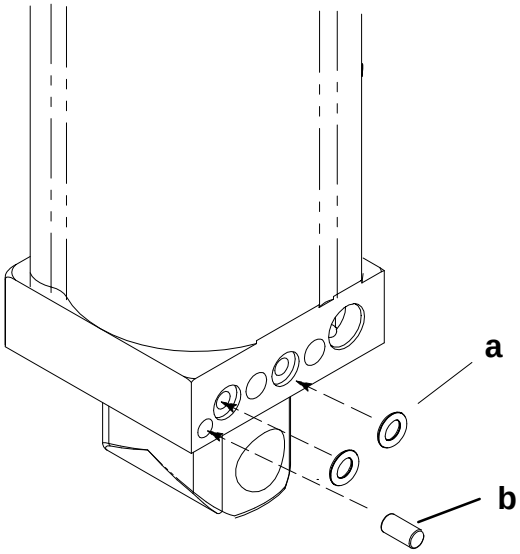
1. Install “E” clip (if removed) and lubricate O-rings to manual release valve.
2. Install manual release valve assembly into manifold.




a - Manifold
b - Manual Release Valve
c - E Clip

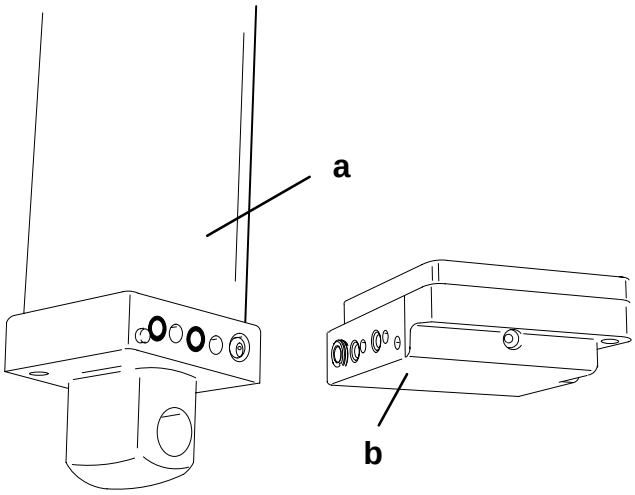
## Manifold Installation

1. Install dowel pin and two (2) lubricated O-rings into trim cylinder.



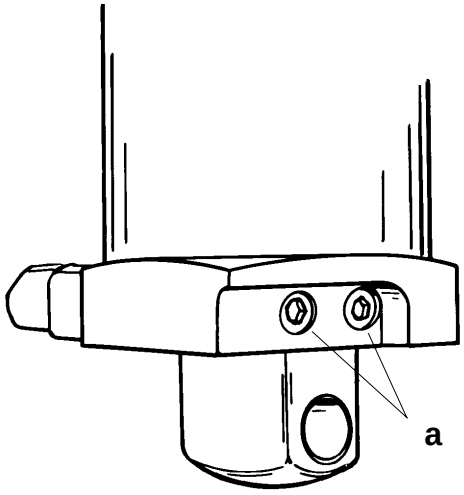

a - O-Rings (2)
b - Dowel Pin

2. Align the trim cylinder and pump/reservoir assembly together.




a - Trim Cylinder Assembly
b - Reservoir/Manifold Assembly

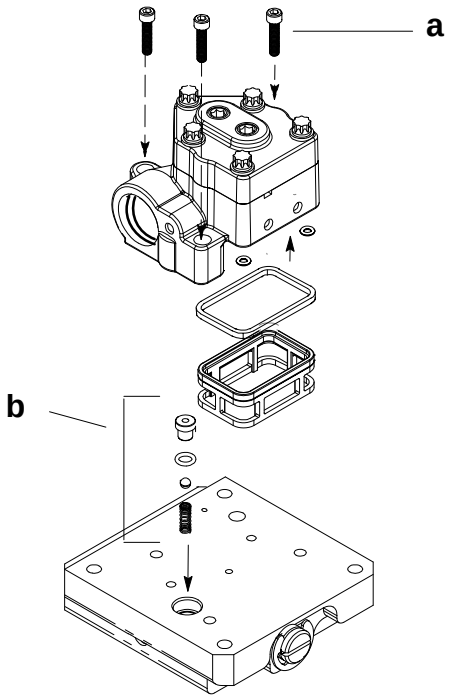
3. Install the two (2) long screws and torque to 100 lb. in. (11 N·m).




a - Screws (2) Torque to 100 lb. in. (11 N·m)

## Oil Pump Installation

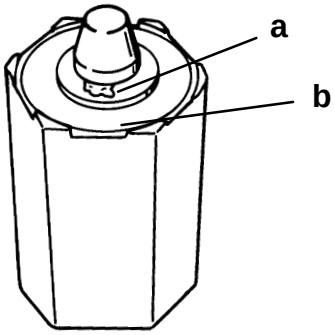
1. Install spring, ball, lubricated O-ring and plastic seat to manifold.
2. Check to see that O-rings are placed on bottom of pump.
3. Install filter and filter seal under pump. Install pump onto manifold. Torque screws to 70 lb. in. (7.7 N·m).




a - Screws (3) Torque to 70 lb. in. (7.7 N·m)
b - Suction Seat Assembly

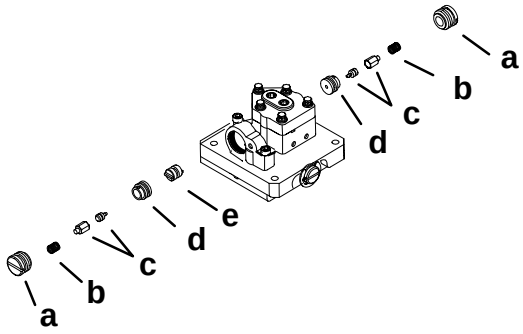
## Pressure Operated Assembly Installation

**IMPORTANT: Inspect poppet assembly for debris in the area shown. If debris is found on poppet replace poppet.**




a - Debris Under Valve Tip
b - Rubber Seat

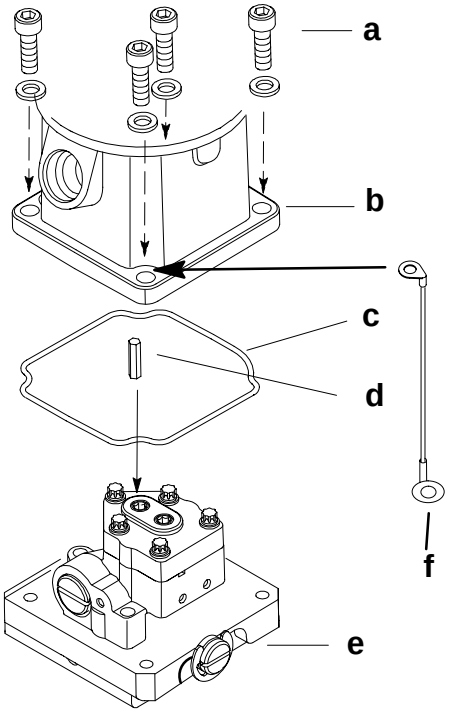
1. Lubricate o-rings.
2. Install spool, seat with O-ring, check valve/poppet, spring and plug with O-ring into pump. Repeat for other side. Torque plugs to 120 lb. in. (13.5 N·m).




a - Plugs (2) Torque to 120 lb. in. (13.5 N·m)
b - Springs (2)
c - Check Valve/Poppet (2)
d - Seats (2)
e - Spool

## Reservoir/Motor Installation

3. Install coupler into top of pump. Make sure reservoir seal is in the reservoir groove and place reservoir onto pump/manifold assembly. Install ground strap under screw shown Torque screws to 80 lb. in. (9 N·m).

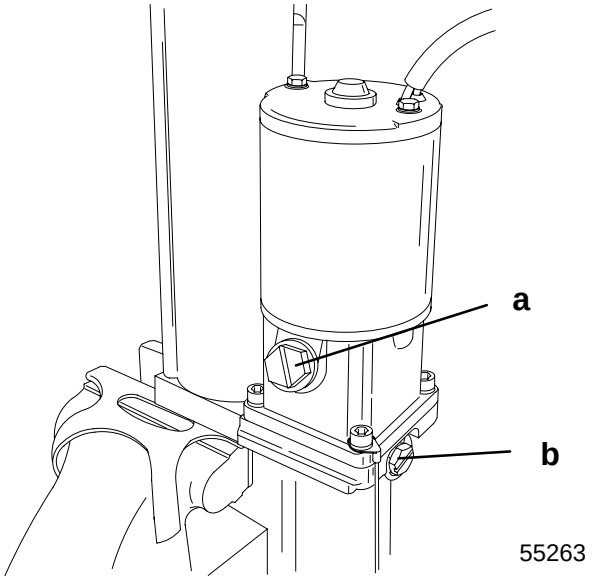



a - Screw (4) Torque to 80 lb. in. (9 N·m)
b - Reservoir
c - Reservoir Seal
d - Coupler
e - Manifold Assembly
f - Ground Strap

4. Fill reservoir to bottom of fill hole using Quicksilver Power Trim Fluid (92-901000A12). If not available, use automotive (ATF) automatic transmission fluid.

## Bleeding Power Trim Unit

1. Secure power trim unit in soft jawed vise.
2. Add power trim fluid until even with the bottom of the fill hole. Reinstall plug.
3. Close the manual release valve. (Turn full clockwise).

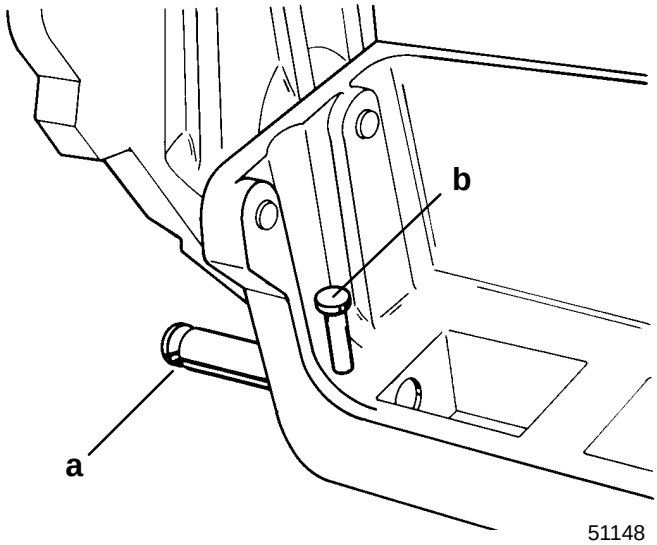



a - Reservoir Plug/Fill Hole
b - Manual Release Valve

4. Using a 12 volt power supply, connect the positive lead to (blue) trim motor wire and negative lead to (green) trim motor wire and drive shock rod to the up position. Repeat for three times.
5. Connect the positive lead to the (green) trim motor wire, and the negative lead to the (blue) trim motor wire and drive the shock rod to the down position.
6. Recheck fluid level, add fluid if required and repeat cycle until fluid level stays even with the bottom of the fill hole.

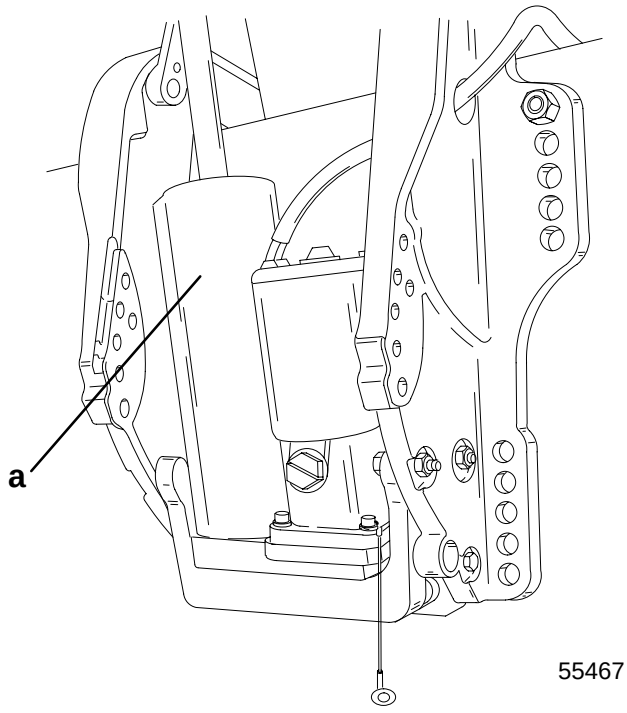
# Installation of Power Trim System

1. Lubricate lower pivot pin, mounting holes with 2-4-C Marine Lubricant.
2. Start lower pivot pin into pivot pin bore and position lower dowel pin (Retained) in its respective hole.



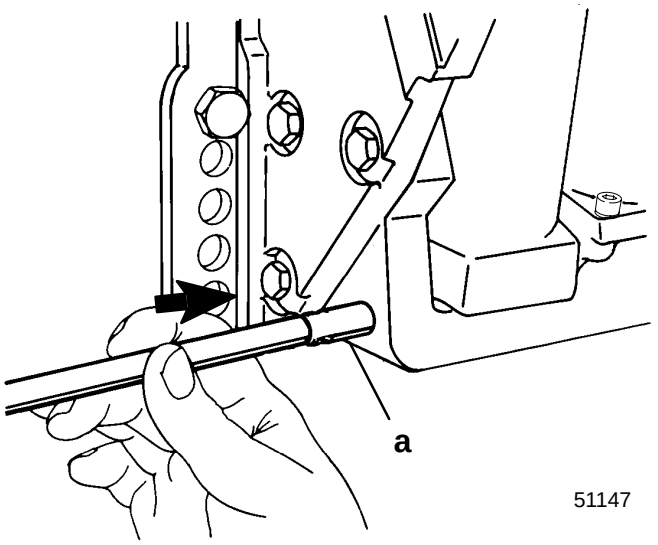

a - Lower Pivot Pin
b - Lower Dowel Pin

3. Position trim cylinder assembly (Bottom First) between clamp brackets.



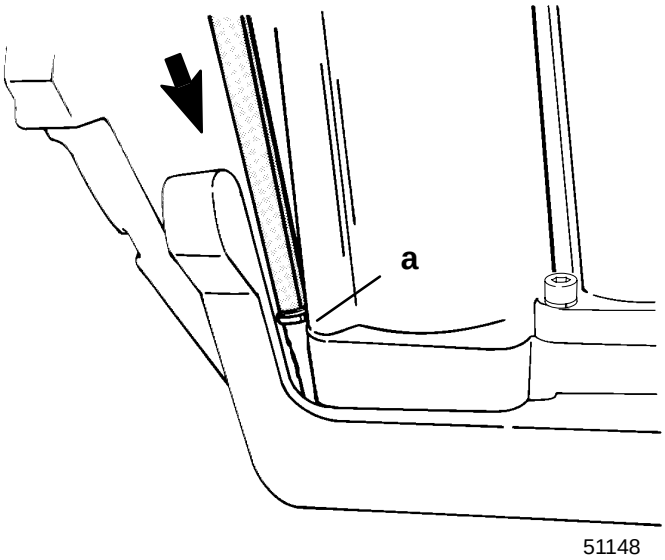

a - Trim Cylinder Assembly

4. Apply 2-4-C Marine Lubricant (92-90018A12) to lower pivot pin. Using a suitable punch, drive lower pivot pin into clamp bracket and trim cylinder assembly until pivot pin is flush with outside surface.



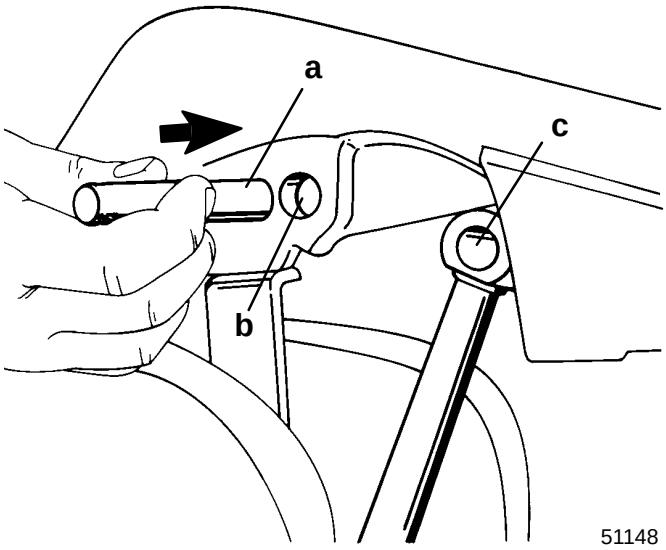

a - Lower Pivot Pin

5. Using a suitable punch, drive lower dowel pin into its hole until seated.



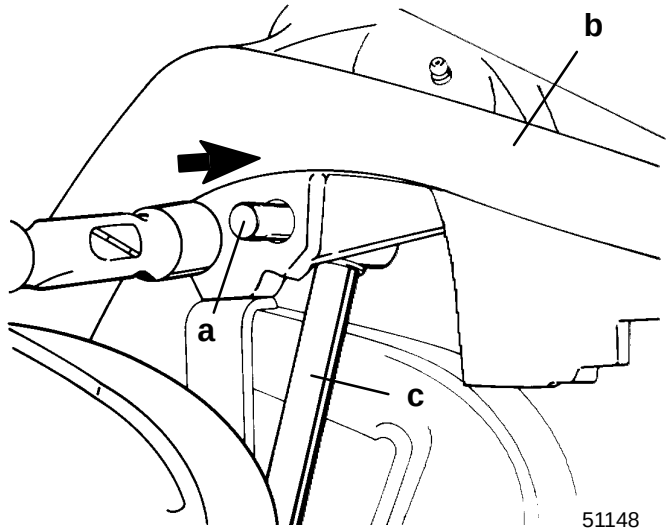

a - Lower Dowel Pin

6. Apply 2-4-C Marine Lubricant (92-90018A12) to surface of upper pivot pin, pivot pin bore and trim ram bore.



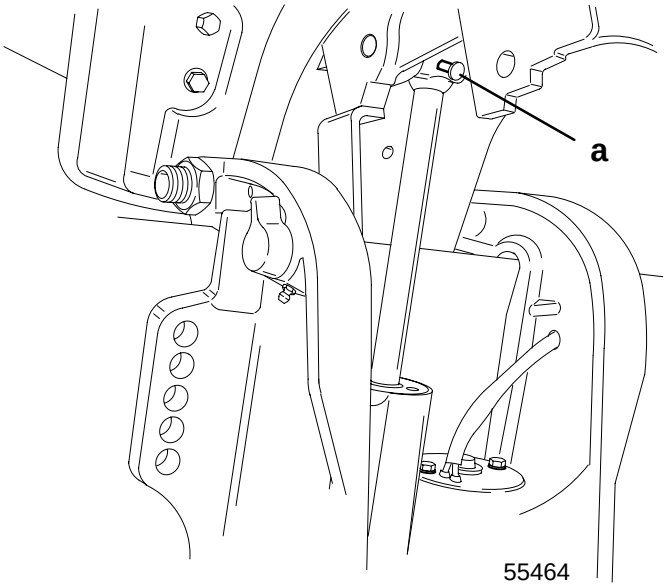

a - Pivot Pin
b - Pivot Pin Bore
c - Trim Ram Bore

7. Using a suitable mallet, drive upper pivot pin into swivel bracket and through trim ram until pivot pin is flush with swivel bracket.



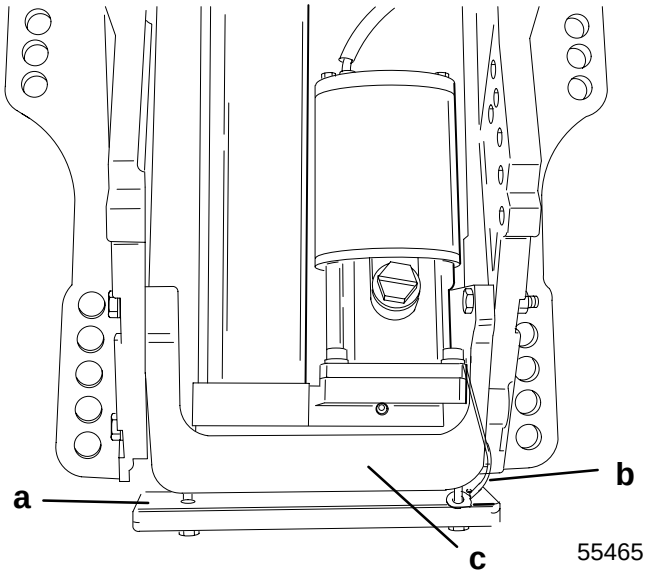

a - Pivot Pin
b - Swivel Bracket
c - Trim Ram

8. Drive trilobe pin (a) into its hole until seated.



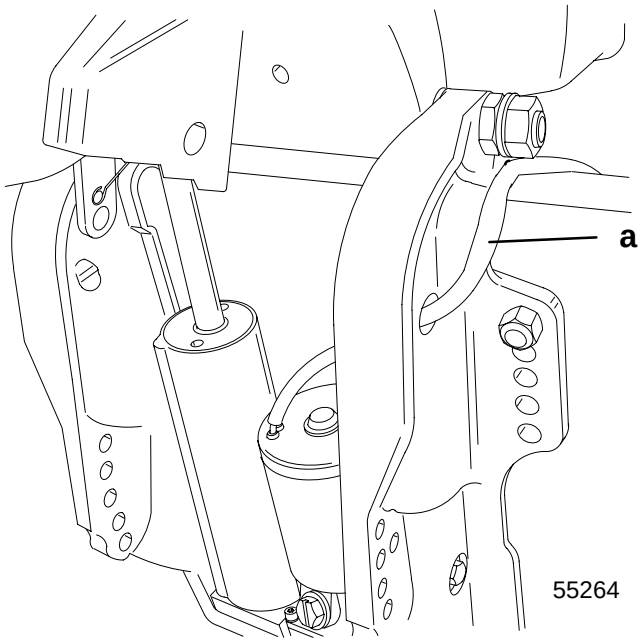

a - Trilobe Pin

9. Install sacrificial aluminum anode to reservoir bracket placing ground strap between bracket and anode as shown.



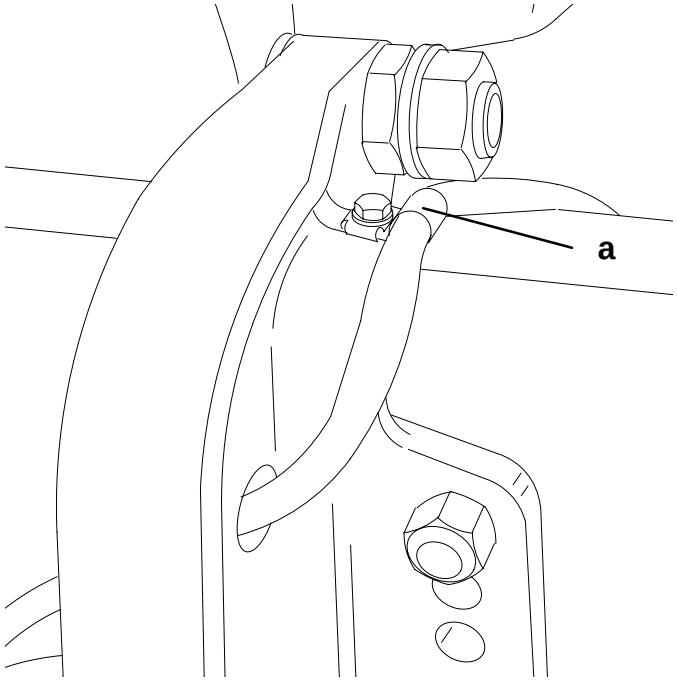

a - Sacrificial Anode
b - Ground Strap
c - Bracket

10. Route trim harness through clamp bracket and cowling.




a - Trim Harness

11. Secure trim harness with clamp as shown.




a - Clamp