



MID-SECTION

Section 5B - Power Trim

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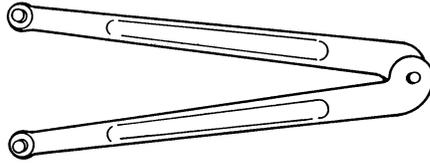
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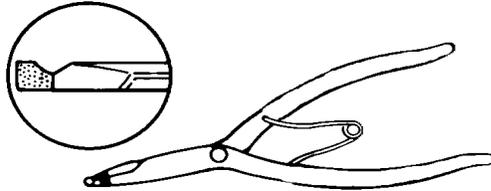


Special Tools

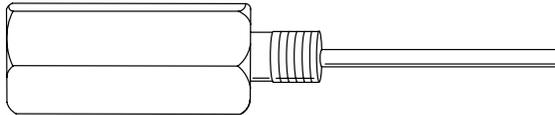
1. Spanner Wrench P/N 91-74951



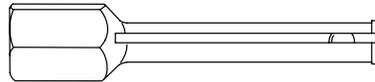
2. Lock-Ring Pliers P/N SRP-4 (Snap-On)



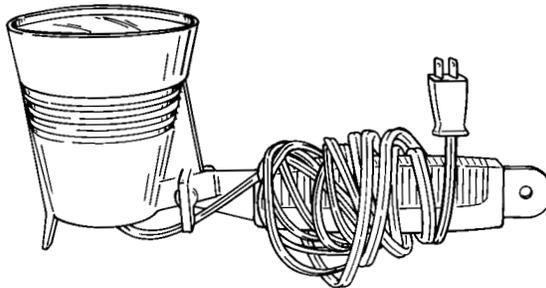
3. Expanding Rod P/N CG 41-11 (Snap-On)



4. Collet P/N CG 41-12 (Snap-On)



5. Heat Lamp P/N 91-63209



Address
 Snap-On Tools Company
 2801 - 80th Street
 Kenosha, Wisconsin 53143
 Phone 414.656.5200

Quicksilver Lubricants and Service Aids

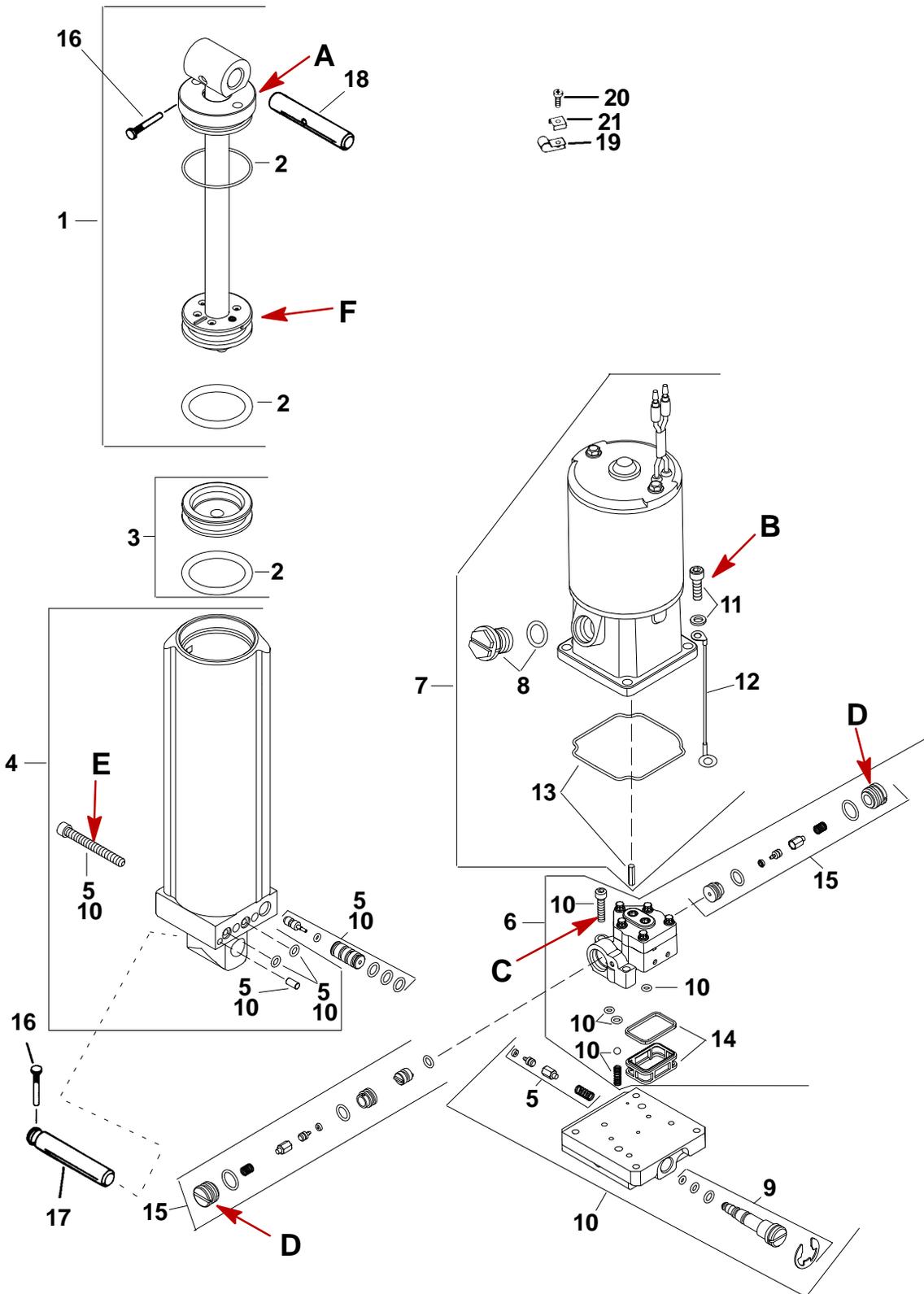
Part No.	Description
92-90100A12	Power Trim Fluid
92-850736A1	2-4-C w/Teflon



Notes:



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	Nm
-	1	POWER TRIM PUMP			
1	1	SHOCK ROD KIT			
2	1	O RING REBUILD KIT			
3	1	MEMORY PISTON ASSEMBLY			
4	1	CYLINDER ASSEMBLY			
5	1	TRIM LIMIT VALVE KIT			
6	1	PUMP ASSEMBLY			
7	1	MOTOR KIT			
8	1	RESERVOIR PLUG			
9	1	MANUAL RELEASE ASSEMBLY			
10	1	MANIFOLD KIT			
11	1	SCREW KIT (MOTOR)			
12	1	CABLE			
13	1	DRIVE SHAFT			
14	1	FILTER KIT			
15	1	P.O. CHECK ASSEMBLY KIT			
-	1	O RING KIT (COMPLETE TRIM)			
16	2	GROOVE PIN			
17	1	ANCHOR PIN			
18	1	SHAFT			
19	2	CLAMP			
20	1	SCREW			
21	1	C WASHER			

A - Torque cylinder cap to 45 lb-ft (61 Nm)

B - Torque screws to 80 lb-in. (9.0 Nm)

C - Torque screws to 70 lb-in. (7.9 Nm)

D - Torque plugs to 120 lb-in. (13.5 Nm)

E - Torque screws to 100 lb-in. (11 Nm)

F - Torque shock piston to 90 lb-ft (122 Nm)



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 “trailing”. 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.

Trailing 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.

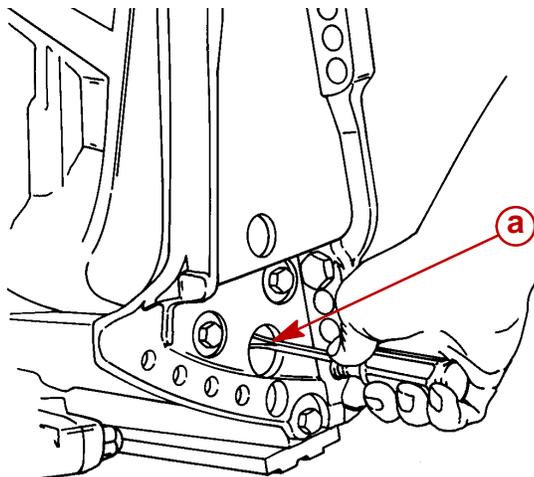
While operating “up” circuit, the cylinder rod will continue to tilt the outboard to a full up position for trailering.

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).

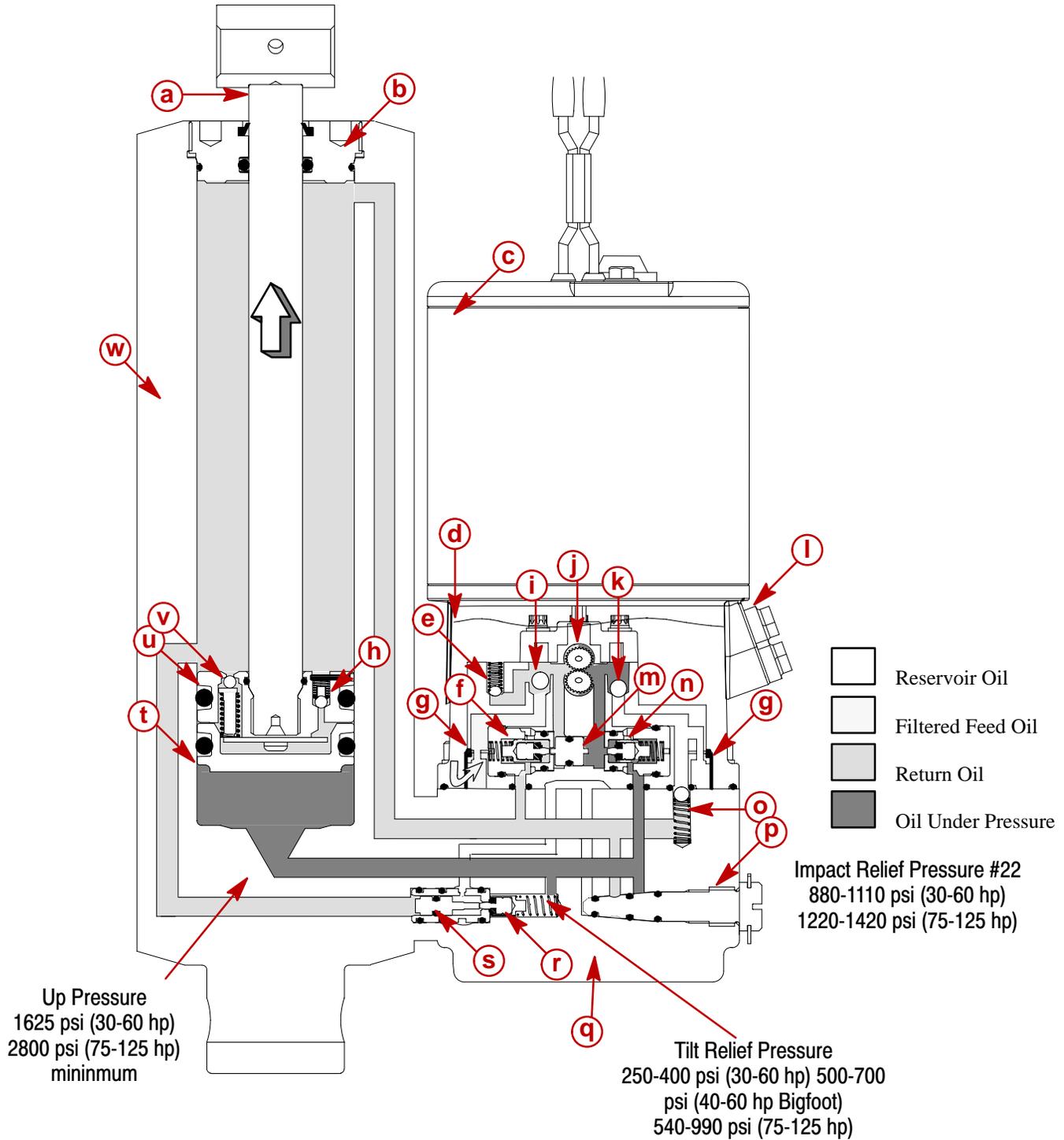


a - Manual Release Valve



Power Trim Flow Diagrams

TRIM UP





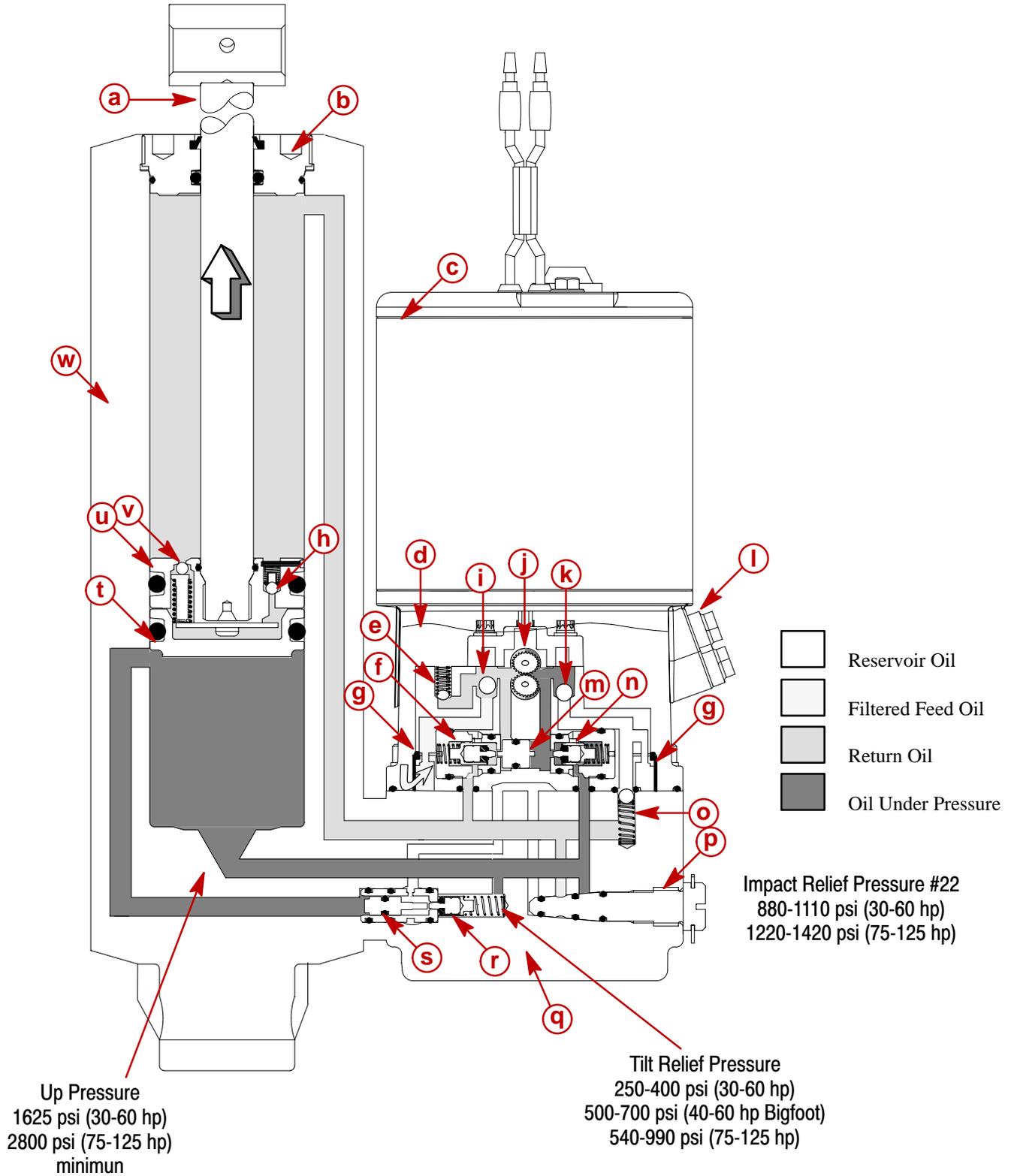
Trim Up

When the trim switch is activated in the up position, the electric motor (c) begins to rotate the oil 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 release 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 trim 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 circuit pressure operated valve (f) and enters the pump as supply for the up circuit.

- a** - Trim Rod
- b** - End Cap
- c** - Electric Motor
- d** - Reservoir Oil
- e** - Down Circuit Pressure Relief Valve
- f** - Down Circuit Pressure Operated Valve
- g** - Filter (2 shown for clarity)
- h** - Shock Return Valve
- i** - Up Circuit Suction Port
- j** - Oil Pump Gears
- k** - Down Circuit Suction Port
- l** - Oil Fill Cap
- m** - Shuttle Valve
- n** - Up Circuit Pressure Operated Valve
- o** - Manifold Reverse Suction Valve
- p** - Manual Release Valve
- q** - Manifold
- r** - Tilt Relief Valve
- s** - Tilt Relief Piston
- t** - Memory Piston
- u** - Shock Piston
- v** - Impact Relief Valve
- w** - Cylinder



Tilt Up





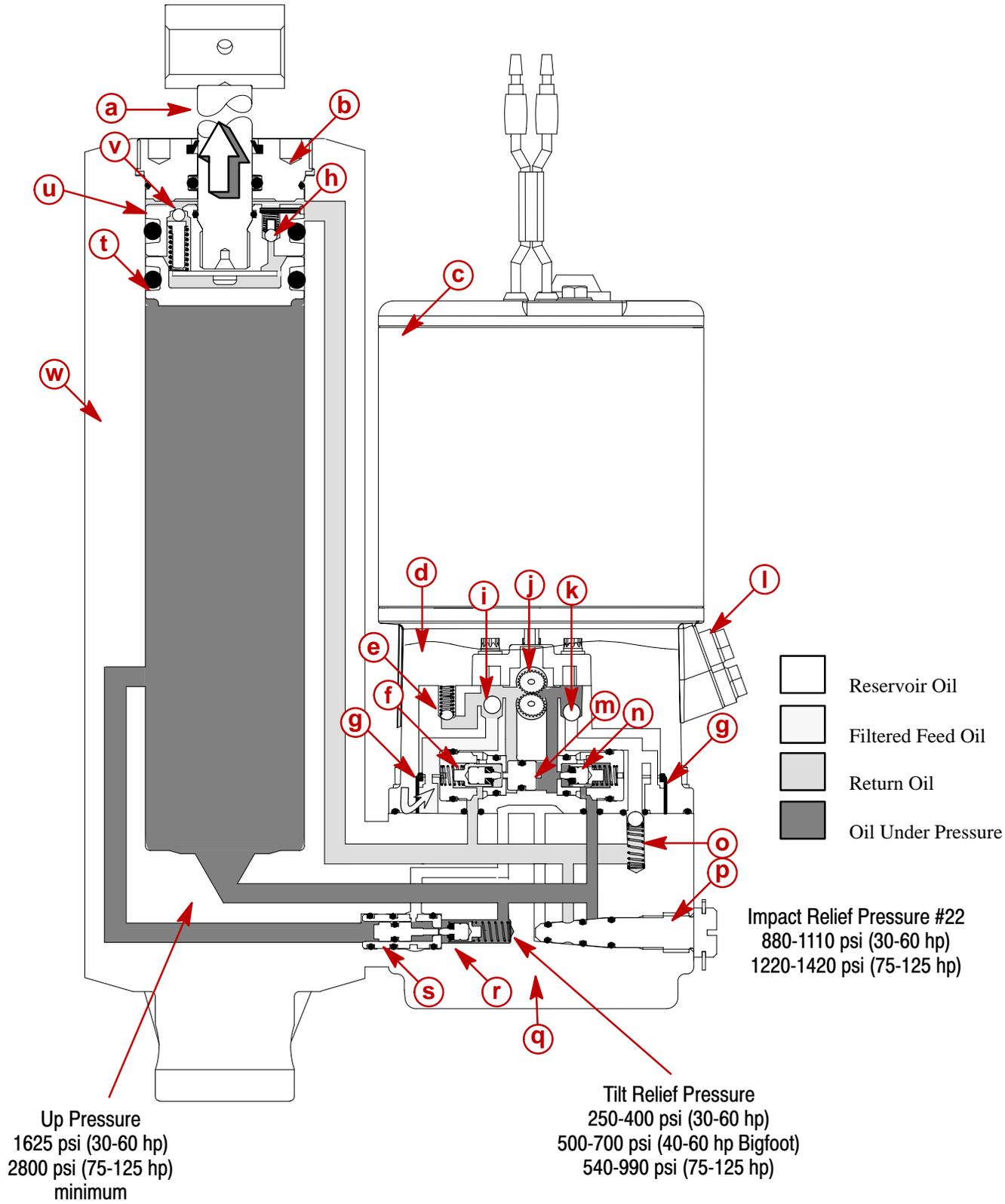
Tilt Up

In the up mode, as the trim 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 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 decreases, or if engine is not in forward gear, the oil pressure is available to extend the trim rod (a) up into the tilt range.

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- b** - End Cap
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Maximum Tilt





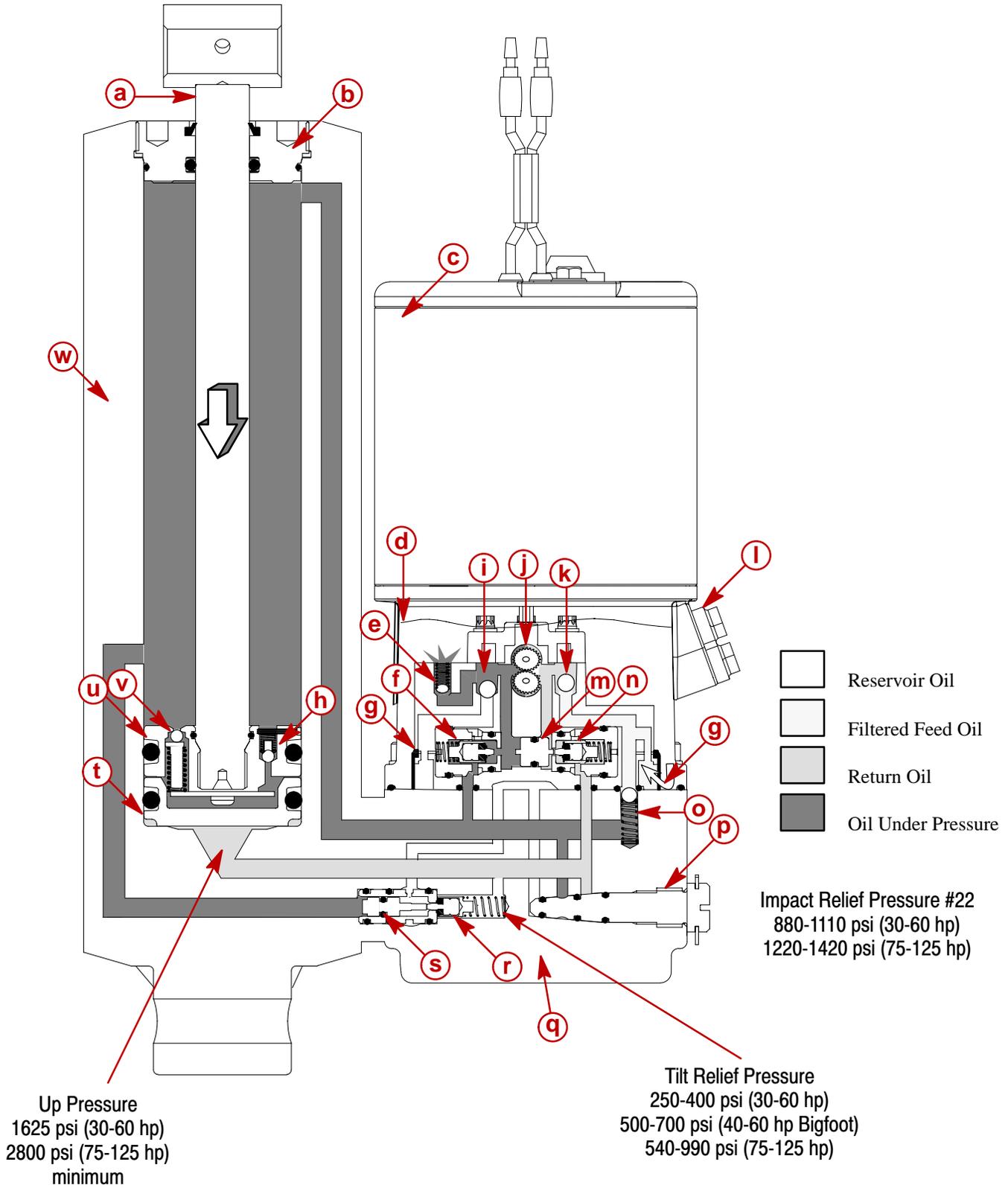
Maximum Tilt

With the trim 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 allowing the oil to flow into the trim relief passage, and returns back into the reservoir.

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- c** - Electric Motor
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Trim Down





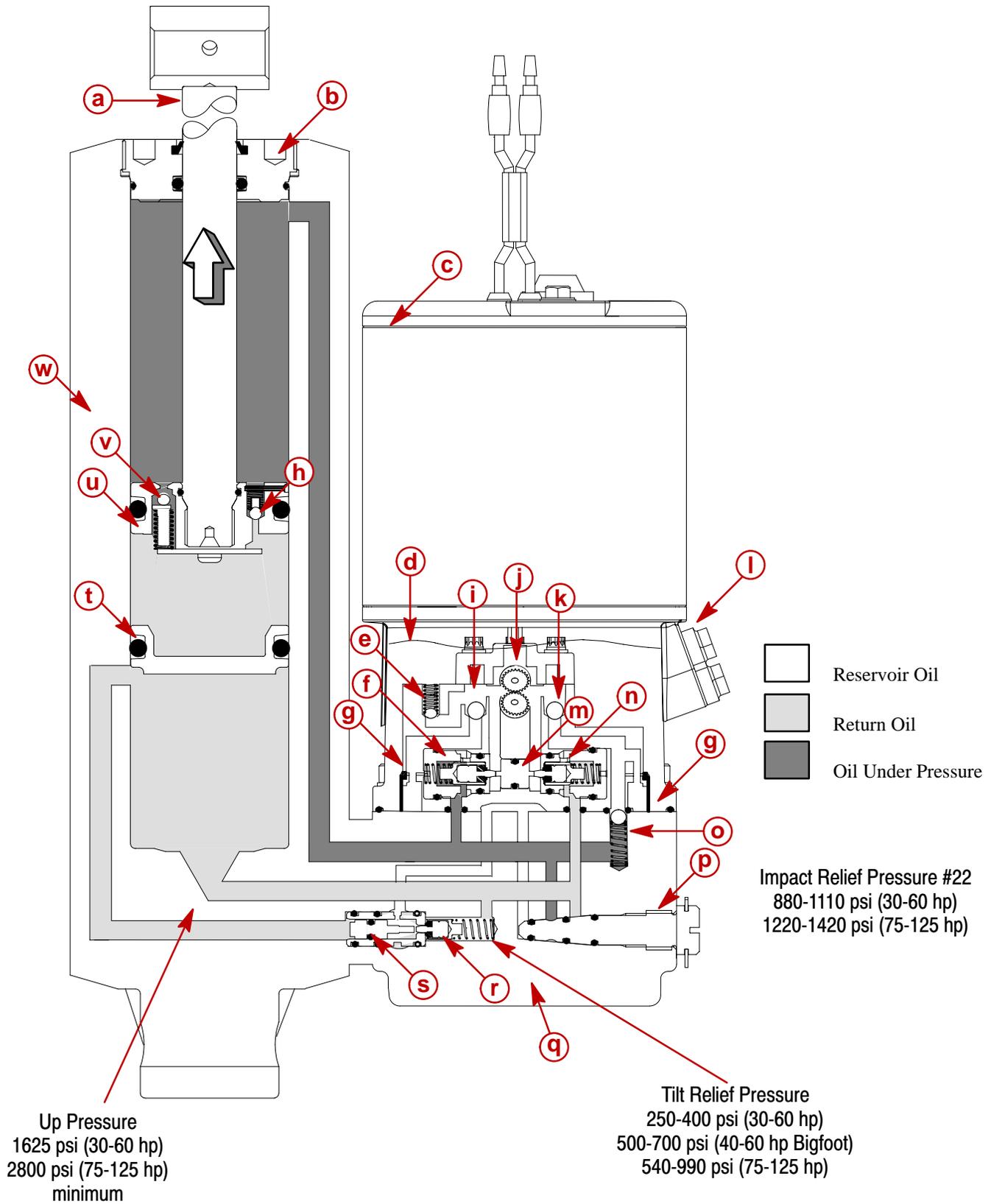
Trim Down

When the trim switch is activated in the down position, the electric motor (c) will rotate the oil pump gears (j) in the opposite direction. With the oil 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 gears (j). As 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 (i) inside the up circuit suction port. Oil, under pressure, opens the down circuit 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 trim rod (a) retracts into the cylinder, lowering the outboard motor. Oil from the up cavity exits the cylinder, and is drawn back into the pump through the open up circuit pressure operated valve (n). When the trim rod reached full travel, the oil pressure inside the down circuit will rise until the down circuit 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 circuit pressure relief 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.

- a** - Trim Rod
- b** - End Cap
- c** - Electric Motor
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- e** - Down Circuit Pressure Relief Valve
- f** - Down Circuit Pressure Operated Valve
- g** - Filter (2 shown for clarity)
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- k** - Down Circuit Suction Port
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- m** - Shuttle Valve
- n** - Up Circuit Pressure Operated Valve
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- p** - Manual Release Valve
- q** - Manifold
- r** - Tilt Relief Valve
- s** - Tilt Relief Piston
- t** - Memory Piston
- u** - Shock Piston
- v** - Impact Relief Valve
- w** - Cylinder



Shock Function Up





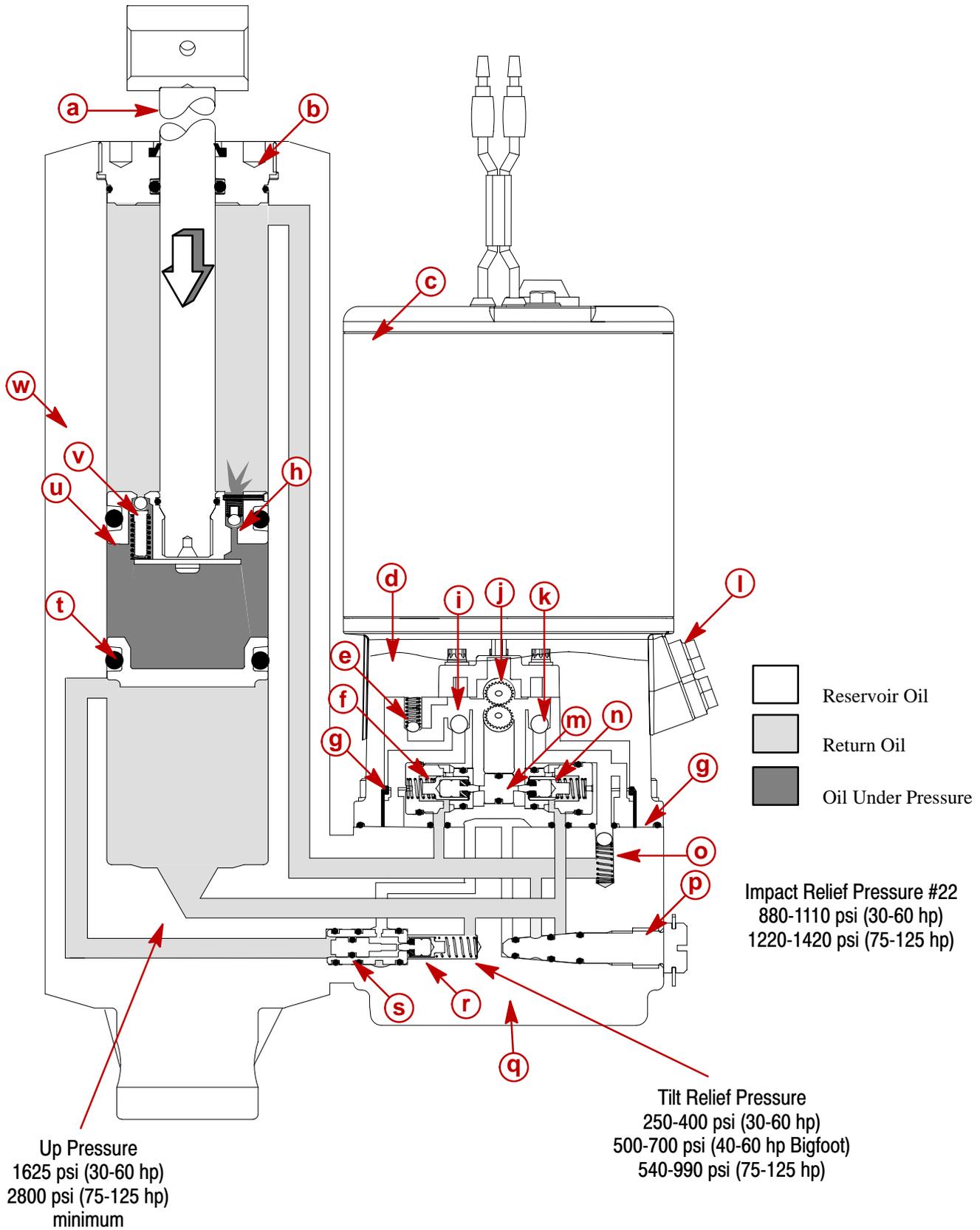
Shock Function Up

Oil inside the down cavity is locked in a static position by the closed down circuit 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 trim rod (a) will try to rapidly extend from the cylinder (w), as 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 trim 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).

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Shock Function Return





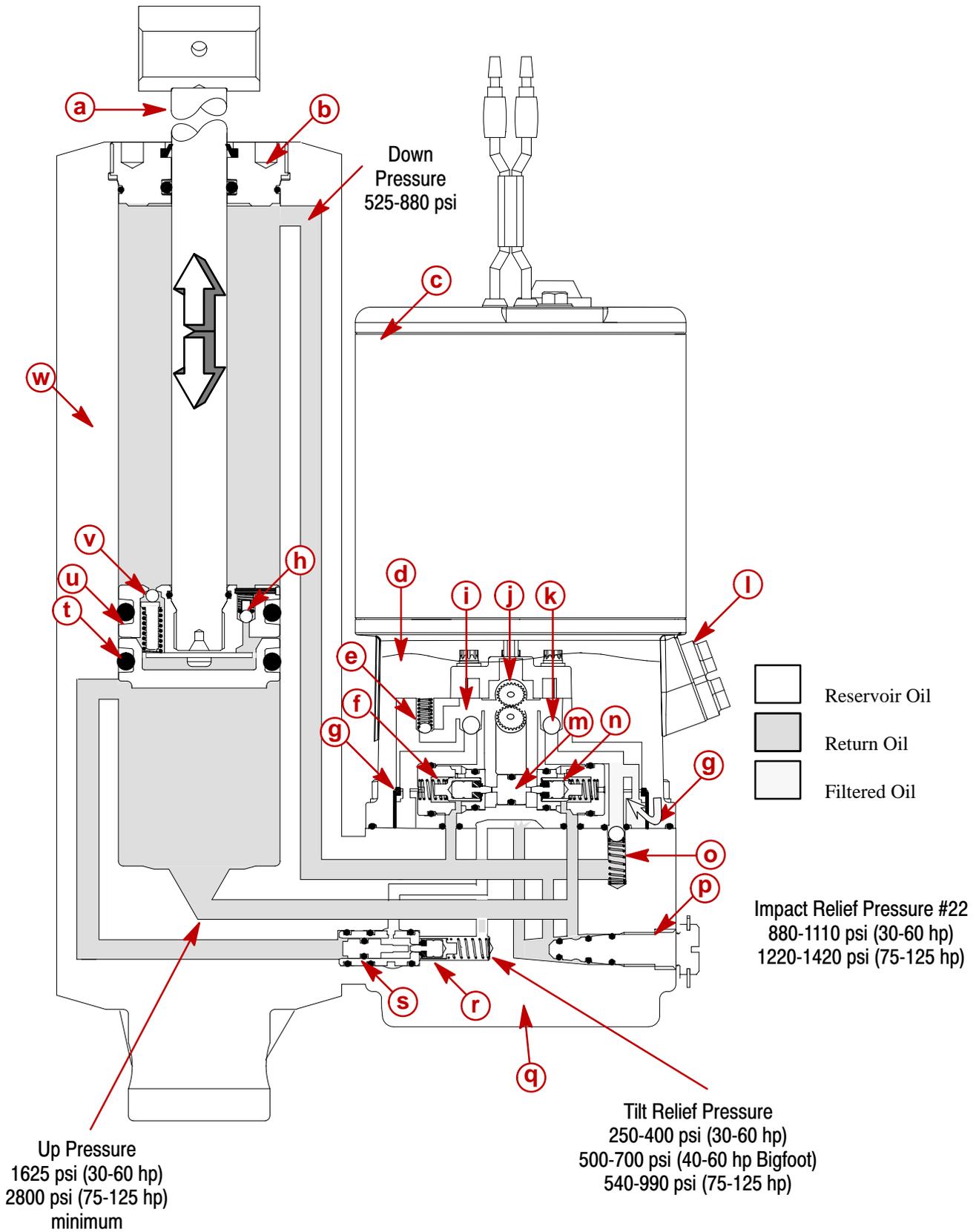
Shock Function Return

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. This allows 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.

- a** - Trim Rod
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- c** - Electric Motor
- d** - Reservoir Oil
- e** - Down Circuit Pressure Relief Valve
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- v** - Impact Relief Valve
- w** - Cylinder



Manual Tilt





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. Trim rod (a) movement will continue until the manual release valve (p) is closed, locking the fluid inside of the cylinder and manifold.

- a** - Trim Rod
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- t** - Memory Piston
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- v** - Impact Relief Valve
- w** - Cylinder



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).

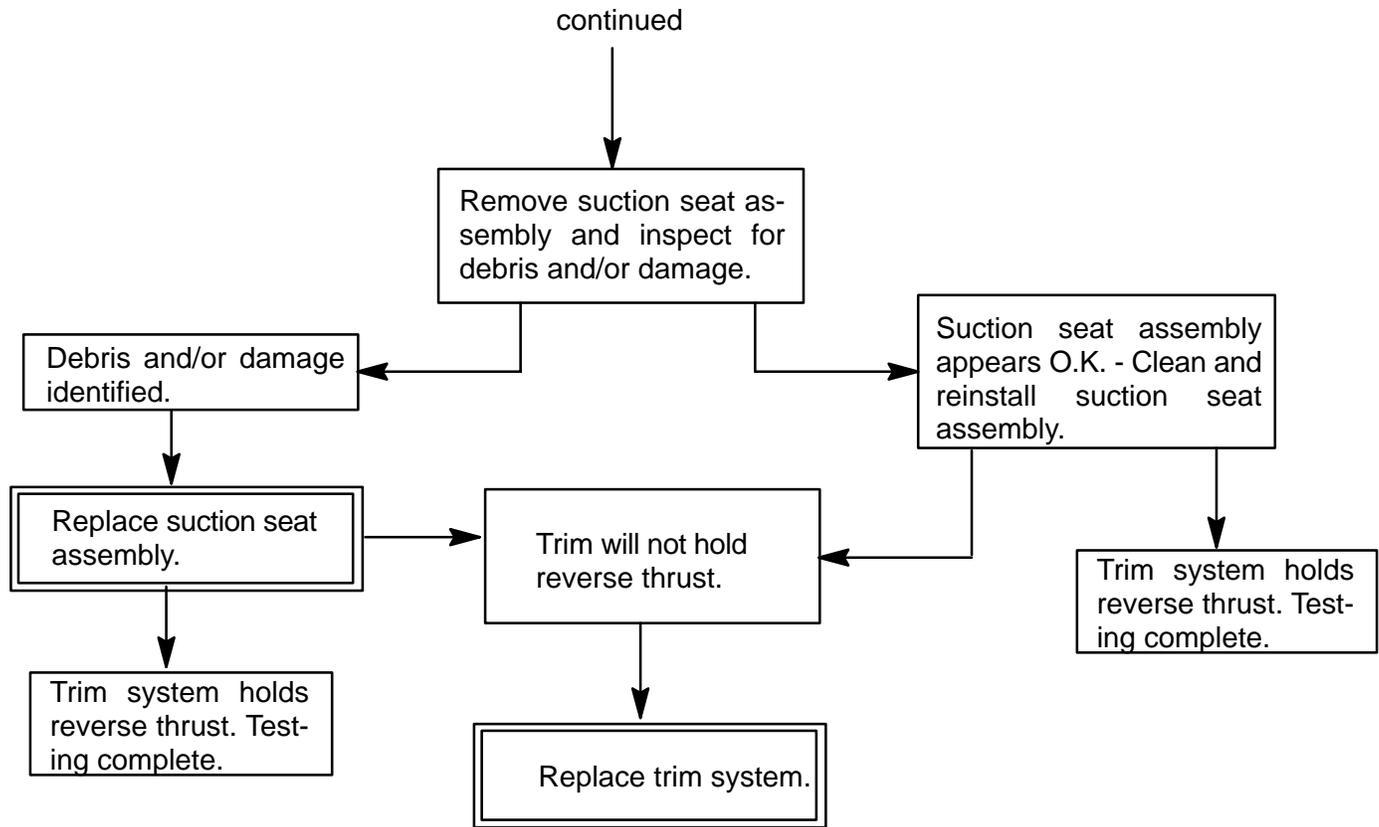
Preliminary Checks

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.

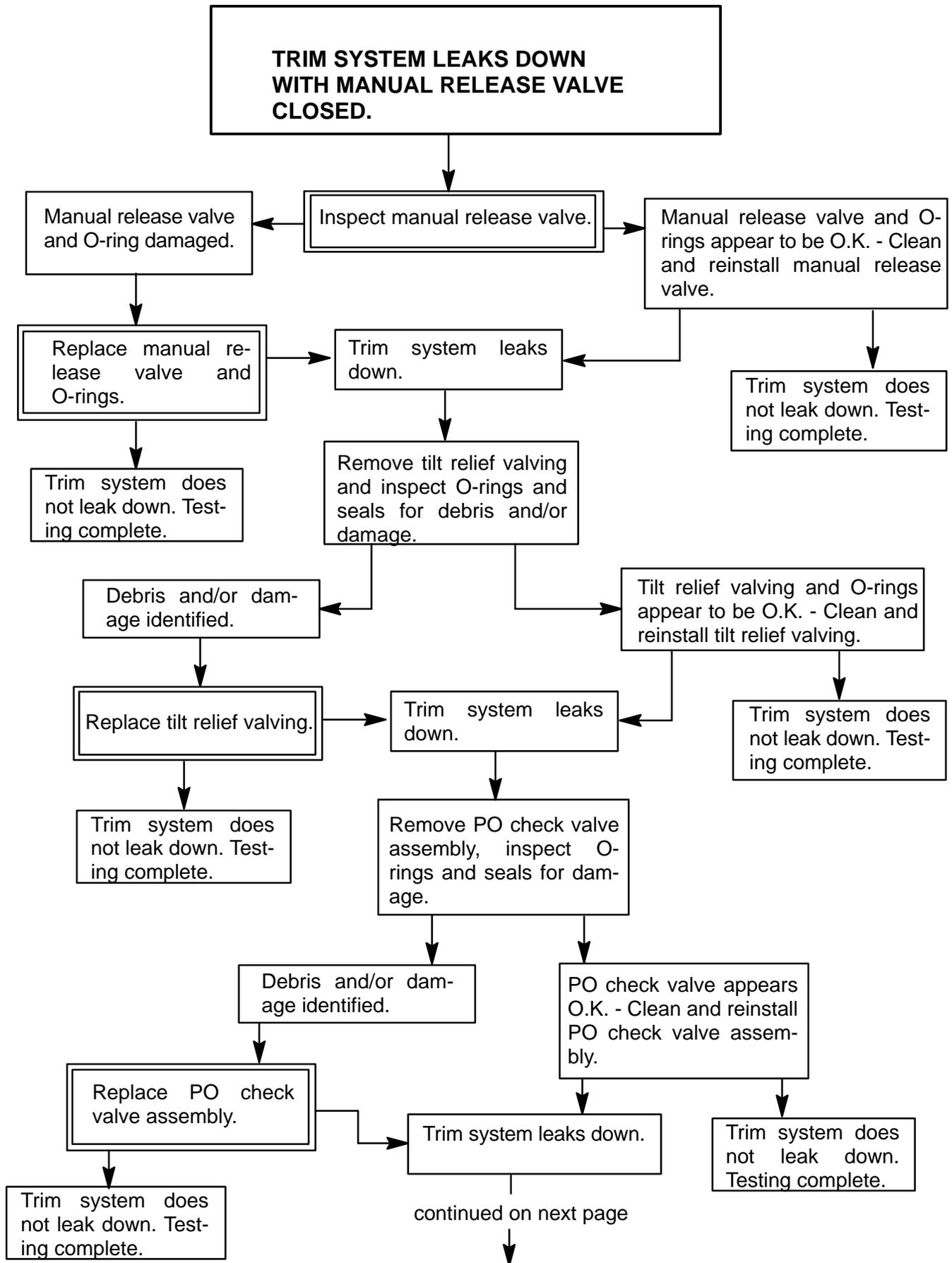


Hydraulic System Troubleshooting Flow Chart



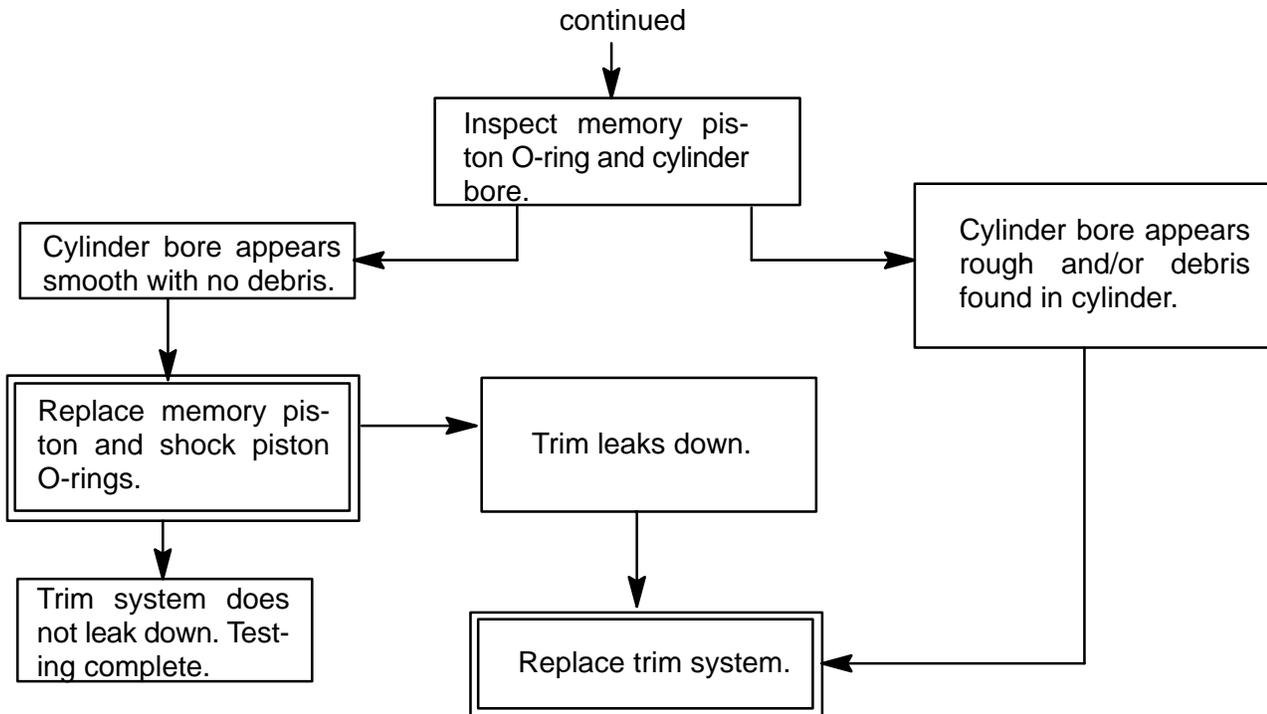


Hydraulic System Troubleshooting Flow Chart



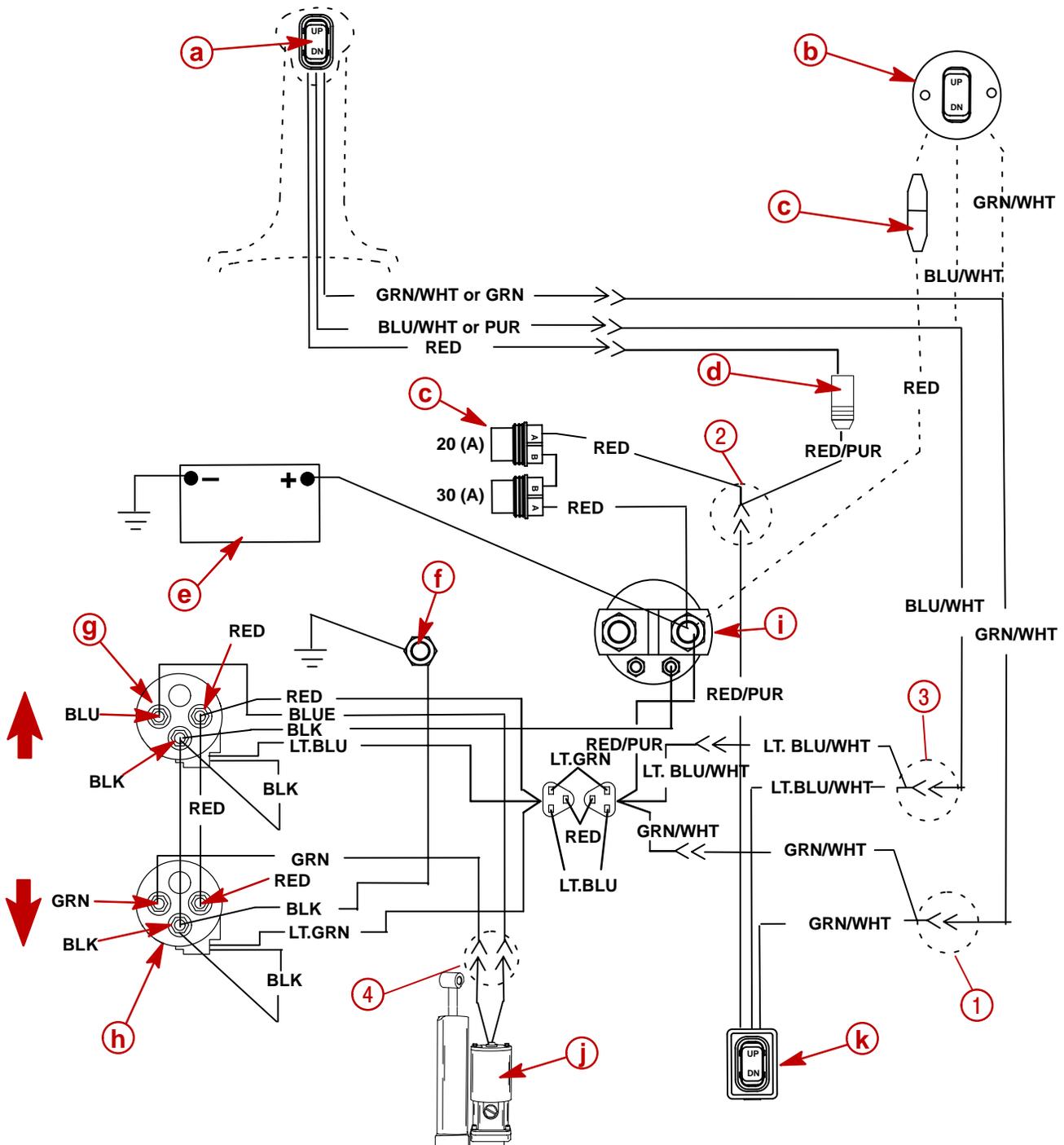


Hydraulic System Troubleshooting Flow Chart





Troubleshooting the Power Trim Electrical System



- a** - Trim Switch (Remote Control Mounted)
- b** - Trim Switch (Panel Mounted)
- c** - Fuses (20A, 30A)
- d** - Remote Control Wiring Plug Connector
- e** - Battery
- f** - Block Bolt

- g** - Up Relay
- h** - Down Relay
- i** - Solenoid - Start
- j** - Trim Pump Motor
- k** - Cowl Switch



Troubleshooting the Power Trim Electrical System

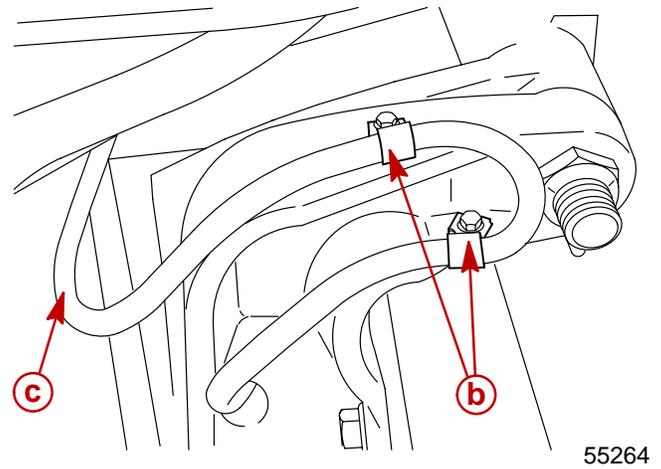
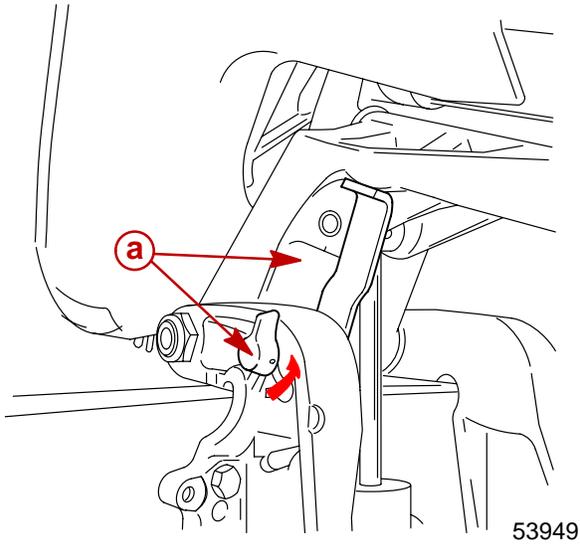
Refer to wiring diagram on preceding page for location of wire connections.

Problem	Possible Cause	Remedy
Trim Switch "UP" is inoperative, but the Cowl Switch "UP" does operate.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (1) and Trim Switch. 2. Faulty Trim Switch. 	<ol style="list-style-type: none"> 1. Check for an open connection or cut wire. 2. Replace.
Cowl Switch "UP" is inoperative, but the Trim Switch "UP" does operate.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (2) and Solenoid. 2. Faulty Cowl Switch. 	<ol style="list-style-type: none"> 1. Check for an open connection or cut wire. 2. Replace.
Trim Switch "UP" and Cowl Switch "UP" are both inoperative.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (1) and the "Up" Relay. 2. Open BLK wire between ground and "UP" Relay. 3. Open RED wire between Solenoid and "UP" Relay. 4. Faulty "UP" Relay. 	<ol style="list-style-type: none"> 1. Check for an open connection. 2. Check for an open connection. 3. Check for an open connection. 4. Replace.
Trim Switch "DOWN" is inoperative, but the Cowl Switch "DOWN" does operate.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (3) and Trim Switch. 2. Faulty Trim Switch. 	<ol style="list-style-type: none"> 1. Check for an open connection or cut wire. 2. Replace.
Cowl Switch "DOWN" is inoperative, but the Trim Switch "DOWN" does operate.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (2) and Solenoid. 2. Faulty Cowl Switch. 	<ol style="list-style-type: none"> 1. Check for a open connection or cut wire. 2. Replace
Trim Switch "DOWN" and Cowl Switch "DOWN" are both inoperative.	<ol style="list-style-type: none"> 1. Open wire between Wire Connection (3) and the "UP" Relay. 2. Open BLK wire between ground and "DOWN" Relay. 3. Open RED wire between Solenoid and "DOWN" Relay. 4. Faulty "DOWN" Relay 	<ol style="list-style-type: none"> 1. Check for an open connection. 2. Check for an open connection. 3. Check for an open connection. 4. Replace.
Trim Switch "UP" and "DOWN" are both inoperative, but the Cowl Switch does operate.	<ol style="list-style-type: none"> 1. 20 AMP Fuse blown. 2. Faulty trim switch. 3. Wire is open between fuse holder and solenoid. 4. Wire is open between fuse holder and trim switch. 	<ol style="list-style-type: none"> 1. Replace fuse. Locate the cause of the blown fuse. Check electrical wiring for a shorted circuit. 2. Replace. 3. Check for a open connection or cut wire. 4. Check for a loose or corroded connection.
Trim Switch and Cowl Switch are both inoperative.	<ol style="list-style-type: none"> 1. One of the Trim Pump Motor wires is open between the motor and the Relays. 2. Faulty trim pump motor. 	<ol style="list-style-type: none"> 1. Check wire connections (4) for loose or corroded condition. 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.	<ol style="list-style-type: none"> 1. The Trim or Cowl switch is shorted. 	<ol style="list-style-type: none"> 1. Replace.



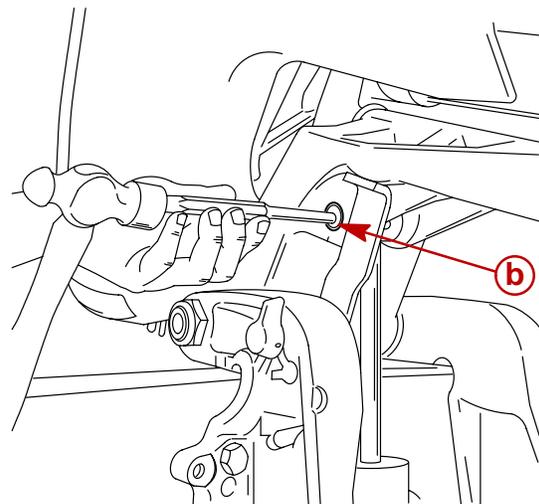
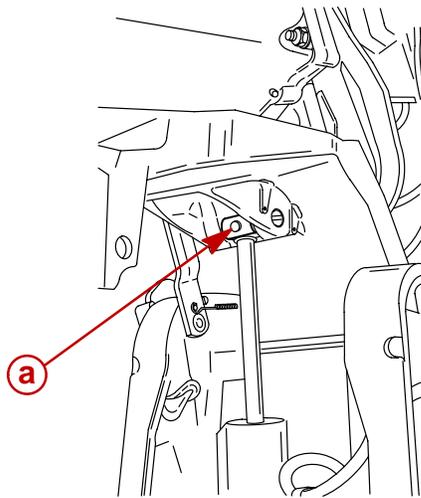
Power Trim System Removal

1. Tilt outboard to the full up position and support with tilt lock pin.
2. Disconnect the power trim wire harness and remove clamp.



- a** - Tilt Lock Pin
- b** - J-Clip
- c** - Harness

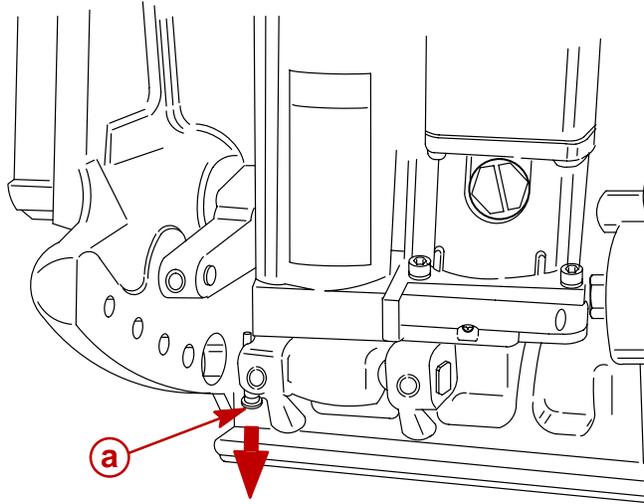
3. Remove the trilobe pin.
4. Drive out the upper pivot pin.



- a** - Trilobe Pin
- b** - Upper Pivot Pin

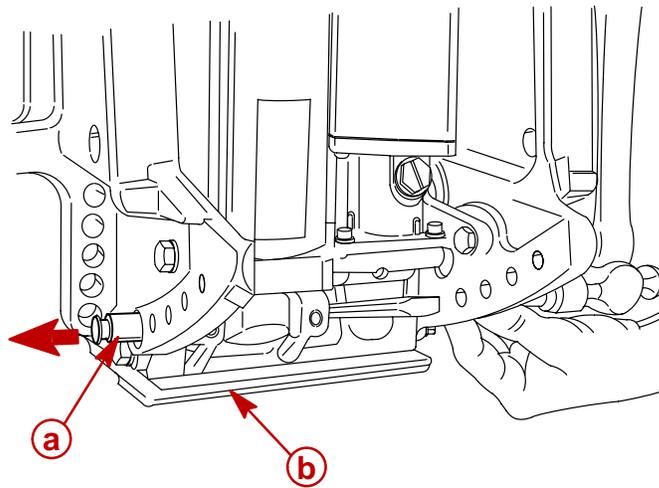


5. Use suitable punch to remove dowel pin.



a - Dowel Pin

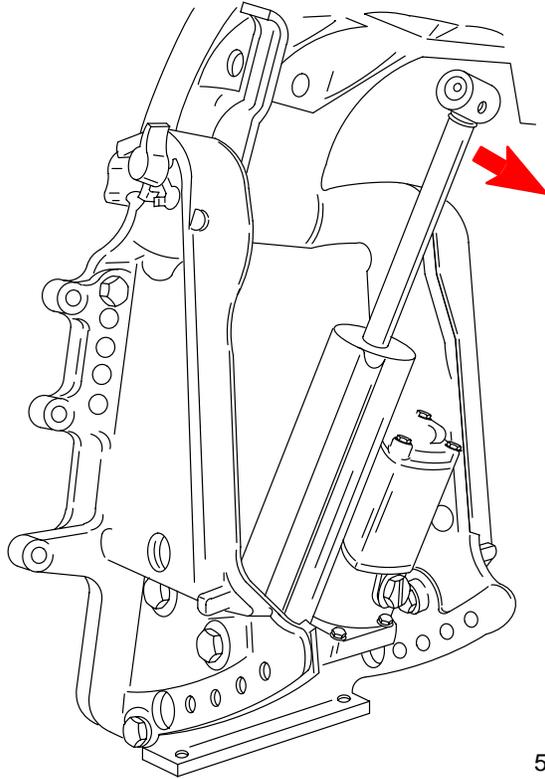
6. Use suitable punch to drive out lower pivot pin.
7. Remove the sacrificial anode.



a - Lower Pivot Pin
b - Sacrificial Anode



8. Tilt power trim assembly (top first) out from clamp bracket and remove assembly.



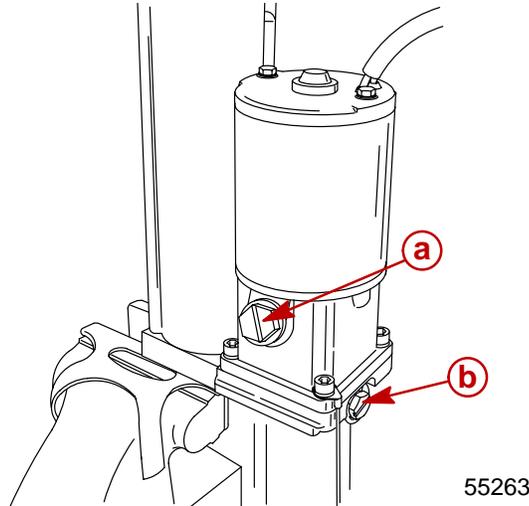
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Power Trim Disassembly

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.

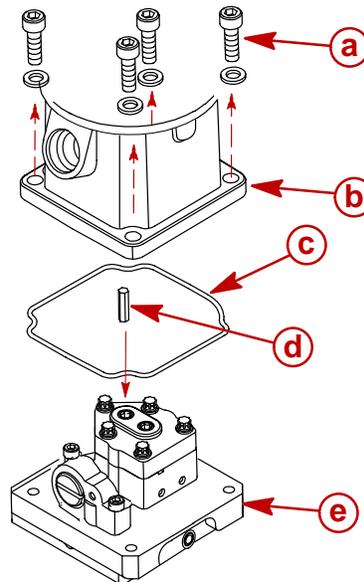
1. Remove reservoir cap.
2. Remove manual release valve assembly to drain oil.



- 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.

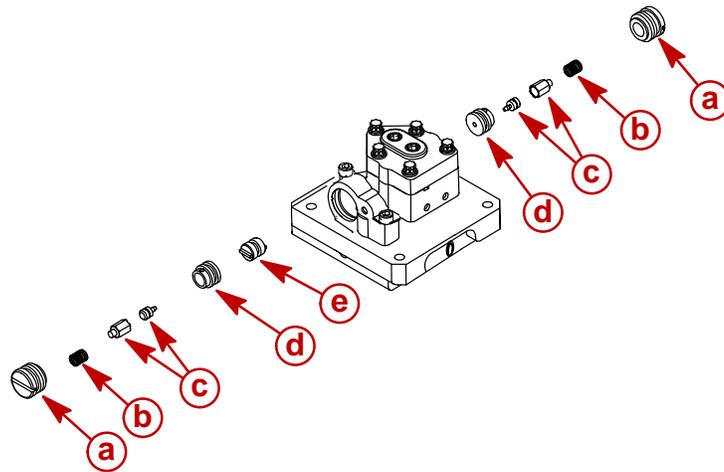


- a** - Screw (4)
- b** - Reservoir
- c** - Reservoir Seal
- d** - Coupler
- e** - Manifold Assembly



Pump and Components Removal

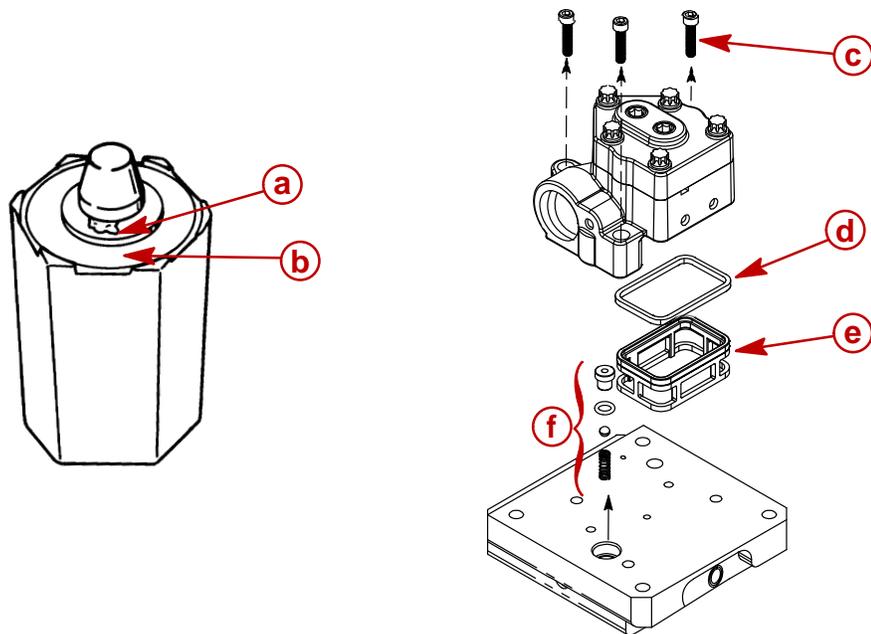
1. Remove pressure operated plugs on pump. Remove spring and check valve/poppet (both sides). Use special tool CG 41-11 and special tool CG 41-14 with 5/16" end to remove spool.



- 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.

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

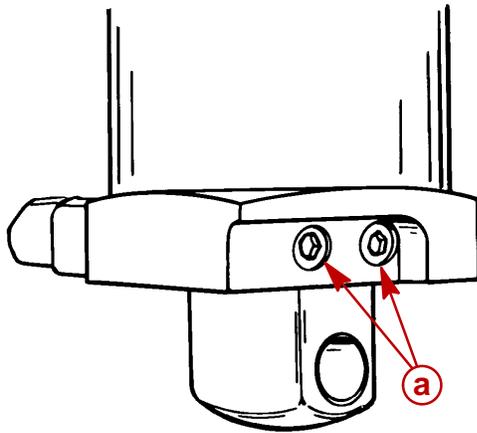


- a - Debris Under Valve Tip
- b - Rubber Seat
- c - Screws (3)
- d - Filter Seal
- e - Filter
- f - Suction Seat Assembly

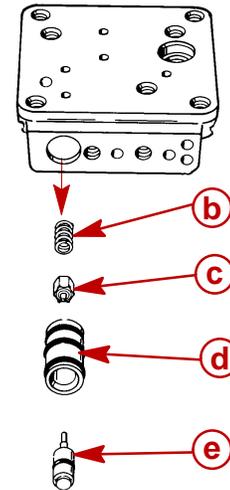


Manifold Removal

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



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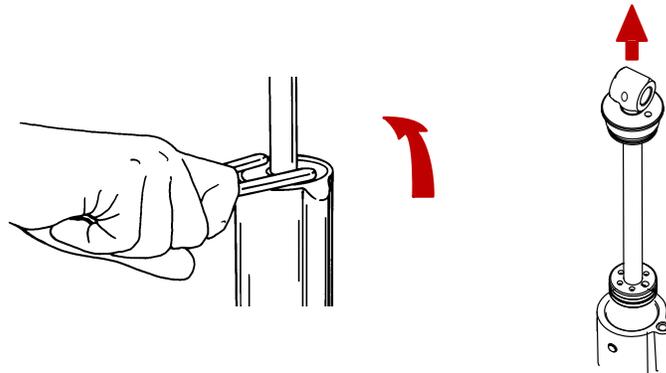


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- a** - Screws (2)
- b** - Spring
- c** - Poppet
- d** - Spool Housing
- e** - Trim Limit Spool

Shock Rod Removal

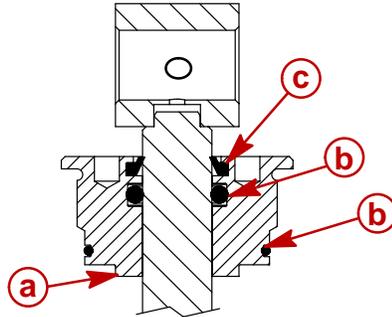
1. Unscrew end cap assembly from cylinder using spanner wrench [1/4 in. x 5/16 in. (6.4 mm x 8 mm) long pegs].
2. Remove shock rod assembly from cylinder.





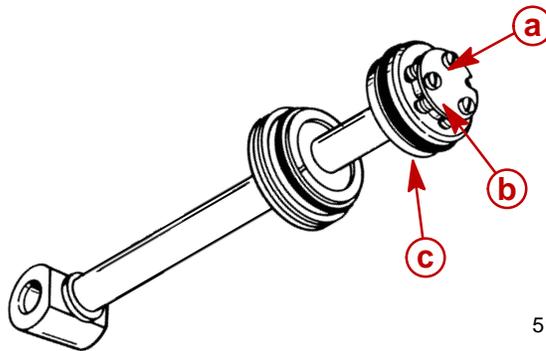
Shock Rod Disassembly

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 (2)
- c** - Wiper Ring

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

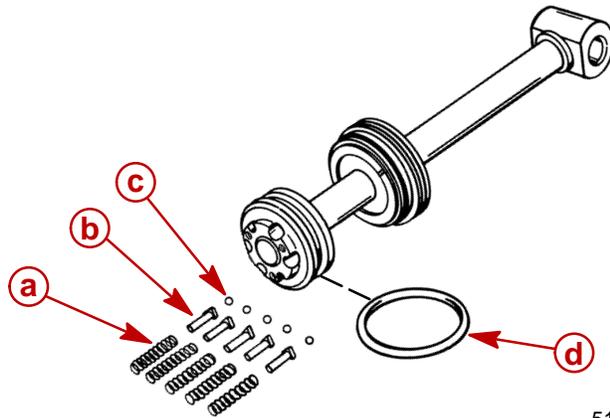


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- a** - Screw (3)
- b** - Plate
- c** - Shock Rod Piston



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



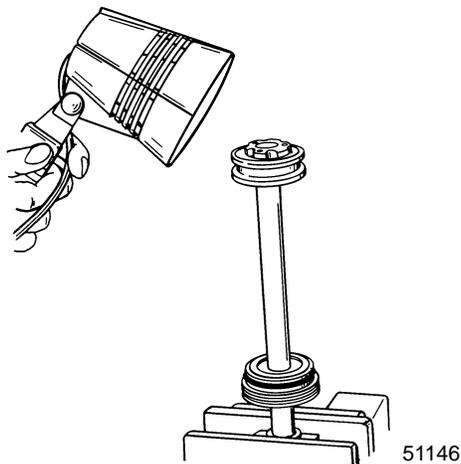
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- a** - Spring (5)
- b** - Seat (5)
- c** - Ball (5)
- d** - O-ring

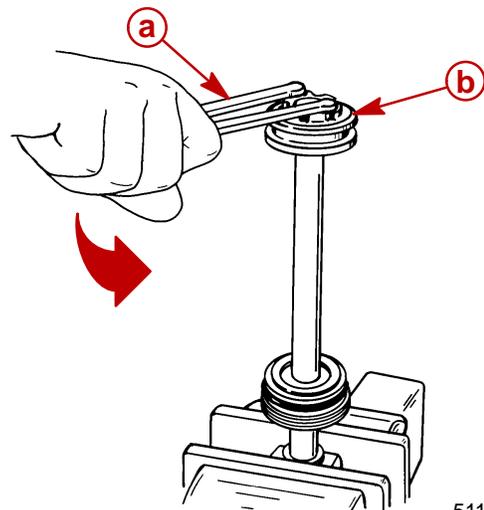
⚠ CAUTION

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.



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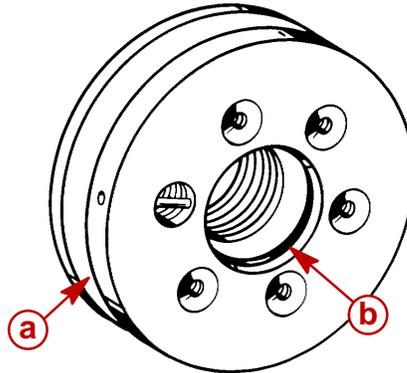


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- a** - Spanner Wrench
- b** - Shock Rod Piston



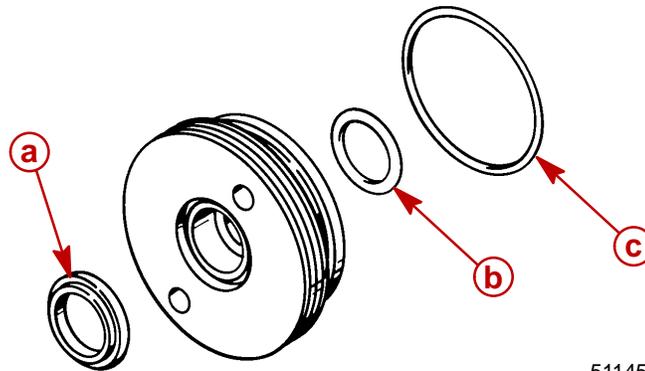
8. Inspect check valve for debris; clean debris from check valve if found. If debris cannot be cleaned from check valve, replace shock piston as an assembly.
9. Clean shock and components with compressed air.
10. Remove inner O-ring from shock rod piston.



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.



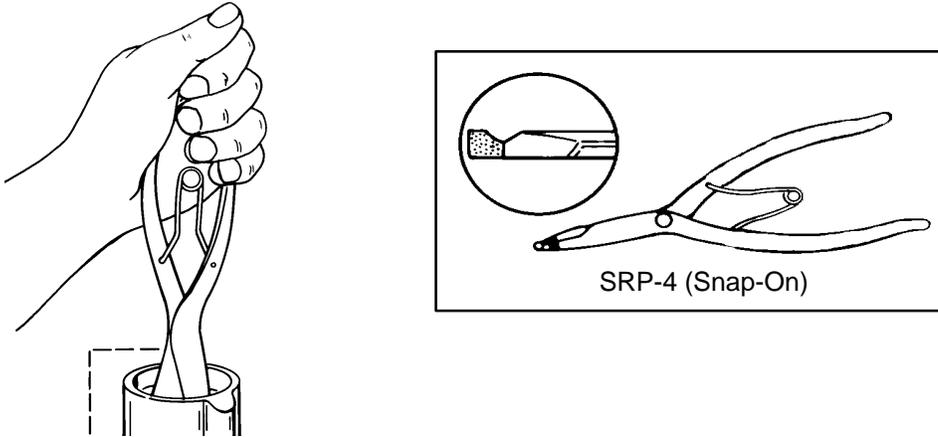
51145

- 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 P/N SRP-4 (Snap-On) or suitable tool.



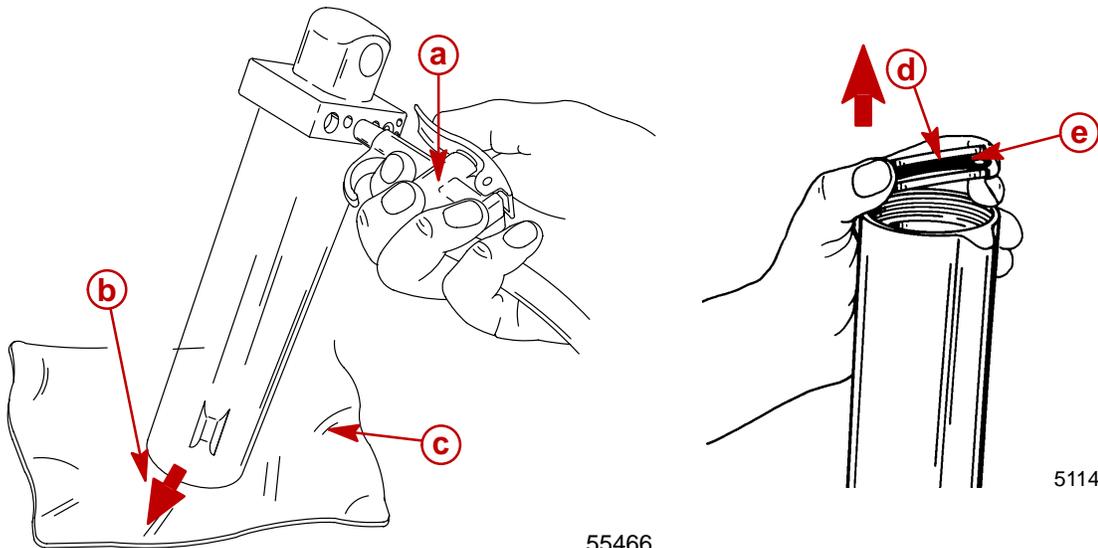
- b. Blowing compressed air into manual release valve hole using air nozzle.

⚠ 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.

2. Remove O-ring from memory piston.



- a** - Adaptor/Air Hose
- b** - Memory Piston Exit
- c** - Shop Rag
- d** - O-Ring
- e** - Memory Piston

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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.

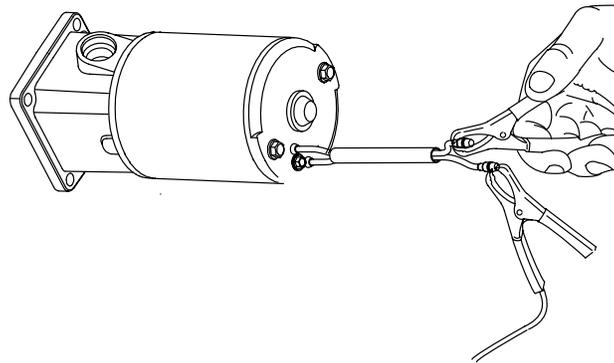
It is recommended that all O-rings in trim system be replaced. Use O-Ring Kit 25-809880A1.

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.

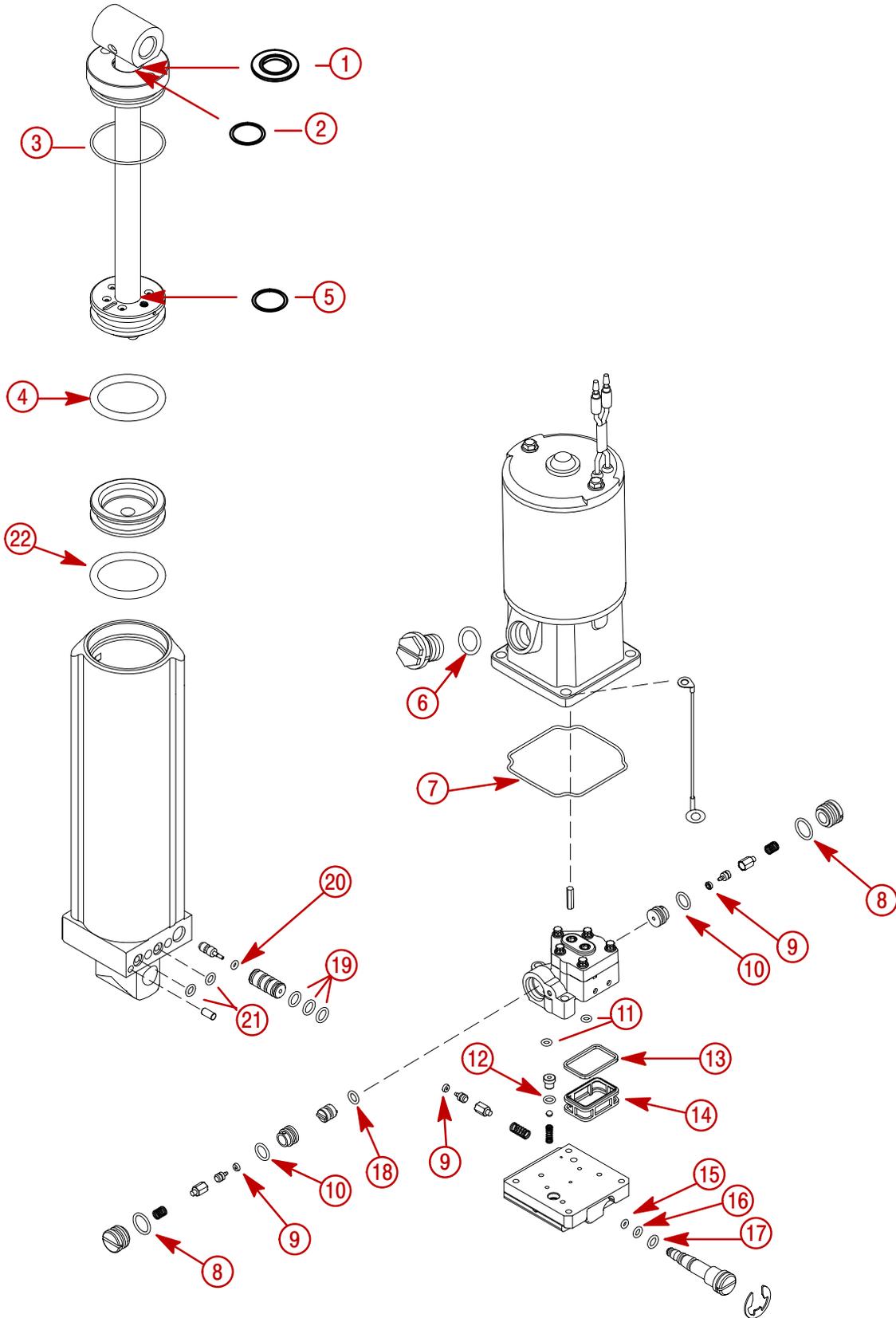




Reassembly

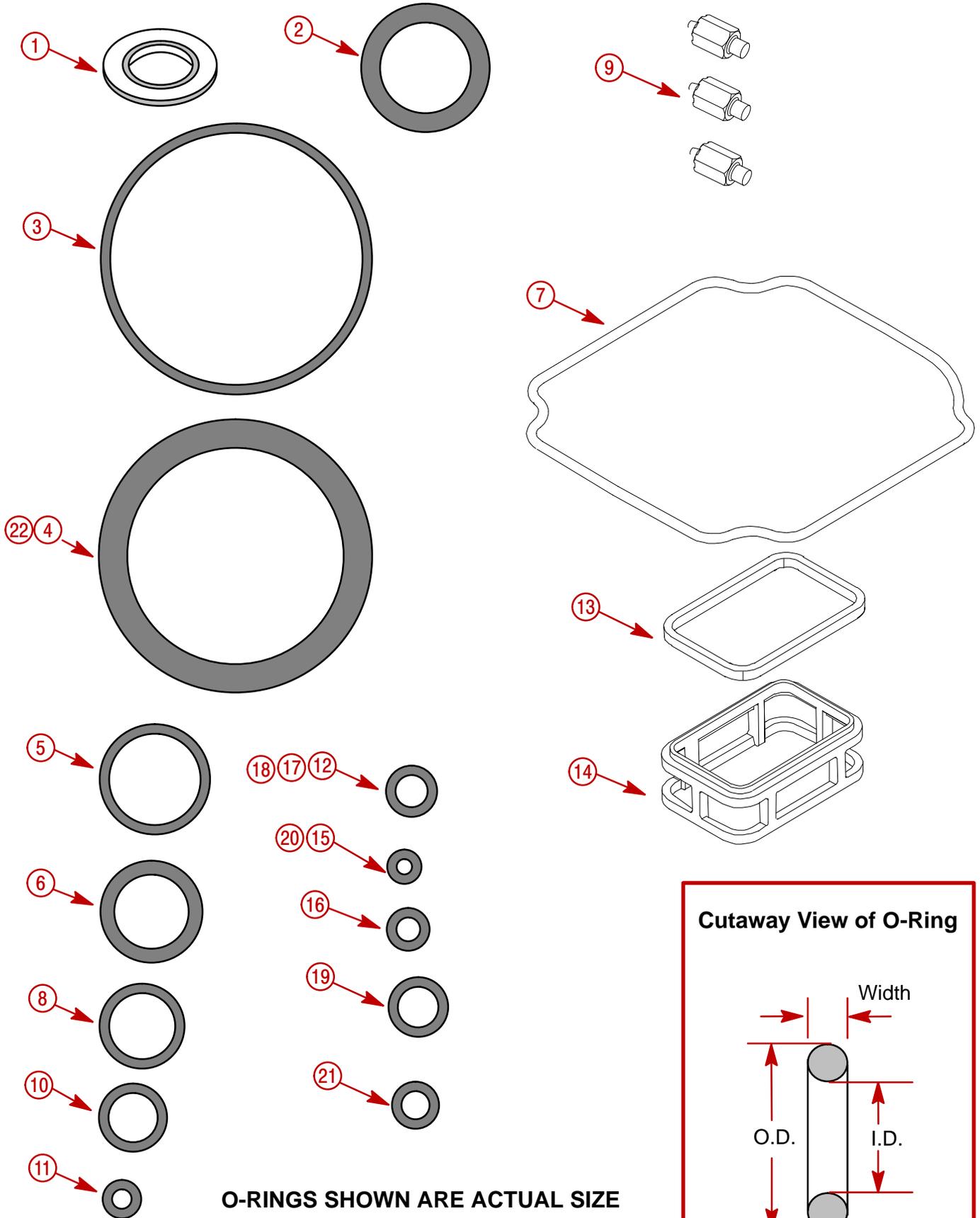
O-Ring and Seal Placement

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





O-Ring Sizes



O-RINGS SHOWN ARE ACTUAL SIZE



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)

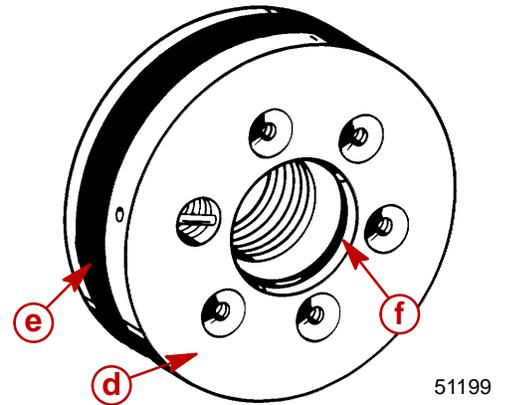
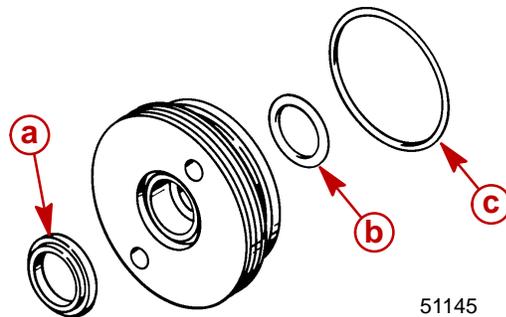


Power Trim Reassembly

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

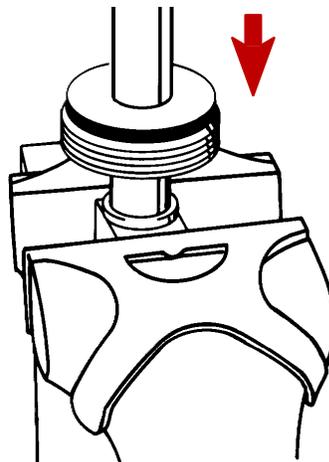
Shock Rod Reassembly

1. Install lubricated O-rings to end cap.
2. Install rod wiper.
3. Install lubricated O-rings to shock piston.



- a** - Rod Wiper
- b** - Inner O-ring
- c** - Outer O-ring
- d** - Shock Piston
- e** - O-ring
- f** - O-ring

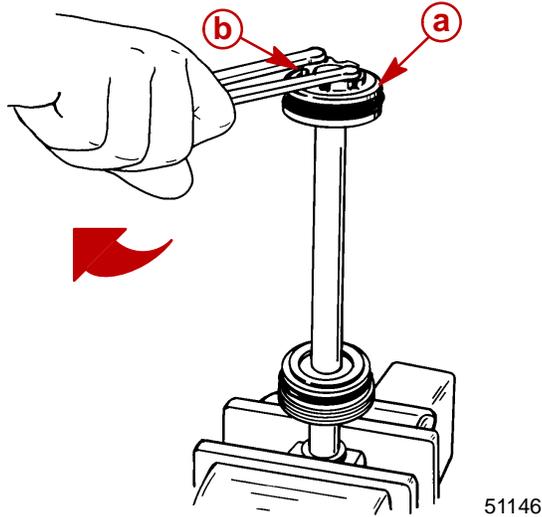
4. Clamp shock rod in soft jawed vise.
5. Position cylinder end cap onto rod as shown.



**⚠ CAUTION**

When installing shock rod piston, spanner wrench must have 1/4 in. x 5/16 in. (6.4mm x 8mm) 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 specified torque.



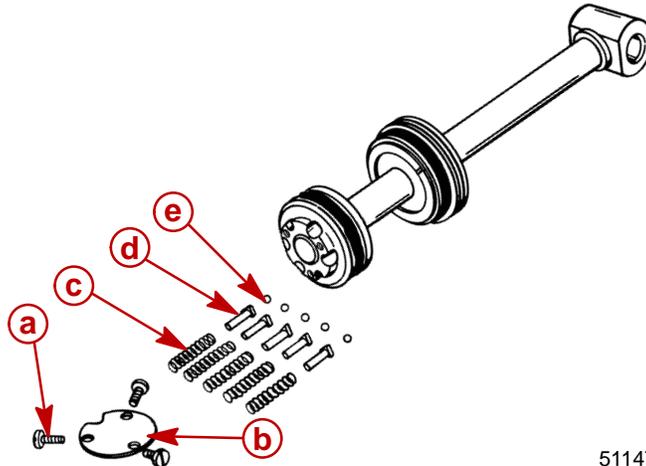
- a** - Shock Rod Piston
b - Spanner Wrench

Shock Piston Torque

90 lb-ft (122 Nm)



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 specified torque.



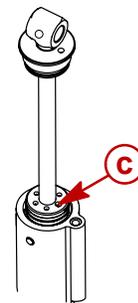
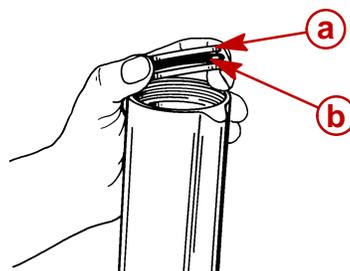
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- a** - Screw (3)
- b** - Plate
- c** - Spring (5)
- d** - Seat (5)
- e** - Ball (5)

Screw Torque
35 lb-in. (4 Nm)

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.
3. Fill cylinder three inches (76.2 mm) 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.



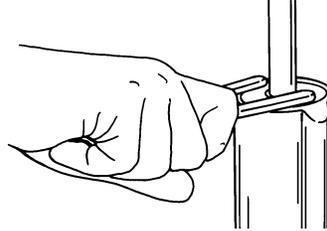
- a** - Memory Piston
- b** - O-ring
- c** - Oil Blow Off Ball Passage



⚠ 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.

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



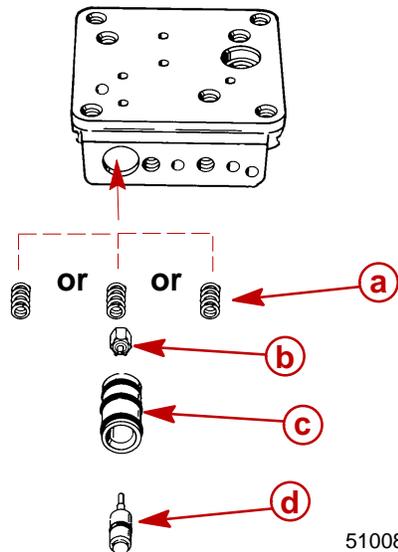
End Cap Torque

45 lb-ft (61 Nm)

Trim Limit Assembly Installation

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

NOTE: There are three different size springs used in this manifold. The heavy spring is used on 75-125 hp outboards. The medium spring is used on 40-60 hp Bigfoot outboards. The light spring is used on 30-60 hp outboards.



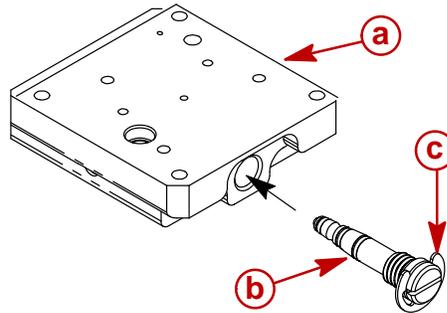
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- a** - Spring
- b** - Poppet
- c** - Spool Housing
- d** - Trim Limit Spool



Manual Release Valve Installation

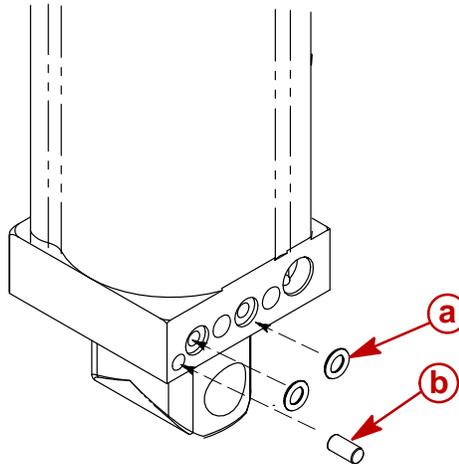
1. Install “E” clip (if removed) and lubricate O-rings on manual release valve.
2. Install manual release valve assembly into manifold.



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

Manifold Installation

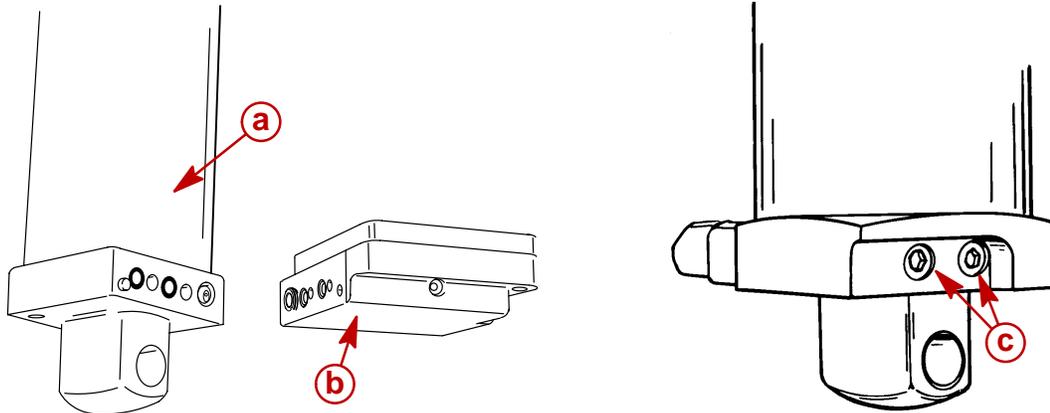
1. Install dowel pin and two (2) lubricated O-rings into trim cylinder.



- a** - O-Ring (2)
- b** - Dowel Pin



2. Align the trim cylinder and pump/reservoir assembly together.
3. Install the two (2) long screws and torque to specified torque.



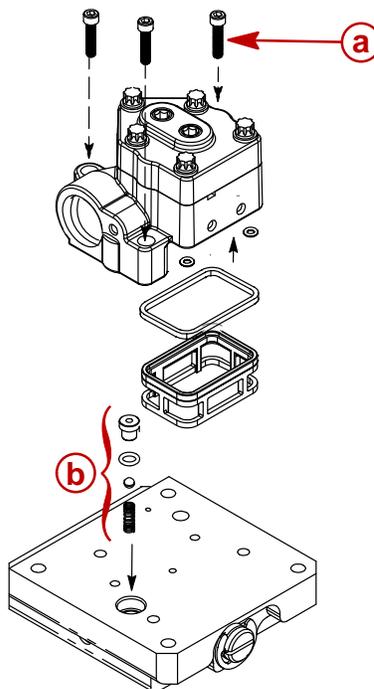
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- a** - Trim Cylinder Assembly
- b** - Reservoir/Manifold Assembly
- c** - Screw (2)

Screw Torque
100 lb-in. (11 Nm)

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 specified torque.



- a** - Screw (3)
- b** - Suction Seat Assembly

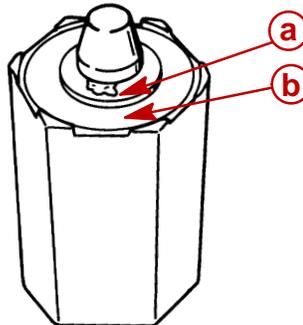


Screw Torque

70 lb-in. (7.7 Nm)

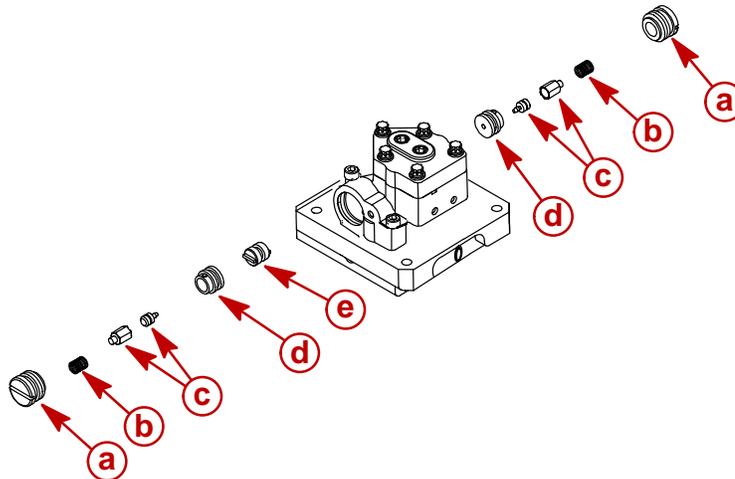
Pressure Operated Assembly Installation

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 Nm).

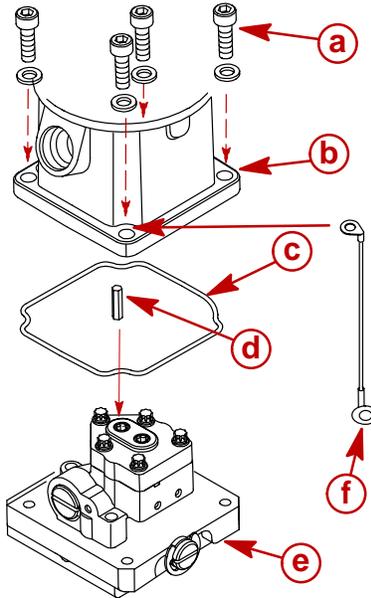


- a** - Plug (2) Torque to 120 lb-in. (13.5 Nm)
- b** - Spring (2)
- c** - Check Valve/Poppet (2)
- d** - Seat (2)
- e** - Spool



Reservoir/Motor Installation

1. 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 Nm).



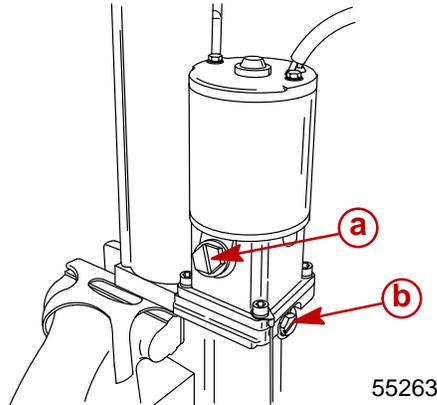
- a** - Screw (4) Torque to 80 lb-in. (9 Nm)
- b** - Reservoir
- c** - Reservoir Seal
- d** - Coupler
- e** - Manifold Assembly
- f** - Ground Strap

2. Fill reservoir to bottom of fill hole using Quicksilver Power Trim Fluid (92-90100A12). 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 it is 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. Cycle system full up and down 3 times or until fluid level remains at proper level.
Connect power trim wire to 12 volt source.

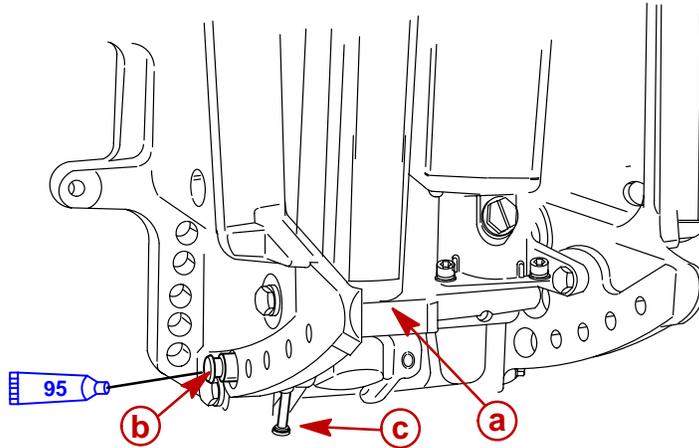
Direction	
↑ Up	↓ Down
Blue + Positive	Blue - Negative
Green - Negative	Green + Positive

5. Recheck fluid level with rod fully extended, add fluid if required and repeat cycle until fluid level stays even with the bottom of the fill hole.

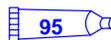


Installation of Power Trim System

1. Apply 2-4-C w/Teflon (92-825407A12) to lower pivot pin bore and pivot pin surface.
2. Position trim cylinder assembly (BOTTOM FIRST) between clamp brackets and route trim pump electrical harness through access hole in starboard clamp bracket.
3. Start lower pivot pin into pivot pin bore and position lower cross pin (RETAINED) in its respective hole.
4. Using a suitable punch, drive lower pivot pin into clamp bracket and trim cylinder assembly until pivot pin is flush with outside surface.

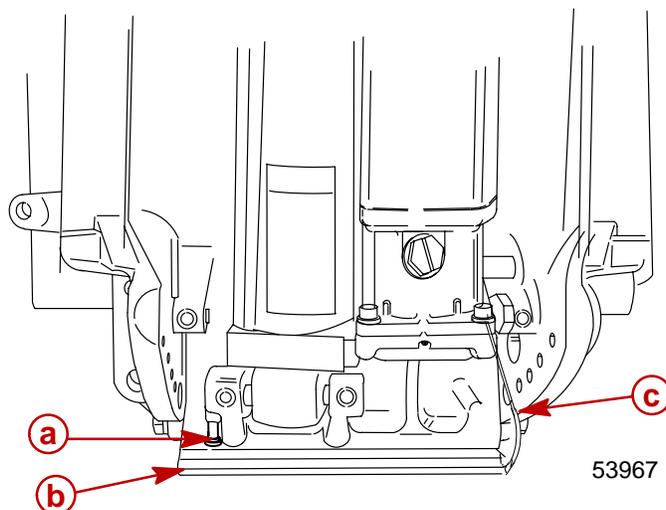


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 2-4-C w/Teflon (92-850736A1)

- a** - Trim Cylinder Assembly
- b** - Lower Pivot Pin
- c** - Lower Cross Pin

5. Using a suitable punch, drive lower cross pin into its respective bore until seated.
6. Install sacrificial aluminum anode to reservoir bracket placing ground strap to anode, as shown.



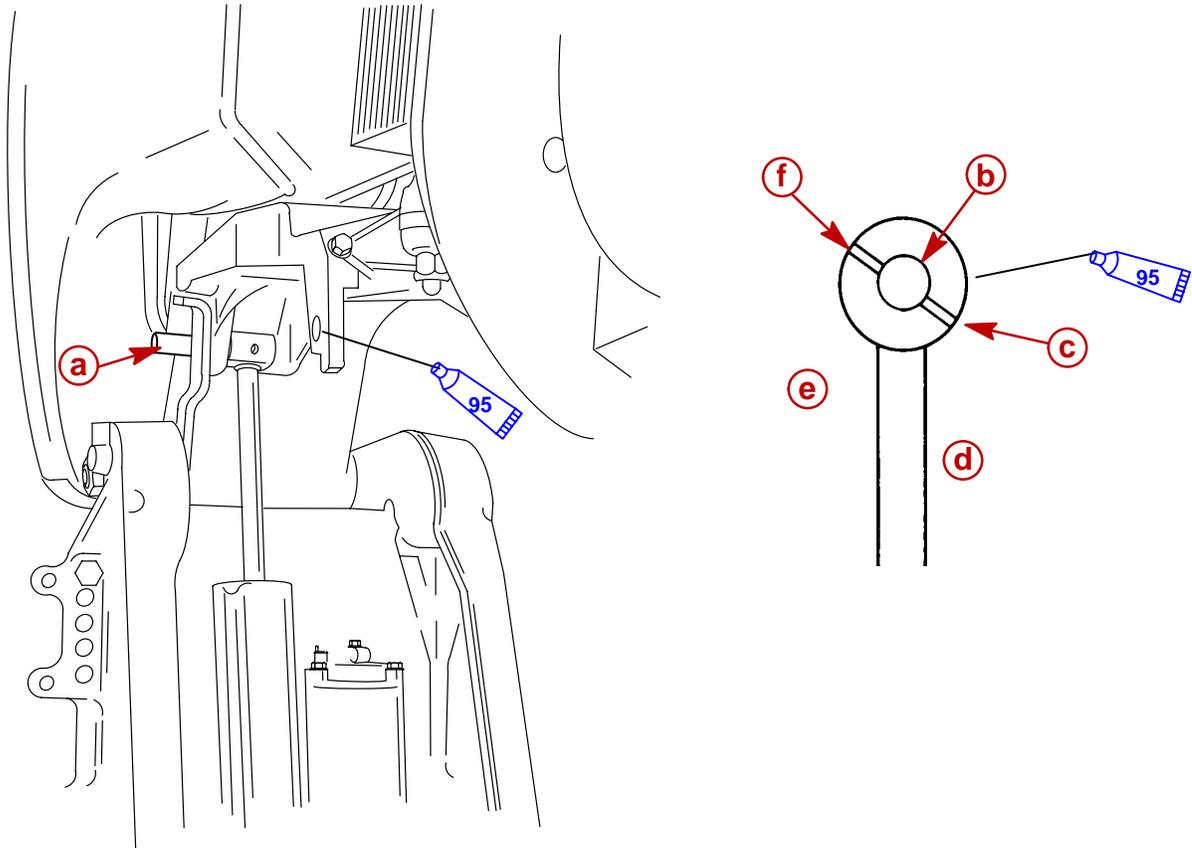
53967

- a** - Lower Cross Pin
- b** - Sacrificial Anode
- c** - Ground Strap



7. Apply 2-4-C w/Teflon (92-825407A12) to surface of upper pivot pin, pivot pin bore and trim ram bore.

NOTE: Install trim ram with cross hole located as shown. If trim ram is installed reversed, the trim sender (if installed) will not operate.

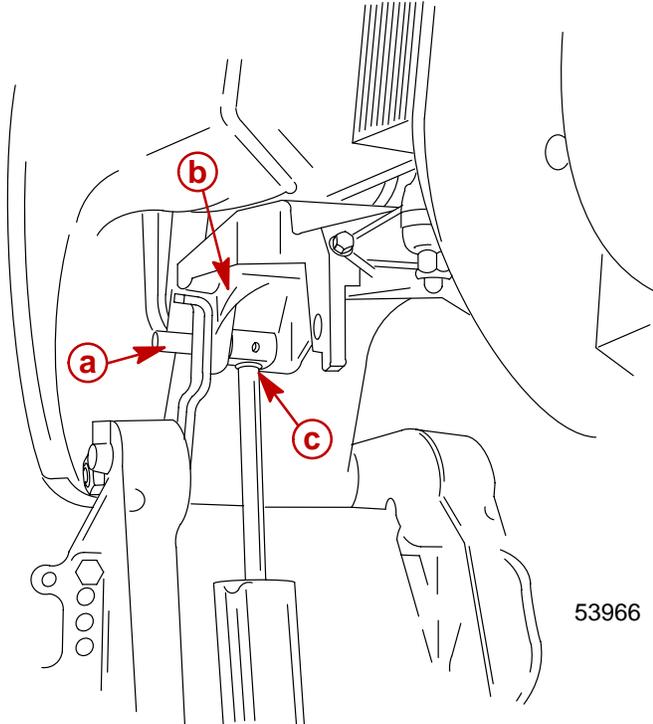


 95 2-4-C w/Teflon (92-850736A1)

- a - Pivot Pin
- b - Trim Ram Bore
- c - Install Trim Ram As Shown
- d - Engine Side
- e - Transom Side
- f - Cross Hole



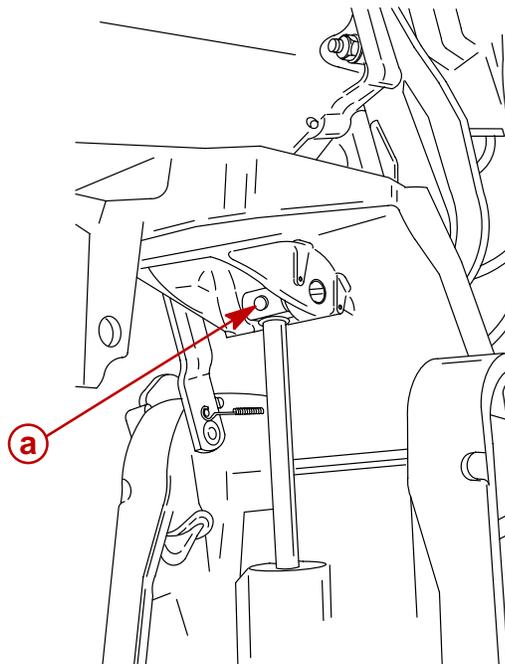
- Using a suitable mallet, drive upper pivot pin into swivel bracket and through trim ram until pivot pin is flush with swivel bracket.



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

- Drive upper retaining pin in until seated.

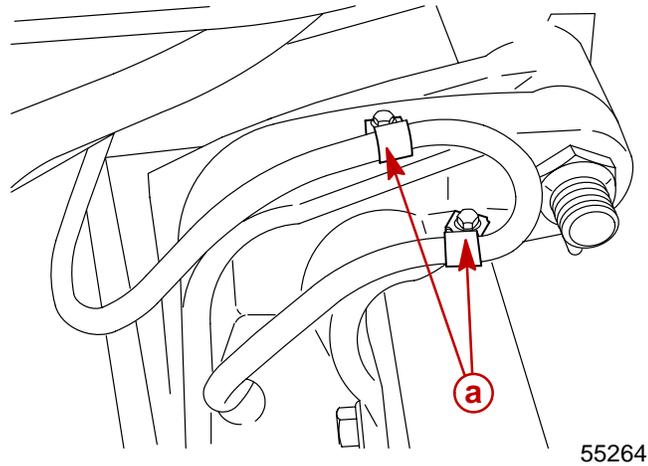


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- a** - Retaining Pin



10. Secure trim harness with clamps.



a - Clamps

11. Recheck fluid level.
12. Power trim may now be operated to lower outboard to desired position. Trim system is self purging.
13. Reconnect power trim leads to relays under ignition cover.
14. Reinstall spark plug leads to spark plugs.
15. Reinstall cowls.
16. Connect battery leads to battery terminals.