

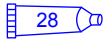
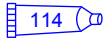
# Power-Assisted Steering System

## Section 9A - Power-Assisted Steering Pump and Related Components

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## Lubricants, Sealants, Adhesives

Tube Ref No.	Description	Where Used	Part No.
 28	Dexron III Automatic	Power-assisted steering system	Obtain Locally
 114	Power Trim and Steering Fluid	Power-assisted steering system	92-858074K01
		Power-assisted steering pump	
		Power steering system	

## Power-Assisted Steering Specifications

**IMPORTANT:** Power-assisted steering pumps are considered non-repairable units and are intended to be removed and replaced with new units when found to be defective.

NOTICE
For more information on the power-assisted steering system and components, refer to the appropriate Mercury MerCruiser sterndrive service manual.

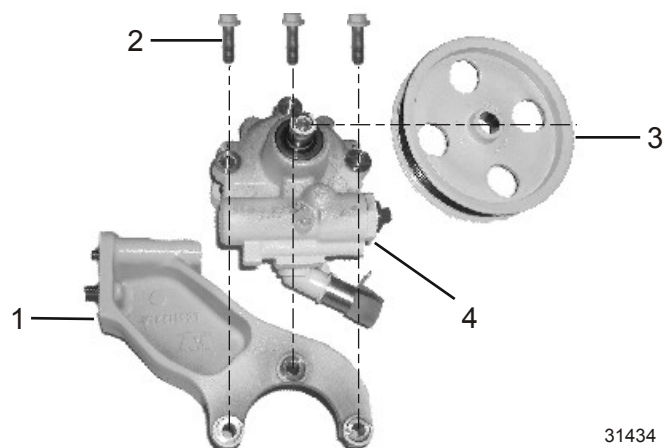
## Fluid Specifications

Description	Fluid Type	Fluid Part Number
Power-assisted steering system	Dexron III Automatic	Obtain locally
	Power Trim and Steering Fluid	92-802880A1 or Q1

**Notes:**

## Exploded Views

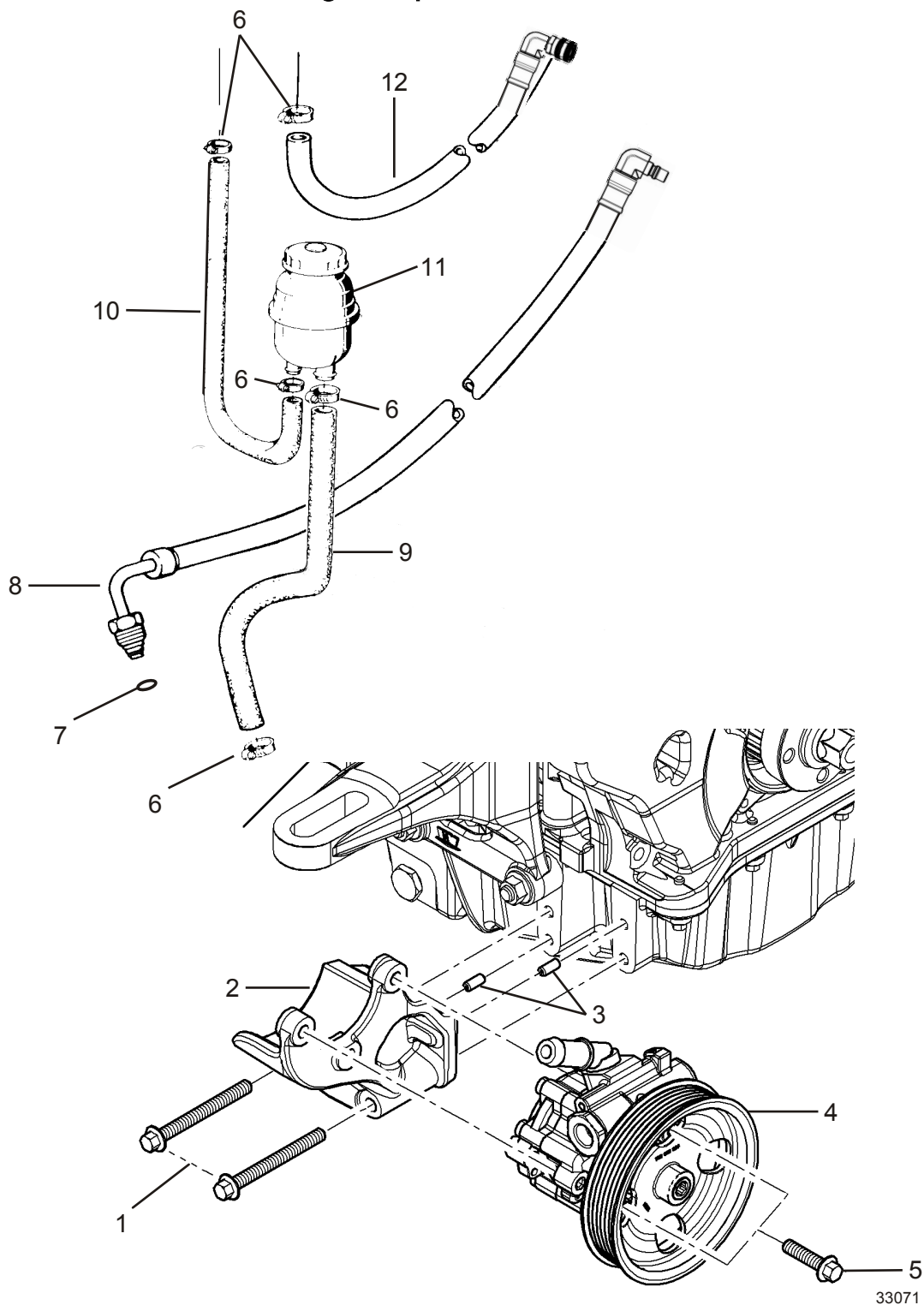
### Power-Assisted Steering Pump Assembly



**Power-Assisted Steering Pump Assembly**

Ref. No.	Qty.	Description	Torque		
			Nm	lb-in.	lb-ft
1	1	Bracket			
2	3	Flange screw	27.5	–	18
3	1	Pulley			
4	1	Power-assisted steering pump			

## Related Power-Assisted Steering Components



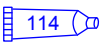
## Related Power-Assisted Steering Components

Ref. No.	Qty.	Description	Torque		
			Nm	lb-in.	lb-ft
1	2	Mounting bolt	24.5	–	18
2	1	Bracket			
3	2	Alignment pin			
4	1	Power-assisted steering pump assembly			
5	2	Flange screw	24.5	–	18
6	5	Hose clamp			
7	1	O-ring			
8	1	High-pressure hydraulic hose (to control valve)			
9	1	Supply hose			
10	1	Return hose (from fluid cooler)			
11	1	Fluid reservoir with cap and dipstick			
12	1	Return hose (low-pressure—from control valve to fluid cooler)			

## Fluid Level

### Power-Assisted Steering Fluid

**IMPORTANT:** Use only Quicksilver Power Trim and Steering Fluid or Dexron III automatic transmission fluid (ATF) in the power-assisted steering system.

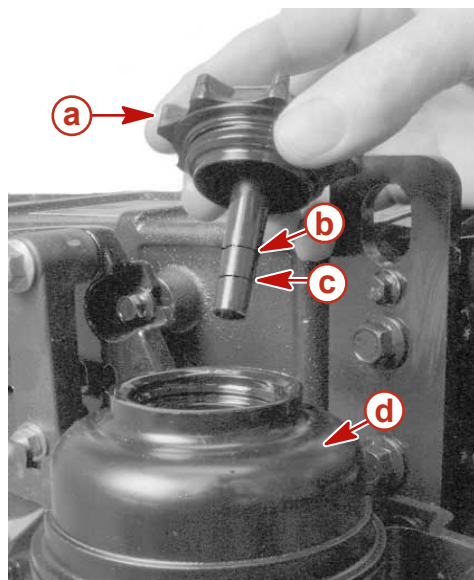
Tube Ref No.	Description	Where Used	Part No.
 114	Power Trim and Steering Fluid	Power-assisted steering system	92-858074K01

Tube Ref No.	Description	Where Used	Part No.
 28	Dexron III Automatic	Power-assisted steering system	Obtain Locally

**IMPORTANT:** Running the pump dry will damage the pump. Always check steering fluid levels before operating the boat.

### Checking

1. Center the sterndrive and stop the engine.
2. Remove the fill cap and dipstick from the fluid reservoir and observe the level.
  - a. The proper fluid level with the engine cold should be between the full cold mark and the end of the dipstick.
  - b. With the engine at normal operating temperature should be between the full hot and full cold marks.



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Typical

**a** - Fill cap and dipstick  
**b** - Full hot mark

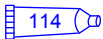
**c** - Full cold mark  
**d** - Fluid reservoir


**IMPORTANT:** If fluid is not visible in the fluid reservoir, see your Cummins MerCruiser Diesel Authorized Repair Facility.

### Filling

1. Remove the fill cap and dipstick and observe the fluid level.
2. Add the specified fluid to bring the fluid level up to the proper level.



Tube Ref No.	Description	Where Used	Part No.
 114	Power Trim and Steering Fluid	Power-assisted steering pump	92-858074K01

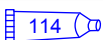
Tube Ref No.	Description	Where Used	Part No.
 28	Dexron III Automatic Transmission Fluid	Power-assisted steering system	Obtain Locally


3. Install the fill cap and dipstick.

## Filling and Bleeding

1. With the engine stopped, center the power-assisted steering.
2. Remove the dipstick from the power-assisted steering reservoir.

**IMPORTANT: Use only Power Trim and Steering Fluid or automatic transmission fluid (ATF) Dexron III in the power-assisted steering system.**

Tube Ref No.	Description	Where Used	Part No.
 114	Power Trim and Steering Fluid	Power steering system	92-858074K01

Tube Ref No.	Description	Where Used	Part No.
 28	Dexron III Automatic	Power-assisted steering system	Obtain Locally

3. Add the required amount of power-assisted steering fluid to bring the level up to the full cold mark on the dipstick. Do not overfill the reservoir.

**IMPORTANT: All air must be removed from the system or the fluid in the pump may foam during operation and discharge from the pump reservoir. Foamy fluid can cause the power-assisted steering system to malfunction or result in poor steering assist.**

4. With the engine stopped, turn the steering wheel at a moderate rate to the end of travel in each direction, pausing a few seconds at the end of travel to allow any air to bubble from the reservoir. Do this a minimum of five complete cycles. Recheck the fluid level and adjust if necessary.
5. Install the dipstick.

### NOTICE

**Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.**

6. Supply cooling water to the water inlet holes.
7. Start the engine and operate at a fast idle until the engine reaches normal operating temperature. During this time, slowly turn the steering wheel to the end of travel in each direction several times.

**IMPORTANT: The sterndrive must be centered and power-assisted steering fluid must be hot to accurately check the fluid level.**

8. With the engine stopped, center the steering. Remove the dipstick from the reservoir. Allow any foam in the pump reservoir to disperse, then check the fluid level. Do not overfill.
9. If the fluid is still foamy, repeat steps 6 and 7 until the fluid does not foam and the fluid level remains constant.
10. Install the dipstick.

# Power-Assisted Steering Pump

## Removal

### ⚠ WARNING

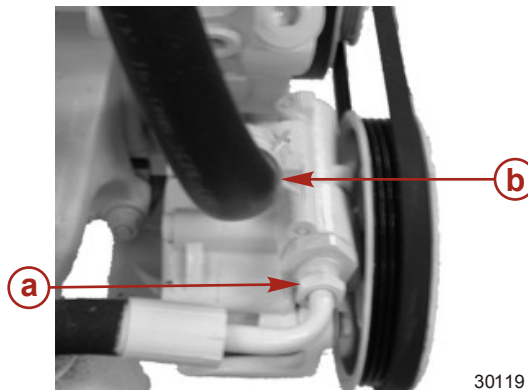
Performing service or maintenance without first disconnecting the battery can cause product damage, personal injury, or death due to fire, explosion, electrical shock, or unexpected engine starting. Always disconnect the battery cables from the battery before maintaining, servicing, installing, or removing engine or drive components.

1. Disconnect both battery cables from the battery.

### ⚠ CAUTION

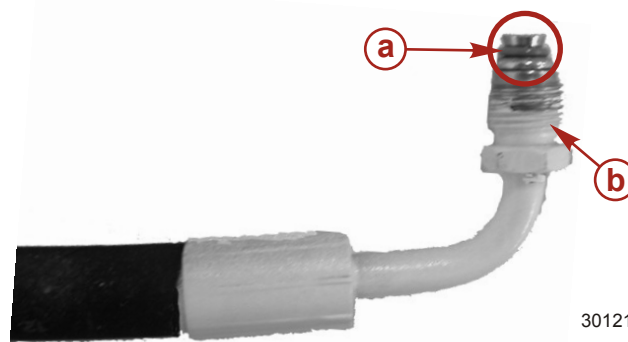
Contamination can damage the hydraulic system or cause the system to malfunction. Failure of power trim or steering components can result in injury or product damage. Ensure that the work area, shop tools and all components are clean and lint free during reassembly.

2. Remove the power-assisted steering pump belt.
3. Remove the reservoir hose and pressure hose from the power-assisted steering pump. Cap or plug all open hydraulic connections.



- a** - Pressure hose and fitting  
**b** - Reservoir hose and clamp

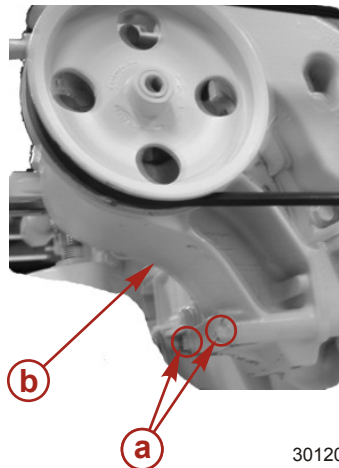
4. Drain the fluid from the power-assisted steering reservoir into a suitable container. Do not reuse the fluid.
5. Inspect the pressure hose fitting O-ring and replace if worn or damaged.



O-ring

Fitting

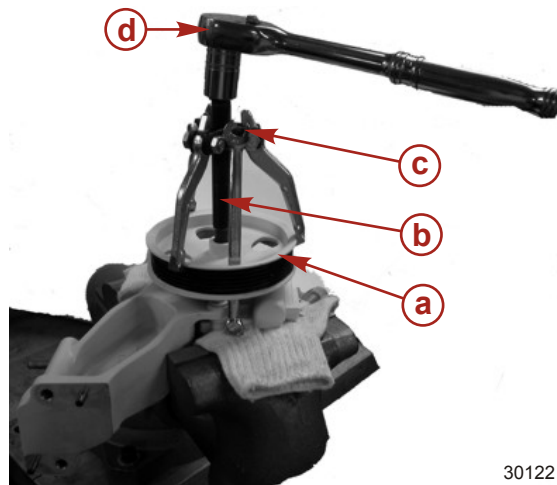
6. Loosen the power-assisted steering pump bracket mounting bolts.



- a** - Bolt (2)
- b** - Bracket

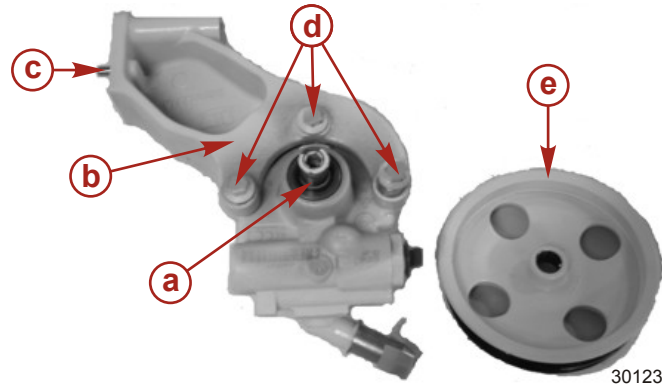
**NOTE:** Pull the power-assisted steering pump bracket straight out from the block to disengage the two dowel pins.

7. Remove the power-assisted steering pump and bracket.
8. Drain the fluid from the power-assisted steering pump into a suitable container. Do not reuse the fluid.
9. Using a suitable puller, remove the pulley from the power-assisted steering pump shaft. Retain the pulley for installation.



- a** - Pulley
- b** - Barring tool
- c** - Three jaw puller
- d** - Drive and socket

10. Loosen the attaching bolts and remove the power-assisted steering pump from the bracket.



- a** - Pump
- b** - Bracket
- c** - Dowel pin
- d** - Bolts (3)
- e** - Pulley

11. Dispose of the fluid properly.

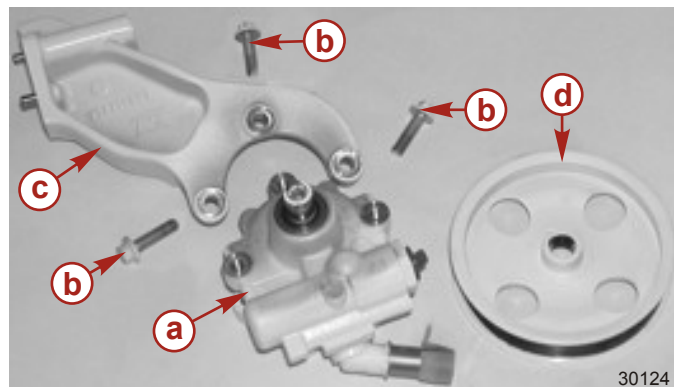
### NOTICE

Discharge of oil, coolant, or other engine/drive fluids into the environment is restricted by law. Use caution not to spill oil, coolant, or other fluids into the environment when using or servicing your boat. Be aware of the local restrictions governing the disposal or recycling of waste, and contain and dispose of fluids as required.

## Cleaning and Inspection

The power-assisted steering pump is not serviceable and must be replaced as a complete assembly.

1. Clean the pump, pulley, and bracket with solvent. Do not allow solvent to enter the body of the power-assisted steering pump.



- a** - Pump
- b** - Bolt (3)
- c** - Bracket
- d** - Pulley

2. Dry the parts with compressed air.

## Inspection

The power-assisted steering pump is not serviceable and must be replaced as a complete assembly.

1. Inspect the power-assisted steering pump bracket for breaks or cracks.
2. Inspect the threads of the power-assisted steering pump to bracket mounting screw holes.
3. Inspect the fluid return line fitting for damage and debris. Cap the fitting when the return line is not installed.
4. Inspect the high pressure line fitting for thread or seal surface damage. Plug the fitting when the high pressure line is not installed.

## Installation

1. Attach the power-assisted steering pump to the bracket and torque the bolts.

Description	Nm	lb-in.	lb-ft
Power-assisted steering pump bolts	25	–	18

2. Place the power-assisted steering pump pulley on to the pump shaft.
3. Thread an appropriately sized screw with a large washer in to the end of the power-assisted steering pump shaft.
4. Using the screw with washer, press the pulley onto the power-assisted steering pump shaft until the pulley face is flush with the shaft end. The screw head and washer should make contact with the shaft end.



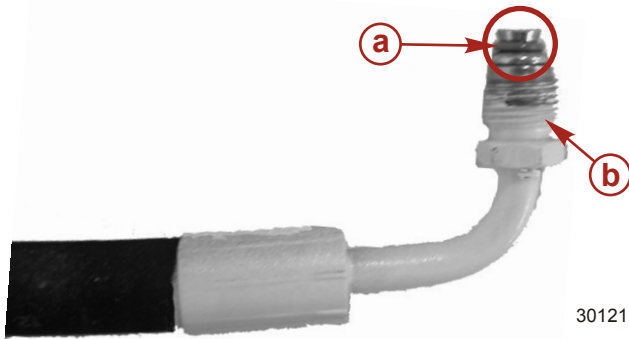
**Pulley installed flush with shaft end**

5. Install the power-assisted steering pump bracket to the engine. Align the dowels and torque the power-assisted steering bracket bolts.

Description	Nm	lb-in.	lb-ft
Power steering bracket bolt	25	–	18

6. Install the reservoir hose and properly position the clamp.

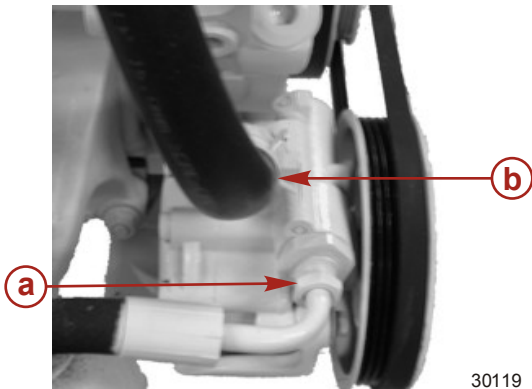
7. Inspect the pressure hose fitting O-ring and replace if worn or damaged. Confirm that the O-ring is properly positioned.



O-ring

Fitting

8. Install the pressure hose on the pump.



- a - Pressure hose and fitting  
b - Reservoir hose and clamp

9. Tighten the pressure hose fitting by hand until finger-tight. Tighten the fitting an additional 1-3/4 to 2-1/4 turns with a wrench. Do not overtighten.

Description	Tightening procedure
Pressure hose fitting	Finger-tight + 1-3/4 to 2-1/4 turns with a wrench. Do not overtighten.

10. Install the power-assisted steering drive belt. See **Section 1B—Maintenance**.

*NOTICE*

Discharge of oil, coolant, or other engine/drive fluids into the environment is restricted by law. Use caution not to spill oil, coolant, or other fluids into the environment when using or servicing your boat. Be aware of the local restrictions governing the disposal or recycling of waste, and contain and dispose of fluids as required.

11. Be sure that power-assisted steering reservoir is completely drained of old fluid into an approved container. Do not reuse fluid. Dispose of properly.
12. Fill the power-assisted steering reservoir with new power-assisted steering fluid.
13. Connect both battery cables.
14. Bleed the air from the power-assisted steering system. See **Filling and Bleeding**.

## Hydraulic Hoses

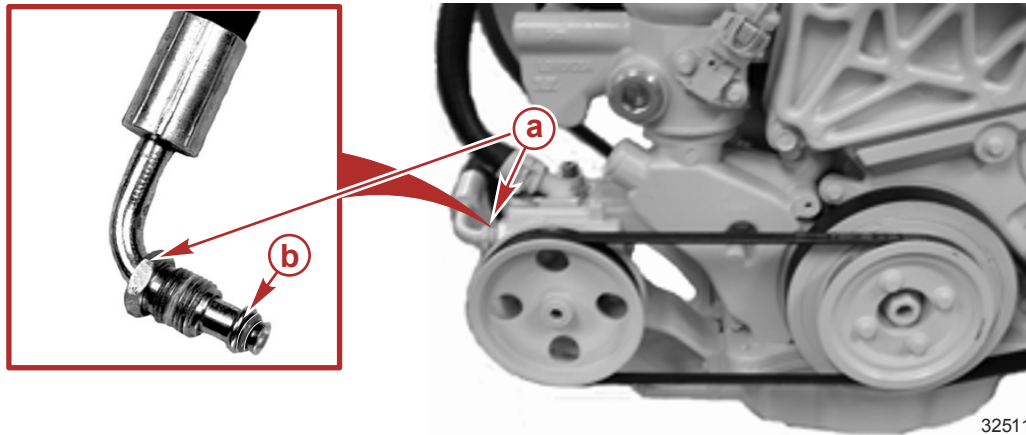
### Pressure Hose—Pump to Control Valve

**NOTE:** Make fluid connections as quickly as possible to avoid fluid loss.

**IMPORTANT:** Cap or plug all open hydraulic connections.

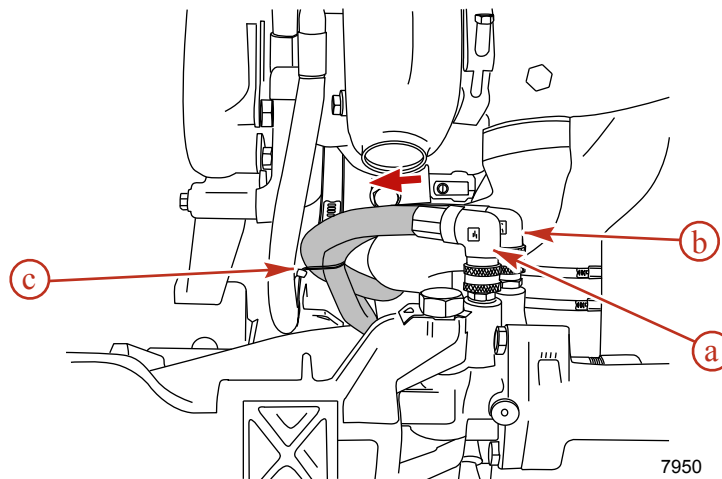
#### REMOVAL

1. Loosen the pressure hose fitting from the power-assisted steering pump. Note the position of the O-ring on the fitting.



- a** - Pressure hose
- b** - O-ring

2. Remove the pressure hose. Note the use of cable ties and the routing to the control valve.
3. Disconnect the pressure hose quick-connect fitting from the control valve.



- a** - Pressure hose—rear fitting
- b** - Return hose—front fitting
- c** - Cable tie

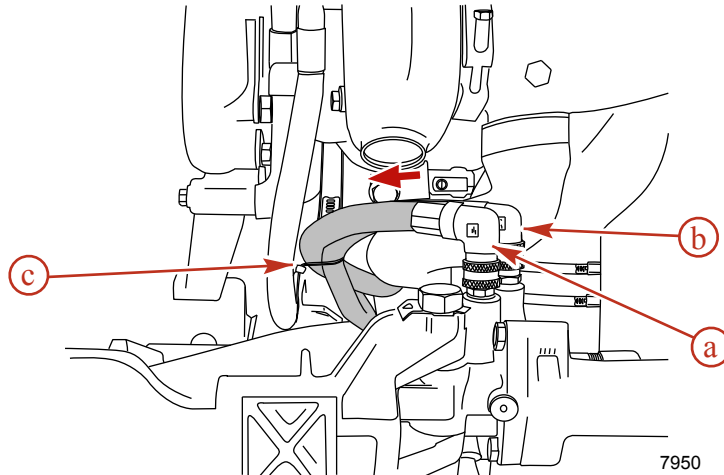


## INSTALLATION

### ⚠ WARNING

Stress on hose fittings or kinks in the hoses can damage hydraulic steering components, leading to serious injury or death due to loss of boat control. Extreme heat can lower the hoses' burst pressure or melt the hose. Route hydraulic hoses to avoid kinks, heat sources, or stress on the hose fittings.

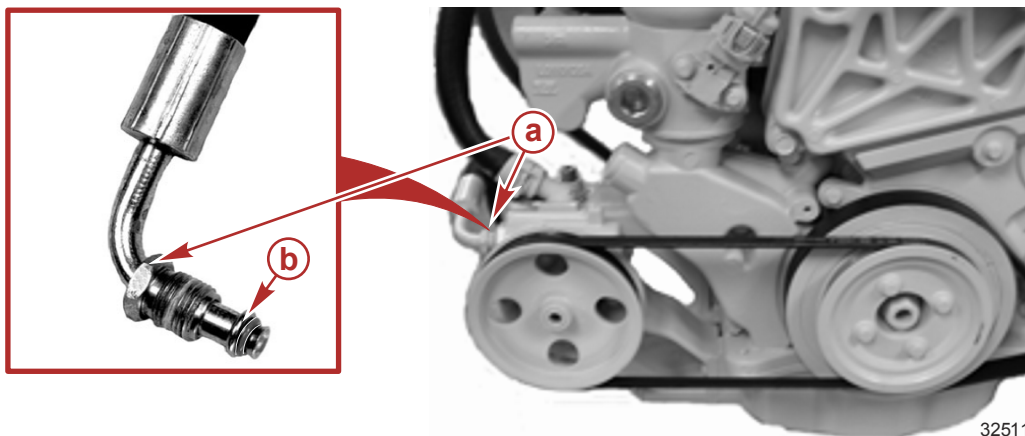
1. Route the hose as previously noted in removal, secure with cable ties.
2. Connect the pressure hose to the control valve. Ensure that the quick-connect fitting snaps into place.



- a** - Pressure hose—rear fitting
- b** - Return hose—front fitting
- c** - Cable tie

**IMPORTANT:** Do not cross the threads or over-tighten the hose fitting.

3. Ensure there is a new O-ring on the pressure hose fitting. Install the fitting into the power-assisted steering pump.
4. Torque the pressure hose fitting.



- a** - Pressure hose
- b** - O-ring



Description	Tightening procedure
Pressure hose fitting	Finger-tight + 1-3/4 to 2-1/4 turns with a wrench. Do not overtighten.

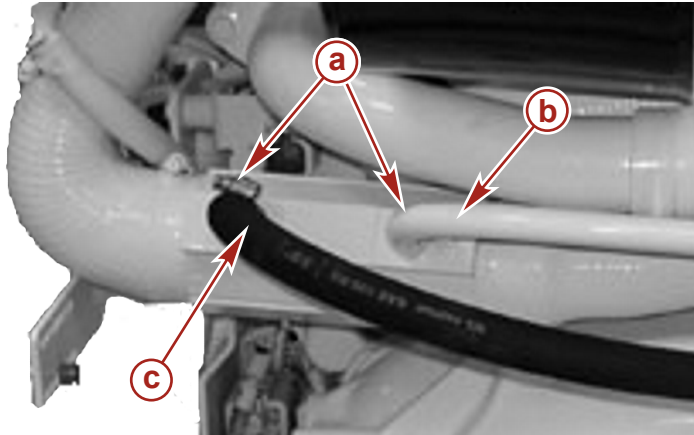
## Return Hose to Control Valve

**NOTE:** Make fluid connections as quickly as possible to avoid fluid loss.

**IMPORTANT:** Cap or plug all open hydraulic connections.

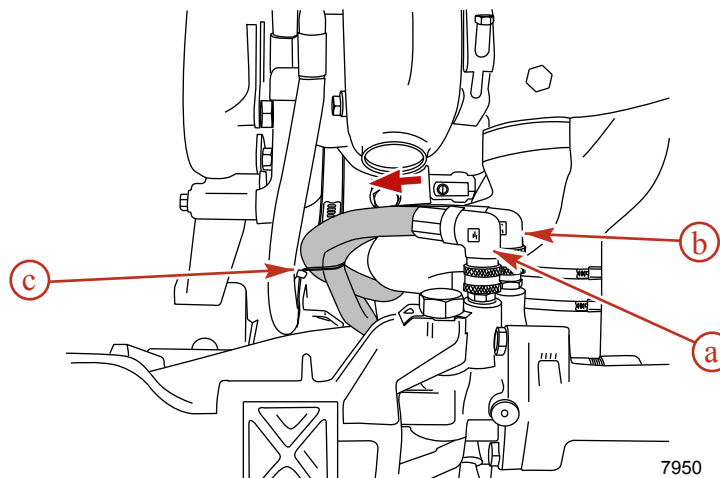
### REMOVAL

1. Loosen the clamp on the return hose from the control valve at the fluid cooler for the power-assisted steering.



- a** - Hose clamp
- b** - Return hose to fluid reservoir
- c** - Return hose from control valve

2. Remove the return hose. Note the use of cable ties and the routing to the control valve.
3. Disconnect the return hose quick-connect fitting from the control valve.



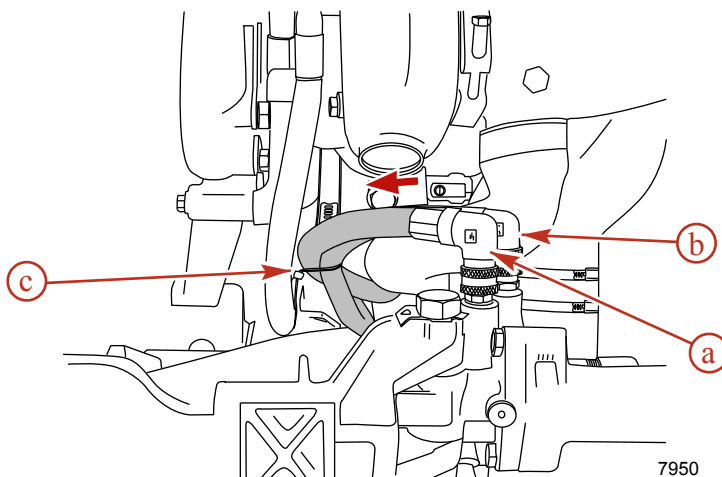
- a** - Pressure hose—rear fitting
- b** - Return hose—front fitting
- c** - Cable tie

## INSTALLATION

### ⚠ WARNING

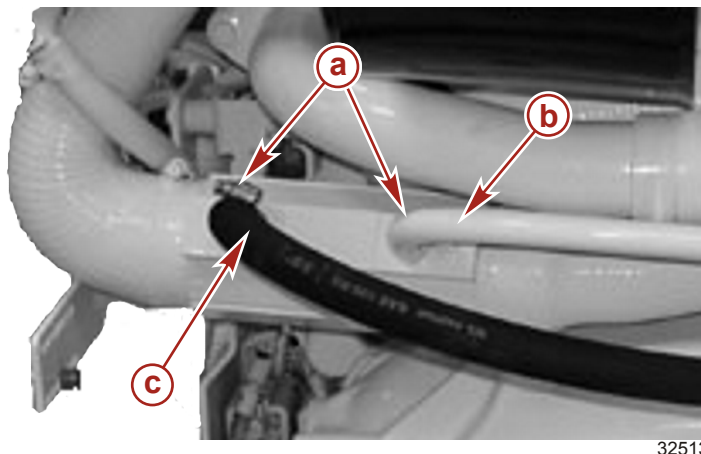
Stress on hose fittings or kinks in the hoses can damage hydraulic steering components, leading to serious injury or death due to loss of boat control. Extreme heat can lower the hoses' burst pressure or melt the hose. Route hydraulic hoses to avoid kinks, heat sources, or stress on the hose fittings.

1. Route the hose as previously noted in removal, secure with cable ties.
2. Connect the return hose to the control valve. Ensure that the quick-connect fitting snaps into place.



- a** - Pressure hose—rear fitting
- b** - Return hose—front fitting
- c** - Cable tie

3. Install the return hose onto the fitting at the fluid cooler.
4. Securely tighten the clamp on the return hose.



- a** - Hose clamp
- b** - Return hose to fluid reservoir
- c** - Return hose from control valve

## Fluid Cooler

For information and procedures regarding the removal, cleaning, inspection, and installation of the fluid cooler for the power-assisted steering system, refer to **Section 6**.

## Notes: