

## 2008 STEERING

### Power Steering - Ranger

## SPECIFICATIONS

### MATERIAL SPECIFICATIONS

Item	Specification	Fill Capacity
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V	1L (2.1 pt) <sup>a</sup>
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1- C (Canada)	ESA-M1C75-B	-

<sup>a</sup> Capacities listed are average system capacities and may vary.

### TORQUE SPECIFICATIONS

Description	Nm	lb-ft
Inner tie rod	100	74
Lower steering column shaft-to-steering gear bolt	55	41
Outer tie-rod end nut	80	59
Power steering fluid cooler nuts	40	30
Power steering fluid reservoir bolts	14	10
Power steering fluid reservoir nut (3.0L)	14	10
Pressure line-to-pump fitting	65	48
Power steering pump bolts (2.3L)	23	17
Power steering pump bolts (3.0L and 4.0L)	25	18
Power steering pump pulley bolts (3.0L and 4.0L)	25	18
Steering gear nuts	150	111
Steering line clamp plate nut	35	26
Tie-rod jam nut	80	59

## DESCRIPTION & OPERATION

### POWER STEERING

The power steering system consists of the following components:

- Power steering pump
- Power steering fluid reservoir
- Power steering pressure and return lines/hoses

- Power steering fluid cooler
- Power steering gear
- Inner tie rod

The power steering system uses a vane-type pump to move the fluid from the reservoir to the steering gear and through the rest of the steering hydraulic system. The power steering pump is mounted to the engine and driven by the engine accessory drive belt. Power steering fluid flows into the pump from the reservoir. The power steering fluid is then trapped between the pump vanes and moved to the high-pressure side of the pump creating a flow of fluid. The restriction of this flow by the steering gear creates the pressure that provides the steering assist. A combined pressure relief/flow valve is built into the pump to control the maximum pressure and flow provided to the steering system. This action prevents damage to the system and provides the correct level of assist during all engine speeds. While under pressure, the power steering fluid flows through the high-pressure power steering line to the steering gear. The fluid exits the gear and flows through the return line, cooler and finally to the reservoir. The reservoir slows the fluid, allows air to escape and filters the fluid before returning it to the pump.

## DIAGNOSTIC TESTS

### POWER STEERING

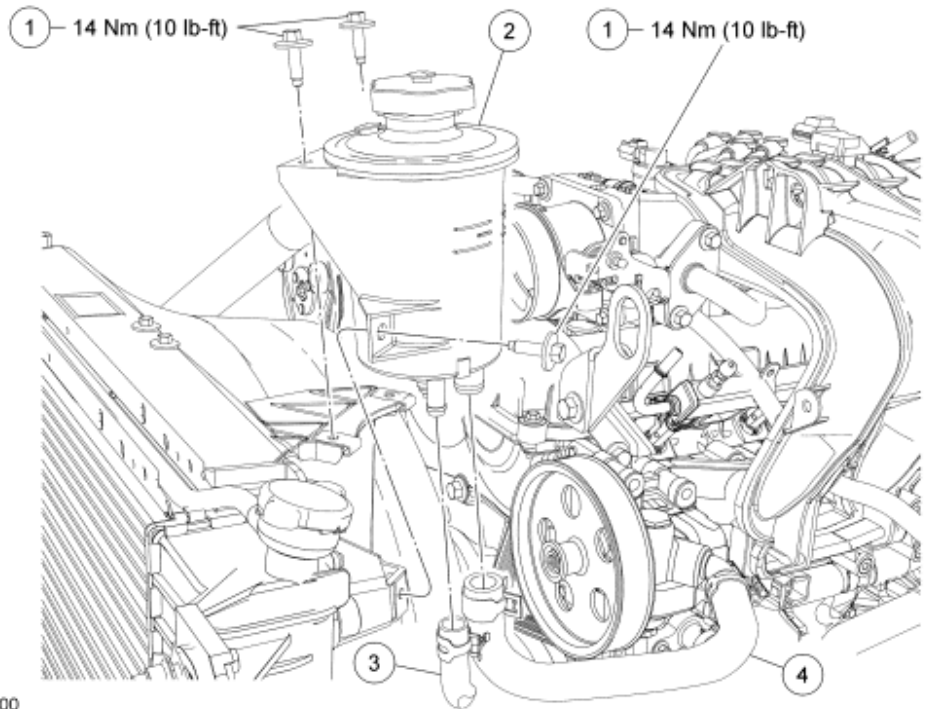
Refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

## REMOVAL & INSTALLATION

### POWER STEERING FLUID RESERVOIR - 2.3L & 4.0L

#### Material

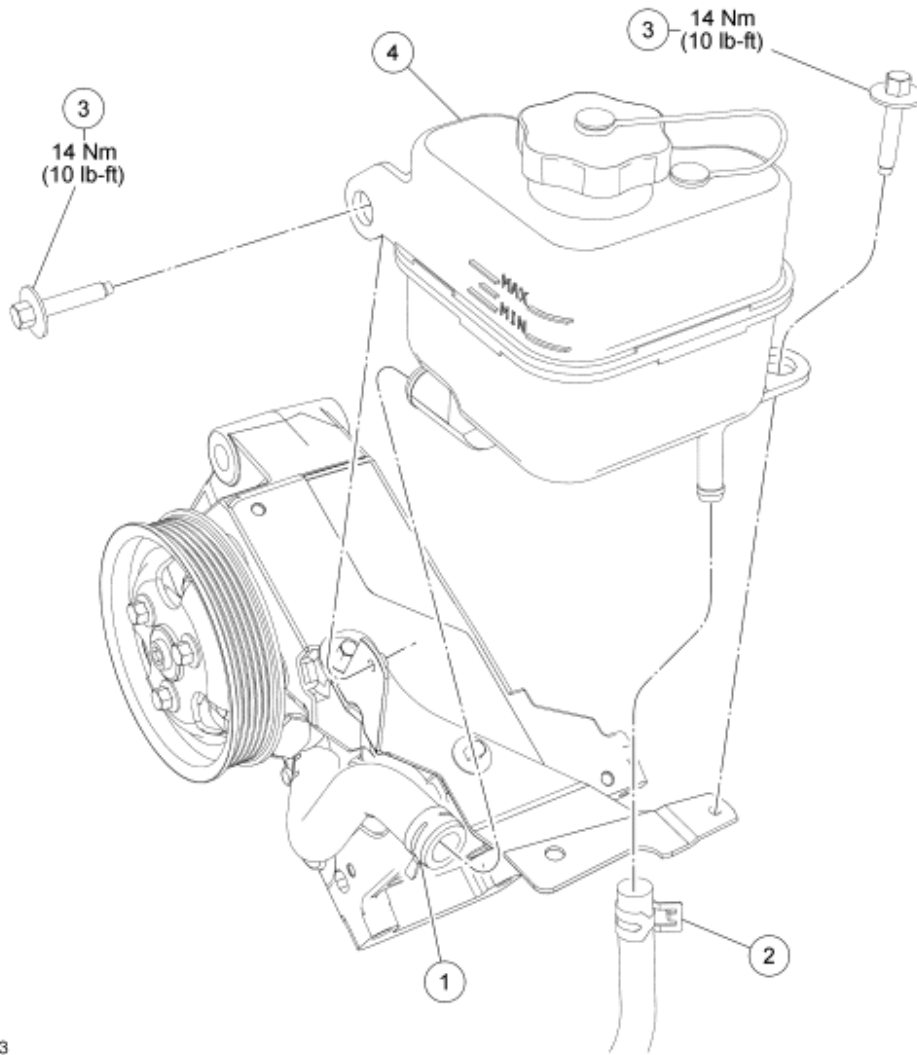
Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V



N0074100

**Fig. 1: Identifying Power Steering Fluid Reservoir - 2.3L With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	W503924	Power steering fluid reservoir bolts (3 required)
2	3R700	Power steering fluid reservoir
3	3A713	Return hose
4	3659	Power steering pump supply hose



N0043843

**Fig. 2: Exploded View Of Power Steering Fluid Reservoir - 4.0L Engine With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	3659	Power steering pump supply hose
2	3A005	Return hose
3	N606678	Power steering fluid reservoir bolts (2 required)
4	3R700	Power steering fluid reservoir

#### REMOVAL & INSTALLATION

**CAUTION:** While repairing the power steering system, care should be taken to prevent the entry of foreign material or failure of the power steering

**components may result.**

**All vehicles**

**CAUTION: Do not allow power steering fluid to contact the engine accessory drive belt or the belt may be damaged.**

1. Using a suitable suction device, remove the power steering fluid from the reservoir.
2. Compress the clamp and disconnect the return hose.
3. Compress the clamp and disconnect the power steering pump supply hose.

**2.3L engines**

4. Remove the 3 bolts and the power steering fluid reservoir.
  - To install, tighten to 14 Nm (10 lb-ft).

**4.0L engines**

5. Remove the 2 bolts and the power steering fluid reservoir.
  - To install, tighten to 14 Nm (10 lb-ft).

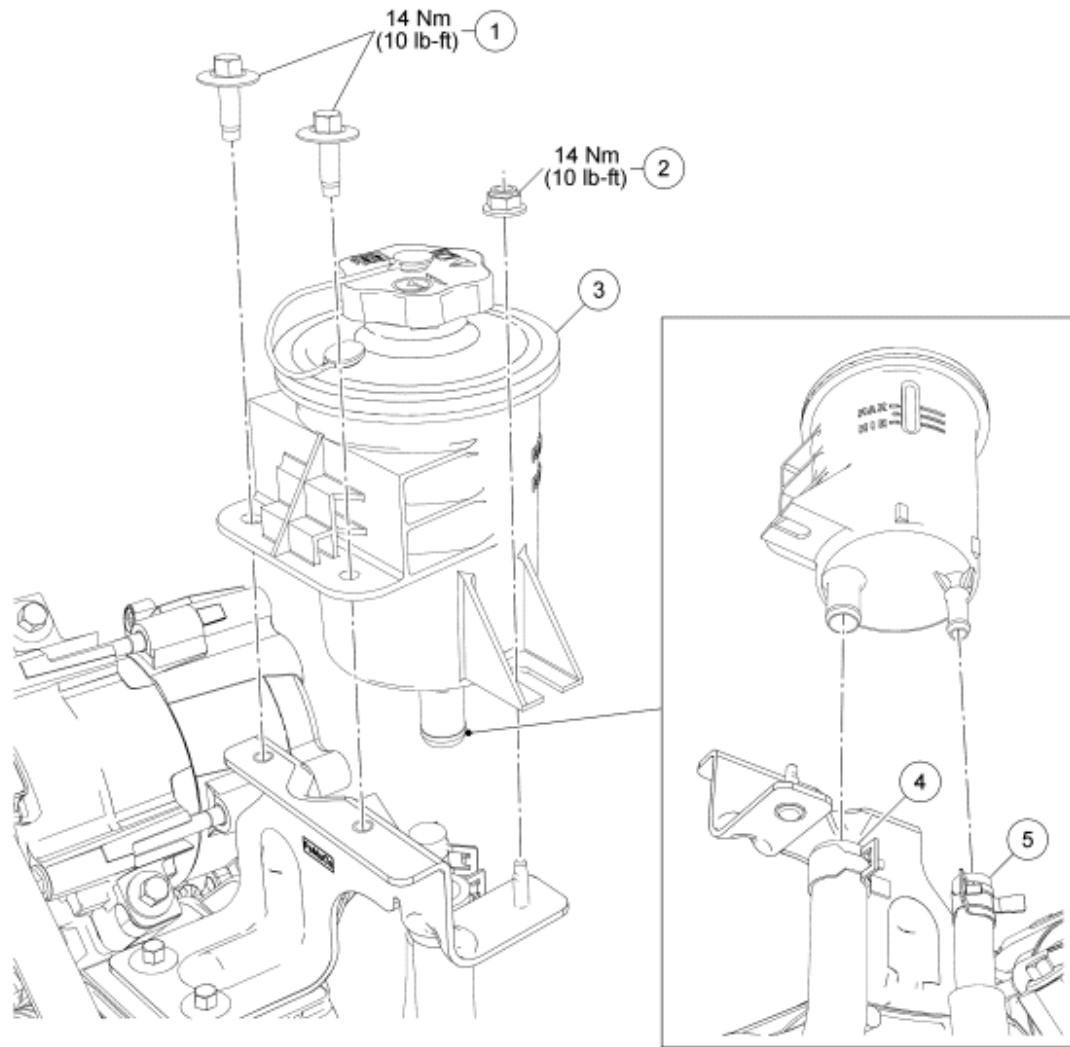
**All vehicles**

6. To install, reverse the removal procedure.
7. Fill the power steering system. For additional information, refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

**POWER STEERING FLUID RESERVOIR - 3.0L**

**Material**

<b>Item</b>	<b>Specification</b>
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V



N0050200

**Fig. 3: Exploded View Of Power Steering Fluid Reservoir - 3.0L Engine With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	W503923	Power steering fluid reservoir bolts (2 required)
2	W520101	Power steering fluid reservoir nut
3	3R700	Power steering fluid reservoir
4	CS7617	Power steering pump supply hose
5	3F731	Return hose

#### REMOVAL & INSTALLATION

**CAUTION:** While repairing the power steering system, care should be taken to

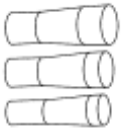
prevent the entry of foreign material or failure of the power steering components may result.

**CAUTION: Do not allow power steering fluid to contact the engine accessory drive belt or the belt may be damaged.**

1. Using a suitable suction device, remove the power steering fluid from the reservoir.
2. Compress the clamp and disconnect the return hose.
3. Compress the clamp and disconnect the power steering pump supply hose.
4. Remove the power steering fluid reservoir nut.
  - To install, tighten to 14 Nm (10 lb-ft).
5. Remove the 2 bolts and the power steering fluid reservoir.
  - To install, tighten to 14 Nm (10 lb-ft).
6. To install, reverse the removal procedure.
7. Fill the power steering system. For additional information, refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

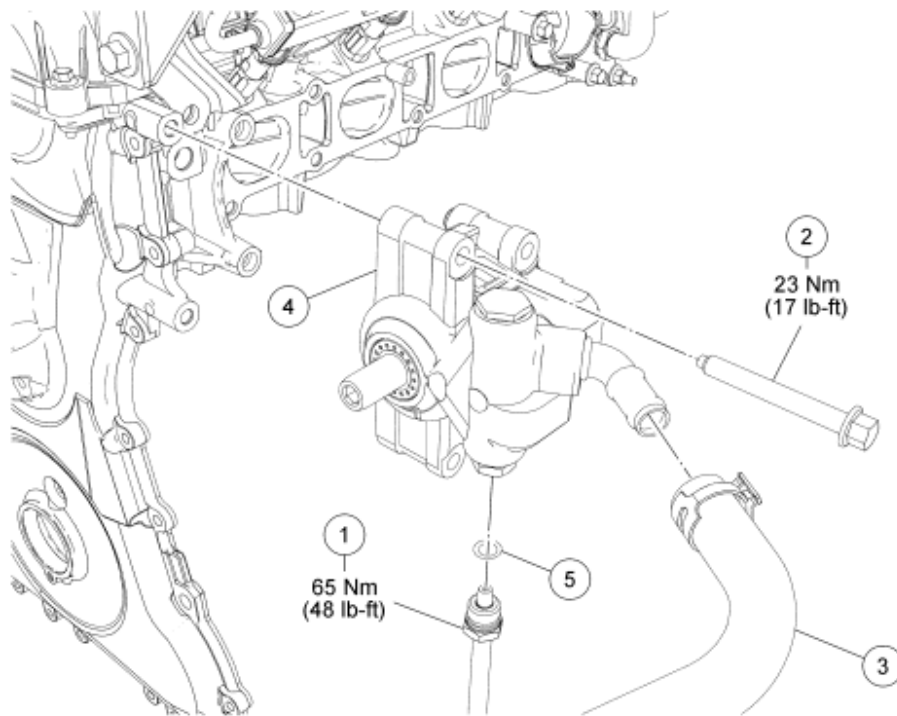
## POWER STEERING PUMP - 2.3L

### Special Tools

Illustration	Tool Name	Tool Number
 <p>ST1444-A</p>	Installer Set, Teflon® Seal	211-D027 (D90P-3517-A) or equivalent

### Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V



N0074019

**Fig. 4: Identifying Power Steering Pump - 2.3L With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	3A719	Pressure line-to-pump fitting
2	W705952	Power steering pump bolt (4 required)
3	C56697	Power steering pump supply hose
4	3A674	Power steering pump
5	N803257	Teflon® seal

#### REMOVAL & INSTALLATION

**CAUTION:** While repairing the power steering system, care should be taken to prevent the entry of foreign material or failure of the power steering components may result.

**CAUTION:** Do not allow power steering fluid to contact the accessory drive belt or the belt may be damaged.

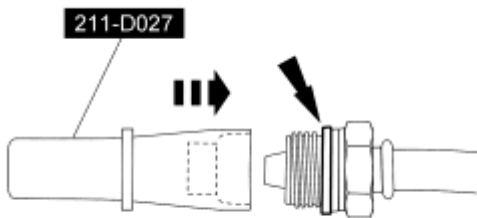
1. Using a suitable suction device, remove the power steering fluid from the reservoir.
2. Remove the power steering pump pulley. For additional information, refer to **Power Steering Pump Pulley - 2.3L**.
3. Compress the clamp and disconnect the power steering pump supply hose.



4. Disconnect the pressure line-to-pump fitting.
  - Remove and discard the Teflon® seal.
  - To install, tighten to 65 Nm (48 lb-ft).
5. Remove the 4 power steering pump bolts and the power steering pump.
  - To install, tighten to 23 Nm (17 lb-ft).

**CAUTION: A new Teflon® seal must be installed any time the pressure line fitting is disconnected from the power steering pump or a fluid leak may occur.**

6. To install, reverse the removal procedure.
  - Using the special tool, install a new Teflon® seal on the pressure line-to-pump fitting.
  - Fill the power steering system. For additional information, refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

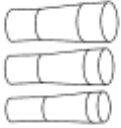


N0032102

**Fig. 5: Installing Teflon(R) Seal Using Special Tool**  
 Courtesy of FORD MOTOR CO.

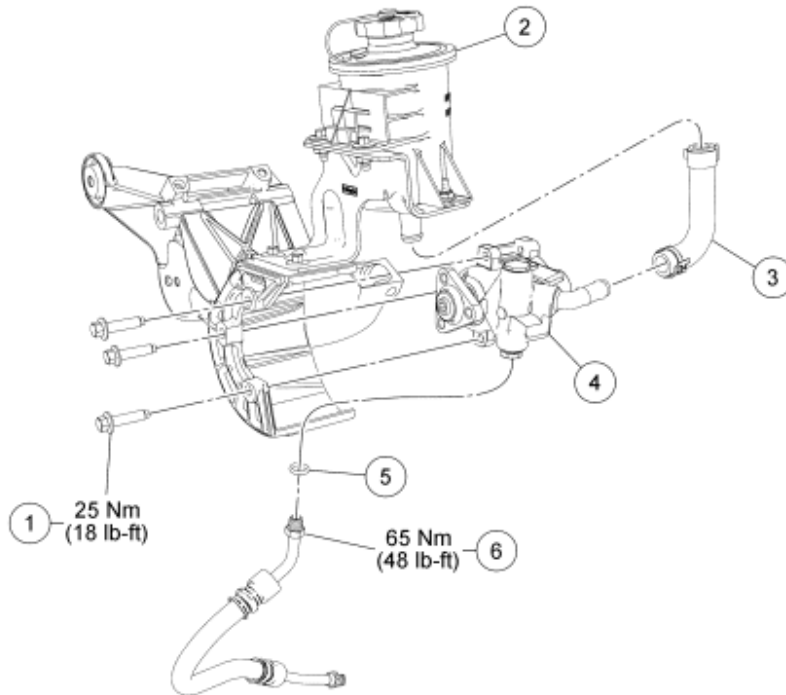
## POWER STEERING PUMP - 3.0L

### Special Tools

Illustration	Tool Name	Tool Number
 ST1444-A	Installer Set, Teflon® Seal	211-D027 (D90P-3517-A) or equivalent

### Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V



N0049931

**Fig. 6: Exploded View Of Power Steering Pump - 3.0L Engine With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	N605784	Power steering pump bolt (3 required)
2	3R700	Power steering fluid reservoir
3	CS7617	Power steering pump supply hose
4	3A674	Power steering pump
5	N803257	Teflon® seal
6	3A719	Pressure line-to-pump fitting

## REMOVAL & INSTALLATION

**CAUTION:** While repairing the power steering system, care should be taken to prevent the entry of foreign material or failure of the power steering components may result.

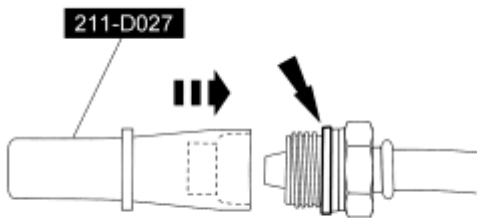
**CAUTION:** Do not allow power steering fluid to contact the engine accessory drive belt or the belt may be damaged.

1. Using a suitable suction device, remove the power steering fluid from the reservoir.
2. Remove the power steering pump pulley. For additional information, refer to **Power Steering Pump Pulley - 3.0L, 4.0L**.
3. Disconnect the pressure line-to-pump fitting

- Remove and discard the Teflon® seal.
  - To install, tighten to 65 Nm (48 lb-ft).
4. Compress the clamp and disconnect the power steering pump supply hose.
  5. Remove the 3 bolts and the power steering pump.
    - To install, tighten to 25 Nm (18 lb-ft).

**CAUTION: A new Teflon® seal must be installed any time the pressure line fitting is disconnected from the power steering pump or a fluid leak may occur.**

6. To install, reverse the removal procedure.
  - Using the special tool, install a new Teflon® seal on the pressure line-to-pump fitting.
  - Fill the power steering system. For additional information, refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

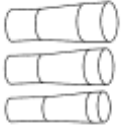


N0032102

**Fig. 7: Installing Teflon(R) Seal Using Special Tool**  
Courtesy of FORD MOTOR CO.

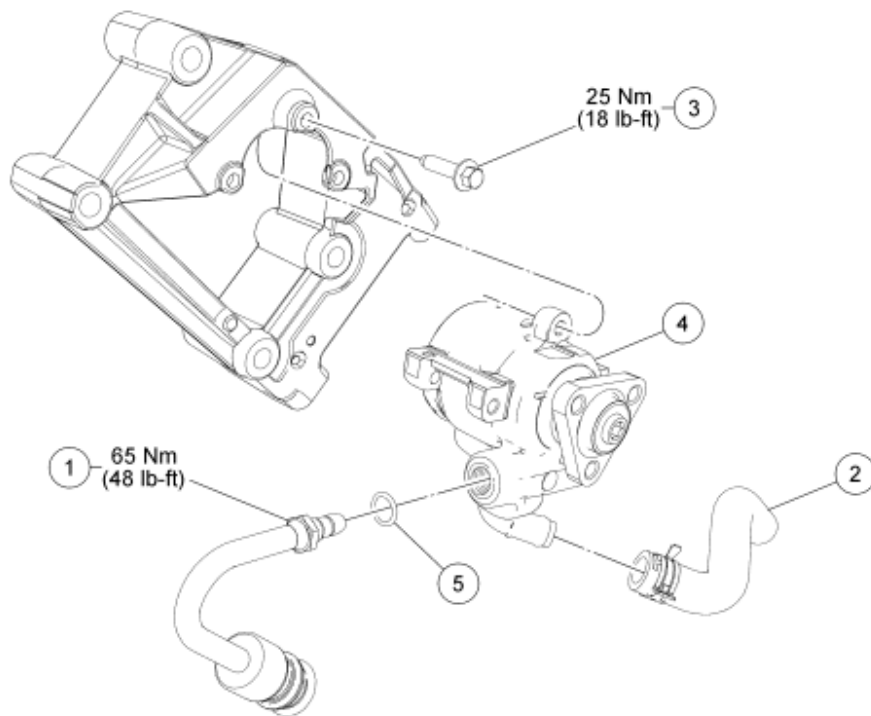
## POWER STEERING PUMP - 4.0L

### Special Tools

Illustration	Tool Name	Tool Number
 ST1444-A	Installer Set, Teflon® Seal	211-D027 (D90P-3517-A) or equivalent

### Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V



N0074020

**Fig. 8: Exploded View Of Power Steering Pump - 4.0L With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	3A719	Pressure line-to-pump fitting
2	3659	Power steering pump supply hose
3	W700839	Power steering pump bolt (3 required)
4	3A674	Power steering pump
5	N803257	Teflon® seal

#### REMOVAL & INSTALLATION

**CAUTION:** While repairing the power steering system, care should be taken to prevent the entry of foreign material or failure of the power steering components may result.

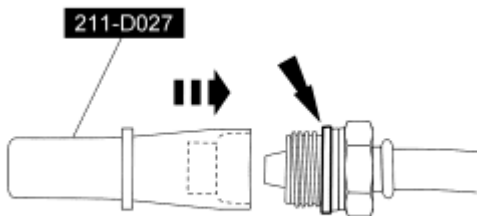
**CAUTION:** Do not allow power steering fluid to contact the accessory drive belt or the belt may be damaged.

1. Using a suitable suction device, remove the power steering fluid from the reservoir.
2. Remove the engine cooling fan. For additional information, refer to **ENGINE COOLING** article.
3. Remove the power steering pump pulley. For additional information, refer to **Power Steering Pump Pulley - 3.0L, 4.0L**.

4. Compress the clamp and disconnect the power steering pump supply hose from the power steering fluid reservoir.
5. Disconnect the pressure line-to-pump fitting.
  - To install, tighten to 65 Nm (48 lb-ft).
6. Compress the clamp and disconnect the power steering pump supply hose from the power steering pump.
7. Remove the 3 bolts and the power steering pump.
  - Tighten to 25 Nm (18 lb-ft).

**CAUTION: A new Teflon® seal must be installed any time the pressure line is disconnected from the power steering pump or a fluid leak may occur.**

8. To install, reverse removal procedure.
  - Using the special tool, install a new Teflon® seal on the pressure line-to-pump fitting.
  - Fill the power steering system. For additional information, refer to **STEERING SYSTEM - GENERAL INFORMATION** article.

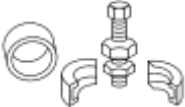


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**Fig. 9: Installing Teflon(R) Seal Using Special Tool**  
 Courtesy of FORD MOTOR CO.

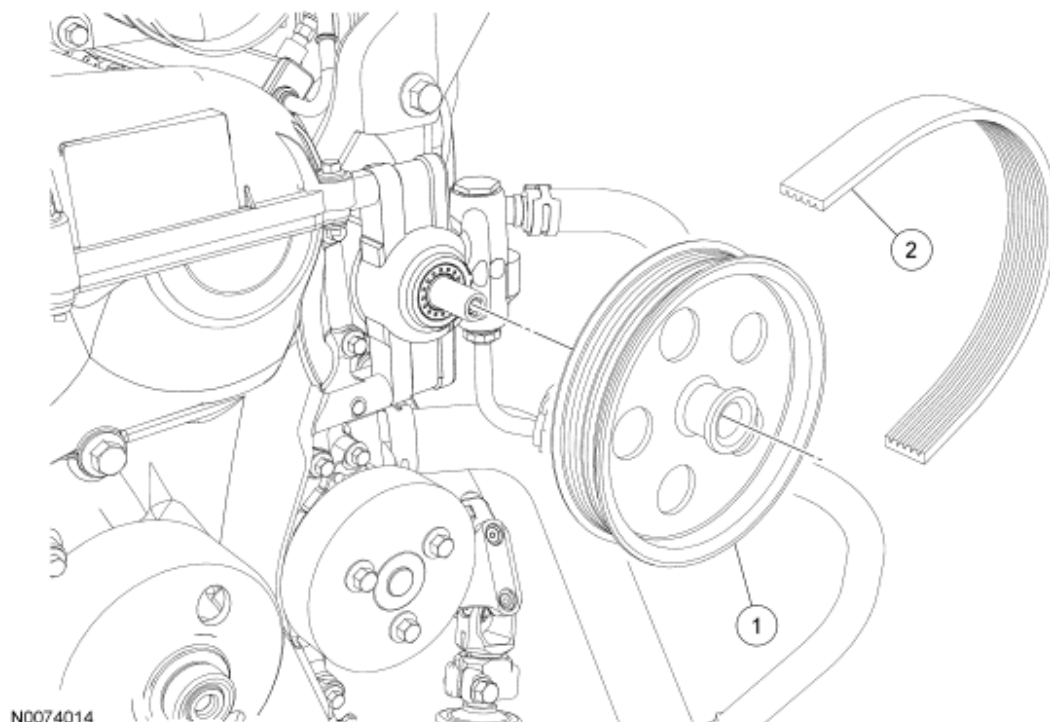
## POWER STEERING PUMP PULLEY - 2.3L

### Special Tools

Illustration	Tool Name	Tool Number
 <p>ST1290-A</p>	Remover, Power Steering Pump Pulley	211-016 (T69L-10300-B)
	Installer, Power Steering Pump Pulley	211-185 (T91P-3A733-A)



ST1586-A

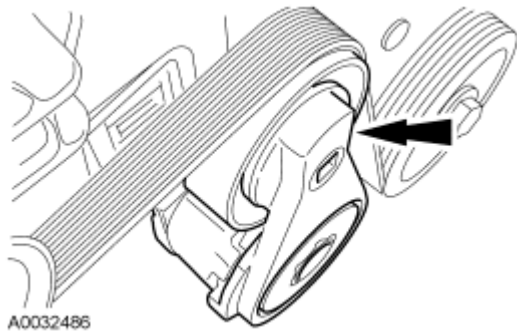


**Fig. 10: Identifying Power Steering Pump Pulley - 2.3L**  
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	3D673	Power steering pump pulley
2	8620	Accessory drive belt

## REMOVAL

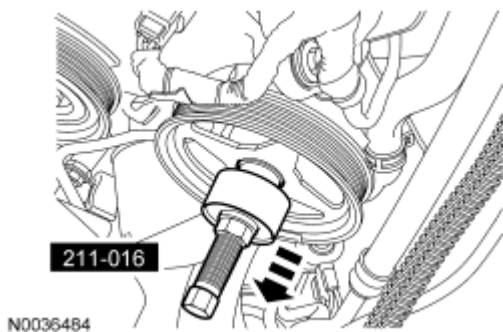
1. Remove the air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING** article.
2. Rotate the accessory drive belt tensioner counterclockwise and position the accessory drive belt aside.



**Fig. 11: Locating Accessory Drive Belt Tensioner**  
Courtesy of FORD MOTOR CO.

**CAUTION:** Do not install a power steering pump pulley that has been removed and installed twice or pulley failure and/or pump damage may occur. Inspect the pulley for paint marks in the web area near the hub. If there are 2 paint marks, discard the pulley and install a new one. If there is 1 paint mark or no paint marks, use a paint pencil to mark the web area of the pulley near the hub.

3. Using the special tool, remove the power steering pump pulley.



**Fig. 12: Removing Pulley Using Special Tool (211-016)**  
Courtesy of FORD MOTOR CO.

## INSTALLATION

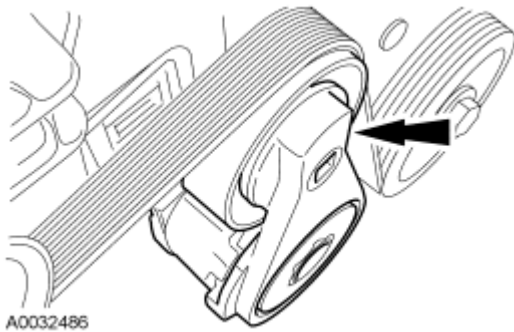
1. Using the special tool, install the power steering pump pulley.



**Fig. 13: Installing Pulley Using Special Tool (211-185)**  
Courtesy of FORD MOTOR CO.

**NOTE:** For additional information on accessory drive belt routing, refer to **ACCESSORY DRIVE** article.

2. Rotate the tensioner counterclockwise and position the belt on the power steering pump pulley.

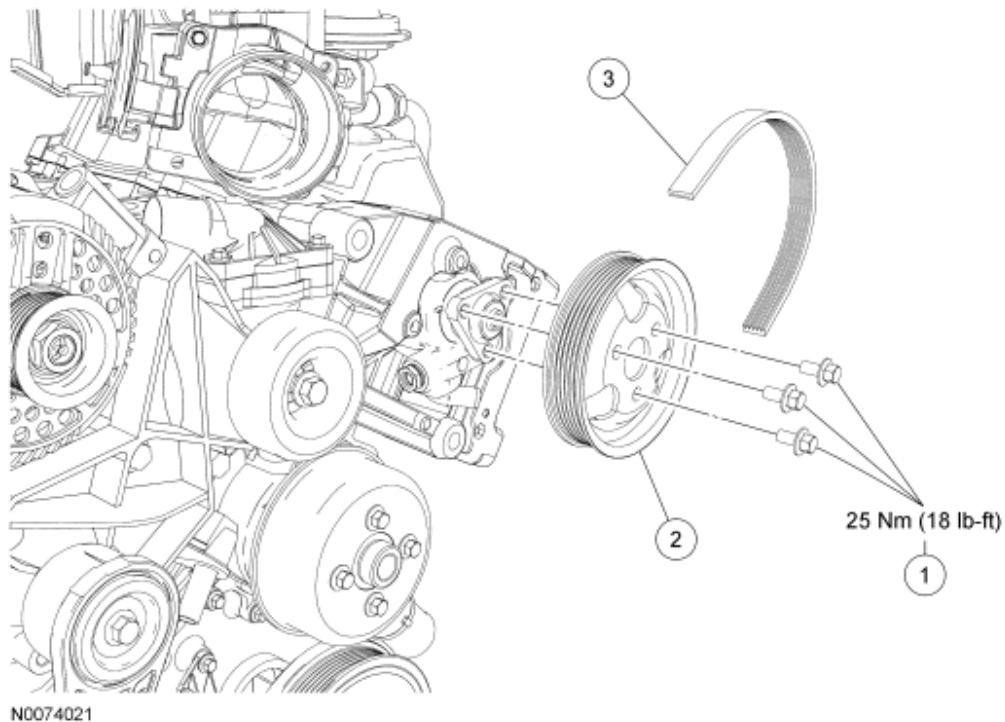


**Fig. 14: Locating Accessory Drive Belt Tensioner**  
Courtesy of FORD MOTOR CO.

3. Install the air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING** article.

**POWER STEERING PUMP PULLEY - 3.0L, 4.0L**





**Fig. 15: Identifying Power Steering Pump Pulley - 3.0L, 4.0L With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	N605784	Power steering pump pulley bolts (3 required)
2	3A733	Power steering pump pulley
3	8620	Accessory drive belt

## REMOVAL & INSTALLATION

**NOTE:** 4.0L engine shown in illustration, 3.0L engine similar.



1. Loosen the power steering pump pulley bolts.

**NOTE:** For additional information on accessory drive belt routing, refer to ACCESSORY DRIVE article.

2. Rotate the accessory drive belt tensioner counterclockwise and position the accessory drive belt aside.
3. Remove the 3 bolts and the power steering pump pulley.
  - To install, tighten to 25 Nm (18 lb-ft).
4. To install, reverse the removal procedure.

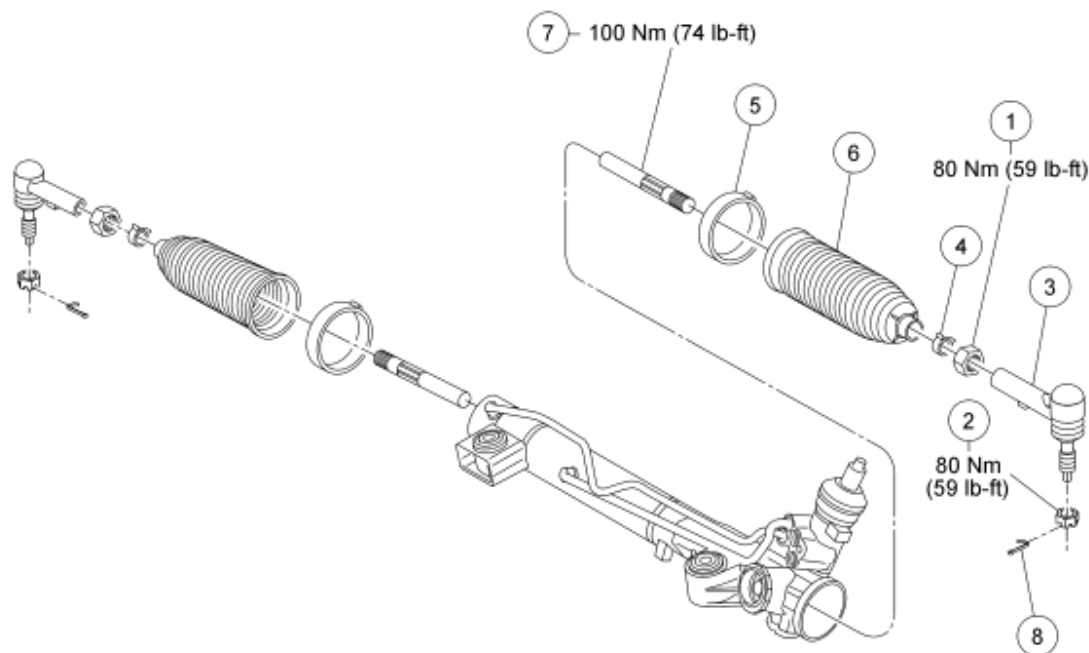
## INNER TIE ROD

## Special Tools

Illustration	Tool Name	Tool Number
 ST1427-A	Inner Tie-Rod Socket Tool	211-D029 or equivalent
 ST1408-A	Tie-Rod End Separator	211-105 (T85M-3395-A) or equivalent

## Material

Item	Specification
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B



N0073932

**Fig. 16: Identifying Inner Tie Rod With Torque Specifications**  
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	N803637	Tie-rod jam nut (part of 3280) (2 required)

2	N800895	Outer tie-rod end nut (2 required)
3	3290	Outer tie-rod end (2 required)
4	3K745	Outer bellows boot clamp (2 required)
5	3C650A	Inner bellows boot clamp (2 required)
6	3K661	Steering gear bellows boot (2 required)
7	3280	Inner tie rod (2 required)
8	N642569	Cotter pin (2 required)

## REMOVAL & INSTALLATION

**CAUTION:** The boots and clamps are designed to provide an airtight seal and protect the internal components of the steering gear. If the seal is not airtight, the vacuum generated during turning may draw water and foreign material into the gear and damage internal components. Zip ties do not produce an airtight seal and must not be used.

**CAUTION:** The inner ball joint grease is not compatible with water. Water and foreign material trapped in the grease may damage the joint.

**CAUTION:** If present, the orientation of the vent tubes must be noted so the boots and vent tubes may be installed in their original locations. Incorrect venting may lead to internal component damage.

### Coil spring suspension vehicles

1. Remove the wheel and tire. For additional information, refer to **WHEELS & TIRES** article.
2. Loosen the tie-rod jam nuts.
  - To install, tighten to 80 Nm (59 lb-ft).
3. Remove the outer tie-rod end cotter pin and nut.
  - Discard the cotter pin.
  - To install, tighten to 80 Nm (59 lb-ft).

**CAUTION:** Do not damage the tie-rod end boot when installing the special tool.

4. Using the special tool, disconnect the outer tie-rod end.

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