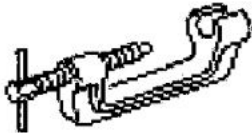




REMOVAL AND INSTALLATION

STEERING GEAR

	C-Frame and Screw 211-023 (T74P-3044-A1)
	Inner Tie-Rod Socket Tool 211-D029 or equivalent
	Boot Clamp Pliers 205-D067 (D87P-1098-A) or equivalent

G03180381

Fig. 11: Identifying Special Tool(S)
Courtesy of FORD MOTOR CO.

MATERIAL SPECIFICATION

Item	Specification
Steering Gear Grease C3AZ-19578-A	ESW-M1C87-A

CAUTION: While repairing the power steering system, care should be taken to prevent the entry of contaminants or premature failure of the power steering components can result.

NOTE: New O-ring seals must be installed any time the lines are disconnected from the steering gear.

1. With the vehicle in NEUTRAL, position the vehicle on a hoist. For additional information, REFER to **JACKING & LIFTING** .
2. Remove the wheel and tire assembly. For additional information, REFER to **SUSPENSION SYSTEM** .

CAUTION: Do not allow the steering column shaft to rotate while the intermediate shaft is disconnected or damage to the clockspring can result. If there is evidence that the shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to **CLOCKSPRING CENTERING** .

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 will draw water and contamination into the gear causing premature damage.

CAUTION: Zip ties do not produce an airtight seal and must not be used.

CAUTION: The inner ball joint grease is not compatible with water and contamination trapped in the grease will degrade the life of the joint.

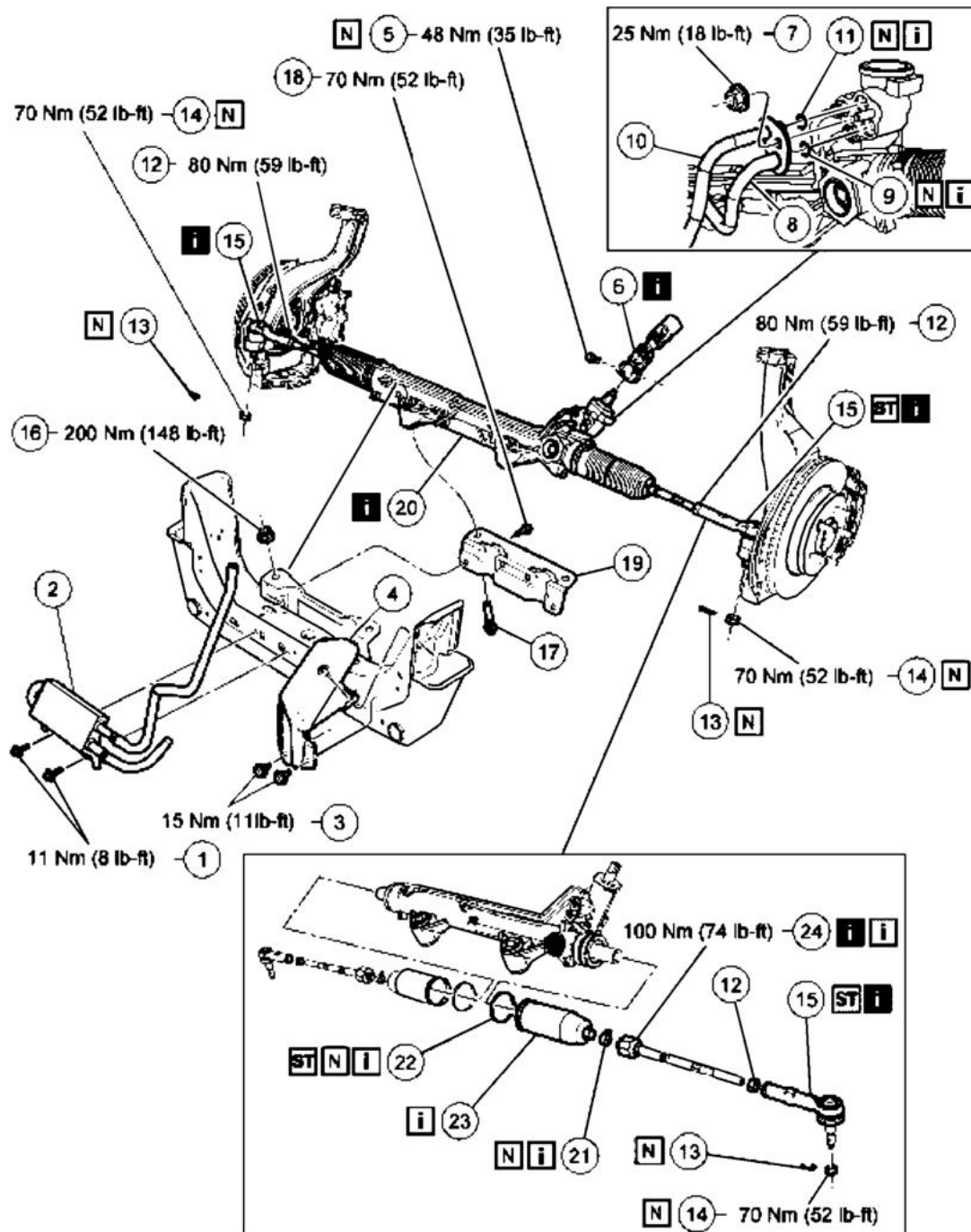
CAUTION: If present, the orientation of the vent tube must be noted so the boots and vent tubes can be installed in the correct location.

3. Remove the parts in the order indicated in the following illustration and table.

To remove individual parts, only carry out the listed steps:

PARTS SPECIFICATION

Part	Steps
Steering gear O-rings	7-11
Inner tie-rod	12-15,21-24
Steering gear	1-20
Outer tie-rod end	12-15



G03180382

Fig. 12: Identifying Removal Order Of Steering Gear (1 Of 2)
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	W708261-S301	Fluid cooler-to-crossmember bolts
2	3D746	Fluid cooler
3	W707079-S	Oil shield-to-crossmember bolts
4	6N634	Oil shield
5	N803942-S	Intermediate shaft-to-steering gear bolt
6	3C662	Intermediate shaft (detach only) Removal Note
7	W704331-S427	Clamp plate-to-steering gear nut
8	3A719	Power steering high-pressure line
9	3F886-AA	O-ring Installation Note
10	—	Power steering return line (part of 3D746)
11	3F886-BA	O-ring Installation Note
12	—	Tie-rod jam nuts (loosen only) (part of 3280)
13	N642569	Cotter pins
14	N800895-S301	Tie-rod nuts
15	3A130	Outer tie-rods Removal Note
16	W520116-S	Steering gear-to-crossmember nuts (2 required)
17	W707523-S	Steering gear-to-crossmember bolts (2 required)
18	W708261-S301	Bracket-to-crossmember bolts (2 required)
19	3E552	Bracket
20	3504	Steering gear Removal Note
21	3C650	Outer bellows clamp Installation Note
22	3C650	Inner bellows clamp Installation Note
23	3K661	Steering gear bellows Installation Note
24	3280	Spindle tie-rod Removal Note Installation Note

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Fig. 13: Identifying Removal Order Of Steering Gear (2 Of 2)
Courtesy of FORD MOTOR CO.

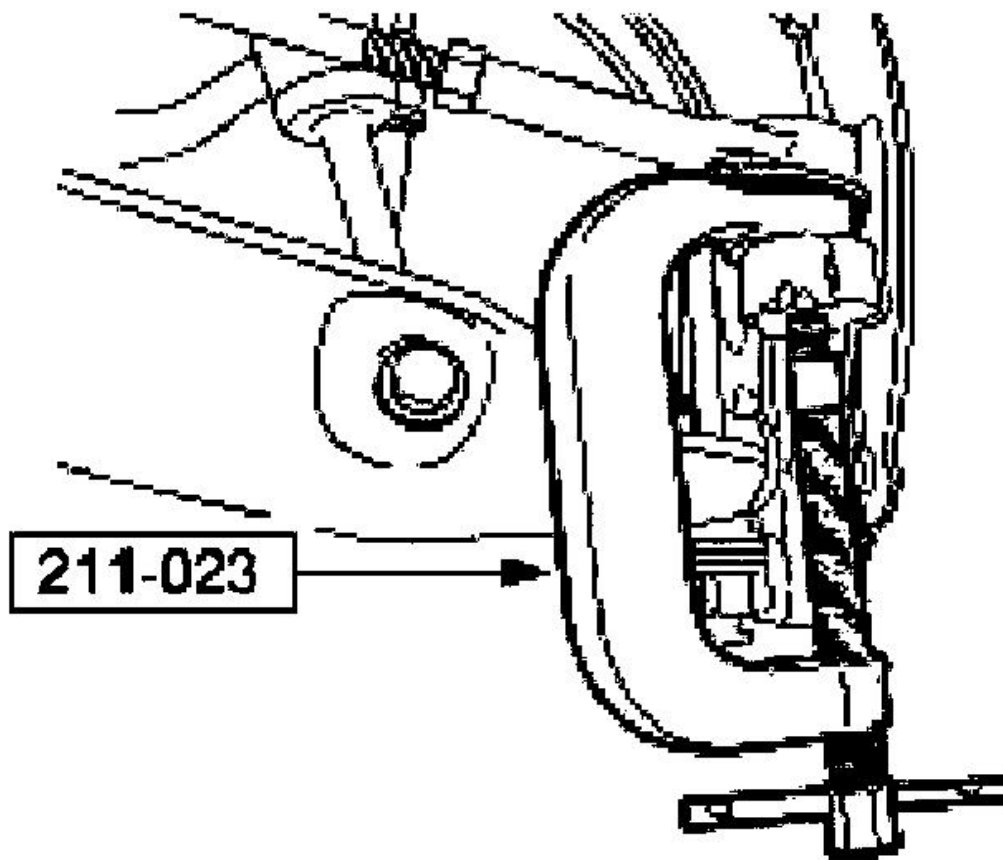
4. To install, reverse the removal procedure.
5. Fill and leak test the system. For additional information, Refer to **POWER STEERING SYSTEM FILLING**.
6. Check and, if necessary, align the front end. For additional information, REFER to **SUSPENSION SYSTEM**

Item 6: Intermediate Shaft Removal Note

1. Do not allow the steering column shaft to rotate while the intermediate shaft is disconnected or damage to the clockspring can result. If there is evidence that the shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to CLOCKSPRING CENTERING .

Item 15: Outer Tie-Rod Removal Note

CAUTION: Do not damage the tie-rod boot while installing the special tool.



G03180384

Fig. 14: Separating Tie-Rod End From Wheel Knuckle
Courtesy of FORD MOTOR CO.

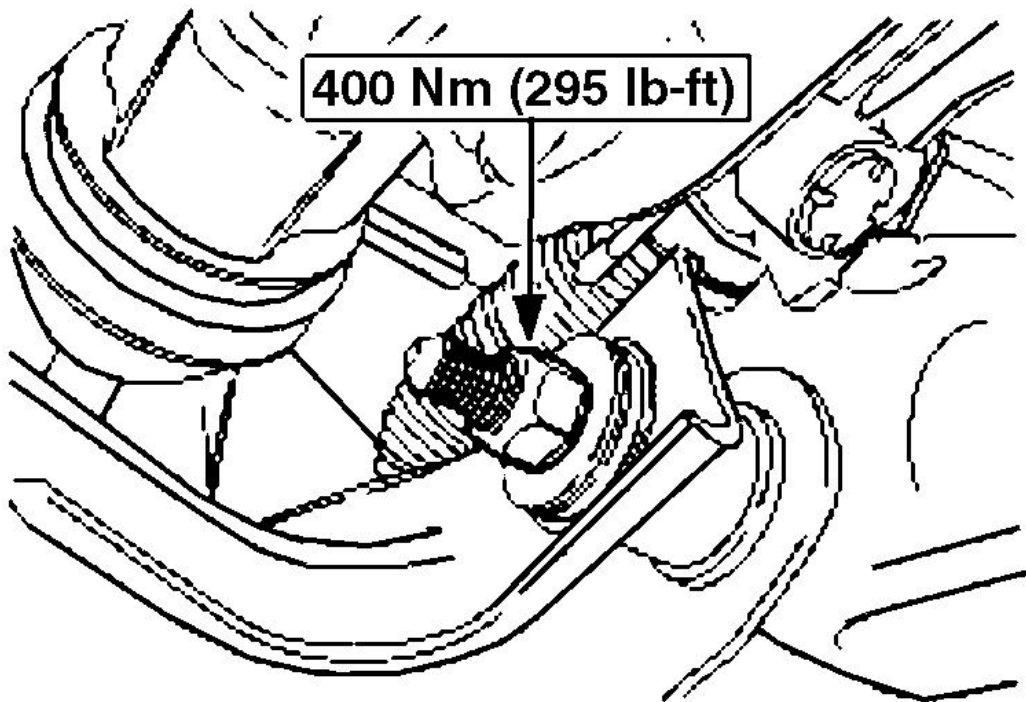
1. Using the special tool, separate the tie-rod end from the wheel knuckle.
2. Note the number of times the tie-rod ends turn for assembly reference.

3. After removing the tie-rod end, remove the tie-rod end jam nut from the front wheel spindle tie-rod.

Item 20: Steering Gear Removal Note

NOTE: On 4x4 vehicles, the following steps (LH lower arm only) must be carried out to provide clearance to remove the steering gear.

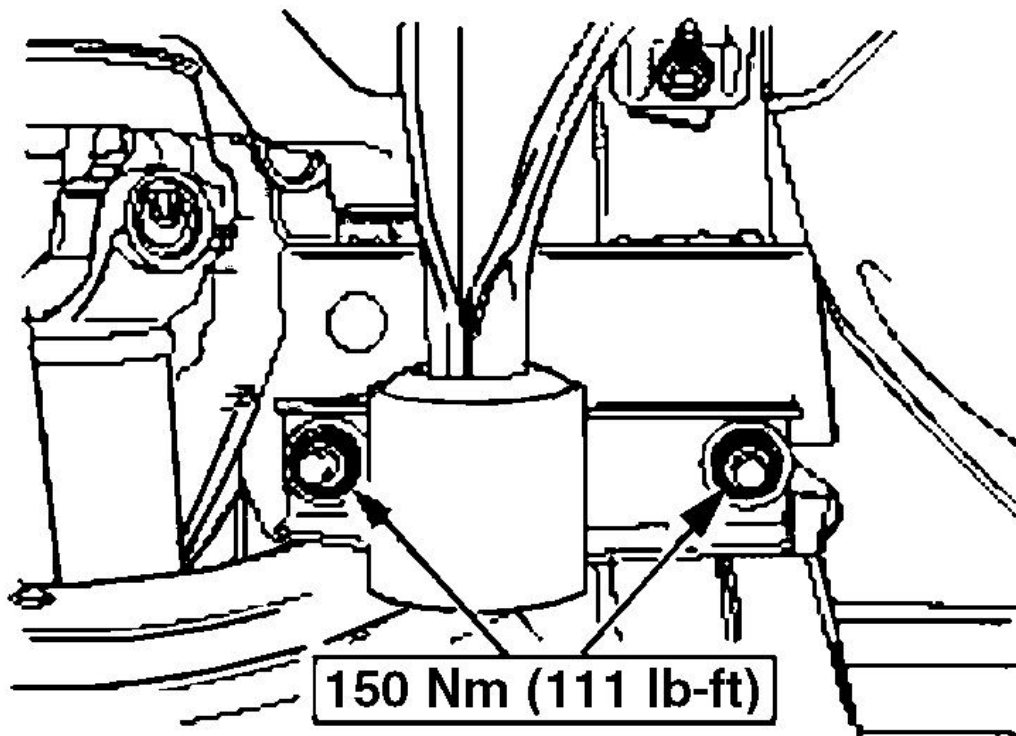
CAUTION: Do not tighten the LH lower arm inboard mounting nuts until the installation procedure is complete and the weight of the vehicle is resting on the wheel and tire assemblies. Make sure to tighten the forward flag bolt and nut before tightening the rearward nuts.



G03180385

Fig. 15: Removing Nut
Courtesy of FORD MOTOR CO.

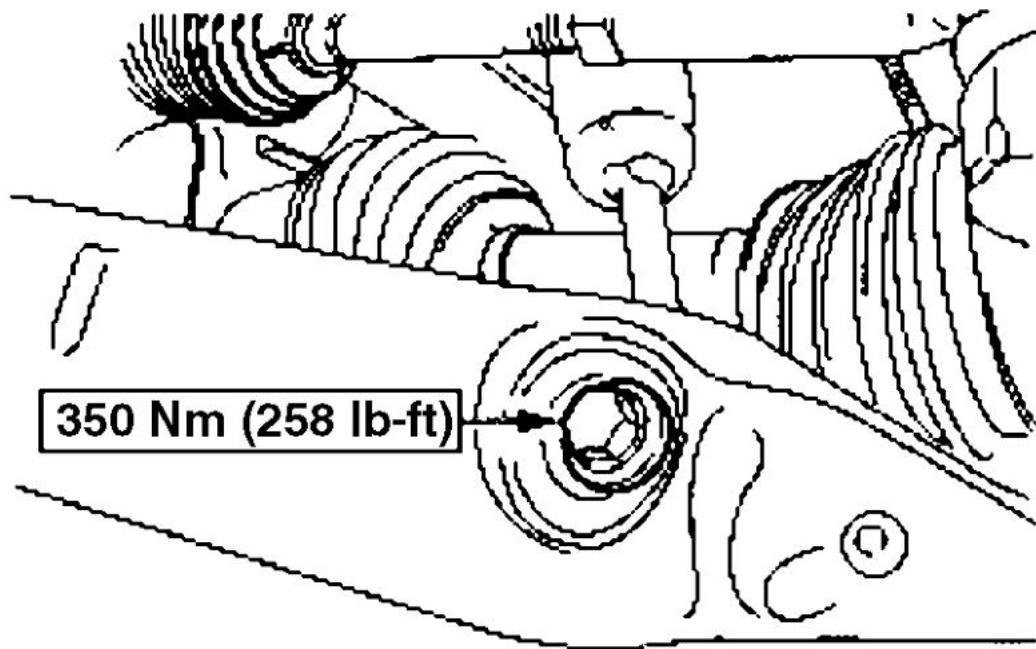
1. Remove the nut and bolt.
 - Discard the nut.
2. Remove and discard the nuts.



G03180386

Fig. 16: Removing Nuts
Courtesy of FORD MOTOR CO.

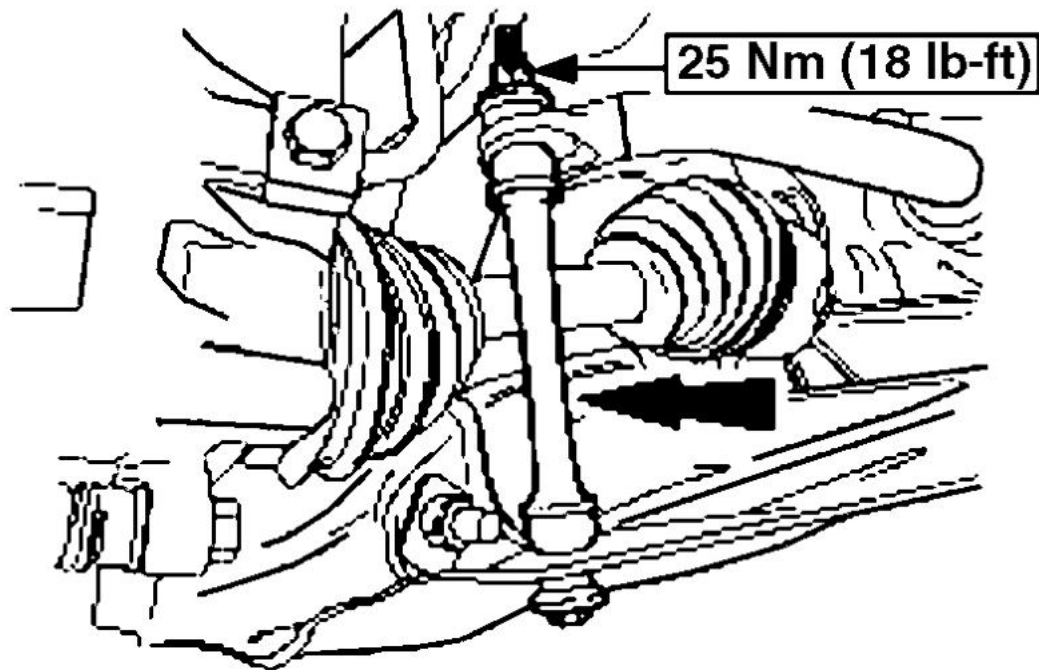
3. Remove the bolt and flag nut.
 - Discard the flag nut.



G03180387

Fig. 17: Removing Bolt And Flag Nut
Courtesy of FORD MOTOR CO.

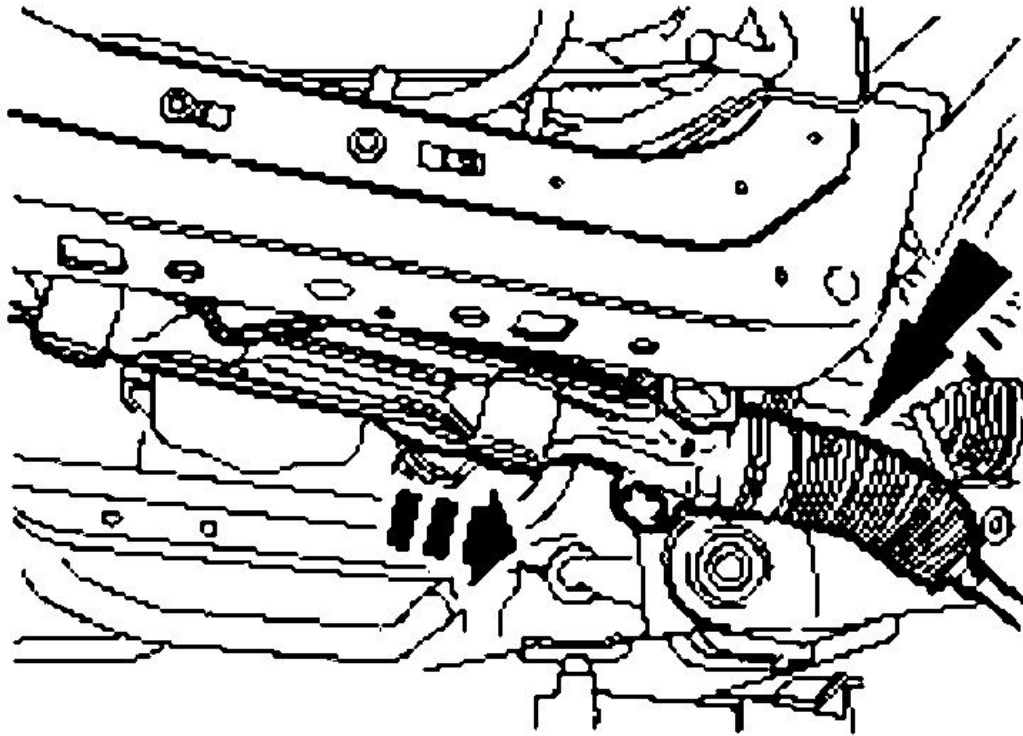
4. Remove the nut and stabilizer bar link.



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Fig. 18: Removing Nut And Stabilizer Bar Link
Courtesy of FORD MOTOR CO.

5. Remove the steering gear.



G03180389

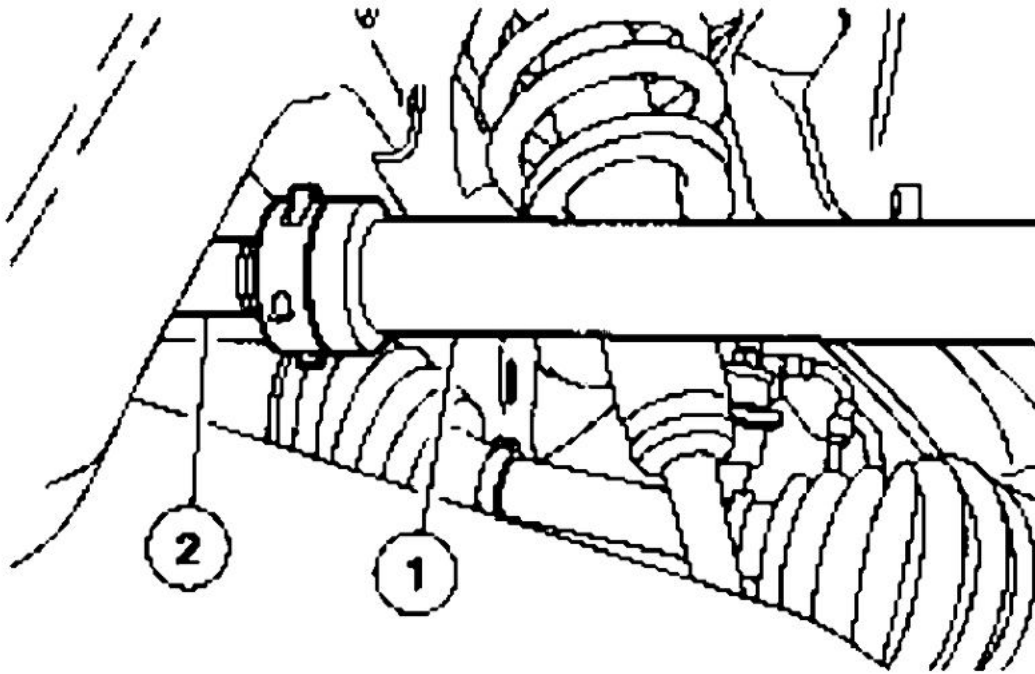
Fig. 19: Removing Steering Gear
Courtesy of FORD MOTOR CO.

Item 24: Spindle Tie-Rod Removal Note

CAUTION: Place the steering gear at the center position. Use a 1 1/16 in. crowfoot on the flat of the rack gear to resist rotation and to prevent damage during removal and installation of the front wheel spindle tie-rod.

NOTE: If repairing the RH side, it will be necessary to pull back the LH inner tie rod boot to hold the steering gear.

NOTE: An assistant may be needed for removal of the RH front wheel spindle tie-rod.



G03180390

Fig. 20: Removing Front Wheel Spindle Tie-Rod
 Courtesy of FORD MOTOR CO.

1. Using the (A) special tool, remove the (B) front wheel spindle tie-rod.

CAUTION: Thoroughly remove any abrasive material. This material is extremely harmful to the steering gear.

2. Thoroughly clean and inspect all the parts to be reused. Replace the parts as necessary.

Item 24: Spindle Tie-Rod Installation Note

1. Lubricate the front wheel spindle tie-rod inner groove with steering gear grease where the front suspension steering ball stud boot seal is clamped.

Item 23: Steering Gear Bellows Installation Note

1. Check that the front suspension steering ball stud boot seal is positioned correctly over the steering gear housing bead at the large inside diameter (ID) and is in the front wheel spindle tie-rod groove at the small ID.
2. Check that the front suspension steering ball stud boot seal is not twisted and the breather tube is securely inserted into the breather nipple at both front suspension steering ball stud boot seals.

Item 22: Inner Bellows Clamp Installation Note

1. Using the special tool, tighten the clamp.

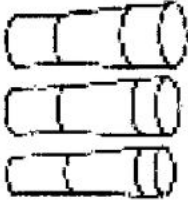
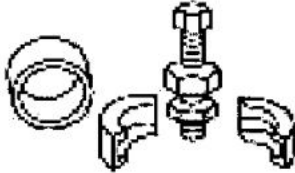

Item 21: Outer Bellows Clamp Installation Note

1. Make sure that the end of the boot is positioned between the two grooves on the inner tie-rod or an internal leak can result.

Items 11 and 9: O-Ring Installation Note

1. Install new O-ring seals onto the power steering hoses.

POWER STEERING PUMP - 4.6L (2V)

	Installer Set, Teflon® Seal 211-D027 (D90P-3517-A) or equivalent
	Remover, Power Steering Pump Pulley 211-016 (T69L-10300-B)
	Installer, Power Steering Pump Pulley 211-185 (T91P-3A733-A)

G03180391

Fig. 21: Identifying Special Tool(S)
Courtesy of FORD MOTOR CO.

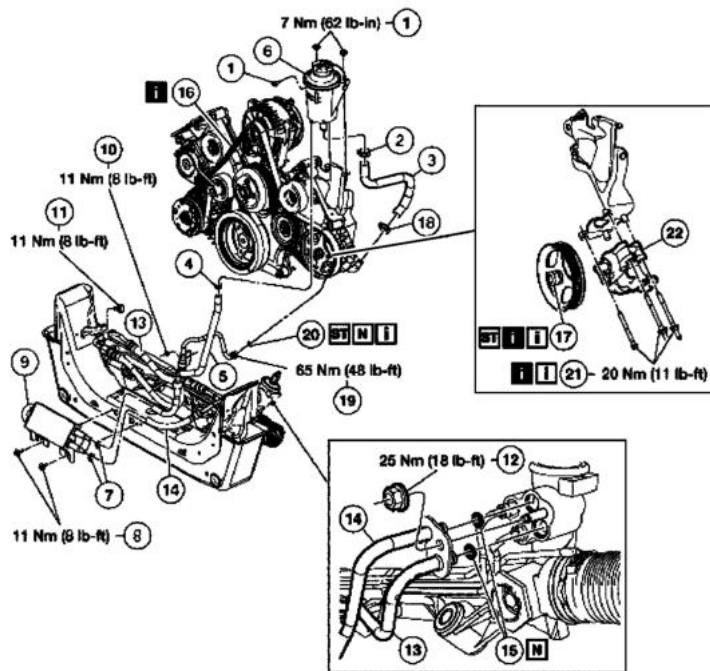
CAUTION: While repairing the power steering system, care should be taken to prevent the entry of contaminants or premature failure of the power steering components can result.

1. With the vehicle in NEUTRAL, position the vehicle on a hoist. For additional information, REFER to **JACKING & LIFTING** .
2. If removing the power steering pump, remove the LH front wheel.
3. If removing the power steering pump or pulley, remove the air cleaner. For additional information, REFER to **INTAKE AIR, FUEL CHARGING & ENGINE ELECTRONICS-4.6I (2V)** .
4. Remove the parts in the order indicated in the following illustration and table.

To remove individual parts, only carry out the listed steps:

PARTS SPECIFICATION

Part	Steps
Power steering pump	10, 16-22
Power steering pump pulley	16-17
Power steering fluid reservoir	1-6
Power steering fluid cooler	7-9
Power steering hoses	1-7, 10-15



Item	Part Number	Description
1	W611101-S	Fluid reservoir bolts
2	W525960-S	Hose clamp
3	—	Reservoir-to-pump hose (part of 3A697)
4	W525923-S	Clamp
5	—	Fluid cooler-to-reservoir hose (part of 3A697)
6	3A697	Power steering fluid reservoir
7	W525923-S	Clamps
8	N606676-S	Cooler-to-crossmember bolts
9	3D746	Power steering fluid cooler
10	N621939-S309	Pressure line bracket-to-engine nut
11	W701834-S	Pressure line bracket-to-crossmember bolt
12	W520143-S	Clamp plate-to-steering gear nut
13	3A719	Pressure line
14	—	Steering gear-to-cooler line (part of 3D746)
15	3F886	O-ring (2 req'd)
16	8620	Drive belt Installation Note
17	3D763	Pulley Removal Note Installation Note
18	W525960-S	Clamp
19	—	Pressure line-to-pump fitting (part of 3A719)
20	3E552	O-ring (2 req'd) Installation Note
21	W707225-S	Pump bolts Removal Note Installation Note
22	3A674	Power steering pump

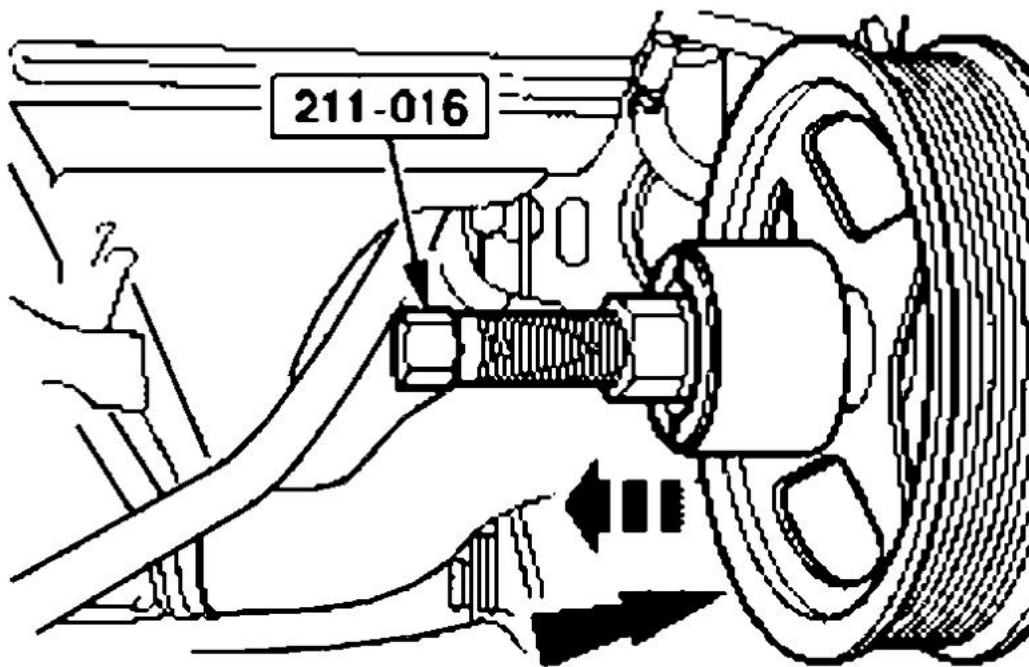
G03180392

Fig. 22: Identifying Removal Order Of Power Steering Pump - 4.6L (2V)
Courtesy of FORD MOTOR CO.

- To install, reverse the removal procedure.
- Fill and leak test the system. For additional information, Refer to **POWER STEERING SYSTEM FILLING**.

Item 17: Pulley Removal Note

1. Using the special tool, remove the pulley.

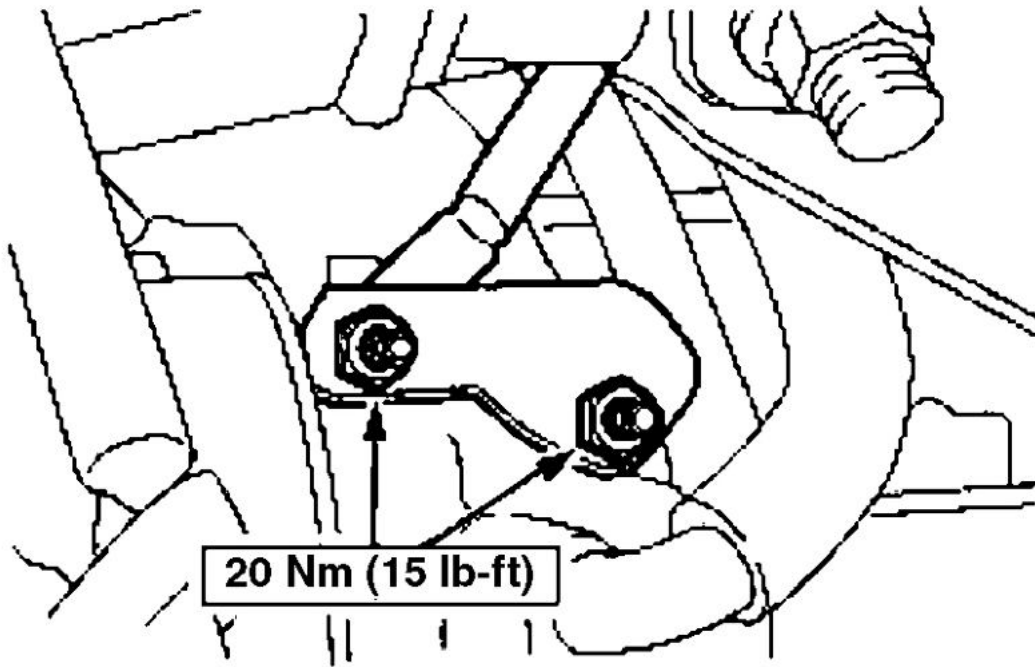


G03180393

Fig. 23: Removing Pulley
Courtesy of FORD MOTOR CO.

Item 21: Pump Bolts Removal Note

1. Remove the nuts and position the bracket and cable aside.
 - Remove the pump bolts.



G03180394

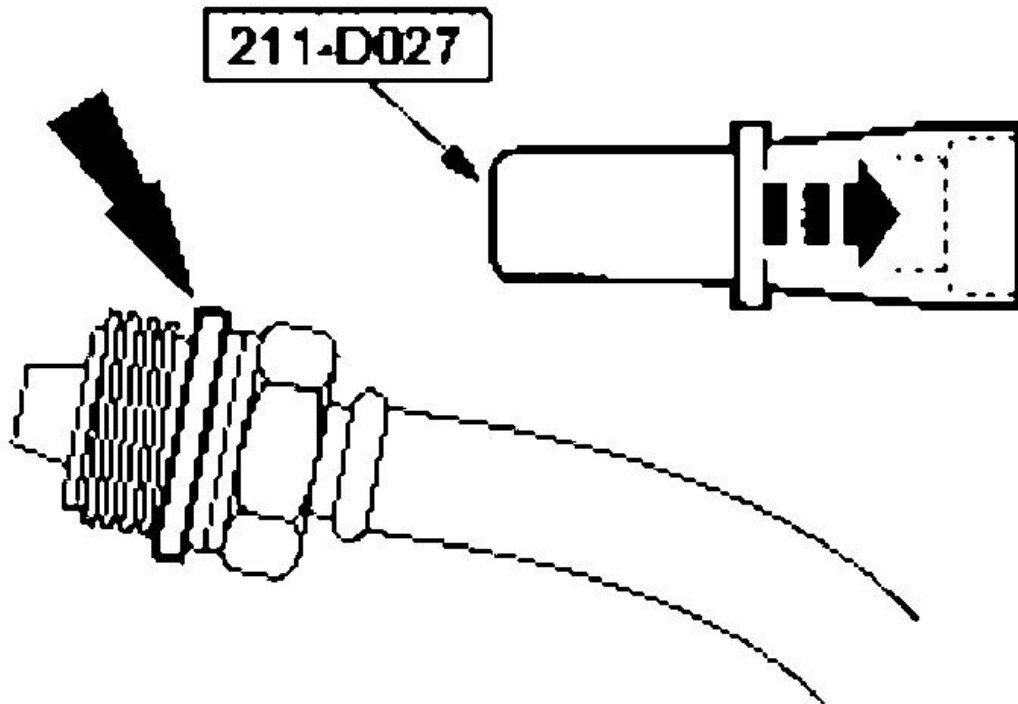
Fig. 24: Removing Pump Bolts
Courtesy of FORD MOTOR CO.

Item 21: Pump Bolts Installation Note

1. Make sure to align the bracket and pump before tightening the bolts.

Item 20: O-Ring Installation Note

1. Using the special tool, install a new Teflon® seal on the pressure line fitting.

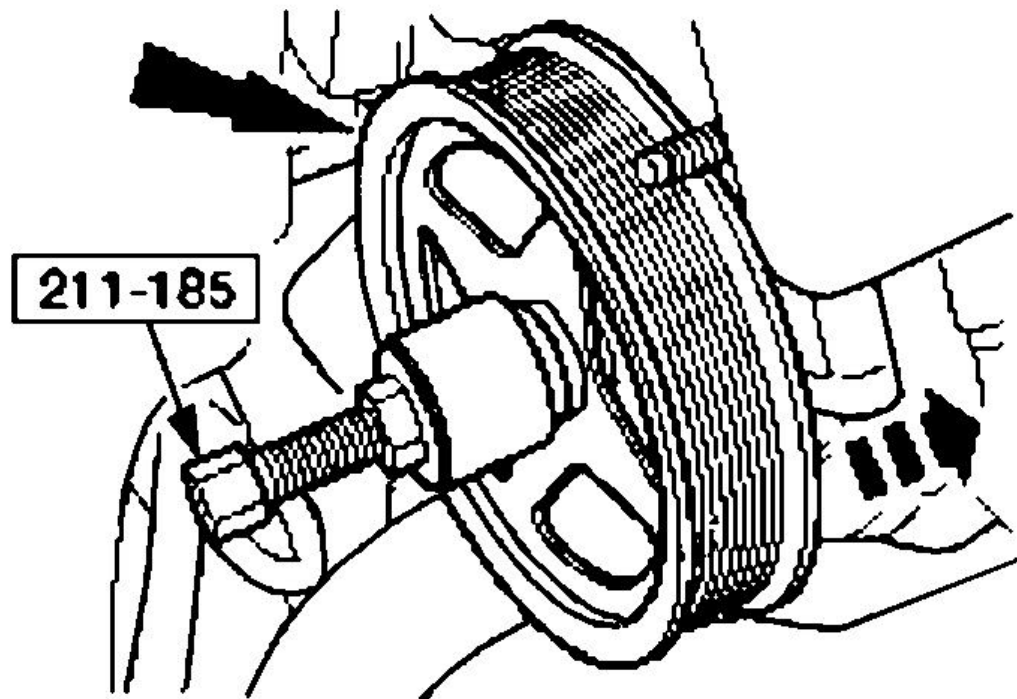


G03180395

Fig. 25: Installing New Teflon® Seal On Pressure Line Fitting
Courtesy of FORD MOTOR CO.

Item 17: Pulley Installation Note

1. Using the special tool, install the pulley.



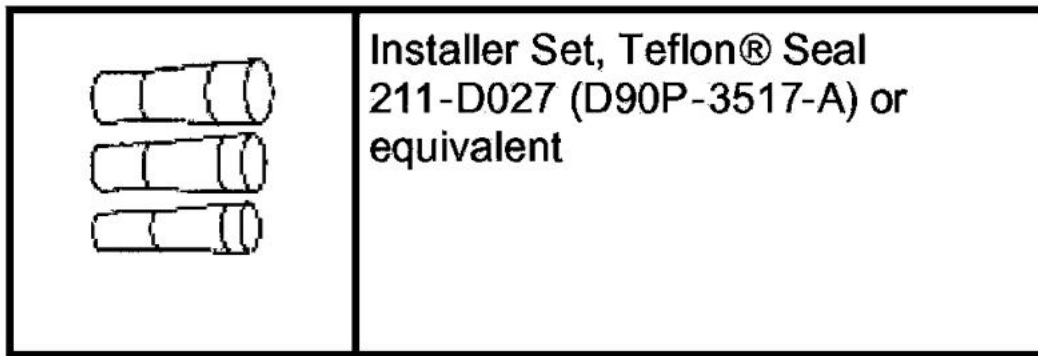
G03180396

Fig. 26: Installing Pulley
Courtesy of FORD MOTOR CO.

Item 16: Drive Belt Installation Note

1. Rotate the tensioner clockwise and remove the belt from the power steering pump pulley.

POWER STEERING PUMP - 4.0L SOHC



G03180397

Fig. 27: Identifying Special Tool(S)
Courtesy of FORD MOTOR CO.

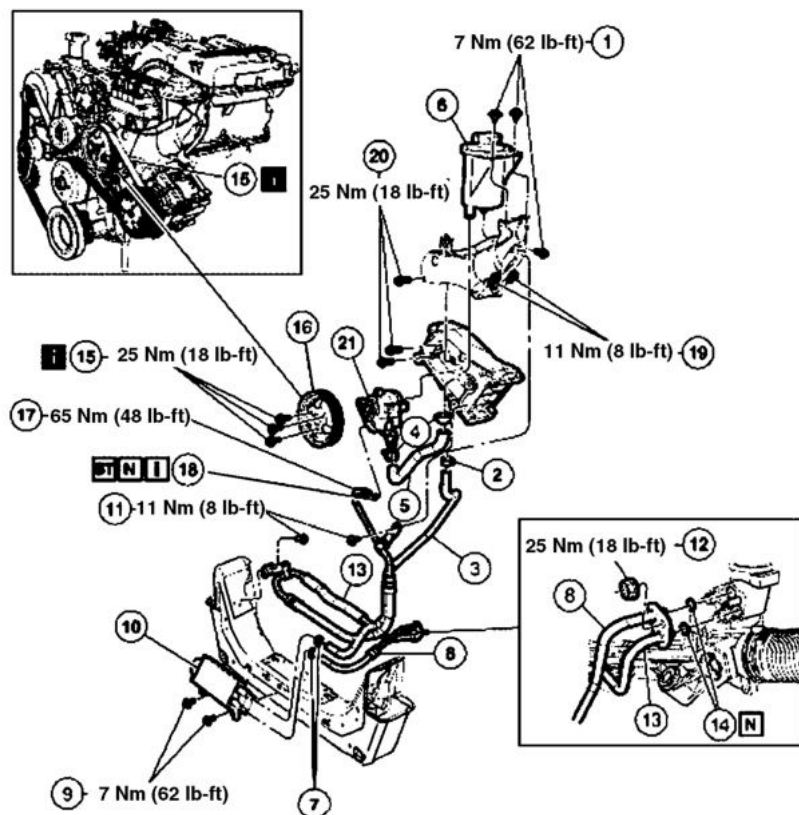
CAUTION: While repairing the power steering system, care should be taken to prevent the entry of contaminants or premature failure of the power steering components can result.

1. With the vehicle in NEUTRAL, position the vehicle on a hoist. For additional information, REFER to **JACKING & LIFTING**
2. Remove the parts in the order indicated in the following illustration and table.

To remove individual parts, only carry out the listed steps:

PARTS SPECIFICATION

Part	Steps
Power steering pump	4-5, 11, 15-21
Power steering pump pulley	15-16
Power steering fluid reservoir	1-6
Power steering fluid cooler	7, 9-10
Steering gear-to-cooler line	7,8, 12, 14
Fluid cooler-to-reservoir hose	2,3,7
Reservoir-to-pump hose	4-5
Pressure line	11-18



Item	Part Number	Description
1	W611101-S/ W500213-S	Fluid reservoir bolts
2	W525923-S	Hose clamp
3	—	Fluid cooler-to-reservoir hose (part of 3A697)
4	W525923-S	Clamps
5	—	Reservoir-to-pump hose (part of 3A697)
6	3A697	Power steering fluid reservoir
7	W525923-S	Clamps
8	—	Steering gear-to-cooler line (part of 3D746)
9	N606676-S	Cooler-to-crossmember bolts
10	3D746	Power steering fluid cooler
11	N606676-S/ W701834-S	Pressure line retainer bracket bolts
12	W520413-S	Clamp plate-to-steering gear nut
13	3A719	Pressure line
14	3F886	O-ring (2 required)
15	W605784-S309	Pulley bolts Removal Note
16	3A733	Pulley
17	—	Pressure line-to-pump fitting (part of 3A719)
18	3F886	O-ring Installation Note
19	W500213-S	Reservoir bracket bolts (loosen only)
20	W7008839-S	Pump bolts
21	3A674	Power steering pump

G03180398

Fig. 28: Identifying Removal Order Of Power Steering Pump - 4.0L SOHC
Courtesy of FORD MOTOR CO.

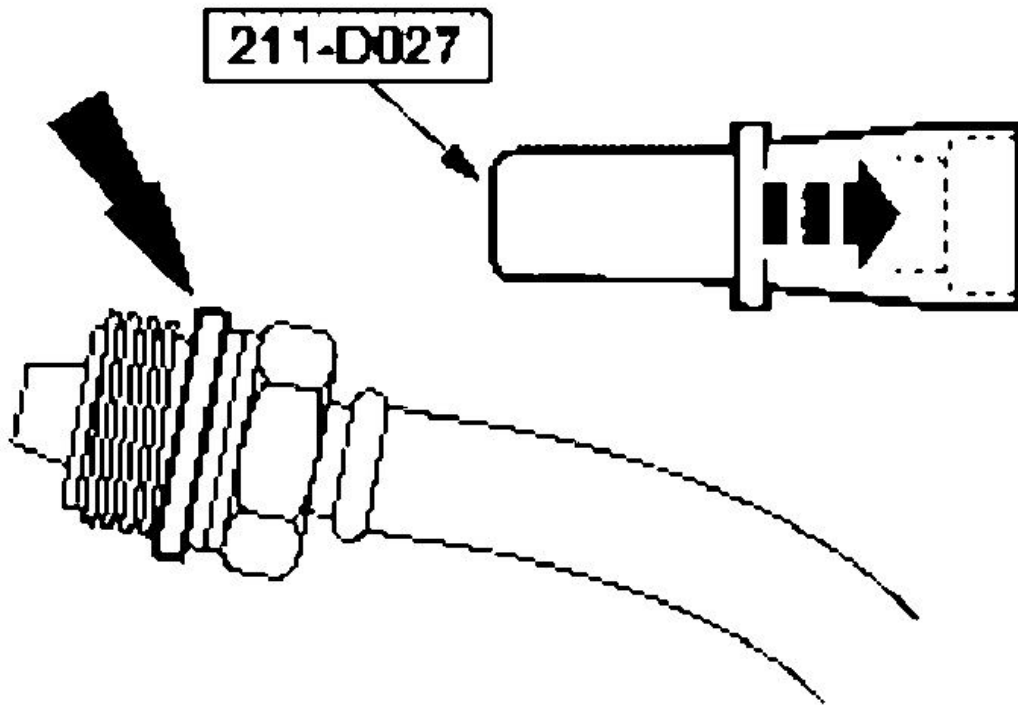
- To install, reverse the removal procedure.
- Fill and leak test the system. For additional information, Refer to **POWER STEERING SYSTEM FILLING**.

Item 15: Pulley Bolts Removal Note

1. Loosen the bolts, rotate the tensioner clockwise and remove the belt from the power steering pump pulley, and then remove the bolts.

Item 18: O-Ring Installation Note

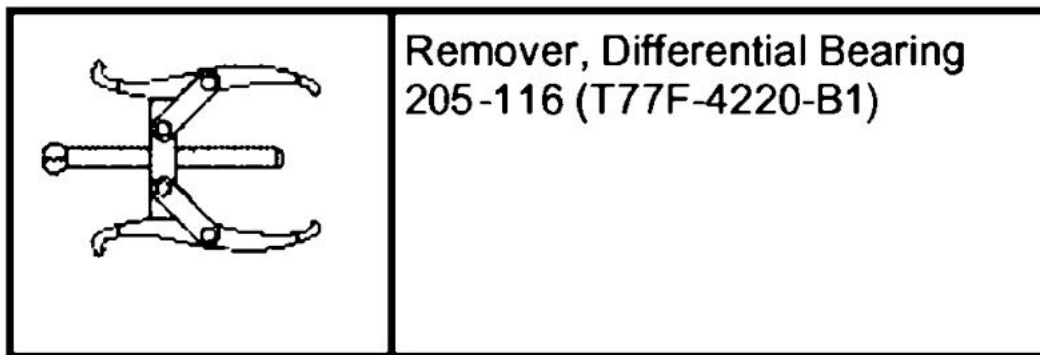
1. Using the special tool, install a new Teflon® seal on the pressure line fitting.



G03180399

Fig. 29: Installing New Teflon® Seal On Pressure Line Fitting
Courtesy of FORD MOTOR CO.

STEERING COLUMN



G03180400

Fig. 30: Identifying Special Tool(S)
Courtesy of FORD MOTOR CO.

1. Turn the steering wheel to the straight-ahead position and turn the ignition switch to the OFF position locking the steering column.

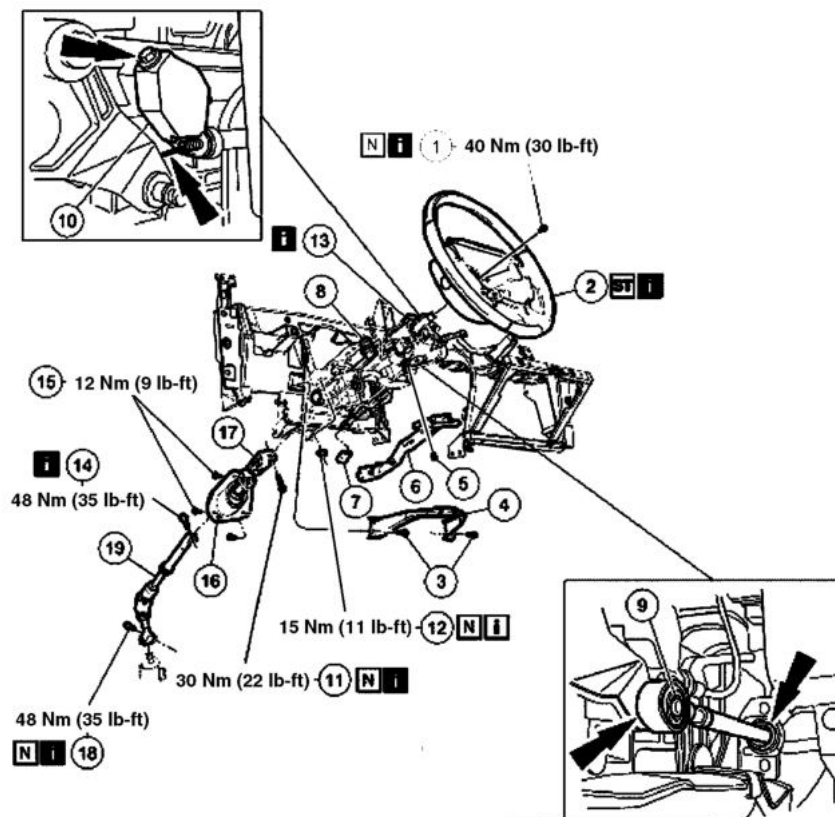
NOTE: **If removing the steering column shaft, proceed to item 8 of the removal procedure.**

2. If removing the steering wheel, remove the driver air bag module. For additional information, refer to **DUAL-STAGE DRIVER-SIDE AIR BAG MODULE** .
3. If removing the steering column, remove the steering column multifunction switch. For additional information, refer to **STEERING COLUMN SWITCHES**.
4. Remove the parts in the order indicated in the following illustration and table.

To remove individual parts, only carry out the listed steps:

PARTS SPECIFICATION

Part	Steps
Steering wheel	1,2
Steering column	3-13
Upper steering column shaft and dash seal	11, 14-17
Lower steering column shaft	14, 18, 19



Item	Part Number	Description
1	043B13	Steering wheel bolt Removal Note
2	3600	Steering wheel Removal Note
3	391727-S436	Reinforcement screws
4	04052	Reinforcement
5	W706952-S436	Wiring shield-to-column screws (4 req'd)
6	14A099	Wiring shield
7	—	Shift interlock harness electrical connector
8	—	Ignition switch electrical connector
9	7E395	Shift cable (detach/column shift only)
10	7A110	Shift position indicator (detach/column shift only)
11	N808463-S301	Steering column shaft-to-steering column bolt Removal Note
12	N806423-S56	Steering column support-to-instrument panel nuts (4 req'd) Installation Note
13	3C529	Steering column assembly Removal Note
14	N801614-S436	Lower shaft-to-upper shaft bolt Removal Note
15	N807437-S436	Dash seal bolts
16	3D677	Dash seal
17	3524	Upper steering column shaft
18	N808684-S301	Lower shaft-to-steering gear bolt Removal Note
19	3C662	Lower steering column shaft

G03180401

Fig. 31: Identifying Removal Order Of Steering Column
Courtesy of FORD MOTOR CO.

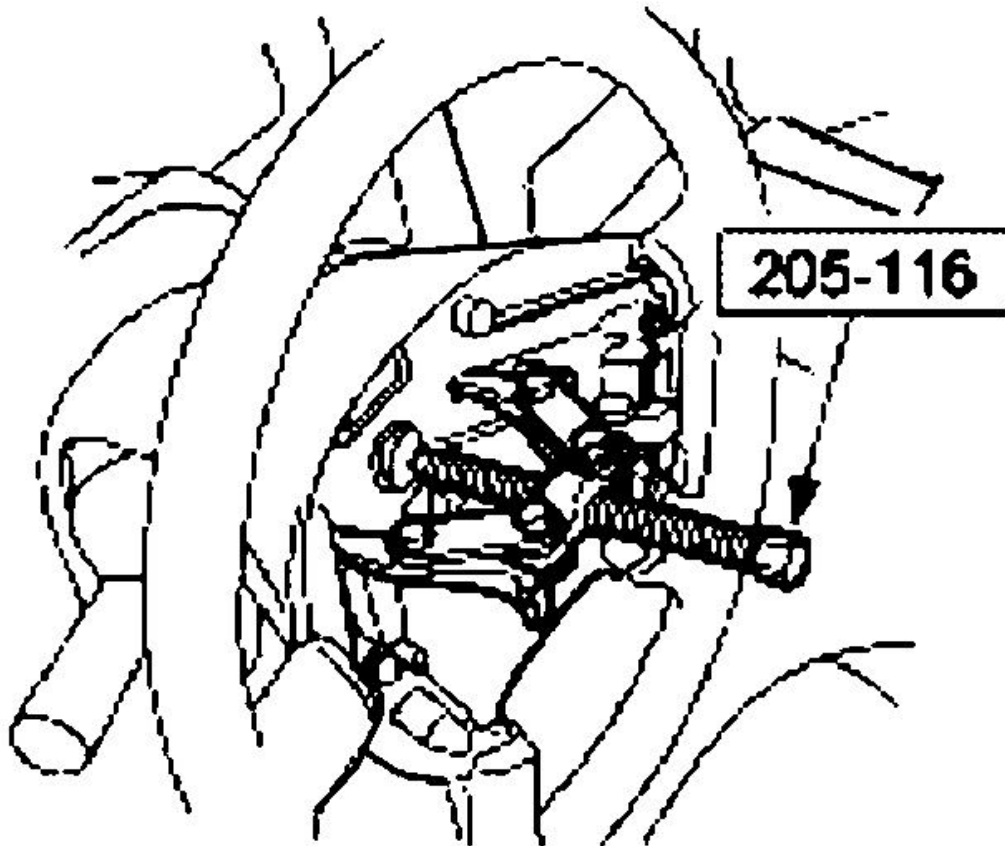
5. To install, reverse the removal procedure.
6. Install the driver air bag module. For additional information, refer to **DUAL-STAGE DRIVER-SIDE AIR BAG MODULE**.

Item 1: Steering Wheel Bolt Removal Note

1. Loosen the bolt until the steering wheel has been separated from the column and then remove and discard the bolt.

Item 2: Steering Wheel Removal Note

CAUTION: Removing the steering wheel without using a puller can damage the column bearings.



G03180402

Fig. 32: Removing Steering Wheel
Courtesy of FORD MOTOR CO.

1. Use the special tool to remove the steering wheel.
 - Disconnect the electrical connector.

Item 11: Steering Column Shaft-to-Steering Column Bolt Removal Note

CAUTION: Do not allow the steering column shaft to rotate while the

intermediate shaft is disconnected or damage to the clockspring can result. If there is evidence that the shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to CLOCKSPRING CENTERING .

1. Remove the bolt and detach the shaft from the column.

Item 13: Steering Column Assembly Removal Note

1. Disconnect the 3 electrical connectors at the clockspring and the passive anti-theft system (PATS) electrical connector.

Item 14: Lower Shaft-to-Upper Shaft Bolt Removal Note

1. Remove the bolt and detach the shaft.

Item 18: Lower Shaft-to-Steering Gear Bolt Removal Note

1. With the vehicle in NEUTRAL position on a hoist. For additional information, REFER to **NOISE, VIBRATION & HARSHNESS** .

Item 12: Steering Column Support-to-Instrument Panel Nuts Installation Note

1. Make sure that the column support bracket is aligned before tightening the nuts.

STEERING COLUMN SWITCHES

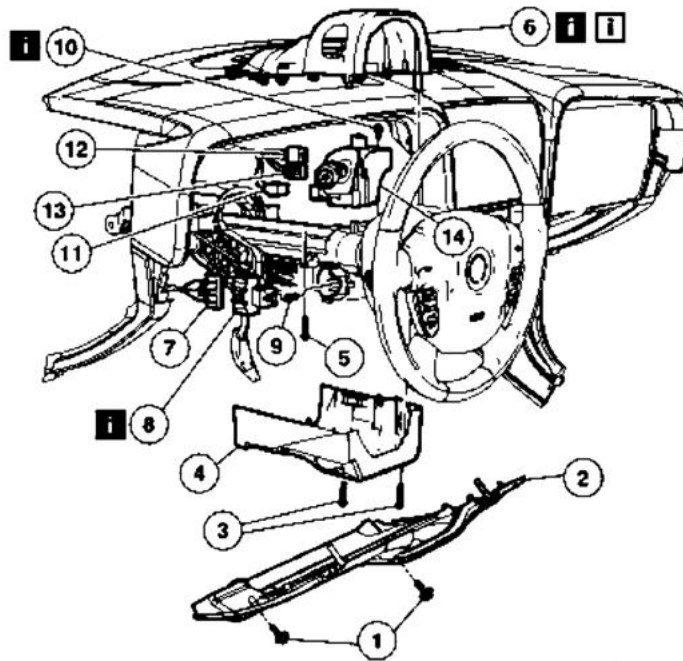
CAUTION: Do not remove the ignition lock cylinder and the ignition switch at the same time or damage to the column can result.

1. If removing the ignition switch, depower the supplemental restraint system (SRS). For additional information, refer to **DISABLING SYSTEM**
2. If removing the multifunction switch, disconnect the battery. For additional information, REFER to **BATTERY DISCONNECT**
3. Remove the parts in the order indicated in the following illustration and table.

To remove individual parts, only carry out the listed steps:

PARTS SPECIFICATION

Part	Steps
Ignition switch	1-9
Multifunction switch	1-6, 10-14



Item	Part Number	Description
1	391727-S436	Steering column opening cover screws
2	04459	Steering column opening cover
3	W705314-S424	Column shroud screws
4	3530	Steering column lower shroud
5	W705314-S424	Column shroud screw
6	3530	Steering column upper shroud Removal Note Installation Note
7	—	Ignition switch electrical connector
8	11572	Ignition switch Removal Note
9	—	Spring (part of 11572)
10	W706952-S424	Multifunction switch screw Removal Note
11	—	Multifunction switch electrical connector
12	—	Multifunction switch electrical connector
13	—	Multifunction switch electrical connector
14	3K359	Multifunction switch

G03180403

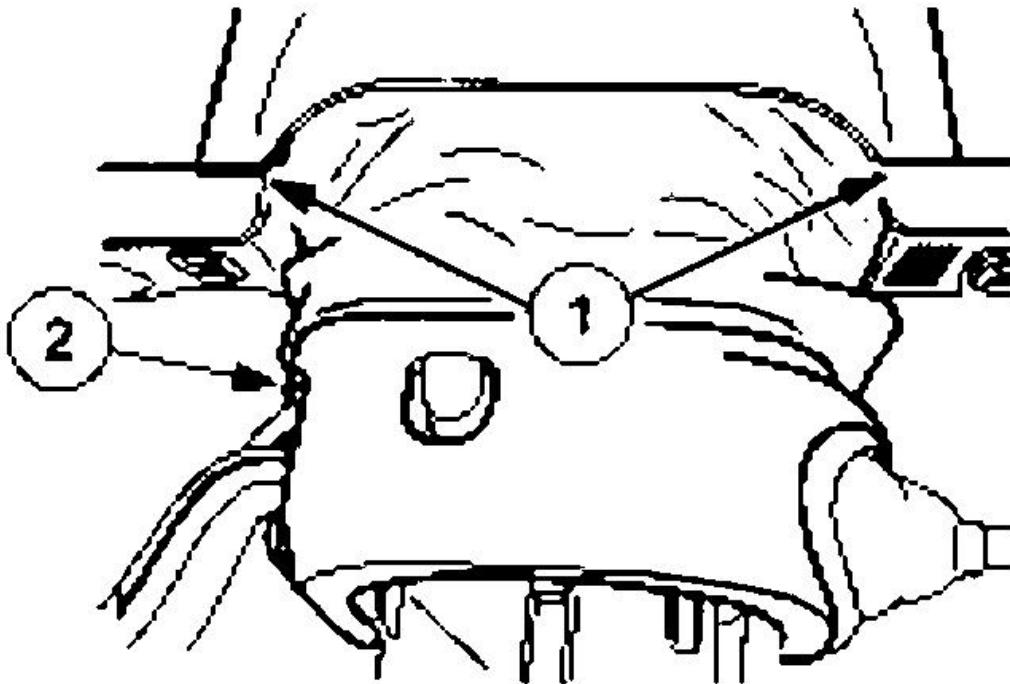
Fig. 33: Identifying Removal Order Of Steering Column Switches
Courtesy of FORD MOTOR CO.

4. To install, reverse the removal procedure.

Item 6: Steering Column Upper Shroud Removal Note

1. Remove the upper steering column shroud.

1. Release the retaining clips and rotate the upper steering column trim panel out of the instrument panel.
2. Remove the upper steering column shroud hard shell.

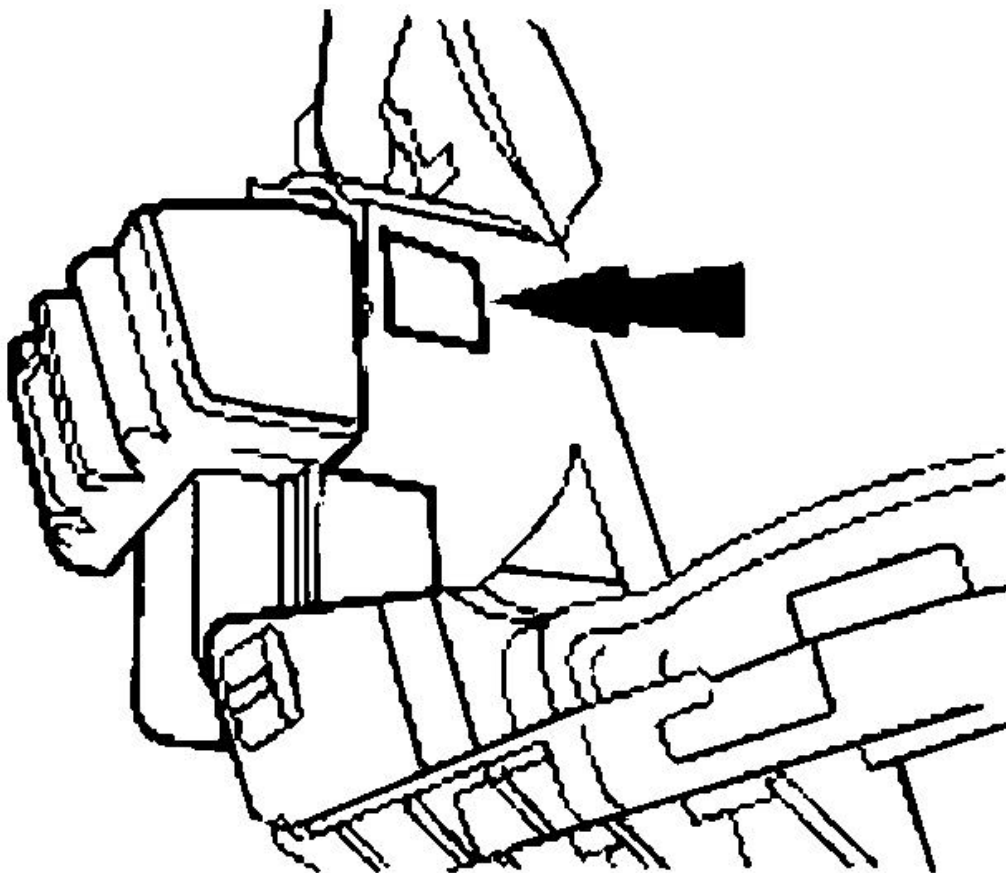


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Fig. 34: Removing Upper Steering Column Shroud Hard Shell
Courtesy of FORD MOTOR CO.

Item 8: Ignition Switch Removal Note

1. Release the two locking tabs and remove the switch.

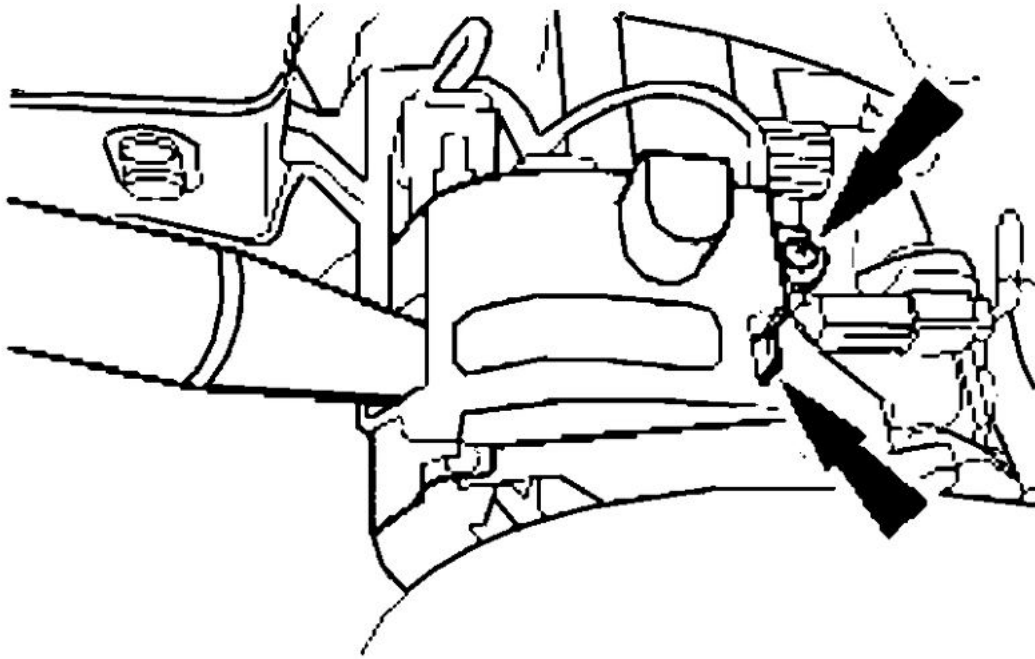


G03180405

Fig. 35: Releasing Locking Tabs And Removing Switch
Courtesy of FORD MOTOR CO.

Item 10: Multifunction Switch Removal Note

1. Remove the screw, push the release tab and raise the switch.



G03180406

Fig. 36: Removing Screw
Courtesy of FORD MOTOR CO.

Item 6: Steering Column Upper Shroud Installation Note

1. Make sure that the upper shroud retainer clips and the upper-to-lower shroud screws secure tightly or a new upper shroud must be installed.