GROUP

DRIVELINE 05

(4000)

SECTION 05-04 Halfshafts, Front Drive

VEHICLE APPLICATION

Taurus/Sable.

DESCRIPTION

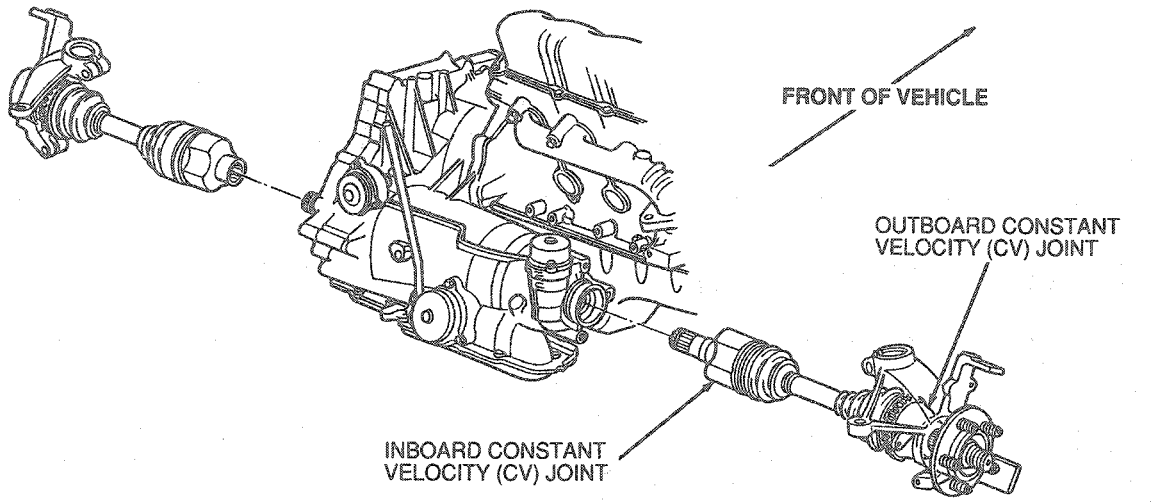
The front-wheel drive halfshaft employs constant velocity (CV) joints at both its inboard (differential) and outboard (wheel) ends for vehicle operating smoothness. The CV joints are connected by an interconnecting shaft. The interconnecting shafts (LH and RH) are splined at both ends and are retained in the inboard and outboard CV joints by circlips.

With the exception of the link shaft assembly used on the MTX transaxles on the RH side, the inboard CV joint stub shaft is splined and held in the differential side gear by a circlip. The link shaft assembly is retained by the support bearing. The outboard CV joint stub shaft is pressed on and secured with a prevailing torque nut. The CV joints are lube-for-life with a special CV joint grease and require no periodic lubrication. The CV joint boots, however, should be periodically inspected and replaced immediately when damage or grease leakage is evident. Continued operation would result in CV joint wear and noise due to contamination or loss of the CV joint grease.

The halfshaft design is similar for AXODE transmission applications except 3.8L powertrains are equipped with heavy duty halfshafts which include larger diameter, 32 tooth spline interconnecting shafts and internal CV joint components. The MTX equipped SHO vehicles employ a link shaft and support bearing in their design. SHO automatic transmission vehicles are equipped with Tri-Plan CV joints and no link shaft. Close attention should be given to service procedures as there are significant differences in design that affect disassembly and assembly. Halfshaft removal procedures also differ between automatic and manual transaxles. Halfshaft removal is accomplished (on AXODE and MTX applications) by applying a load to the back face of the inboard constant velocity (CV) joint assembly.

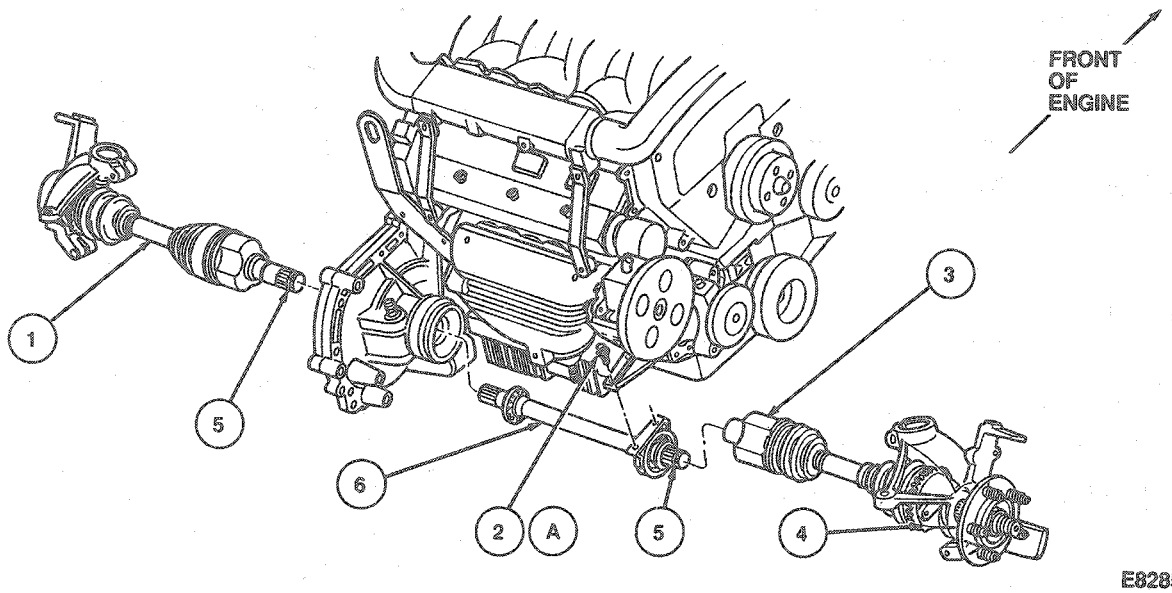
DESCRIPTION (Continued)

AXODE



E8284-A

MTX

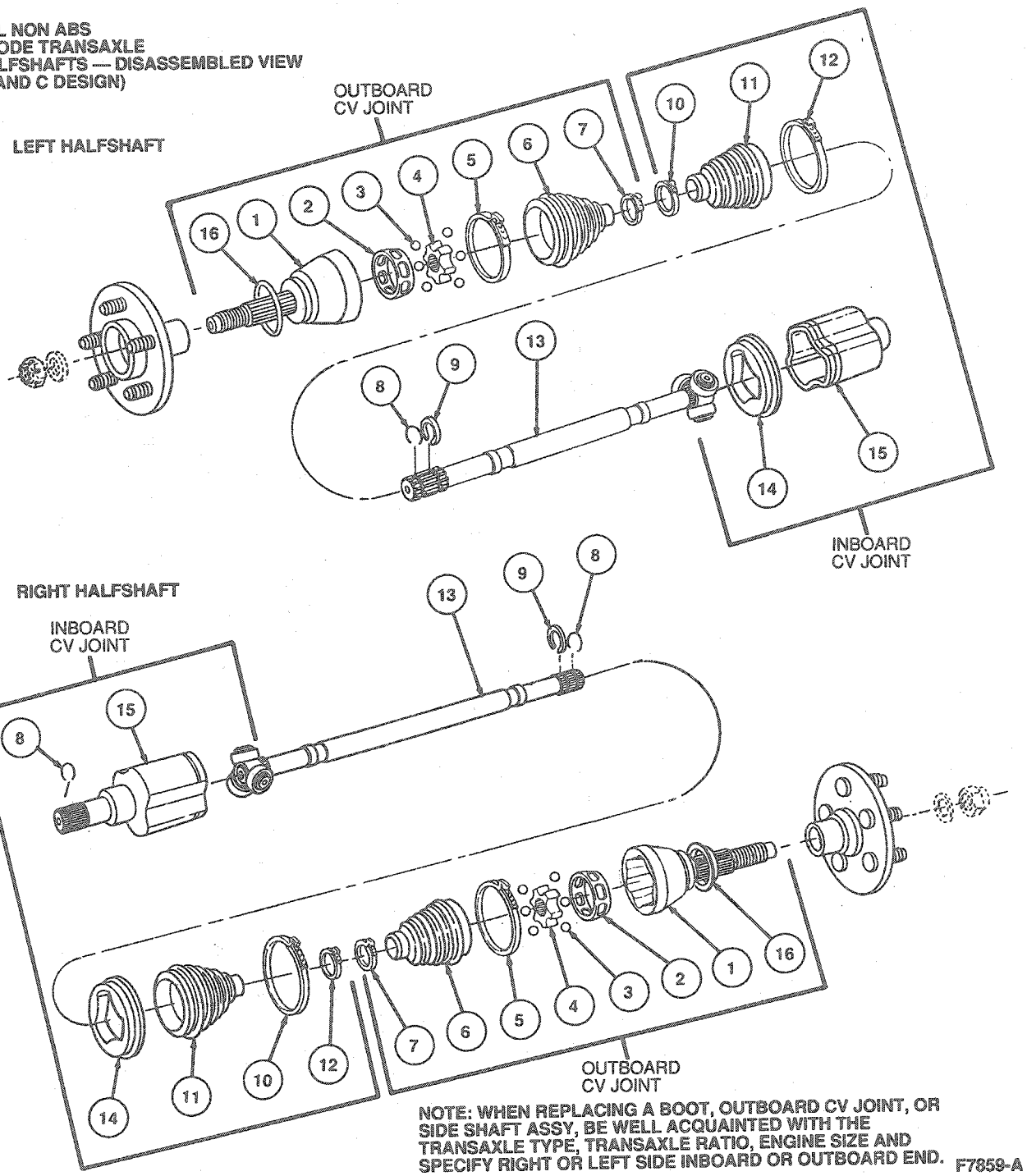


E8285-A

Item	Part Number	Description
1	3B437	LH Halfshaft Assy
2A	N605904-S100	Bolt (2 Req'd)
3	—	RH Inboard CV Joint
4	—	RH Outboard CV Joint
5	—	Snap Rings (2 Req'd)
6	3C081	Link Shaft Assy
A		Tighten to 21-32 N·m (15.5-23 Lb-Ft)

DESCRIPTION (Continued)

3.0L NON ABS
AXODE TRANSAXLE
HALFSHAFTS — DISASSEMBLED VIEW
(T AND C DESIGN)



NOTE: WHEN REPLACING A BOOT, OUTBOARD CV JOINT, OR SIDE SHAFT ASSY, BE WELL ACQUAINTED WITH THE TRANSAXLE TYPE, TRANSAXLE RATIO, ENGINE SIZE AND SPECIFY RIGHT OR LEFT SIDE INBOARD OR OUTBOARD END. F7859-A

Item	Description
1	Outboard Joint Outer Race and Stub Shaft
2	Ball Cage
3	Balls (6 Req'd)
4	Outboard Joint Inner Race
5	Boot Clamp (Large)
6	Boot

(Continued)

Item	Description
7	Boot Clamp (Small)
8	Circlip
9	Stop Ring
10	Boot Clamp (Small)
11	Boot
12	Boot Clamp (Large)
13	Interconnecting Shaft

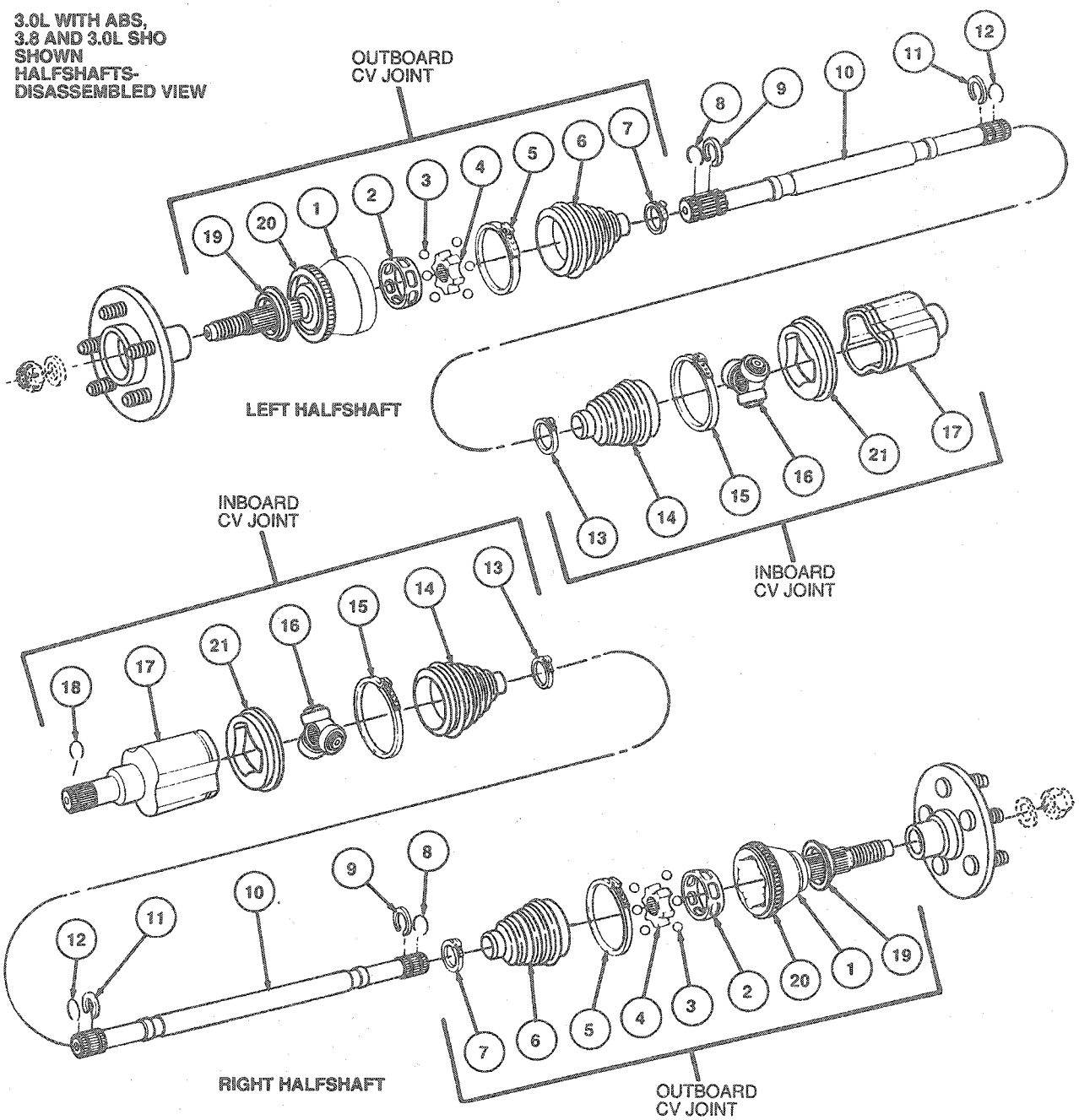
(Continued)

DESCRIPTION (Continued)

Item	Description
14	Trilobe Insert

(Continued)

Item	Description
15	Inboard Joint Outer Race and Stub Shaft
16	Dust Seal



NOTE: WHEN REPLACING A BOOT, CV, JOINT, INTERCONNECTING SHAFT, OR COMPLETE HALFSHAFT ASSY, BE WELL ACQUAINTED WITH THE TRANSAXLE TYPE, TRANSAXLE RATIO, ENGINE SIZE AND SPECIFY RIGHT OR LEFT SIDE INBOARD OR OUTBOARD END.

E5523-G

DESCRIPTION (Continued)

Item	Description
1	Outboard Joint Outer Race and Stub Shaft
2	Ball Cage
3	Balls (Six)
4	Outboard Joint Inner Race
5	Boot Clamp (Large)
6	Boot
7	Boot Clamp (Small)
8	Circlip
9	Stop Ring

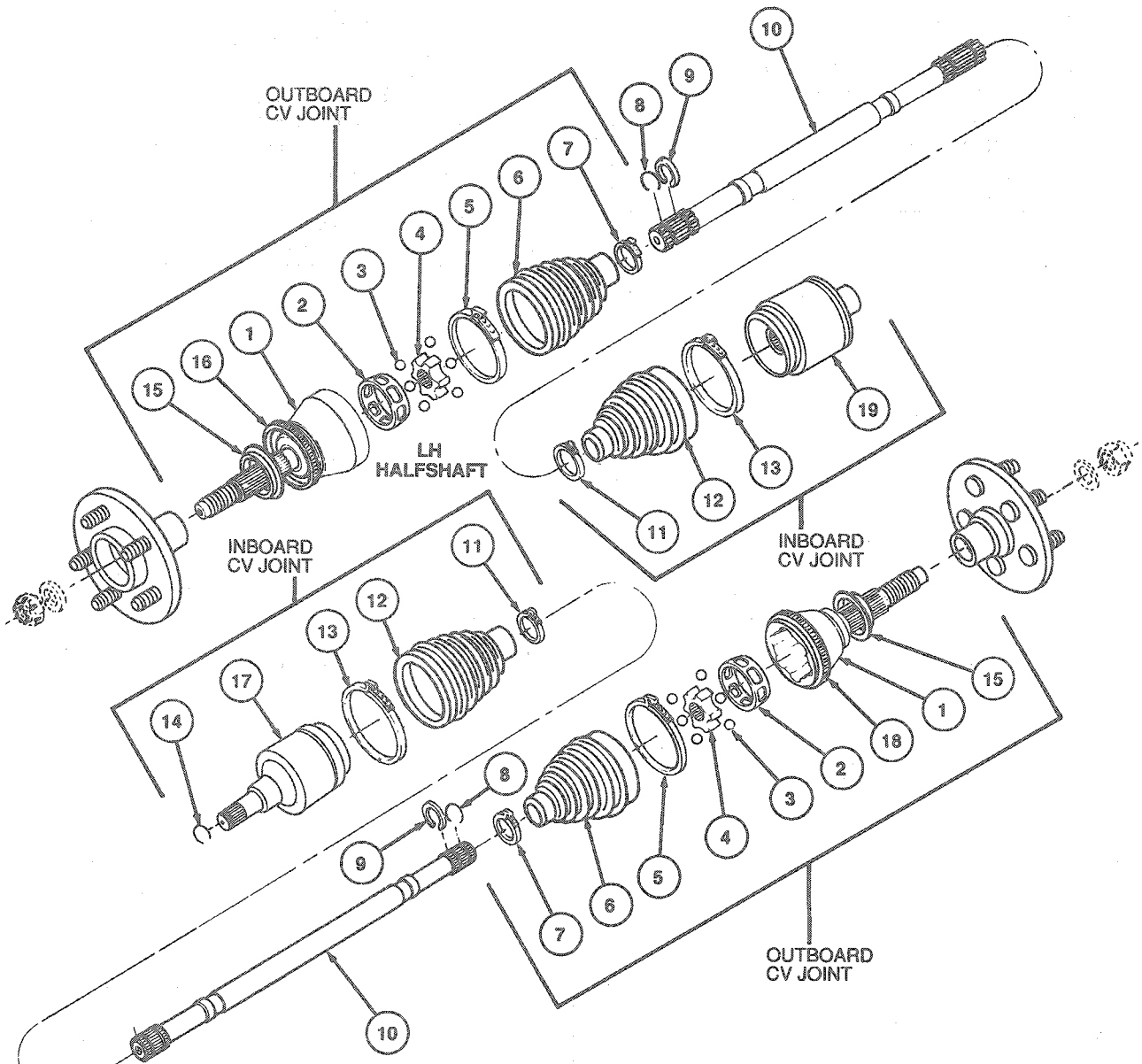
(Continued)

Item	Description
10	Interconnecting Shaft
11	Stop Ring
12	Circlip
13	Boot Clamp (Small)
14	Boot
15	Boot Clamp (Large)
16	Inboard Joint Tripod Assy
17	Inboard Joint Outer Race and Stub Shaft
18	Circlip
19	Dust Seal
20	Speed Indicator Ring (Anti-Lock Brakes)
21	Trilobe Insert

DESCRIPTION (Continued)

3.2L SHO Automatic

HALFSHAFTS — DISASSEMBLED VIEW



NOTE: WHEN REPLACING A BOOT, CV, JOINT INTERCONNECTING SHAFT, OR COMPLETE HALFSHAFT ASSY, BE WELL ACQUAINTED WITH THE TRANSAXLE TYPE, TRANSAXLE RATIO, ENGINE SIZE AND SPECIFY RH OR LH SIDE INBOARD OR OUTBOARD END.

E6708-F

Item	Part Number	Description
1	3B413	Outboard Joint Outer Race and Stub Shaft
2	3B413	Ball Cage
3	3B413	Balls (Six)
4	3B413	Outboard Joint Inner Race

(Continued)

Item	Part Number	Description
5	3B478	Boot Clamp (Large)
6	3A331	Boot
7	3B478	Boot Clamp (Small)
8	N803655-S	Circlip
9	N803657-S	Stop Ring

(Continued)

DESCRIPTION (Continued)

Item	Part Number	Description
10	3A329	Interconnecting Shaft
11	3B478	boot Clamp (Small)
12	3A331	Boot
13	3B478	Boot Clamp (Large)
14	N803655-S	Circlip
15	3K070	Dust Seal

(Continued)

Item	Part Number	Description
16	2C182	Speed-Indicator ring (Anti-Lock Brakes)
17	3B414	Inboard Tri-Plan CV Joint (If equipped)
18	2C182	Speed Indicator Ring (Anti-Lock Brakes)
19	3B414	Inboard Tri-Plan CV Joint (If equipped)

*NOTE: The Tri-Plan CV Joint can be identified by its large round outer race. This type CV Joint does not have a removable tripod.

Halfshaft Handling

Care should be exercised during halfshaft removal and installation, and during the various component disassembly and assembly procedures as outlined.

- Do not remove inboard CV joint by pulling on interconnecting shaft.
- The complete halfshaft should be handled by the interconnecting shaft to avoid pulling apart or potential damage to the inboard plunging CV joint.

  CAUTION: Never hold the CV joint and halfshaft assembly by the inboard or outboard joint only.
- Do not over-angle CV joints beyond their capacity.
- Ensure that ground surfaces and splines are not damaged.
- Do not allow CV joint boots to come into contact with sharp edges or hot engine and exhaust components.
- Do not drop assembled halfshafts, as the impact will cut the CV joint boots from the inside without external evidence of damage.
- Halfshaft assembly is not to be used as a lever arm to position other front end components. Always support free end of halfshaft.
- Ensure internal CV joint cleanliness and proper grease refill when boot is replaced.
- An assembled inboard CV joint may be damaged if it is "over-plunged" outward from the joint housing.
- Never use a hammer to remove or install halfshafts.

Wheel and Tire Balancing, Front

WARNING: ON-VEHICLE FRONT WHEEL AND TIRE BALANCING WITH FRONT SUSPENSION IN THE FULLY EXTENDED (REBOUND) POSITION MAY OVERHEAT AND DAMAGE THE CV JOINTS. PROPER BALANCING REQUIRES THAT THE FRONT WHEEL(S) AND TIRE(S) BE LIFTED OFF THE GROUND BY PLACING A JACK UNDER THE FRONT SUSPENSION LOWER ARM.

ANOTHER METHOD IS TO REMOVE THE FRONT WHEEL(S) AND TIRE(S) FROM THE VEHICLE FOR BALANCING.

Hoisting

Never raise vehicle using the halfshafts as lift points. Refer to Section 00-02.

Towing

Never tow vehicle using the halfshafts as anchor points for tow truck cable chains.

Undercoating and Rustproofing

Extreme care must be taken during undercoating and rustproofing procedures to protect CV joint boots from coating materials. Foreign materials on the rubber boot convolutions will cause advanced wear.

OPERATION

The primary purpose of the front-wheel drive halfshaft is to transmit engine torque from the transaxle to the front wheels. Additionally, the constant velocity joints used must be capable of operating at varying angles and provide a means for shaft length changes to allow for vertical suspension (wheel) and engine dynamic movement.

OPERATION (Continued)

These requirements are satisfied by using constant velocity (CV) joints at the inboard (differential) end and outboard (wheel) end of the halfshaft. A constant velocity joint is a mechanism for transmitting uniform torque and rotary motion while operating through its angle range. The inboard CV joint is a "plunge"-type joint which provides for the required axial movement to affect shaft length changes. The outboard CV joint has a higher angle capability than the inboard CV joint to accommodate wheel turning angles.

The front-wheel drive CV joints and halfshaft assemblies rotate at approximately one-third the speed of conventional rear wheel drive driveshafts and do not contribute to rotational vibration disturbances.

DIAGNOSIS

NOTE: CV joints should not be replaced unless disassembly and inspection reveals unusual wear.

Noise and Vibration in Turns

Clicking, popping or grinding noises while turning may be caused by the following:

1. Damaged CV joint boots or loose boot clamps resulting in inadequate or contaminated lube in outboard or inboard CV joints.
2. Another component contacting halfshaft assembly.
3. Worn, damaged or improperly installed wheel bearing, brake or suspension / steering components.

Vibration at Highway Speeds:

1. Out of balance front wheels or tires.
2. Out of round front tires.
3. Improperly seated outboard CV joint in front wheel hub.

Refer to Section 00-04 for high-speed shake diagnosis.

NOTE: Halfshafts are not balanced and do not contribute to rotational vibration disturbances.

Shudder or Vibration During Acceleration:

1. Excessively high CV joint operating angles caused by improper ride height. Check ride height, verify proper spring rate and check items 1, 2 and 3 under Halfshaft or CV Joint Pullout.
2. Excessively worn or damaged inboard or outboard CV joint.

Halfshaft or CV Joint Pullout

1. Inboard CV joint circlip missing or not properly seated in transaxle side gear.
2. Engine / transaxle assembly mispositioned. Check engine mounts for damage or wear.
3. Frame rail or strut tower out of position or damaged. Check underbody dimensions. Refer to Section 01-00.
4. Front suspension components worn or damaged. Check for worn bushings or bent components (stabilizer bar, control arm, etc.).

INSPECTION

1. Inspect boots for evidence of cracks, tears or splits.

   NOTE: While inspecting the boots, watch for indentations ("dimples") in the boot convolutions. If an indentation is observed, it must be removed. Refer to CV Joint Boot Indentation Removal procedure.
2. Inspect underbody for any indication of grease splatter in vicinity of CV joint boots, outboard and inboard locations, which is an indication of boot and / or clamp damage.
3. A boot vent is used on the RH inboard silicone rubber boot on AXODE applications. The tri-lobe boot uses a pinhole vent inboard of the small clamp. The non tri-lobe boot uses a keyway vent between the interconnecting shaft and the boot under the small clamp. A small amount of grease leakage at the vent is normal.
4. Inspect for transaxle differential oil seal leakage at inboard CV joint.
5. Ensure wheel hub retainer nut is the correct prevailing torque type.
6. The silicone boot will sweat during operation, causing a light film of grease to show on the outside of the boot. This condition is normal.

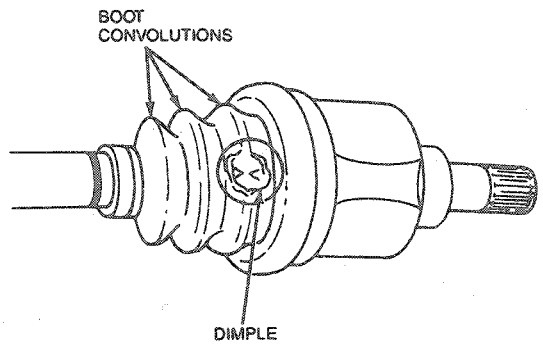
CV Joint Boot Indentation

Removal

Indentations or "dimples" in the inboard and / or outboard CV joint boots may occur due to improper handling during storage or service of the halfshafts. If, during inspection, a boot is observed to be "dimpled," perform the following procedure.

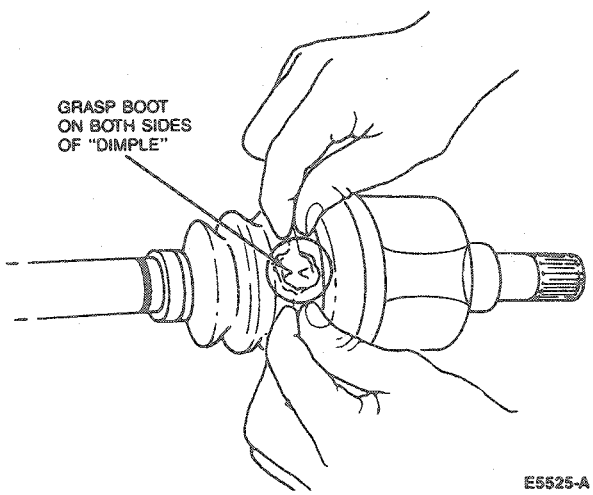
INSPECTION (Continued)

1. Inspect the boot(s) for any sign of grease leakage in the dimple which would indicate a cut. Replace the boot if a cut exists or if there is evidence of other damage.



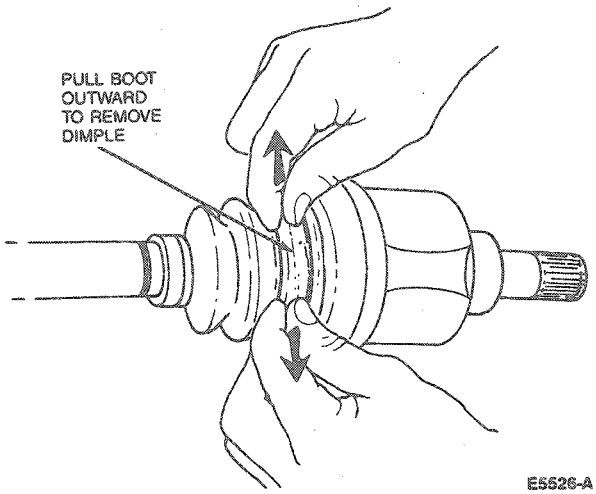
E5524-A

2. If the boot is in good condition, the dimple can be removed as follows:
   a. Grasp the dimpled convolution on either side of the dimple using the forefinger and thumb of each hand.



E5525-A

   b. While grasping boot, pull the convolution by moving hands in opposite directions. The dimple should "pop out." If the dimple does not invert or if it dimples again, one clamp should be removed and the internal and external air pressure equalized. Refer to Boot Installation for the necessary procedure.



E5526-A

Extreme care should be taken not to allow CV joint boots to come in forceful contact with foreign objects that may cause the external boot convolutions to become indented.

REMOVAL AND INSTALLATION

Halfshaft Assembly

Removal

Tools Required:

- Front Hub Installer T81P-1104-A
- Metric Hub Remover Adapter T86P-1104-A1
- Front Hub Remover / Replacer T81P-1104-C
- Transaxle Plugs T81P-1177-B
- Metric Hub Remover Adapter T83P-1104-BH
- CV Joint Puller T86P-3514-A1
- CV Joint Puller Extension T86P-3514-A2
- Impact Slide Hammer D79P-100-A

CAUTION: When removing both the LH and RH halfshafts on MTX equipped vehicles, Transaxle Plugs T81P-1177-B must be installed. Failure to use these tools can result in dislocation of the differential side gears. Should the gears become misaligned, the differential will have to be removed from the transaxle to re-align the gears.

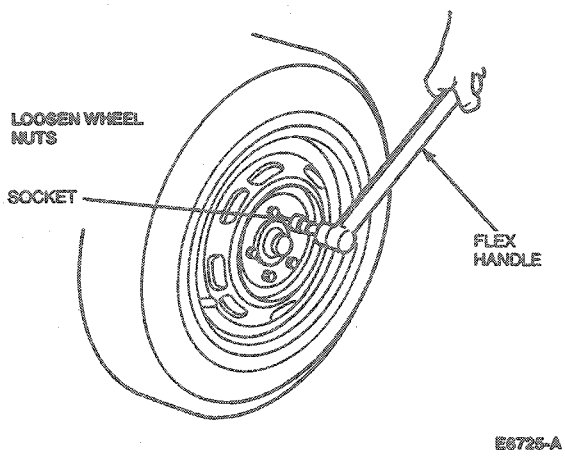
CAUTION: Do not begin this removal procedure unless the following parts are available:

- **A new hub retainer nut assembly (Step 1).**
- **A new lower control arm-to-steering knuckle retaining bolt and nut (Step 4).**
- **A new inboard CV joint stub shaft circlip.**
- **A new link shaft snap ring.**

Once removed, these parts must not be reused during assembly. Their torque holding ability or retention capability is diminished during removal.

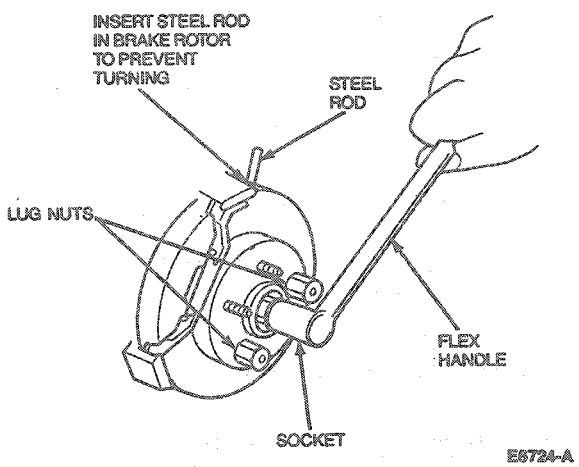
REMOVAL AND INSTALLATION (Continued)

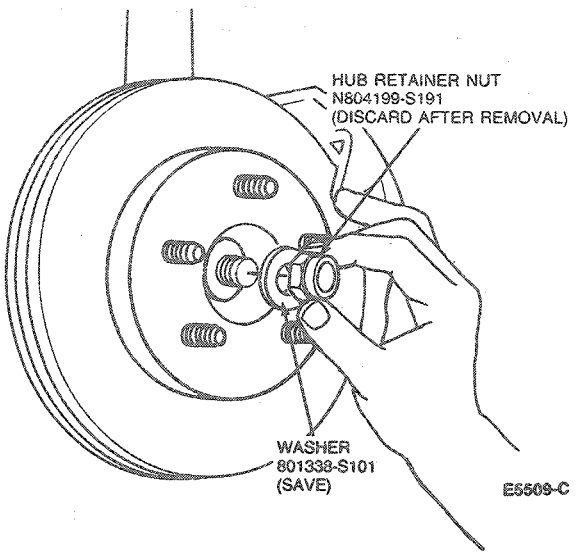
1. Remove wheelcover / hub cover from wheel and tire assembly and loosen wheel lugs nuts.



CAUTION: Discard the hub retainer nut. It is a torque prevailing design and cannot be reused.

2. After raising the vehicle on a frame contact hoist and removing the wheel and tire assembly, remove the hub retainer nut and washer.

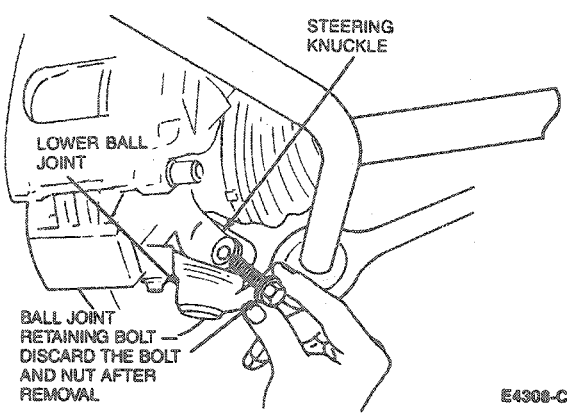




3. Remove nut from the ball joint-to-steering knuckle retaining bolt.

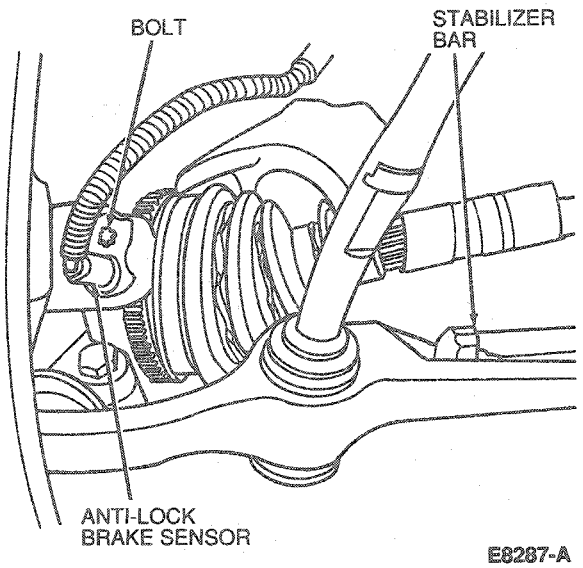
CAUTION: Discard the bolt and nut. They are of a torque prevailing design and cannot be reused.

4. Drive bolt out of steering knuckle using a punch and hammer.



REMOVAL AND INSTALLATION (Continued)

5. If equipped with anti-lock brakes, remove anti-lock brake sensor and position out of way.



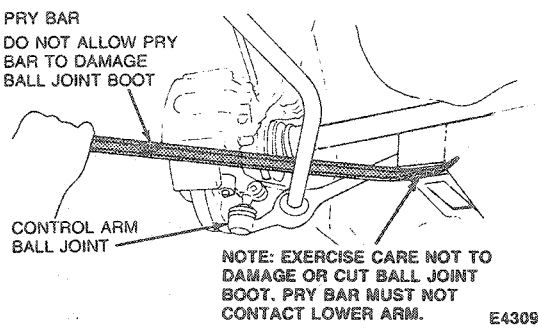
E8287-A

6. Separate ball joint from steering knuckle using a pry bar.

   Position the end of the pry bar outside of bushing pocket to avoid damage to bushing.

   Use care to prevent damage to the ball joint boot.

   Remove stabilizer bar link at stabilizer bar.

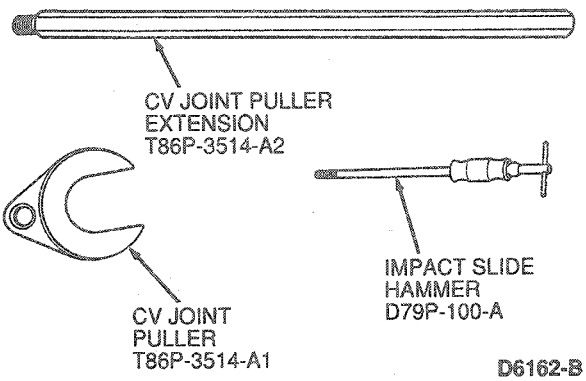


E4309-C

The remaining removal procedures for the RH and LH halfshafts are different depending on application. Refer to the appropriate procedure for the vehicle you are servicing.

Halfshaft—AXODE, RH and LH; MTX, LH

NOTE: The following tools are required to remove the inboard CV joints.



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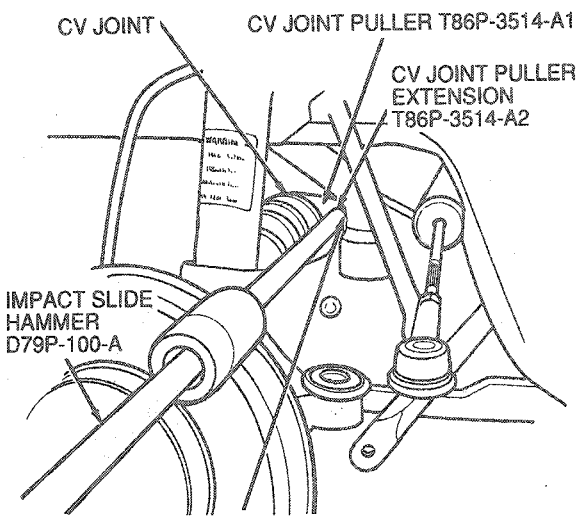
NOTE: Turn steering hub and / or wire strut assembly out of the way.

7. Install CV Joint Puller T86P-3514-A1 between CV joint and transaxle case.
8. Install CV Joint Puller Extension T86P-3514-A2 into CV joint puller and hand tighten.

   Install Impact Slide Hammer D79P-100-A or equivalent onto extension.
9. Remove CV joint from transaxle.

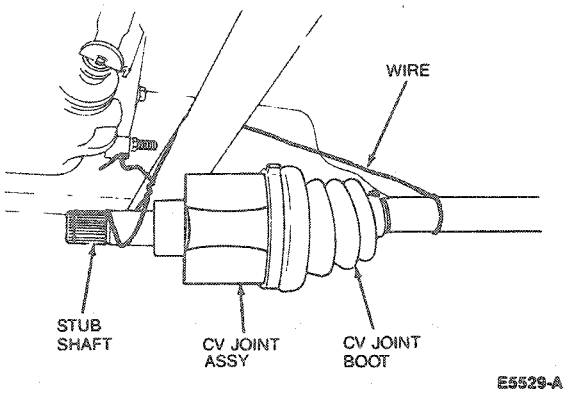


D6161-F

CAUTION: Do not allow shaft to hang unsupported, damage to the outboard CV joint may result.

REMOVAL AND INSTALLATION (Continued)

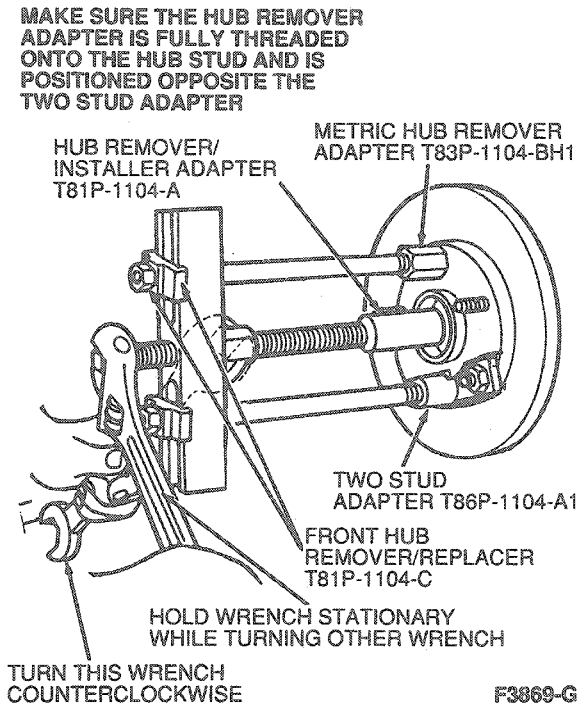
10. Support the end of the shaft by suspending from a convenient underbody component with a length of wire.



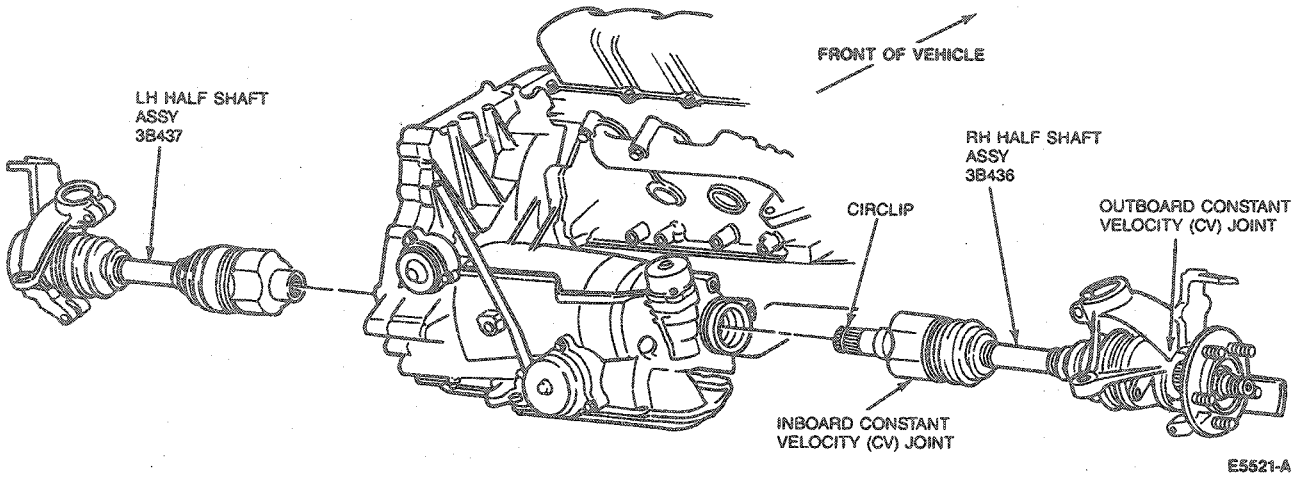
CAUTION: Never use a hammer to separate the outboard CV joint stub shaft from the hub. Damage to the CV joint threads and internal components may result.

11. Separate the outboard CV joint from the hub using Front Hub Remover / Replacer T81P-1104-C, Metric Hub Remover Adapter T83P-1104-BH, T86P-1104-A1 and Front Hub Installer T81P-1104-A.

12. Remove halfshaft assembly from vehicle.



AXODE



Refer to illustration under Step 9 of Halfshaft / Link Shaft for MTX.

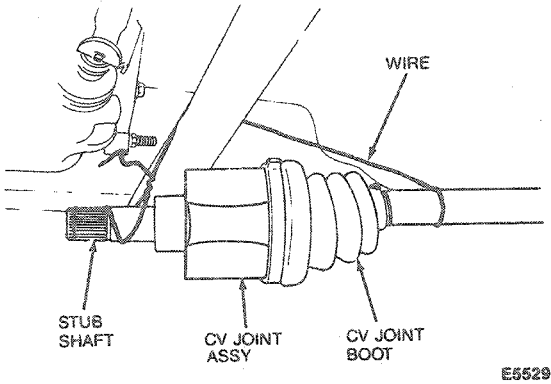
Halfshaft / Link Shaft—MTX, RH

7. Remove two bearing support retaining bolts from bracket. Slide link shaft out of transaxle.

CAUTION: Do not allow the shaft to hang unsupported, damage to the outboard CV joint may result.

REMOVAL AND INSTALLATION (Continued)

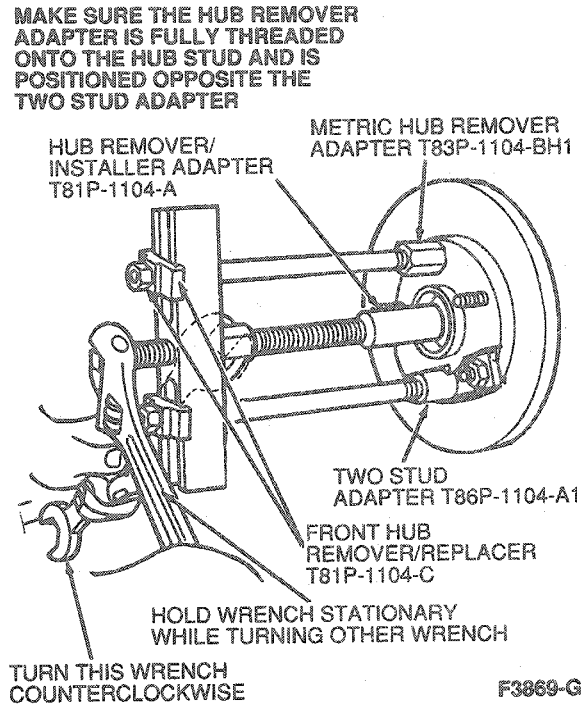
8. Support end of shaft by suspending from a convenient underbody component with a length of wire.

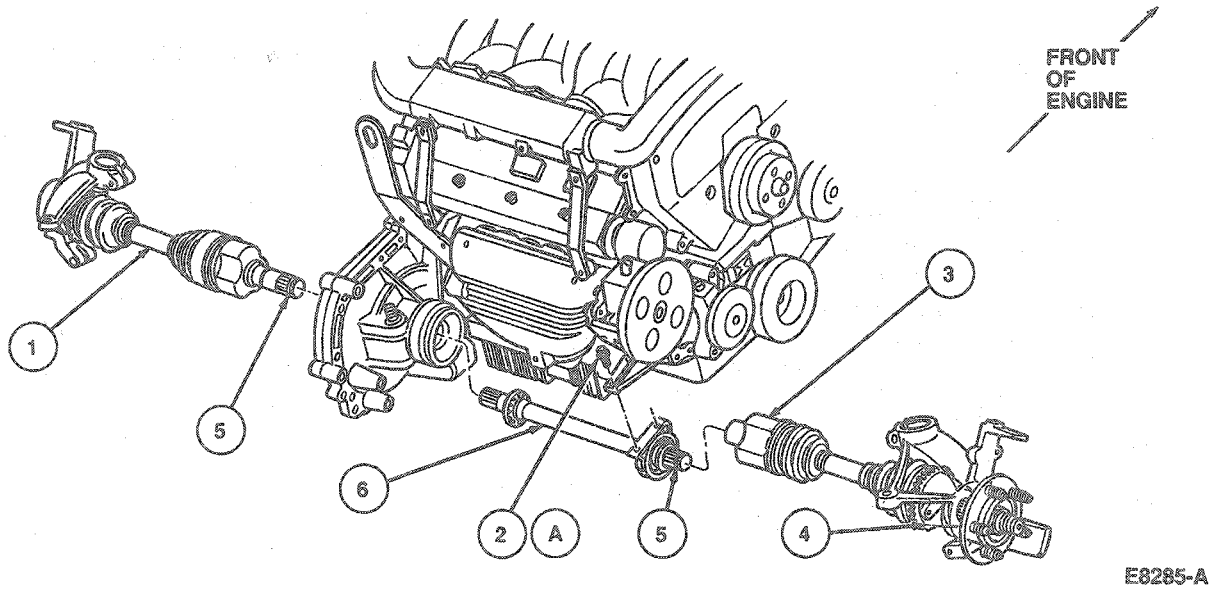


CAUTION: Never use a hammer to separate the outboard CV joint stub shaft from the hub. Damage to the CV joint threads and internal components may result.

NOTE: The RH link shaft and halfshaft assembly are removed as a complete unit. Refer to Disassembly and Assembly to separate link shaft and halfshaft.

9. Separate the outboard CV joint from the hub using Front Hub Remover / Replacer T81P-1104-C, Metric Hub Remover Adapter T83P-1104-BH, T86P-1104-A1 and Front Hub Installer T81P-1104-A.





Item	Part Number	Description
1	3B437	LH Halfshaft Assy
2A	N605904-S100	Bolt (2 Req'd)
3	—	RH Inboard CV Joint

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
4	—	RH Outboard CV Joint
5	—	Snap Rings (2 Req'd)
6	3C081	Link Shaft Assy
A		Tighten to 21-32 N·m (15.5-23 Lb-Ft)

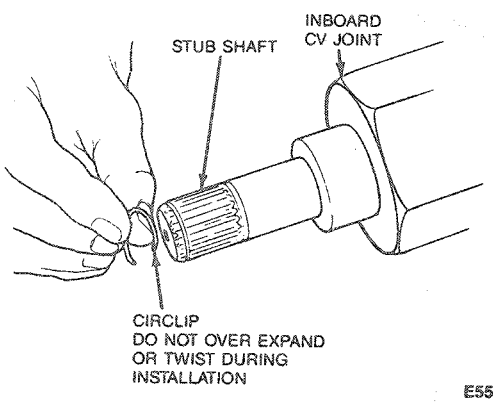
Installation

NOTE: To install the circlip properly, start one end in the groove and work the circlip over the stub shaft end and into the groove. This will avoid over-expanding the circlip.

CAUTION: DO NOT reuse circlip. A new circlip must be installed each time the inboard CV joint is installed into the transaxle differential.

1. Install a new circlip on the inboard CV joint stub shaft and / or link shaft.

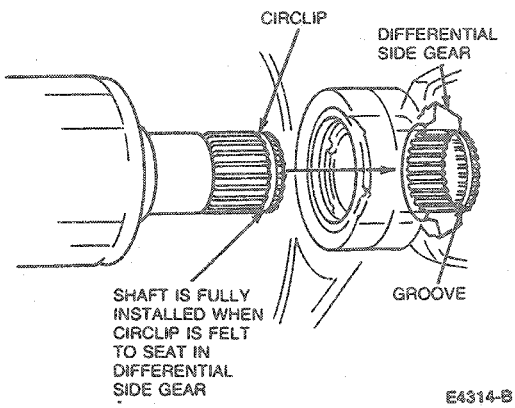
   The outboard CV joint stub shaft does not have a circlip.



   NOTE: A non-metallic mallet may be used to aid in seating the circlip into the differential side gear groove. If a mallet is necessary, tap only on the outboard CV joint stub shaft.

2. Carefully align splines of inboard CV joint stub shaft or link shaft with the splines in the differential. Exerting some force, push CV joint into differential until the circlip is felt to seat in the differential side gear. On MTX equipped vehicles, tighten link shaft bearing retaining bolts to 21-32 N·m (16-23 lb-ft).

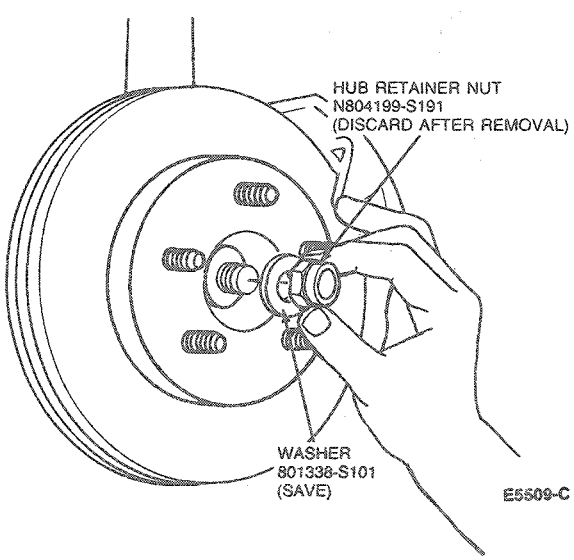
   Use care to prevent damage to the differential oil seal.



3. Carefully align splines of outboard CV joint stub shaft with splines in hub and push the shaft into the hub as far as possible.
4. Temporarily fasten rotor to hub with washers and two wheel lug nuts. Insert a steel rod into the rotor and rotate clockwise to contact the knuckle to prevent the rotor from turning during CV joint installation.

   CAUTION: A new hub retainer nut must be installed.

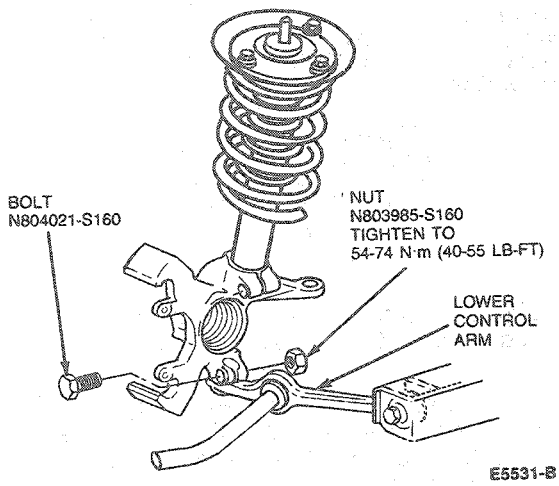
5. Install the hub nut washer and a new hub retainer nut. Manually thread the retainer onto the CV joint shaft as far as possible.



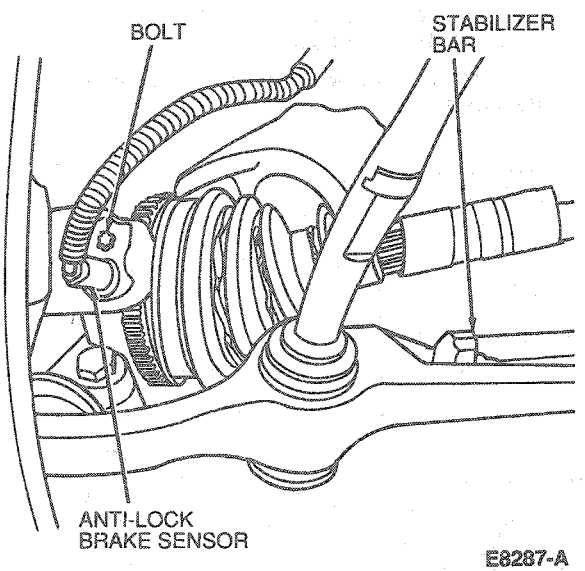
REMOVAL AND INSTALLATION (Continued)

CAUTION: A new bolt and nut must be installed.

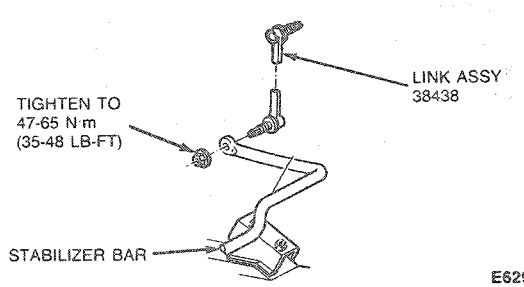
6. Connect control arm to the steering knuckle and install a new nut and bolt. Tighten nut to 54-74 N·m (40-55 lb-ft).



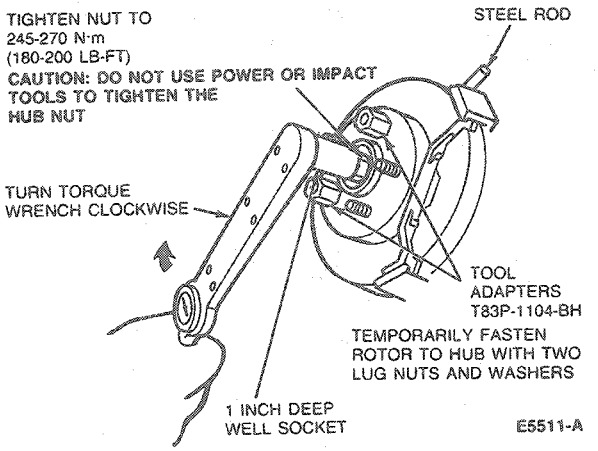
7. Install anti-lock brake sensor if equipped.



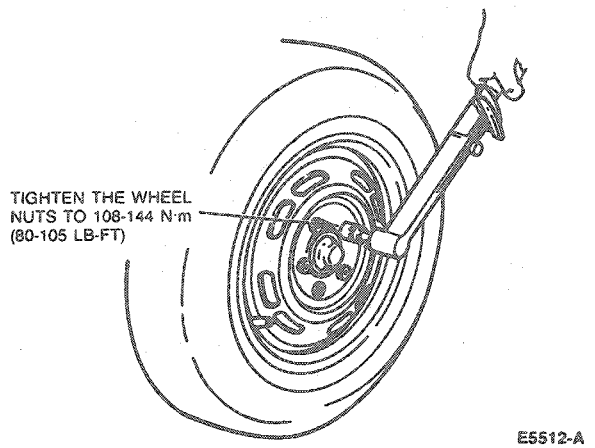
8. Connect stabilizer bar link to stabilizer bar. Tighten to 47-65 N·m (35-48 lb-ft).



9. Tighten hub retainer nut to 245-270 N·m (180-200 lb-ft).



10. Install wheel and tire assembly and lower vehicle.
11. Tighten wheel lug nuts to 115-142 N·m (85-105 lb-ft).



12. Fill transaxle to proper level with specified lubricant.

AXODE—ESP-M2C185-A MERCON®

Refer to Section 07-02.

MTX—ESP-M2C185-A MERCON®

Refer to Section 07-03 for the Transaxle Fluid Level Check.

DISASSEMBLY AND ASSEMBLY

Outboard CV Joint and Boot

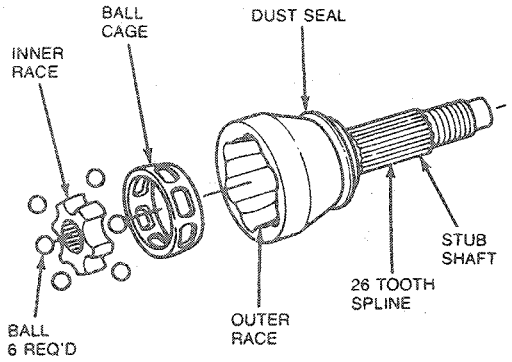
Tools Required:

- Boot Clamp Pliers D87P-1098-A

DISASSEMBLY AND ASSEMBLY (Continued)

Disassembly

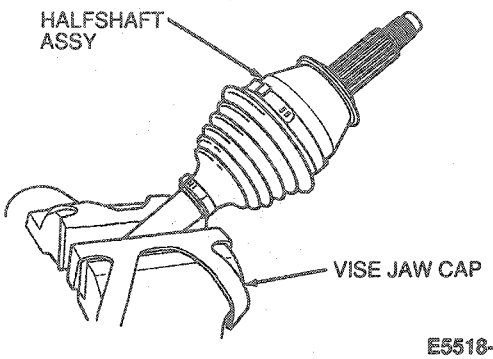
NOTE: The CV joint components are matched during manufacture and therefore cannot be interchanged with components from another CV joint. Extreme care should be taken not to mix or substitute like components between CV joints.



E4266-D

1. Clamp halfshaft in a vise. Do not allow vise jaws to contact the boot or its clamp.

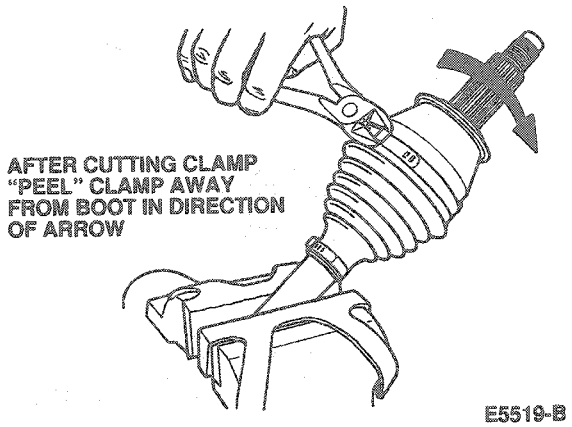
   The vise should be equipped with jaw caps to prevent damage to any machined surfaces.



E5518-B

2. Cut the large boot clamp using side cutters and pull away from the boot.

   After removing the clamp, roll boot back over shaft.



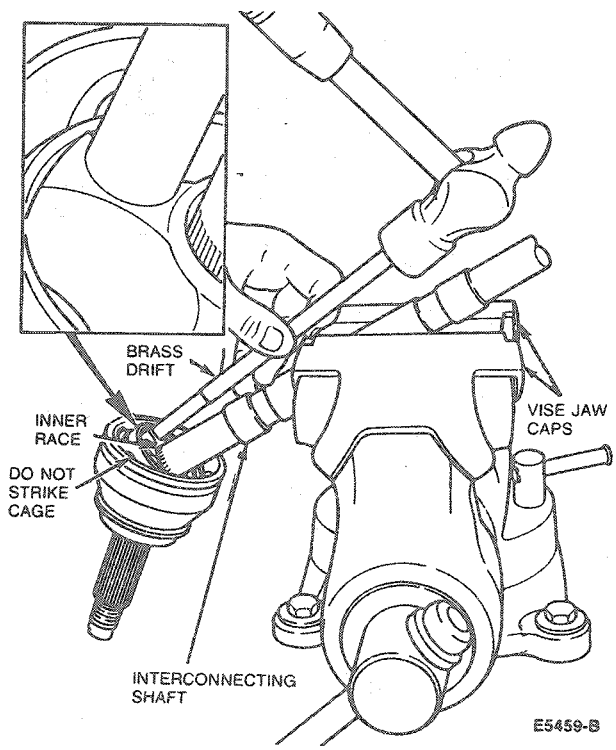
E5519-B

3. Support interconnecting shaft in a soft jaw vise and angle the CV joint to expose the inner bearing race.

   NOTE: Vise jaw caps are made of copper, brass, wood or other soft material. They are slipped over the steel jaws of the vise so as not to scratch or nick finished surfaces.

4. Using a brass drift and hammer, give a sharp tap to the inner bearing race to dislodge the internal circlip and separate the CV from the interconnecting shaft. Care should be taken not to drop the CV joint at separation.

   The boot (not shown), can now be removed from the shaft.

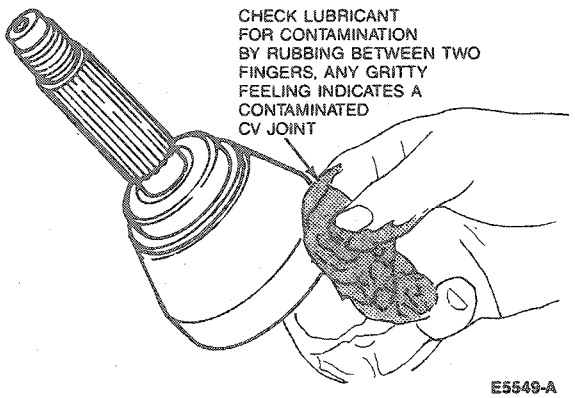


E5459-B

DISASSEMBLY AND ASSEMBLY (Continued)

5. Inspect CV joint grease for contamination. If the CV joints are operating satisfactorily, and the grease does not appear to be contaminated, add grease and replace boot.

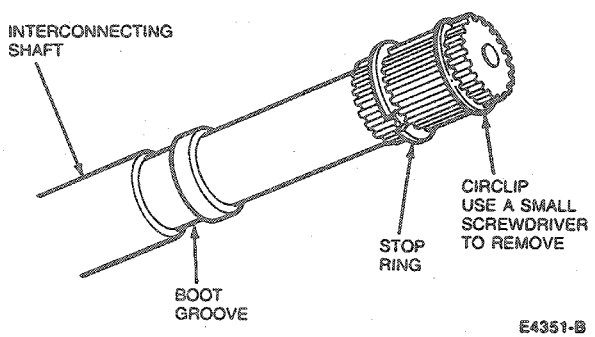
   If the lubricant appears contaminated, proceed with a complete CV joint disassembly and inspection.



CAUTION: DO NOT reuse circlip. Replace used circlip with a new circlip before assembly.

6. Remove circlip located near the end of the shaft. Discard the circlip. A new clip is supplied with both the boot replacement kit and CV joint.

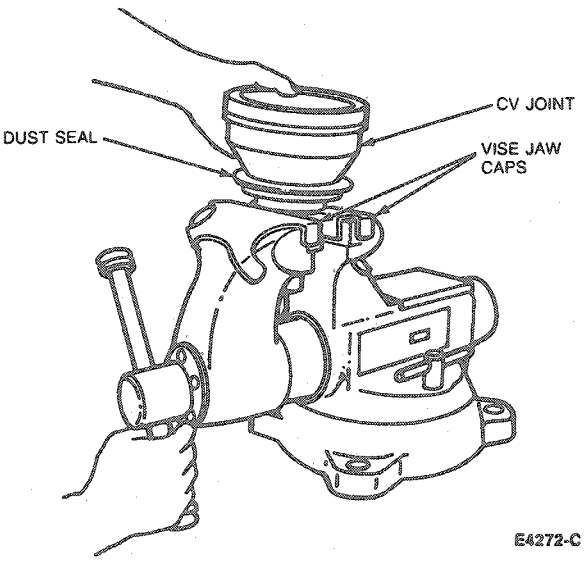
   The stop ring, located just below the circlip, should be removed only if it is damaged, worn or otherwise unserviceable.

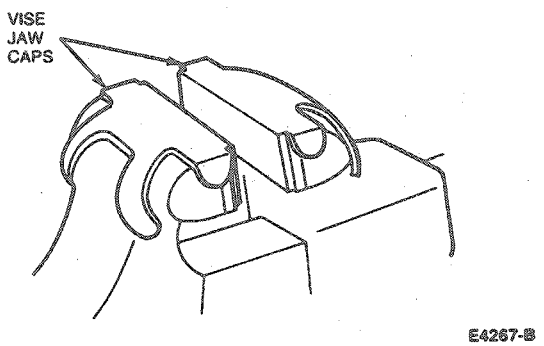


NOTE: Vise jaw caps are made of copper, brass, wood or other soft material. They are slipped over the steel jaws of the vise so as not to scratch or nick finished surfaces.

7. Clamp CV joint stub shaft in a vise with the outer face facing up. Care should be taken not to damage dust seal.

   The vise must be equipped with jaw caps to prevent damage to the shaft splines.

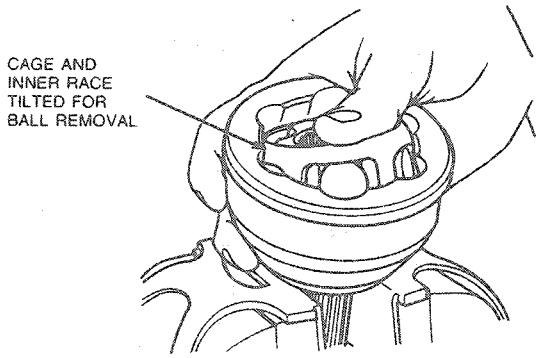


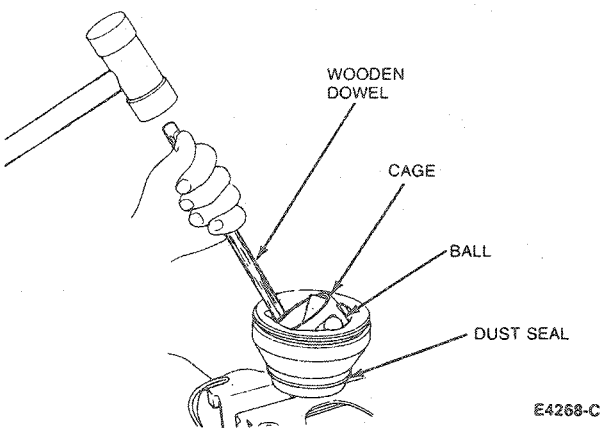


DISASSEMBLY AND ASSEMBLY (Continued)

8. Press down on inner race until it tilts enough to allow removal of the ball.

   A tight assembly can be tilted by tapping the inner race with wooden dowel and hammer. Do not hit the cage.





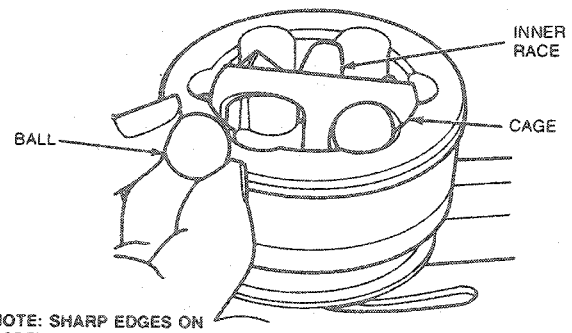
CAUTION: Exercise care to prevent scratching or other damage to the inner race or cage spheres.

9. With the cage sufficiently tilted, remove ball from cage.

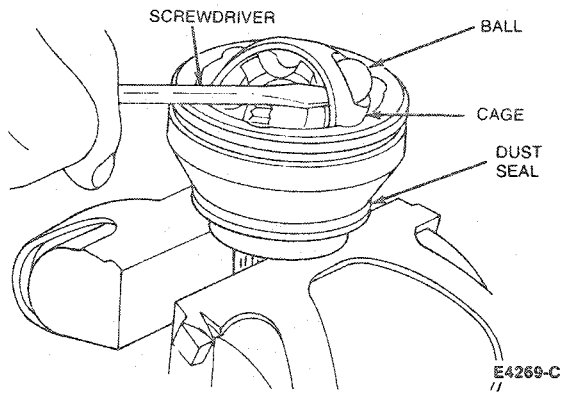
   Repeat this Step until all six balls are removed.

   If balls are tight in the cage, use a screwdriver to pry the balls from cage.

   If a screwdriver is necessary, use an old screwdriver and blunt any sharp edges on the blade with a grinder or file.

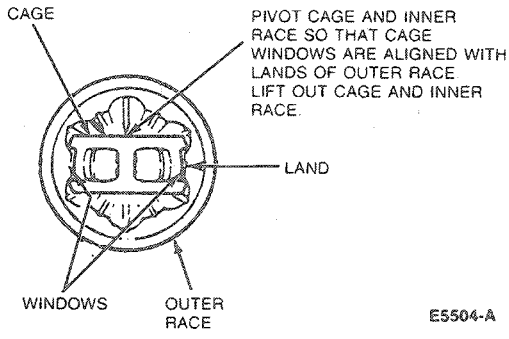


NOTE: SHARP EDGES ON SCREWDRIVER SHOULD BE BLUNTED TO PREVENT SCRATCHING OF FINISHED SURFACES.

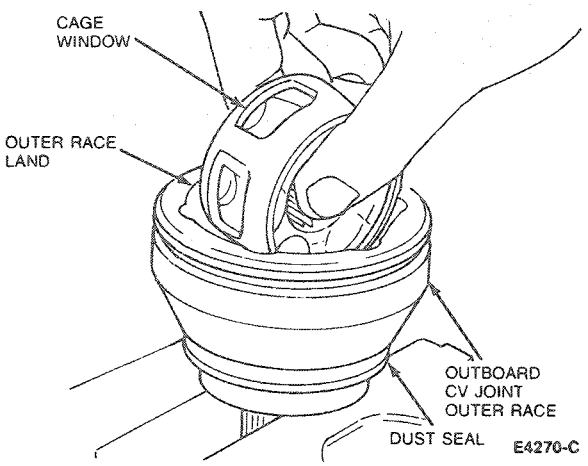


10. Pivot cage and inner race assembly until it is straight up and down in the outer race. Align cage windows with outer race lands while pivoting the bearing cage.

    With the cage pivoted and aligned, lift assembly from the outer race.



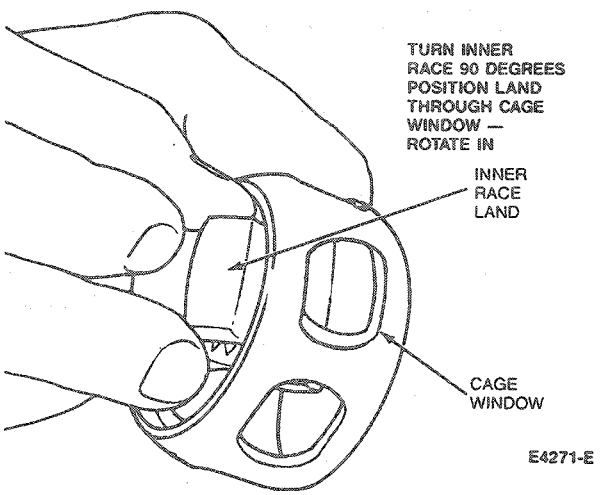
DISASSEMBLY AND ASSEMBLY (Continued)



11. Rotate inner race up and out of the cage.

Cage Windows

Pivot the inner race until it is straight up and down in the cage. Align one of the inner race lands with one of the cage windows and position the race through the window. Rotate the inner race up and out of the cage.



Inspection

1. Clean all parts (except boots) in a suitable solvent.
2. Wipe excessive grease from boots and wash in soap and water only.
3. Inspect boots for cuts or damage.
4. Inspect all CV joint parts for excessive wear, looseness, pitting, rust and cracks.

   NOTE: Because CV joint components are matched during assembly, individual components are not available for service. If inspection determines a part to be unserviceable, the CV joint must be replaced as an assembly.

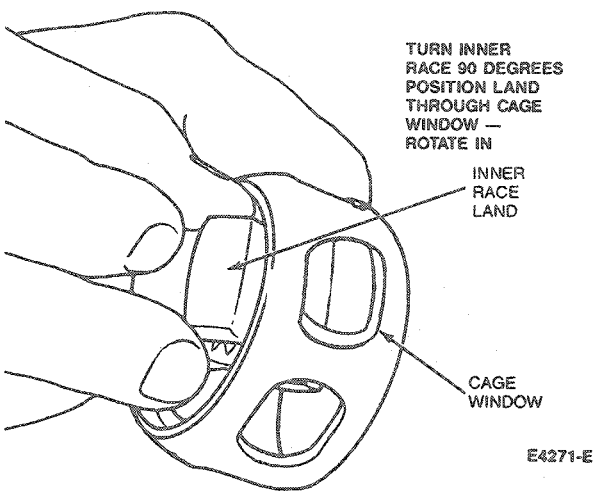
5. Replace parts only if required.

Do not replace a joint merely because the parts appear polished. Shiny areas in ball races and on the cage spheres are normal. A CV joint should be replaced ONLY if inspection determines a component(s) to be cracked, broken, severely pitted, worn or otherwise unserviceable.

Assembly

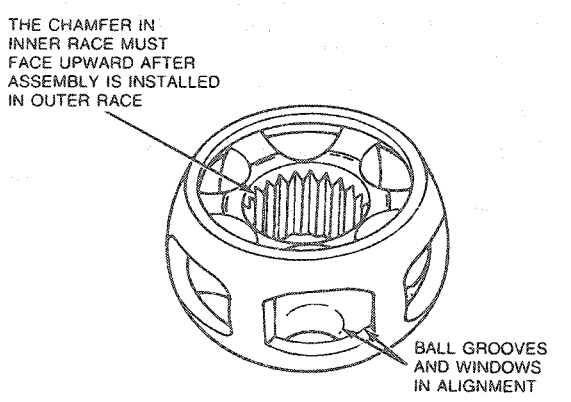
1. Apply a light coating of grease on inner and outer ball races.

   Install the inner race in the bearing cage.



CAUTION: Use only Ford Constant Velocity Joint Grease E43Z-19590-A (ESP-M1C207-A) or equivalent.

2. Install inner race and cage assembly in the outer race.

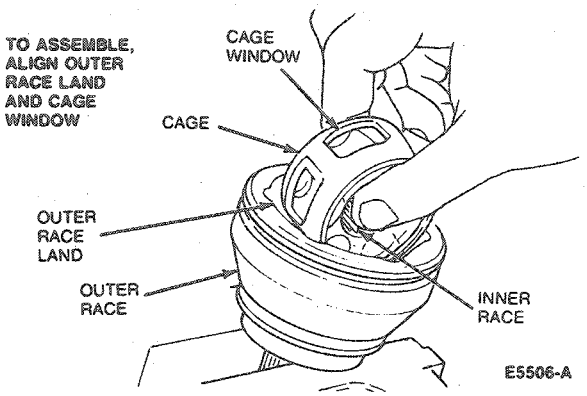


3. Install the assembly vertically and pivot 90 degrees into position.
4. Align bearing cage and inner race with outer race.

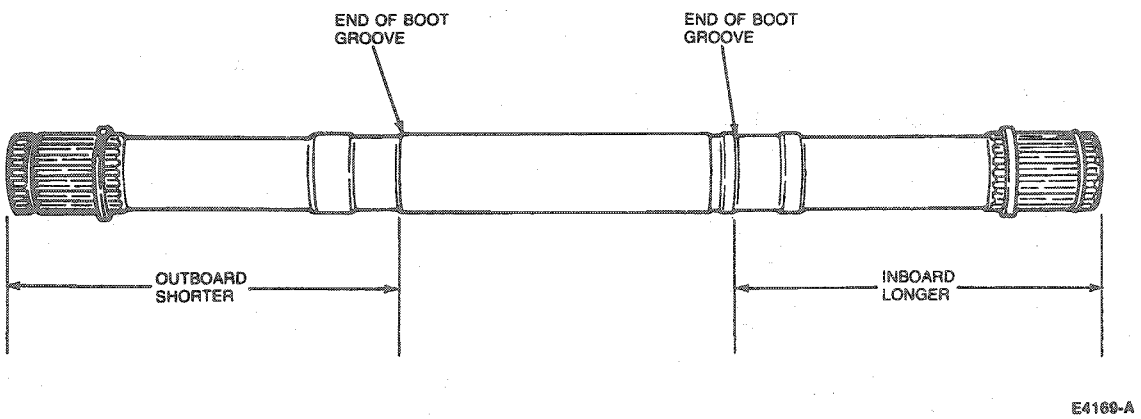
   Tilt the inner race and cage and install a ball.

DISASSEMBLY AND ASSEMBLY (Continued)

Repeat this Step until six balls are installed.



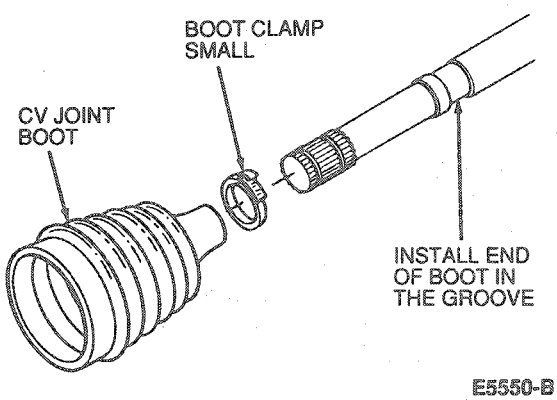
5. The LH and RH interconnecting shafts are not the same end for end. The outboard end is shorter from end of shaft to end of boot groove than the inboard end. Take a measurement to ensure correct inboard and outboard CV joint-to-shaft installation.



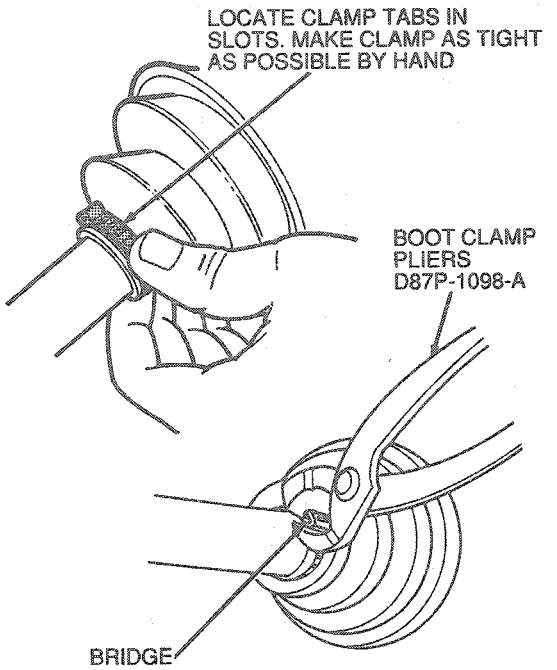
CAUTION: Tighten the clamp securely, but not to the point where the clamp bridge is cut or the boot is damaged.

6. If removed, install CV joint boot after removing stop ring.

   Ensure the boot is seated in its groove and clamp in position using Boot Clamp Pliers D87P-1098-A or equivalent.



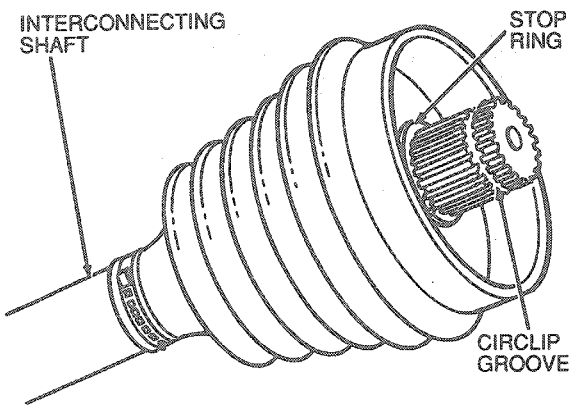
DISASSEMBLY AND ASSEMBLY (Continued)



E4298-F

7. If removed, install the stop ring.

   If not removed, ensure stop ring is properly seated in its groove.



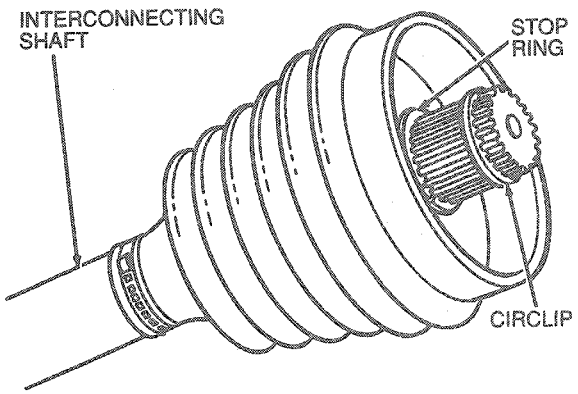
E4296-C

NOTE: To install circlip, start one end in the groove and work the circlip over the stub shaft end and into the groove. This will avoid over-expanding the circlip.

CAUTION: DO NOT reuse circlip. Replace circlips before assembly.

8. Install a new circlip, supplied with the service kit, in the groove nearest the end of the shaft.

   Do not over-expand or twist the circlip during installation.

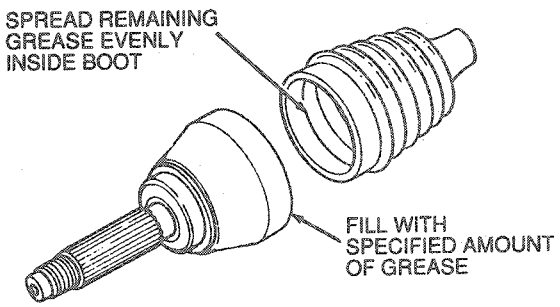


E4293-C

9. Before positioning boot over CV joint, pack CV joint and boot with the grease supplied in the service kit as follows:

   NOTE: Use Ford Constant Velocity Joint Grease E43Z-19590-A (ESP-M1C207-A) or equivalent on all outboard CV joints.

   Pack CV joint with grease. Any grease remaining in tube is to be spread evenly inside boot. For grease quantity, refer to Lubricant Specifications.

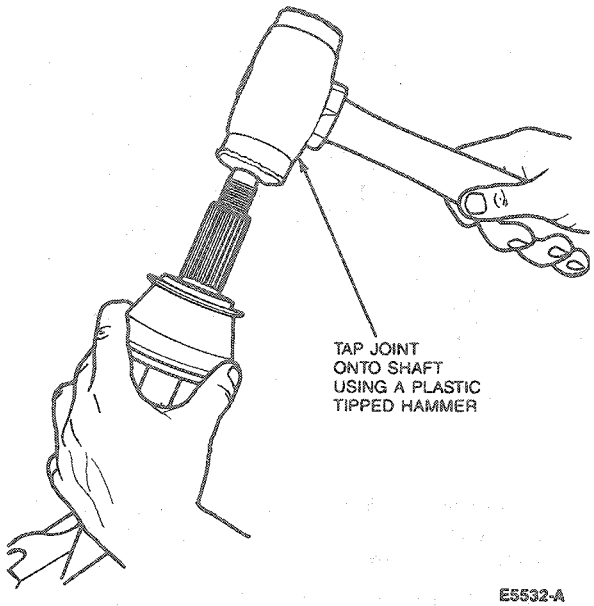


OUTBOARD CV JOINT E6700-B

DISASSEMBLY AND ASSEMBLY (Continued)

10. With the boot held back, position CV joint on shaft and tap into position using a plastic tipped hammer.

    The CV joint is fully seated when the circlip locks in the groove cut into the CV joint inner race. Check for circlip seating by attempting to pull the joint from the shaft.

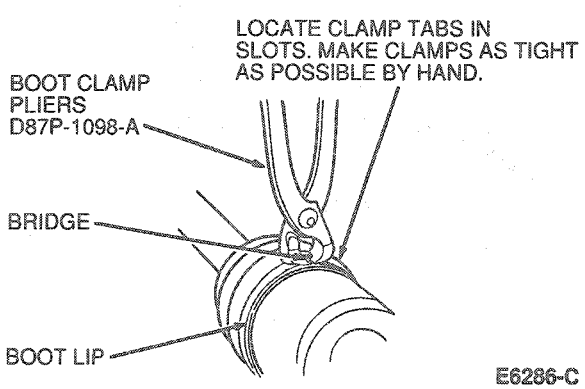


E5532-A

11. Remove all excess grease from the CV joint external surfaces and mating boot surface.
12. Position boot over CV joint.

    CAUTION: Tighten the clamp securely, but not to the point where the clamp bridge is cut or the boot is damaged.

13. Make sure the boot is seated in its groove and clamp in position using Boot Clamp Pliers D87P-1098-A or equivalent.



E6286-C

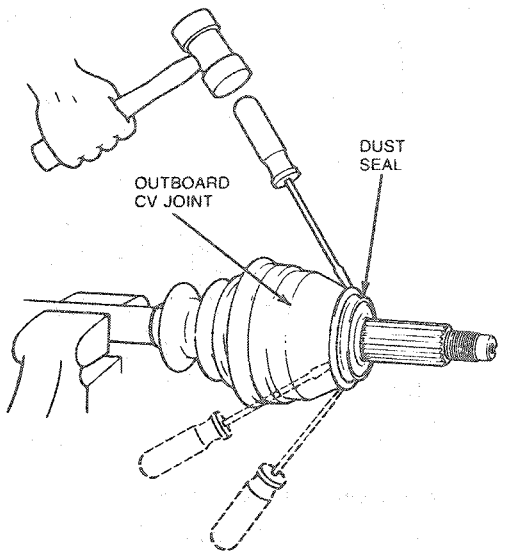
Outboard CV Joints Dust Seal

Disassembly

Tools Required:

- Spindle / Axle Seal Installer T83T-3132-A1
- Dust Seal Installer T86P-1104-A4

Using a light duty hammer and screwdriver, tap uniformly around seal until it becomes unseated.

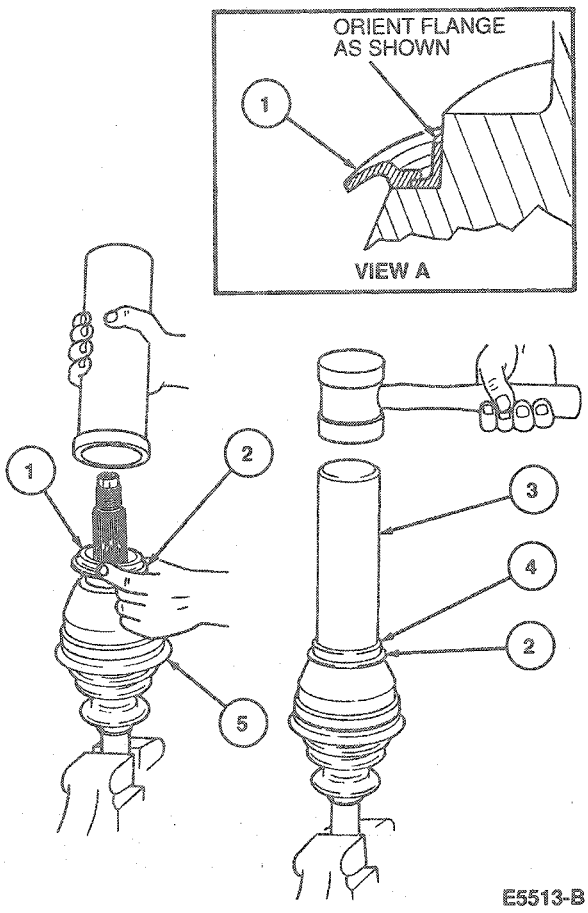


E5453-B

Assembly

Using Spindle / Axle Seal Installer T83T-3132-A1 and Dust Seal Installer T86P-1104-A4, install the dust seal. The dust seal flange must face outboard.

DISASSEMBLY AND ASSEMBLY (Continued)



Item	Part Number	Description
1	—	Seal Flange
2	—	Dust Seal
3	T83T-3132-A1	Spindle / Axle Seal Installer
4	T86P-1104-A4	Dust Seal Installer
5	—	Outboard CV Joint

TE5513B

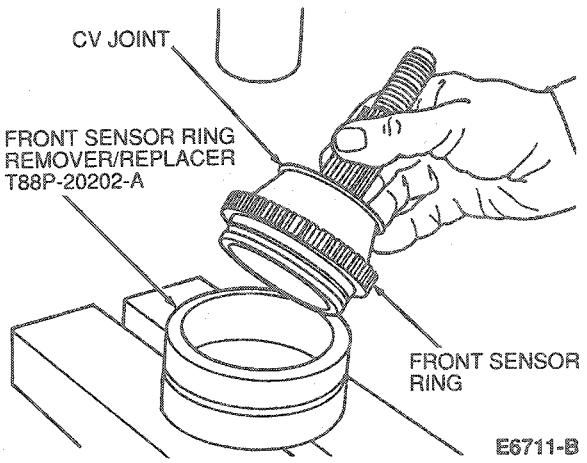
Speed Indicator Ring

Disassembly

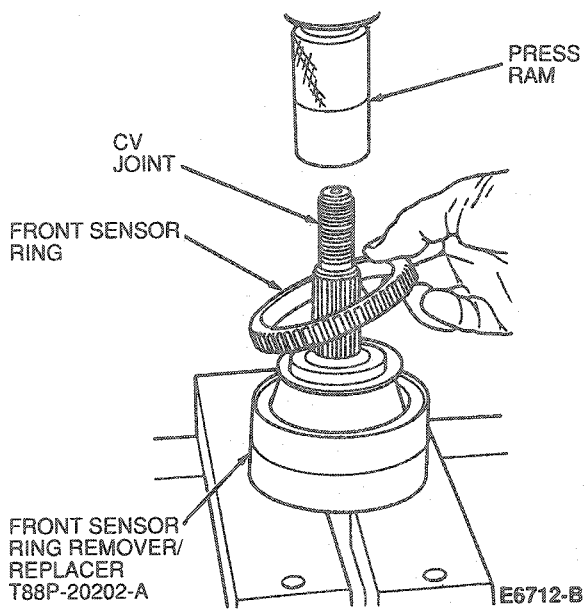
Tools Required:

- Sensor Ring Remover / Replacer T88P-20202-A

1. Remove outboard CV joint as outlined.
2. Position Front Sensor Ring Remover / Replacer T88P-20202-A on a press. Position CV joint on tool.



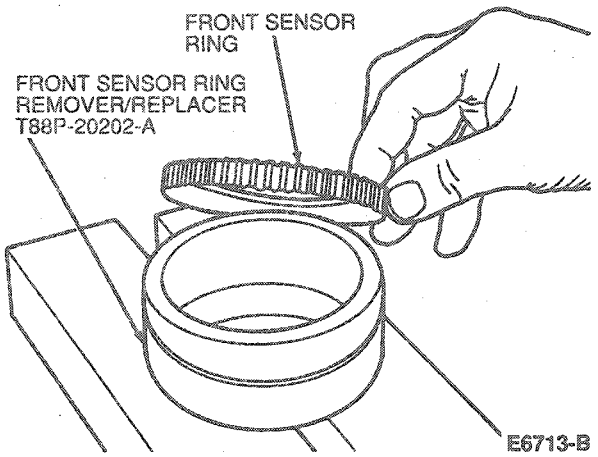
3. With CV joint positioned on tool, use press ram to apply pressure to CV joint and remove speed indicator ring.



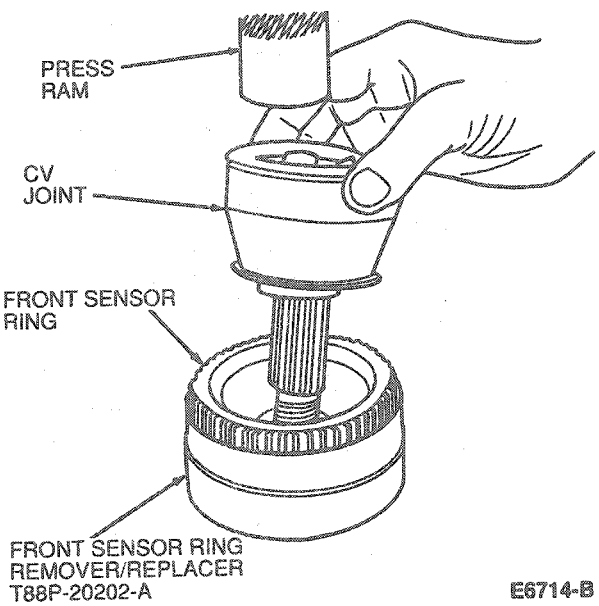
DISASSEMBLY AND ASSEMBLY (Continued)

Assembly

1. With Front Sensor Ring Remover / Replacer T88P-20202-A positioned on press, place sensor ring on tool.

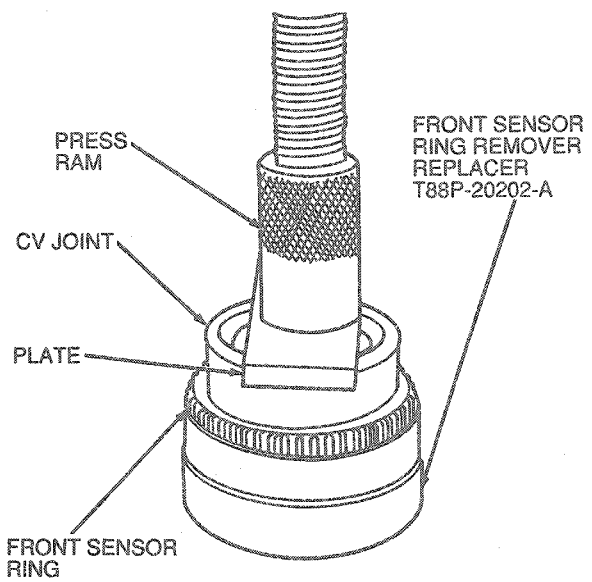


2. Position CV joint in Front Sensor Remover / Replacer T88P-20202-A. Allow CV joint to rest on ring.



CAUTION: Extra care should be taken not to damage the front sensor ring during installation. If teeth are damaged, brake performance will be affected.

3. With CV joint installed in tool, place a steel plate across CV joint back face. Press CV joint until CV joint bottoms out in Front Sensor Ring Remover Replacer T88P-20202-A. The ring will be properly installed when bottomed out in tool.



Inboard CV Joint

Three different designs of inboard CV joints are used on Taurus / Sable:

1. **3.0L Non-ABS:** Tripod design. Positive retention of tripod assembly to interconnecting shaft. CV joint and interconnecting shaft are serviced as an inboard sideshaft assembly only. Boot kits and clamps are serviced.
2. **3.0L ABS, 3.8L and 3.0L SHO Manual Transmission:** Tripod design. Tripod assembly removable from interconnecting shaft. Inboard CV joint kit, interconnecting shaft, boot kits and clamps are serviced.
3. **3.2L SHO Automatic Transmission:** Tri-Plan design. The tri-plan CV joint is removable from the interconnecting shaft. The tripod assembly is permanently retained inside the outer race by a crimped metal ring. The tri-plan CV joint is serviced as an assembled CV joint, interconnecting shaft, boot kits and clamps are also serviced.

Disassembly — 3.0L Non-ABS Inboard CV Joints

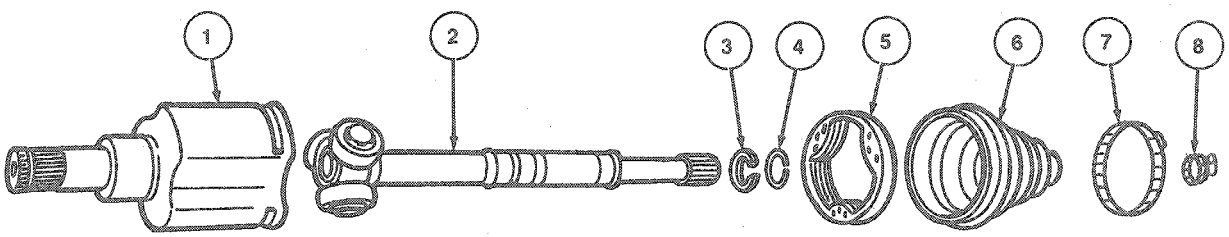
Tools Required:

- Boot Clamp Pliers D87P-1090-A
- Boot Clamp Pliers D87P-1098-A

CAUTION: Although the designs are similar, there is no interchangeability of parts between the three designs. The CV joint tripod, outer race, boot and interconnecting shaft are unique for each style.

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: The tripod assembly cannot be removed from the interconnecting shaft on this design. If a tripod assembly, outer race or interconnecting shaft is required, an inboard side shaft assembly must be used. However, if a boot kit or clamps are required, these are available.



E8836-A

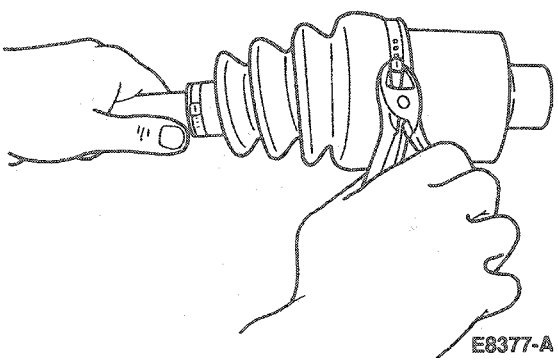
Item	Description
1	Inboard Joint Outer Race and Stub Shaft
2	Interconnecting Shaft Assy
3	Stop Ring

(Continued)

Item	Description
4	Circlip
5	Trilobe Insert
6	Inboard Boot
7	Boot Clamp (Large)
8	Boot Clamp (Small)

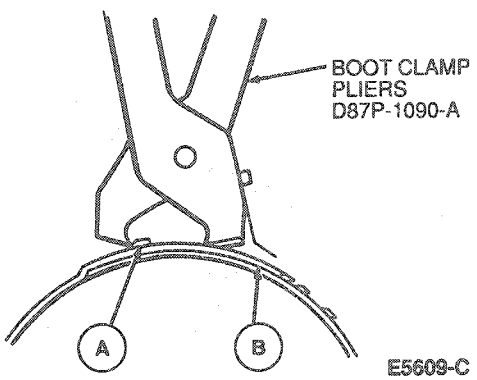
CAUTION: On all vehicles (except SHO powertrains), the RH inboard CV joint requires a reusable, low profile large boot clamp. A special tool is required to remove and install the clamp. Use Boot Clamp Pliers D87P-1090-A or equivalent.

1. Cut and remove both boot clamps and slide boot back on shaft.



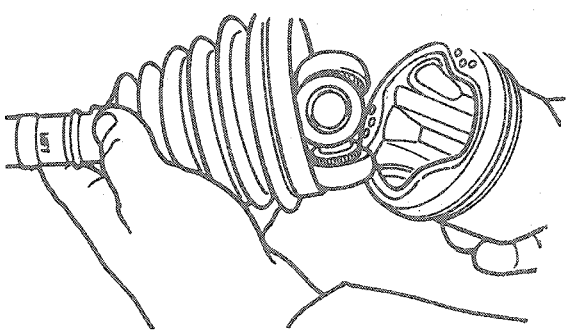
E8377-A

Remove clamp by engaging pincer jaws in closing hooks (A and B) and drawing hooks together. Disengage windows and locking hooks and remove clamp.



E5609-C

2. Slide outer race off tripod.

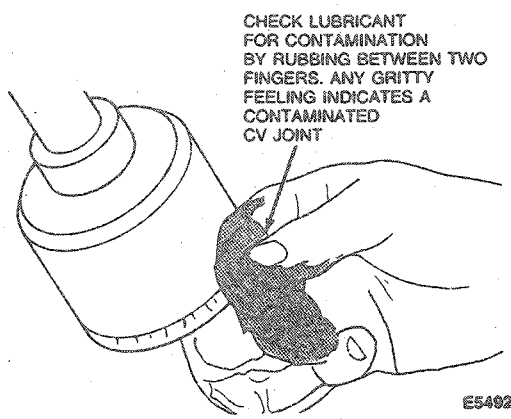


E8367-A

DISASSEMBLY AND ASSEMBLY (Continued)

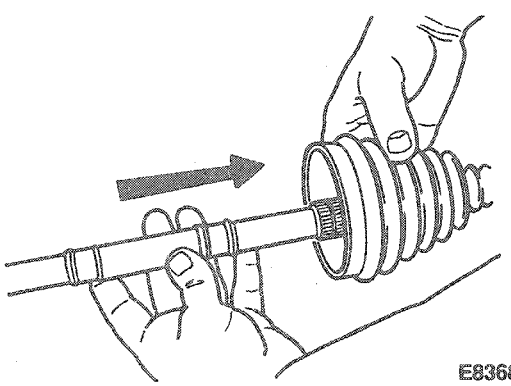
3. When replacing damaged CV joint boots, the grease should be checked for contamination. If the CV joints are operating satisfactorily, and the grease does not appear to be contaminated, add grease and replace the boot.

   If the grease appears contaminated, proceed with a complete CV joint disassembly and inspection.

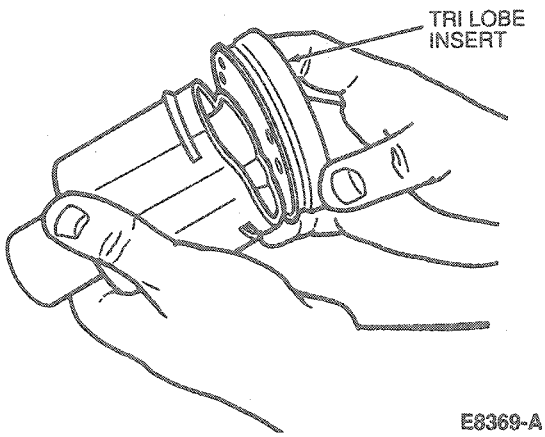


   NOTE: If further disassembly is required, first remove outboard CV joint and boot as outlined in Outboard CV Joint and Boot Disassembly and Assembly Section.

4. Remove outboard CV joint stop ring and circlip.
5. Slide inboard boot of interconnecting shaft.

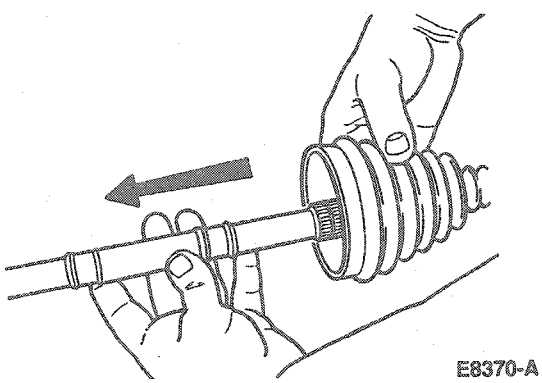


6. Remove trilobe insert from CV joint outer race. Remove grease from outer race and inspect outer race and tripod assembly.

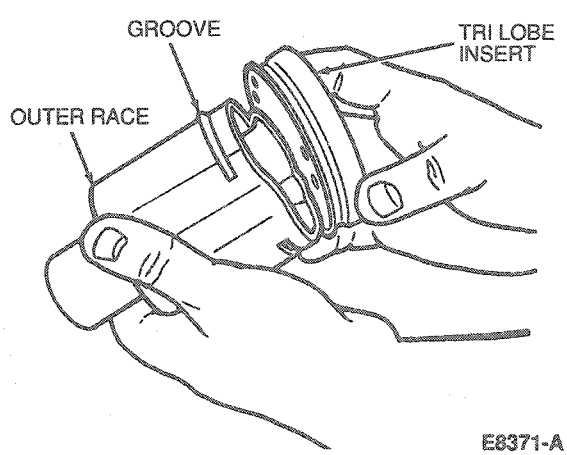


Assembly

1. Install CV joint boot on interconnecting shaft. Position boot to allow for CV joint outer race installation.



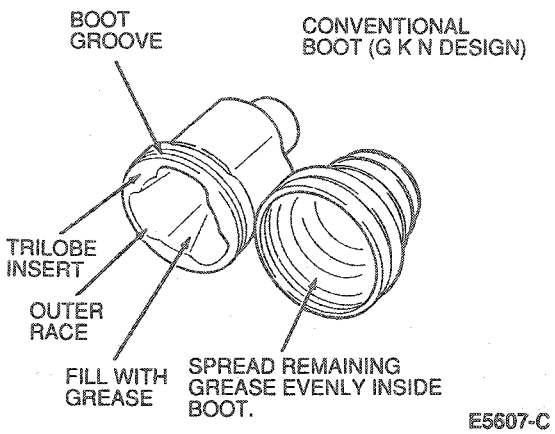
2. Install trilobe insert on CV joint outer race. Position in groove on outer race.



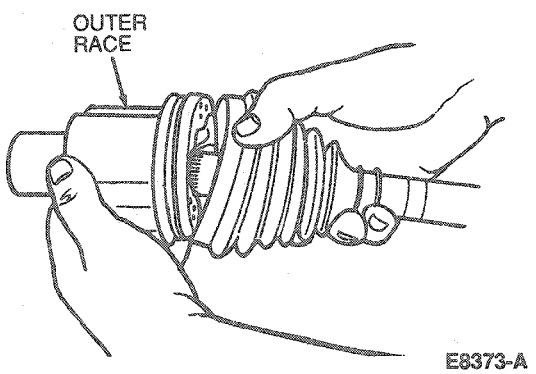
   NOTE: Use Ford Constant Velocity Grease E43Z-19590-A (ESP-M1C207-A) or equivalent.

DISASSEMBLY AND ASSEMBLY (Continued)

3. Fill CV joint outer race with grease and spread remaining grease evenly inside boot. Total fill is 250 grams (9 oz).



4. Install outer race on tripod assembly.

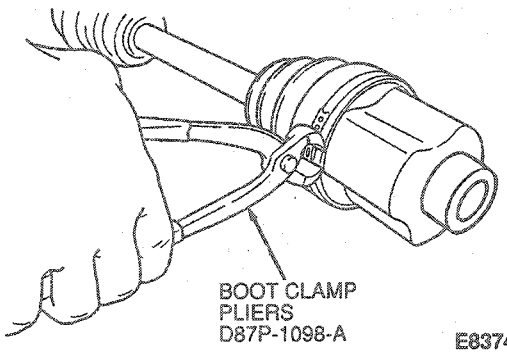


NOTE: Before installing boot clamp, ensure any air pressure which may have built up in boot is relieved. Insert a dulled screwdriver blade between boot and outer bearing race to allow trapped air to escape from boot. The air should be released from the boot only after adjusting to dimension shown in Specifications.

5. Remove all excess grease from CV joint external surfaces and mating boot surface. Position boot over CV joint making sure boot is seated in groove. Move CV joint in and out, as necessary, to adjust to length shown in Specifications

CAUTION: All vehicles (except SHO powertrains) require a reusable low profile large clamp on the RH inboard CV joint.

6. Seat boot in groove and clamp in position using Boot Clamp Pliers D87P-1098-A or equivalent on left inboard CV joints.



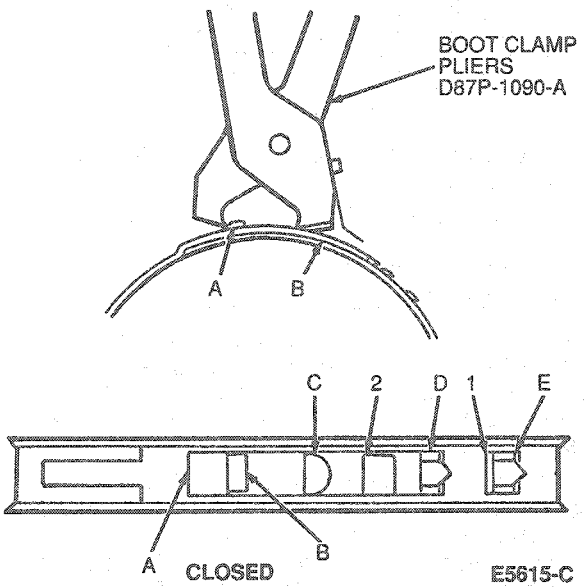
Install clamp as follows:

a. With boot seated in groove, place clamp over boot.

b. Engage hook (C) in window.

c. Using Boot Clamp Pliers, D87P-1090-A or equivalent, place pincer jaws in closing hooks (A and B)

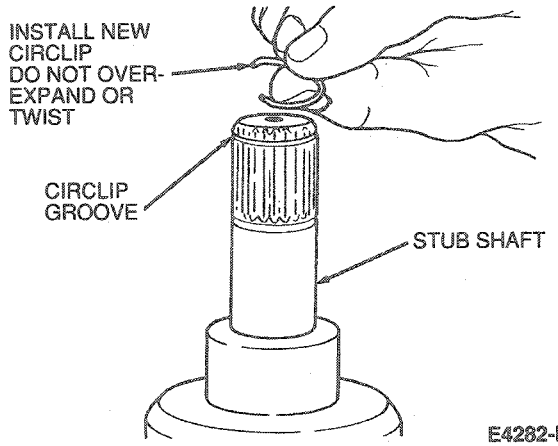
d. Secure clamp by drawing closing hooks together. When windows (1 and 2) are above locking hooks (D and E) spring tab will press windows over locking hooks and engage clamp.



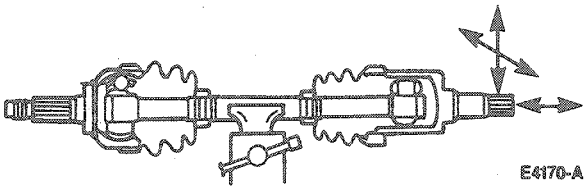
CAUTION: Do not over-expand or twist circlip during installation. DO NOT reuse circlips. Replace with new circlips before assembly.

DISASSEMBLY AND ASSEMBLY (Continued)

7. On RH side CV joints, install a new circlip, supplied with service kit, in groove nearest end of shaft by starting one end in groove and working circlip over stub shaft end and into groove.



8. Work the CV joint through its full range of travel at various angles. The joint should flex, extend and compress smoothly.



Disassembly — 3.0L ABS, 3.8L and SHO Manual Transmission

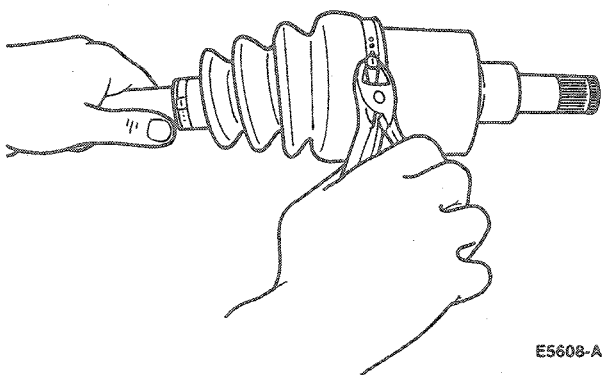
Tools Required:

- Boot Clamp Pliers D87P-1090-A
- Boot Clamp Pliers D87P-1098-A

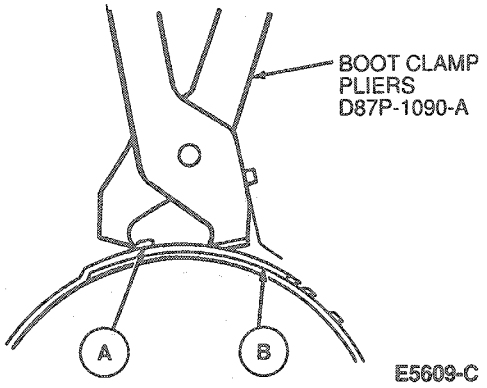
CAUTION: Although the designs are similar, there is no interchangeability of parts between the three designs. The CV joint tripod, outer race, boot and interconnecting shaft are unique for each style.

CAUTION: On all vehicles (except SHO powertrains) the RH inboard CV joint requires a reusable, low profile large boot clamp. A special tool is required to remove and install the clamp. Use Boot Clamp Pliers D87P-1090-A or equivalent.

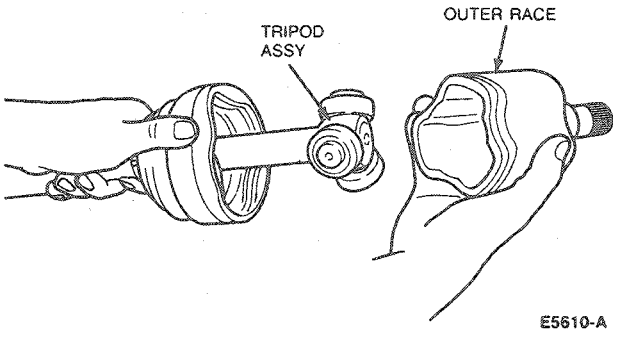
1. Cut and remove both boot clamps and slide boot back on shaft.



Remove clamp by engaging pincer jaws in closing hooks (A and B) and drawing hooks together. Disengage windows and locking hooks and remove clamp.



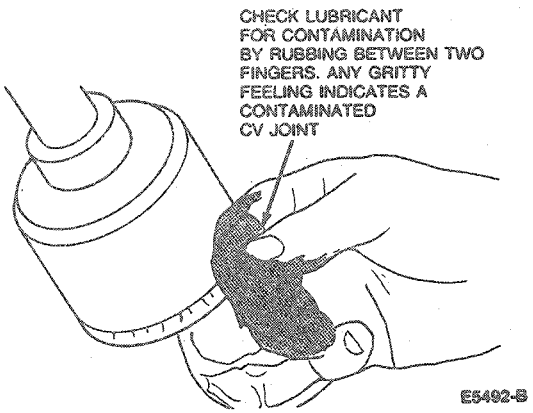
2. Slide outer race off of tripod.



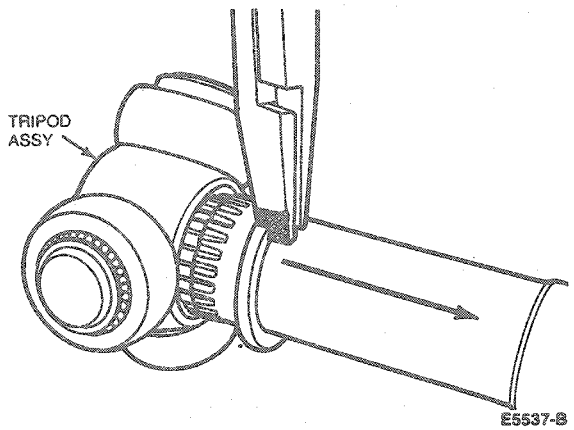
DISASSEMBLY AND ASSEMBLY (Continued)

3. When replacing damaged CV joint boots, the grease should be checked for contamination. If the CV joints are operating satisfactorily, and the grease does not appear to be contaminated, add grease and replace the boot.

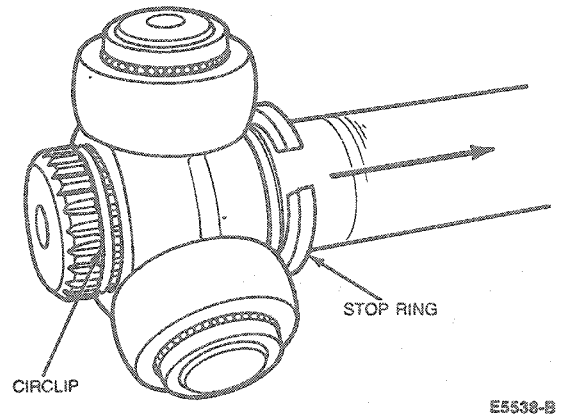
   If the grease appears contaminated, proceed with a complete CV joint disassembly and inspection.



4. Move stop ring back on shaft using snap-ring pliers.



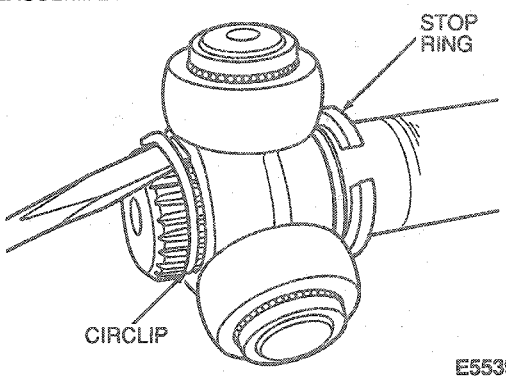
5. Move tripod assembly back on shaft to allow access to circlip.



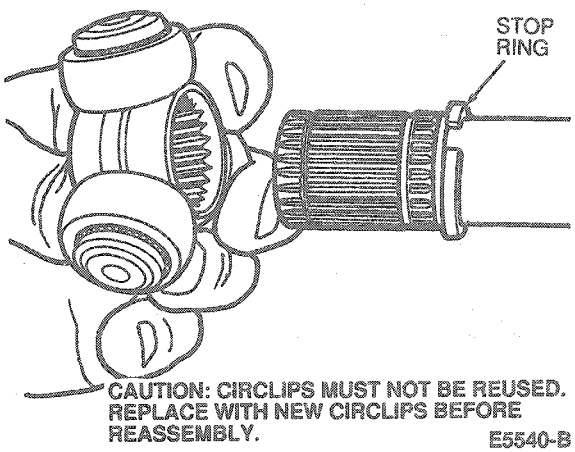
CAUTION: Circlips must not be reused. Replace with new circlips before reassembly

6. Remove circlip from shaft.

CAUTION: CIRCLIPS MUST NOT BE REUSED. REPLACE WITH NEW CIRCLIPS BEFORE REASSEMBLY.



7. Remove tripod assembly from shaft. Remove boot if necessary.

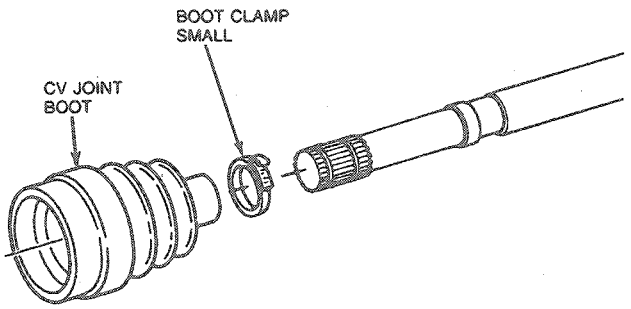


Assembly

CAUTION: Tighten clamp securely, but not to the point where clamp bridge is cut or boot is damaged.

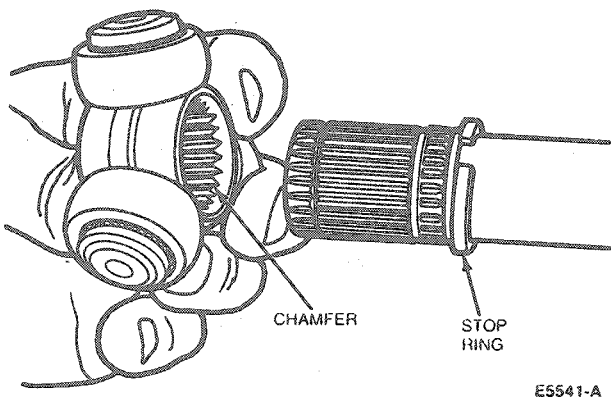
DISASSEMBLY AND ASSEMBLY (Continued)

1. Install CV joint boot on shaft, if removed during disassembly. Ensure boot is seated in boot groove on shaft. Tighten clamp using Boot Clamp pliers.



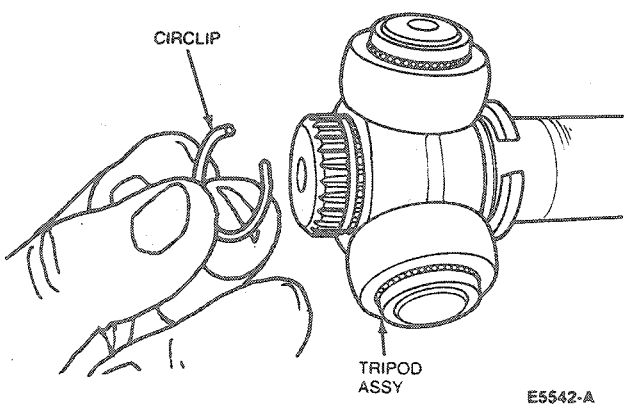
E4297-C

2. Install tripod assembly on shaft with chamfered side toward stop ring.



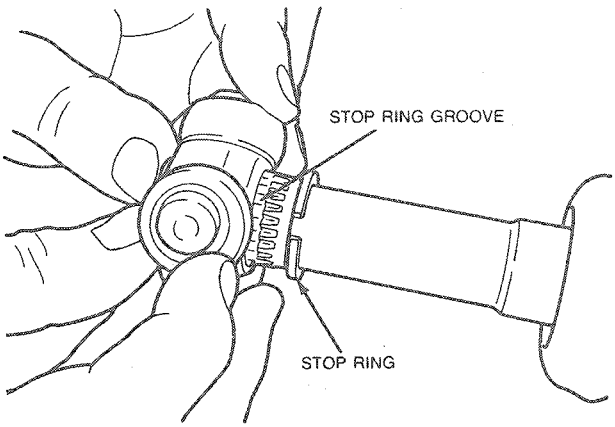
E5541-A

3. Install new circlip.



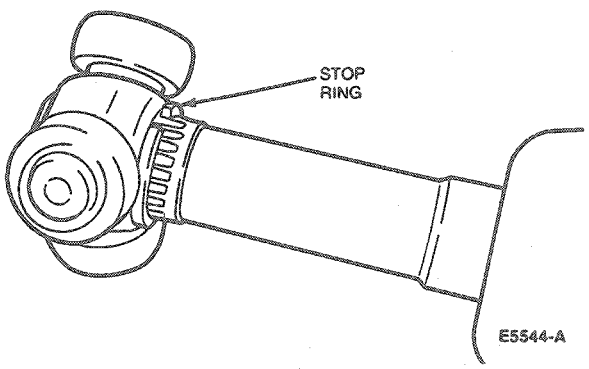
E5542-A

4. Compress circlip and slide tripod assembly forward over circlip to expose stop ring groove.



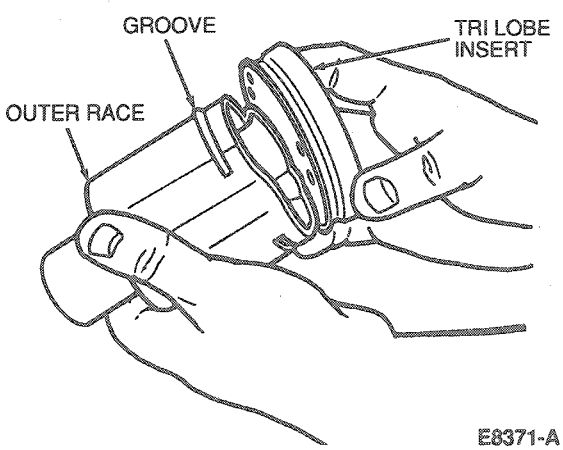
E5543-A

5. Move stop ring into groove using snap-ring pliers, making sure it is fully seated in groove.



E5544-A

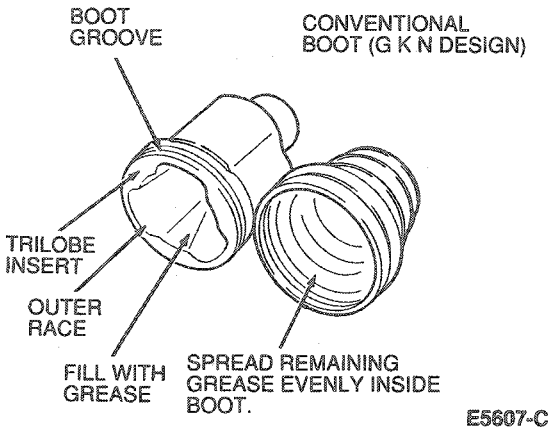
6. Install trilobe insert over CV joint inner race and position on outer race.



E8371-A

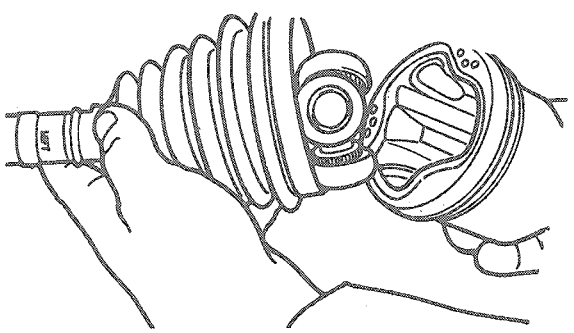
DISASSEMBLY AND ASSEMBLY (Continued)

7. Fill CV joint outer race and CV boot with grease and spread remaining grease evenly inside boot. Total combined fill is 250 grams (9 oz). Use Ford Constant Velocity Joint Grease High Temperature E43Z-19590-A (ESP-M1C207-A) or equivalent.



E5607-C

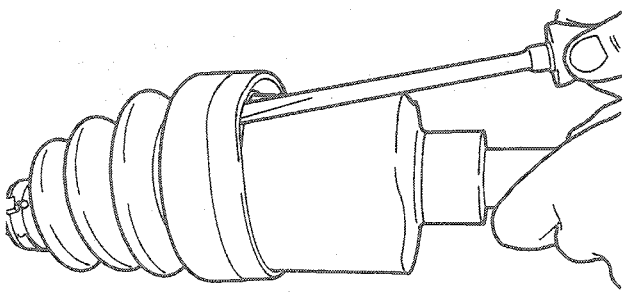
8. Install outer race over tripod assembly.



E8367-A

NOTE: Before installing boot clamp, ensure any air pressure which may have built up in boot is relieved. Insert a dulled screwdriver blade between boot and trilobe insert to allow trapped air to escape from boot. The air should be released from the boot only after adjusting to dimension shown in Specifications.

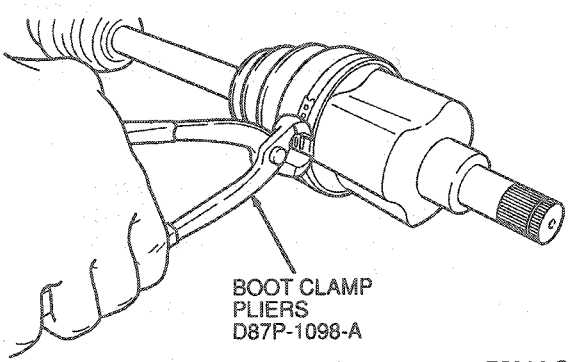
9. Remove all excess grease from CV joint external surfaces and mating trilobe insert surface. Position boot over CV joint making sure boot is seated in groove. Move CV joint in and out, as necessary, to adjust to length shown in Specifications.



E5613-A

CAUTION: All vehicles (except SHO powertrains) require a reusable low profile large clamp on the RH inboard CV joint.

10. Seat boot in groove and clamp in position using Boot Clamp Pliers D87P-1098-A or equivalent.



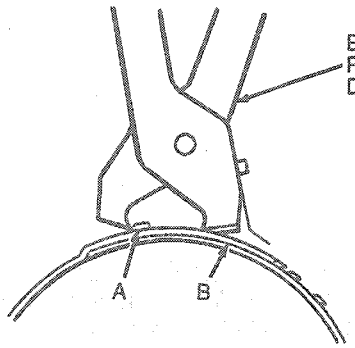
E5614-C

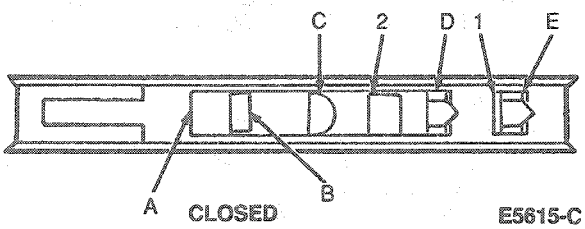
Install clamp as follows:

a. With boot seated in groove, place clamp over boot.
b. Engage hook (C) in window.
c. Using Boot Clamp Pliers, D87P-1090-A or equivalent, place pincer jaws in closing hooks (A and B).

DISASSEMBLY AND ASSEMBLY (Continued)

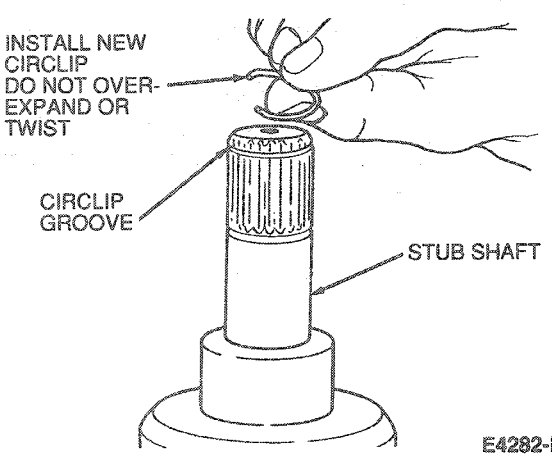
d. Secure clamp by drawing closing hooks together. When windows (1 and 2) are above locking hooks (D and E) spring tab will press windows over locking hooks and engage clamp.



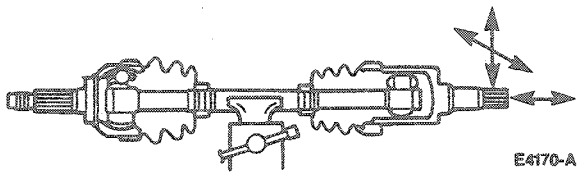


CAUTION: Do not over-expand or twist circlip during installation. DO NOT reuse circlips. Replace with new circlips before assembly.

11. Install a new circlip, supplied with service kit, in groove nearest end of shaft by starting one end in groove and working circlip over stub shaft end and into groove.



12. Work the CV joint through its full range of travel at various angles. The joint should flex, extend and compress smoothly.

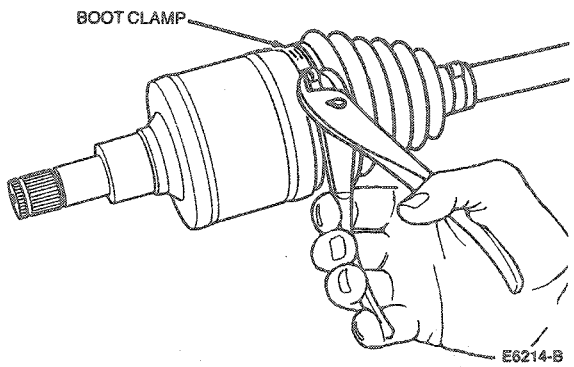


Disassembly — 3.2L SHO Automatic Transmission

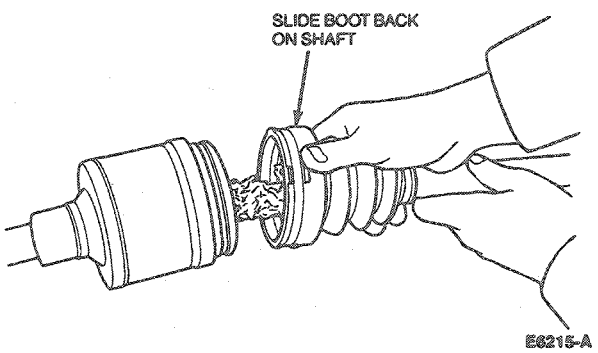
Tools Required:

- Boot Clamp Pliers D87P-1090-A
- Boot Clamp Pliers D87P-1098-A

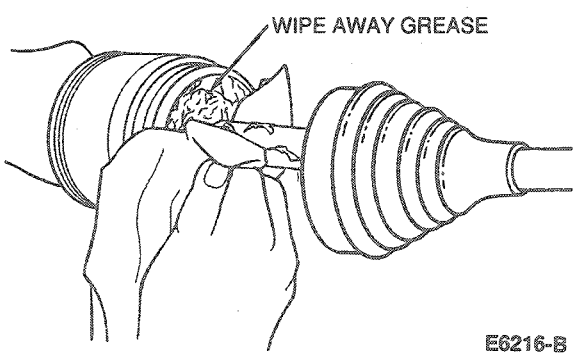
1. Cut and Remove both boot clamps.



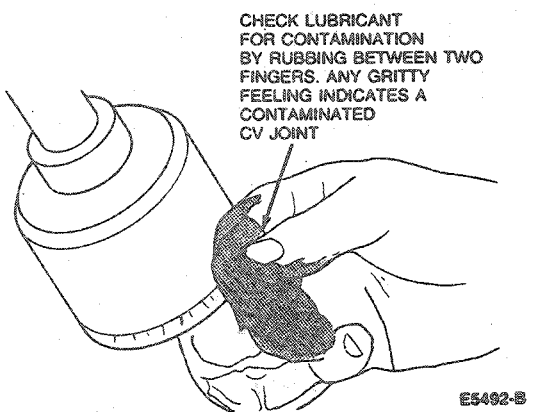
2. Slide boot back on shaft.



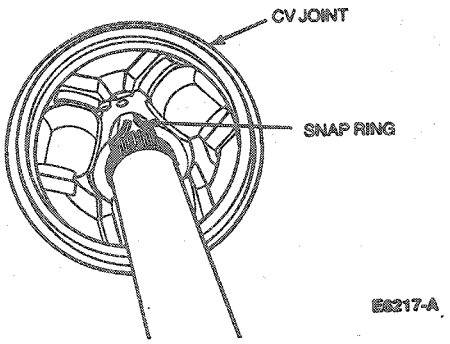
3. Wipe grease away from CV joint.



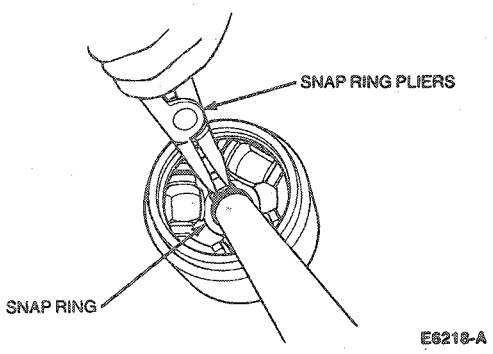
DISASSEMBLY AND ASSEMBLY (Continued)



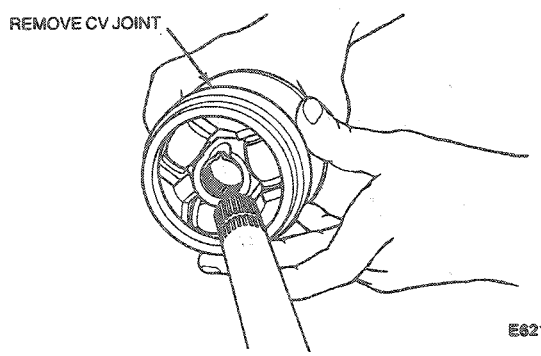
4. After grease has been removed, position CV joint in a vise with snap ring facing up.



5. Using snap ring pliers, expand snap ring and pull CV joint from shaft.

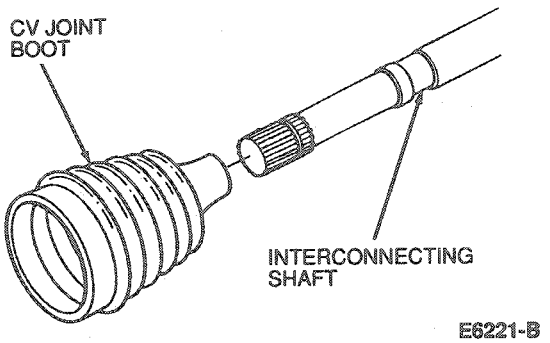


6. Remove CV joint.

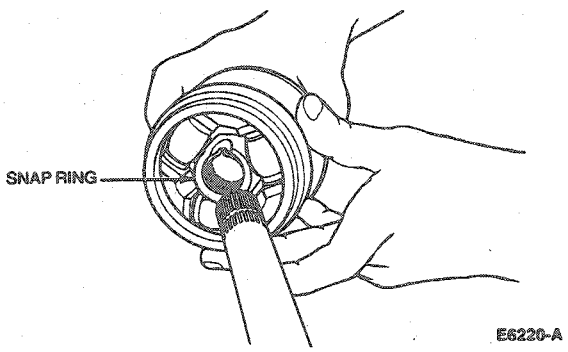


Assembly

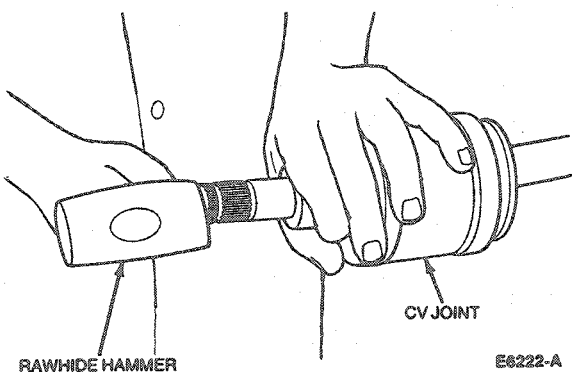
1. If removed, install CV joint boot on interconnecting shaft. Slide boot down shaft to allow room for CV joint installation.



2. Position CV joint tripod on interconnecting shaft splines.



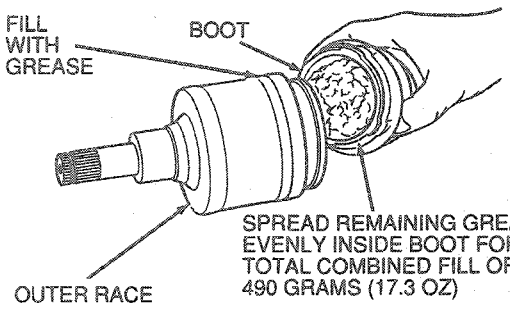
3. With tripod splines engaged with interconnecting shaft splines, tap into position using a rawhide hammer. The CV joint is fully seated when the snap ring locks into groove in interconnecting shaft. Check by attempting to pull CV joint from shaft.



NOTE: Use Ford Constant Velocity Joint Grease High Temperature E43Z-19590-A (ESP-M1C207) or equivalent.

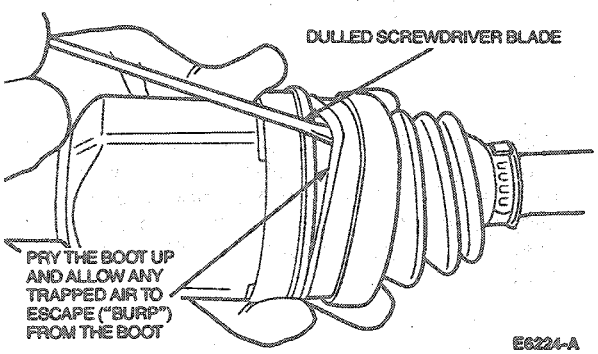
DISASSEMBLY AND ASSEMBLY (Continued)

4. Fill CV joint outer race with grease, then spread remaining grease evenly inside boot for a total combined fill of 490 grams (17.3 oz).

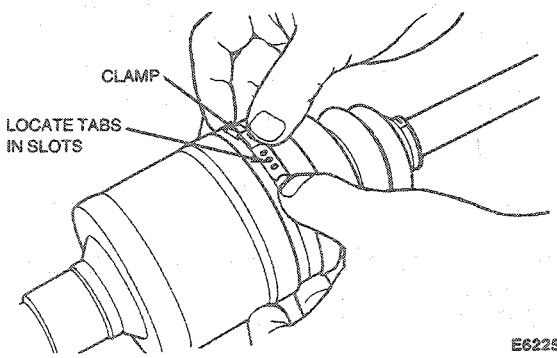


NOTE: Before installing boot clamp, ensure any air pressure which may have built up in boot is relieved. Insert a dulled screwdriver blade between boot and outer bearing race to allow trapped air to escape from boot. The air should be released from the boot only after adjusting dimension shown in Specifications.

5. Remove all excess grease from CV joint external surfaces and boot sealing surface. Slide boot up shaft and position on CV joint and interconnecting shaft boot groove. Move CV joint in and out, as necessary, to adjust to length shown in Specifications.

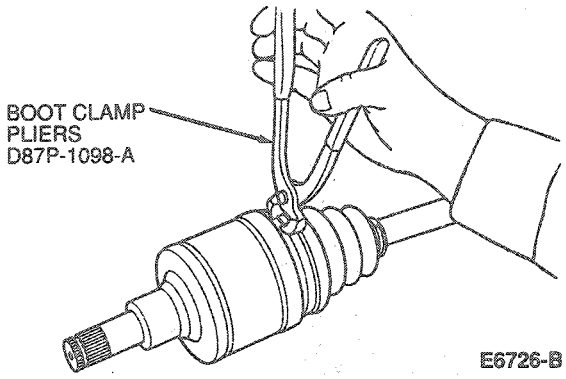


6. Locate clamp tabs in slots. Make clamps tight as possible by hand.



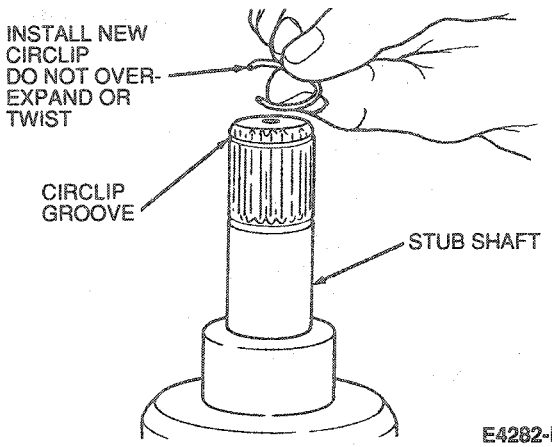
CAUTION: Tighten the clamps securely, but not to the point where the clamp bridges are cut or the boot is damaged.

7. Ensure boot is seated in its grooves and clamp in position using Boot Clamp Pliers D87P-1098-A or equivalent.



CAUTION: Do not over-expand or twist circlip during installation. DO NOT reuse circlips. Replace with new circlips before assembly

8. Install a new circlip, supplied with service kit, in groove nearest end of shaft. Start one end in groove and work circlip over stub shaft end and into groove.



Link Shaft/Halfshaft — SHO Manual Transmission

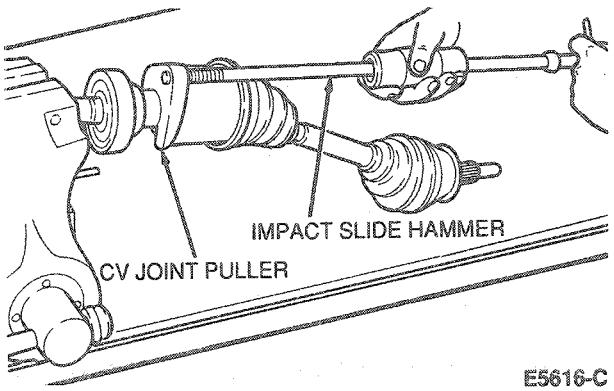
Disassembly and Assembly

Tools Required:

- CV Joint Puller T86P-3514-A1
- Impact Slide Hammer D79P-100-A
- Bearing Puller Attachment D84L-1123-A

DISASSEMBLY AND ASSEMBLY (Continued)

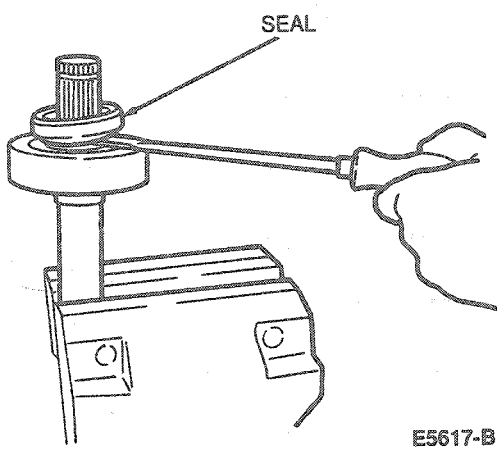
1. Clamp link shaft in vise with halfshaft supported on work bench. Using CV Joint Puller T86P-3514-A1 and Impact Slide Hammer D79P-100-A or equivalent, separate link shaft from halfshaft.



E5616-C

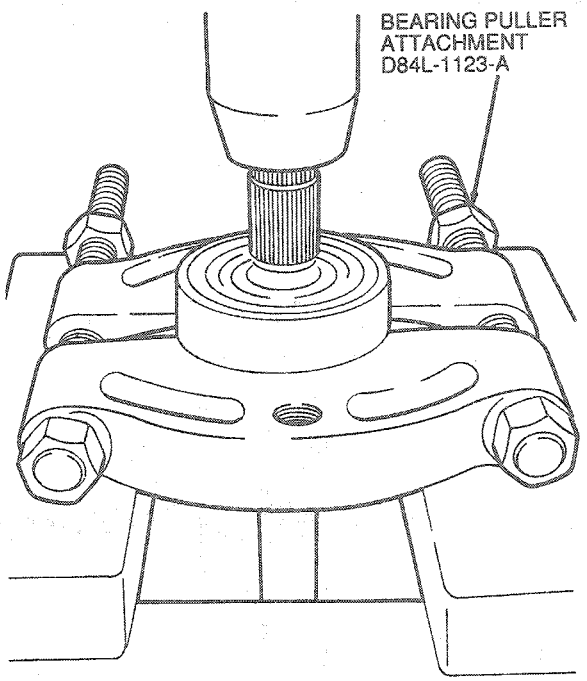
2. Remove seal from link shaft by prying it off with a screwdriver.

CAUTION: Use care to prevent damage to bearing dust shield.



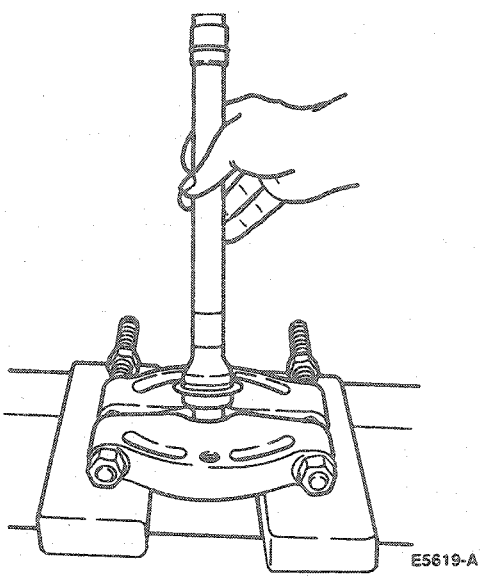
E5617-B

3. Place shaft assembly in arbor press, using Bearing Puller Attachment D84L-1123-A or equivalent, with bearing supported and press out link shaft.



E5618-C

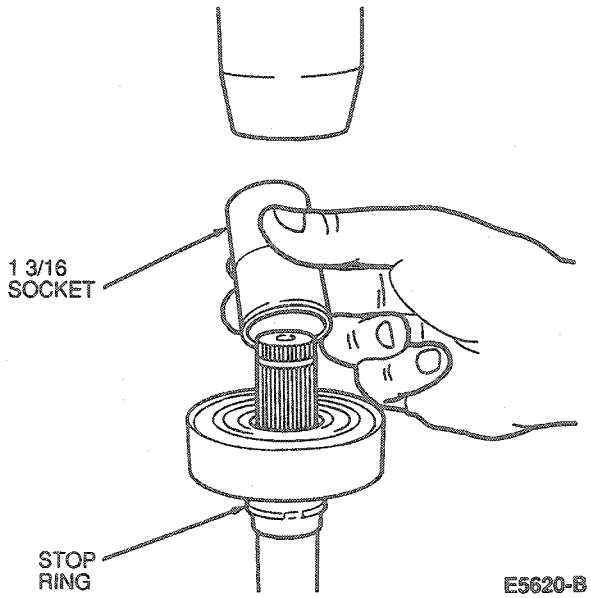
4. Support link shaft in press fixture with step in shaft.



E5619-A

DISASSEMBLY AND ASSEMBLY (Continued)

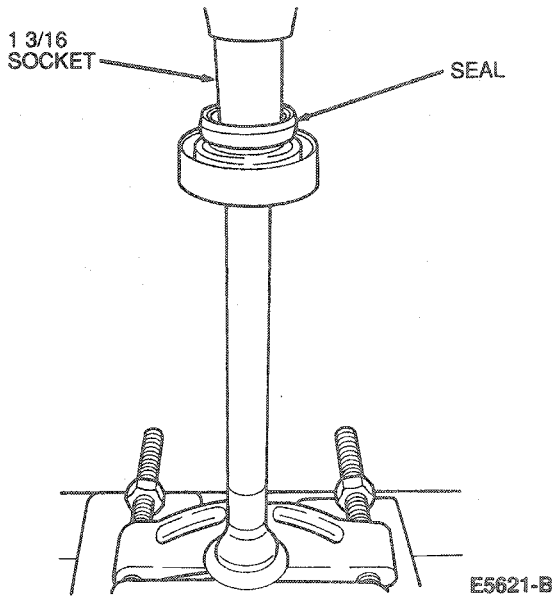
5. Place bearing on shaft and press bearing onto shaft using a 1-3/16 inch deep well socket until it contacts stop ring.



6. Place seal on shaft and press seal onto shaft using a 1-3/16 inch deep well socket until it contacts bearing.

7. Assemble halfshaft and link shaft.

NOTE: Before assembly, coat link shaft spline, seal lip and seal cavity with Constant Velocity Joint Grease High Temperature E2FZ-19590-A (ESP-M1C207-A) or equivalent.



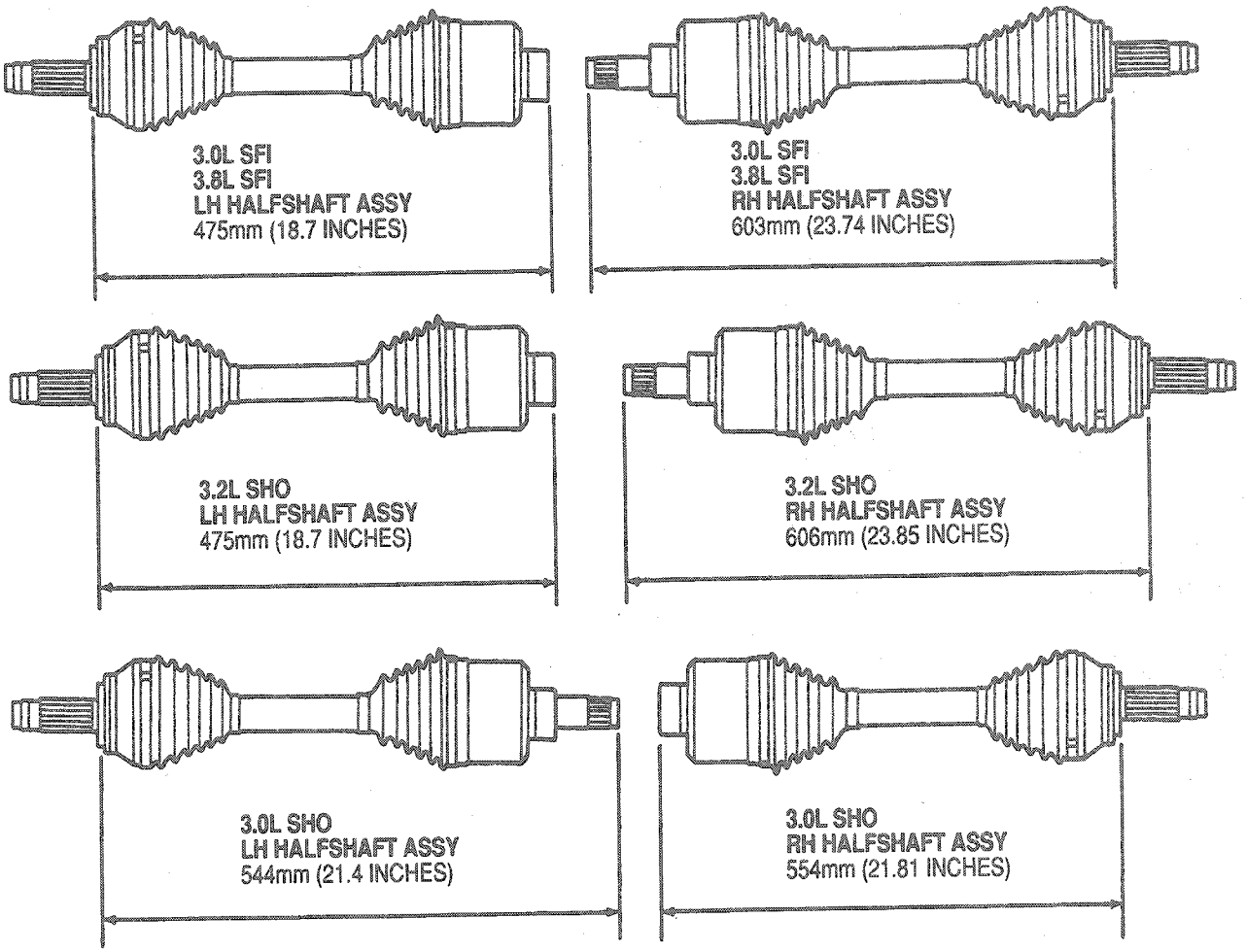
SPECIFICATIONS

LUBRICANT SPECIFICATIONS—HALFSHAFT ASSEMBLIES

POWERTRAIN		SPECIFICATION	TOTAL FILL AMOUNT			
			INBOARD CV		OUTBOARD CV	
Engine	Transmission	Lubricant	LH	RH	LH	RH
3.0L	AXODE without ABS	ESP-M1C207-A (E43Z-19590-A)	250 g 8.8 oz	250 g 8.8 oz	145 g 5.1 oz	145 g 5.1 oz
3.0L	AXODE with ABS	ESP-M1C207-A (E43Z-19590-A)	250 g 8.8 oz	250 g 8.8 oz	170 g 6.0 oz	170 g 6.0 oz
3.8L	AXODE without ABS	ESP-M1C207-A (E43Z-19590-A)	250 g 8.8 oz	250 g 8.8 oz	170 g 6.0 oz	170 g 6.0 oz
3.8L	AXODE with ABS	ESP-M1C207-A (E43Z-19590-A)	250 g 8.8 oz	250 g 8.8 oz	170 g 6.0 oz	170 g 6.0 oz
3.2L	SHO Automatic	ESP-M1C207-A (E43Z-19590-A)	490 g 17.3 oz	490 g 17.3 oz	170 g 6.0 oz	170 g 6.0 oz
3.2L	SHO Manual MTX	ESP-M1C207-A (E43Z-19590-A)	250 g 8.8 oz	250 g 8.8 oz	170 g 6.0 oz	170 g 6.0 oz

SPECIFICATIONS (Continued)

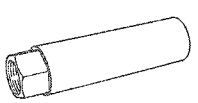
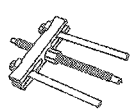
HALFSHAFT ASSEMBLED LENGTHS



TORQUE SPECIFICATIONS

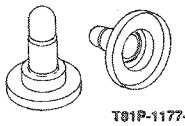
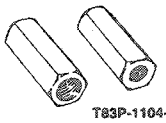
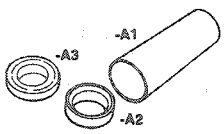
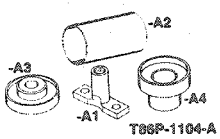
Description	N·m	Lb-Ft
Front Hub Retainer Nut	245-270	180-200
Control Arm To Steering Knuckle Nut	54-74	40-55
Stabilizer Link to Stabilizer Bar	47-65	35-48
Wheel Lug Nuts	115-142	85-105
Link Shaft Bearing Retaining Bolts	21-32	16-23
Link Shaft Bearing Bracket Bolts	40-64	30-47

SPECIAL SERVICE TOOLS

Tool Number / Description	Illustration
T81P-1104-A Front Hub Installer	
T81P-1104-C Front Hub Remover / Replacer	

(Continued)

SPECIAL SERVICE TOOLS (Continued)

Tool Number / Description	Illustration
T81P-1177-B Transaxle Plugs	
T83P-1104-BH Metric Hub Remover Adapter	
T83T-3132-A1 Spindle / Axle Seal Installer	
T86P-1104-A1 Metric Stud Adapter T86P-1104-A4 Dust Seal Installer	

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Tool Number / Description	Illustration
T86P-3514-A Tool Set— Consists of: T86P-3514-A1 CV Joint Puller, T86P-3514-A2 CV Joint Puller Extension	
T88P-20202-A Front Sensor Ring Remover / Replacer	

Tool Number	Description
D79P-100-A	Impact Slide Hammer
D83P-4026-A	Halfshaft Remover
D84L-1123-A	Bearing Puller Attachment
D87P-1090-A	Boot Clamp Pliers
D87P-1096-A	Boot Clamp Pliers