

DIFFERENTIAL AND DRIVELINE

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DESCRIPTION AND OPERATION

FRONT DRIVESHAFTS

Vehicles equipped with either an automatic or manual transmission uses an unequal length drive-shaft system (Fig. 1).

Vehicles equipped with automatic transaxles use a solid short interconnecting shaft on the left side. The right side of the vehicle uses a longer solid interconnecting shaft.

The left driveshaft uses a tuned rubber damper weight. When replacing the left driveshaft, be sure the replacement driveshaft has the same damper weight.

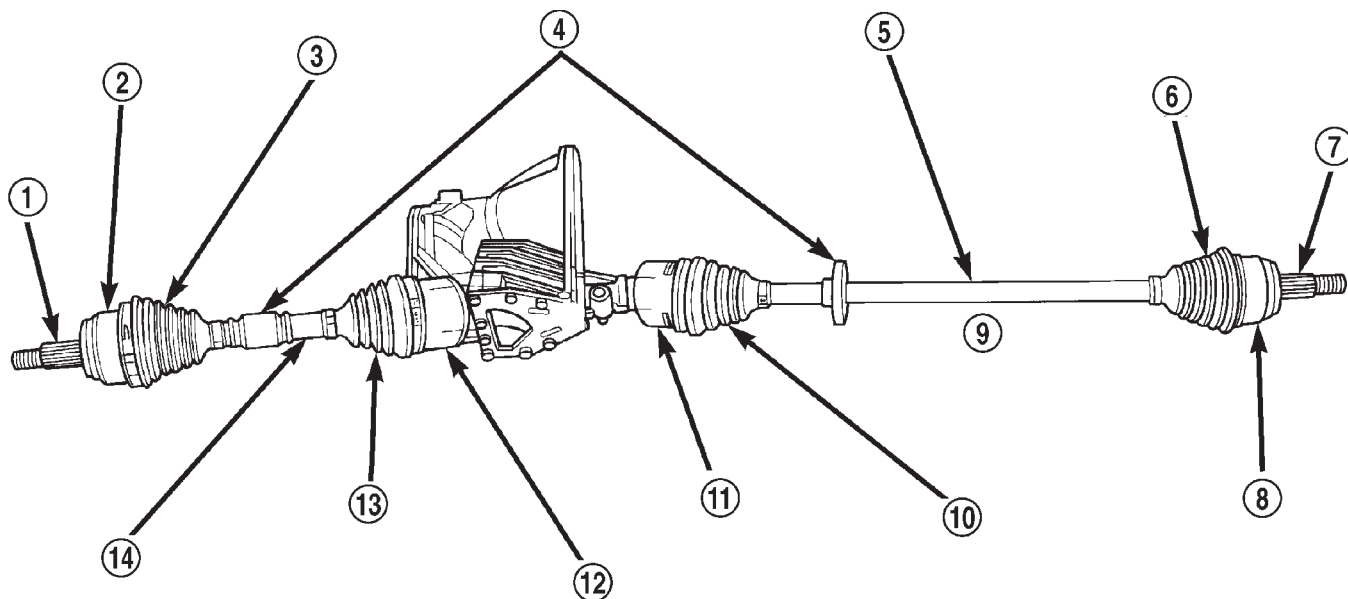


Fig. 1 Unequal Length Driveshaft System

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- | | |
|--------------------------------|--|
| 1 – STUB AXLE | 8 – OUTER C/V JOINT |
| 2 – OUTER C/V JOINT | 9 – RIGHT DRIVESHAFT |
| 3 – OUTER C/V JOINT BOOT | 10 – INNER TRIPOD JOINT BOOT |
| 4 – TUNED RUBBER DAMPER WEIGHT | 11 – INNER TRIPOD JOINT |
| 5 – INTERCONNECTING SHAFT | 12 – INNER TRIPOD JOINT |
| 6 – OUTER C/V JOINT BOOT | 13 – INNER TRIPOD JOINT BOOT |
| 7 – STUB AXLE | 14 – INTERCONNECTING SHAFT LEFT DRIVESHAFT |

DESCRIPTION AND OPERATION (Continued)

Both driveshaft assemblies use the same type of inner and outer joints. The inner joint of both driveshaft assemblies is a tripod joint, and the outer joint of both driveshaft assemblies is a Rzeppa joint. Both tripod joints and Rzeppa joints are true constant velocity (C/V) joint assemblies. The inner tripod joint allows for the changes in driveshaft length through the jounce and rebound travel of the front suspension.

On vehicles equipped with ABS brakes, the outer C/V joint is equipped with a tone wheel used to determine vehicle speed for ABS brake operation.

The inner tripod joint of both driveshafts is splined into the transaxle side gears. The inner tripod joints are retained in the side gears of the transaxle using a snap ring located in the stub shaft of the tripod joint. The outer C/V joint has a stub shaft that is splined into the wheel hub and retained by a steel hub nut.

NOTE: This vehicle does not use a rubber lip bearing seal as on past front wheel drive cars, to prevent contamination of the front wheel bearing. It is important though to thoroughly clean the outer C/V joint and the wheel bearing area in the steering knuckle before it is assembled after servicing.

DIAGNOSIS AND TESTING

DRIVESHAFT DIAGNOSIS

VEHICLE INSPECTION

(1) Check for grease in the vicinity of the inboard tripod joint and outboard C/V joint; this is a sign of inner or outer joint seal boot or seal boot clamp damage.

(2) A light film of grease may appear on the right inner tripod joint seal boot; this is considered normal and should not require replacement of the seal boot.

NOISE AND/OR VIBRATION IN TURNS

A clicking noise and/or a vibration in turns could be caused by one of the following conditions:

(1) Damaged outer C/V or inner tripod joint seal boot or seal boot clamps. This will result in the loss and/or contamination of the joint grease, resulting in inadequate lubrication of the joint.

(2) Noise may also be caused by another component of the vehicle coming in contact with the driveshafts.

CLUNKING NOISE DURING ACCELERATION

This noise may be a result of one of the following conditions:

(1) A torn seal boot on the inner or outer joint of the driveshaft assembly.

(2) A loose or missing clamp on the inner or outer joint of the driveshaft assembly.

(3) A damaged or worn driveshaft C/V joint.

SHUDDER OR VIBRATION DURING ACCELERATION

This problem could be a result of:

(1) A worn or damaged driveshaft inner tripod joint.

(2) A sticking tripod joint spider assembly (inner tripod joint only).

(3) Improper wheel alignment. See Wheel Alignment in this group for alignment checking and setting procedures and specifications.

VIBRATION AT HIGHWAY SPEEDS

This problem could be a result of:

(1) Foreign material (mud, etc.) packed on the backside of the wheel(s).

(2) Out of balance front tires or wheels. See Group 22, Wheels And Tires for the required balancing procedure.

(3) Improper tire and/or wheel runout. See Group 22, Wheels And Tires for the required runout checking procedure.

REMOVAL AND INSTALLATION

FRONT DRIVESHAFTS

REMOVAL

(1) Loosen (but do not remove) stub axle to hub/bearing retaining nut. Loosen hub nut while vehicle is on the floor with the brakes applied (Fig. 2). The front hub and driveshaft are splined together and retained by the hub nut.

(2) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting, in the Lubrication and Maintenance section, for required lifting procedure to be used for this vehicle.

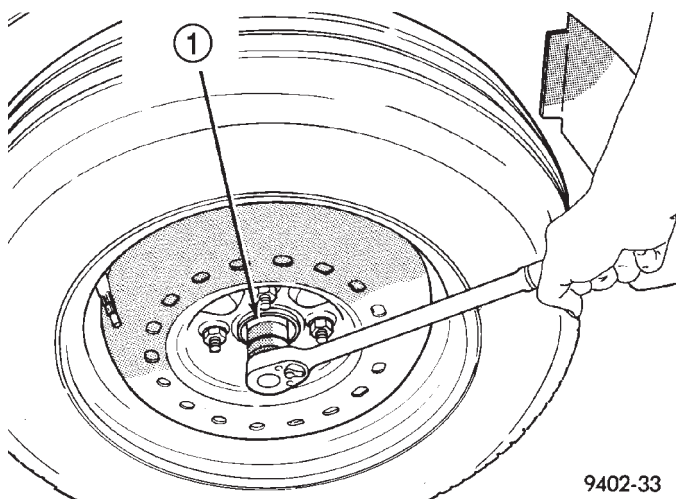
(3) Remove front tire and wheel assembly from the hub.

(4) Remove the driveshaft-to-hub and bearing retaining nut (Fig. 3).

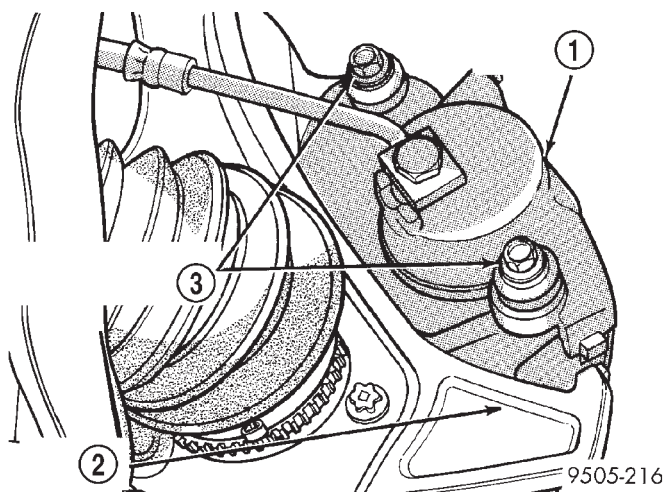
(5) Remove front disc brake caliper assembly to steering knuckle guide pin attaching bolts (Fig. 4).

(6) Remove disc brake caliper assembly from steering knuckle. Caliper is removed by first lifting bottom of caliper away from steering knuckle, and then removing top of caliper out from under steering knuckle (Fig. 5).

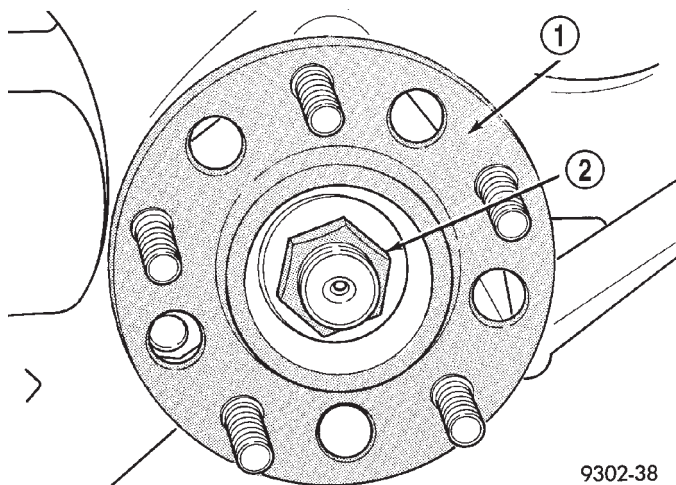
REMOVAL AND INSTALLATION (Continued)

**Fig. 2 Loosening Front Hub Retaining Nut**

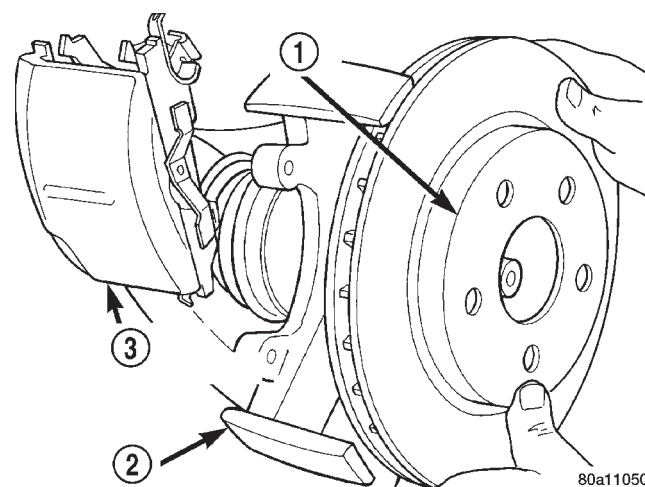
1 - FRONT HUB

**Fig. 4 Caliper Guide Pin Attaching Bolts**

1 - DISC BRAKE CALIPER ASSEMBLY
 2 - STEERING KNUCKLE
 3 - CALIPER ASSEMBLY GUIDE PIN BOLTS

**Fig. 3 Driveshaft Retaining Nut—Typical**

1 - HUB/BEARING ASSEMBLY
 2 - NUT

**Fig. 5 Removing Disc Brake Caliper and Rotor**

1 - BRAKING DISC
 2 - STEERING KNUCKLE
 3 - DISC BRAKE CALIPER ASSEMBLY (STORED)

(7) Support brake caliper/adaptor assembly using a wire hook (Fig. 6). **Do not support assembly by the brake flex hose.**

(8) Remove braking disc from front hub (Fig. 5).

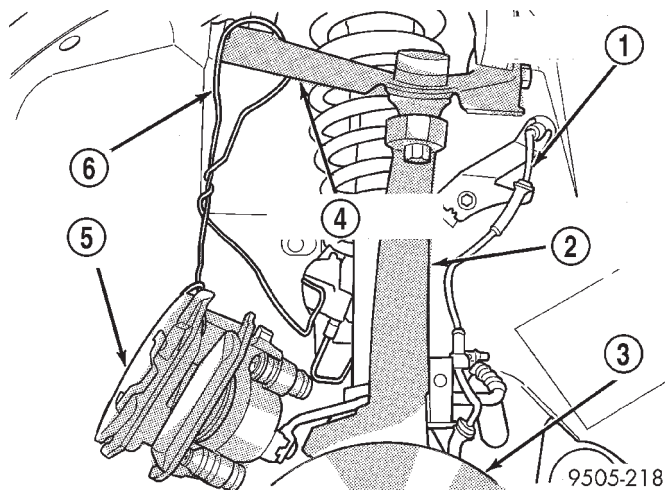
(9) Remove nut attaching outer tie rod end to steering knuckle. **Remove nut from tie rod end by holding tie rod end stud with a 11/32 socket and loosen and remove nut (Fig. 7).**

(10) Remove the tie rod end stud from steering knuckle arm, using remover, Special Tool MB-991113 (Fig. 8).

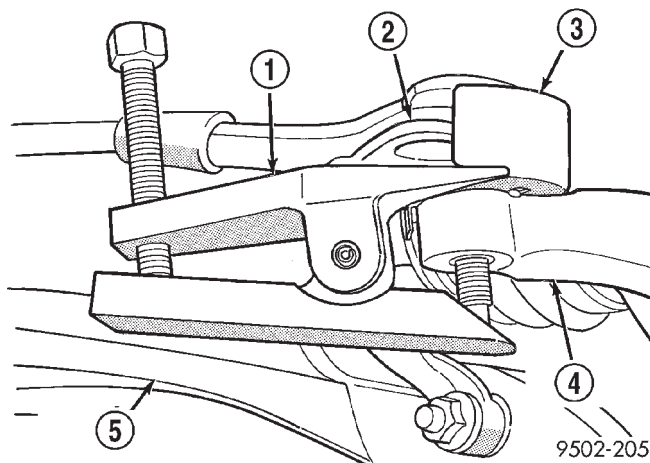
(11) If equipped with antilock brakes, remove the speed sensor cable routing bracket from the steering knuckle (Fig. 9).

(12) Remove cotter pin and castle nut (Fig. 10) from stud of lower ball joint at the steering knuckle.

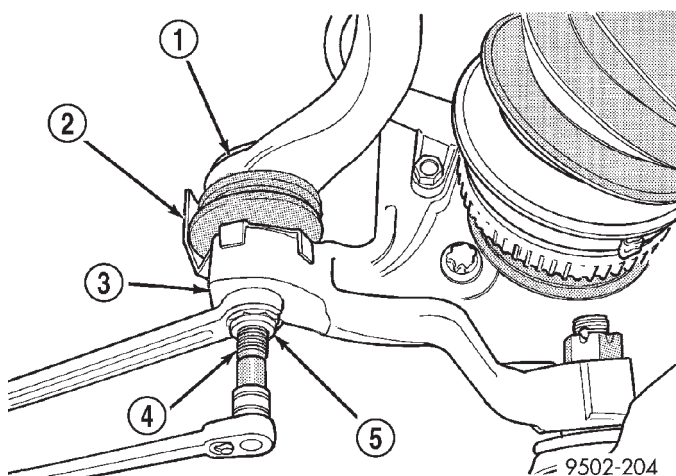
REMOVAL AND INSTALLATION (Continued)

**Fig. 6 Correctly Supported Brake Caliper**

- 1 - ABS SPEED SENSOR CABLE
- 2 - STEERING KNUCKLE
- 3 - ROTOR
- 4 - UPPER CONTROL ARM
- 5 - DISC BRAKE CALIPER ASSEMBLY
- 6 - WIRE HANGER

**Fig. 8 Tie Rod End Removal from Steering Knuckle**

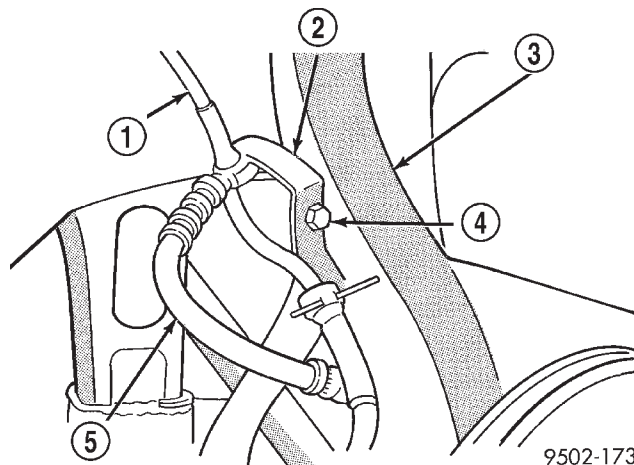
- 1 - SPECIAL TOOL MB-991113
- 2 - TIE ROD END
- 3 - HEAT SHIELD
- 4 - STEERING KNUCKLE
- 5 - LOWER CONTROL ARM

**Fig. 7 Removing Tie Rod End Attaching Nut**

- 1 - TIE ROD END
- 2 - HEAT SHIELD
- 3 - STEERING KNUCKLE
- 4 - TIE ROD END STUD
- 5 - NUT

CAUTION: No tool is to be inserted between the steering knuckle and the lower ball joint to separate stud of lower ball joint from the steering knuckle. The steering knuckle is to be separated from the stud of the ball joint only using the procedure as described in Step 13.

(13) Turn steering knuckle so the front of the steering knuckle is facing as far outboard in the

**Fig. 9 Wheel Speed Sensor Cable Routing Bracket**

- 1 - WHEEL SPEED SENSOR CABLE
- 2 - SPEED SENSOR CABLE ROUTING BRACKET
- 3 - STEERING KNUCKLE
- 4 - ATTACHING BOLT
- 5 - BRAKE CALIPER FLEX HOSE

wheel well as possible. Using a hammer strike steering knuckle boss until steering knuckle separates from stud of lower ball joint (Fig. 11). **When striking steering knuckle, care MUST be taken not to hit lower control arm or ball joint grease seal.**

NOTE: Care must be taken not to separate the inner C/V joint during this operation. Do not allow driveshaft to hang by inner C/V joint. Driveshaft must be supported.

REMOVAL AND INSTALLATION (Continued)

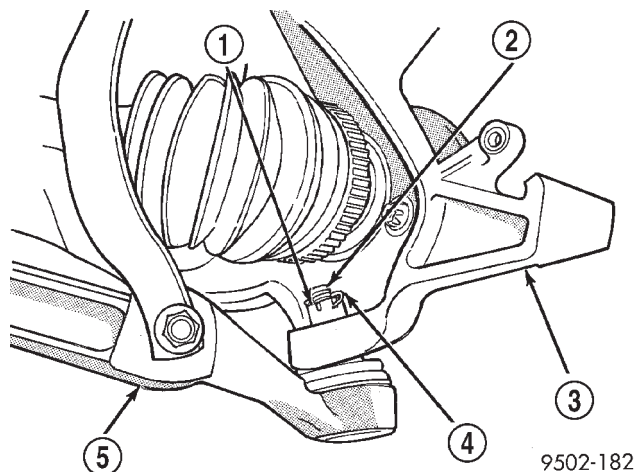


Fig. 10 Lower Ball Joint to Steering Knuckle Attachment

- 1 - CASTLE NUT
- 2 - BALL JOINT STUD
- 3 - STEERING KNUCKLE
- 4 - COTTER PIN
- 5 - LOWER CONTROL ARM

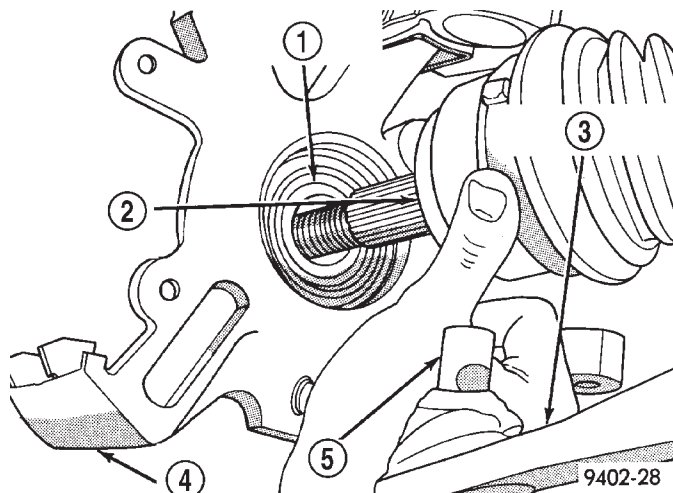


Fig. 12 Separating Steering Knuckle from Outer C/V Joint

- 1 - HUB/BEARING ASSEMBLY
- 2 - DRIVE SHAFT
- 3 - LOWER CONTROL ARM
- 4 - STEERING KNUCKLE
- 5 - BALL JOINT

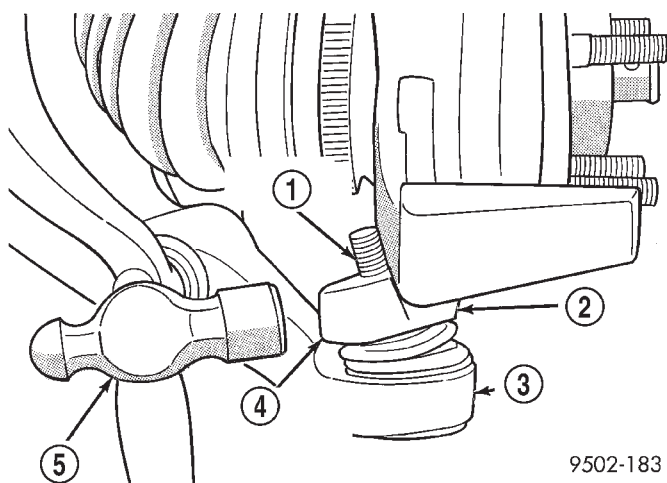


Fig. 11 Separating Ball Joint Stud from Steering Knuckle

- 1 - BALL JOINT STUD
- 2 - STEERING KNUCKLE
- 3 - LOWER CONTROL ARM
- 4 - STEERING KNUCKLE BOSS
- 5 - HAMMER

(14) Pull steering knuckle assembly out and away from outer C/V joint of the driveshaft assembly (Fig. 12).

CAUTION: When inserting pry bar between inner tripod joint and transaxle case, care must be used to ensure no damage occurs to oil seal in transaxle case.

(15) Support the outer end of the driveshaft assembly. Insert a pry bar between inner tripod joint and transaxle case (Fig. 13). Pry against inner tripod joint, until tripod joint retaining snap ring is disengaged from transaxle side gear.

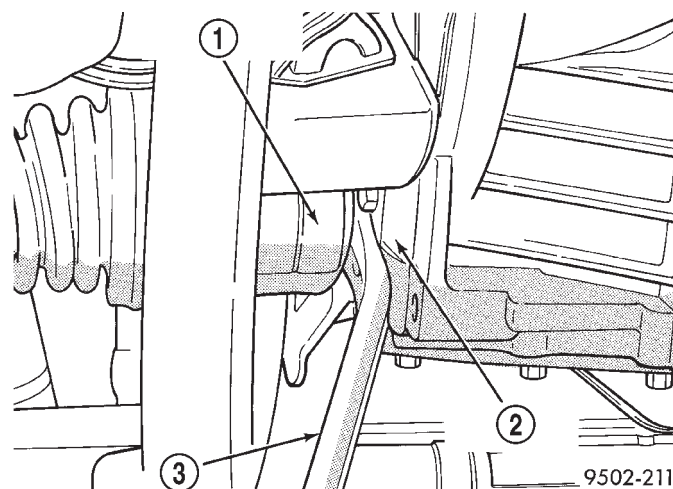


Fig. 13 Disengaging Inner Tripod Joint From Transaxle

- 1 - INNER TRIPOD JOINT
- 2 - TRANSAXLE CASE
- 3 - PRY BAR

(16) Hold inner tripod joint and interconnecting shaft of driveshaft assembly. Remove inner tripod joint from transaxle, by pulling it straight out of transaxle side gear and transaxle oil seal (Fig. 14).

REMOVAL AND INSTALLATION (Continued)

When removing tripod joint, do not let spline or snap ring drag across sealing lip of the transaxle to tripod joint oil seal.

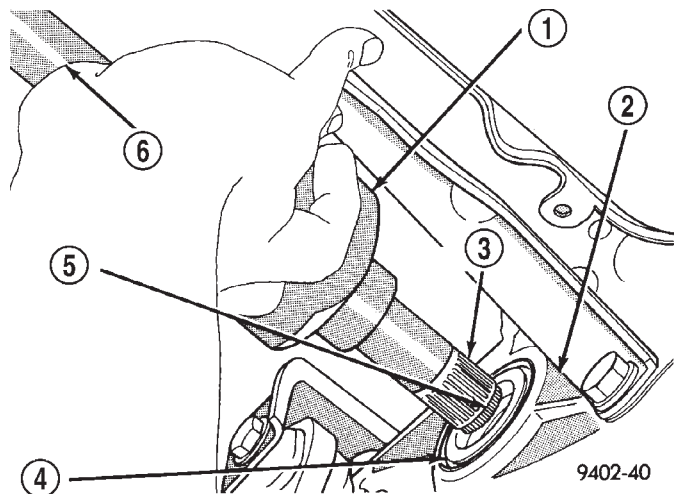


Fig. 14 Tripod Joint Removal from Transaxle

- 1 - INNER TRIPOD JOINT
- 2 - TRANSAXLE
- 3 - SPLINE
- 4 - OIL SEAL
- 5 - SNAP RING
- 6 - INTERCONNECTING SHAFT

INSTALLATION

(1) Thoroughly clean spline and oil seal sealing surface, on tripod joint. Lightly lubricate oil seal sealing surface on tripod joint with fresh clean transmission lubricant.

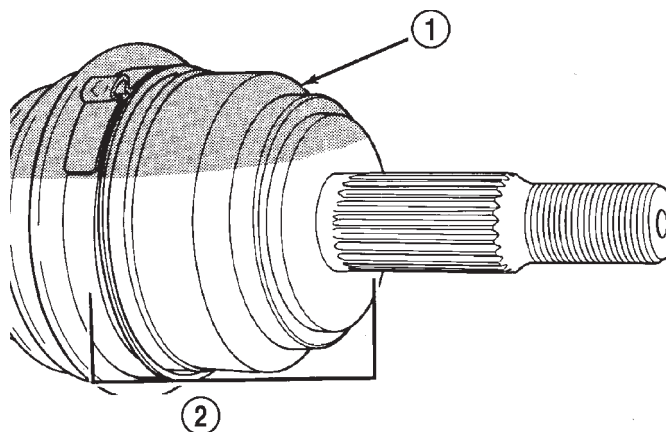
(2) Holding driveshaft assembly by tripod joint and interconnecting shaft, install tripod joint into transaxle side gear as far as possible by hand (Fig. 14).

(3) Grasp inner tripod joint and interconnecting shaft. Forcefully push the tripod joint into side gear of transaxle, until snap ring is engaged with transaxle side gear. **Test that snap ring is fully engaged with side gear by attempting to remove tripod joint from transaxle by hand. If snap ring is fully engaged with side gear, tripod joint will not be removable by hand.**

(4) Clean all debris and moisture out of steering knuckle, in the area where outer C/V joint will be installed into steering knuckle.

(5) Ensure that front of outer C/V joint which fits against the face of the hub and bearing is free of debris and moisture before installing outer C/V joint into hub and bearing assembly (Fig. 15).

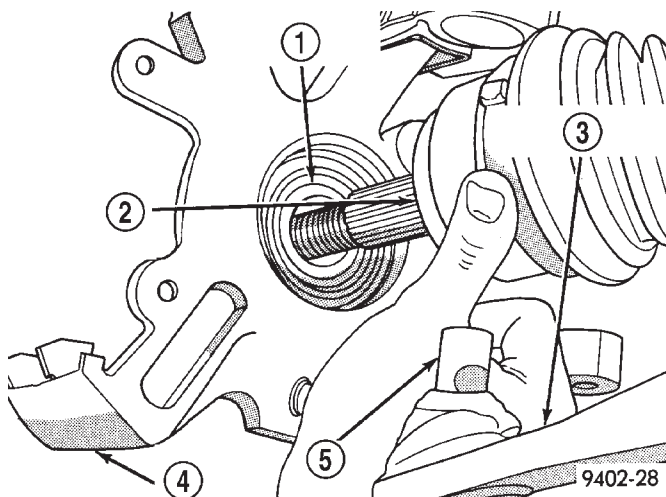
(6) Slide driveshaft back into front hub (Fig. 16). Then install steering knuckle onto the lower control arm ball joint stud.



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Fig. 15 Outer C/V Joint Inspection

- 1 - OUTER C/V JOINT
- 2 - THIS AREA OF OUTER C/V JOINT MUST BE FREE OF ALL DEBRIS AND MOISTURE, BEFORE INSTALLATION INTO STEERING KNUCKLE.



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Fig. 16 Steering Knuckle Installation on Outer C/V Joint

- 1 - HUB/BEARING ASSEMBLY
- 2 - DRIVE SHAFT
- 3 - LOWER CONTROL ARM
- 4 - STEERING KNUCKLE
- 5 - BALL JOINT

(7) Install the steering knuckle to ball joint stud castle nut (Fig. 17). Tighten the castle nut to 95 N·m (70 ft. lbs.).

(8) If equipped with antilock brakes, install the speed sensor cable on the steering knuckle and securely tighten bolt (Fig. 18).

REMOVAL AND INSTALLATION (Continued)

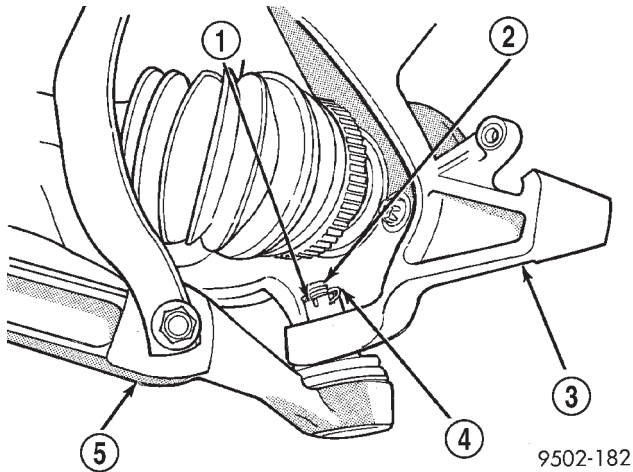


Fig. 17 Lower Ball Joint to Steering Knuckle Attachment

- 1 - CASTLE NUT
- 2 - BALL JOINT STUD
- 3 - STEERING KNUCKLE
- 4 - COTTER PIN
- 5 - LOWER CONTROL ARM

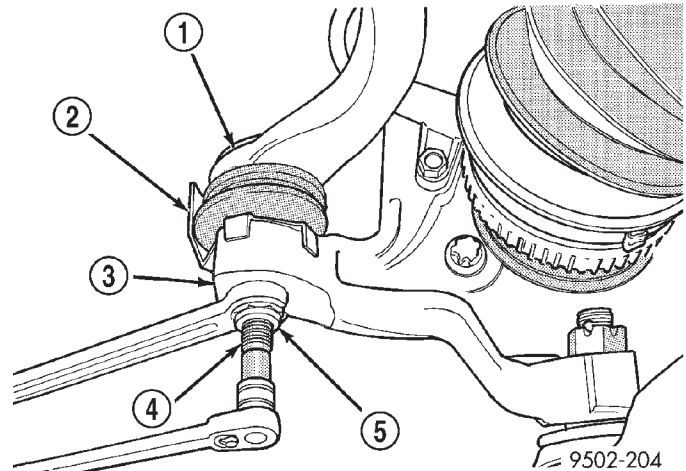


Fig. 19 Installing Tie Rod End Nut

- 1 - TIE ROD END
- 2 - HEAT SHIELD
- 3 - STEERING KNUCKLE
- 4 - TIE ROD END STUD
- 5 - NUT

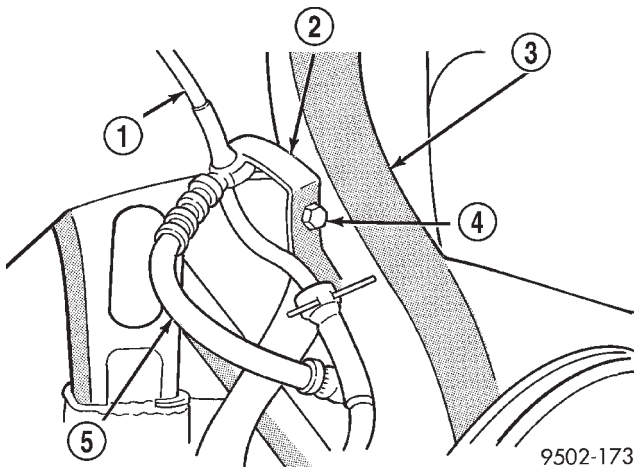


Fig. 18 Wheel Speed Sensor Cable Routing Bracket

- 1 - WHEEL SPEED SENSOR CABLE
- 2 - SPEED SENSOR CABLE ROUTING BRACKET
- 3 - STEERING KNUCKLE
- 4 - ATTACHING BOLT
- 5 - BRAKE CALIPER FLEX HOSE

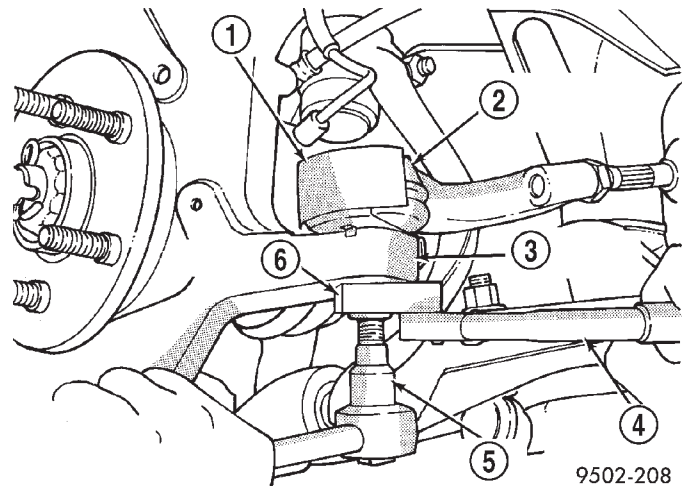


Fig. 20 Torquing Tie Rod End Nut

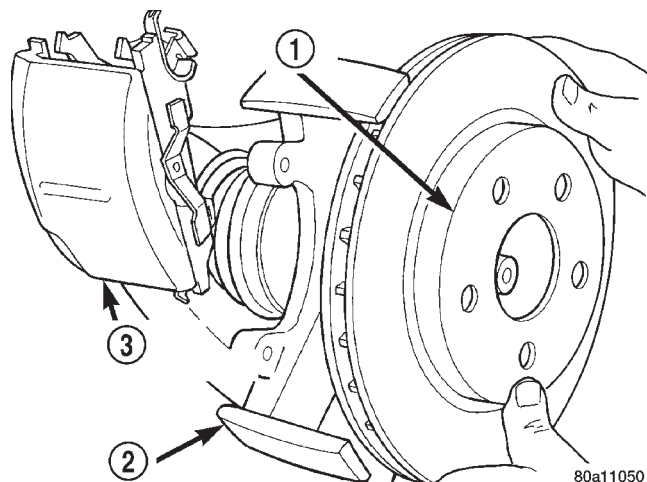
- 1 - HEAT SHIELD
- 2 - TIE ROD END
- 3 - STEERING KNUCKLE
- 4 - TORQUE WRENCH
- 5 - 11/32 SOCKET
- 6 - CROWFOOT

(9) Install tie rod end into the steering knuckle. Start tie rod end to steering knuckle nut onto stud of tie rod end. While holding stud of tie rod end stationary (Fig. 19), tighten tie rod end to steering knuckle nut. Using a crowfoot and 11/32 socket, tighten the nut to 61 N·m (45 ft. lbs.) (Fig. 20).

(10) Install braking disc back on hub and bearing assembly.

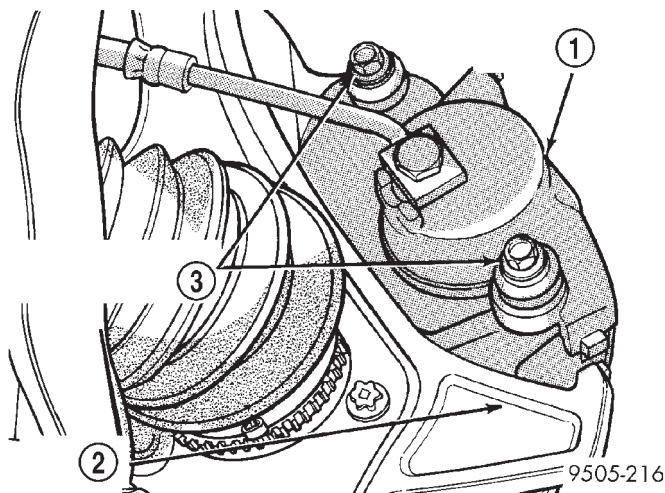
(11) Install disc brake caliper assembly on steering knuckle. Caliper is installed by first sliding top of caliper under top abutment on steering knuckle. Then installing bottom of caliper against bottom abutment of steering knuckle (Fig. 21).

REMOVAL AND INSTALLATION (Continued)

**Fig. 21 Installing Disc Brake Caliper and Rotor**

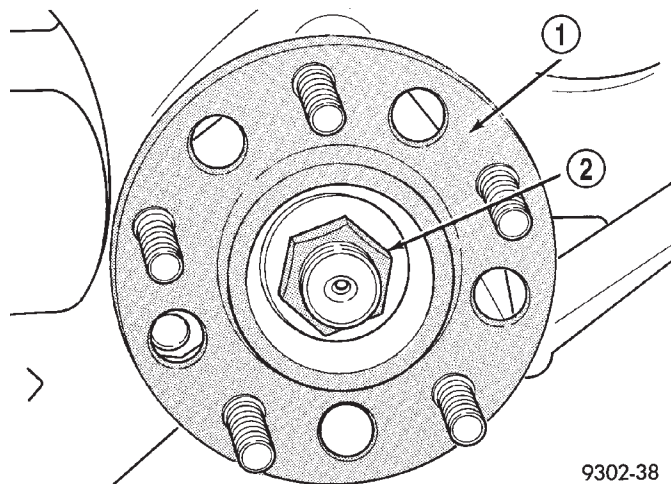
- 1 - BRAKING DISC
- 2 - STEERING KNUCKLE
- 3 - DISC BRAKE CALIPER ASSEMBLY (STORED)

(12) Install caliper assembly to steering knuckle guide pin bolts (Fig. 22). Tighten caliper assembly bolts to 31 N·m (23 ft. lbs.).

**Fig. 22 Disc Brake Caliper Bolts**

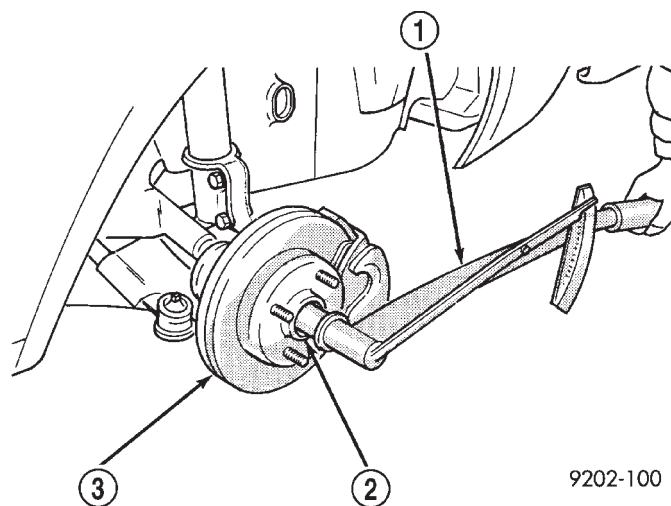
- 1 - DISC BRAKE CALIPER ASSEMBLY
- 2 - STEERING KNUCKLE
- 3 - CALIPER ASSEMBLY GUIDE PIN BOLTS

(13) Clean all foreign matter from the threads of the outer C/V joint stub axle. Install hub nut onto threads of stub axle and tighten nut. (Fig. 23).

**Fig. 23 Driveshaft Retaining Nut—Typical**

- 1 - HUB/BEARING ASSEMBLY
- 2 - NUT

(14) With vehicle brakes applied to keep braking disc from turning, tighten hub nut to 142 N·m (105 ft. lbs.) (Fig. 24).

**Fig. 24 Torquing Front Hub Nut**

- 1 - TORQUE WRENCH
- 2 - HUB
- 3 - BRAKING DISC

(15) Install front wheel and tire assembly. Install front wheel lug nuts and tighten in the correct sequence (Fig. 25). Tighten lug nuts to 135 N·m (100 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

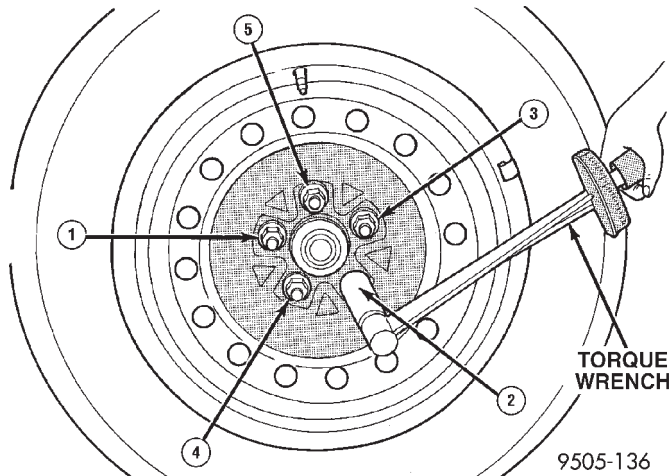


Fig. 25 Wheel Lug Torquing Sequence

- (16) Lower vehicle.
- (17) Check for correct fluid level in transaxle assembly. Refer to Group 21, Transaxle for the correct fluid level checking procedure for the type of transaxle being checked.
- (18) Set front toe on vehicle to required specification.

DISASSEMBLY AND ASSEMBLY

INNER TRIPOD JOINT SEAL BOOT

REMOVAL

To remove sealing boots from driveshafts, the driveshaft assemblies must be removed from the vehicle. See Servicing Driveshaft for the required driveshaft removal and replacement procedure.

The inner tripod joints use no internal retention in the tripod housing to keep the spider assembly in the housing. Therefore, do not pull on the interconnecting shaft to disengage tripod housing from transmission stub shaft. Removal in this manner will cause damage to the inboard joint sealing boots.

(1) Remove the driveshaft requiring boot replacement from the vehicle. See Servicing Driveshaft for the required driveshaft removal procedure.

(2) Remove large boot clamp which retains inner tripod joint sealing boot to tripod joint housing and discard. Remove small clamp which retains inner tripod joint sealing boot to interconnecting shaft and discard. Remove the sealing boot from the tripod housing and slide it down the interconnecting shaft.

CAUTION: When removing the tripod joint housing from the spider assembly, hold the bearings in place on the spider trunions to prevent the bearings from falling away.

(3) Slide the tripod joint housing off the spider assembly and the interconnecting shaft (Fig. 26).

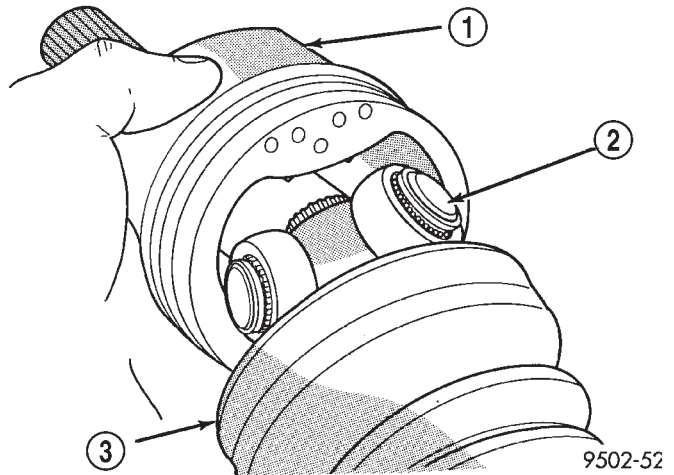


Fig. 26 Spider Assembly Removal from Tripod Joint Housing

- 1 - TRIPOD JOINT HOUSING
- 2 - SPIDER ASSEMBLY
- 3 - SEALING BOOT

(4) Remove snap ring which retains spider assembly to interconnecting shaft (Fig. 27). Remove the spider assembly from interconnecting shaft. If spider assembly will not come off interconnecting shaft by hand, it can be removed by tapping spider assembly with a brass drift (Fig. 28). **Do not hit the outer tripod bearings in an attempt to remove spider assembly from interconnecting shaft.**

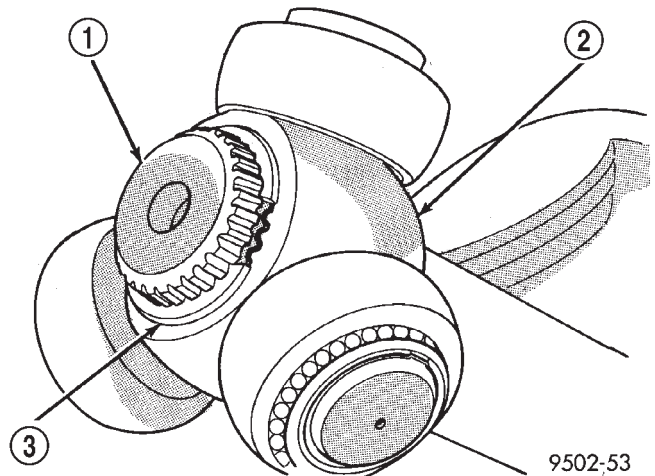


Fig. 27 Spider Assembly Retaining Snap Ring

- 1 - INTERCONNECTING SHAFT
- 2 - SPIDER ASSEMBLY
- 3 - RETAINING SNAP RING

(5) Slide sealing boot off interconnecting shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

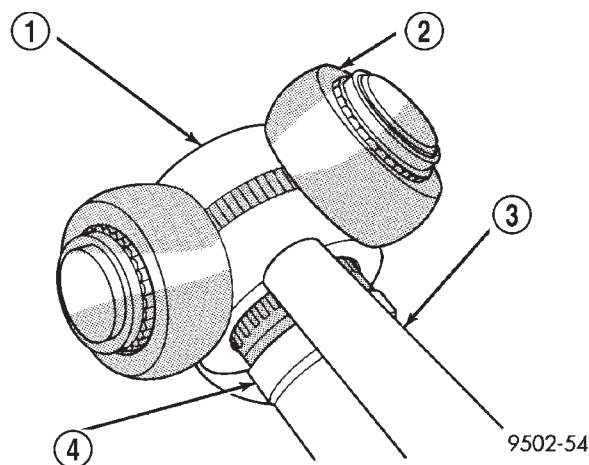


Fig. 28 Spider Assembly Removal from Interconnecting Shaft

- 1 - SPIDER ASSEMBLY
- 2 - DO NOT HIT SPIDER ASSEMBLY BEARINGS WHEN REMOVING SPIDER ASSEMBLY
- 3 - BRASS DRIFT
- 4 - INTERCONNECTING SHAFT

(6) Thoroughly clean and inspect spider assembly, tripod joint housing, and interconnecting shaft for any signs of excessive wear. **If any parts show signs of excessive wear, the driveshaft assembly will require replacement. Component parts of these driveshaft assemblies are not serviceable.**

INSTALLATION

NOTE: The inner tripod joint sealing boots are made from two different types of material. High temperature applications use silicone rubber where as standard temperature applications use hytrel plastic. The silicone sealing boots are soft and pliable. The Hytrel sealing boots are stiff and rigid. The replacement sealing boot **MUST BE** the same type of material as the sealing boot which was removed.

(1) Slide inner tripod joint seal boot retaining clamp, onto interconnecting shaft. Then, slide the replacement inner tripod joint sealing boot onto the interconnecting shaft. **Inner tripod joint seal boot MUST be positioned on interconnecting shaft, so the raised bead on the inside of the seal boot is in groove on interconnecting shaft (Fig. 29).**

(2) Install spider assembly onto interconnecting shaft (Fig. 30). Spider assembly must be installed on interconnecting shaft far enough to fully install spider retaining snap ring. If spider assembly will not fully install on interconnecting shaft by hand, it can be installed by tapping the spider body with a brass drift (Fig. 31). **Do not hit the outer tripod bear-**

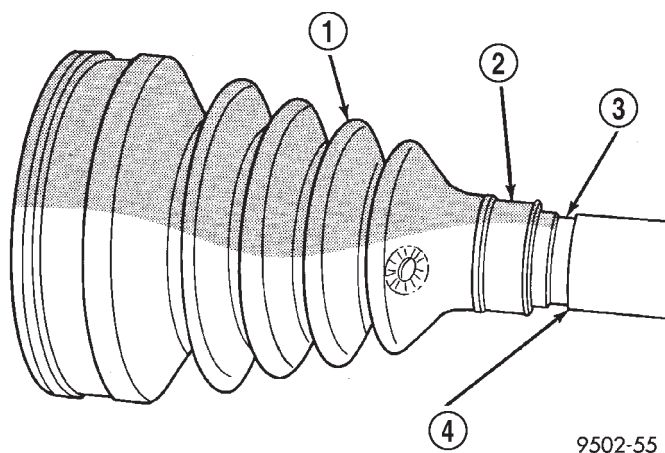


Fig. 29 Sealing Boot Installation on Interconnecting Shaft

- 1 - SEALING BOOT
- 2 - RAISED BEAD IN THIS AREA OF SEALING BOOT
- 3 - GROOVE
- 4 - INTERCONNECTING SHAFT

ings in an attempt to install spider assembly on interconnecting shaft.

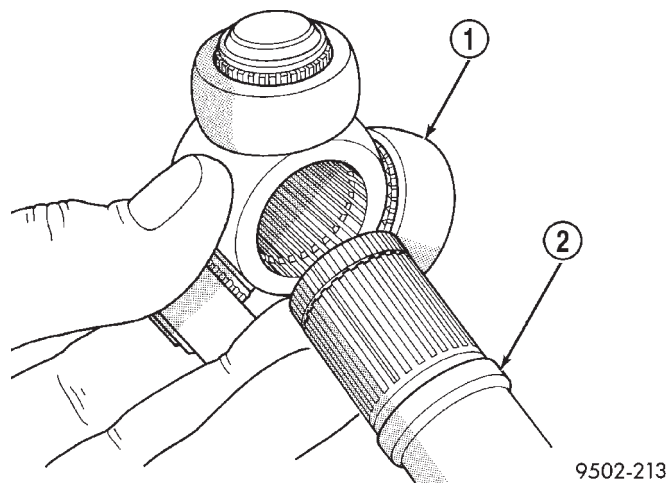


Fig. 30 Spider Assembly Installation on Interconnecting Shaft

- 1 - SPIDER ASSEMBLY
- 2 - INTERCONNECTING SHAFT

(3) Install the spider assembly to interconnecting shaft retaining snap ring into groove on end of interconnecting shaft (Fig. 32). Be sure the snap ring is fully seated into groove on interconnecting shaft.

(4) Distribute 1/2 the amount of grease provided in the seal boot service package (**DO NOT USE ANY OTHER TYPE OF GREASE**) into tripod housing. Put the remaining amount into the sealing boot.

(5) Align tripod housing with spider assembly and then slide tripod housing over spider assembly and interconnecting shaft (Fig. 33).

DISASSEMBLY AND ASSEMBLY (Continued)

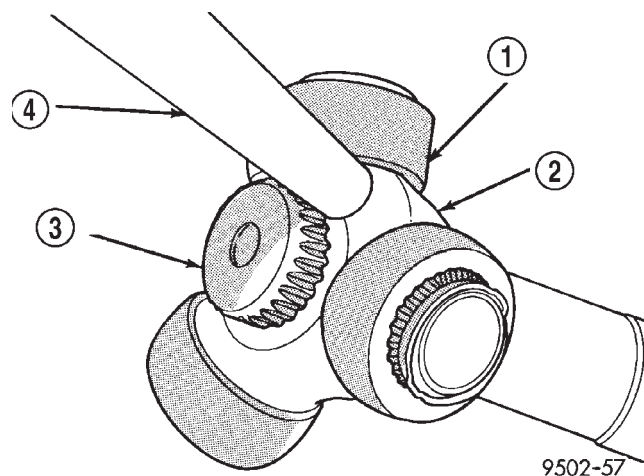


Fig. 31 Installing Spider Assembly on Interconnecting Shaft

- 1 – DO NOT HIT BEARINGS WHEN INSTALLING THE SPIDER ASSEMBLY
- 2 – SPIDER ASSEMBLY
- 3 – INTERCONNECTING SHAFT
- 4 – BRASS DRIFT

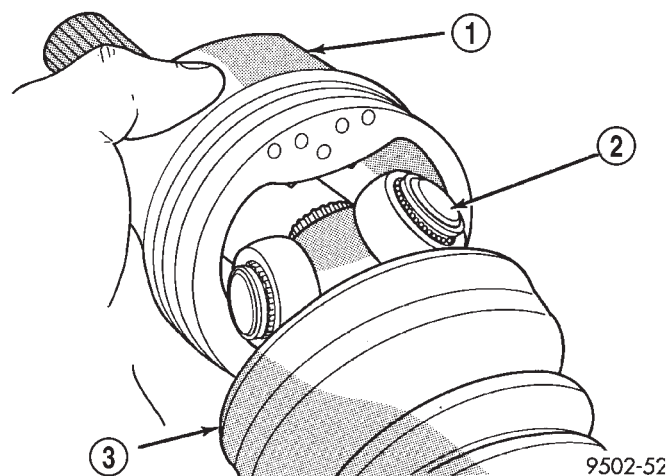


Fig. 33 Installing Tripod Housing on Spider Assembly

- 1 – TRIPOD JOINT HOUSING
- 2 – SPIDER ASSEMBLY
- 3 – SEALING BOOT

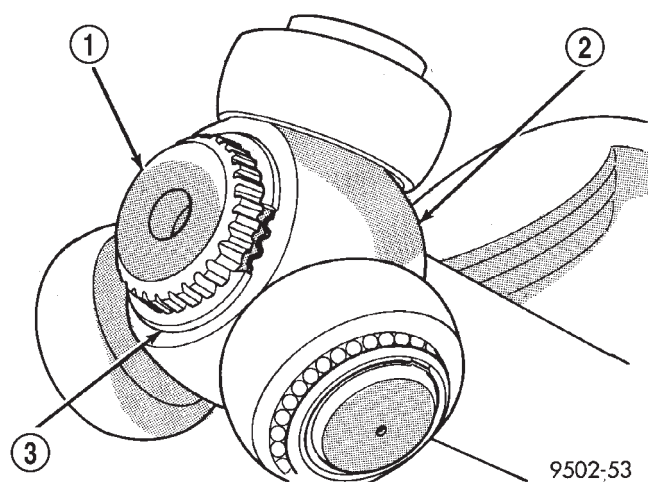


Fig. 32 Spider Assembly Retaining Snap Ring Installed

- 1 – INTERCONNECTING SHAFT
- 2 – SPIDER ASSEMBLY
- 3 – RETAINING SNAP RING

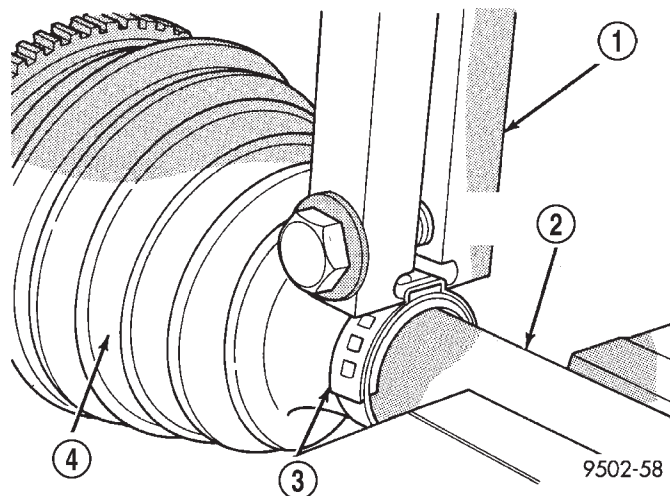


Fig. 34 Crimping Tool Installed on Sealing Boot Clamp

- 1 – SPECIAL TOOL C-4975A
- 2 – INTERCONNECTING SHAFT
- 3 – CLAMP
- 4 – SEALING BOOT

(6) Install inner tripod joint seal boot to interconnecting shaft clamp evenly on sealing boot.

(7) Clamp sealing boot onto interconnecting shaft using crimper, Special Tool C-4975-A and the following procedure. Place crimping tool C-4975-A over bridge of clamp (Fig. 34). Tighten nut on crimping tool C-4975-A until jaws on tool are closed completely together, face to face (Fig. 35).

CAUTION: Seal must not be dimpled, stretched or out of shape in any way. If seal is NOT shaped correctly, equalize pressure in seal and shape it by hand.

(8) Position sealing boot into the tripod housing retaining groove. Install seal boot retaining clamp evenly on sealing boot.

DISASSEMBLY AND ASSEMBLY (Continued)

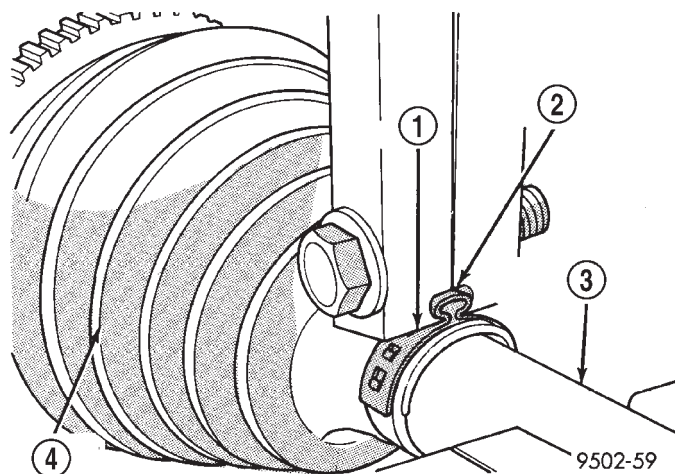


Fig. 35 Sealing Boot Retaining Clamp Installed

- 1 - CLAMP
- 2 - JAWS OF SPECIAL TOOL C-4975A MUST BE CLOSED COMPLETELY TOGETHER HERE
- 3 - INTERCONNECTING SHAFT
- 4 - SEALING BOOT

CAUTION: The following positioning procedure determines the correct air pressure inside the inner tripod joint assembly prior to clamping the sealing boot to inner tripod joint housing. If this procedure is not done prior to clamping sealing boot to tripod joint housing sealing boot durability can be adversely affected.

CAUTION: When venting the inner tripod joint assembly, use care so inner tripod sealing boot does not get punctured, or in any other way damaged. If sealing boot is punctured, or damaged in any way while being vented, the sealing boot can not be used.

(9) Insert a trim stick between the tripod joint and the sealing boot to vent inner tripod joint assembly (Fig. 36). **When inserting trim stick between tripod housing and sealing boot ensure trim stick is held flat and firmly against the tripod housing. If this is not done damage to the sealing boot can occur.** If inner tripod joint has a Hytrel (hard plastic) sealing boot, be sure trim stick is inserted between soft rubber insert and tripod housing not the hard plastic sealing boot and soft rubber insert.

(10) With trim stick inserted between sealing boot and tripod joint housing, position the interconnecting shaft so it is at the center of its travel in the tripod joint housing. Remove the trim stick from between the sealing boot and the tripod joint housing. **This procedure will equalize the air pressure in the**

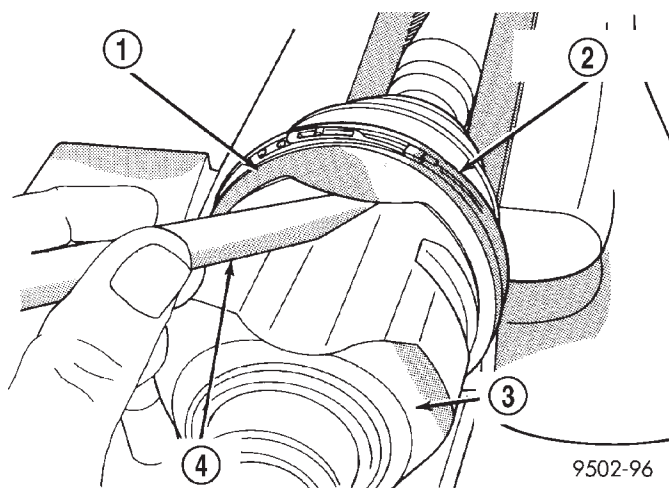


Fig. 36 Trim Stick Inserted for Venting Tripod Joint

- 1 - INNER TRIPOD JOINT SEALING BOOT
- 2 - SEALING BOOT CLAMP
- 3 - INNER TRIPOD JOINT HOUSING
- 4 - TRIM STICK

tripod joint, preventing premature sealing boot failure.

(11) Position trilobal boot to interface with the tripod housing. The lobes of the boot must be properly aligned with the recess's of the tripod housing.

(12) Clamp tripod joint sealing boot to tripod joint, using required procedure for type of boot clamp application.

CRIMP TYPE BOOT CLAMP

If seal boot uses crimp type boot clamp:

- Clamp sealing boot onto tripod housing using Crimper, Special Tool C-4975-A.
- Place crimping tool C-4975-A over bridge of clamp (Fig. 37).
- Tighten nut on crimping tool C-4975-A until jaws on tool are closed completely together, face to face (Fig. 38).

LATCHING TYPE BOOT CLAMP

If seal boot uses low profile latching type boot clamp:

- Clamp sealing boot onto tripod housing using clamp locking tool, Snap-On YA3050 or an equivalent.
- Place prongs of clamp locking tool in the holes of the clamp (Fig. 39).
- Squeeze tool together until top band of clamp is latched behind the two tabs on lower band of clamp (Fig. 40).

(13) Install the driveshaft back on the vehicle. See Servicing Driveshaft, for the required driveshaft installation procedure.

DISASSEMBLY AND ASSEMBLY (Continued)

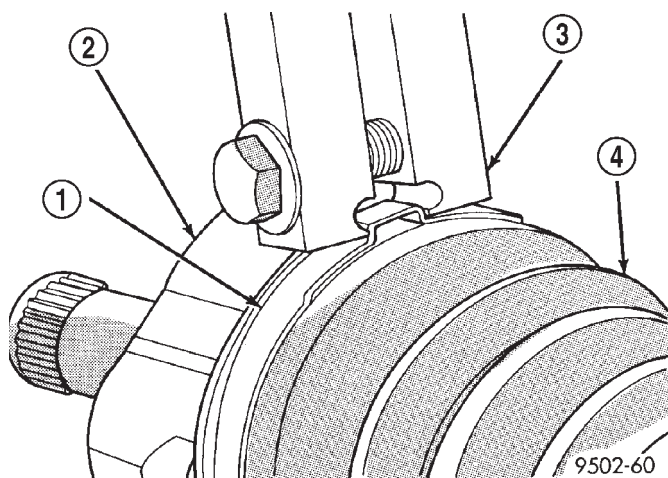


Fig. 37 Crimping Tool Installed on Sealing Boot Clamp

- 1 - CLAMP
- 2 - TRIPOD JOINT HOUSING
- 3 - SPECIAL TOOL C-4975A
- 4 - SEALING BOOT

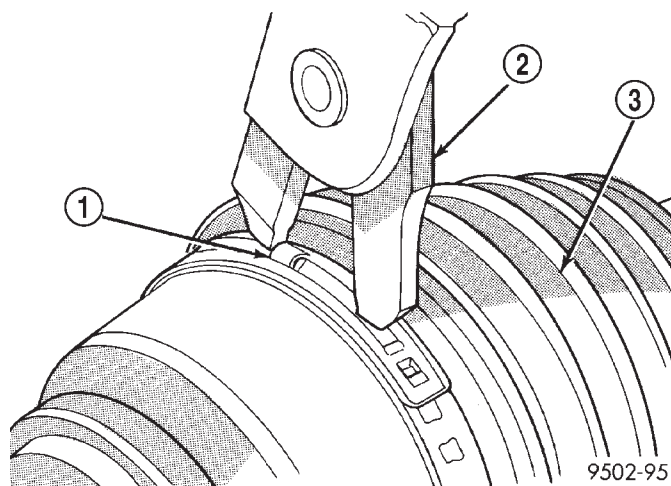


Fig. 39 Clamping Tool Installed on Sealing Boot Clamp

- 1 - CLAMP
- 2 - SPECIAL TOOL YA3050
- 3 - SEALING BOOT

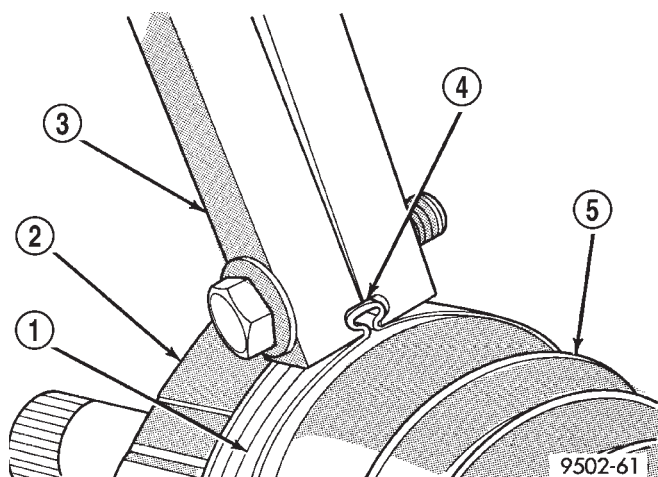


Fig. 38 Sealing Boot Retaining Clamp Installed

- 1 - CLAMP
- 2 - TRIPOD HOUSING
- 3 - SPECIAL TOOL C-4975A
- 4 - JAWS OF SPECIAL TOOL C-4975A MUST BE CLOSED COMPLETELY TOGETHER HERE
- 5 - SEALING BOOT

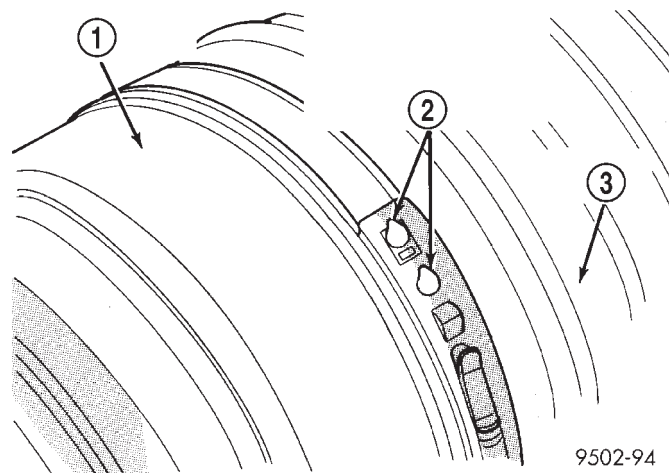


Fig. 40 Sealing Boot Clamp Correctly Installed

- 1 - INNER TRIPOD JOINT HOUSING
- 2 - TOP BAND OF CLAMP MUST BE RETAINED BY TABS AS SHOWN HERE TO CORRECTLY LATCH BOOT CLAMP
- 3 - SEALING BOOT

OUTER C/V JOINT SEAL BOOT

REMOVAL

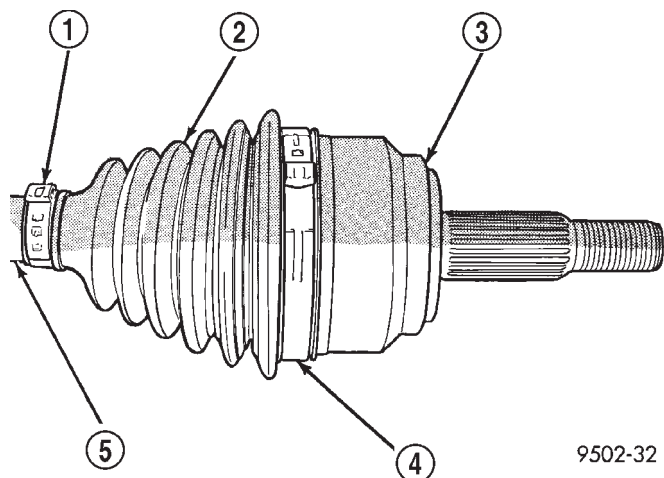
To remove outer C/V joint sealing boot from a driveshaft for replacement, the driveshaft assembly must be removed from the vehicle. See Driveshaft Removal and Installation in this section for the required driveshaft removal and replacement procedure.

(1) Remove driveshaft assembly requiring boot replacement from vehicle. See Driveshaft Removal and Installation in this section for the required driveshaft removal procedure.

(2) Remove large boot clamp retaining C/V joint sealing boot to C/V joint housing (Fig. 41) and discard. Remove small clamp that retains outer C/V joint sealing boot to interconnecting shaft and discard. Remove sealing boot from outer C/V joint housing and slide it down interconnecting shaft.

(3) Wipe away grease to expose outer C/V joint and interconnecting shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

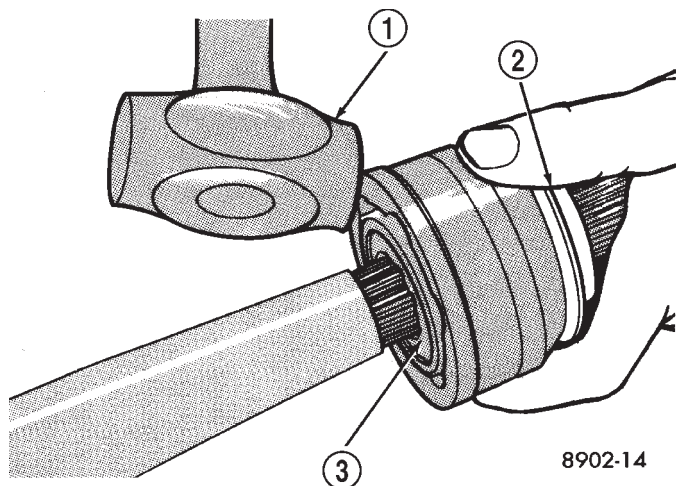


9502-32

Fig. 41 Outer C/V Joint Seal Boot Clamps

- 1 - SMALL CLAMP
- 2 - SEALING BOOT
- 3 - OUTER C/V JOINT HOUSING
- 4 - LARGE CLAMP
- 5 - INTERCONNECTING SHAFT

(4) Remove outer C/V joint from interconnecting shaft using the following procedure: Support interconnecting shaft in a vise **equipped with protective caps on jaws of vise to prevent damage to interconnecting shaft**. Then, using a **soft-faced hammer**, sharply hit the end of the C/V joint housing to dislodge housing from internal circlip on interconnecting shaft (Fig. 42). Then slide outer C/V joint off end of interconnecting shaft, joint may have to be tapped off shaft using a **soft-faced hammer**.

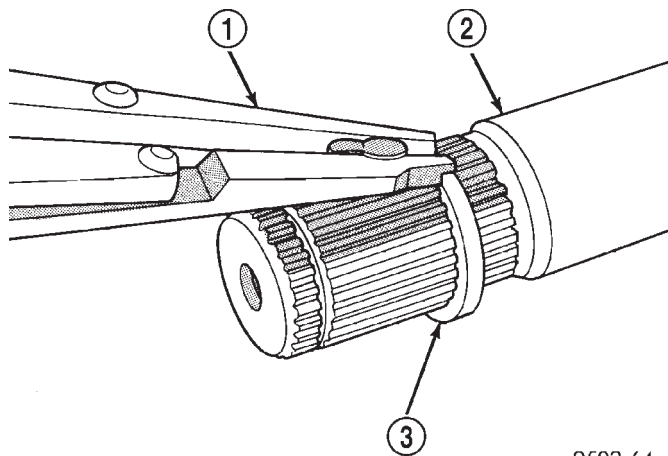


8902-14

Fig. 42 Outer C/V Joint Removal from Interconnecting Shaft

- 1 - SOFT HAMMER (TAP HOUSING)
- 2 - WEAR SLEEVE
- 3 - CIRCLIP (OUTER END OF SHAFT)

(5) Remove large circlip (Fig. 43) from the interconnecting shaft before attempting to remove outer C/V joint sealing boot.



9502-64

Fig. 43 Circlip Removal from Interconnecting Shaft

- 1 - SNAP RING PLIERS
- 2 - INTERCONNECTING SHAFT
- 3 - CIRCLIP

(6) Slide failed sealing boot off interconnecting shaft.

(7) Thoroughly clean and inspect outer C/V joint assembly and interconnecting joint for any signs of excessive wear. **If any parts show signs of excessive wear, the driveshaft assembly will require replacement. Component parts of these driveshaft assemblies are not serviceable.**

INSTALLATION

(1) Slide new sealing boot to interconnecting shaft retaining clamp onto interconnecting shaft. Slide the outer C/V joint assembly sealing boot onto the interconnecting shaft (Fig. 44). **Seal boot MUST be positioned on interconnecting shaft so the raised bead on the inside of the seal boot is in groove on interconnecting shaft.**

(2) Align splines on interconnecting shaft with splines on cross of outer C/V joint assembly and start outer C/V joint onto interconnecting shaft.

(3) Install outer C/V joint assembly onto interconnecting shaft by using a **soft-faced hammer** and tapping end of stub axle (with nut installed) until outer C/V joint is fully seated on interconnecting shaft (Fig. 45).

(4) Outer C/V joint assembly must be installed on interconnecting shaft until cross of outer C/V joint assembly is seated against circlip on interconnecting shaft (Fig. 46).

(5) Distribute 1/2 the amount of grease provided in seal boot service package (**DO NOT USE ANY OTHER TYPE OF GREASE**) into outer C/V joint

DISASSEMBLY AND ASSEMBLY (Continued)

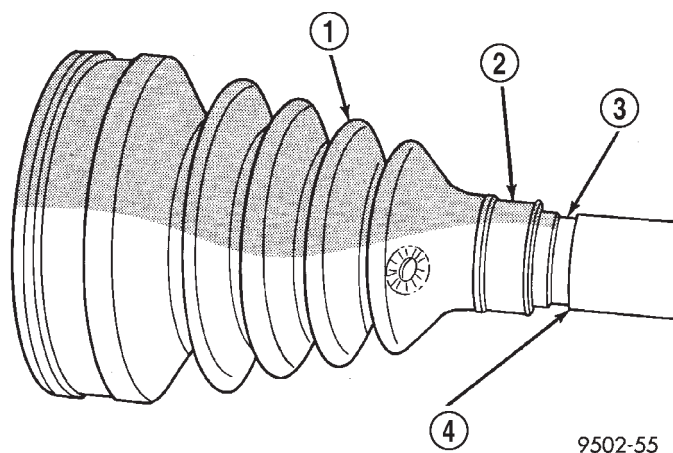


Fig. 44 Sealing Boot Installation on Interconnecting Shaft

- 1 - SEALING BOOT
- 2 - RAISED BEAD IN THIS AREA OF SEALING BOOT
- 3 - GROOVE
- 4 - INTERCONNECTING SHAFT

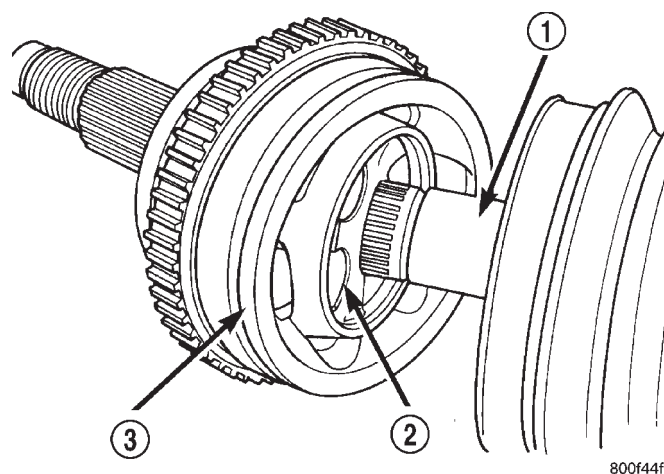


Fig. 46 Outer C/V Joint Correctly Installed on Interconnecting Shaft

- 1 - INTERCONNECTING SHAFT
- 2 - CROSS
- 3 - OUTER C/V JOINT ASSEMBLY

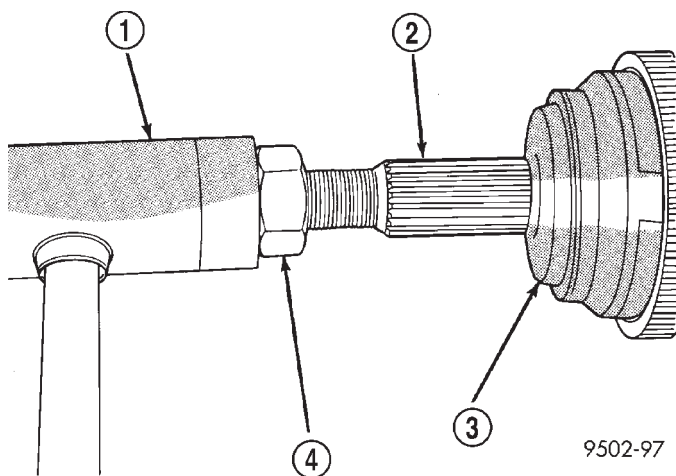


Fig. 45 Outer C/V Joint Installation on Interconnecting Shaft

- 1 - SOFT FACED HAMMER
- 2 - STUB AXLE
- 3 - OUTER C/V JOINT
- 4 - NUT

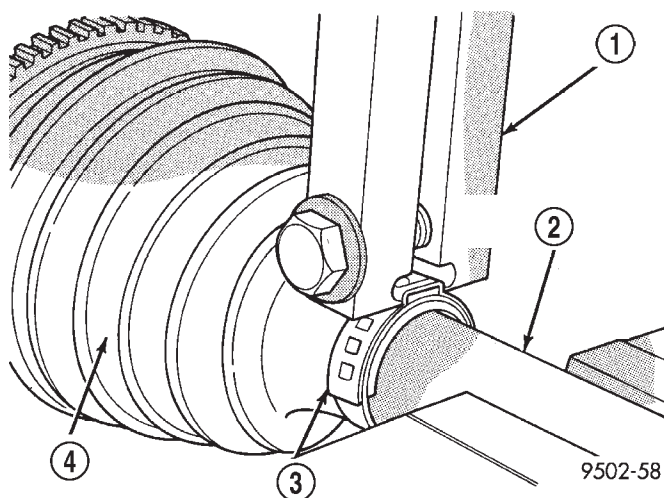


Fig. 47 Crimping Tool Installed on Sealing Boot Clamp

- 1 - SPECIAL TOOL C-4975A
- 2 - INTERCONNECTING SHAFT
- 3 - CLAMP
- 4 - SEALING BOOT

assembly housing. Put the remaining amount into the sealing boot.

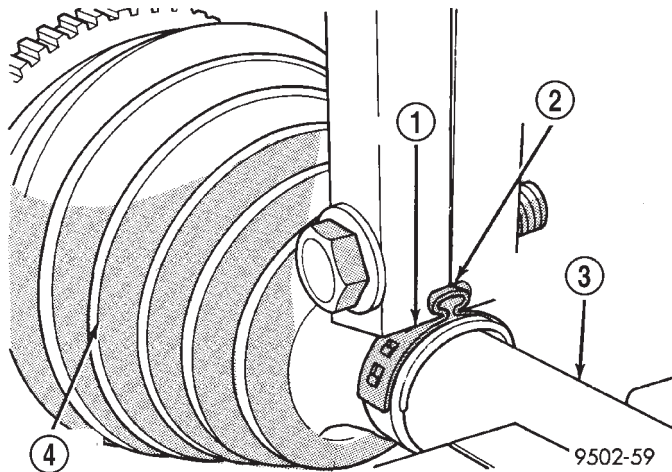
(6) Install outer C/V joint sealing boot to interconnecting shaft clamp evenly on sealing boot.

(7) Clamp sealing boot onto interconnecting shaft using crimper, Special Tool C-4975-A and the following procedure. Place crimping tool C-4975-A over bridge of clamp (Fig. 47). Tighten nut on crimping tool C-4975-A until jaws on tool are closed completely together, face to face (Fig. 48).

CAUTION: Seal must not be dimpled, stretched, or out-of-shape in any way. If seal is NOT shaped correctly, equalize pressure in seal and shape it by hand.

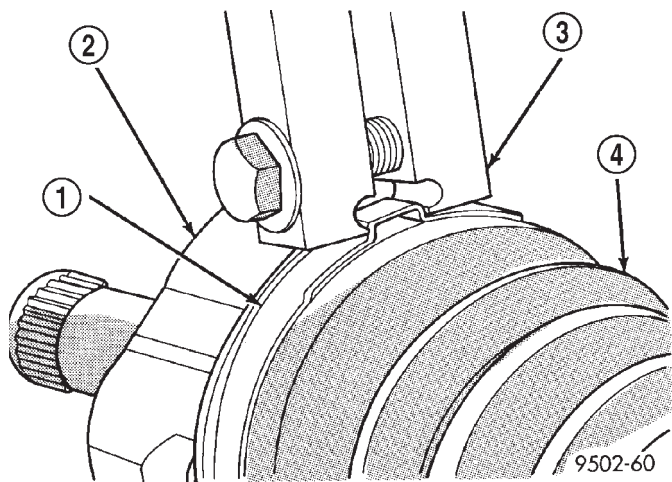
(8) Position outer C/V joint sealing boot into its retaining groove on outer C/V joint housing. Install sealing boot to outer C/V joint retaining clamp evenly on sealing boot.

DISASSEMBLY AND ASSEMBLY (Continued)

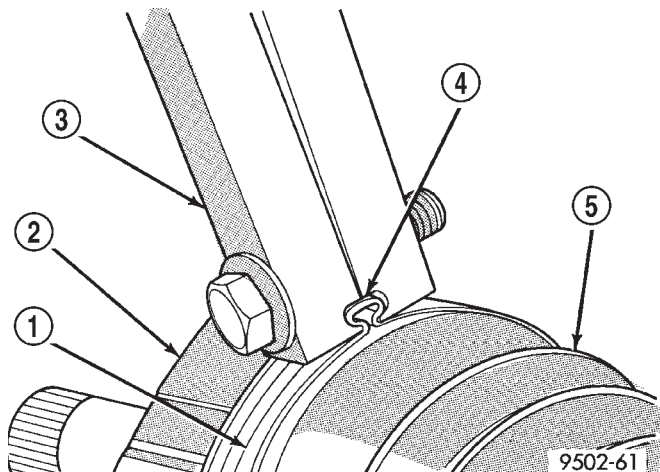
**Fig. 48 Sealing Boot Retaining Clamp Installed**

- 1 - CLAMP
- 2 - JAWS OF SPECIAL TOOL C-4975A MUST BE CLOSED COMPLETELY TOGETHER HERE
- 3 - INTERCONNECTING SHAFT
- 4 - SEALING BOOT

(9) Clamp sealing boot onto outer C/V joint housing using Crimper, Special Tool C-4975-A and the following procedure. Place crimping tool C-4975-A over bridge of clamp (Fig. 49). Tighten nut on crimping tool C-4975-A until jaws on tool are closed completely together, face to face (Fig. 50).

**Fig. 49 Crimping Tool Installed on Sealing Boot Clamp**

- 1 - CLAMP
- 2 - TRIPOD JOINT HOUSING
- 3 - SPECIAL TOOL C-4975A
- 4 - SEALING BOOT

**Fig. 50 Sealing Boot Retaining Clamp Installed**

- 1 - CLAMP
- 2 - TRIPOD HOUSING
- 3 - SPECIAL TOOL C-4975A
- 4 - JAWS OF SPECIAL TOOL C-4975A MUST BE CLOSED COMPLETELY TOGETHER HERE
- 5 - SEALING BOOT

(10) Install the driveshaft requiring boot replacement back on the vehicle. See Driveshaft Removal and Installation in this section for the required driveshaft installation procedure.

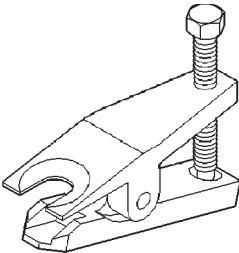
SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Caliper To Knuckle Bolts	31 N·m (23 ft. lbs.)
Driveshaft Nut	142 N·m (105 ft. lbs.)
Front Wheel Lug Nuts	135 N·m (100 ft. lbs.)
Knuckle To Ball Stud Nut	95 N·m (70 ft. lbs.)
Tie Rod End To Knuckle	61 N·m (45 ft. lbs.)

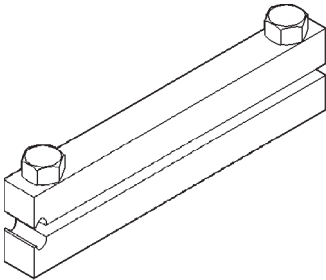
SPECIAL TOOLS

DRIVESHAFT



801109eC

Tie Rod Remover MB-991113



Boot Clamp Installer C-4975A

