

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

2007 DRIVELINE

Differential & Driveline - Nitro

PROPELLER SHAFT

DIAGNOSIS AND TESTING

PROPELLER SHAFT

PROPELLER SHAFT VIBRATION

DRIVELINE VIBRATION

Drive Condition	Possible Cause	Correction
Propeller Shaft Noise	<ol style="list-style-type: none">1. Undercoating or other foreign material on shaft.2. Loose propeller shaft.3. Loose or bent joint or excessive runout.4. Incorrect driveline angularity.5. Worn joint.6. Propeller shaft damaged or out of balance.7. Broken rear spring.8. Excessive runout or unbalanced condition.9. Excessive drive pinion gear shaft runout.10. Excessive pinion flange deflection.11. Excessive transfer case runout.	<ol style="list-style-type: none">1. Clean exterior of shaft and wash with solvent.2. Install new screws and tighten to proper torque.3. Install new propeller shaft.4. Measure and correct driveline angles.5. Install new propeller shaft6. Install new propeller shaft.7. Install new rear spring.8. Re-index propeller shaft, test, and evaluate.9. Re-index propeller shaft and evaluate.10. Inspect and replace propeller shaft if necessary.11. Inspect and repair as necessary.
Joint Noise	<ol style="list-style-type: none">1. Loose screws.2. Lack of lubrication.	<ol style="list-style-type: none">1. Install new screws and tighten to proper torque.2. Replace propeller shaft as necessary.

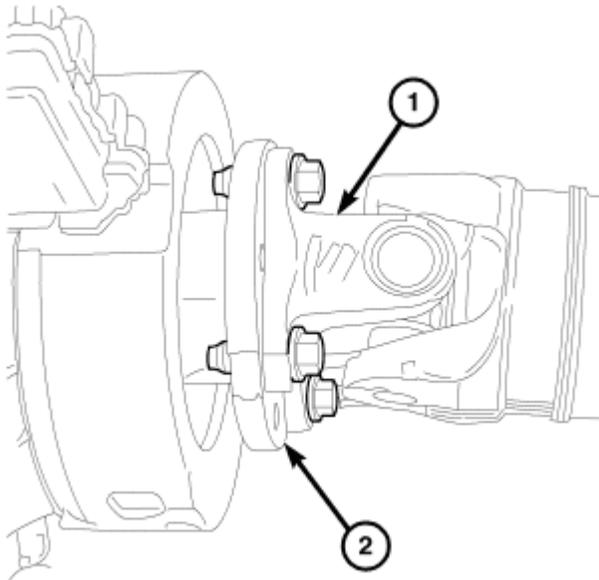
A out of round tire or wheel that is out of balance, will cause a low frequency vibration.

Brake rotors that are unbalanced will cause a harsh, low frequency vibration.

Driveline vibration can be caused by loose or damaged engine mounts.

Propeller shaft vibration increases with vehicle speed. A vibration that occurs at a specific speed is not usually caused by a out of balance propeller shaft. Worn universal joints or an incorrect propeller shaft angle, can cause such a vibration.

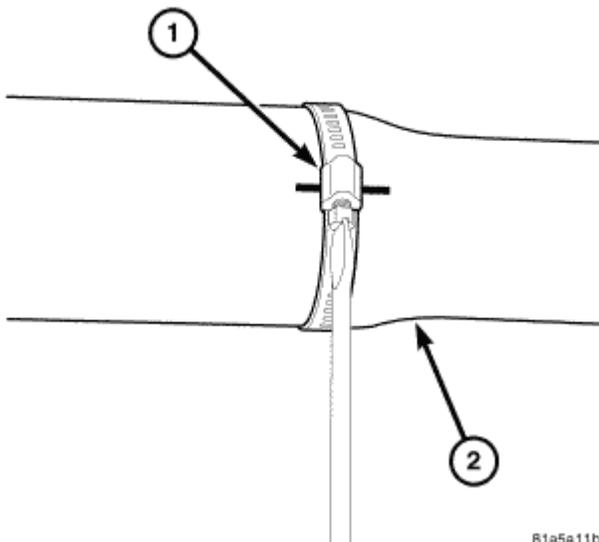
BALANCE



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Fig. 1: Identifying Propeller Shaft & Flange
Courtesy of CHRYSLER LLC

NOTE: Indexing the propeller shaft (1) 90° relative to the flange (2) may eliminate some vibrations.



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Fig. 2: Identifying Screw Clamp & Propeller Shaft

Courtesy of CHRYSLER LLC

1. Raise the vehicle.
2. Clean all the foreign material from the propeller shaft and universal joints.
3. Inspect propeller shaft for missing balance weights, broken welds, and bent areas.

NOTE: If the propeller shaft is bent, it must be replaced.

4. Inspect joints for wear, proper installation and correct alignment with the shaft.
5. Remove wheels and tires and install wheel lug nuts to retain brake drums/rotors.
6. Mark and number the shaft six inches from the pinion flange end at four positions 90 degrees apart.
7. Run and accelerate the vehicle until vibration occurs. Note the intensity and speed the vibration occurred. Stop the engine.
8. Position one screw clamp (1) on the propeller shaft (2) at one of the 90 degree marks.
9. Start the engine and check for vibration. If there is little or no change in vibration, move the clamp to the next mark. Repeat the vibration test. If there is no difference in vibration at the other positions, the source of the vibration may not be propeller shaft.

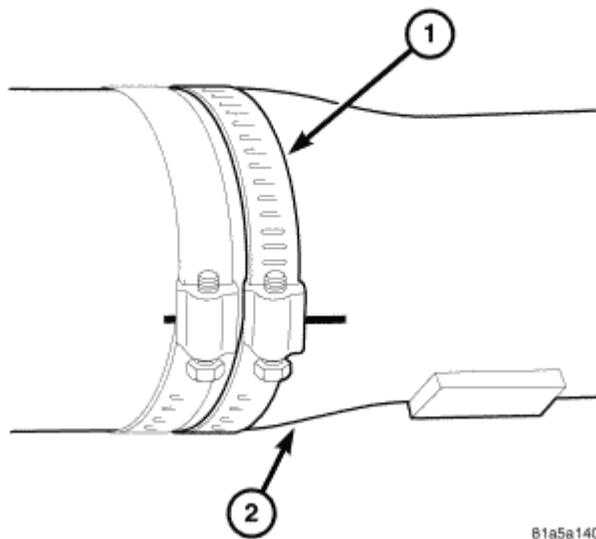
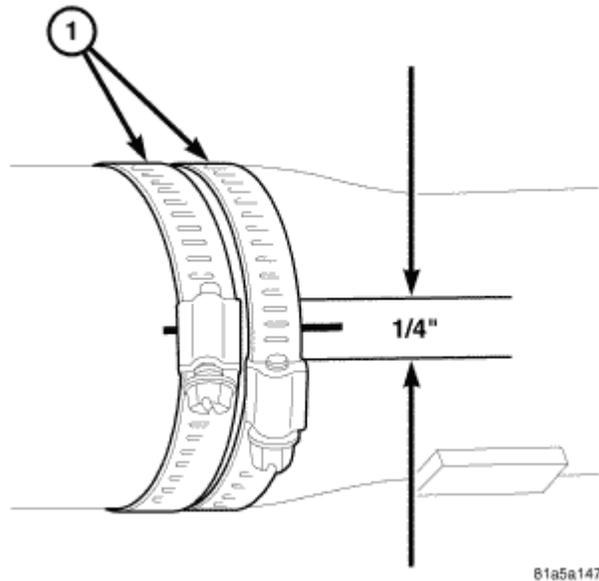


Fig. 3: Identifying Second Clamp & Propeller Shaft
Courtesy of CHRYSLER LLC

10. If vibration is decreased, install a second clamp (1) in the same position on the propeller shaft (2) and repeat the test.



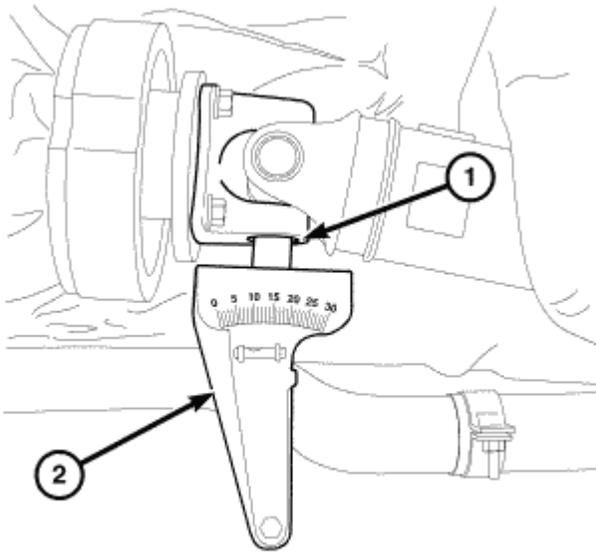
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Fig. 4: Separating Clamps 1/4 Inch
Courtesy of CHRYSLER LLC

11. If the additional clamp causes an additional vibration, separate the clamps (1) 1/4 inch above and below the mark. Repeat the vibration test.
12. Increase distance between the clamps and repeat the test until the amount of vibration is at the lowest level. Bend the slack end of the clamps so the screws will not loosen.
13. If vibration remains unacceptable, repeat the procedure to the front end of the propeller shaft.
14. Install wheel and tires, and lower vehicle.

STANDARD PROCEDURE

PROPELLER SHAFT



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Fig. 5: Identifying Yoke Bearing Cap & Inclinometer

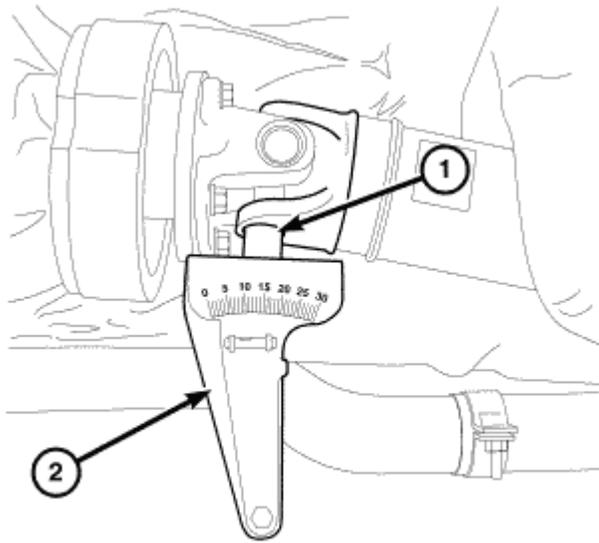
Courtesy of CHRYSLER LLC

This procedure applies to the front and rear propeller shaft. To obtain front (output) angle on the C/V front propeller shaft, place Inclinometer 7663 on the machined ring of the pinion flange. To obtain propeller shaft angle measurement transfer case C/V front propeller shaft, place inclinometer on the propeller shaft tube.

1. Raise and support the vehicle at the axles as level as possible. Allow the wheels and propeller shaft to turn.
2. Rotate shaft until transmission/transfer case output yoke bearing cap is facing downward.

NOTE: Always make measurements from front to rear and from the same side of the vehicle.

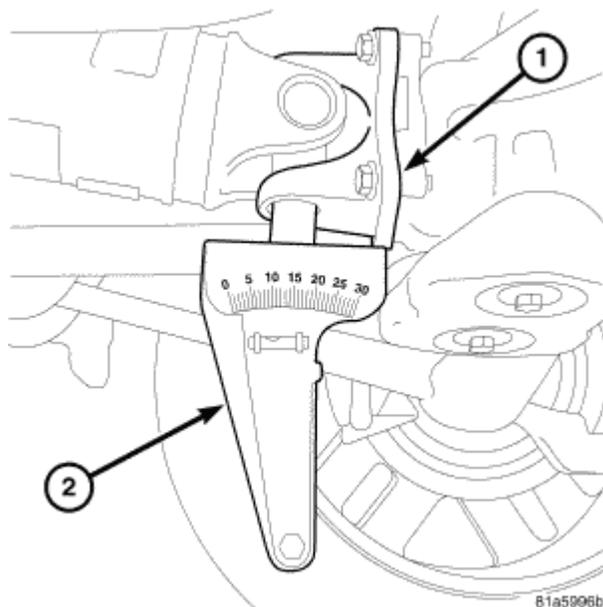
3. Place inclinometer (2) on yoke bearing cap (1) or pinion flange ring parallel to the shaft. Center bubble in sight glass and record measurement. This measurement will give you the transmission or Output Yoke Angle (A).



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Fig. 6: Identifying Yoke Bearing Cap & Inclinometer
 Courtesy of CHRYSLER LLC

4. Rotate propeller shaft 90 degrees and place inclinometer (2) on yoke bearing cap (1) or propeller shaft tube on C/V propeller shaft, parallel to the shaft. Center bubble in sight glass and record measurement. This measurement can also be taken at the rear end of the shaft. This measurement will give you the propeller shaft angle (C).
5. Subtract smaller figure from larger (C minus A) to obtain transmission output operating angle.



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Fig. 7: Identifying Pinion Yoke Bearing Cap & Inclinometer
 Courtesy of CHRYSLER LLC

6. Rotate propeller shaft 90 degrees and place inclinometer (2) on pinion yoke bearing cap (1) parallel to the

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shaft. Center bubble in sight glass and record measurement. This measurement will give you the pinion shaft or input yoke angle (B).

7. Subtract smaller figure from larger (C minus B) to obtain axle Input Operating Angle.

RULES

Good cancellation of U-joint operating angles is within 1 degree.

Operating angles less than 4 degrees single cardan U-joint.

Operating angles less than 10 degrees for CV joints.

SPECIFICATIONS

PROPELLER SHAFT

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Front Shaft - Transfer case CV Bolts	30	22	-
Front Shaft - Axle Flange Bolts	108	80	-
Rear Shaft - Flange Bolts	108	80	-

SPECIAL TOOLS

PROPELLER SHAFT

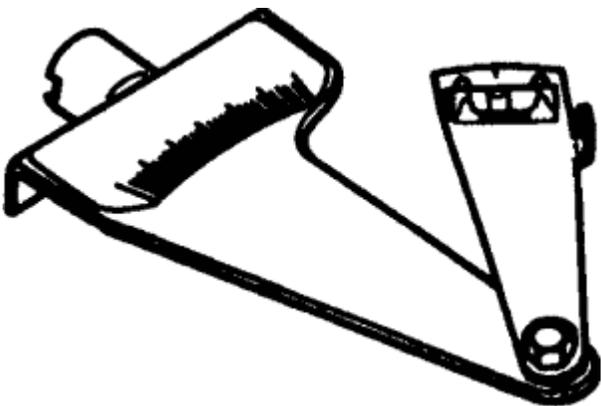


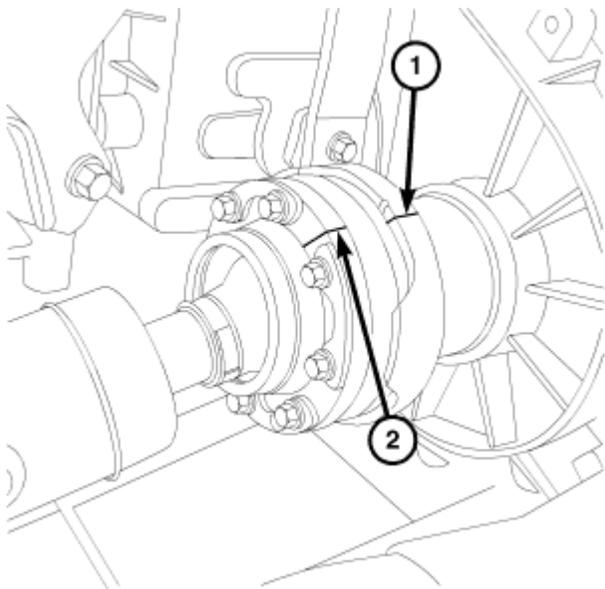
Fig. 8: Inclinometer 7663

Courtesy of CHRYSLER LLC

SHAFT-PROPELLER FRONT

REMOVAL

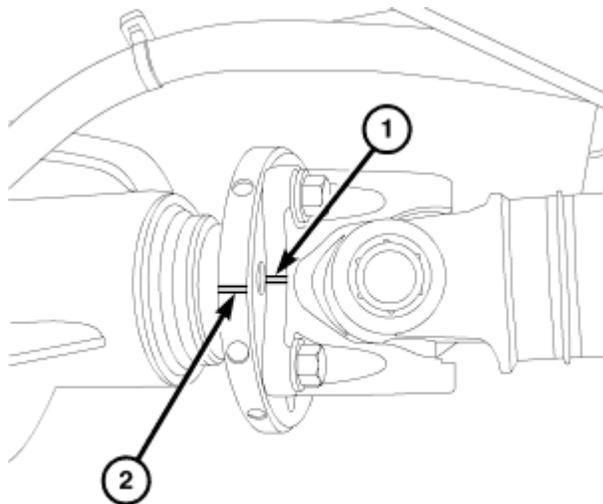
SHAFT-PROPELLER FRONT



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Fig. 9: Identifying Front Propeller Shaft CV Joint & Transfer Case Flange
Courtesy of CHRYSLER LLC

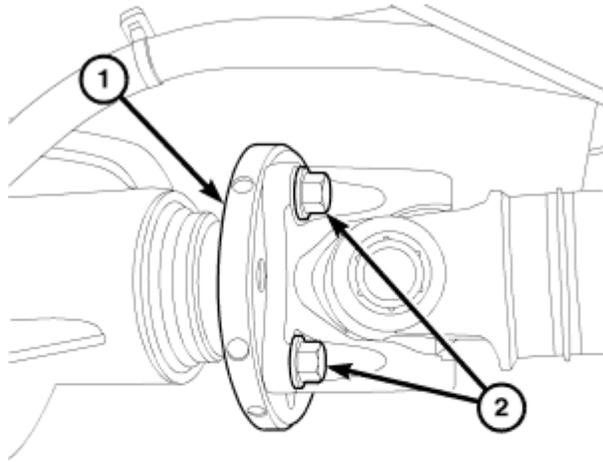
1. With vehicle in neutral, position vehicle on hoist.
2. Mark an installation reference line across the front propeller shaft CV joint (1) and transfer case flange (2).



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Fig. 10: Identifying Front Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

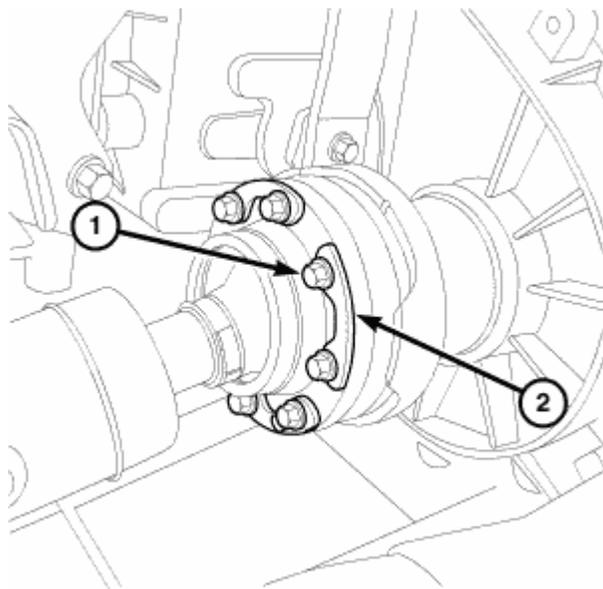
3. Mark an installation reference line across the front propeller shaft flange (1) and the axle flange (2).



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Fig. 11: Removing Axle Flange Bolts
Courtesy of CHRYSLER LLC

4. Remove the axle flange (1) bolts (2).



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Fig. 12: Removing CV Joint Bolts And Retainers
Courtesy of CHRYSLER LLC

5. Remove the CV joint bolts (1) and retainers (2).
6. Compress the propeller shaft enough to remove the shaft from the flanges.

INSTALLATION

SHAFT-PROPELLER FRONT

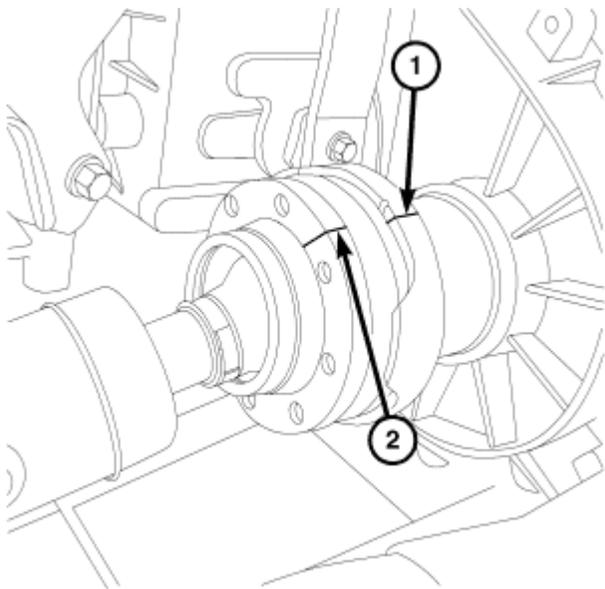


Fig. 13: Aligning Installation Reference Marks On Transfer Case Flange Front Shaft CV Joint
Courtesy of CHRYSLER LLC

NOTE: Clean all propeller shaft bolts and apply Mopar® Lock & Seal Adhesive or equivalent to the threads before installation.

1. Compress the propeller shaft enough to install the shaft into the axle and transfer case flanges.
2. Align installation reference marks on the transfer case flange (1) front shaft CV joint (2).

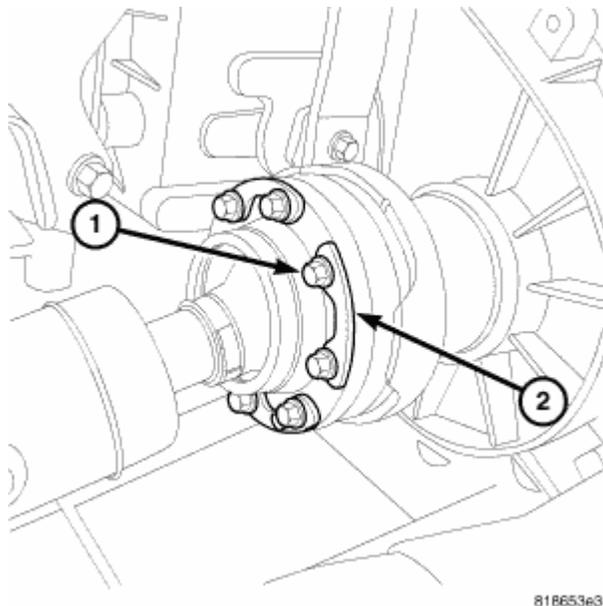
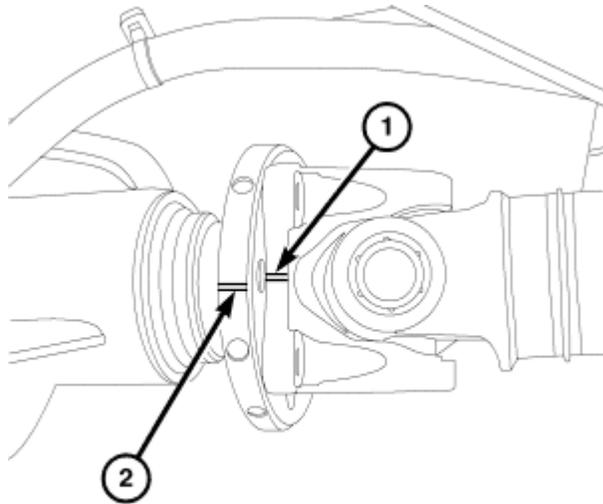


Fig. 14: Installing CV Joint Retainers And Bolts
Courtesy of CHRYSLER LLC

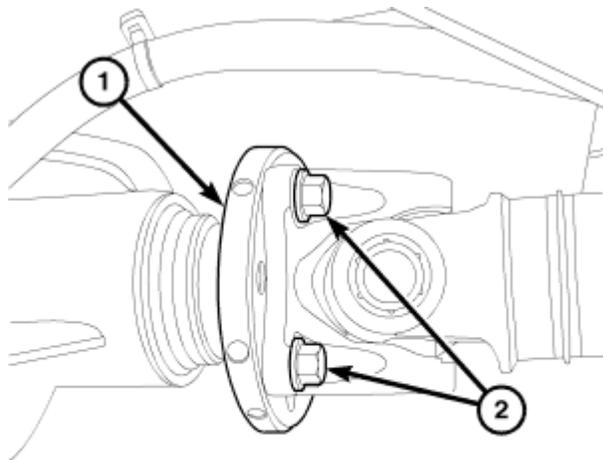
3. Install CV joint retainers (2) and bolts (1). Tighten bolts to 30 N.m (22 ft. lbs.).



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Fig. 15: Identifying Front Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

4. Align installation reference marks on the front propeller shaft flange (1) and axle flange (2).



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Fig. 16: Installing Axle Flange Bolts
Courtesy of CHRYSLER LLC

5. Install the axle flange (1) bolts (2) and tighten to 108 N.m (80 ft. lbs.).

REMOVAL

REAR PROPELLER SHAFT

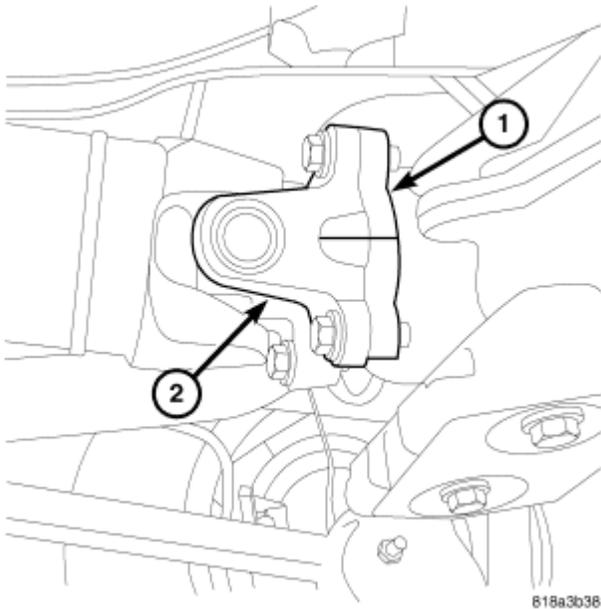


Fig. 17: Identifying Line Across Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Mark a reference line across axle flange (1) and propeller shaft flange (2) for installation.

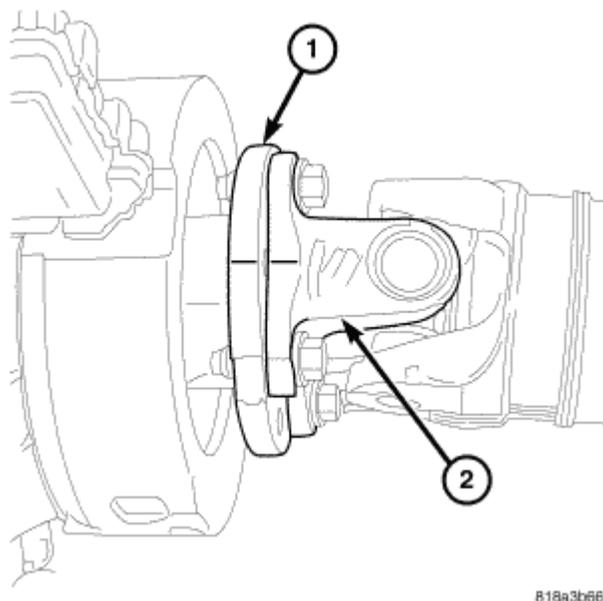


Fig. 18: Identifying Line Across Transmission/Transfer Case Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

3. Mark a reference line across transmission/transfer case flange (1) and propeller shaft flange (2) for installation.

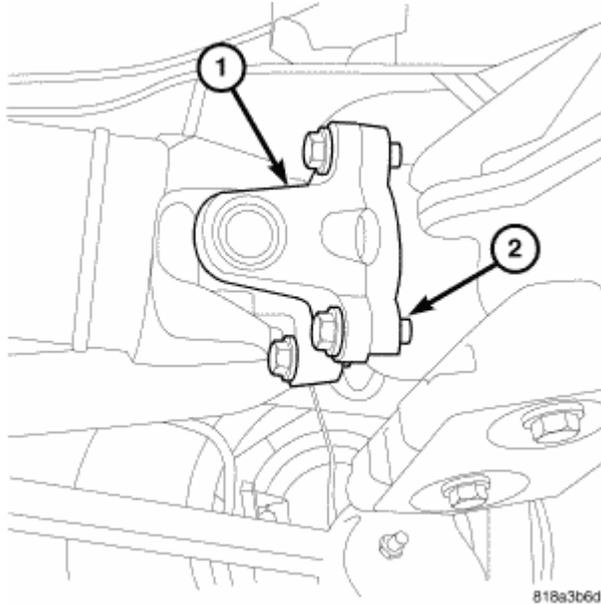


Fig. 19: Identifying Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

4. Remove propeller shaft flange (1) bolts from axle flange (2).

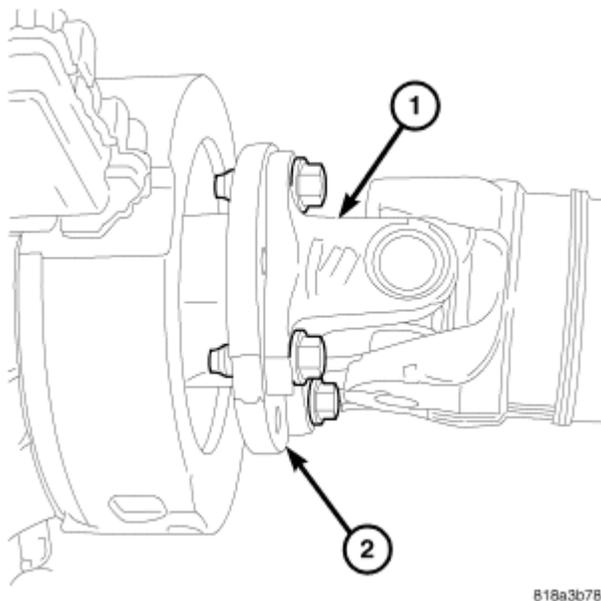


Fig. 20: Identifying Propeller Shaft & Flange
Courtesy of CHRYSLER LLC

5. Remove propeller shaft flange (1) bolts from transmission/transfer case flange (2).
6. Remove propeller shaft.

INSTALLATION

REAR PROPELLER SHAFT

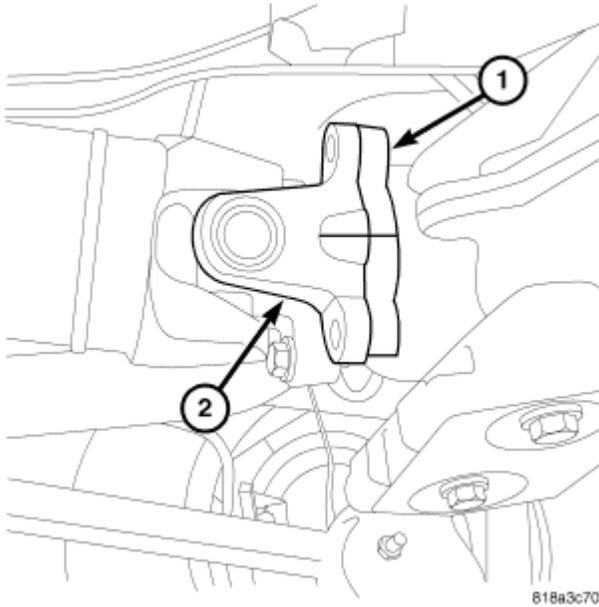


Fig. 21: Identifying Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

NOTE: Clean all propeller shaft bolts and apply Mopar® Lock & Seal Adhesive or equivalent to the threads before installation.

1. Install propeller shaft.
2. Align reference mark on axle flange (1) with propeller shaft flange (2).

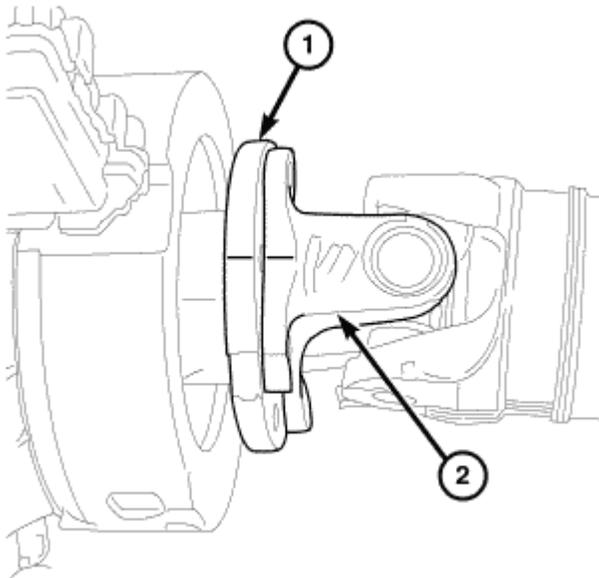


Fig. 22: Identifying Transmission/Transfer Case Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

3. Align reference mark on transmission/transfer case flange (1) with propeller shaft flange (2).

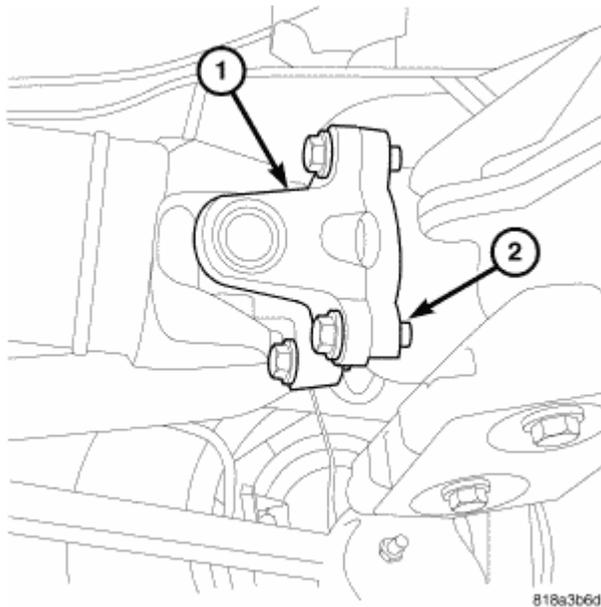


Fig. 23: Identifying Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

4. Install propeller shaft bolts (2) in axle flange (1) and tighten to 108 N.m (80 ft. lbs.).

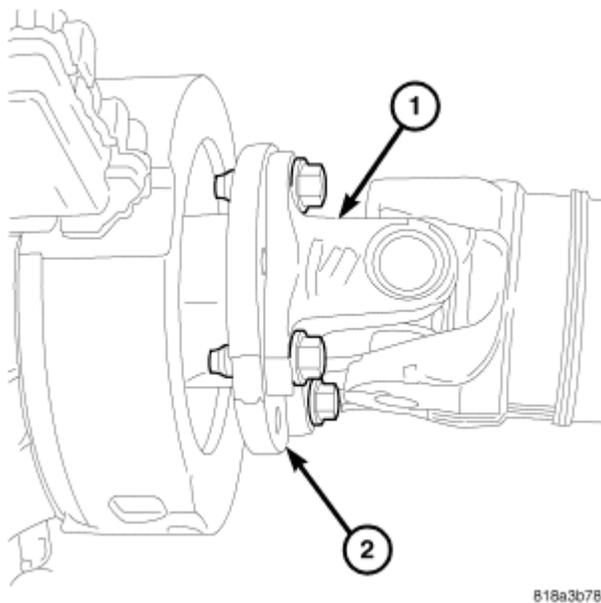


Fig. 24: Identifying Propeller Shaft & Flange
Courtesy of CHRYSLER LLC

5. Install propeller shaft bolts in transmission/transfer case flange (2) and tighten to 108 N.m (80 ft. lbs.).

HALF SHAFT

CAUTION

HALF SHAFT

CAUTION: Never grasp half shaft assembly by the boots. This may cause the boot to pucker or crease and reduce the service life of the boot.

Avoid over angulating or stroking the C/V joints when handling the half shaft.

Half shafts exposed to battery acid, transmission fluid, brake fluid, differential fluid or gasoline may cause the boots to deteriorate. Failure to follow these instructions will result in damage.

DIAGNOSIS AND TESTING

HALF SHAFT

Check inboard and outboard C/V joint for leaking grease. This is a sign of boot or boot clamp damage.

NOISE/VIBRATION IN TURNS

A clicking noise or vibration in turns could be caused by a damaged outer C/V or inner tripod joint seal boot or seal boot clamps. This will result in the loss/contamination of the joint grease, resulting in inadequate lubrication of the joint. Noise could also be caused by another component of the vehicle coming in contact with the half shafts.

CLUNKING NOISE DURING ACCELERATION

This noise may be a damaged or worn C/V joint. A torn boot or loose/missing clamp on the inner/outer joint which has allowed the grease to be lost will damage the C/V joint.

SHUDDER/VIBRATION DURING ACCELERATION

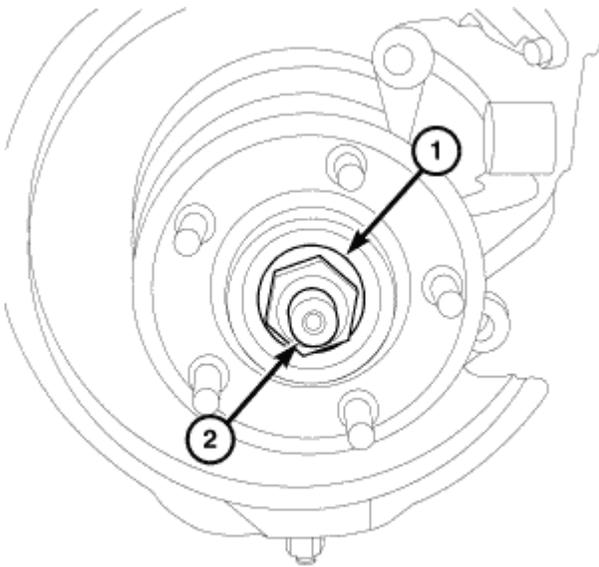
This could be a worn/damaged inner tripod joint or a sticking tripod joint. Improper wheel alignment may also cause a shudder or vibration.

VIBRATION AT HIGHWAY SPEEDS

This problem could be a result of out of balance front tires or tire/wheel runout. Foreign material (mud, etc.) packed on the backside of the wheel(s) will also cause a vibration.

REMOVAL

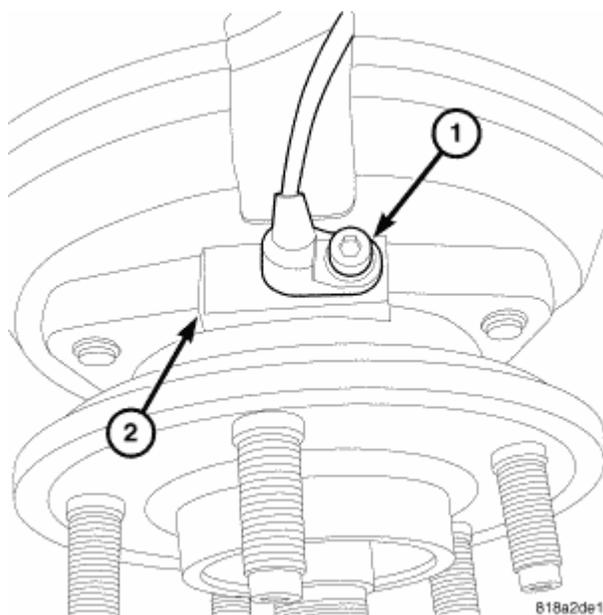
HALF SHAFT



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Fig. 25: Identifying Hub Nut & Half Shaft
Courtesy of CHRYSLER LLC

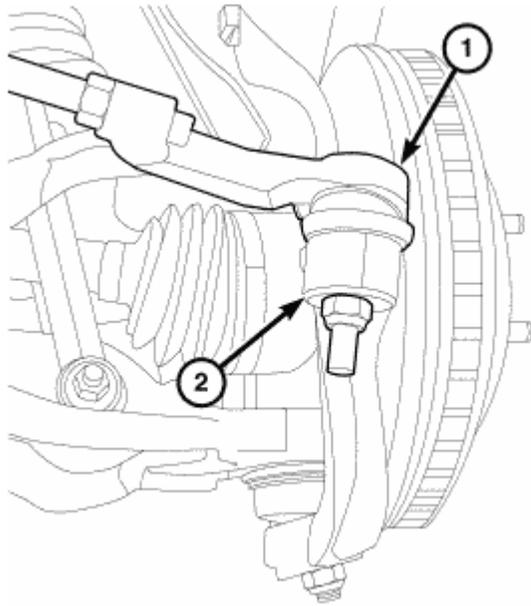
1. With vehicle in neutral, position vehicle on hoist.
2. Remove brake caliper and rotor.
3. Remove nut (1) from half shaft (2).



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Fig. 26: Identifying Sensor & Hub Bearing
Courtesy of CHRYSLER LLC

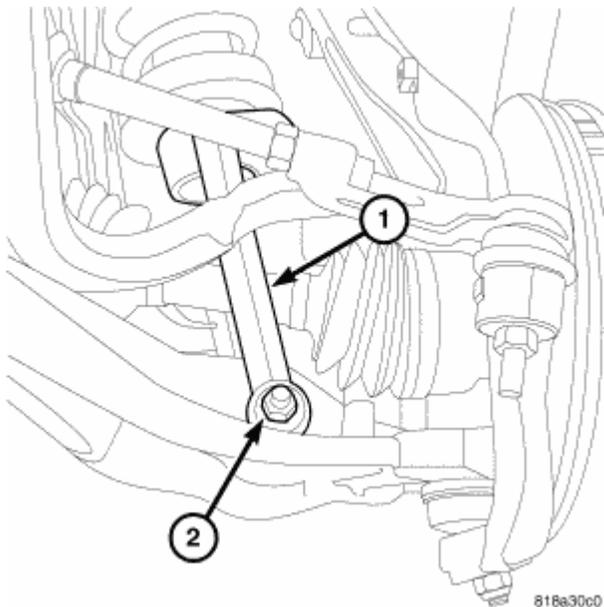
4. Remove sensor (1) from hub bearing (2).



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Fig. 27: Identifying Tie Rod End & Steering Knuckle
Courtesy of CHRYSLER LLC

5. Remove stabilizer link from stabilizer bar.
6. Remove tie rod end (1) nut and remove tie rod from steering knuckle (2).



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Fig. 28: Identifying Shocks Clevis & Nuts
Courtesy of CHRYSLER LLC

7. Remove clevis bracket (1) lower nut (2) and bolt.

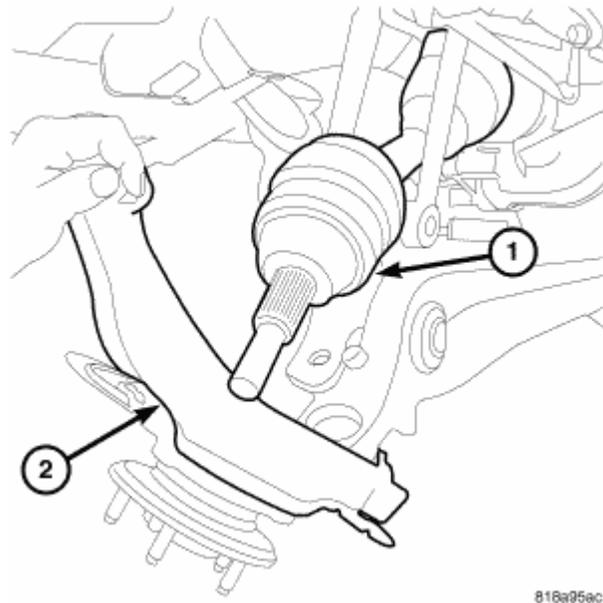


Fig. 29: Identifying Half Shaft & Knuckle
Courtesy of CHRYSLER LLC

8. Remove upper ball joint nut and separate upper control arm from steering knuckle.
9. Pull out on the steering knuckle and push half shaft (1) out of the hub bearing and knuckle (2).
10. With a pry bar remove the half shaft from the axle.

INSTALLATION

HALF SHAFT

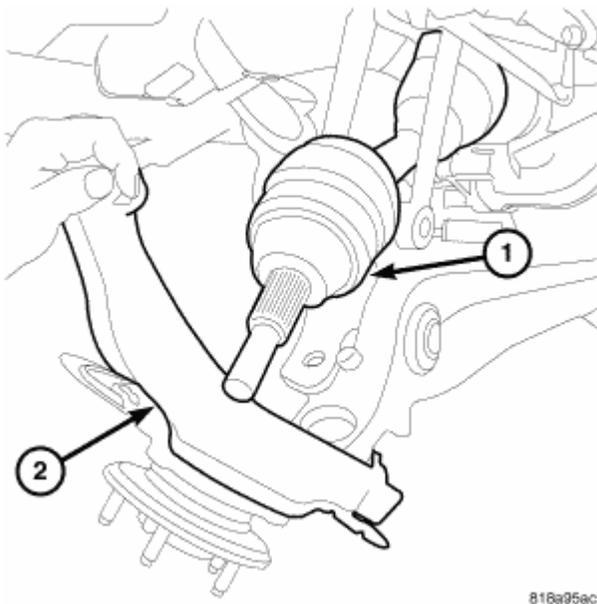


Fig. 30: Identifying Half Shaft & Knuckle
Courtesy of CHRYSLER LLC

1. Apply a light coat of wheel bearing grease on the female splines of the inner C/V joint.
2. Clean hub bearing bore and apply a light coat of wheel bearing grease.
3. Install half shaft (1) in axle and push firmly to engage the snap ring.
4. Pull out on the steering knuckle (2) and push the half shaft (1) through the knuckle and hub bearing.
5. Install upper control arm on steering knuckle and tighten ball joint nut to specifications.

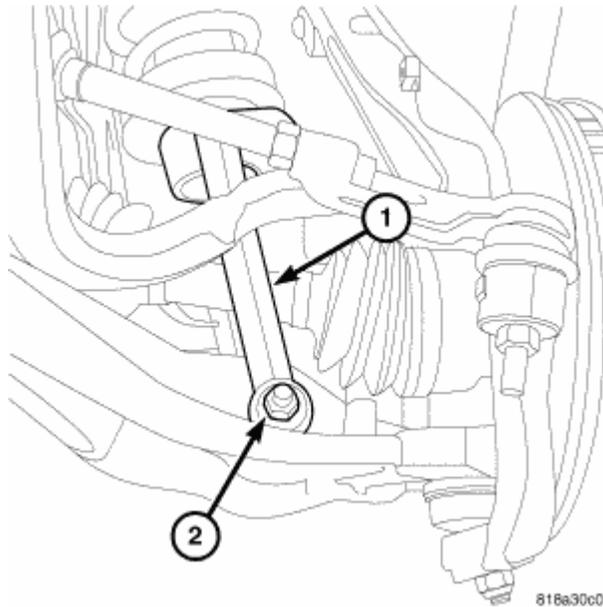


Fig. 31: Identifying Shocks Clevis & Nuts
Courtesy of CHRYSLER LLC

6. Align clevis (1) with lower control arm. Install lower clevis (1) and tighten nut (2) to specifications.

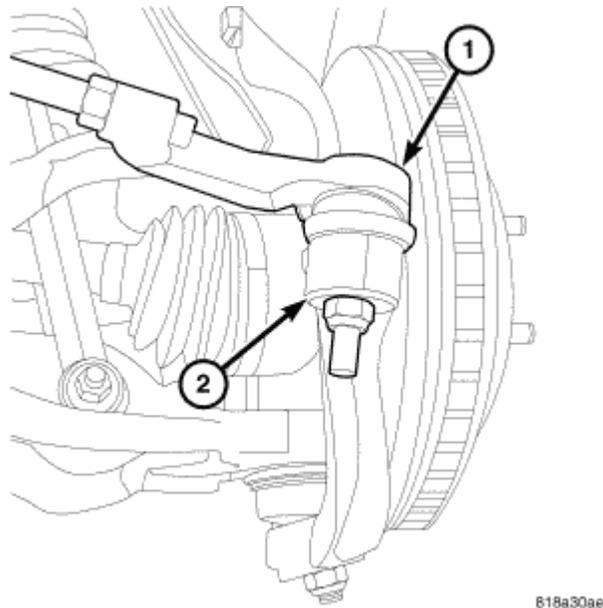
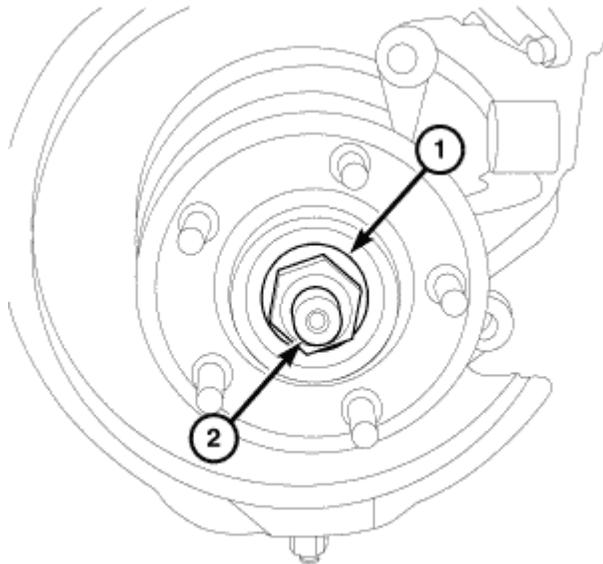


Fig. 32: Identifying Tie Rod End & Steering Knuckle

Courtesy of CHRYSLER LLC

7. Install tie rod end (1) in steering knuckle (2) and tighten nut to specifications.
8. Install stabilizer bar link and tie rod end.



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Fig. 33: Identifying Hub Nut & Half Shaft
 Courtesy of CHRYSLER LLC

9. Install half shaft (2) hub nut (1) and tighten to specifications.

SPECIFICATIONS

HALF SHAFT

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Half Shaft Nut	136	100	-

SPECIAL TOOLS

HALF SHAFT

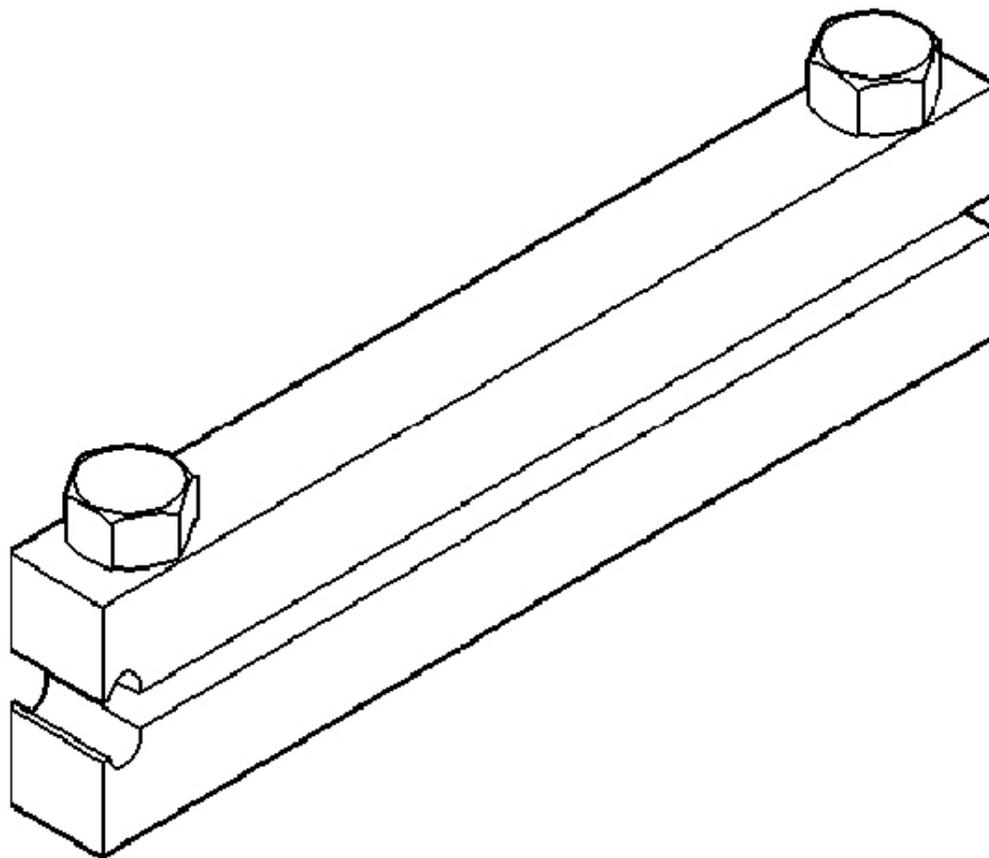
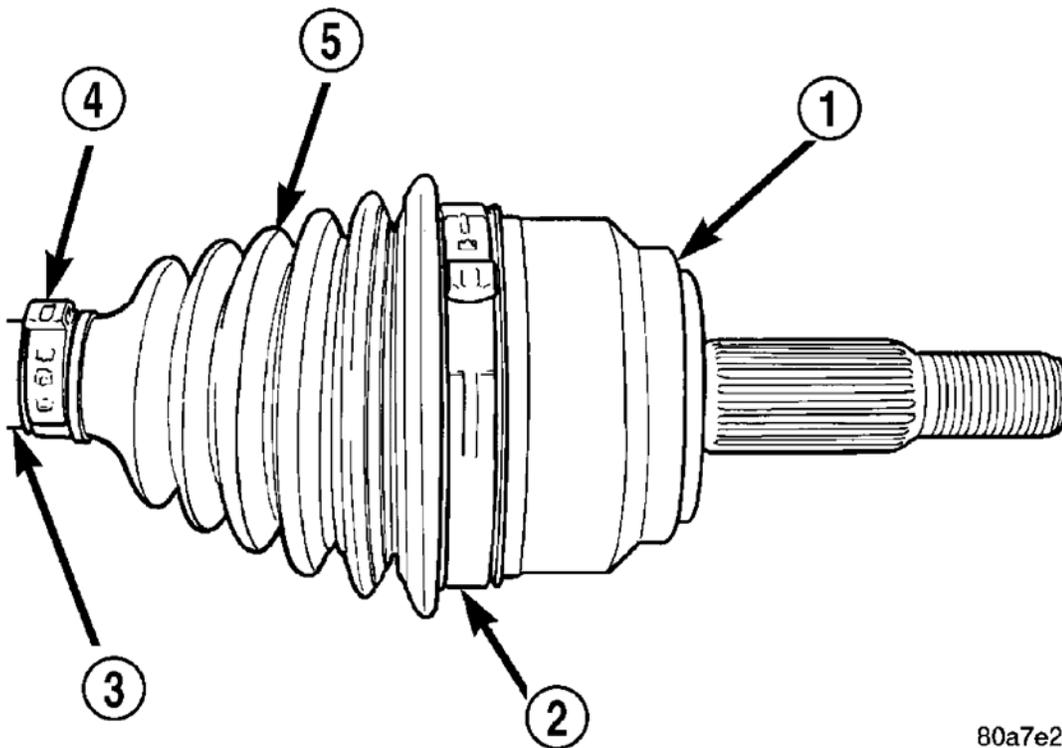


Fig. 34: Clamp Installer C-4975-A
Courtesy of CHRYSLER LLC

JOINT/BOOT-C/V OUTER

REMOVAL

C/V JOINT-OUTER



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Fig. 35: Boot Clamp Locations
Courtesy of CHRYSLER LLC

1. Place shaft in vise with soft jaws and support C/V joint.

CAUTION: Do not damage C/V housing or half shaft.

2. Remove clamps (2) (4) with a cut-off wheel or grinder.

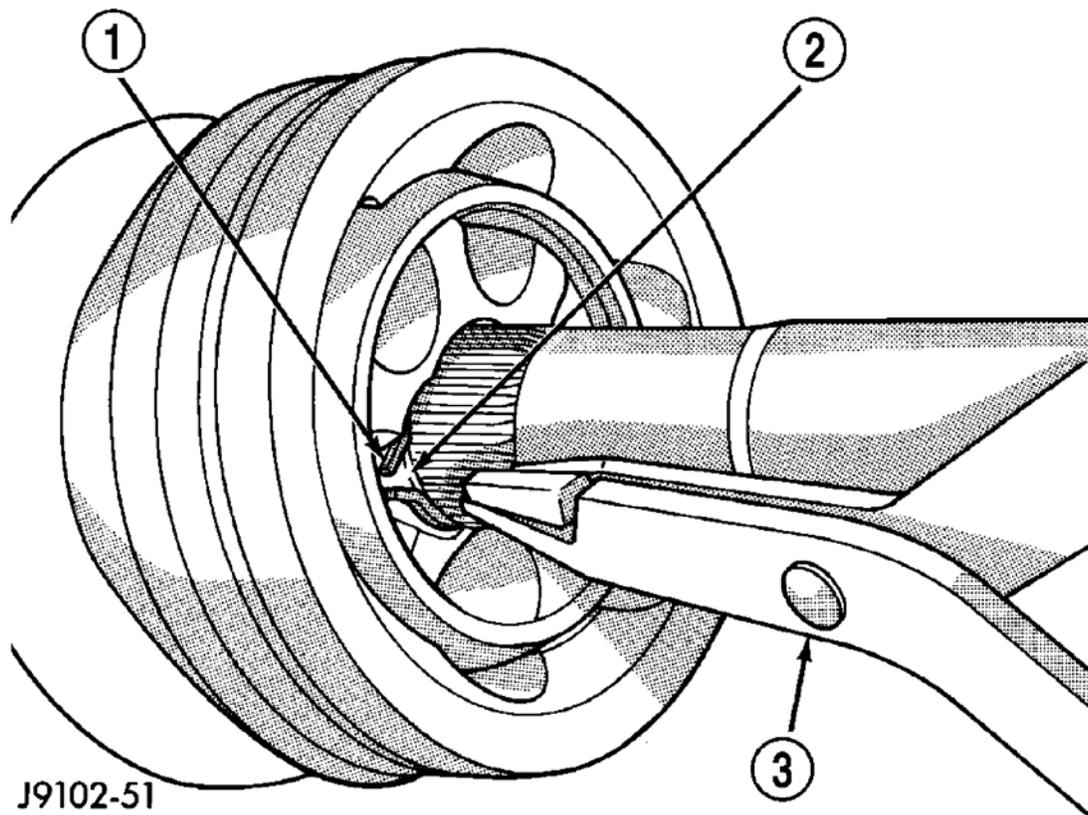


Fig. 36: Spreading Snap Ring And Slide Joint Off Shaft
Courtesy of CHRYSLER LLC

3. Slide the boot down the shaft.
4. Remove lubricant to expose the C/V joint snap ring.
5. Spread snap ring (1) and slide the joint off the shaft.

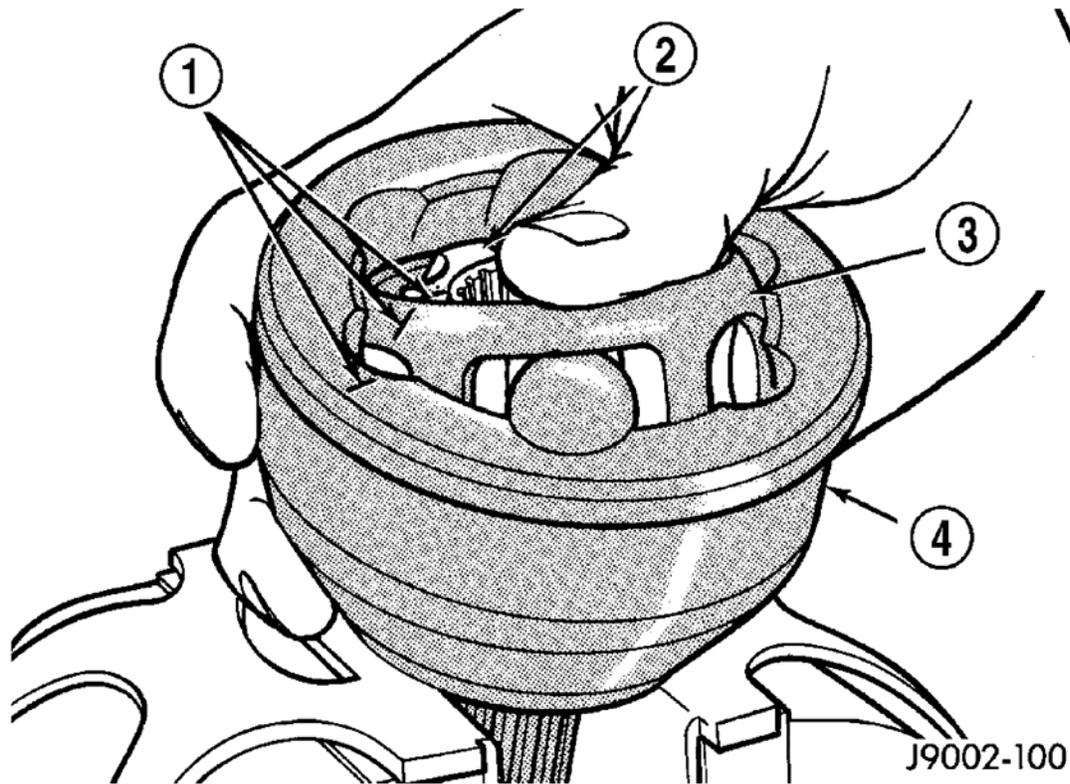
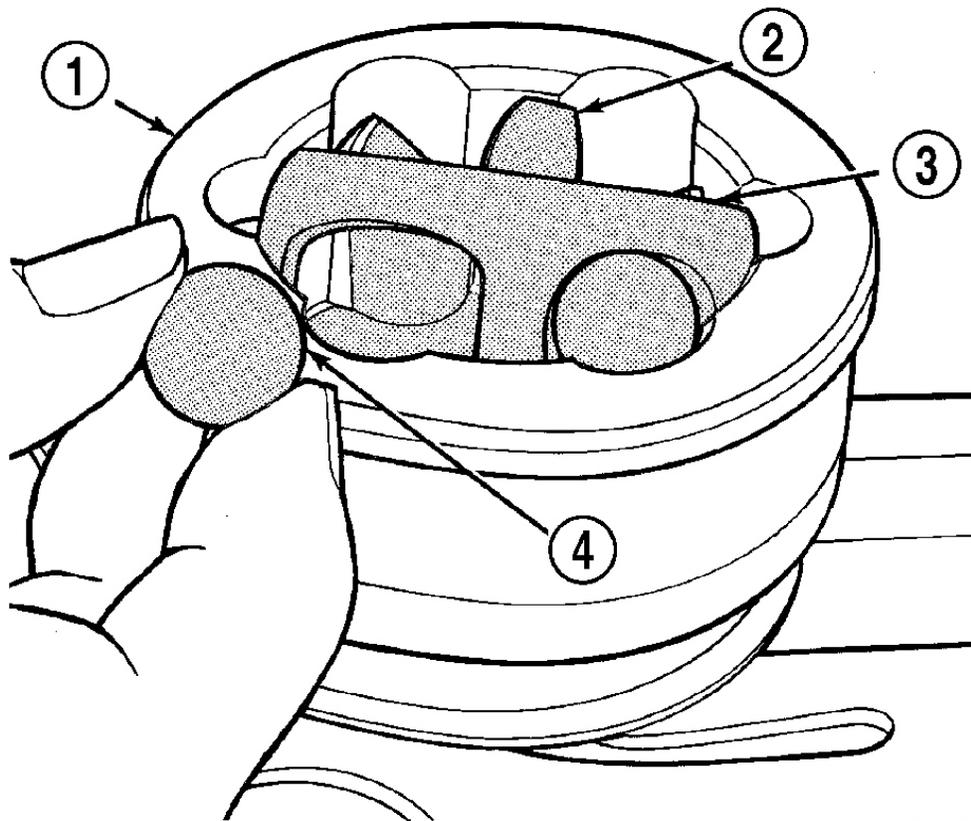


Fig. 37: Marking Alignment Marks On Inner Race/Hub, Bearing Cage And Housing With Dabs Of Paint
Courtesy of CHRYSLER LLC

6. Slide boot off the shaft and discard old boot.
7. Mark alignment marks (1) on the inner race/hub (2), bearing cage (3) and housing with dabs of paint.



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Fig. 38: Removing Ball From Bearing Cage
Courtesy of CHRYSLER LLC

8. Clamp C/V joint in a vertical position in a soft jawed vise.
9. Press down one side of the bearing cage (3) to gain access to the ball at the opposite side.

NOTE: If joint is tight, use a hammer and brass drift to loosen the bearing hub. Do not contact the bearing cage with the drift.

10. Remove ball (4) from the bearing cage (3).

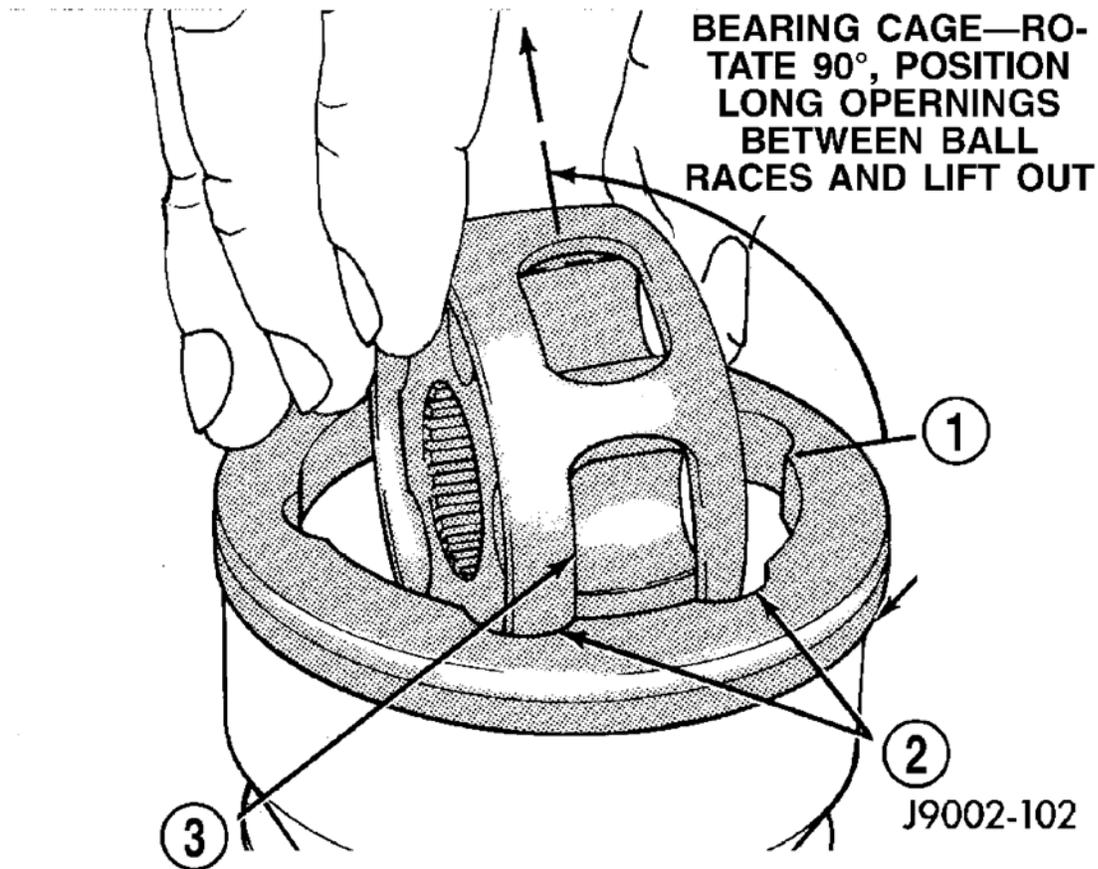


Fig. 39: Lifting Cage/Inner Race Upward And Out From Housing
Courtesy of CHRYSLER LLC

11. Repeat step above until all six balls are removed from the bearing cage.
12. Lift cage and inner race (2) upward and out from the housing (1).

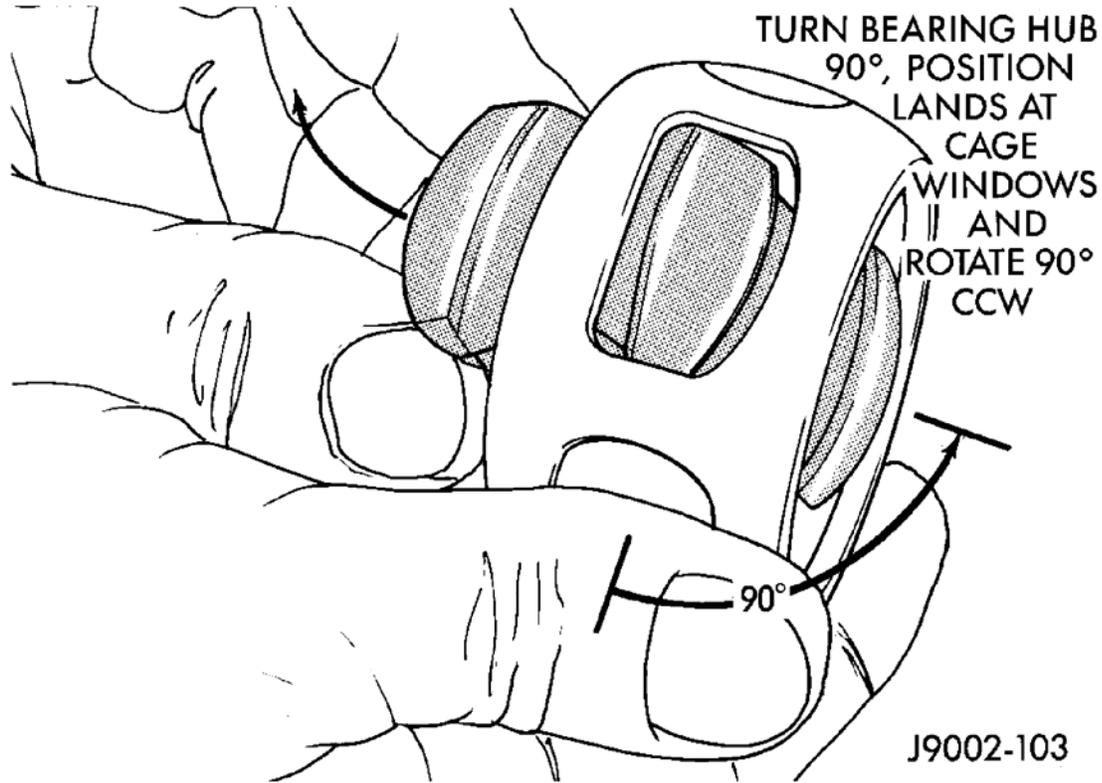


Fig. 40: Turning Inner Race 90° In Cage And Rotating Inner Race/Hub Out Of Cage
Courtesy of CHRYSLER LLC

13. Turn inner race 90° in the cage and rotate the inner race/hub out of the cage.

INSTALLATION

C/V JOINT-OUTER

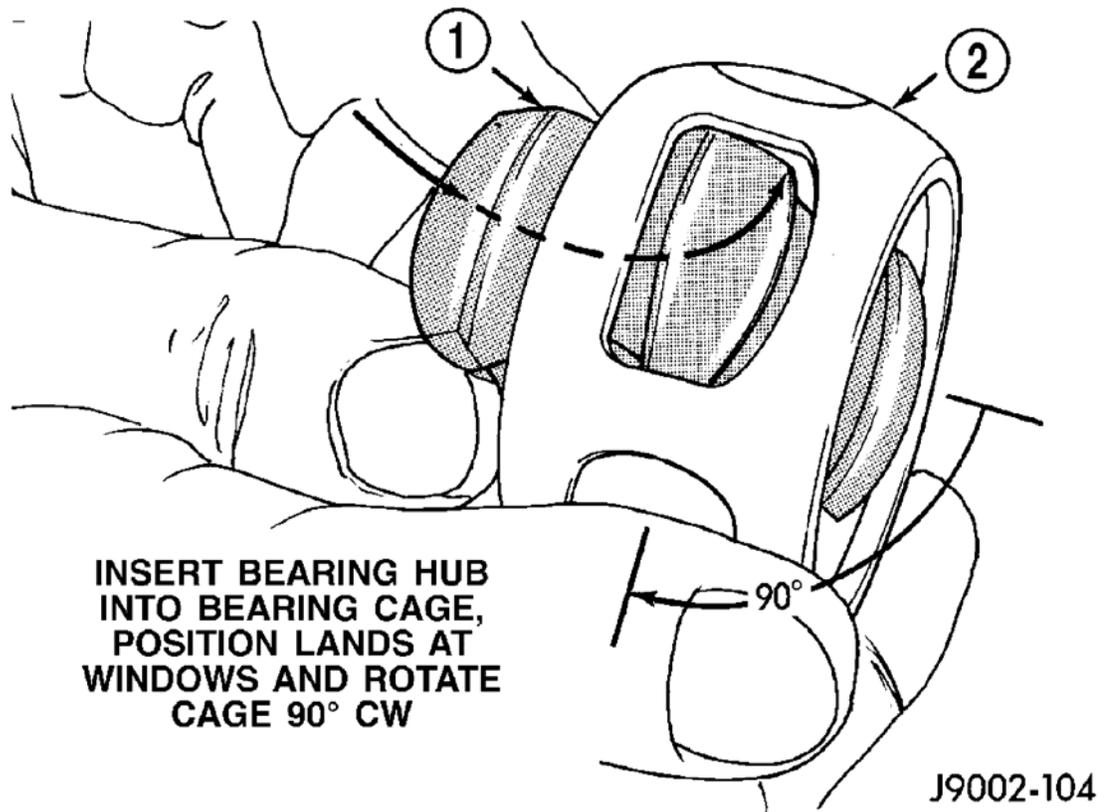


Fig. 41: Inserting Inner Race Into Cage And Rotate Race Into Cage
Courtesy of CHRYSLER LLC

1. Apply a light coat of grease to the C/V joint components before assembling them.
2. Align inner race, cage and housing according to the alignment reference marks.
3. Insert inner race (1) into the cage (2) and rotate race into the cage.

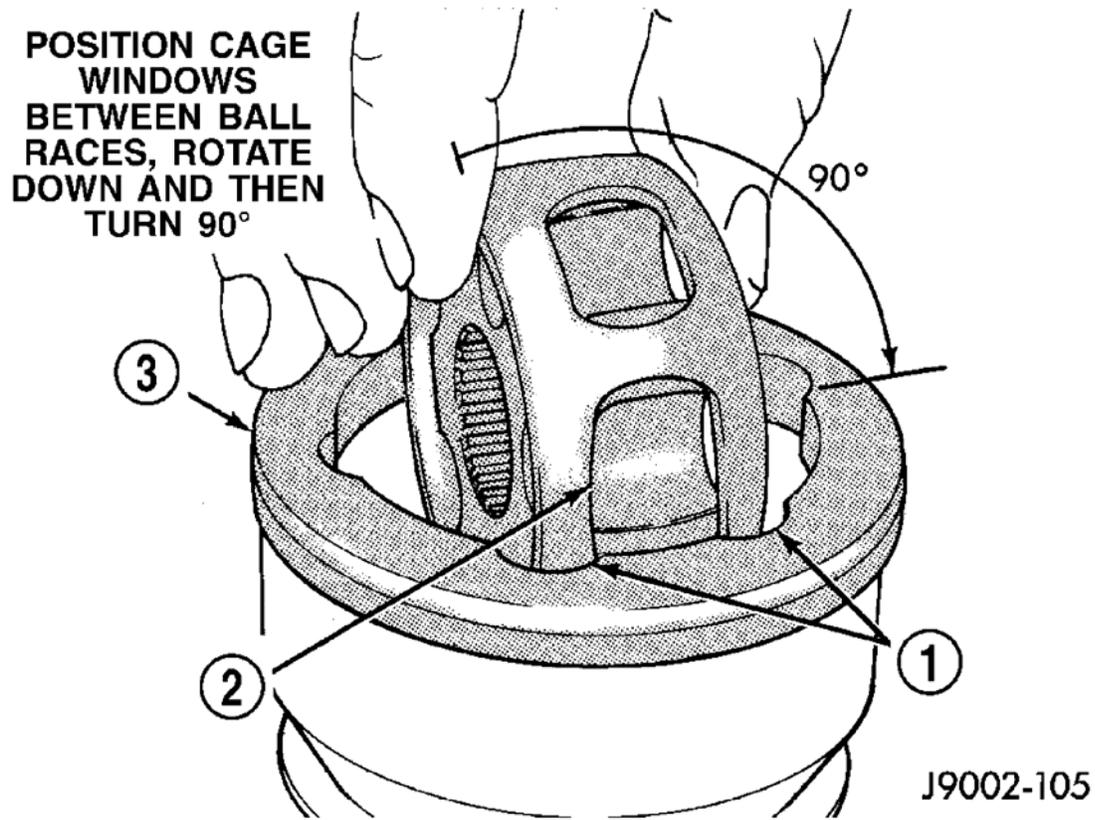
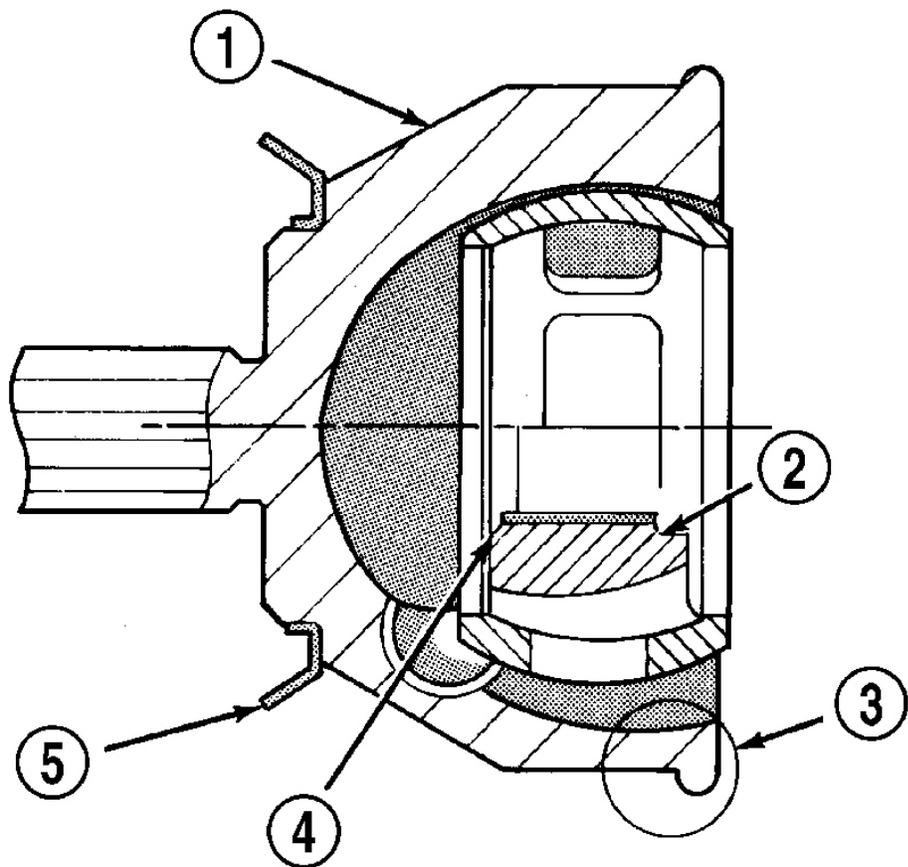


Fig. 43: Inserting Cage Into Housing
Courtesy of CHRYSLER LLC

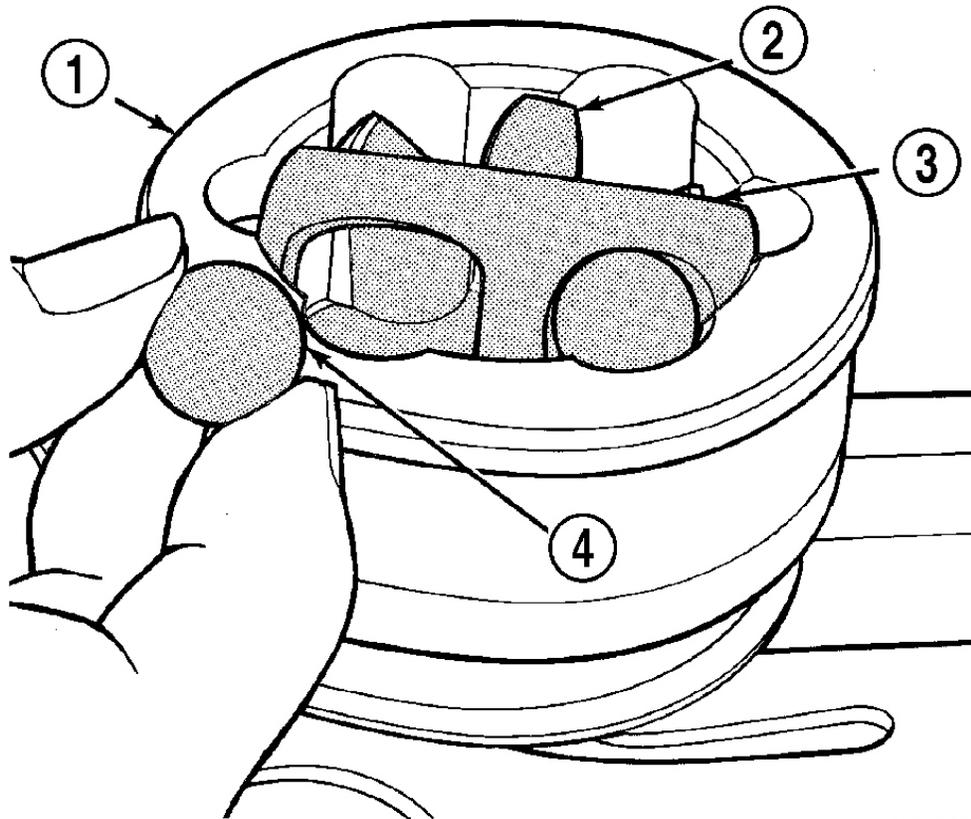
5. Insert cage into the housing (3).



J9102-43

Fig. 44: Rotating Cage Into Housing
Courtesy of CHRYSLER LLC

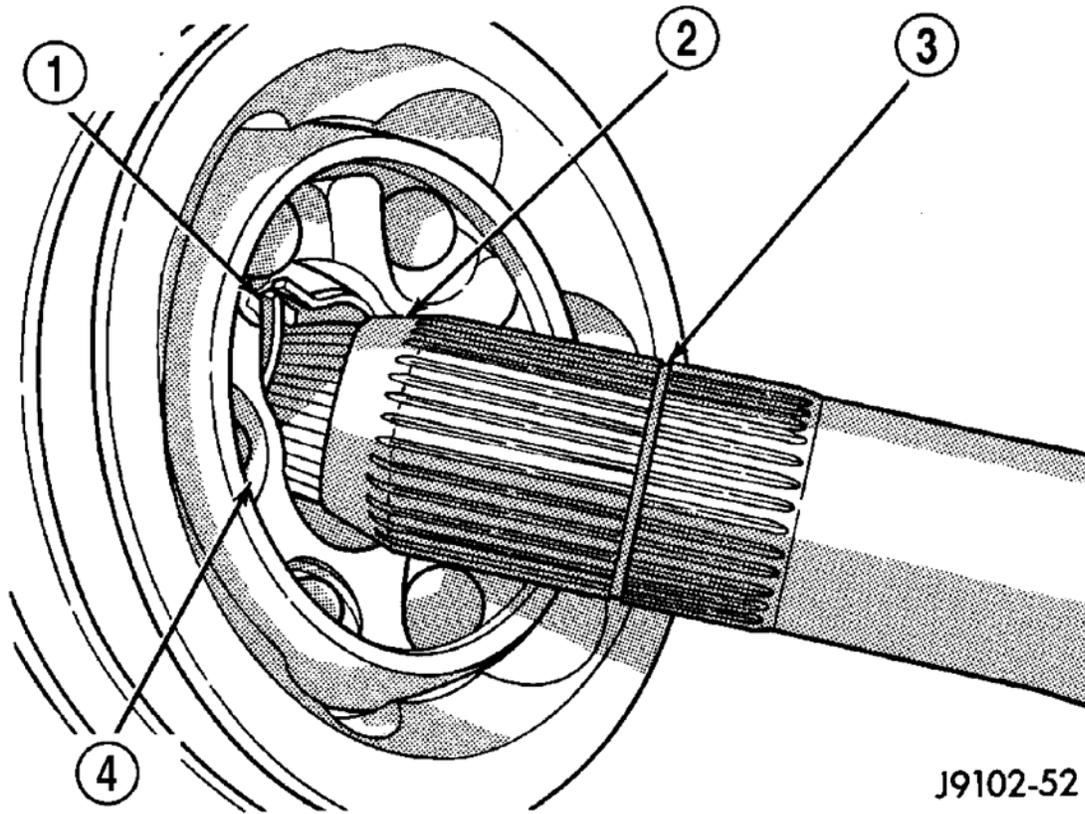
6. Rotate cage 90° into the housing (1).



J9002-101

Fig. 45: Tilting Inner Race/Hub And Cage And Installing Balls
Courtesy of CHRYSLER LLC

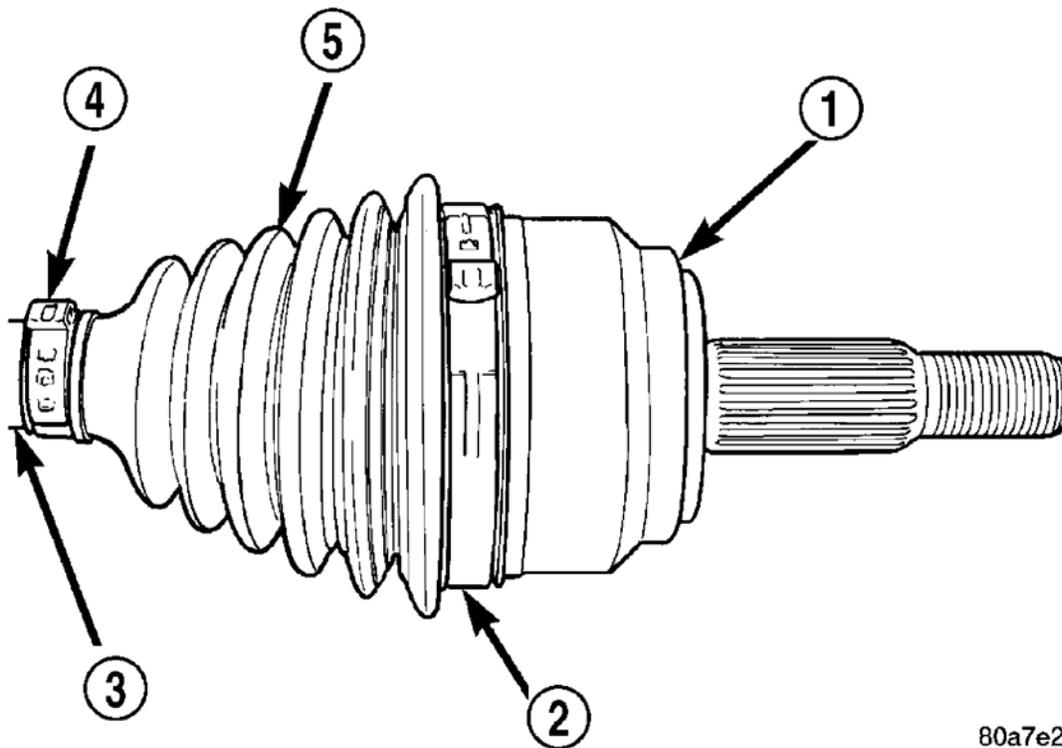
7. Apply lubricant included with replacement boot/joint to the ball races. Spread lubricant equally between all the races.
8. Tilt inner race/hub (2) and cage (3) and install the balls (4).



J9102-52

Fig. 46: Pushing Joint Onto Shaft Until Snap Ring Seats In Groove
Courtesy of CHRYSLER LLC

9. Place new clamps onto new boot and slide boot onto the shaft to its original position.
10. Apply the rest of lubricant to the C/V joint and boot.
11. Push the joint onto the shaft until the snap ring (1) seats in the groove (3). Pull on the joint to verify the span ring has engaged.



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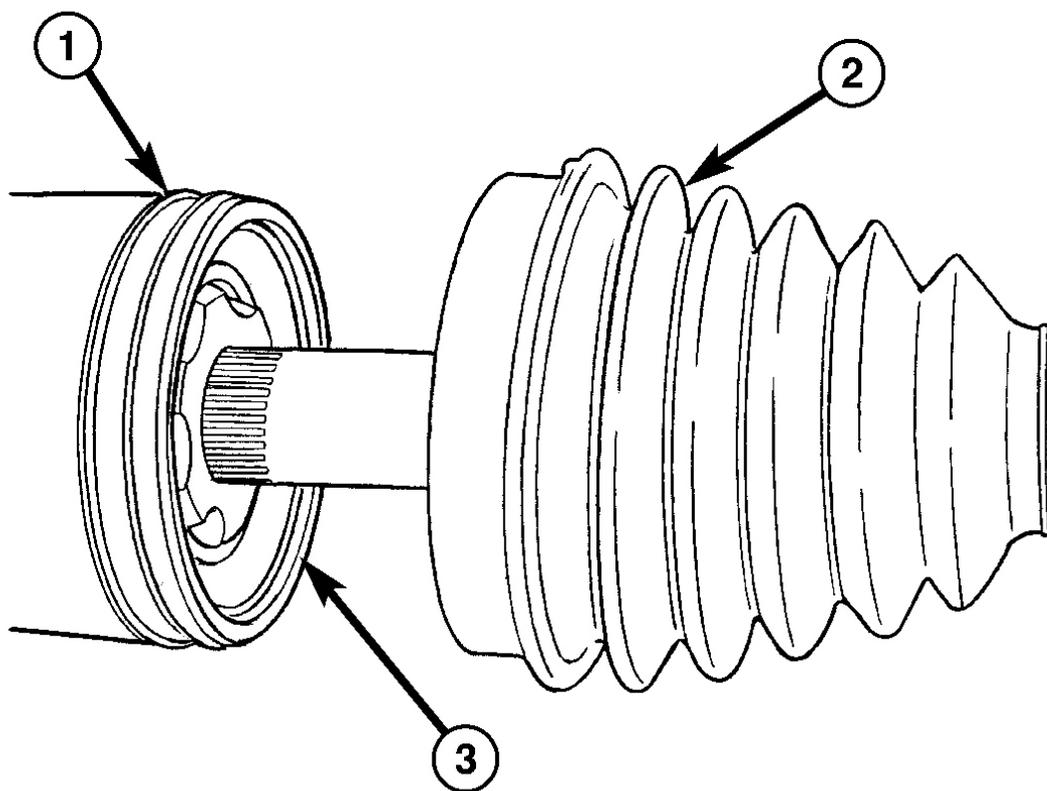
Fig. 47: Securing Both Boot Clamps With Clamp Installer C-4975A
Courtesy of CHRYSLER LLC

12. Position boot on the joint in its original position. Ensure boot is not twisted and remove any excess air.
13. Secure both boot clamps (2) (4) with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until the jaws of the tool are closed.

JOINT/BOOT-C/V INNER

REMOVAL

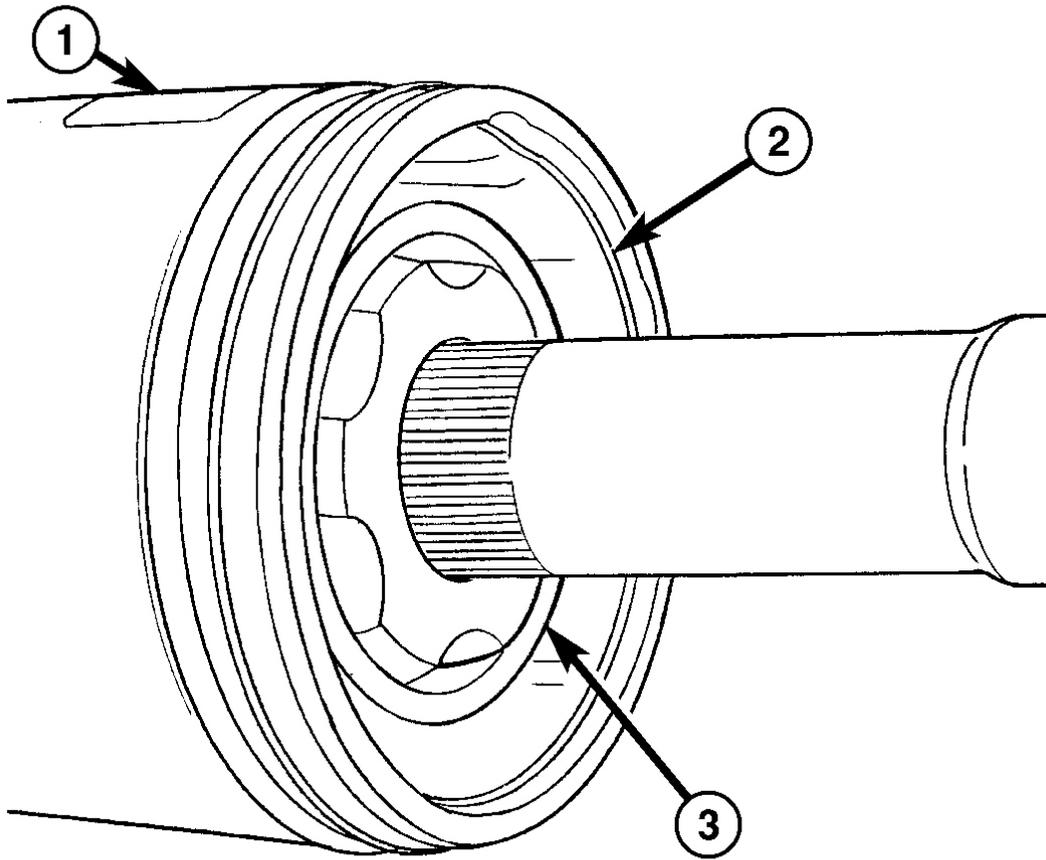
C/V JOINT-INNER



80cac344

Fig. 48: Identifying C/V Joint & Boot
Courtesy of CHRYSLER LLC

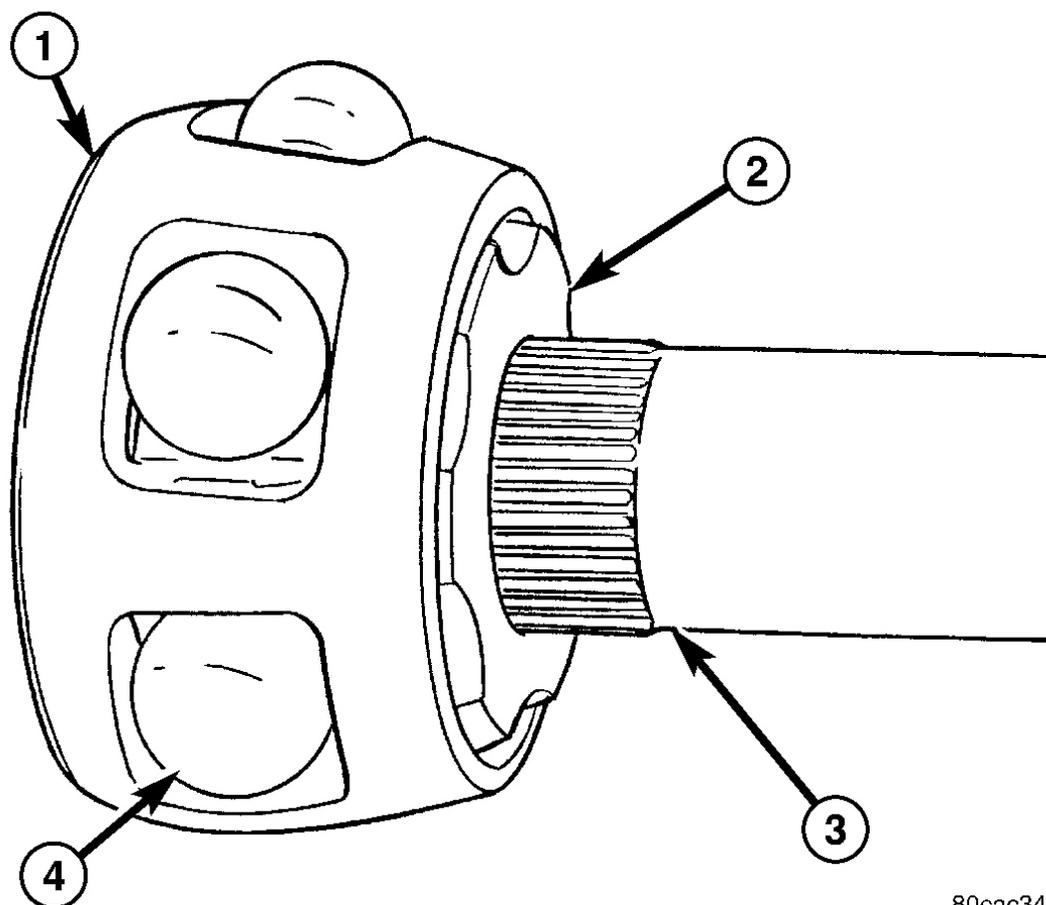
1. Clamp shaft in a vise (with soft jaws) and support C/V joint (1).
2. Remove clamps with a cut-off wheel or grinder.
3. Slide boot down (2) the shaft.



80cac348

Fig. 49: Removing Lubricant From Housing To Expose C/V Snap Ring And Removing Snap Ring
Courtesy of CHRYSLER LLC

4. Remove lubricant from housing (1) to expose the C/V snap ring (2) and remove snap ring.

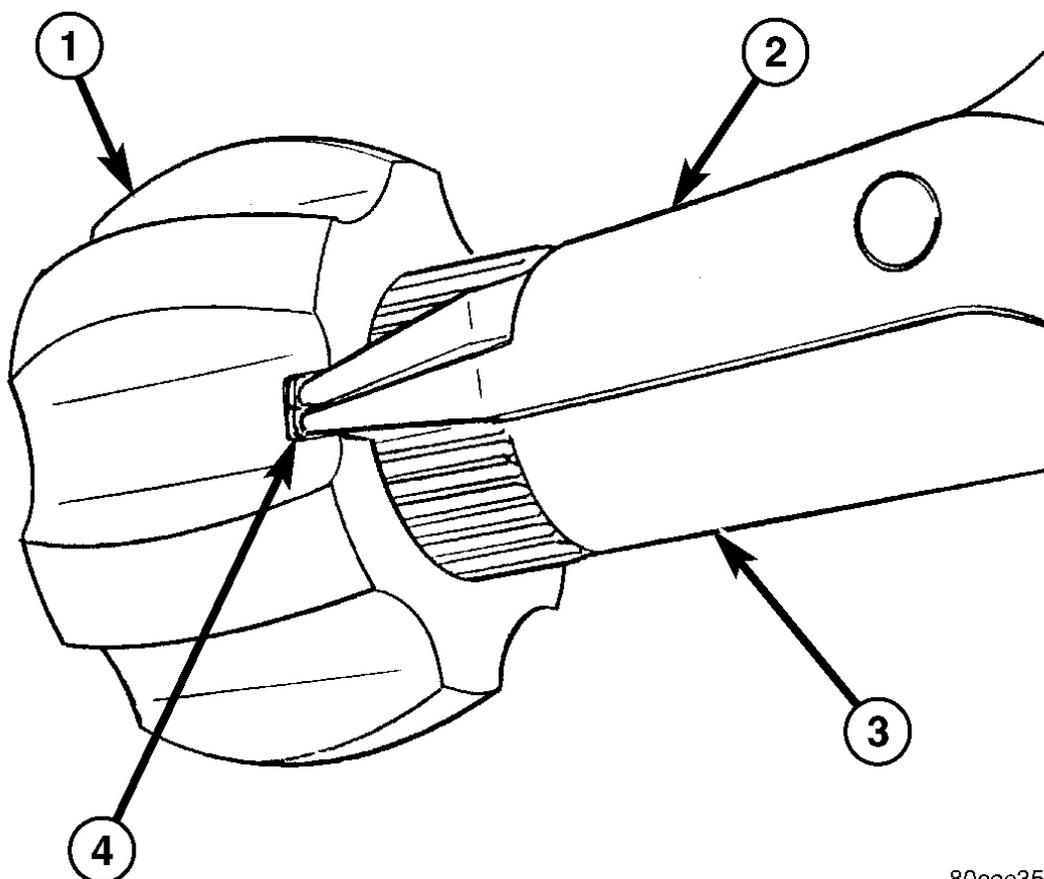


80cac34c

Fig. 50: Identifying Cage, Inner Race, Shaft & Bearings

Courtesy of CHRYSLER LLC

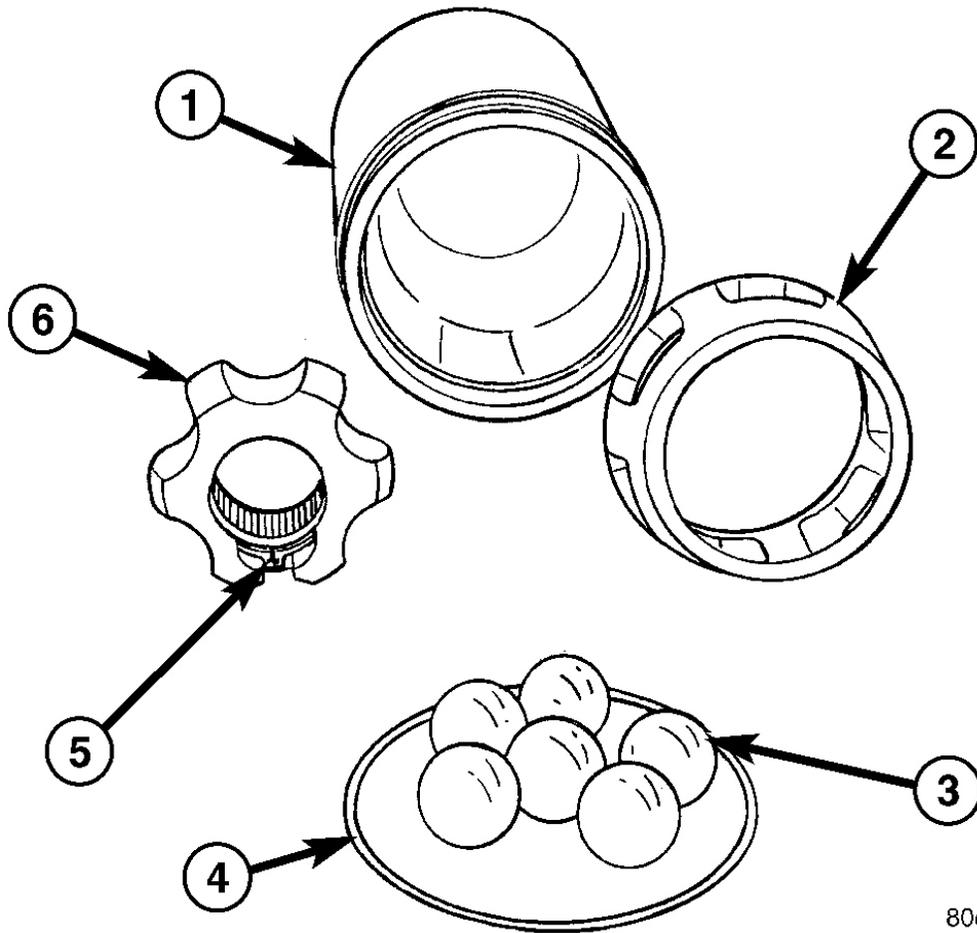
5. Remove bearings (4) from the cage (1).
6. Rotate cage (1) 30° and slide cage off the inner race (2) and down the shaft (3).



80cac350

Fig. 51: Removing Spread Inner Race Snap Ring And Race From Shaft
Courtesy of CHRYSLER LLC

7. Remove spread inner race (1) snap ring (4) and remove race (1) from the shaft (3).
8. Remove boot from the shaft and discard.



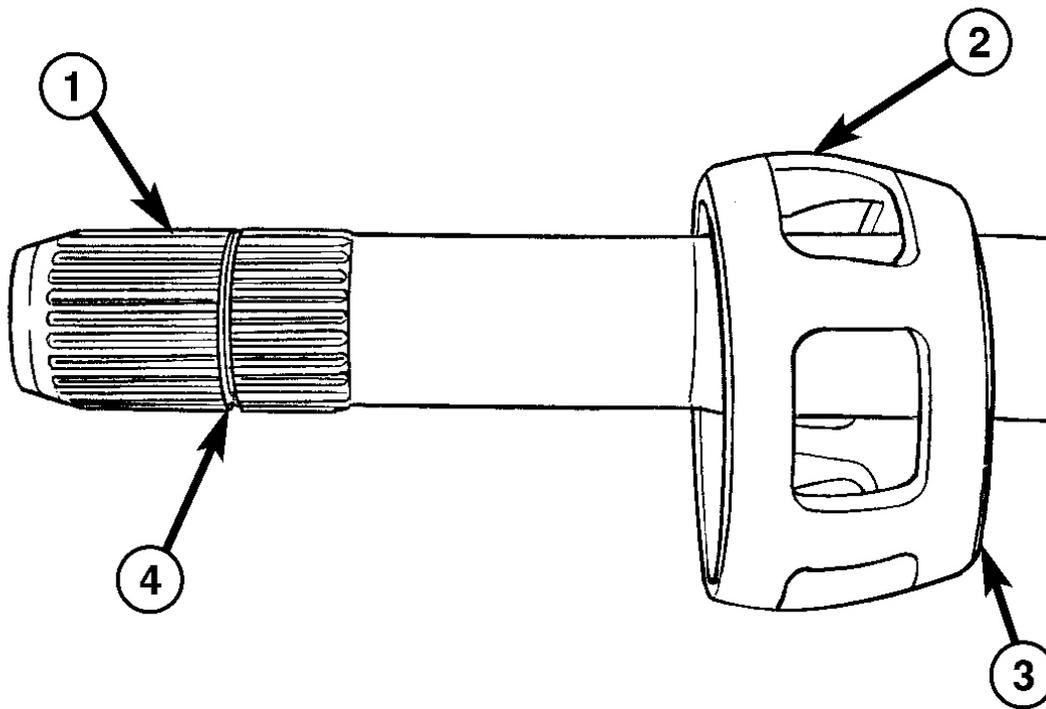
80cac3a6

Fig. 52: Cleaning/Inspecting Housing, Cage, Bearings, Housing Snap-Ring, Inner Race Snap-Ring And Inner Race For Wear Or Damage
Courtesy of CHRYSLER LLC

9. Clean and inspect housing (1), cage (2), bearings (3), housing snap-ring (4), inner race snap-ring (5) and inner race (6) for wear or damage.

INSTALLATION

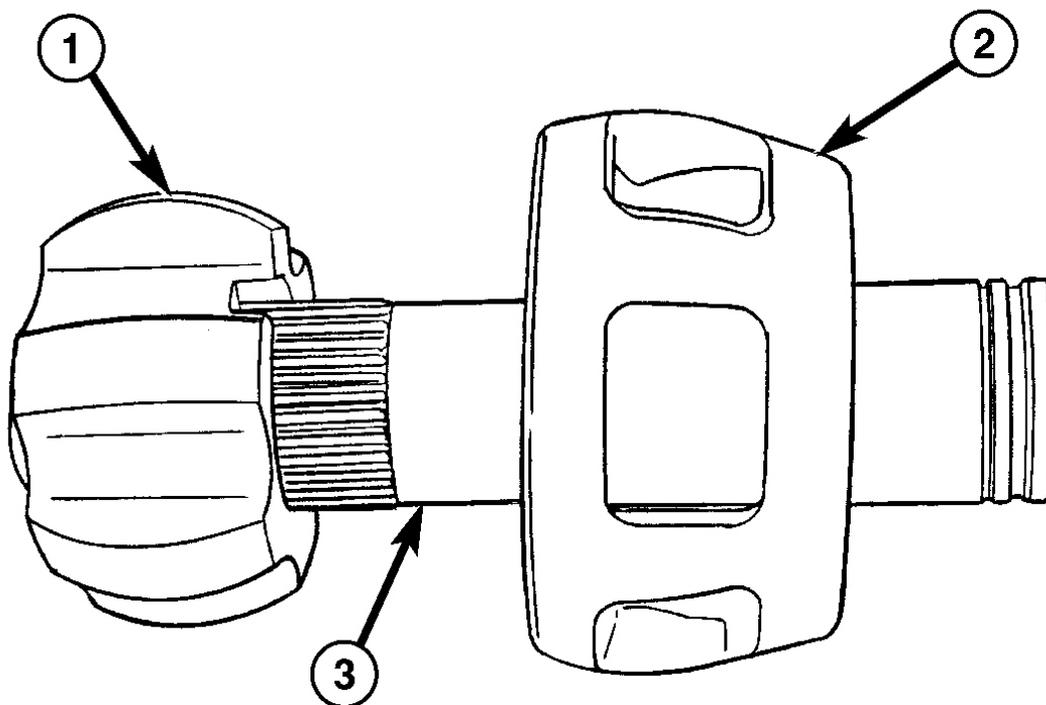
C/V JOINT-INNER



80cac512

Fig. 53: Sliding Cage Onto Shaft With Small Diameter End Towards Boot
Courtesy of CHRYSLER LLC

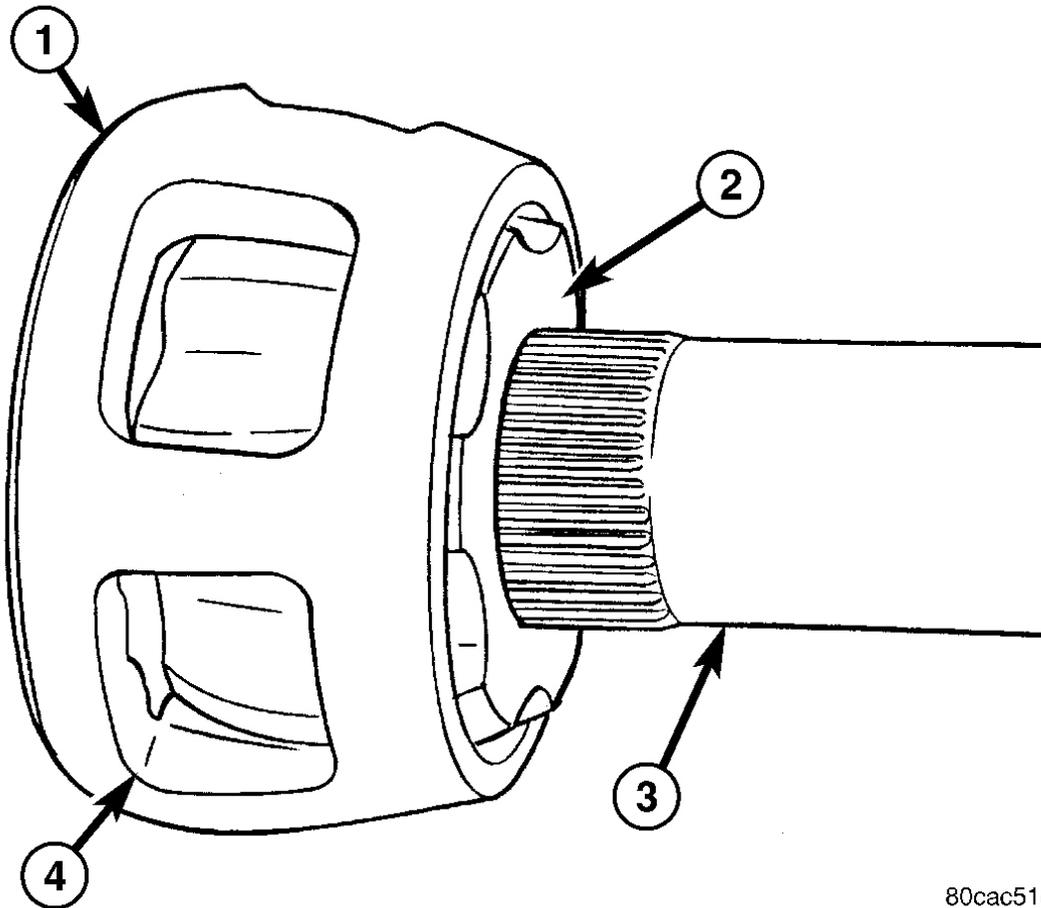
1. Apply a coat of grease supplied with the joint/boot to the C/V joint components before assembling them.
2. Place new clamps on the new boot and slide boot down the shaft.
3. Slide cage (2) onto the shaft (1) with the small diameter (3) end towards the boot.



80cac517

Fig. 54: Installing Inner Race Onto Shaft
Courtesy of CHRYSLER LLC

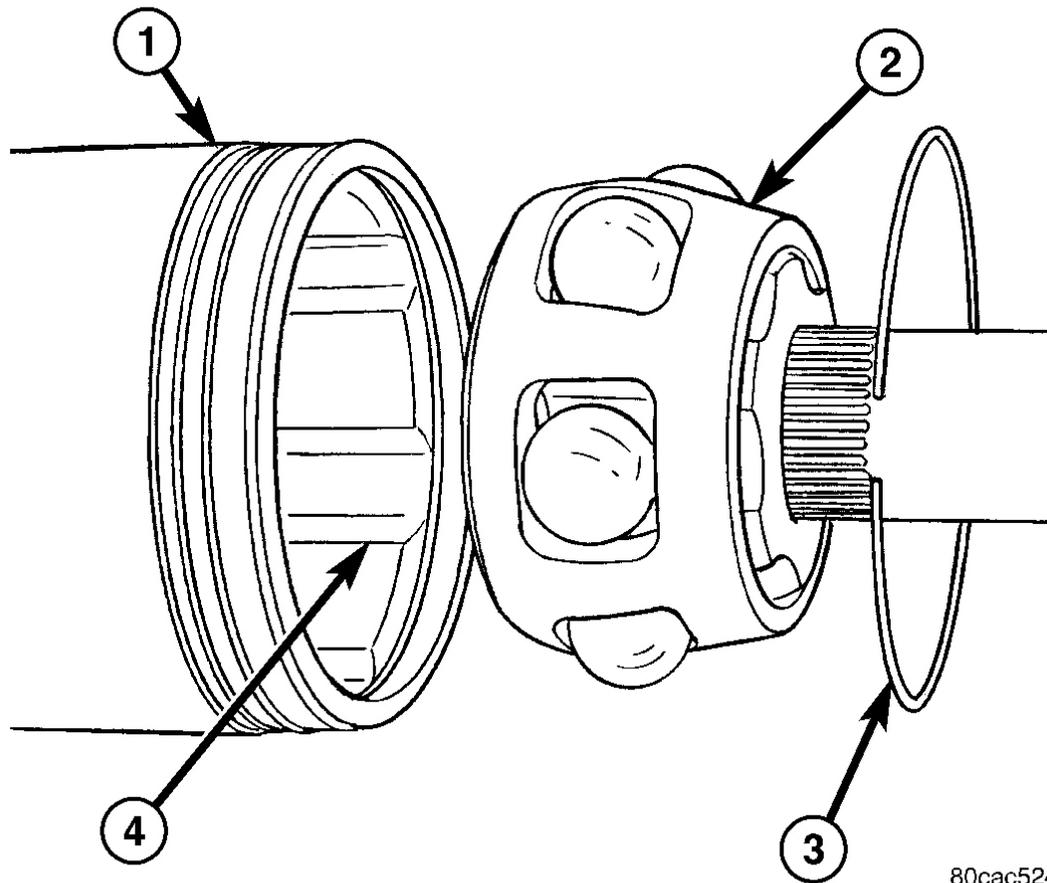
4. Install the inner race (1) onto the shaft (3). Pull on the race to verify snap ring has engaged.



80cac51e

Fig. 55: Aligning Cage With Inner Race And Sliding Over Race
Courtesy of CHRYSLER LLC

5. Align cage (1) with the inner race (2) and slide over the race.
6. Turn the cage 30° to align the cage windows (4) with the race (2).



80cac524

Fig. 56: Identifying Housing, Bearing Assembly, Housing Snap Ring & Housing Bore
 Courtesy of CHRYSLER LLC

7. Apply grease to the inner race and bearings and install the bearings.
8. Apply grease to the housing bore (4) then install the bearing assembly (2) into the housing (1).
9. Install the housing snap ring (3) and verify it is seated in the groove.
10. Fill the housing and boot with the remaining grease.
11. Slide the boot onto the C/V housing into its original position. Ensure boot is not twisted and remove any excess air.
12. Secure both boot clamps with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until the jaws of the tool are closed.

FRONT AXLE - 186FIA

DIAGNOSIS AND TESTING

FRONT AXLE - 186FIA

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, tooth contact, worn/damaged gears or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant
- Incorrect ring gear backlash
- Gear damage

Differential side and pinions gears, usually do not cause noise during straight-ahead driving, when the gears are unloaded. The side gears are loaded during turns. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

Bearing noise can be either a whining or a growling sound.

Pinion bearings have a constant high pitch noise, because it rotates at a faster rate. This noise changes with vehicle speed. If noise is heard under a load, the rear pinion bearing is the source. If noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. The differential bearing noise is constant and varies only with vehicle speed.

Axle shaft bearing noise generally changes when the bearings are loaded. Turn vehicle sharply to the left and the right during a road test. This will load and unload the bearings and change the noise level. If axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joints/CV joint
- Worn side-gear thrust washers
- Worn pinion shaft bore

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

- Damaged drive shaft
- Missing drive shaft balance weight(s)
- Worn or out-of-balance wheels
- Loose wheel lug nuts
- Worn U-joints/CV joint
- Loose/broken springs
- Damaged axle shaft bearing(s)
- Loose pinion gear nut
- Excessive pinion yoke run out
- Bent axle shaft(s)

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be an axle vibration. Also look at engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear or the clutch engaged, can be caused by:

- High engine idle speed
- Transmission shift operation
- Loose engine/transmission/transfer case mounts
- Worn U-joints/CV joint
- Loose spring mounts
- Loose pinion gear nut and yoke
- Excessive ring gear backlash
- Excessive side gear to case clearance

To determine the source of a snap/clunk noise, raise vehicle on a hoist with the wheels free to rotate. Have a helper shift the transmission into gear and listen for the noise.

DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	<ol style="list-style-type: none">1. Wheel loose.2. Worn wheel bearing.	<ol style="list-style-type: none">1. Tighten loose nuts.2. Replace bearing.
Axle Noise	<ol style="list-style-type: none">1. Misaligned axle tube.2. Bent or sprung axle shaft.3. End-play in pinion bearings.	<ol style="list-style-type: none">1. Inspect axle tube alignment. Correct as necessary.2. Inspect and correct as necessary.3. Refer to pinion pre-load

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2007 DRIVELINE Differential & Driveline - Nitro

	<ol style="list-style-type: none"> 4. Excessive gear backlash between the ring gear and pinion. 5. Improper adjustment of pinion gear bearings. 6. Loose pinion yoke nut. 7. Scuffed gear tooth contact surfaces. 	<p>information and correct as necessary.</p> <ol style="list-style-type: none"> 4. Check adjustment of the ring gear and pinion backlash. Correct as necessary. 5. Adjust the pinion bearings pre-load. 6. Tighten the pinion yoke nut. 7. Inspect and replace as necessary.
Axle Shaft Broke	<ol style="list-style-type: none"> 1. Misaligned axle tube. 2. Vehicle overloaded. 3. Erratic clutch operation. 4. Grabbing clutch. 	<ol style="list-style-type: none"> 1. Replace the broken shaft after correcting tube mis-alignment. 2. Replace broken shaft and avoid excessive weight on vehicle. 3. Replace broken shaft and avoid or correct erratic clutch operation. 4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	<ol style="list-style-type: none"> 1. Improper adjustment of the differential bearings. 2. Excessive ring gear backlash. 3. Vehicle overloaded. 4. Erratic clutch operation. 	<ol style="list-style-type: none"> 1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly. 2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly. 3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight. 4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	<ol style="list-style-type: none"> 1. Insufficient lubrication. 2. Improper grade of lubricant. 3. Excessive spinning of one wheel/tire. 	<ol style="list-style-type: none"> 1. Replace scored gears. Fill differential with the correct fluid type and quantity. 2. Replace scored gears. Fill differential with the correct fluid type and quantity. 3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	<ol style="list-style-type: none"> 1. Lubricant level too high. 2. Worn axle shaft seals. 3. Cracked differential housing. 	<ol style="list-style-type: none"> 1. Drain lubricant to the correct level. 2. Replace seals. 3. Repair as necessary.

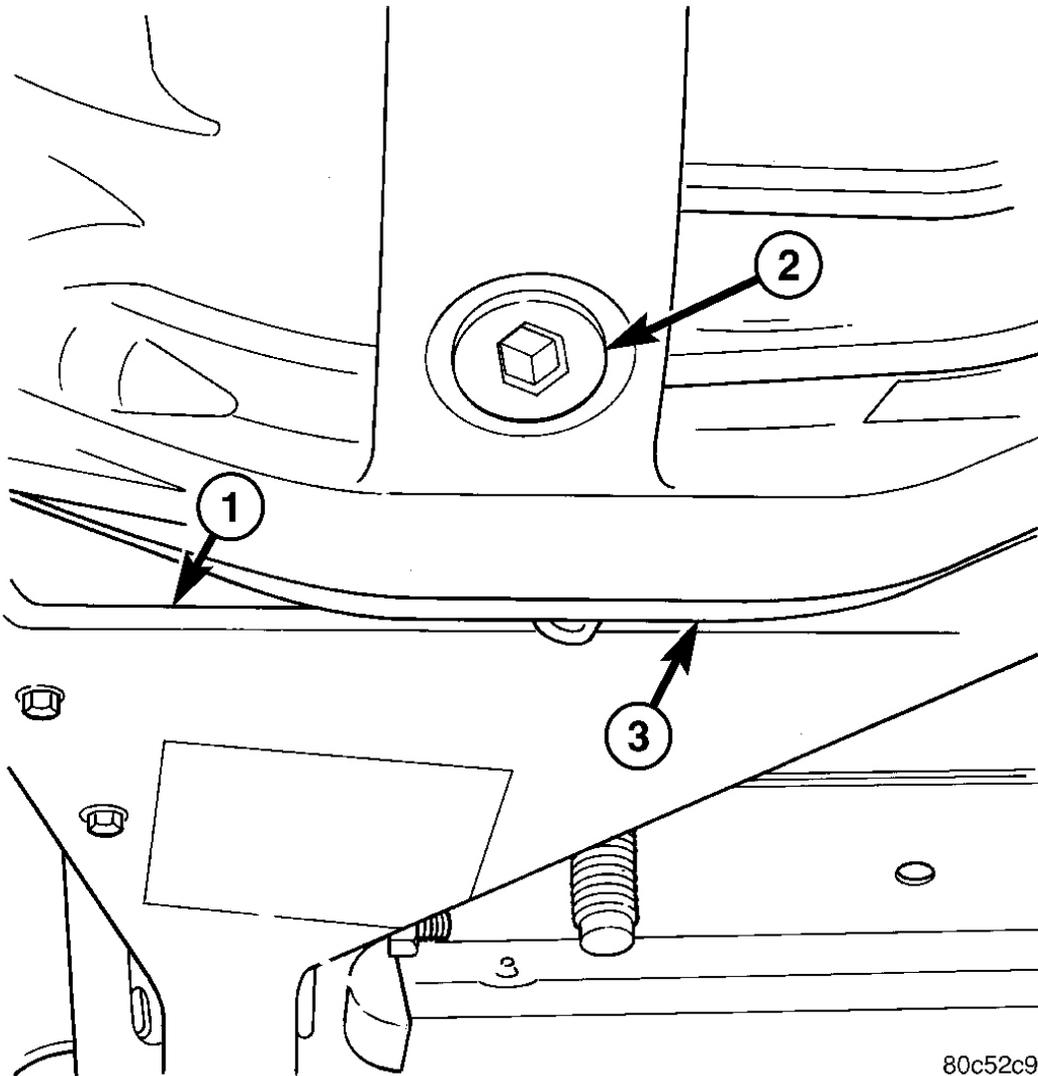
2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

	<ol style="list-style-type: none"> 4. Worn pinion seal. 5. Worn/scored yoke. 6. Axle cover not properly sealed. 	<ol style="list-style-type: none"> 4. Replace seal. 5. Replace yoke and seal. 6. Remove, clean and seal cover.
Axle Overheating	<ol style="list-style-type: none"> 1. Lubricant level low. 2. Improper grade of lubricant. 3. Bearing pre-loads too high. 4. Insufficient ring gear backlash. 	<ol style="list-style-type: none"> 1. Fill differential to correct level. 2. Fill differential with the correct fluid type and quantity. 3. Adjust bearing pre-loads. 4. Adjust ring gear backlash.
Gear Teeth Broke	<ol style="list-style-type: none"> 1. Overloading. 2. Erratic clutch operation. 3. Ice-spotted pavement. 4. Improper adjustments. 	<ol style="list-style-type: none"> 1. Replace gears. Examine other gears and bearings for possible damage. 2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation. 3. Replace gears and examine remaining parts for damage. 4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	<ol style="list-style-type: none"> 1. Insufficient lubricant. 2. Improper ring gear and pinion adjustment. 3. Unmatched ring gear and pinion. 4. Worn teeth on ring gear or pinion. 5. Loose pinion bearings. 6. Loose differential bearings. 7. Ring gear run-out. 8. Loose differential bearing cap bolts. 9. Housing not machined properly. 	<ol style="list-style-type: none"> 1. Fill differential with the correct fluid type and quantity. 2. Check ring gear and pinion contact pattern. 3. Replace gears with a matched ring gear and pinion. 4. Replace ring gear and pinion. 5. Adjust pinion bearing pre-load. 6. Adjust differential bearing pre-load. 7. Measure ring gear run-out. Replace components as necessary. 8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued to specifications. 9. Replace housing.

REMOVAL

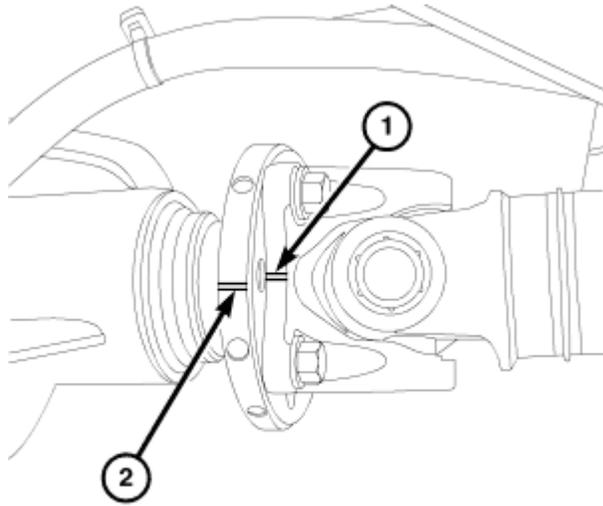
FRONT AXLE - 186FIA



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Fig. 57: Identifying Differential Housing & Drain Plug
Courtesy of CHRYSLER LLC

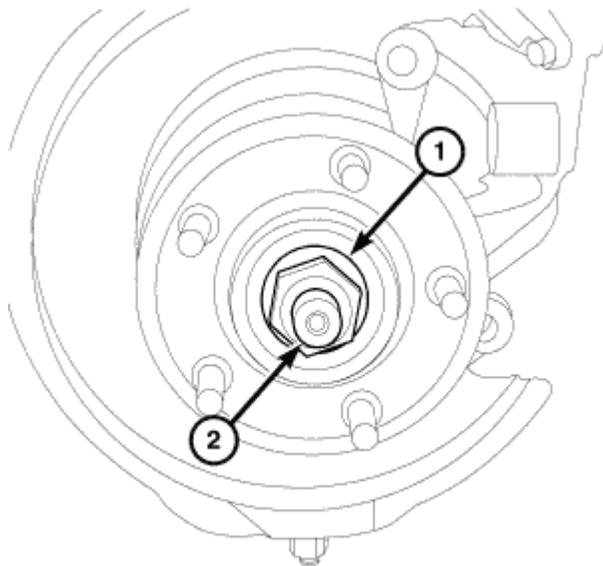
1. With vehicle in neutral, position vehicle on hoist.
2. Remove skid plate.
3. Remove differential housing (3) drain plug (2) and drain fluid.



81865360

Fig. 58: Identifying Front Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

4. Mark front propeller shaft (1) and pinion flange (2) for installation reference. Remove propeller shaft from pinion flange.



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Fig. 59: Identifying Hub Nut & Half Shaft
Courtesy of CHRYSLER LLC

5. Remove hub nuts (1) from half shafts (2).

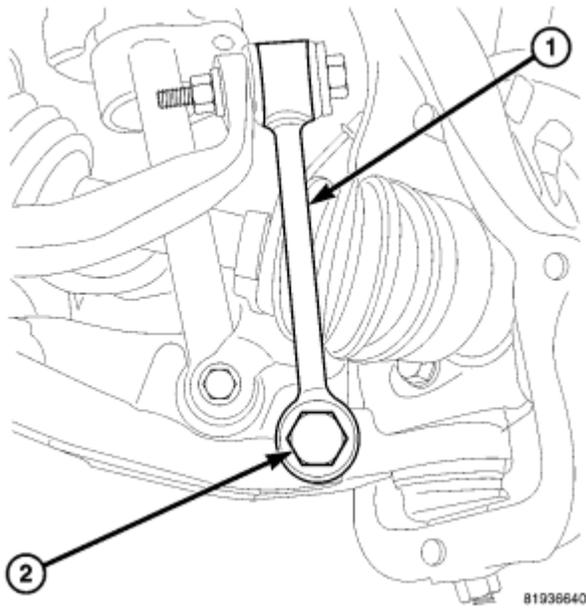


Fig. 60: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

6. Remove stabilizer bar link (1) bolts (2) from lower control arm.

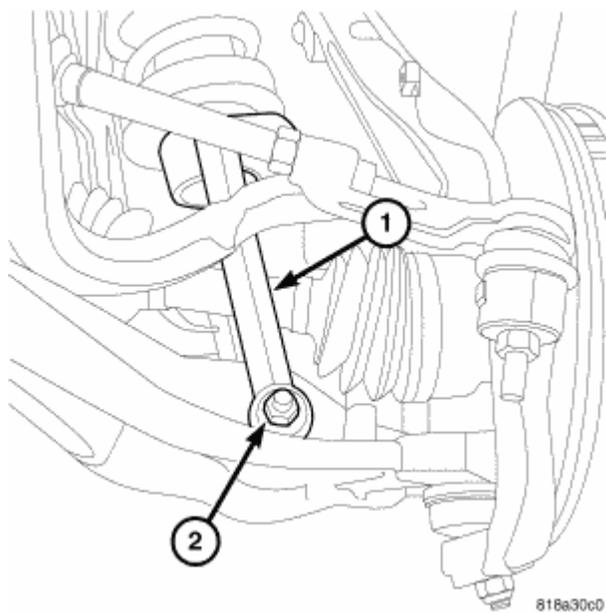


Fig. 61: Identifying Shocks Clevis & Nuts
Courtesy of CHRYSLER LLC

7. Remove shocks clevis (1) nut (2) and bolt.

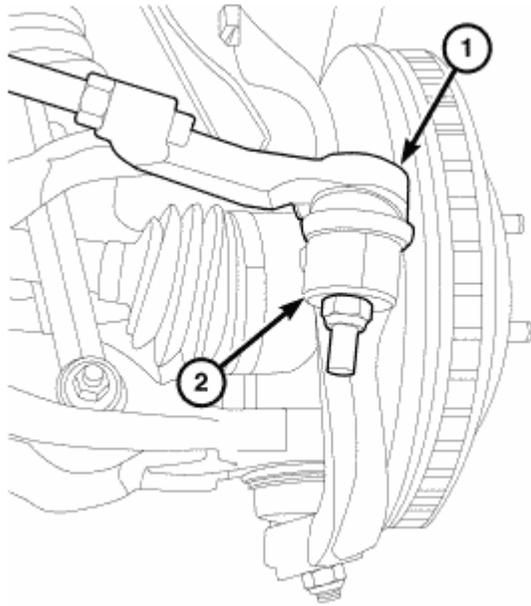


Fig. 62: Identifying Tie Rod End & Steering Knuckle
Courtesy of CHRYSLER LLC

8. Remove tie rod end (1) nuts and separate ends from the steering knuckles (2).

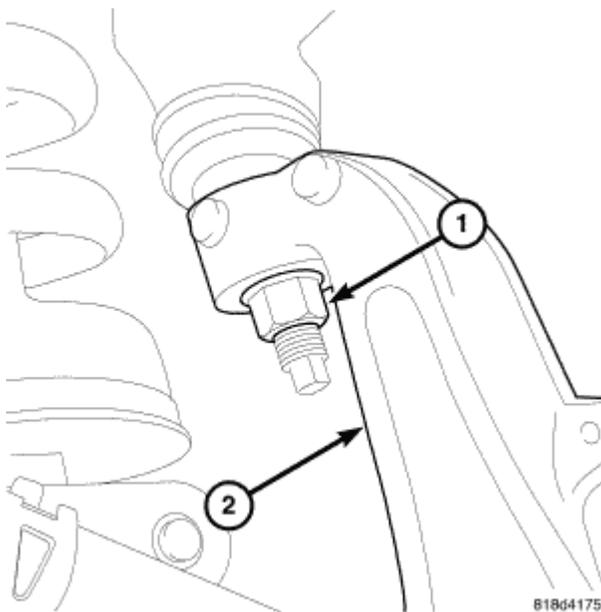


Fig. 63: Identifying Upper Ball Joint Nuts & Steering Knuckles
Courtesy of CHRYSLER LLC

9. Remove upper ball joint nuts (1) from steering knuckles (2) and separate ball joints from steering knuckles (2).

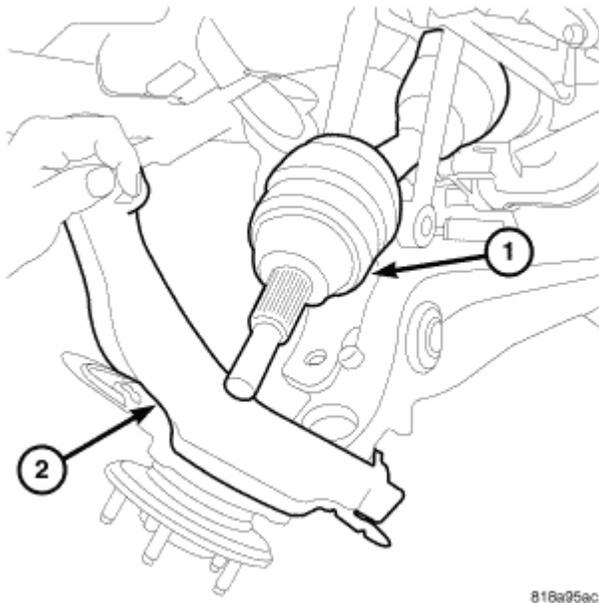


Fig. 64: Identifying Half Shaft & Knuckle
Courtesy of CHRYSLER LLC

10. Pull out on the steering knuckles (2) and push the half shaft (1) out of the knuckles.
11. With a pry bar remove the half shafts (1) from the axle.

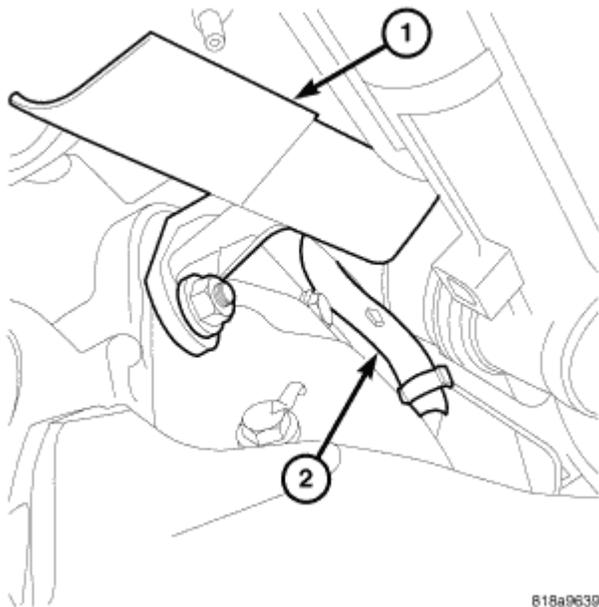


Fig. 65: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

12. Remove oil filter drain tray (1) and vent hose (2) from differential cover.

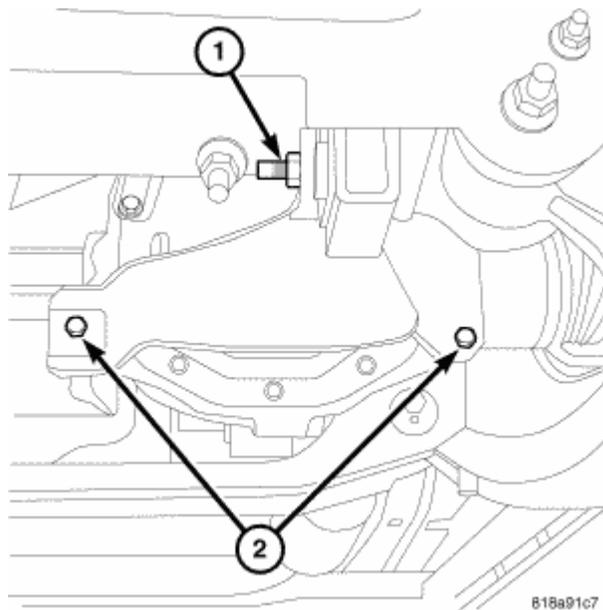


Fig. 66: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
Courtesy of CHRYSLER LLC

13. Support axle with a lift/jack.
14. Remove front axle bracket nut and bolt (1) from crossmember. Remove front axle bracket nuts and bolts (2) from axle housing and remove bracket.

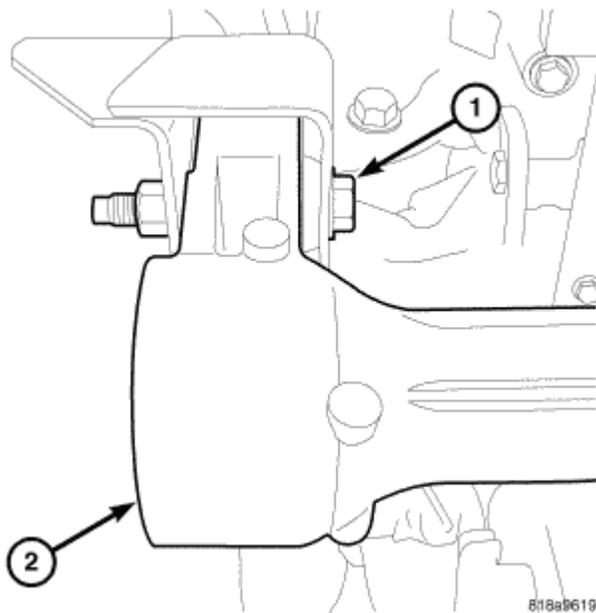
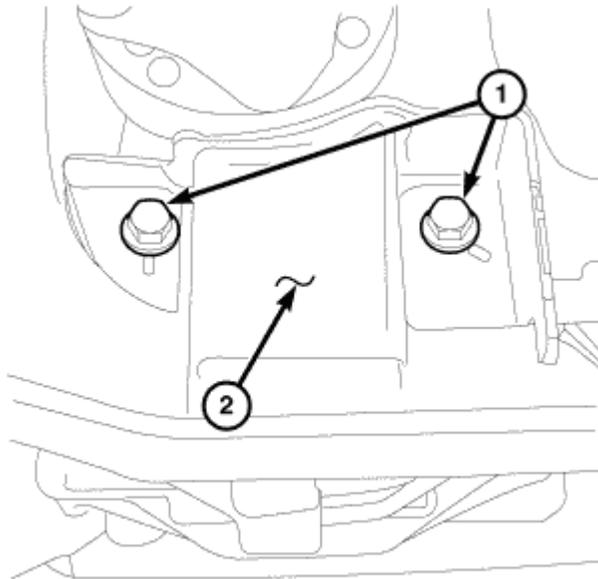


Fig. 67: Identifying Nut/Bolt & Right Axle
Courtesy of CHRYSLER LLC

15. Remove nut and bolt (1) from right axle (2) bracket.



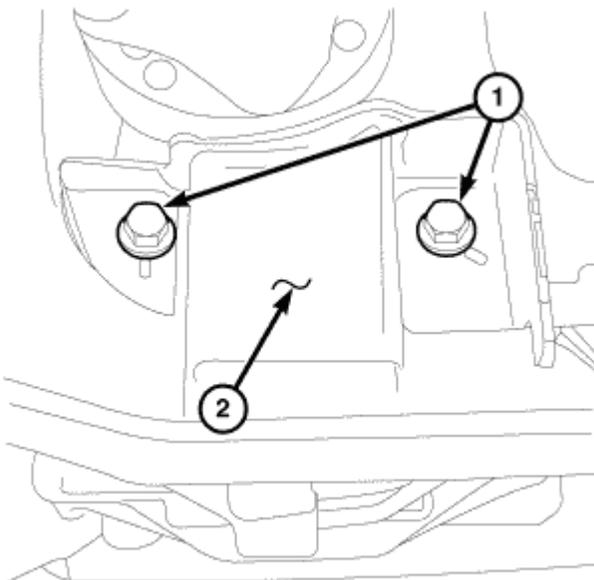
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Fig. 68: Identifying Bolts & Rear Axle Bracket
Courtesy of CHRYSLER LLC

16. Remove bolts (1) from rear axle bracket (2).
17. Lower axle and from vehicle.

INSTALLATION

FRONT AXLE - 186FIA



81Ba91ce

Fig. 69: Identifying Bolts & Rear Axle Bracket
Courtesy of CHRYSLER LLC

1. Lift axle into vehicle.
2. Install bolts (1) in rear axle bracket (1) and tighten to 88 N.m (65 ft. lbs.).

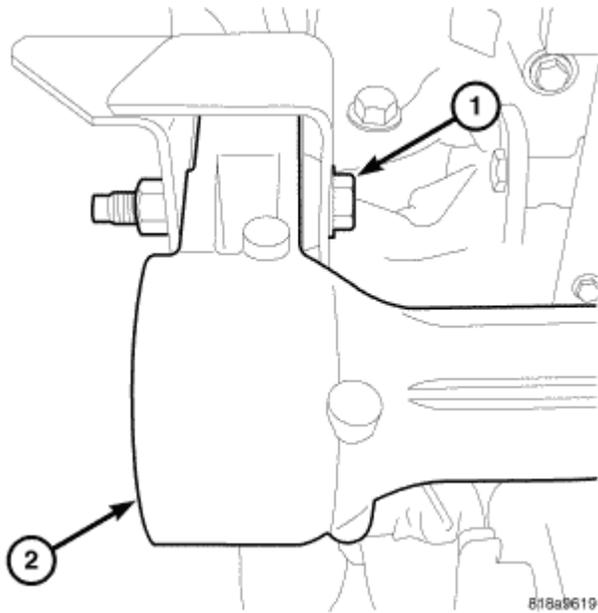


Fig. 70: Identifying Nut/Bolt & Right Axle
Courtesy of CHRYSLER LLC

3. Install bolt (1) and nut in right axle (2) bracket and tighten to 61 N.m (45 ft. lbs.).

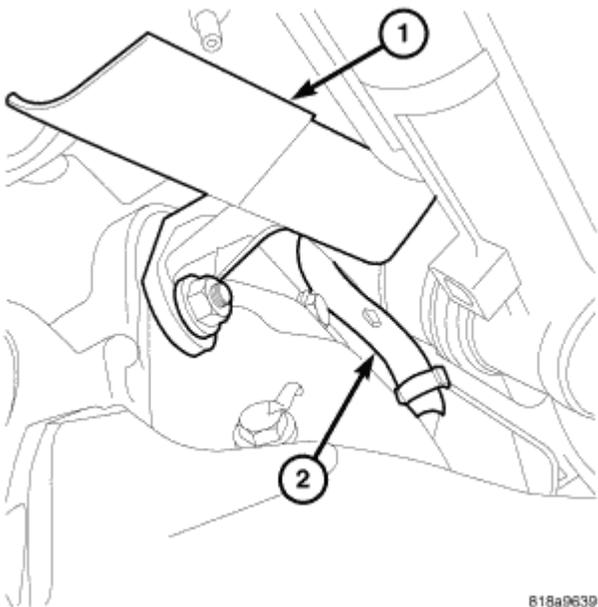


Fig. 71: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

4. Install oil filter drain tray (1) and vent hose (2) on differential cover.

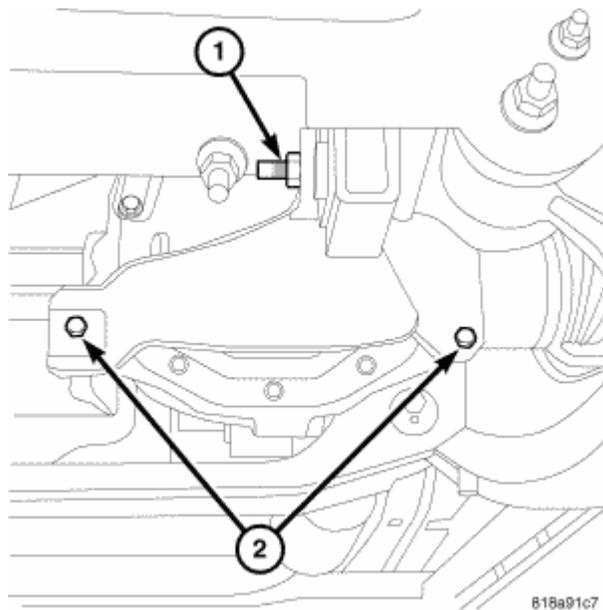


Fig. 72: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
Courtesy of CHRYSLER LLC

5. Install front axle bracket, bolts (2) and nuts on axle housing. Install front axle bracket bolt (1) and nut in front crossmember. Tighten front axle bracket nuts to 61 N.m (45 ft. lbs.).

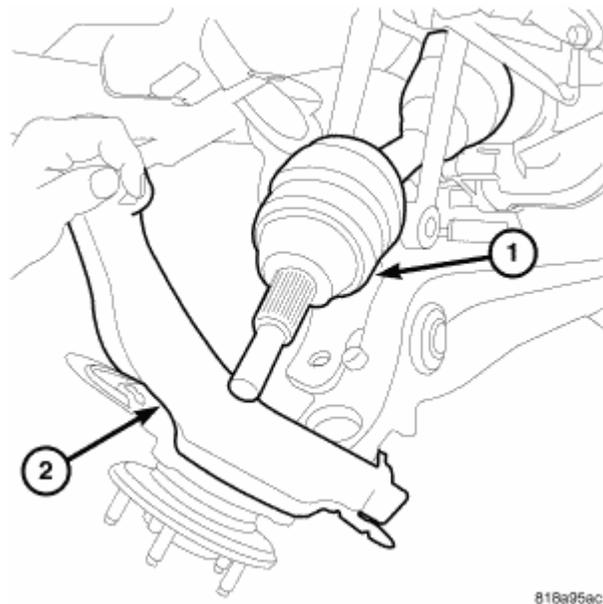


Fig. 73: Identifying Half Shaft & Knuckle
Courtesy of CHRYSLER LLC

6. Install half shafts (1) into axle and steering knuckle (2) and hub bearing.

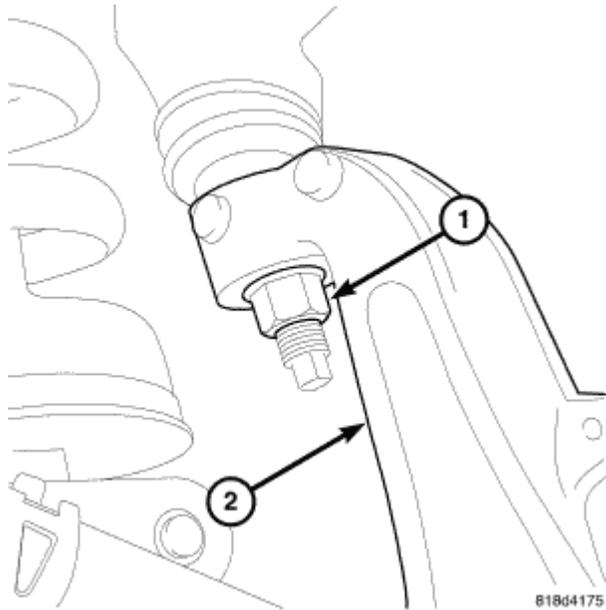


Fig. 74: Identifying Upper Ball Joint Nuts & Steering Knuckles
Courtesy of CHRYSLER LLC

7. Install upper ball joint into steering knuckles (2) and tighten nuts (1) to specifications.

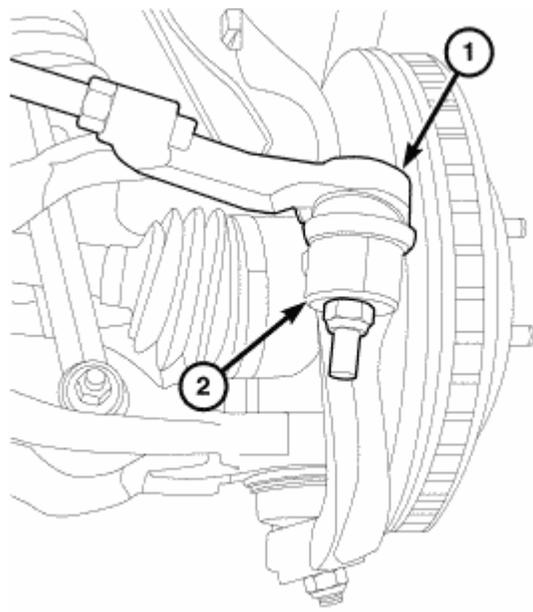


Fig. 75: Identifying Tie Rod End & Steering Knuckle
Courtesy of CHRYSLER LLC

8. Install tie rod ends (1) on steering knuckles (2) and tighten to specifications.

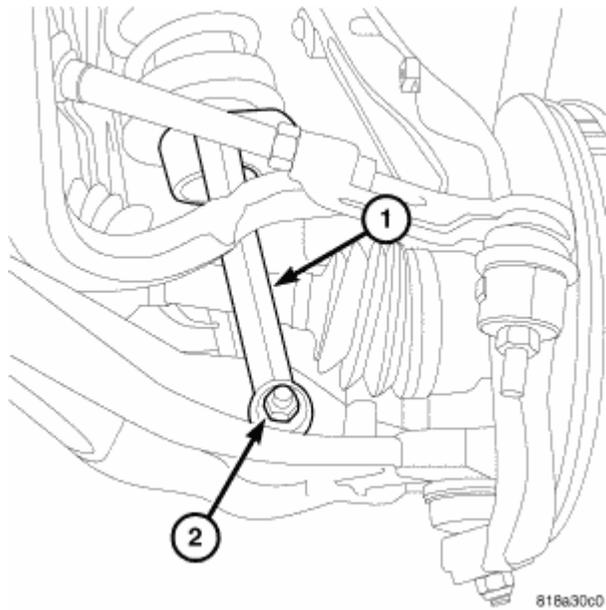


Fig. 76: Identifying Shocks Clevis & Nuts
Courtesy of CHRYSLER LLC

9. Align clevis (1) with lower control arm and install clevis bolts. Tighten clevis and nuts (2) to specifications.

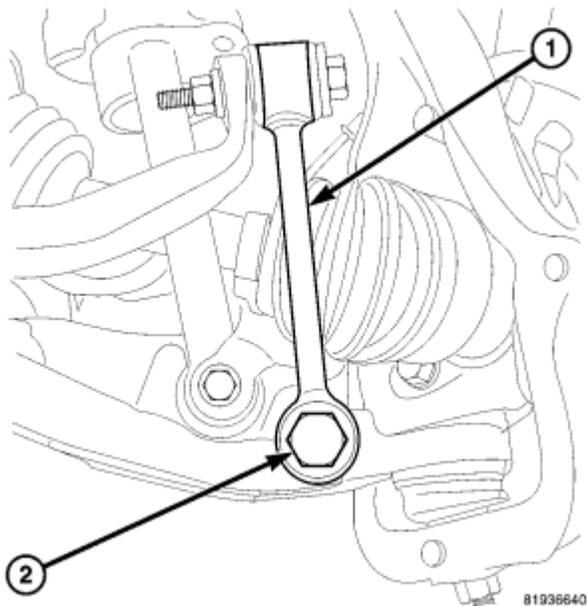
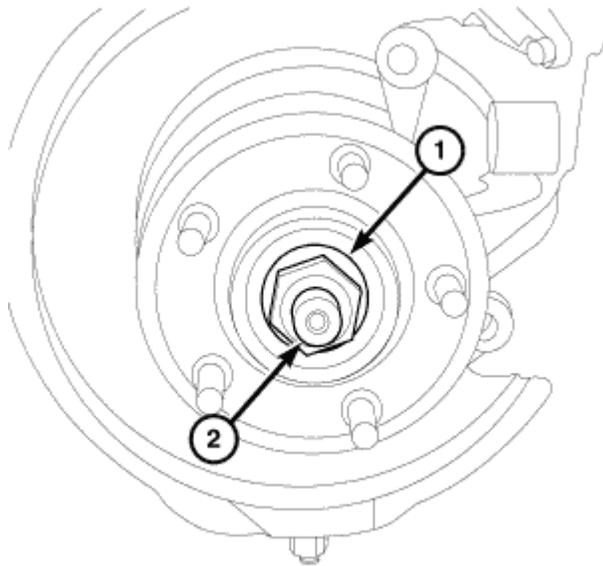


Fig. 77: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

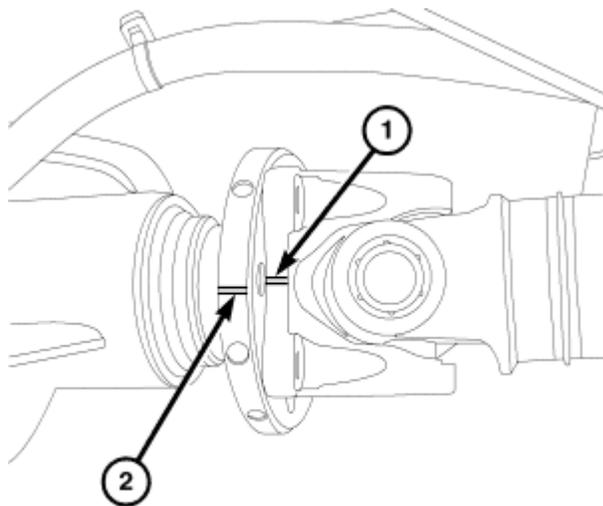
10. Install stabilizer bar links (1) and tighten bolts (2) to specifications.



818a2de5

Fig. 78: Identifying Hub Nut & Half Shaft
Courtesy of CHRYSLER LLC

11. Install new half shaft (2) hub nuts (1) and tighten to 136 N.m (100 ft. lbs.).



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Fig. 79: Identifying Front Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

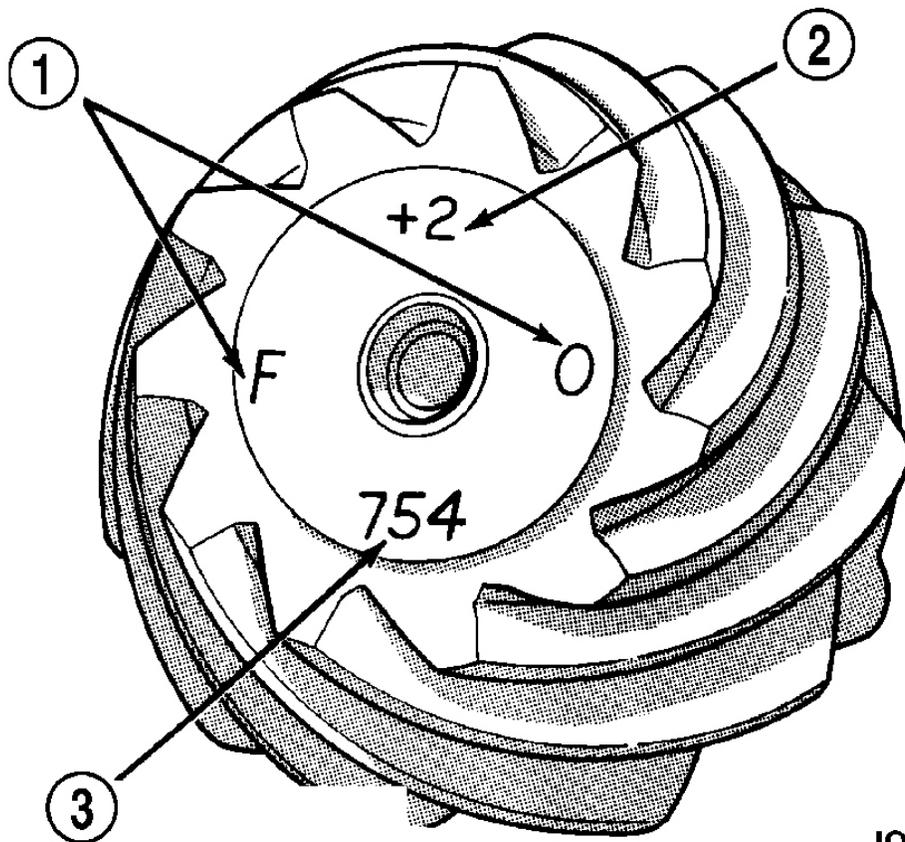
12. Install propeller shaft with reference marks (1, 2) aligned.

NOTE: Clean propeller shaft bolts and apply Mopar Lock & Seal Adhesive or equivalent to the threads before installation.

13. Install propeller shaft bolts and tighten to specifications.
14. Fill differential with gear lubricant.
15. Install skid plate, if equipped.

ADJUSTMENTS

FRONT AXLE - 186FIA



J9003-100

Fig. 80: Pinion Gear ID Numbers
Courtesy of CHRYSLER LLC

Ring and pinion gears are supplied as matched sets. Gear match numbers (3) for the ring and pinion gear are etched onto each gear. A plus (+) number, minus (-) number or zero (0) is etched into the face of the pinion gear (2). This number is the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion etched with a (0).

If installing a new gear, note the depth variance number of the original and replacement pinion. The numbers represent thousands of an inch deviation from the standard. Add or subtract this number from the original depth

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shim/oil slinger to compensate for the difference in the depth variances. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.

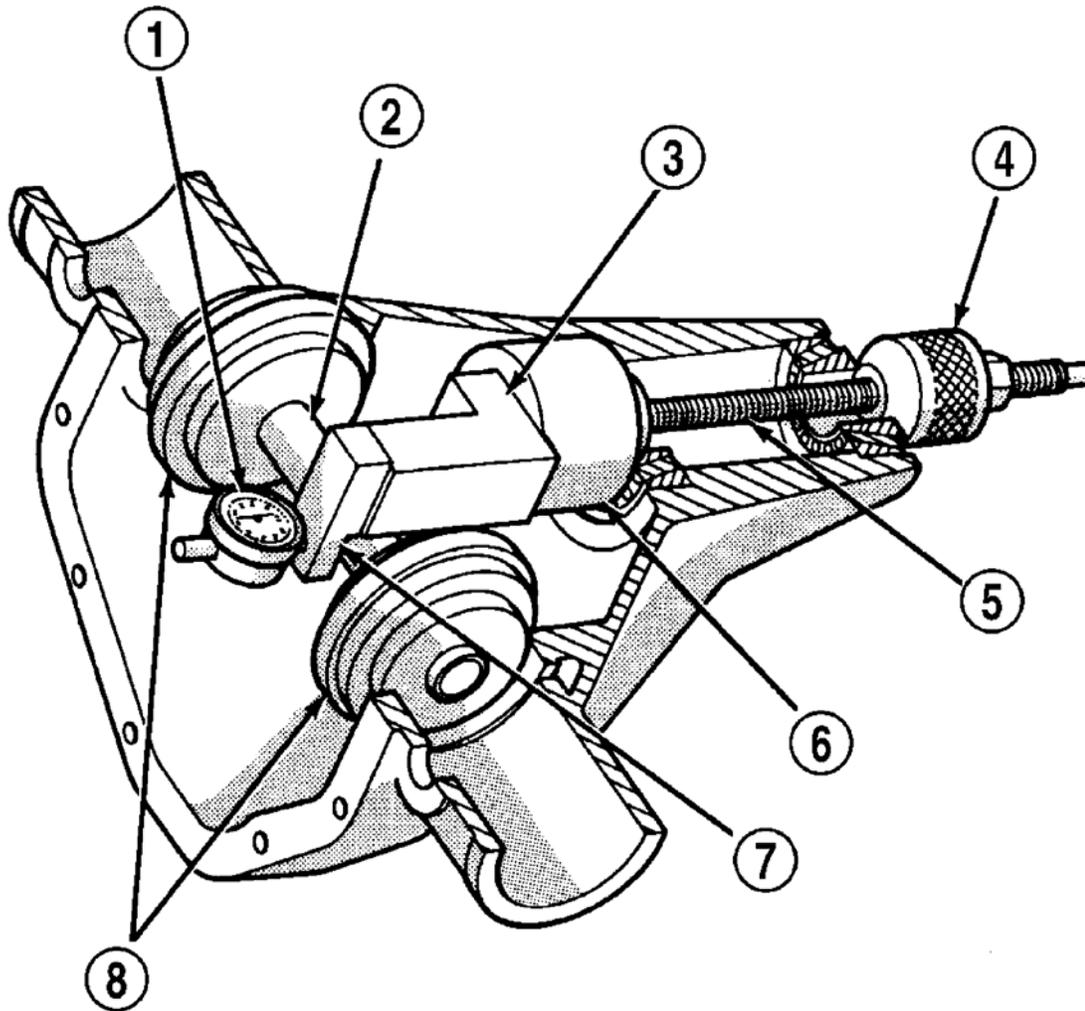
Compensation for pinion depth variance is achieved with a select shim/oil slinger. The shims are placed between the rear pinion bearing and pinion gear head.

Pinion Gear Depth Variance Chart : Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

PINION GEAR DEPTH VARIANCE

Original Pinion Gear Depth Variance	Replacement Pinion Gear Depth Variance								
	-4	-3	-2	-1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003
0	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004
-1	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005
-2	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006
-3	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007
-4	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007	-0.008

PINION DEPTH MEASUREMENT

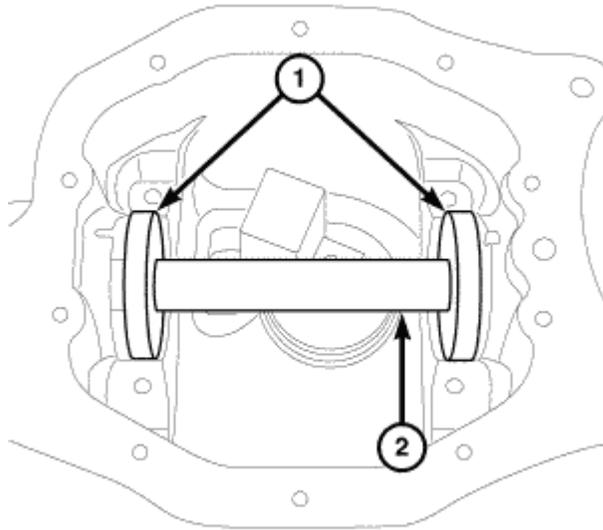


J9403-45

Fig. 81: Pinion Gear Depth Tools
Courtesy of CHRYSLER LLC

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339A (1).

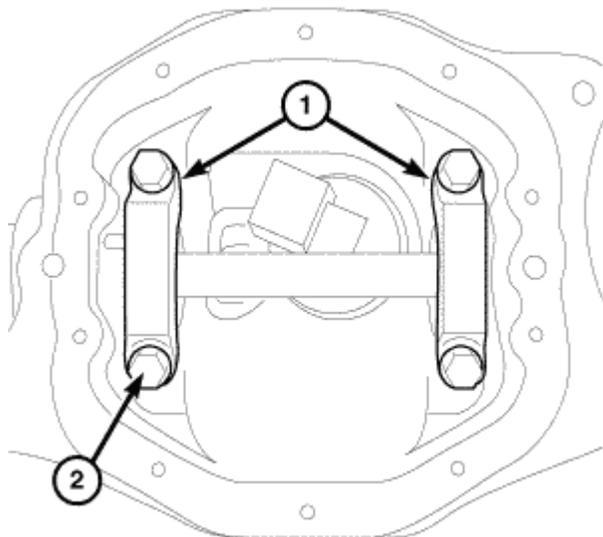
1. Assemble Pinion Height Block 6739 (3), Pinion Block 8804 (6) and rear pinion bearing onto Screw 6741 (5).
2. Insert height gauge components into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-nut 6740 (4) onto the screw. Tighten Cone-Nut until Torque To Rotate screw is 1.7 N.m (15 in. lbs.).



818d47ad

Fig. 82: Positioning Arbor Discs 6927A And Arbor D-115-3 Into Housing Bearing Cradles
Courtesy of CHRYSLER LLC

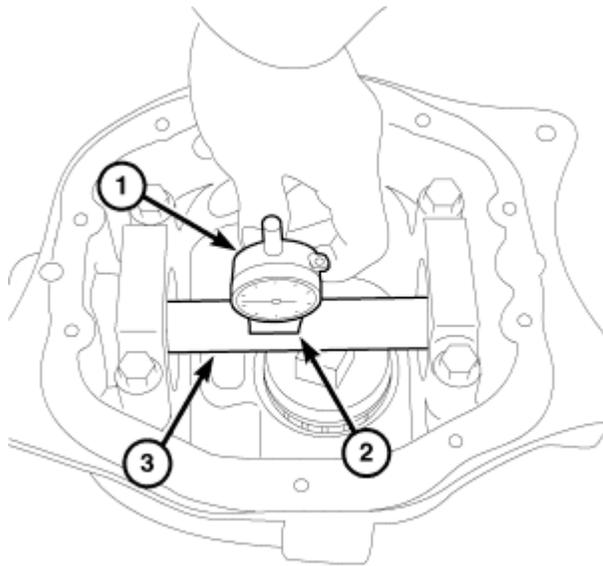
4. Position Arbor Discs 6927A (1) and Arbor D-115-3 (2) into the housing bearing cradles.



818d4944

Fig. 83: Installing Differential Bearing Caps On Arbor Discs And Tightening Bolts
Courtesy of CHRYSLER LLC

5. Install differential bearing caps (1) on Arbor Discs and tighten bolts (2) to 61 N.m (45 ft. lbs.).

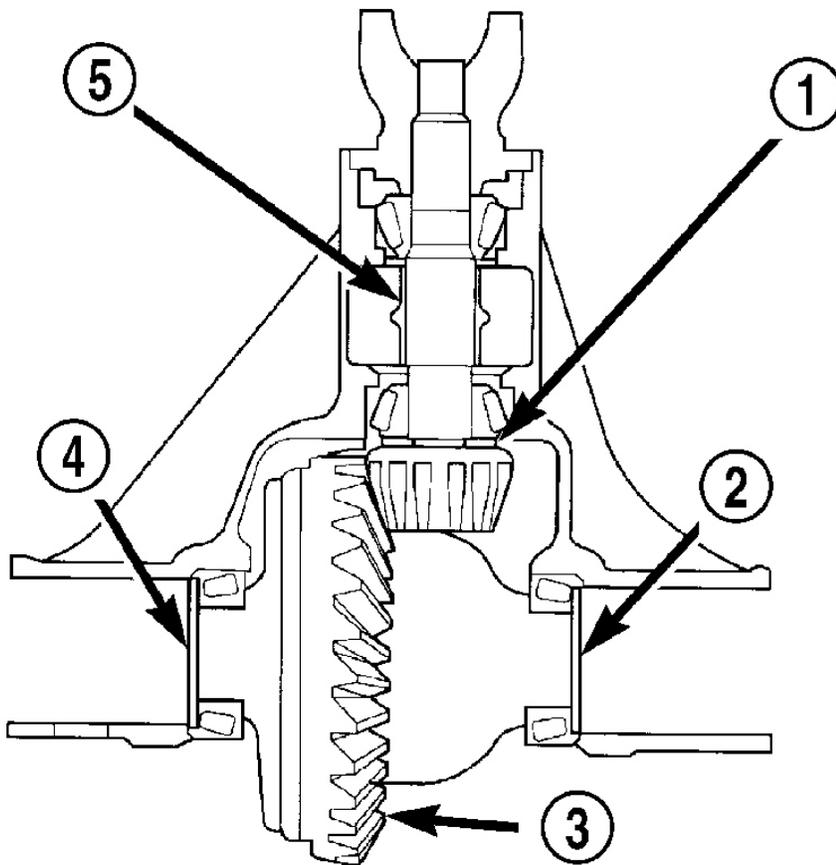


818d458c

Fig. 84: Identifying Dial Indicator, Scooter Block & Arbor
Courtesy of CHRYSLER LLC

6. Assemble Dial Indicator C-3339A into Scooter Block D-115-2 and secure set screw.
7. Position Dial Indicator (1) with Scooter Block (2) flush on the pinion height block. Hold scooter block and zero the dial indicator.
8. Slowly slide the scooter block (2) across the pinion block over to the arbor (3). Move the scooter block till the dial indicator probe crests the arbor (3) and record the highest reading.
9. Select a shim equal to the dial indicator reading plus or minus the pinion depth variance number on the face of the pinion. For example: If the depth variance is -2, add 0.002 in. to the dial indicator reading. If the depth variance is +2, subtract 0.002 in. from the dial indicator reading.

DIFFERENTIAL SIDE BEARING PRELOAD AND GEAR BACKLASH



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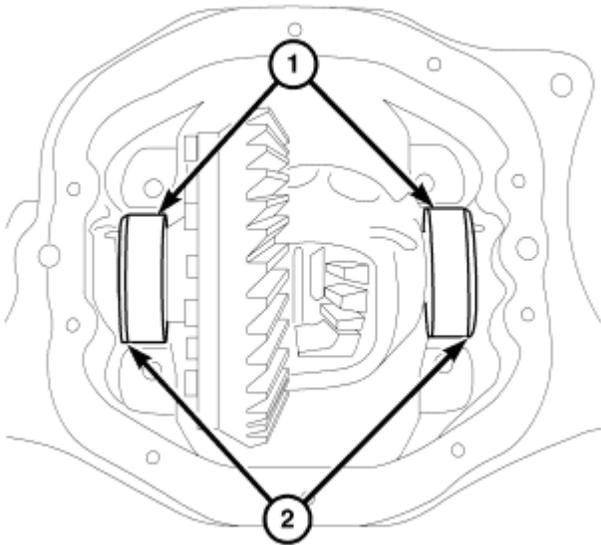
Fig. 85: Shim Locations

Courtesy of CHRYSLER LLC

Differential bearing preload and gear backlash is achieved with selective shims (2) (4) located between the differential bearing cups and differential housing. Shim thickness is determined using Dummy Bearings D-348 and Dummy Shims 8107 in place of the differential side bearings and preload shims.

Before measuring differential bearing preload and gear backlash, pinion gear depth must be established and pinion gear prepared for installation. Pinion gear depth is essential to establishing gear backlash and tooth contact patterns.

PRELOAD SHIM SELECTION

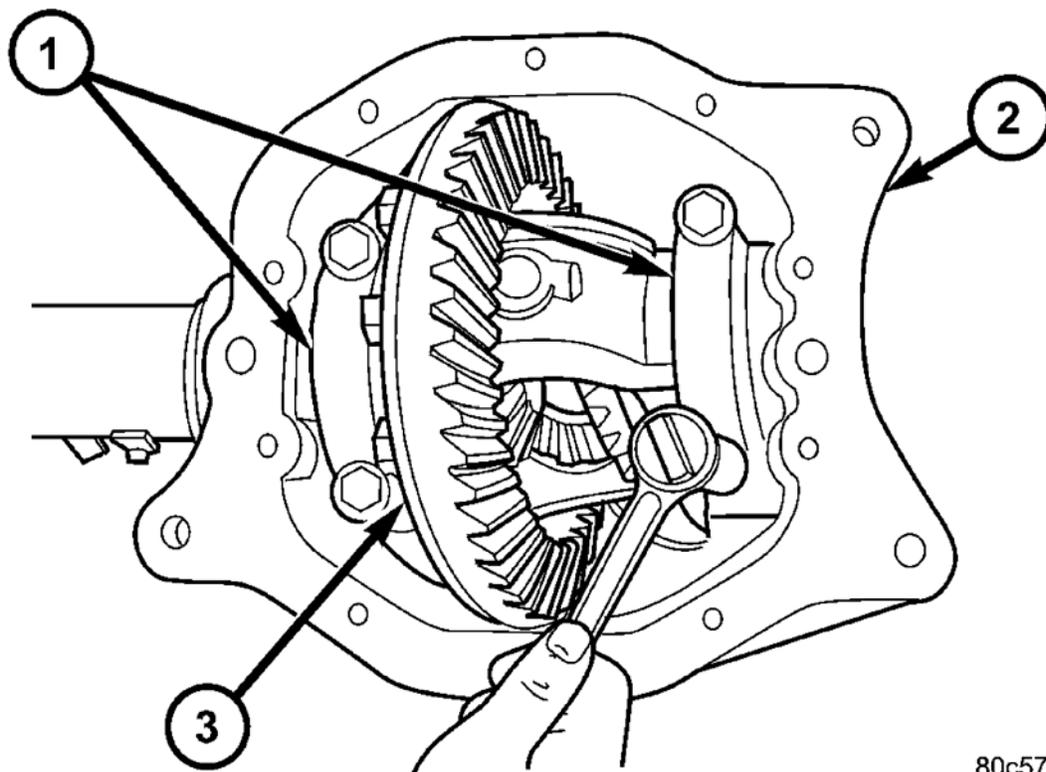


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Fig. 86: Identifying Dummy Bearings D-348 & Dummy Shims 8107
Courtesy of CHRYSLER LLC

1. Remove differential side bearings from differential case.
2. Install ring gear on differential case and tighten bolts to specification.
3. Install Dummy Bearings D-348 (1) on differential case.
4. Install differential case in the housing.
5. Record thickness of Dummy Shims 8107 (2) then install shims between dummy bearings and differential housing.

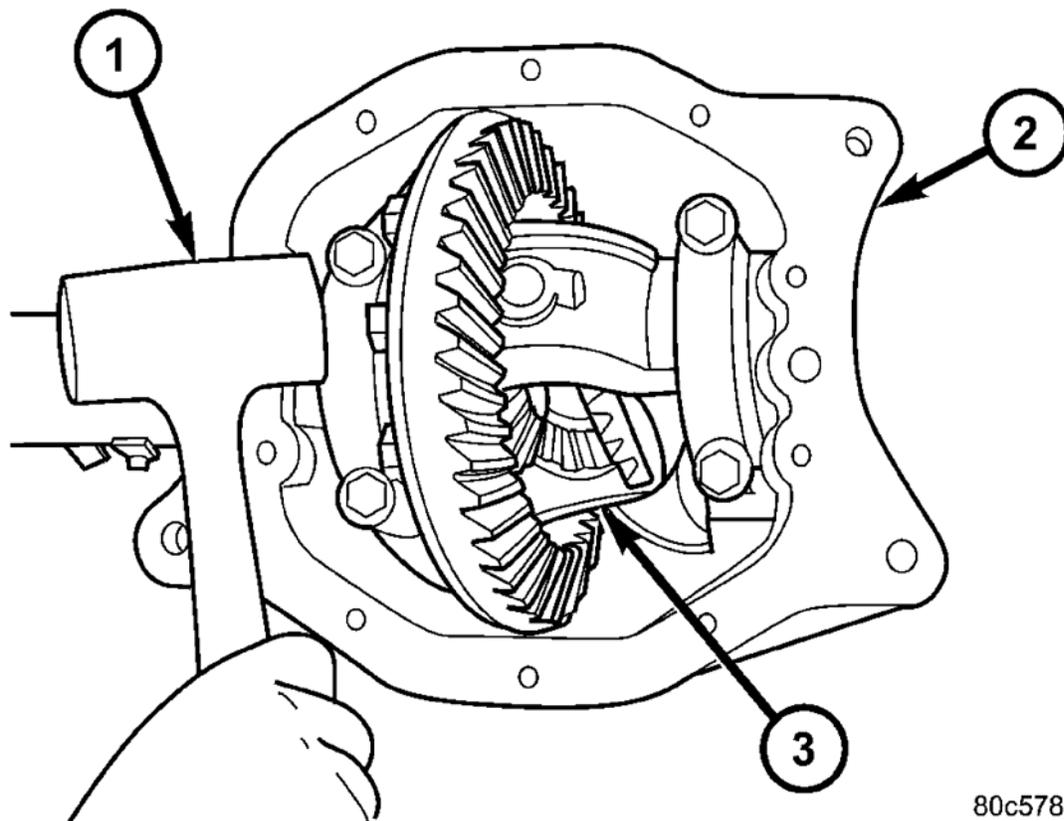
NOTE: Each dummy shim is 3 mm (0.118 in.) thick.



80c5786b

Fig. 87: Identifying Bearing Caps & Snug Bearing Cap Bolts
Courtesy of CHRYSLER LLC

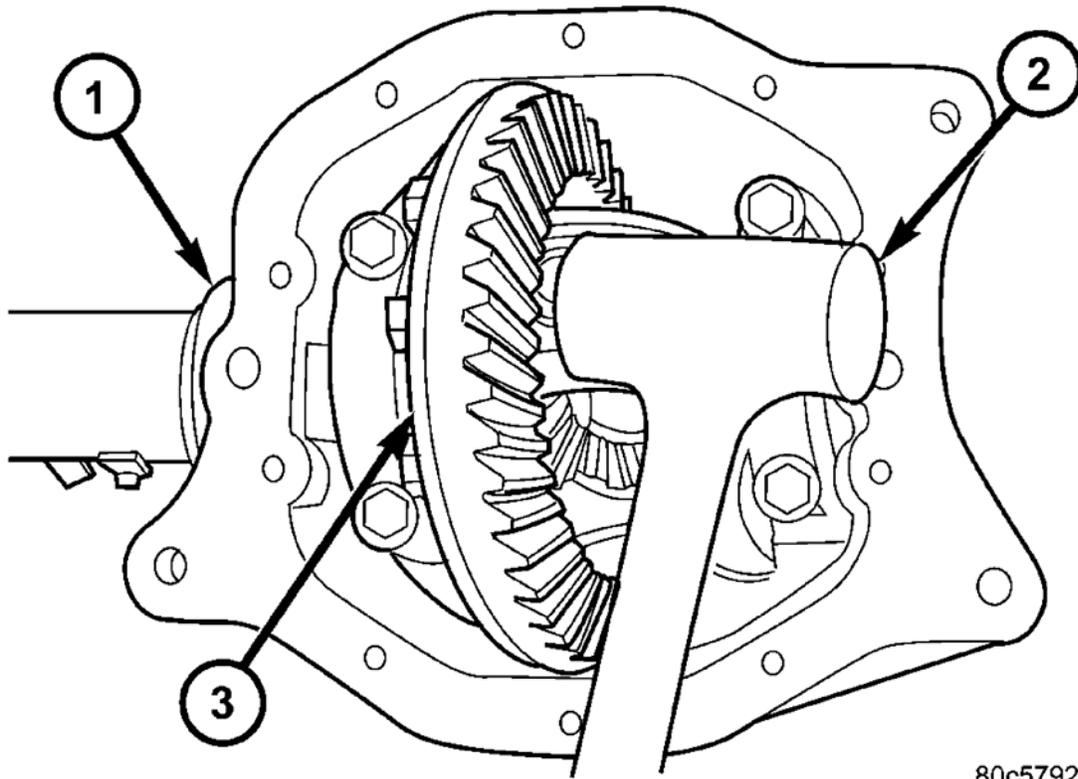
6. Install bearing caps (1) in their correct positions and snug bearing cap bolts (3).



80c578e9

Fig. 88: Identifying Dead-Blow Hammer & Housing
Courtesy of CHRYSLER LLC

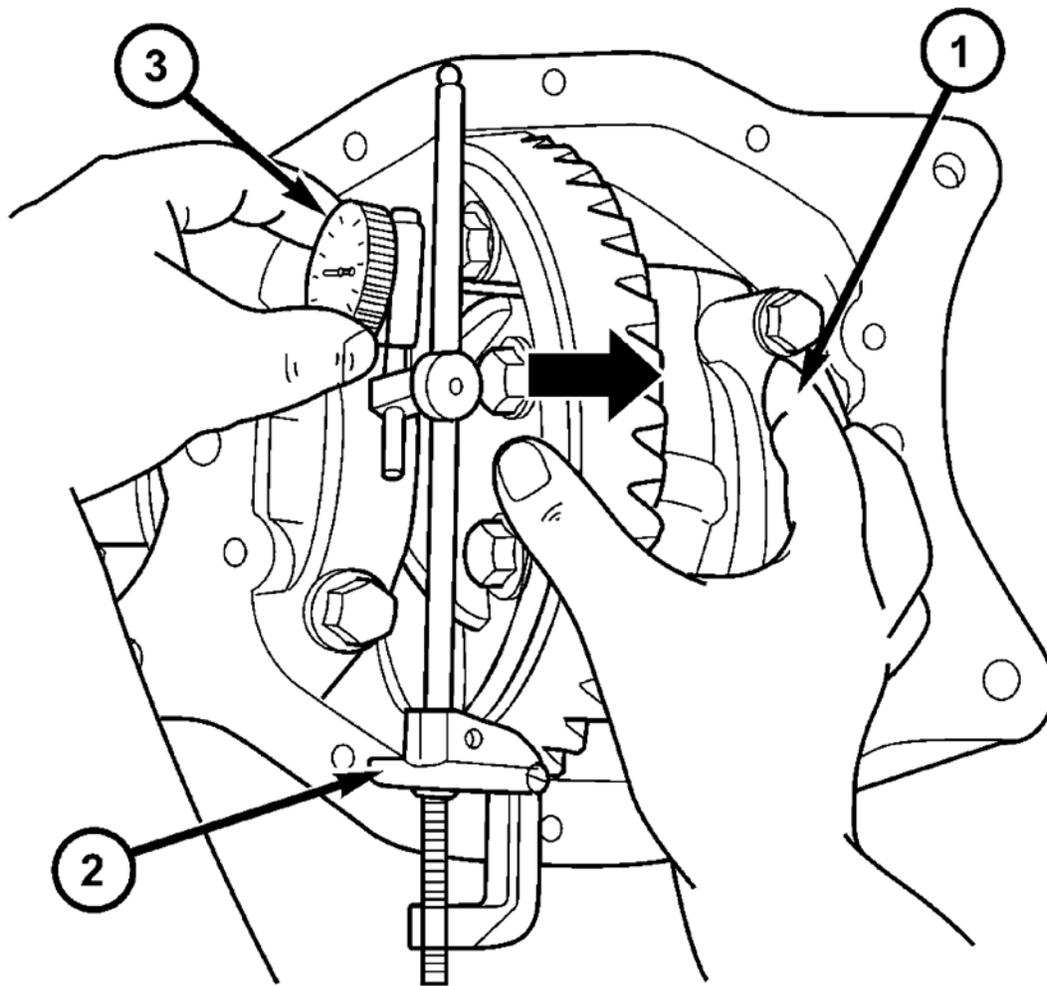
7. With a dead-blow hammer (1), seat differential dummy bearing to pinion side of the housing (2).



80c57926

Fig. 89: Seat Dummy Bearing Ring Gear Side
Courtesy of CHRYSLER LLC

8. With a dead-blow hammer (2), seat differential dummy bearing to ring gear (3) side of the housing (1).



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Fig. 90: Identifying Pinion Gear Side, Pilot Stud C-3288-B & Dial Indicator C-3339A
Courtesy of CHRYSLER LLC

9. Thread Pilot Stud C-3288-B (2) into rear cover bolt hole below ring gear.
10. Attach a Dial Indicator C-3339A (3) to the Pilot Stud. Position the dial indicator plunger on flat surface between the ring gear bolts.
11. Push and hold differential case to pinion gear side (1) of the housing and zero dial indicator.

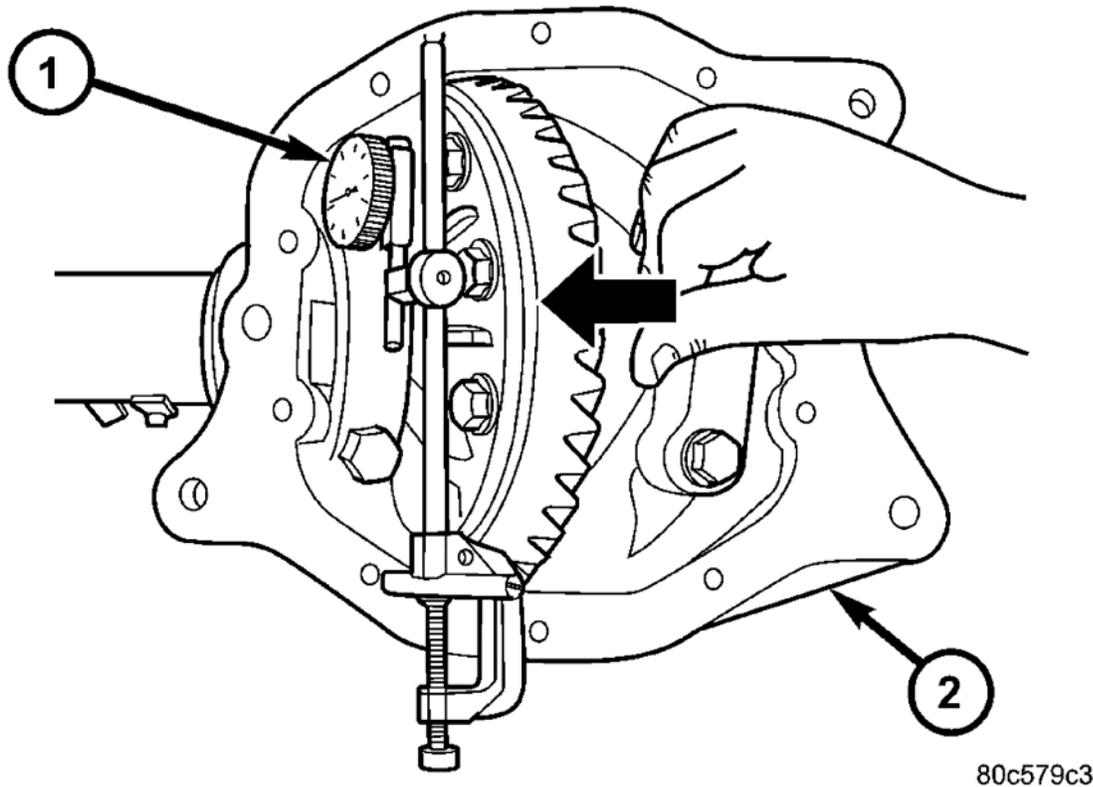
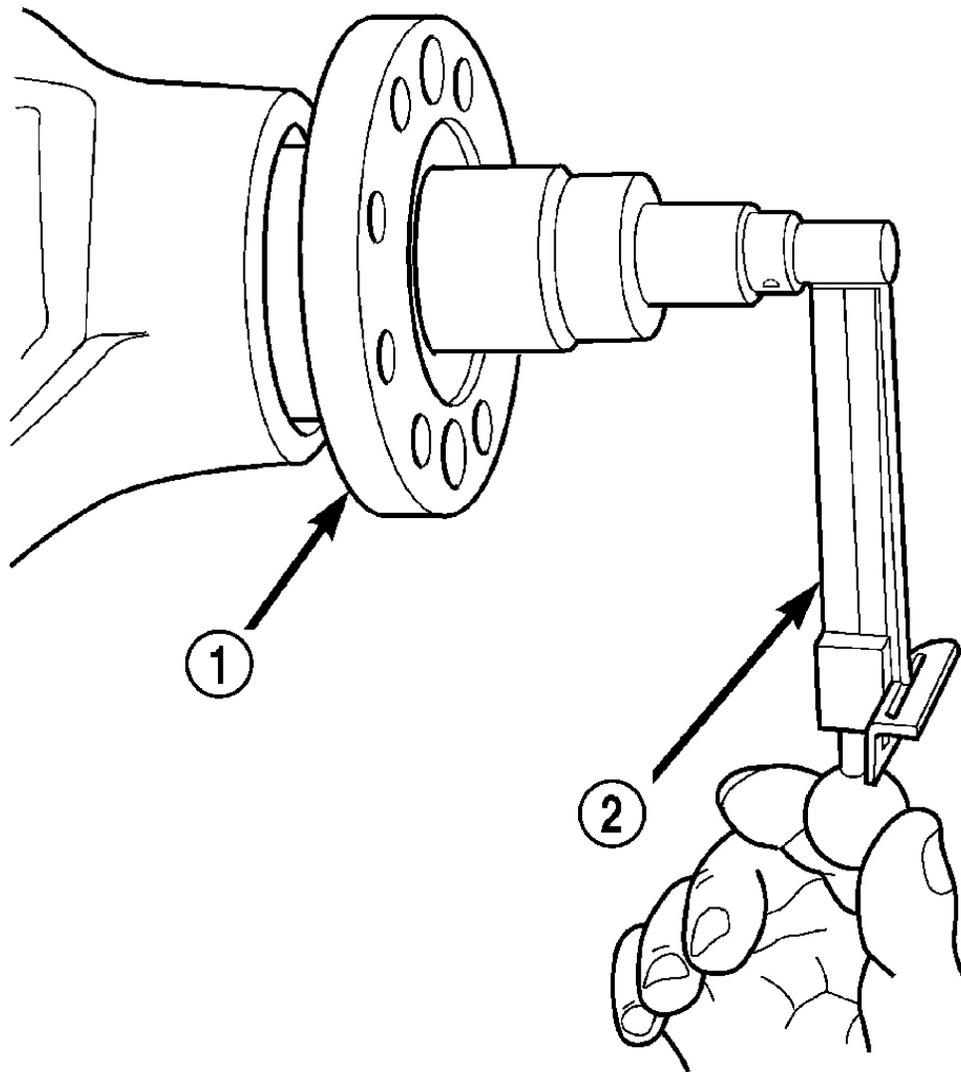


Fig. 91: Identifying Record Dial Indicator & Housing
 Courtesy of CHRYSLER LLC

12. Push and hold differential case to ring gear side of the housing (2) and record dial indicator (1) reading.
13. Add dummy shims thickness 6 mm (0.236 in.) plus preload specification 0.152 mm (0.006 in.) to the dial indicator reading. This is the total shim thickness needed to preload the new bearings when the differential is installed.

EXAMPLE: Differential Dial Indicator Reading + Dummy Shims 6 mm (0.236 in.) + Preload Specification 0.152 mm (0.006 in.) = Total Differential Shim

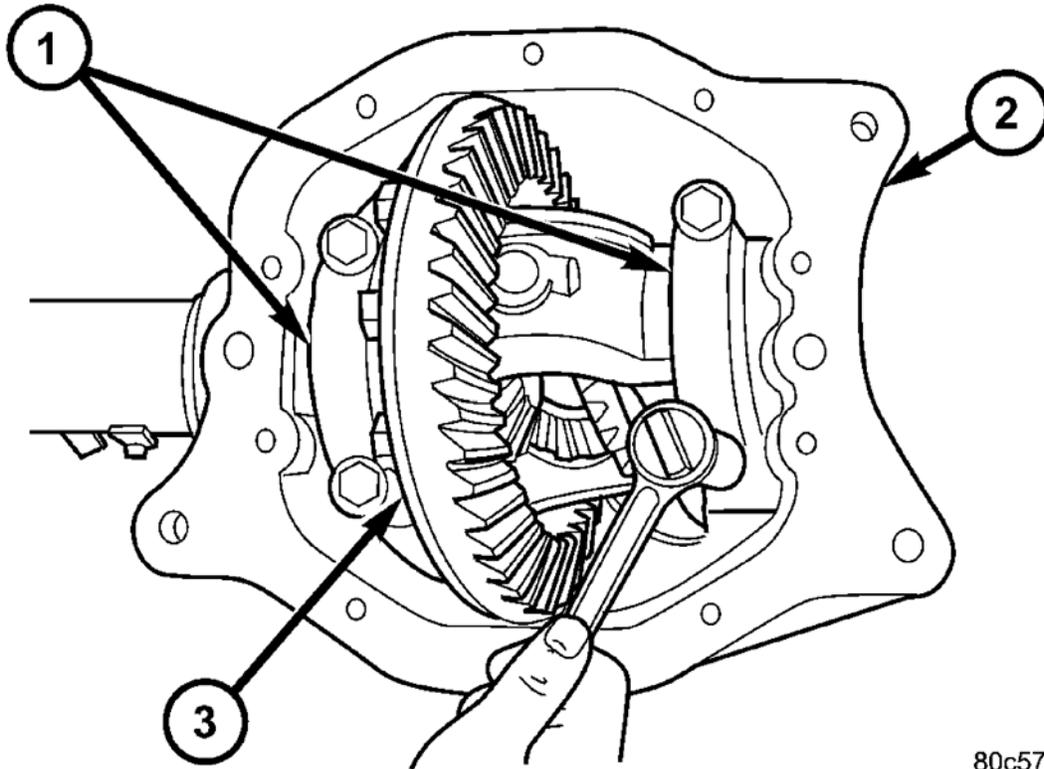
14. Rotate dial indicator out of the way on the pilot stud.
15. Remove differential case and dummy bearings from the housing.



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Fig. 92: Pinion Rotation Torque & Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

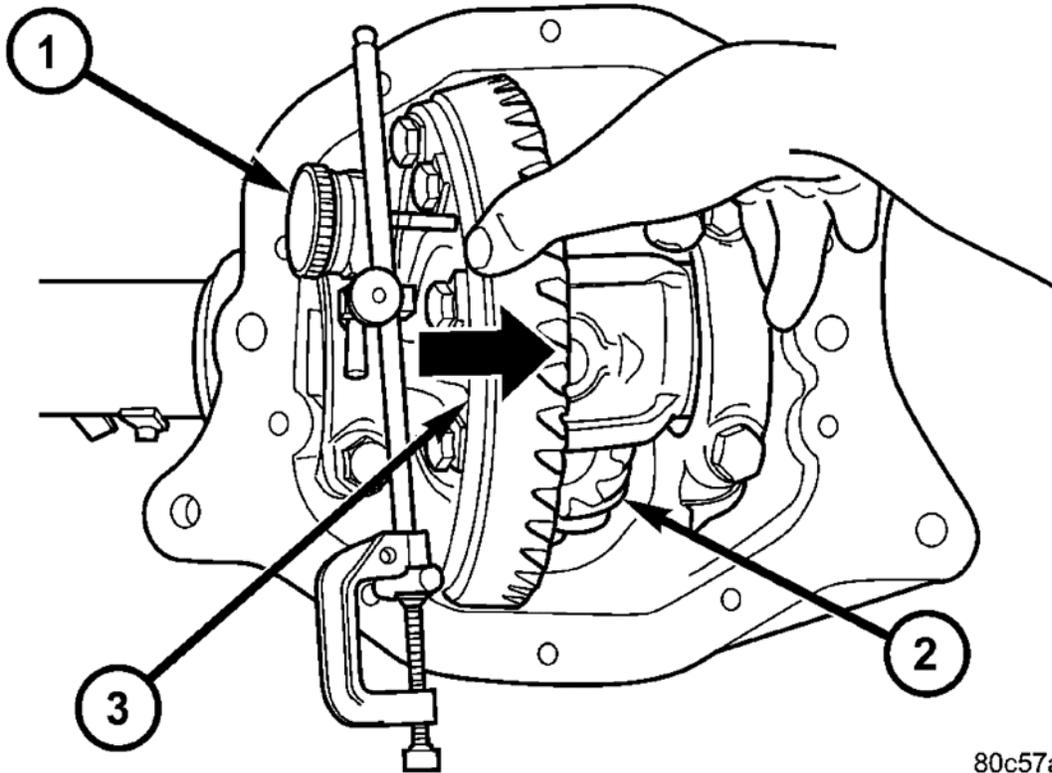
16. Install pinion gear in the housing. Install the pinion flange (1) and establish pinion torque to rotate with an inch pound torque wrench (2).



80c5786b

Fig. 93: Identifying Bearing Caps & Snug Bearing Cap Bolts
Courtesy of CHRYSLER LLC

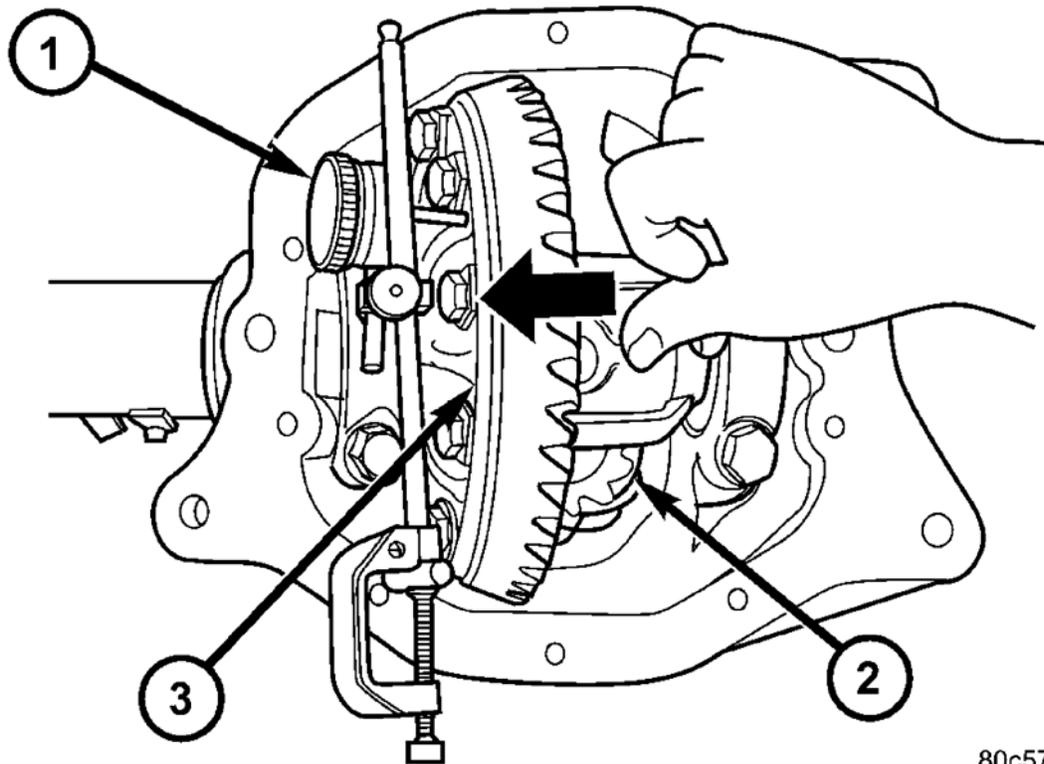
17. Install differential case and Dummy Bearings D-348 in the housing.
18. Install a single dummy shim in the ring gear side. Install bearing caps (1) and tighten bearing cap bolts (3) snug.



80c57a39

Fig. 94: Identifying Dial Indicator, Pinion Gear & Ring Gear
Courtesy of CHRYSLER LLC

19. Seat ring gear side dummy bearing.
20. Position the dial indicator (1) plunger on a flat surface between the ring gear (3) bolt heads.
21. Push and hold differential case toward pinion gear (2) and zero dial indicator (1).



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Fig. 95: Identifying Ring Gear Side Dial Indicator, Differential Case & Ring Gear Side
 Courtesy of CHRYSLER LLC

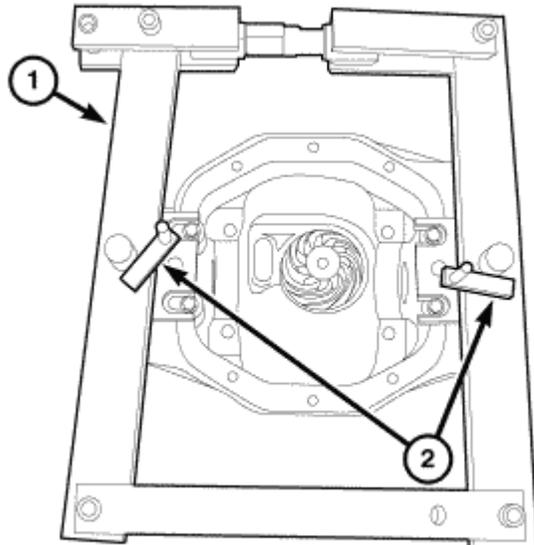
22. Push and hold differential case (2) to ring gear side (3) of the housing and record ring gear side dial indicator (1) reading. Add 3 mm (0.118 in.) one dummy shim thickness to ring gear side reading.
23. Subtract backlash specification 0.076 mm (0.003 in.) from total ring gear side reading for ring gear backlash. This is the shim needed on the ring gear side of the differential.

EXAMPLE: Ring Gear Side Dial Indicator Reading + One Dummy Shim 3 mm (0.118 in.) - Backlash Specification 0.076 mm (0.003 in.) = Ring Gear Side Shim

24. Subtract ring gear shim total from preload shim total thickness. The remainder is the shim thickness needed on the pinion side of the differential.

EXAMPLE : Total Differential Shim - Ring Gear Side Shim = Pinion Gear Side Shim

25. Rotate dial indicator out of the way on pilot stud.
26. Remove differential case and dummy bearings from the housing.
27. Install side bearings and cups on differential case.



B18ed1ad

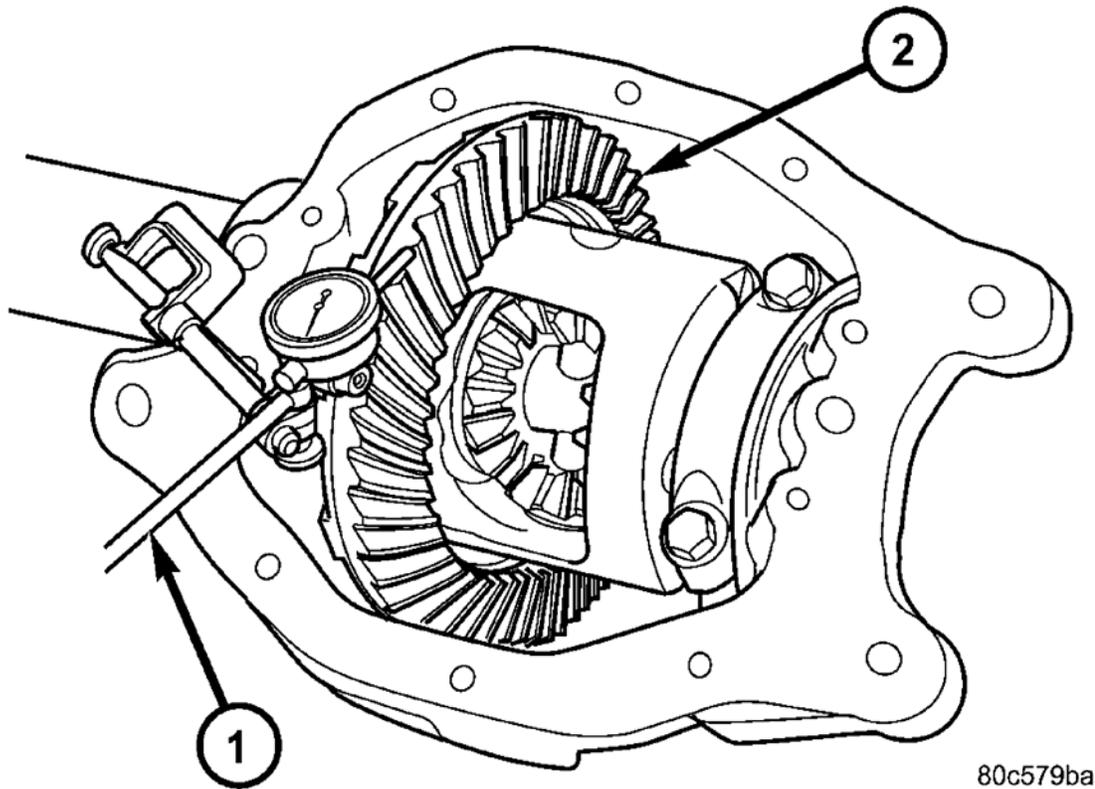
Fig. 96: Identifying Spreader W-129-B & Spreader Retainers W-129-1
Courtesy of CHRYSLER LLC

28. Install Spreader Adapters 9959, Spreader W-129-B (1) and Spreader Retainers W-129-1 (2) on housing tighten spreader turnbuckle finger-tight.
29. Attach Dial Indicator C-3339 to spreader retainer stud. Load indicator plunger against opposite side of the housing and zero the indicator
30. Spread the differential case 0.34 mm (0.013 in).

CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instruction could result in distorting the housing.

31. Install differential case with shims.

GEAR BACKLASH



80c579ba

Fig. 97: Identifying Indicator Plunger & Ring Gear Tooth
Courtesy of CHRYSLER LLC

1. Rotate the differential case several times to seat the side bearings.
2. Position the indicator plunger (1) against a ring gear tooth (2).
3. Push and hold ring gear upward while not allowing the pinion gear to rotate.
4. Zero dial indicator face to pointer.
5. Push and hold ring gear downward while not allowing the pinion gear to rotate. Dial indicator reading (backlash) should be between 0.12 - 0.20 mm (0.005 - 0.008 in.).

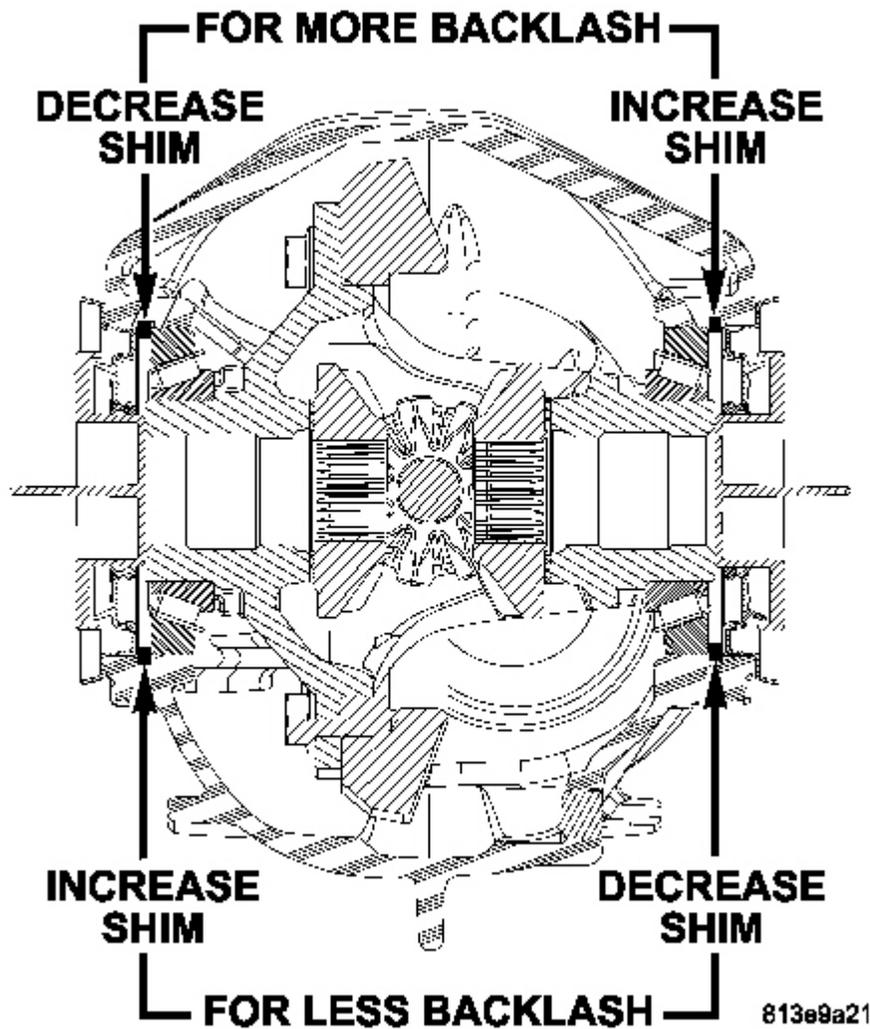


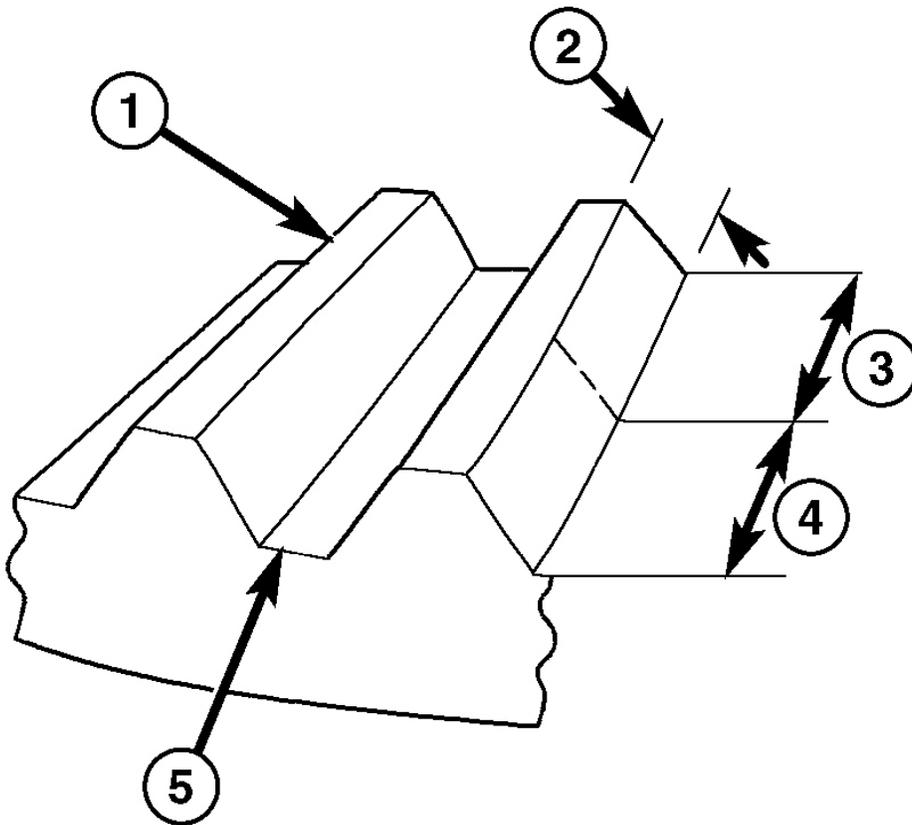
Fig. 98: Backlash Shim Correction
Courtesy of CHRYSLER LLC

NOTE: If backlash is not within specifications, transfer the necessary shim thickness from one side of the housing to the other.

6. Verify differential case and ring gear runout by measuring ring to pinion gear backlash at eight locations around the ring gear. Readings should not vary more than 0.05 mm (0.002 in.). If readings vary more than specified, the ring gear or the differential case is defective.

After the proper backlash is achieved, perform Gear Contact Pattern Analysis procedure.

GEAR CONTACT PATTERN



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Fig. 99: Gear Description

Courtesy of CHRYSLER LLC

The ring gear and pinion teeth contact patterns will show if the pinion depth is correct in the housing. It will also show if the ring gear backlash has been adjusted correctly. The backlash can be adjusted within specifications to achieve desired tooth contact patterns.

The TOP LAND (1) of the gear tooth is the top surface of the tooth. The PROFILE (2) of the gear tooth is the depth of the tooth. The TOE (3) of the gear is the portion of the tooth surface at the end towards the center. The HEEL (4) of the gear is the portion of the tooth at the outer-end. The ROOT (5) of the gear tooth is the lowest portion of the tooth.

NOTE: If the PROFILE across the tooth is the same it is a 3 Axis cut gear. If the PROFILE across the tooth is tapered, it is a 2 Axis cut gear.

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1. Apply a thin coat of hydrated ferric oxide or equivalent to the drive and coast side of the ring gear teeth.
2. Wrap, twist and hold a shop towel around the pinion yoke to increase the turning resistance of the pinion. This will provide a more distinct contact pattern.
3. With a boxed end wrench on a ring gear bolt, rotate the differential case one complete revolution in both directions while a load is being applied from shop towel.

The areas on the ring gear teeth with the greatest degree of contact against the pinion teeth will squeegee the compound to the areas with the least amount of contact. Note and compare patterns on the ring gear teeth to Gear Tooth Contact Patterns chart and adjust pinion depth and gear backlash as necessary.

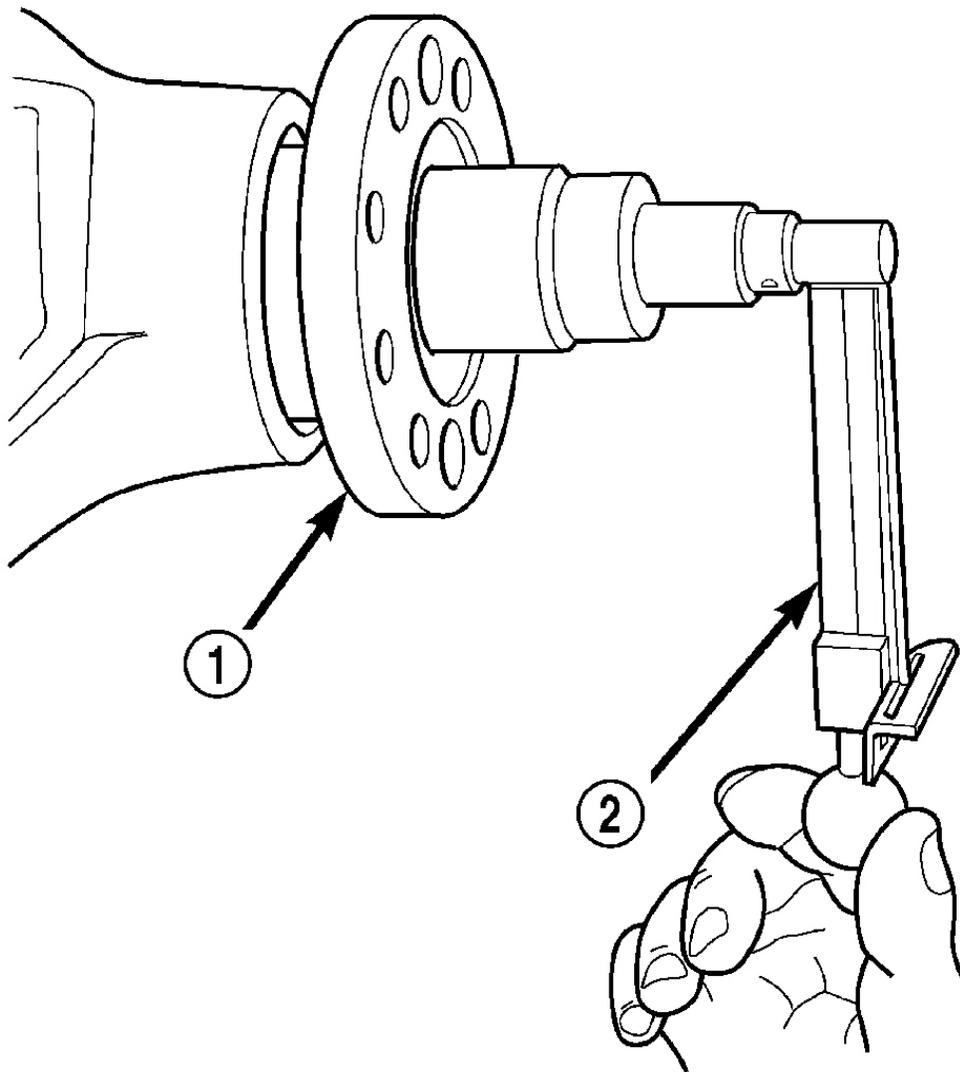
DRIVE SIDE HEEL TOE	CONDITION	COAST SIDE TOE HEEL	CONDITION	ACTION REQUIRED
	Desirable pattern. The drive pattern should be centered on the tooth. There should be some clearance between the pattern and the top of the tooth.		Desirable pattern. The coast pattern should be centered on the tooth, but may be slightly toward the toe. There should be some clearance between the pattern and the top of the tooth.	None
	Top heel contact		Top toe contact	Backlash correct. Thicker pinion position shim required.
	Root toe contact		Root heel contact	Backlash correct. Thinner pinion position shim required.
	Top heel contact		Top heel contact	Pinion position shim correct. Decrease backlash.
	Root toe contact		Root toe contact	Pinion position shim correct. Increase backlash.

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Fig. 100: Pattern Interpretation (Gear Cut 2 Axis)

Courtesy of CHRYSLER LLC

DIFFERENTIAL BEARING PRELOAD CHECK



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Fig. 101: Pinion Rotation Torque & Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

With an inch pound torque wrench (2) measure Total Torque To Rotate (TTTR). This is the final check on the differential assembly before installing the axle shafts. This will verify the correct differential bearing preload.

Total Torque to Rotate is, Pinion Torque To Rotate (PTTR) plus:

Gear Ratio 3.21: 0.34 - 1.24 N.m (3 - 10.9 in. lbs.)

Gear Ratio 3.55: 0.48 - 0.78 N.m (4.2 - 6.9 in. lbs.)

Gear Ratio 3.73: 0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)

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NOTE: If TTTR is high, decrease the shim thickness equally on both sides of the differential and check TTTR again. If TTTR is low, increase the shims thickness equally on both sides of the differential and check TTTR again.

SPECIFICATIONS

FRONT AXLE - 186FIA

AXLE SPECIFICATIONS

DESCRIPTION	SPECIFICATION	
Axle Ratio	3.21/3.55/3.73	
Ring Gear Diameter	186 mm (7.33 in.)	
Ring Gear Backlash	0.12 - 0.20 mm (0.005 - 0.008 in.)	
Pinion Torque To Rotate: Original Bearings	1 - 2.2 N.m (10 - 20 in. lbs.)	
Pinion Torque To Rotate: New Bearings	1.7 - 2.8 N.m (15 - 25 in. lbs.)	
Total Torque To Rotate is Pinion Torque To Rotate plus: -		
Gear Ratio 3.21	0.53 - 0.87 N.m (4.6 - 7.7 in. lbs.)	
Gear Ratio 3.55	0.48 - 0.78 N.m (4.2 - 6.9 in. lbs.)	
Gear Ratio 3.73	0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)	

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Ring Gear Bolts	108	80	-
Differential Bearing Cap Bolts	54 - 68	39 - 50	-
Drain Trough Nut	23	-	200
Differential Cover Bolts	19 - 26	14 - 19	-
Pinion Nut	217 - 352	160 - 260	-
Rear Axle Bracket Bolts	88	65	-
Front Axle Brackets To Frame Nut	61	45	-
Front Axle Bracket to Axle Nuts	61	45	-
Right Axle Bracket Nut	61	45	-

SPECIAL TOOLS

FRONT AXLE - 186FIA

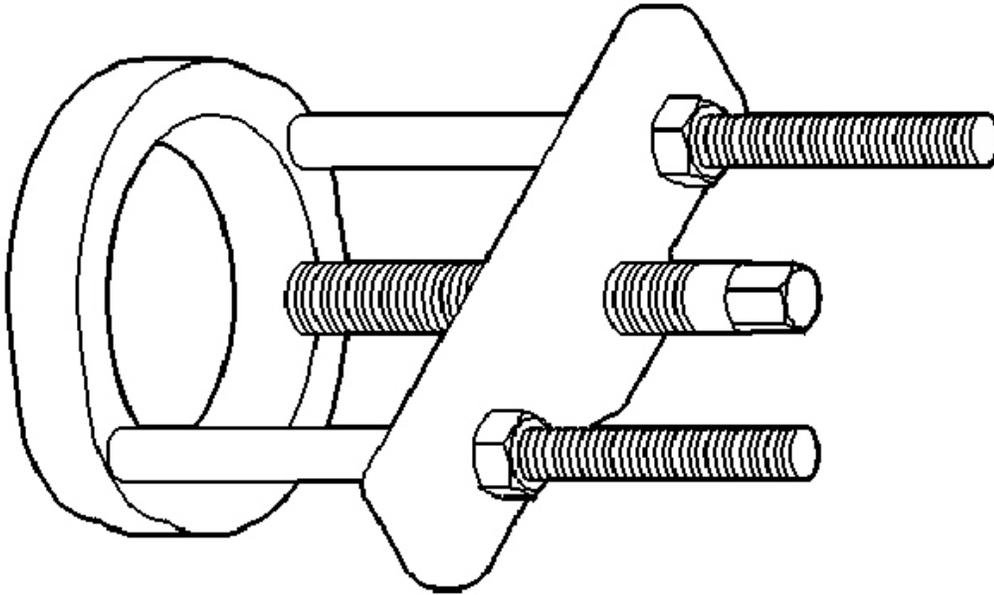


Fig. 102: Puller C-293-PA
Courtesy of CHRYSLER LLC

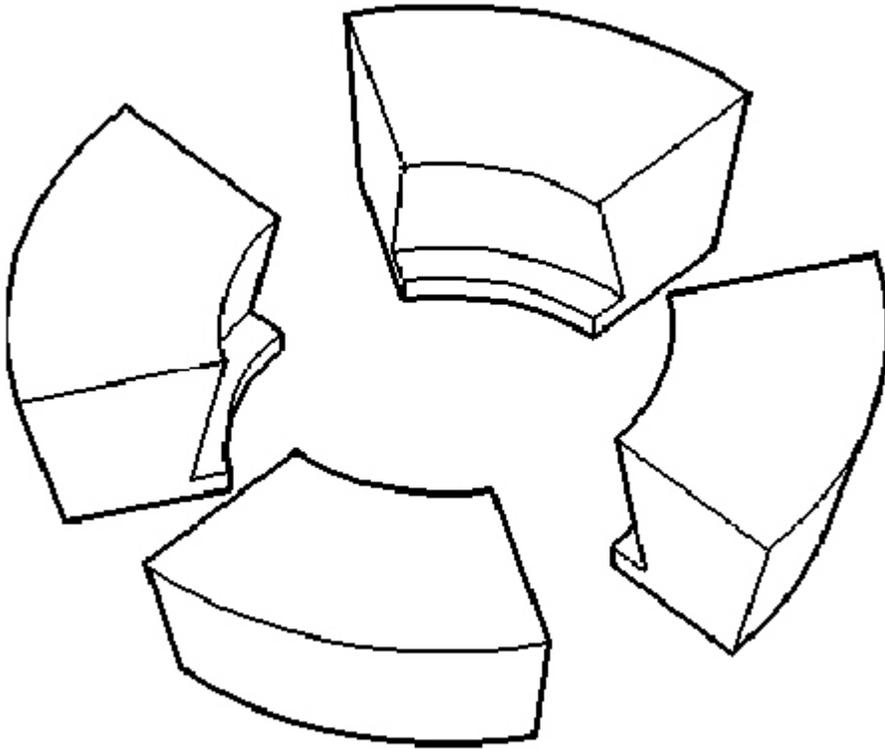


Fig. 103: Adapter C-293-39
Courtesy of CHRYSLER LLC

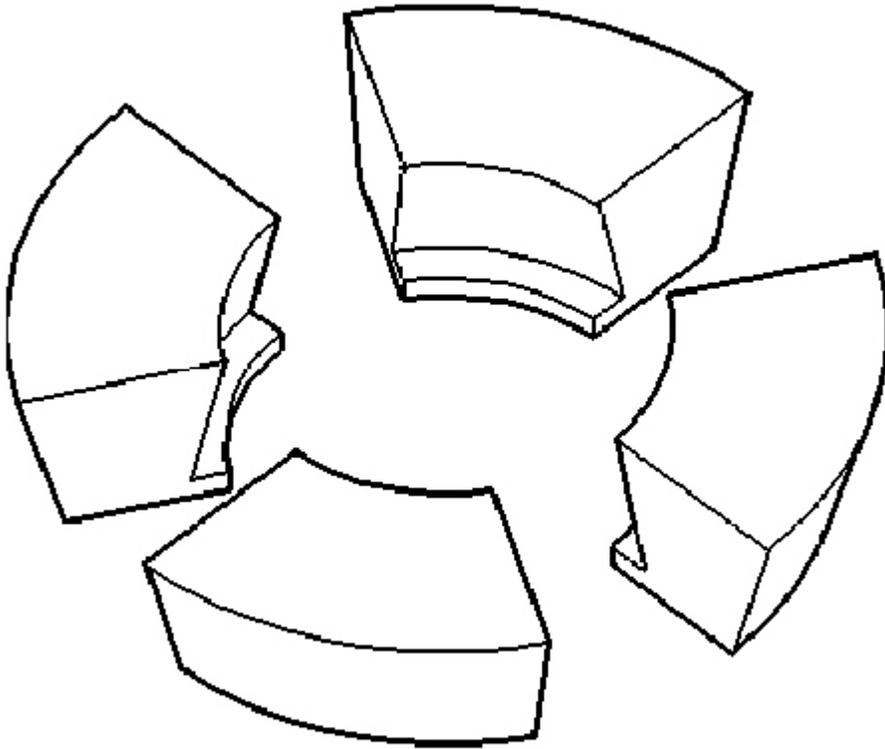


Fig. 104: Adapter C-293-42
Courtesy of CHRYSLER LLC

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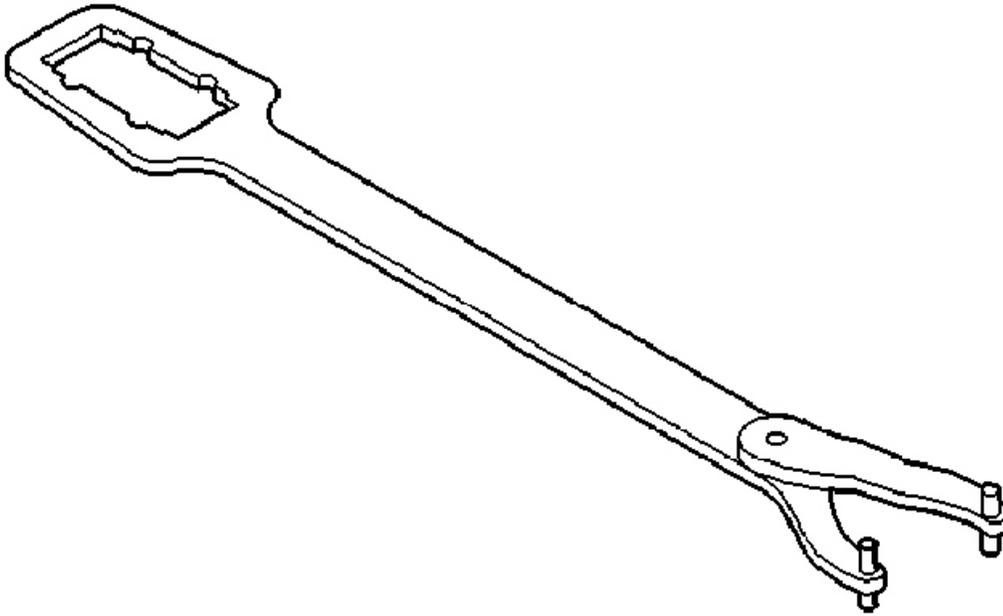


Fig. 105: Flange Holder C-3281
Courtesy of CHRYSLER LLC

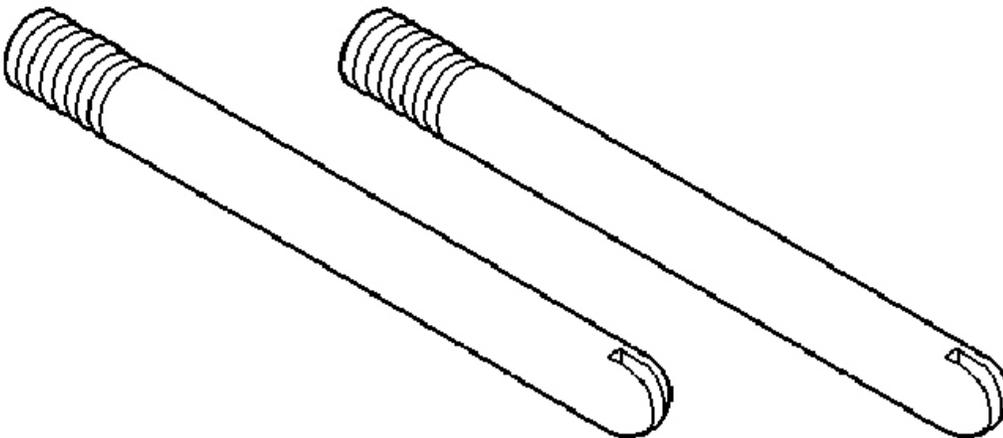
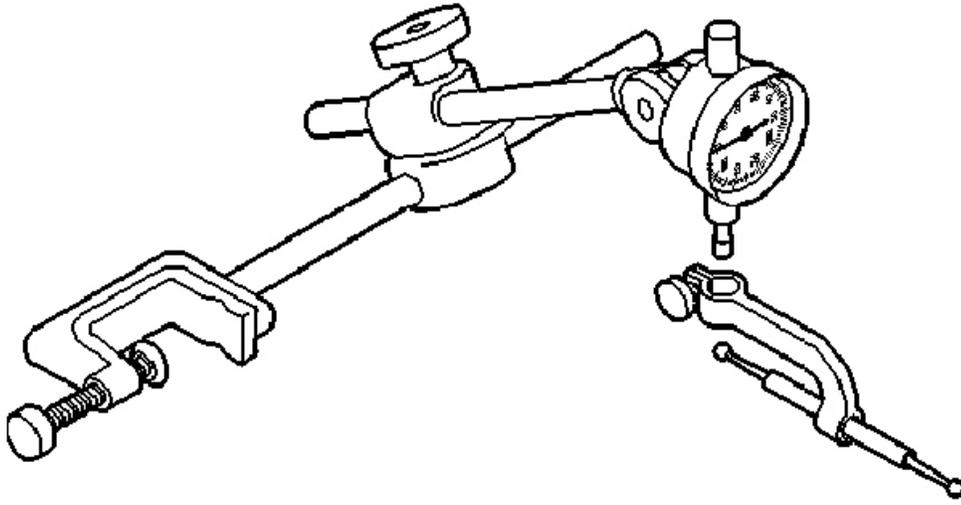


Fig. 106: Pilot Stud C-3288-B
Courtesy of CHRYSLER LLC

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Fig. 107: Dial Indicator C-3339
Courtesy of CHRYSLER LLC

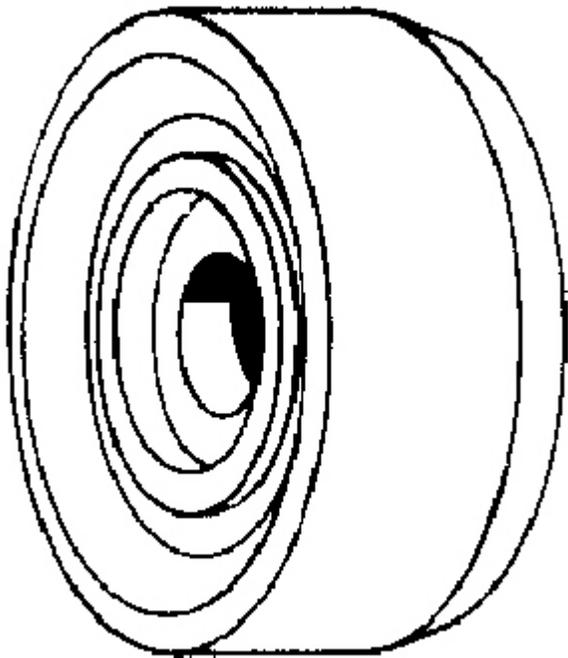


Fig. 108: Installer C-3716-A
Courtesy of CHRYSLER LLC

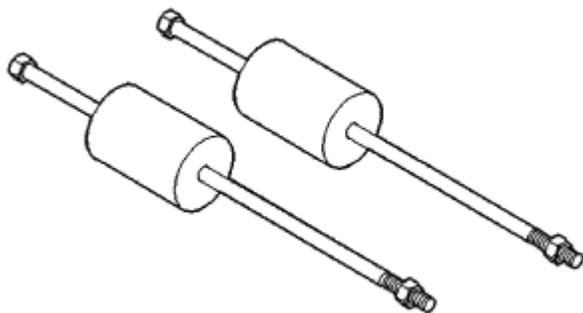


Fig. 109: Slide Hammer C-3752
Courtesy of CHRYSLER LLC

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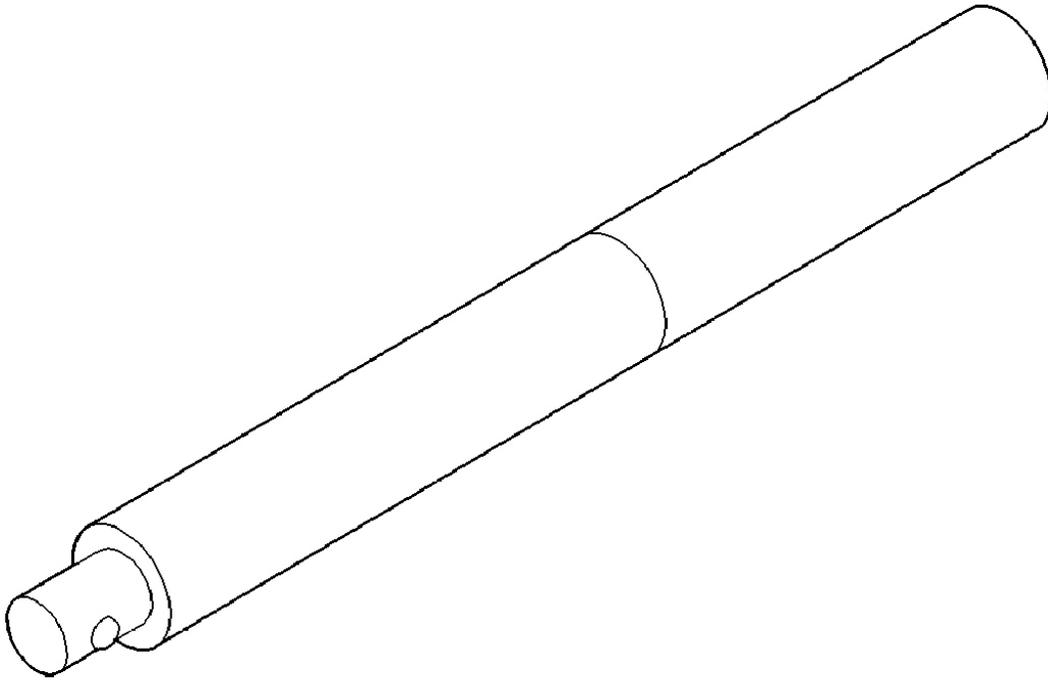


Fig. 110: Handle C-4171
Courtesy of CHRYSLER LLC

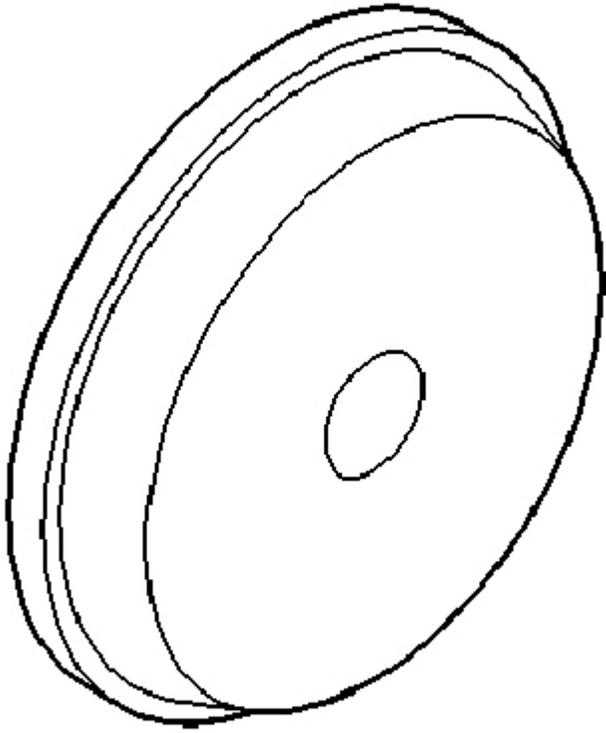


Fig. 111: Installer C-4308
Courtesy of CHRYSLER LLC

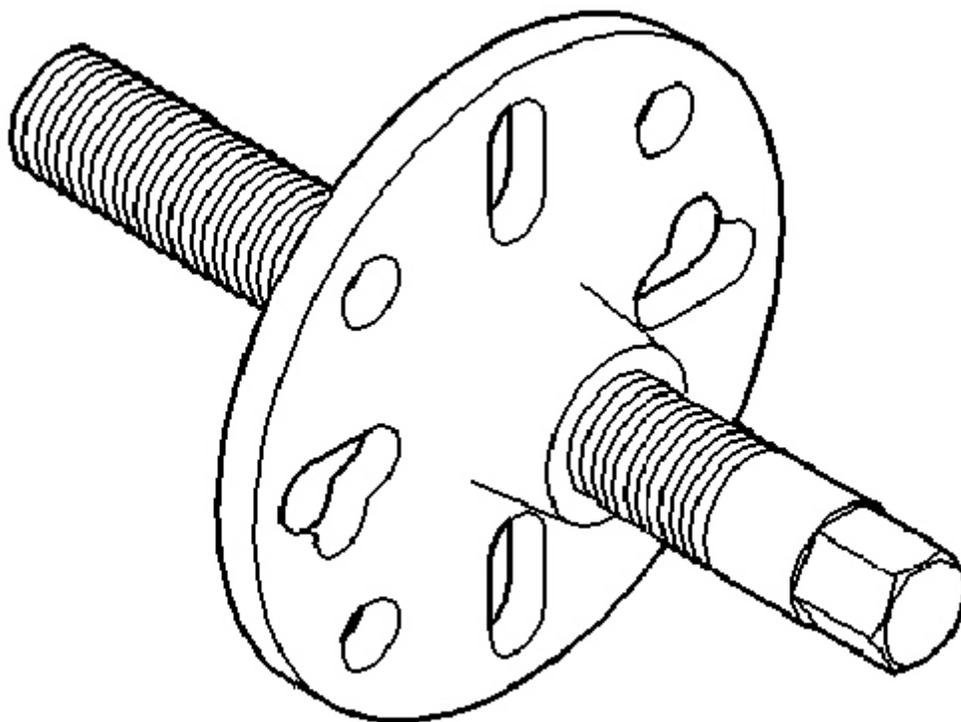


Fig. 112: Puller C-452
Courtesy of CHRYSLER LLC

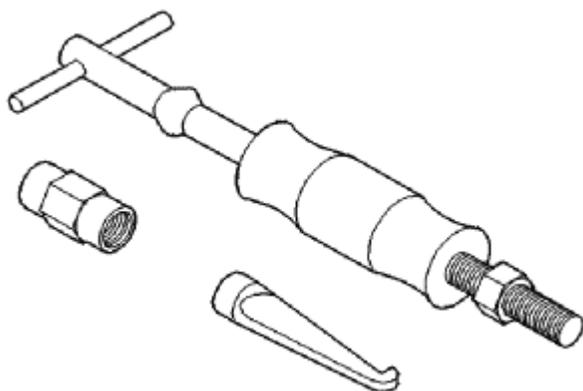


Fig. 113: Slide Hammer C-637
Courtesy of CHRYSLER LLC

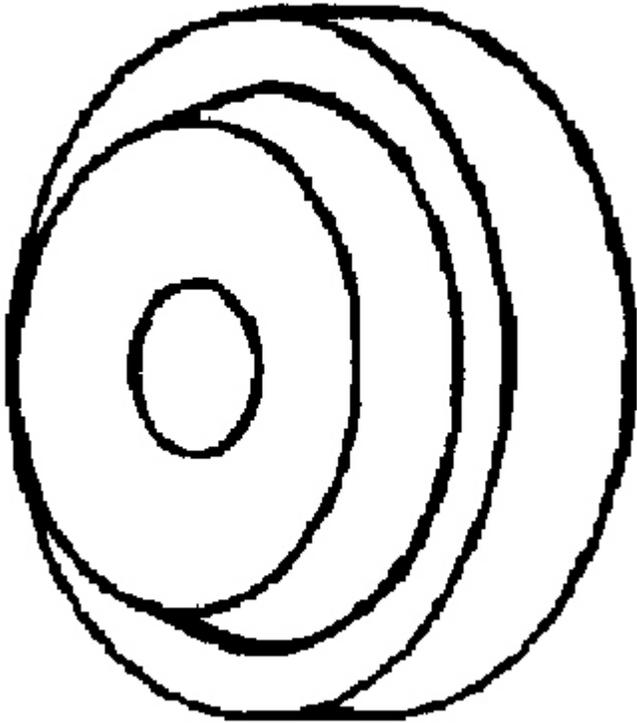


Fig. 114: Installer D-146
Courtesy of CHRYSLER LLC

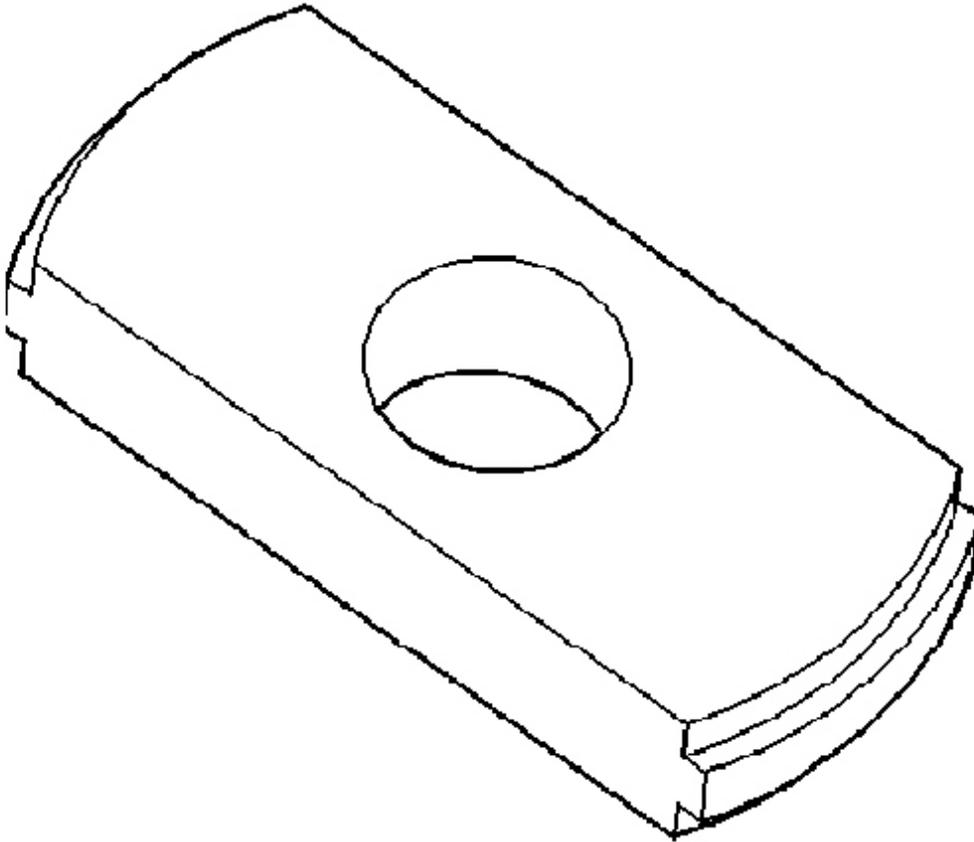


Fig. 115: Remover D-149
Courtesy of CHRYSLER LLC

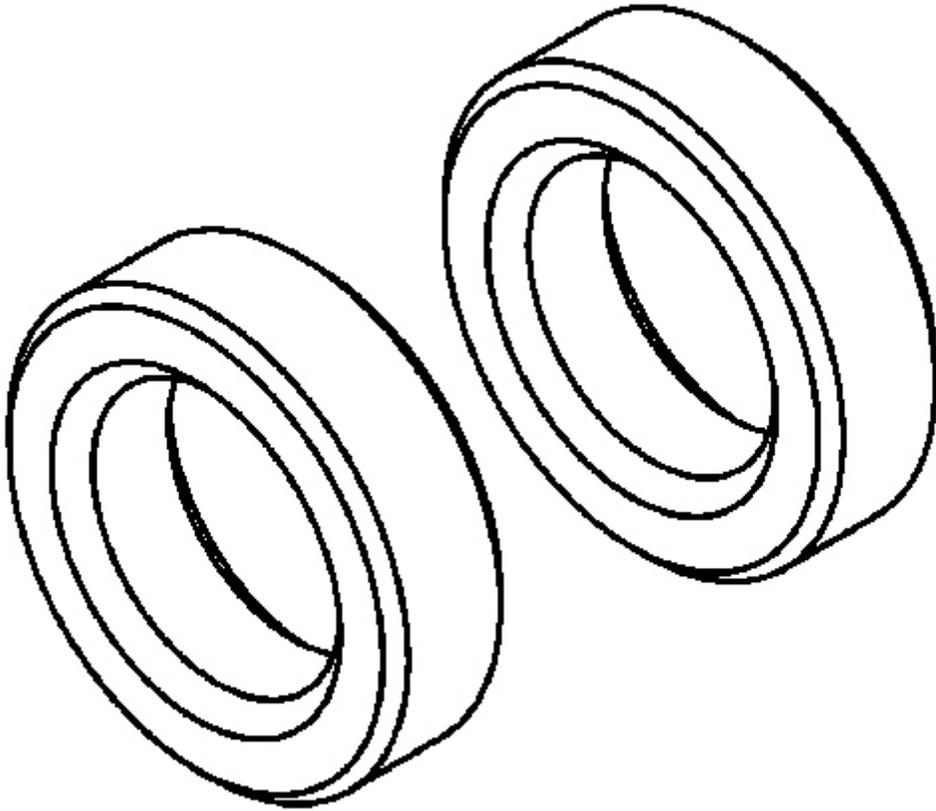


Fig. 116: Dummy Bearings D-348
Courtesy of CHRYSLER LLC

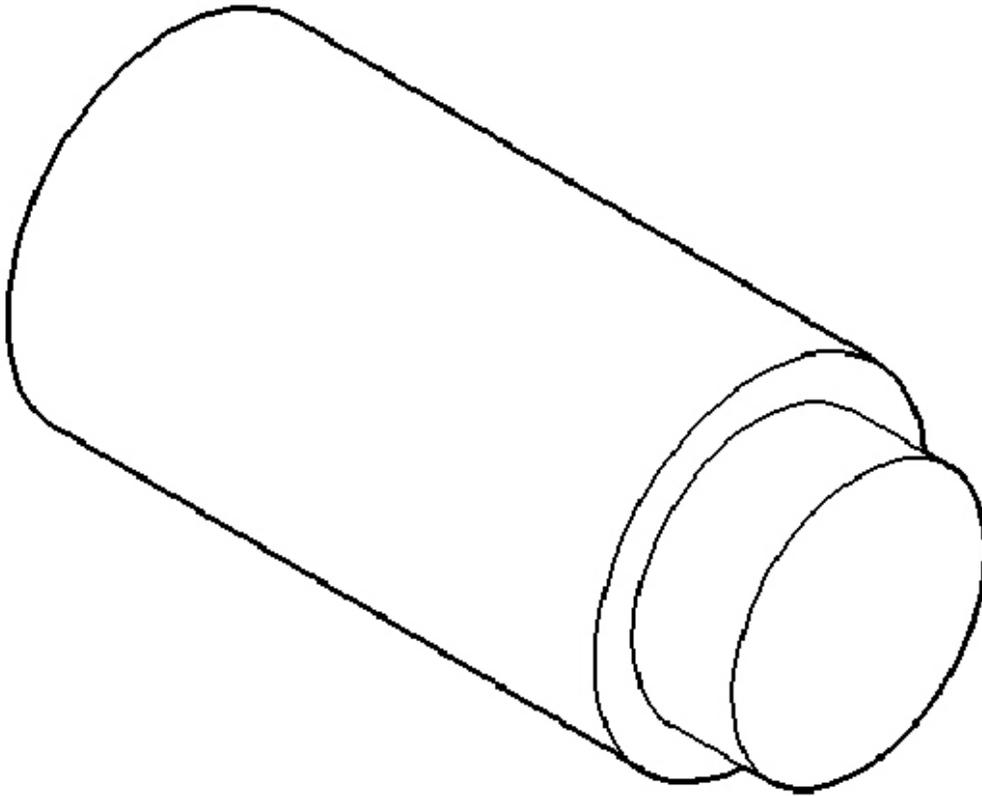


Fig. 117: Plug SP-3289
Courtesy of CHRYSLER LLC

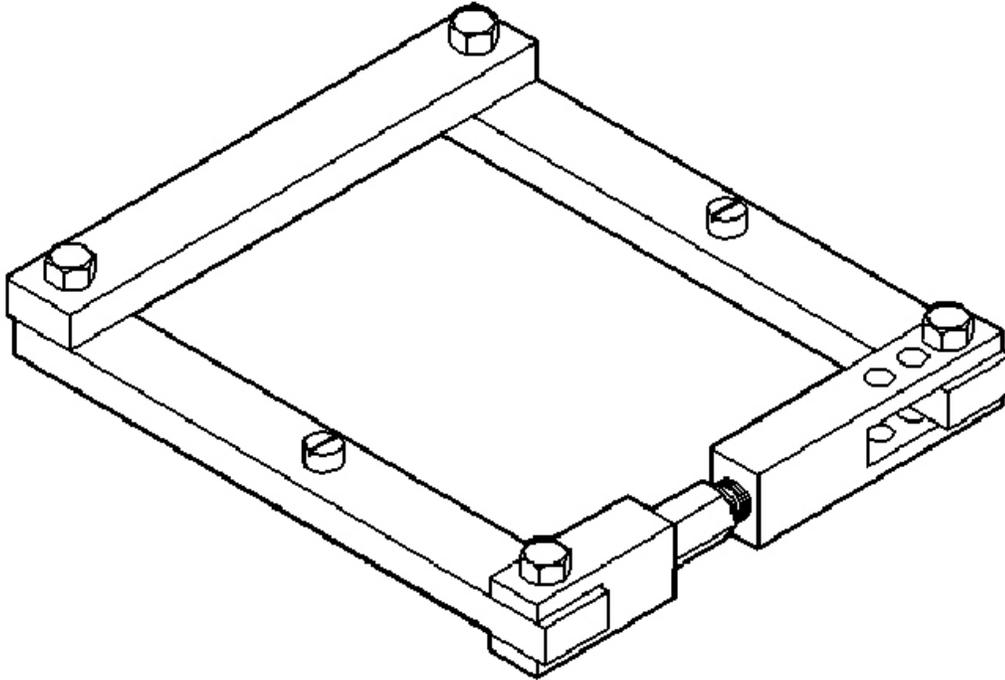


Fig. 118: Spreader W-129-B
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

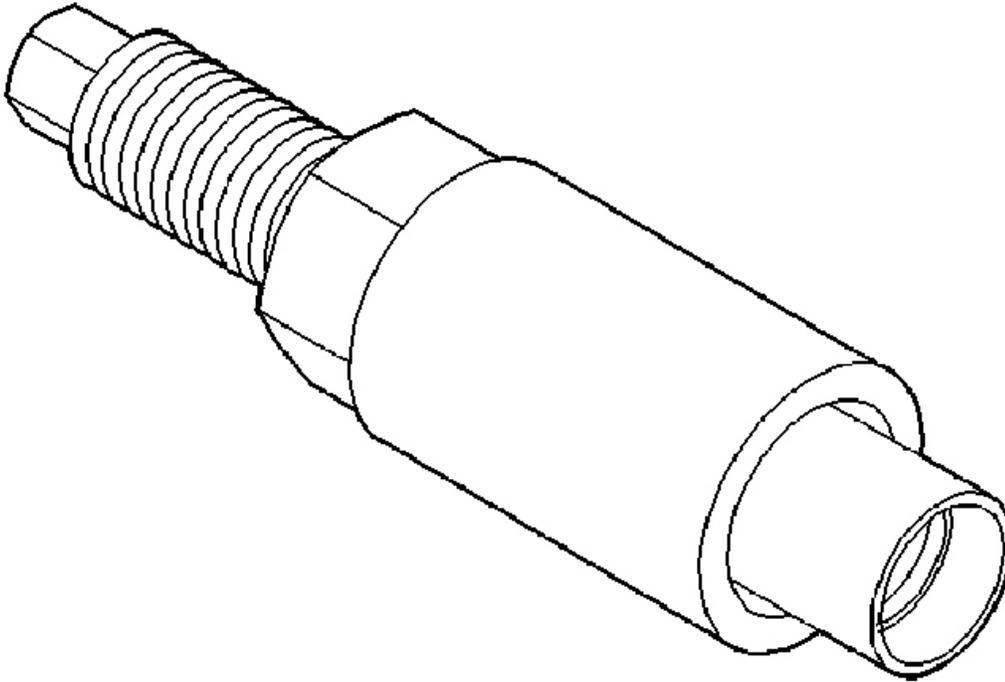


Fig. 119: Installer W-162-D
Courtesy of CHRYSLER LLC

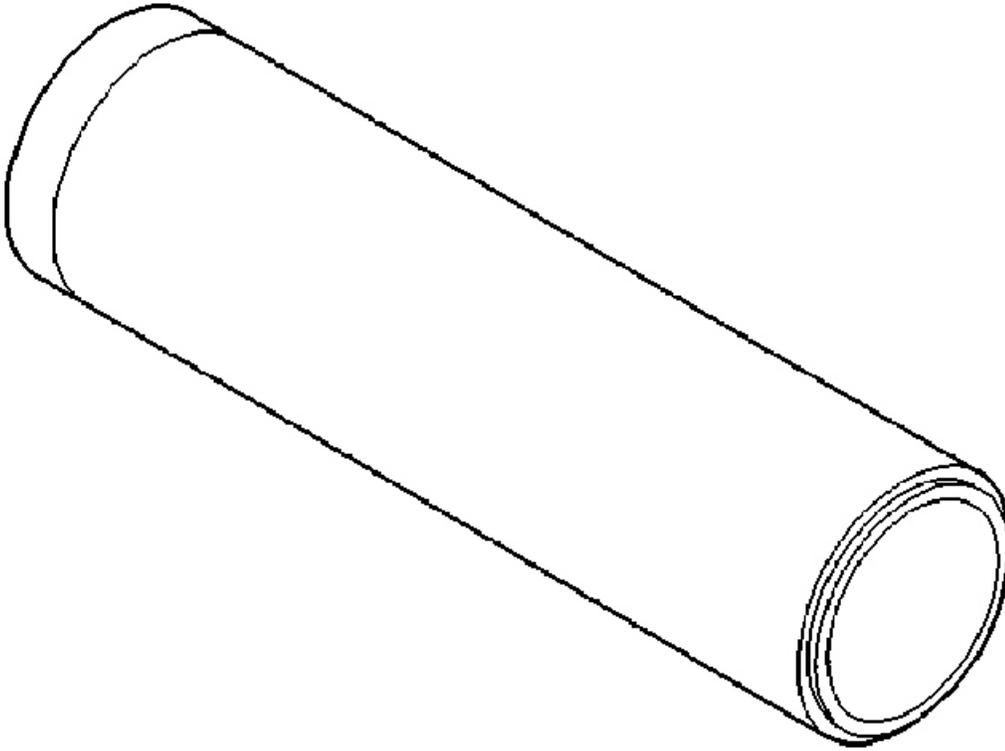


Fig. 120: Installer 6448
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

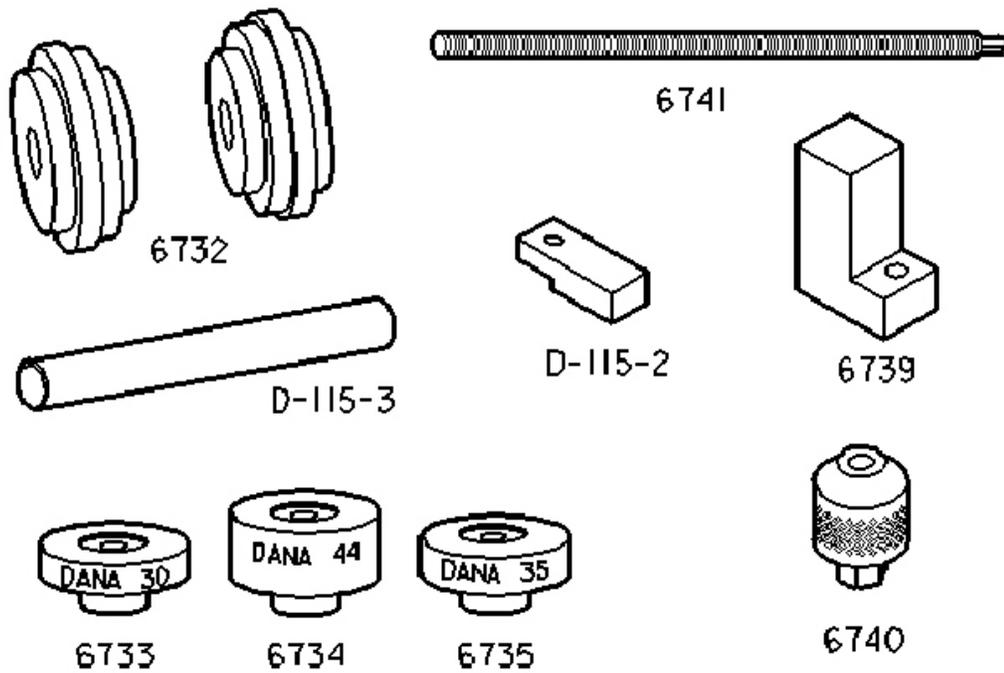


Fig. 121: Pinion Depth Set 6774
Courtesy of CHRYSLER LLC

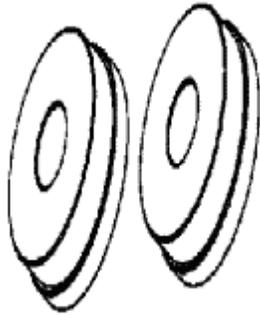


Fig. 122: Arbor Discs 6927A
Courtesy of CHRYSLER LLC

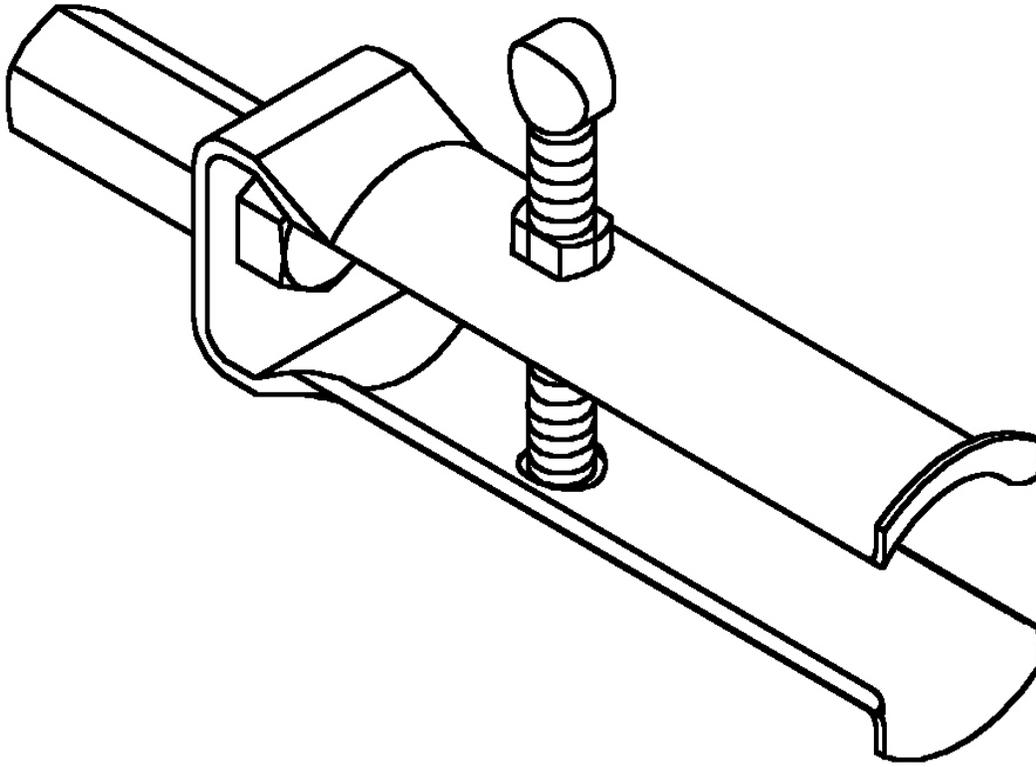


Fig. 123: Remover 7794-A
Courtesy of CHRYSLER LLC

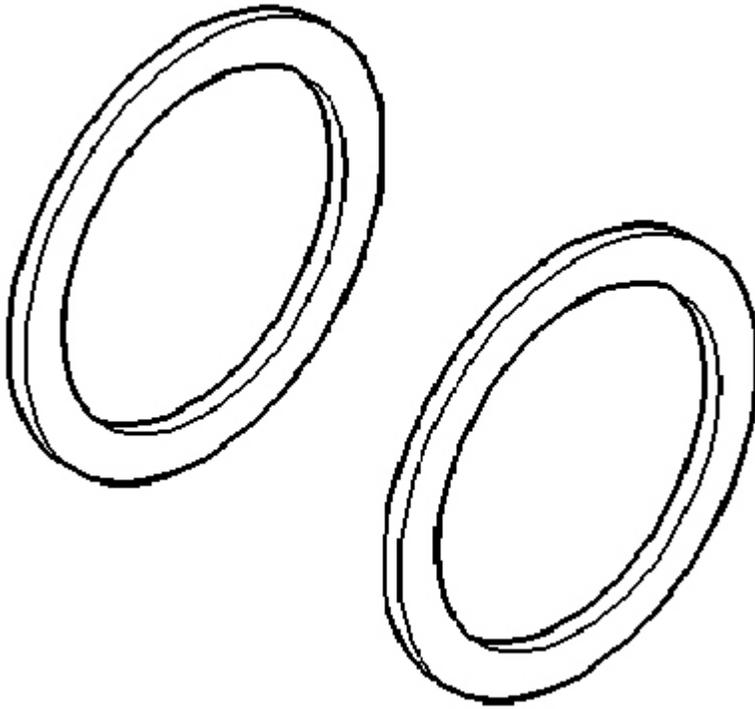


Fig. 124: Dummy Shims 8107
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

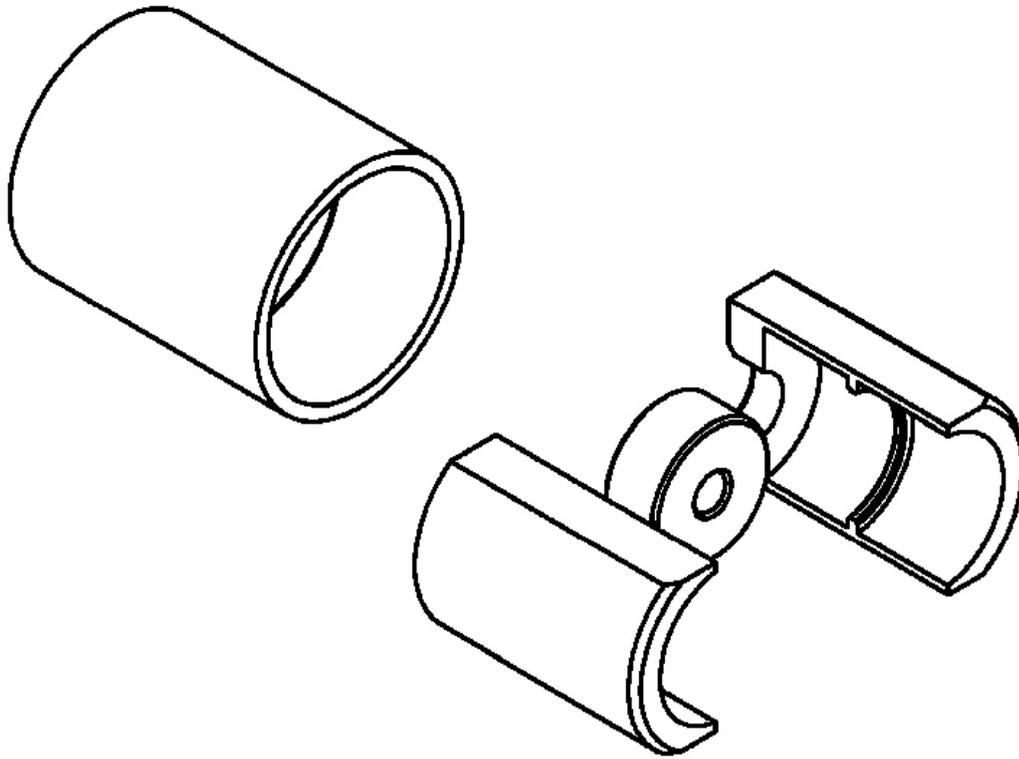


Fig. 125: Remover 8420A
Courtesy of CHRYSLER LLC

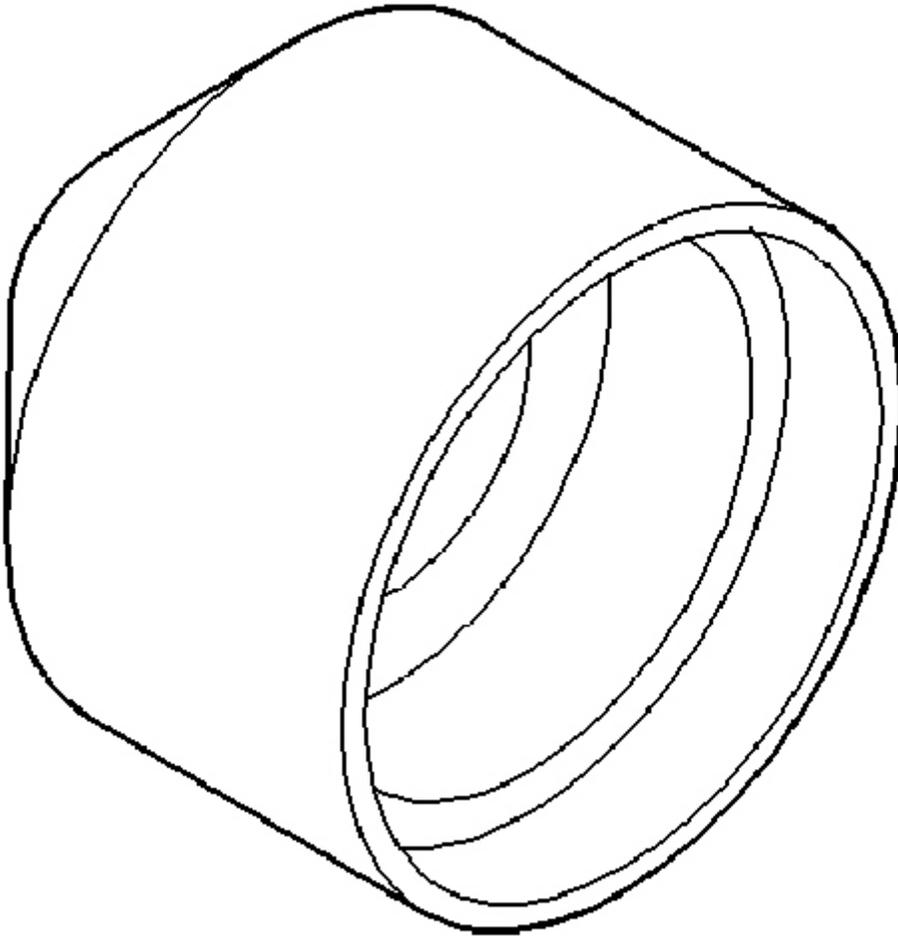


Fig. 126: Installer 8681
Courtesy of CHRYSLER LLC

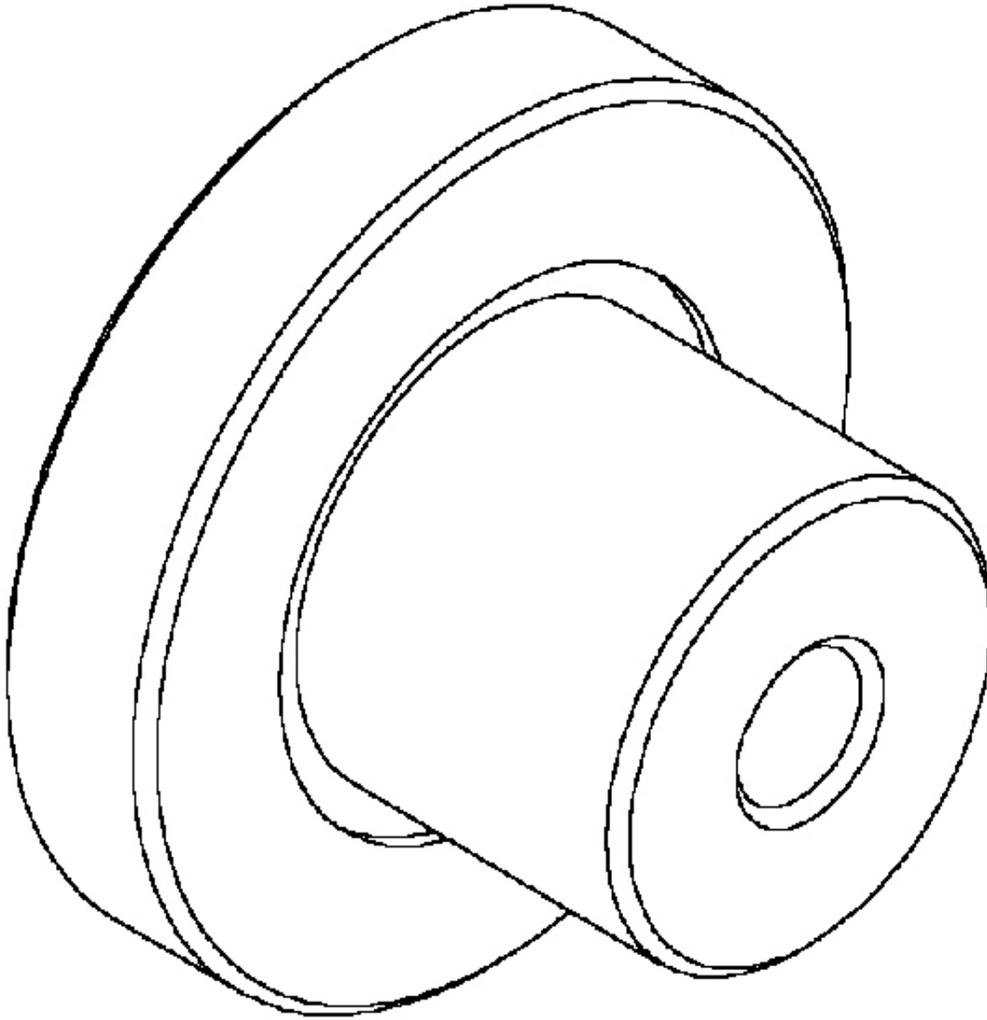


Fig. 127: Pinion Block 8804
Courtesy of CHRYSLER LLC

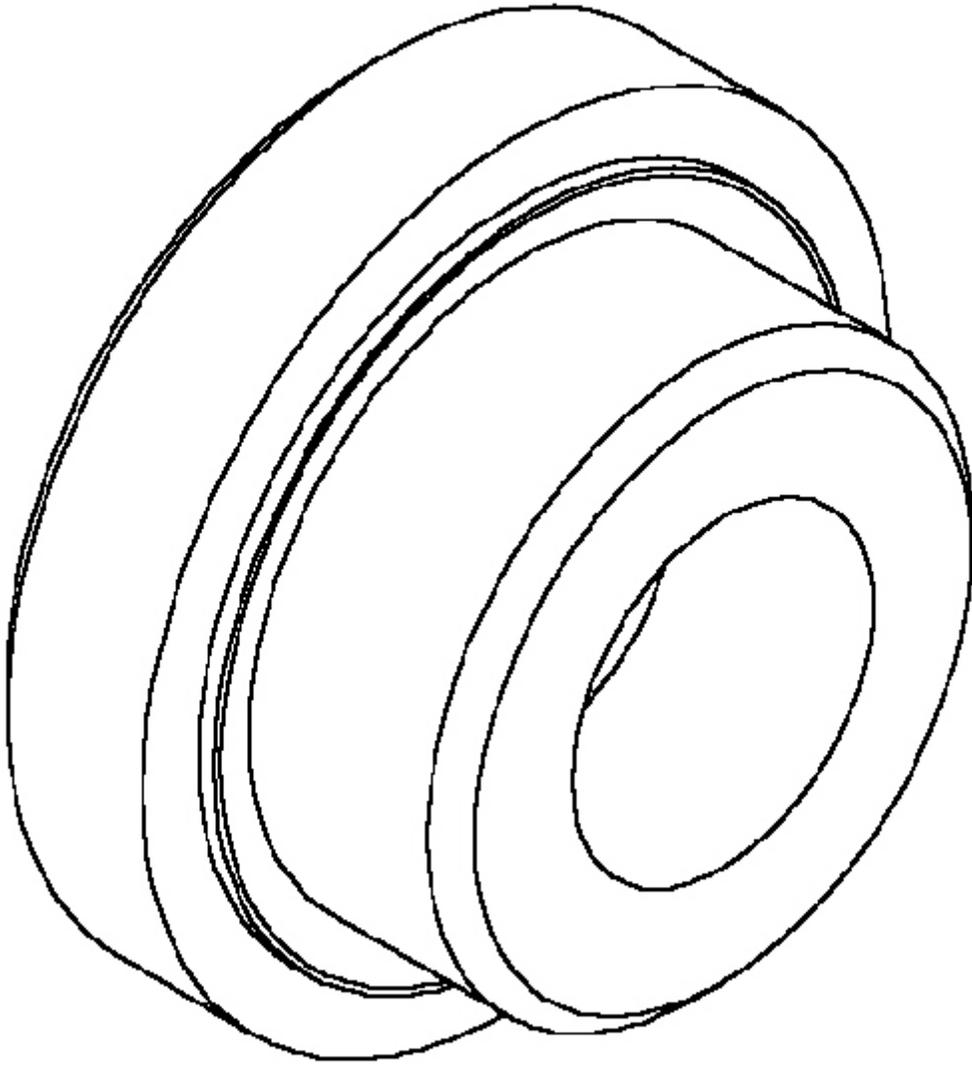


Fig. 128: Installer 8805

Courtesy of CHRYSLER LLC

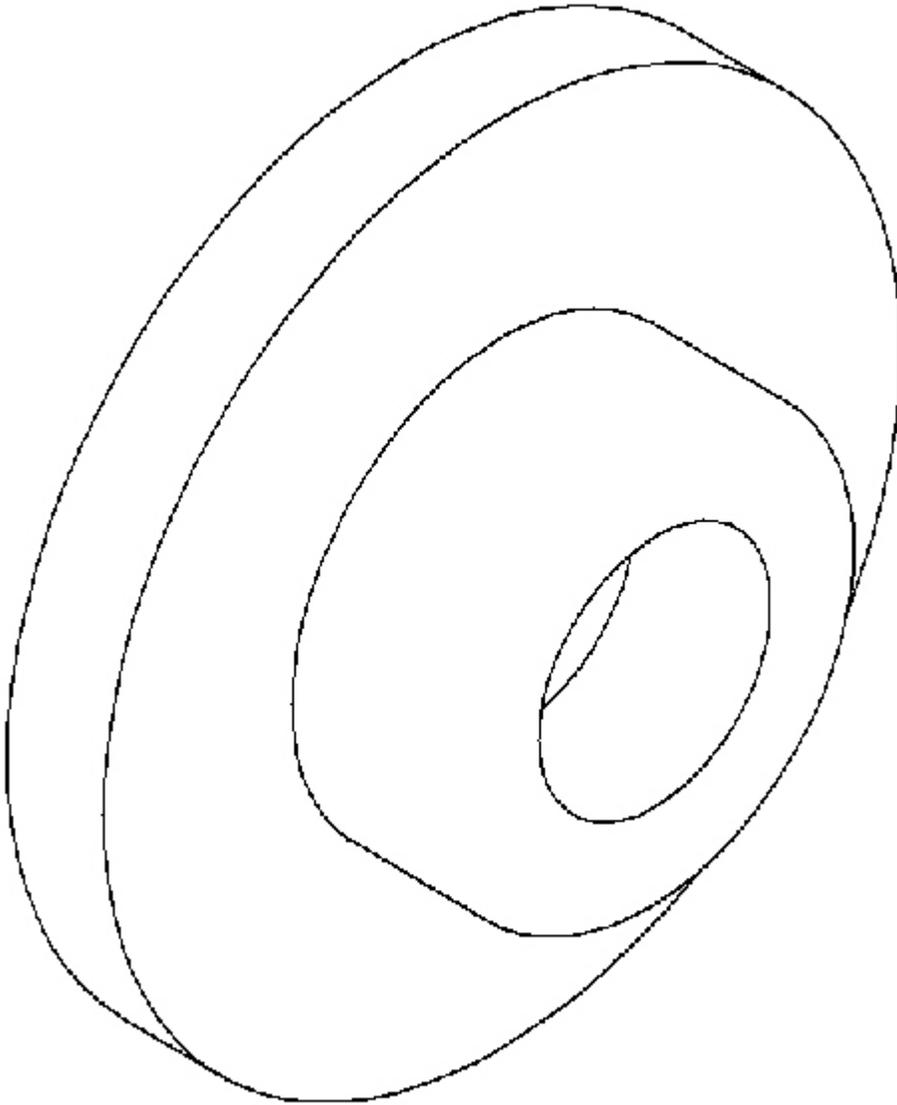


Fig. 129: Installer 8806
Courtesy of CHRYSLER LLC

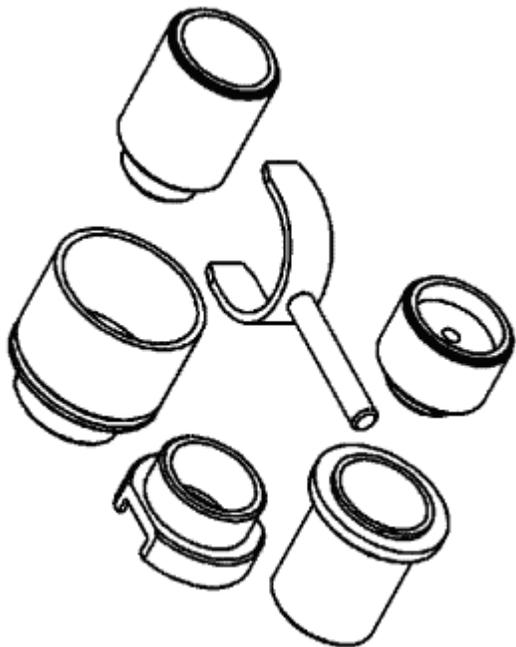


Fig. 130: Remover/Installer 9958
Courtesy of CHRYSLER LLC

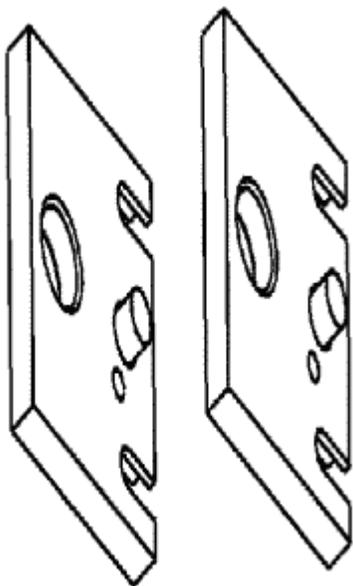


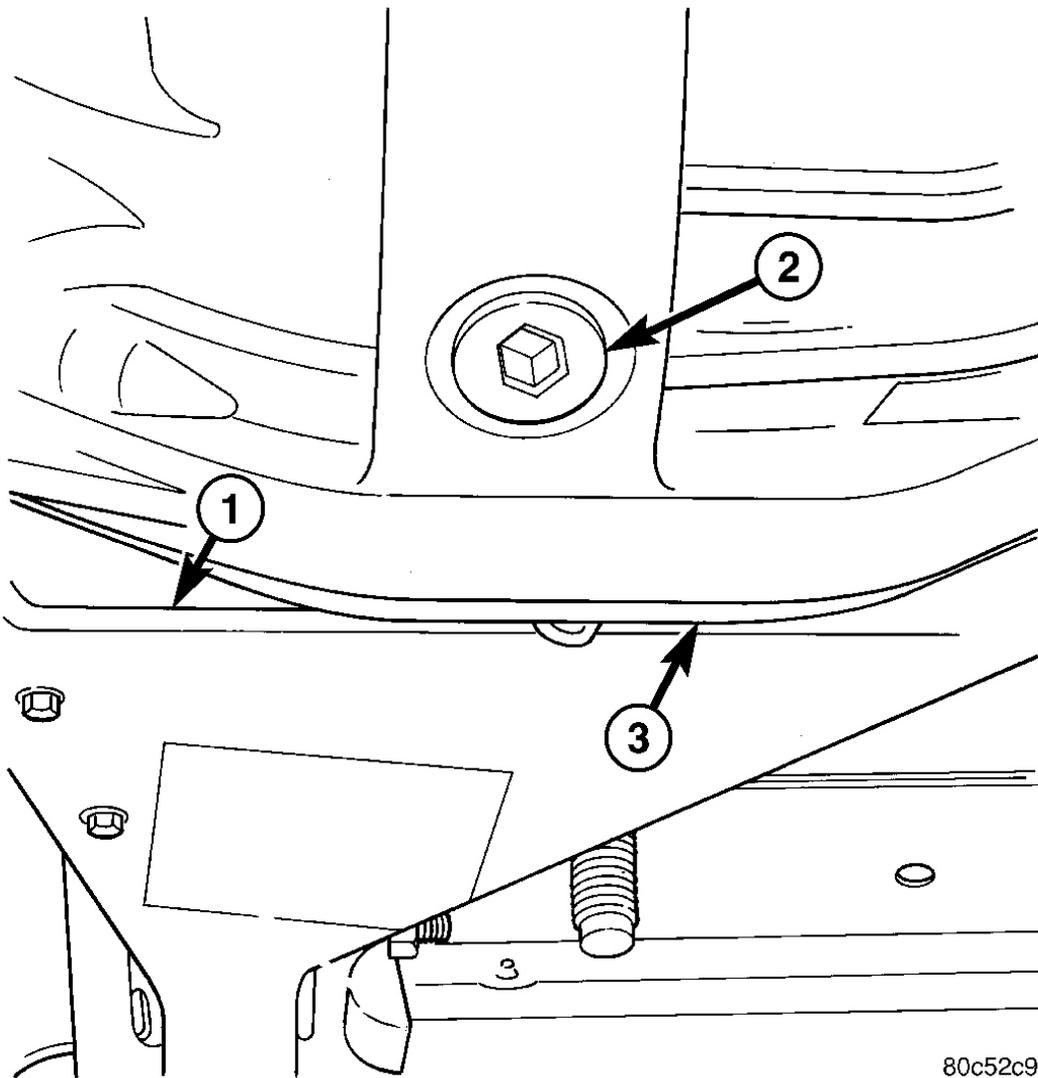
Fig. 131: Adapters 9959

Courtesy of CHRYSLER LLC

COVER-DIFFERENTIAL

REMOVAL

COVER-DIFFERENTIAL



80c52c97

Fig. 132: Identifying Differential Housing & Drain Plug
Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Remove skid plate.

3. Remove drain plug (2) from housing (3) and drain fluid.

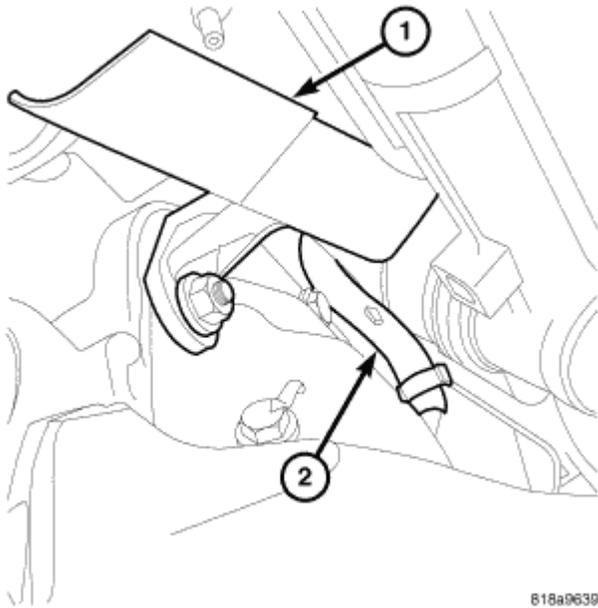


Fig. 133: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

4. Remove oil filter drain tray (1) and vent hose from differential cover.

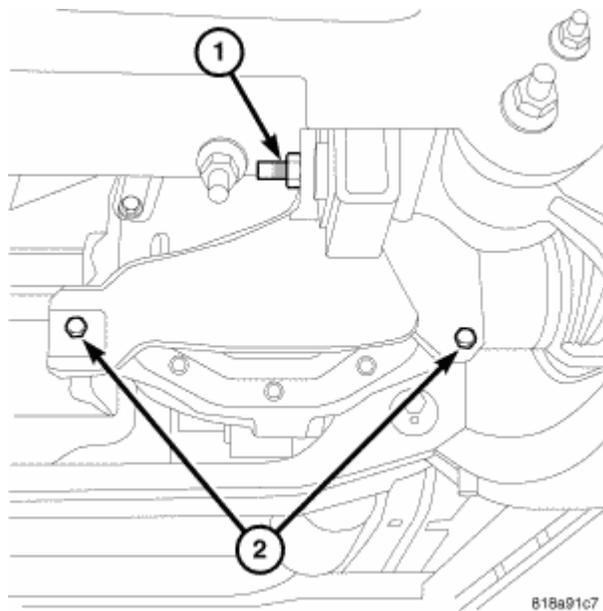


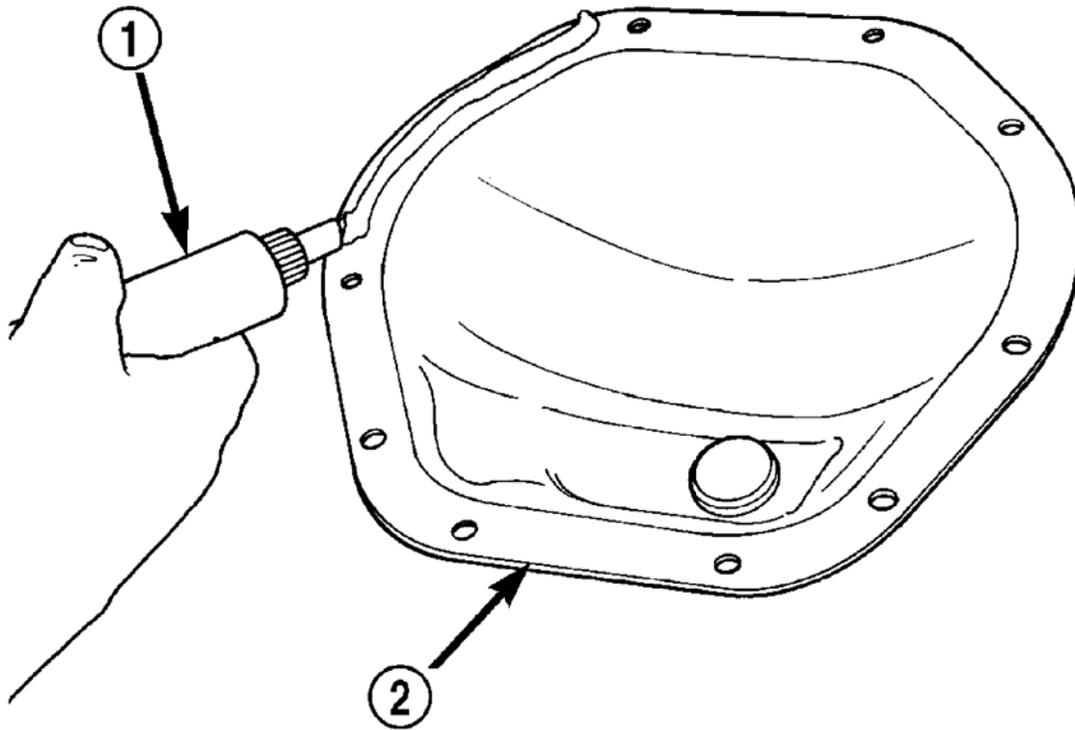
Fig. 134: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
Courtesy of CHRYSLER LLC

5. Loosen front axle bracket bolt (1).
6. Remove front axle bracket bolts (2) from the axle and let bracket hang forward of the axle.

7. Remove differential cover bolts and remove cover.

INSTALLATION

COVER-DIFFERENTIAL

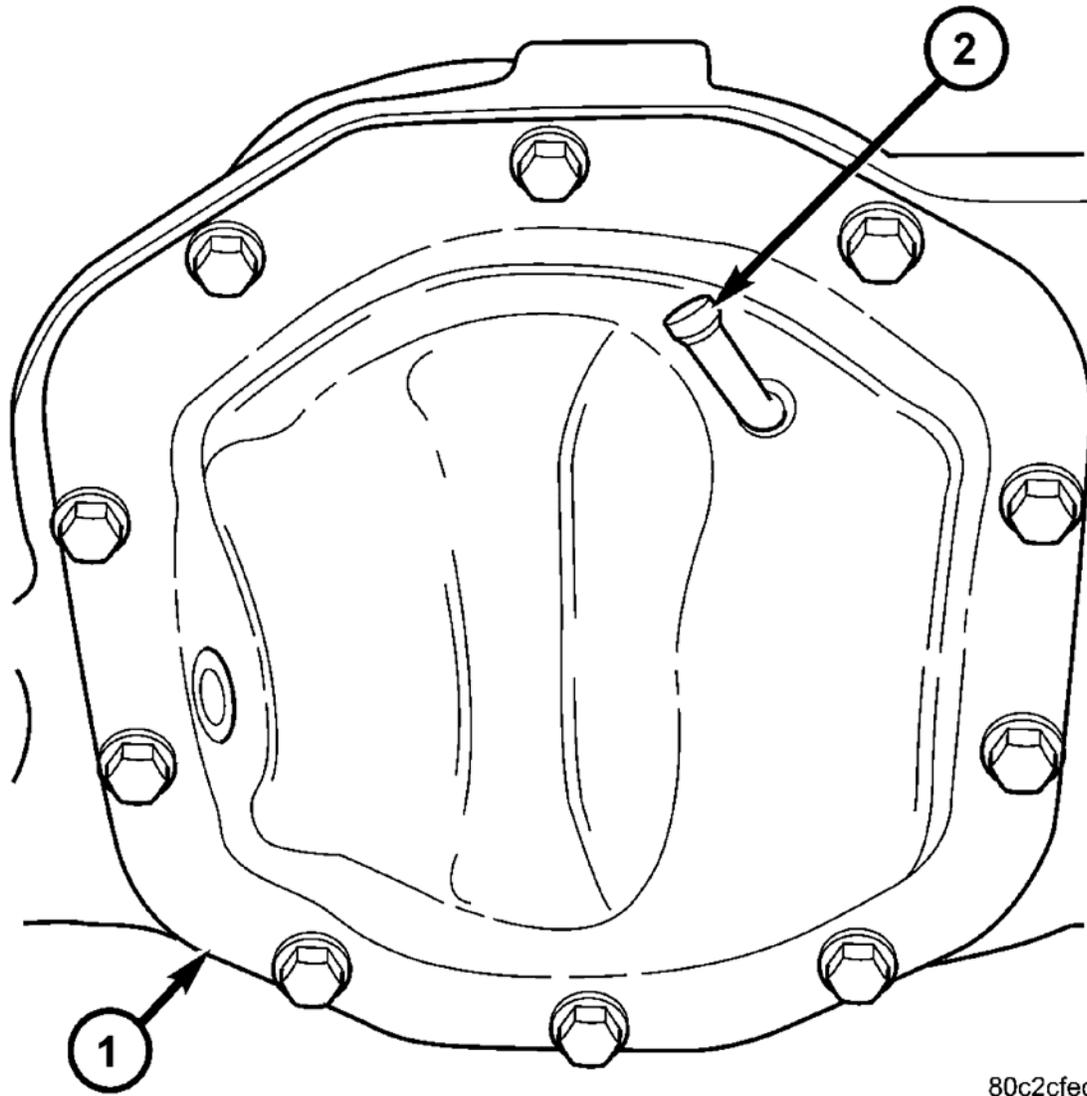


80a534a8

Fig. 135: Applying Bead Of Mopar Axle RTV Sealant To Differential Cover
Courtesy of CHRYSLER LLC

1. Clean cover and mating surface.
2. Apply a bead of Mopar Axle RTV sealant (1) or equivalent to the differential cover (2).

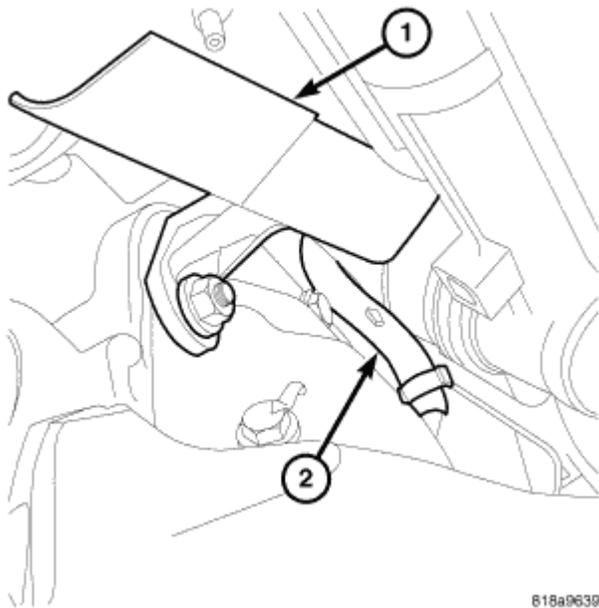
CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will result in a leak.



80c2cfed

Fig. 136: Removing/Installing Differential Housing Cover
Courtesy of CHRYSLER LLC

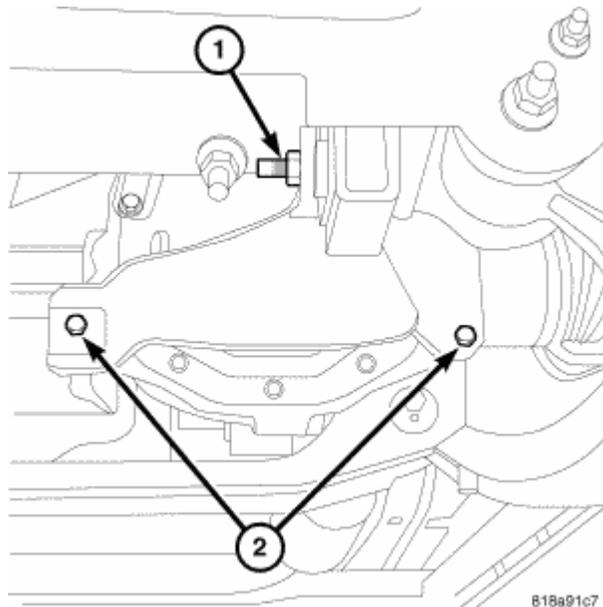
3. Install differential housing cover (1) and tighten bolts in a criss-cross pattern to 19-26 N.m (14-19 ft. lbs.).



818a9639

Fig. 137: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

4. Install oil filter drain tray (1) and tighten nut to 23 N.m (200 in. lbs.).
5. Install vent hose (2) on differential cover with new clamp.



818a91c7

Fig. 138: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
Courtesy of CHRYSLER LLC

6. Install front axle bracket bolts (2) and nuts. Tighten nuts to 61 N.m (45 ft. lbs.).
7. Tighten front axle bracket cradle nut (1) to 61 N.m (45 ft. lbs.).
8. Install skid plate.

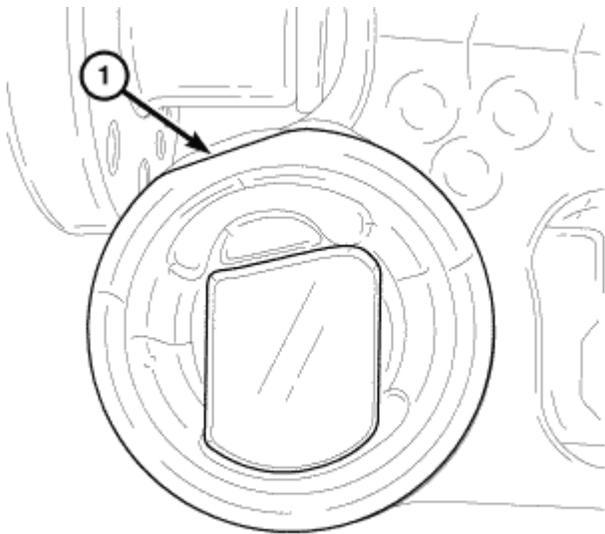
BUSHING-AXLE

REMOVAL

BUSHING-AXLE

CAUTION: Bushing must be installed in the original location ± 2 degrees. Failure to follow these instruction will result in a NVH problem.

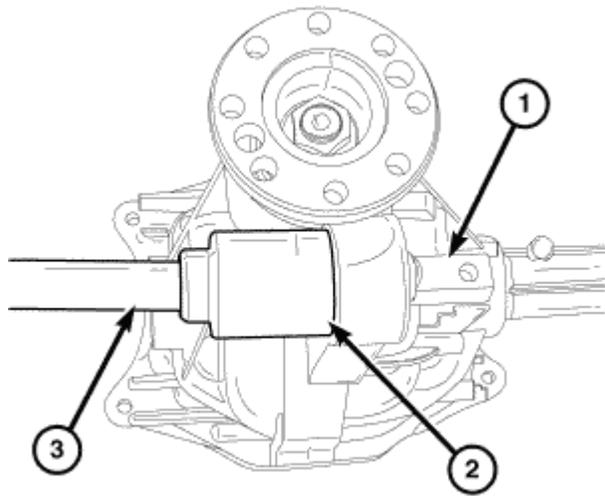
PINION NOSE BUSHING



81d07c3

Fig. 139: Marking Bushing Flange Flat Location On Axle For Installation Reference
Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle for installation reference.

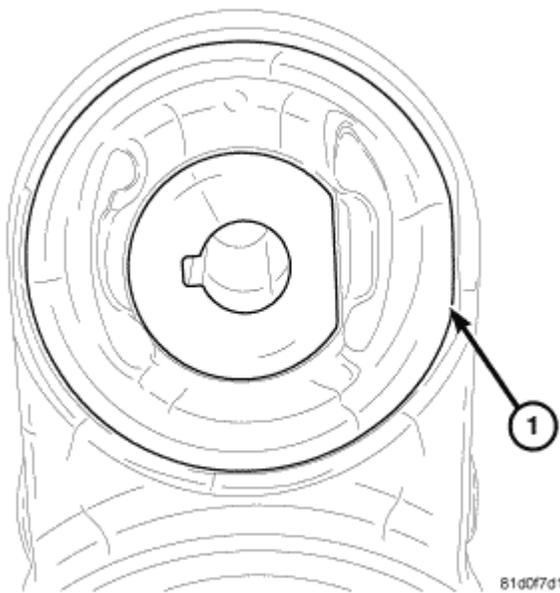


81d0fb1

Fig. 140: Removing Pinion Nose Bushing With Remover 9958-5 And Handle C-4171
Courtesy of CHRYSLER LLC

2. Remove pinion nose bushing (1) with Remover 9958-5 (2) and Handle C-4171 (3). Drive bushing out with a hammer.

AXLE TUBE BUSHING



81d0f7d1

Fig. 141: Marking Bushing Flange Flat Location On Axle For Installation Reference
Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle for installation reference.

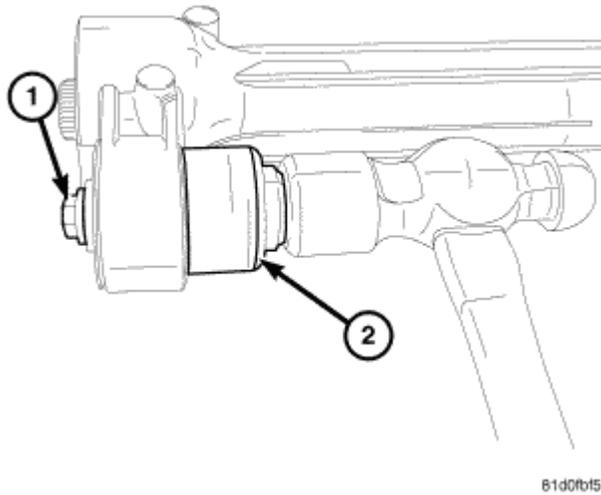


Fig. 142: Identifying Bolt & Remover 9958-3
Courtesy of CHRYSLER LLC

2. Bolt (1) Remover 9958-3 (2) to axle tube bushing. Drive bushing out with a hammer.

AXLE BRACKET BUSHING

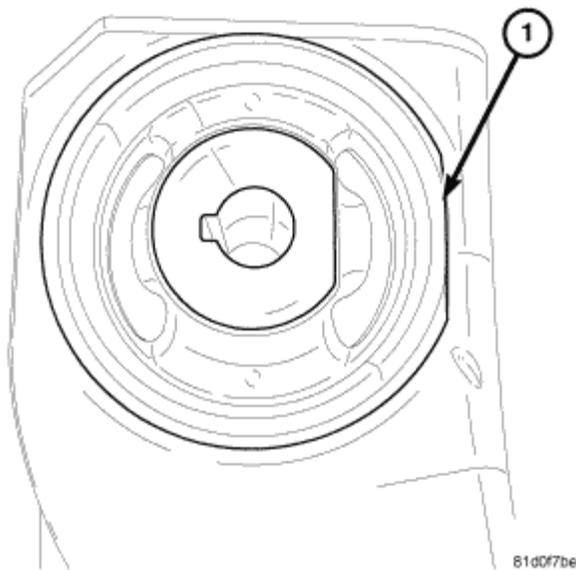


Fig. 143: Identifying Bushing Flange Flat Location
Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle bracket for installation reference.

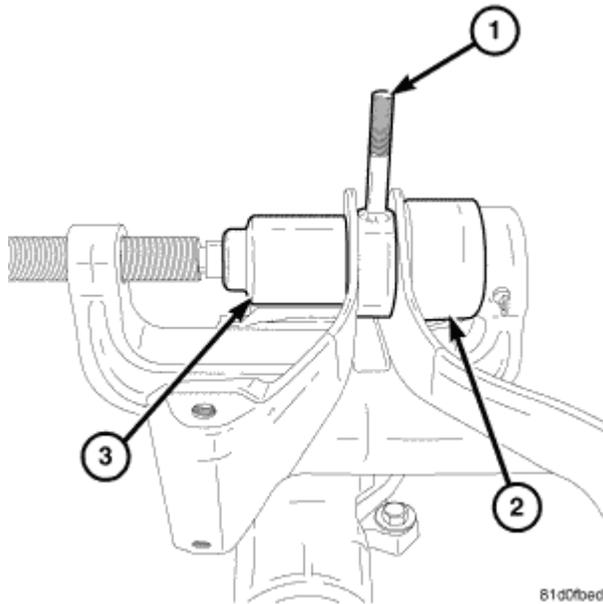


Fig. 144: Identifying Spacer 9958-1, Receiver 9958-6 & Remover 9958-5
Courtesy of CHRYSLER LLC

2. Clamp Press C-4212F into vise.
3. Place Spacer 9958-1 (1) over bushing in the bracket. Press bushing out of the bracket into Receiver 9958-6 (1) with Remover 9958-5 (3) and Press C-4212F.

INSTALLATION

BUSHING-AXLE

CAUTION: Bushing must be installed in the original location ± 2 degrees. Failure to follow these instruction will result in damaging the bushing and a NVH problem.

PINION NOSE BUSHING

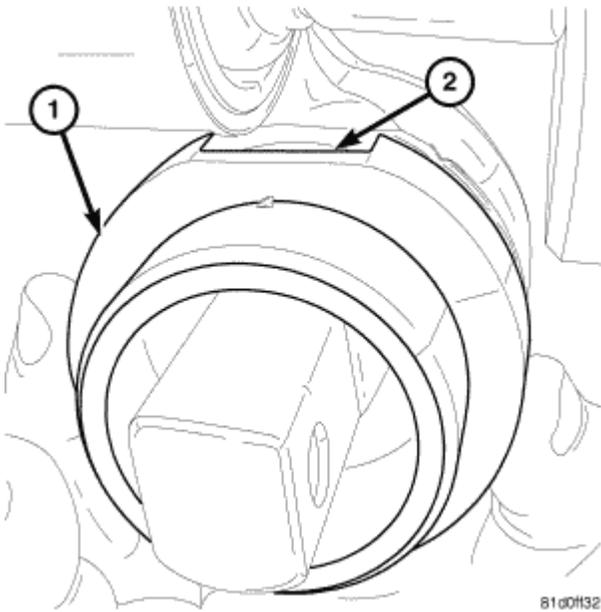


Fig. 145: Identifying Receiver 9958-2 & Flat Spots
Courtesy of CHRYSLER LLC

1. Start bushing in axle housing with bushing reference mark aligned.
2. Center one of the Receiver 9958-2 (1) flat spots (2) under pinion for tool clearance.

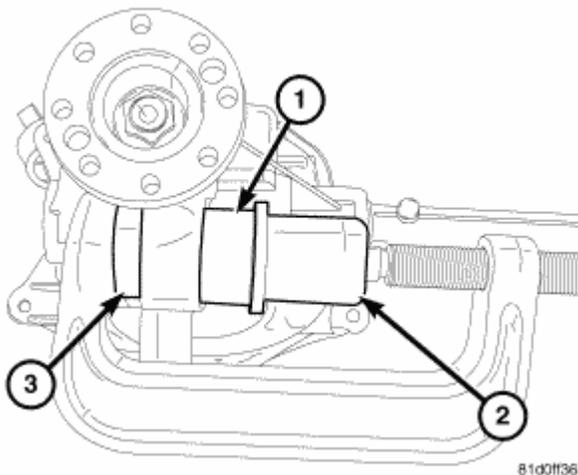
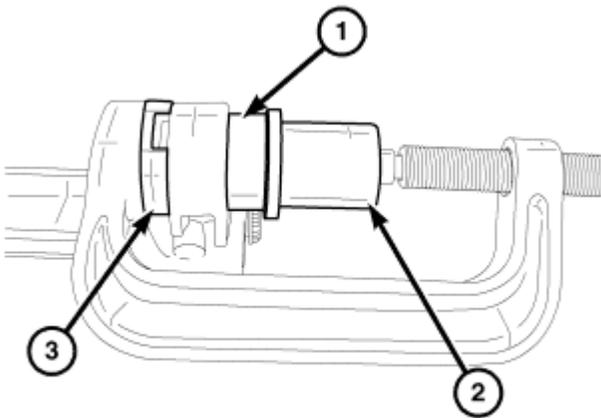


Fig. 146: Installing Bushing With Installer 9958-3, Receiver 9958-2 And Press C-4212F
Courtesy of CHRYSLER LLC

3. Install bushing (1) with Installer 9958-3 (2) Receiver 9958-2 (3) and Press C-4212F.

AXLE TUBE BUSHING

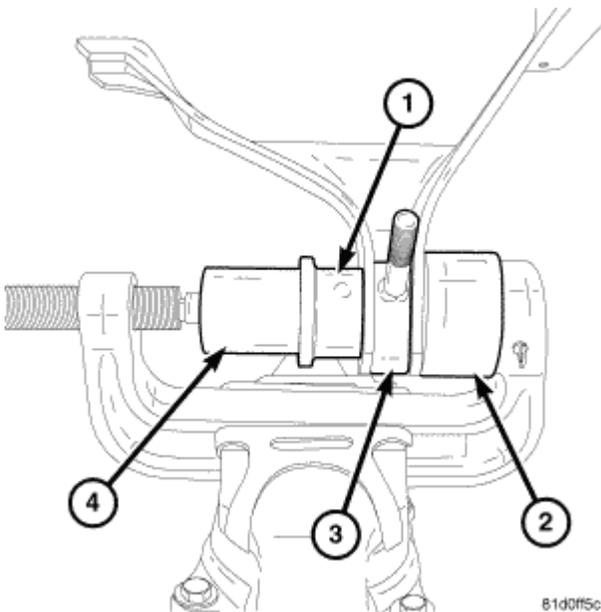


81d0ff55

Fig. 147: Installing Bushing With Installer 9958-3, Receiver 9958-2 And Press C4212F
Courtesy of CHRYSLER LLC

1. Start bushing in axle tube with bushing reference mark aligned.
2. Center one of the Receiver 9958-2 (3) flat spots over the axle tube for tool clearance.
3. Install bushing (1) with Installer 9958-3 (2) Receiver 9958-2 (3) and Press C4212F.

AXLE BRACKET BUSHING



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Fig. 148: Identifying Bushing, Receiver 9958-6, Spacer 9958-1 & Installer 9958-3
Courtesy of CHRYSLER LLC

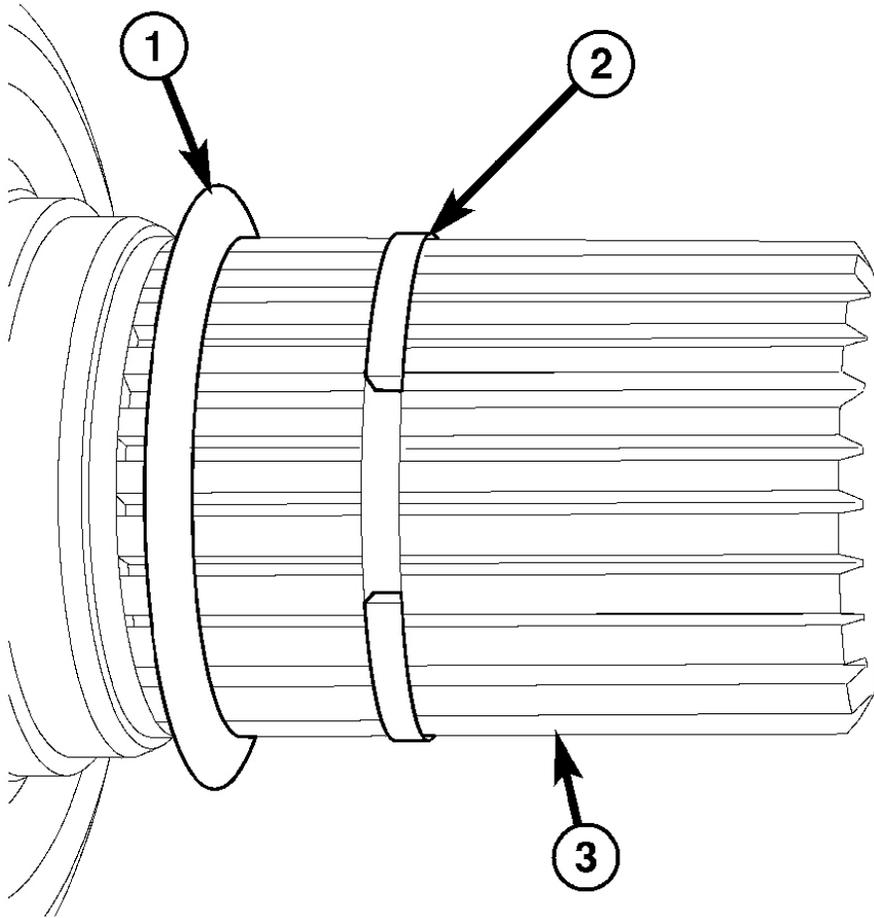
1. Start bushing in axle bracket with bushing reference mark aligned.
2. Install bushing (1) with Receiver 9958-6 (2) Spacer 9958-1 (3) position in bracket, Installer 9958-3 (4) and Press C4212F. Press bushing through the first side of the bracket then remove Spacer 9958-1 (3).

Verify bushing is aligned with the second side of the bracket. Installer Spacer 9958-1 (3) and press bushing through the second side of the bracket.

SHAFT-AXLE

REMOVAL

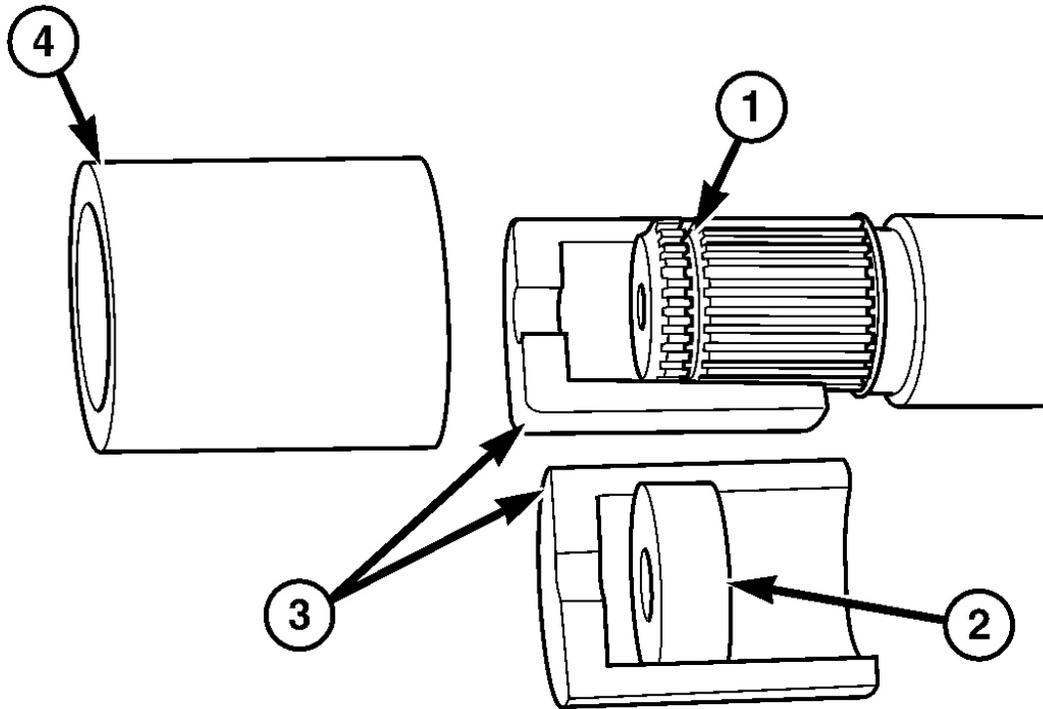
SHAFT-AXLE



815b2e58

Fig. 149: Identifying Snap Ring, O-Ring And Shaft
Courtesy of CHRYSLER LLC

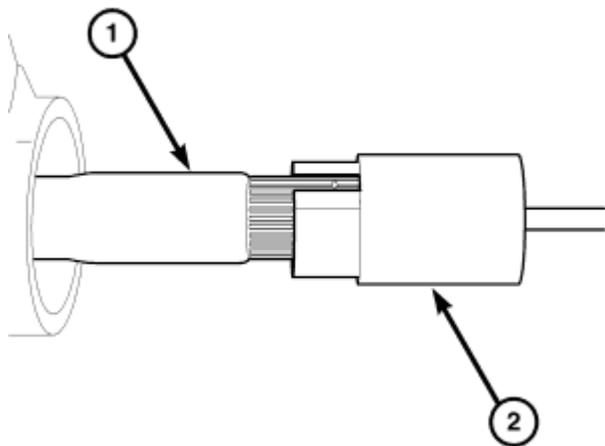
1. Remove right half shaft from vehicle.
2. Remove O-ring (1) and snap ring (2) and from axle shaft (3).



80c52f58

Fig. 150: Axle Shaft Puller
Courtesy of CHRYSLER LLC

3. Assemble Remover 8420A blocks (3) with hammer threads (2) on snap ring groove (1) on right axle shaft. Slide collar (4) over blocks and thread Slide Hammer C-3752.



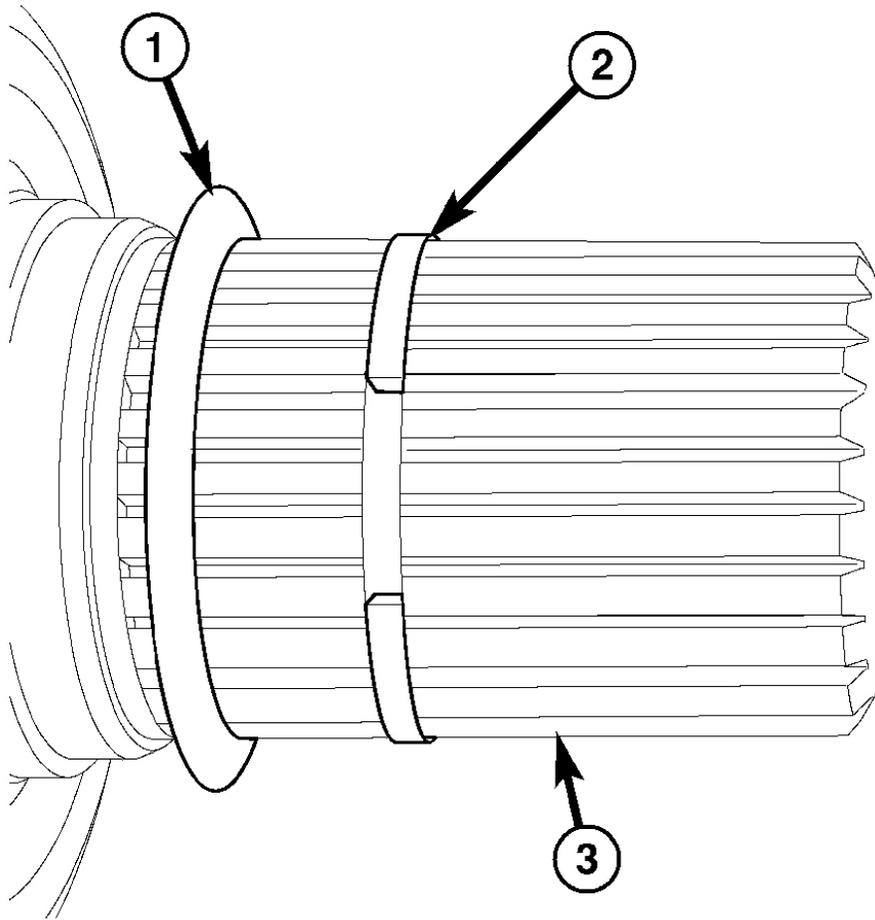
818d6bd7

Fig. 151: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

4. Remove right axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.
5. Slide axle shaft out of the axle tube.

INSTALLATION

SHAFT-AXLE



815b2e58

Fig. 152: Identifying Snap Ring, O-Ring And Shaft
Courtesy of CHRYSLER LLC

1. Lubricate bearing bore and seal lip with gear lubricant. Insert axle shaft through seal, bearing and engage it into side gear splines.

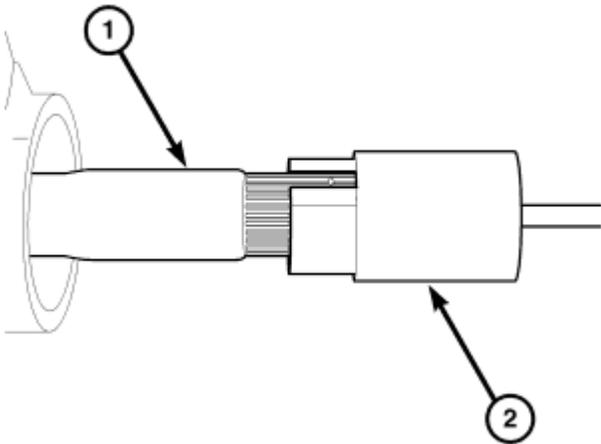
NOTE: Use care to prevent shaft splines from damaging axle shaft seal.

2. Install O-ring (1) and snap ring (2) on axle shaft (3).
3. Push the axle shaft until the axle shaft snap-ring passes through the side gear.
4. Install right half shaft.
5. Check differential fluid level.

SEAL-AXLE SHAFT

REMOVAL

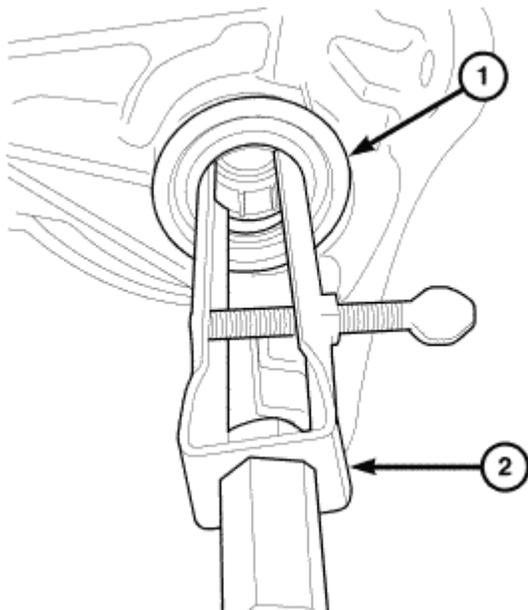
SEAL-AXLE SHAFT



818d5bd7

Fig. 153: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

1. Remove haft shafts.
2. On the right side, remove axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



818d6cc5

Fig. 154: Removing Shaft Seal From Axle With Remover 7794-A And Slide Hammer C-637
Courtesy of CHRYSLER LLC

3. Remove shaft seal (1) from axle with Remover 7794-A (2) and a Slide Hammer C-637.

INSTALLATION

SEAL-AXLE SHAFT

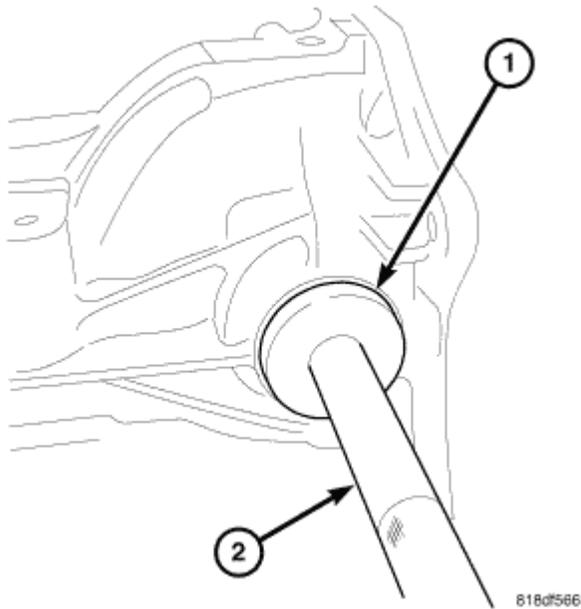


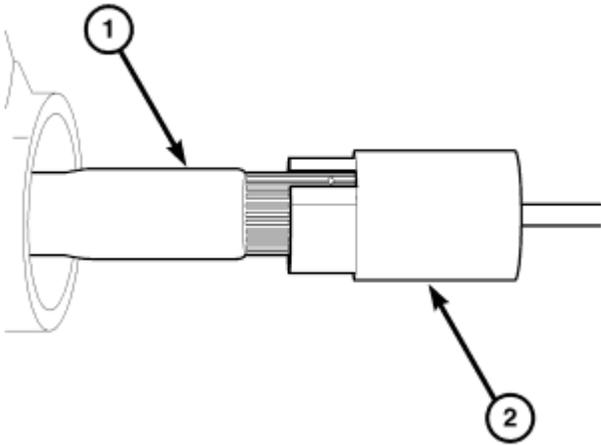
Fig. 155: Installing Shaft Seal With Installer 8806 And Handle C-4171
Courtesy of CHRYSLER LLC

1. Apply a light coat of lubricant on the lip of the shaft seal.
2. Install **new** shaft seal with Installer 8806 (1) and Handle C-4171 (2).
3. Install right axle shaft and half shafts.

BEARING-AXLE

REMOVAL

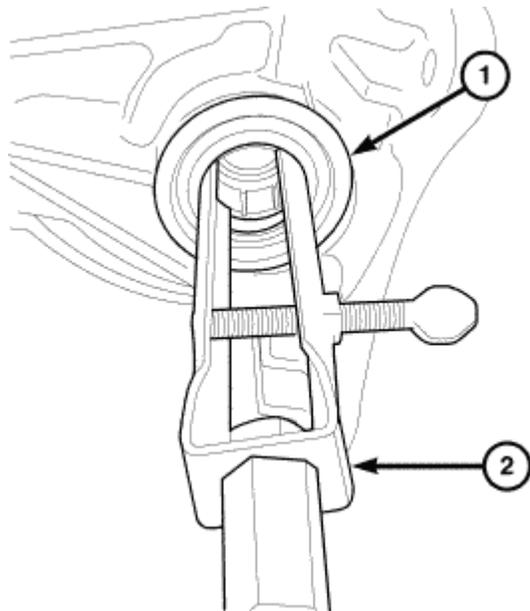
BEARING-AXLE



818d6bd7

Fig. 156: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

1. Remove haft shafts.
2. On the right side, remove axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



818d6cc5

Fig. 157: Removing Shaft Seal From Axle With Remover 7794-A And Slide Hammer C-637
Courtesy of CHRYSLER LLC

3. Remove shaft seal (1) with Remover 7794-A (2) and a Slide Hammer C-637.

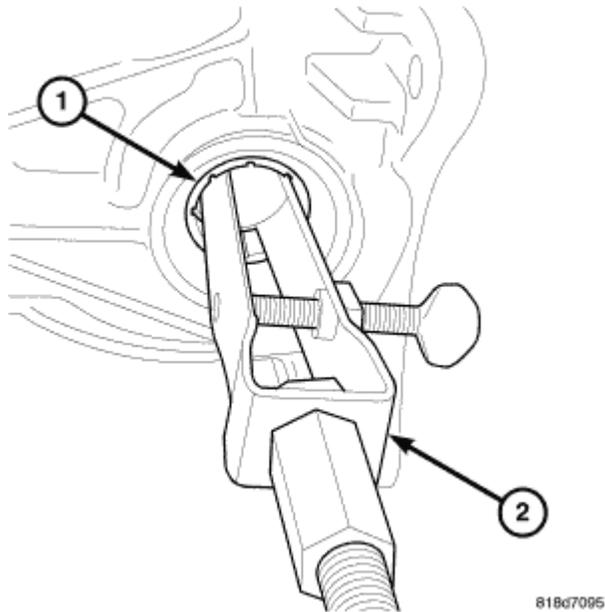


Fig. 158: Removing Shaft Bearing/Bushing With Remover 7794-A And Slide Hammer C-637
Courtesy of CHRYSLER LLC

4. Remove shaft bearing/bushing (1) with Remover 7794-A (2) and a Slide Hammer C-637.

INSTALLATION

BEARING-AXLE

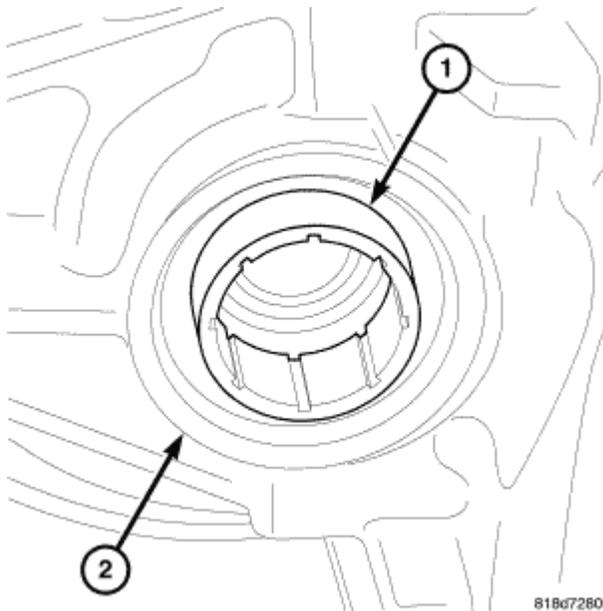
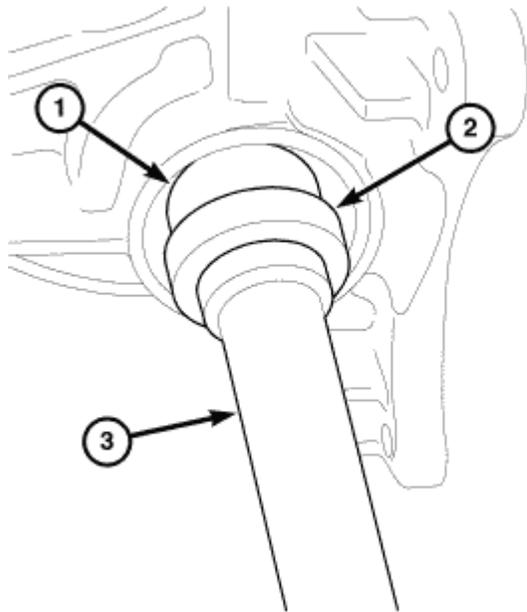


Fig. 159: Positioning Bearing/Bushing In Housing Bore
Courtesy of CHRYSLER LLC

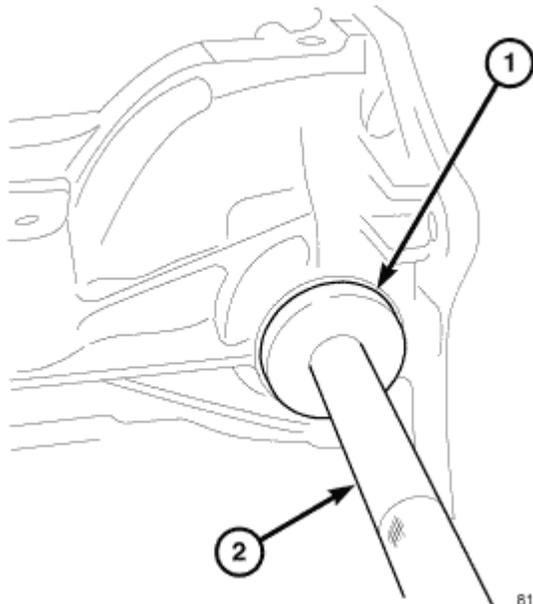
1. Position bearing/bushing (1) in the housing (2) bore.



618d7284

Fig. 160: Identifying Shaft Bearing/Bushing, Installer 8805 & Handle C-4171
Courtesy of CHRYSLER LLC

2. Install shaft bearing/bushing (1) with **large diameter end** of Installer 8805 (2) and Handle C-4171 (3). Drive bearing/bushing in flush with housing bore.



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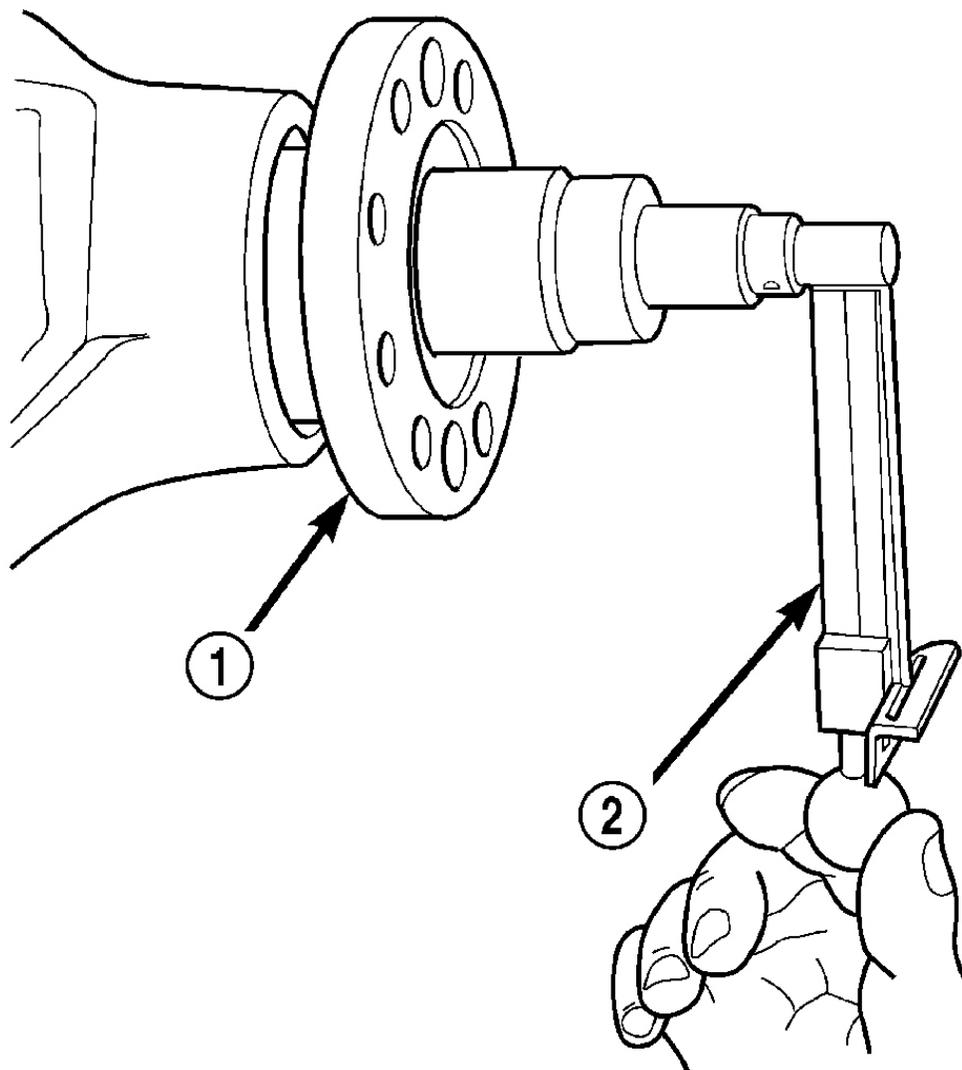
Fig. 161: Installing Shaft Seal With Installer 8806 And Handle C-4171
Courtesy of CHRYSLER LLC

3. Apply a light coat of lubricant on the lip of the shaft seal.
4. Install **new** shaft seal in axle with Installer 8806 (1) and Handle C-4171 (2).
5. Install right axle shaft and half shafts.

SEAL-PINION

REMOVAL

SEAL-PINION



80c07132

Fig. 162: Pinion Rotation Torque & Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

1. Remove brake calipers and rotors.
2. Remove propeller shaft.

3. Rotate pinion gear several times and verify the pinion rotates smoothly.
4. Record pinion torque to rotate (1) with an inch pound torque wrench (2).

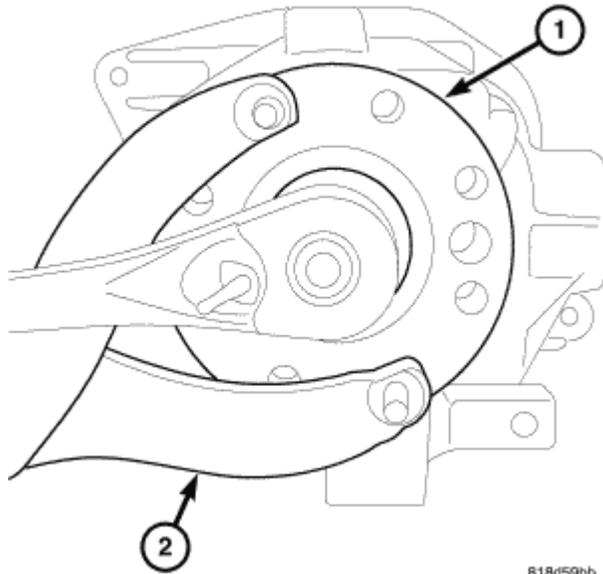


Fig. 163: Holding Pinion Flange With Flange Holder C-3281
Courtesy of CHRYSLER LLC

5. Hold pinion flange (1) with Flange Holder C-3281 (2) and remove pinion nut.
6. Mark a line on the pinion shaft and flange for installation reference.

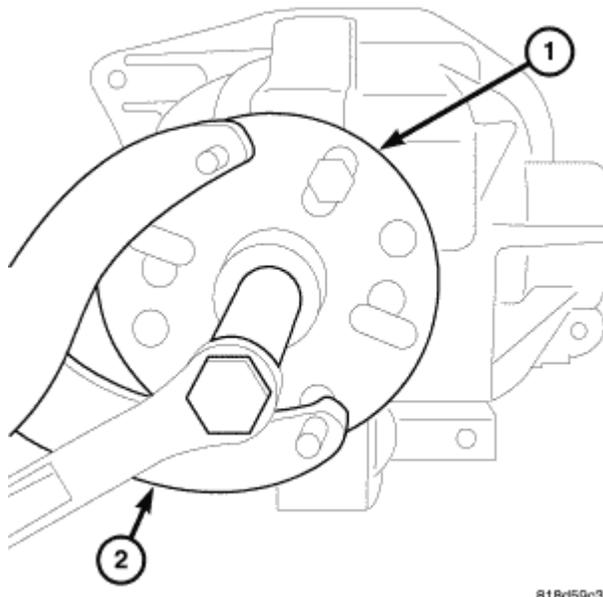


Fig. 164: Removing Pinion Flange With Puller C-452 And Flange Holder C-3281
Courtesy of CHRYSLER LLC

7. Remove pinion flange with Puller C-452 (1) and Flange Holder C-3281 (2).
8. Remove pinion seal with a seal puller.

INSTALLATION

SEAL-PINION

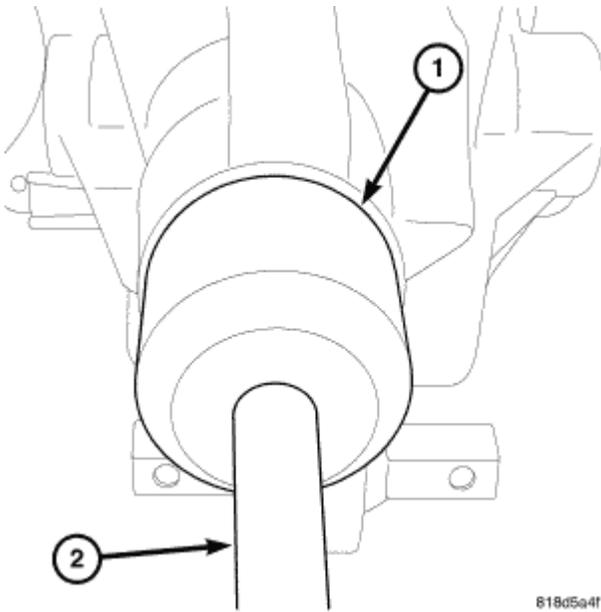


Fig. 165: Identifying Installer 8681 & Handle C-4171
Courtesy of CHRYSLER LLC

1. Apply a light coating of gear lubricant on the lip of pinion seal. Install with Installer 8681 (1) and Handle C-4171 (2).

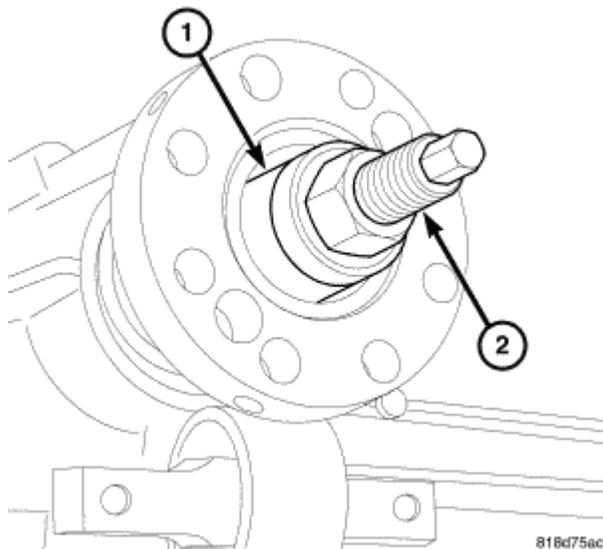


Fig. 166: Identifying Installer W-162-D & Screw 8112
Courtesy of CHRYSLER LLC

2. Position flange on the pinion shaft with the reference marks aligned.
3. Install flange with Installer W-162-D (1) and Screw 8112 (2).

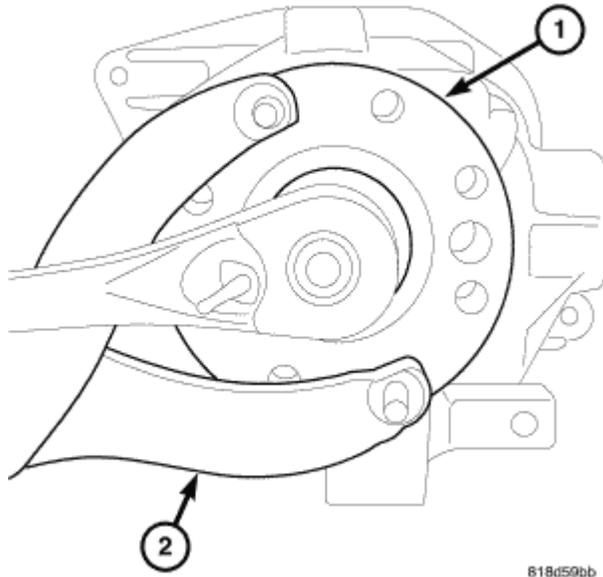
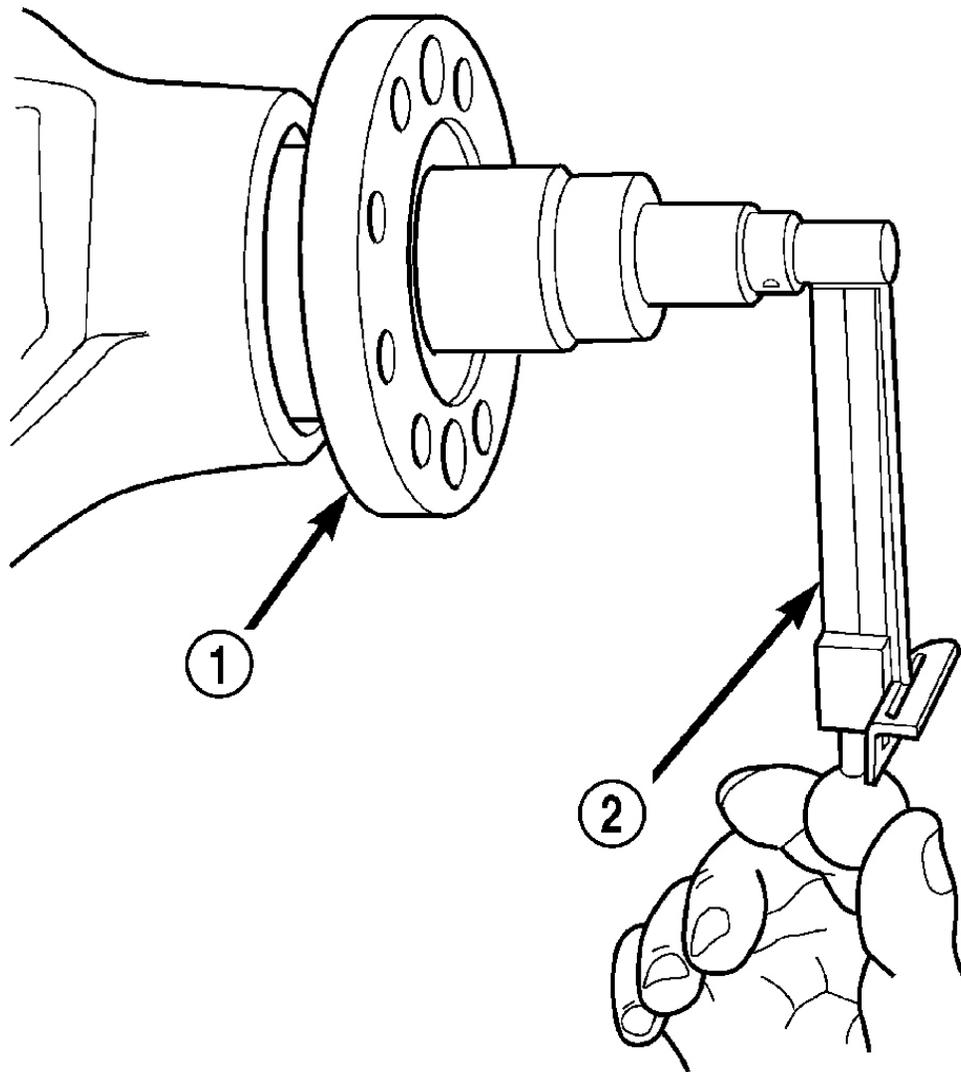


Fig. 167: Holding Pinion Flange With Flange Holder C-3281
Courtesy of CHRYSLER LLC

4. Install a **new** nut on the pinion gear. Hold pinion flange (1) with Flange Holder C-3281 (2) and tighten pinion nut to 217 N.m (160 ft. lbs.).

NOTE: Do not exceed minimum tightening torque 217 N.m (160 ft. lbs.) at this point.



80c07132

Fig. 168: Pinion Rotation Torque & Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

5. Rotate pinion several times and verify pinion rotates smoothly.
6. Measure pinion torque to rotate (1) with an inch pound torque wrench (2). Pinion torque to rotating should be equal to recorded reading plus 0.56 N.m (5 in. lbs.).

If rotating torque is low, tighten the pinion nut in 6.8 N.m (5 ft. lbs.) increments until proper rotating torque is achieved.

CAUTION: If maximum tightening torque is reached 352 N.m (260 ft. lbs.) prior to

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reaching required rotating torque, the collapsible spacer may have been damaged.

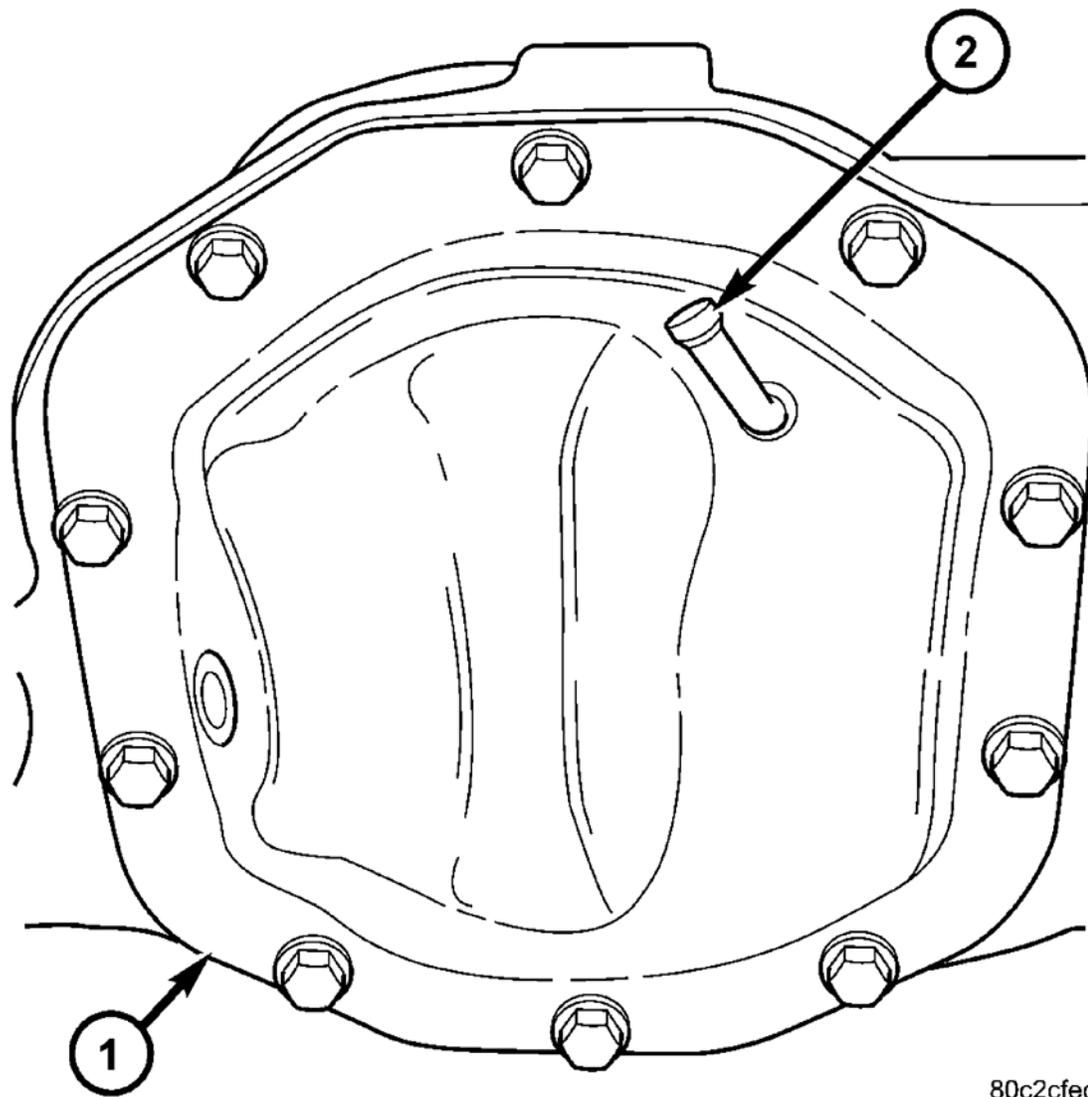
Never loosen pinion nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instructions will result in damage.

7. Install brake rotors, calipers and propeller shaft.
8. Fill differential with gear lubricant.

DIFFERENTIAL

REMOVAL

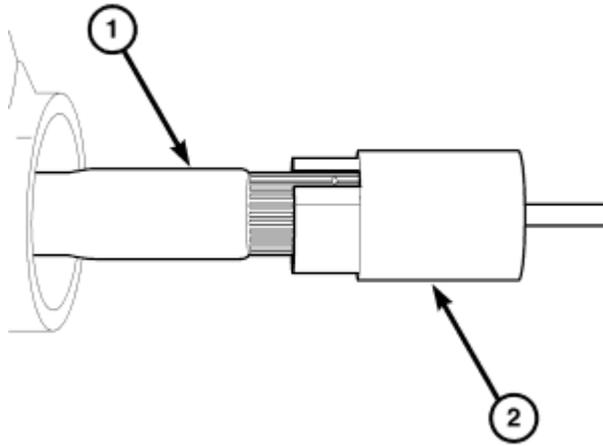
DIFFERENTIAL



80c2cfed

Fig. 169: Removing/Installing Differential Housing Cover
Courtesy of CHRYSLER LLC

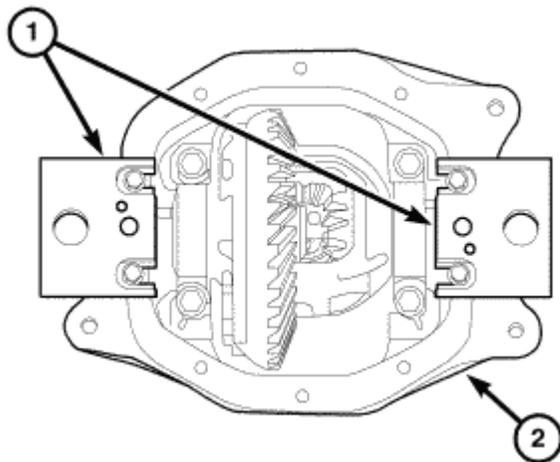
1. Remove differential housing cover (1).



818d6bd7

Fig. 170: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

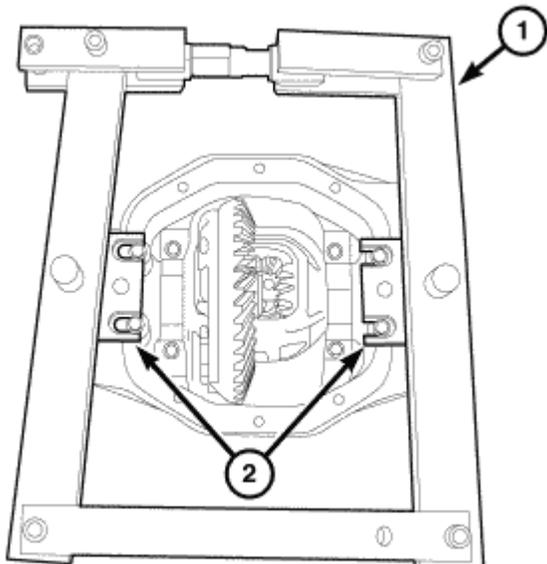
2. Remove half shafts and remove right axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



818eb4f9

Fig. 171: Removing/Installing Spreader Adapters 9959 On Differential Housing
Courtesy of CHRYSLER LLC

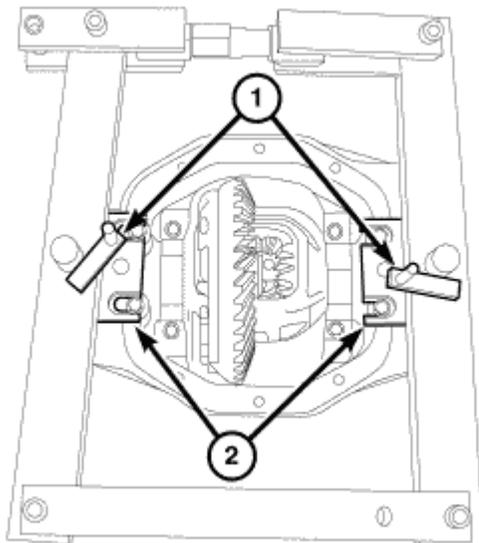
3. Mark differential bearing caps for installation reference.
4. Loosen bearing cap bolts.
5. Install Spreader Adapters 9959 (1) on differential housing (2).



818ec353

Fig. 172: Installing Spreader W-129-B On Spreader Adapters 9959 And Tightening Spreader Turnbuckle Finger-Tight
Courtesy of CHRYSLER LLC

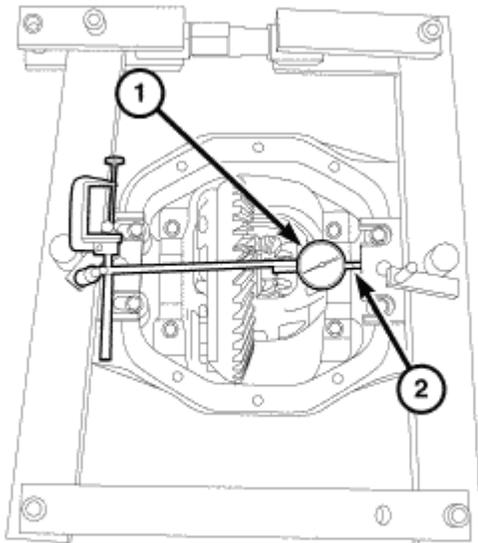
6. Install Spreader W-129-B (1) on Spreader Adapters 9959 (2) and tighten spreader turnbuckle finger-tight.



818ec392

Fig. 173: Installing Spreader Retainers W-129-1 On Spreader Adapters 9959 And Across Spreader
Courtesy of CHRYSLER LLC

7. Install Spreader Retainers W-129-1 (1) on Spreader Adapters 9959 (2) and across spreader.

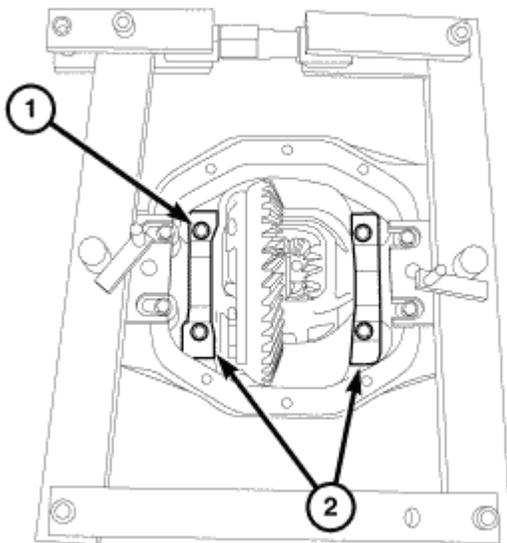


818ec3a8

Fig. 174: Attaching Dial Indicator C-3339A To Spreader Retainer Stud And Loading Indicator Plunger Against Opposite Side Of Housing
 Courtesy of CHRYSLER LLC

8. Attach Dial Indicator C-3339A (1) to spreader retainer stud. Load indicator plunger (2) against the opposite side of the housing and zero the indicator
9. Spread the differential case 0.34 mm (0.013 in).

CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instructions will damage the housing.

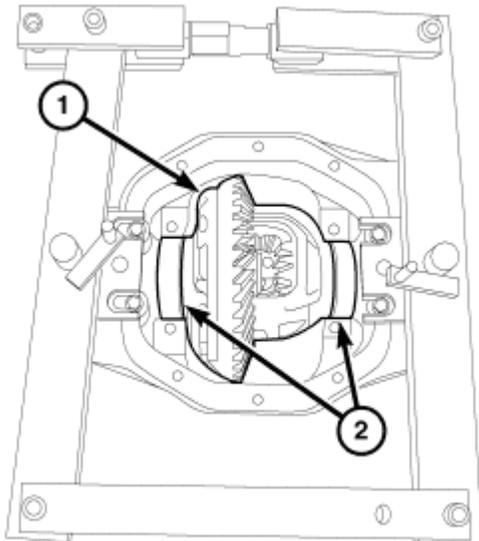


818ec6fc

Fig. 175: Holding Differential Case And Removing Bearing Cap Bolts/Bearing Caps

Courtesy of CHRYSLER LLC

10. Remove dial indicator.
11. Hold differential case and remove bearing cap bolts (1) and bearing caps (2).



816ec3d7

Fig. 176: Removing/Installing Differential Case, Bearing Cups And Shims
Courtesy of CHRYSLER LLC

12. Remove differential case (1), bearing cups (2) and shims from housing.
13. Tag differential bearing cups and shims to indicate location.
14. Remove spreader from housing.

DISASSEMBLY

DIFFERENTIAL

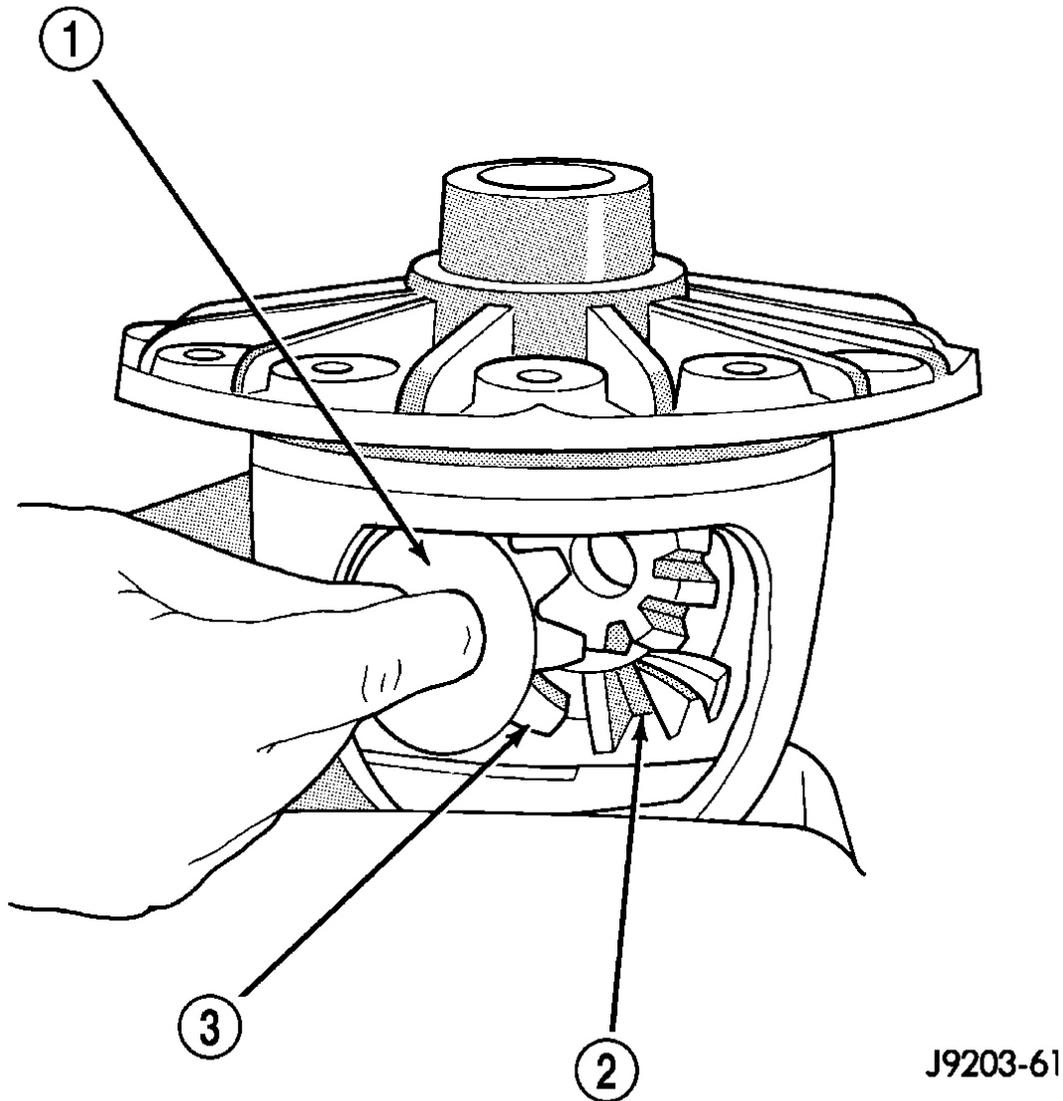
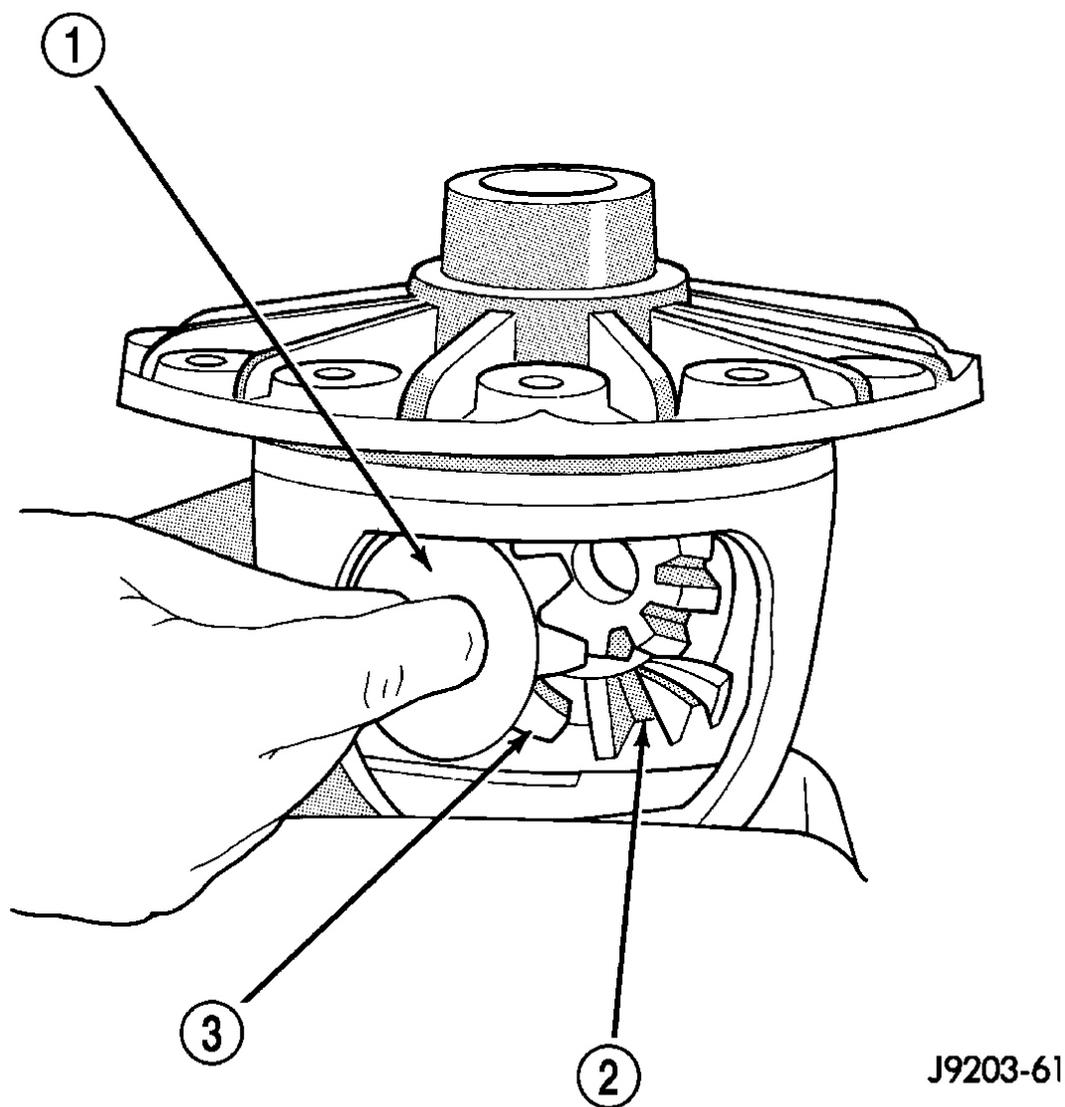


Fig. 177: Identifying Differential Side Gears, Pinion Gears & Thrust Washers
Courtesy of CHRYSLER LLC

1. Remove ring gear.
2. Remove roll-pin holding mate shaft in housing.
3. Remove pinion gear mate shaft.
4. Rotate differential side gears (2) and remove pinion gears (3) and thrust washers (1).
5. Remove differential side gears and thrust washers.

ASSEMBLY

DIFFERENTIAL



J9203-61

Fig. 178: Identifying Differential Side Gears, Pinion Gears & Thrust Washers
Courtesy of CHRYSLER LLC

1. Install differential side gears (2) and thrust washers.
2. Install pinion mate gears (3) and thrust washers (1).
3. Install pinion gear mate shaft.

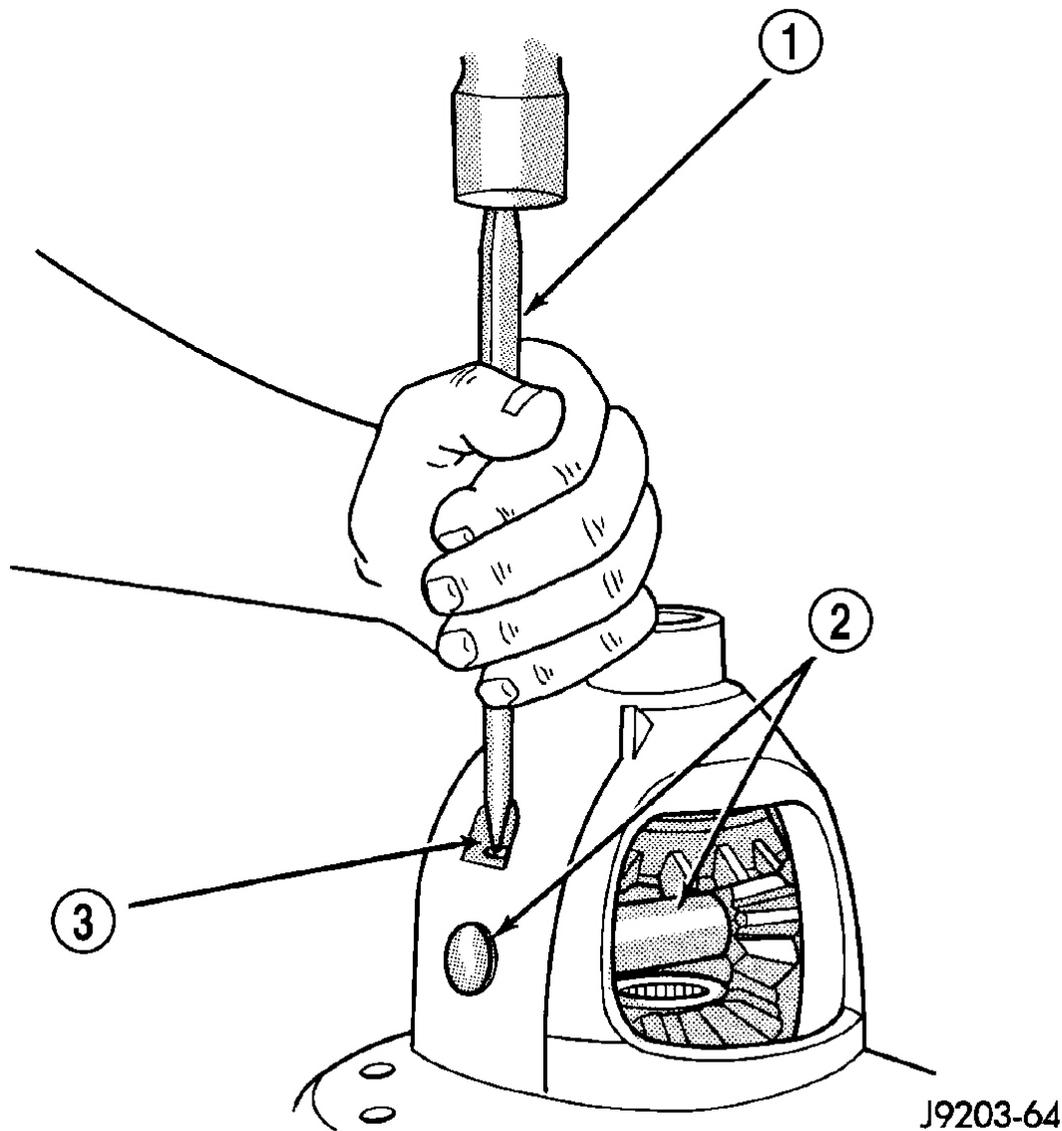


Fig. 179: Installing Roll-Pin In Differential Case With Hammer And Punch
Courtesy of CHRYSLER LLC

4. Align hole in the pinion gear mate shaft (2) with the hole in the differential case.
5. Install the roll-pin (3) in the differential case with a hammer and punch (1). Peen the edge of the roll-pin hole in the differential case in two places 180° apart.
6. Lubricate all differential components with gear lubricant.
7. Install ring gear.

INSTALLATION

DIFFERENTIAL

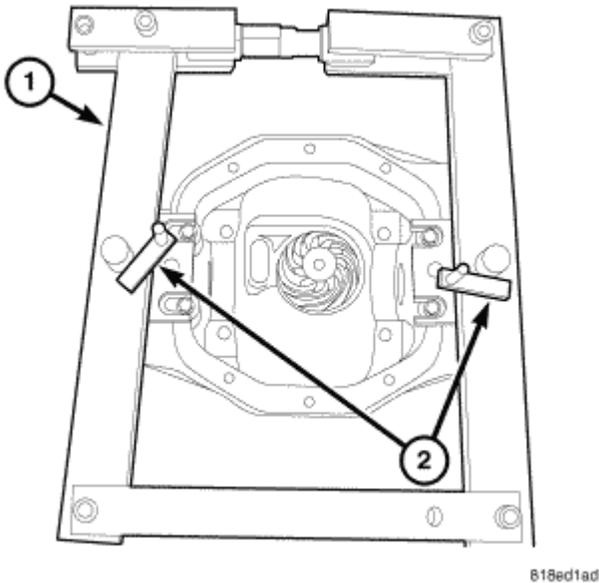


Fig. 180: Identifying Spreader W-129-B & Spreader Retainers W-129-1
Courtesy of CHRYSLER LLC

NOTE: If differential bearings or differential case are replaced, differential bearing preload and gear backlash must be adjusted.

1. Install Spreader W-129-B (1) and Spreader Retainers W-129-1 (2) on Spreader Adapters 9959 and tighten spreader turnbuckle finger-tight.

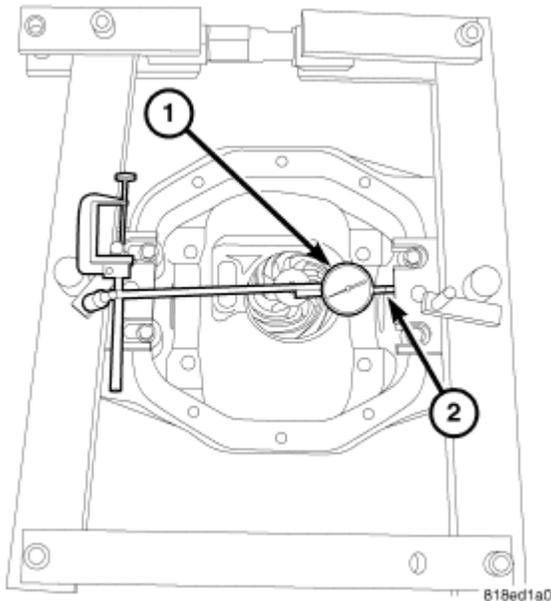
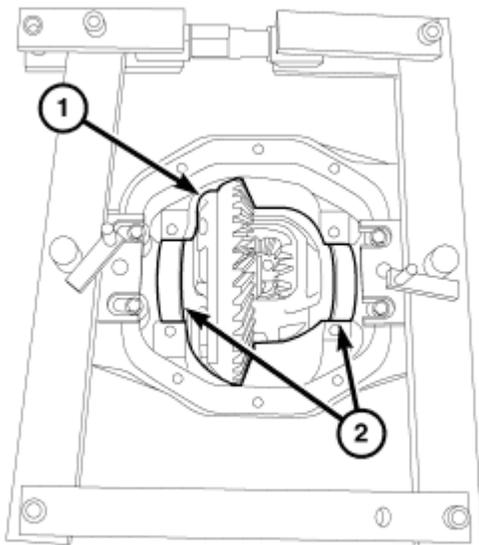


Fig. 181: Identifying Dial Indicator C-3339A & Indicator Plunger
Courtesy of CHRYSLER LLC

2. Attach Dial Indicator C-3339A (1) to spreader retainer stud. Load indicator plunger (2) against opposite side of the housing and zero the indicator
3. Spread the differential case 0.34 mm (0.013 in).

CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instructions will damage the housing.



818ec3d7

Fig. 182: Removing/Installing Differential Case, Bearing Cups And Shims
Courtesy of CHRYSLER LLC

4. Remove dial indicator.
5. Install differential case (1) bearing cups (2) and shims into housing.
6. Install bearing caps and loosely install bolts.
7. Loosen turnbuckle remove spreader retainers and spreader.

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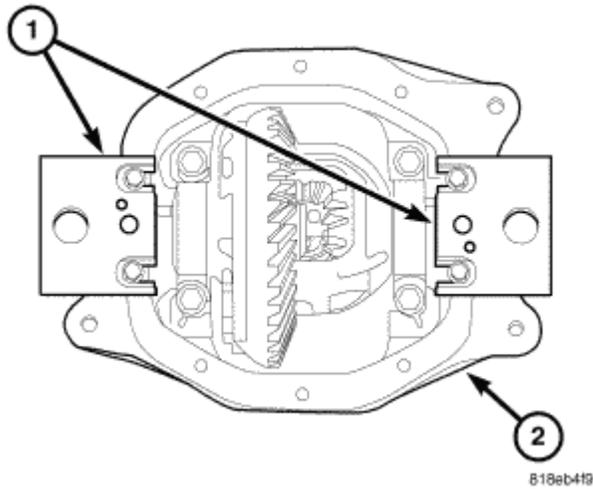
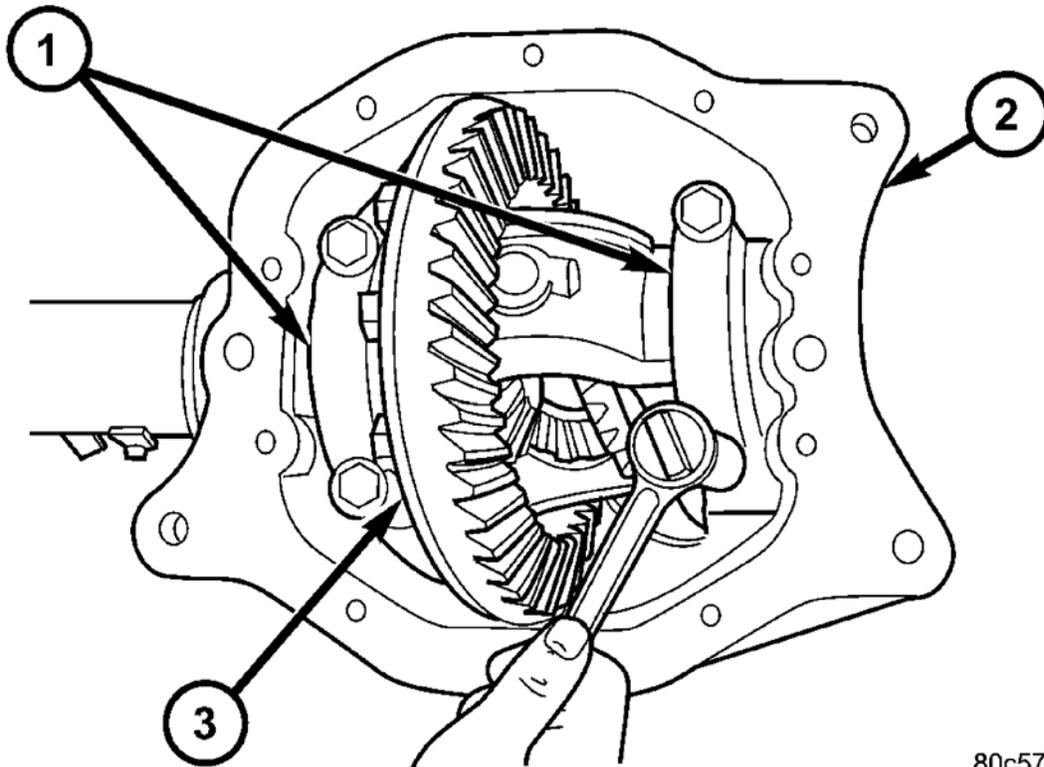


Fig. 183: Removing/Installing Spreader Adapters 9959 On Differential Housing
Courtesy of CHRYSLER LLC

8. Remove spreader adapters (1) from differential housing (2).



80c5786b

Fig. 184: Identifying Bearing Caps & Snug Bearing Cap Bolts
Courtesy of CHRYSLER LLC

9. Tighten bearing cap (1) bolts in a criss-cross pattern to 54-68 N.m (39-50 ft. lbs.).

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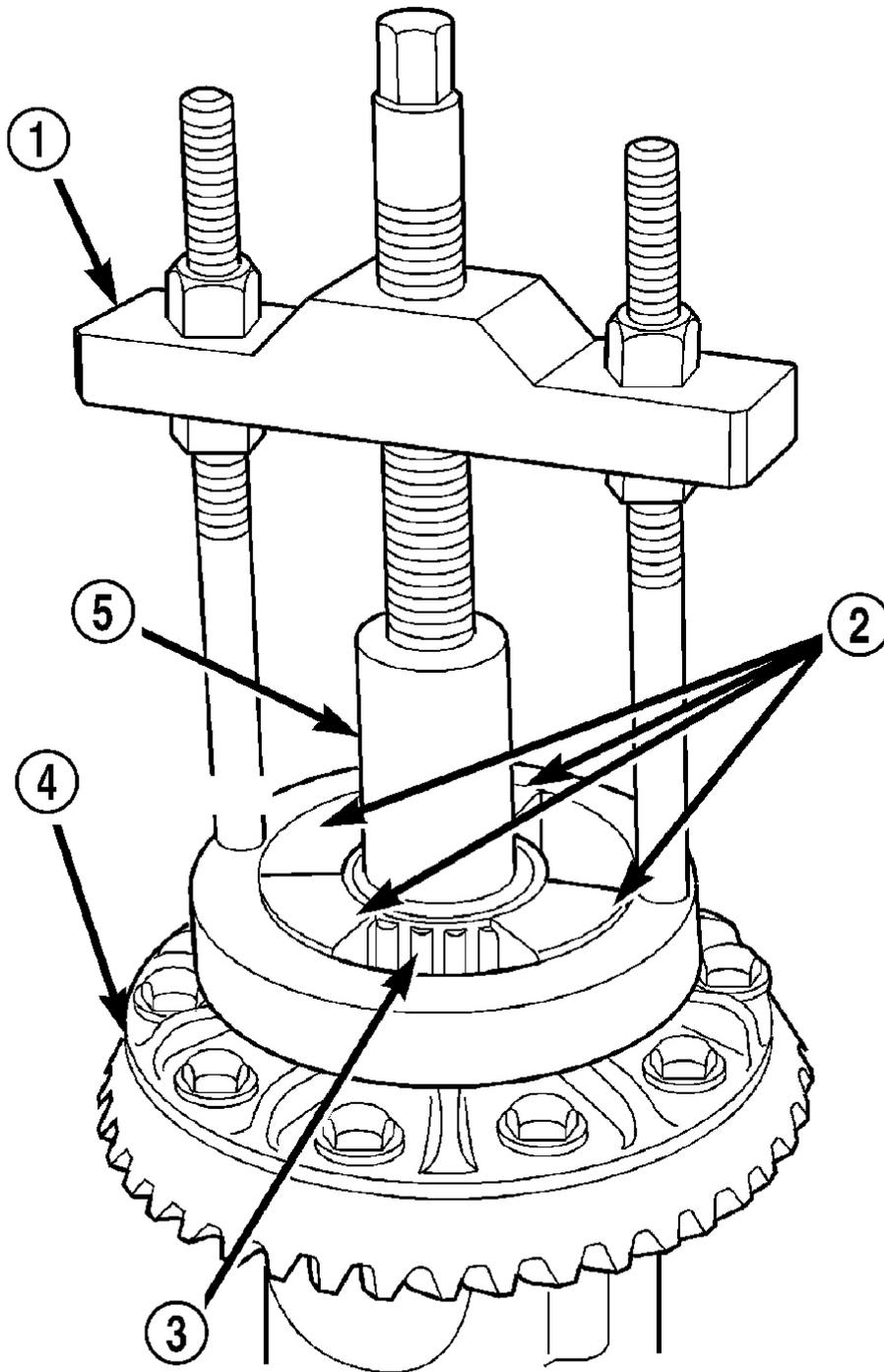
2007 DRIVELINE Differential & Driveline - Nitro

10. Install right axle shaft and half shafts.
11. Install differential housing cover.

BEARING-DIFFERENTIAL CASE

REMOVAL

BEARINGS-DIFFERENTIAL CASE



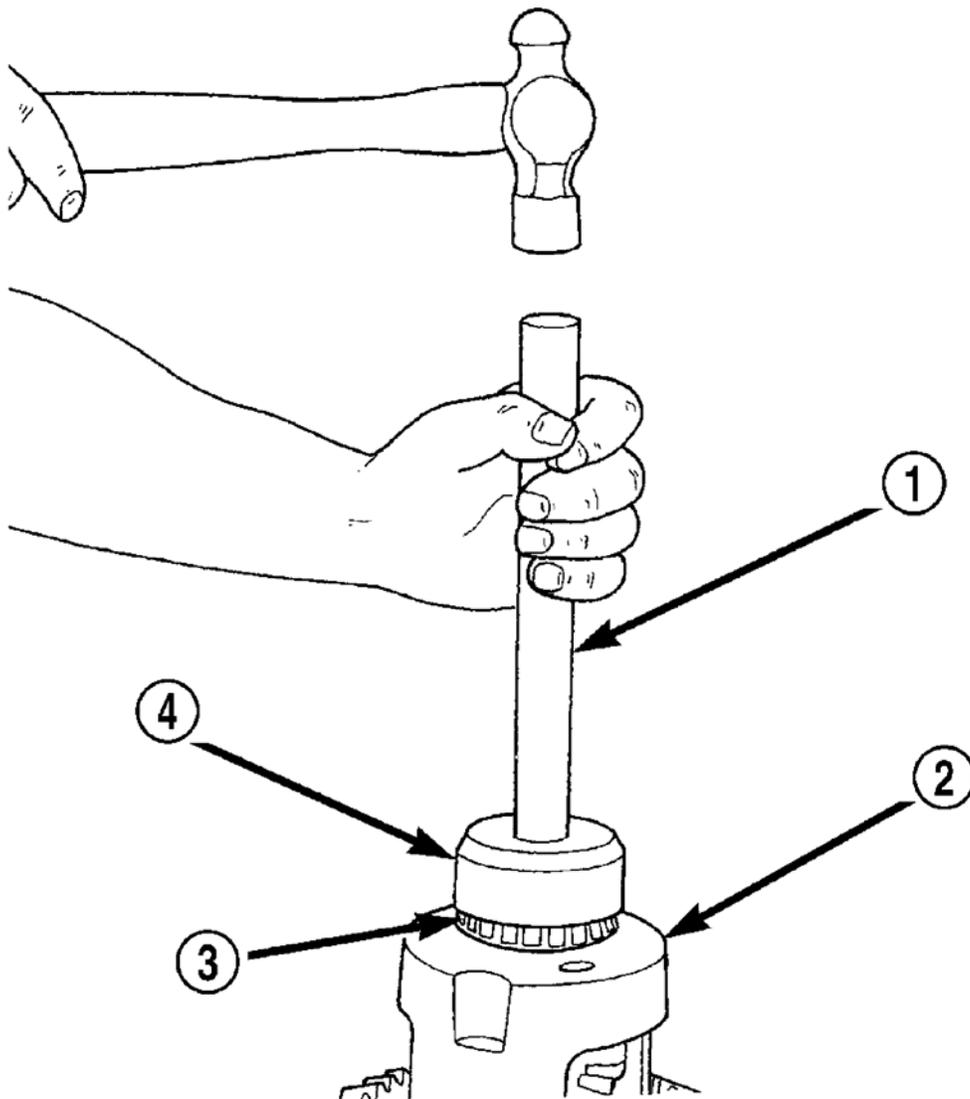
80a982f2

Fig. 185: Removing Bearings From Differential Case With Puller C-293-PA, Adapters C-293-48 And Plug SP-3289
Courtesy of CHRYSLER LLC

1. Remove differential from the housing.
2. Remove bearings (3) from the differential case (4) with Puller C-293-PA (1), Adapters C-293-48 (2) and Plug SP-3289 (5).

INSTALLATION

BEARINGS-DIFFERENTIAL CASE



80a9539a

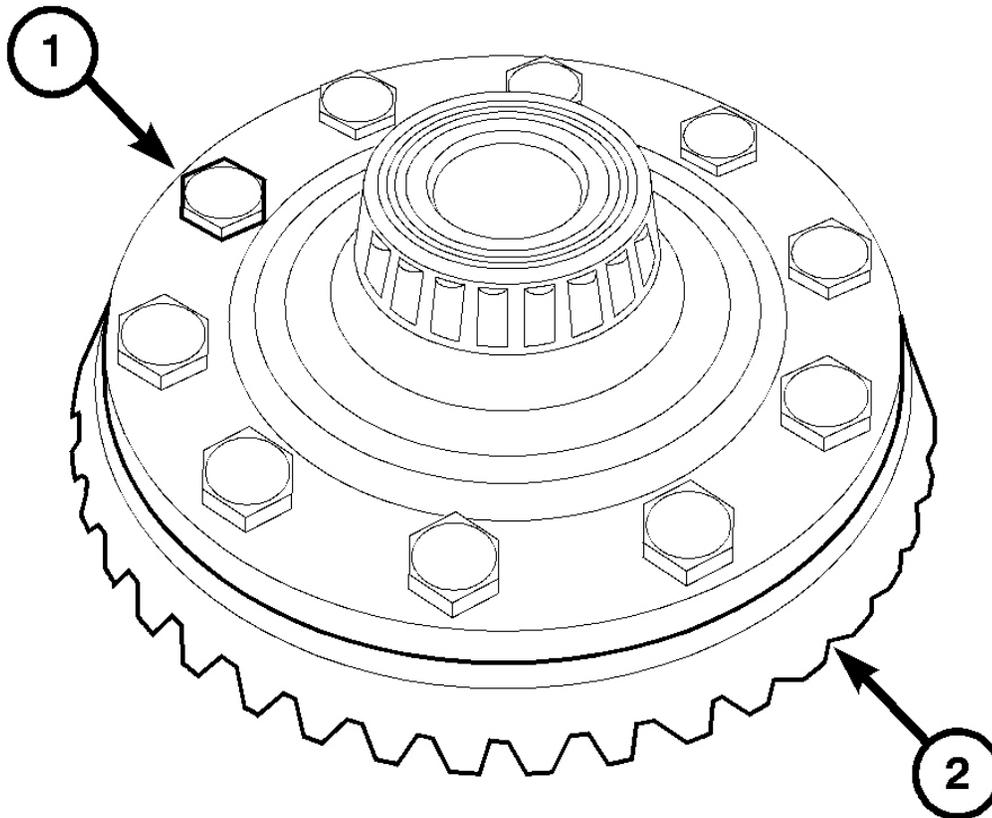
Fig. 186: Installing Differential Case Bearings With Installer C-3716-A And Handle C-4171
Courtesy of CHRYSLER LLC

1. Install differential case bearings (3) with Installer C-3716-A (4) and Handle C-4171(1).
2. Install differential into the housing.

GEAR-PINION/RING

REMOVAL

GEAR-PINION/RING

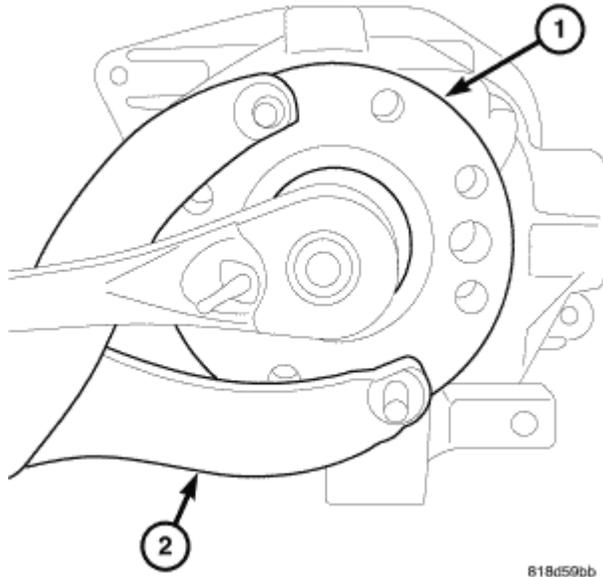


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Fig. 187: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

NOTE: The ring gear and pinion are serviced as a matched set. Never replace ring gear without replacing the matched pinion gear.

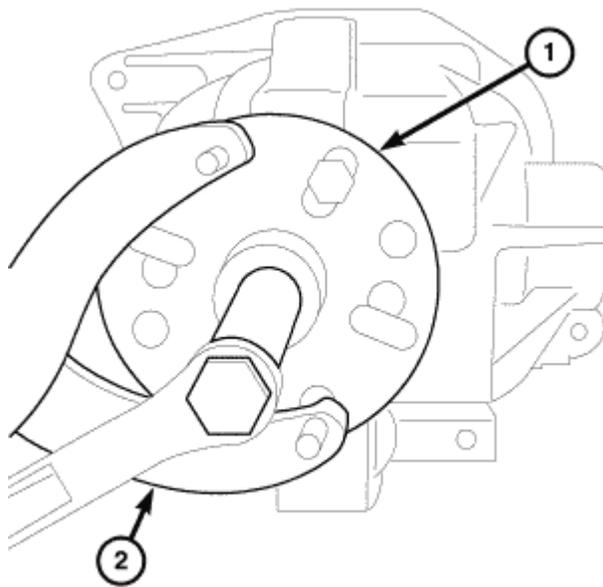
1. Remove differential from axle housing.
2. Place differential case in a vise with soft jaws.
3. Remove ring gear bolts (1) and tap ring gear (2) off differential case with a dead-blow hammer.



818d59bb

Fig. 188: Holding Pinion Flange With Flange Holder C-3281
Courtesy of CHRYSLER LLC

4. Hold pinion flange (1) with Flange Holder C-3281 (2) and remove pinion nut.



818d59c3

Fig. 189: Removing Pinion Flange With Puller C-452 And Flange Holder C-3281
Courtesy of CHRYSLER LLC

5. Remove pinion flange with Puller C-452 (1) and Flange Holder C-3281 (2).
6. Remove pinion gear from housing with dead-blow hammer.

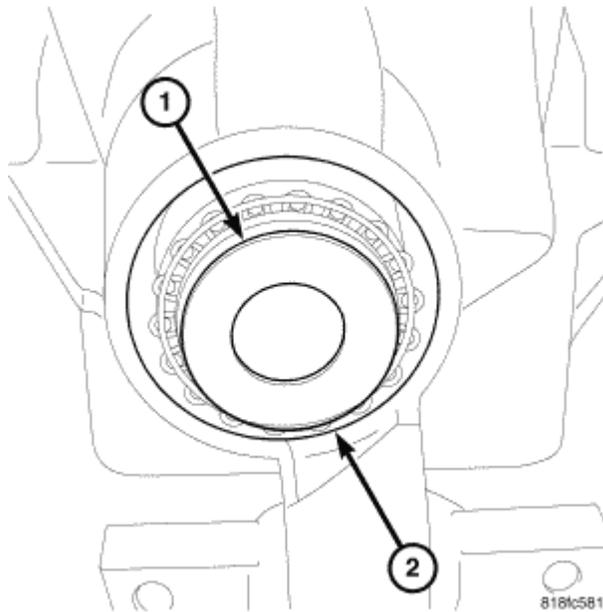


Fig. 190: Removing Oil Slinger From Housing
Courtesy of CHRYSLER LLC

7. Remove pinion seal with seal puller.
8. Remove oil slinger (1) from housing (2).

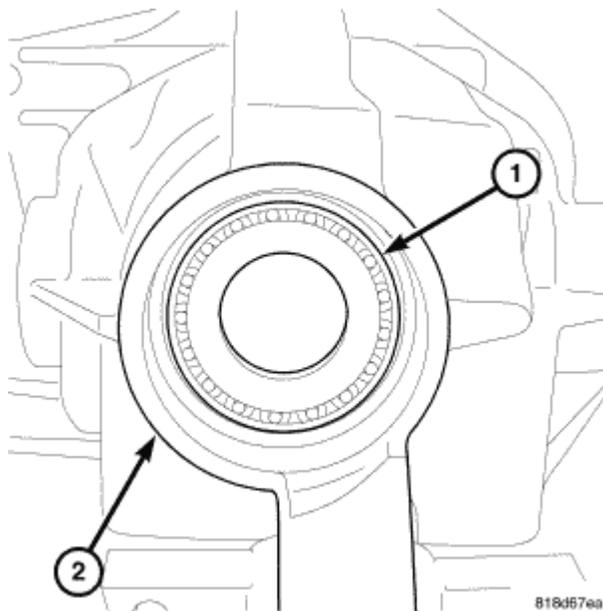
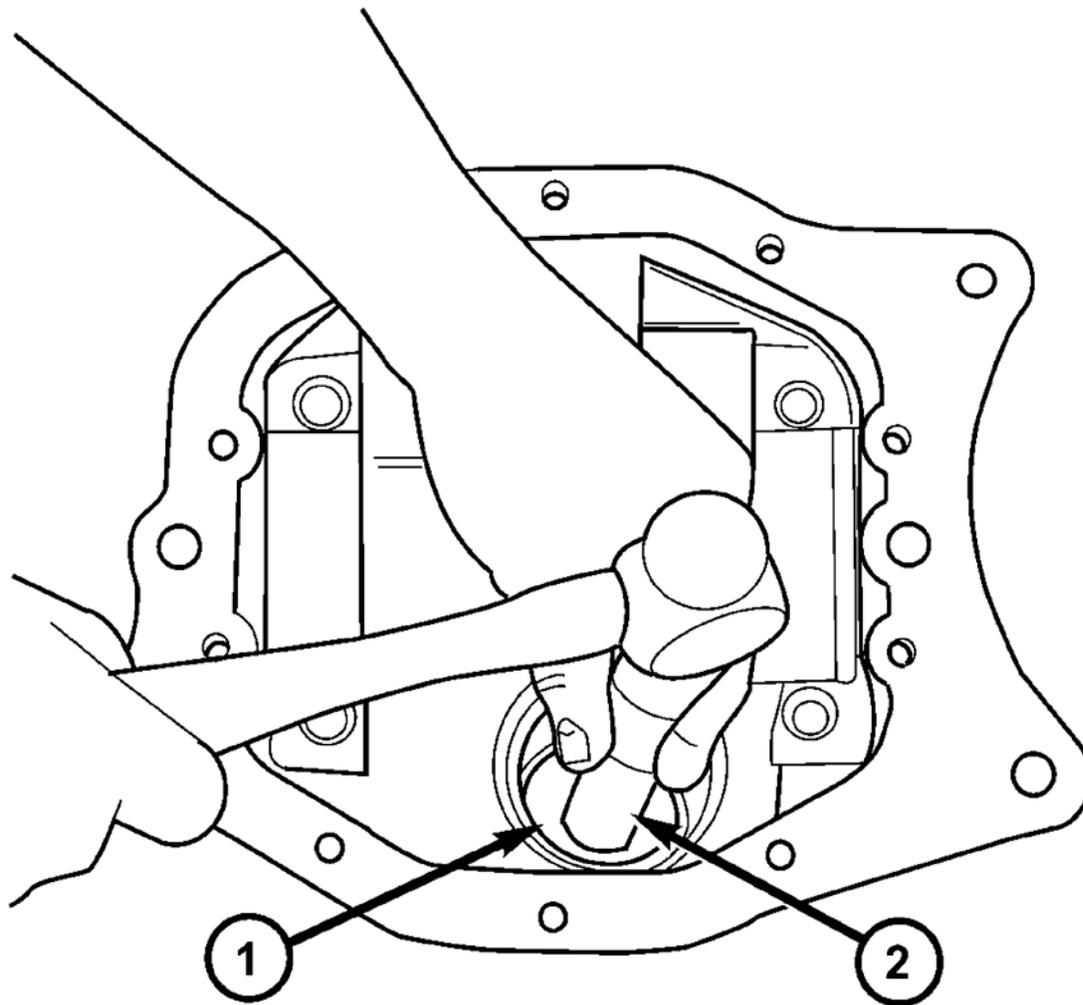


Fig. 191: Removing Front Pinion Bearing From Housing
Courtesy of CHRYSLER LLC

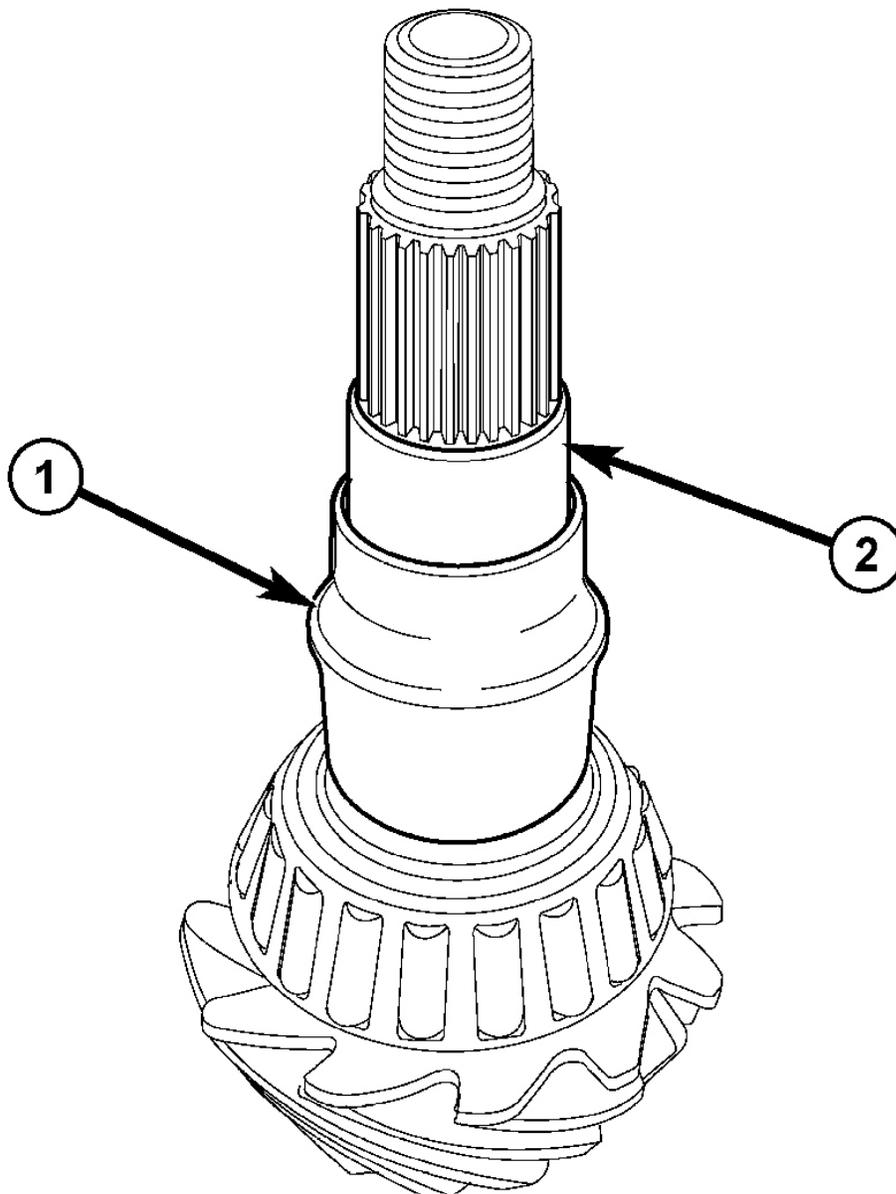
9. Remove front pinion bearing (1) from housing (2).



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Fig. 192: Removing Front Pinion Bearing Cup With Remover D-149 And Handle C-4171
Courtesy of CHRYSLER LLC

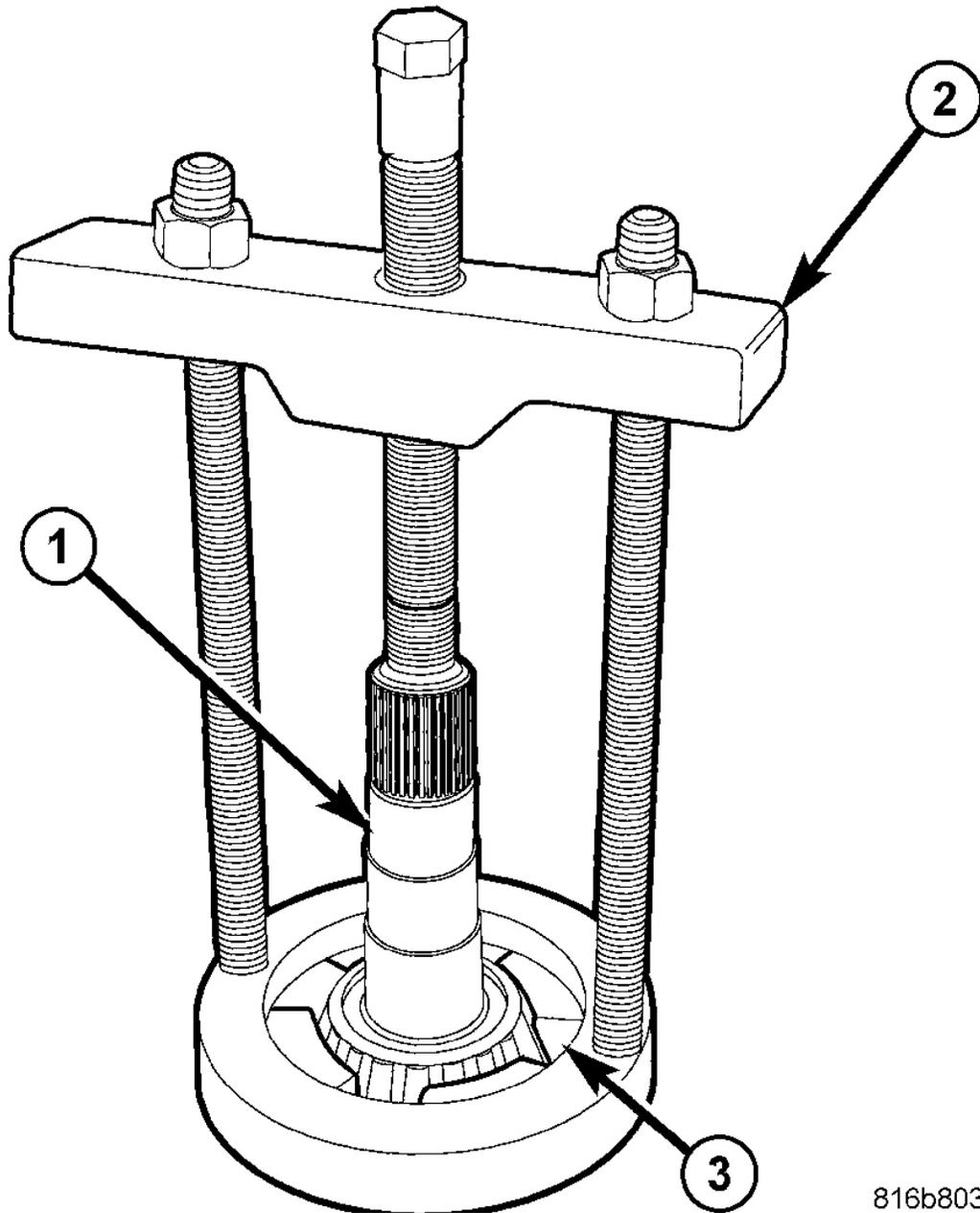
10. Remove rear pinion bearing cup with a hammer and drift.
11. Remove front pinion bearing cup with Remover D-149 (1) and Handle C-4171 (2).



816b5dcb

Fig. 193: Removing Collapsible Spacer From Pinion Shaft
Courtesy of CHRYSLER LLC

12. Remove collapsible spacer (1) from pinion shaft (2).



816b803a

Fig. 194: Removing Rear Pinion Bearing From Pinion With Puller C-293-PA And Adapters C-293-42
Courtesy of CHRYSLER LLC

13. Remove rear pinion bearing from the pinion (1) with Puller C-293-PA (2) and Adapters C-293-42 (3).

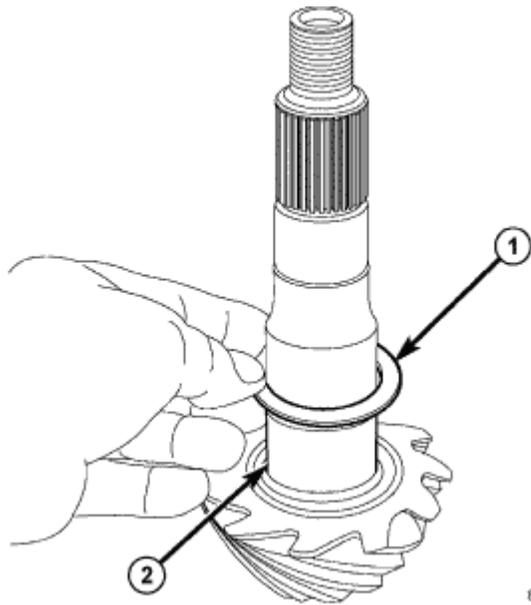


Fig. 195: Removing/Installing Pinion Depth Shim From/On Pinion Shaft
Courtesy of CHRYSLER LLC

14. Remove pinion depth shim (1) from the pinion shaft (2) and record thickness.

INSTALLATION

GEAR-PINION/RING

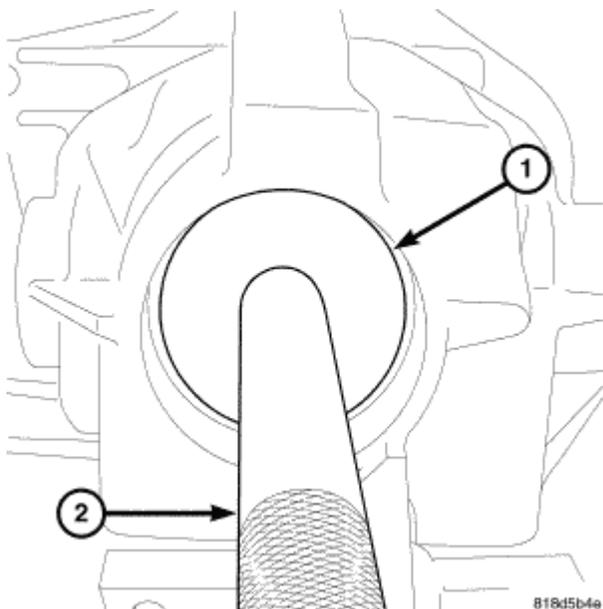


Fig. 196: Installing Front Bearing Cup With Installer D-146 And Handle C-4171
Courtesy of CHRYSLER LLC

NOTE: Pinion depth shims are located under the rear pinion bearing. Refer to

Adjustments (Pinion Gear Depth) to select the proper thickness shim before installing pinion gear. If ring and pinion gears are reused, the pinion depth shim should not require replacement.

1. Install front bearing cup with Installer D-146 (1) and Handle C-4171 (2).

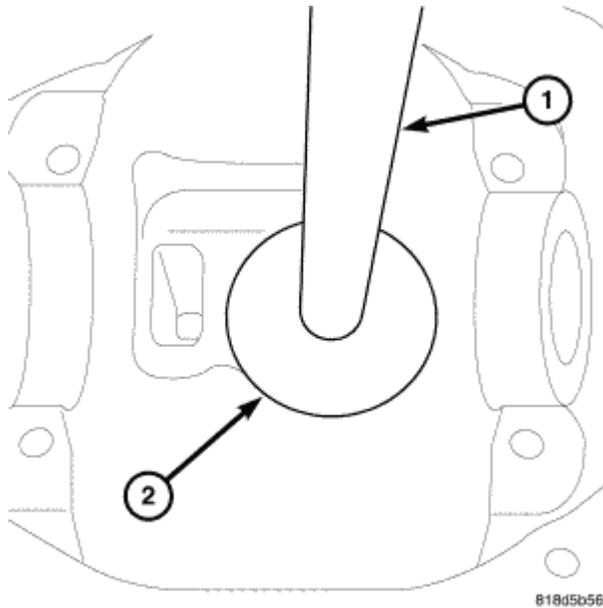


Fig. 197: Installing Rear Bearing Cup With Installer C-4308 And Handle C-4171
Courtesy of CHRYSLER LLC

2. Install rear bearing cup with Installer C-4308 (2) and Handle C-4171 (1).

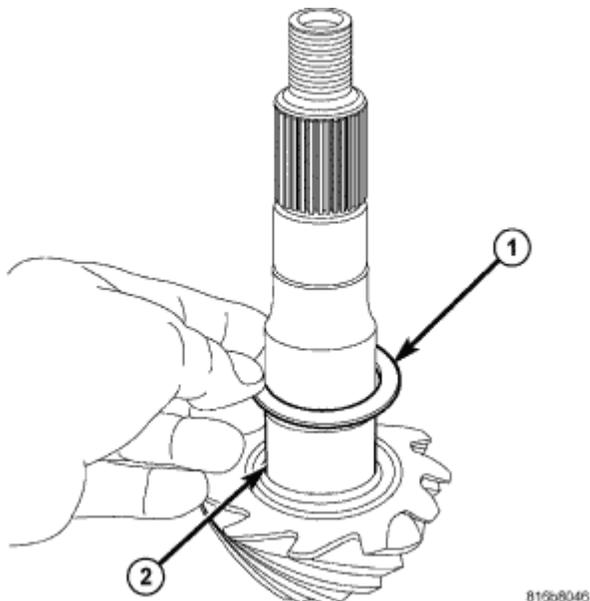
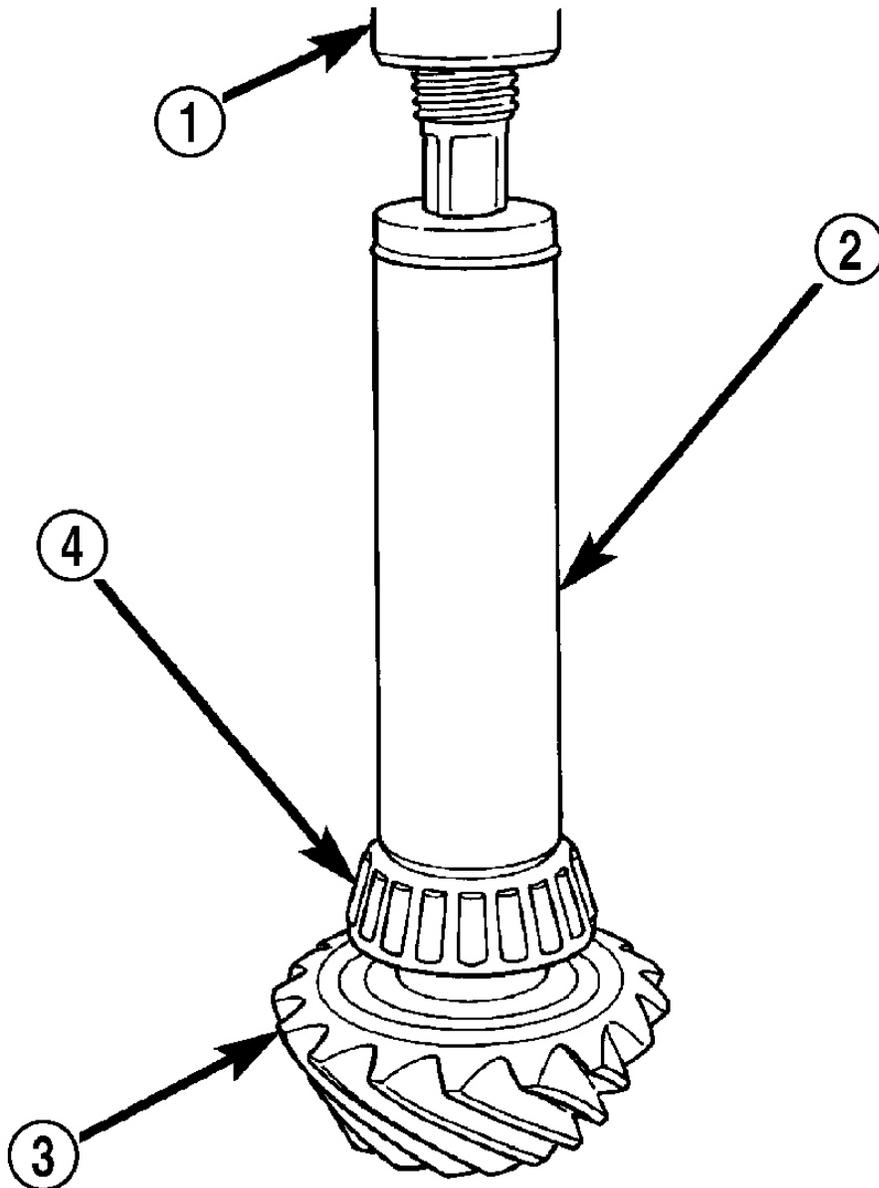


Fig. 198: Removing/Installing Pinion Depth Shim From/On Pinion Shaft
Courtesy of CHRYSLER LLC

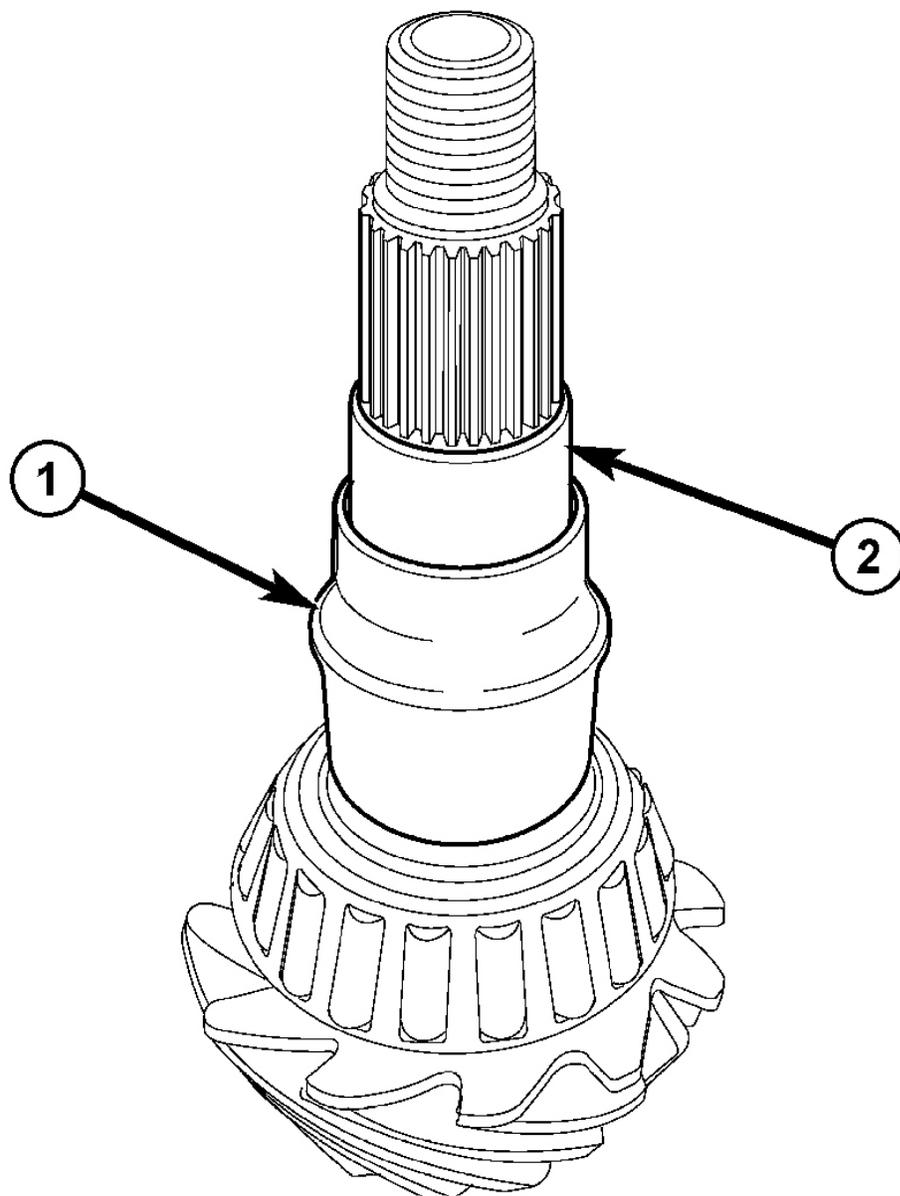
3. Install pinion depth shim (1) on pinion shaft (2).



80be4607

Fig. 199: Removing/Installing Rear Pinion Bearing On Pinion With Installer C-4040 And Press
Courtesy of CHRYSLER LLC

4. Install rear pinion bearing (4) on pinion (3) with Installer C-4040 (2) and a press (1).



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Fig. 200: Removing/Installing Collapsible Spacer From Pinion Shaft
Courtesy of CHRYSLER LLC

5. Install a **new** collapsible spacer (1) on pinion shaft (2).
6. Install pinion in housing.

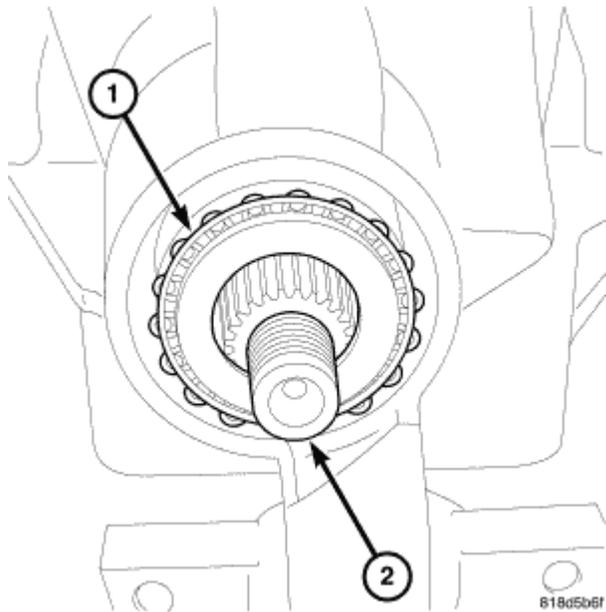


Fig. 201: Installing Front Pinion Bearing On Pinion Shaft
Courtesy of CHRYSLER LLC

7. Install front pinion bearing (1) on pinion shaft (2).

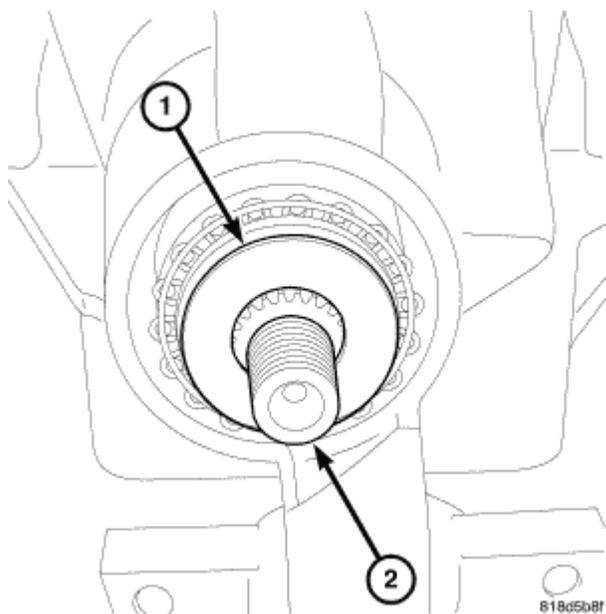


Fig. 202: Installing Front Pinion Bearing Oil Slinger On Pinion Shaft
Courtesy of CHRYSLER LLC

8. Install front pinion bearing oil slinger (1) on pinion shaft (2).

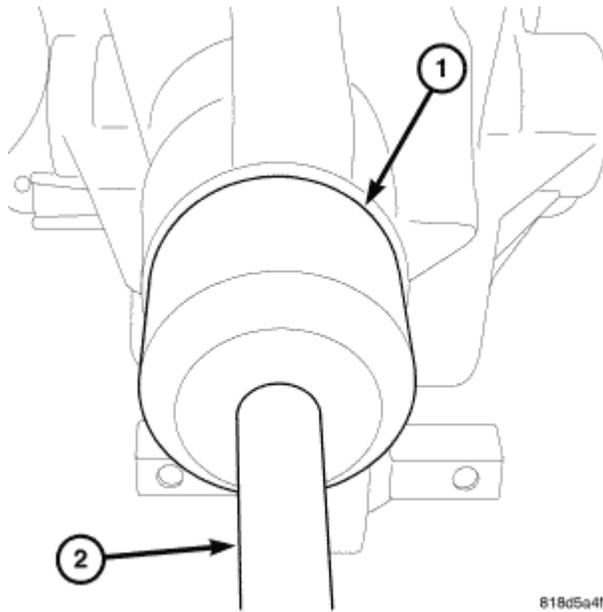


Fig. 203: Identifying Installer 8681 & Handle C-4171
Courtesy of CHRYSLER LLC

9. Apply a light coating of gear lubricant on the lip of pinion seal. Install seal with Installer 8681 (1) and Handle C-4171 (2).

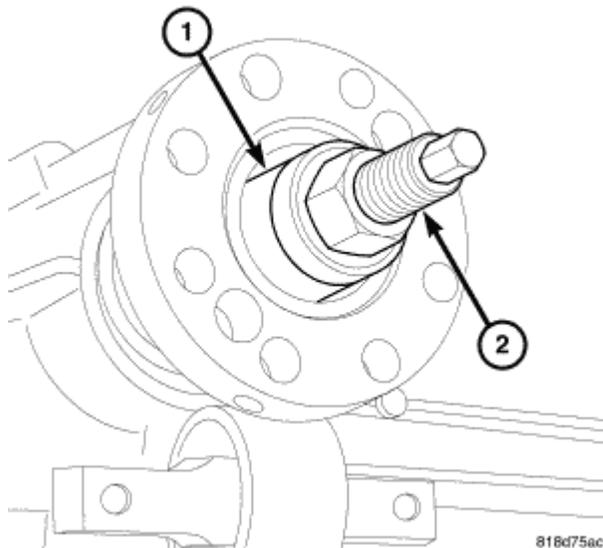
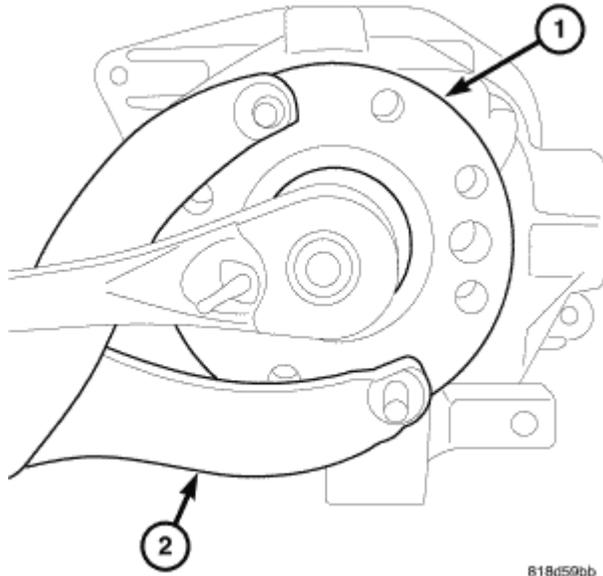


Fig. 204: Identifying Installer W-162-D & Screw 8112
Courtesy of CHRYSLER LLC

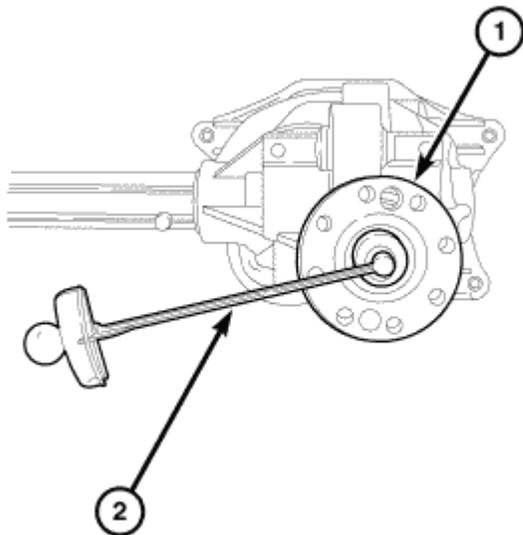
10. Install pinion flange with Installer W-162-D (1) Screw 8112 (2).



818d59bb

Fig. 205: Holding Pinion Flange With Flange Holder C-3281
 Courtesy of CHRYSLER LLC

11. Install **new** pinion nut. Hold flange (1) with Holder C-3281 (2) and tighten the nut to 217 N.m (160 ft. lbs.). **Do not exceed minimum tighten torque 217 N.m (160 ft. lbs.).**
12. With a torque wrench set at 352 N.m (260 ft. lbs.) Tighten pinion nut until pinion end play is eliminated.



818df5cf

Fig. 206: Measuring Pinion Torque To Rotate (PTTR) With An Inch Pound Torque Wrench
 Courtesy of CHRYSLER LLC

13. Rotate pinion several times to seat bearings and verify pinion (1) rotates smoothly.
14. Slowly tighten the pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotate is achieved. Measure rotating torque frequently to avoid over crushing the collapsible spacer.

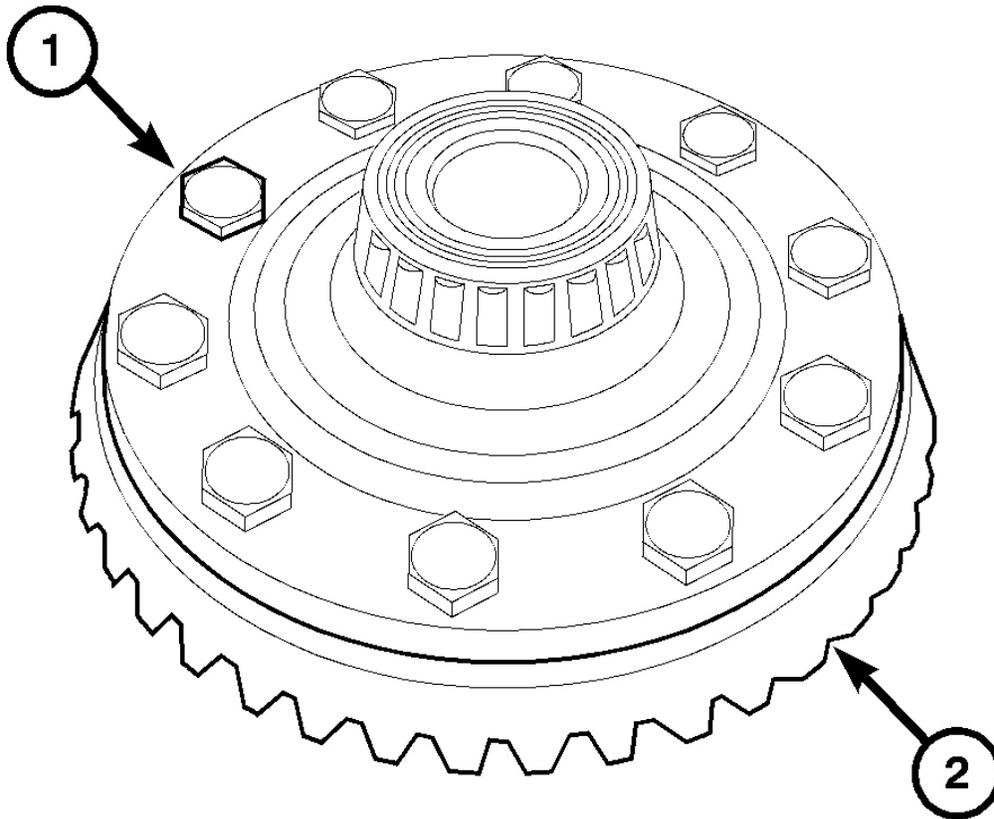
15. Measure pinion torque to rotate (PTTR) with an inch pound torque wrench (2).

Pinion Torque To Rotate is:

Original Bearings: 1.0 - 2.2 N.m (10 - 20 in. lbs.).

New Bearings: 1.7 - 2.8 N.m (15 - 25 in. lbs.).

CAUTION: Never loosen pinion gear nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instructions will result in damage.



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Fig. 207: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

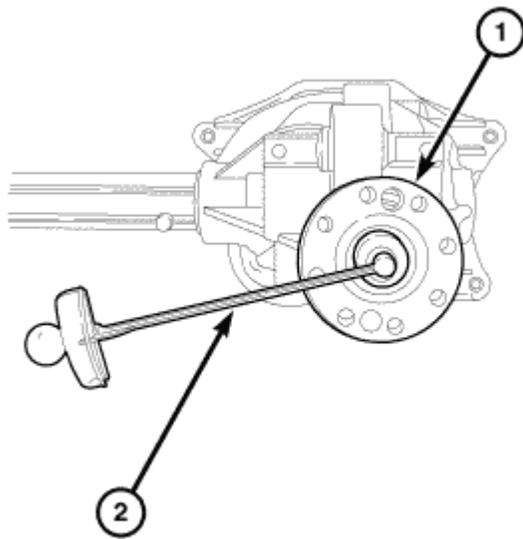
16. Invert differential case and start two ring gear bolts. This will provide case-to-ring gear bolt hole

alignment.

17. Invert differential case in the vise. Install **new** ring gear (2) bolts (1) and alternately tighten to 108 N.m (80 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

18. Install differential in housing.



819df5cf

Fig. 208: Measuring Pinion Torque To Rotate (PTTR) With An Inch Pound Torque Wrench
 Courtesy of CHRYSLER LLC

19. Measure Total Torque to Rotate (TTTR) with an inch pound torque wrench (2). This will verify the correct differential bearing preload.

Total Torque to Rotate (TTTR) is Pinion Torque To Rotate (PTTR) plus:

Gear Ratio 3.21: 0.53 - 0.87 N.m (4.6 - 7.7 in. lbs.)

Gear Ratio 3.55: 0.48 - 0.78 N.m (4.2 - 6.9 in. lbs.)

Gear Ratio 3.73: 0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)

If TTTR is high, decrease shim thickness equally on both sides of the differential and check TTTR again. If TTTR is low, increase shim thickness equally on both sides of the differential and check TTTR again.

20. Verify differential gear contact pattern.

DIAGNOSIS AND TESTING

REAR AXLE - 8 1/4

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.

- Incorrect ring gear backlash.

- Gear damage.

Differential side and pinions gears, usually do not cause noise during straight-ahead driving, when the gears are unloaded. The side gears are loaded during turns. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

Bearing noise can be either a whining or a growling sound.

Pinion bearings have a constant high pitch noise, because it rotates at a faster rate. This noise changes with vehicle speed. If noise is heard under a load, the rear pinion bearing is the source. If noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. The differential bearing noise is constant and varies only with vehicle speed.

Axle shaft bearing noise generally changes when the bearings are loaded. Turn vehicle sharply to the left and the right during a road test. This will load and unload the bearings and change the noise level. If axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joints/CV joint.

- Worn side-gear thrust washers.

- Worn pinion shaft bore.

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2007 DRIVELINE Differential & Driveline - Nitro

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joints/CV joint.
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be an axle vibration. Also look at engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear or the clutch engaged, can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints/CV joint.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

To determine the source of a snap/clunk noise, raise vehicle on a hoist with the wheels free to rotate. Have a helper shift the transmission into gear and listen for the noise.

DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose. 2. Worn wheel bearing.	1. Tighten loose nuts. 2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.

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	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
Axle Shaft Broke	<ol style="list-style-type: none"> 1. Misaligned axle tube. 2. Vehicle overloaded. 3. Erratic clutch operation. 4. Grabbing clutch. 	<ol style="list-style-type: none"> 1. Replace the broken shaft after correcting tube mis-alignment. 2. Replace broken shaft and avoid excessive weight on vehicle. 3. Replace broken shaft and avoid or correct erratic clutch operation. 4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	<ol style="list-style-type: none"> 1. Improper adjustment of the differential bearings. 2. Excessive ring gear backlash. 3. Vehicle overloaded. 4. Erratic clutch operation. 	<ol style="list-style-type: none"> 1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly. 2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly. 3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight. 4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	<ol style="list-style-type: none"> 1. Insufficient lubrication. 2. Improper grade of lubricant. 3. Excessive spinning of one wheel/tire. 	<ol style="list-style-type: none"> 1. Replace scored gears. Fill differential with the correct fluid type and quantity. 2. Replace scored gears. Fill differential with the correct fluid type and quantity. 3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	<ol style="list-style-type: none"> 1. Lubricant level too high. 2. Worn axle shaft seals. 3. Cracked differential housing. 4. Worn pinion seal. 5. Worn/scored yoke. 6. Axle cover not properly sealed. 	<ol style="list-style-type: none"> 1. Drain lubricant to the correct level. 2. Replace seals. 3. Repair as necessary. 4. Replace seal. 5. Replace yoke and seal. 6. Remove, clean and seal cover.
Axle Overheating	<ol style="list-style-type: none"> 1. Lubricant level low. 2. Improper grade of lubricant. 3. Bearing pre-loads too high. 4. Insufficient ring gear backlash. 	<ol style="list-style-type: none"> 1. Fill differential to correct level. 2. Fill differential with the correct fluid type and quantity. 3. Adjust bearing pre-loads. 4. Adjust ring gear backlash.

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Gear Teeth Broke	<ol style="list-style-type: none">1. Overloading.2. Erratic clutch operation.3. Ice-spotted pavement.4. Improper adjustments.	<ol style="list-style-type: none">1. Replace gears. Examine other gears and bearings for possible damage.2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.3. Replace gears and examine remaining parts for damage.4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	<ol style="list-style-type: none">1. Insufficient lubricant.2. Improper ring gear and pinion adjustment.3. Unmatched ring gear and pinion.4. Worn teeth on ring gear or pinion.5. Loose pinion bearings.6. Loose differential bearings.7. Ring gear run-out.8. Loose differential bearing cap bolts.9. Housing not machined properly.	<ol style="list-style-type: none">1. Fill differential with the correct fluid type and quantity.2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth.3. Replace gears with a matched ring gear and pinion.4. Replace ring gear and pinion.5. Adjust pinion bearing pre-load.6. Adjust differential bearing pre-load.7. Measure ring gear run-out. Replace components as necessary.8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued to t specifications.9. Replace housing.

REMOVAL

REAR AXLE - 8 1/4

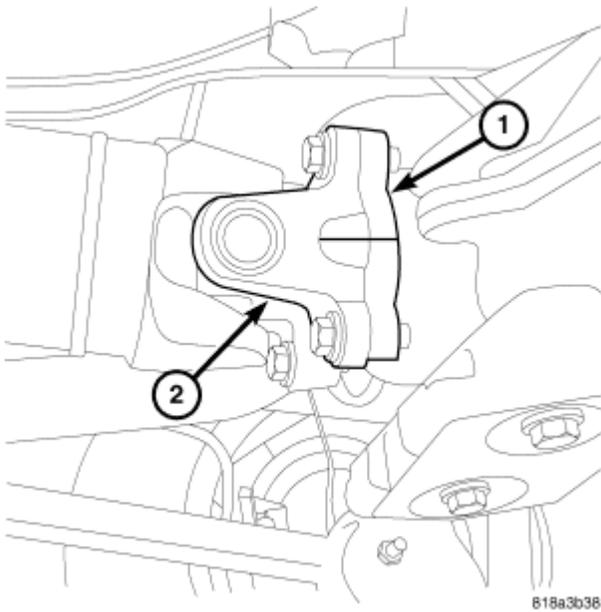


Fig. 209: Identifying Line Across Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift/jack under the axle and secure axle to device.
3. Mark axle pinion flange (1) and propeller shaft flange (2) for installation reference.
4. Remove propeller shaft and suspend under the vehicle.

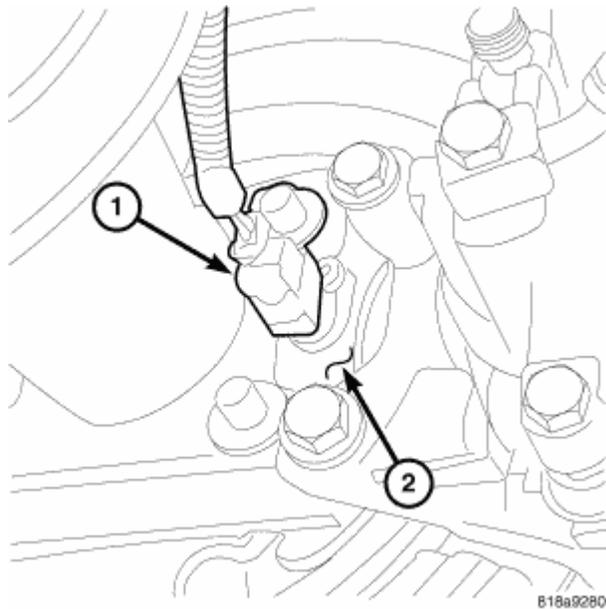


Fig. 210: Identifying Brake Sensor & Axle
Courtesy of CHRYSLER LLC

5. Remove brake sensor (1) from axle (2) and remove calipers, rotors and cables.

NOTE: The parking brake is self-adjusting, and cables must be locked out before removal. Refer to **ADJUSTMENTS** .

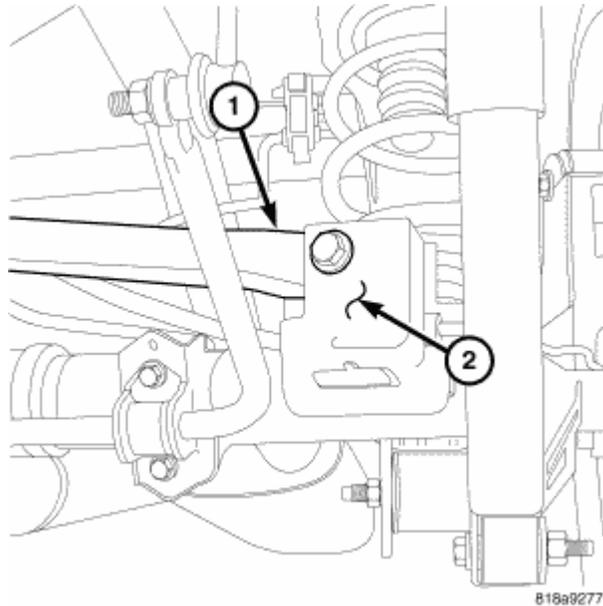


Fig. 211: Identifying Track Bar & Axle Bracket
Courtesy of CHRYSLER LLC

6. Remove track bar (1) bolt from axle bracket (2).

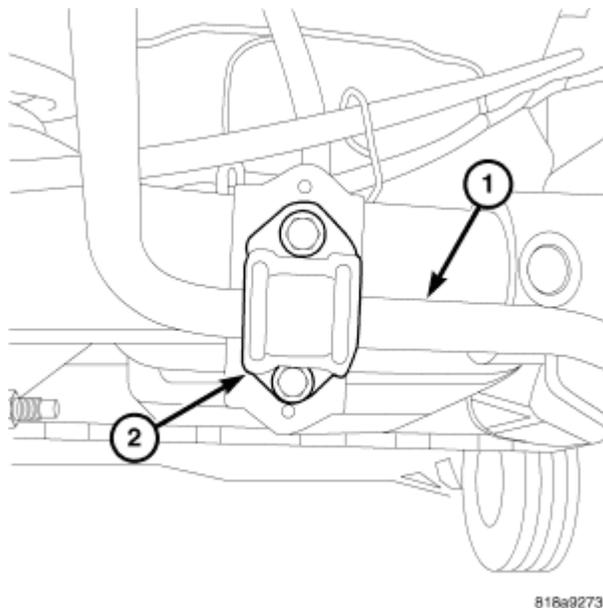
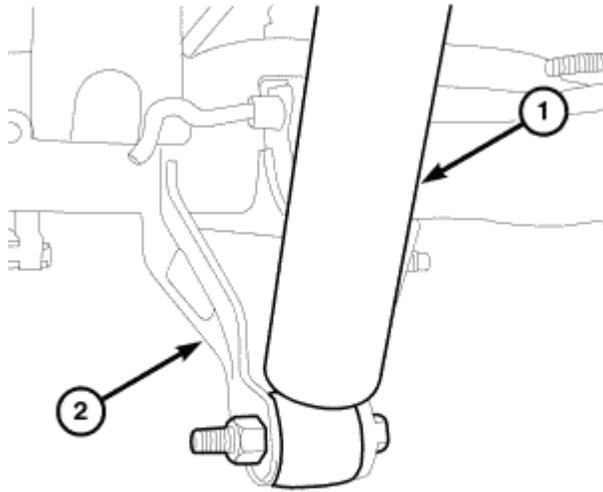


Fig. 212: Identifying Stabilizer Bar & Axle Bracket
Courtesy of CHRYSLER LLC

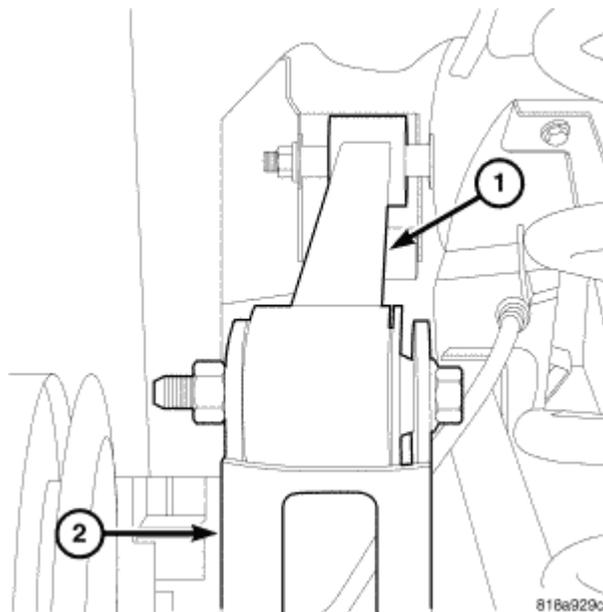
7. Remove vent hose from the axle shaft tube.
8. Remove stabilizer bar (1) axle bracket (2).



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Fig. 213: Identifying Shock Absorbers & Axle Brackets
Courtesy of CHRYSLER LLC

9. Remove shock absorbers (1) from axle brackets (2).



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Fig. 214: Identifying Upper Control Arm & Axle Brackets
Courtesy of CHRYSLER LLC

10. Remove upper control arm (1) nuts and bolts from the axle brackets (2).

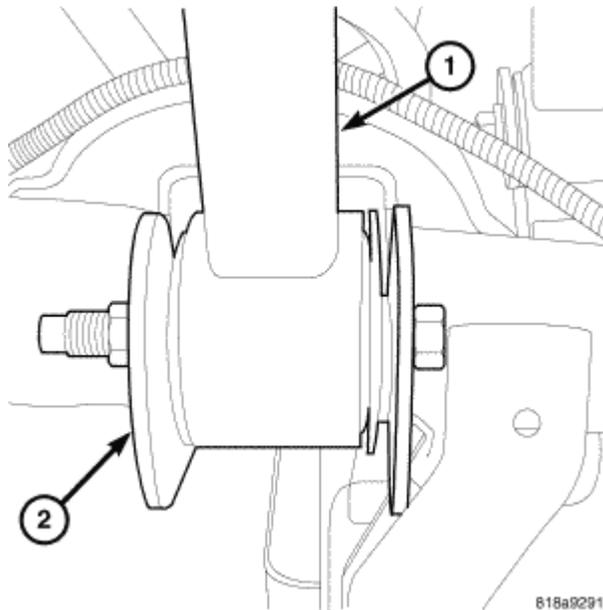


Fig. 215: Identifying Lower Control Arm & Axle Brackets
Courtesy of CHRYSLER LLC

11. Lower axle enough to remove coil springs and spring insulators.
12. Remove lower control arm (1) mounting bolts from axle brackets (2).
13. Lower and remove the axle.

INSTALLATION

REAR AXLE - 8 1/4

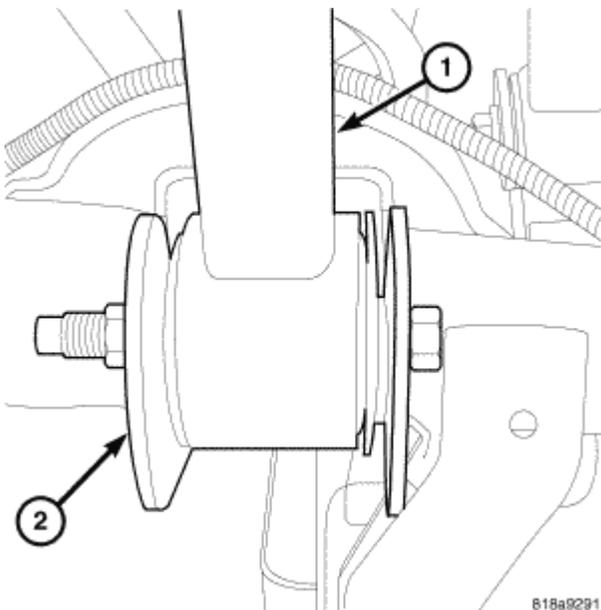


Fig. 216: Identifying Lower Control Arm & Axle Brackets
Courtesy of CHRYSLER LLC

CAUTION: The weight of the vehicle must be supported by the springs before the control arms and track bar are tightened. Failure to follow these instructions will cause premature bushing failure.

1. Raise the axle under the vehicle.
2. Install lower control arms (1) onto the axle brackets (2). Loosely install mounting bolts and nuts.
3. Install coil spring isolators and springs.
4. Raise axle up until springs are seated.

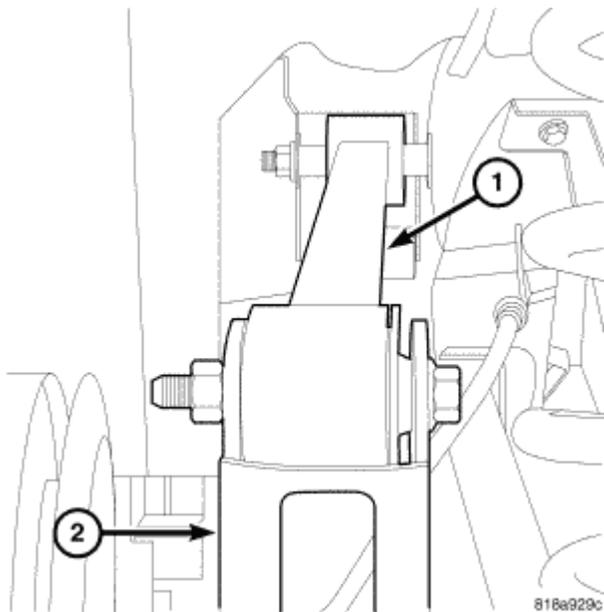
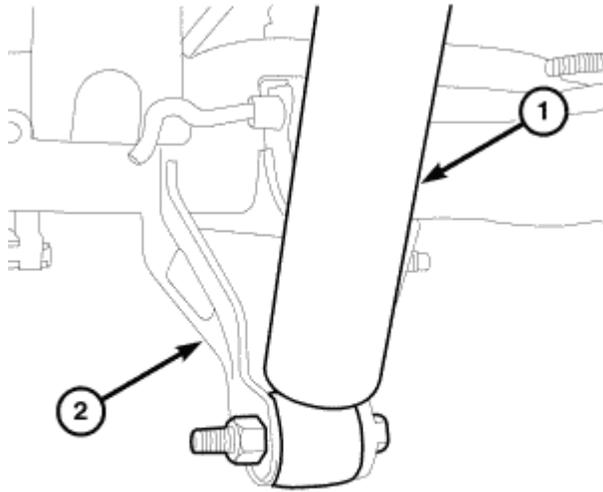


Fig. 217: Identifying Upper Control Arm & Axle Brackets
Courtesy of CHRYSLER LLC

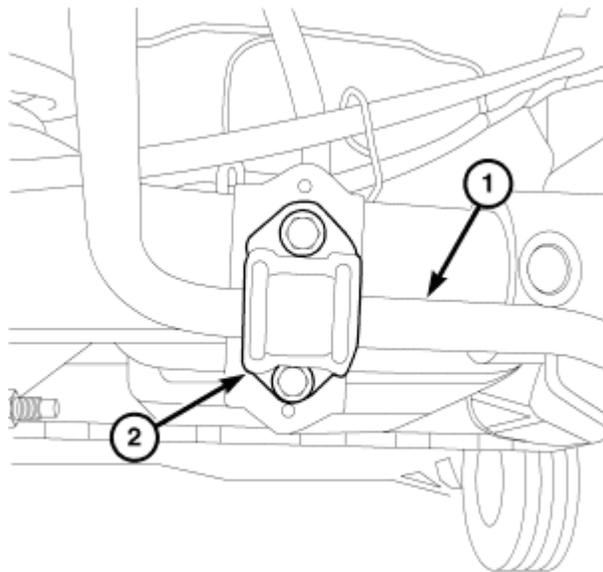
5. Install upper control arms (1) into axle brackets (2). Loosely install mounting bolts and nuts.



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Fig. 218: Identifying Shock Absorbers & Axle Brackets
Courtesy of CHRYSLER LLC

6. Install shock absorbers (1) in axle brackets (2). Install shock bolts and nuts and tighten nuts to specifications.



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Fig. 219: Identifying Stabilizer Bar & Axle Bracket
Courtesy of CHRYSLER LLC

7. Install stabilizer bar (1) and clamps (2) on axle. Tighten clamp (2) bolts to torque specifications.
8. Install vent hose to axle shaft tube.

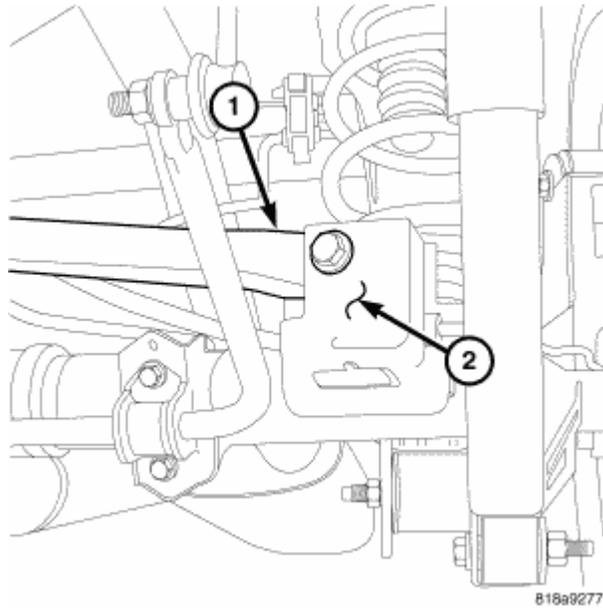


Fig. 220: Identifying Track Bar & Axle Bracket
Courtesy of CHRYSLER LLC

9. Install track bar (1) in axle bracket (2). Loosely install track bar (1) bolt.

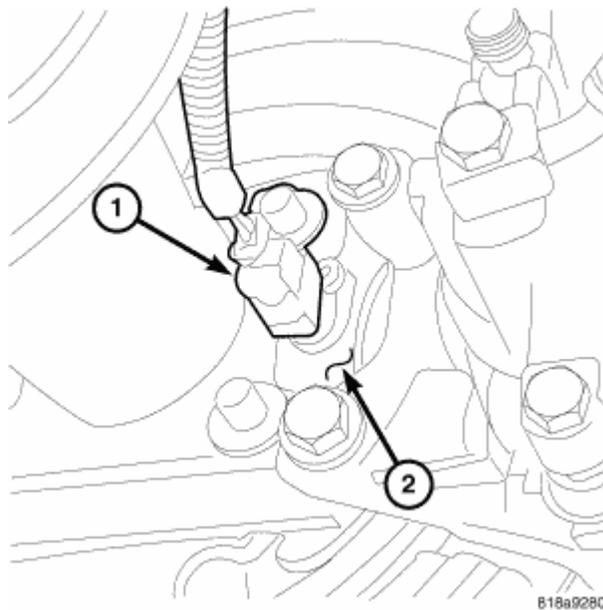


Fig. 221: Identifying Brake Sensor & Axle
Courtesy of CHRYSLER LLC

10. Install brake rotors, calipers and brake sensor (1) on axle (2).
11. Install parking brake cables. Refer to **INSTALLATION**.

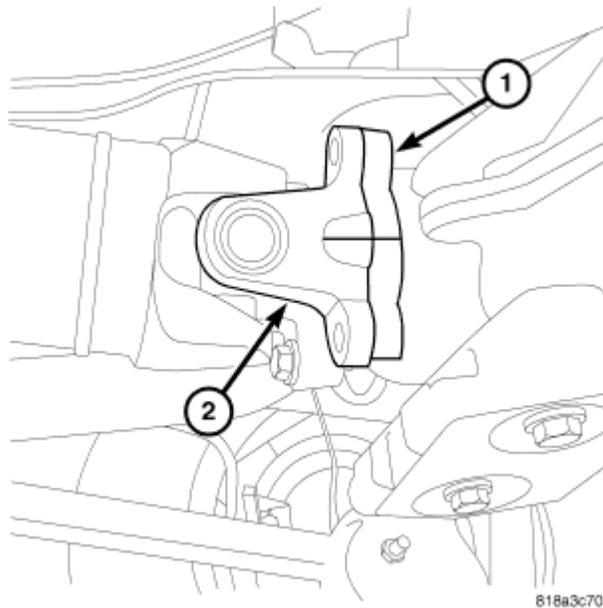


Fig. 222: Identifying Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

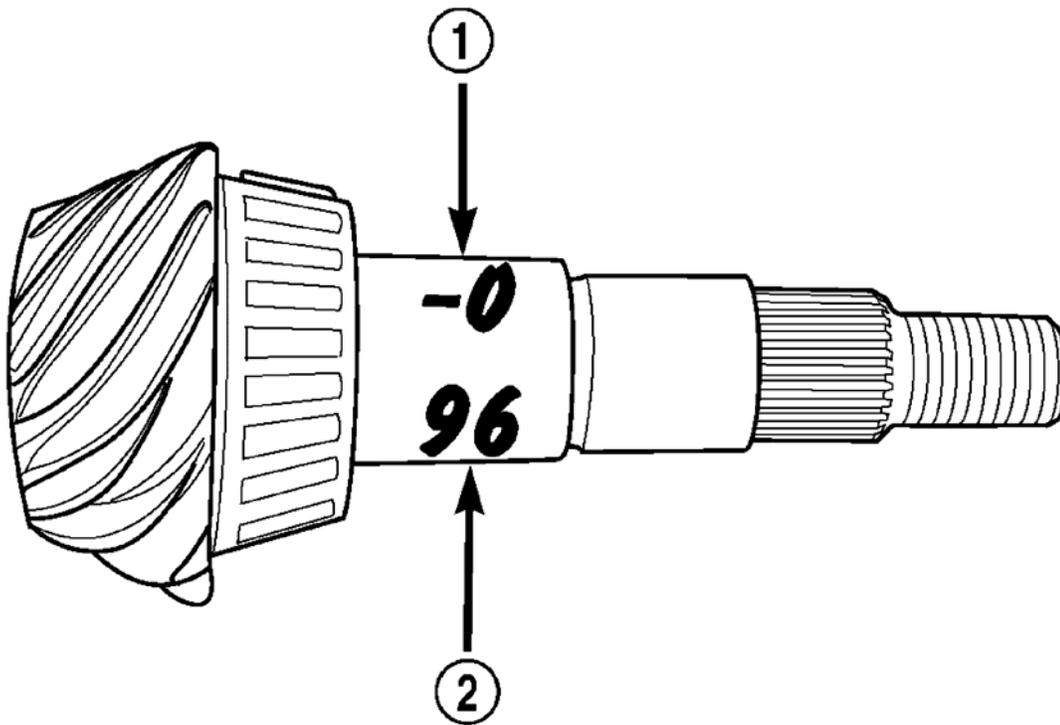
12. Install propeller shaft with pinion flange (1) and propeller shaft flange (2) reference marks aligned.

NOTE: Clean all propeller shaft bolts and apply Mopar Lock & Seal Adhesive or equivalent to the threads before installation.

13. Install propeller shaft bolts and tighten to specifications.
14. Install the wheels and tires.
15. Remove lifting device from axle and lower the vehicle.
16. Tighten lower control arms, upper control arms and track bar bolts to torque specifications.

ADJUSTMENTS

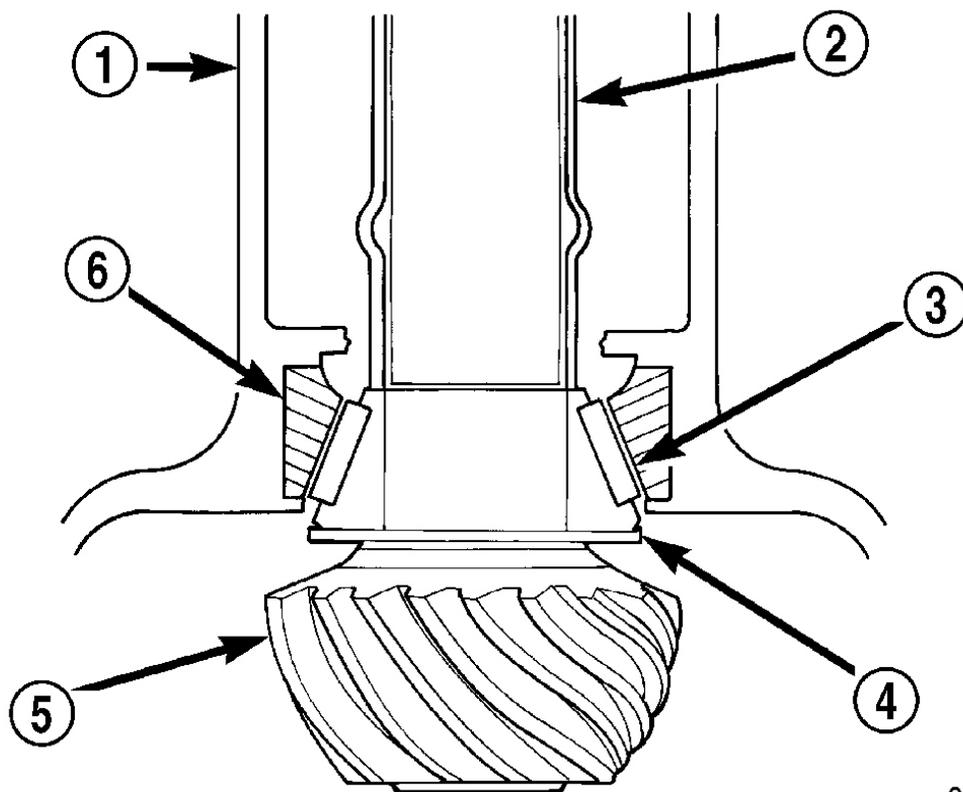
REAR AXLE - 8 1/4



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Fig. 223: Pinion ID Numbers
Courtesy of CHRYSLER LLC

Ring gear and pinion are supplied as matched sets. Identifying numbers for the ring gear and pinion are painted onto the pinion gear shaft and the side of the ring gear. A plus (+) number, minus (-) number or zero (0) along with the gear set sequence number (2) (01 to 99) is on each gear. This first number (1) the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion marked with a (0). The next two numbers are the sequence number of the gear set. The standard depth provides the best teeth contact pattern.



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Fig. 224: Adjustment Shim Locations
 Courtesy of CHRYSLER LLC

Compensation for pinion depth variance is achieved with select shims (4). The shims are placed behind the rear pinion bearing.

If installing a new gear, note the depth variance number of the original and replacement pinion. Add or subtract this number from the original depth shim to compensate for the difference in the depth variances. The numbers represent thousands of an inch deviation from the standard. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.

Pinion Gear Depth Variance Chart : Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

PINION GEAR DEPTH VARIANCE

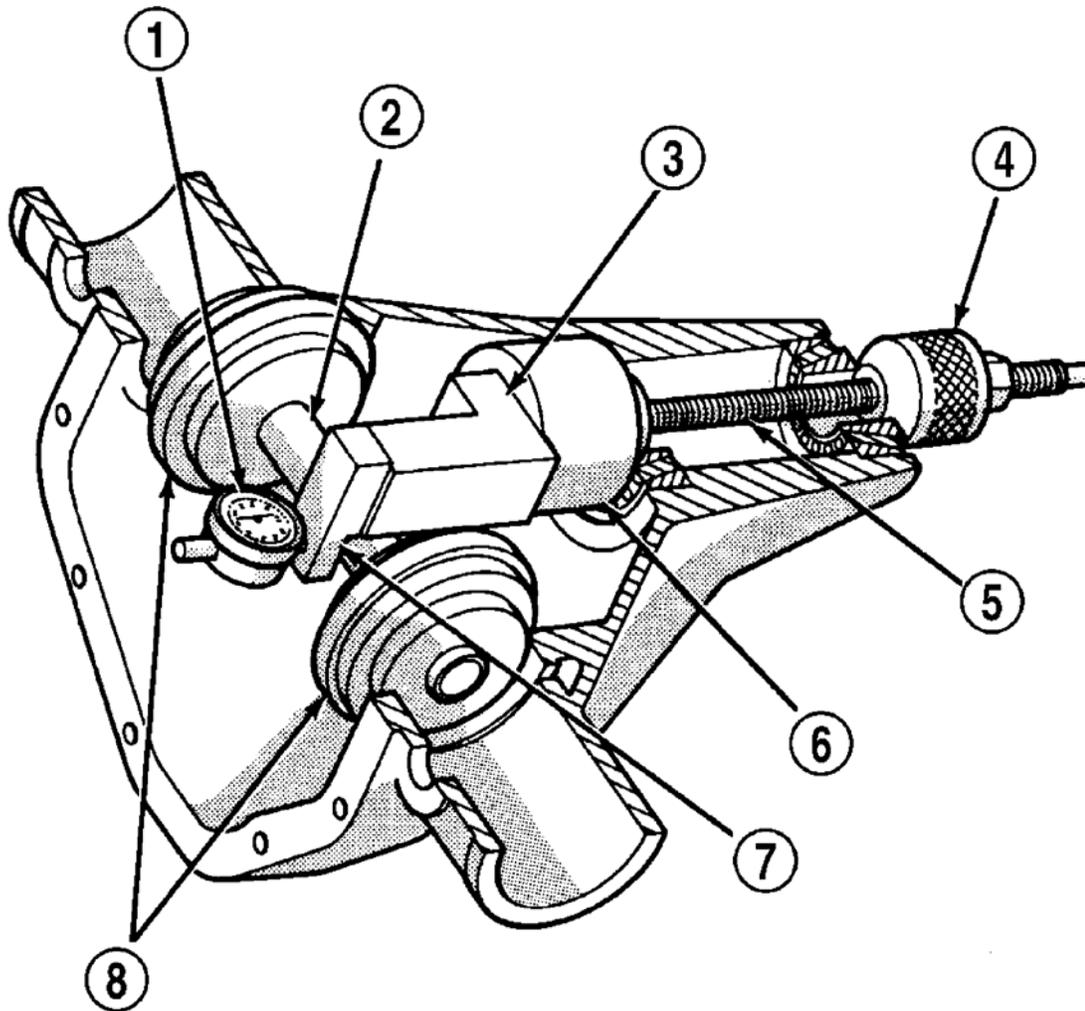
Original Pinion Gear Depth Variance	Replacement Pinion Gear Depth Variance								
	-4	-3	-2	-1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001

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+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003
0	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004
-1	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005
-2	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006
-3	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007
-4	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007	-0.008

PINION DEPTH MEASUREMENT



J9403-45

Fig. 225: Pinion Depth Gauge Tools
 Courtesy of CHRYSLER LLC

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take

measurements with Pinion Gauge Set 6730 and Dial Indicator C-3339A (1).

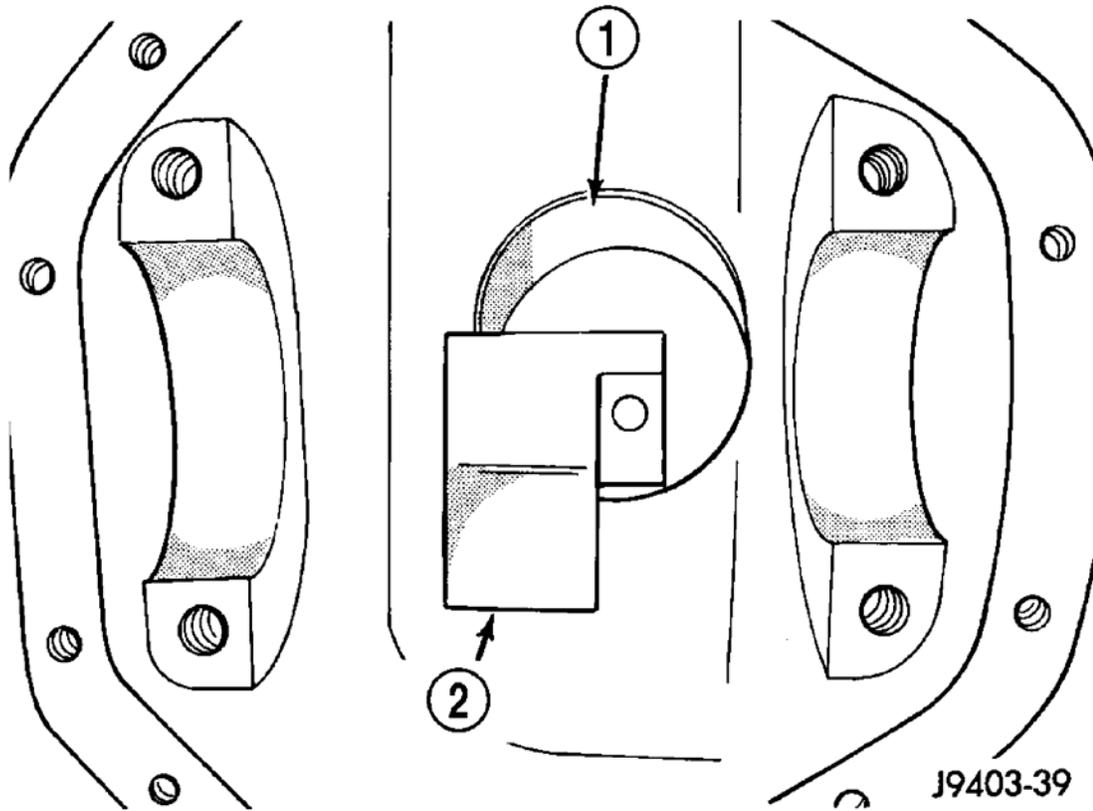


Fig. 226: Identifying Pinion Block 8540 & Pinion Height Block 6739
Courtesy of CHRYSLER LLC

1. Assemble Pinion Height Block 6739 (2), Pinion Block 8540 (1) and rear pinion bearing onto Screw 6741.
2. Insert assembled height gauge components, rear bearing and screw into housing through pinion bearing cups.

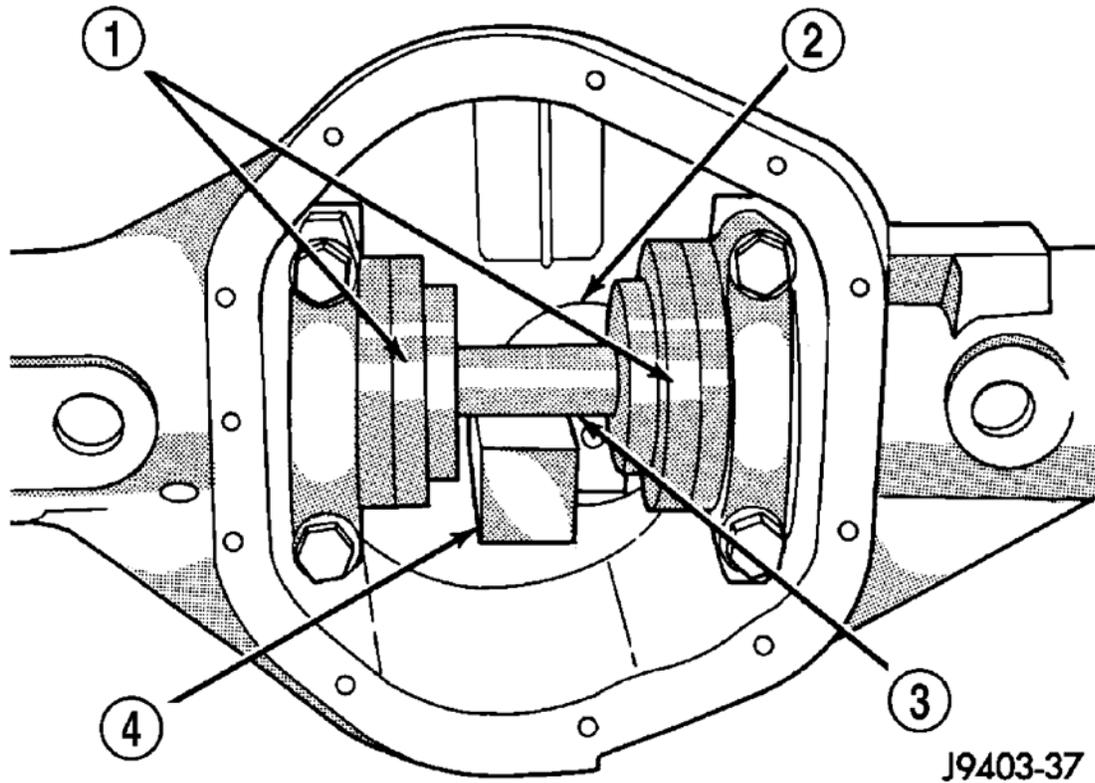


Fig. 227: Gauge Tools In Housing
Courtesy of CHRYSLER LLC

3. Install front pinion bearing and Cone-Nut 6740 on the screw. Tighten Cone-Nut until Torque To Rotate screw is 1.7 N.m (15 in. lbs.).
4. Place Arbor Disc 8541 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles. Install differential bearing caps on arbor discs and tighten cap bolts to 41 N.m (30 ft. lbs.).

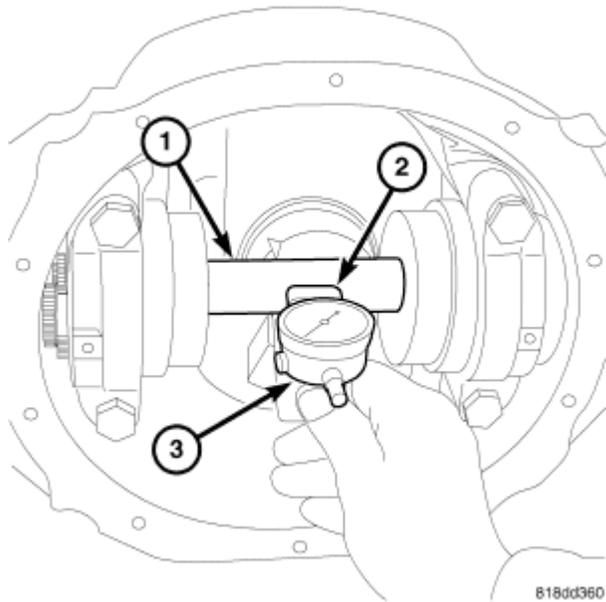
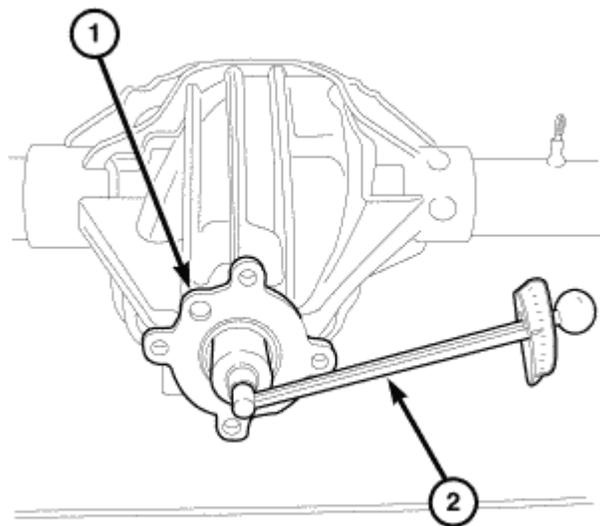


Fig. 228: Assembling Dial Indicator C-3339A Into Scooter Block D-115-2A And Securing Set Screw
 Courtesy of CHRYSLER LLC

5. Assemble Dial Indicator C-3339A (3) into Scooter Block D-115-2A (2) and secure set screw.
6. Place Scooter Block/Dial Indicator in position in axle housing so dial probe and scooter block are flush against the rearward surface of the pinion height block. Hold scooter block in place and zero the dial indicator. Tighten dial indicator face lock screw.
7. Slowly slide the dial indicator probe over the edge of the pinion height block.
8. Slide the dial indicator probe across the gap between the pinion height block and the arbor bar (1) with the scooter block against the pinion height block. When dial probe contacts the arbor bar, the dial pointer will turn clockwise. Continue moving the dial probe to the crest of the arbor bar and record the highest reading. If the dial indicator can not achieve a zero reading, the rear bearing cup or the pinion depth gauge set is not installed correctly.
9. Select a shim equal to the dial indicator reading, plus the drive pinion gear depth variance number marked on the shaft of the pinion. If the depth variance is -2, add 0.002 in. to the dial indicator reading. If the depth variance is +2, subtract 0.002 in. from the dial indicator reading. Then subtract 0.041 mm (0.0016 in.) from the total measurement. This will be the correct pinion height shim selection.

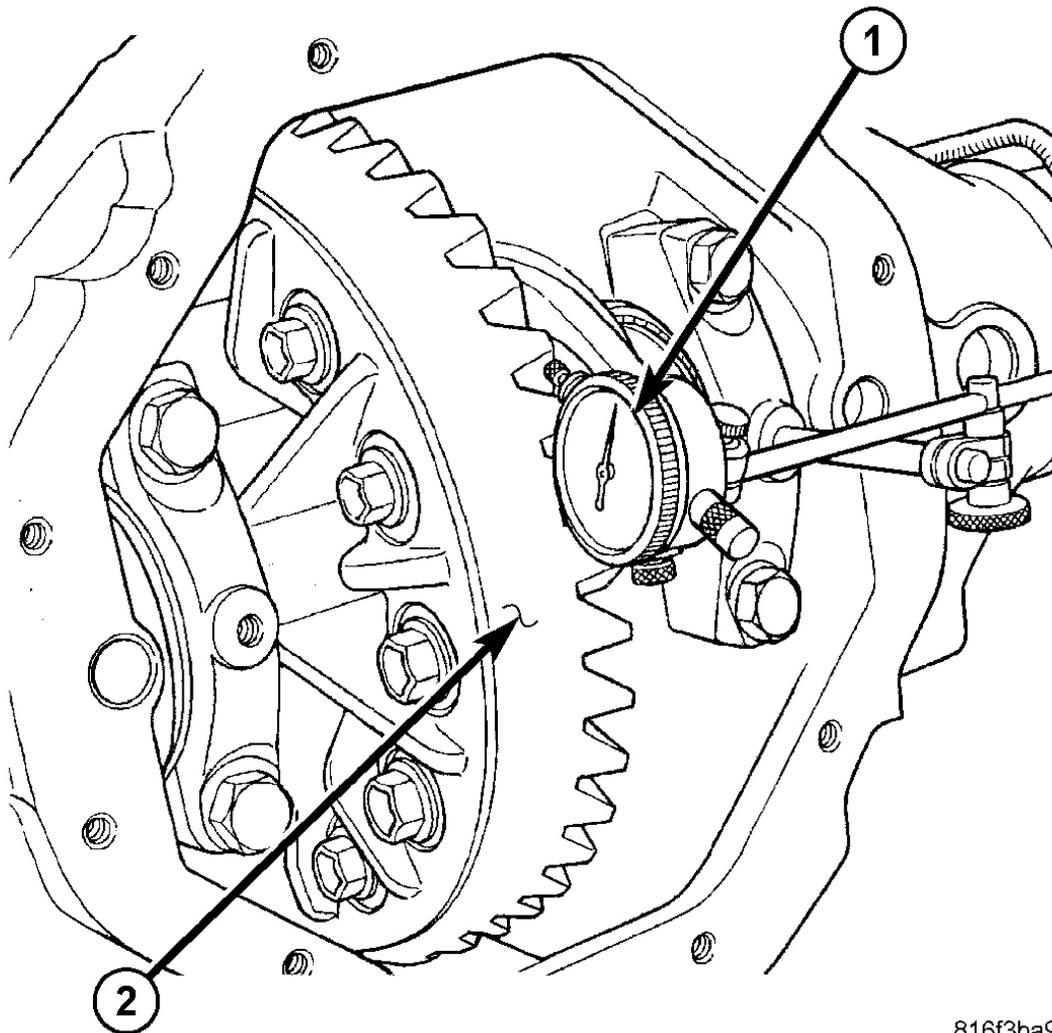


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Fig. 229: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

10. Install pinion gear and establish Pinion Torque To Rotate (PTTR) with an inch pound torque wrench (1).

DIFFERENTIAL BEARING PRELOAD AND GEAR BACKLASH



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Fig. 230: Installing Dial Indicator C-3339A With Plunger Position Against Drive Side Of Ring Gear Tooth

Courtesy of CHRYSLER LLC

1. Turn each thread adjuster inward with Wrench C-4164 until differential bearing end-play is eliminate and ring gear backlash is approximately 0.25 mm (0.01 in.). Seat bearing cups by rapidly rotating the pinion gear a half turn back and forth several times.
2. Install Dial Indicator C-3339A (1) with plunger position against drive side of a ring gear (2) tooth. Measure and record backlash at 4 positions, 90 degrees apart around the ring gear.

Mark lowest backlash position on the ring gear and make all backlash measurements at this location.

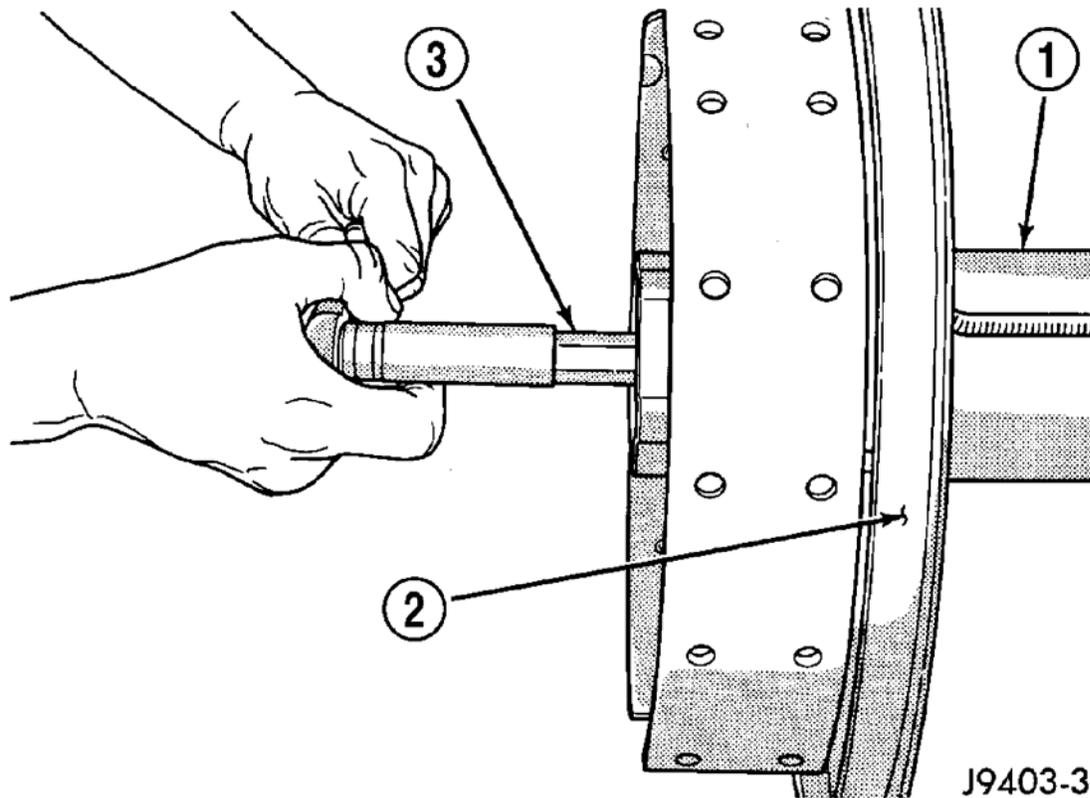


Fig. 231: Identifying Axle Tubes & Adjuster C-4164
 Courtesy of CHRYSLER LLC

3. Loosen left-side adjuster and tighten right-side threaded adjuster with Wrench C-4164 (3) to obtain a backlash of 0.076 - 0.102 mm (0.003 - 0.004 in.).
4. Tighten both adjusters to 14 N.m (10 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times.
5. Tighten differential bearing cap bolts 95 N.m (70 ft. lbs.).
6. Tighten right-side threaded adjuster to 102 N.m (75 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times. Continue this procedure until right-side adjuster torque remains a constant 102 N.m (75 ft. lbs.).
7. Measure the ring gear backlash. Backlash should be 0.12 - 0.20 mm (0.005 - 0.008 in.).

If backlash is less than 0.12 (0.005 in.) increase right-side threaded adjuster torque until specified backlash is obtained.

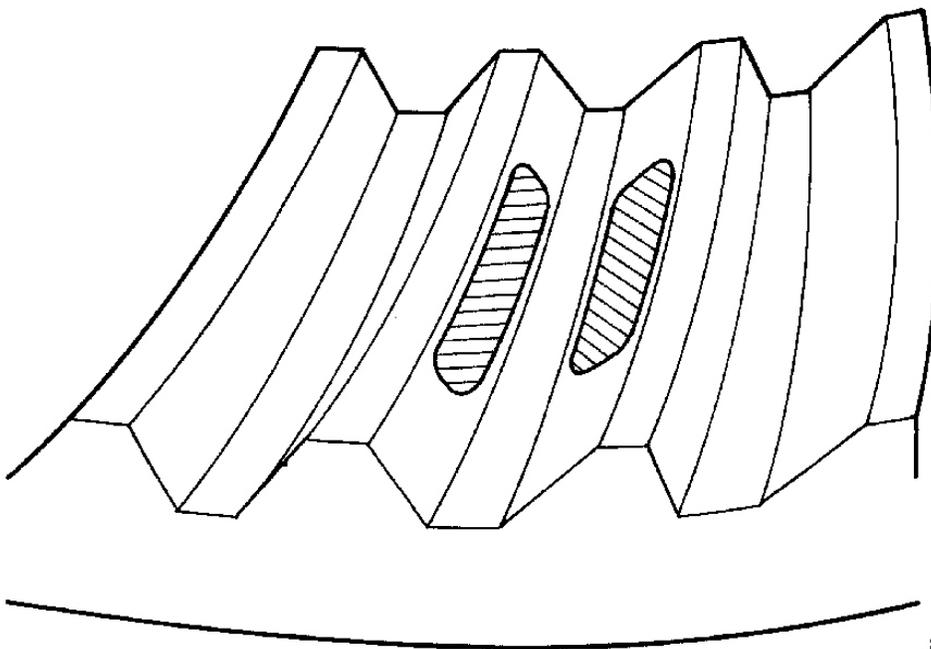
If backlash is more than 0.20 (0.008 in.) repeat procedure from the beginning.

8. Tighten left-side threaded adjuster to 102 N.m (75 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times. Continue this procedure until left-side adjuster torque remains a constant 102 N.m (75 ft. lbs.).

9. Install threaded adjuster locks and tighten the lock screws to 10 N.m (90 in. lbs.).
10. Measure and backlash at 4 positions, 90 degrees apart around the ring gear. Maximum ring gear backlash variation is 0.076 mm (0.003 in.).

After backlash is achieved, perform Gear Contact procedure.

GEAR CONTACT PATTERN



80e22005

Fig. 232: Gear Contact Pattern Is Correct
Courtesy of CHRYSLER LLC

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque specifications.
4. Apply parking brakes lightly to create at 14 N.m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

Gear contact pattern is correct. Backlash and pinion depth is correct.

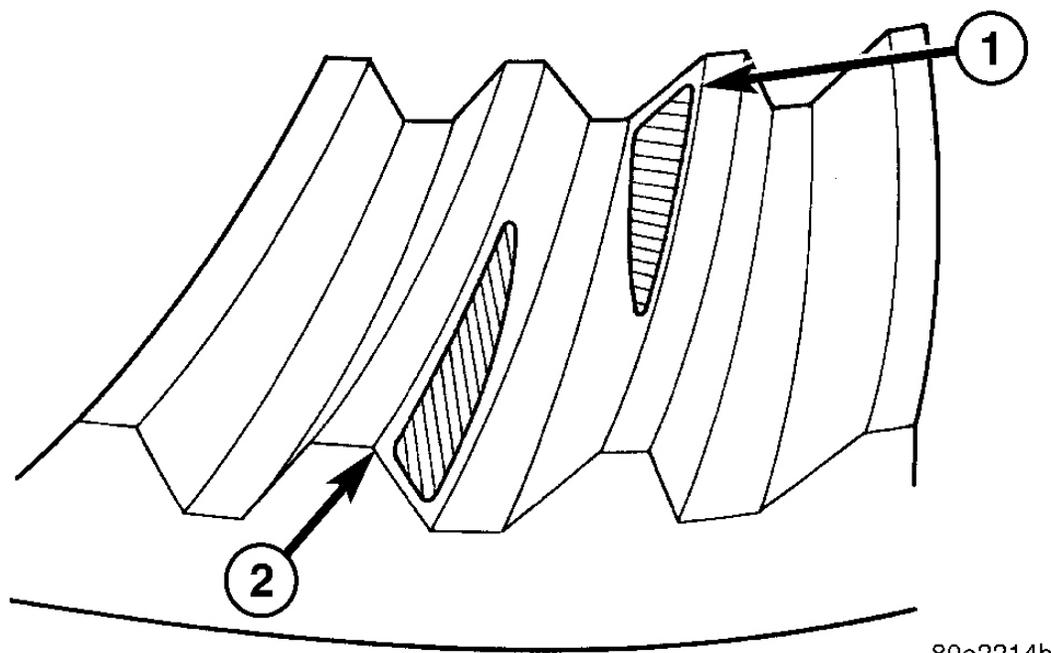
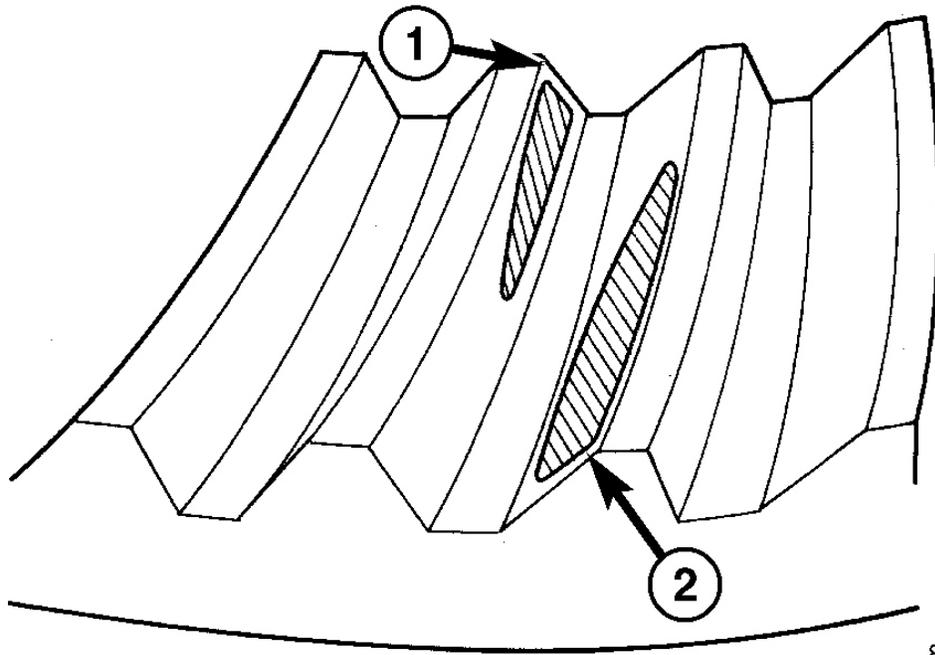


Fig. 233: Identifying Coast Side Toe & Drive Side Heel
Courtesy of CHRYSLER LLC

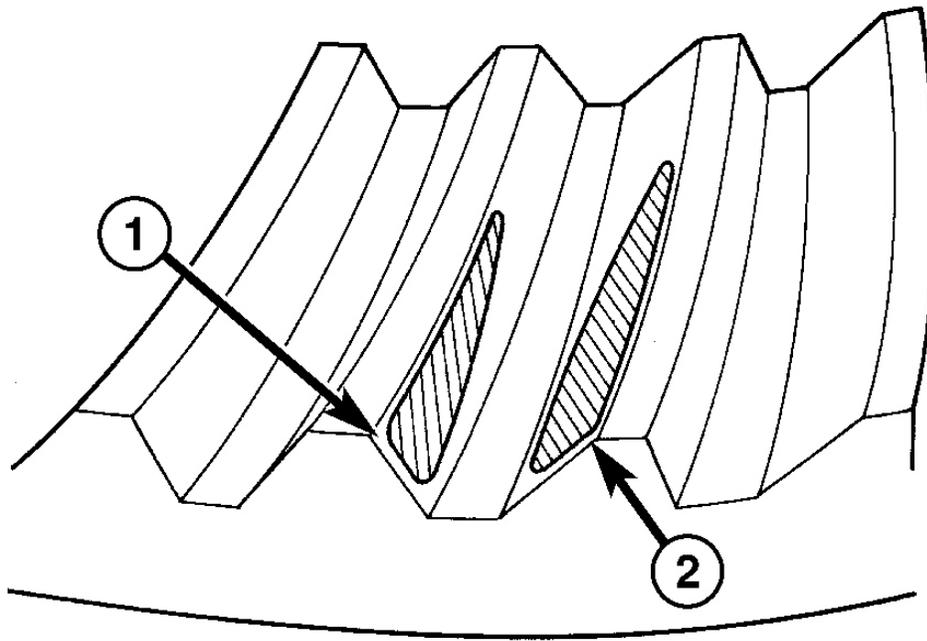
Ring gear is too far away from the pinion gear, coast side toe (1) drive side heel (2). Decrease backlash by moving ring closer to the pinion gear using the adjusters.



80e222bd

Fig. 234: Identifying Drive Side Toe & Coast Side Heel
Courtesy of CHRYSLER LLC

Ring gear is too close to the pinion gear, drive side toe (1) coast side heel (2). Increase backlash by moving ring away from the pinion gear using the adjusters.



80e222ca

Fig. 235: Identifying Drive Side Heel & Coast Side Heel
Courtesy of CHRYSLER LLC

Ring gear is too far away from the pinion gear, drive side heel (1) coast side heel (2). Decrease backlash by moving ring gear closer to the pinion gear using the adjusters.

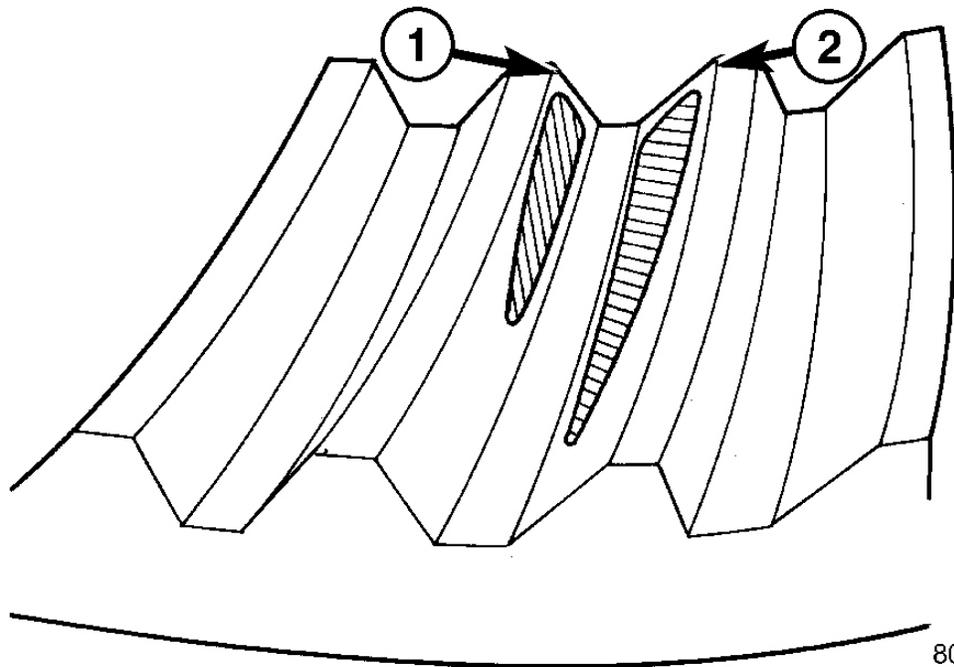
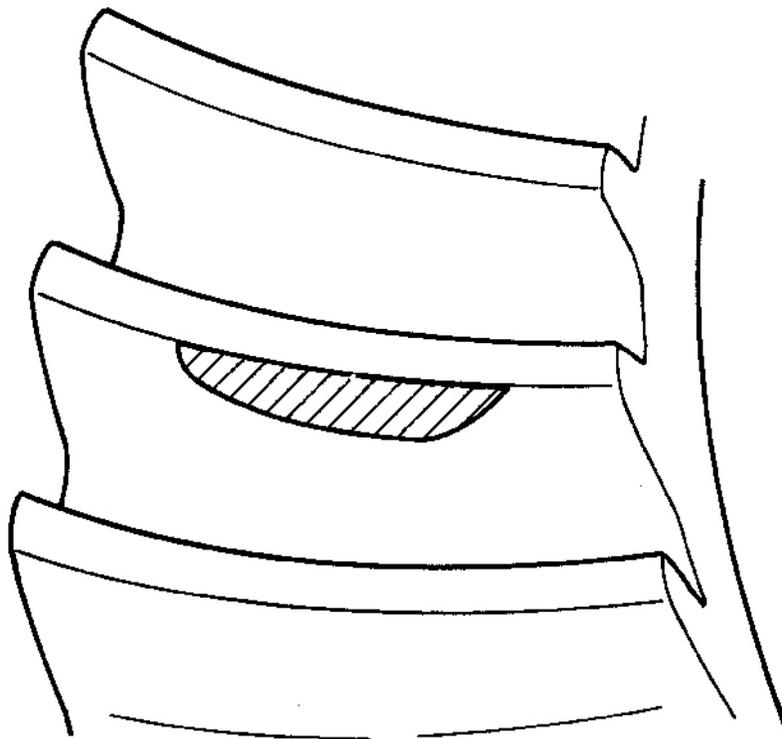


Fig. 236: Identifying Drive Side Toe & Coast Side Toe
Courtesy of CHRYSLER LLC

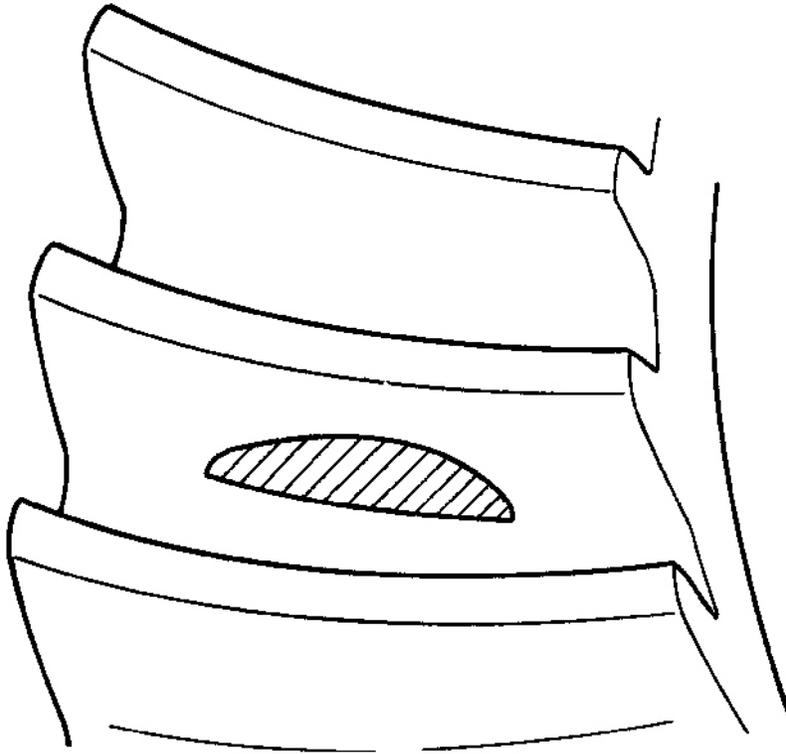
Ring gear is too close to the pinion gear, drive side toe (1) coast side toe (2). Increase backlash by moving ring gear away from the pinion gear using the adjusters.



80e2238f

Fig. 237: Pinion Gear Is Set Too Low
Courtesy of CHRYSLER LLC

Pinion gear is set too low. Increase pinion gear height, by increasing pinion depth shim thickness.



80e223a6

Fig. 238: Pinion Gear Is Set Too High
Courtesy of CHRYSLER LLC

Pinion gear is set too high. Decrease pinion height by decreasing the pinion depth shim thickness.

AXLE SHAFT END-PLAY

Visual inspect differential case, pinion mate shaft, axle shaft end button, C-lock, differential pinion gears, differential side gears and washers for damage or excessive wear. Replace damaged components.

1. Assemble differential and install.
2. Install differential pinion mate shaft locking screw to locate the shaft without torque it down.
3. Mount dial indicator base on the axle tube flange.
4. Push axle shaft inward until its end touches differential pinion mate shaft. Set dial indicator plunger on the end of axle shaft flange surface and zero dial indicator.
5. Pull axle shaft out until it stops and record dial indicator end-play reading. Rotate axle shaft about 180 degrees and record dial indicator end-play reading again. Two readings should be within 0.05 mm (0.002 in.).
6. Conduct the same procedure on the axle shaft on the opposite side.

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End-play specifications should be 0.13 - 0.38 mm (0.005 - 0.015 in.). If specifications can not be met, shim side gears and/or replace differential case.

SPECIFICATIONS

REAR AXLE - 8 1/4

AXLE SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Axle Ratio	3.21/3.55/3.73
Differential Case Flange Runout	0.076 mm (0.003 in.)
Differential Case Clearance	0.12 mm (0.005 in.)
Ring Gear Diameter	213 mm (8.25 in.)
Ring Gear Backlash	0.12 - 0.20 mm (0.005 - 0.008 in.)
Ring Gear Runout	0.12 mm (0.005 in.)
Pinion Torque To Rotate - Original Bearings	1 - 2 N.m (10 - 20 in. lbs.)
Pinion Torque To Rotate - New Bearings	1 - 3.4 N.m (10 - 30 in. lbs.)

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Differential Cover Bolts	41	30	-
Bearing Cap Bolts	135	100	-
Ring Gear Bolts - Gas Engines	122	90	-
Pinion Nut Minimum	285	210	-
Pinion Mate Shaft Screw	26	19	-
Axle Damper	61	45	-
Adjuster Lock Screw	26	19	-

Ring Gear Bolts - Diesel Engines: Follow service procedure to tighten ring gear bolts on vehicles equipped with diesel engine and 3.21 gear ratio.

SPECIAL TOOLS

REAR AXLE - 8 1/4

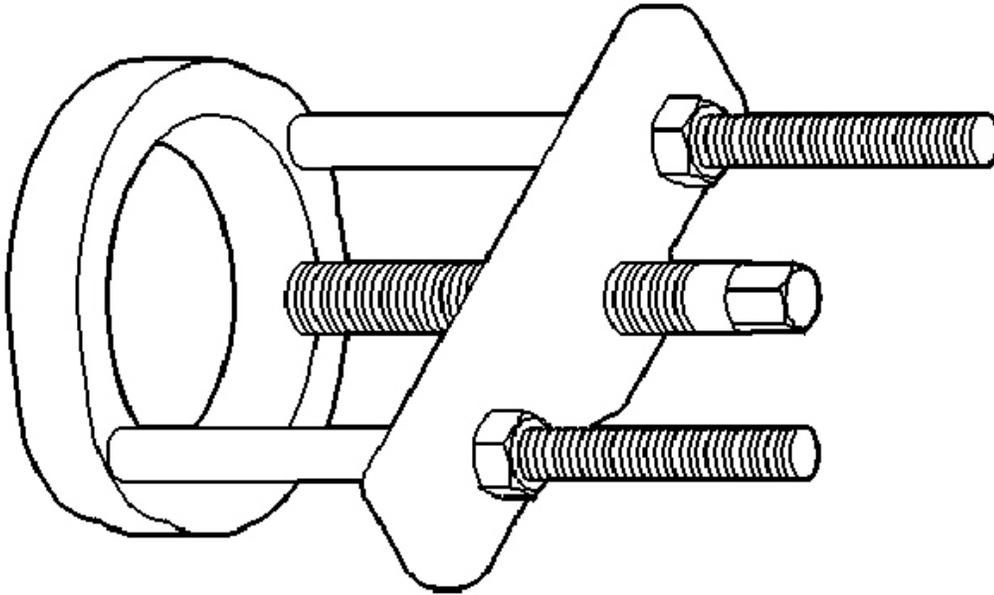


Fig. 239: Puller/Press C-293-PA
Courtesy of CHRYSLER LLC

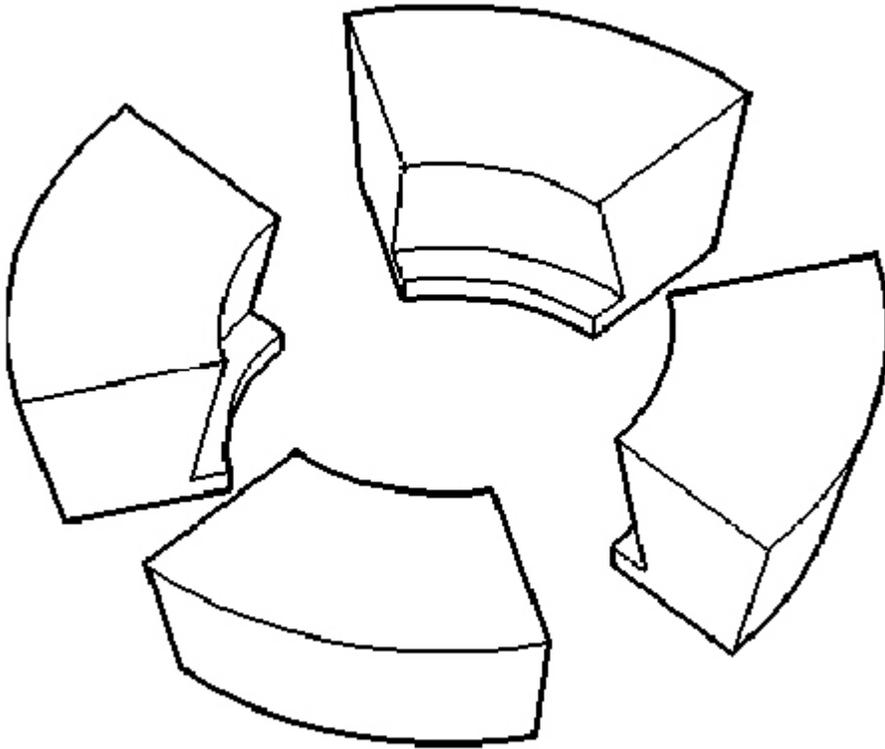


Fig. 240: Adapters C-293-47
Courtesy of CHRYSLER LLC

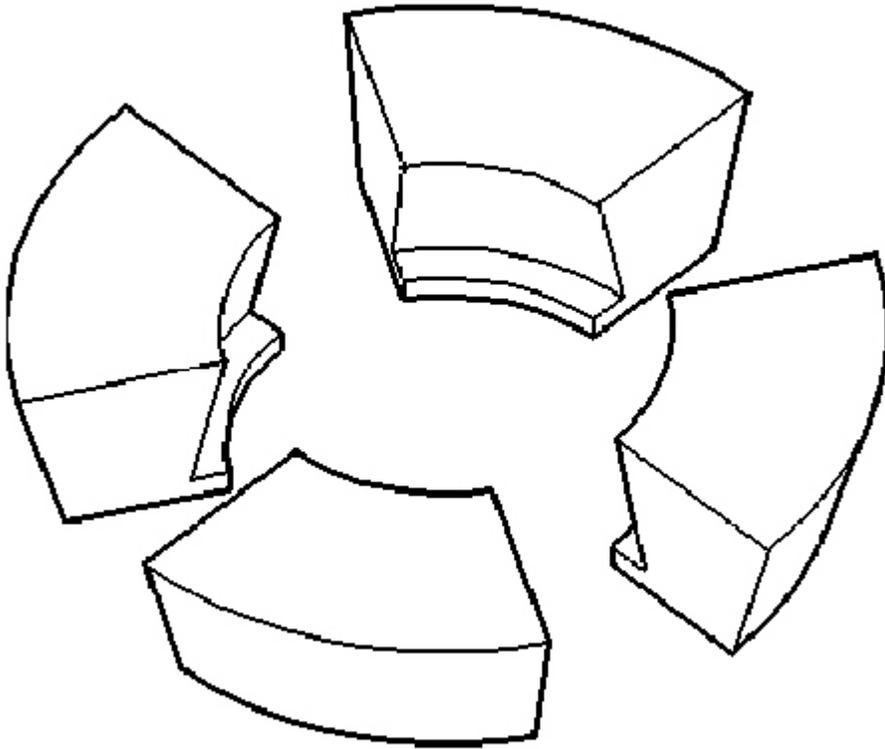


Fig. 241: Blocks, Adapter - C-293-48
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

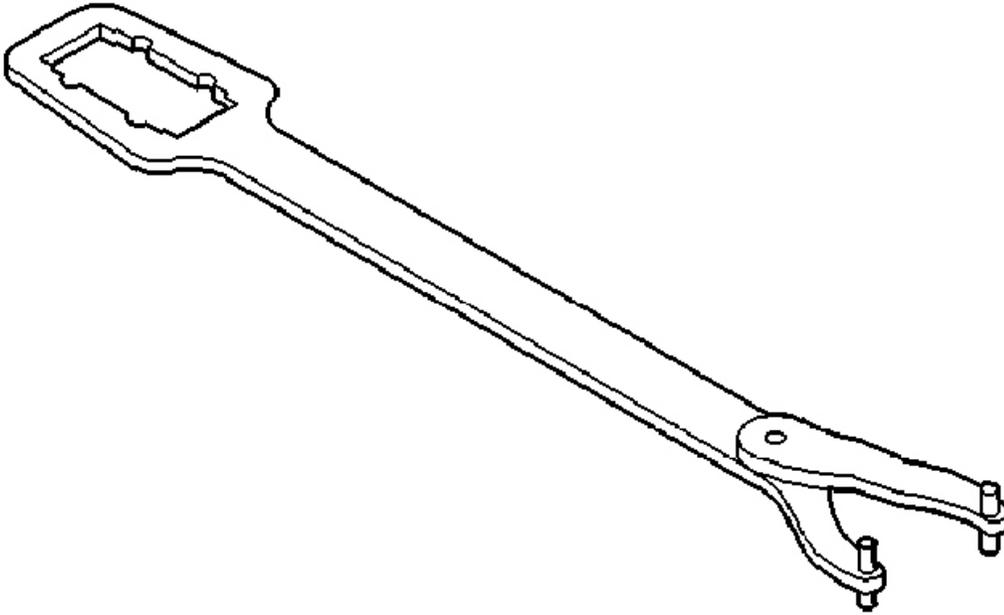
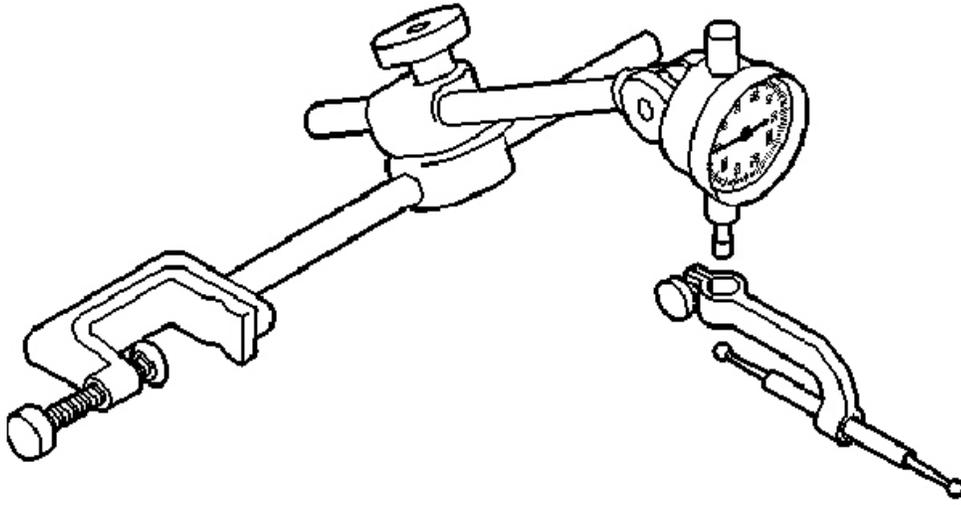


Fig. 242: Flange Holder C-3281
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro



8011d42b

Fig. 243: Dial Indicator C-3339
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

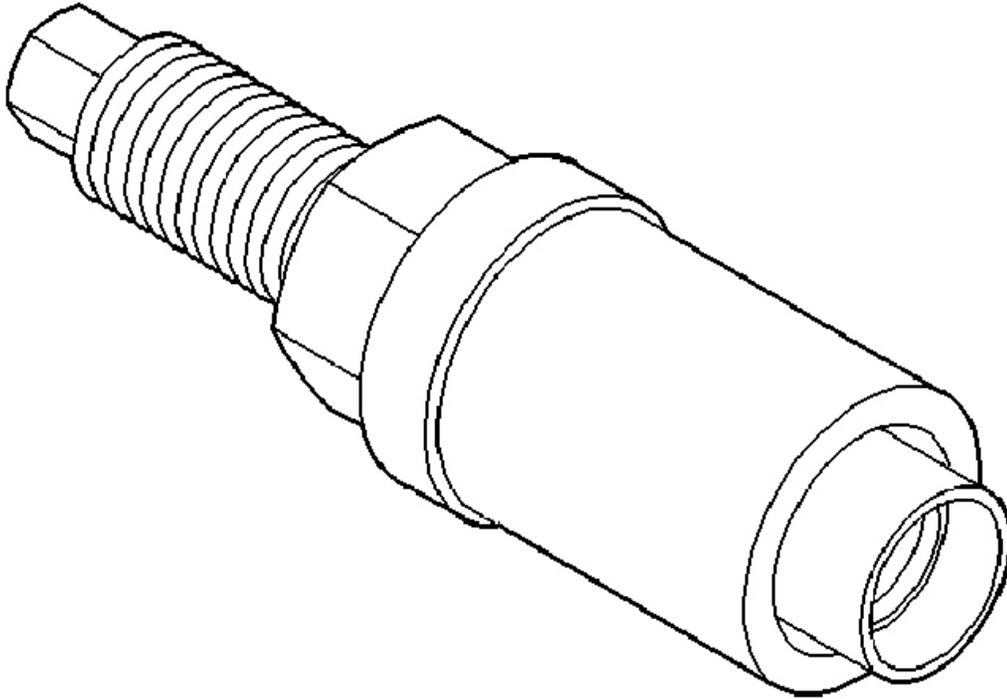


Fig. 244: Installer C-3718
Courtesy of CHRYSLER LLC

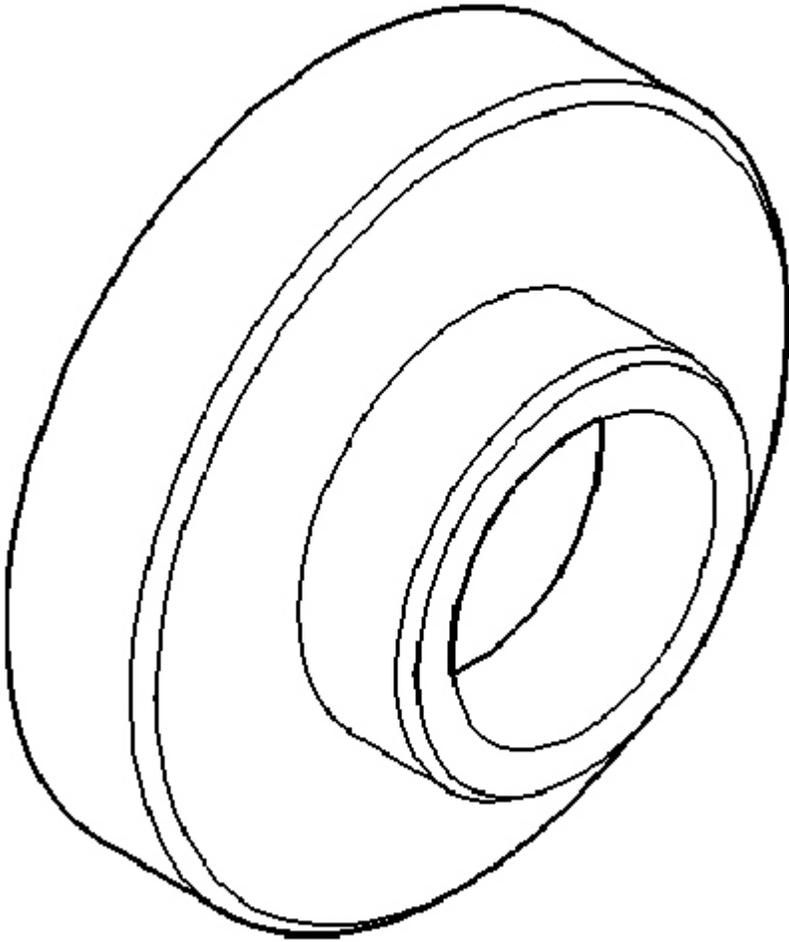


Fig. 245: Installer C-4076-B
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

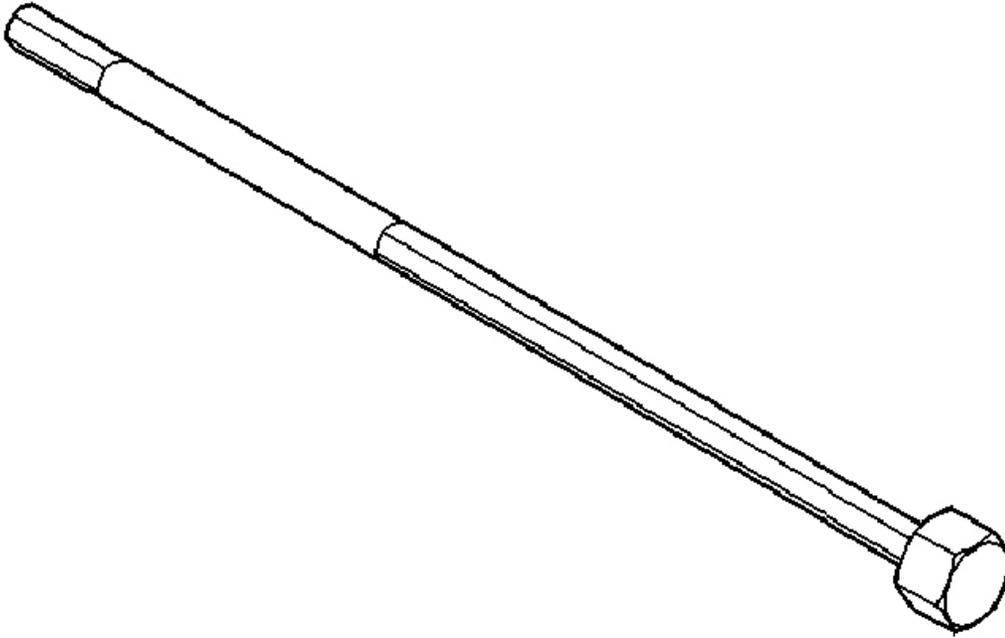


Fig. 246: Adjustment Wrench C-4164
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

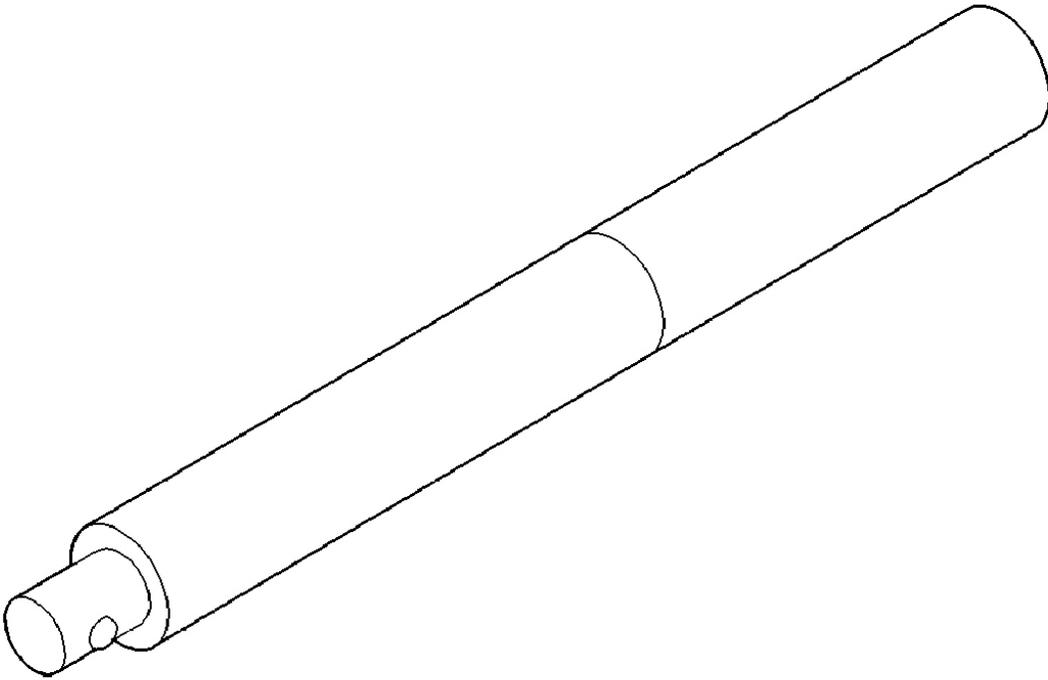


Fig. 247: Handle C-4171
Courtesy of CHRYSLER LLC

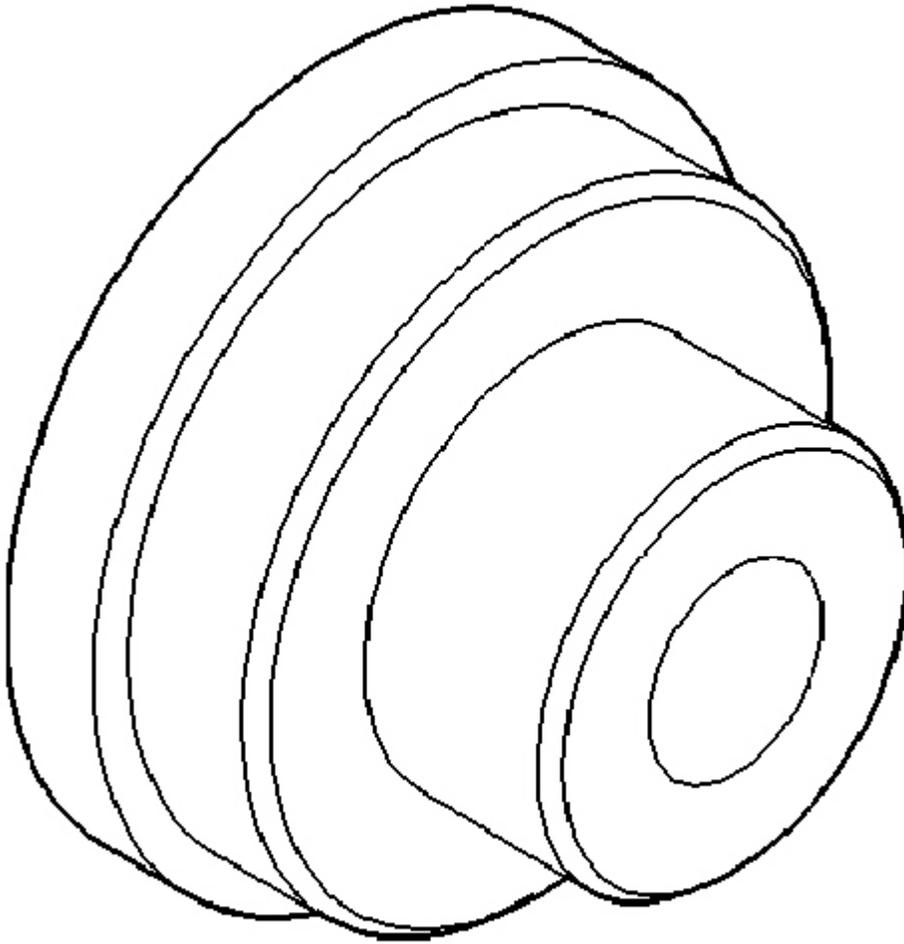


Fig. 248: Installer C-4198
Courtesy of CHRYSLER LLC

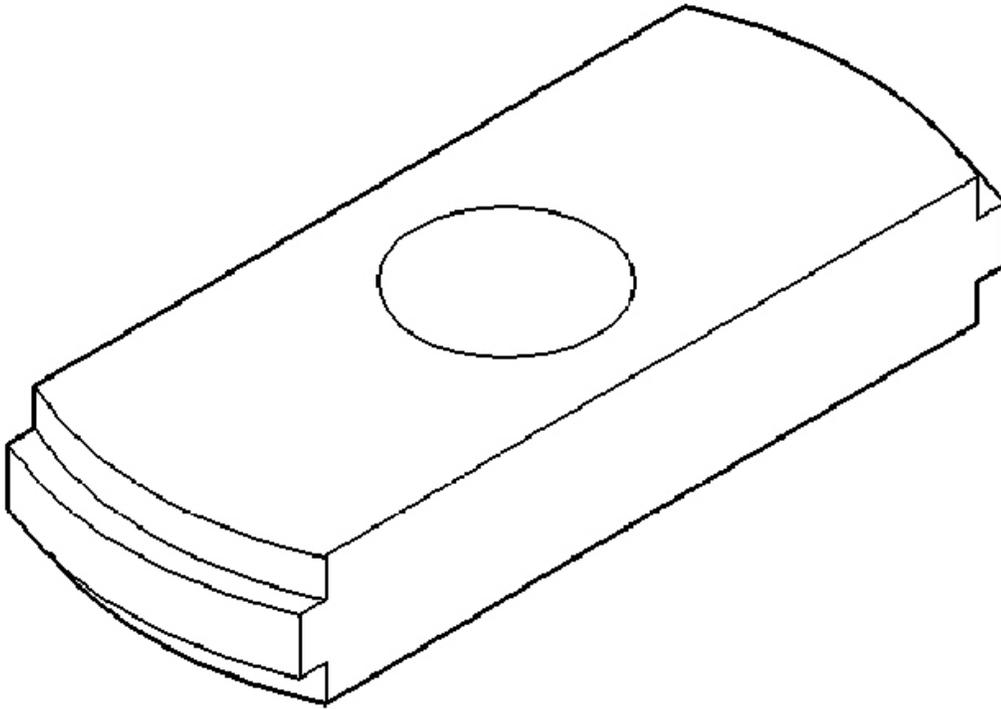


Fig. 249: Remover C-4307
Courtesy of CHRYSLER LLC

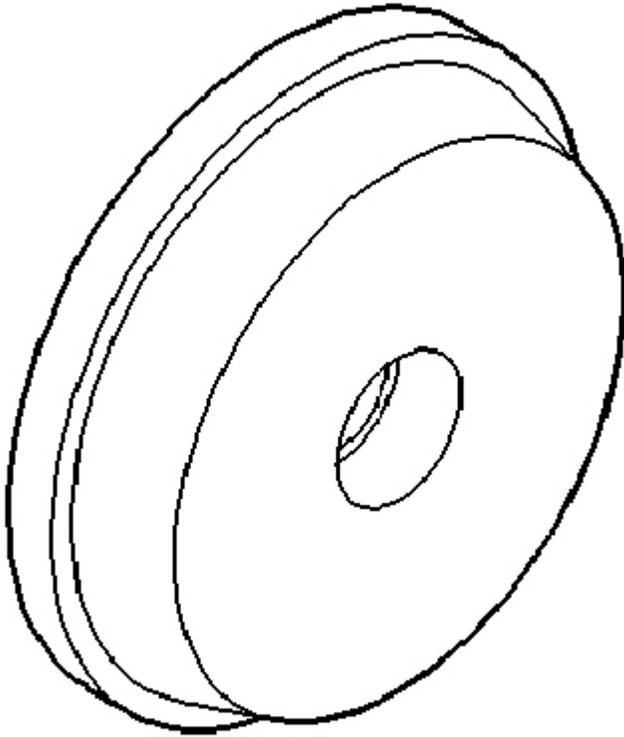


Fig. 250: Installer C-4308
Courtesy of CHRYSLER LLC

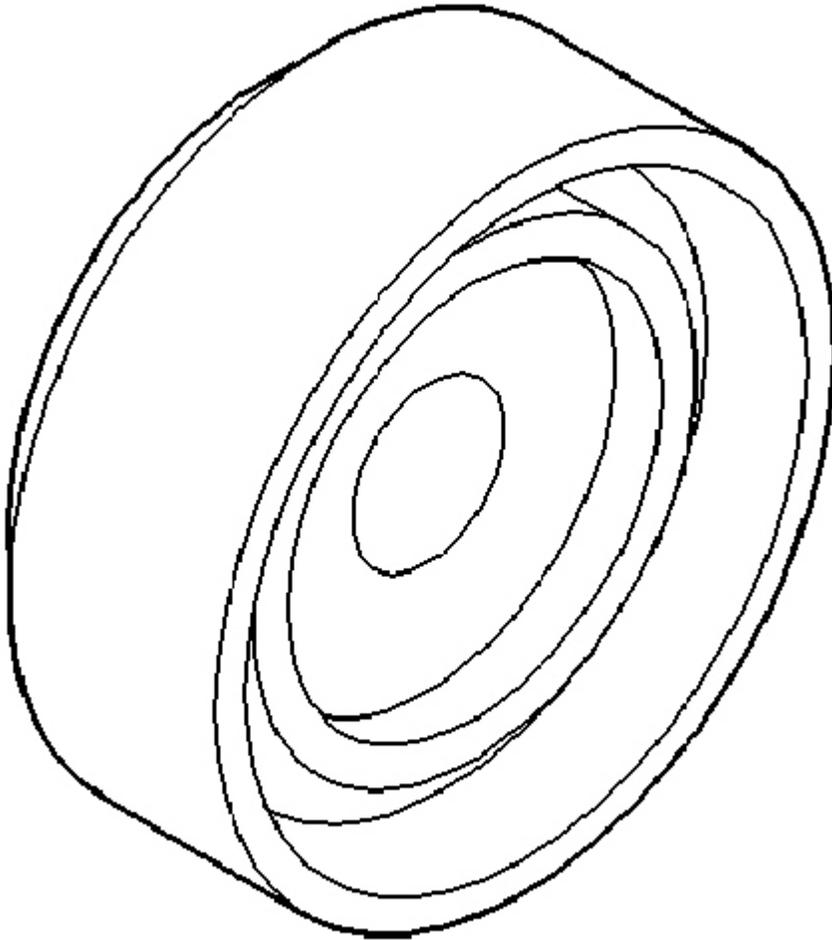


Fig. 251: Installer C-4340
Courtesy of CHRYSLER LLC

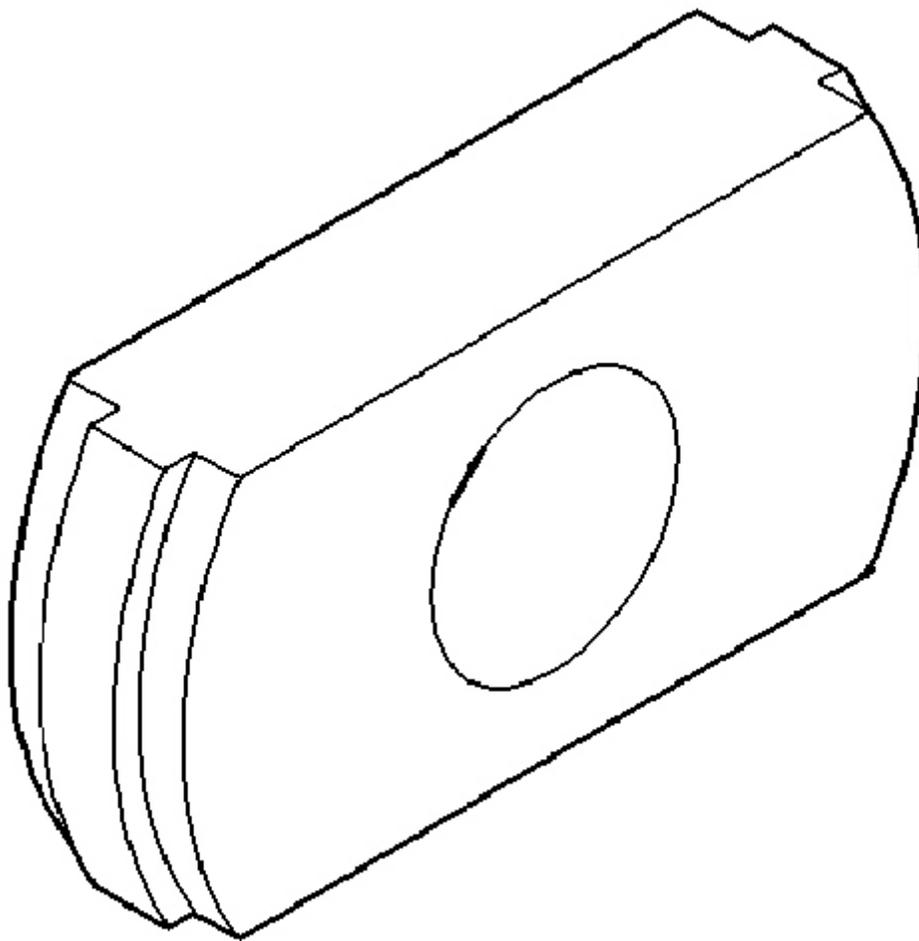


Fig. 252: Remover C-4345
Courtesy of CHRYSLER LLC

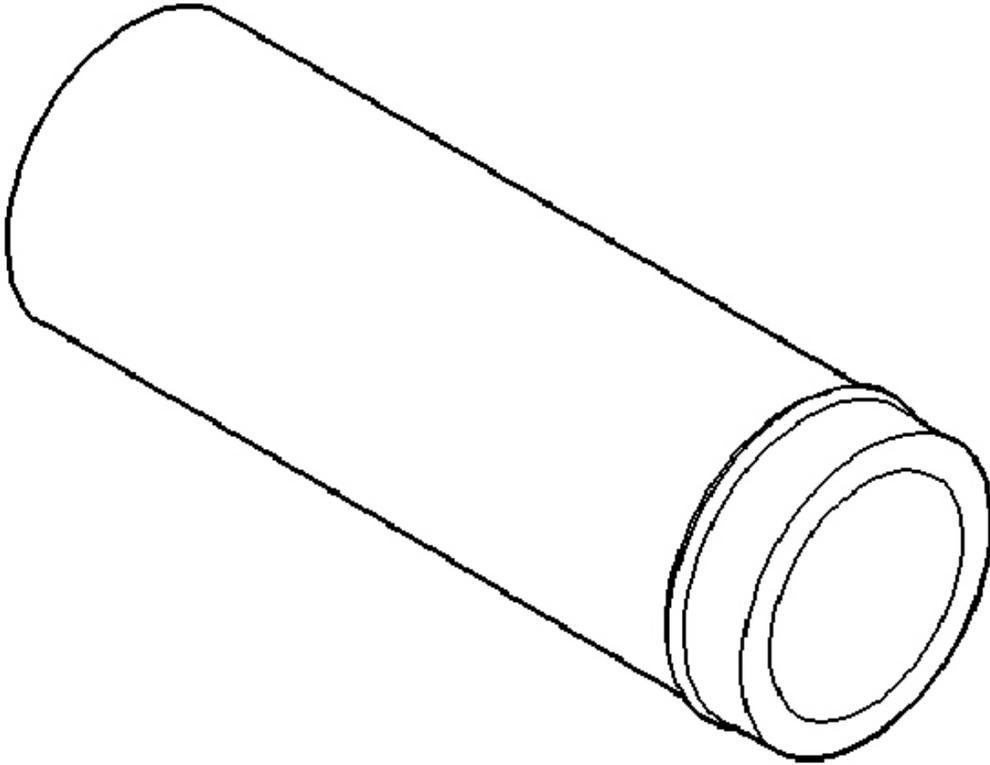


Fig. 253: Handle C-4735
Courtesy of CHRYSLER LLC

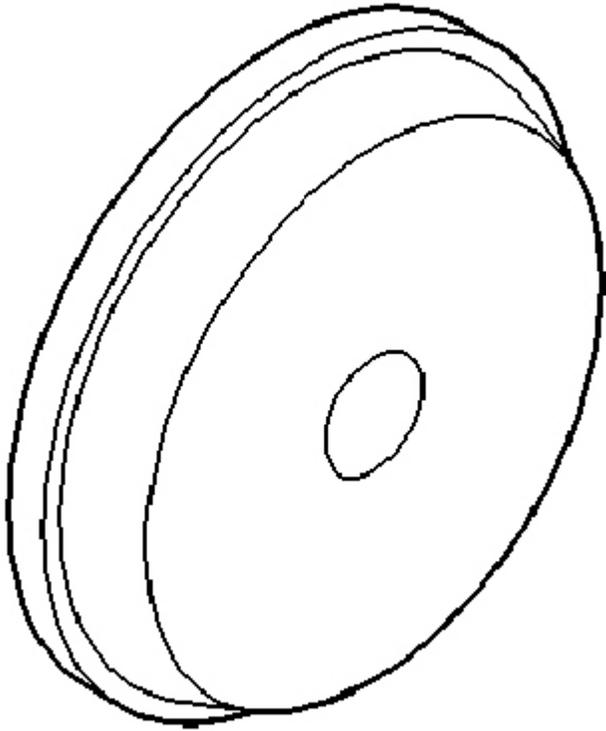


Fig. 254: Installer - D-130
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

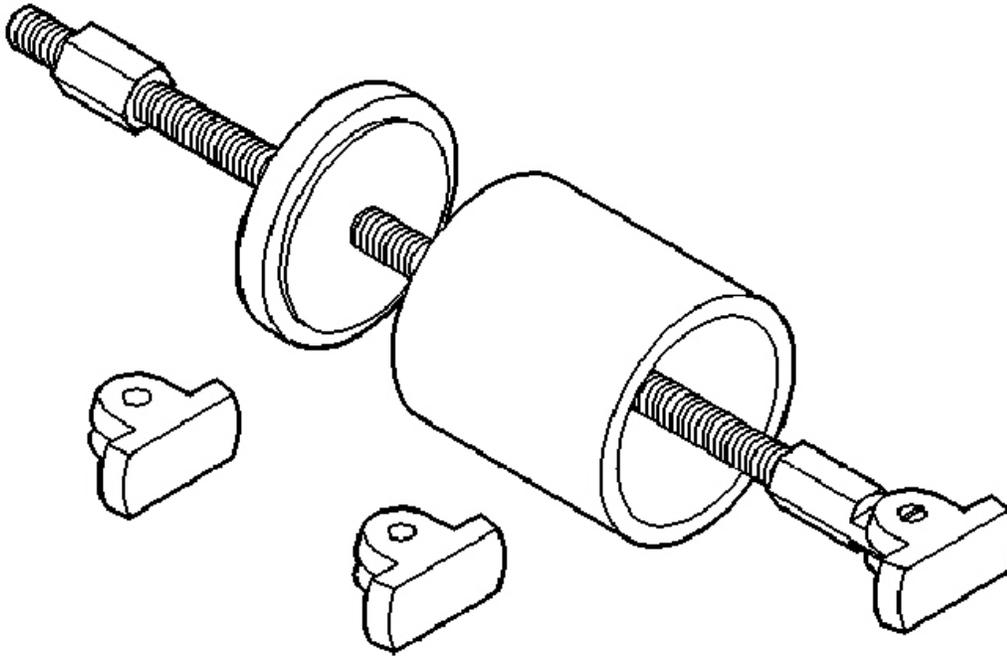


Fig. 255: Remover 6310
Courtesy of CHRYSLER LLC

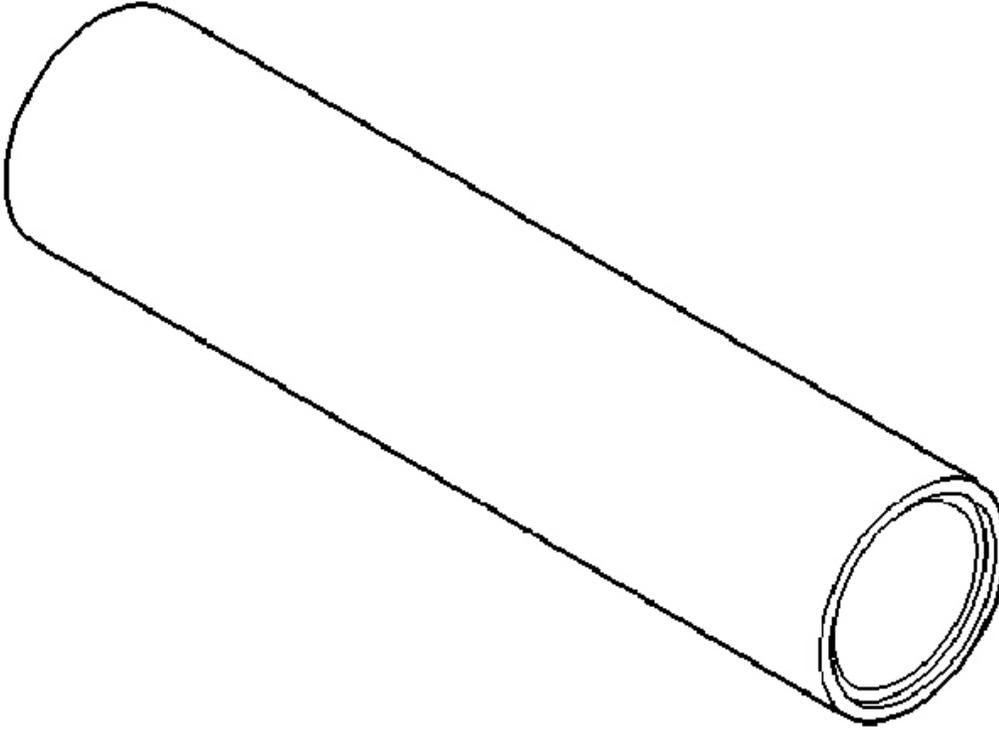


Fig. 256: Installer 6448
Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

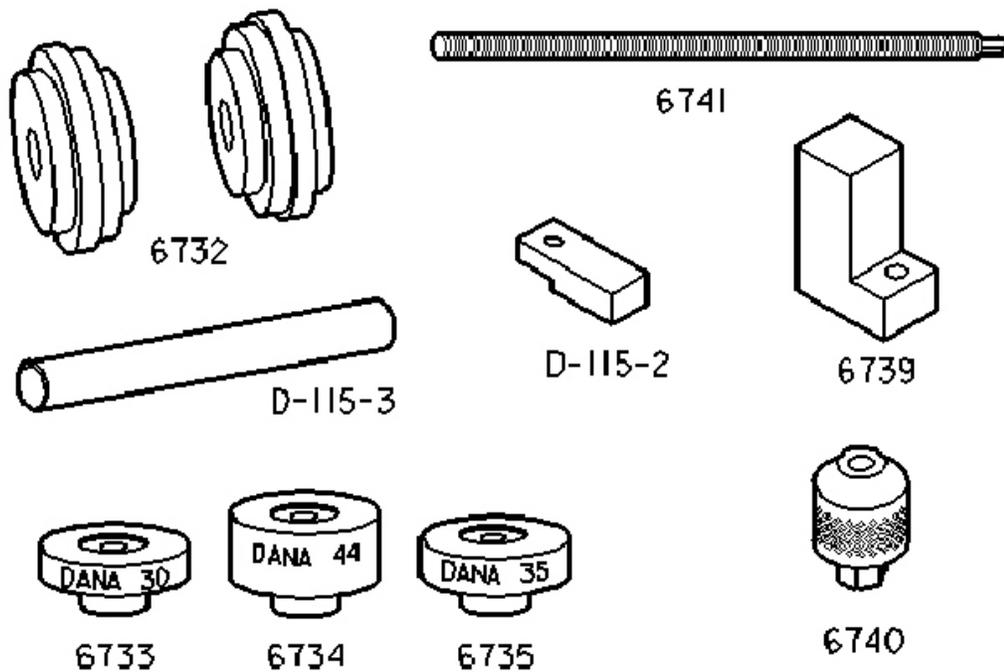


Fig. 257: Pinion Gauge Set 6774
Courtesy of CHRYSLER LLC

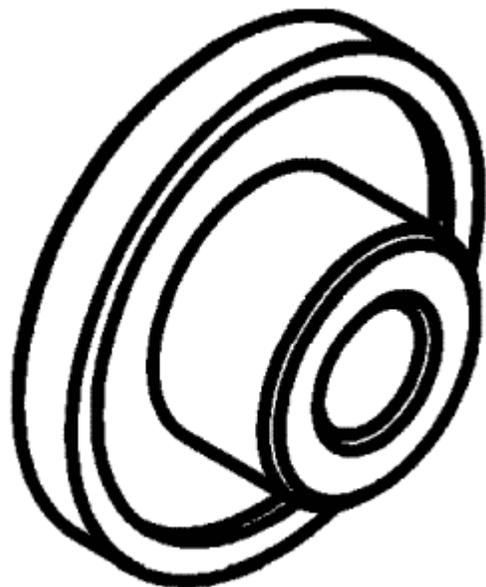


Fig. 258: Installer 8493

Courtesy of CHRYSLER LLC

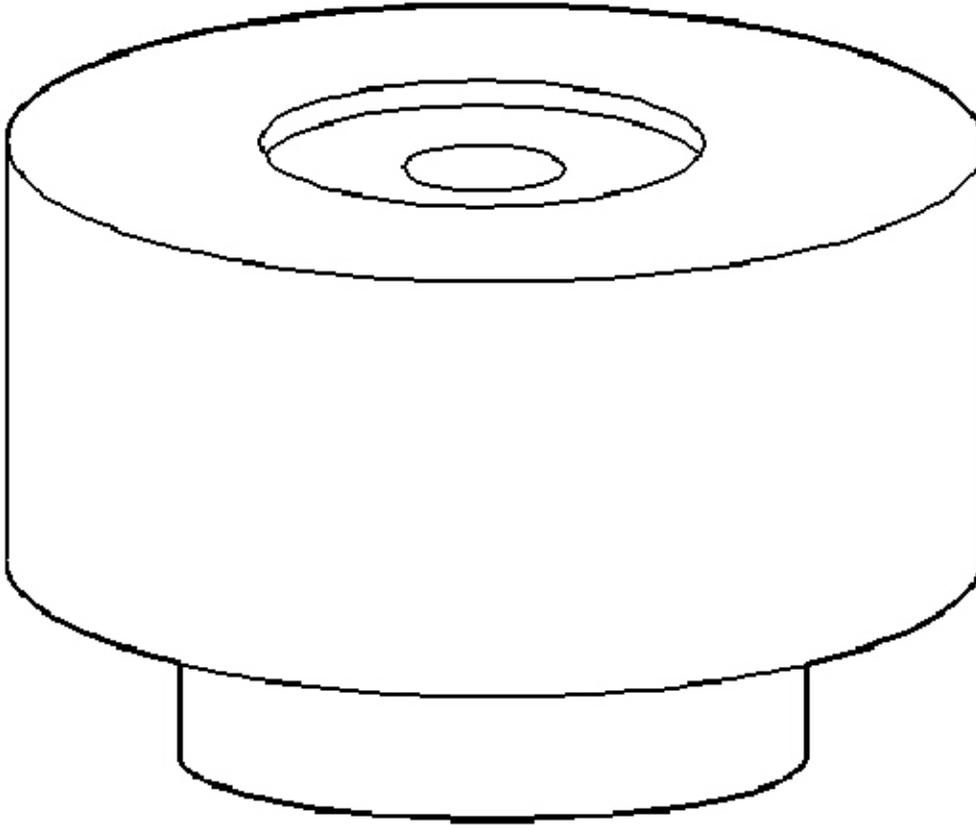


Fig. 259: Pinion Block 8540
Courtesy of CHRYSLER LLC

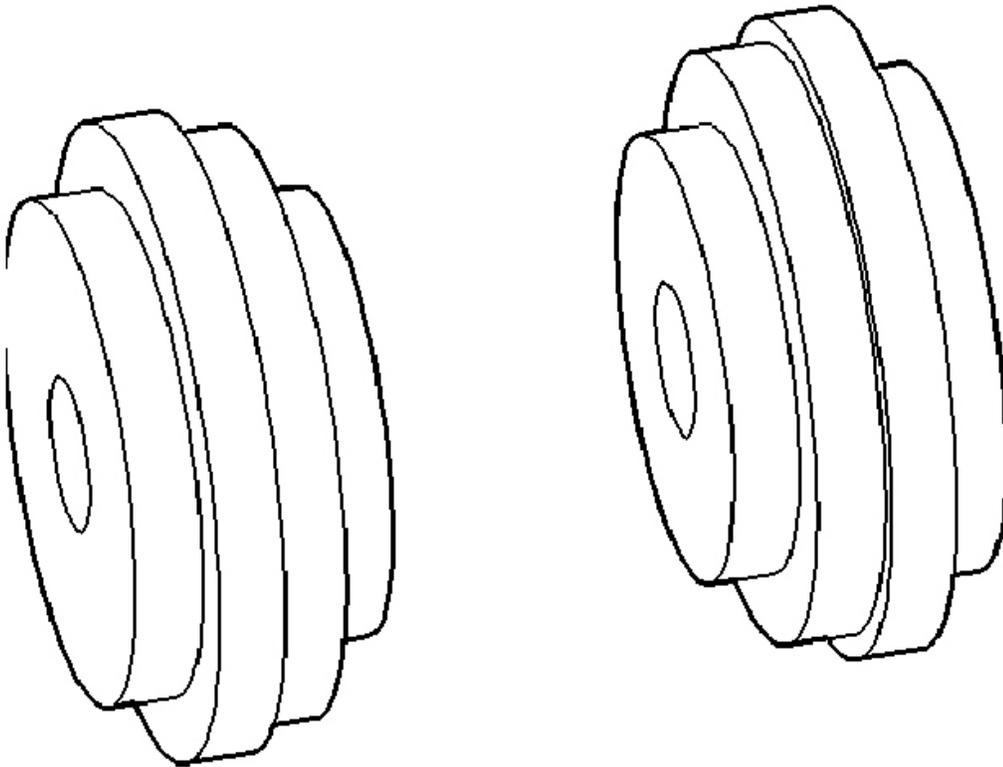


Fig. 260: Arbor Discs 8541
Courtesy of CHRYSLER LLC

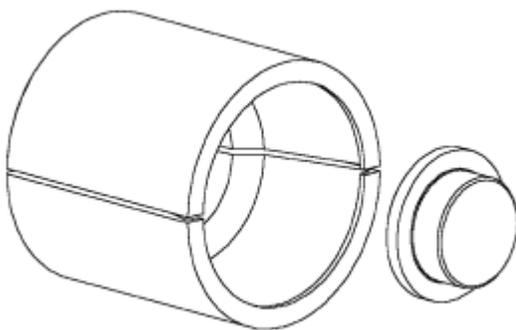


Fig. 261: Plug 8926-2
Courtesy of CHRYSLER LLC

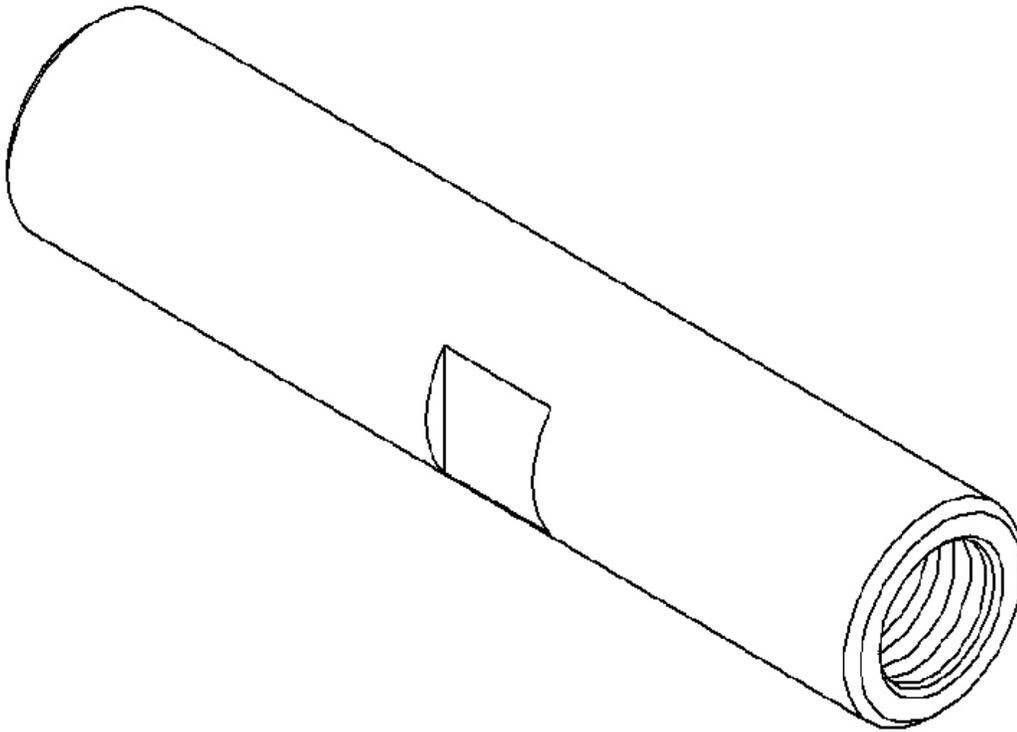


Fig. 262: Pinion Driver 8976
Courtesy of CHRYSLER LLC

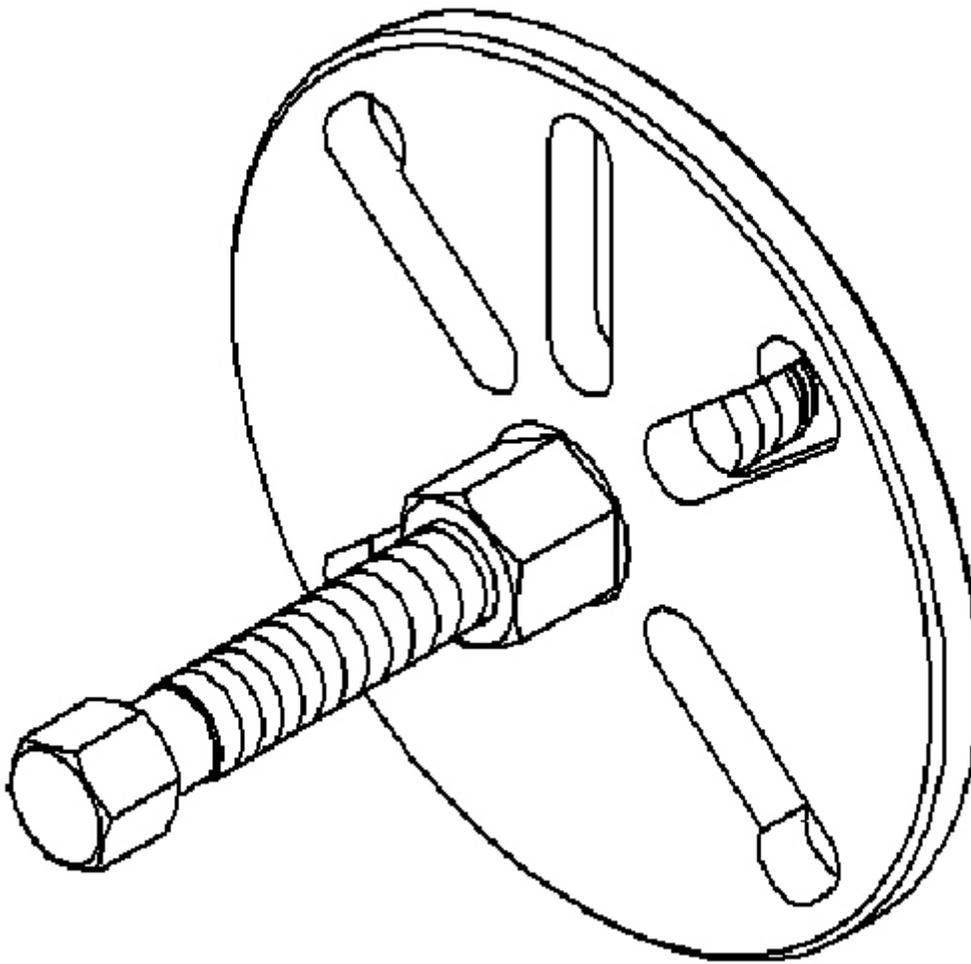


Fig. 263: Flange Puller 8992
Courtesy of CHRYSLER LLC

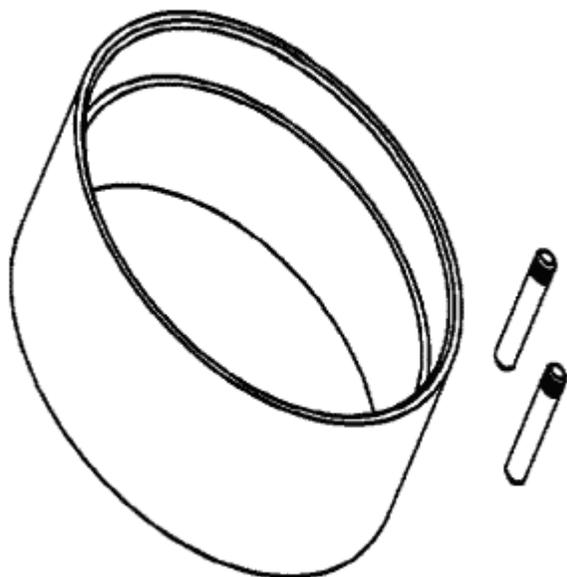


Fig. 264: Remover/Installer 10126
Courtesy of CHRYSLER LLC

COVER-DIFFERENTIAL

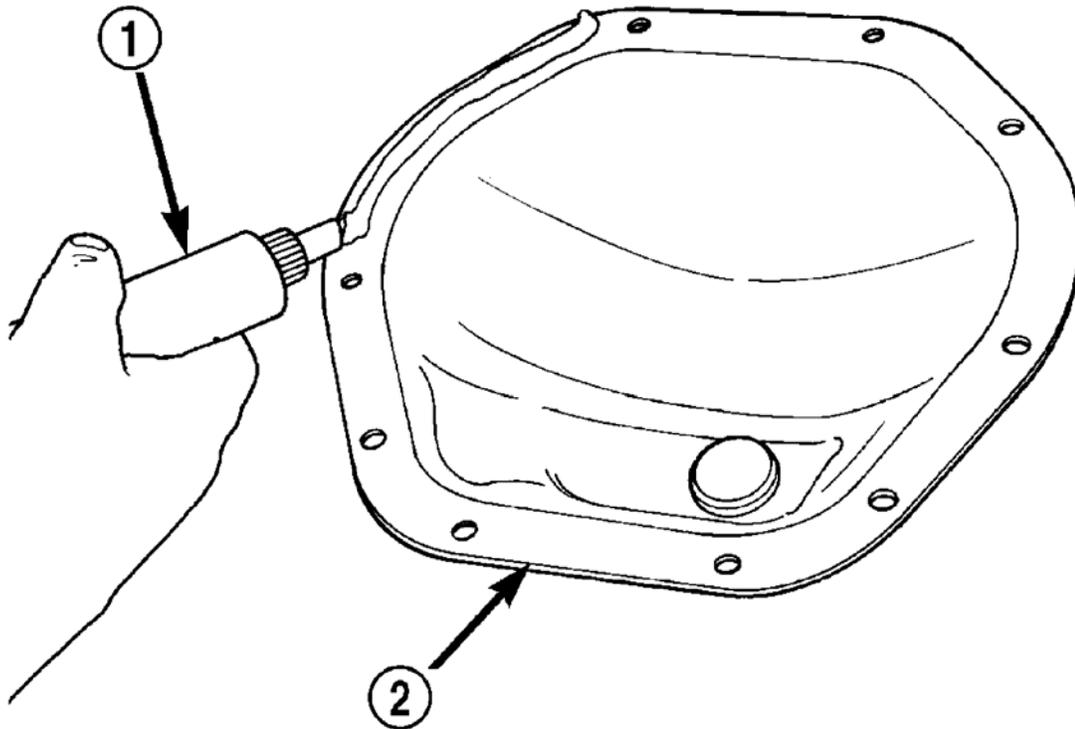
REMOVAL

COVER-DIFFERENTIAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove cover bolts.
3. Remove cover and drain lubricant.

INSTALLATION

COVER-DIFFERENTIAL



80a534a8

Fig. 265: Applying Bead Of Orange Mopar™ Axle RTV Sealant To Housing Cover
Courtesy of CHRYSLER LLC

1. Apply a bead of orange Mopar™ Axle RTV sealant (1) or equivalent to the housing cover (2).

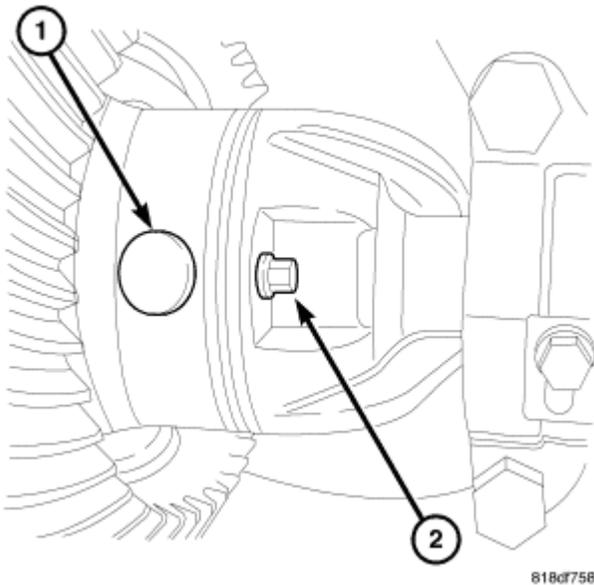
CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will cause a leak.

2. Install cover and identification tag. Tighten cover bolts in a criss-cross pattern to 41 N.m (30 ft. lbs.).
3. Fill differential to specifications.
4. Install fill plug.

SHAFT-AXLE

REMOVAL

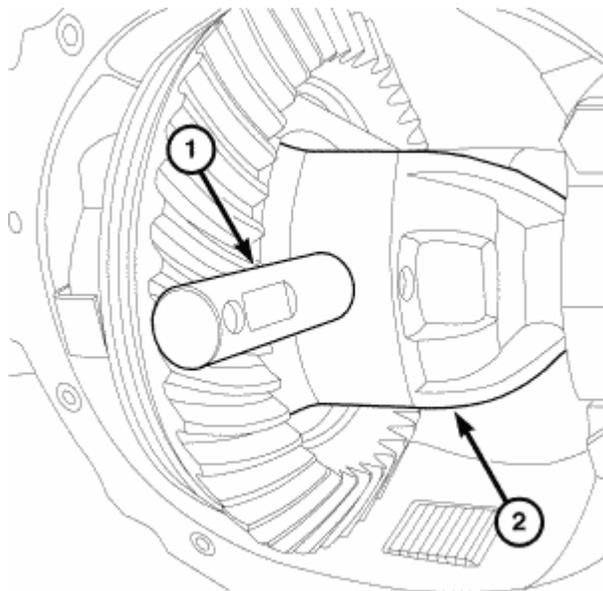
SHAFT-AXLE



818df758

Fig. 266: Identifying Pinion Mate Shaft & Lock Screw
 Courtesy of CHRYSLER LLC

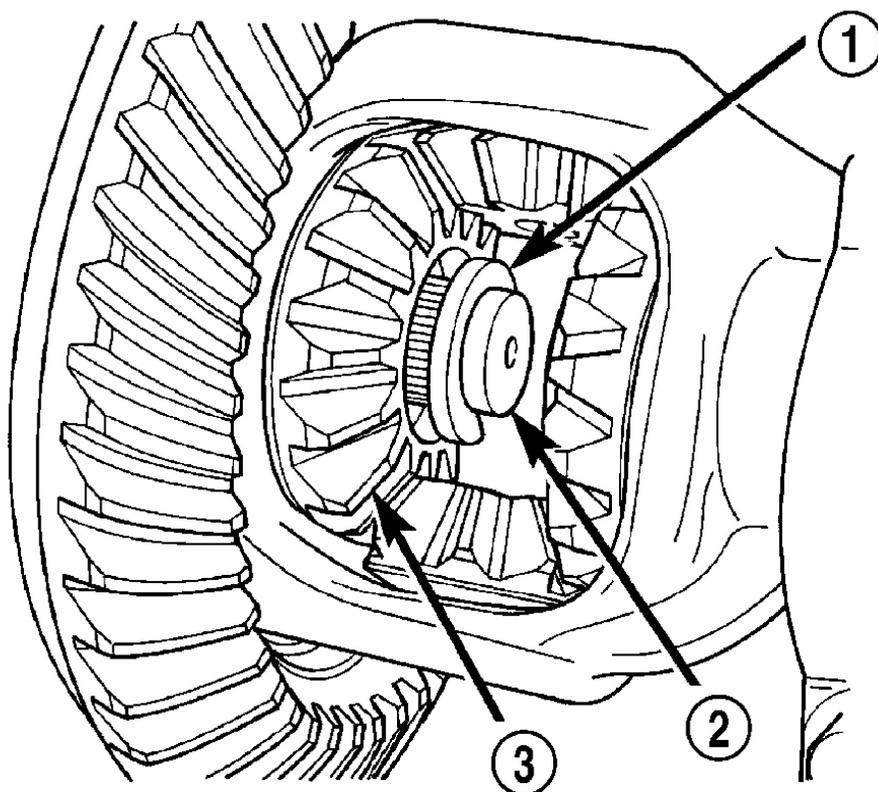
1. With vehicle in neutral, position vehicle on hoist.
2. Remove rear brake components.
3. Remove wheel speed sensor.
4. Remove differential housing cover and drain lubricant.
5. Rotate differential case so pinion mate shaft (1) lock screw (2) is accessible. Remove pinion mate shaft lock screw (2) from differential case.



818dcb14

Fig. 267: Identifying Pinion Mate Shaft & Differential Case
 Courtesy of CHRYSLER LLC

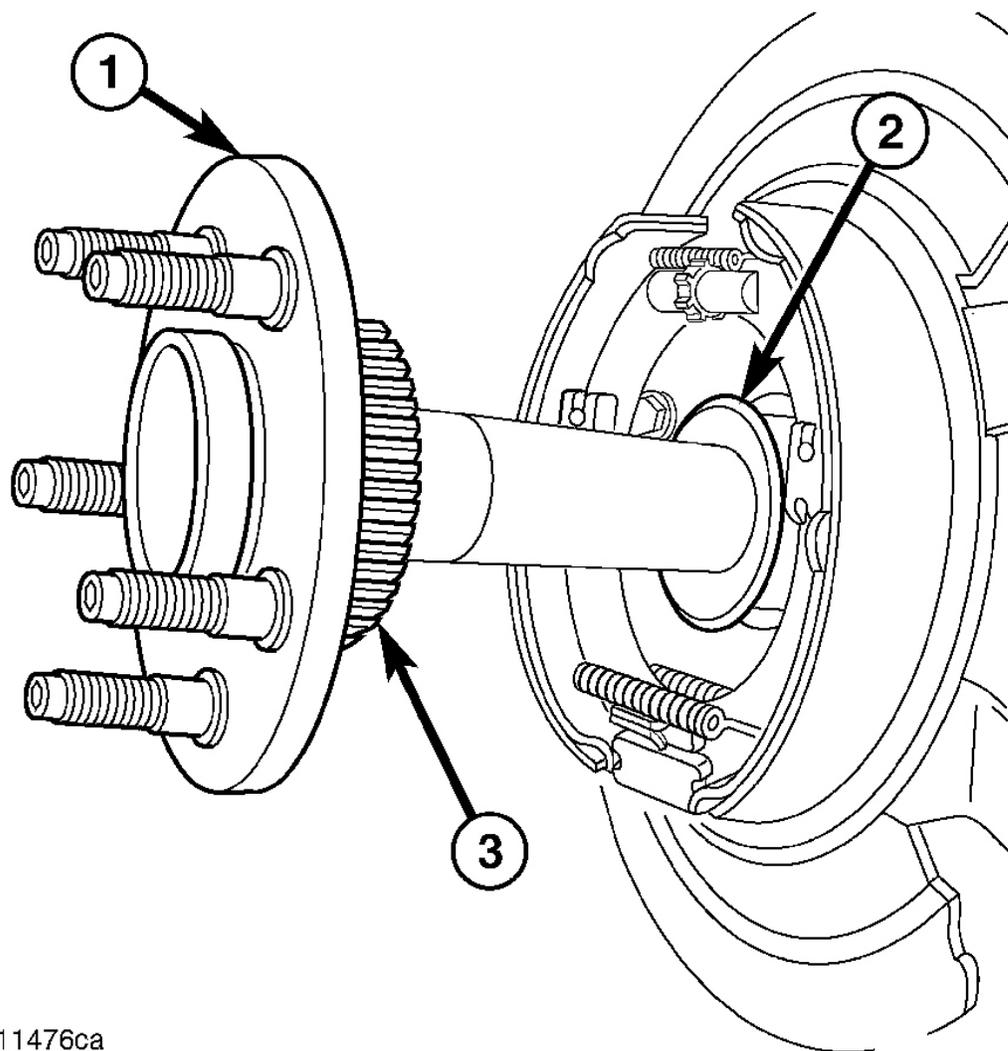
6. Remove pinion mate shaft (1) from differential case (2).



80be4603

Fig. 268: Identifying Axle Shaft C-Lock, Axle Shaft & Differential Side Gears
Courtesy of CHRYSLER LLC

7. Push axle shaft inward and remove axle shaft C-lock (1) from the axle shaft (2).



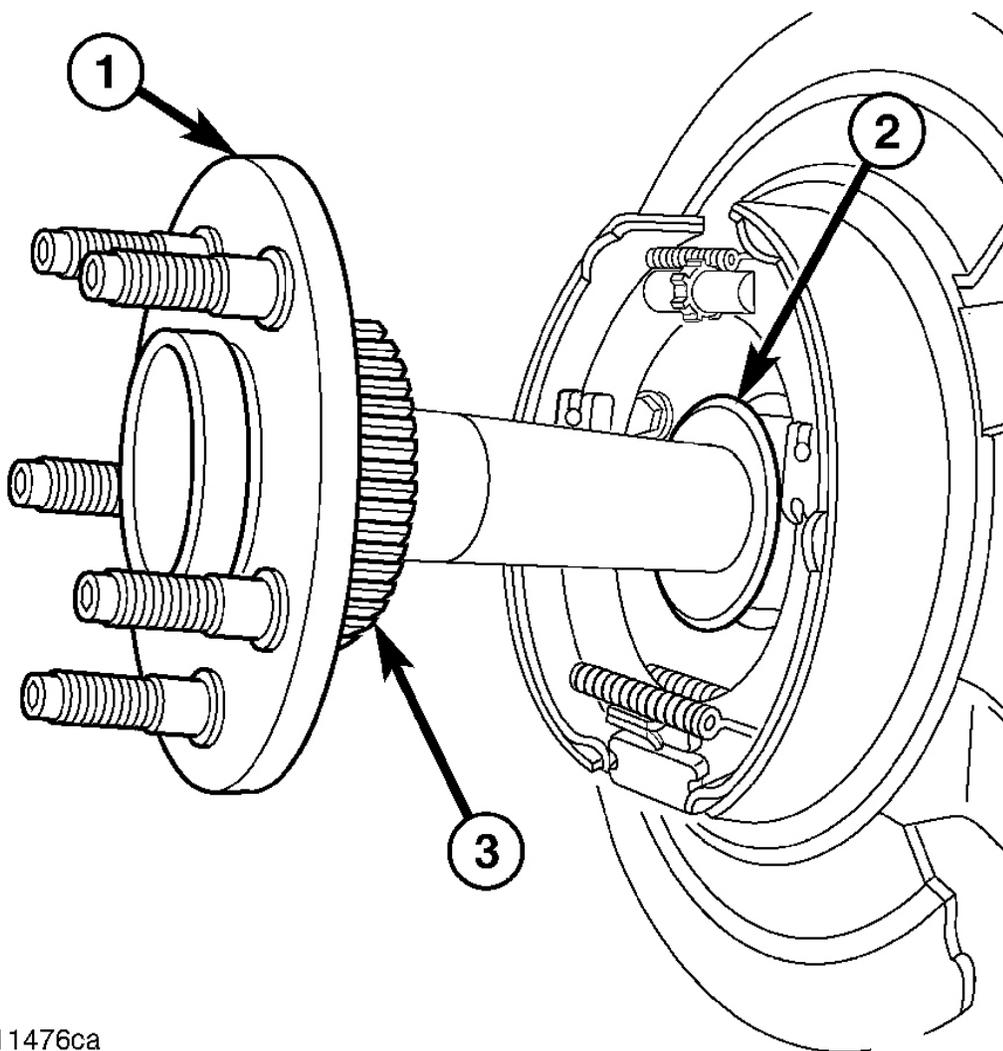
811476ca

Fig. 269: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

8. Remove axle shaft (1) from side gear and axle tube (2).

INSTALLATION

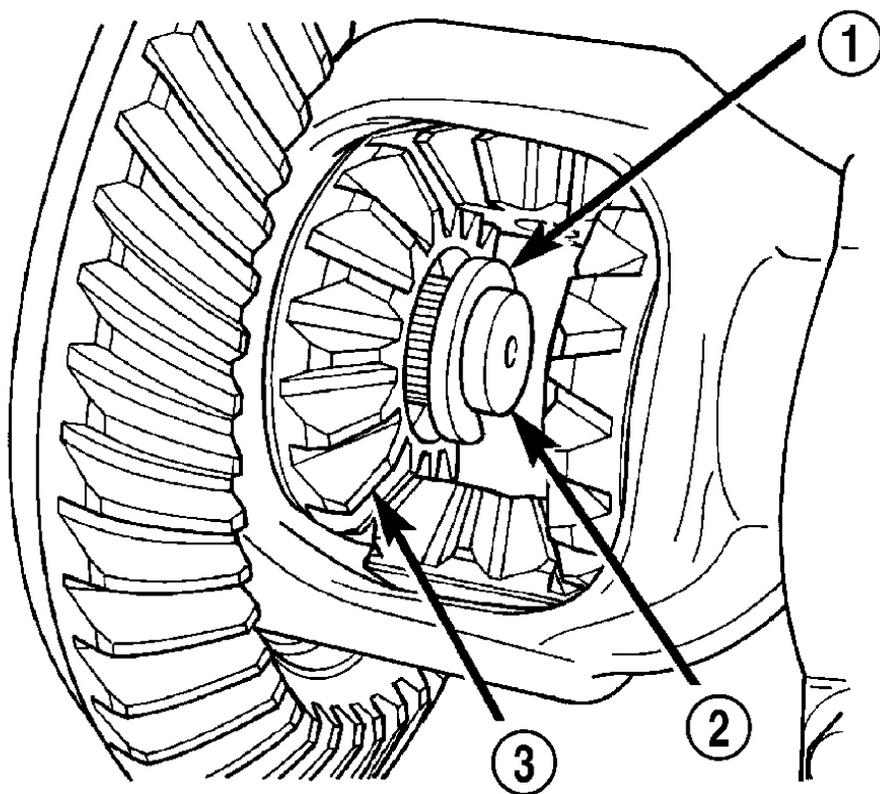
SHAFT-AXLE



811476ca

Fig. 270: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

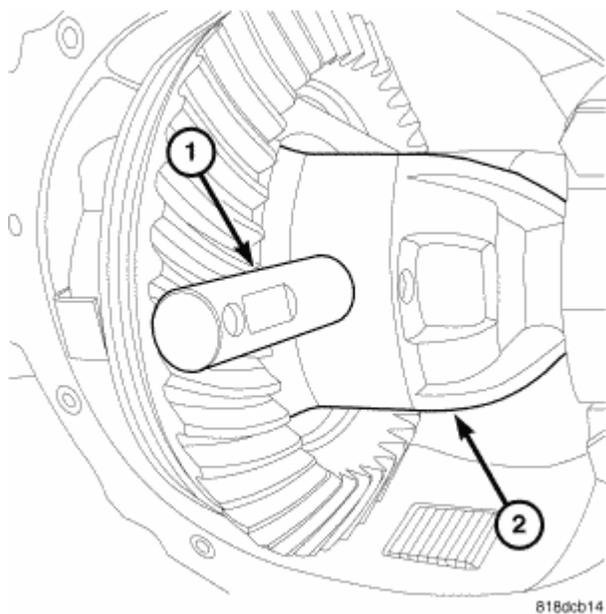
1. Install axle shaft (1) in axle tube (2) and engage into side gear splines.



80be4603

Fig. 271: Identifying Axle Shaft C-Lock, Axle Shaft & Differential Side Gears
Courtesy of CHRYSLER LLC

2. Lubricate bearing bore and seal lip with gear lubricant.
3. Install C-lock (1) in axle shaft end, then push axle shaft outward to seat C-lock in side gear.



818dcb14

Fig. 272: Identifying Pinion Mate Shaft & Differential Case
Courtesy of CHRYSLER LLC

4. Install pinion mate shaft (1) into differential case (2) and through thrust washers and differential pinions.

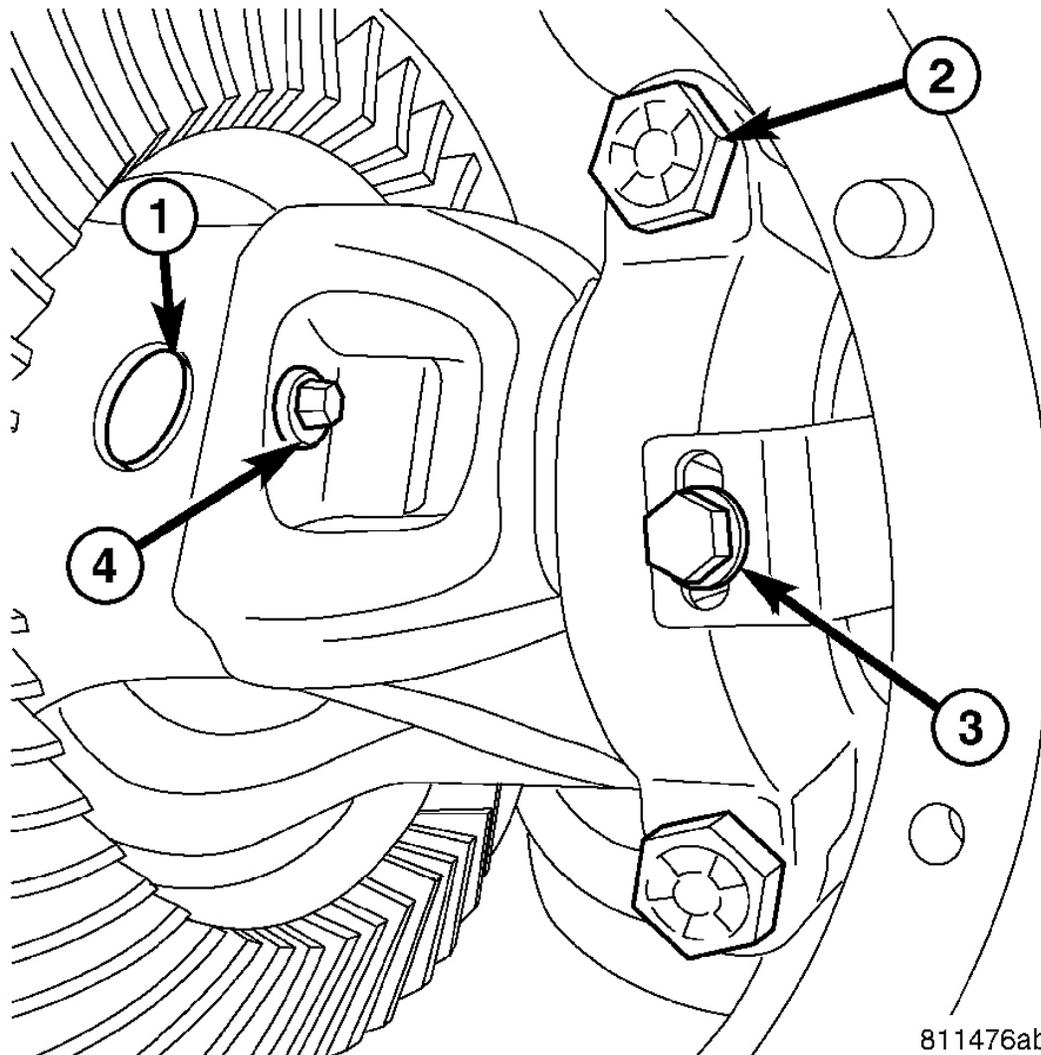


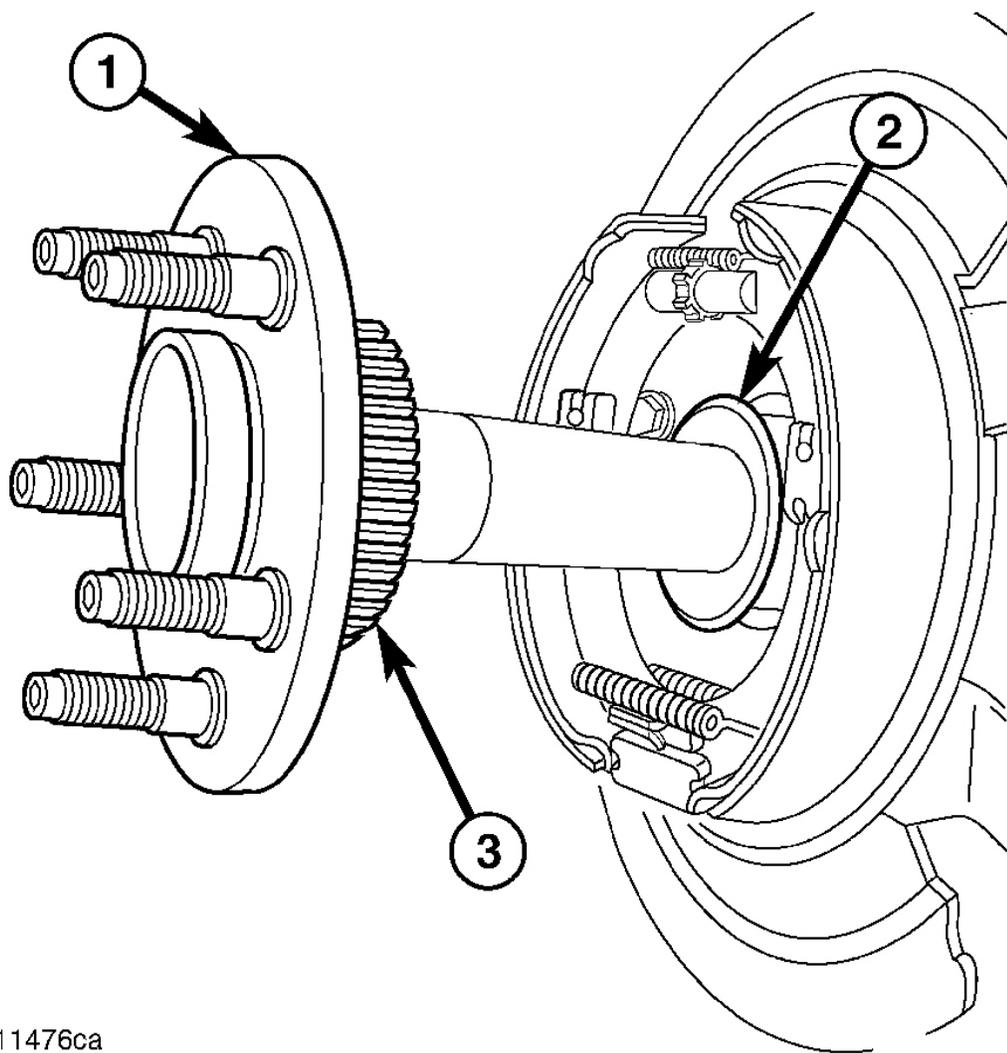
Fig. 273: Identifying Lock Screws
Courtesy of CHRYSLER LLC

5. Align hole in shaft with hole in the differential case and install lock screw (4) with Mopar Lock & Seal or equivalent on the threads. Tighten lock screw to 26 N.m (19 ft. lbs.).
6. Install differential cover.
7. Install rear brake components.

SEAL-AXLE SHAFT

REMOVAL

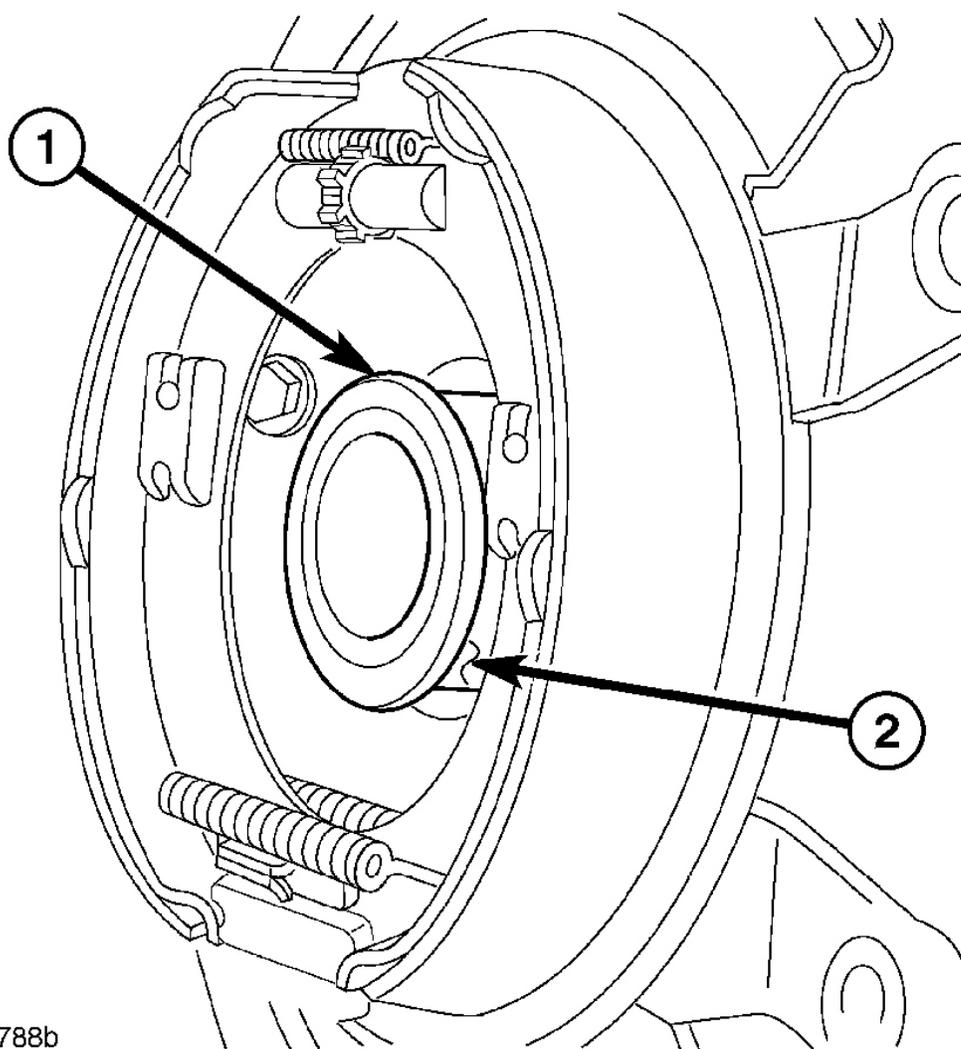
SEAL-AXLE SHAFT



811476ca

Fig. 274: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

1. Remove axle shaft (1) from axle tube (2).



8114788b

Fig. 275: Removing Axle Shaft Seal From Axle Tube With Seal Puller
Courtesy of CHRYSLER LLC

2. Remove axle shaft seal (1) from axle tube (2) with seal puller.

INSTALLATION

SEAL-AXLE SHAFT

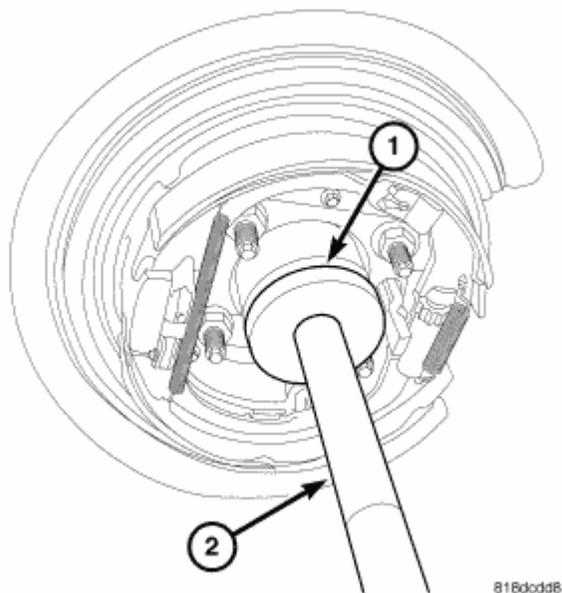
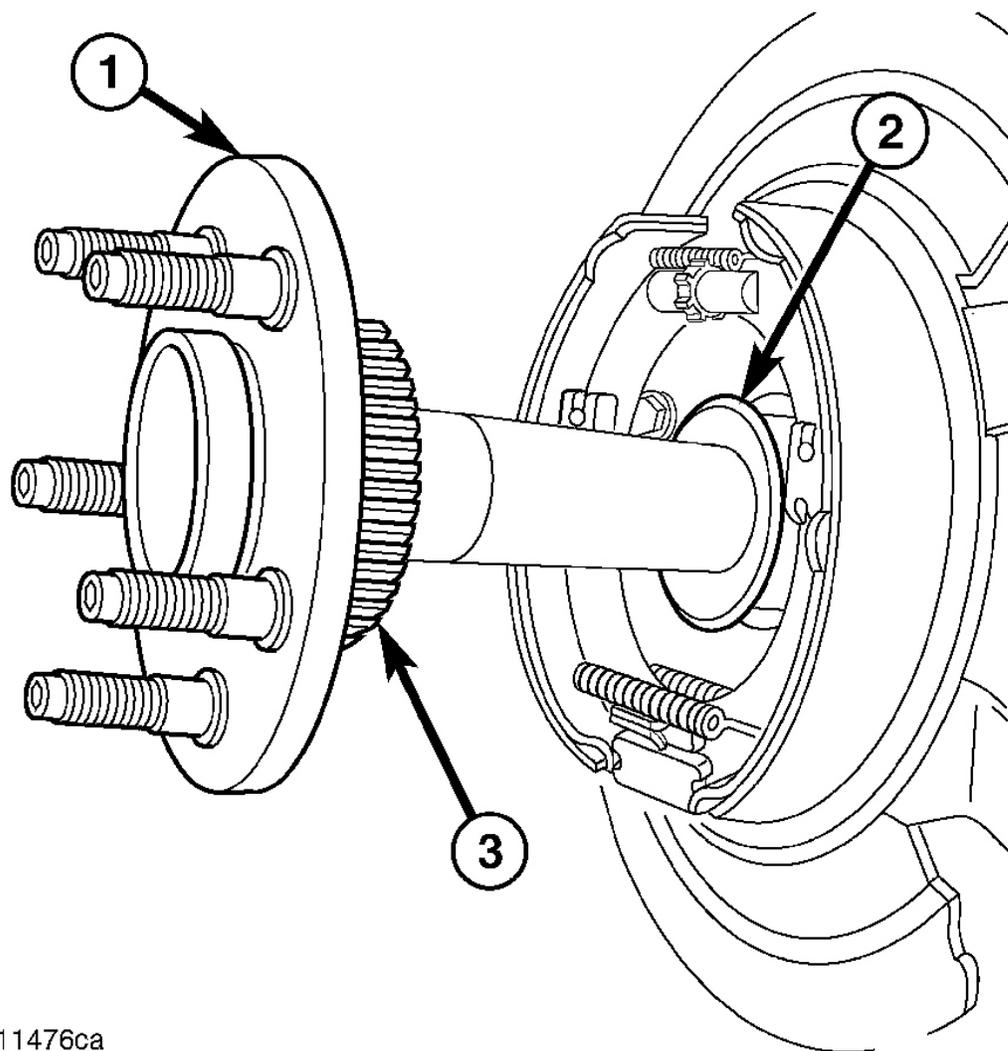


Fig. 276: Coating Seal Lip With Axle Lubricant And Installing Seal With Installer 8493 And Handle C-4171

Courtesy of CHRYSLER LLC

1. Remove any old sealer/burrs from axle tube.
2. Coat **new** seal lip with axle lubricant and install seal with Installer 8493 (1) and Handle C-4171 (1).



811476ca

Fig. 277: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

3. Install axle shaft (1) in axle tube (2).

BEARING-AXLE

REMOVAL

BEARING-AXLE

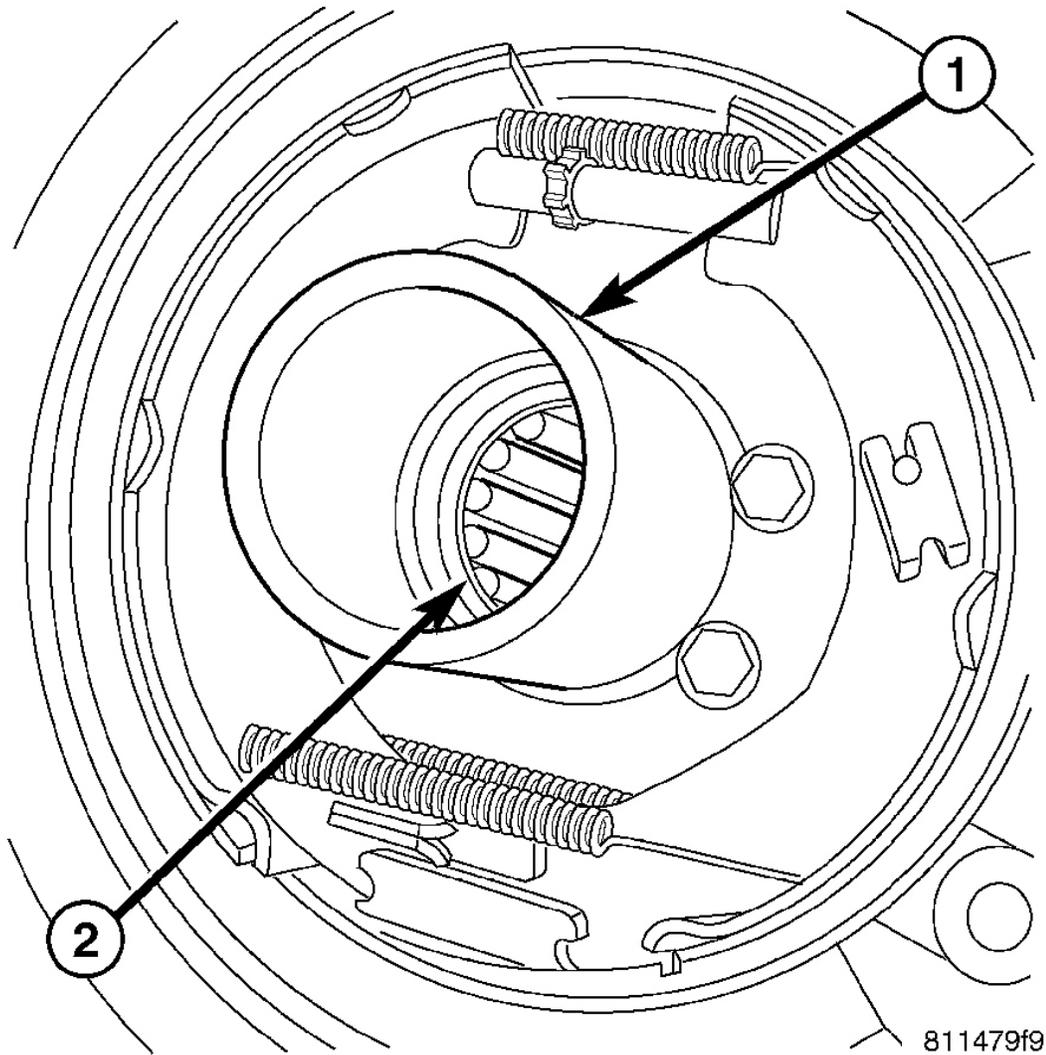
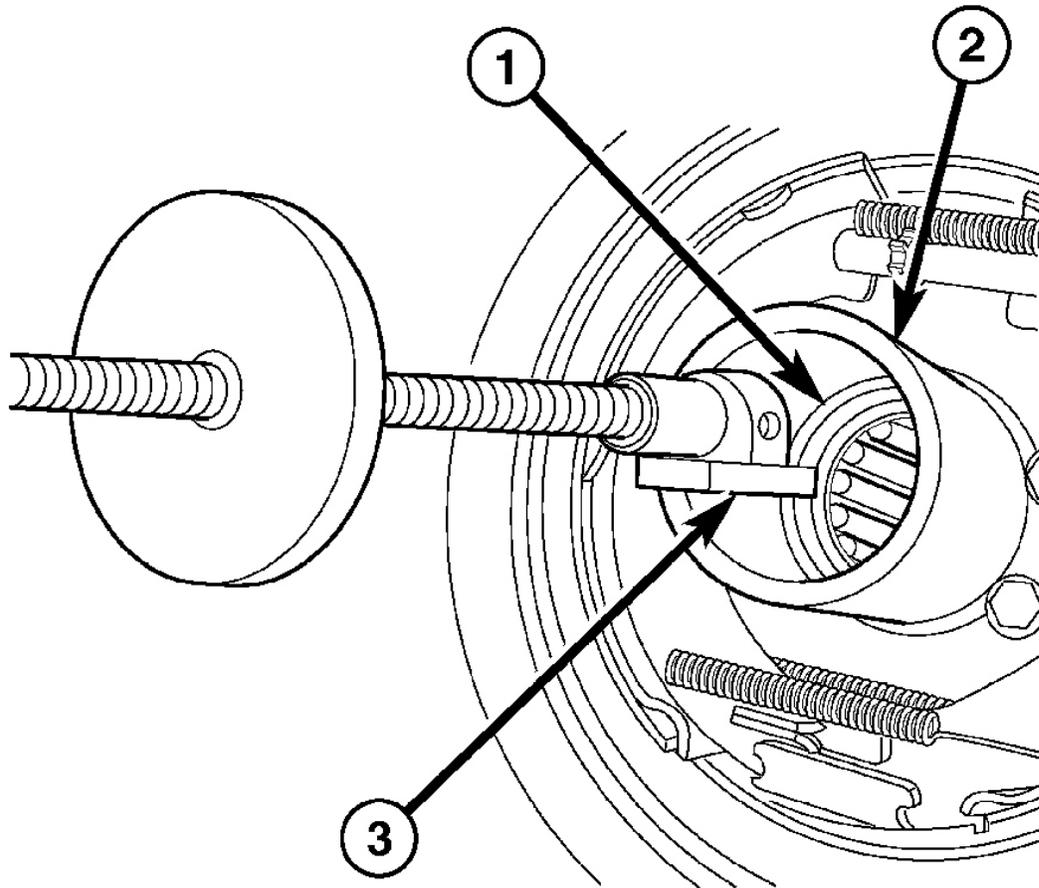


Fig. 278: Positioning Bearing Receiver On Axle Tube
Courtesy of CHRYSLER LLC

NOTE: Remove bearing with Bearing Remover 6310 and Foot 6310-9.

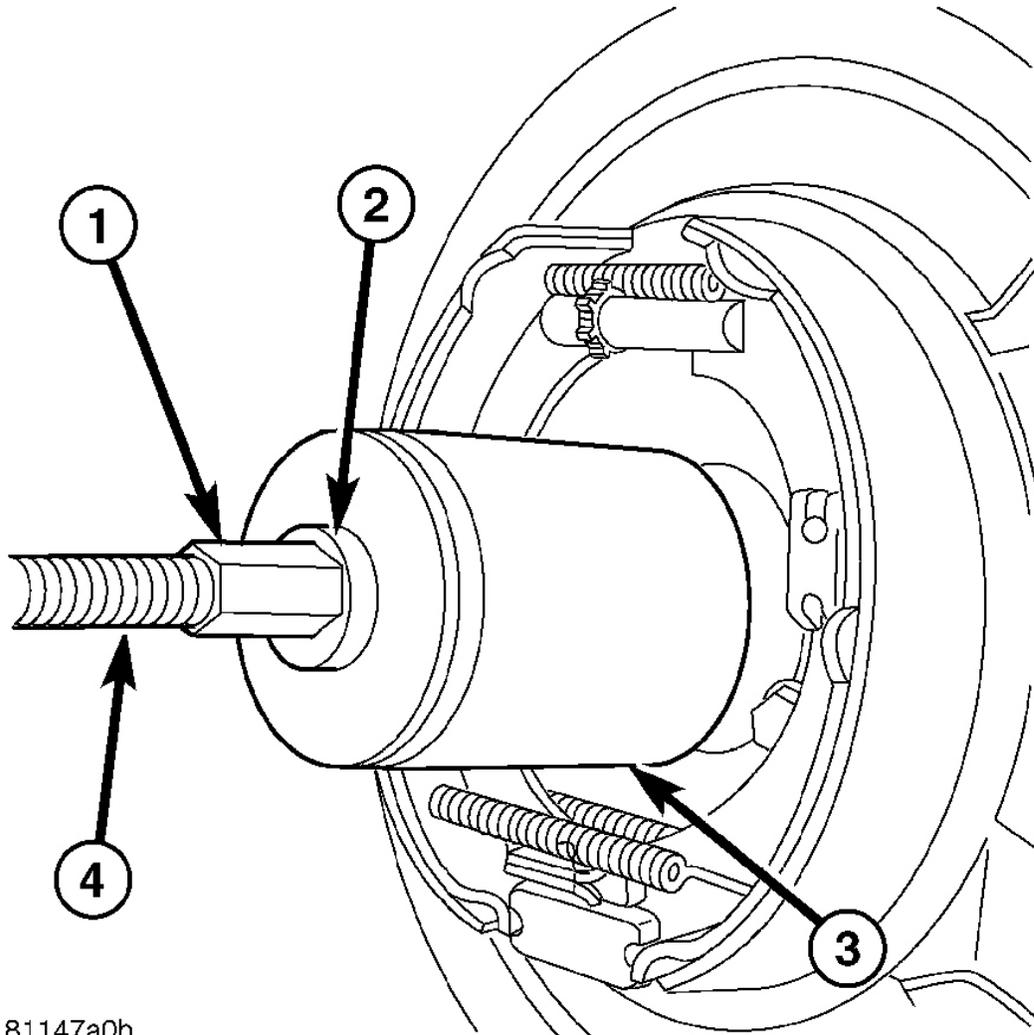
1. Remove axle shaft.
2. Remove axle seal with seal pick.
3. Position bearing (2) receiver (1) on axle tube.



81147a07

Fig. 279: Inserting Bearing Remover Foot 6310-9 Through Receiver And Bearing
Courtesy of CHRYSLER LLC

4. Insert bearing remover Foot 6310-9 (3) through receiver (2) and bearing (1).



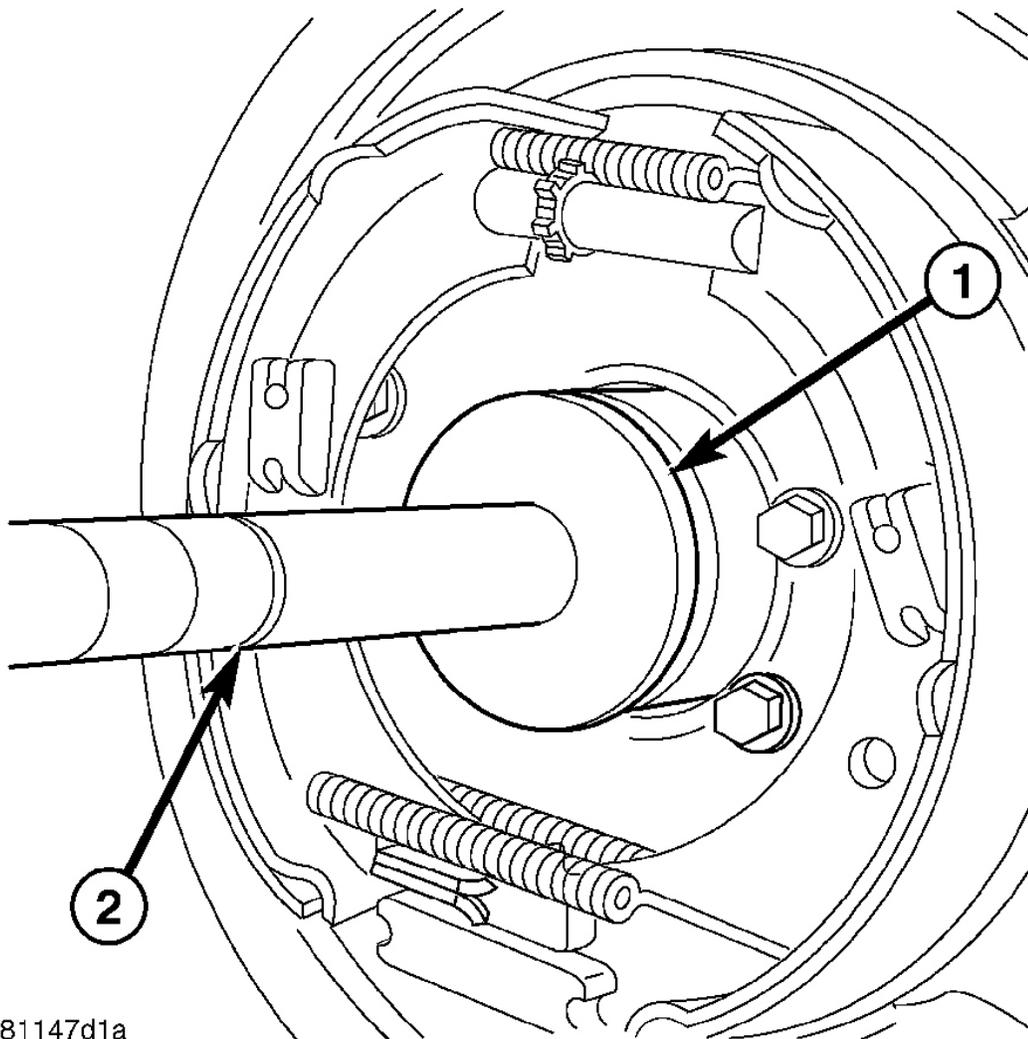
81147a0b

Fig. 280: Tightening Remove Nut On Shaft To Pull Bearing Into Receiver
Courtesy of CHRYSLER LLC

5. Tighten remove nut (1) on the shaft (4) to pull bearing into the receiver (3).

INSTALLATION

BEARING-AXLE



81147d1a

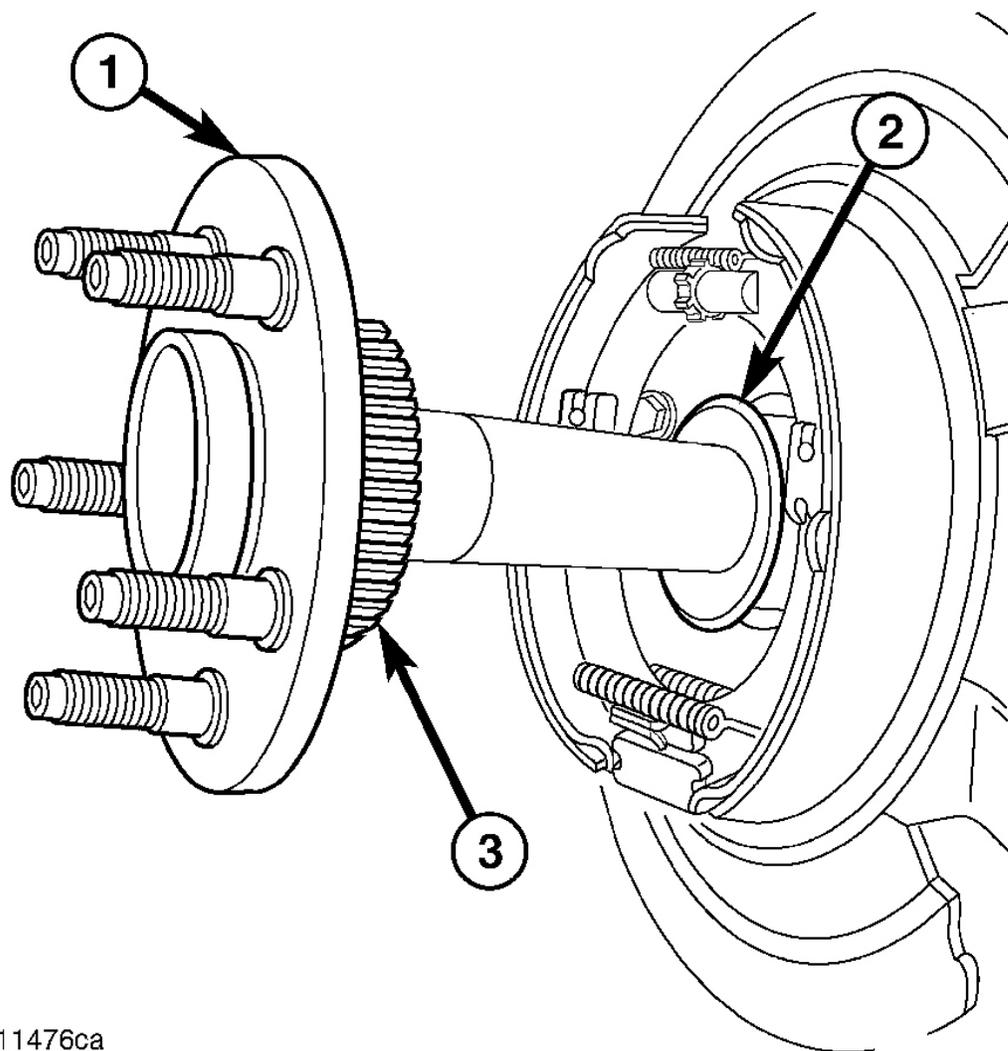
Fig. 281: Identifying Installer C-4198 & Handle C-4171

Courtesy of CHRYSLER LLC

1. Remove any old sealer/burrs from axle tube.
2. Install axle shaft bearing with Installer C-4198 (1) and Handle C-4171 (2). Drive bearing in until tool contacts the axle tube.

NOTE: Bearing is installed with the bearing part number against installer.

3. Coat **new** axle seal lip with axle lubricant. Install seal with Installer 8493 and Handle C-4171.



811476ca

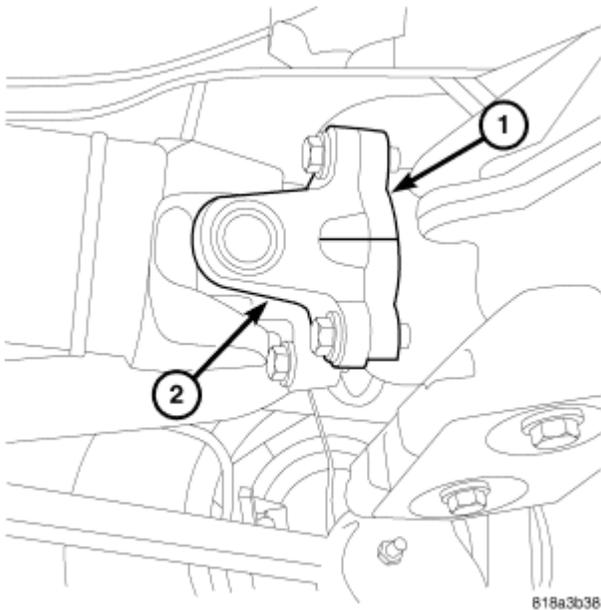
Fig. 282: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

4. Install axle shaft (1) in axle tube (2).

SEAL-PINION

REMOVAL

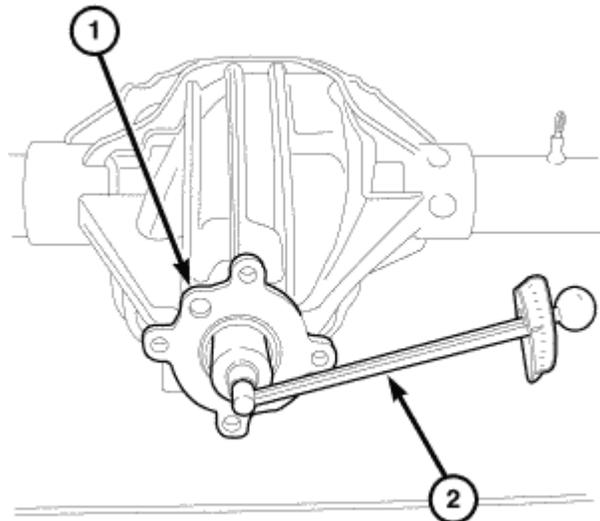
SEAL-PINION



818a3b38

Fig. 283: Identifying Line Across Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

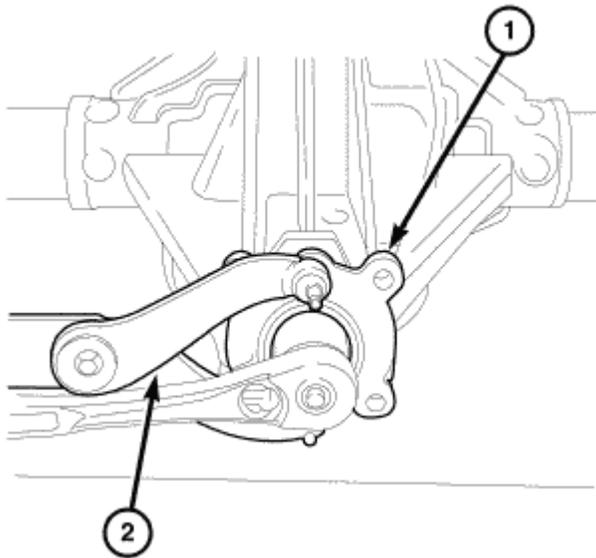
1. With vehicle in neutral, position vehicle on hoist.
2. Remove wheel and tire assemblies.
3. Mark a reference line across the axle flange (1) and propeller shaft flange (2).
4. Remove companion flange bolts and remove propeller shaft.
5. Remove brake calipers and rotors to prevent any drag.



818ded97

Fig. 284: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

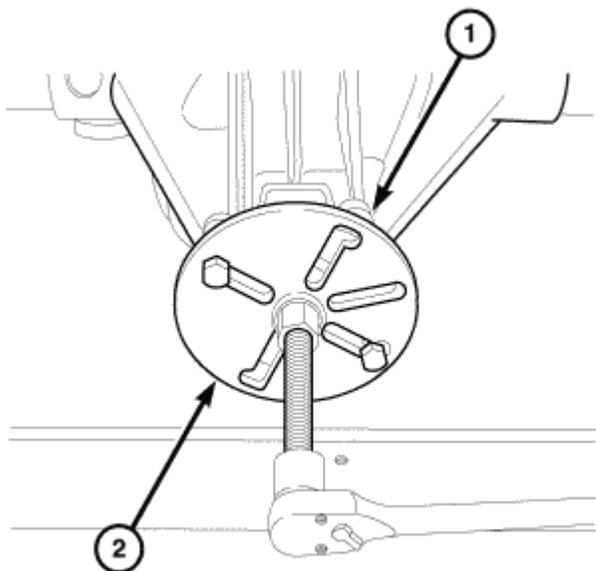
6. Rotate companion flange three or four times and verify flange rotates smoothly.
7. Record pinion torque to rotating (1) with an inch pound torque wrench (2) for installation reference.



818decb9

Fig. 285: Holding Pinion Flange With Holder C-3281
Courtesy of CHRYSLER LLC

8. Hold pinion flange (1) with Holder C-3281 (2) and remove pinion nut.
9. Mark a line across the pinion shaft and flange for installation reference.



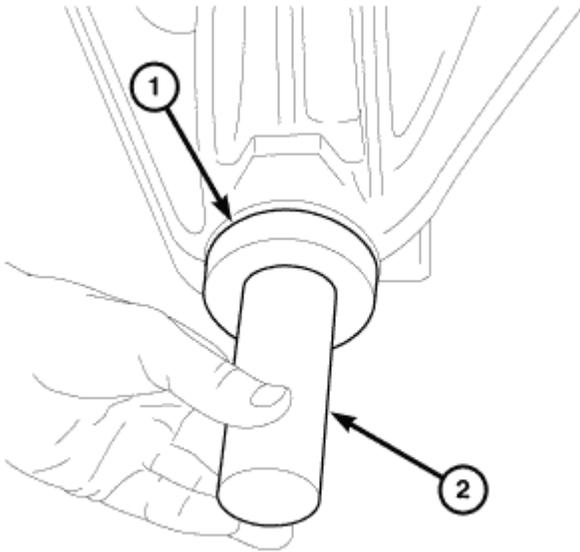
818decc9

Fig. 286: Identifying Pinion Flange & Puller 8992
Courtesy of CHRYSLER LLC

10. Remove pinion flange (1) with Puller 8992 (2).
11. Remove pinion seal with a seal puller.

INSTALLATION

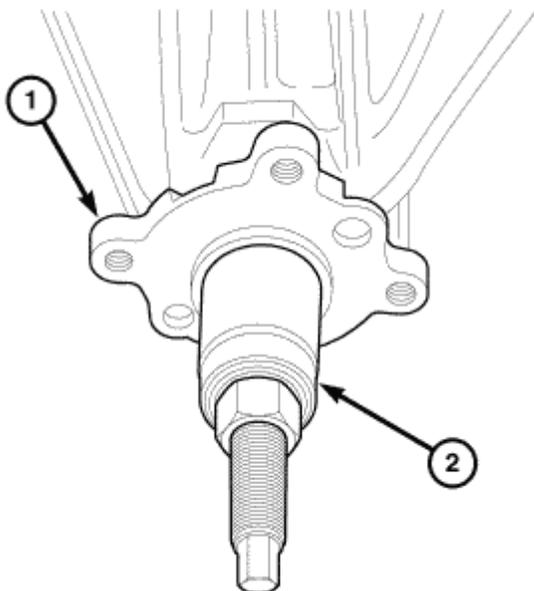
SEAL-PINION



818ddc4f

Fig. 287: Installing Pinion Seal With Installer C-4076-B And Handle C-4735
Courtesy of CHRYSLER LLC

1. Apply a light coating of gear lubricant on the lip of pinion seal.
2. Install **new** pinion seal with Installer C-4076-B (1) and Handle C-4735 (2).

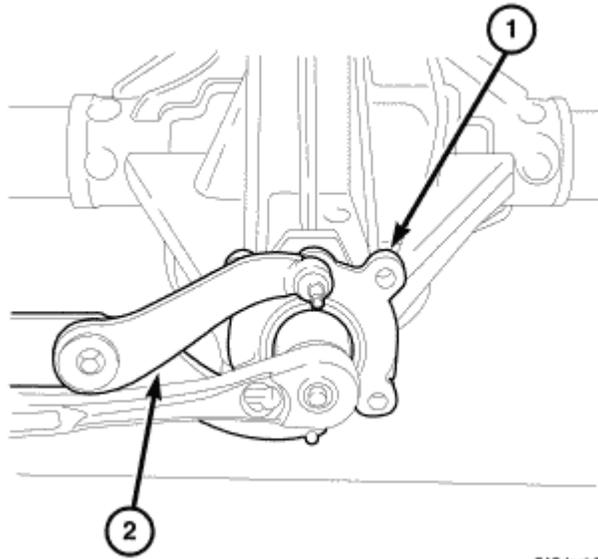


818ddc43

Fig. 288: Installing Flange With Installer C-3718

Courtesy of CHRYSLER LLC

3. Install flange on the pinion shaft with the reference marks aligned.
4. Install flange (1) with Installer C-3718 (2).



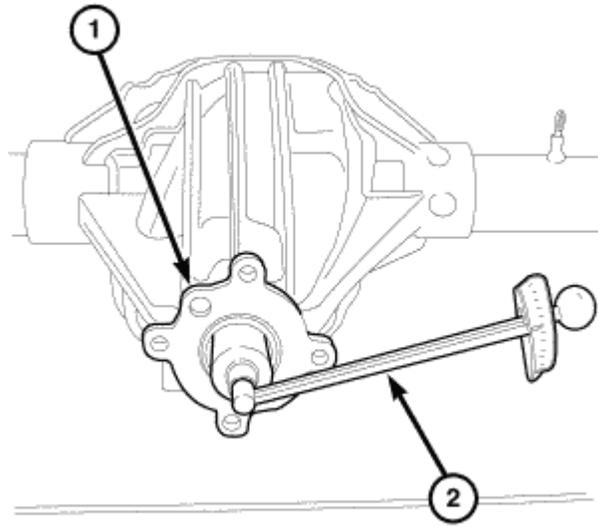
818decb9

Fig. 289: Holding Pinion Flange With Holder C-3281

Courtesy of CHRYSLER LLC

5. Install new pinion nut. Hold flange (1) with Holder C-3281 (2) and tighten pinion nut to 285 N.m (210 ft. lbs.). Rotate pinion several revolutions to ensure the bearing rollers are seated.

NOTE: Do not exceed the minimum torque 285 N.m (210 ft. lbs.) when installing the pinion nut at this point.



818ded97

Fig. 290: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

6. Measure pinion torque to rotate (1) with an inch pound torque wrench (2). Pinion torque to rotating should be equal to recorded reading plus an additional 0.56 N.m (5 in. lbs.).

If pinion torque to rotate is low, tighten pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotating is achieved.

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque. If pinion torque to rotating is exceeded, a new collapsible spacer must be installed. Failure to follow these instructions will result in damage to the axle.

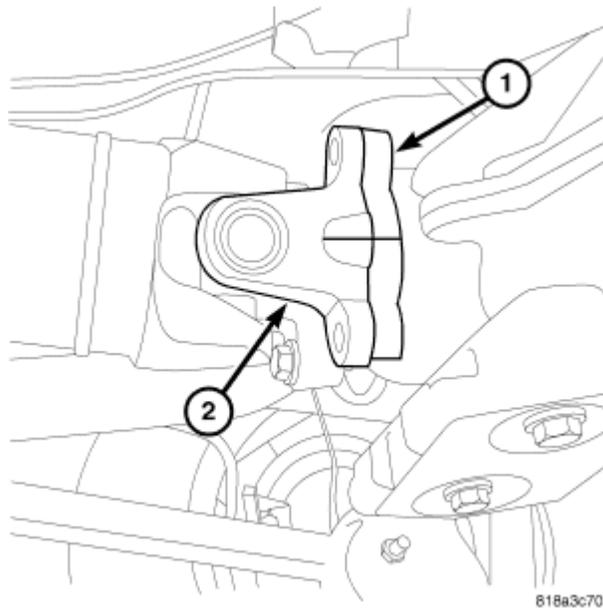


Fig. 291: Identifying Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

7. Install propeller shaft (1) with axle flange (2) installation reference marks aligned.
8. Install rear brake components.

DIFFERENTIAL

REMOVAL

DIFFERENTIAL

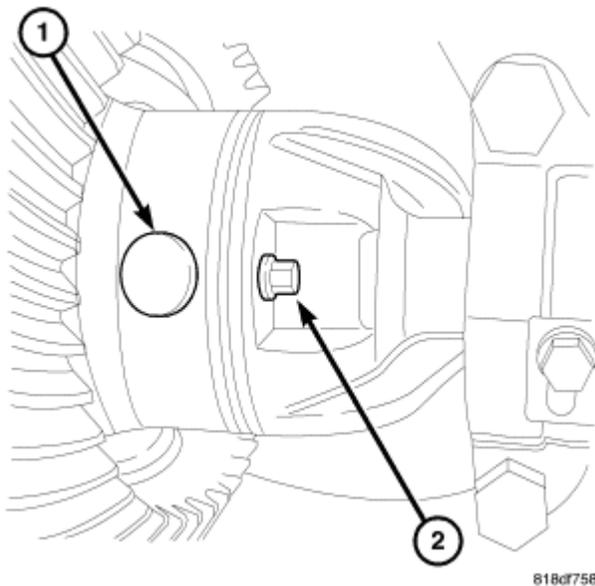


Fig. 292: Identifying Pinion Mate Shaft & Lock Screw

Courtesy of CHRYSLER LLC

1. Remove differential fill plug.
2. Remove differential cover and drain lubricant.
3. Remove pinion mate shaft (1) lock screw (2) from differential case.

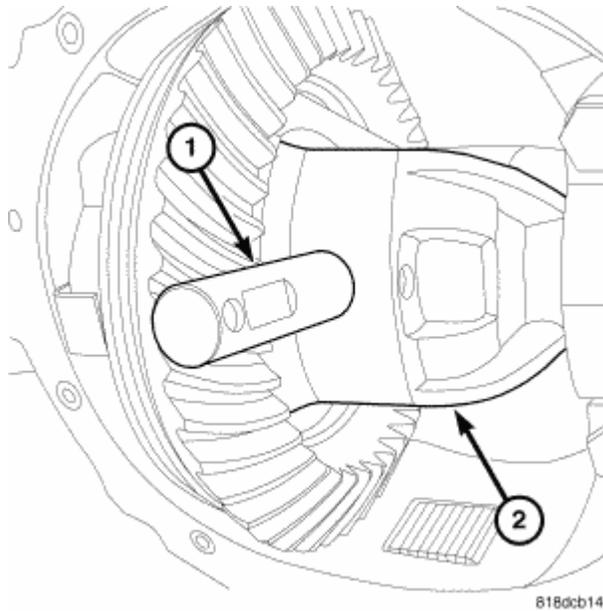
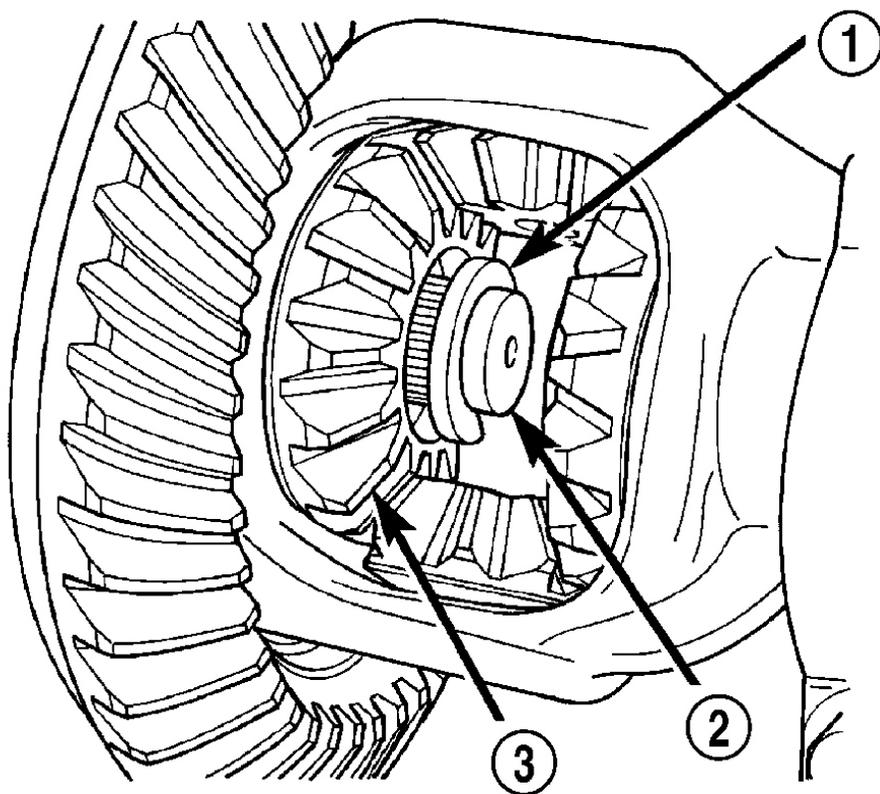


Fig. 293: Identifying Pinion Mate Shaft & Differential Case
Courtesy of CHRYSLER LLC

4. Remove pinion mate shaft (1) from differential case (2).



80be4603

Fig. 294: Identifying Axle Shaft C-Lock, Axle Shaft & Differential Side Gears
Courtesy of CHRYSLER LLC

5. Push axle shaft inward and remove axle shaft C-lock (1) from the axle shaft (2). Slide axle shafts (2) out of differential side gears (3).

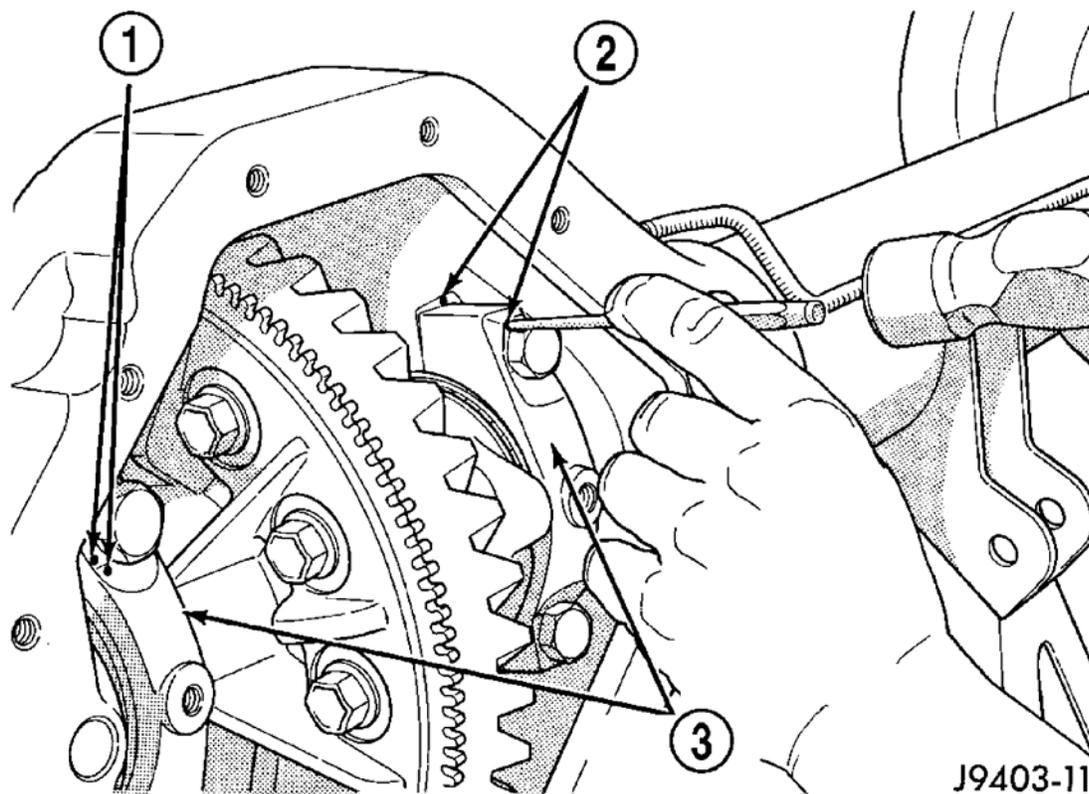
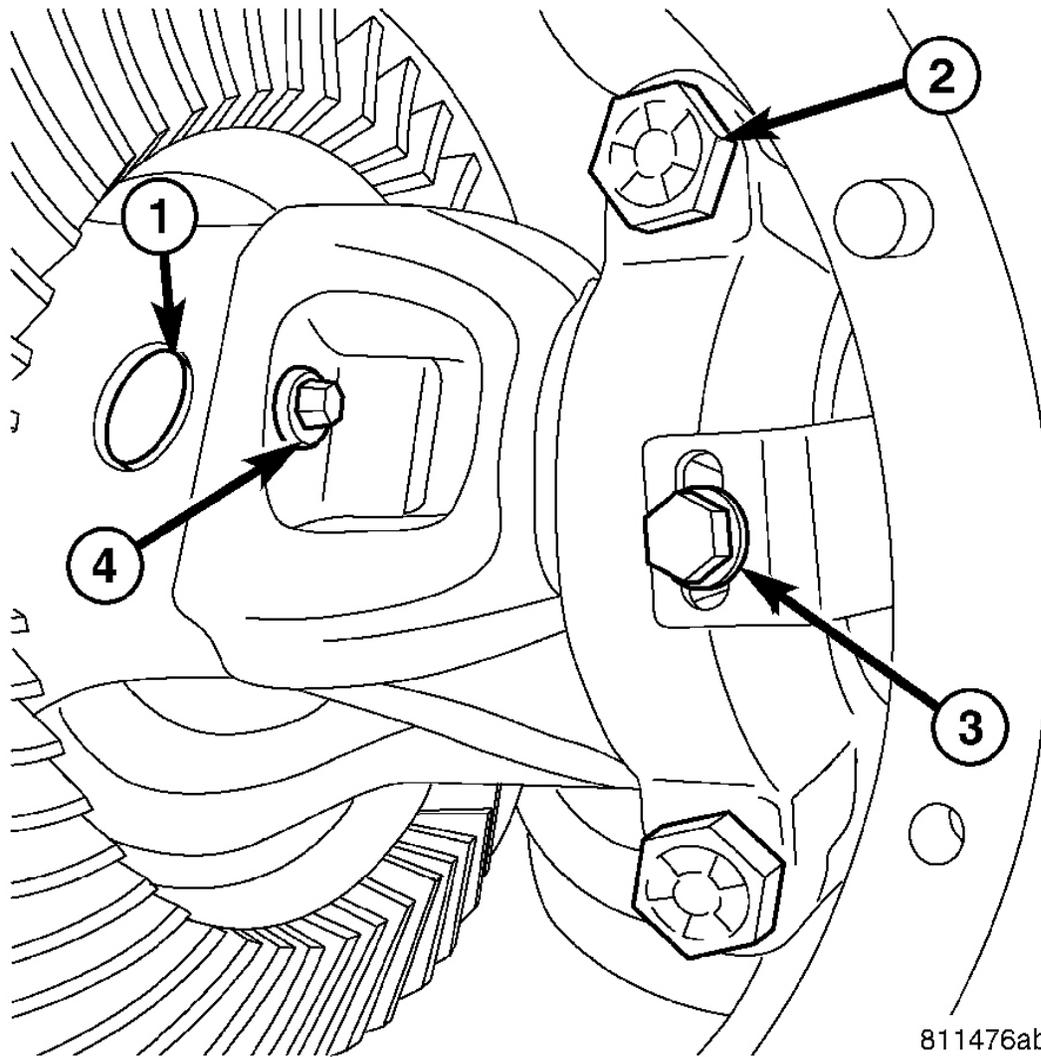


Fig. 295: Marking Differential Housing And Bearing Caps For Installation Reference
Courtesy of CHRYSLER LLC

6. Mark (1) (2) differential housing and bearing caps (3) for installation reference.



811476ab

Fig. 296: Removing Bearing Adjuster Lock Bolt From Bearing Caps & Loosening Differential Bearing Cap Bolts

Courtesy of CHRYSLER LLC

7. Remove bearing adjuster lock bolt (3) from bearing caps.
8. Loosen differential bearing cap bolts (2).

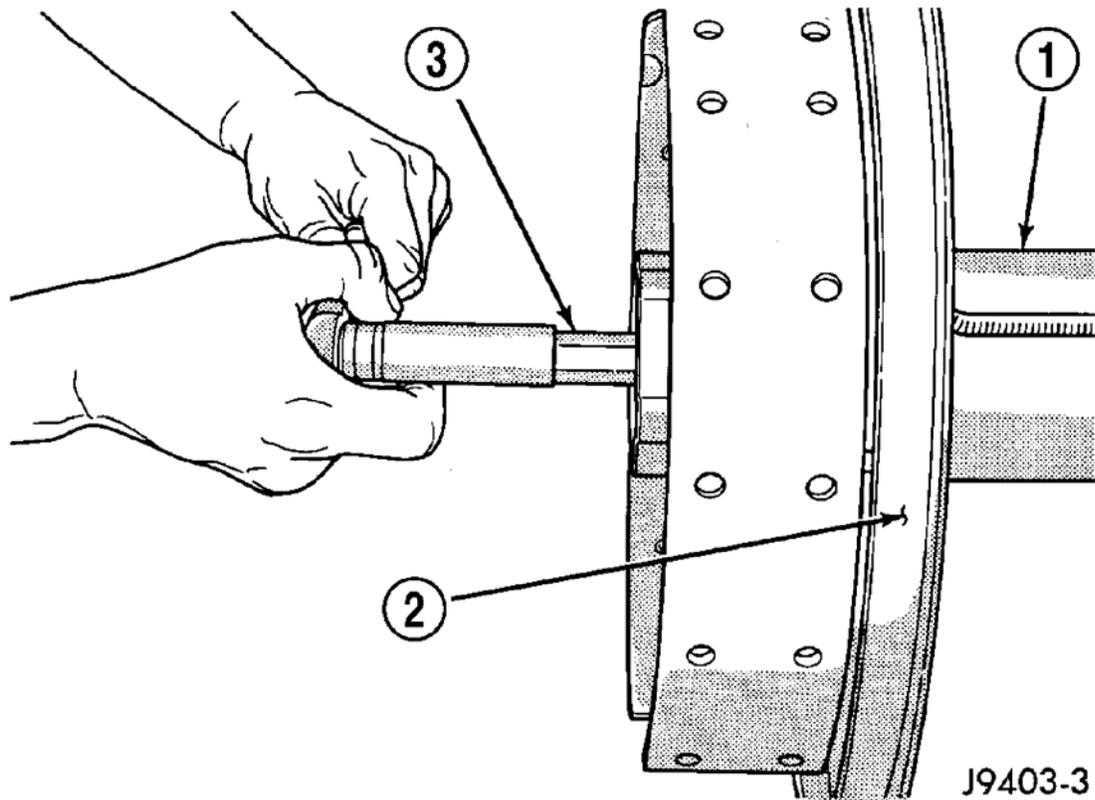


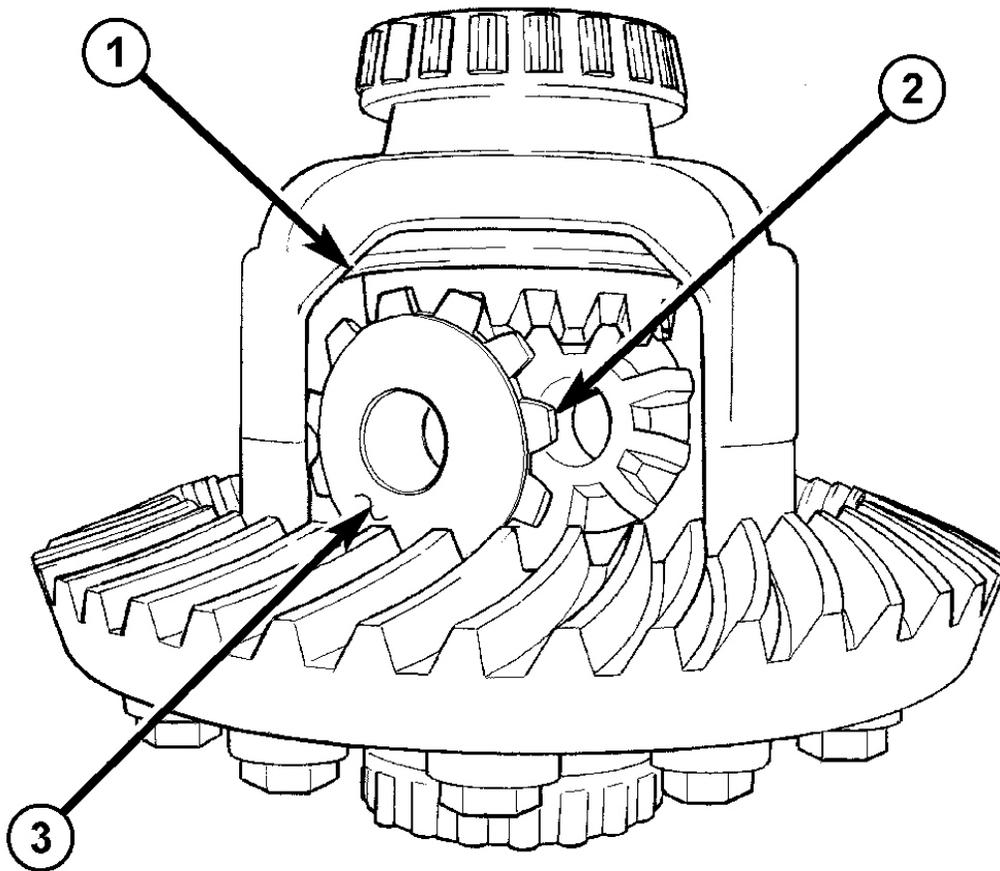
Fig. 297: Identifying Axle Tubes & Adjuster C-4164

Courtesy of CHRYSLER LLC

9. Loosen differential bearing adjusters through the axle tubes (1) with Adjuster C-4164 (3).
10. Hold differential case while removing bearing caps and adjusters.
11. Remove differential case and tag differential bearing cups and adjusters to indicate location.
12. Clean housing cavity with flushing oil, light engine oil or a lint free cloth.

DISASSEMBLY

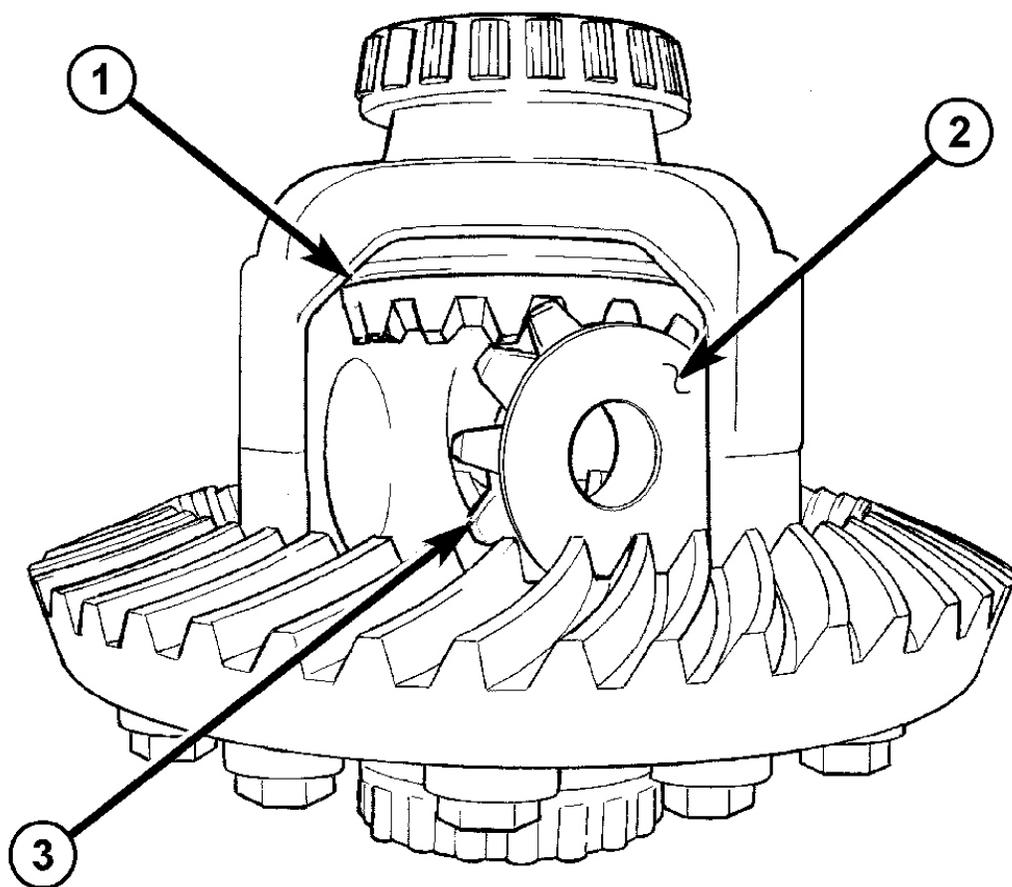
DIFFERENTIAL



816f3cb7

Fig. 298: Identifying Differential Window, Pinion Gear & Thrust Washer
Courtesy of CHRYSLER LLC

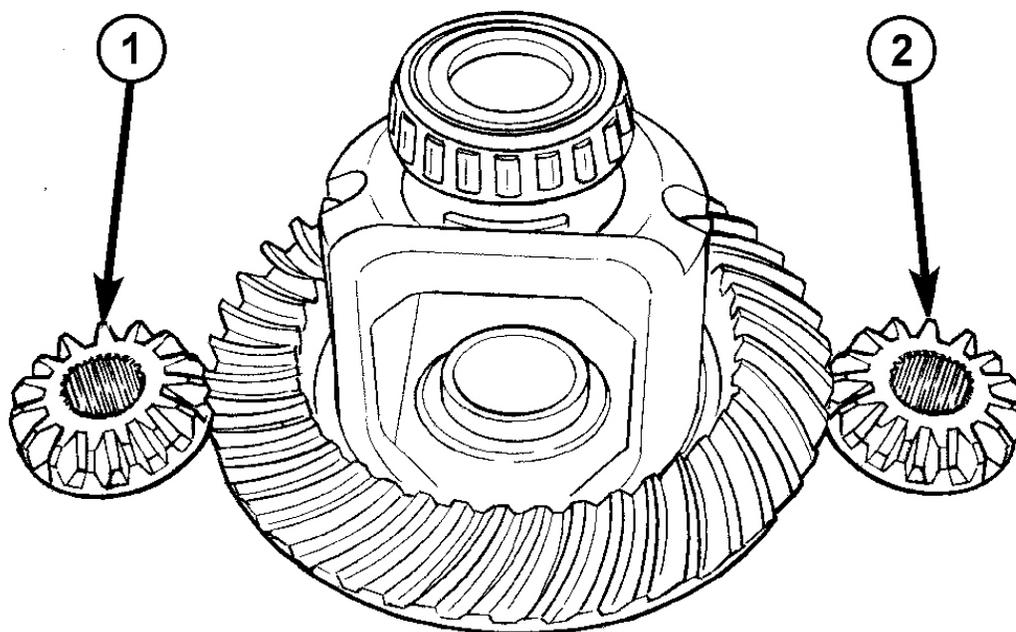
1. Rotate one pinion gear (2) with thrust washer (3) to the differential window (1) and remove gear and thrust washer.



816f3cd1

Fig. 299: Identifying Differential Window, Thrust Washer & Pinion Gear
Courtesy of CHRYSLER LLC

2. Rotate remaining pinion gear (3) with thrust washer (2) to the differential window (1) and remove gear and washer.



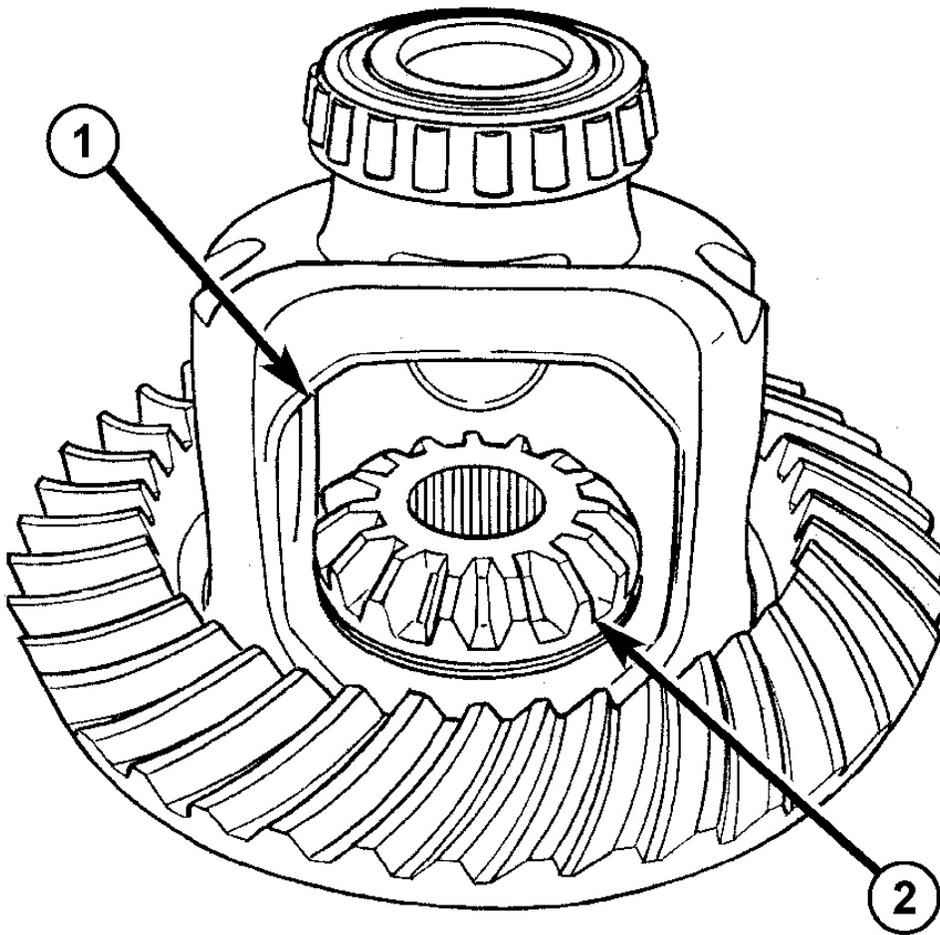
816f3cea

Fig. 300: Removing Differential Side Gears And Thrust Washers
Courtesy of CHRYSLER LLC

3. Remove differential side gears (1) (2) and thrust washers.

ASSEMBLY

DIFFERENTIAL



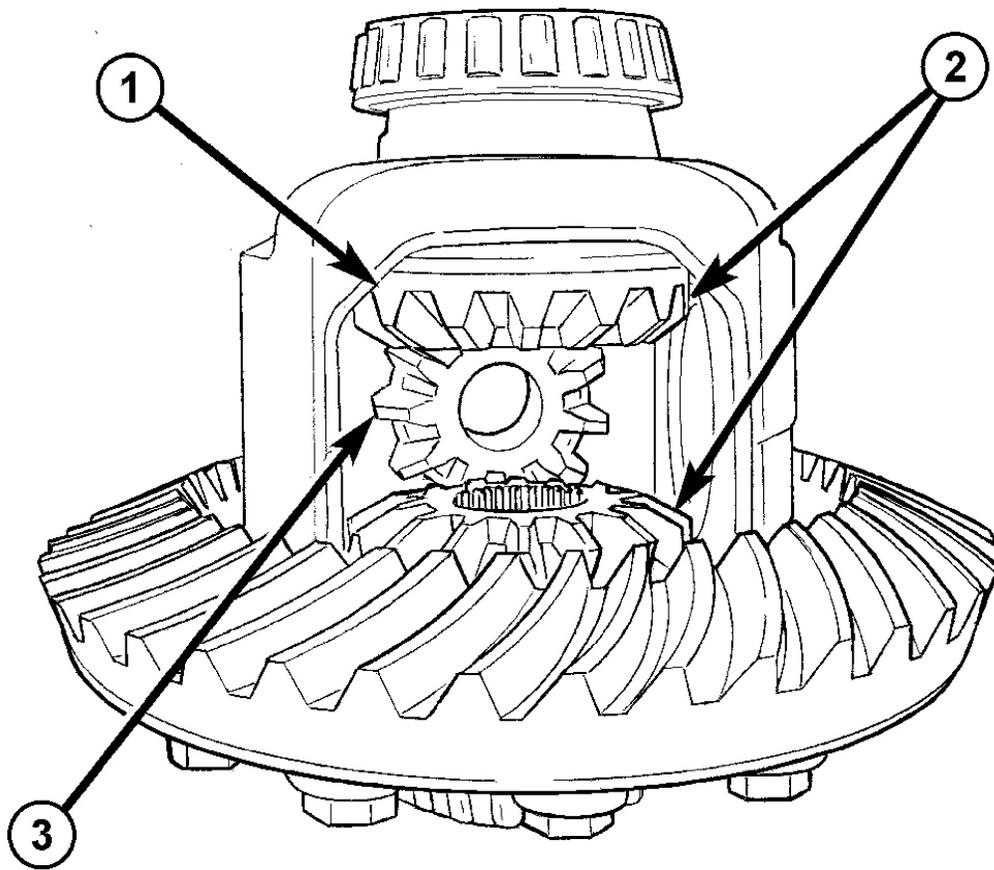
816f3db1

Fig. 301: Identifying Differential Side Gears & Differential Window

Courtesy of CHRYSLER LLC

NOTE: If same gears and thrust washers are being used, install them into their original locations.

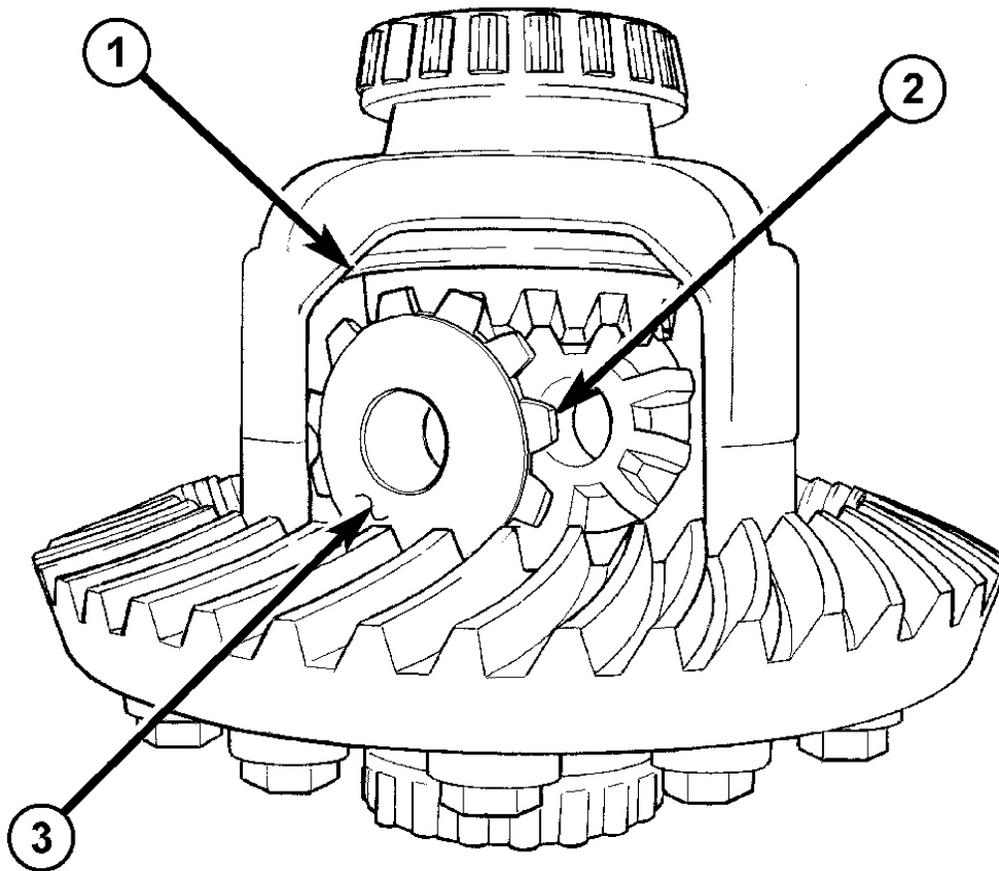
1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers through differential window (1).



816f3e23

Fig. 302: Identifying First Pinion Gear, Differential Window & Side Gears
Courtesy of CHRYSLER LLC

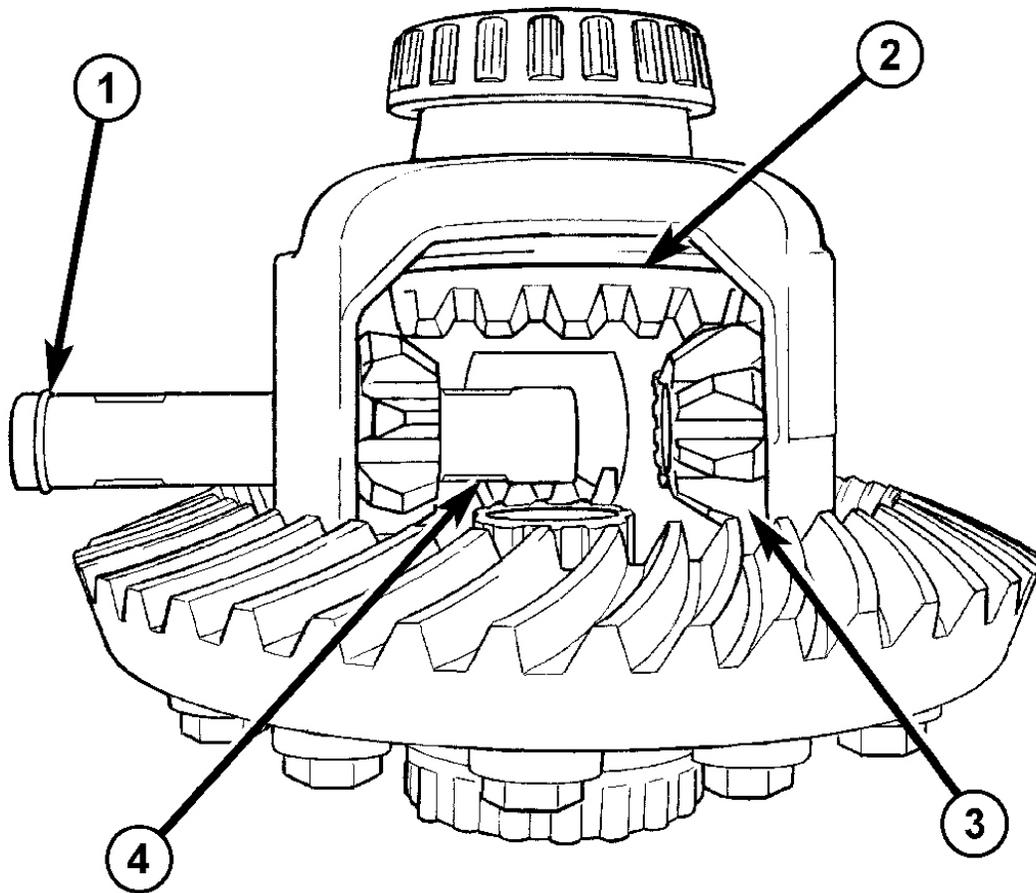
3. Install first pinion gear (3) with thrust washer into differential window (1) and side gears (2). Rotate pinion gear into the case.



816f3cb7

Fig. 303: Identifying Differential Window, Pinion Gear & Thrust Washer
Courtesy of CHRYSLER LLC

4. Install remaining pinion gear (2) and thrust washer (3). Rotate gears to align hole in the pinion gears with hole in the differential case.



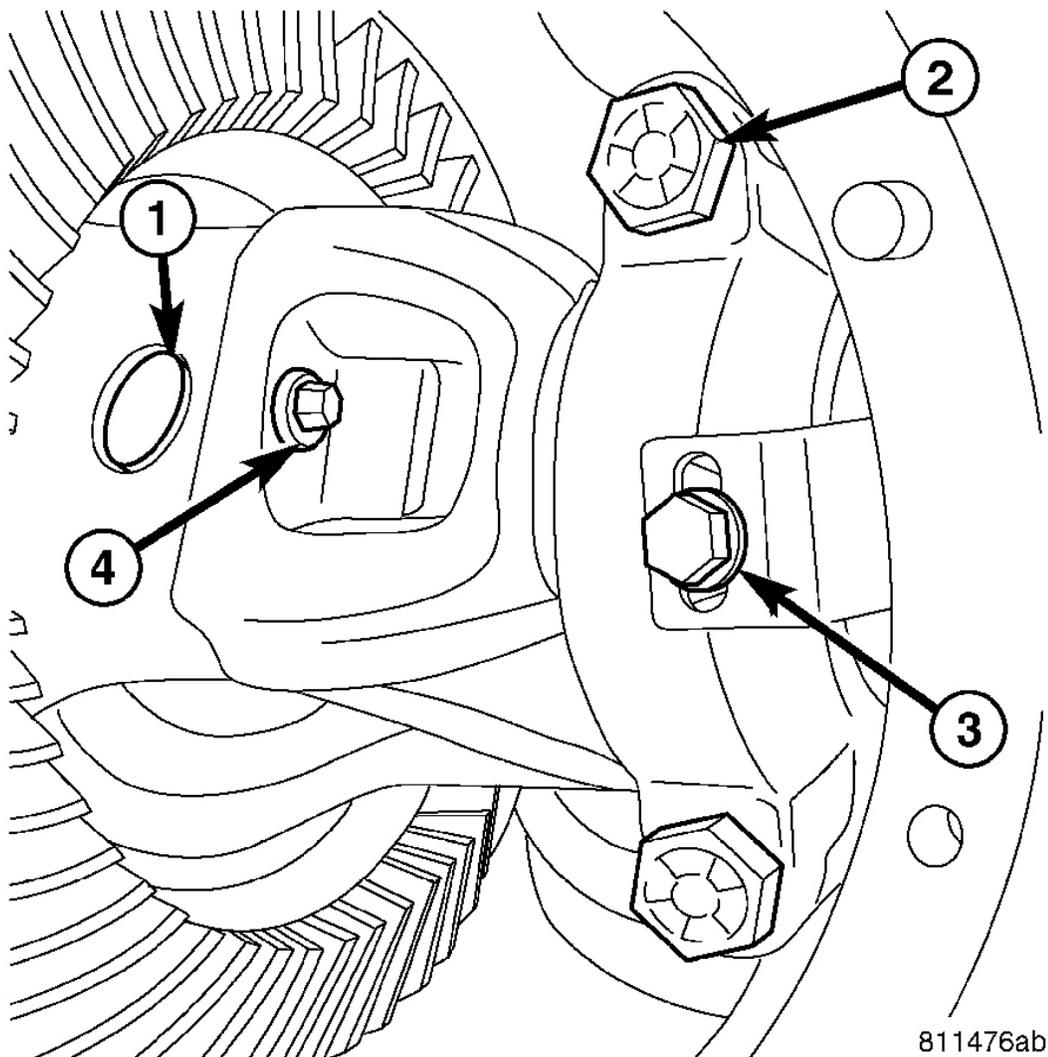
816f3da7

Fig. 304: Sliding Pinion Shaft Into Case And Through Pinion Gears To Align Gears
Courtesy of CHRYSLER LLC

5. Slide pinion shaft (1) into the case and through the pinion gears (3) to align the gears.

INSTALLATION

DIFFERENTIAL



811476ab

Fig. 305: Installing Differential Bolts

Courtesy of CHRYSLER LLC

1. Apply a coat of hypoid gear lubricant to differential bearings, bearing caps and threaded adjusters.

NOTE: Grease can be used to keep the adjusters in position.

2. Install differential assembly into the housing.
3. Install differential bearing caps in their original locations.
4. Install bearing cap bolts (2) and tighten upper bolts to 14 N.m (10 ft. lbs.). Tighten lower bolts finger-tight until bolt head is seated.

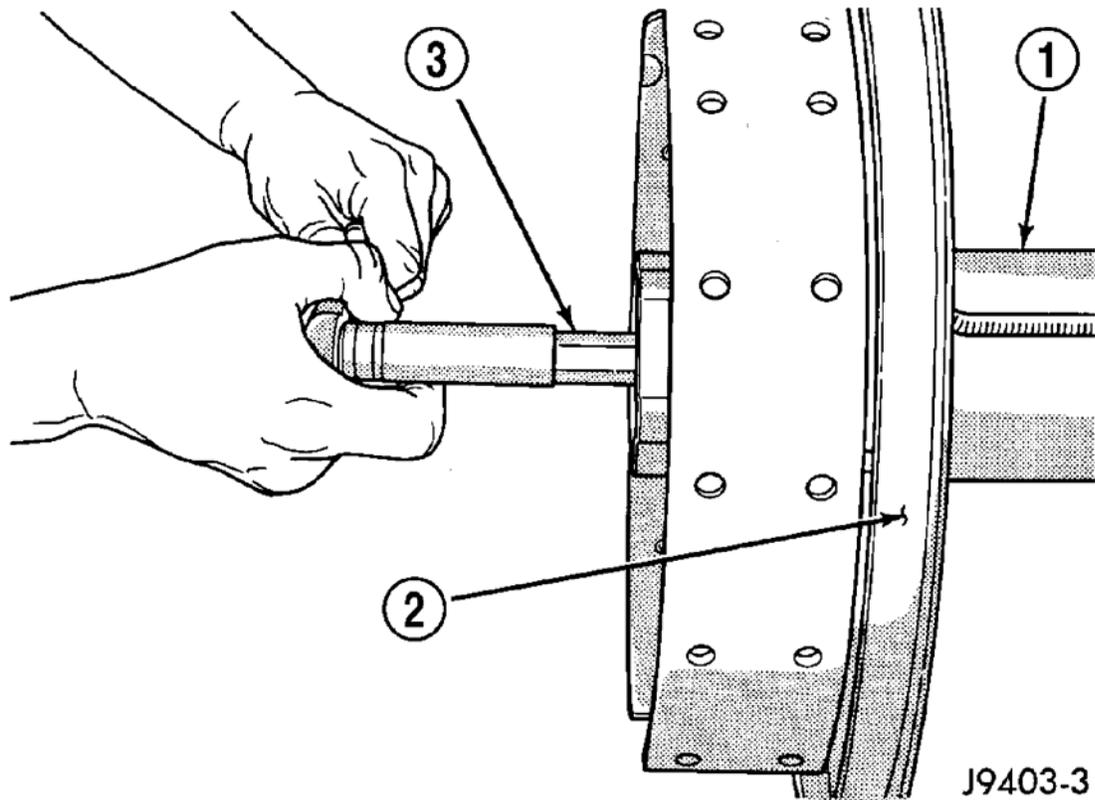
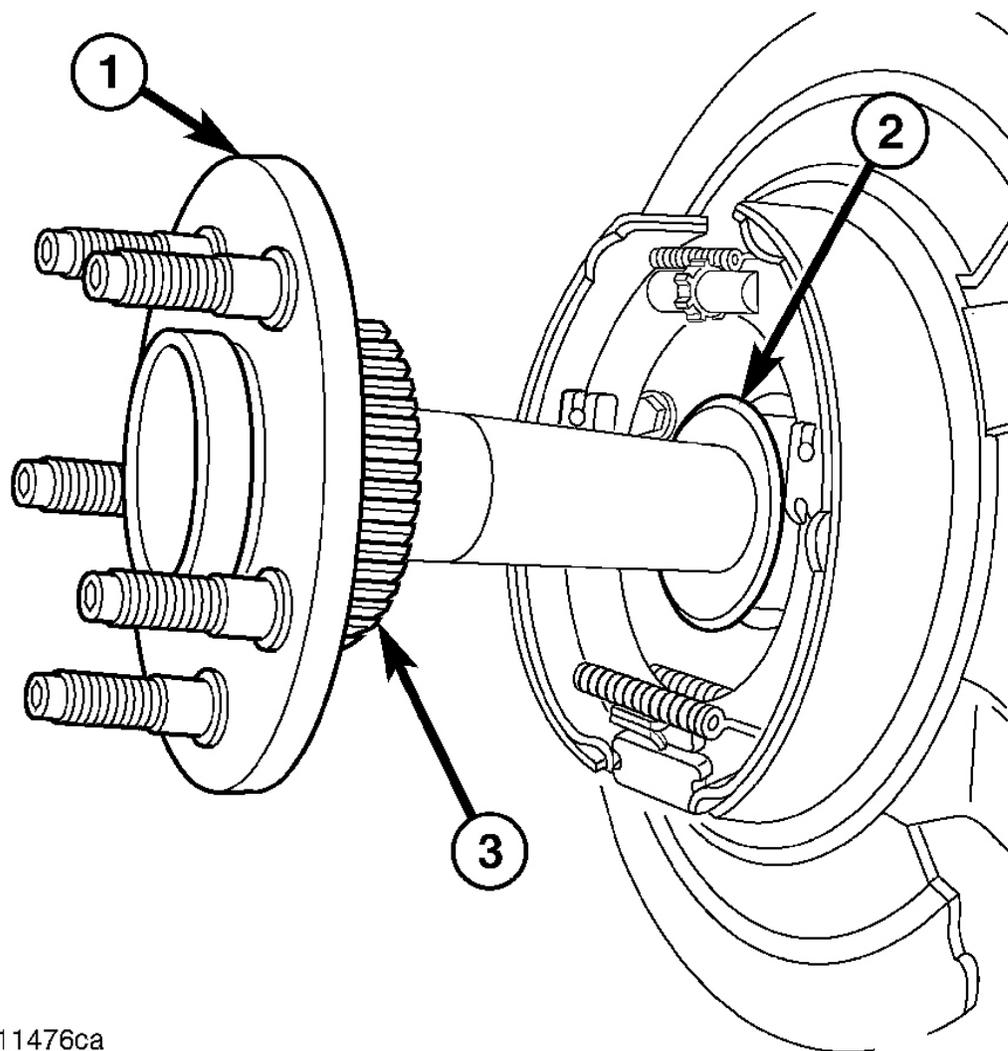


Fig. 306: Identifying Axle Tubes & Adjuster C-4164
Courtesy of CHRYSLER LLC

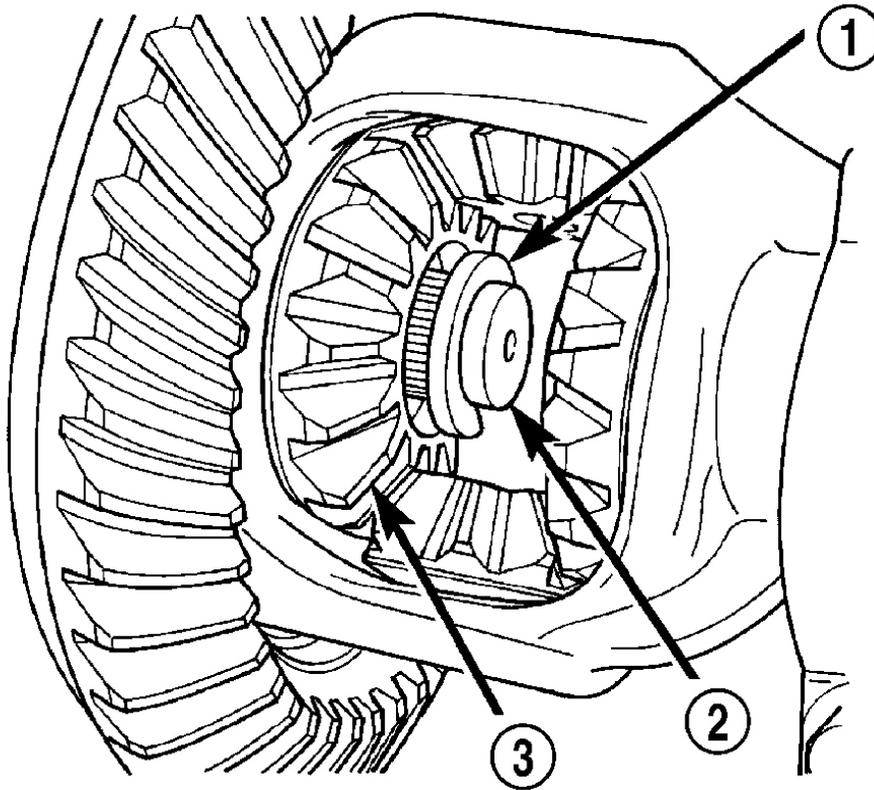
5. Perform differential bearing preload adjustment procedure with Wrench C-4164 (3).
6. Tighten bearing cap bolts in a criss-cross pattern to 135 N.m (100 ft. lbs.).
7. Install adjuster locks on bearing caps and tighten to 10 N.m (90 in. lbs.).



811476ca

Fig. 307: Identifying Axle Shaft & Axle Tube
Courtesy of CHRYSLER LLC

8. Install axle shaft (1) in axle tube (2) and engage into side gear splines.



80be4603

Fig. 308: Installing C-Lock In Axle Shaft End, Then Pushing Axle Shaft Outward To Seat C-Lock In Side Gear

Courtesy of CHRYSLER LLC

9. Lubricate bearing bore and seal lip with gear lubricant.
10. Install C-lock (1) in axle shaft end, then push axle shaft outward to seat C-lock in side gear.

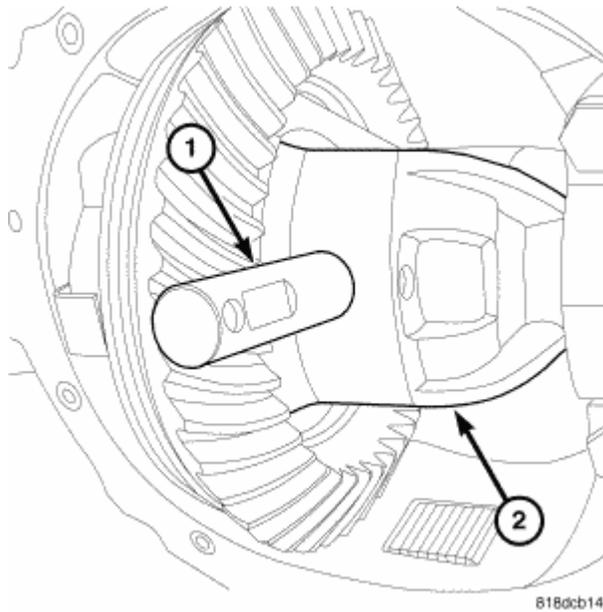


Fig. 309: Identifying Pinion Mate Shaft & Differential Case
Courtesy of CHRYSLER LLC

11. Install pinion mate shaft (1) into differential case (2) and through thrust washers and differential pinions.

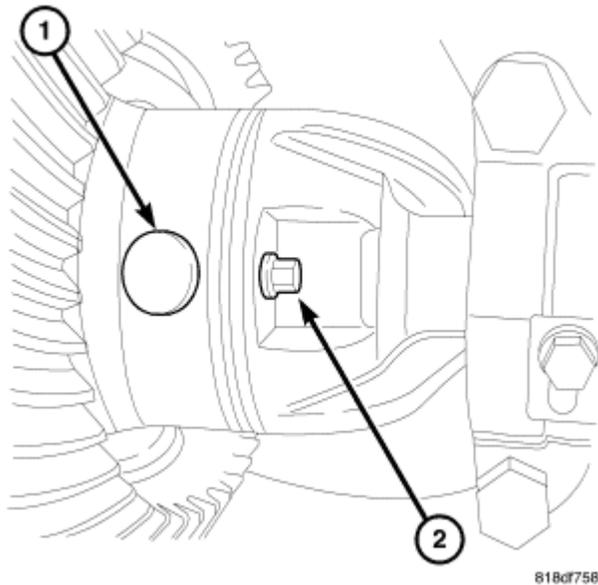


Fig. 310: Identifying Pinion Mate Shaft & Lock Screw
Courtesy of CHRYSLER LLC

12. Align hole in mate shaft (1) with hole in the differential case. Apply Mopar Lock & Seal Adhesive or equivalent to lock screw (2) threads. Install lock screw and tighten to 26 N.m (19 ft. lbs.).
13. Install differential cover.

REMOVAL

BEARINGS-DIFFERENTIAL CASES

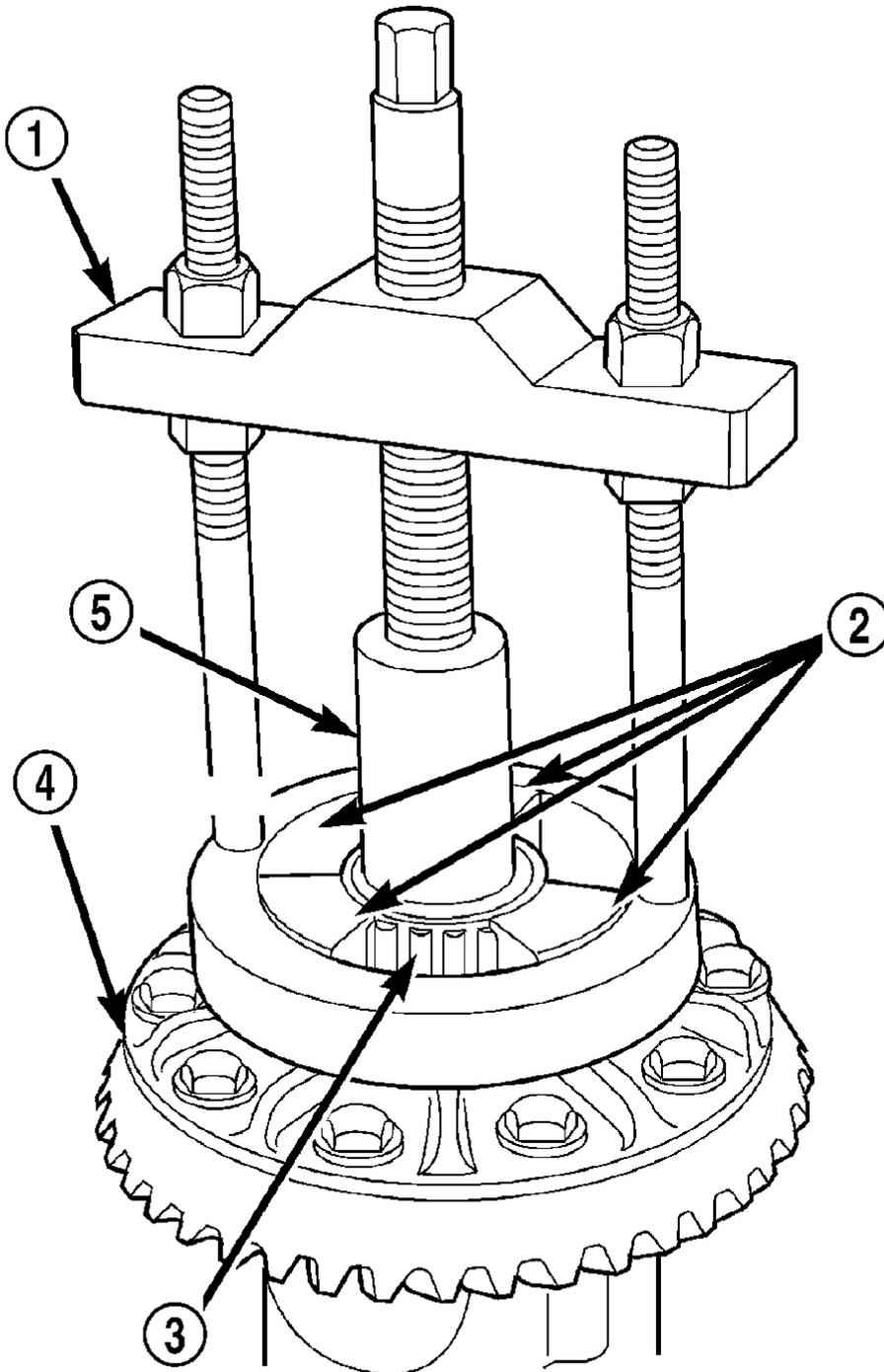
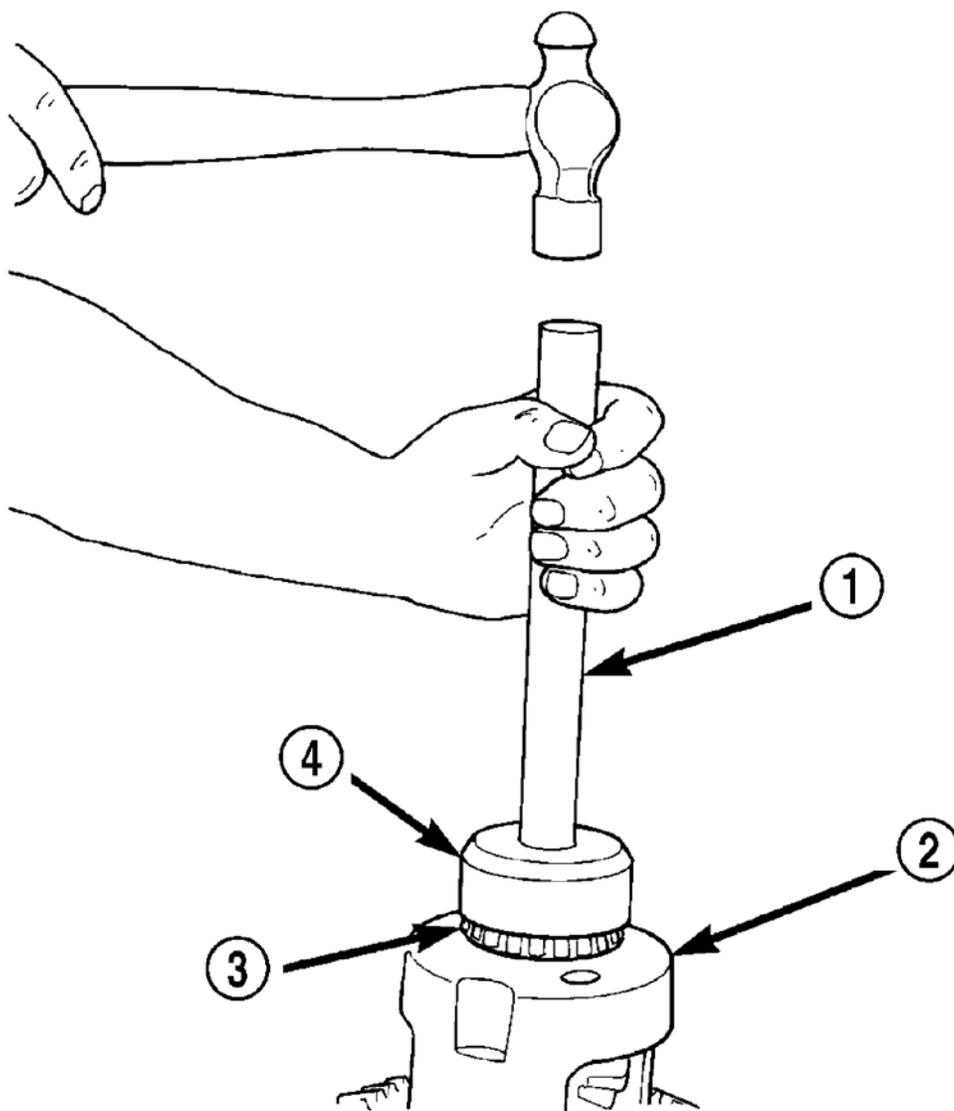


Fig. 311: Removing Differential Bearings From Case With Puller/Press C-293-PA And Adapters C-293-48 And Plug 8926-2

Courtesy of CHRYSLER LLC

1. Remove differential case from axle.
2. Remove differential bearings (3) from the case with Puller/Press C-293-PA (1) and Adapters C-293-48 (2) and Plug 8926-2 (5).

INSTALLATION**BEARINGS-DIFFERENTIAL CASE**

80a0c4fe

Fig. 312: Installing Differential Bearings With Installer C-4340 And Handle C-4171

Courtesy of CHRYSLER LLC

1. Install differential (2) bearings (3) with Installer C-4340 (4) and Handle C-4171(1).
2. Install differential case in axle.

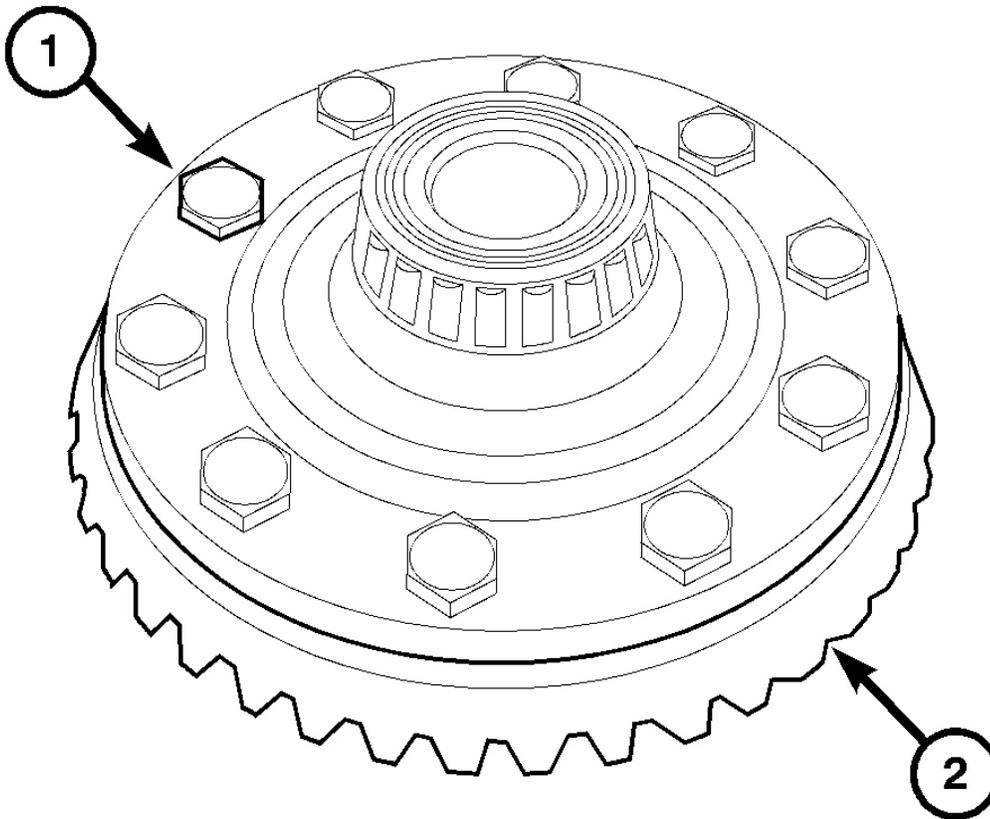
GEAR-PINION/RING

REMOVAL

GEAR-PINION/RING

NOTE: The ring and pinion gears are serviced in a matched set. Never replace one gear without replacing the other matched gear.

RING GEAR REMOVAL - GAS ENGINE



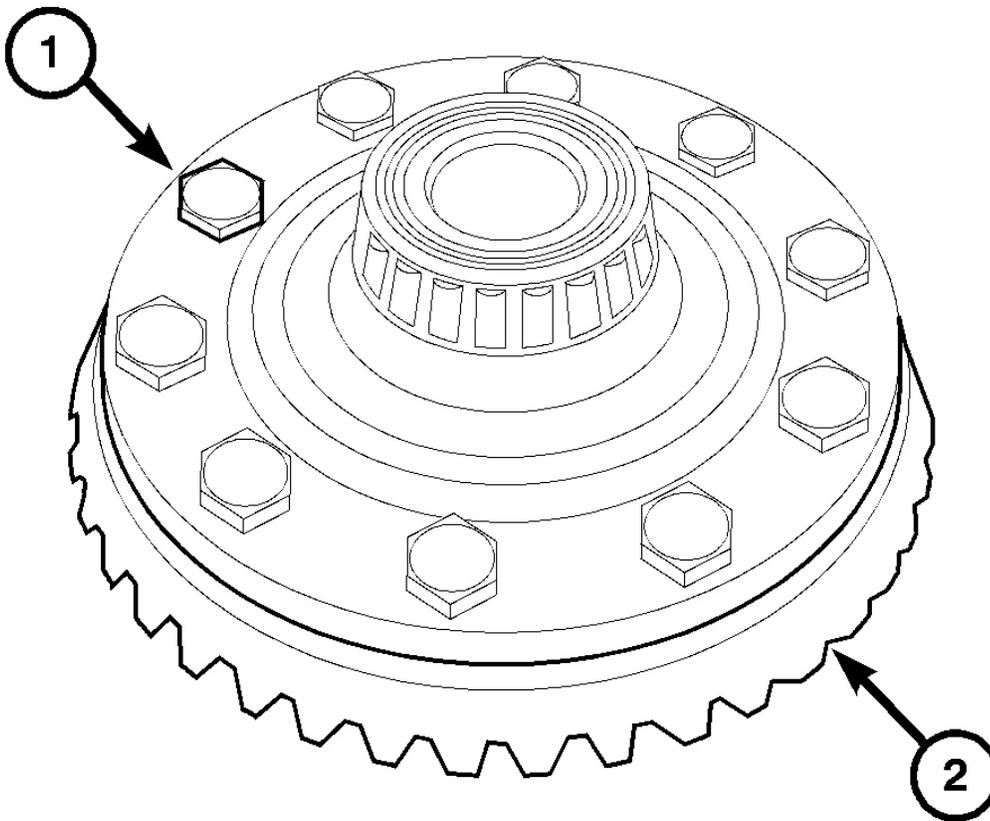
816f133e

Fig. 313: Identifying Ring Gear & Bolts

Courtesy of CHRYSLER LLC

1. Remove differential from axle housing.
2. Place differential case in a vise with soft metal jaw.
3. Remove bolts (1) holding ring gear (2) to differential case.
4. Drive ring gear from differential case with a dead-blow hammer.

RING GEAR REMOVAL - DIESEL ENGINE



816f133e

Fig. 314: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

1. Remove differential from axle housing.
2. Place differential case in a vise with soft metal jaw.
3. Remove **left hand threaded bolts** (1) holding ring gear (2) to differential case.

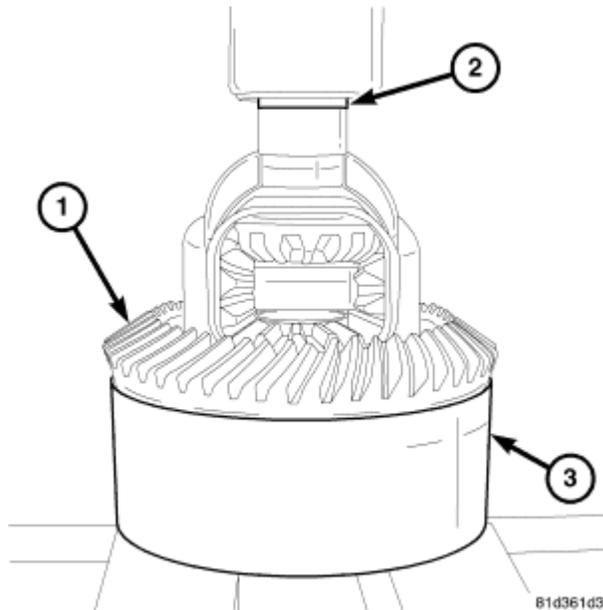


Fig. 315: Pressing Ring Gear Off Differential With Plug 8926-2 And Removing 10126-1
Courtesy of CHRYSLER LLC

4. Press ring gear (1) off differential with Plug 8926-2 (2) and Remove 10126-1 (3).

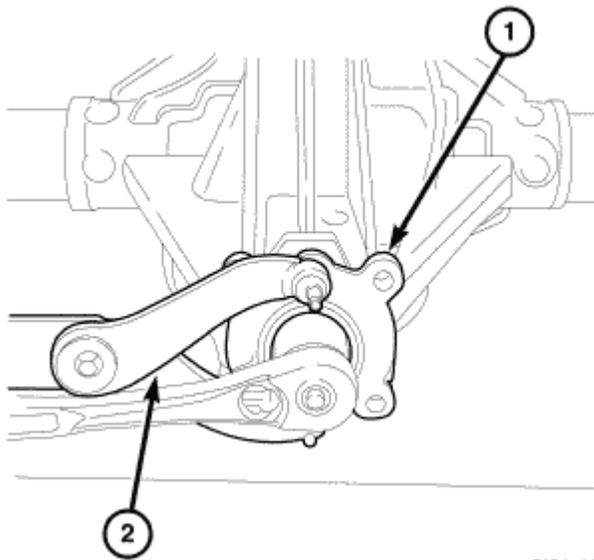
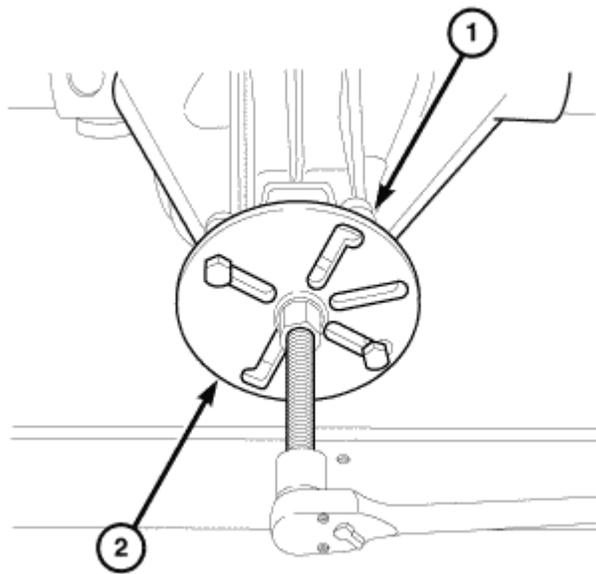


Fig. 316: Holding Pinion Flange With Holder C-3281
Courtesy of CHRYSLER LLC

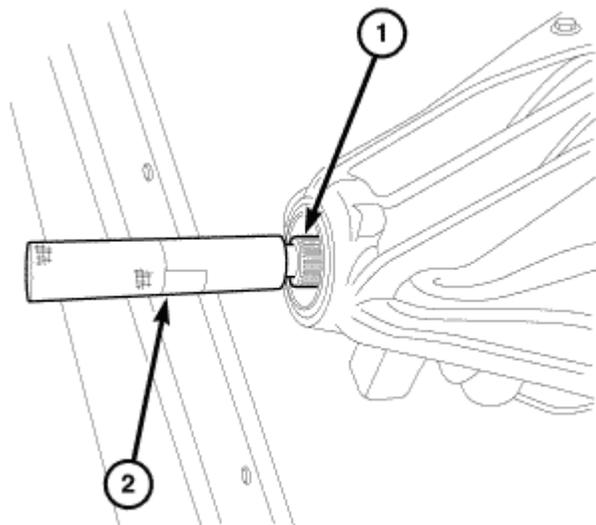
5. Hold pinion flange (1) with Holder C-3281 (2) and remove flange nut.



818decc9

Fig. 317: Identifying Pinion Flange & Puller 8992
Courtesy of CHRYSLER LLC

6. Remove pinion flange (1) from pinion shaft with Puller 8992 (2).



818df0aa

Fig. 318: Removing Pinion From Housing With Driver 8976 And Hammer
Courtesy of CHRYSLER LLC

7. Remove pinion (1) from the housing with Driver 8976 (2) and hammer.
8. Remove pinion shaft seal with a seal puller.
9. Remove front pinion bearing.

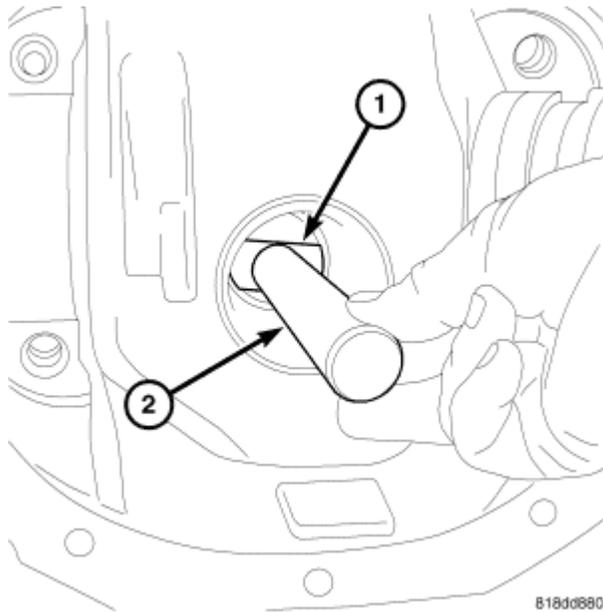


Fig. 319: Removing Front Pinion Bearing Cup With Remover C-4345 And Handle C-4171
Courtesy of CHRYSLER LLC

10. Remove front pinion bearing cup with Remover C-4345 (1) and Handle C-4171 (2).

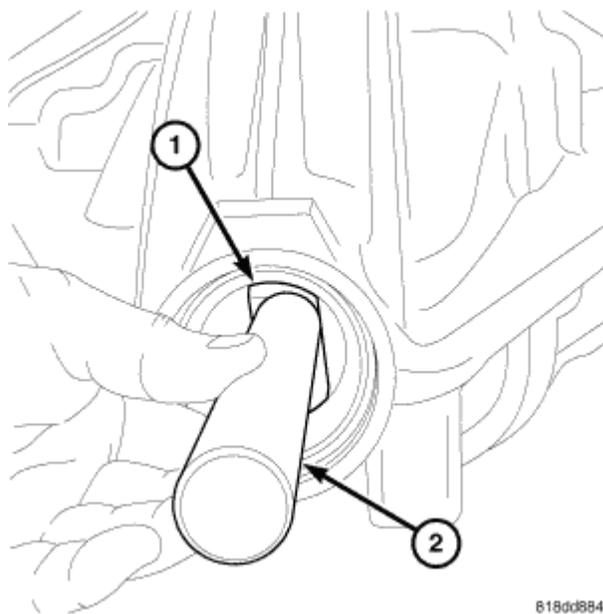
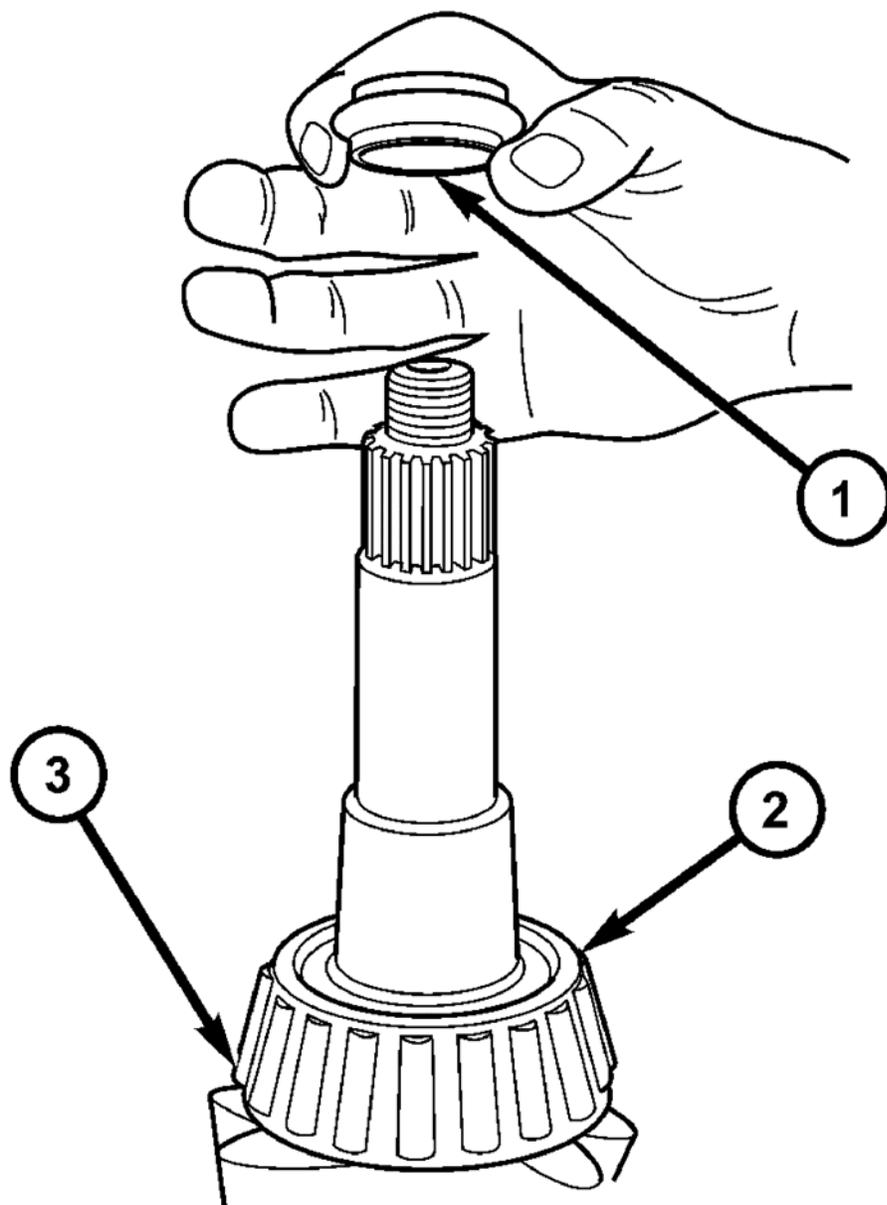


Fig. 320: Removing Rear Bearing Cup With Remover C-4307 And Handle C-4171
Courtesy of CHRYSLER LLC

11. Remove rear bearing cup with Remover C-4307 (1) and Handle C-4171 (2).



80cfe262

Fig. 321: Removing/Installing Collapsible Spacer From Pinion Shaft
Courtesy of CHRYSLER LLC

12. Remove collapsible spacer (1) from pinion shaft (3).

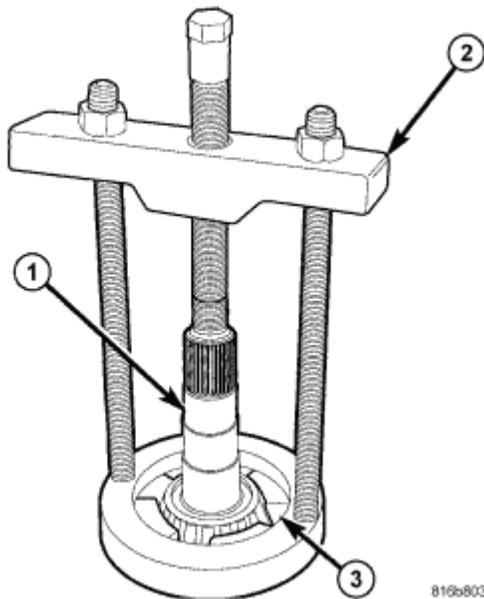


Fig. 322: Removing Rear Pinion Bearing From Pinion Shaft With Puller/Press C-293-PA And Adapters C-293-47
Courtesy of CHRYSLER LLC

13. Remove rear pinion bearing from pinion shaft (1) with Puller/Press C-293-PA (2) and Adapters C-293-47 (3).

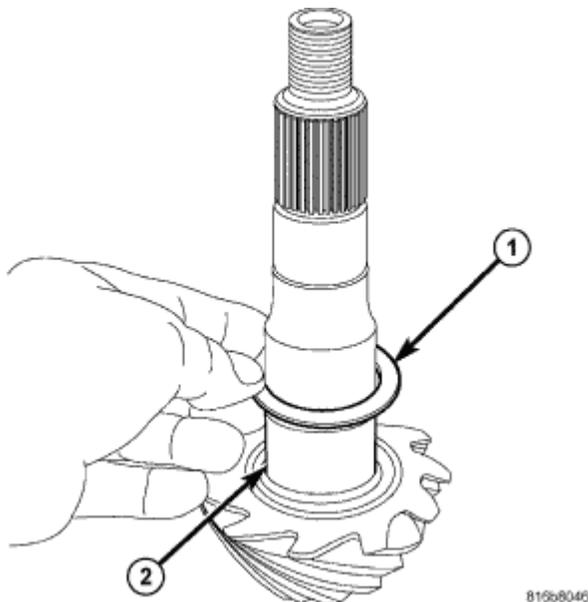
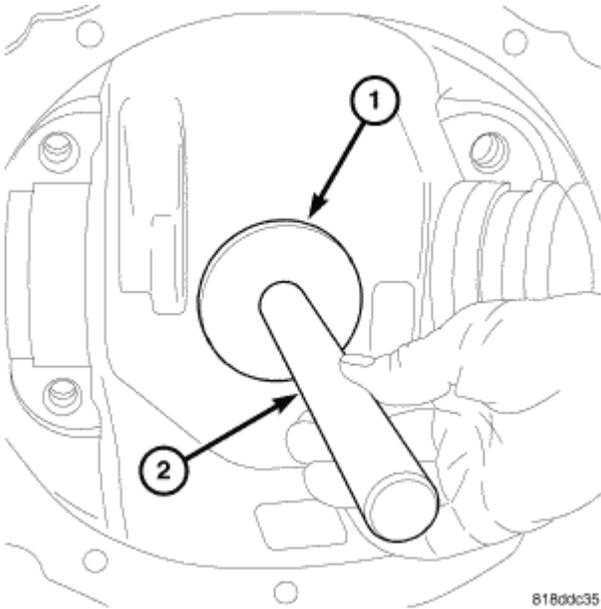


Fig. 323: Removing/Installing Depth Shims From Pinion Shaft
Courtesy of CHRYSLER LLC

14. Remove depth shims (1) from the pinion shaft (2) and record the shims thickness.

INSTALLATION

GEAR-PINION/RING

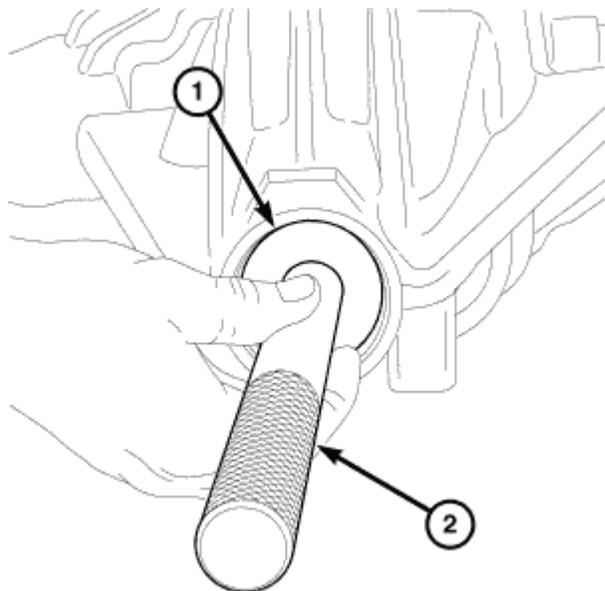


818ddc35

Fig. 324: Installing Rear Pinion Bearing Cup With Installer C-4308 And Handle C-4171
Courtesy of CHRYSLER LLC

NOTE: A pinion depth shim is located under the rear pinion bearing. If ring and pinion gears are reused, the original pinion depth shim/oil baffle can be used. Refer to **Adjustments (Pinion Gear Depth)** to select the proper shim thickness if ring and pinion gear are replaced.

1. Install rear pinion bearing cup with Installer C-4308 (1) and Handle C-4171 (2).

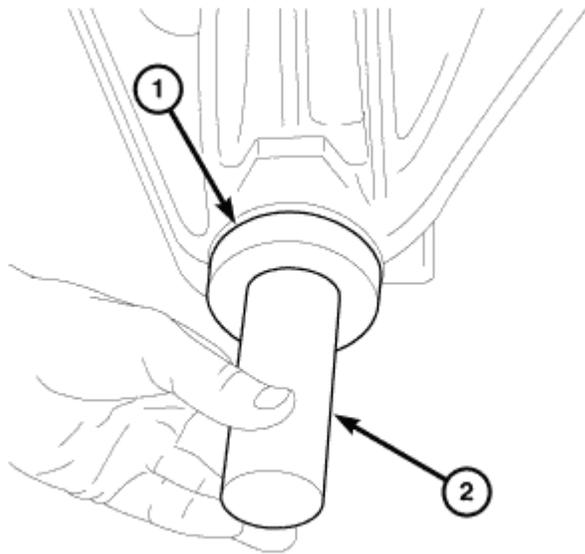


818ddc3e

Fig. 325: Installing Front Pinion Bearing Cup With Installer D-130 And Handle C-4171

Courtesy of CHRYSLER LLC

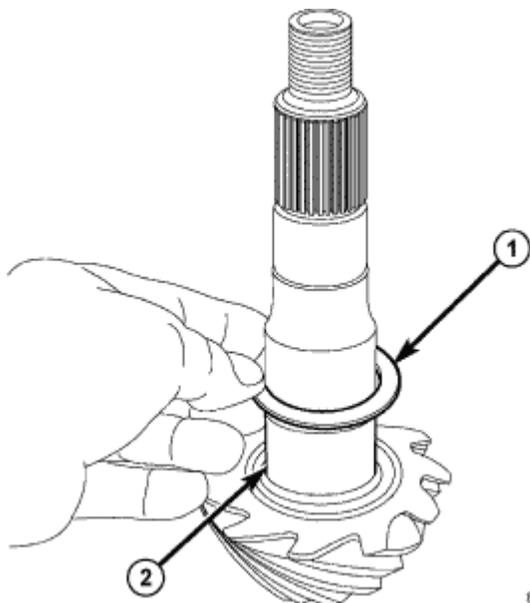
2. Install front pinion bearing cup with Installer D-130 (1) and Handle C-4171 (2).



818ddc4f

Fig. 326: Installing Pinion Seal With Installer C-4076-B And Handle C-4735
Courtesy of CHRYSLER LLC

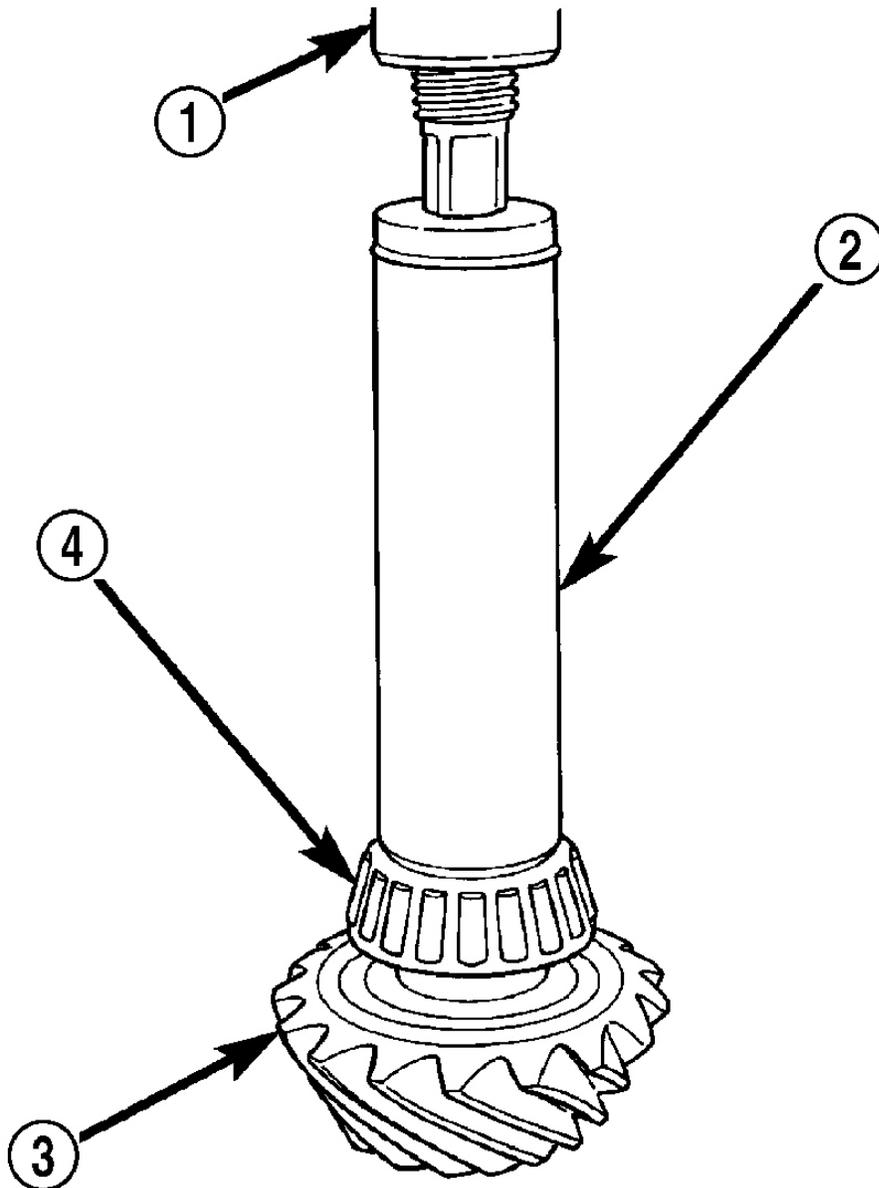
3. Install pinion front bearing in housing.
4. Apply a light coating of gear lubricant on the lip of pinion seal and install seal with Installer C-4076-B (1) and Handle C-4735 (2).



816b8046

Fig. 327: Removing/Installing Depth Shims From Pinion Shaft
Courtesy of CHRYSLER LLC

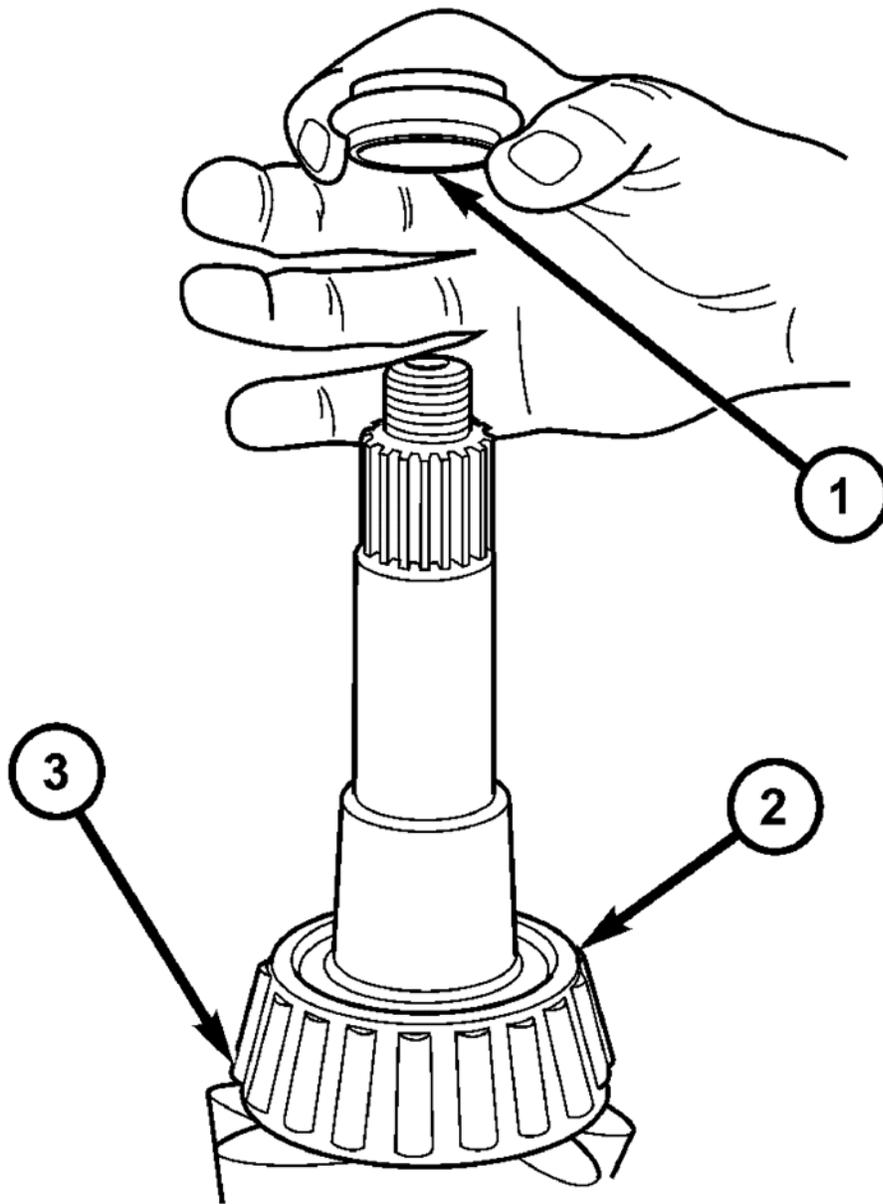
5. Install pinion depth shim (1) on pinion shaft (2).



80be4607

Fig. 328: Removing/Installing Rear Pinion Bearing On Pinion With Installer C-4040 And Press
Courtesy of CHRYSLER LLC

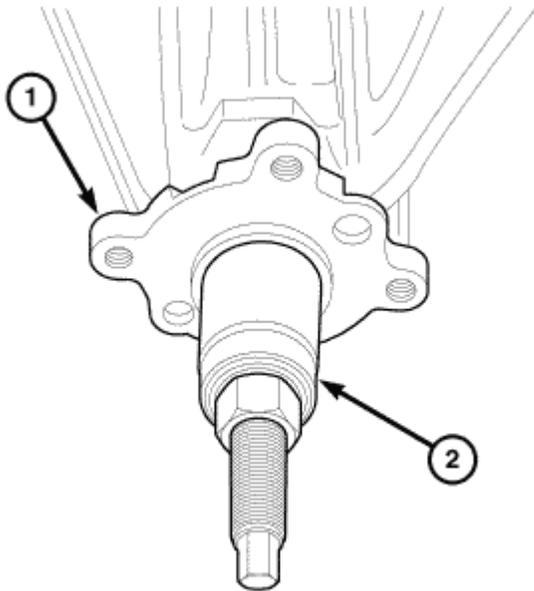
6. Install rear bearing (4) on pinion gear (3) and slinger if equipped, with Installer 6448A (2) and a press (1).



80cfe262

Fig. 329: Removing/Installing Collapsible Spacer From Pinion Shaft
Courtesy of CHRYSLER LLC

7. Install a **new** collapsible spacer (1) on pinion shaft (3) and install pinion in housing.

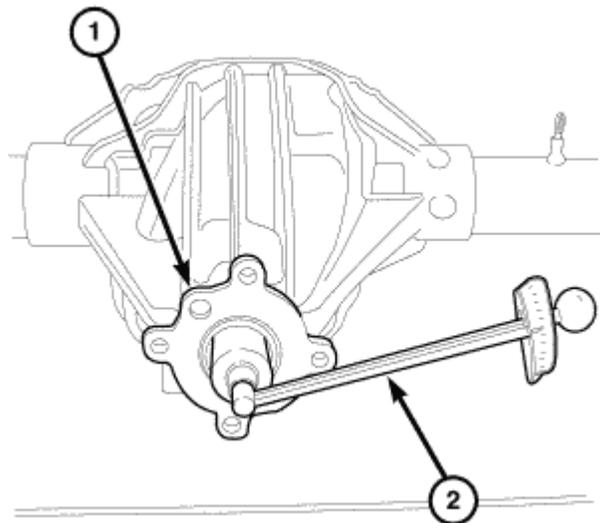


818ddc43

Fig. 330: Installing Flange With Installer C-3718
 Courtesy of CHRYSLER LLC

8. Install pinion flange (1) with Installer C-3718 (2).
9. Install a new nut on the pinion.
10. Holding flange (1) with Holder C-3281 and tighten nut with torque wrench to 285 N.m (210 ft. lbs.).

NOTE: Do not exceed the minimum torque 285 N.m (210 ft. lbs.) when installing the pinion nut at this point.



818ded97

Fig. 331: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
 Courtesy of CHRYSLER LLC

2007 Dodge Nitro R/T

2007 DRIVELINE Differential & Driveline - Nitro

11. Measure pinion torque to rotating (1) with an inch pound torque wrench (2). Measure pinion torque to rotating frequently to avoid over over-crushing the collapsible spacer.

Pinion Torque To Rotate is:

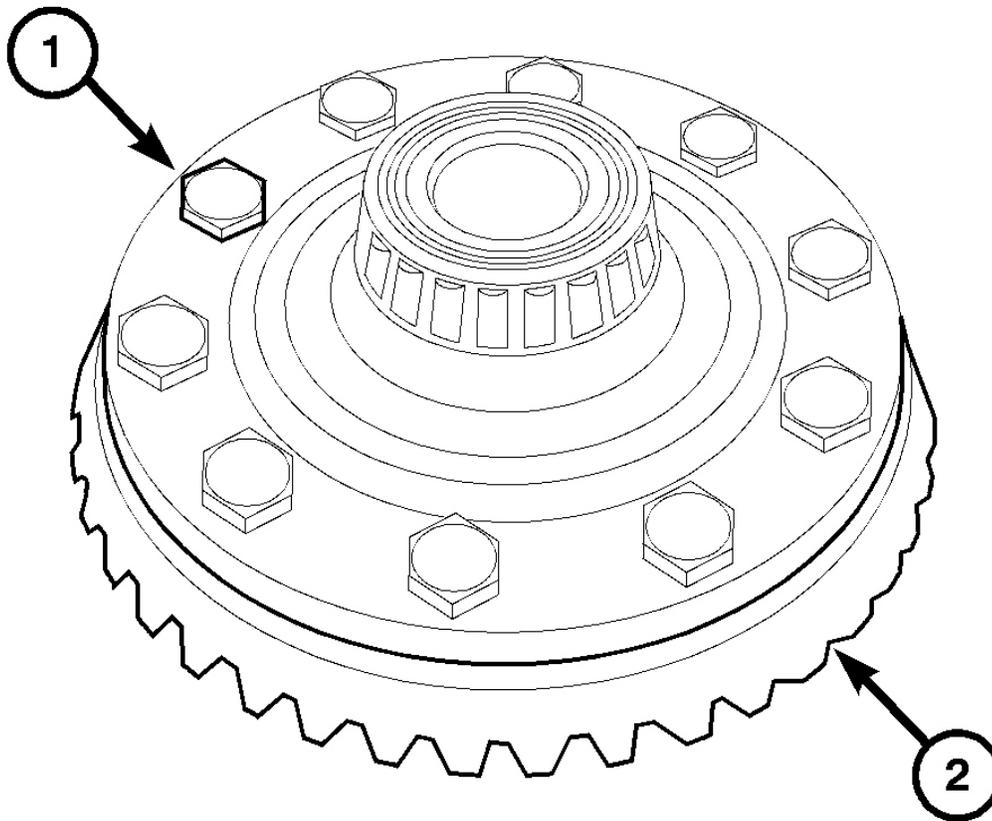
Original Bearings 1 - 2.2 N.m (10 - 20 in. lbs.)

New Bearings 1- 5 N.m (10 - 30 in. lbs.)

If pinion torque to rotate is low, tighten pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotate is achieved.

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque. If pinion torque to rotating is exceeded a new collapsible spacer must be installed. Failure to follow these instructions will damage the axle.

RING GEAR INSTALLATION - GAS ENGINES



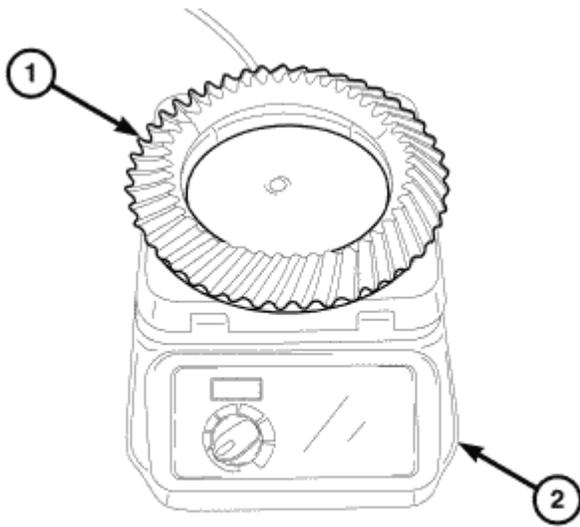
816f133e

Fig. 332: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

1. Install ring gear on differential case.
2. Invert differential case in the vise.
3. Install **new** ring gear (2) bolts (1) and alternately tighten to 122 N.m (90 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

4. Install differential in axle housing and verify gear mesh refer to Adjustments (Gear Contact Pattern).



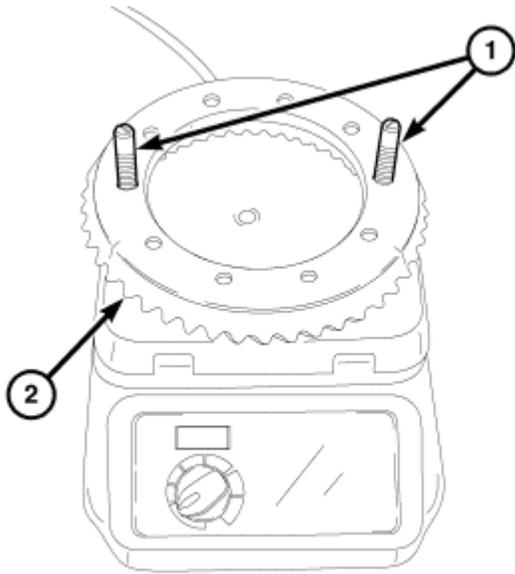
81d3635e

Fig. 333: Heating Ring Gear On Bearing Heater
Courtesy of CHRYSLER LLC

WARNING: Use welding gloves when handling heated components. Failure to follow these instructions will result in personal injury.

CAUTION: A bearing heater is used to install the ring gear on the differential. Use only a bearing heater/hot plate and follow manufacture's instructions. Heat components to 107 - 121 Celsius (225° Min. - 250° Max Fahrenheit). Never use an open flame to heat components. Never leave components on heater for and extended amount of time. If component is discolored after heating, the component has been overheated and must not be used. Failure to follow these instructions will result in component damage.

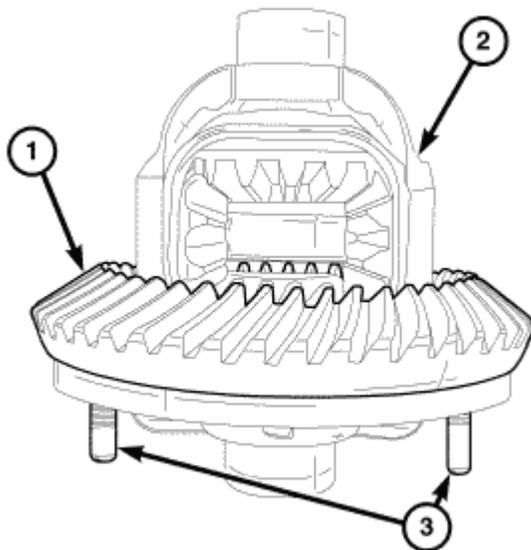
1. Heat ring gear (1) on bearing heater (2) to 107 - 121 Celsius (225° Min. - 250° Max Fahrenheit).



81d36387

Fig. 334: Installing Left Hand Threaded Pins 10126-2 Into Ring Gear
Courtesy of CHRYSLER LLC

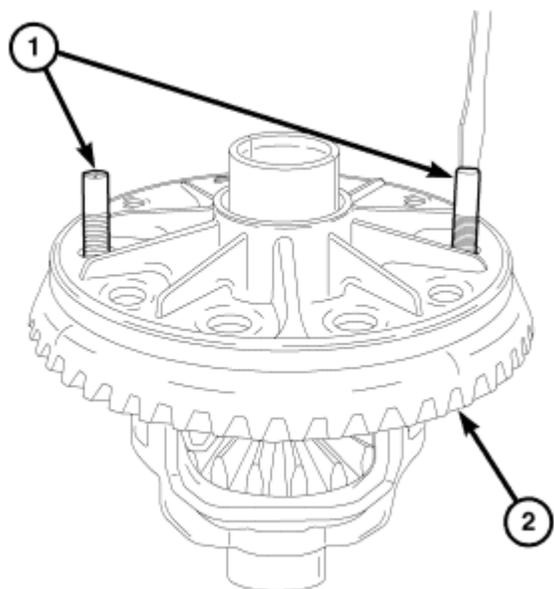
2. Turn ring gear over on bearing heater with welding gloves once the temperature has been reached.
3. Install left hand threaded Pins 10126-2 (1) into ring gear (2).



81d3639b

Fig. 335: Installing Ring Gear On Differential Using Pins 10126-2 To Align Ring Gear Bolts Hole
Courtesy of CHRYSLER LLC

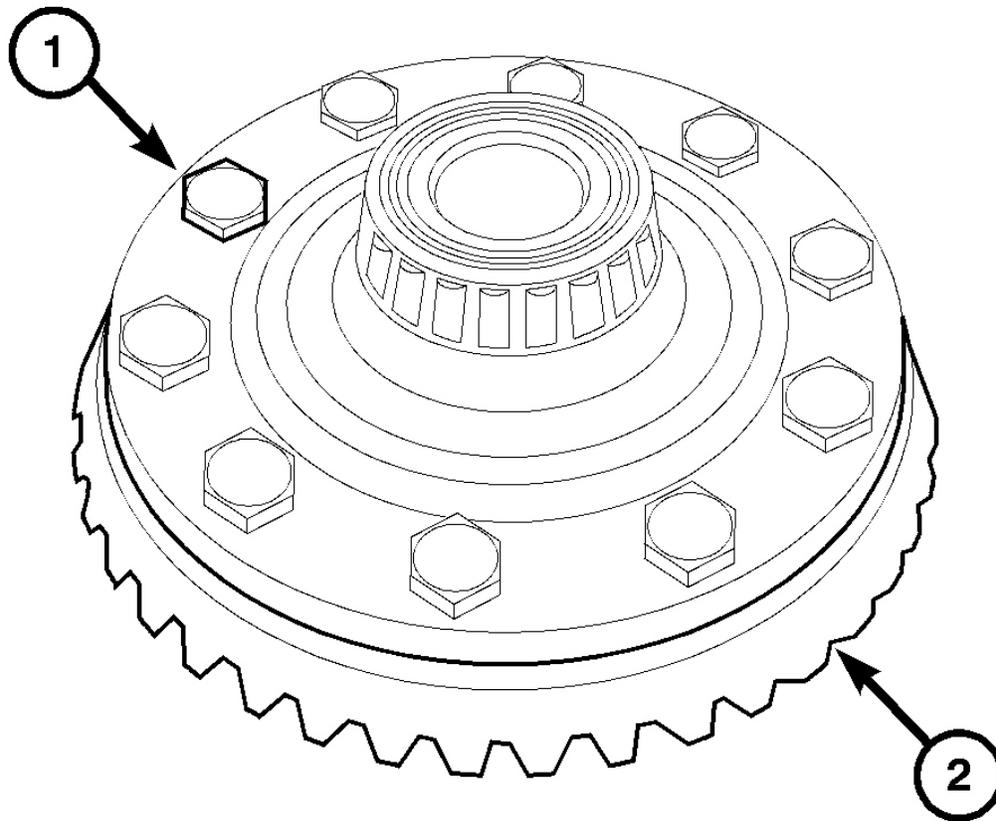
4. Install ring gear (1) on differential (2) using Pins 10126-2 (3) to align ring gear bolts hole.



81d363d4

Fig. 336: Turning Differential Over And Removing Pins 10126-2 From Ring Gear
Courtesy of CHRYSLER LLC

5. Allow ring gear time to cool, then turn the differential over and remove Pins 10126-2 (1) from ring gear (2).



816f133e

Fig. 337: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

6. Install **new** left hand threaded ring gear (2) bolts (1) and alternately tighten to 27 N.m (20 ft. lbs.). Then with torque angle gauge alternately tighten to 95 degrees \pm 5 degrees.

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

7. Install differential in axle housing and verify gear mesh refer to Adjustments (Gear Contact Pattern).