

DRIVE AXLE - FRONT

1991 Mitsubishi Montero

1990-92 DRIVE AXLES
Differentials & Axle Shafts - Front

Montero, Pickup 4WD

DESCRIPTION

Front axle assembly consists of differential carrier, housing tube, inner shaft and drive axles. A full-floating axle design is used. Drive axles are flexible assemblies made up of inner and outer CV joints. Birfield Joints (BJ) and Double Offset Joints (DOJ) are used at opposite ends of each drive axle.

AXLE RATIO & IDENTIFICATION

Ratio is determined by dividing number of ring gear teeth by number of drive pinion teeth.

AXLE RATIO SPECIFICATIONS

Application	Ratio
Montero	4.63:1
Pickup	4.22:1

NOTE: References to BJ refer to Birfield Joint and DOJ to Double Offset Joint.

TESTING

TOTAL ASSEMBLY BACKLASH

Place transfer case in "4H" position. Raise and support vehicle. Check total backlash at flange. If backlash at flange exceeds .55" (14.0 mm), check assembly for wear and proper adjustment.

DRIVE AXLES R & I

REMOVAL

1) Remove undercover on Montero. Place hub in free-wheeling position. Place transfer case in 2H position. Remove drive hub cover, snap ring and shim from drive axle. Remove brake calipers and wire out of way.

2) Using dial indicator, check drive axle end play. Rotate drive axle forward and rearward until maximum end play is obtained. End play must be adjusted during reassembly if not within .008-.020" (.20-.50 mm). Disconnect tie rod assembly. Support lower control arm with jack.

3) Separate ball joints from knuckle. Remove knuckle and front hub assembly. Remove left drive axle from differential carrier. Use care not to damage oil seal. On right drive axle, remove drive axle-to-inner shaft retaining bolts. Remove right drive axle.

CAUTION: Support lower control arm during drive axle removal and installation.

CAUTION: Always replace circlips on BJ splines of left drive axle and splines of inner shaft.

INSTALLATION

1) Install right drive axle on inner shaft. Install new circlip on BJ side of left drive axle. Drive left drive axle into differential. Use care not to damage oil seal.

2) Reinstall knuckle with front hub assembly. If drive axle end play requires adjustment, select proper shim to obtain proper end play. Shim is located behind snap ring on end of drive axle. Install shim and recheck axle end play. Install remaining components in reverse of removal procedure.

DIFFERENTIAL CARRIER R & I

REMOVAL

1) Raise and support vehicle. Drain gear oil. Support differential carrier. Remove drive axles and inner shaft. See DRIVE AXLES R & I and INNER SHAFT & BEARING R & I in this article. Place alignment mark on drive shaft and pinion flange for reassembly reference.

2) Remove drive shaft. Remove differential mounting brackets at differential and frame. See Fig. 1. Disconnect front crossmember from frame. Remove differential carrier assembly and front crossmember. Remove differential carrier from front crossmember.

INSTALLATION

To install, reverse removal procedure. Align marks on drive shaft and pinion flange.

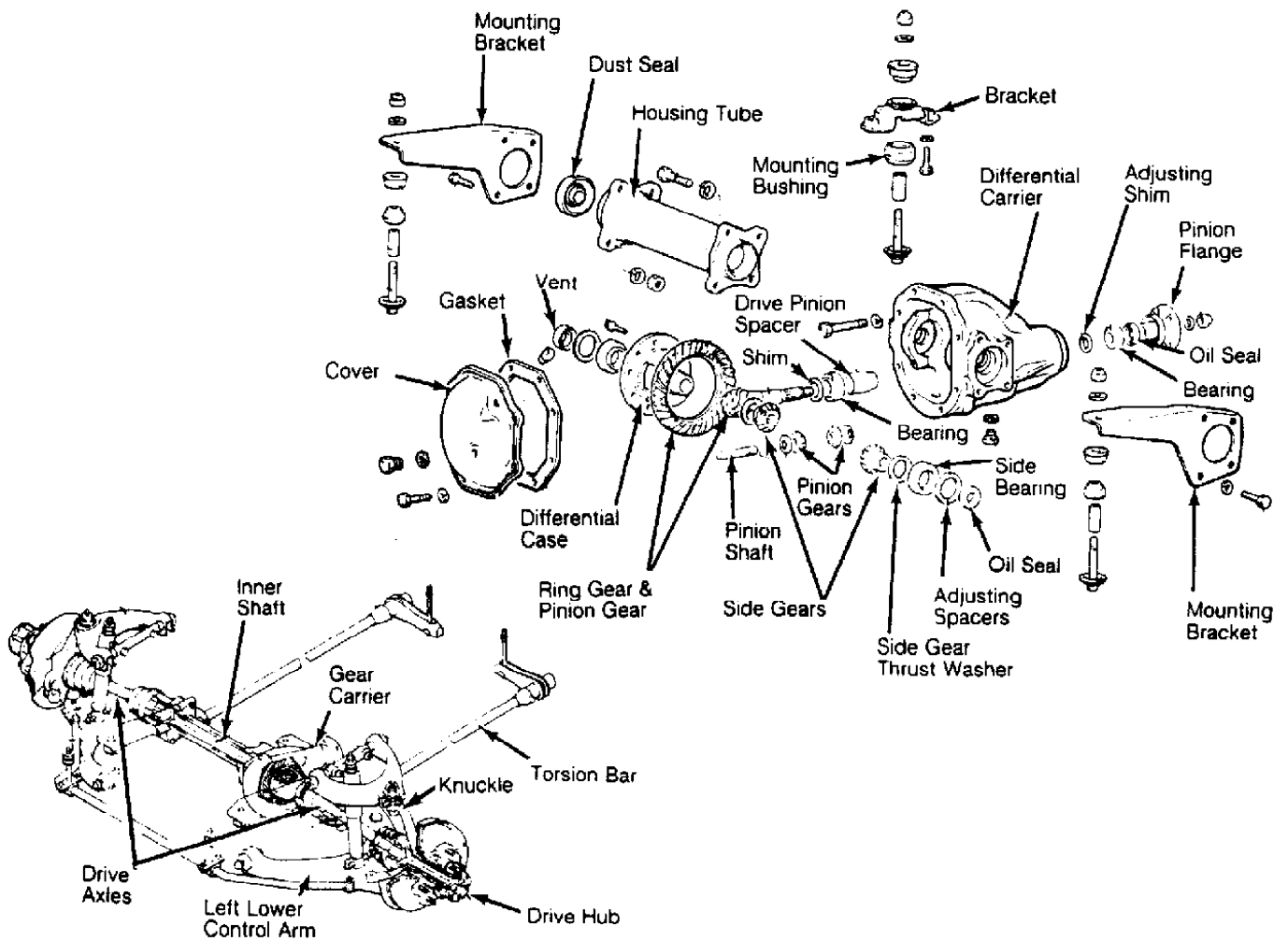


Fig. 1: Front Drive Axle & Suspension
 Courtesy of Chrysler Motors.

INNER SHAFT & BEARING R & I

REMOVAL

1) Remove right drive axle. See DRIVE AXLES R & I in this article. Remove inner shaft from differential carrier. Pry dust seal from housing tube assembly using a screwdriver if replacement is required. See Fig. 1.

2) If oil seal replacement is required, remove housing tube. Using slide hammer, remove oil seals. Bend outer area of dust cover inward on inner shaft. Press bearing from shaft. Remove dust cover from shaft.

INSPECTION

Inspect inner shaft for damaged splines or threads. Inspect bearing for roughness or damage. Measure shaft O.D. Replace shaft if not within specification. See INNER SHAFT SPECIFICATIONS table.

INNER SHAFT SPECIFICATIONS

Application	In. (mm)
Shaft O.D.	
Bearing Area	1.38 (35.0)
Center Area	1.24 (31.4)

INSTALLATION

1) If oil seal replacement is necessary, install new oil seal in differential carrier using Oil Seal Installer (MB990934-01) and Handle (MB990938-01). Coat seal lips with grease. Install housing tube. Using Seal Installer (MB990955) and Handle (C-4171), install new dust seal in housing tube. Dust seal must be even with housing tube. Coat seal lip with grease.

2) Using a pipe with O.D. of 2.95" (74.3 mm), wall thickness of .16" (4.0 mm) and with overall length of 1.97" (50.0 mm), install dust cover on shaft. Coat inside of dust cover with grease. Press bearing on shaft. Install new circlip on inner shaft. Drive inner shaft into differential. Use care not to damage oil seal.

DRIVE AXLES & BEARINGS OVERHAUL

NOTE: References to BJ refer to Birfield Joint and DOJ to Double Offset Joint.

DISASSEMBLY

1) Remove boot bands. Remove circlip from DOJ outer race. Separate drive axle from DOJ outer race. Remove balls from DOJ cage. Remove DOJ cage from DOJ inner race in direction of BJ. See Fig. 2.

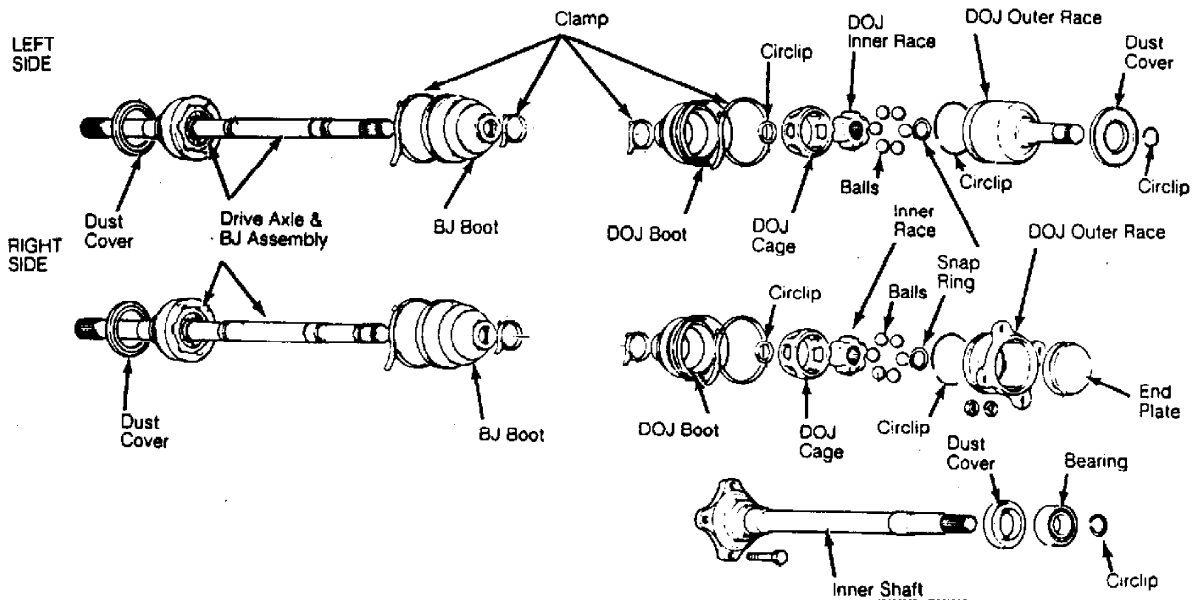


Fig. 2: Exploded View of Drive Axles
Courtesy of Chrysler Motors.

2) Remove snap ring from drive axle shaft. Remove DOJ inner race from shaft. Remove circlip from shaft. Wrap tape around splines

of shaft to prevent boot damage during removal.

3) Remove DOJ boot. Note size of boot. Remove dust cover from shaft. Straighten BJ boot protector and remove protector band. Move boot protector toward BJ side of shaft and remove. Remove BJ boot.

CAUTION: Drive axle and BJ are serviced as a unit. DO NOT disassemble BJ and drive axle.

REASSEMBLY

1) Coat shaft with light coat of grease. Wrap splines with tape. Install BJ boot, bands and DOJ boot on shaft. Ensure correct size boot is installed in proper location.

2) Boot bands must be installed so lever is pulled toward rear of vehicle when band is tightened. Pack proper amount of grease in BJ and BJ boot. See GREASE APPLICATION table.

3) Place DOJ cage on shaft with smaller diameter installed first. Install circlip, DOJ inner race, and snap ring on shaft. Apply grease to DOJ inner race and cage. Install balls into cage.

4) Apply proper amount of grease to outer DOJ race. Install shaft into DOJ outer race. Apply proper amount of grease to DOJ outer race and install circlip. See GREASE APPLICATION table.

5) Place DOJ boot over DOJ outer race. Install boot bands so lever is pulled toward rear of vehicle when band is tightened. Adjust DOJ boot bands to have proper distance between centerline of boot bands. See BOOT BAND SPECIFICATIONS table. This distance is necessary to control air in DOJ boot. Tighten boot bands.

6) Install boot protector and band. Install dust cover on shaft. Use a pipe with O.D. of 2.68" (68.0 mm), wall thickness of .09" (2.3 mm) and with overall length of 6.70" (170.1 mm) to install dust cover.

GREASE APPLICATION

Application	Ozs. (g)
BJ Boot	
Montero	
3.0L Engine	4.6 (130)
All Others	3.9 (110)
DOJ Outer Race	
Montero	
3.0L Engine	2.3 (60)
All Others	1.9 (55)

BOOT BAND SPECIFICATIONS

Application	In. (mm)
All Models	3.03-3.27 (76.9-83.0)

DIFFERENTIAL DISASSEMBLY

1) Remove differential carrier from vehicle. See DIFFERENTIAL CARRIER R & I in this article. Remove cover. Mark bearing caps for reassembly reference. Remove bearing caps. Remove differential case assembly from carrier.

CAUTION: Ensure adjusting spacers, bearing caps, gears and side bearings are marked for reassembly reference. Components

must be installed in original location.

2) Using bearing puller, remove differential case side bearings. Loosen ring gear retaining bolts in diagonal sequence. Remove ring gear.

3) Remove drive pinion shaft lock pin from ring gear side. Remove pinion shaft and pinion gears. Remove side gears and thrust spacers.

DRIVE PINION

1) Remove pinion flange nut. Scribe alignment mark on pinion flange and pinion. Remove flange. Using soft-faced hammer, drive out pinion. Remove rear bearing and oil seal from carrier. Remove rear adjusting shim from pinion.

2) Press front bearing from pinion. Remove front adjusting shim and spacer from pinion. Inspect all components for unusual wear or damage. Replace as necessary.

DIFFERENTIAL REASSEMBLY & ADJUSTMENTS

CASE REASSEMBLY

1) Place side gear thrust spacers behind side gears in original position. Assemble side gears in differential case. Install pinion gears and washers. Rotate pinion gears to mesh with side gears.

2) Install pinion shaft without lock pin. Check pinion and side gear backlash. Install wooden wedge to lock side gears. Using dial indicator, measure gear backlash. See Fig. 3.

3) Backlash must be within specification. See PINION & SIDE GEAR BACKLASH SPECIFICATIONS table. Adjust backlash by using different side gear spacers. Ensure both sides are equally shimmed.

4) Install pinion shaft lock pin. Securely stake in 2 places. Ensure adhesive is removed from ring gear mounting bolts and gear mounting surface. Clean internal threads with tap.

5) Install ring gear on differential case. Ensure alignment marks on differential case and ring gear are aligned. Apply Loctite 271 to bolts and install. Tighten bolts alternately in diagonal sequence to specification. See TORQUE SPECIFICATIONS table at the end of this article.

PINION & SIDE GEAR BACKLASH SPECIFICATIONS

Application	In. (mm)
Standard003 (.08)
Wear Limit008 (.20)

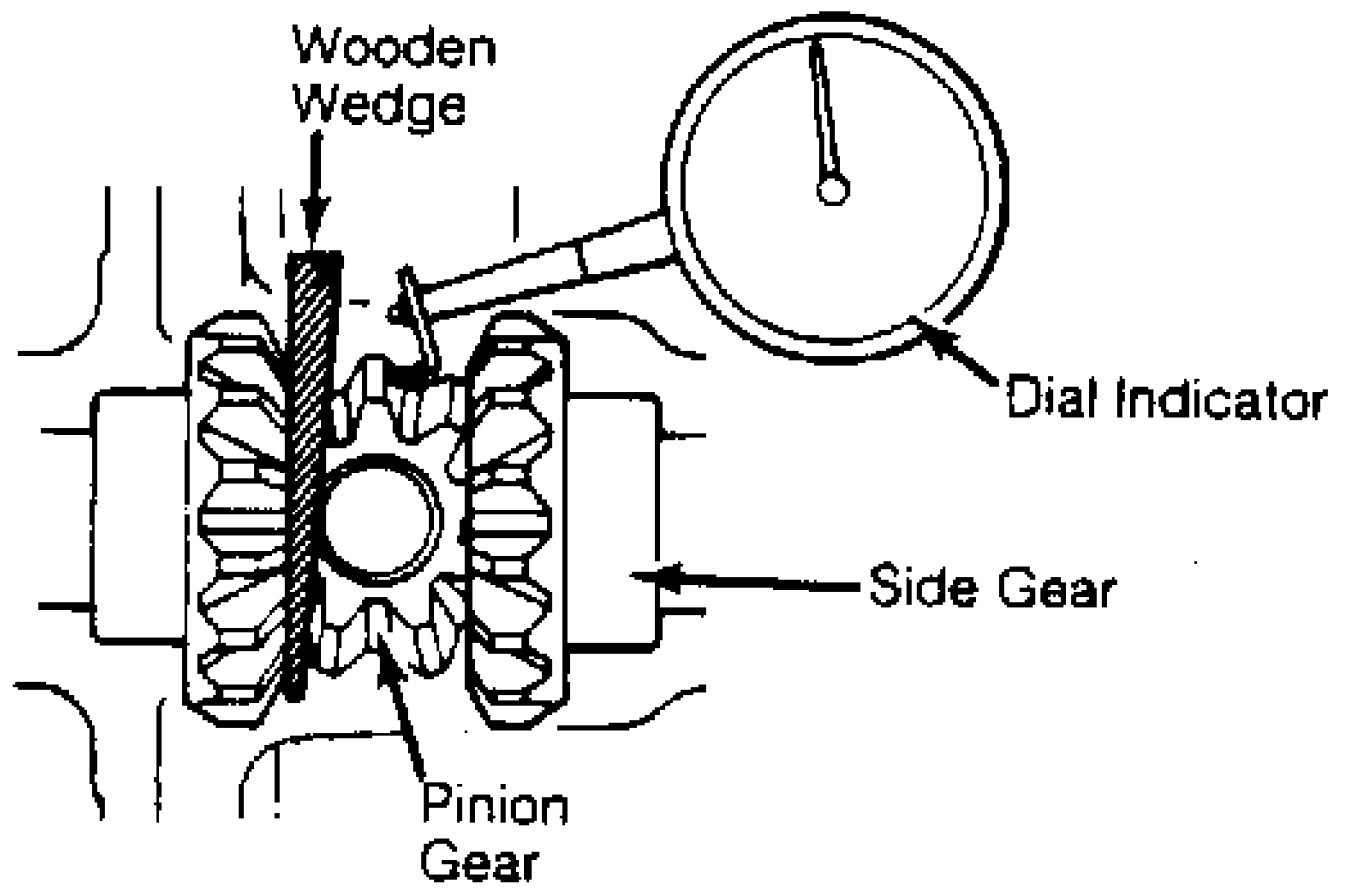


Fig. 3: Checking Pinion & Side Gear Backlash
Courtesy of Chrysler Motors.

DRIVE PINION DEPTH

1) Install pinion bearing races in carrier. For front race use Handle (MB990938-01) and Race Installer (MB990934-01) for 2.4L and 2.6L models and Race Installer (MB990935-01) for 3.0L models. For rear race, use Handle and Race Installer (MB990936-01). Ensure races are fully seated.

2) Install Pinion Height Gauge (MB990901-01) and pinion bearings. See Fig. 4. DO NOT install oil seal. Using INCH lb. torque wrench, measure pinion rotating torque. Gradually tighten pinion height gauge to increase rotating torque to proper specification. See PINION ROTATING TORQUE SPECIFICATIONS table.

3) Install Cylinder Gauge (MB990903-01) in side bearing seats. Ensure flat areas are aligned and gauge contacts side bearing seat firmly. See Fig. 4.

4) Select adjusting shim with same thickness as gap between cylinder gauge and pinion height gauge. Use minimum amount of adjusting shims. Install selected adjusting shims between drive pinion gear and rear pinion bearing. Using Bearing Installer (MB990802-01), install rear pinion bearing.

PINION ROTATING TORQUE SPECIFICATIONS

Application	INCH Lbs. (N.m)
With Oil Seal	
2.4L & 2.6L Engines	3.04-3.91 (.35-.45)
3.0L Engine	5.21-6.08 (.6-.7)
Without Oil Seal	
2.4L & 2.6L Engines	1.30-2.17 (.15-.25)
3.0L Engine	3.47-4.34 (.4-.5)

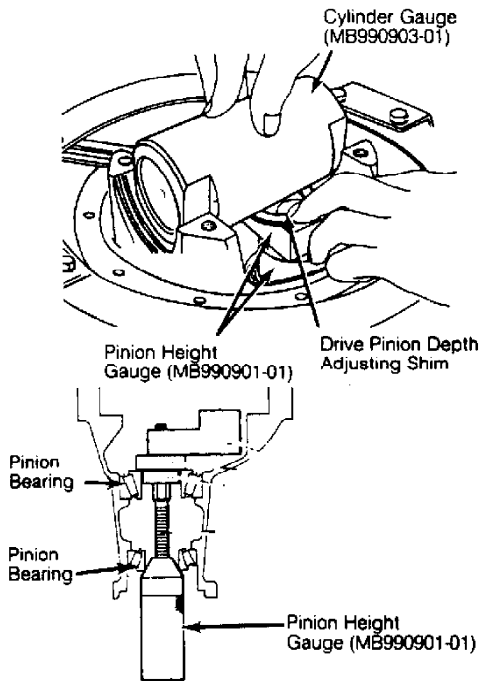


Fig. 4: Setting Pinion Depth
 Courtesy of Chrysler Motors.

DRIVE PINION PRELOAD

1) Install drive pinion in differential carrier. Install spacer, pinion front shim(s) and front pinion bearing. DO NOT install oil seal at this time. Install pinion flange, washer and retaining nut. Check pinion rotating torque without pinion oil seal.

2) Recheck rotating torque. Rotating torque must be within specification. See PINION ROTATING TORQUE SPECIFICATIONS table. Adjust rotating torque by replacing drive pinion front shims or spacer. Once correct rotating torque is obtained, install oil seal. Coat seal lip with grease.

3) Install pinion flange so alignment marks are correct. Apply light coat of grease to flange washer contact area. Install new retaining nut. Check pinion rotating torque with pinion oil seal installed. Rotating torque must be within specification. See PINION ROTATING TORQUE SPECIFICATIONS table.

SIDE BEARING

1) Using Bearing Installer (MB990802-01), install bearings on differential case. Select 2 side bearing adjusting shims thinner than those removed. Shims must be equal thickness on both sides. Install shims on each side of case assembly. Install case assembly in differential carrier.

2) Push case assembly fully to one side of carrier. Using 2 feeler gauges, measure clearance between carrier and side bearing shim at opposite sides of bearing. Remove shims from one side of differential carrier.

3) Measure thickness of shims removed. Add removed shim thickness and 1/2 of feeler gauge clearance measurement plus .002" (.05 mm). This is thickness of shim that should be installed on each side of case. Select proper shims. Install equal shims on each side of case assembly.

NOTE: Ensure no clearance exists between gear carrier and adjusting shim.

4) Install side bearing shims and differential case assembly in differential carrier. Using brass drift, tap shims to fit them to side bearing outer race. Install bearing caps. Check ring gear backlash.

RING GEAR BACKLASH

1) Lock drive pinion in place. Using dial indicator, check ring gear backlash at heel of ring gear tooth. Measure at 4 locations of ring gear. Gear backlash must be within .004-.006" (.10-.15 mm).

2) If not within specification, change side bearing adjusting shims and recheck backlash. If backlash is too small, install thinner shim behind ring gear and thicker shim opposite ring gear.

3) If backlash is excessive, install thicker shim behind ring gear and thinner shim opposite ring gear. Check gear tooth contact using paint impression method.

CAUTION: When changing shims, total thickness of all shims must remain constant.

RING GEAR RUNOUT

Using dial indicator, measure runout at back side of ring gear. Runout must be within .002" (.05 mm). If runout is excessive, change ring gear-to-differential case mounting position. Recheck runout. Install cover and gasket.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bearing Cap Bolt	40-47 (54-64)
Brake Caliper Bolt	58-72 (79-98)
Carrier-to-Housing Tube Bolt	58-72 (79-98)
Cover Bolt	11-16 (15-22)
Drain Plug	43-51 (58-69)
Fill Plug	29-43 (39-58)
Front Crossmember Bolt	72-87 (98-118)
Hub Cover	13-25 (18-34)
Knuckle-to-Ball Joint Nut	
Upper	43-65 (58-88)
Lower	87-130 (118-176)
Mount Bracket-to-Frame Bolt	58-80 (79-108)
Mount Bracket-to-Housing Tube Bolt ...	58-72 (79-98)
Pinion Flange Nut	
2.4L & 2.6L	116-159 (157-216)
3.0L	137-181 (186-245)
Drive Shaft Flange Bolt	36-43 (49-58)
Right Drive Axle-to-Inner Shaft Bolt ..	36-43 (49-58)
Ring Gear-to-Case Bolt	58-65 (79-88)
Tie Rod-to-Knuckle Nut	33 (45)
Wheel Lug Nuts	
Montero	72-87 (98-188)
Pick-Up	87-101 (118-137)
	INCH Lbs. (N.m)
Undercover-to-Frame Bolts (Montero)	84-108 (9.5-12.2)