CHRYSLER CORP. IMPORTS

Arrow Pickup
Challenger
Ram-50 Pickup
Sapporo

DESCRIPTION

Rear axle is rigid axle type with a banjo type rear axle housing into which semi-floating rear axle shafts are installed. The differential is composed of hypoid gears for reduction and straight bevel gears for differential gears.

AXLE RATIO & IDENTIFICATION

The sticker indicating gear ratio is attached to axle housing. Challenger and Sapporo use a 3.545:1 ratio for both manual and automatic transmissions. Arrow and Ram-50 pickups use a 3.909:1 ratio for manual and 3.545:1 ratio differential for automatic transmissions. Side bearing preload is adjusted by side bearing nuts. Pinion bearing preload and pinion depth adjustments are made with shims, while differential side gears are adjusted with spacers.

REMOVAL & INSTALLATION

AXLE SHAFTS & BEARINGS

Removal (Pickups) – 1) Raise and support rear axle housing so rear wheels clear ground. Remove rear wheel and brake drum. Disconnect hydraulic line from wheel cylinder. Disconnect bearing case from axle housing. Remove back plate, bearing case and axle shaft as an assembly. Use suitable puller set (CT-1003 & C-637) if required, and remove axle shaft.

2) Remove "O" ring and shims, retain shims for reassembly. Using suitable tool (C-637 with hook), remove and discard inner axle shaft oil seal. Mount back plate, bearing case and axle shaft assembly in a vise. Loosen axle shaft bearing lock washer, then using suitable wrench (MB990785), remove lock nut on rear of back plate. Remove washers and reinstall lock nut on axle shaft approximately 3 turns.

3) Install suitable puller (MB990787A) to bearing case on rear of back plate. Remove bearing case, then using a hammer and drift, remove bearing outer race. Remove outer bearing oil seal.

4) Using a dial indicator, inspect axle shaft deflection at points shown in illustration. Replace axle shaft if specifications are exceeded. Inspect wheel hub bolts for tightness and bearing outer retainer for deformation, replace defective parts as necessary.

Installation (Pickups) – 1) Apply grease to outer surface of bearing outer race and to lip of new oil seal (outer). Drive into bearing case. Slide bearing case and bearing over rear axle shaft. Apply grease on bearing rollers. Fit bearing inner race by a thrust.

2) Apply grease to bearing rollers. Install washer, lock washer and lock nut. Tighten lock nut to specifications using special tool (MB990785). Bend tab on lock washer into groove on lock nut. Apply grease to lip of oil seal (inner). Drive oil seal into rear axle housing end using installer tool (C-4572).

3) Before assembly operations, remove old sealer and any rust from mating face of bearing case and housing. Insert a .04" (1.0 mm) shim and "O" ring into left side of housing. Apply sealer to mating face of bearing case. Fit left side axle shaft assembly into left side of housing and tighten bearing case and bearing to specifications.

4) Fit right side shaft assembly into right side housing. Do not use a shim or an "O" ring. Temporarily tighten bearing case to torque of 5 INCH lbs. (0.6 N·m). Measure the gap between bearing case and housing with a feeler gauge. Clearance between bearing and housing should be .002-.008" (.05-.20 mm).

5) Loosen bearing case nuts and separate axle shaft assembly from housing. Select 1 shim with a thickness equivalent to gap measured in step **4)**, and a second shim with a thickness of from .0020-.0079" (.05-.20 mm). Insert shims selected and "O" ring into housing. Apply sealer to mating face of bearing case.

6) Fit right side axle shaft assembly into housing and tighten bearing case and bearing to specifications. Using dial indicator check axial play of axle shaft. Axial play of rear axle shaft should be .002-.008" (.05-.20 mm).

Axle Shaft Deflection Table

Application	Service Limit In. (mm)
Point "A"	
Pickups	0-.0024 (0-.06)
All Others	0-.0015 (0-.04)
Point "B"	
Pickups	0-.039 (0-1)
All Others	0-.001 (0-.025)
Point "C" (Passenger Only)	0-.039 (0-1)

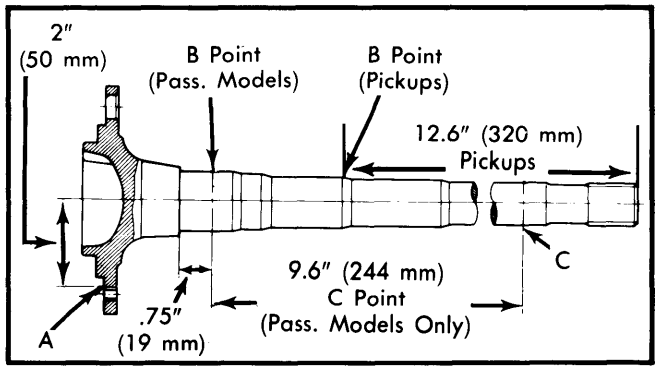

Fig. 1 Measuring Axle Shaft Deflection

Removal (All Others) – 1) Raise and support rear axle housing so rear wheels clear ground. Remove rear wheel and backing plate nuts. If equipped with disc brakes, remove caliper support together with parking brake rear cable, caliper assembly and brake hose. Remove brake disc.

2) Remove bolts attaching bearing outer retainer to axle housing through hole in flange. Attach puller (CT-1003 & C-637) to lug studs and work slide hammer until axle shaft is free to be withdrawn. Set brake backing plate with parking brake attached out of way. Remove oil seal.

3) Axle bearing removal procedure is as follows: Grind down bearing retainer at 1 point until retainer thickness is .04-.06" (1.0-1.5 mm). Chisel ground portion and remove retainer. Using suitable bearing puller or press (CT-1120) remove bearing from axle.

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4) Using a dial indicator, inspect axle shaft deflection at 3 points. See *Fig. 1*. Replace axle shaft if specifications listed in table are exceeded. Rear axle bearing should be replaced when bearing noise is detected. Inspect wheel hub bolts for tightness and bearing outer retainer for deformation. Replace as necessary.

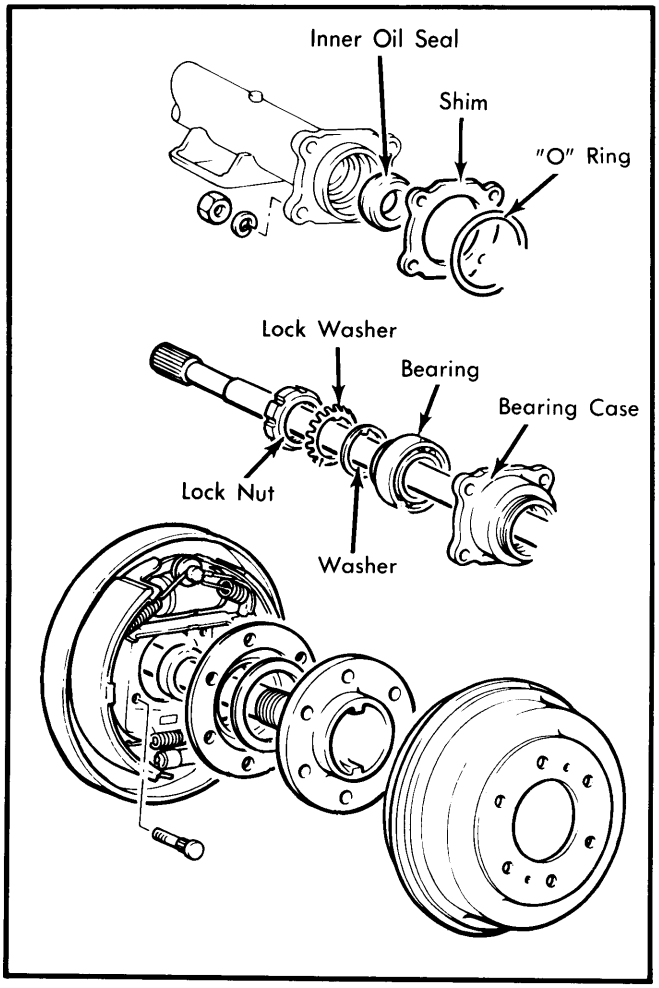

Fig. 2 Exploded View of Pickup Axle Assembly

Installation (All Others) – 1) Install onto rear axle shaft the bearing outer retainer, rear wheel bearing and bearing inner retainer. Press onto rear axle shaft bearing inner retainer until its face is firmly pressed against rear wheel bearing. Make sure pressure applied to install bearing inner retainer is less than 13,200 lbs. (58,800 N).

2) Clean rear axle housing oil seal and apply multi-purpose grease. Using tools (DT-1007D and C-4171) tap new oil seal into axle housing until it contacts rear of axle housing. Apply grease to oil seal lip and to oil seal surface with contacts bearing inner retainer.

3) Insert rear axle assembly into rear axle housing, taking care not to damage oil seal. Attach bearing outer retainer by tightening in a criss-cross pattern. Tighten to specifications.

4) Vehicles with rear brake drums: Remove rear brake shoes and lining from backing plate. Measure clearance between bearing outer retainer and backing plate. According to measurement obtained, select gasket(s) and bearing retainer shim(s) so that clearance is within standard value of 0-.01" (0-.25 mm).

5) Remove rear axle shaft assembly and install selected gasket(s) and bearing retainer shim(s) with oil escape holes downward. Reassemble as previously described.

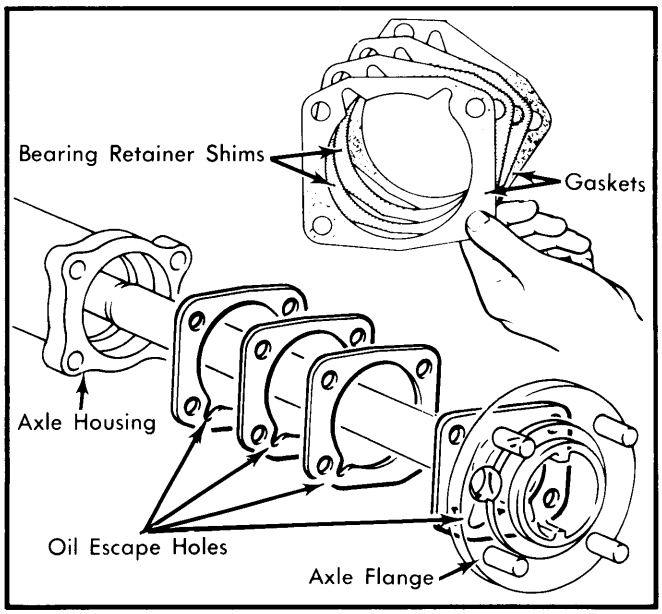

Fig. 3 Exploded View of Axle Shaft Assembly (Passenger Car Models)

DIFFERENTIAL CARRIER

Removal – Drain oil from rear axle differential housing. Mark flange yoke and companion flange and disconnect propeller shaft. Pull out both rear axle shafts 2½". Remove differential gear housing mounting nuts and withdraw the differential gear carrier. It may be necessary to tap outside of housing to break gear carrier loose.

Installation – Lightly coat each bearing and gear with oil. Apply sealing compound on packing and axle housing seat. Assemble gear carrier to axle housing with nuts and tighten. Fill differential gear housing with 1.4 quarts of multi-purpose gear oil (API GL-5).

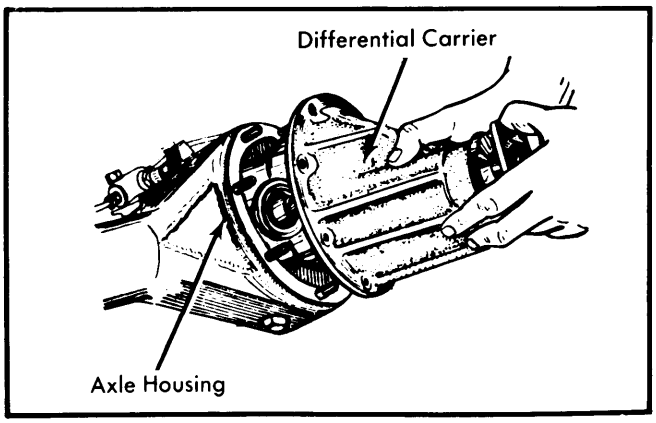

Fig. 4 Removing Differential Gear Housing

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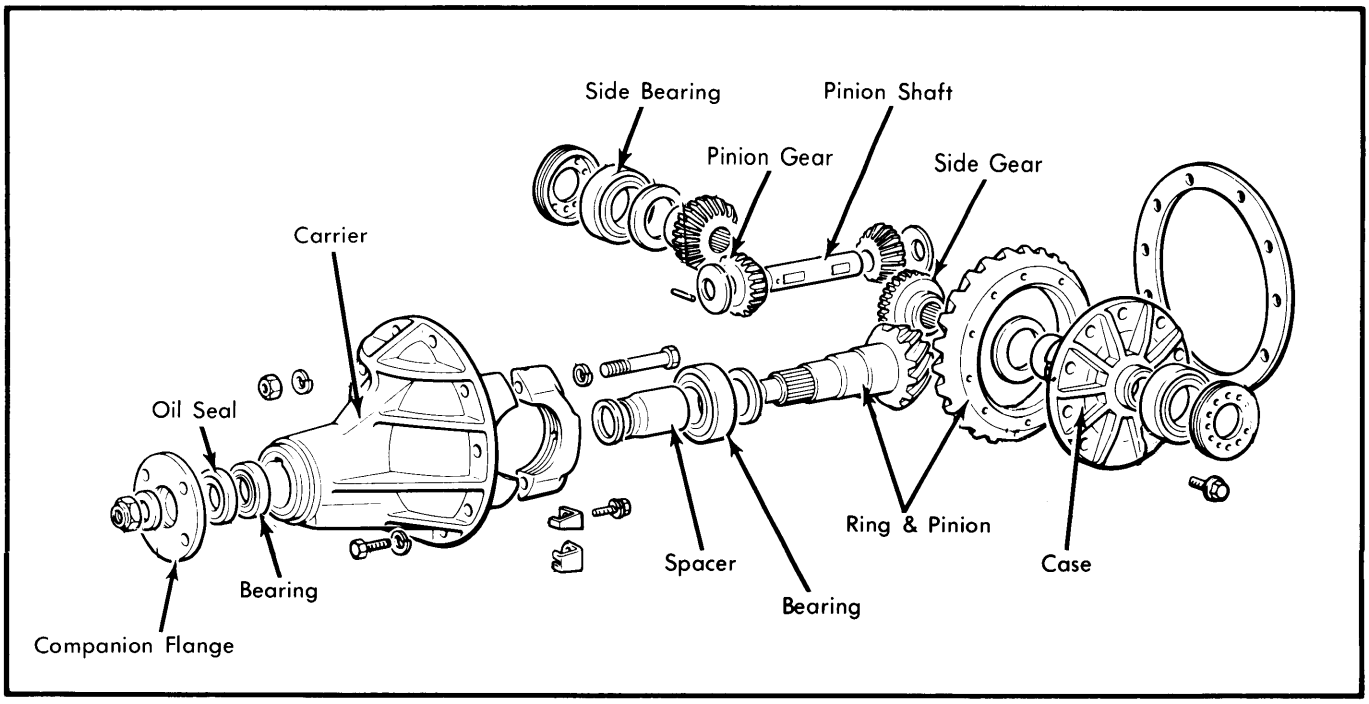

Fig. 5 Exploded View of Chrysler Corp. Import Differential (Challenger & Sapporo)

OVERHAUL

DISASSEMBLY

Differential Gear Assembly – 1) With assembly out of case, remove lock plate. Remove side bearing nut using special wrench (MB990201). Remove bearing carrier cap and lever gear case assembly from housing. Using bearing puller tool, remove differential side bearing. Keep right and left bearings and shims in sequence for reassembly.

2) Remove ring gear lock plate tabs and loosen bolts in diagonal sequence, then remove ring gear. Drive out pinion shaft lock pin from ring gear back side using a punch; pull out pinion shaft and pinion. Pinion side gears and spacers are now accessible. Note placement of pinion side gear and spacers and ensure they are reassembled in same position.

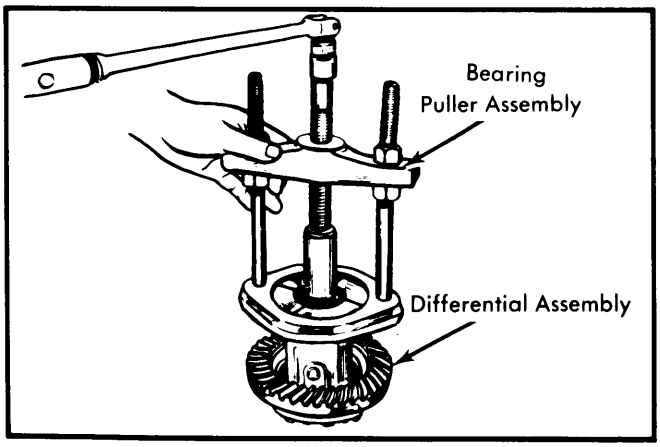

Fig. 6 Removing Differential Side Bearings

Drive Pinion – 1) Hold end yoke with suitable tool (C-3281) and remove lock nut, then remove end yoke. Using a wheel puller, force out drive pinion with adjusting shim, rear inner bearing race, spacer and preload adjusting shim.

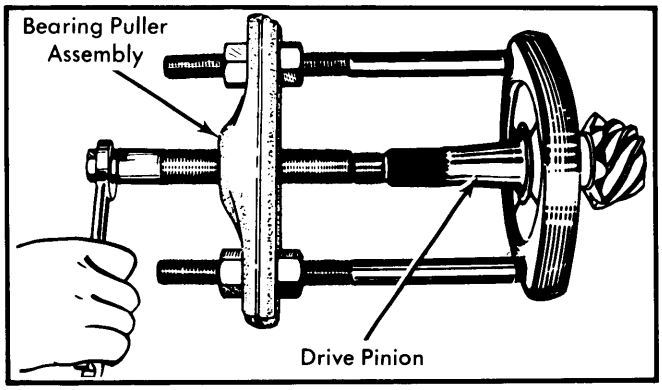

Fig. 7 Removing Rear Drive Pinion Bearing

2) With suitable bearing puller, remove rear bearing inner race and at same time, pull off drive pinion adjusting shim. Using suitable drift, remove front drive pinion bearing outer race and oil seal. Repeat same procedure to remove rear bearing outer race.

INSPECTION

Check differential gears for correct tooth contact and replace gears if wear is excessive. Inspect bearing faces for roughness or score marks and replace bearing assembly, if necessary. Ensure splines of side gears and rear axle shafts fit correctly. Check clearance between pinion gears and pinion shaft, if wear is excessive, replace components.

NOTE – *To check gear tooth contact using paint impression method, refer to beginning of this section.*

REASSEMBLY & ADJUSTMENT

Case Assembly – 1) Install thrust washers (spacers) behind side gears in their original position and assemble pinion and

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side gears in differential. Insert both pinion gears, with pinion washers attached, so they mesh with side gears. It may be necessary to slightly rotate pinions to achieve desired meshing. Insert drive pinion shaft.

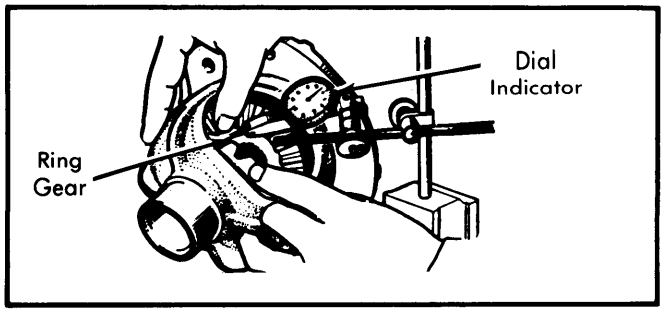

Fig. 8 Checking Differential and Side Gear Backlash

2) Check pinion and side gear backlash as shown in illustration. If backlash is beyond .002-.005" (.05-.127 mm) on pickups or .006" (.15 mm) on all other models, adjust by selecting a side gear thrust washer (spacer) of correct size. If backlash is to be adjusted, ensure right and left sides are equally shimmed.

3) Align drive pinion shaft with drive pinion shaft lock pin hole in differential case and drive lock pin into hole from back side of ring gear. Securely stake lock pin in 2 places to prevent movement.

4) Remove old adhesive from ring gear mounting bolts and gear mounting surface. Apply Loctite or equivalent and install bolts and lock washers. Tighten bolts alternately in a diagonal sequence and bend over lock tabs. Ensure lock washers are in contact with case rib after final torque has been achieved.

NOTE – *Keep differential stationary to harden anaerobic adhesive for ½ to 1 hour.*

Drive Pinion – **1)** Using a suitable drift and hammer or a press, seat front and rear bearing outer races into gear carrier ensuring that outer races do not cock. Ensure bearing races are completely seated before proceeding. Install shim between drive pinion and rear bearing. Using suitable bearing installer, press bearing onto drive pinion shaft.

2) If drive pinion and bearings are scheduled to be reused, shims should be replaced with new shims of same thickness. In instances where the gear set is to be replaced, install new shims that are the same thickness as the used shims on drive pinion.

NOTE – *When determining the desired thickness of shim pack, amount of compression (sinkage) of shim pack and wear of the bearing (where old bearing is reused) must be taken into consideration.*

Drive Pinion Depth – Install drive pinion spacer, front bearing, washer, end yoke and washer in order of removal. Fit pinion shaft retaining nut and slowly tighten nut, continuously checking, until pinion bearing preload is 6-9 INCH Lbs. (.7-1.0 N·m) with oil seal not installed. Place suitable cylinder gauge on inside bearing pedestals of gear carrier housing. Place a block gauge on top end of drive pinion and slip a feeler gauge between the 2 gauges to obtain correct pinion height. Select appropriate shim(s) to adjust pinion height to within ± .0012" (.03 mm) of measurement taken with block gauge and feeler gauge.

NOTE – *If pinion depth has to be adjusted by more than .065" (1.65 mm), use two shims. One MUST be .0118" (.30 mm).*

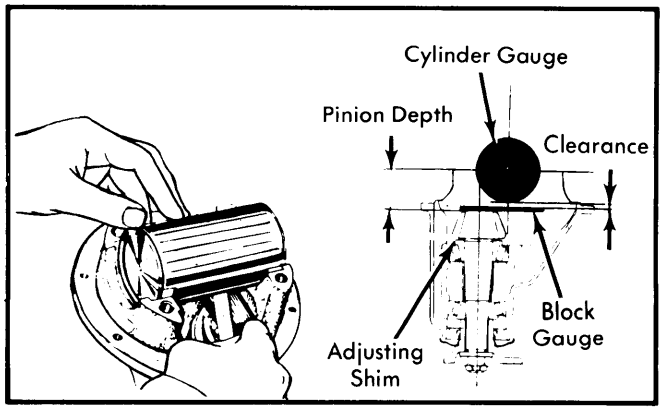

Fig. 9 Measuring Drive Pinion Depth

Pinion Bearing Preload – This adjustment must be performed after setting of drive pinion depth. Remove end yoke and insert bearing preload adjusting shim between pinion spacer and bearing. Tighten end yoke to 9-11 INCH Lbs. (1.0-1.3 N·m) with oil seal installed. In addition to preload adjusting shims, there are spacers available to provide proper adjustment. After finishing adjustment of drive pinion bearing preload, remove end yoke and apply a thin coat of grease to outer surface of oil seal. Drive seal into position in gear carrier. After greasing oil seal lip, insert end yoke and tighten nut.

Side Bearing – Install side bearing inner races with suitable installer. Install differential carrier in housing and install outer races. Align bearing cap index marks and tighten cap bolts to specifications. Install bearing nuts. Tighten bearing nuts in clockwise rotation until bearing outer surface is flush with bearing cap outer surface. Back nut out counterclockwise and retighten nut to completely seat bearing. Tighten bearing nuts to 11 ft. lbs. (15 N·m) of pull at end of tightening tool (MB990201).

Ring Gear Runout – Attach a dial indicator to back side of ring gear and measure runout. If ring gear has excessive runout, correct position of assembly by tightening/loosening bearing nuts. Replace ring gear or differential case if runout exceeds .002" (.05 mm).

Drive Pinion Backlash – Measure backlash of drive pinion in at least four different spots on ring gear face with drive pinion securely fixed in final position. Set up a dial indicator on ring gear teeth edges. If measured backlash exceeds .005-.007", correct position of assembly as described for *Ring Gear Deflection*.

NOTE – *Check gear tooth contact using paint impression method described at beginning of this section.*

Final Inspection & Assembly – Lightly coat each gear and bearing before and during reassembly with gear oil. After installing each component, ensure all rotating parts are free to move smoothly. Install differential gear assembly to axle housing after applying sealing agent and tighten gear carrier mounting nuts in diagonal sequence.

CHRYSLER CORP. IMPORTS (Cont.)

AXLE ASSEMBLY SPECIFICATIONS

Application	Specifications In. (mm)
Bearing-to-Bearing Retainer	
Pickup	.002-.008 (.05-.20)
All Others	0-.01 (0-.30)
Differential Pinion-to-Pinion Shaft	
Pickup	0-.0025 (0-.07)
All Others	.001-.003 (.02-.08)
Differential Pinion and Side Gear Backlash	
Pickup	.002-.005 (.05-.13)
All Others	0-.006 (.15)
Drive Pinion and Ring Gear Backlash	.005-.007 (.13-.18)
Ring Gear Runout (Backside)	0-.002 (0-.05)

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N·m)
Outer Bearing Retainer	11-16 (15-22)
Ring Gear-to-Differential Case	58-65 (78-88)
Final Drive End Yoke (Final Torque)	
Pickup	137-180 (186-245)
All Others	116-159 (157-216)
Differential Carrier Cap	
Pickup	40-47 (54-64)
All Others	25-29 (34-39)
Differential Gear Carrier Assembly-to-Axle Housing	18-22 (25-29)
Lock Plate	11-16 (15-22)