CHRYSLER CORP. 8 3/8" & 9 1/4" RING GEAR

All 100 Series
B200 & PB200

DESCRIPTION

The axle assembly is the hypoid gear type with an integral carrier housing. It is used on light duty vehicles with semi-floating axles. The pinion bearing preload adjustment is made with a collapsible spacer. The differential bearing preload adjustment is made with the adjusting nuts on which the bearing cups seat. A removable housing cover permits inspection and minor servicing of differential without removal from vehicle. Service procedures are the same for both size assemblies, except for some tightening specifications and special tool numbers.

AXLE RATIO & IDENTIFICATION

Small metal tag attached to one of cover screws identifies axle ratio by giving number of teeth on drive pinion and ring gear. Ratio is found by dividing larger number by smaller number. Chrysler Corp. also uses Dana/Spicer axles in many applications. They can be distinguished from Chrysler built axles by shape of housing cover or gasket. *See illustrations in Dana/Spicer Semi-Floating Axles in this Section.*

REMOVAL & INSTALLATION

AXLE SHAFTS & BEARINGS

Removal – 1) Raise vehicle, then remove wheel, tire and brake drum. Loosen housing cover attaching bolts to drain lubricant, then remove housing cover. Remove pinion shaft lock screw and differential pinion shaft. Force axle shaft toward center of vehicle, then remove "C" washer lock from groove in axle shaft.

2) Pull axle shaft out of housing, using care not to damage roller bearing. Remove oil seal from housing, using differential end of axle shaft. Dents caused by axle shaft splines should be polished smooth or rubber on outside diameter of seal will be torn and seal leakage will result.

3) Using suitable adapter and slide hammer, remove axle shaft bearing. Inspect both axle shaft and bearing. If either show signs of excessive wear, discard bearing. *NOTE – Always install new axle shaft oil seal.*

Installation – 1) Clean all parts thoroughly. Install axle shaft bearing squarely into housing bore, making sure bearing is bottomed against shoulder in bore. Install oil seal and slide axle shaft into place in housing.

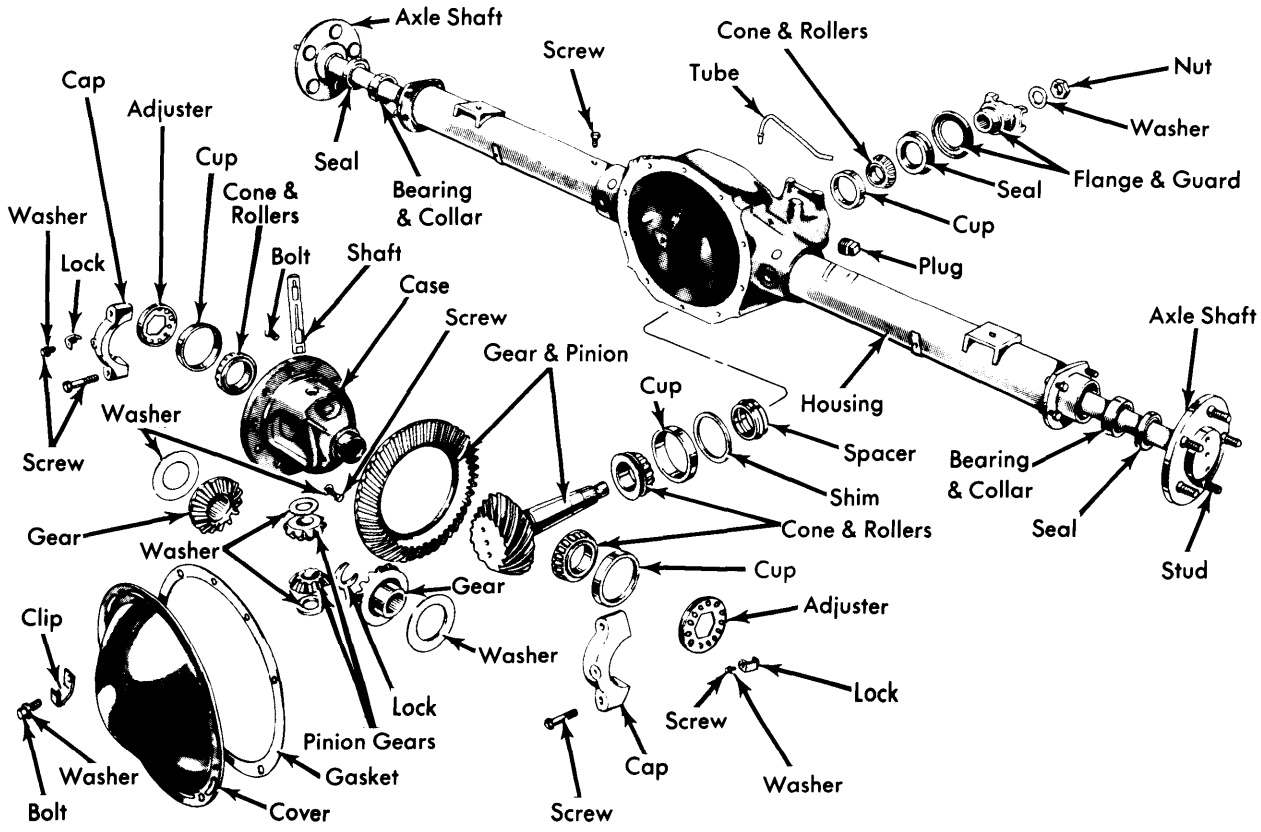

Fig. 1 Exploded View of Chrysler Corp. Drive Axle Assembly (8 3/8" Shown, 9 1/4" Similar)

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2) Install "C" washer lock into groove in axle shaft, then pull outward on axle shaft so that "C" washer lock seats in counterbore of differential side gear.

3) Install differential pinion shaft through case and pinions, aligning hole in shaft with lock screw hole in case. Install pinion shaft lock screw and tighten securely. Install housing cover and identification tag.

PINION FLANGE & SEAL

Removal – 1) Raise vehicle, then remove wheels, tires and brake drums. Mark propeller shaft universal joint, drive pinion flange and end of pinion stem for reassembly reference. Disconnect propeller shaft and tie out of way.

2) Remove rear wheels and brake drums to prevent false preload reading. Using an INCH Lb. torque wrench, measure and record pinion bearing preload. Remove drive pinion nut and pull off flange using a suitable puller. Pry out oil seal, taking care not to damage machined surface.

Installation – 1) Install new pinion oil seal squarely into bore in housing until seal flange seats against housing flange face. *NOTE – Outside diameter of seal is precoated with a special sealer, so no sealing compound is required.* Position pinion flange on pinion stem, making sure marks are aligned, then install pinion washer (convex side out) and nut. Tighten nut to specifications and rotate pinion through several revolutions to be sure bearing rollers are properly seated.

2) Measure pinion bearing preload. Continue tightening pinion nut until preload is same as that noted before diassembly. Under no circumstances should preload be more than 10 INCH lbs. over original setting. *CAUTION – Under no circumstances should pinion nut be backed off to lessen preload. If desired preload is exceeded, a new collapsible spacer MUST be installed, and nut retightened until proper preload is obtained.*

AXLE ASSEMBLY

Removal & Installation – Raise vehicle and block brake pedal in "up" position. Remove wheels, tires and brake drums, then disconnect brake hydraulic lines at wheel cylinders and cap them to prevent fluid loss. Mark propeller shaft and universal joint for reassembly reference, then remove propeller shaft and tie out of way. Remove shock absorbers and rear spring "U" bolts, then remove axle assembly. To install, reverse removal procedure.

OVERHAUL

DISASSEMBLY

1) Remove wheels, and brake drums. Drain lubricant and remove cover. Remove axle shafts as previously outlined. Measure and record differential side play, ring gear runout, and pinion bearing preload. *NOTE – There should be no side play and ring gear runout should not exceed .005".* Mark differential gear and case at point of maximum runout. Measure and record pinion bearing preload.

2) Remove drive pinion flange and seal as previously outlined. Mark side bearing caps and differential housing for reassembly reference. Remove caps and adjustings nuts. Lift differential assembly out of axle housing. Make sure bearing cups and adjusters are marked to ensure installation in original position.

3) Using a soft drift punch and hammer, drive pinion shaft out of housing. *NOTE – Bearing cones and cups, and collapsible spacer must be replaced after driving out pinion.* Drive pinion bearing cups out of housing using a hammer and a soft drift punch. Remove shim from behind rear cup and record thickness

4) Remove bearing rollers from pinion shaft using a suitable puller. Care must be taken not to pull on roller cage. Mount differential assembly in a soft jawed vise. Remove and discard ring gear bolts (left hand thread). Using a soft faced hammer, drive ring gear off differential case.

CLEANING & INSPECTION

1) Clean all components in a suitable cleaning solvent. Inspect all machined surfaces for smoothness or raised edges. Inspect all bearings and cups for wear or pitting and replace as necessary. Inspect all gear teeth for wear or chipping and replace as necessary. Inspect all splined components for wear or damage and replace as necessary.

2) If drive gear runout exceeded .005", differential case flange runout must be checked. Install differential case, and bearing cups and adjusters in correct position. Install bearing caps and tighten down slightly. Using suitable tool (C-4164) tighten adjusters until all differential case side play is eliminated.

3) Attach a dial indicator to housing and position so that indicator stem contacts ring gear flange on differential case. Rotate differential case several revolutions and note fluctuation of readings on dial indicator. If indicator readings fluctuated more than .003", replace differential case.

REASSEMBLY & ADJUSTMENT

Case Assembly – 1) Install thrust washers on differential side gears and position gears in differential case. Place thrust washers on differential pinion gears and position gears in case such that they are 180° apart when they are in mesh with side gears.

2) Rotate side gears until holes in pinion gears are in alignment with pinion shaft holes in case. Install differential pinion shaft, making sure hole in shaft is aligned with lock screw hole in case. *CAUTION – Use care not to damage pinion thrust washers.*

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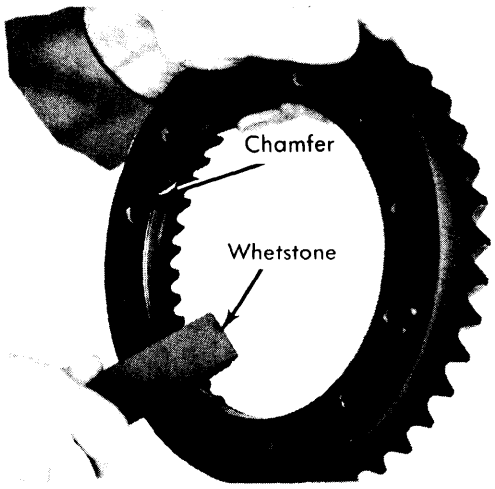

Fig. 2 Procedure to Relieve Ring Gear Chamfer

3) Contact surfaces of drive gear and differential case flange must be clean and free of all burrs. Using a fine whetstone, relieve the sharp edge of chamfer on inside diameter of ring gear. *CAUTION — Relieving chamfer is important operation and should not be omitted. It insures that there will be no burrs caught between ring gear and case to cause ring gear run-out.* Install three equally spaced pilot shafts on ring gear. Place heated ring gear on brass jawed vice and install differential case using new bolts (lefthand threads). *CAUTION — Use heat lamp or hot oil or water to heat ring gear. Do not use torch. Do not heat gear over 300°F.*

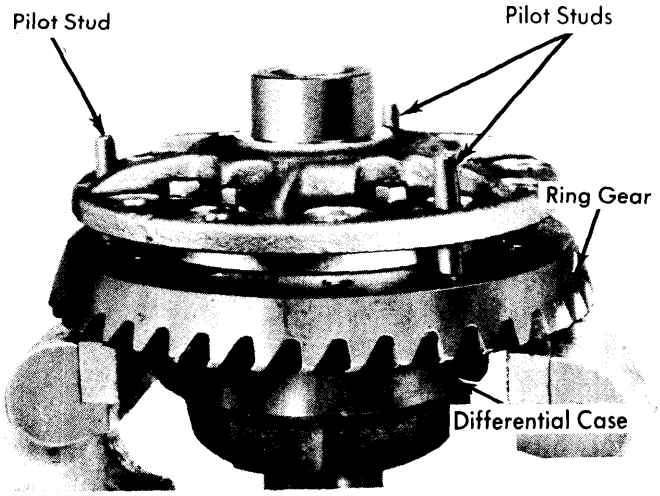

Fig. 3 Procedure to Install Ring Gear on Case

4) Tighten ring gear-to-differential case bolts alternately and evenly to specifications. Install side bearings on differential case journals using suitable tool (small ring gear, C-4107; large ring gear, C-4213 and C-4171). Lubricate assembly with hypoid gear lubricant.

Drive Pinion Depth — On axles with 8 3/8" ring gear, two methods are used in production to adjust drive pinion depth. The first production method is the usual method of placing shims forward of the rear pinion bearing cup. In this case the shims can be either the thick series or the thin series (.020-.037"). The second production method is to place a shim directly forward of the drive pinion head. If this shim is present, there will be no shims in the usual location (forward of the rear bearing cup). If axle with shim forward of pinion head is being overhauled, that shim must be removed and pinion depth adjustment made with new shims in usual location in front of bearing cup. The new shims used must be of the thin series.

1) —Start both drive pinion bearing cups into axle housing bores making sure they are not cocked. ***NOTE — Special tool numbers used in this procedure apply to assembly with 8 3/8" ring gear. For equivalent tool numbers used on 9 1/4" ring gear assembly, see chart following procedure.*** **Assemble pinion locating spacer (SP-5408) over body of main stem (SP-5385) followed by rear pinion bearing cone, then insert assembly into axle carrier from rear side.**

2) On 8 3/8" assembly, hold spacer and main stem assembly in position and install front pinion bearing over spacer (SP-5382) and position over main stem of tool. On 9 1/4" assembly, position spacer and main stem assembly in housing, then install front pinion bearing cone and washer (SP-6022). Procedure from this point is same for both assemblies except for tool numbers (see note in preceding step). Position suitable compression sleeve (SP-3194B), centralizing washer (SP-534), and main screw nut (SP-3193) on main stem. Hold compression sleeve with tool (C-3281) and tighten nut. Allow tool to rotate while nut is being tightened to prevent damage to bearings and cups.

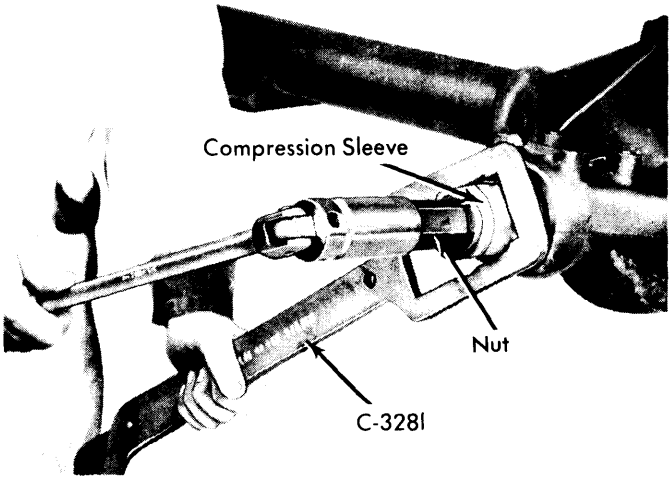

Fig. 4 Procedure for Seating Pinion Bearing Cups

3) Loosen tool nut, then retighten to obtain pinion preload of 10-30 INCH lbs. (15-25 INCH lbs. with 9 1/4 assembly). Rotate tool after tightening to properly seat bearings. Install suitable gauge block (SP-5383) on main and tighten screw.

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4) Position cross bore arbor (SP-5380) in housing side bearing seats, and center arbor in bore. Position bearing caps on carrier pedestals and insert .002" spacer between arbor and each cap. Install cap bolts and tighten to 10 ft. lbs.

5) Use feeler gauge to determine proper thickness of shims that will fit snugly between arbor and gauge block. This fit must be snug but not excessively tight.

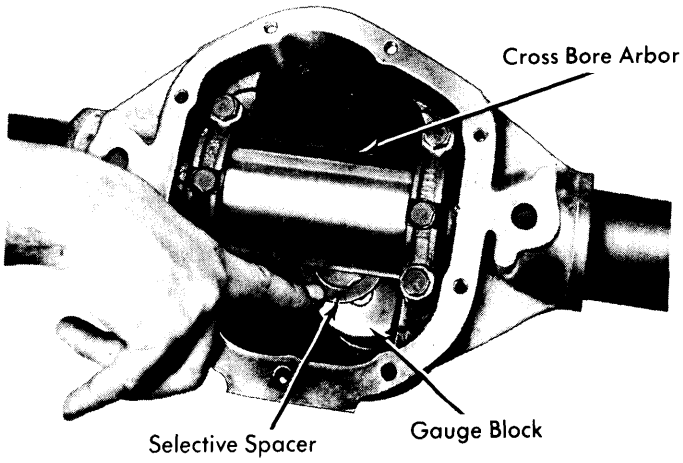

Fig. 5 Procedure to Determine Shim Pack Thickness

6) To select correct shim pack, read markings on end of pinion head. When marking is minus, add that amount of thickness to feeler gauge thickness to obtain thickness of correct shim pack. When marking is plus, subtract that amount of thickness. Remove all tools and REAR pinion bearing cup from housing.

Equivalent Tool Numbers

Application	8 3/8"	9 1/4"
Spacer	SP-5408	SP-6017
Main Stem	SP-5385	SP-526
Spacer	SP-5382	Not Used
Washer	Not Used	SP-6022
Compression Sleeve	SP-3194B	SP-535A
Centralizing Washer	SP-534	SP-534
Nut	SP-3193	SP-533
Holding Tool	C-3281	C-3281
Gauge Block	SP-5383	SP-6020
Cross Bore Arbor	SP-5380	SP-6018
Bearing Installer	DD-955	DD-955

Pinion Bearing Preload – 1) Place selected shim in pinion shaft bore and reinstall rear pinion bearing cup. Lubricate rear pinion bearing and press into position on drive pinion stem.

2) Insert drive pinion assembly through axle housing, then install collapsible spacer and front pinion bearing onto stem of gear. Install pinion flange and nut and tighten nut until front bearing is seated. *CAUTION – Use care not to collapse spacer. If spacer is collapsed, a new spacer MUST be installed.*

3) With front bearing fully seated, remove pinion flange and install anti-clang washer over pinion stem. Press pinion oil seal into position such that flange of seal is fully seated against housing flange face.

4) Position pinion flange and nut on pinion stem. While rotating pinion assembly to insure proper bearing seating, tighten pinion flange nut until all pinion end play is removed.

5) Tighten pinion nut to specified torque and measure pinion bearing preload by rotating pinion through several revolutions with an INCH lb. torque wrench. Continue tightening pinion flange nut in small increments until correct bearing preload is obtained.

CAUTION – Do not back off nut to lessen bearing preload. If desired preload is exceeded, a new collapsible spacer MUST be installed and nut retightened until proper preload is obtained.

Backlash & Side Bearing Preload – Two precautions must be observed when checking and adjusting ring gear backlash and differential bearing preload. 1) Permissible backlash variation is .003". For example if backlash at minimum point is .006" and backlash at maximum point is .009", variation is correct. It is important to index gears so that same teeth are meshed during all backlash measurements. 2) It is also important to maintain specified adjuster torque to obtain accurate differential bearing preload.

2) Using suitable tool (C-4164) turn each adjuster until bearing freeplay is eliminated with approximately .010" backlash. Seat differential roller bearings. *NOTE – Differential bearings do not always move directly with adjusters. To ensure accurate adjustment, bearings must be seated by oscillating drive pinion a half turn in each direction five to ten times each time adjusters are moved.*

3) Install a dial indicator on cover flange surface. Position indicator stem against drive side of ring gear. Check backlash every 90°to find point of minimum backlash. Mark each position so that backlash readings will be taken with same teeth meshed. Rotate ring gear to point of minimum backlash.

4) Loosen right adjuster and tighten left adjuster until backlash is .003-.004" with each adjuster tightened to 10 ft. lbs. Seat bearings as previously outlined. Tighten bearing cap bolts to 100 ft. lbs. Using adjuster tool (C-4164), tighten right adjuster to 75 ft. lbs. Seat bearings and continue to tighten right adjuster until torque remains constant 75 ft. lbs.

5) Check backlash again with indicator. If backlash is not between .006-.008", increase torque on right adjuster and seat bearings. Continue this operation until backlash is .006-.008". Tightenleft adjuster to 75 ft. lbs. and seat bearings. With adjustments completed, install adjuster locks. Make sure lock teeth are engaged in adjuster threads. Tighten lock screws to 90 INCH lbs.

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Final Inspection & Assembly – With pinion bearing preload and ring gear backlash properly adjusted, make a tooth pattern contact check. When pattern is satisfactory, install axle shafts, brake drums, wheels and tires, axle housing cover and refill with hypoid gear lubricant.

AXLE ASSEMBLY SPECIFICATIONS

Ring Gear Backlash	.006-.008"
Pinion Bearing Preload	
New Bearings	20-35 INCH Lbs.
Used Rear, New Front Bearing	10-25 INCH Lbs.
Maximum Ring Gear Runout	.005"

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Ring Gear-to-Differential Case	70
8 3/8" Ring Gear	55
9 1/4" Ring Gear	70
Drive Pinion Nut (Minimum)	210
Axle Housing Cover	15-25
Side Bearing Cap Bolt	
8 3/8" Ring Gear	55
9 1/4" Ring Gear	100
Bearing Adjuster Lock Bolts	90 INCH Lbs.

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