

2000-01 DRIVE AXLES**Dana 10 1/2", 11" & 11 1/2" Full-Floating Axles****MODEL IDENTIFICATION****MODEL IDENTIFICATION**

Series ⁽¹⁾	Model
"C"	2WD Pickup, Sierra, Silverado, Suburban, Tahoe, Yukon & Yukon XL
"K"	4WD Escalade, Pickup, Sierra, Silverado, Suburban, Tahoe, Yukon & Yukon XL
"G"	Express & Savana
(1) Fifth character of VIN.	

DESCRIPTION

The 10 1/2", 11" and 11 1/2" ring gear rear axle assemblies use an integral carrier with conventional hypoid ring gear and pinion assembly. Axle shaft flange is bolted to outer wheel hub assembly. Wheel hub assembly is supported by bearings that mount to axle housing tube. Splined end of axle shaft is supported by differential side gear and case bearing.

AXLE RATIO & IDENTIFICATION

Rear axle identification is stamped on forward side of axle tube. The first 3 digits indicate rear axle ratio, the next digit indicates axle assembly build source code and the next 3 digits indicate the day built.

LUBRICATION

On all models except C and K series with standard differential, fill differential with 80W or 80W-90 GL-5 gear lubricant to within 1/4" (6 mm) below edge of filler hole.

Some C and K series rear standard differentials require the use of a synthetic gear lubricant. Differentials using synthetic gear oil come from factory equipped with a tag indicating the use of GM P/N 12378261 SAE 75W-90 Synthetic gear lubricant only. Otherwise use 80W or 80W-90 GL-5 gear lubricant. If tag does not exist and there is doubt as to which differential is used in vehicle. VIN must be used through dealership to determine differential usage.

TROUBLE SHOOTING

NOTE: See appropriate table in TROUBLE SHOOTING article in GENERAL INFORMATION.

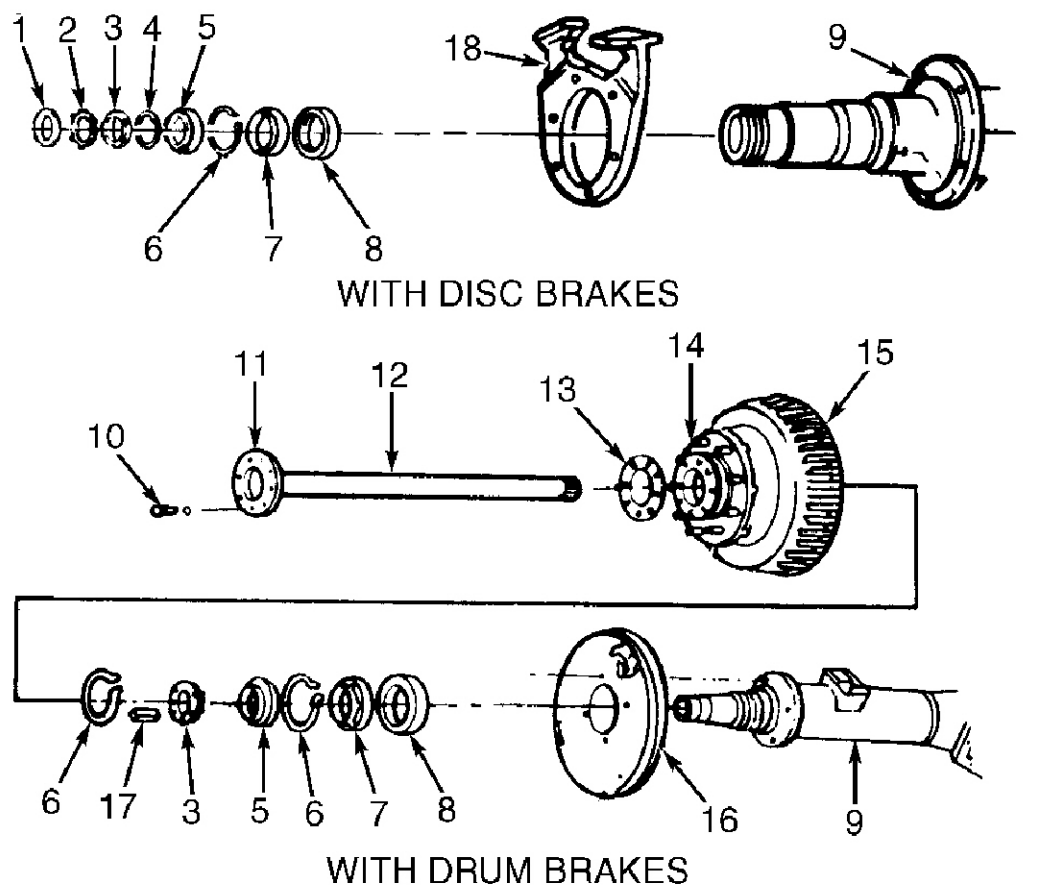
REMOVAL & INSTALLATION**AXLE SHAFTS****Removal**

Raise and support vehicle. Remove wheel assembly. Remove axle shaft bolts. See **Fig. 1**. Remove axle shaft from carrier. Remove gasket.

Installation

Clean axle shaft flange and hub assembly. Install NEW gasket. Install axle shaft into axle tube. Install and tighten

axle flange bolts to specification. See **TORQUE SPECIFICATIONS** . Install wheel. Add lubricant.



- | | | |
|-------------------|-----------------------|------------------------------|
| 1. Outer Lock Nut | 8. Oil Seal | 15. Drum |
| 2. Lock Washer | 9. Axle Tube | 16. Brake Backing Plate |
| 3. Adjusting Nut | 10. Axle Flange Bolts | 17. Locking Key |
| 4. Washer | 11. Axle Shaft Flange | 18. Caliper Mounting Bracket |
| 5. Outer Bearing | 12. Axle Shaft | |
| 6. Retaining Ring | 13. Gasket | |
| 7. Inner Bearing | 14. Hub | |

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Fig. 1: Exploded View Of Axle & Hub Assembly
 Courtesy of GENERAL MOTORS CORP.

HUB & DRUM ASSEMBLY

Removal

Raise and support vehicle. Remove wheel assembly. Remove axle shaft. See **AXLE SHAFTS** under REMOVAL & INSTALLATION. Remove outer retaining ring and locking key. See **Fig. 1** . Using Wheel Bearing Nut Wrench Set (J-2222-C), remove adjusting nut. Slide hub and drum assembly off axle shaft tube.

Installation

1. Lightly oil top of axle shaft tube. Install hub and drum assembly onto axle shaft tube. Ensure inner bearing and oil seal are correctly installed.
2. Lubricate and install outer bearing. Using torque wrench and socket from Wheel Bearing Nut Wrench Set (J-2222-C), install adjusting nut. To set wheel bearing preload, turn hub and drum assembly while tightening adjusting nut to 50 ft. lbs. (68 N.m).
3. Stop turning hub. Back off adjusting nut until nut is just slightly loose. Tighten adjusting nut until nut just contacts bearing (barely snug). Align slots in nut and axle groove.

4. Install locking key into nut/axle slot. Install and seat retaining ring into position. Install axle shaft and wheel assembly. Add lubricant.

HUB & ROTOR ASSEMBLY

Removal

1. Raise and support vehicle. Remove wheel assembly. Remove caliper from mounting bracket, and wire aside. Remove axle shaft. See **AXLE SHAFTS** under REMOVAL & INSTALLATION.
2. Bend up locking tang(s) from retaining lock nut. Using Torque Wrench and Socket Wrench Set (J-2222-C), remove wheel bearing outer retaining lock nut.
3. Remove retaining ring. Remove lock or key. Remove inner adjusting nut and washer (if equipped). Slide hub and rotor assembly off axle shaft tube.

Installation

1. Lightly oil top of axle shaft tube. Install hub and rotor assembly onto axle shaft tube. Ensure inner bearing and oil seal are correctly installed.
2. Install lubricated outer bearing. Install washer (if equipped) and adjusting nut. Using torque wrench and socket, snug-tighten adjusting nut. To set wheel bearing preload, turn hub and rotor assembly while tightening inner adjusting nut to 50 ft. lbs. (68 N.m).
3. Stop turning hub. Back off adjusting nut until nut is just slightly loose. Turn hub and rotor assembly again while tightening adjusting nut to 30-40 ft. lbs. (40-54 N.m). Back off nut 135-150 degrees.
4. Install locking tang washer and outer lock nut. Tighten lock nut to 65 ft. lbs. (88 N.m). Bend minimum of 2 locking tangs into notches of outer lock nut. Install axle shaft and wheel assembly. Add lubricant.

PINION FLANGE & PINION SEAL

NOTE: If replacing pinion and ring gear, discard original pinion flange after removal. Replacement pinion, ring gear and pinion flange are balanced as assembly.

NOTE: Accurately mark all driveline components, relative to drive shaft and axles, for installation reference.

Removal

1. Raise vehicle and support. Allow rear axle housing assembly to hang free. Remove drive shaft from pinion flange.
2. Hold pinion flange with Pinion Flange Holder/Remover (J-8614-01). See **Fig. 2**. Remove pinion self-locking nut and washer (if equipped) from yoke. Remove pinion flange yoke from axle carrier using special nut and forcing screw of holder/remover. Remove pinion oil seal from axle carrier.

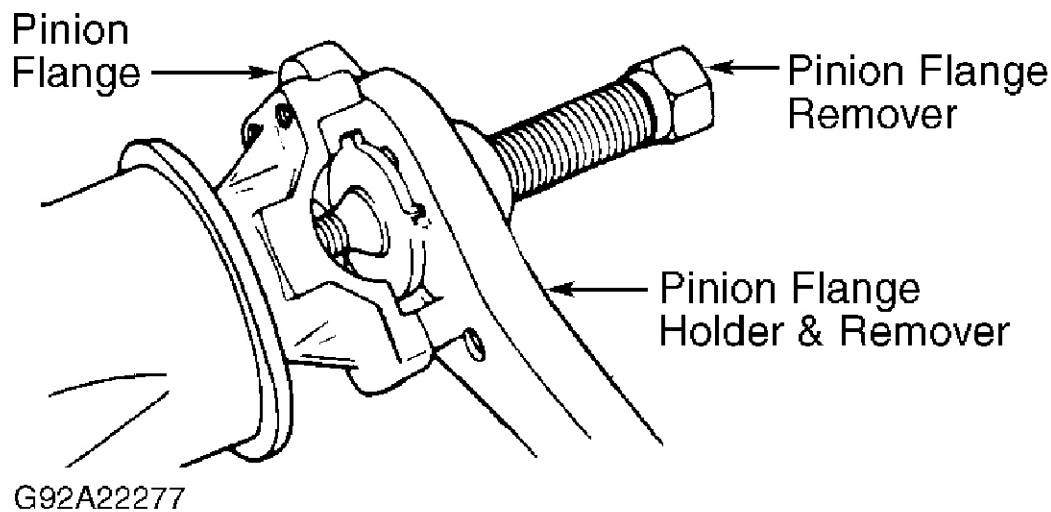


Fig. 2: Removing Pinion Flange
 Courtesy of GENERAL MOTORS CORP.

Installation

Lubricate slip joint prior to installation. Install NEW companion flange bolts. Clean mating surfaces bearing caps, bearing straps and pinion yoke using crocus cloth, and clean all parts.

CAUTION: Do not hammer pinion flange onto pinion shaft, or pinion flange, ring gear and pinion may be damaged.

1. Inspect pinion flange. Replace pinion flange if damaged. Lubricate seal.
2. Using Dana Pinion Seal Installer (J-24384), drive oil seal into housing bore. Install a non-hardening sealer onto pinion splines or into internal splines of pinion flange.
3. Install washer (if equipped) and self-locking nut onto pinion, and snug tighten. Using Pinion Flange Holder/Remover (J-8614-01), hold pinion flange and tighten pinion nut to position indicated by alignment mark made during disassembly. Measure rotating torque of pinion. Tighten pinion to required torque. Tighten all other fasteners to specification. See **TORQUE SPECIFICATIONS**. Install drive shaft. Add lubricant.

REAR AXLE HOUSING ASSEMBLY

Removal

1. Raise and support vehicle. Drain lubricant. Remove drive shaft and wheel assemblies.
2. Remove hub and drum assembly or hub and rotor assembly. See **HUB & DRUM ASSEMBLY** or **HUB & ROTOR ASSEMBLY**. Disconnect parking brake cable from lever and at brake flange plates. Remove brakeline bracket and brakelines. Detach height-sensing/brake proportioning valve linkage (if equipped). Remove shock absorbers.
3. Remove stabilizer bar (if equipped). Disconnect hose from axle vent fitting (if equipped). Support rear axle assembly. Remove leaf spring "U" bolt nuts. Lower rear axle assembly, and remove from under vehicle.

Installation

Raise rear axle assembly. Align spring saddle holes with leaf spring center bolts. Install "U" bolts and nuts. To complete installation, reverse removal procedure. Add lubricant. Bleed brake system.

DIFFERENTIAL ASSEMBLY

Removal & Installation

Removal and installation of differential assembly is covered as part of overhaul procedure. See **DIFFERENTIAL ASSEMBLY** under OVERHAUL.

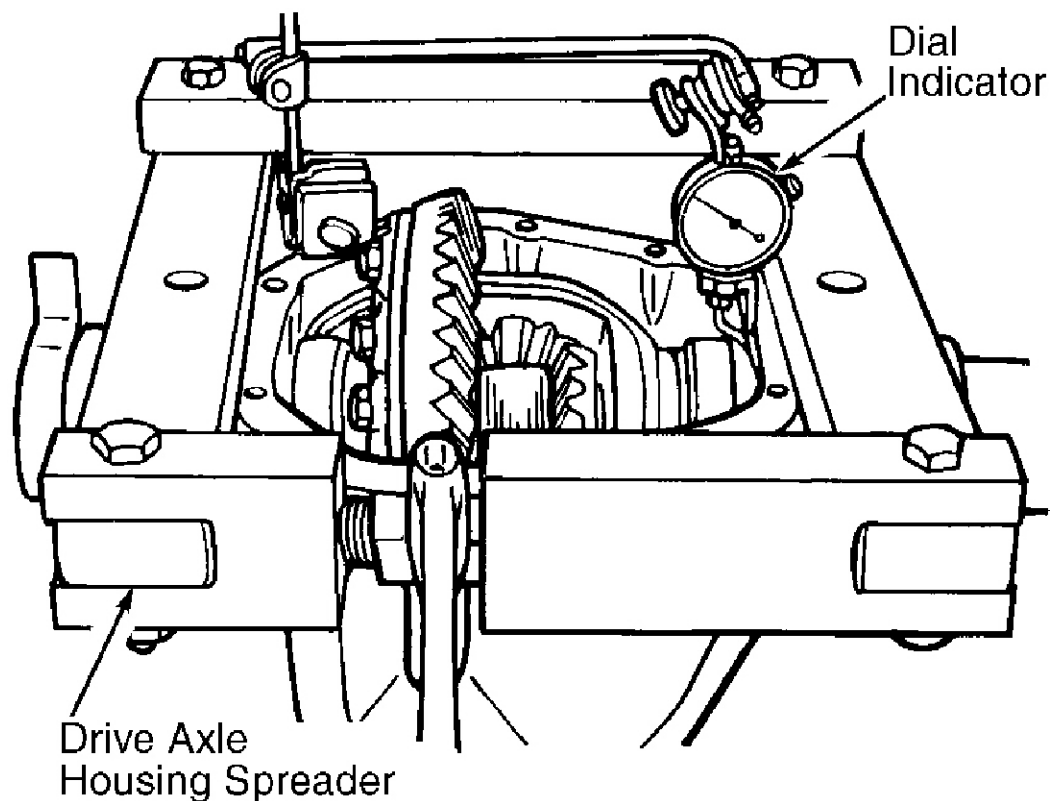
OVERHAUL

DIFFERENTIAL ASSEMBLY

Disassembly

1. Remove axle housing. See **REAR AXLE HOUSING ASSEMBLY** under REMOVAL & INSTALLATION. Place axle in suitable support, and remove differential cover bolts and cover. This will drain oil. Pull axle shafts out of housing until axle shafts are clear of differential case.
2. Note letters on bearing caps and drive axle housing for reassembly reference. Remove differential bearing cap bolts and caps. See **Fig. 4** . Mount Differential Housing Spreader (J-24385-01) and onto differential housing. See **Fig. 3** . Mount Dial Indicator (J-39704), and preset gauge to minimum of .200" (5.1 mm). Rotate indicator housing to zero on dial.

CAUTION: DO NOT spread housing more than .015" (.38 mm), or damage may result.



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Fig. 3: Spreading Drive Axle Housing
 Courtesy of GENERAL MOTORS CORP.

3. Spread drive axle housing to maximum of .015" (.38 mm) while observing dial indicator. Using 2 pry bars, pry differential case out of axle housing.
4. Remove axle housing spreader. Mark bearing, race, and shims left or right side for reassembly reference. Remove bearing caps. Remove bearings using Differential Side Bearing Remover (J-29721), Side Bearing

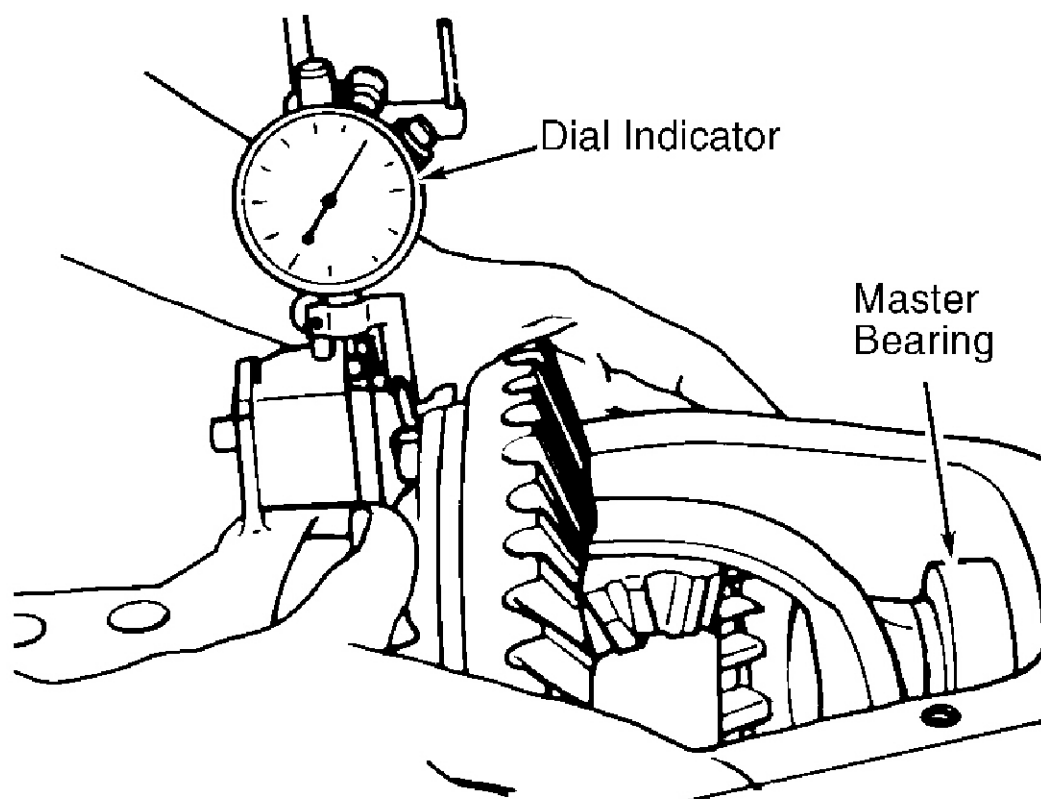
Adapters (J-29721-70) and Side Bearing Puller Plug (J-8107-03). Remove shims.

5. Using shop towels, place differential case in soft-jaw vise. Remove ring gear bolts. Ring gear bolts are right-hand thread. Using a soft-face hammer, tap ring gear off differential case. Remove lock pin screw.
6. Using hammer and brass drift, remove pinion shaft pinion shaft. See **Fig. 4**. Mark all gears and washers for reassembly reference. Remove pinion gears and thrust washers. Remove differential side gears and thrust washers.
7. Install differential cover with 2 bolts (to prevent drive pinion from falling out of housing). Measure drive pinion rotating torque, and record measurement. Move pinion assembly back and forth to check for looseness of pinion assembly. Looseness indicates excessive bearing or pinion wear.
8. Using Pinion Flange Holder/Remover (J-8614-01), remove drive pinion nut and washer. See **Fig. 2**. Using pinion flange holder/remover, remove pinion flange.
9. Tap out drive pinion using soft-faced hammer. Remove cover, drive pinion and small diameter pinion preload shims. Keep shims together for reassembly.
10. Pry out drive pinion oil seal. Remove outer drive pinion bearing and oil slinger. Remove drive pinion bearing races from drive axle housing using Bearing Race Remover (J-39330).
11. Remove drive pinion adjustment shims and baffle (if equipped). Keep shims and baffle together for reassembly. Using Differential Side Bearing Remover (J-29721) and Adapters (J-29721-70), remove inner drive pinion bearing.

- Place pinion gears onto side gears so that pinion gear holes are 180 degrees apart. Rotate pinion gears and ensure pinion gears line up with pinion shaft holes.
- Slide pinion thrust washers into place. Align pinion shaft with roll pin hole in case. Install pinion shaft. Install roll pin.
- Position ring gear on differential case. Align bolt holes. Install 2 studs, 180 degrees apart, into differential case. Press ring gear onto differential case. Install and tighten NEW ring gear bolts, in crisscross pattern, to specification. See **TORQUE SPECIFICATIONS**.

Determining Total Differential Shim Pack

- Ensure drive pinion is out of drive axle housing. Install Master Differential Bearings (J-39705) onto differential case. Install assembled differential case into drive axle housing. Mount Dial Indicator (J-39704) onto ring gear bolt side of case. See **Fig. 5**.



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Fig. 5: Determining Total Differential Shim Pack
 Courtesy of GENERAL MOTORS CORP.

- Force differential assembly toward dial indicator as far as possible. Preload dial indicator to one half of its travel. Place tip of dial indicator onto a machined (flat) differential surface, just next to ring gear bolt. Mark this location with chalk for future reference. Reset preloaded dial indicator gauge dial to zero.
- Force differential assembly away from dial indicator as far as possible. Repeat this step until constant indicator reading is obtained. Record number of thousandths that dial indicator traveled. Number is NOT present reading on dial (dial may have gone completely around once). This reading determines thickness of shim pack to be used without any bearing preload, which will be added later.
- Remove dial indicator from drive axle housing. Remove differential case from drive axle housing. DO NOT remove master bearings from differential case assembly at this time. Go to **PINION DEPTH ADJUSTMENT** under OVERHAUL.

1. Clean all drive axle housing bearing race bores. Ensure drive pinion bore is free of nicks and dirt. Assemble Bearing Driver (J-41690) into drive axle housing using Adapter Cone (J-41691) and Threaded Rod (J-41692). See [Fig. 6](#). Assemble Side Bearing Disc (J-21777-45) onto Arbor (J-39702). Install arbor and side bearing disc into drive axle housing.
2. Place Pinion Height Block (J-41689) on top of master drive pinion block and against arbor. See [Fig. 6](#). Place Dial Indicator (J-39704) on upper step of pinion height block. While applying downward pressure on dial indicator block, set dial indicator to zero.
3. Slide dial indicator block over to arbor. Move dial indicator block back and forth (perpendicular to arbor) to get highest reading. This reading, added together with plus (+) or minus (-) figure etched on drive pinion head, is thickness of shim pack necessary for proper pinion depth adjustment. See [Fig. 7](#).

NOTE: A positive (+) value figure on drive pinion head indicates distance between ring gear centerline and drive pinion must be increased by number of thousandths marked on pinion head. A negative (-) value figure indicates distance must be decreased. A zero (0) figure etched on drive pinion means to use shim thickness as determined by this procedure. See [Fig. 7](#).

4. Measure each shim thickness. Add thickness of shims to obtain total shim pack thickness. If necessary, baffle or slinger thickness must also be included in shim pack thickness.

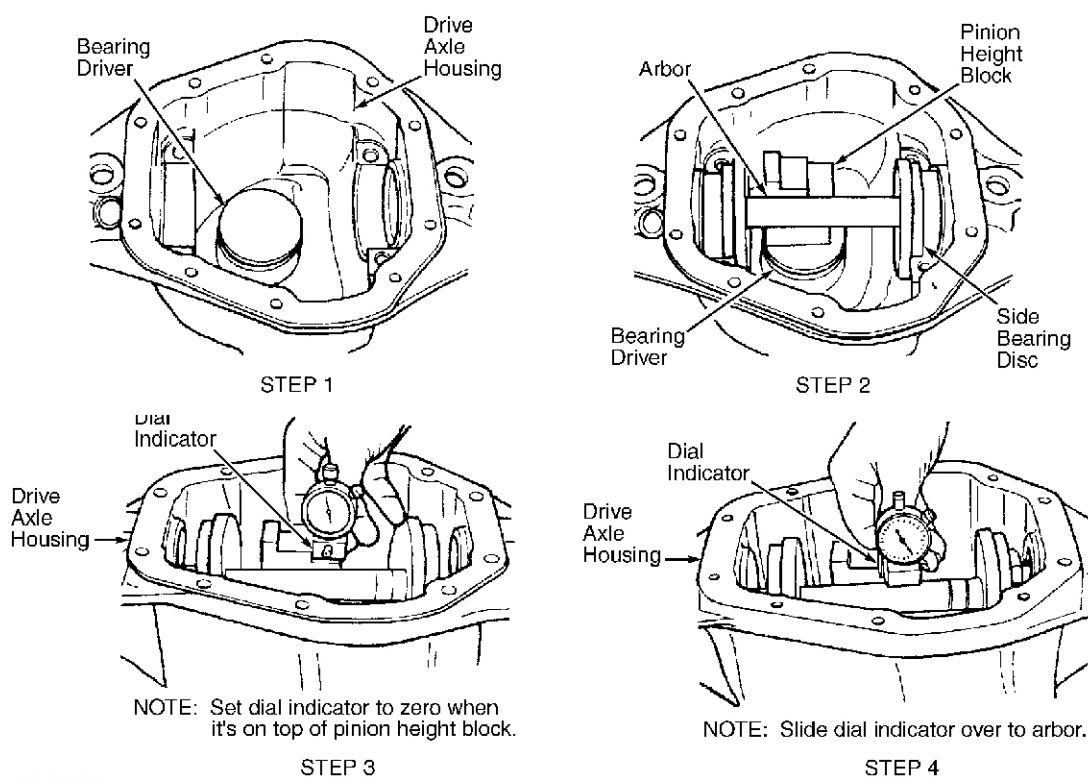


Fig. 6: Adjusting Pinion Depth
 Courtesy of GENERAL MOTORS CORP.

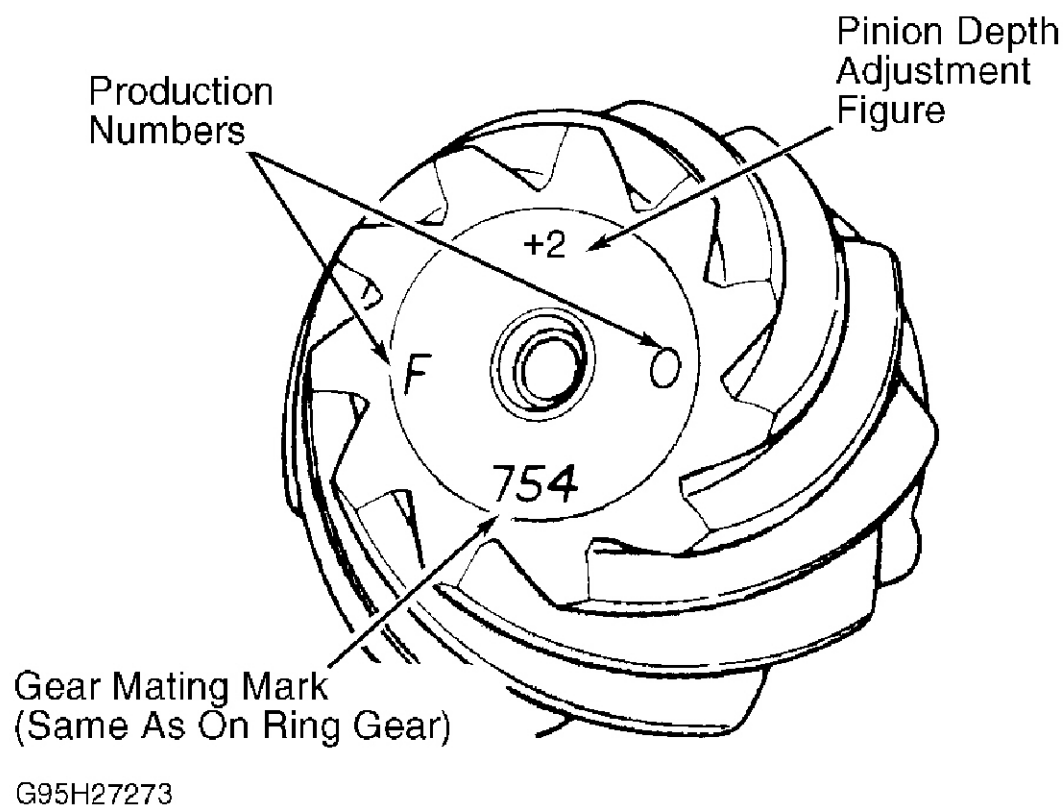


Fig. 7: Drive Pinion Head Markings
 Courtesy of **CHRYSLER CORP.**

Drive Pinion Assembly & Preload

1. Put required amount of shims and baffle (if used) in inner bearing bore. See **PINION DEPTH ADJUSTMENT** under OVERHAUL. Use Rear Pinion Bearing Cup Installer (J-39707) and Handle (J-39708) to install drive pinion inner bearing race into drive axle housing. Ensure race is fully seated on shims.
2. Use Rear Pinion Bearing Cone Installer (J-5590) to install drive pinion outer bearing race into drive axle housing. Use Pinion Bearing Installer (J-5590) to install inner bearing and baffle (if used) onto drive pinion.
3. Install drive pinion into drive axle housing. Install outer drive pinion bearing and slinger (if used). Install preload shims. Lubricate and install oil seal.
4. Install drive pinion flange. Install washer and NEW drive pinion nut. Using Pinion Flange Holder/Remover (J-8614-01) to hold pinion, tighten drive pinion nut to specification. See **TORQUE SPECIFICATIONS**. Tighten nut until pinion end play is just take up. Rotate drive pinion several times to seat bearings. Once there is no end play, check preload torque.

NOTE: Pinion preload should be at or less than 35 INCH lbs. (4 N.m) on new bearings, or 10 INCH lbs. (1.1 N.m) on old bearings.

5. Check preload by rotating pinion with INCH-lb. torque wrench. See **Fig. 8**. If necessary, remove small diameter shims to increase preload, or add shims to decrease preload.

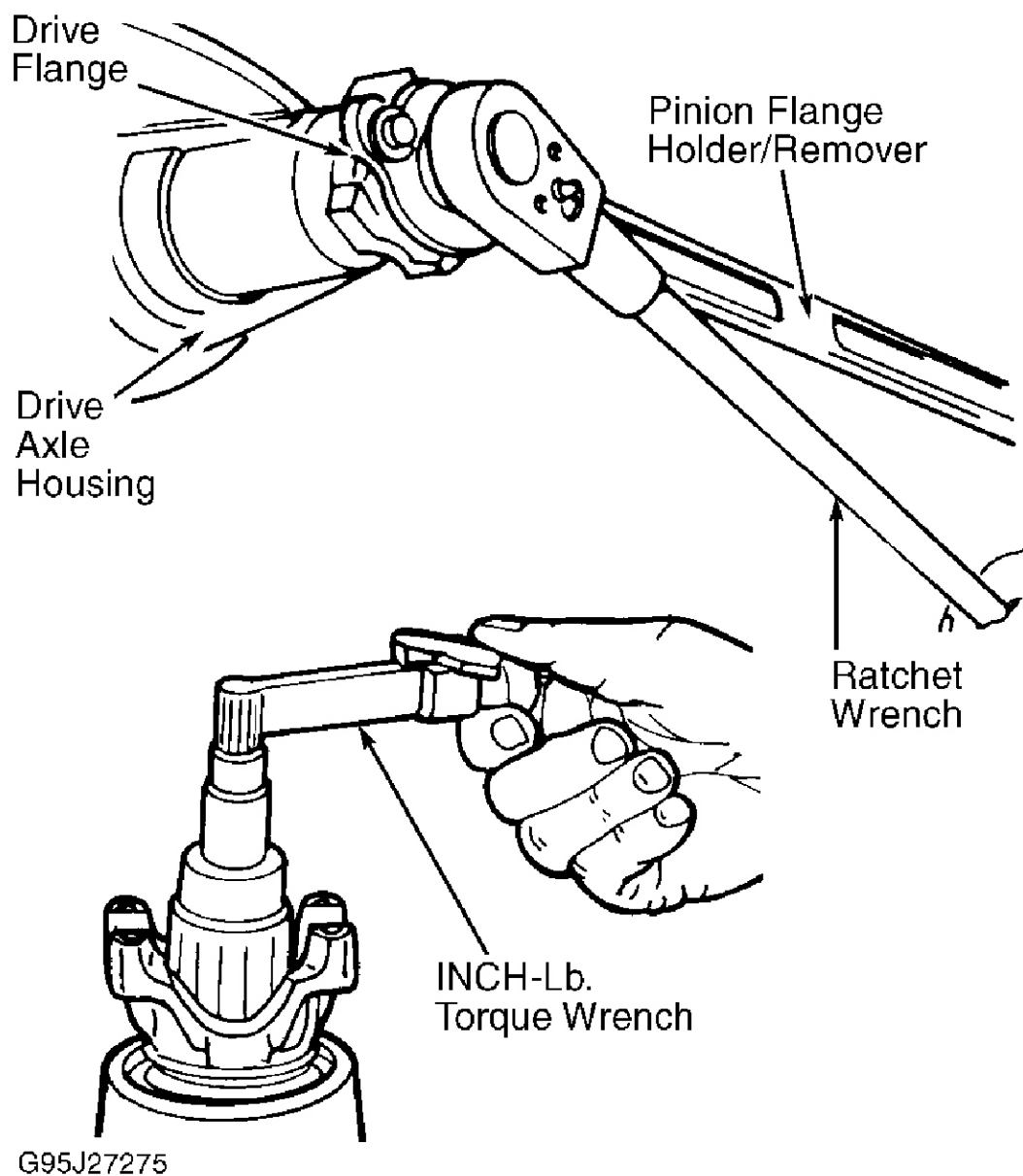


Fig. 8: Checking Drive Pinion Preload
 Courtesy of GENERAL MOTORS CORP.

Differential Case Installation

1. Ensure drive pinion is installed into drive axle housing. Force ring gear mesh with drive pinion gear. Rock ring gear back and forth to allow teeth to mesh. Install assembled differential case, with Master Differential Bearings (J-39705) installed into drive axle housing.
2. Mount Dial Indicator (J-39704) onto ring gear bolt side of differential case. See **Fig. 5**. Place dial indicator tip on chalk mark made during step 2 of DETERMINING TOTAL DIFFERENTIAL SHIM PACK. While prying force is still applied to differential case, set dial indicator to zero.
3. Force differential case away from drive pinion gear to obtain indicator reading. Repeat this step until constant reading is obtained. Record reading. Remove dial indicator. Remove differential case from drive axle housing. Remove master differential bearings from differential case.

NOTE: Reading recorded in step 3 of this procedure will determine shim size to be used on ring gear side of differential case. Use remaining portion of shim pack on opposite side of differential case after adding an additional .010" (.25 mm) to preload bearings.

4. Subtract reading found in step 3 of this procedure from total shim pack reading obtained under **DETERMINING TOTAL DIFFERENTIAL SHIM PACK** .
5. Place proper amount of shims on differential bearing hub (ring gear side). Drive or press differential bearing onto hub using Driver Handle (J-8092) and Differential Side Bearing Installer (J-23690).
6. Place calculated amount of shims on differential bearing hub (opposite ring gear side). Place an additional .010" (.25 mm) shim to preload bearings. Drive or press differential bearing onto hub using driver handle and differential side bearing installer.
7. Mount dial indicator on differential housing to measure housing spread, in order to install differential case. See **Fig. 3** . Preload dial indicator to .020" (.51 mm), then rotate gauge to zero dial. Using Drive Axle Housing Spreader (J-24385-01), spread drive axle housing, while observing indicator. DO NOT spread housing more than .015" (.38 mm), or housing damage may result.
8. Remove dial indicator. Install races to differential case bearings. Install differential case into drive axle housing. If necessary, use rawhide or rubber mallet to properly seat differential case into housing.
9. Remove drive axle housing spreader. Install bearing caps and tighten to specification. See **TORQUE SPECIFICATIONS** .

Checking Ring Gear Backlash

1. Mount Dial Indicator (J-39704) onto drive axle housing. See **Fig. 9** . Place dial indicator tip at heel end of ring gear tooth. Check backlash at 3 equally spaced locations around ring gear.
2. Backlash should be .005-.009" (.13-.23 mm). Ensure variation between points checked is not more than .002" (.05 mm). High backlash is corrected by moving ring gear closer to drive pinion. Low backlash is corrected by moving ring gear away from pinion.
3. To adjust backlash, remove both differential case side bearings. Move shims from one side to other.
4. When backlash is correct, check ring gear tooth contact pattern. See GEAR TOOTH CONTACT PATTERNS article in GENERAL INFORMATION.
5. To complete assembly, install NEW cover gasket and cover. Tighten cover bolts to specification. See **TORQUE SPECIFICATIONS** . Install axle shafts. Fill drive axle with lubricant.

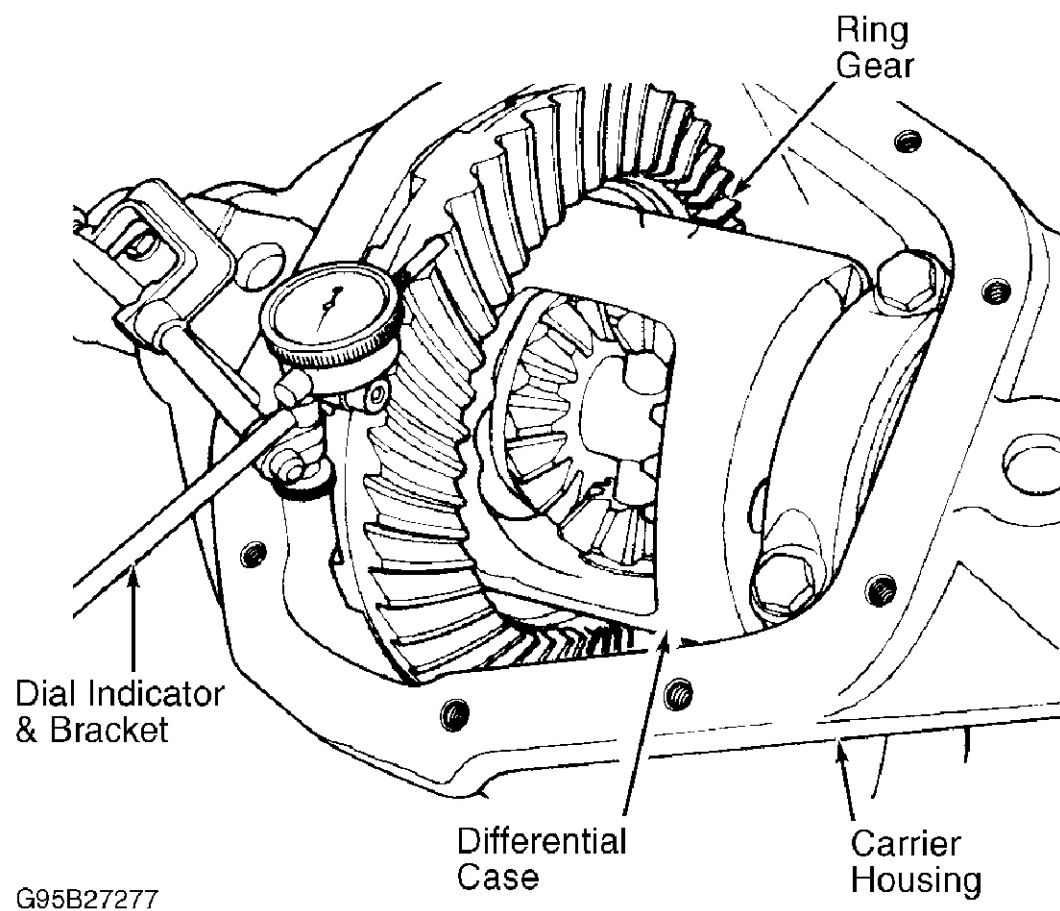


Fig. 9: Checking Ring Gear Backlash
 Courtesy of CHRYSLER CORP.

DRIVE AXLE ASSEMBLY SPECIFICATIONS

DRIVE AXLE ASSEMBLY SPECIFICATIONS ⁽¹⁾

Application	Specification
Pinion Bearing Preload	
New Bearings	15-30 INCH Lbs. (1.7-3.4 N.m)
Used Bearings	10-25 INCH Lbs. (1.1-2.8 N.m)
Ring Gear Backlash	.005-.009" (.13-.23 mm) ⁽¹⁾
(1) Adjustment shims are available in .003" (.08 mm), .005" (.13 mm), .010" (.25 mm) and .030" (.76 mm) thicknesses.	

TORQUE SPECIFICATIONS

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Applications	Ft. Lbs. (N.m)
Anchor Nut (Rear Disc)	78 (106)
Axle Flange Bolt/Nut	
10 1/2"	115 (156)
11"	(1)
11 1/2"	148 (200)

Bearing Cap Bolt	
10 1/2"	136 (185)
11"	85 (115)
11 1/2"	153 (207)
Brake Backing Plate Bolt	
2000	
"C" & "K" Series Truck (New Style)	100 (135)
"C" & "K" Series Truck (Old Style)	
10 1/2"	110 (150)
11"	77 (105)
"G" Van	(1)
2001	
"C" & "K" Series Truck	103 (140)
"G" Van	103 (140)
Drive Shaft Bolt	
"G" Van	15 (20)
"C" & "K" Series Truck	18 (25)
Filler Plug	
2000	
"C" & "K" Series Truck (New Style)	44 (60)
"C" & "K" Series Truck (Old Style)	
10 1/2"	26 (35)
11"	24 (33)
"G" Van	30 (40)
2001	
"C" & "K" Series Truck	24 (33)
"G" Van	24 (33)
Housing Rear Cover Bolt	
	30 (40)
Lower Shock Mount Nut	
"C" & "K" Series Truck (New Style)	70 (95)
"C" & "K" Series Truck (Old Style)	
Except 2WD-3500 HeavyDuty (Dual Wheel)	74 (100)
2WD-3500 HeavyDuty (Dual Wheel)	52 (70)
"G" Van	
2000	59 (80)
2001	79 (107)
Pinion Nut	
10 1/2"	(1)
11"	470 (637)
11 1/2"	(1)
Ring Gear Bolts	
10 1/2"	122 (165)
11"	220 (298)
11 1/2"	175 (237)
Wheel Lug Nuts	
2000	

"G" Van	140 (190)
"C" & "K" Series Truck (New Style)	140 (190)
"C" & "K" Series Truck (Old Style)	
Except 2WD-3500 HeavyDuty (Dual Wheel)	125 (170)
2WD-3500 HeavyDuty (Dual Wheel)	162 (220)
2001	
"C" & "K" Series Truck	177 (240)
"G" Van	177 (240)
(1) Not provided by manufacturer.	

