DANA/SPICER FULL FLOATING AXLES

Chevrolet (1965-74)
Dodge (1965-74)
Ford (1965-74)
GMC (1965-74)
International Harvester (1965-74)
Jeep (1965-74)
Plymouth (1974)

NOTE — Some models use other units, see appropriate vehicle manufacturer on Contents Page.

DESCRIPTION

Axle is banjo-type housing, "overhung" mounted hypoid drive pinion, integral differential carrier type axle assembly used in front and rear locations, and with open-type or closed-type steering knuckles. Whether used in front or rear, axles are similar except for steering knuckles and locking hubs used on front wheel drive units. *See Steering Knuckles and Locking Hubs in this Section*

AXLE RATIO & IDENTIFICATION

Dana/Spicer Model Identification — Model Series can be determined two ways. It is cast on differential housing in one of three locations: Right rear, on rib below axle housing; on top, to right of centerline; on bottom, on rib between axle bore and pinion bore. Model Series can also be determined by diameter of ring gear.

Model Series Identification

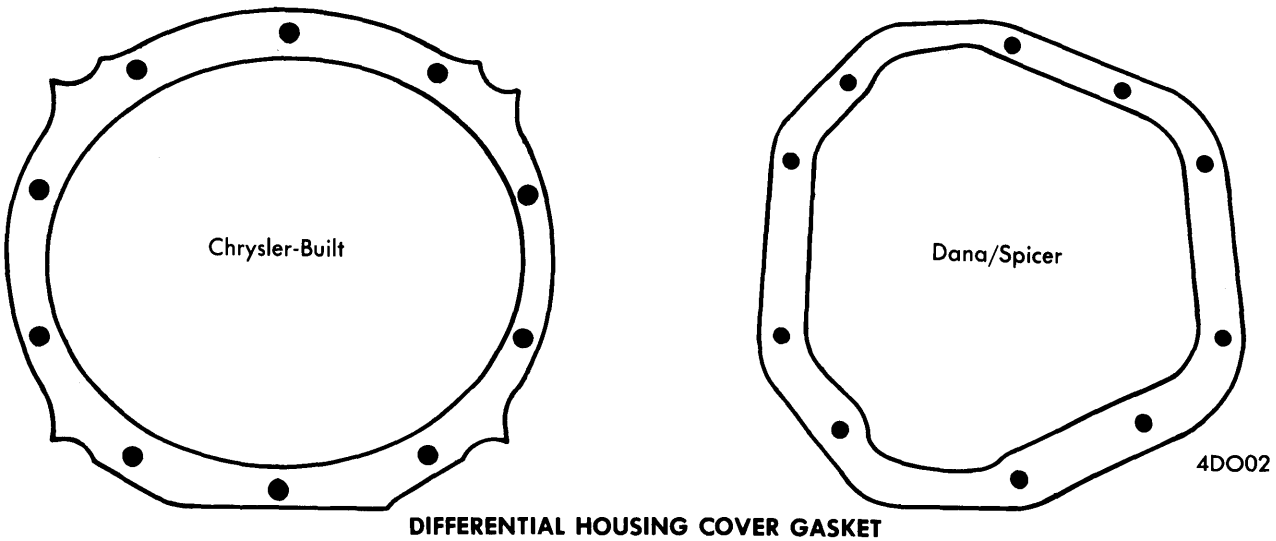
Ring Gear Diameter	Model Series Number
7.125"	27-XX, 30-XX
8.5"	44-XX
9.25"	53-XX
9.75"	60-XX
10.5"	70-XX

1965-69 Chevrolet & 1965-72 GMC — Axle Model Number is stamped on right rear of differential housing. Axle ratio is stamped on metal tag attached to bolt on left side of differential housing cover.

1970-74 Chevrolet & 1973-74 GMC — Ratio code or number is stamped on forward side of axle housing tube. This identification is usually found on right tube but may be found on left tube. It is adjacent to differential housing.

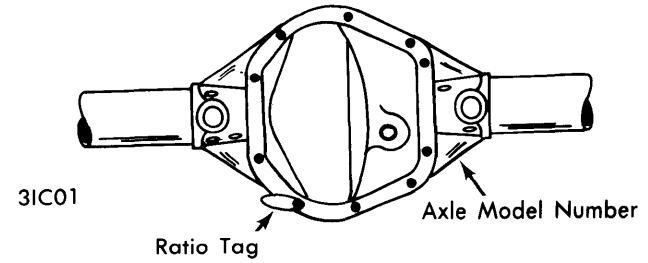
Axle Ratio Codes

Ratio	Conventional	Positive Traction
1970 (Chev. Only)		
3.73-1	TDF	TDK
4.56-1	TYS	
1971 (Chev. Only)		
3.54-1	TKD, TKH, TKP	TKG, TKJ, TKR
3.73-1		THL
4.10-1	TAJ,TJS,TKK,TKS TJP,TJS,TKK,TKS	TJJ,TKL TJJ,TKL
4.56-1	TKW, TRA, TRC TRD, TRG	
1972 (Chev. Only)		
3.54-1	RKD, RKH RKP, RKR	RKG, RKJ
3.73-1	RAW	RAX
4.10-1	RAJ, RJB, RJH, RJP RJS, RKB, RKK, RKS	RAH, RJA, RJJ RKC, RKL, RKT
4.56-1	RKW, RKX, RRA RRC, RRG	RRB, RRD RRH
1973 (Chev. & GMC)		
3.07-1	TAH	TAJ
3.73-1	TBH, TLM TLS, TLW	TBJ, TLT TLX
4.10-1	TFR, TKB TKD, TKM	TFM, TKA TKC, TKL
4.56-1	TFZ, TKS, TKU TLA, TLC	THB, TKR TKT, TLB
4.88-1	MLT	
1974 (Chev. & GMC)		
3.07-1	TAH, KAH	KAJ, TAJ
3.73-1	TBH, KBH, KKC KKF, KKM	TBJ, KBJ, KKD KKH, KKN
4.10-1	KJS, KJU, KMF KMM, KMR, KMZ KMA, KMC, KMJ	KJT, KJW, KMH KMN, KMU, KMB KMD, KMK
4.56-1	KFA, KFB, KFD, KRF KRN, KRZ, KRT, KRA KRC, KRK, KRS	KFC, KFF, KRJ KRR,KSA, KRU, KRW, KRB, KRD, KRM
4.88-1	KTA	



DIFFERENTIAL HOUSING COVER GASKET

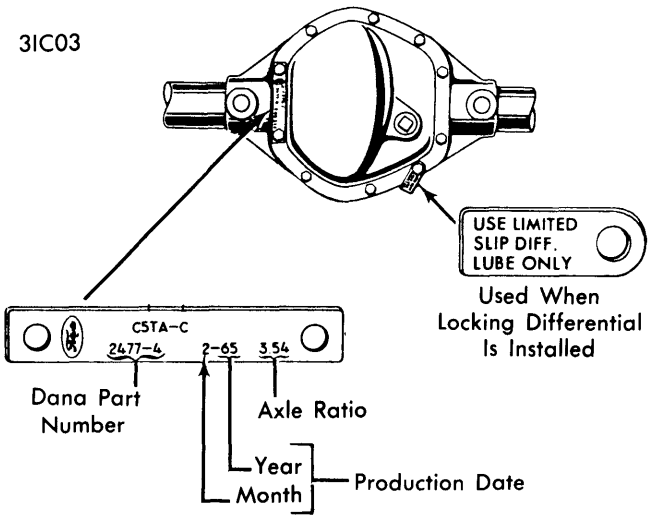
DANA/SPICER FULL FLOATING AXLES (Cont.)



AXLE MODEL & RATIO TAG LOCATION

Dodge – Some Chrysler built drive axles also used an integral housing. Dana/Spicer drive axles can be distinguished from these by the shape of the differential housing cover gasket (see illustration).

Ford – All axles with integral housing are Dana/Spicer. The axle ratio is stamped on a metal tag attached to two differential housing cover screws.



FORD RATIO TAG LOCATION

International Harvester – Axle can be identified by code number on Part Code Sheet found in glove compartment and mounted on sun visor, or by corresponding model number found on metal tag on differential housing cover bolt. Metal tag also identifies axle ratio. All front drive axles are Dana/Spicer.

IHC Dana/Spicer Axle Identification

Model Number	Code Number
RA-1	14001
RA-3	14003
RA-4	14004
RA-14	14014
RA-15	14015
RA-16	14016
RA-17	14017
RA-18	14018
RA-23	14023
RA-28	14028
RA-53	14053
RA-54	14054
RA-63	14063
RA-83	14083
RA-84	14084

Jeep – All drive axles are Dana/Spicer. Ratio is stamped on tag attached to cover plate bolt.

REMOVAL & INSTALLATION

FRONT AXLE SHAFTS & BEARINGS

Removal – 1) Support vehicle with front wheel off ground. If equipped with adjustable hubs, see Locking Hubs in this section for removal procedure. Remove adjustable hub or grease cup from wheel. Remove drive flange from shaft and hub.

Drum Brakes Only: Remove lock nut and adjusting nut from shaft and remove wheel, hub, and drum as an assembly. Disc Brakes Only: Remove bolts holding disc brake caliper assembly and place assembly out of way. Remove rotor and hub assembly. All: Remove backing plate or disc brake shield and tap spindle loose with soft-faced hammer. Remove spindle and pull axle shaft assembly out of opening.

2) Remove seals from hub and drive bearing cups out with drift pin. Inspect bearings and cups for wear and replace as required. Install bearings and seals in hub.

Installation – To install, reverse removal procedure noting the following: Be sure that inner oil seal (next to differential side bearing in axle housing bore) is not damaged when axle shaft is installed. Tighten bearing adjusting nut to 50 ft. lbs. while rotating wheel; then back off nut 1/6 turn. Be sure that lock nut does not change adjusting nut setting.

REAR AXLE SHAFTS & BEARINGS

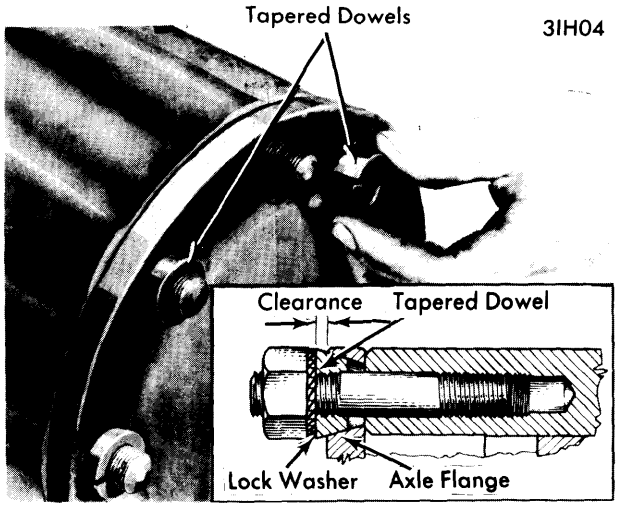
Removal – 1) Remove flange nuts from hub studs. Using a heavy hammer, rap sharply on center of axle flange to loosen tapered dowels (if equipped). Remove dowels. Rap center of flange again to cause flange and axle assembly to spring away from hub. Remove axle without using prying devices which might damage axle flange and hub mating surfaces. To service bearings, remove locking devices and bearing adjusting nut. Pull wheel straight off axle housing using care to avoid dropping bearing cones. Remove and discard seal(s). Remove bearing cones from hub or axle housing.

2) Two methods are used to position outer bearing cup in hub: Seating cup against a machined shoulder, and seating cup against a removable snap ring set into a machined groove. To remove machined shoulder type, drive each bearing cup out of hub using a long drift or suitable tool. To remove snap ring type, remove inner cup with long drift. Remove snap ring with pliers. Using a suitable tool, drive outer bearing and cup out of hub.

Installation – 1) To install machined shoulder type, drive or press inner and outer bearing cups into place using a suitable tool. Make sure that cups are firmly seated against shoulders in hub. To install snap ring type, insert outer bearing cone into hub. Insert bearing cup into hub and drive beyond snap ring groove. Install snap ring. Drive cone and cup assembly back against snap ring making sure that it is fully seated. Install inner bearing cup and cone. Install seal(s).

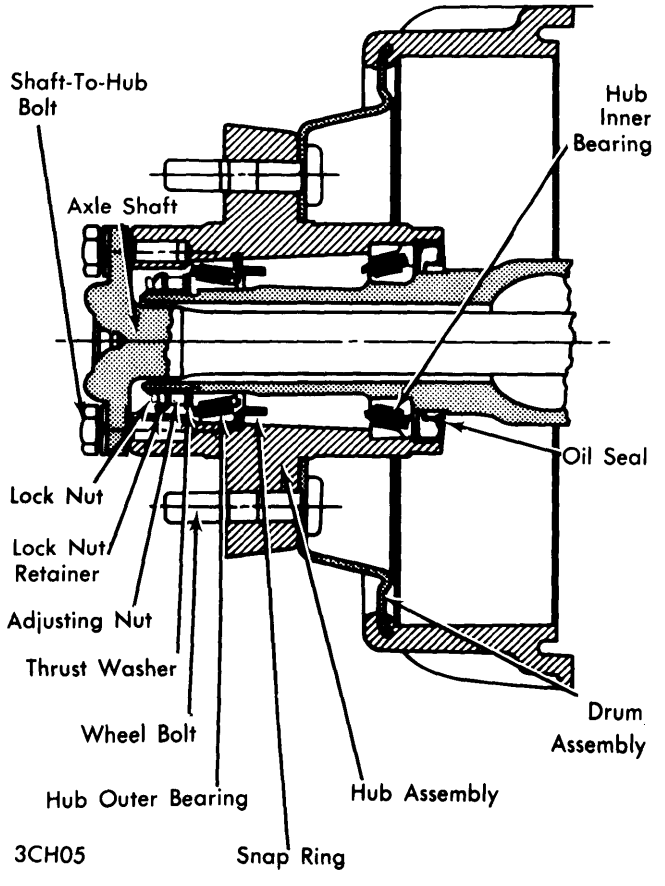
2) Install hub onto axle housing. Install thrust washer and adjusting nut. Tighten adjusting nut while rotating wheel in both directions until bearings just begin to bind (approx. 50 ft. lbs.). Back off adjusting nut 1/6 turn. Install locking device and lock nut. Tighten lock nut making sure that adjusting nut setting is not changed. Lock into place.

DANA/SPICER FULL FLOATING AXLES (Cont.)

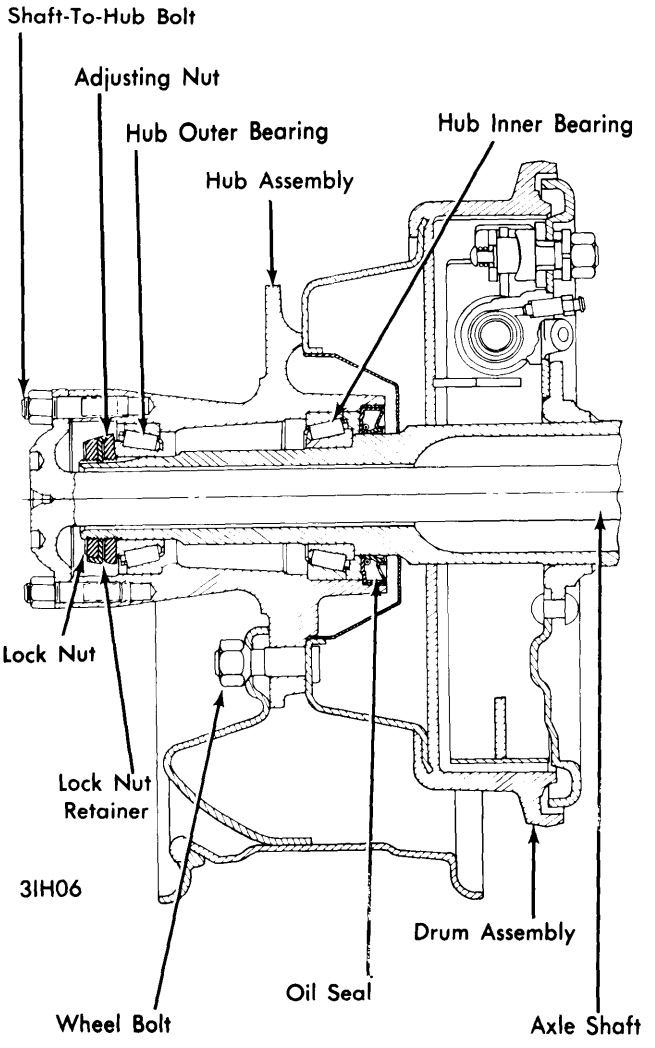


DETAILS OF TAPERED DOWELS

3) Install axle into housing making sure that splined end does not damage seals. Install tapered dowels (if equipped), lock washers, and nuts onto hub studs and tighten evenly. *NOTE — Tapered dowel equipped wheels only: Make sure that clearance exists between lockwasher and axle flange after nuts are tightened. No clearance could cause premature hub or flange failure.*



FULL FLOATING AXLE SHAFT & BEARINGS W/SNAP RING BEARING RETAINER (TYPICAL)



FULL FLOATING AXLE SHAFT & BEARINGS W/MACHINED SHOULDER BEARING RETAINER (TYPICAL)

WHEEL & HUB

See Axle Shafts & Bearings for procedure.

PINION FLANGE & SEAL

NOTE — Pinion seal can be serviced with axle assembly installed in vehicle.

Removal — Disconnect drive shaft and scribe a line down pinion shaft, flange, and nut. Remove nut and, using a suitable tool, remove flange. *CAUTION — Do not hammer flange off. Damage to pinion gear, ring gear, and bearing could result.* Pry seal from bore using care not to damage machined surfaces.

Installation — Lubricate cavity between seal lips with a high melting point lubricant. Install seal into bore making sure that it bottoms against shoulder. Place flange on shaft and draw it down with pinion nut. Tighten pinion nut to specifications. *CAUTION — Failure to tighten pinion nut to full specifications will result in flange or pinion shaft failure.* Install drive shaft.

DANA/SPICER FULL FLOATING AXLES (Cont.)

AXLE ASSEMBLY

Removal – Raise vehicle on hoist and support axle assembly to take weight off springs. Disconnect drive shaft at pinion flange and tie out of way. Remove hub and drum assembly. Disconnect vent tube (if equipped), and disconnect parking brake cable(s) and service brake hydraulic lines. Disconnect shock absorbers at axle brackets. Disconnect springs and remove axle.

Installation – Reverse removal procedure. Do not fully tighten shock absorbers nut until assembly is completed. Bleed hydraulic lines and adjust parking brake before moving vehicle.

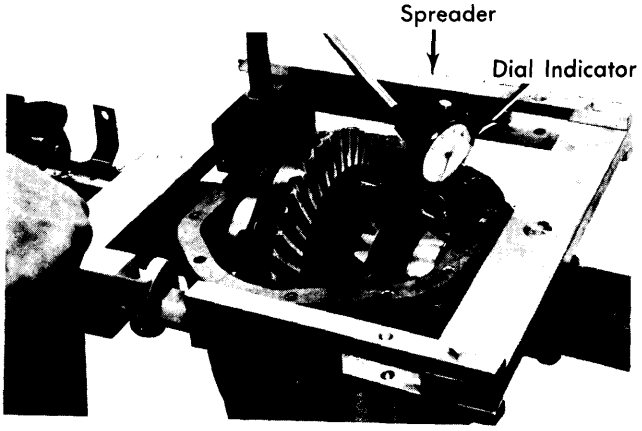
OVERHAUL

DISASSEMBLY

NOTE – Remove axle housing assembly before beginning overhaul.

1) Remove axles and housing cover. Be sure that side bearing caps are marked so that they can later be installed in their original positions. Remove bolts and side bearing caps. Use a housing spreader to spread differential housing .015-.020". Use a dial indicator to measure spread. *CAUTION – Do not spread housing more than .020". Permanent damage to housing could result.* Carefully pry differential case out of housing. Be careful not to damage machined surface of housing. Remove spreader immediately to prevent possibility of carrier taking a set.

2) Remove bolts holding ring gear to differential case. With a small punch drive out lock pin. Remove differential shaft and thrust block. Remove differential pinion gears and thrust washers.



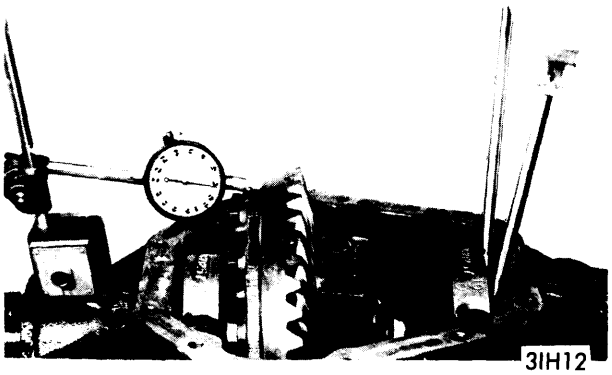
SPREADING DIFFERENTIAL HOUSING (TYPICAL)

3) Remove pinion nut. With suitable puller, remove pinion flange. Using soft-faced hammer, drive pinion shaft out of housing. *NOTE – Pinion bearing adjusting shims may remain on pinion shaft, stick to bearing, or fall loose. Collect them and save them for reassembly.* From pinion shaft bore, remove oil seal and bearing cone. A baffle or an oil slinger may also be present; record the order in which they were removed so that they may be installed correctly. Discard seal. Remove inner bearing cone and press pinion bearing off pinion shaft.

4) Using a suitable puller, remove side bearings from differential case. Often during removal of side bearings, shims between bearings and differential case are mutilated. If so, shims must be individually measured and their thicknesses recorded, so that new shim packs can be secured.

REASSEMBLY & ADJUSTMENT

Case Assembly – 1) Place differential case in holding fixture or vise. Lubricate side and pinion gears and all thrust washers and install in case. Rotate side gears until holes in pinion gears and washers line up with holes in case. Install spacer block (if equipped) and differential pinion shaft. If old thrust washers are used, check for preload of side gears. Clearance between side gears and case should be .000-.006"; if not, shims can be installed (at least one on each side) or new thrust washers used. Install lock pin and peen over hole to retain pin. Inspect ring gear and case for burrs and nicks. Install ring gear and tighten bolts evenly.



MEASURING DIFFERENTIAL ENDPLAY

2) Install differential side bearings. Assemble case in housing WITHOUT shims. Install bearing caps and tighten bolts just enough to seat bearing cups. Mount dial indicator to read at back of differential flange. Measure and record amount of side play of differential case by moving back and forth with a screwdriver (see illustration). The measurement will be used later to determine proper shim pack dimension. Remove case from housing.

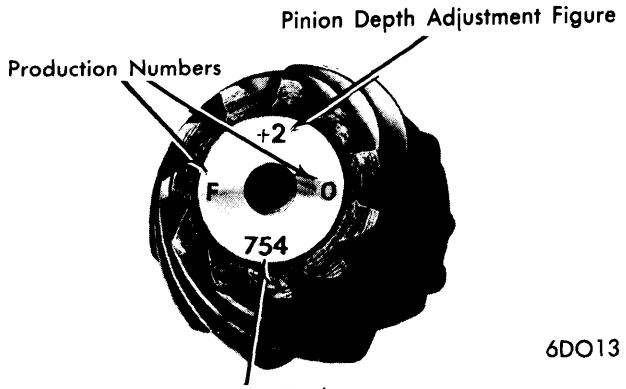
Pinion Depth & Bearing Preload – 1) Pinion is adjusted by shims placed between inner bearing cup and housing, and by shims placed between pinion shaft shoulder and outer bearing. Shims behind inner bearing cup adjust position of pinion in relation to ring gear. Shims behind outer bearing adjust pinion inner and outer bearing preload.

2) If old pinion and ring gear assembly are used, proceed as follows: Install original shims and inner bearing cup. Install outer bearing cup. Press bearing cone onto pinion shaft and install shaft into housing. Install outer bearing cone, companion flange, and nut. Do not install outer shims or seal at this time. Tighten nut to obtain bearing preload of 10-30 ft. lbs. Use a suitable gauge to measure distance from ring gear center to machined button on end of pinion gear. Add or subtract shims from under inner bearing cup to obtain nominal dimension listed in specifications.

3) If new pinion and ring gear assembly are to be installed, proceed as follows: Determine pinion depth adjustment figure (see illustration) of old and new pinions and find shim adjustment figure from chart. Adjust original shim pack accordingly and proceed as in step 2).

DANA/SPICER FULL FLOATING AXLES (Cont.)

4) Remove pinion flange and nut, and remove front pinion bearing cone. Install original preload shim pack. Lubricate and install bearing cone. Install pinion flange and nut and tighten to specifications while rotating pinion shaft. Place housing in position so that pinion shaft is vertical, pointing up. With INCH lb. wrench rotate shaft through several revolutions to measure rotating torque. *NOTE — Ignore torque needed to start shaft rotating.* Check measurement against pinion bearing preload in specifications. To decrease preload, add shims; to increase preload; subtract shims. After adjustment is made, install oil seal and recheck pinion depth.



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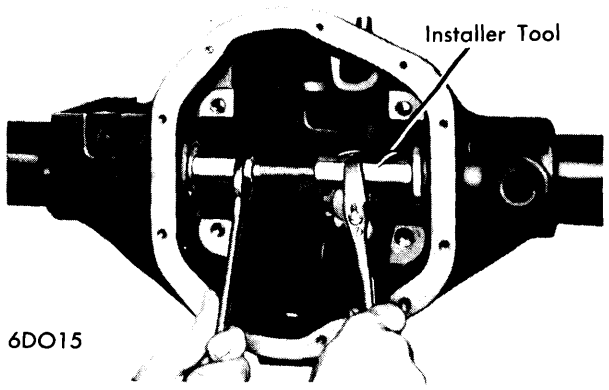
PINION DEPTH ADJUSTMENT FIGURE

5) Front axles only: Check seals in axle housing bores. If condition is questionable, replace using suitable installer tool (see illustration). *NOTE — When installing front axle shafts be sure that these seals are not dislodged.*



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INSTALLING INNER OIL SEALS

Side Bearing Preload — 1) With pinion installed in housing and depth and preload adjustments properly made, install differential case into housing and set dial indicator so that it reads at back of ring gear. Leave bearing cap bolts loose enough to allow movement of case. Insert screwdriver between bearing cap and housing at opposite end from ring gear. Jam case toward ring gear side and, with force still applied to case, set dial indicator to zero. Jam case the other way (making sure that ring and pinion gears mesh) and record reading. Repeat several times until readings are the same. This reading is amount of shims that will go between case and bearing on ring gear side. Install these shims.

2) From the figure originally recorded under Case Assembly, subtract amount of shims just installed on case. Add .015" for bearing preload and install new shim pack on end of case opposite ring gear.

Example: +.070" (Original Recorded Sideplay)
−.032" (Sideplay With Pinion Installed)
=.038" (Amount Left From Original Sideplay)
+.015" (Additional Amount For Bearing Preload)
=.053" (Amount Installed Opposite of Ring Gear)

Old Pinion	New Pinion								
	−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

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PINION DEPTH SHIM ADJUSTMENT CHART

DANA/SPICER FULL FLOATING AXLES (Cont.)

3) Install spreader to housing, spread housing and install differential case. *NOTE — Do not spread housing more than .020". Permanent damage to housing could result.* Install differential assembly. Remove spreader and install bearing caps. Make sure that caps are in original position, then tighten caps evenly.

Backlash & Final Assembly – Mount dial indicator to housing and measure ring gear to pinion gear backlash in three places around ring gear (see specifications). Variation between readings should not exceed .002". Adjust to specifications by moving shims from one side of differential case to other, or by changing depth of pinion gear. Check tooth contact pattern (see Tooth Contact Pattern in this section). Install cover and tighten bolts to specifications.

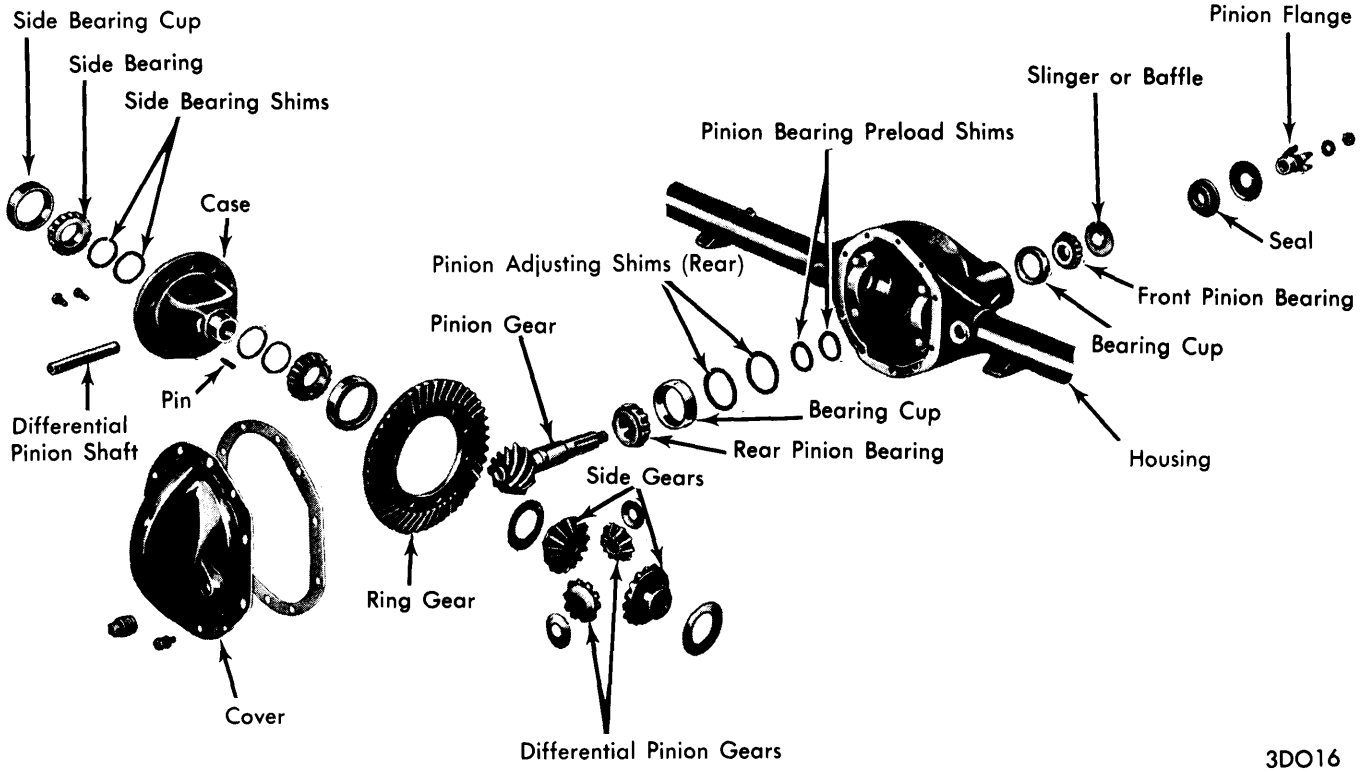
AXLE ASSEMBLY SPECIFICATIONS

Ring Gear Backlash	.005-.009"
Side Bearing Preload	.015"
Pinion Bearing Preload	
New Bearings	20-40 INCH lbs.
Used Bearings	10-20 INCH lbs.
Pinion Gear Depth (Nominal Dimension)	
Models 2558, 2559, 2682	2.625"
Model Series 23 & 30	2.250"
Model Series 25	①
Model Series 27	2.094"
Model Series 44	2.625"
Model Series 53	②
Model Series 60	3.125"
Model Series 70	3.500"

① – Use Jeep Gauge Block (W-101-A-22), side "G".
② – Use Jeep Gauge Block (W-101-A-22), side "F".

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Models 2558, 2559, & 2682	
Model Series 23, 25, 27, 30, 44, & 53	
Pinion Shaft Flange Nut	210
Side Bearing Cap Bolt	
All (Exc. 44 & 53)	45
44 & 53	80
Ring Gear-To-Case Bolt	55
Axle Flange-To-Hub Bolt	35
Axle Shaft Or Bearing Retainer Bolt	65
Cover-To-Housing Bolt	35
Model Series 60-70	
Pinion Shaft Flange Nut	260
Side Bearing Cap Bolt	80
Ring Gear-To-Case Bolt	110
Axle Flange-To-Hub Bolt	
60	55
70	85
Axle Shaft Or Bearing Retainer Bolt	75
Cover-To-Housing Bolt	40



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DANA/SPICER INTEGRAL HOUSING AXLE ASSEMBLY