

AMERICAN MOTORS – FRONT

Eagle

DESCRIPTION

Eagle 4-wheel drive models use the same semi-floating rear axles as used in 2-wheel drive AMC models. Eagle is equipped with a front axle which is engine mounted. This axle is equipped with half-shafts for use with the independent front suspension used on Eagle models. The half shafts transfer torque to front wheels through an integral hub assembly that is mounted in the steering knuckle. The half shafts use Rzeppa type constant velocity joints at the outboard ends and tripod design constant velocity joints at the inboard ends. The shafts are connected to the front axle shafts by flanges. Ring gear diameter for all models is 7 9/16". Axle ratio and number of teeth are stamped on a tag which is on differential cover.

Eagles are equipped with Select Drive system. Select Drive consists of a dash mounted switch, vacuum actuated front axle disconnect and vacuum actuated shift lever in transfer case. See *American Motors Model 129 Transfer Case* in this section. Select Drive provides drive train selection appropriate for road conditions. Selection of "2 WD" activates vacuum operated disconnect which disconnects right half shaft from axle shaft by moving spline clutch coupling. Selection of "4 WD" moves spline clutch coupling to engage right half shaft with axle shaft to deliver driving torque to front wheels. See Fig. 1.

REMOVAL & INSTALLATION

HUBS & BEARINGS

NOTE – Eagle front axle hub and bearing assemblies do not require lubrication or periodic maintenance. The hub has ball or tapered bearings which seat in races in hub. There may be darkened areas surrounding bearing race areas of hub. These darkened areas are from a heat treatment process and should not be mistaken for a problem condition.

Removal – 1) Raise and support front of vehicle. Remove wheel, caliper and rotor. Remove bolts attaching axle shaft flange to half-shaft, remove cotter pin, nut lock and axle hub nut. Remove half-shaft.

2) Remove steering arm from steering knuckle, remove caliper anchor plate from steering knuckle. Remove 3 torx head bolts retaining hub assembly using suitable tool (J-25359). Remove hub assembly from steering knuckle.

3) Press hub out of hub and bearing carrier. Remove splash shield, bearings, hub spacer, steering knuckle pin seal, hub seal, carrier "O" ring and bearing spacer (if equipped). Remove outer bearing races.

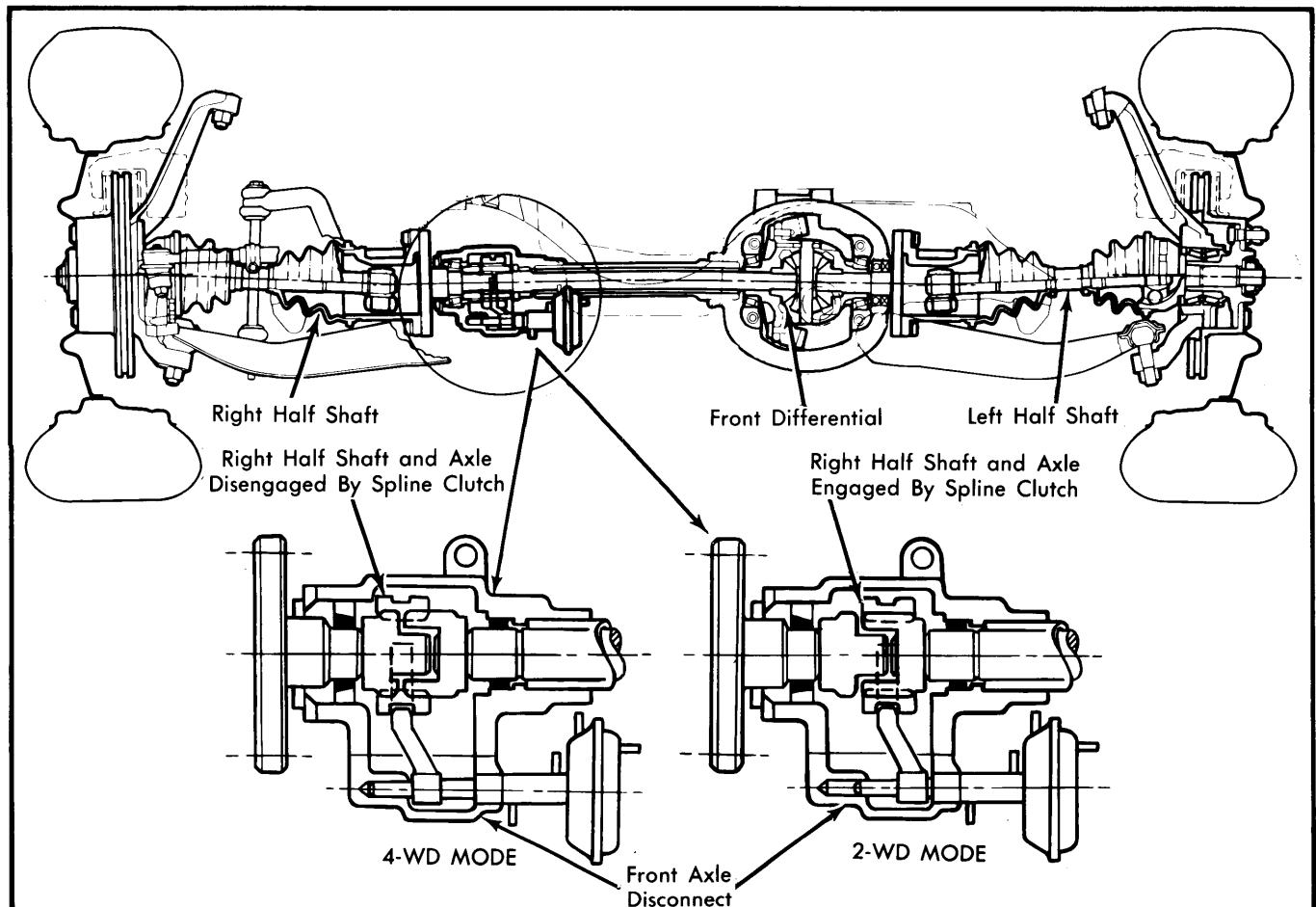


Fig. 1 Exploded View of Eagle Select Drive System with Exploded View of Front Axle Disconnect

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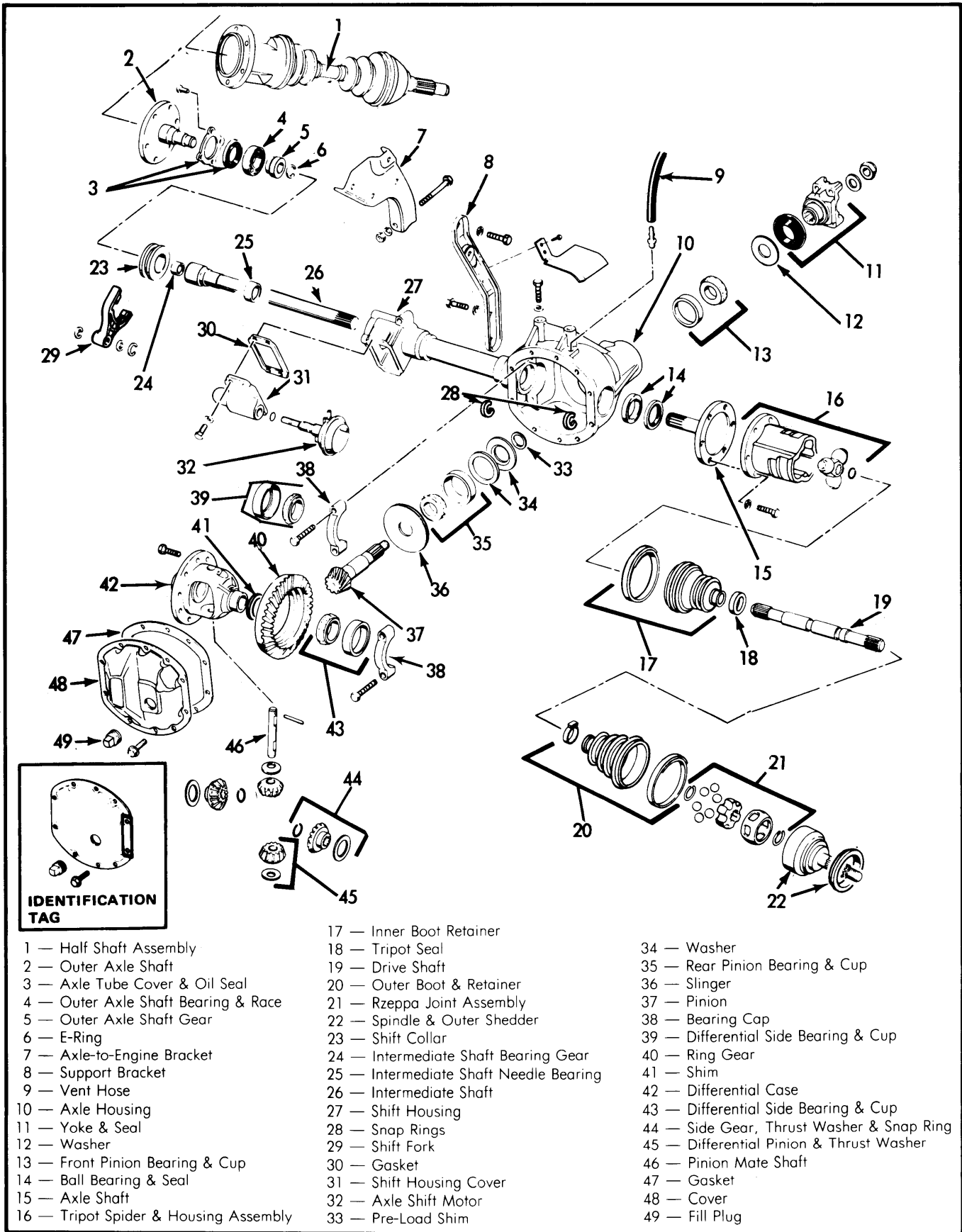


Fig. 2 Exploded View of Eagle Front Axle Assembly

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NOTE — If hub contains tapered bearings, internal components may be serviced or replaced. If hub contains ball bearings, internal components cannot be serviced. Hub must be replaced if internal damage is evident.

Installation — 1) Fill cavities in steering knuckle pin, hub and bearing carrier and lip-type seals with lithium base grease. Pack bearings with same lubricant and install bearings and spacer (if equipped). Install hub seal. Press hub through bearings and install hub spacer on hub shaft. Install steering knuckle pin inner seal.

2) Install splash shield on hub and bearing carrier, then install "O" ring. Install carrier assembly in steering knuckle pin and tighten attaching bolts. Partially fill hub cavity of steering knuckle with chassis lubricant and install hub assembly. Tighten hub torx head bolts. Install caliper anchor plate and tighten retaining bolts.

3) Install steering arm bolts and tighten. Install half-shaft. Install axle flange-to-shaft bolts and install hub nut. Tighten half-shaft-to-flange bolts. Tighten hub nut. Install nut lock and cotter pin. Install rotor, caliper and wheel.

AXLE SHAFTS, BEARINGS & SHIFT HOUSING

Removal (Right Side) — 1) Remove front axle assembly. Remove housing cover and drain lubricant. Remove shift housing attaching bolts, remove shift fork, housing and shift motor as an assembly. Remove axle tube cover retaining screws. Screws are accessible through access hole in outer axle shaft flange. Tap axle shaft out using rubber or plastic mallet. Remove snap ring that retains intermediate shaft in differential.

2) Remove intermediate shaft and shift collar. Remove outer axle shaft bearing race using puller tool (J-26941) and slide hammer (J-2619-6). Remove intermediate shaft needle bearings from axle tube end using adapter tool (J-26225) and slide hammer (J-6471-2). Remove intermediate shaft gear bearing using tool (J-29369-1 and J-2619-01).

NOTE — The intermediate shaft gear is retained on shaft by an internal-type expandable snap ring. When removing bearing from gear, be sure to support gear face on vise jaws to avoid pulling gear off the shaft. The gear gear and shaft are serviced as an assembly only.

3) Remove "E" ring that retains outer axle shaft gear on shaft. Mark outer axle shaft gear position for reassembly, and remove gear from shaft. Using arbor press remove outer axle shaft bearing. Remove oil seal and axle tube cover from outer axle shaft. Clean and inspect all components for wear, cracks, scoring or galling. Replace component that shows these conditions.

NOTE — The intermediate shaft gear is retained on shaft by an internal-type expandable snap ring. When removing bearing from gear, be sure to support gear face on vise jaws to avoid pulling gear off the shaft. The gear and shaft are serviced as an assembly only.

Installation — 1) Install axle tube cover and oil seal on outer axle shaft. Using arbor press install outer axle shaft bearing and race on shaft. Install outer axle shaft gear on shaft using arbor press. Gear splines must be facing outward. Install "E" ring on outer shaft. Install intermediate shaft needle bearing in axle tube using installer tool (J-29153). Using arbor press install intermediate shaft gear needle bearing in gear bore. Place intermediate shaft in axle tube, install shift collar on intermediate shaft and seat shaft in differential.

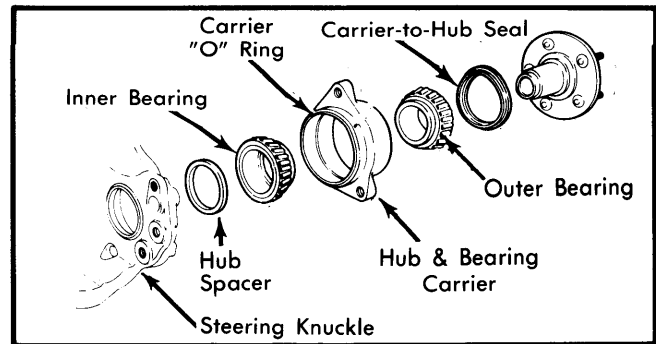


Fig. 3 Exploded View of Eagle Axle Hub Assembly

2) Install outer axle shaft assembly and install axle tube cover bolts evenly and in a cross pattern to seat bearing race and seal. Torque bolts to 144 INCH lbs. (16.2 N•m). Install gasket on shift housing cover and install gasket and axle shift housing. Be sure shift fork and tabs are aligned in shift collar. Install axle cover gasket and install cover. Fill shift housing with 5 ounces of gear lubricant and install plug. Fill axle housing to edge of fill plug hole with suitable lubricant and install plug.

Removal & Installation (Left Side) — 1) Remove axle assembly. Remove axle housing cover and drain lubricant. Remove "C" clips that retain axle shafts in differential. Remove axle shafts. Remove axle shaft seal using screwdriver. Install shaft seal using installer tool (J-29152 on right side and J-29154 on left side).

2) Install axle shaft. Install shaft retaining "C" clips. Install housing cover and fill differential with suitable lubricant. Fill axle shaft housing with 5 ounces of lubricant.

YOKE & PINION OIL SEAL

Removal — Raise vehicle, mark propeller shaft and yoke for reassembly reference. Remove propeller shaft. Remove pinion nut and washer, then remove yoke and pinion seal.

Installation — Install pinion seal using seal driver tool (J-25104). Install yoke, pinion washer and nut. Tighten pinion nut. Align reference marks on yoke and propeller shaft. Install and tighten attaching bolts.

FRONT AXLE ASSEMBLY

Removal — 1) Raise and support front of vehicle. Install half shaft boot protectors (J-28712) on boots. Remove half shafts and tie to vehicle underbody. Insert wire through half shaft flange bolt holes, compress half shaft and wrap wire between boots to prevent separation.

2) Mark propeller shaft and yoke for reassembly. Support axle assembly on hydraulic jack. Remove axle mounting bolts, partially lower axle assembly to disconnect vent hose. Lower and remove axle assembly.

NOTE — Do not apply any weight to hub assembly when half-shafts are not securely attached to axle shaft flanges.

Installation — Support axle assembly on hydraulic jack. Partially raise axle assembly to allow installation of vent hose. Raise axle into position. Install and tighten mounting bolts. Connect propeller shaft to yoke using reference marks as an aligning point. Install half-shafts and tighten bolts.

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OVERHAUL

DISASSEMBLY

1) Remove axle assembly as previously described. Remove axle housing cover, mark bearing caps for reassembly reference. Loosen bearing cap bolts, install axle spreader tool J-24385-01 and adapters J-24161. Mount dial indicator on axle housing with stylus contacting one side of housing.

2) Spread housing no more than .020". Remove dial indicator, bearing caps and differential assembly by prying out of housing with a bar. Remove spreader tool.

NOTE — Spreader tool must be removed after differential assembly is removed from housing to prevent housing from remaining set.

3) Mount differential in vise, remove and discard ring gear attaching bolts. Remove ring gear, use brass hammer to tap gear off case. Remove pinion mate shaft lock pin using small pin punch. Remove pinion mate shaft and thrust block, rotate pinion gears until gears are aligned with case opening and remove pinion gears, side gears and thrust washers. Remove differential side bearings with puller. Remove and discard preload shims (if used).

4) Remove pinion nut, dust cap and yoke. Tap yoke end of gear with rawhide mallet to drive pinion out of rear bearing and housing. Assemble bearing remover set J-25100 on bearing and gear, remove bearing from gear. Assemble bearing set J-25100 on bearing case and remove bearing from case.

NOTE — Pinion bearing preload adjusting shims may remain on pinion shaft, stick to front bearing or fall out. Collect, tag and retain preload adjusting shims for reassembly.

5) Remove pinion rear bearing cup by tapping out of housing with brass punch. Remove pinion depth shims and retain for reassembly. Repeat procedure for front bearing cup.

INSPECTION

Clean all parts in solvent, allow all bearings to air dry. Dry all other parts with compressed air. Inspect all parts for damage or wear and replace as necessary.

REASSEMBLY

Drive Pinion — 1) Measure thickness of pinion depth shim removed during disassembly. Record pinion depth variance numbers etched on old and new pinion gears. Refer to pinion variance chart and determine amount to be added or subtracted from original shim to arrive at starter shim thickness.

2) Install pinion front bearing cup in housing bore. Install starter shim in rear bearing bore. Center shim to prevent tipping bearing cup and install shim with chamfer (if equipped) facing housing bore. Install original oil slinger on pinion.

3) Ensure slinger is seated against pinion head, then install rear bearing. Install pinion gear in housing. Install pinion front bearing, pinion yoke, washer and old pinion nut. Tighten nut only enough to remove free play.

NOTE — A new nut, pinion seal, slinger or dust cap are not installed at this time. Pinion will be removed after depth measurement.

Differential Case — 1) Install differential side bearings onto case with bearing driver and installer. Install thrust washers on side gears (oil pocket side toward gear). Install gears into bores in differential case. Install thrust washers behind pinion gears. Mesh gears with side gears so holes are opposite each other and in line.

2) Roll gears around until pinion gear holes are aligned with shaft holes in case. Measure any existing clearance between differential side gears and case, using 2 feeler gauges on opposite sides of 1 gear. Clearance should not exceed .006". If clearance exceeds .006", replace differential case. Install lock pin.

ADJUSTMENTS

Drive Pinion Depth — 1) Note pinion depth variance marked on pinion gear. If number is preceded by a plus (+) sign, add that amount (in thousands) to standard setting for axle model being overhauled. If number is preceded by a minus (-) sign, subtract that amount (in thousands) from standard setting.

2) Assemble gauge arbor J-5223-4 and discs J-5223-26. Install arbor and discs in differential bearing cup bores. Install bearing caps and tighten. Install gauge block J-5223-20. Position block so plunger is directly under arbor J-5223-4

NOTE — Do not tighten bearing caps to specification.

3) Assemble bolt J-5223-29 and clamp J-5223-24 and mount tools on axle housing. See Fig. 4. Extend clamp bolt until it presses against gauge block. Align gauge block plunger with center of gauge arbor and tighten clamp bolt until it presses against block with enough force to prevent block from moving.

4) Loosen gauge block thumbscrew and release plunger. When plunger contacts arbor tool, tighten thumbscrew to lock plunger in position. Remove clamp and bolt from axle housing, remove gauge block and measure distance from end of anvil to end of plunger. This dimension represents measured pinion depth.

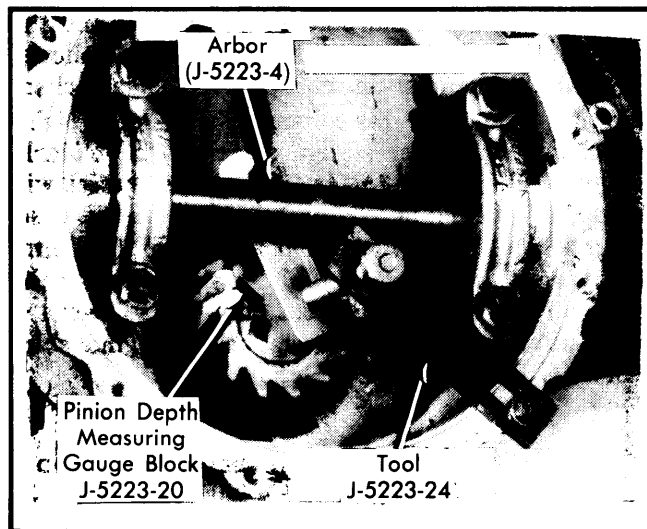


Fig. 4 Measuring Drive Pinion Depth

Drive Axles

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5) Remove bearing caps and remove arbor tool. Remove pinion gear, rear bearing cup and depth shim from axle housing. Measure thickness of depth shim, add this dimension to measured pinion depth obtained previously. From this total, subtract desired pinion depth. Result represents shim thickness required to adjust pinion depth.

Pinion Bearing Preload – 1) Install preload shims on pinion. Install pinion gear, front bearing, oil slinger, yoke, washer and old pinion nut. Tighten nut to 260 ft. lbs. Using an INCH lb. torque wrench, measure torque required to turn pinion. Add shims to decrease preload; subtract shims to increase preload.

NOTE – Rotating torque should be 20 to 40 INCH lbs. with new bearing, or 10 to 20 INCH lbs. with old bearing.

2) Remove pinion nut, washer and yoke. Install new oil seal with seat driver tool (J-25104). Install yoke and pinion washer. Install NEW pinion nut and tighten to 210 ft. lbs.

Differential Bearing Preload – 1) Place outer bearing races on bearings and install differential into housing. Install bearing caps and tighten securely (not to specification). Hold ring gear in contact with pinion gear. Using a screwdriver, pry differential outer bearing races toward center of case.

2) Insert various thickness feeler gauges between each outer bearing race and axle housing until ring gear backlash is .001-.002" with feeler gauges installed at both sides of differential at same time. Assemble shim pack that will provide desired backlash. Insert shims between bearing outer races and housing. Recheck backlash. When correct backlash is obtained, remove, tag and retain shims.

3) Remove differential case from housing. Add an additional .015" shim to drive tooth side of ring gear shim pack. Remove differential bearings. Install preselected shim packs to appropriate sides of differential case, spread housing no more than .020" and reinstall bearings. Install differential in housing and remove spreader. Ring and pinion gear teeth must mesh completely. Install bearing caps, apply sealing compound to bearing cap bolts and tighten bolts.

Ring Gear Backlash — 1) Mount dial indicator on housing and measure ring gear backlash at 2 points. Backlash should be .005-.010". If backlash is not to specifications, add or subtract shims from 1 bearing shim pack. Alternate shims from side-to-side, do not change total thickness of shims.

2) Reposition dial indicator to back side of ring gear and measure ring gear runout. If runout exceeds .006", case may be distorted, there may be dirt between case and gear or ring gear bolts are loose.

Check and correct as necessary. Remove dial indicator, install axle shaft, housing cover and fill axle with 2.5 pints of gear lubricant.

NOTE – Altering the position of a .005" shim will change backlash approximately .003".

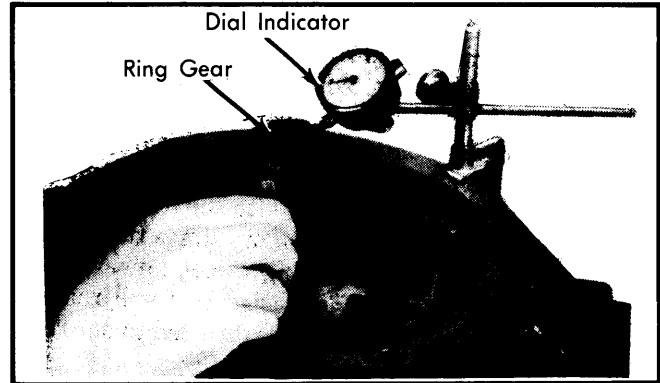


Fig. 5 Measuring Ring Gear Backlash

AXLE ASSEMBLY SPECIFICATIONS

Application	Specifications
Capacity	2.5 Pts.
Pinion Bearing Preload	
New Bearings	20-40 INCH Lbs.
Old Bearings	15-25 INCH Lbs.
Differential Bearing Preload15"
Ring Gear Backlash005-.010"
Gear-to-Case Clearance000-.006"

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N·m)
Housing Cover	20 (27)
Differential Bearing Cap Bolts	40 (54)
Ring Gear-to-Case Bolts	55 (75)
Pinion Nut	210 (286)
Universal Joint Bolts	17 (23)
Axle Mounting Bolts	50 (68)
Axle Shaft-to-Half Shaft	45 (61)
Axle Torx Head Bolts	75 (102)
Axle Hub Nut	180 (245)
Caliper Plate Bolts	100 (136)

PINION VARIANCE CHART

Old Pinion Marking	New Pinion Marking								
	-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