GENERAL MOTORS INTEGRAL HOUSING

Buick
Cadillac Seville
Chevrolet
Oldsmobile
Pontiac

DESCRIPTION

Semi-floating hypoid gear type with integral housing, with centerline of pinion set below centerline of ring gear. Differential is designed for use with an open drive line and coil or leaf springs. A removable steel cover, bolted to rear of housing, permits service of differential case without removing complete axle assembly from vehicle.

AXLE RATIO & IDENTIFICATION

Rear axle ratio, differential type, manufacturer and build date information is stamped on the forward side of the right axle tube except for "B" axles and Corvette. A tag giving this information is attached by a cover bolt at the seven o'clock position on "B" axles.

Corvette axle information is stamped on bottom edge of differential carrier flange. First two LETTERS indicate axle code and third LETTER indicates manufacturer: "B" - Buick, "C" - Chevrolet Buffalo, "G" - Chevrolet Gear and Axle, "K" and "M" - G.M. of Canada, "O" - Oldsmobile and "P" - Pontiac.

Axle shafts on "B" types are retained by an outer retainer bolted to the brake backing plate and an inner retainer which is pressed against the inner bearing race. All other axles are retained in housing by "C" locks positioned in circular grooves near inner ends of axle shafts.

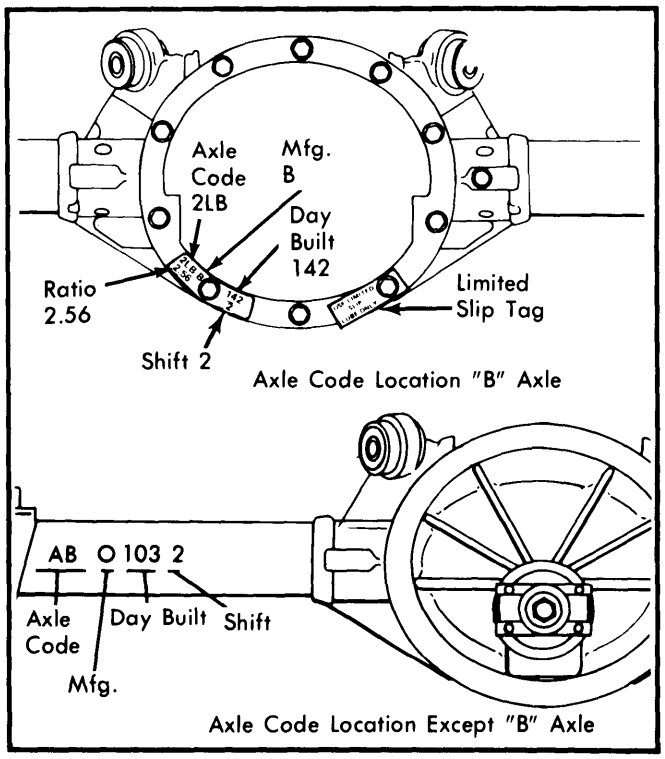

Fig. 1 Axle Ratio Code Location

Axle Ratio Identification

BUICK

Axle Ratio	Conventional	Positive Traction
2.29-1	AH, RA	BH
2.41-1	AJ, AZ, GF, KA, LA, TE, WL	BJ, BZ, KZ, NR, TV, WN.
2.56-1	EB, FB, KB, RL, WA, YD	EY, KY, RC, TZ, YU, WR
2.73-1	AB, AX, KC, LC, MS, RD, RX, WF, YE	BB, BX, KX, KZ, MV, NC, WX, YW
2.93-1	AG, ED	BG, EW
3.08-1	KF, LF, TC, WM, WN, YJ	KU, NF, TX, WD, WP, YY
3.23-1	AD, FE, KG, LG, RU, WK, YK	BD, BU, KT, NG, TW, WZ, YZ

CADILLAC SEVILLE

Axle Ratio	Conventional	Positive Traction
2.56-1	ME	MD
3.08-1	MJ	MG

CHEVROLET

Axle Ratio	Conventional	Positive Traction
2.29-1	RA	BH
2.41-1	AZ, GF, LA, PJ, TE	BZ, NR, PS, TV
2.56-1	AA, RC, YD	BA, YU
2.73-1	AB, AX, FC, LC, PA, RD, RX, TB	BB, BX, FX, NC, PU, TY
2.93-1	AG	BG
3.08-1	LF, PC, TC, YJ	NF, PW, TX, YY
3.42-1	PE	PY
3.73-1	PF	PZ

CHEVROLET CHEVETTE

Axle Ratio	Conventional	Positive Traction
3.70-1	QU, QW	
4.11-1	QX, QY	

CHEVROLET CORVETTE

Axle Ratio	Positive Traction
3.08-1	OK
3.36-1	OM
3.55-1	OH
3.70-1	OJ

CHEVROLET MONZA

Axle Ratio	Conventional	Positive Traction
2.29-1	EA	EZ
2.56-1	EB	EY
2.73-1	EC	EX
2.93-1	ED	EW
3.08-1	EJ	ER
3.23-1	EE	EV

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

OLDSMOBILE

Axle Ratio	Conventional	Positive Traction
2.29-1	AH, EH, RA	BH,EZ
2.41-1	AJ, AZ, FH, GF, KA, LA, RB, TE	BJ, BZ, FZ, KZ, NR, TU
2.56-1	AA, AY, EB, FB, GA, KB, LB, RC, RY, YD	BA, BY, EY, FY, KY, NB, YU
2.73-1	AB, AX, EC, FC, FJ, KC, LC, RD, RX, YE	BB, BX, EX, FP, FX, KX, NC, YW
2.93-1	AG, AW, ED, FD, FM, RE, RW	BG, BW, EW, FN, FW
3.08-1	AC, AV, EJ, FG, FK, KF, LF, RF, RV, TL, YJ	BC, BV, ER, FQ, FT, KU, NF, TX, YY
3.23-1	AD, AU, EE, FE, KG, LG, RG, RU, YK	BD, BU, EV, FV, KT, NG, YZ
3.42-1	FF, FL	FR, FU

PONTIAC

Axle Ratio	Conventional	Positive Traction
2.29-1	AH, EA, RA	BH, EZ
2.41-1	AJ, AZ, GF, MN, PJ, RB, TE	BJ, BZ, MZ, PS, TV
2.56-1	AA, EB, FB, KJ, KK, LA, PH, RC	BA, EY, FY, KR, KS, NF, NR, PT
2.73-1	AB, AX, EL, KN LC, MS, YE	BB, BX, EX, MV, NC, YW
2.93-1	AG, ED	BG, EW, RG
3.08-1	EJ, MP, PC, TC, YJ	ER, MY, PW, TX, YY
3.23-1	AD, AU, EE, FE, LG, MO, PD, YK	BD, BU, EV, FV, MX, NG, PX, YZ
3.42-1	FF, PE,	FU, PY

REMOVAL & INSTALLATION

CORVETTE WHEEL SPINDLE & SUPPORT

See Corvette Rear in SUSPENSION Section.

AXLE SHAFTS

"B" Type – Buick built axles are retained by an inner retainer and an outer retainer which is bolted to the brake backing plate. Maximum end play for "B" axles is from .002—.020". Do not attempt to shim bearing or housing to take up excess clearance. Components causing excess clearance must be replaced. Remove wheels and brake drums, then remove retainer plate from brake backing plate. Hold backing plate in place with screws, then remove axle shaft using adapter and slide hammer. To install, coat splines with gear lube and seal surfaces of axle shaft with wheel bearing grease. Carefully install axle shaft and reverse removal procedures.

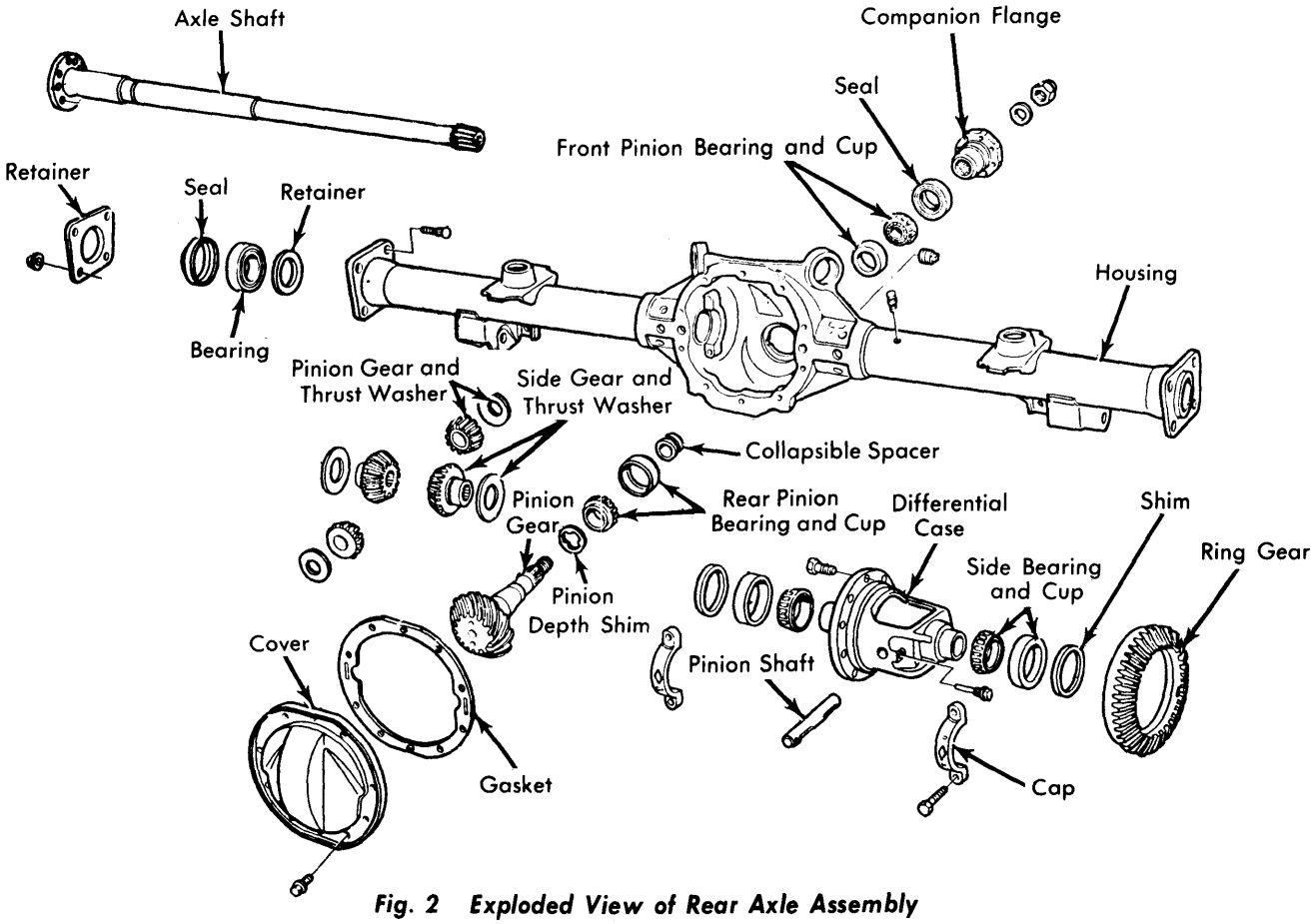

Fig. 2 Exploded View of Rear Axle Assembly

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

NOTE – *Maximum axle shaft end play for "C" lock type axles is .025" with 7½" and 8½" ring gear and .032" with 8¾" gear. Do not attempt to shim to take up excess clearance. Components causing excess clearance must be replaced.*

"C" Lock Type – Remove wheel, tire, brake drum, and drain rear axle lubricant by removing cover. Remove differential pinion shaft lock screw and pinion shaft. Push axle shaft toward center of vehicle and remove "C" lock from shaft. Remove axle shaft from housing, taking care not to damage seal. To install, reverse removal procedure. CAUTION – *Axle shaft must be pulled outward after installing "C" lock to properly seat lock in differential side gear.*

Corvette Axle Drive Shaft – Disconnect inboard driveshaft trunion from side gear yoke. Bend bolt lock tabs down and remove bolts securing shaft flange to spindle drive flange. Scribe mark on camber adjusting cam and on mounting bracket. Loosen camber adjusting nut and rotate cam so that high point of cam points inboard. Remove driveshaft by withdrawing outboard end first. To install, place driveshaft inboard trunion into side gear yokes and assemble "U" bolts. Rotate yokes so that trunion seats are 90° apart. Install outboard drive flange into spindle drive flange pilot, position lock over bolt holes then install bolts. Tighten bolts then bend lock tabs against flats of bolt head.

COMPANION FLANGE & OIL SEAL

Removal (All Models, Exc. Chevette & Corvette) – Raise vehicle, then remove propeller shaft, marking parts for reassembly reference. Using an INCH lb. torque wrench, measure and record pinion bearing preload by rotating pinion shaft through several revolutions. Mark companion flange, nut and pinion shaft for reassembly reference, then remove nut using suitable tools. Remove washer, then use a suitable puller to remove flange. Pry oil seal out of housing using a screwdriver or hammer and chisel.

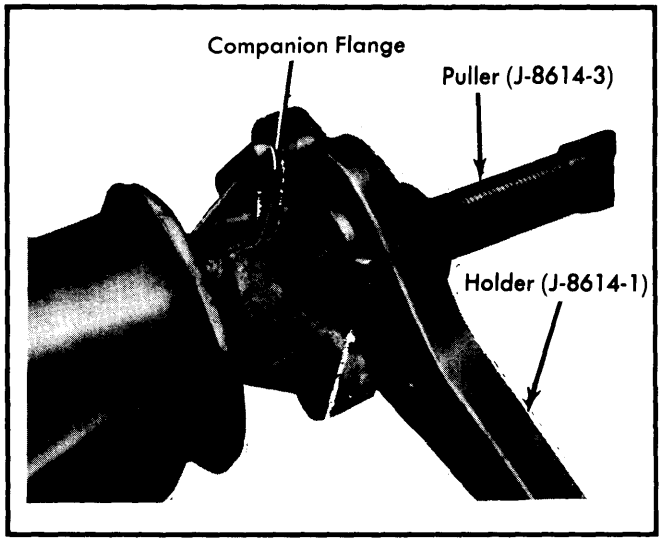

Fig. 3 Removal of Companion Flange

Installation – Pack seal lip cavity of new seal with lithium base extreme pressure lubricant, then install seal into housing until it seats against internal shoulder. Install companion flange, washer and nut, then tighten nut until all end play is removed. Continue tightening in small increments and checking preload until preload is 1-5 INCH lbs. more than recorded during disassembly. CAUTION – *Do not exceed original preload by more than 5 INCH lbs.* Install propeller shaft.

Removal (Chevette) – NOTE – *As Chevette rear axle has an extension housing and an extension shaft coupled to front of axle housing, the companion flange is attached to forward end of extension shaft. Instead of a companion flange there is a drive coupling on the end of the pinion shaft. Axle housing oil seal contacts extension shaft instead of companion flange.* Raise vehicle, then disconnect propeller shaft from companion flange and remove shaft from transmission. Place a floor stand under front of rear axle housing. Support extension housing and disconnect center support bracket from underbody. Remove bolts attaching extension housing to axle housing and separate them using a screwdriver or lever if necessary. Pry oil seal from axle housing with a screwdriver or a lever.

Installation – Using suitable tool (J-25597), drive oil seal into axle housing. Making sure thrust washer is in place between extension shaft and pinion shaft, slide extension shaft over drive coupling and support front end with a floor stand. Install flange-to-axle housing bolts and connect center support bracket to underbody. Install propeller shaft, being sure thrust spring is in place. Remove floor stands and lower vehicle.

Removal (Corvette) – With wheels hanging freely, disconnect propeller shaft and remove. Disconnect axle drive shafts from carrier. Measure pinion bearing preload, then mark all parts for reassembly reference. Remove companion flange nut and washer, then drive flange off pinion using a brass drift and hammer. Pry oil seal out of carrier.

Installation – Pack cavity between seal lips of seal with lithium base extreme pressure lubricant, then install seal into carrier bore. Lubricate companion flange splines, then tap flange into place on pinion stem. Install washer and nut, then tighten nut until torque exceeds original preload by 1-5 INCH lbs. CAUTION – *Do not exceed original torque by more than 5 INCH lbs.* Install propeller shaft and axle drive shafts.

REAR AXLE ASSEMBLY

Buick – 1) Raise vehicle, then support at frame on both sides. Place floor jack under center of axle housing and lift until it just starts to raise housing.

2) On Skyhawk, disconnect torque arm at differential. Disconnect rear universal joint from pinion flange, marking parts for reassembly reference. Disconnect parking brake cables at equalizer, and rear brake hose at floor pan.

3) On coil spring equipped vehicles, disconnect shock absorbers at lower end and upper control arms at axle housing. Lower axle housing, remove springs, then disconnect lower control arms at axle housing and remove axle assembly from vehicle.

4) On vehicles with leaf springs, disconnect shock absorbers at lower end. Support vehicle on jack stands at frame in front and at rear of springs. Remove lower spring plate attaching nuts, front and rear spring attaching bolts, then remove axle assembly from vehicle.

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

5) To install, reverse removal procedure. On coil spring vehicles, control arm bolts must be tightened with suspension in normal load position.

Seville – 1) Raise vehicle on a hoist and support axle so it may be raised or lowered. Raise axle assembly so that all tension is removed from springs and disconnect rear leveling valve overtravel lever from link. Hold lever down in exhaust position to deflate shock absorbers.

2) Remove lower shock absorber nut and bolt and position shocks out of the way. Disconnect parking cables at equalizer and at all cable clamps. Loosen spring front eye bushing to retaining bracket bolt. Remove spring front bracket attaching bolts.

3) Lower axle sufficiently to remove bolt and bracket. Remove "U" bolt and "T" bolts attaching lower spring plate to axle and stabilizer bar brackets. Remove upper and lower rubber spring pads and spring plate.

4) Support spring with jack stand and remove both nuts from rear shackle. Separate shackle and remove spring. Remove clip securing brake hose to body and disconnect hose from brake line. Remove stabilizer bar link nuts with retainers and bushings.

5) Mark propeller shaft for reassembly and disconnect from axle pinion flange. Hang propeller shaft aside, clear of rear axle. Lower rear axle and remove from vehicle.

6) To install, reverse removal procedures. **NOTE** – *While installing springs, loosely tighten all nuts and bolts. After complete installation, torque nuts and bolts to specifications.*

Chevrolet (Exc. Corvette) – Raise vehicle, then install lifting device under axle. On Monza, disconnect torque arm at differential. On Chevette disconnect stabilizer bar, tie rod and rear axle extension bracket. **CAUTION** – *Support axle extension so that it does not swing down rapidly when disconnected from body bracket.* Remove propeller shaft and disconnect shock absorbers. Disconnect upper control arms from axle on models with coil springs. Remove wheels, brake drums, disconnect brake lines from clips on axle tubes, then remove axle shafts. Remove brake backing plates and wire to frame. On models with coil springs, remove lower control arm pivot bolts, then lower axle assembly out of vehicle. For leaf spring suspension, remove lower spring brackets, then shift axle assembly to clear springs. To install, reverse removal procedure.

Corvette – Raise vehicle, then remove exhaust system behind front crossmember. Disconnect axle driveshafts at carrier, and carrier front mounting bracket bolt. Remove propeller shaft. Disconnect strut rod bracket from underside of carrier and lower bracket with strut rods attached. Loosen spring-to-carrier bolts, then remove cover bolts and allow lubricant to drain. Remove carrier. To install, insert two ½-13 x 1¼" bolts (heads cut off and slotted at unthreaded ends) into two below-center carrier bolt holes, one on each side. Insert one 9/16-18 x 1¼" bolt (head cut off and slotted at unthreaded end) into underside of carrier. These aligning studs aid in installation of carrier and strut rod bracket. Install gasket and sealer to carrier and cover. Mount carrier to cover and install six cover bolts, then remove two aligning studs and install remaining cover bolts. Position strut rod bracket to carrier, install three bolts, then remove aligning stud and install remaining bolt. Tighten spring-to-carrier bolts. Install propeller shaft, axle drive shafts, and exhaust system.

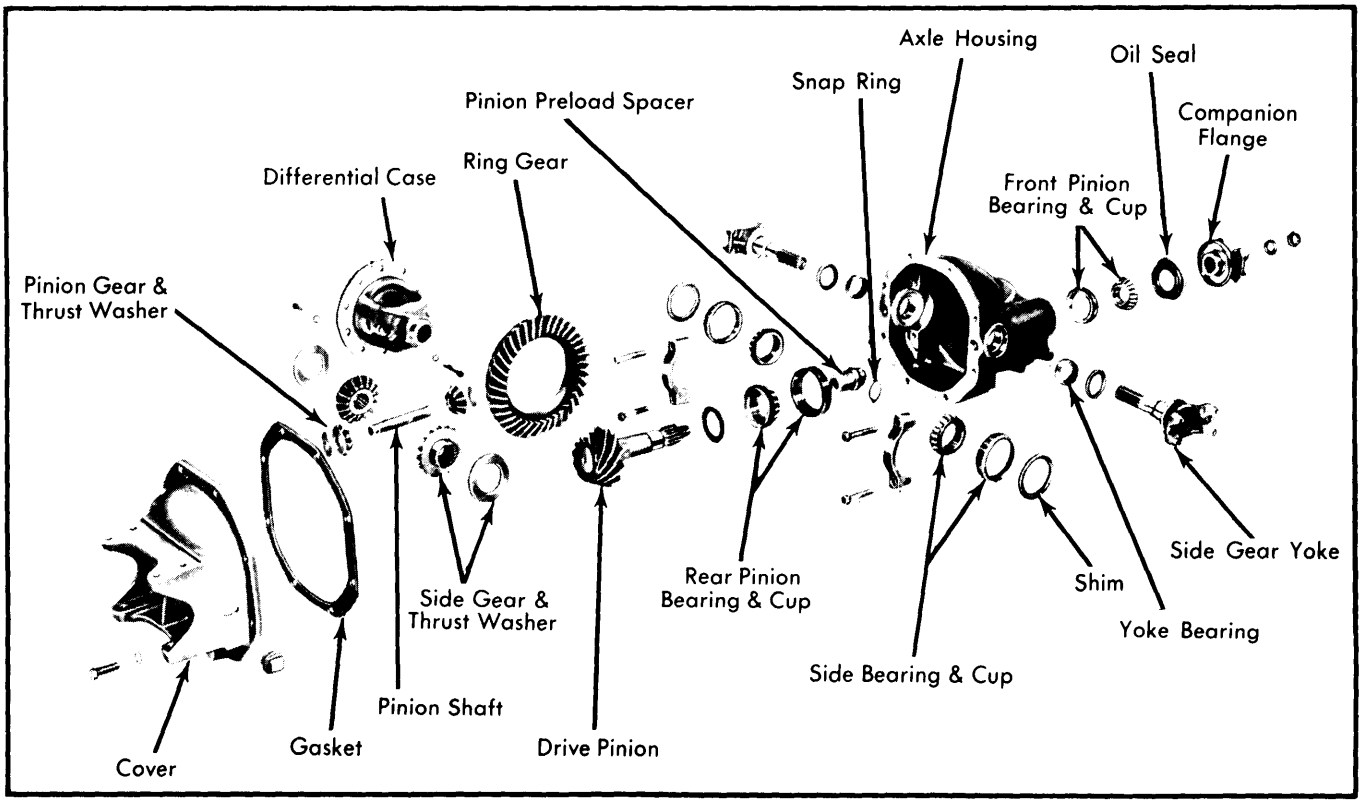

Fig. 4 Exploded View of Corvette Rear Axle Assembly

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

Oldsmobile – 1) Raise and support vehicle at frame. Mark drive shaft at pinion flange. Disconnect and support drive shaft at rear. Disconnect shock absorbers.

2) Disconnect lower control arms. Disconnect torque arm and tie rod on Starfire. On Omega, disconnect "U" bolts and spring shackles. Remove rear wheels, drums and axle shafts.

3) Disconnect parking brake cable at equalizer then remove bolt from brake line junction block at axle housing. Disconnect brake lines from axle housing clips and wheel cylinders, then remove backing plates.

4) Disconnect upper control arms (except Starfire and Omega), lower axle housing and remove springs. To install, reverse removal procedures.

Pontiac – 1) Raise and support vehicle. Disconnect shock absorbers at lower end. Mark rear universal joint and flange for proper reassembly. On Sunbird, disconnect upper control arm at differential end.

2) Disconnect parking brake cables at equalizer. Disconnect rear brake hose at floor pan. On coil spring vehicles, remove upper and lower control arm bolts at housing. For leaf spring equipped vehicles, remove spring plate attaching bolts and shackles. Remove assembly from beneath vehicle.

3) To install, reverse removal procedure. Control arm and shock absorber fasteners must be in normal load position while tightening.

DISASSEMBLY

CORVETTE

Remove side gear yoke snap rings and remove yokes. Mark differential bearing caps and housing for reassembly reference, then remove caps and differential case from housing. Remove side bearing shims and mark for reassembly. Remove companion flange nut, flange and seal, then remove pinion shaft and rear bearing. Remove front pinion bearing. Remove side gear yoke seals from housing then remove yoke bearings. Disassemble differential by removing pinion pin lock screw, pinion pin, pinions and side gears. Remove ring gear only if gear set is to be replaced or side bearings are to be replaced. Remove pinion bearing cups from housing, then press pinion shaft out of rear bearing and note size of depth shim pack.

NOTE – *See Positive Traction Differentials this section.*

ALL MODELS (EXCEPT CORVETTE)

NOTE – *Check ring gear and pinion backlash and pinion bearing preload before disassembly. Following procedure is with axle shafts removed.*

1) Mark differential bearing caps and housing for reassembly reference. Remove caps and pry differential from housing. Remove cups and shims and keep with bearing caps for proper reassembly.

2) Remove differential pinion shaft, gears, and side gears with thrust washers keeping them in order for reassembly. Remove ring gear bolts *(Left Hand Threads)* and tap gear from case using soft drift and hammer.

3) Remove pinion nut and companion flange (drive coupling on Chevette), then remove pinion shaft and front bearing. If necessary, remove pinion bearing cups from housing using a brass drift. Press pinion shaft out of rear bearing and note thickness of pinion depth shim pack.

REASSEMBLY

PINION SHAFT & BEARINGS

Pinion Depth Adjustment – 1) Drive pinion rear bearing shim thickness, controlling pinion depth of mesh with ring gear, must be determined whenever a new axle housing, ring and pinion set, or pinion bearings and races are installed. Depth of mesh is determined by using suitable Pinion Setting Gauge tool set. NOTE – *Checking procedure for different axles is the same, however, tool component combinations vary between axles. See Fig. 5 and Tool Application Table for tool numbers and location of components used.* Insure all parts are clean and free of burrs, then proceed as follows:

2) If removed, install pinion bearing races, then install lubricated pinion bearings. Position gauge plate and rear pinion bearing pilot (if used) on preload stud, then install through far pinion bearing and through front pinion bearing and front pinion bearing pilot. Install hex nut until snug, then rotate bearings to insure proper seating. Hold preload stud stationary with a wrench on flats, then tighten hex nut until 20 INCH lbs. are required to rotate bearings.

3) Mount side bearing gauging discs on ends of arbor, then place arbor into carrier making sure discs are properly seated. Install side bearing caps and bolts, then tighten bolts to avoid movement. Position dial indicator on mounting post of arbor, with contact button resting on top surface of plunger. Preload dial indicator one-half revolution, then tighten in this position.

4) Place plunger onto gauging area of gauge plate. Rock plunger rod slowly back and forth across gauging area until dial indicator reads greatest deflection, then set indicator to zero. Repeat rocking action several times to verify setting. Once zero reading is obtained, swing plunger until it is removed from gauging area. Dial indicator will now read required pinion shim thickness for a "nominal pinion". Record this reading.

5) Check drive pinion for painted or stamped markings on pinion stem, or a stamped code number on small end of pinion gear. If marking is found to be a plus or minus number (for instance +2 or -5), add or subtract that many thousandths from indicator reading. This will then be thickness of rear pinion bearing shim pack. NOTE – *If no markings are found on pinion, use dial indicator reading as shim thickness.*

6) If marking is found to be a code number, see following chart, then add or subtract that many thousandths from dial indicator reading. NOTE – *All production pinions are "nominal pinions" and may not be marked "45".*

7) Remove bearing caps and gauging tools from housing. Place selected shim pack on drive pinion, then install lubricated pinion bearing onto pinion shaft using a suitable press.

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

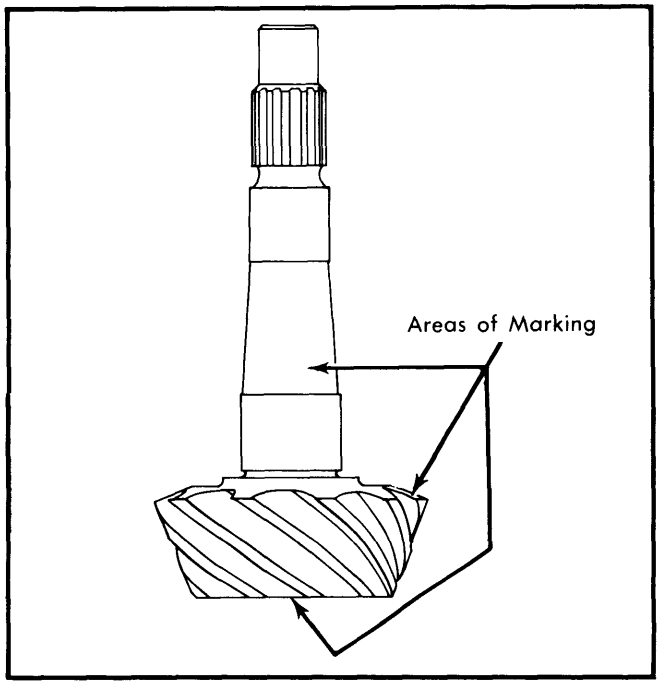

Fig. 5 Pinion Marking Locations

Pinion Code	Correction Required
40	Subtract .005"
41	Subtract .004"
42	Subtract .003"
43	Subtract .002"
44	Subtract .001"
45	No Correction
46	Add .001"
47	Add .002"
48	Add .003"
49	Add .004"
50	Add .005"

TOOL APPLICATION

NOTE – *See illustration for component location.*

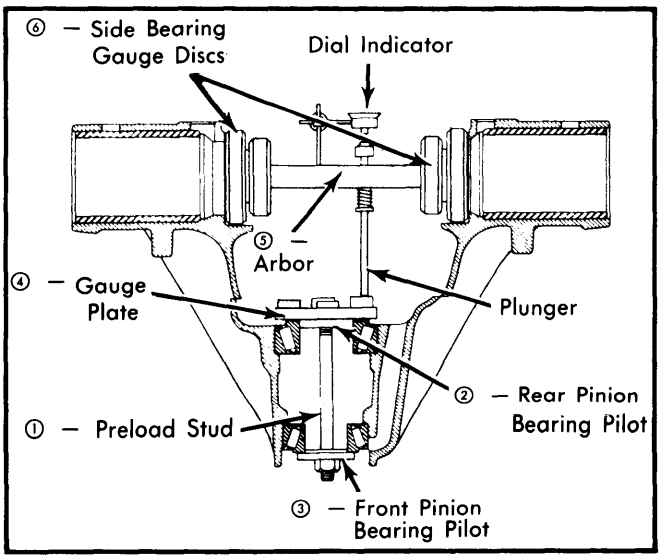

Fig. 6 Pinion Depth Gauge Set

Tool Location	Tool Part Number

Buick 7 ½" Ring Gear

①	J-21777-43
②	J-21777-12 ("H" Series) J-21777-40 (Exc. "H")
③	J-21777-42
④	J-23597-11
⑤	J-23597-1
⑥	J-21777-45

* – Used on "K" and "P" axles. Use J-21777-40 for "O" axles.

Buick 8 ½" & 8¾" Ring Gear

①	J-21777-43
②	J-21777-35
③	J-21777-42
④	J-21777-29
⑤	J-21777-1
⑥	J-21777-45

Cadillac Seville 8 ½" Ring Gear

①	J-21777-43
②	J-21777-35
③	J-21777-42
④	J-21777-29
⑤	J-21777-1
⑥	(Small Step) J-21777-45

Monza 6 ½" & 7 ½" Ring Gear

①	J-21777-43
②	J-23597-13 (6½") J-23597-12 (7½")
③	J-21777-42
④	J-23597-11
⑤	J-23597-1
⑥	J-23597-4 (6½") J-21777-45 (7½")

Chevrolet 7 ½" Ring Gear

①	J-21777-43
②	J-23597-12
③	J-21777-42
④	J-23597-11
⑤	J-23597-1
⑥	J-21777-45

Chevrolet 8 ½" & 8¾" Ring Gear

①	J-21777-43
②	J-21777-35
③	J-21777-42
④	J-21777-29
⑤	J-21777-1
⑥	J-21777-45

Corvette 8⅜" Ring Gear

①	J-21777-43
②	J-21777-35
③	J-21777-42
④	J-21777-36
⑤	J-21777-1
⑥	(Large Step) J-21777-45

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

Tool Location	Tool Part Number

Chevrolet Chevette

①	Not Available
②	Not Used
③	J-23597-21
④	J-23597-20
⑤	J-23597-6
⑥	J-23597-4

Oldsmobile 7½" Ring Gear

①	J-21777-43
②	J-21777-12 (Starfire) J-21777-40 (Exc. Starfire)
③	J-21777-42
④	J-23597-11
⑤	J-23597-1
⑥	J-23597-1 (Starfire) J-21777-45 (Exc. Starfire)

Oldsmobile 8½" & 8¾" Ring Gear

①	J-21777-43
②	J-21777-35
③	J-21777-42
④	J-21777-21 (8½") J-21777-2 (8¾")
⑤	J-21777-1
⑥	J-8619-10 (8½") J-21777-3 (8¾")

Pontiac 7½" Ring Gear

①	J-21777-43
②	J-23597-12
③	J-8619-12
④	J-23597-11
⑤	J-23597-1
⑥	J-21777-45

Pontiac 8½" & 8¾" Ring Gear

①	J-8619-13
②	J-21777-35
③	J-8619-12
④	J-21777-26
⑤	J-21777-1
⑥	J-8619-10

Pinion Installation & Preload Adjustment – Install a new collapsible spacer over pinion stem, then position pinion in housing. While holding pinion forward, carefully drive front pinion bearing onto pinion shaft until a few threads are exposed. Install new oil seal, then drive coupling (Chevette) or companion flange (All Others), washer and nut, and tighten until end play is removed. Rotate pinion several times to seat bearings, then check preload using an INCH lb. torque wrench. Continue tightening nut and checking preload until proper preload is obtained (see specifications). CAUTION – *Do not back off nut to lessen preload. If preload is exceeded, a new collapsible spacer must be installed and nut retightened until proper preload is obtained.*

DIFFERENTIAL

Case Reassembly – Place ring gear onto case, install new bolts, then alternately tighten bolts to pull ring gear into position on case. Place side gear thrust washers over side gear hubs, then install assemblies into case in their original position. Install pinions and thrust washers into case, then install pinion shaft and lock bolt. Using suitable installing tools, install side bearings onto differential case.

Side Gear Yoke Bearings and Seals (Corvette) – Using suitable tool (J-9773), drive bearing into carrier bore until fully seated. Install new seal in bore outboard of bearing.

Side Bearing Preload (Buick, Oldsmobile & Pontiac) – NOTE – *Side bearing preload adjustment is to be made before pinion is installed. If pinion is installed, remove ring gear from case.*

1) Measure thickness of original side bearing preload shims, then select a service shim (.170") and service spacers with a total thickness slightly less than the original shims. Install differential case in housing. Install service spacer between each bearing cup and housing with chamfered edge of spacer against housing. Install left bearing cap loosely so that differential case is free to move.

2) With left bearing race and spacer against housing, install both right and left service shims previously selected between right bearing race and service spacer. Insert progressively larger feeler gauges until a noticeable drag is felt. This will indicate "slip fit" clearance.

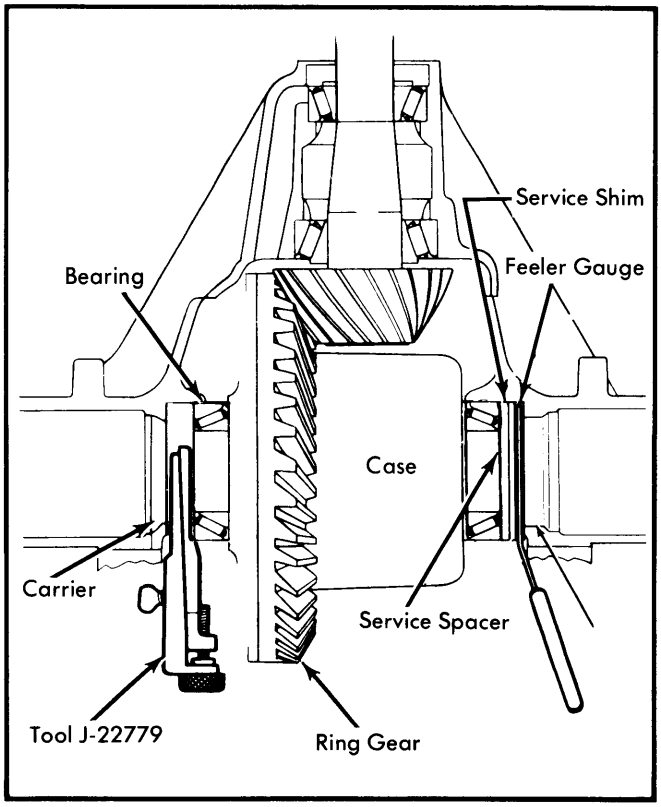

Fig. 7 Determining Side Bearing Shim Requirements

GENERAL MOTORS INTEGRAL HOUSING (Cont.)

3) Remove carrier and install ring gear (if removed). Select two shims with a total thickness equal to that of service shims and feeler gauge and reinstall with carrier (equal thickness on each side of carrier). Adjust differential backlash, then preload differential bearings with an additional .004" shim on each side.

NOTE – *Do not attempt to reinstall the original production shims as they will break when tapped into place. Previously installed SERVICE shims may be re-used.*

Side Bearing Preload (Chevrolet) – **1)** Install differential assembly in housing with ring gear firmly against pinion. For 8½" and 8¾" ring gear: Insert suitable gauging tool (J-22779) between left bearing cup and carrier housing. While oscillating tool, turn adjusting nut clockwise until noticeable drag is felt and lock the tool. For 6½" and 7½" ring gear: Insert service spacer, service shim and feeler gauge in side of housing. Feeler gauge thickness should produce slight drag when moved between carrier and shims.

2) Insert service spacer, service shim and feeler gauge thick enough to produce slight drag between right bearing and carrier. Record measured thickness of tool (J-22779) or service shim, spacer and feeler gauge for each side. Add .004" to each side for proper preload and install left shim first, then wedge right shim between bearing cup and spacer.

NOTE – *Subtract service spacer thickness of .160" (6½" and 7½" ring gear) or .170" (8½", 8¾" or 8⅜" Corvette ring gear) to obtain proper shim pack thickness. Corvette procedures use gauge on both sides and preload of .008" on RIGHT side ONLY.*

Ring Gear & Pinion Backlash – Check backlash with a dial indicator mounted to axle housing at four locations around ring gear. Variation should not exceed .002". If backlash is not correct (see specifications), adjust side bearing shims as necessary. After all adjustments have been completed, tighten all bolts, then make a tooth contact pattern check to insure correct assembly.

SPECIFICATIONS

Application	Clearance or Torque
Pinion Bearing Preload ①	
Buick (Exc. Skyhawk), Pontiac (Exc. Sunbird)	
New Bearings	20-25 INCH Lbs.
Used Bearings	10-15 INCH Lbs.
Cadillac Seville	
New Bearings	15-30 INCH Lbs.
Used Bearings	5-10 INCH Lbs.
Chevrolet (Exc. Corvette, Monza)	
New Bearings	15-30 INCH Lbs.
Used Bearings	5-10 INCH Lbs.
Corvette	
New Bearings	20-25 INCH Lbs.
Used Bearings	5-10 INCH Lbs.
Chevette	
New Bearings	15-25 INCH Lbs.
Used Bearings	3-6 INCH Lbs.
Oldsmobile	
New Bearings	24-32 INCH Lbs.
Used Bearings	8-12 INCH Lbs.
Monza, Skyhawk, Skylark, Sunbird	
New Bearings	10-25 INCH Lbs.
Used Bearings	8-12 INCH Lbs.
Side Bearing Preload	
Buick	
New Bearings	②35-40 INCH Lbs.
Used Bearings	②20-25 INCH Lbs.
Chevrolet	③Slip Fit Plus .008"
Oldsmobile	④Slip Fit Plus .008"
Pontiac	③Slip Fit Plus .008"
Ring Gear Backlash	
Buick, Pontiac	.006-.008"
Chevrolet	.005-.008"
Oldsmobile	.005-.009"

① – Measured with new seal without ring gear installed.
② – Total assembly preload measured at pinion nut.
③ – Add .004" to each side to preload bearings (except Corvette). For Corvette: add .008" to Right Side Only.
④ – .004" added to each side after backlash set.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Ring Gear-to-Case Bolt	
Buick	80
Corvette, Monza	50
Cadillac, Chevrolet, Pontiac	90
Chevette	48
Oldsmobile	95
Bearing Cap Bolt	
Corvette, Monza, Chevette	55
Buick, Cadillac, Chevrolet	60
Oldsmobile	65
Pontiac	55
Pinion Shaft Lock Bolt	
Buick, Pontiac	15
Cadillac, Chevrolet	25
Corvette, Oldsmobile	20
Monza	150 INCH lbs.
Chevette	12
Housing Cover Bolts	
Buick, Oldsmobile, Pontiac	30
Cadillac, Chevrolet	25
Corvette	50
Monza, Skyhawk, Skylark	20
Chevette	22
Universal Joint Flange-to-Pinion Flange	
Monza, Sunbird	14
Buick, Chevrolet, Corvette	15
Cadillac	70
Oldsmobile	20
Pontiac	15
Corvette Axle Drive Shafts	
To Spindle	75
To Yoke	15
Universal Joint Flange-to-Companion Flange	
Chevette	16