

REAR AXLE

Subject	Page	Subject	Page
Axle Identification	268	Differential Bearing Preload Spacer Selection	280
Maintenance	268	REAR AXLE - LIMITED SLIP DIFFERENTIAL ...	281
Rear Axle Lubricant Level	268	Description and Operation	281
Rear Axle Shaft and Bearing - Conventional Diff.	270	Repairs	281
Remove	270	Differential Case	282
Install	270	Dismantle	282
Rear Axle Bearing/Seal Replace	270	Assemble	282
Remove	271	Pinion Gear Tooth Contact	283
Install	271	Rear Gear Pinion Contact Pattern	283
Pinion Oil Seal. Conventional Diff & I.R.S. Diff	271	Ideal Tooth Pattern	283
Remove	271	Drive Side Pattern	283
Install	271	Coast Side Pattern	283
MAJOR REPAIRS AND REBUILD	272	Acceptable Heel Contacts Tooth Pattern	284
Axle Housing and Differential - Conventional Diff	272	Drive Side Tooth Pattern	284
Remove	272	Coast Side Tooth Patterns	284
Install	272	Acceptable Toe Contacts	284
Differential and Axles - I.R.S.	273	Drive Side Toe Contacts	284
Remove	273	Coast Side Toe Contacts	284
Install	274	Trailing Arm (Axle) - I.R.S. Diff.	284
Differential Case & Drive Pinion - Conventional Diff		Remove	284
& I.R.S.	275	Install	285
Remove	275	PROBLEM DIAGNOSIS	286
Inspect	276	CONVENTIAL DIFFERENTIAL SPEC.	287
Dismantle	276	CONVENTIAL DIFFERENTIAL TORQUE	
Differential Case	277	SPECIFICATIONS Nm	287
Dismantle	277	I.R.S. DIFFERENTIAL SPECIFICATIONS	288
Clean and Inspect	277	I.R.S. DIFFERENTIAL TORQUE SPEC. Nm.	288
Assemble	277		
Pinion/Ring Gear Identification	279		
Drive Pinion & Bearings	279		
Install	279		
Differential Installation & Backlash Check	280		

REAR AXLE

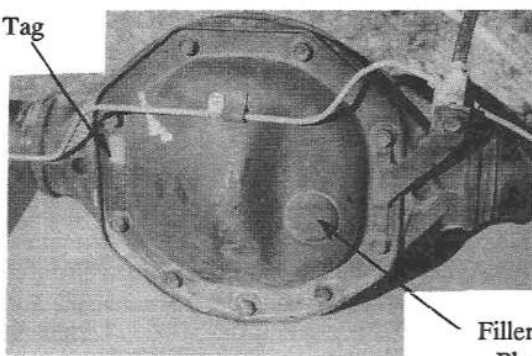
Axle Identification

There is a metal tag fixed to the cover plate bolt, identifying the axle assembly part number, axle serial number, and axle ratio. Vehicles are equipped with a 190.5mm diameter ring gear.

Conventional Differential

There is a metal tag fixed to the cover plate bolt

ID Tag



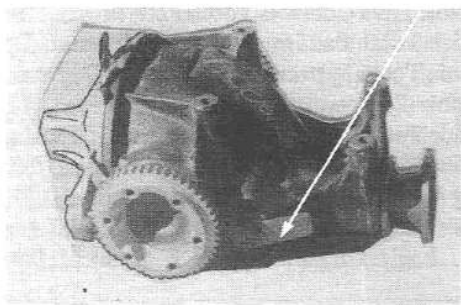
Filler Plug

Identification tag is located (see from the rear) on the left side of rear axle cover.

IRS - Independent Rear Suspension

Identification tag is located on the front right side of the differential looking from the front.

Identification Tag



Independent Rear Suspension have the same type of differential with a 190.5mm diameter ring gear. The axles from the differential are driven through a constant velocity joint and outer axle shaft bearings.

V8's, some LSD and utility vehicles use a special synthetic high performance lubricant, other differential lubricant should not be used as these diffs run with seals that are designed for high performance lubricant. Look for High Performance Oil identification tag on rear axle.

LSD Differential Production Option G80.

Limited Slip Differentials have a red/brown coloured filler plug. IRS vehicles use a special synthetic high performance lubricant, other differential lubricant should not be used as these diffs run with seals that are designed for the high performance lubricant.

Maintenance

Rear Axle Breather.

The breather valve should be checked regularly to ensure that the cover rotates freely and that the exhaust is not restricted or blocked by mud.

Rear Axle Drain Plug.

The drain hole in each brake backing plate (adjacent to the axle housing flange), should be checked periodically to ensure that the holes have not become blocked with mud or sand.

Axle Bearing.

The axle bearings are lubricated by the oil in the rear axle assembly and therefore require no periodic maintenance.

Differential Carrier Assemblies.

Check for lubricant leaks at every maintenance service. If there is evidence of leakage, correct leak and add lubricant as necessary.

Every 20,000 kms or 12 months, check to ensure that the lubricant level is to the bottom of the filler plug hole when the rear axle is COLD.

Limited Slip Differential Precautions

* If servicing a vehicle fitted with a Limited Slip Differential, never run the engine with the transmission in gear and one wheel raised. The driving force to the wheel on the ground may cause the vehicle to move.

* Wheel balancers that are designed to use on the vehicle are not recommended for use on the rear wheels of vehicles equipped with a Limited Slip Differential. One rear wheel will drive if in contact with the ground when the opposite wheel is raised.

This type of balancer may be used by removing the wheel opposite to the one being balanced with the vehicle raised, refit wheel nuts, reversed, to retain brake disc. Ensure that safety stands are used to support the vehicle.

Rear Axle Lubricant Level

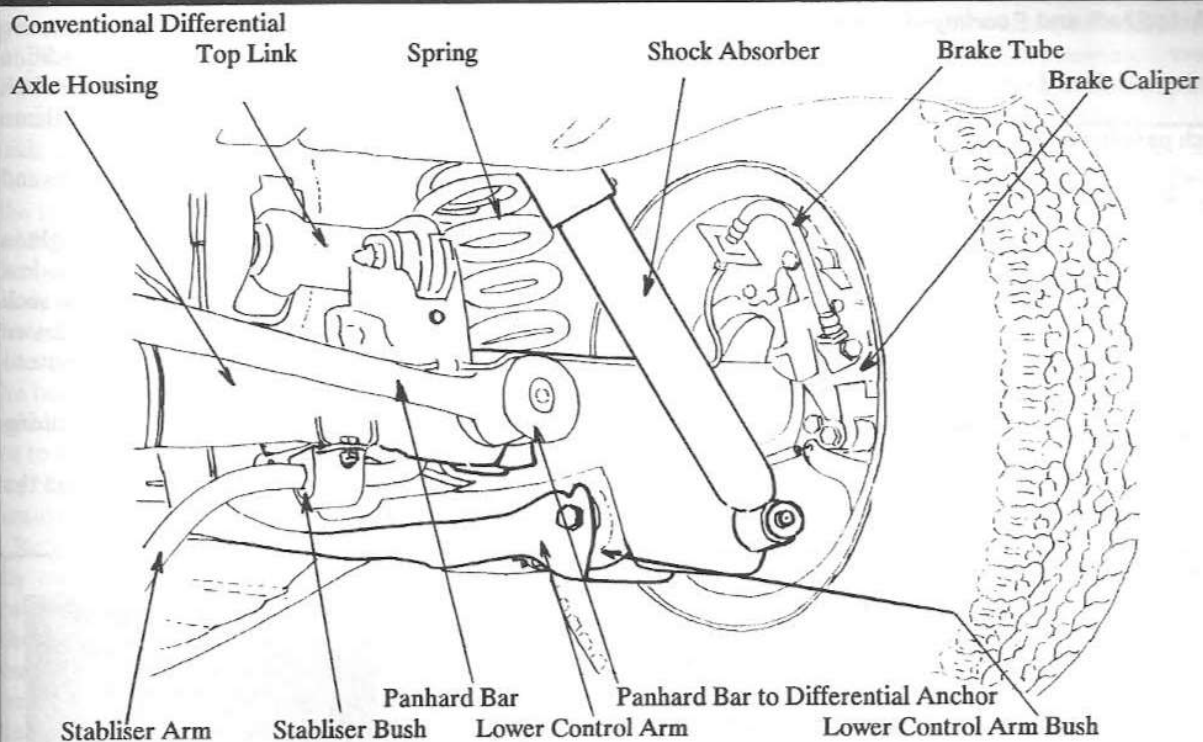
1. Remove the filler plug situated in the back cover plate of the rear axle.

* If the vehicle has been recently driven take care as the oil could be hot enough to burn skin on contact.

2. Check the oil level by inserting your finger into the oil filler hole to check on oil level. The oil level should be at

REAR AXLE

Page 269

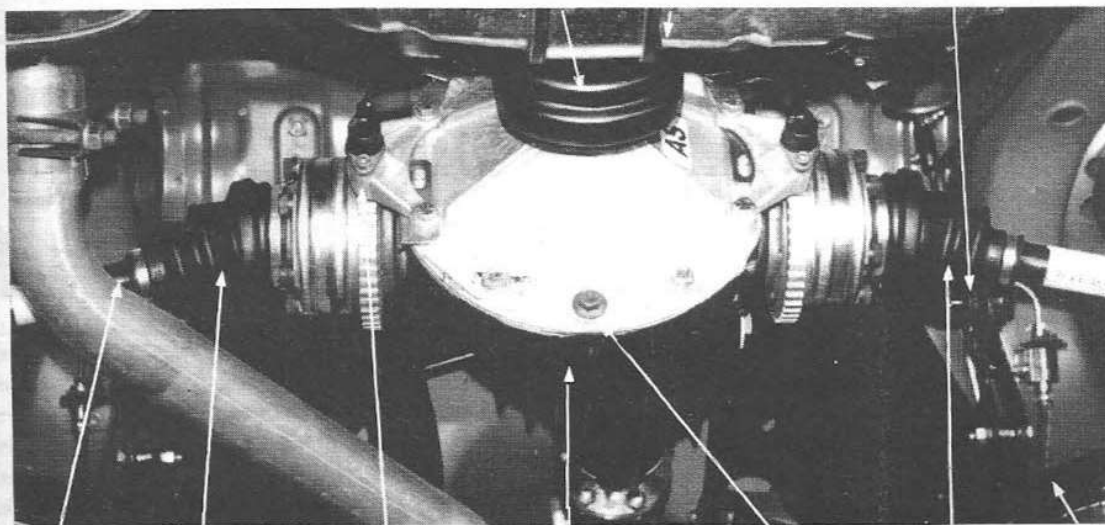


IRS - Independent Rear Suspension

Differential Mount

Fuel Tank

Stabiliser Bar / Link



the same level as the filler plug, but not so high that oil will run out when the plug is removed.

3. Top up with specified oil if required.

Specified Lubricant:

V6 Conventional Diff and LSD: SAE 90 API GL5.

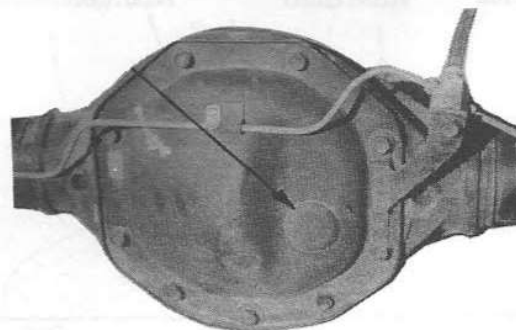
V8 Conventional Diff, LSD, Utilities:

Mobilube SHC 80W-140ID

V6 IRS: SAE 90 API GL 5

V8 IRS V6 with LSD: Mobilube SHC 80W-140ID

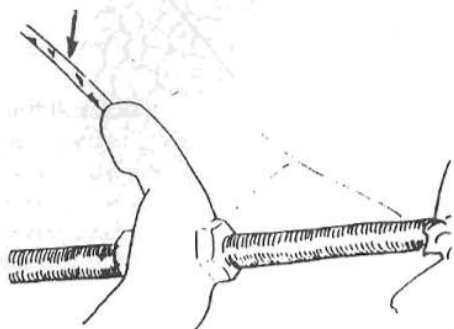
4. Replace the filler plug.

Filler Plug

Rear Axle Shaft and Bearing - Conventional Diff.**Remove**

1. Raise vehicle and remove road wheel.

Detach park brake cable at the equaliser



* Detach hand brake cable at the equaliser and disconnect the cable from the rear brake assembly.

* Remove the caliper lower guide pin and nut and pivot caliper on the upper guide pin until the caliper is clear of the disc.

* Remove attaching screw and separate the disc from the axle flange.

* Remove screws attaching the splash shield and position the splash shield to obtain access to the heads of the bolts.

2. Working through access hole in the axle flange use a socket wrench to remove the four bearing retainer plate nuts.

Take out the axle shaft and bearing assembly.

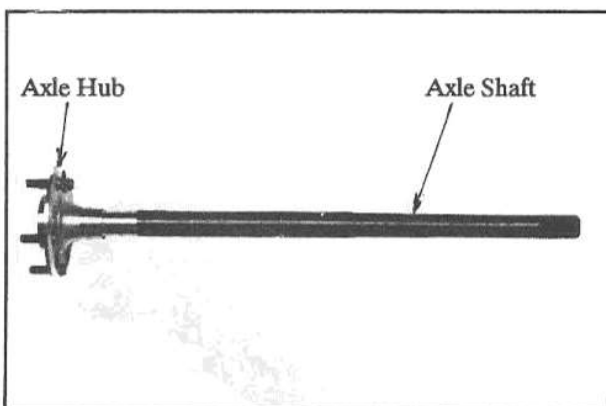
* The bearing cup will normally remain in the axle housing.

Install

* Friction surfaces of brake parts must be kept contamination free.

1. If the bearing cup was previously removed install it in the axle housing. Make sure that the cup back face is seated against the back shoulder in the housing.

* Lubricate bearing before installation. Apply a film of bearing grease to the outside diameter of the seal prior to installation.



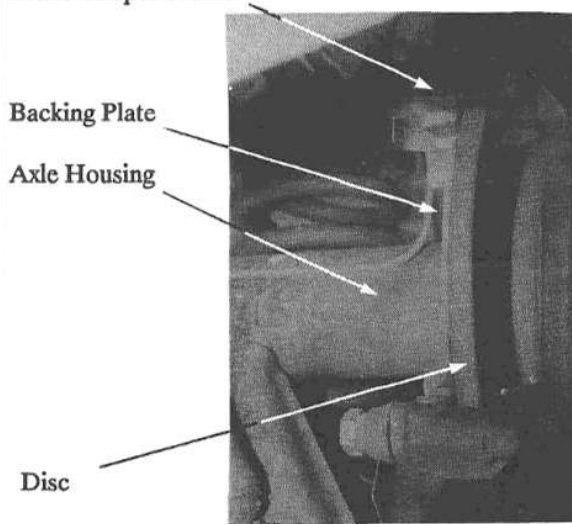
2. Take care when installing the axle shaft to make sure gasket beneath bearing retainer plate is in good condition - replace if defective. Start the splined end of the shaft into the differential and start the cup rib ring and seal into the housing.

3. Line up retaining plate to the retaining plate bolts and push the axle into the housing as far as possible.

4. Start the nuts onto the retaining plate bolts and tighten to finger tight only. Then tighten the nuts to 20 Nm, in a diagonal sequence. The nuts should be tightened in such a manner to assure that the seal and cup rib ring are drawn easily against the cup in the housing. Tighten the nuts to specification.

5. * Place disc on the axle flange and install the securing screw, install the caliper lower guide pin and nut.

* Connect park brake cable to the calipers and the brake equaliser, install splash shield.

Brake Caliper Frame

Caliper Anchor Plate bolts	55-70Nm
Caliper Guide Pins	38-48Nm
Caliper Guide Pins (Heavy Duty)	38-48Nm
Dust Shield bolts	8-10Nm
Parking Brake cable to Backing plate	12-16Nm

6. Replace road wheel and lower vehicle, tighten wheel nuts, check park brake adjustment.

Wheel Nuts specified torque: 100-125Nm

Rear Axle Bearing/Seal Replace

* A complete assembly must be installed when a bearing is replaced. The final assembled end play on the shaft of 0.4 to 0.5mm is dependent on the dimensions of the interference fit between the cone and the axle shaft. The standard recommended cone fit is 0.025 to 0.055mm tight. The cups are a snug fit in the housing. Used bearings may have a max. of 0.7mm end bearing.

The bearing is held on the shaft by the interference fit the bearing cone and retaining collar. The cup and rib

ring are clamped together in the axle housing through the seal by retaining plate. The axle seal wipes on the rotating axle shaft and at the same time functions as a static seal to prevent lube from escaping between the housing and seal outside diameter.

It is important to note that the seal also acts as a 'spacer' in the clamp up of the bearing of the axle housing. It is crucial that the specified seal is used.

The bearing cone assembly should not be pulled from the axle shaft unless:

The seal is to be replaced, the retaining plate has to be replaced due to damage or distortion.

The bearing is to be replaced, a used bearing assembly should have all parts completely covered with rear axle oil prior to installation into the axle housing. Quarter fill the cavity between the seal lips with grease.

Remove

1. Retaining collar removal. The retaining collar can be easily removed by drilling a 6mm hole in the outside diameter of the collar to the depth approx. three quarters of the thickness of the collar. Do not drill all the way through the collar as the drill could damage the axle shaft. After drilling the retaining collar, place a chisel across the drilled hole and strike sharply to brake the collar.

*** Retaining collars are not reusable after having once been installed and must be scrapped after removal even if some removal method is used which does not cause obvious damage to the collar.**

Slide the retaining plate and seal toward the axle flange, using special tools, press the bearing from the shaft. The special tools support the bearing behind the bearing cone face and prevent damage to the bearing and the seal surface of the shaft.

*** Do not heat or cut the bearing assembly as damage to the axle shaft will result.**

Install

1. When installing new bearings, new seals and retaining collars must be used. Examine retaining plate for damage or distortion with a straight edge, if the plate is distorted, replace it.

2. Clean the axle shaft, make sure that there are no burrs or nicks on the bearing seat, seal surface, cone backing shoulder and chamfer leading to the seal seat. Sharp edges or nicks on the chamfer leading to the seal surface will damage the seal lips during installation of the seal on the shaft. To avoid damage to the wheel studs, place the axle shaft flange face on a support.

3. Install the retaining plate on the axle shaft, make sure that it is placed with the clamping face of the plate towards the bearing. Apply grease to the cavity between the seal lips and carefully slide seal into position on the seal seat. When installed the outer face of the seal must be toward the axle flange.

4. A used bearing that has been washed must be lubricated with axle oil prior to installation. Do not wash a new bearing prior to installation. The new bearing has a

protective grease which provides initial lubrication until the rear axle lubricating oil reaches the bearing.

If the bearing has to be washed, it must be completely lubricated with rear axle oil prior to installation.

5. Position lubricated bearing on the vehicle shaft making sure the cup ring is facing toward the axle flange.

6. Install new retaining collar on the axle shaft and allow it to rest on the bearing cone assembly.

7. Press the bearing and the retaining collar on the axle shaft simultaneously using special tool. Apply sufficient load to assure the proper seating of all parts. Check for proper seating of all parts. Check for proper seating of the bearing cone assembly against shaft shoulder and the retaining collar against the cone face by using feeler gauges.

*** When pressing the bearing and retaining collar on the axle shaft, make sure all faces of the installation are square, parallel and free from any burrs. Installing the retaining collar in a skewed manner can reduce its holding ability by as much as 50%.**

Pinion Oil Seal. Conventional Diff & IRS Diff

CAUTION: Differentials which use a synthetic lubricant (see start of chapter) that is not compatible with standard polyacrylic pinion seals. Synthetic seals must not be soaked or washed in cleaning solvents.

Remove

1. Raise vehicle, detach the drive shaft from the drive pinion flange after marking the drive shaft and pinion flange to make sure correct placement on assembly.

2. Mark pinion shaft and the pinion flange to make sure correct placement on assembly. Mark the pinion flange and the pinion nut to establish bearing pre-load assembly.

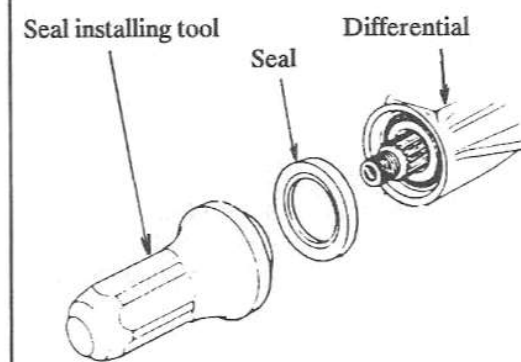
3. Hold pinion flange with an appropriate tool and remove the self locking nut.

4. Place a drain pan beneath the pinion housing, mark the ends of a pinion flange spline for correct alignment during installation.

5. Clean the pinion bearing housing around the oil seal, remove the pinion flange and remove the pinion oil seal by prying it out with a suitable tool.

Install

Correct seal location is from flush to 0.25mm below the carrier surface.



1. Check the splines on the pinion shaft and pinion flange for burrs and if necessary clean up with fine crocus cloth, wipe flange and shaft clean.

2. Clean oil seal seat, clear lubricant return passage.

3. Lubricate seal lips and the outside with oil and install the seal, using the special tool. Correct seal location is from flush to 0.25mm below the carrier surface.

4. Align the pinion flange spline mark with the pinion shaft spline mark and install the flange with a smear of lubrication on the splines.

Tighten nut until marks previously made on the pinion flange and the nut are in alignment establishing the pinion bearing preload.

5. Install the drive shaft with the marking on the drive shaft and the pinion flange in alignment. Examine level of axle lubricant, top up as required.

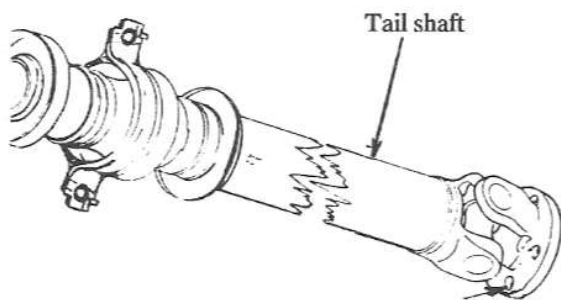
Major Repairs and Rebuild

Axle Housing and Differential - Conventional Diff

Remove

1. Loosen rear wheel nuts, raise vehicle supporting underbody, remove rear wheels.

Disconnect the tail shaft from the pinion flange



Remove attaching bolts and nuts

2. Mark the relationship of the tail shaft and the pinion flange and disconnect the tail shaft from the pinion flange.

3. Remove exhaust system from the rear of the catalytic converter.

4. Disconnect park brake cable at the equaliser (this will loosen the cable to the rear brakes) and detach the cables from the calipers.

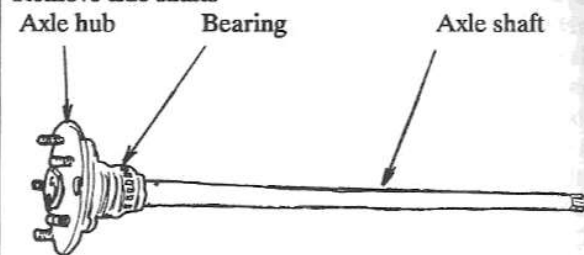
(a) Remove caliper lower guide pin locknuts and pins, and pivot the calipers on the upper guide pins until calipers are clear of the discs.

(b) Remove discs.

(c) Remove splash shields.

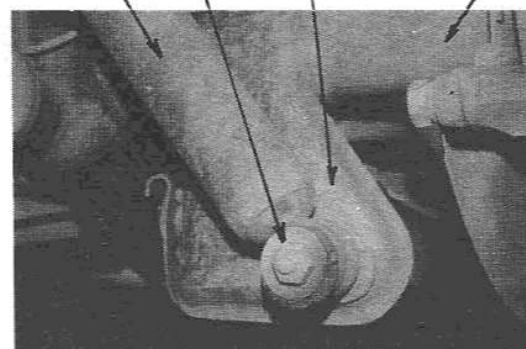
5. Remove axle shafts, disconnect the brake line from the axle housing. Remove the bracket and caliper assembly and, using a piece of wire, suspend the assembly from

Remove axle shafts



Remove shock absorber lower mounting nut

Shock absorber bracket Nut Axle



the underbody. Leave hydraulic lines attached, but disconnect from axle housing.

*** Don't strain the brake lines and/or hoses.**

6. Support axle housing and lower hoist to remove the spring tension.

(a) Remove shock absorber lower mounting nut and washers, from each shock absorber.

(b) Disconnect the stabiliser bar from the axle housing.

(c) Disconnect the panhard rod from the rear axle.

(d) Remove the upper rear suspension bar nut and bolt at the axle and detach the upper rear suspension bar from the axle.

(e) Support the axle housing and lower the hoist to remove the spring tension from the rear coil springs.

(f) Remove the lower rear suspension bar nut and bolt at the axle and lower the axle assembly.

(g) Remove the rear coil springs with care.

(h) Detach the lower rear suspension bars from the axle.

7. Raise body to clear the axle and remove the axle from the supports, drain oil from axle housing through an axle tube.

Install

1. Place the axle on supports.

2. Connect the panhard rod to the rear axle.

3. Connect the axle to the lower suspension arms and loosely install the attaching bolts.

4. Locate the springs in the body, lower the body to compress springs.

REAR AXLE

Page 273



5. Install the shock absorber attaching bolts and nuts.
6. Install the upper rear suspension bars to the rear axle, nuts of bolts to centre, do not torque nuts at this stage.
7. Support vehicle on axle housing (curb load position) and torque all above mountings, install stabiliser bar.

Lower Control Arm Attaching Bolts	95 - 110
Upper Control Arm Attaching Bolts	60 - 75
Stabilizer Bar Bracket Attaching Nuts	14 - 18
Stabilizer Bar Spacer Stud Nuts	7 - 10
Panhard Rod Attaching Nut to Axle Housing	54 - 70
Panhard Rod Attaching Bolt to Body Mounting	95 - 110
Shock Absorber Upper Mounting Nut	12 - 16
Shock Absorber Lower Mounting Nut	26 - 29

7. Install caliper and bracket assemblies and brake lines, install axle shafts.

9. Install splash shields.

* Install discs, install caliper lower guide pins and nuts



Brake Caliper

Disc

and connect park brake cable to the calipers and the brake equaliser. Tighten to specification.

Brake Pipe Junction to Axle Housing Bolt	20-25Nm
Caliper Anchor Plate bolts	55-70Nm

Caliper Guide Pins	38-48Nm
Caliper Guide Pins (Heavy Duty)	38-48Nm
Dust Shield bolts	8-10Nm
Parking Brake cable to Backing plate	12-16Nm

10. Align marks on drive shaft and pinion flanges and connect drive shaft. Tighten to specification.

Rear Universal Joint Flange to Pinion Flange 55-65Nm

11. Install and hang the exhaust system section which was removed.

12. Install rear wheels.

13. With vehicle in curb load position fill the axle to the bottom of the filler plug hole with the specified oil.

Rear Axle Lubricant:

V6 Conventional Diff and LSD: SAE 90 API GL5.

V8 Conventional Diff, LSD, Utilities:

Mobilube SHC 80W-140ID

Rear Axle Lubricant Amount: 1.7Litres

CAUTION: Premature gear fault may result if specified lubricant is not used.

14. Lower vehicle and tighten the wheel nuts to specification and check park brake adjustment.

Wheel Nuts specified torque: 100-125Nm

Differential and Axles - I.R.S.

Remove

1. Loosen rear wheel nuts, raise vehicle supporting underbody, remove rear wheels.

2. Mark the relationship of the tail shaft and the pinion flange and disconnect the tail shaft from the pinion flange.

3. Remove differential breather hose from differential housing.

4. Remove the exhaust system from the rear of the catalytic converter.

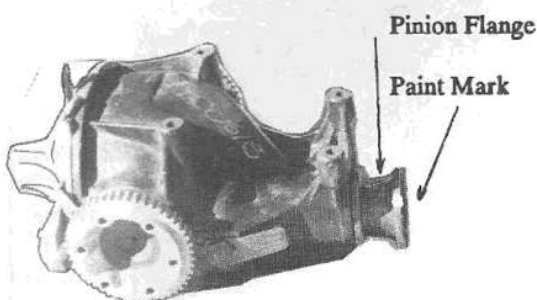
5. Disconnect park brake cable at the equaliser (this will loosen the cable to the rear brakes) and detach the cables from the calipers.

- (a) Remove caliper lower guide pin locknuts and pins, and pivot the calipers on the upper guide pins until calipers are clear of the discs.

- (b) Remove discs.

- (c) Remove splash shields.

Mark the relationship of the tail shaft and the pinion flange and disconnect the tail shaft from the pinion flange



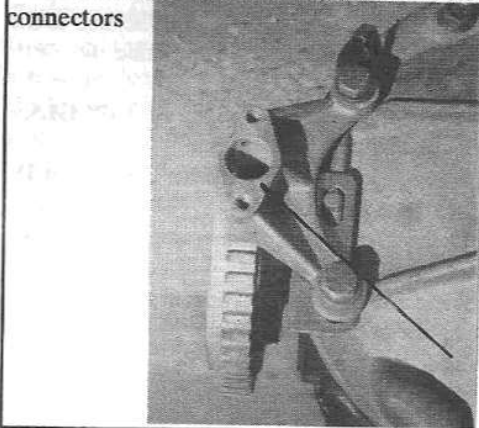
6. Disconnect the brake lines.

Remove the bracket and caliper assembly and, using a piece of wire, suspend the assembly from the underbody. Leave hydraulic lines attached, but well clear of the rear axle assembly.

*** Don't strain the brake lines and/or hoses.**

7. If the vehicle is fitted with ABS disconnect the electrical wiring connectors.

Vehicles fitted with ABS disconnect the electrical wiring connectors



8. Support weight of differential carrier with floor jack, mark the location of the rear mounting bracket with a felt pen. Remove rear mount attaching bolts and lower the centre differential 75mm, while positioning two jacks under left and right trailing arms, lift enough to release spring pressure.

9. Disconnect rear shock absorber lower mounting bolts from trailing arms, and remove shock absorber from the trailing arms.

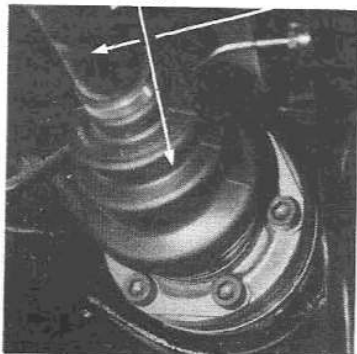
*** The drive shaft constant velocity joint boots will be damaged if the shock absorbers are disconnected from the trailing arm before the rear of the differential centre has been lowered 75mm.**

10. Take care and remove rear springs.

11. Jack up the trailing arms and remove the bolts supporting the front brace of crossmember and trailing arms

Drive shaft constant velocity joint boot

Constant Velocity Joint Boot Axle drive shaft



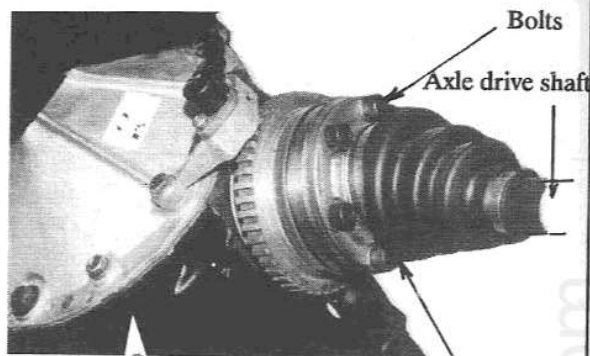
12. Remove support to vehicle underbody attaching bolts. Remove rear crossmember, lower assembly on jack and remove from beneath vehicle. With assistant supporting front end of rear crossmember, lower assembly.

13. Remove drive shaft inner constant velocity joint to inner axle shaft attaching bolts (8mm Allen key socket) and plates.

13. Disconnect the inner constant velocity joint.

14. Lower the differential from the under body of the

Remove drive shaft inner constant velocity joint bolts



vehicle. Remove rear mounting bracket to rear cover attaching bolts, remove mount bracket.

Install

*** When installing IRS differential centre use new bolts for all mounting brackets either to the differential centre or the floor pan and crossmember.**

1. Fit the rear mounting bracket to rear cover of differential with new bolts leave loose. Line up felt pen markings made while removing, tighten to torque specification.

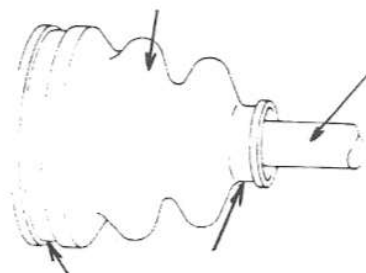
Differential to Rear Crossmember bolt specified torque: 90 Nm plus 30 to 45 degrees

2. Install drive shaft constant velocity joint boots onto axle. Replace the axle shaft inner constant velocity joint to the differential centre and tighten the bolts to specified torque.

Drive Shaft Constant Velocity Joint To Trunnion Flange bolt torque spec: 50 Nm plus 60-75 degrees:

Replace drive shaft constant velocity joint boots

Constant velocity joint boot Axle shaft

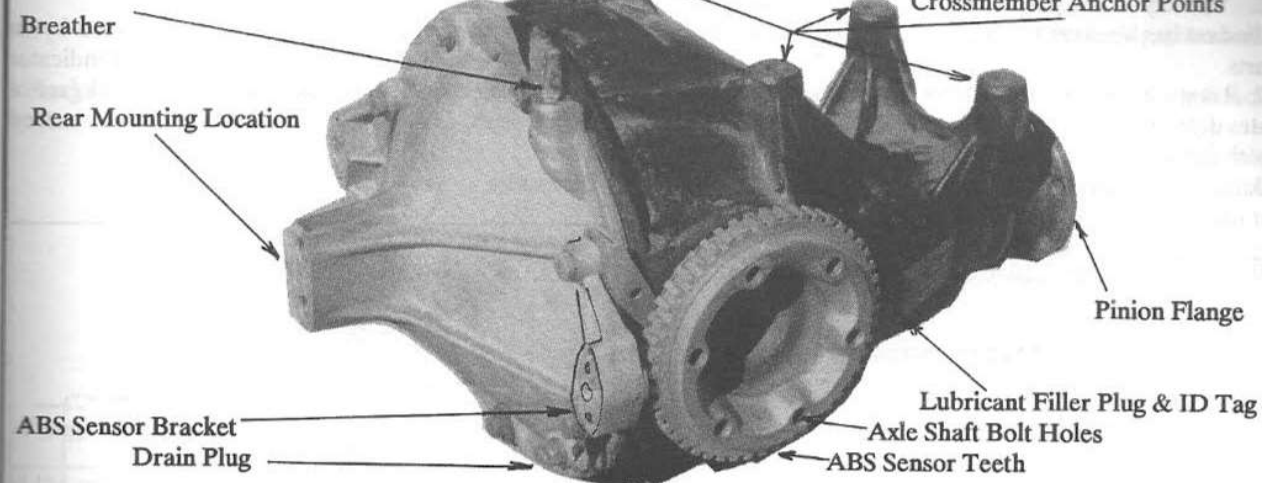


Location of constant velocity joint boot clips

REAR AXLE

Page 275

IRS Differential Assembly



3. Lift differential assembly on jack fitting the assembly to the crossmember. Line up felt pen markings made while removing, tighten to torque specification.

Rear Crossmember Front Mounting bolt specified torque: 125 Nm plus 30-45 degrees

Front Brace Bolt Torque Specification: 60-70 Nm

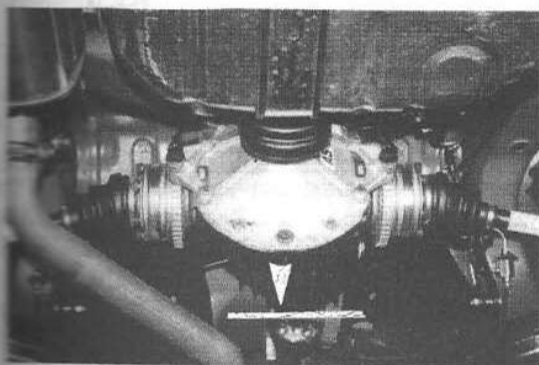
4. Tighten the rear cover mounting bracket bolts to specification, it will be necessary to lower rear of differential to gain access. While tightening the new bolts keep the crossmember parallel to the underbody.

Rear Mount to Rear Cover Bolt torque spec: 95-105 Nm.

5. Install springs and shock absorbers, it will be necessary to lower the differential crossmember assembly, however do not lower further than 75mm otherwise the velocity joints will be damaged.

Install bolts and washers to shock absorber lower mounts and trailing arms. Tighten bolts to the correct torque specification.

* Lower the differential centre and crossmember assembly rear mount 75mm from the floor pan. Otherwise you may damage the drive shaft constant velocity joint boots.



Lower Differential Centre 75mm from the floor pan

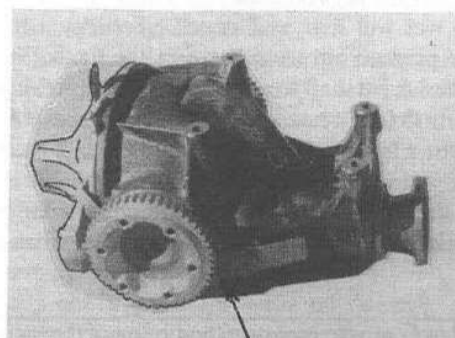
Shock Absorber Lower bolt torque spec: 105-125 Nm

6. Install the differential crossmember assembly to the underbody of the vehicle. If felt pen marks were made during removal, align the marks to keep the rear wheel alignment correct, if there are no alignment marks for the assembly, rear wheel alignment will have to be adjusted later.

Rear Mount to Floor Pan Bolt torque spec: 30-40 Nm

7. For vehicle with ABS brakes fitted, the sensor wiring loom will need to be connected.

8. Check differential lubricant level, if it needs to be topped up, fill with specified lubricant.



Check differential lubricant level, if it needs to be topped up, fill with specified lubricant

Capacity

1.6 litres

V6

SAE 90 API GL 5

V8

Mobilube SHC 80W-140ID

9. Connect and adjust hand brake adjustment and bleed brake hydraulic system.

Differential Case & Drive Pinion - Conventional Diff & I.R.S.

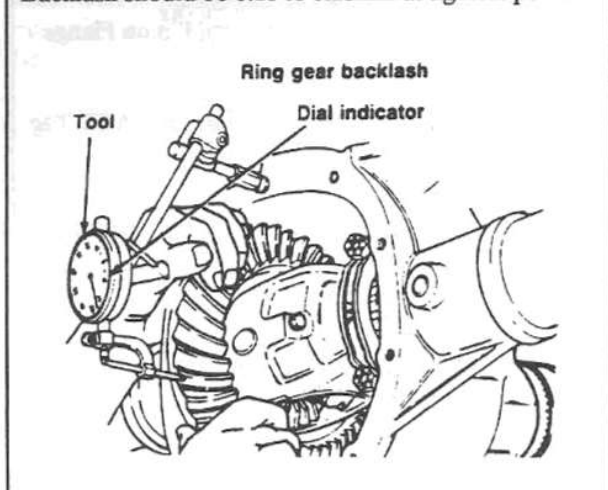
Remove

1. Drain the lubricant from the differential. Remove the rear cover bolts, remove the cover.

Inspect

1. Visually check parts for wear or damage, after the lubricant has been wiped away from the internal working parts.
2. Rotate the gears to check for roughness which indicates defective bearings or chipped gears, inspect the gear tooth for scoring or signs of abnormal wear.
3. Inspect differential case and drive pinion for end play, set up dial indicator and check points around drive gear.

Backlash should be 0.10 to 0.18mm at tightest point.

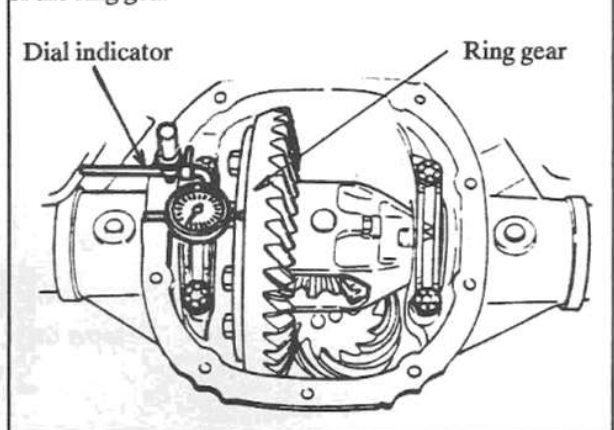


Backlash should be 0.10 to 0.18mm at tightest point.

4. If there is no obvious fault, check gear tooth contact, (Full gear tooth procedure later in this chapter) paint the gear tooth with suitable gear marking compound, such as paste made with dry red lead and a little oil. A mixture that is too wet will rear and smear. Too dry a mixture cannot be pressed out from between the teeth. Wrap a cloth around drive shaft to act as a brake. Rotate ring gear back and forth (use a box wrench on the drive gear attaching bolts for a lever) until a clear tooth contact pattern is obtained.

5. Certain types of gear tooth contact patterns on the drive gear indicate incorrect adjustment. Noise caused by

Use dial indicator to measure the runout of the back face of the ring gear

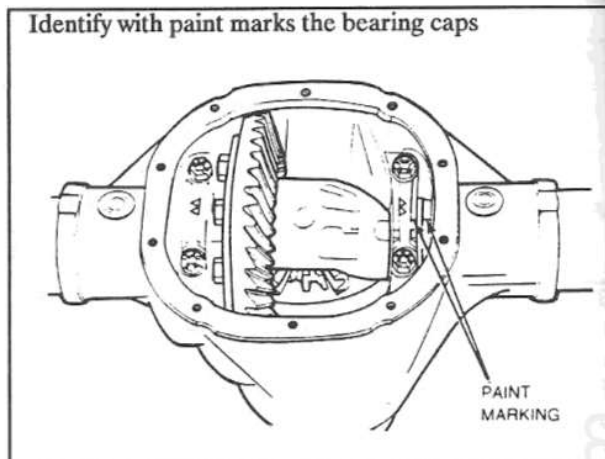


incorrect adjustment can often be corrected by readjusting the gears.

Gear tooth runout can sometimes be detected by an erratic pattern on the teeth. However, a dial indicator should be used to measure the runout of the back face of the ring gear, as shown, this runout should not exceed 0.13mm.

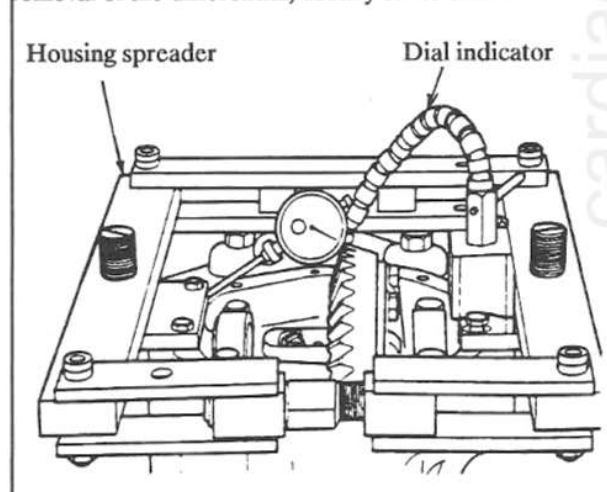
Dismantle

Identify with paint marks the bearing caps



1. Identify with paint marks the bearing caps and remove the bearing cap bolts and bearing caps.
2. Use differential housing special spreading tool to aid the removal of the differential case, bearings and spacers.

Spread carrier the minimum amount which will allow the removal of the differential, usually 0.1 to 0.2mm



Spread carrier the minimum amount which will allow the removal of the differential, usually 0.1 to 0.2mm will be adequate. (Spread is measured across the carrier adjacent to the bearings).

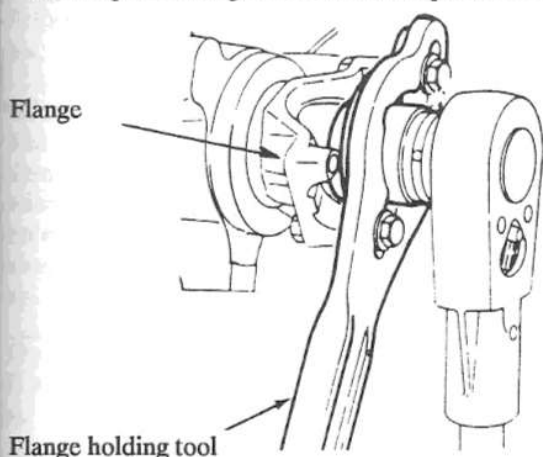
CAUTION: The carrier should not be spread more than 0.5mm in any case.

3. Mark the relationship of the drive shaft and the pinion flanges and detach the drive shaft. Mark the relationship

REAR AXLE

Page 277

Hold the pinion flange and remove the pinion nut.

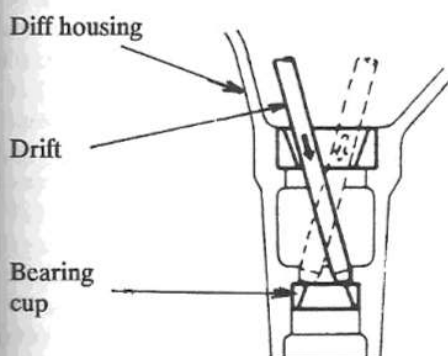


of the pinion flange to the pinion shaft, hold the pinion flange and remove the pinion nut.

6. Remove pinion flange, and with a soft faced hammer, drive the pinion out of the front bearing cone and remove it through the rear of the carrier casting.

7. Drive the pinion flange seal and the bearing cone out of the carrier casting, if the pinion bearing cups are to be replaced, remove them from the carrier using the special tool.

Remove the bearing cups with a special tool or drift



*** It is essential to renew the cups one after the other so that in each instance the other cup serves as a guide for the replacer tool.**

A pinion depth adjusting shim is installed between the rear pinion bearing cup and axle housing. Dispose of damaged shims.

8. If the pinion rear bearing cone and roller is to be replaced, lubricate the pinion shaft and remove the bearing cone from the pinion. Dispose of the bearing whenever it has been removed from the pinion.

Differential Case Dismantle

1. Remove bolts that attach the ring gear to the differential case.

CAUTION: All axles use L/H thread ring gear bolts-identified by L on bolt head.

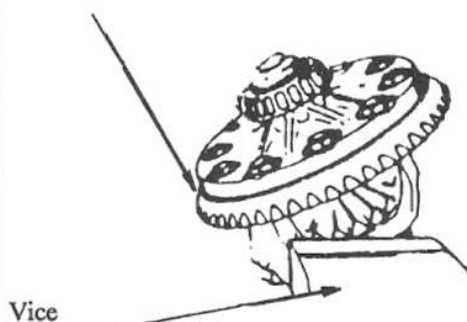
Press ring gear from the case or tap it off with a soft faced hammer.

2. With a suitable drift, drive out the differential pinion cross shaft retainer pin, use a soft drift to separate the two piece differential frame.

3. With the same drift, remove the pinion cross shaft from the differential frame. Lift the pinion gears thrust washers from the case.

Hold the differential case with a soft jawed vice.

Ring Gear Differential



4. Drive the short differential pinion shaft retaining pins from the frame. Drive the short pinion shafts from the frame. Lift the remaining two pinions, thrust washers and the thrust block from the frame.

5. Remove the side gears and thrust washers from each section of the case, remove the differential bearings. Dispose of bearings when they are removed from the carrier.

Clean and Inspect

Clean all of the components with a suitable solvent and air dry before inspection.

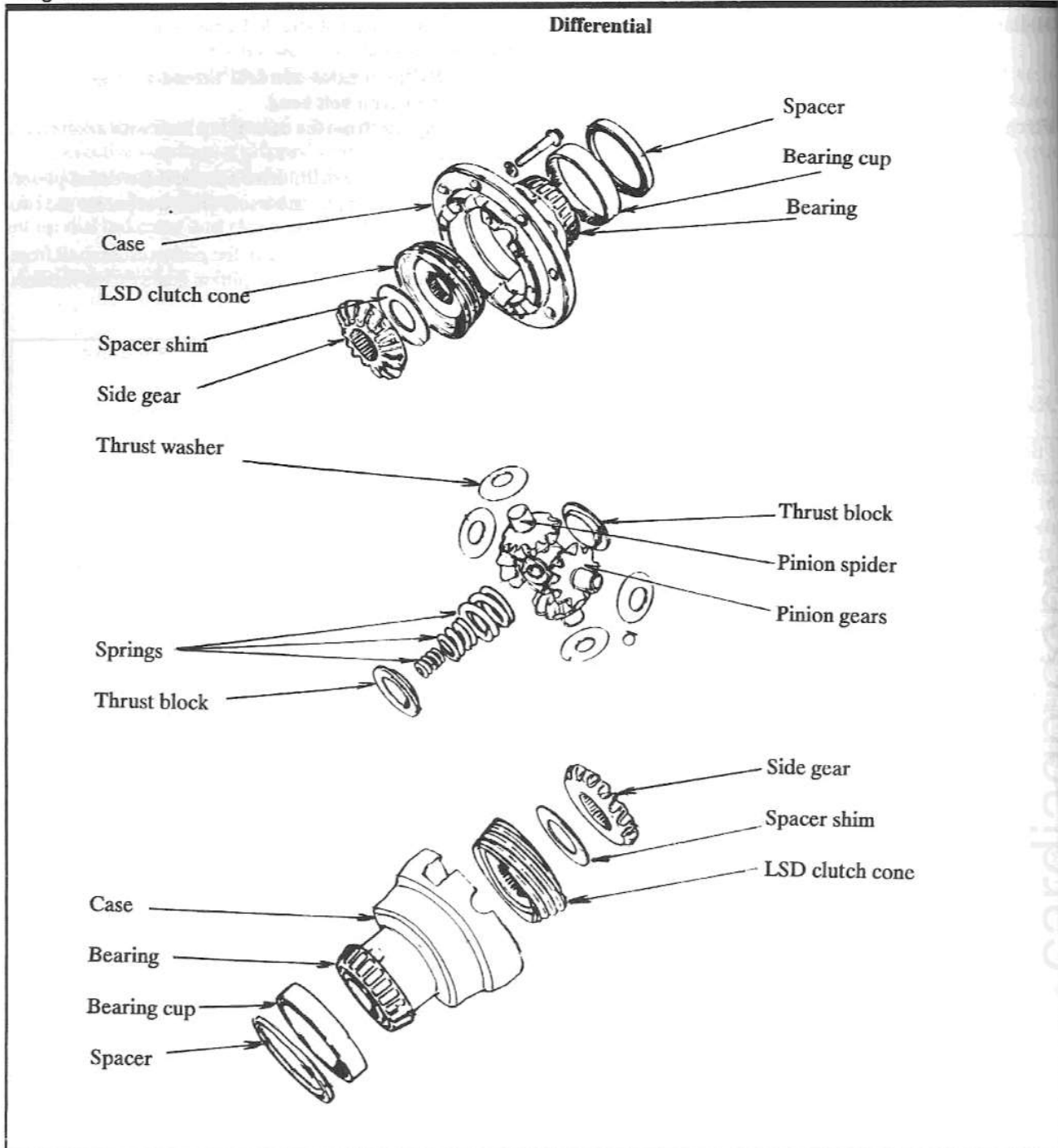
Inspections can help to find the cause of the trouble and to determine the corrections needed.

Visually check parts for wear or damage, after the lubricant has been washed away from the internal working parts. Rotate the gears to check for roughness which indicates defective bearings or chipped gears, inspect the gear tooth for scoring or signs of abnormal wear.

Assemble

1. All the components belonging to the differential should be lubricated with recommended rear axle lubricant, before installation. Position side gear thrust washers over the side gear journals. Place a side gear in the larger section of the differential case.

2. Place the two differential pinions and the thrust washers on the large section of the case. On a four pinion differential position the thrust block in the case.



3. Drive the pinion cross shaft into place, make sure that the retainer pin hole is in line with the hole in the case. Take care not to damage the differential pinion thrust washers.

4. Place the other two pinions and thrust washers in the larger case section and drive the two short pinion shafts through the case, pinions, and thrust block bores. Make sure that the retainer pin holes are in line with the holes in the case.

5. Drive the three pinion shaft retaining pins through the pinion shaft leaving the pinion cross shaft retaining pin

partially out by 6mm of the case mating surface to act as a locator pin while installing the other case section.

6. Install the second side gear and thrust washer in the smaller section of the case.

7. Holding the side gear in place through the case bore push the two sections of the case together locating on the retaining pin. Rotate side gear, if necessary, to make sure that the gear and pinions are meshing correctly.

8. Place the ring gear in position in the case, and torque the bolts to specification.

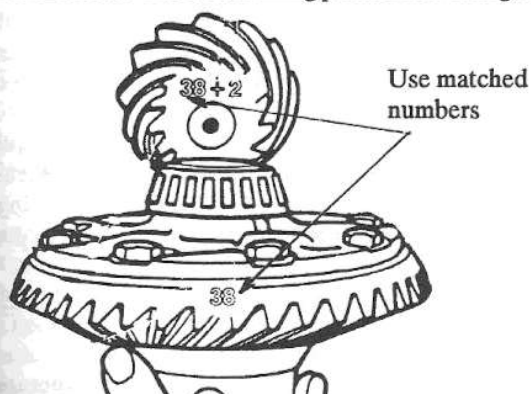
Ring Gear Retaining Bolt torque spec: 130-145Nm

9. Press the differential side bearings onto the case journals.

Pinion/ Ring Gear Identification

The pinion and the ring gear are manufactured within a tolerance of a specified distance. On the end of each pinion, there is a (+) or a (-), or a (0) which indicate the best running position for each gear set. This dimension is controlled by the shimming behind the rear pinion bearing cup.

On the end of each pinion, there is a (+) or a (-), or a (0) which indicate the best running position for each gear set.



The marking on the pinion is an imperial measurement

When the shim thickness is decreased, the pinion gear is moved away from the ring gear. When the shim thickness is increased, the pinion is moved closer to the ring gear.

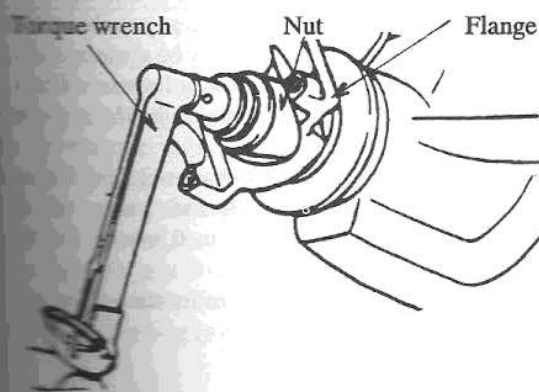
A (+) on the drive pinion means that a thinner shim should be installed to move the pinion gear away from the ring gear. A (-) means that a thicker shim should be used to move the drive pinion closer to the ring gear.

For selection of the correct shim thickness follow these steps: Lubricate all differential parts with the recommended rear axle lubricant, before they are installed.

* The exact same rear pinion bearing that is to be used in the vehicle, is to be used when using the dummy pinion.

1. Install front and rear pinion bearing cups into the axle housing.

Tighten the nut until a bearing preload



Fit pinion bearing cone and rollers to the dummy pinion tool. Install the dummy pinion to the axle housing. Fit the pinion front cone and roller to the dummy pinion. Install tool thrust collar and the nut to the dummy pinion.

2. Tighten the nut until a bearing preload of 1.7 to 2.8 Nm (new bearing), 0.9 to 1.4 Nm (used bearing) is achieved while rotating the dummy pinion back and forth to make sure correct seating of the bearing rollers.

3. Place the depth gauge cylinder in the carrier and fit the bearing caps, tightening lightly.

4. Discover the size of pinion shim that will pass between the depth gauge and the dummy pinion head, check the drive pinion installation marking. The size of the pinion shim should then be altered as follows:

A positive e.g. (+ 0.002) marking means that this pinion has to be set at this number of thousandths of an inch further from the drive gear, i.e. a shim this amount thinner must be used.

A negative e.g. (- 0.002 inch) marking means that a shim this size thicker must be used. A zero (0) marking indicates that the shim selected with the gauge is the correct one for the carrier/pinion combination. Position shims are available in .001 in (0.025mm) increments from .008 to 0.030 in (0.2 to 0.75mm).

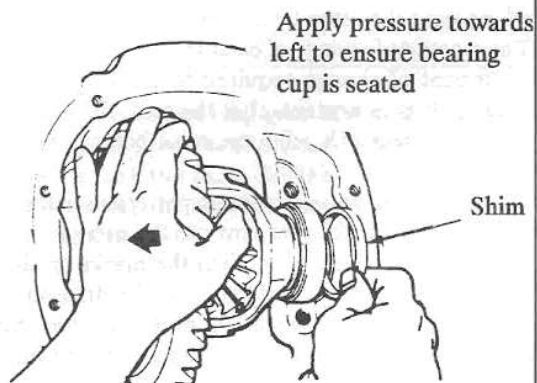
* The marking on the pinion is an imperial measurement.

5. Remove tools from the carrier, remove the rear pinion bearing cup from the housing.

Drive Pinion & Bearings**Install**

1. Position pinion rear bearing cone on the pinion shaft. Press the bearing against the pinion shaft shoulder.

2. Install the shims (previously established), between the rear bearing cup and the housing and install the new cups using the special Tool. Ensure the cups are properly seated in their bores. If a 0.025mm feeler gauge can be inserted between a cup and the bottom of its bore at any point around the cup, the cup is not seated properly.

Installing the shim on the right side

3. Lubricate pinion rear bearing with axle lubricant, position the pinion in the carrier and install a new collapsible pinion spacer.

4. Lubricate the front pinion bearing and install the bearing onto the pinion while supporting the pinion under the head, lubricate the seal lips and the seal outside diameter, and install the seal from flush to 0.25mm below the carrier surface.

5. Install the pinion flange and nut. Tighten the nut while rotating the pinion backwards and forward to seat the bearings. Check the bearing preload frequently while tightening nut. Tighten the nut until the specified bearing preload is achieved. 1.7 Nm to 3.4 Nm with new bearings. 0.9 Nm to 1.6 Nm with used bearings.

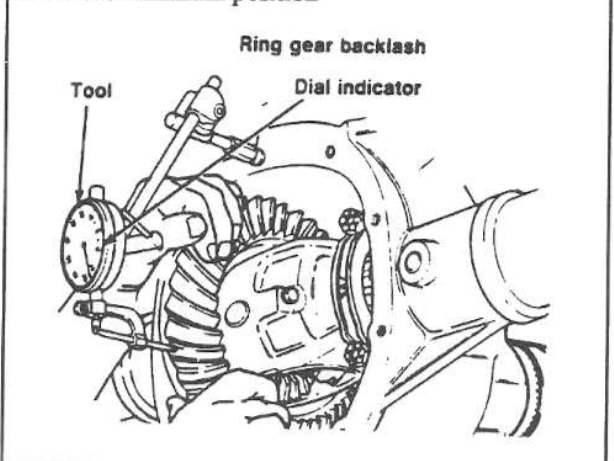
*** If the preload is exceeded the collapsible spacer must be replaced.**

Differential Installation & Backlash Check

1. Install differential assembly with the tentatively selected spacers in the carrier, following the procedure in Differential Bearing Preload Spacer Selection

2. Measure the backlash on several teeth around ring gear to find the minimum position. Backlash here should be 0.13 to 0.18mm. If the backlash is not within the range,

Measure the backlash on several teeth around ring gear to find the minimum position



decrease the thickness of one differential bearing spacer and increase the other by the same amount.

The amount of change of each spacer is approx. equal to the amount of change required to correct the backlash reading. It is important that the total thickness be the same after backlash adjustment as before, so that the correct preload is retained.

3. Check the gear tooth contact pattern as detailed later in this chapter, fit the rear cover to the carrier.

4. Install the axle shafts, align the marks on the drive shaft and pinion flanges and connect the drive shaft.

5. With the vehicle weight supported on the rear axle housing (curb load position), tighten the mountings. With

the vehicle in the curb load position fill the axle to the bottom of the filler plug hole with the correct lubricant.

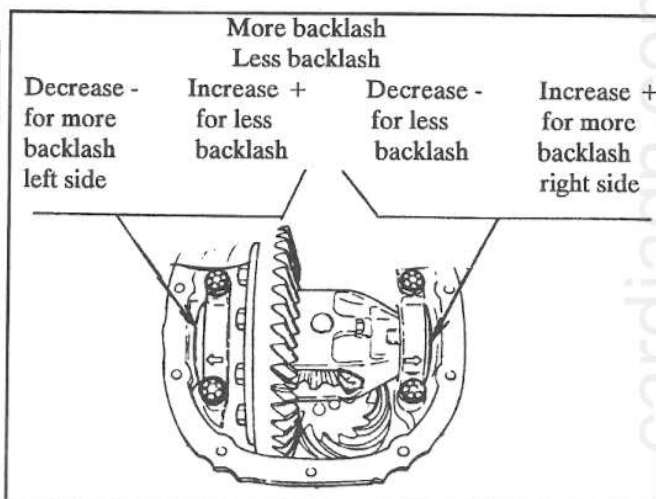
Differential Bearing Preload Spacer Selection

Lubricate all differential parts with the recommended rear axle lubricant, before they are installed.

1. Select any two spacer washers and place one against each of the differential bearing cups. Position the cups on the bearing cones and install the differential assembly in the carrier. When installed, there should be a small amount of end play.

2. With the differential held firmly against one side of the carrier, use a feeler gauge on each side of the centre line of the case to measure the end play between the cup and spacer. Rotate the carrier to seat the bearing with the feeler gauges in place, check to see that the end play has not been increased by this procedure. Remove assembly and measure the spacers.

3. To establish the thickness of the spacers required:- Total thickness of the two spacers- Add the gap measured with the feeler gauges. Add a 0.15mm when using new bearings or 0.1mm when using used bearings to preload the bearings.



4. The two spacers or shims to be selected must have a combined thickness of the dimension calculated in step number 3.

5. Fit the carrier spreader adaptors and the spreader to the carrier, together with a dial indicator positioned over the carrier differential opening, as close as possible to the centre line of the axle shafts. This may be done by using a pilot stud screwed into the side bearing lower stud hole, with the dial indicator plunger in contact with the opposite side of the carrier opening.

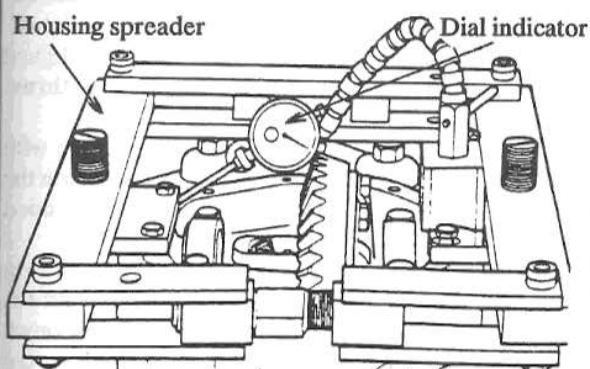
6. Use the spreader to expand the case until the differential assembly with bearings and selected spacers will fit into the carrier. A spread of 0.25 to 0.3mm is usually adequate.

The carrier should not be spread more than 0.5mm in any case.

REAR AXLE

Page 281

A spread of 0.25 to 0.3mm is usually adequate.



The carrier should not be spread more than 0.5mm

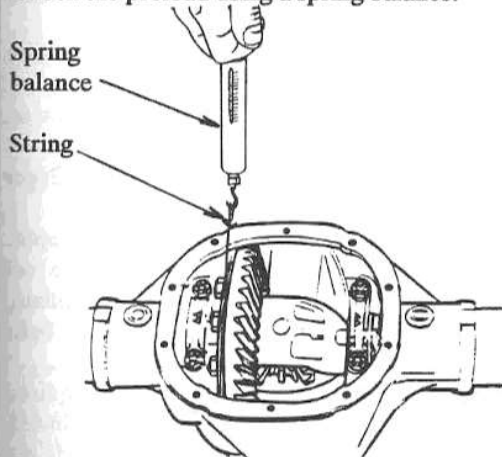
7. The differential assembly, with bearing cups and selected spacers held against the bearing cones, may now be fitted to the carrier, after removing the dial indicator.

8. Replace and remove the spreader tool leaving adaptors in place, fit the bearing cups in their original places, tightening the bolts to 55 Nm torque.

9. Rotate differential assembly at least six full turns to seat the rollers in the bearing cups.

10. Check the preload using a spring balance. Measure the tension required to revolve the assembly when a string is wrapped around the differential case on the larger diameter, just behind the drive gear.

Check the preload using a spring balance.



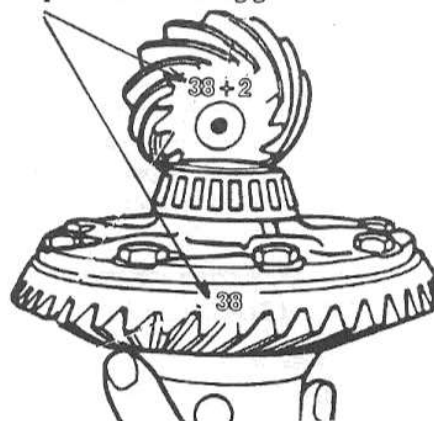
Balance readings must be within the following limits:-

New bearings 25 +/- 10 N. Used bearings 13 +/- 5 N.

11. Remove the assembly from the carrier using the spreader. If the preload is correct, tie the selected spacers to the bearing cups to have them available for use in determining gear backlash. If correct preload is not obtained, a variation of 0.025mm on spacers will alter preload 8 N for new bearings and approx. 4 N for used bearings. Repeat Drive Pinion Position- Shim Selection

There is an identification marking number on the drive pinion and the ring gear (38). When a new gear set is being

Be sure that the same matching number appears on both the drive pinion and the ring gear.



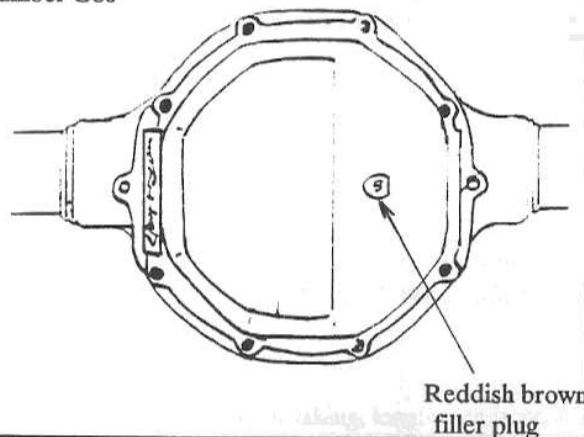
installed in an axle, be sure that the same matching number appears on both the drive pinion and the ring gear.

REAR AXLE - LIMITED SLIP DIFFERENTIAL

DESCRIPTION AND OPERATION

A metal tag identifying the differential as a LSD or the colour of the filler plug.

Metal tag identifying the differential as a LSD model number G80



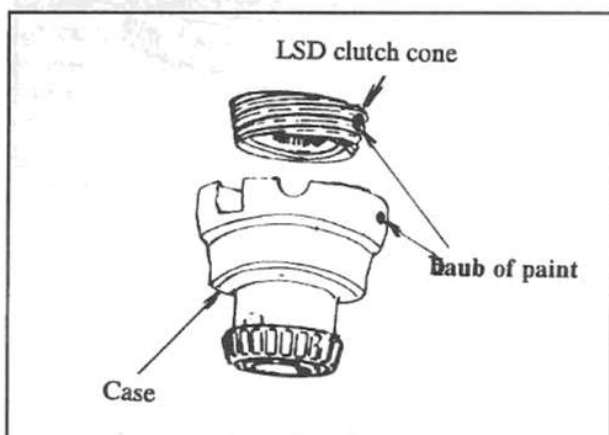
REPAIRS

* The repair procedure, ring gear and pinion settings, tooth markings and overhaul procedure for the limited slip differential are the same for the conventional axle, except for servicing the internal components of the differential assembly.

Differential Case**Dismantle**

1. Place the assembly in a vice equipped with cooper jaws, remove bolts holding the two sections of the differential case together and separate the sections.

*** Make sure that the cones are not interchanged during assembly, mark the cone and the corresponding side of the differential case with a daub of paint. If shims are present they must also marked so that they will be assembled in their correct case half.**

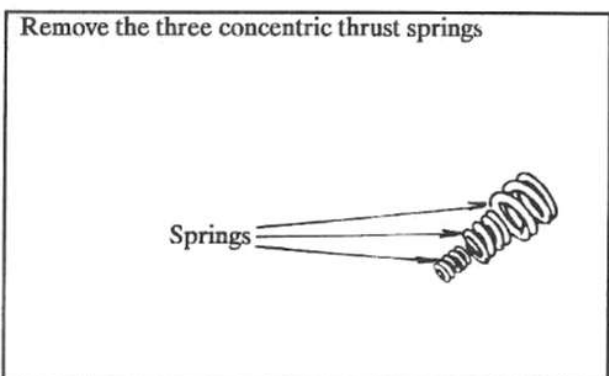


2. (a) Remove the cone and shim (if fitted), side gear, thrust block, thrust springs, pinion shaft and gears.

(b) Remove remaining thrust block, side gear and cone and shim (if fitted).

(c) Take out the pinion shaft dowel from the case.

3. (a) Remove thrust block, side gear, cone and shim (if fitted) from the smaller case section.



(b) Remove the three concentric thrust springs from the centre of the spider.

(c) Lift the spider, pinions and thrust washers from the case.

(d) Remove the remaining thrust block, side gear, shim (if fitted) and cone from the larger section.

4. For inspection after removing and dismantling refer to inspection

Assemble

Lubricate all the differential parts with the recommended rear axle lubricant, before installation.

*** When assembling the unit use the special tool with spline adaptors or axle shafts as a mounting to make sure correct alignment of the side gear and cone splines. Attempting to force the axle shafts through misaligned splines will result in damage to the springs and the thrust blocks.**

Clamp the special tool or an axle shaft in a vice with approx. 75mm extending above the vice jaws. Position the smaller section of the differential case over the extended tool or axle shaft spline with interior facing upward.

Install the cone, over the splines, seating it in position in the case, followed by a shim (if originally fitted) and the side gear. If desired check for correct shim thickness, install the brake cone tightly in the case. Measure the distance from the case mounting surface to the flat surface of the brake cone. Select the correct shim thickness. Each case half with its respective brake cone must be measured for its respective shim.

- Position a thrust block on the side gear with the tab in the oil channel in the case.

- Install pinion shaft, pinions and thrust washers. Position the shaft so that the dowel hole is in line with the hole in the case, and install the dowel.

- Install the thrust springs over the dimples in the thrust block and place the second thrust block over the springs with the tab in the oil channel.

- Place a thrust block, convex side up, on the side gear.

- Install pinion spider together with the pinions and thrust washers.

*** The mating marks on the pinion spider and case must be tightened.**

- Install the three concentric thrust springs in the centre of the spider.

- Position the second thrust block, convex side down, on the spider.

Install two case bolts in opposite holes and tighten finger tight.

Install remaining part of the special tool with adaptor spline, or an axle shaft through the case, rotating the tool to enter the cone splines and then the side gear splines. Leaving the tool in this position, tighten the two case bolts evenly to 35 Nm.

Using the Special Tool check that the torque required to continuously rotate side gears is 90 Nm minimum. Reading should be steady within 6 Nm. If torque is not satisfactory, reselect shim.

Remove the tools or axle shaft from the assembly and install remaining case bolts.

*** If the tool or axle shaft binds in the spline a light tap with a hammer may be necessary.**

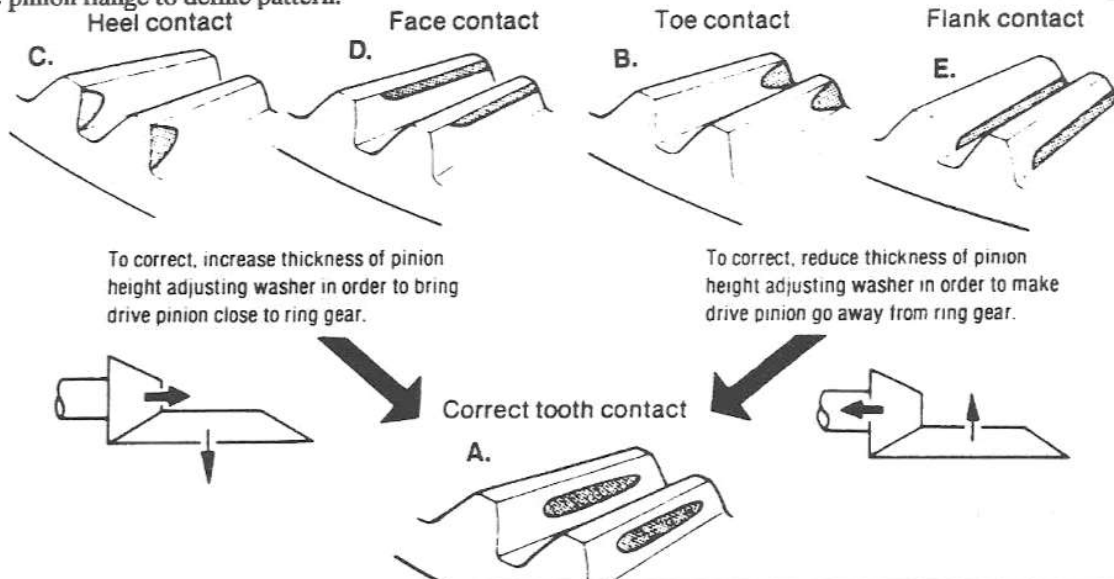
After the unit has been assembled into the housing, do not attempt to rotate one axle shaft until the other shaft is in place. Rotation of one axle shaft without the other shaft installed will result in misalignment of cone and side gear splines and prevent entry of the second axle shaft.

REAR AXLE

Page 283

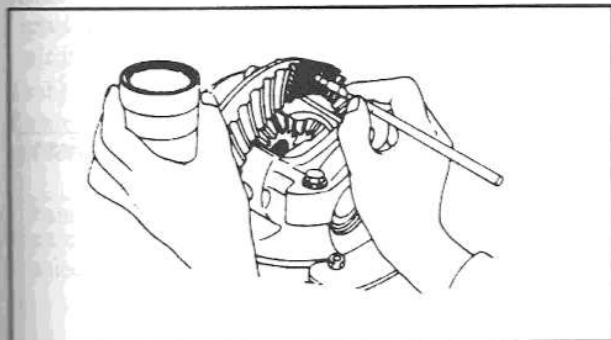
GEAR TOOTH CONTACT PATTERNS

Thoroughly clean ring gear and pinion teeth. Paint ring gear teeth lightly and evenly with gear marking compound. Assemble axles and brakes, adjust park brake to develop 80Nm at pinion flange. Rotate pinion flange to define pattern.

**PINION GEAR TOOTH CONTACT****Ring Gear Pinion Contact Pattern**

Paint ring gear teeth lightly and evenly with gear marking. Such as dry red lead and a small amount of oil, if it is too oily it will run and smear or if it is too dry it will not press out between the teeth and give the desired pattern.

Rotate pinion through several revolutions in both directions while lightly loading gear set.



To load gear set, use a piece of heavy dowel such as a broom handle between ring gear outer diameter and differential carrier.

Inspect contact pattern produced by above procedure.

The "Heel" is the large end of the tooth and the small end the "Toe", also the top of the tooth which is above the pitch line is called the "Face" while the area below the pitch line is called the "Flank". The clearance between the pinion and ring gear teeth is referred to as "Backlash".

The diagram above illustrates correct and incorrect contact patterns. Illustration pattern '1' provides the ideal marking for quietness and long life. If the pattern shows a toe contact '2', it indicates not enough backlash. To correct, move the ring gear away from the pinion by

increasing the size of the shim on the pinion side of the ring gear and decreasing the size of the shim on the pinion side of the ring by an equal amount.

Adjustments are carried out by increasing and decreasing shim thickness by 0.04mm at a time. Check contact with gear marking compound and continue adjustment until tooth contact appears in '1'. Backlash must remain within specified limits.

To correct a pattern such as '4', it will be necessary to install a thicker pinion as described in 'Hypoid Pinion Positioning Shim Selection' in this section. A 0.025mm thicker shim is recommended as a starting point. Continued changes may be necessary to obtain correct setting. If the pattern shows a flank contact 'E', indicates that the pinion is in too far. To correct, replace the pinion shim and recheck contact pattern.

In making pinion position adjustments, be sure backlash is correct before testing contact pattern. Moving the pinion 'IN' reduces backlash and moving pinion 'OUT' increases backlash.

Ideal Contact:**Drive Side:**

- * A central toe contact marking, lengthwise in position and slightly low contact in the profile position.
- * Total length approximately 5/8 of the gear face width.
- * There should be clearance of about 1 mm between the contact marking and the toe and along the top face angle line.

Coast Side:

- * A centrally located marking, lengthwise in position and slightly high in the profile position.
- * Total length approximately 5/8 of the gear face width.
- * There should be clearance between the contact and the face angle line of the gear.

Acceptable Heel Contacts:**Drive Side:**

- * An acceptable marking is, centrally located, slightly low contact.

- * Length of the marking should not be closer than 5mm to the heel end of the tooth.

Coast Side:

- * An acceptable marking is, centrally located, slightly high contact.

- * Length of the marking should not be closer than 5mm to the coast end of the tooth.

- * Total length approximately 5/8 of the gear face width.

Acceptable Toe Contacts:**Drive Side:**

- * An acceptable marking is, centrally located, slightly low contact.

- * Length of the marking should start at the toe end of the tooth and approximately 5/8 of the gear face width.

Coast Side:

- * An acceptable marking is, centrally located, slightly high contact.

- * Length of the marking should start at the toe end of the tooth and approximately 5/8 of the gear face width.

- * The contact marking being almost at the toe end face and may appear pointed as shown in figure. A square end is equally acceptable.

- * The total length of the contact marking is approximately 1/2 of the face width.

- * A high profile marking position is desirable, although a central profile is acceptable.

4. Once the contact pattern has been determined and corrected if necessary, clean off all paint dye from the ring gear and pinion gear. All the surfaces of the ring gear and pinion gear should be lubricated with recommended rear axle lubricant.

5. Apply a 1.5/2.0mm diameter continuous bead of RTV 1080 sealant to inside edge of rear cover and around drain plug hole.

6. Install rear cover to differential carrier.

Rear Cover bolt torque specification: 23-31 Nm

7. Fit screw adjuster lock plates to rear cover, ensuring that lock plates fit over ribs or between ribs on screw adjuster.

ABS Brakes: If equipped with ABS, install both sensors and mounting brackets, using the four longer bolts. Check that sensor to toothed inner axle shafts air gap is to specification. If necessary, air gap can be corrected by the use of shims under the sensor.

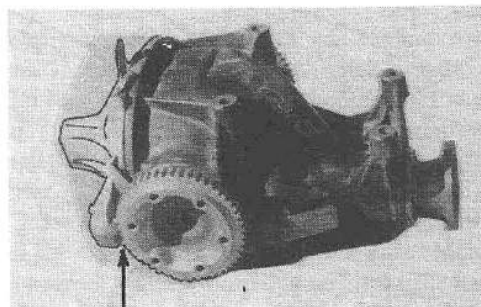
ABS Sensor Air Gap: 0.3-1.0mm

8. Install inner axle shafts, aligning splines with side gears.

L.S.D. Differentials: Align splines with clutch cups for L.S.D., make sure that both inner axle shafts are installed fully before rotating either shaft. If rotation of one shaft occurs before both are fully installed, misalignment of

If necessary, air gap can be corrected by the use of shims under the sensor.

ABS Sensor Air Gap: 0.3-1.0mm



opposite side gear and clutch cup will occur, therefore hindering assembly of remaining shaft.

ABS Brakes: The inner axle shafts have special design for this application.

9. Push both shafts until clips snap into side gear grooves, it may be necessary to tap the end of the shafts.

TRAILING ARM (Axle) - I.R.S. Diff.**Remove**

1. Before taking off the back wheels or lifting the weight of the vehicle or removing the stabilizer bar loosen and remove axle shaft constant velocity joint to inner axle shaft and trunion flange attaching bolts, if the wheel has been removed and the stabilizer has been removed hold the trunion with a bar so it will not turn.

loosen and remove axle shaft constant velocity joint to inner axle shaft and trunion flange attaching bolts

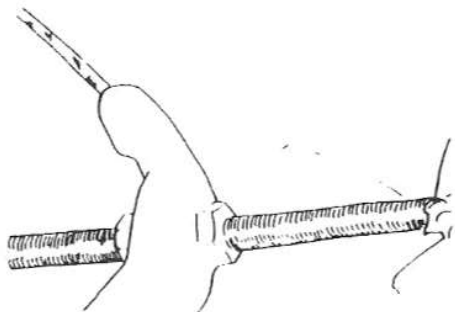


2. Lift rear of vehicle and remove wheel.

3. Remove rear brake caliper anchor plate to trailing arm attaching bolts, remove caliper from disc. Tie the brake

caliper out of the way, do not allow the brake caliper to hang on the brake hose as this will damage the hose.

Remove the parking brake equalizer so it is easier to remove the parking brake rod.



4. Remove the parking brake equalizer so it is easier to remove the parking brake rod.

5. Remove axle shaft constant velocity joints to inner axle shaft and trunnion flange attaching bolts

6. Remove rear brake disc backing plate from the trailing arm.

7. Remove shock absorber from trailing arm.

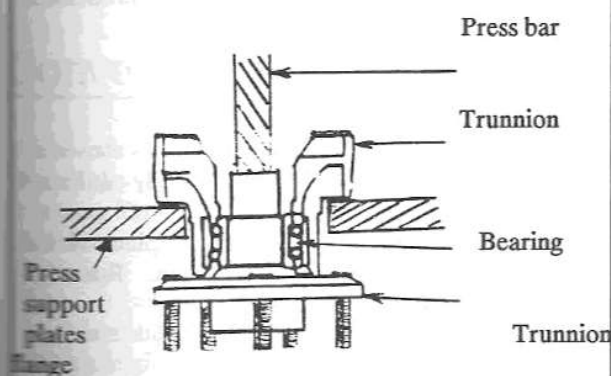
Lower the trailing arm just enough to take any pressure off the rear spring and remove the spring.

8. Remove stabilizer bar from trailing arm if it has not been removed.

[Dismantle Trunion / Replace rear wheel bearing]

9. Clamp the trunion and remove the trunion flange (hub) attaching nut. Remove the trunion and trunion flange (hub) by clamping the trunion in a press, (hydraulic preferably) push the trunion flange (hub) free of the

Remove the trunion and trunion flange by clamping the trunion in a press, (hydraulic preferably) push the trunion flange free of the trunion.



trunion.

10. Remove the backing plate, use a torx ratchet.

11. Remove the wheel bearing cir-clip from trailing arm.

12. Using a press, (hydraulic preferably) push the trunion free of the wheel bearing.

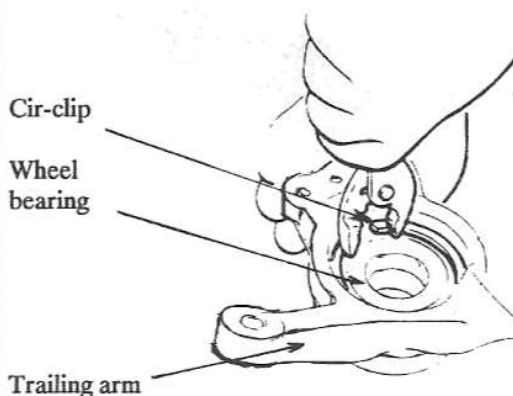
13. Press wheel bearing from the trailing arm.

Install

1. Press new bearing into Trailing arm.

2. Replace the wheel bearing cir-clip to the trailing arm.

Replace the wheel bearing cir-clip to the trailing arm



3. Fit new seal to brake bracket, fit backing plate to trailing arm and tighten bolts to specification.

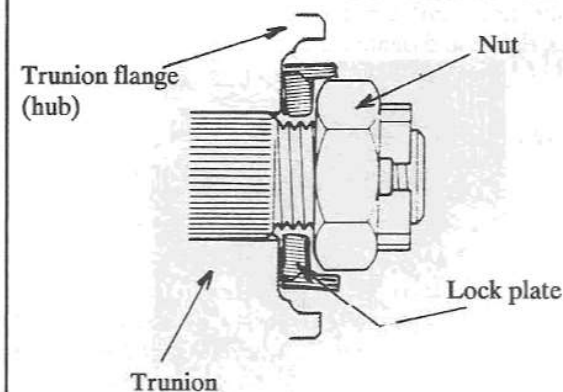
Brake Bracket and Backing Plate bolts spec torque:
70-80Nm

4. Using a press, (hydraulic preferably) wheel bearing onto trunion assembly.

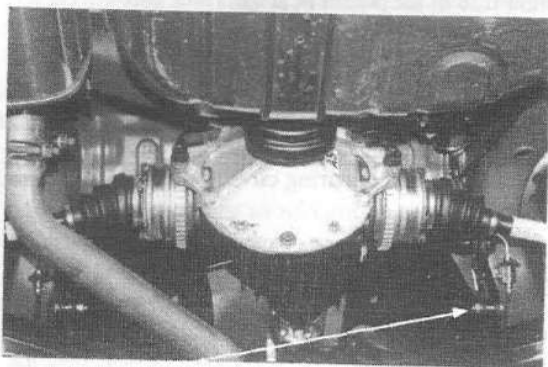
5. Using a press, (hydraulic preferably) trunion flange (hub) onto trunion assembly. Do not press on the wheel studs.

6. Clamp the trunion and fit new trunion flange (hub) nut and tighten to specification, fit new locking plate to nut.

Fit new trunion flange (hub) nut and tighten to specification



Trunion Flange Nut torque specification: 295-305Nm

Stabilizer Bar to Trailing Arm nut torque spec:18-26Nm

7. Replace stabilizer bar to the trailing arm and tighten to specification.

Stabilizer Bar to Trailing Arm nut torque spec:18-26Nm

8. Replace trailing arm to crossmember, do not torque bolts until the trailing arm is completely assembled including the rear wheels and the vehicle weight is on the rear suspension.

9. Position trailing arm to enable the fitting of the rear spring.

10. Fit shock absorber to trailing arm and tighten to specification.

Shock Absorber to Trailing Arm torque spec:**105-125Nm**

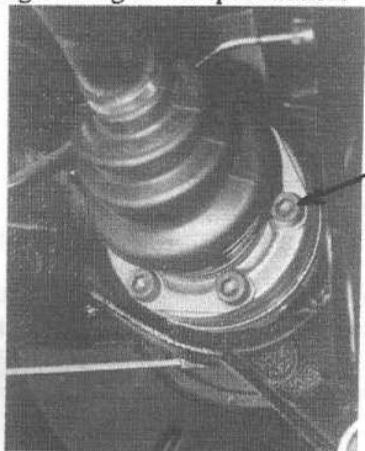
11. Reconnect the stabilizer arm to the trailing arm and tighten to specification.

Stabilizer Arm to Trailing Arm bolt spec torque:18-26Nm

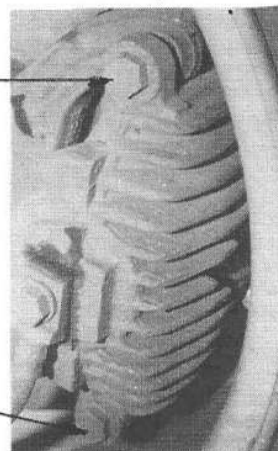
12. Fit the axle shaft constant velocity joint bolts to the trunion flange and tighten to specification.

Axle Shaft Constant Velocity Joint bolts to the Trunion Flange specified torque: 50Nm plus 60°-75° turn

Fit the axle shaft constant velocity joint bolts to the trunion flange and tighten to specification.



13. Replace the rear brake caliper anchor plate to trailing arm and brake caliper, tighten bolts to correct specification.

Replace the rear brake caliper**Brake Caliper and Backing Plate bolt specified torque:****70-100Nm**

14. Replace wheel and tighten bolts in the correct manner to correct specification.

Wheel nut specified torque:**100-125Nm**

15. Tighten trailing arm to crossmember bolts to correct specification.

Trailing Arm to Crossmember specified torque:**95-105Nm**

PROBLEM DIAGNOSIS

Problem: Oil leak from rear axle!**Possible Causes and Remedies:**

- * Oil seals worn or damaged. Remedy - replace oil seal.
- * Bearing retainer loose. Remedy - replace retainer.
- * Rear axle housing cracked. Remedy - repair as necessary.

Problem: Oil leak from pinion shaft!**Possible Causes and Remedies:**

- * Oil level too high or wrong grade. Remedy - drain and replace oil.
- * Oil seal worn or damaged. Remedy - replace oil seal.
- * Companion flange loose or damaged. Remedy - tighten or replace flange.

Problem: Noises in rear axle!**Possible Causes and Remedies:**

REAR AXLE

Page 287

- * Oil level low or wrong grade. Remedy - drain and replace oil.
- * Excessive backlash between pinion and ring or side gear. Remedy - check backlash.
- * Ring, pinion or side gears worn or chipped. Remedy - inspect gears.
- * Pinion shaft bearing worn. Remedy - replace bearing.
- * Axle shaft bearing worn. Remedy - replace bearing.
- * Differential bearing loose or worn. Remedy - tighten or replace bearings.

Problem: Bottoming!**Possible Causes and Remedies:**

- * Shock absorber worn out. Remedy - replace shock absorber.
- * Springs weak. Remedy - replace spring.

Problem: Bearing abrasive roller wear!**Possible Cause:**

- * Pattern on races and rollers caused by fine abrasives.

Remedy:

- * Clean all parts and housings.
- * Check seals and bearings and replace if leaking, rough or noisy.

Problem: Metal Surface etching!**Possible Cause:**

- * Bearing surfaces appear grey (or greyish black) in colour with related etching away of material usually at roller spacing.

Remedy:

- * Replace bearings, check seals and check for proper lubrication.

Problem: Bearing Discolouring!**Possible Cause:**

- * Surface indentations in raceway caused by rollers either under impact loading or vibration while the bearing is not rotating.

Remedy:

- * Replace bearing if rough or noisy.

Conventional Differential Sp's

Rear Axle Assembly	Borg Warner 78 Series
Axle Type	Semi Floating
Housing Type	Unitized Carrier Construction
Lubricant	
Capacity	1.7 litres
Type	
V6 Conventional Diff and LSD:	SAE 90 API GL5.
V8 Conventional Diff, LSD, Utilities:	
	Mobilube SHC 80W-140ID
Standard & L.S.D. Axles	
Gear Type	Hypoid

Ratio 3.08:1 [Ratio is stamped on I.D. tag attached to rear cover]

Differential Gears

Type	Straight Bevel
Pinion Gear	10 teeth
Side Gears	16 teeth

Axle Shaft

Type	Semi Floating
Bearing Type	Tapered Roller
Oil Seal	Spring Loaded Synthetic Rubber

End Float

* New	0.40-0.48 mm	As assembled
* Used	0.76 mm (max)	to axle shaft

Differential Pinion Gear

Bearing Type	Adjustable Tapered Roller
Bearing Adjustment	Collapsible Spacer

Bearing Pre-Load

* New [w/ oil seal]	1.6 - 3.4 Nm
* New [w/o oil seal]	1.6 - 2.8 Nm
* Used [w/ oil seal]	0.8 - 1.7 Nm
* Used [w/o oil seal]	0.8 - 1.4 Nm

Differential Side Bearings

Type	Tapered Roller
Adjustment	Shims
Bearing Pre-Load	

* New	15 - 35 N}	Torque measured
* Used	8 - 18 N}	w/o axles or pinion installed

Run out specifications

Case Assembly[w/o ring gear attached]	0.5 mm (max)
Ring Gear Rear Face[when assembled onto case assembly]	0.13 mm (max)

Gear Tooth Combination

Ratio	3.08:1
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Number of Teeth

* Ring Gear	40
* Pinion Gear	13

Backlash 0.10 - 0.18 mm [at the tightest point]

L.S.D. Pre-Load Specification 68 Nm

Conventional Differential**Torque Spec's Nm**

Differential Ring Gear Bolts	130 - 145
Differential Bearing Cap Bolts	48 - 60
Rear Cover Bolts	23 - 31
Breather	40 - 55
Axle Bearing Outer Retainer to Housing Nuts	40 - 55
Lower Control Arm Attaching Bolts	95 - 110
Upper Control Arm Attaching Bolts	60 - 75
Stabilizer Bar Bracket Attaching Nuts	14 - 18
Stabilizer Bar Spacer Stud Nuts	7 - 10
Panhard Rod Attaching Nut to Axle Housing	54 - 70
Panhard Rod Attaching Bolt to Body Mounting	95 - 110
Shock Absorber Upper Mounting Nut	12 - 16

Adjustment	Screw adjusters on each side of carrier.	
Side Bearing pre-load	New	15-35 N
	Used	8-18 N
Torque measured at the differential case, without inner axle shafts or pinion installed.		
RUN-OUT SPECIFICATIONS		
Case assembly		
(without ring gear attached)		0.05mm (max)
Ring gear rear face		
(when assembled onto case assembly)		0.13mm (max)
Gear tooth combination ratio		3.08:1
No. of teeth	Ring gear	40
	Pinion gear	13
Ring gear backlash	0.10 to 0.18mm at the tightest point	
L.S.D. torque check specification		68 Nm

I.R.S. Differential Torque

Specifications	Nm
1. Material: High-strength steel alloy.	1. Material: High-strength steel alloy.
2. Dimensions: 100mm x 50mm x 10mm.	2. Dimensions: 100mm x 50mm x 10mm.
3. Weight: 0.5kg.	3. Weight: 0.5kg.
4. Strength: 1000N.	4. Strength: 1000N.
5. Corrosion Resistance: Excellent.	5. Corrosion Resistance: Excellent.
6. Temperature Range: -20°C to 100°C.	6. Temperature Range: -20°C to 100°C.
7. Surface Finish: Polished.	7. Surface Finish: Polished.
8. Compliance: ISO 9001.	8. Compliance: ISO 9001.
9. Lead Time: 2 weeks.	9. Lead Time: 2 weeks.
10. Warranty: 1 year.	10. Warranty: 1 year.

Rear cover attaching bolts	25-30
L.S.D. case cap to cover attaching bolts	35-45
Collar nut to trunnion assembly w/- new nut	295-305
Drive shaft constant velocity joint to trunnion/inner axle shaft flange bolts	50 Nm + 60 to 75 degrees turn angle
Brake caliper anchor plate to trailing arm bolts	70-100
Rear brake backing plate to trailing arm attaching bolts	70-80
Differential carrier to rear crossmember attaching bolts	90 Nm + 30 to 45degrees turn angle
Rear mount to vehicle underbody attaching bolts	30-40
Rear mount to differential carrier rear cover attaching bolts	85-105
Shock absorber lower mounting bolt	105-125
Crossmember front mounting brace to underbody bolts	60-70
Crossmember front mounting bolt	125 Nm + 30 to 45 degrees turn angle

Capacity 1.65 litres.
Type: (V6 Engine) Std. or L.S.D. Hypoid Gear Oil,
SAE 90.A.P.I GL5. Suitable for L.S.D. application To
Holden's Spec. HN1561 or equivalent.

(V8 Engine) Std. or L.S.D. Synthetic Hypoid Gear Oil to Holden's Spec. HN2040. (Mobilube SHC 80W-140 (I.D.) or equivalent).

Gear type Hypoid
Ratio: 3.08:1(optionGU4) & 3.27:1(optionGW6)
Ratio is on I.D. tag.

Type	Straight bevel
Pinion gears	10 teeth
Side gears	16 teeth
Trunnion Assembly Hub run-out	0.16mm Total In-
Indicated Run-Out	

Bearing type	Adjustable Tapered Roller.
Bearing adjustment	Collapsible Spacer
Bearing pre-load	New with oil seal 1.4 to 2.4 Nm
	New without oil seal 1.4 to 2.0 Nm
Used with oil seal	0.7 to 1.2 Nm
Used without oil seal	0.7 to 1.0 Nm

Type Adjustable Tapered Roller.

[illegible]

