

Shafts

Inspect mainshaft gears for signs of chipping or excessive wear.

Countershaft surfaces must not be damaged or excessively worn.

Splines should be free from nicks and burns, so that hubs may slide freely.

Check countershaft centering by placing it between two centers and rotating it by hand; maximum permissible runout, measured with dial indicator, is .001 in (.025 mm).

The surface of reverse shaft should be smooth and free from nicks and burrs.

Minor imperfections on working surfaces, that do not render parts unfit for service, may be dressed up with extra-fine emery cloth.

Minor distortions of shafts can be corrected with a small press, taking care not to damage surfaces. If shafts are badly distorted, they must be replaced.

Gears

Gears should not show damage or excessive tooth wear. Gear tooth contact pattern must extend to entire working surface. Inspect pattern for roughness or signs of excessive wear.

Gear lash should be .004 in (0.10 mm) for new parts; maximum allowable lash is .008 in (0.20 mm).

Fit clearance between bushings and countershaft gears is .001 to .003 in (0.04 to 0.08 mm). Replace gears worn beyond specified limits.

Hubs – Sleeves – Synchronizer Rings

Check that sliding sleeve hubs for engagement of first-second, third-fourth and fifth gears are not nicked, especially on sleeve sliding surface.

Synchronizer rings must not be excessively worn, either on their inside surface or on teeth that mesh with sliding sleeves. Ring must not be loose in its gear seat.

The outside diameter of seated synchronizer ring when new is $3.004 \pm .008$ in (76.31 ± 0.2 mm) for first and second gears; $2.607 \pm .008$ in (66.22 ± 0.2 mm) for third, fourth and fifth gears.

When replacing a synchronizer ring, check that its diameter in its gear seat conforms to specifications.

If splined parts do not slide smoothly, remove imperfection with a fine file.

Parts worn beyond limits should be replaced.

Bearings

Bearings must be in perfect condition. End play must not exceed .020 in (.050 mm). Hold bearing firmly and turn it both ways to check for roughness.

Replace bearings that are not in perfect condition.

Rods – Forks

Shift control forks should not be distorted and control rods should slide freely, but without excessive play, in transmission case and housing guide holes.

Detent balls and rollers should slide freely in their seats.

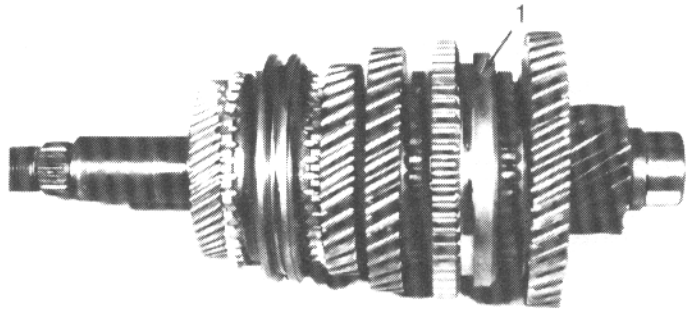
Any sign of seizure could cause engagement or disengagement problems.

Wear patterns should be the same on both sides of forks.

REASSEMBLY

Reassembly is reverse of disassembly with special attention to following Notes, Cautions and Procedures.

CAUTION: During reassembly of countershaft, be certain that first and second gear sliding sleeve hub reverse gear (1) faces first gear as shown. If this part is to be replaced, make certain that correct sliding sleeve hub is installed since four speed transmission sliding sleeve hub can be installed, but is incorrect, and will result in locked transmission.

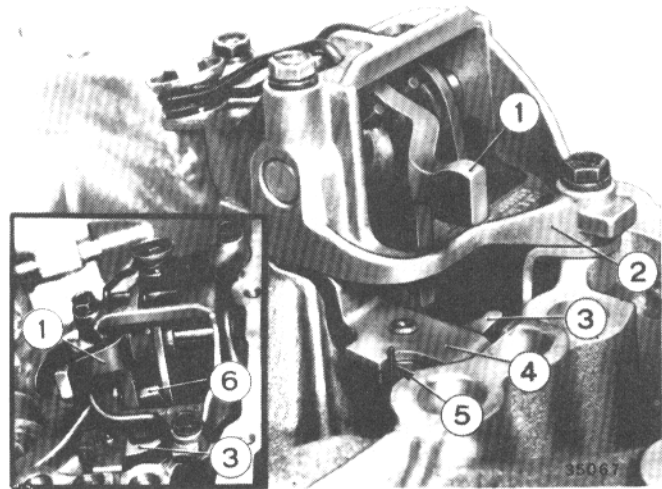


1. First and second gear sliding sleeve hub reverse gear

Installation of Shift Rods

Install support bracket (2) so that gear shift lever (6) is positioned as shown.

- 1. Selector lever 2. Support bracket 3. Reverse lockout pawl
- 4. Pawl support 5. Pawl return spring 6. Gear shift lever

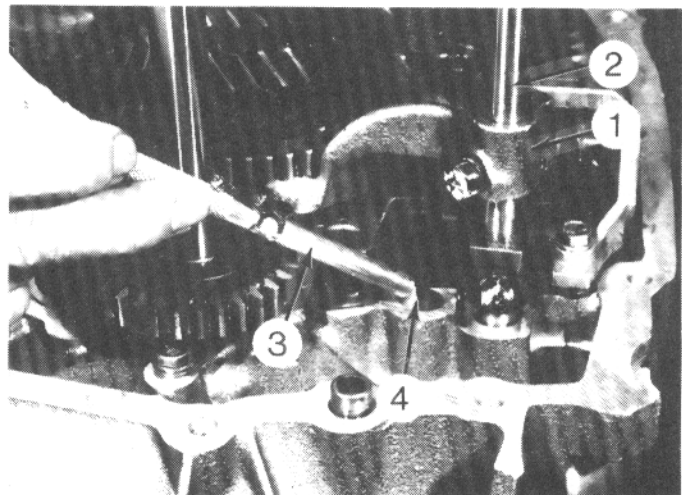


Place forks (1) in position on sliding sleeves/hubs.

Install first and second shift rod (2).

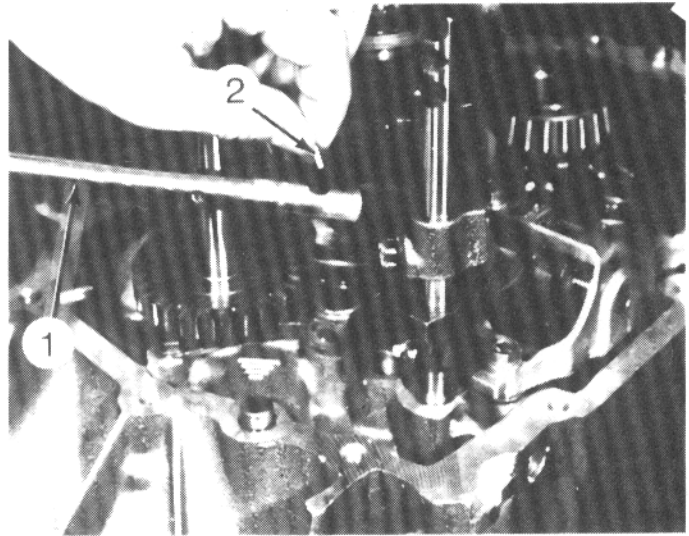
With magnetic tool (3), install lock pin (4) down into its slot in bore as shown. Insure that pin is fully seated.

- 1. Fork 2. First and second shift rod 3. Magnetic tool 4. Lock pin



Before installing third and fourth shift rod (1), install pin (2) in rod as shown. Insert rod into bore.

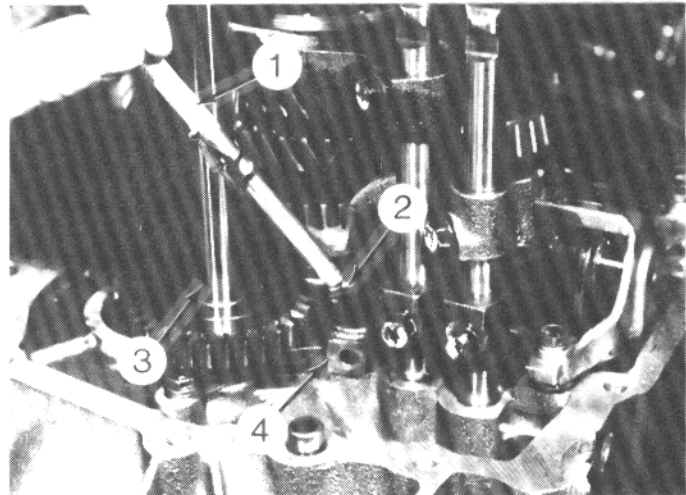
1. Third and fourth shift rod 2. Pin



With magnetic tool (1) insert last lock pin (2) as shown. Insure that pin is fully seated.

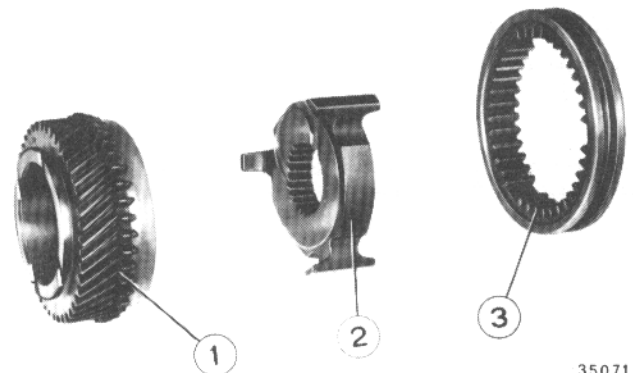
Install reverse idler assembly (3) with fork (4) installed. Install fifth and reverse shift rod.

1. Magnetic tool 2. Lock pin 3. Reverse idler assembly 4. Fork



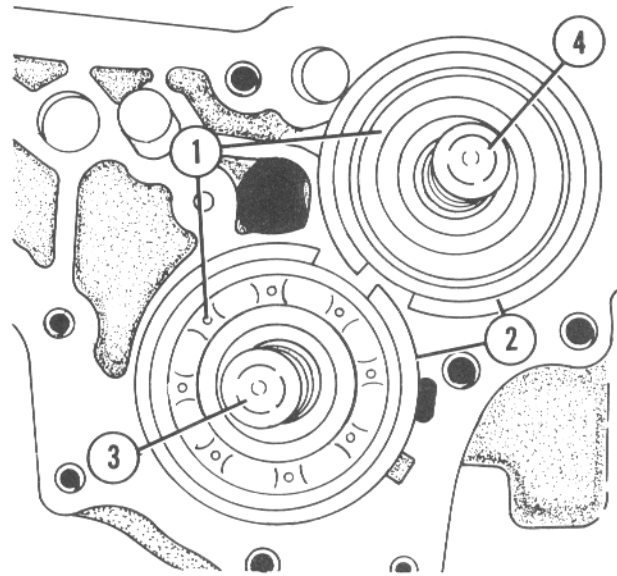
NOTE: On reassembly of fifth gear, synchro hub (2) oil groove should face fifth gear (1) as shown.

1. Fifth gear 2. Synchro hub 3. Sliding sleeve



CAUTION: Position bearing snap rings (2) as shown or bearings will not seat properly.

1. Bearing 2. Snap ring 3. Mainshaft 4. Countershaft



To torque main and countershaft locknuts, transmission must first be locked-up.

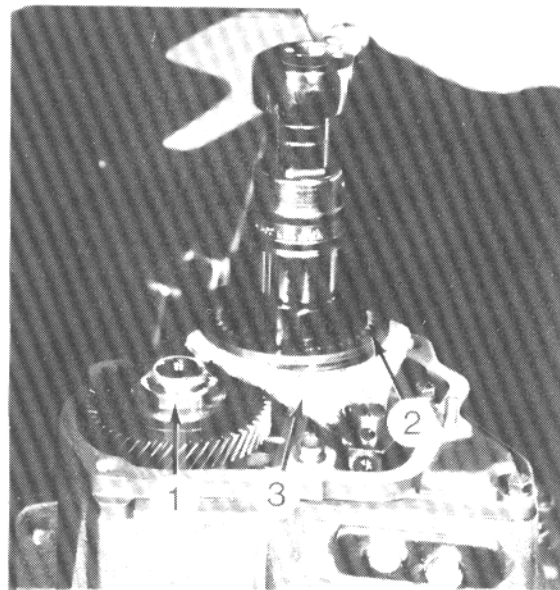
Remove fifth speed fork (3) bolt and engage fifth speed manually by pressing hub (2) down.

Engage transmission in another gear by moving shift lever, this will lock shafts.

Nuts can now be torqued to 86.8 ft lb (12 kgm) as shown.

Disengage hub and reinstall fork bolt.

1. Locknut 2. Hub 3. Fork

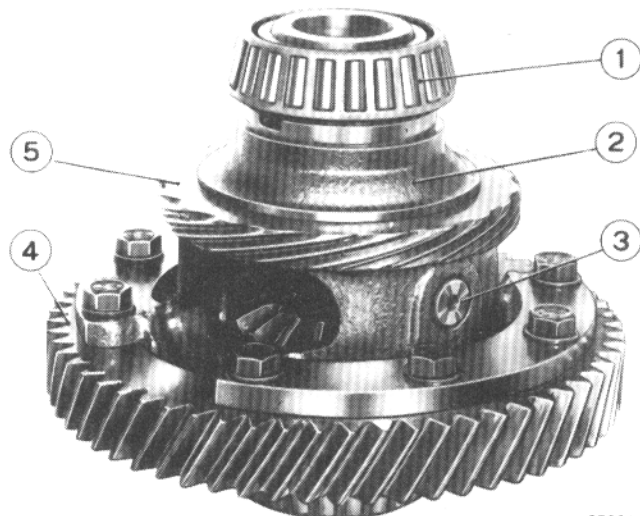


DIFFERENTIAL

DISASSEMBLY

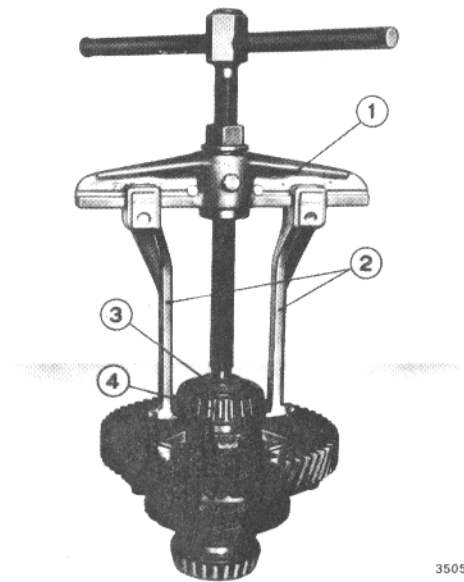
To remove crown gear (4) remove eight bolts (6) attaching it to case (2).

1. Differential bearing 2. Differential case 3. Pinion shaft
4. Crown gear 5. Speedometer drive gear



To remove both differential bearings (4), use puller A.40005/002 (1) together with arms A.40005/302 (2) and spacer A.45028 (3) as shown.

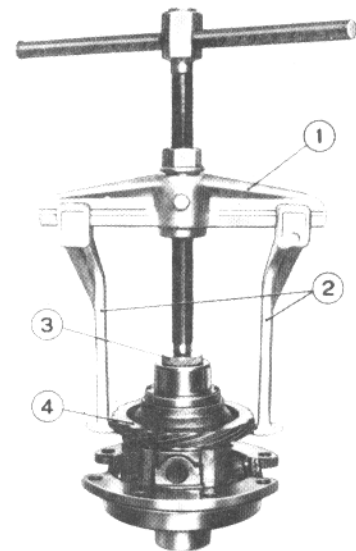
- 1. Puller A.40005/002
- 2. Arms A.40005/302
- 3. Spacer A.45028
- 4. Bearing



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To remove speedometer drive gear (4), use puller A.40005/002 (1) together with arms A.40005/302 (2) and spacer A.45028 (3) as shown.

- 1. Puller A.40005/002
- 2. Arms A.40005/302
- 3. Spacer A.45028
- 4. Speedometer drive gear

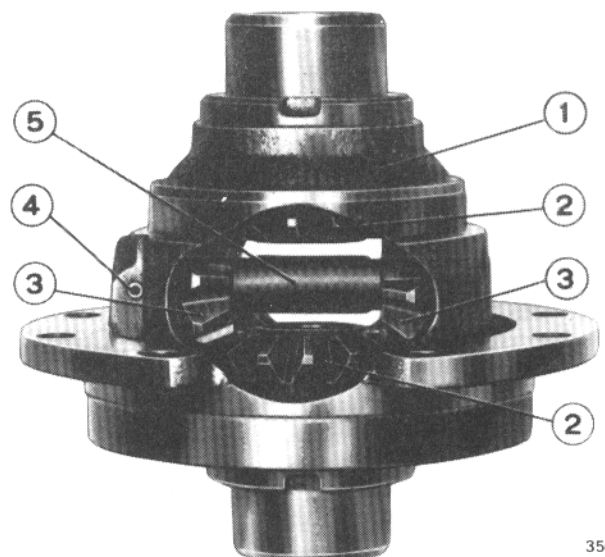


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To remove differential pinion shaft (5) and gears (2 and 3), drive out retaining pin (4) and then slide shaft out.

Remove gears through large opening in case (1).

- 1. Differential case
- 2. Side gear
- 3. Pinion gear
- 4. Retaining pin
- 5. Pinion shaft



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INSPECTION

Check teeth for scoring or signs of abnormal wear and make sure contact pattern extends to entire thrust surface.

If excessive wear is found, replace affected parts.

Gears with chipped teeth should be replaced and mating gears carefully examined for damage.

Inspect pinion shaft and pinion bores for scoring or nicks. Minor damage can be dressed off with extra-fine emery cloth; otherwise replace parts. Follow a similar procedure for inspecting side gears and counterbores in case.

Inspect roller bearings, these should be in perfect condition with no signs of wear and should have perfectly smooth surfaces. If there is any doubt as to their serviceability, replace them, as faulty operation of bearings will result in gear noise and/or seizure.

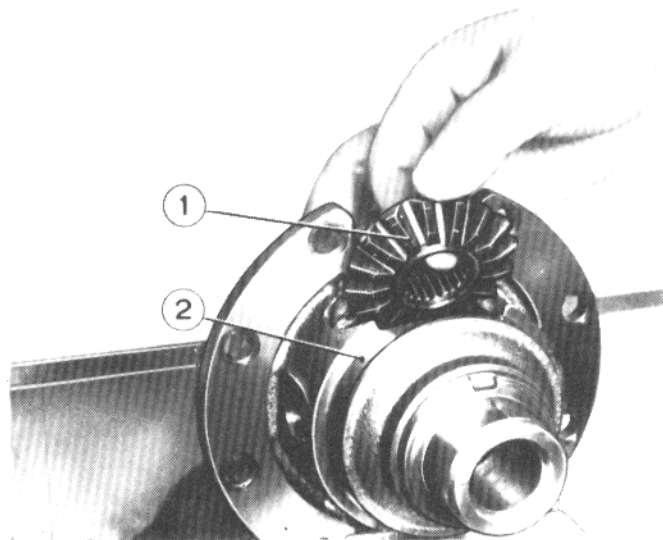
REASSEMBLY

Refit differential gears to case as follows; place side gears (1) in case directly opposite each other, seated in their counterbores.

Place pinion gear in mesh with side gears.

Carefully rotate assembly so that pinion gear is directly opposite large opening in case and place second pinion gear in mesh.

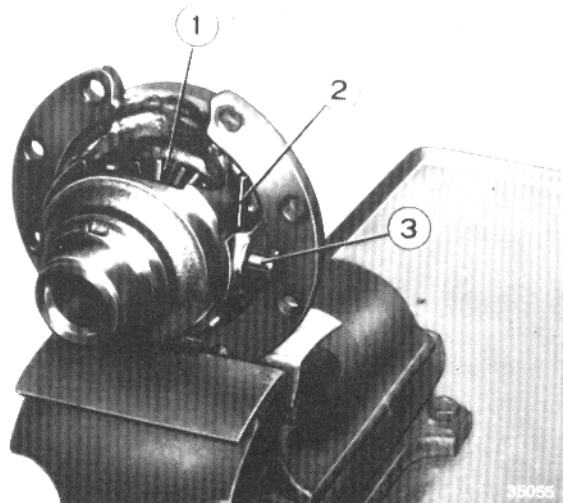
1. Side gear 2. Differential case



Rotate assembly so that pinion shaft (3) can be inserted through pinion gears.

Line up pinion shaft pin hole with hole in case and insert retaining pin (2).

1. Side gear 2. Retaining pin 3. Pinion shaft

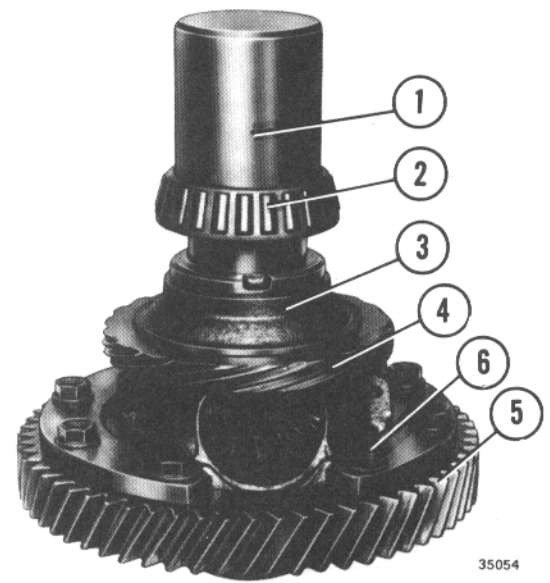


Using a suitable installer, refit speedometer drive gear.

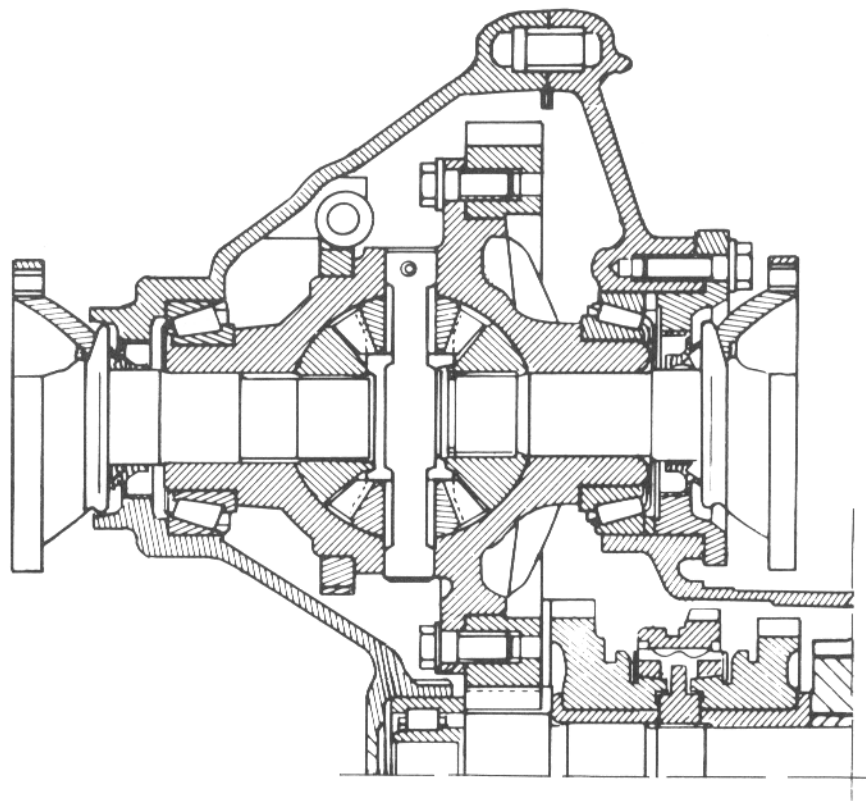
Using installer A.70190 (1) refit bearing (2).

Install crown gear (5) with eight bolts (6).

1. Installer A.70190 2. Bearing 3. Differential case
4. Speedometer drive gear 5. Crown gear 6. Bolt



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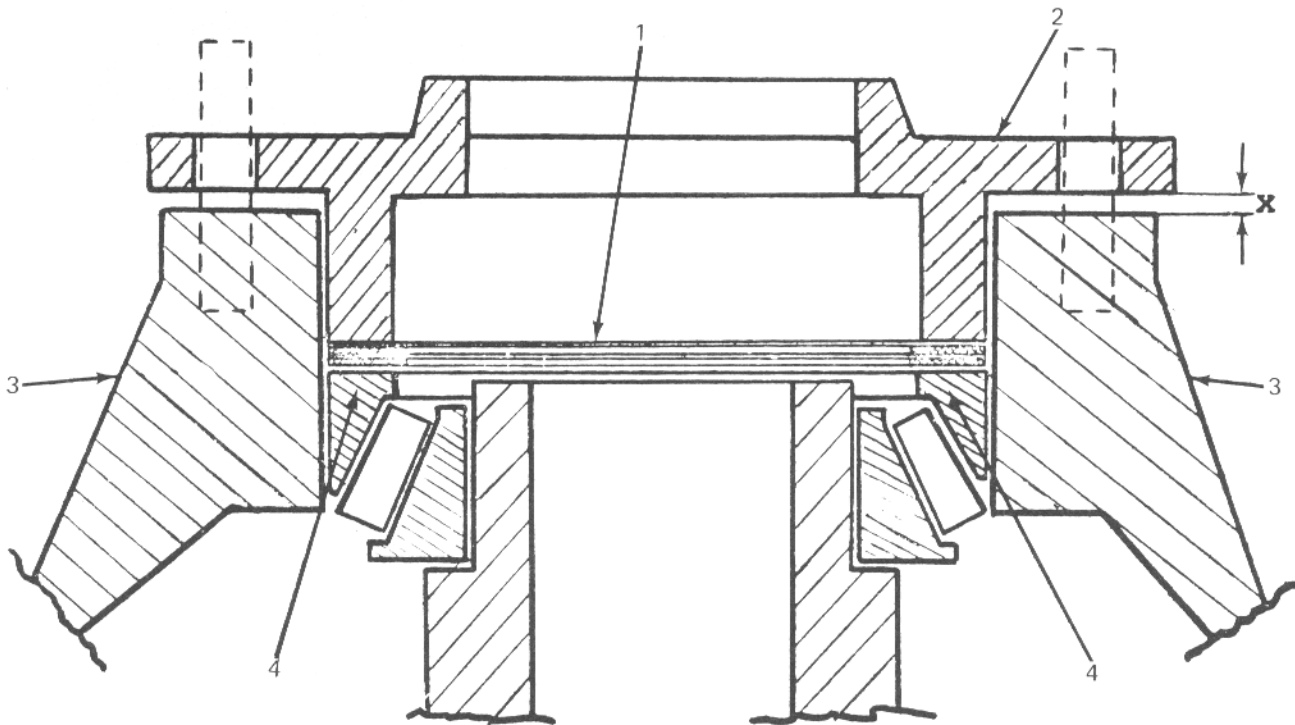
**LONGITUDINAL SECTION
THROUGH FINAL DRIVE UNIT**

DIFFERENTIAL BEARING SETTING

NOTE: Bearing preload must not be changed unless the bearings or transmission housing has been replaced.

The bearing on the differential must be preloaded. Preload is obtained by placing shims between outer ring of the bearing and the sealing cover. To set preload, do one of the following:

If fixture A.95655 is not available, place outer ring of carrier bearing in its seat. Place shims on top of bearing. Place retaining flange on shims. Using feeler gauge measure clearance between flange and transmission housing. If clearance is not 0.003 to 0.005 in. (0.08 to 0.12mm), add or remove shims to obtain this clearance. Install two nuts on studs thru flange and tighten nuts. Turn transmission one full turn to set bearings. Loosen nuts and check clearance. Install nuts on studs. Torque nuts to 18 ft. lbs. (2.5kgm).



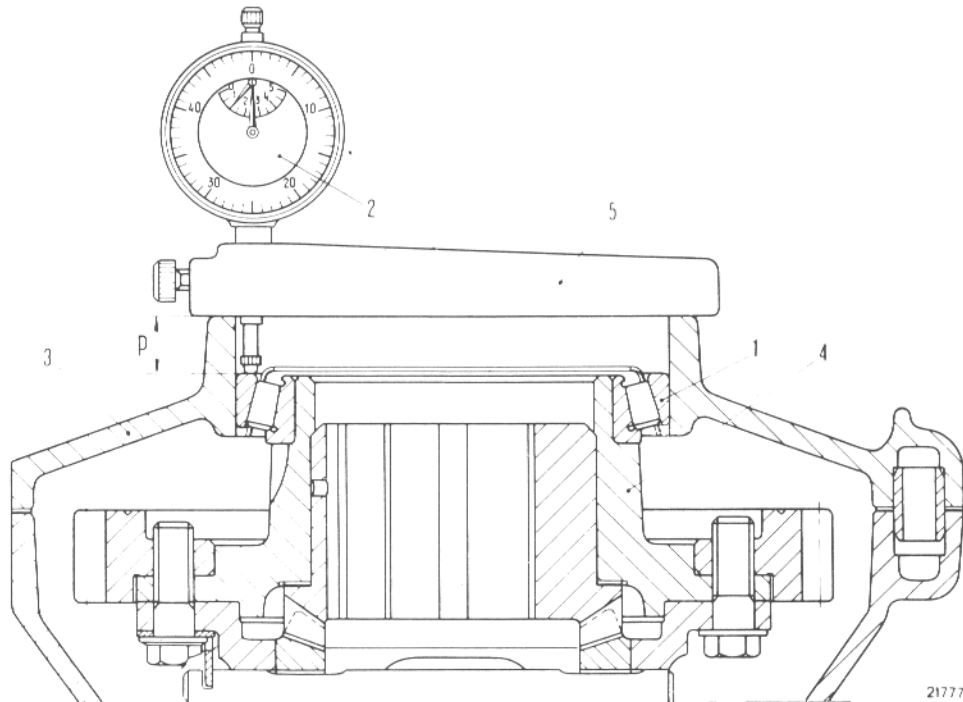
1. Shims 2. Retaining flange 3. Transmission housing 4. Bearing

If fixture A.95655 is available, apply a load of 770 lbs. (350kg) to settle bearings. Place fixture A.95655 with dial indicator on surface for sealing cover. Set dial indicator finger against outer ring of bearing. Zero indicator.

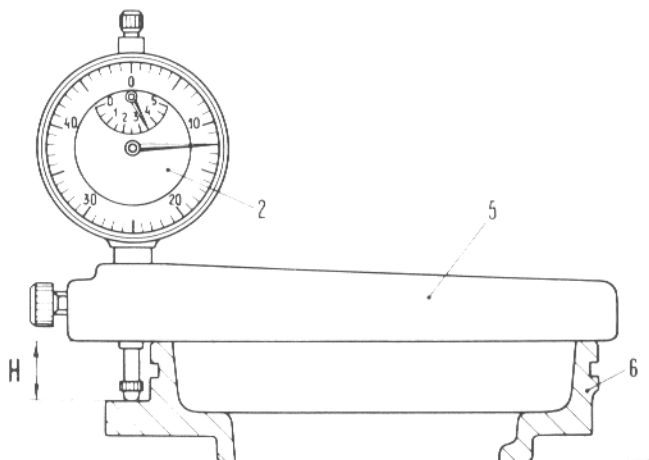
Without changing the indicator, place fixture on sealing cover with finger on cover and case surface. Value on indicator is difference between distance "P" and height "H".

Add 0.0031 in. (0.08mm) to value on indicator to determine thickness of shims. Choose a shim with a thickness as close as possible to this value.

NOTE: Shims are supplied in the following thicknesses; 0.0196, 0.0236, 0.0275, 0.0315, 0.0354, 0.0394, 0.0433 in. (0.50, 0.60, 0.70, 0.80, 0.90, 1.00, 1.10mm).



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1. Bearing 2. Dial indicator 3. Transmission case 4. Differential case 5. Tool A.95655 6. Sealing cover

P = Distance between mounting surface for cover (6) and outer ring of bearing (1).

H = Height of sealing cover.