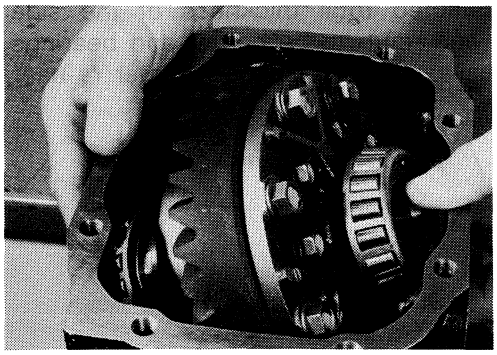
For quiet and reliable final drive operation, the following five adjustments must be made correctly:

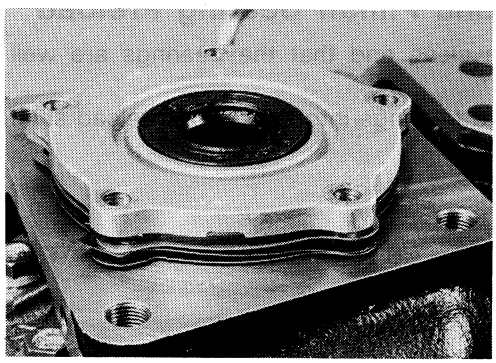
1. Side bearing preload.
2. Pinion gear height.
3. Pinion bearing preload.
4. Ring gear-to-pinion backlash. (Refer to ASSEMBLY.)
5. Ring and pinion gear tooth contact pattern.

Side Bearing Preload

A selection of carrier side bearing preload shims is required for successful completion of this precedure.



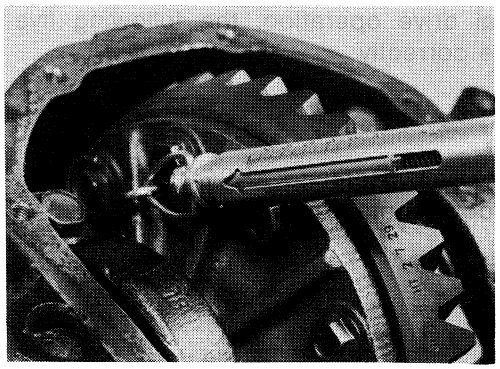
1. Make sure all parts are clean and that the bearings are well lubricated with light oil or Dexron™ type automatic transmission fluid.
2. Install differential carrier and side bearing assembly into the final drive housing.



3. Place all of original side bearing preload shims onto the side bearing retainer that goes at the ring gear end of the carrier.

4. Install both bearing retainers onto the final drive housing and torque the retainer bolts.
   Bolt torque specification:
   9 - 12 N•m (0.9 - 1.2 kg-m, 6.5 - 7.2 ft-lb)

Side Bearing Preload (Cont'd)

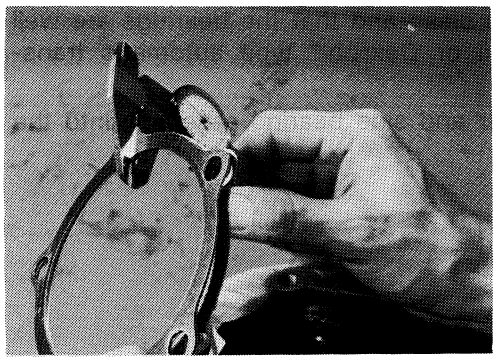


5. Turn the carrier several times to seat the bearings.
6. Measure the carrier turning torque with a spring gauge, J-8129, at the ring gear retaining bolt.

   Turning torque specification:

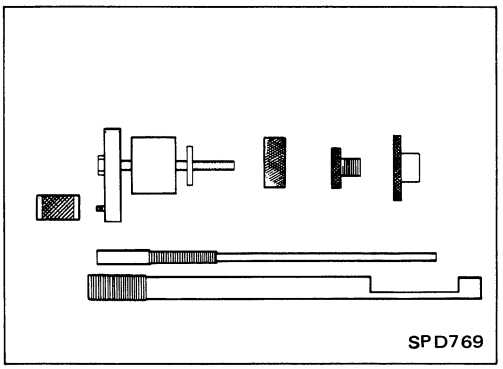
   34.3 - 39.2 N (3.5 - 4.0 kg, 7.7 - 8.8 lb) of pulling force at the ring gear bolt.

7. If the turning torque measured is incorrect, establish the correct bearing preload by adding to or subtracting from the total amount of shim thickness.
   - Increase shim thickness to decrease turning torque on the carrier.
   - Decrease shim thickness to increase turning torque on the carrier.

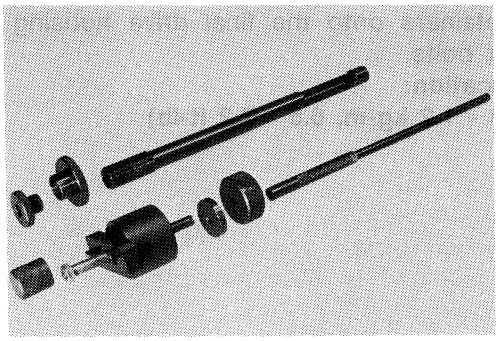


8. Record the correct, selected total thickness of the side bearing preload shims, and remove the carrier and bearings from the final drive housing. Save all shims for later re-use.

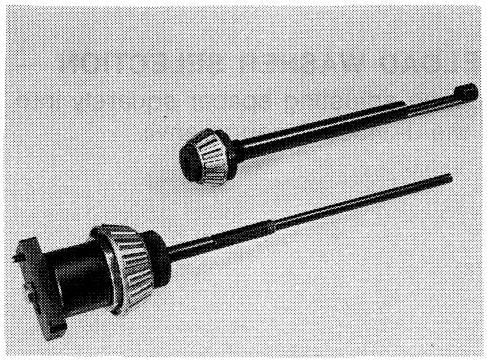
Pinion Gear Height and Pinion Bearing Preload



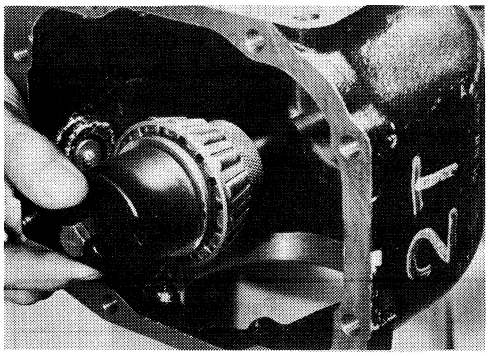
1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the pinion preload shim selector tool, J-34309.



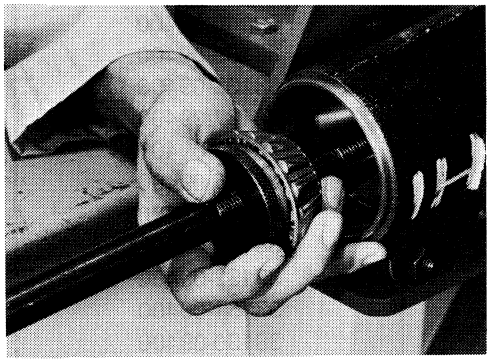
Pinion Gear Height and Pinion Bearing Preload (Cont'd)



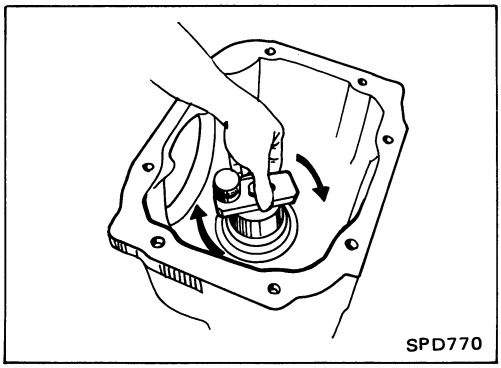
- **Front pinion bearings** — make sure the J-34309-3 front pinion bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the front pinion bearing pilot, J-34309-7, to secure the bearing in its proper position.
- **Rear pinion bearing** — the rear pinion bearing pilot, J-34309-8, is used to center the rear pinion bearing only. The rear pinion bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.



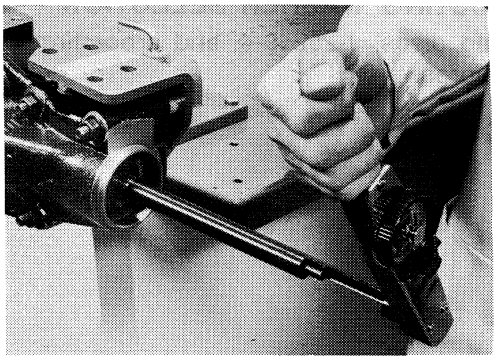
3. Place the pinion preload shim selector tool gauge screw, J-34309-1, with the pinion rear bearing inner cone installed, into the final drive housing.



4. Install the J-34309-2 gauge anvil with the front pinion bearing into the final drive housing and assemble it to the J-34309-1 gauge screw. Make sure that the J-34309-16 gauge plate will turn a full 360 degrees, and tighten the two sections by hand.



5. Turn the assembly several times to seat the bearings.



6. Measure the turning torque at the end of the J-34309-2 shaft using torque wrench J-25765-A.

   Turning torque specification:

   1.0 - 1.3 N•m (10 - 13 kg-cm, 8.7 - 11.3 in-lb)

7. Place the J-34309-10 pinion height adapter onto the gauge plate and tighten it by hand.

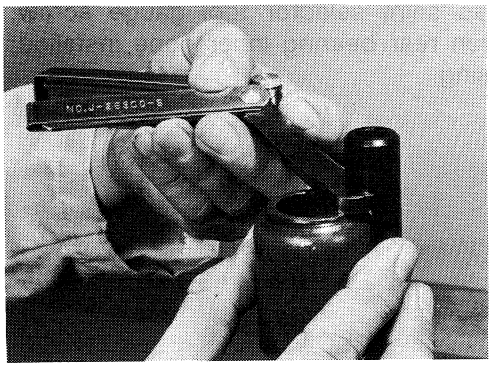
CAUTION:

Make sure all machined surfaces are clean.

Pinion Gear Height and Pinion Bearing Preload (Cont'd)

— PINION BEARING PRELOAD WASHER SELECTION —

8. Place the solid pinion bearing adjusting spacer squarely into the recessed portion of the J-34309-2 gauge anvil.

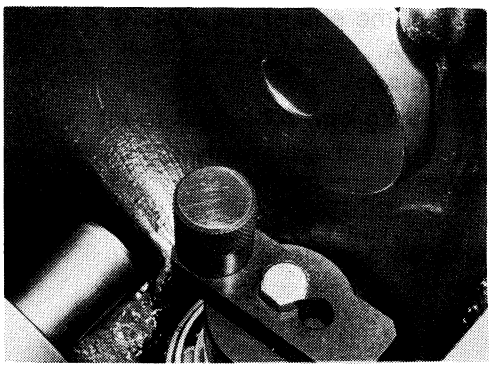


9. Select the correct thickness of pinion bearing preload adjusting washer using a standard gauge of 6 mm (0.24 in) and the J-34309-101 feeler gauge. Required thickness of adjusting washer is obtained by subtracting 4 mm (0.16 in) from total measured value (using a gauge). Select the correct washer from the following chart.

Drive pinion bearing adjusting washer (R180 and R180V)

Thickness mm (in)	Part number
2.31 (0.0909)	38141-09400
2.33 (0.0917)	38140-09400
2.35 (0.0925)	38139-09400
2.37 (0.0933)	38138-09400
2.39 (0.0941)	38137-09400
2.41 (0.0949)	38136-09400
2.43 (0.0957)	38135-09400
2.45 (0.0965)	38134-09400
2.47 (0.0972)	38133-09400
2.49 (0.0980)	38132-09400
2.51 (0.0988)	38131-09400
2.53 (0.0996)	38130-09400
2.55 (0.1004)	38129-09400
2.57 (0.1012)	38128-09400
2.59 (0.1020)	38127-09400

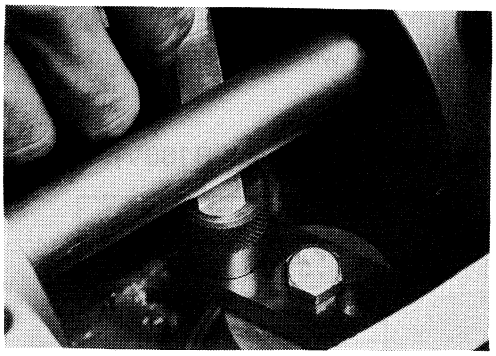
10. Set the selected, correct pinion bearing preload adjusting washer aside for use when assembling the pinion and bearings into the final drive housing.



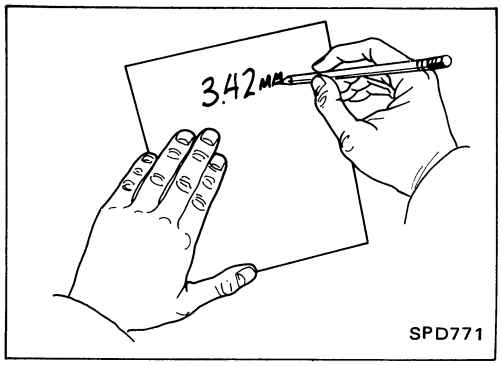
— PINION HEIGHT ADJUSTING WASHER SELECTION —

11. Position the side bearing discs, J-25269-4, and arbor firmly into the side bearings bores.

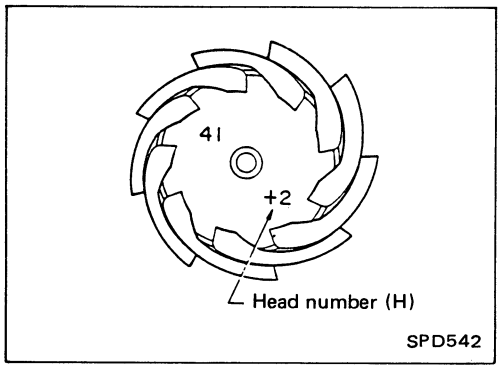
Pinion Gear Height and Pinion Bearing Preload (Cont'd)



12. Select the correct standard pinion height adjusting washer thickness using a standard gauge of 3 mm (0.12 in) and the J-34309-101 feeler gauge. Measure the distance between the J-34309-10 pinion height adapter and the arbor.



13. Write down the exact total measurement.



14. Correct the pinion height washer size by referring to the "pinion head number".

There are two numbers painted on the pinion gear. The first one refers to the pinion and ring gear as a matched set and should be the same as the number on the ring gear. The second number is the "pinion head height number," and it refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.

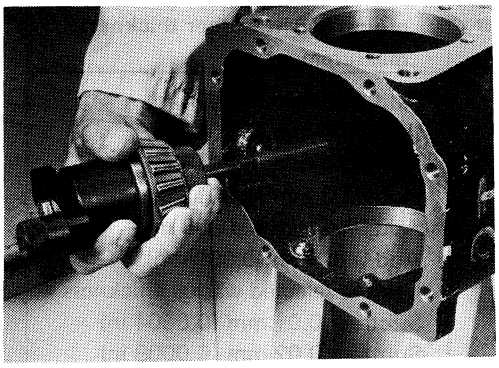
Pinion head height number	Add or remove from the standard pinion height washer thickness measurement
−6	Add 0.06 mm (0.0024 in)
−5	Add 0.05 mm (0.0020 in)
−4	Add 0.04 mm (0.0016 in)
−3	Add 0.03 mm (0.0012 in)
−2	Add 0.02 mm (0.0008 in)
−1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

Pinion Gear Height and Pinion Bearing Preload (Cont'd)

15. Select the correct pinion height washer from the following chart.

Drive pinion height adjusting washer (R180 and R180V)

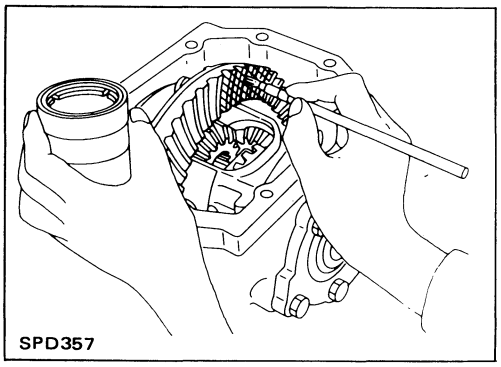
Thickness mm (in)	Part No.
3.09 (0.1217)	38154-P6017
3.12 (0.1228)	38154-P6018
3.15 (0.1240)	38154-P6019
3.18 (0.1252)	38154-P6020
3.21 (0.1264)	38154-P6021
3.24 (0.1276)	38154-P6022
3.27 (0.1287)	38154-P6023
3.30 (0.1299)	38154-P6024
3.33 (0.1311)	38154-P6025
3.36 (0.1323)	38154-P6026
3.39 (0.1335)	38154-P6027
3.42 (0.1346)	38154-P6028
3.45 (0.1358)	38154-P6029
3.48 (0.1370)	38154-P6030
3.51 (0.1382)	38154-P6031
3.54 (0.1394)	38154-P6032
3.57 (0.1406)	38154-P6033
3.60 (0.1417)	38154-P6034
3.63 (0.1429)	38154-P6035
3.66 (0.1441)	38154-P6036



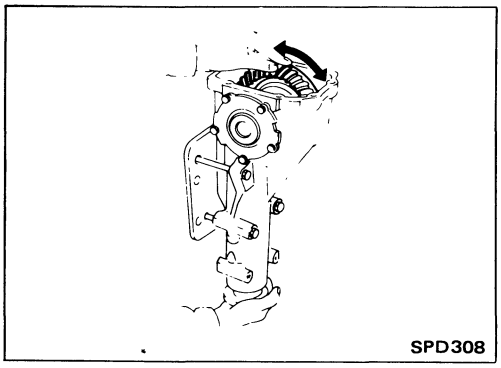
16. Remove the J-34309 pinion preload shim selector tool from the final drive housing and disassemble to retrieve the pinion bearings.

Tooth Contact

Checking of gear tooth contact pattern is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear sets which are not positioned properly in relation to one another may be noisy, or have a short life, or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.


SPD357

1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.


SPD308

3. Hold companion flange steady by hand and rotate the ring gear in both directions.