PINION DEPTH ADJUSTMENT

Fig. 20 Pinion depth gauge assembly. Front drive axles

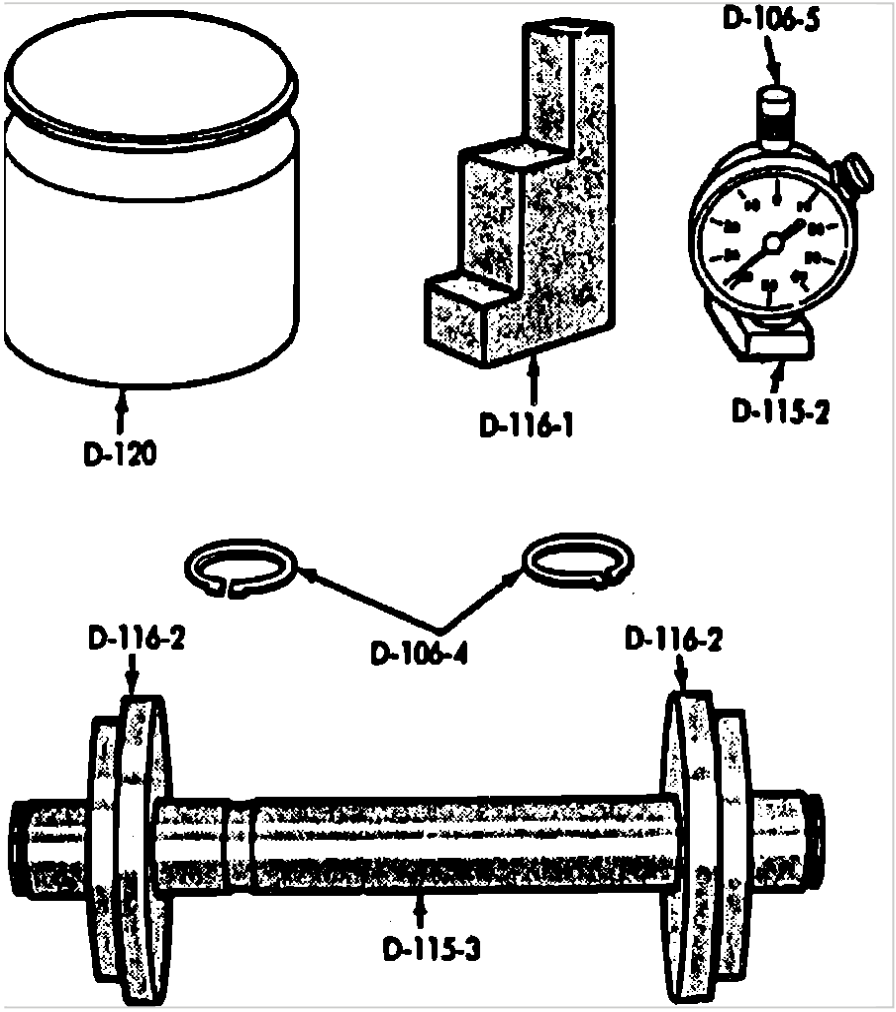


Fig. 21 Pinion depth gauge assembly. Rear mounted model 60

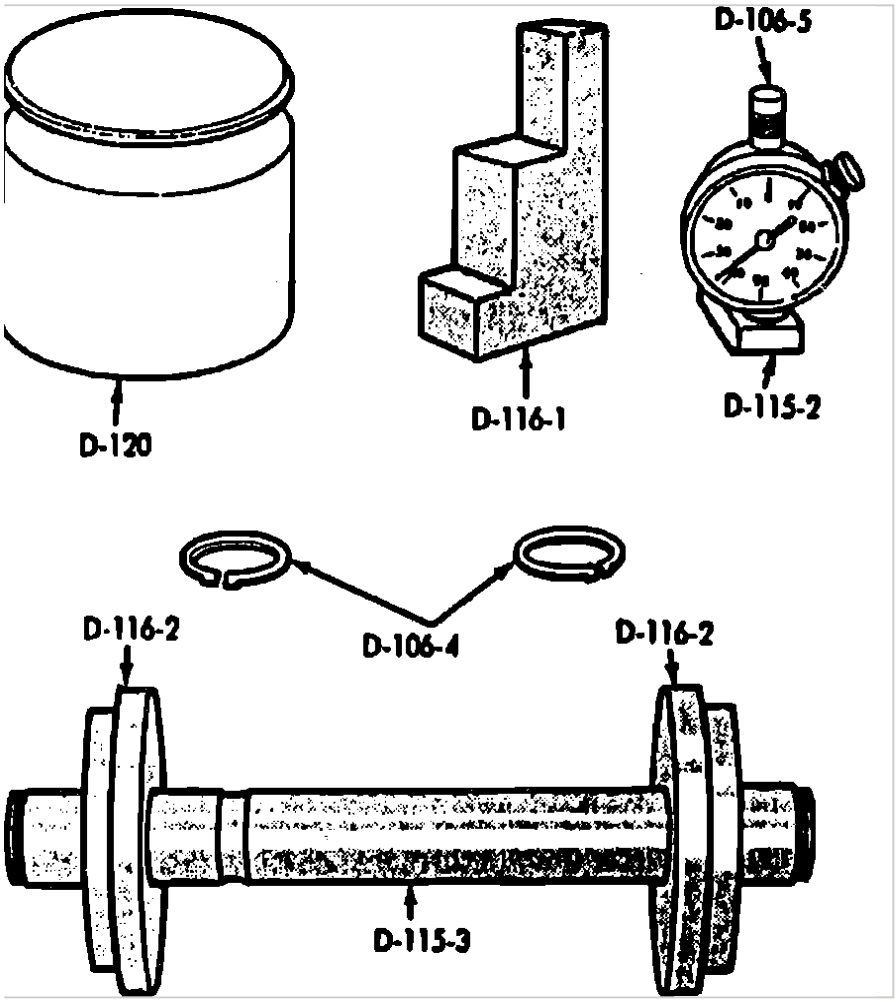
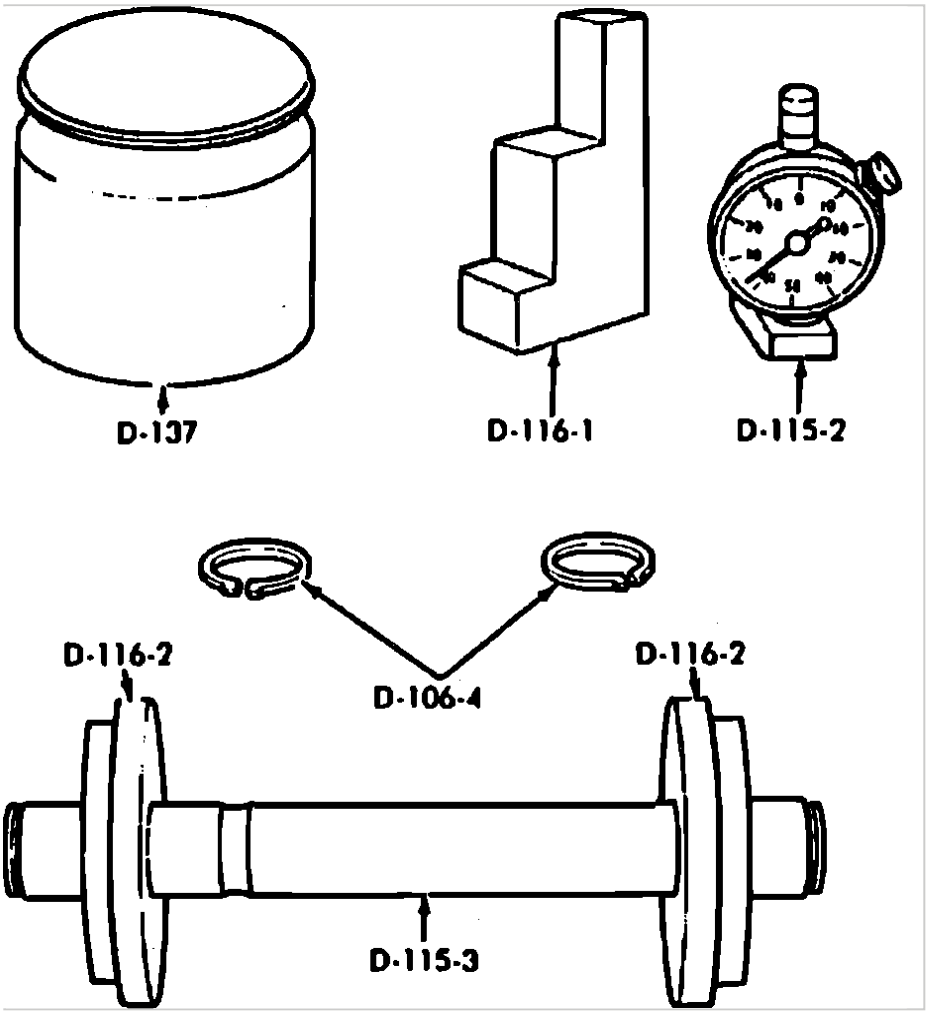


Fig. 22 Pinion depth gauge assembly. Model 70

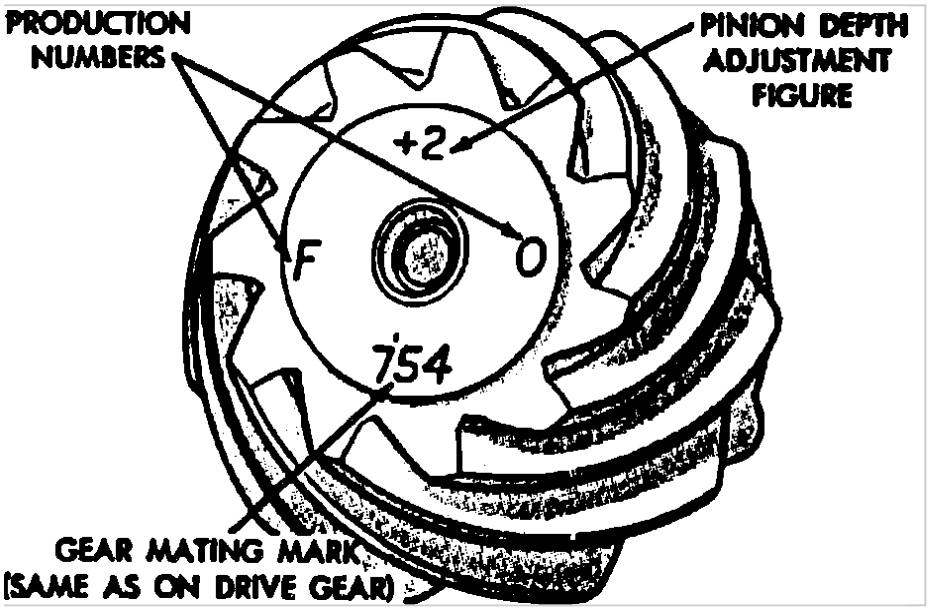


PINION DEPTH, ADJUST

If original ring gear and pinion, rear pinion bearing and housing are reused, original pinion depth adjusting shims can be reused to adjust pinion depth. However, if gear set, rear pinion bearing or housing are replaced, pinion depth adjusting shims must be selected in order to establish proper ring gear and pinion tooth contact. Several types of pinion depth gauging tools are available from a variety of manufacturers, and manufacturer's recommendations as to component selection and installation must be followed when using any depth gauging assembly. Procedures outlined use gauge assembly D-271 for front drive axles, and D-116-60 or D-116-70 for rear drive axles. If no pinion depth gauge is available, preliminary shims can be selected as outlined, and final shim selection can be determined by performing gear tooth contact inspection outlined under "Final Assembly and Adjustment."

PRELIMINARY SHIM SELECTION

Fig. 23 Pinion depth modification code identification



1. Inspect face of both new and old drive pinion for pinion depth modification code. To ensure proper contact of ring gear and pinion teeth, pinion may be marked with a plus (+) or minus (-) code number. This number indicates in thousandths of an inch necessary modifications of nominal pinion depth. It is essential that this code number be factored when selecting pinion depth adjusting shims.
2. Measure thickness of shim pack removed from behind rear pinion bearing race and record thickness.

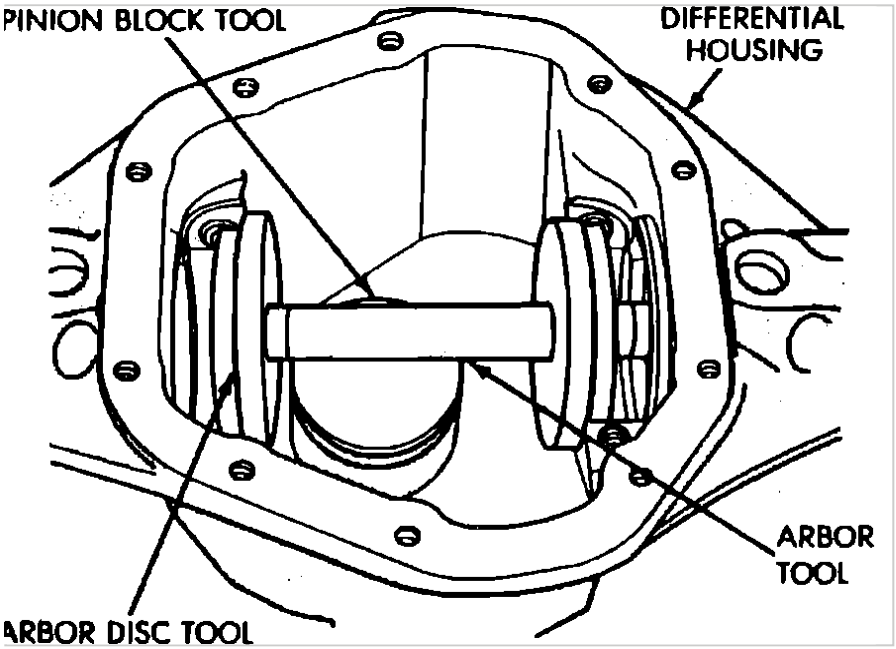
Fig. 24 Preliminary pinion depth adjusting shim selection chart

Old Pinion Marking	New Pinion Marking (U.S. Standards)								
	−4	−3	−2	−1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003
0	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004
−1	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005
−2	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006
−3	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007
−4	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007	−0.008

3. Refer to chart and select preliminary shim pack thickness by adding or subtracting indicated value from thickness of original shims.**If baffle is installed in assembly, thickness of baffle must be included in shim pack.**
4. Install selected shim pack behind rear pinion race as outlined in assembly procedures, then perform tooth contact inspection.
5. Adjust pinion shim thickness as needed, to obtain proper tooth contact.

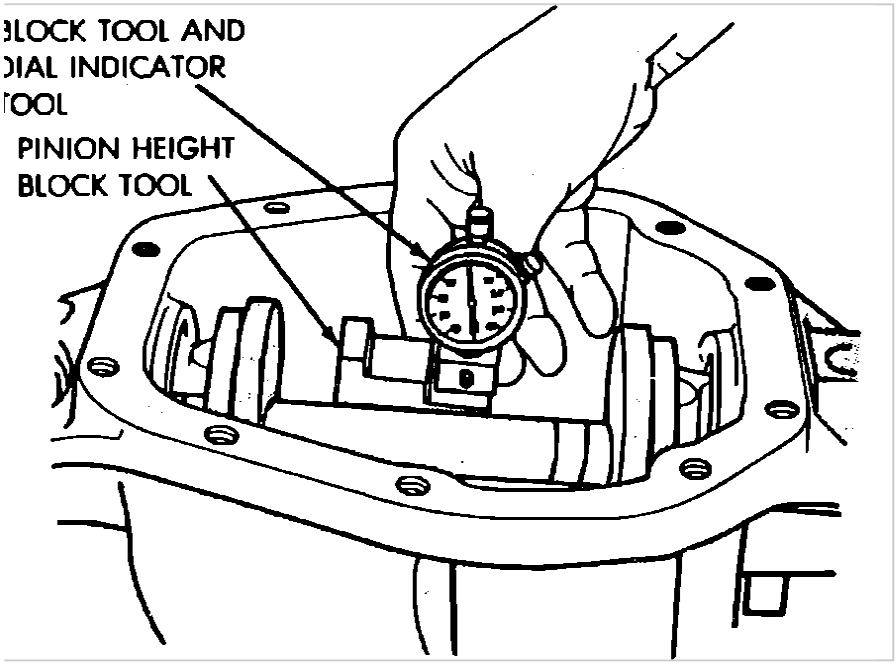
SHIM SELECTION USING DEPTH GAUGE

Fig. 25 Typical pinion block installation



1. Install master pinion block into pinion bore in housing.
2. Install side bearing discs on arbor, then mount arbor assembly in housing ensuring arbor is centered and discs are seated in bearing bores.

Fig. 26 Typical height block & dial indicator installation



3. Position pinion height block on pinion block and against arbor.
4. Install gauge block and dial indicator on small step of pinion height block, ensuring gauge assembly is flat on height block, then zero dial indicator.
5. With dial indicator at zero, move gauge so that indicator plunger contacts arbor.
6. Move gauge assembly back and forth, recording indicator reading at highest point of contact.**Repeat steps 4 and 5 several times to ensure accurate reading.**
7. Indicator reading obtained in step 6 is proper shim thickness for "Nominal" pinion.

8. Inspect face of drive pinion for modification code, described in preliminary shim selection and select pinion depth adjusting shims as follows:

a. If pinion depth code is a plus (+) number, subtract that number of thousandths from dimension obtained in step 6 and select shim pack equal to remainder.

b. If pinion depth code is a minus (-) number, add that number of thousandths to dimension obtained in step 6 and select shim pack equal to sum.**If baffle or oil slinger is used, thickness of these components must be included in shim pack.**

DRIVE PINION, INSTALL

1. Install selected pinion depth adjusting shims in rear pinion bearing bore in housing, then seat rear bearing race in housing using suitable driver.
2. Install front bearing race in housing using suitable driver.
3. Install oil slinger, if used, then press rear bearing onto pinion.
4. Insert pinion into housing, then install front bearing, oil slinger (if used), companion flange washer and nut. **Do not install preload shims or oil seal at this time.**
5. Ensure that bearings are lubricated, then tighten nut in small increments until bearing preload is 10 inch lbs., rotating pinion and checking rotating **torque** with suitable torque wrench after each adjustment.
6. Recheck pinion depth adjustment as follows:
   a. Install arbor and disc assembly in bearing cap bores, then position height block on pinion face.
   b. Position gauge block and dial indicator assembly on small step of height block (high step for model 70).
   c. Zero indicator, then slide gauge across or over arbor.
   d. Indicator should read within 0.002 inch of modification code etched on pinion at highest point.
   e. If reading is not within 0.002 inch of value on pinion, repeat shim selection.
7. When pinion depth has been verified, remove gauge tools, pinion nut, washer, companion flange and front bearing.
8. Install preload shims removed during disassembly on pinion shaft, then the front bearing and oil slinger, if used.
9. Install new seal in housing and coat seal lips with grease.
10. Install companion flange washer and pinion nut, then **torque** pinion nut to 250-270 ft. lbs.
11. Measure pinion bearing preload (rotating torque) with suitable torque wrench.
12. If preload is not within specifications, add or subtract shims to obtain specified preload at specified pinion nut torque.