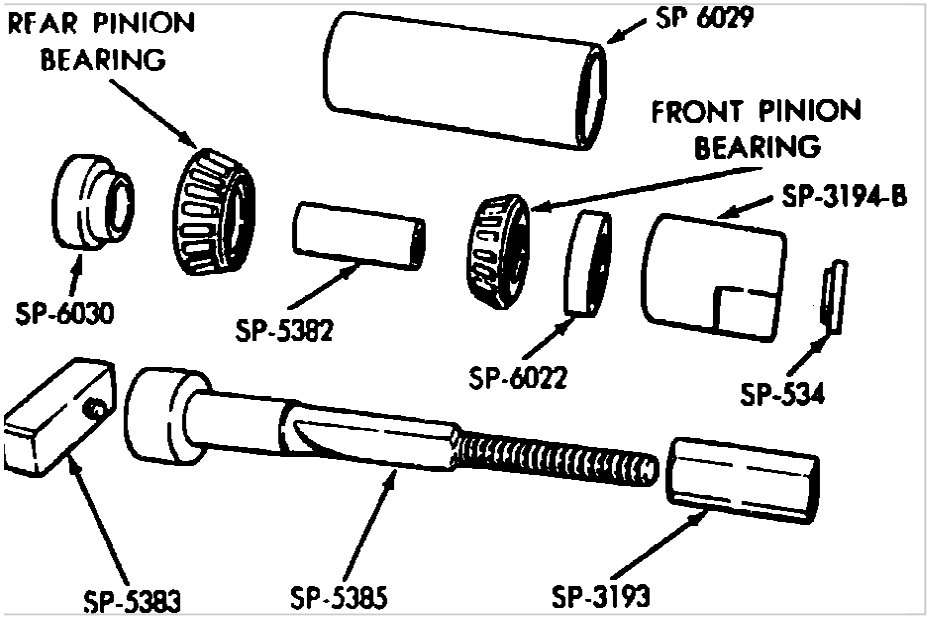
# DRIVE PINION

**ADJUST**

**Correct pinion depth must be established to ensure proper ring gear and pinion tooth contact. Pinion depth is adjusted by varying thickness of shims installed either between rear pinion bearing and gear, or between rear pinion bearing race and housing. If original ring gear and pinion, rear pinion bearing and housing are to be reused, original shims removed during disassembly can be used to adjust pinion depth. However, if gear set, rear pinion bearing assembly or housing are replaced, proper pinion depth must be adjusted using following procedures.**

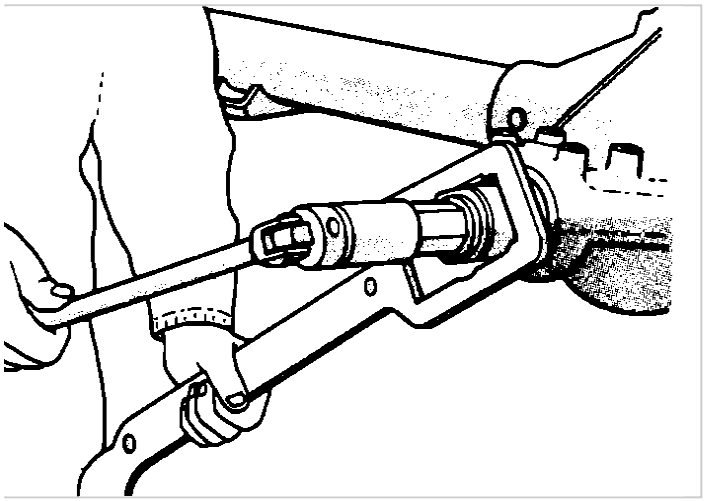
Fig. 18 Pinion depth gauge assembly. Models w/8-1/4 inch ring gear




Pinion setting gauge assembly and adapter set, or suitable equivalents must be used to select pinion depth adjusting shim and install pinion bearing races. Depth adjusting shims are installed between rear pinion bearing race and gear.

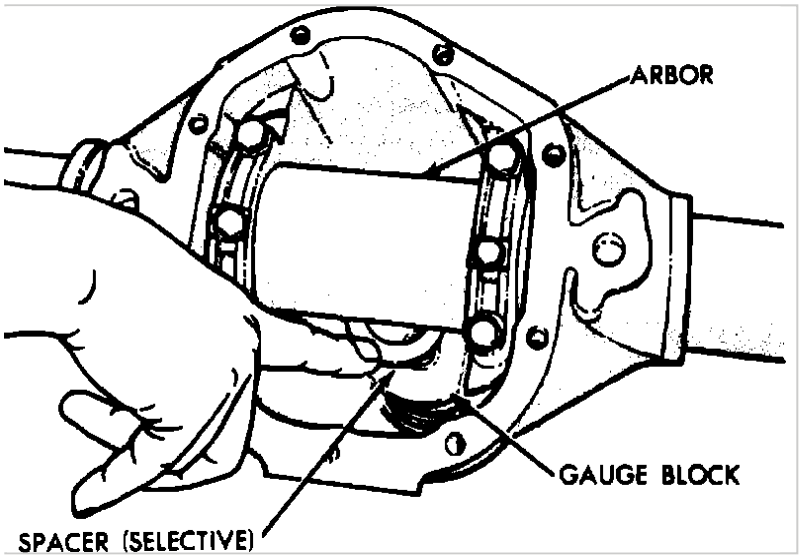
1. Start both pinion bearing races in respective housing bores, ensuring races are not cocked, then lubricate pinion bearings and races.
2. Assemble spacer SP-6030 on shaft SP-5385 followed by rear bearing cone, then insert assembly into housing from case side.
3. Hold assembly in case, then install shaft locating sleeve SP-5382, front bearing cone, washer SP-6022, compression sleeve SP-3194-B, washer SP-534 and nut SP-5385 or SP-3193 or equivalents.

Fig. 16 Typical pinion bearing race installation



4. Hold compression sleeve with suitable tool, then tighten nut to draw bearing races into housing, rotating shaft to prevent damage to bearings.
5. When bearing races are fully seated, loosen nut, then retighten in small increments to obtain 15-25 inch lbs. preload, checking preload with suitable torque wrench after each adjustment. **Ensure bearing rollers are lubricated to ensure accurate reading.**
6. Rotate tool to ensure bearings are properly seated, recheck preload and adjust as needed.
7. Mount gauge block SP-5383 onto shaft SP-5385 and wrench SP-531, then securely tighten screw SP-536.
8. Mount arbor SP-6029 in housing side bearing bores, ensuring arbor is centered.
9. Install side bearing caps in proper position, insert 0.002 inch shim stock between each bearing cap and arbor, and **torque** bearing cap bolts to 10 ft. lbs.

Fig. 17 Pinion depth adjusting shim selection




10. Insert progressively thicker shims between arbor and gauge block, until fit of shim is snug but not excessively tight, then record thickness of shim.
11. Inspect head of pinion for pinion depth modification code and select shim as follows: **To ensure proper tooth contact, pinion may be marked with a plus (+) or minus (-) code number, indicating in thousandths of an inch necessary modifications to the "nominal" depth setting. It is essential that this modification code be factored when selecting pinion depth adjusting shim.**

a. If pinion is marked with a minus ( - ) code, add that number of thousandths to dimension obtained in step 10, and select shim thickness equal to sum.

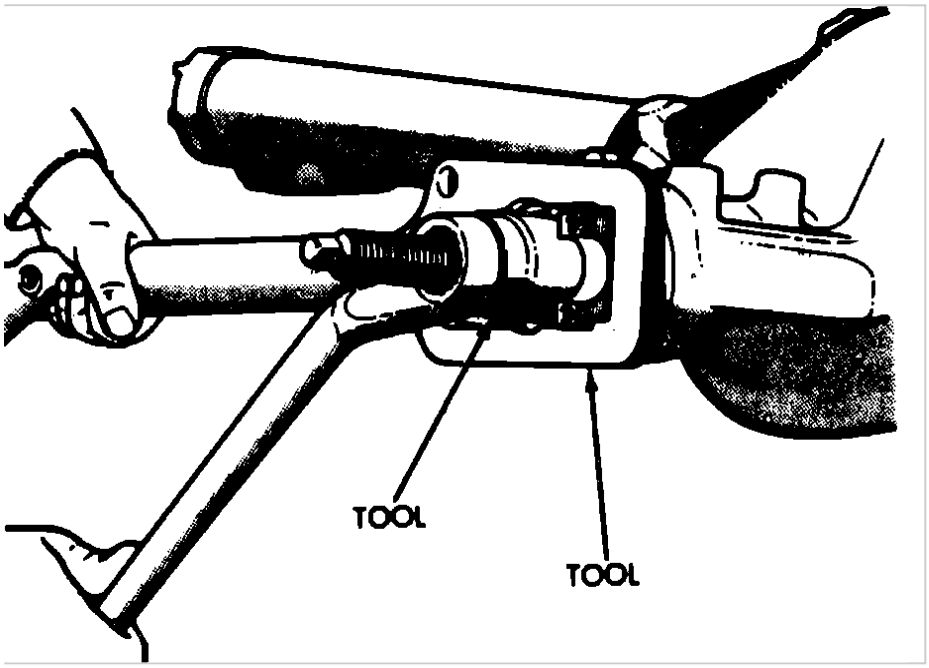
b. If pinion is marked with a plus (+) code, subtract that number of thousandths from dimension obtained in step 10 and select shim thickness equal to remainder.

12. Remove gauge tool and adapter assemblies from housing and pinion bearings from shaft.
13. Retain selected shim for pinion installation.

**DRIVE PINION, INSTALL**

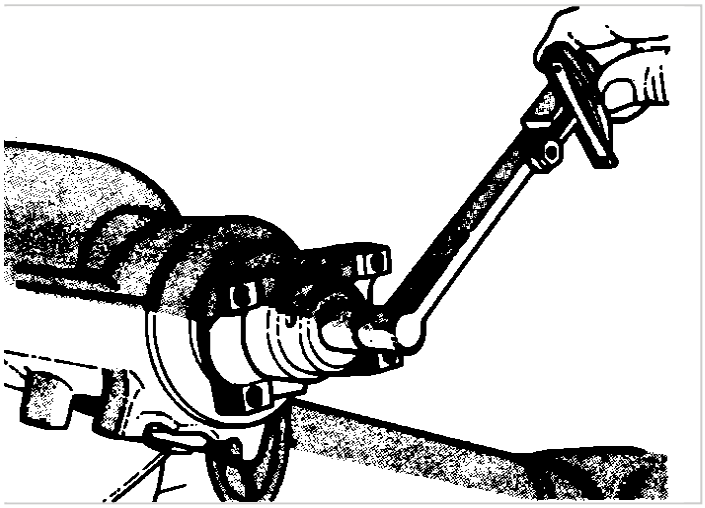
1. Install bearing races, and bearing race shims if equipped.
2. Install selected depth adjusting shim on pinion.
3. Press rear bearing onto pinion using suitable spacer to ensure bearing is fully seated.
4. Install new collapsible spacer on pinion, lubricate pinion bearings, then insert pinion assembly into housing.

Fig. 21 Companion flange & front pinion bearing installation




5. Install front pinion bearing, companion flange and forcing tool on pinion. Use tool C-3718 on models with 8-3/8 inch ring gear, C-496 on models with 9-1/4 inch ring gear or suitable equivalents.
6. Hold companion flange and tighten nut on forcing tool to seat front bearing on pinion shaft. **Care must be taken not to collapse spacer when seating front bearing on pinion shaft. Tighten tool only until endplay has been eliminated.**
7. Remove forcing tool and companion flange, then install new pinion seal using suitable driver.
8. Lubricate lips of pinion seal, then reinstall companion flange using forcing tool as outlined in steps 5 and 6.
9. Remove forcing screw, then install washer and new pinion nut.

Fig. 8 Measuring pinion rotating torque (bearing preload)



10. Hold companion flange and **torque** pinion nut to 210 ft. lbs., then check bearing preload using suitable torque wrench. Bearing preload must be within specifications with pinion nut **torqued** to a minimum of 210 ft. lbs. If bearing preload is greater than specified at minimum torque specification, or if preload is not even through full rotation, recheck pinion installation, replace collapsible spacer and repeat adjustment.
11. If bearing preload is less than specified, continue tightening nut in small increments, checking preload after each adjustment. **If specified preload is exceeded, spacer will be collapsed too far to be reused. Spacer must be replaced and adjustment procedure must be repeated. Do not loosen pinion nut to reduce preload.**