ACRO ENGINEERING

R.R. 4 Box 30A
Greensburg, IN 47240

Machine - Tool - Die

Ph. 812-663-6236
Ph. 812-663-7629

DANA, Spicer, and Crosley gear sets are made from SAE 8620 with a yield strength of 120,000 PSI. Acro Heavy Duty gear sets are made from SAE 4820 which has a yield strength of 198,000 PSI. The 4820 is not nearly as sensitive to small variations in heat treating as is 8620. All Acro gear sets have a 7 tooth pinion and a 36 tooth ring gear, which gives you a much easier set up, smoother operation, stronger gear set, and a final ratio of 5.14 - 1.

The follwoing data must be used for the proper installation of Acro Heavy Duty Ring & Pinion sets.

Housing Preparation

Suggested tools needed for this are: reworked bolt and nut as sketch shows, Dial Indicator with .100 travel, parallels and surface plate or round gauge wires and parallel or depth micrometer with a round quill, and inside micrometer.

To install the pinion bearings, heat the housing to 300° - 400°. Install the bearing cup with the aid of a draw bar, be sure they are properly seated in the bore. Let housing cool.

Since the bearing will vary as much as .008, be sure to keep them in their respective positions.

Housing Preparation Data

All Acro pinions are pre-ground to an "0" tolerance. Center of axle to back of pinion, "0" gear		2.8440
subtract 1/2 of inside diameter of housing	-	
	=	
subtract expansion rate difference of steel & aluminum	-	.0030
= actual difference between gear side of bearing to the lowest point on the housing bore. (see insert 72-12)	=	

Reference

If your actural dimension is lesser than the calculated dimension, the excess must be ground from the surface, where the gear seats on the (Timken #1380) bearing (see pg. 72-12). If it is greater, then try another Timken #1380 bearing cone. Many times you can get what you need simply by changing the cone. If you cannot get sufficient height, the 1328 cup must be removed from the housing. Sometimes this can be easily done with an Arc Welder by welding a bead 1/4 of the way around the cup. This of course ruins the cup. Place a sufficient whim behind the new cup and repeat the above procedures. Do not attempt to check gear mash pattern with white lead or blue. The mash pattern will not look right. But it is. When changing the ring and pinion, the housing should always be checked for proper pinion location as covered above.

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Alternate Method
Housing Preparation Using Depth Micrometer

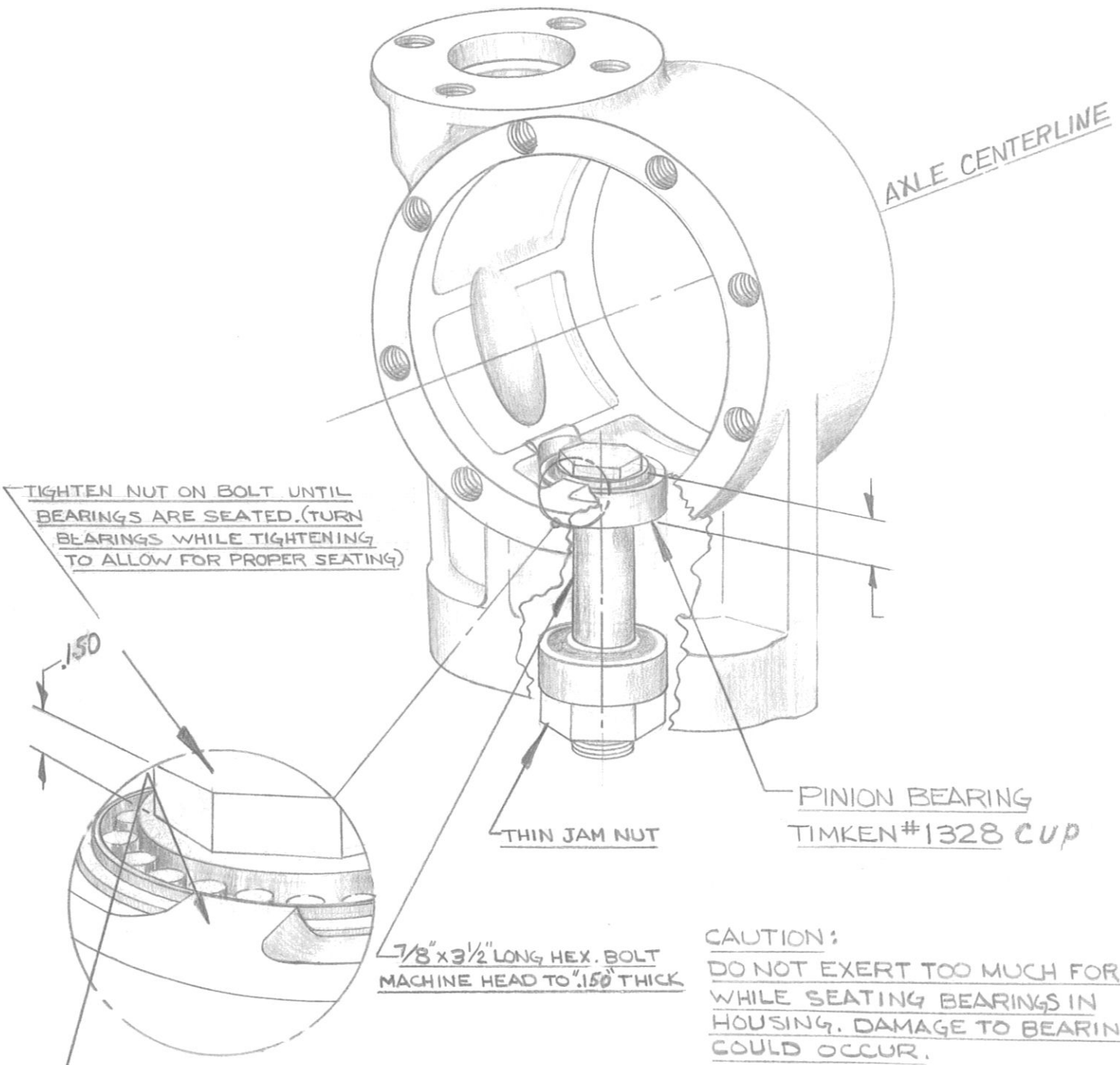
Add the following figures.

1/2 inside diameter of the housing.	.
Expansion difference of steel and aluminum	+ .003
Head of draw bolt	+ .150
Total Height of parts.	= .
Subtract pinion mounting distance. "O" gear.	-2.8440
This is the distance from the top of bolt to lowest point in the housing bore.	= .

Place base of depth micrometer on bolt head and screw micrometer quill down until you get the maximum reading possible. (Be sure you are at the lowest point in the housing bore).

If your actual dimension is greater than the calculated dimension, the excess must be ground from the surface, where the gear seats on the (Timken #1380) bearing (see pg. 85-11). If it is less, then try another Timken #1380 bearing cone. Many times you can get what you need simply by changing the cone. If you cannot get additional height, the 1328 cup must be removed from the housing. Sometimes this can be easily done with an Arc Welder by welding a bead 1/4 of the way around the cup. This of course ruins the cup. Place a sufficient shim behind the new cup and repeat the above procedures.

NOTE:
HOUSING MUST BE SET ON FLAT SURFACE FOR DIAL INDICATOR READINGS



CAUTION:
DO NOT EXERT TOO MUCH FORCE WHILE SEATING BEARINGS IN HOUSING. DAMAGE TO BEARINGS COULD OCCUR.

After bearings are seated, set indicator on bearing where the pinion seats. Set the indicator to "0".
Next move it to the lowest point of the housing bore. Now refer to page 85-10A, bottom of page (Reference) for further instructions.

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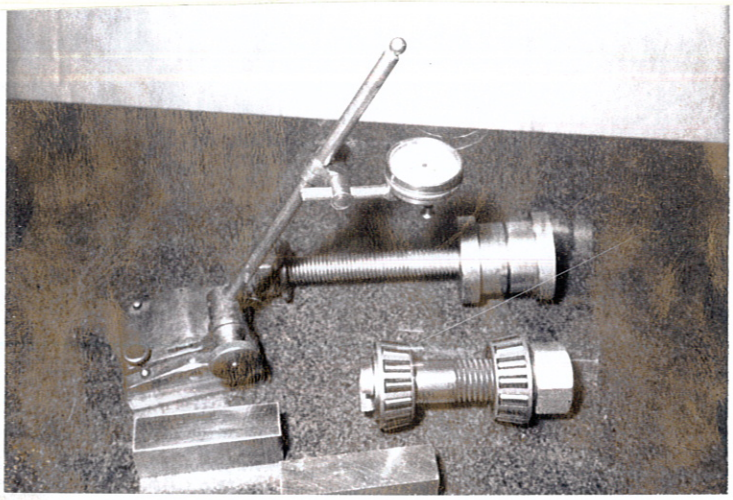
Preload settings at room temperature. Pinion bearings preload .000 - .002. Preload ring gear bearings .0025 each side (.005 - .006 total preload). Ring gear backlash .005 - .008.

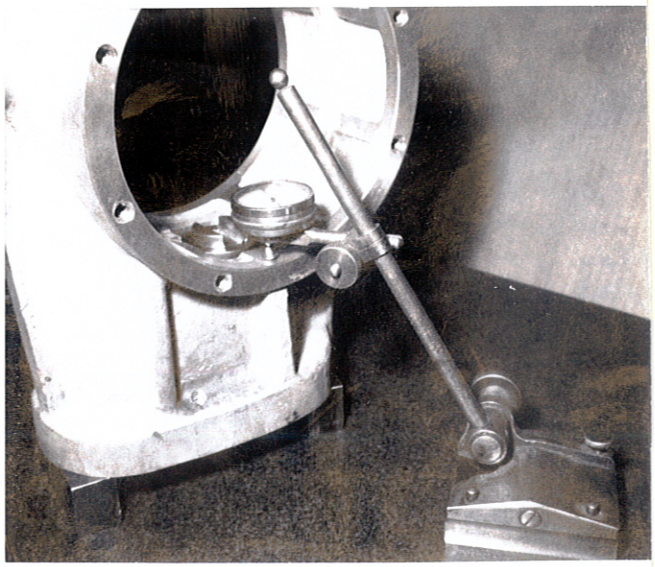
The Acro Engineering Co. has the equipment and parts it takes to do this work. Only cost is for the parts used.

If your pinion is off only .005, the gear set will not last any reasonable length of time.

These settings cannot be "eyballed", they must be checked with gauges.

If DANA, Spicer, or Crosley ring & pinion are used, set up information is available, just contact ACRO.





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Be sure you have .080 from the back of pinion bearing (gear side) to the tooling boss inside casting. The bearing must be seated into the cup completely. Use your fingers to force it down and turn it back and forth until the dial indicator doesn't change. If you have more than .080 + or - .001 the cone Timkin #1380 must be replaced and excess material ground from gear side of bearing. When grinding, be sure the roller cage doesn't interfere with the proper location of the race on the grinding machine chuck.