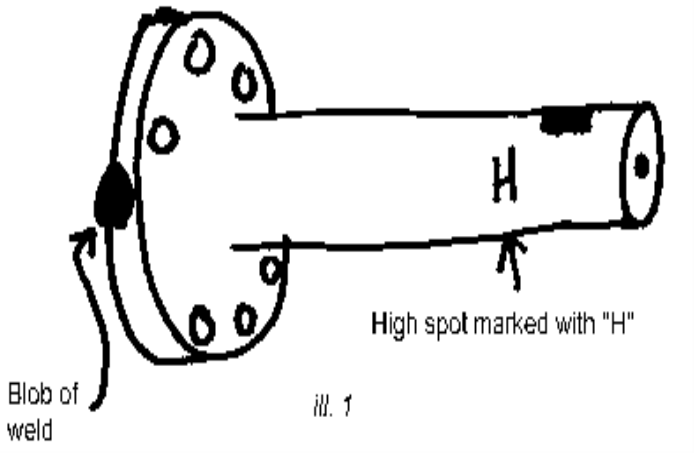
A quick easy way to align the transmission gear shaft.

by Tom Carnegie

The transmission gear shaft is clamped between the crankshaft and the flywheel. It is secured by four bolts and aligned by two dowel pins. It is important for this shaft to run concentric to the crankshaft main line. If this shaft is off, the three drums will be off and the tailshaft will be out of alignment with the fourth main. The best way I have found to check to see if this shaft is in correct alignment is to do the following steps:



ill. 1

1. With just the crank in the block, invert the block so that the head surface is resting on the bench. The rods should be disconnected, as should the camshaft. If the valves are still in the block, put three short 7/16" bolts in the head bolt holes in a triangular pattern to keep the valves from hitting on the bench. Some people make this test with the motor standing on its nose. This is not the best way to do it as the crank can shift slightly in the main bearings which makes getting an accurate reading difficult. With the engine in a horizontal position, everything is much more stable. Plus, the flywheel is in the position it will be when it is in service, albeit, upside-down. Some people make this test in a lathe by supporting the front main in the chuck and the rear main in the steady rest. This is also not a good way to do it as the center main can flex and throw your readings off.

2. Put some sort of match marks onto the crankshaft, gearshaft and flywheel so that it will be assembled the same way each time.

3. Assemble the flywheel and gearshaft to the crankshaft and tighten the four bolts.

4. With a dial indicator, measure the runout of the gearshaft as close to the triple gear pins as you can. Take another reading out near the end of the shaft. Don't measure the necked down part where the bushing rides, but rather on the larger part, near the keyhole. The two measurements should be very nearly the same. If they are not, the gearshaft is bent, or the flange on the crank or gearshaft is off. There could be a burr or object on the flange causing it to be off. More likely one or both of the shafts will have to be trued in the lathe. The crankshaft should have been trued when it was reground. The gearshaft can easily be trued by a machine shop if you don't have a lathe. If you don't have a lathe, my advice is to get one. They are not terribly expensive, and you'll wonder how in the world you ever got

by without one once you get one.

5. With the shafts trued repeat step four. The runout should now be equal between the two measurement points. Typically the shaft will run out from .005" to .015". Note how much the shaft is running out. Mark the high spot on the gearshaft.

6. Disassemble the assembly. Preferably with a mig welder, place a spot of weld on the edge of the gearshaft in line with the high spot. (see ill. 1) Alternatively, you can use brass or a stick welder.

7. Chuck the gearshaft into the lathe and turn off the weld until it is one half as high as the amount the shaft was running out in step 5. If you don't have a lathe, you can grind and file the lump away.

8. Drive the shaft back into the flywheel with a brass drift or rubber hammer. If you find that you cannot drive the gearshaft into the flywheel, you may have to file the dowel pin holes slightly. The gearshaft should now be a tight fit into the flywheel.

9. Reassemble the flywheel to the crankshaft and take new readings. You should find the gearshaft much closer to being true. If it is within .001", I'd call it good enough, if not, you may have to fine-tune your lump of weld slightly.

10. Check the runout on the bushing surface at the end of the shaft. If it is more than .003", I'd say repair or replace it.

(end of technical article)