## Flywheel Housing Alignment Pt 3



Figure 1 shows schematically a perfect aligned forward drive train. Note how the rear face of the engine block (A-A), the crankshaft flange (B-B), the forward face of the flywheel housing (C-), the rear face of the flywheel housing (E-E), the era bore of the flywheel (F-F), the mating surface for the clutch pressure plate (G-G), the pressure plate mating surface (H-H), the rear face of the clutch housing (J-J) and , finally, the forward face of the transmission (K-K) are all absolutely parallel, with their centerlines exactly on axis X-X.

Conversely, Figure 2, shows a misaligned forward drive train, the trouble having started when the flywheel housing was not installed exactly square with the crankshaft axis. Note how the centerline of the transmission drive gear shaft is cocked along axis X'-X' instead of along crankshaft axis X-X. But why is this bad?

With misalignment, each time the crankshaft turns, regardless of whether the clutch pedal is in or out, the flywheel also turns and grinds like a lather against the end of the drive gear shaft riding in the pilot bearing. Although this is the least serious consequence, it will cause frictional heat, noise, and premature wear of both the pilot bearing and shaft.

The real danger comes from the spline misalignment between the clutch plate and shaft. In normal operation, with the clutch pedal out, the clutch plate is squeezed against, and essentially locked to, the flywheel by force exerted by the springs in the pressure plate. The torque transmitted from the splines of the shaft. If the car is in gear, it moves. With things perfectly aligned, as in Figure 1, the clutch plate contact is uniform on the flywheel, the splines of the plate and shaft engages quietly and easily, and the engine torque is transmitted along a perfectly straight axis of rotation from the crankshaft to universal joint. In short, everything works as it was designed to.

Even when the clutch pedal is in there is very little clearance between the rotating flywheel and the forward face of the clutch plate, so major misalignment can cause the flywheel to rub against part of the plate, causing considerable unwanted frictional heat and some unwanted rotation of the clutch plate and drive gear. This is known as "dragging" clutch, with which quiet shifting of gears is practically impossible.

The major evil consequence of misalignment affects the clutch plate the most. Each revolution of the cocked shaft imparts tremendous non-uniform forces to the hub of the plate. Vibration, eventual destruction of the plate, clutch chatter, grabbing and dragging are almost inevitable. In non technical terms, the car drives just plain lousy.

So much for the bad news, maybe this has helped you to understand why your Model A doesn't drive as smoothly as others.

Notwithstanding the dire consequences of misalignment, the difficulty can easily be eliminated during assembly, a very low cost, and with only a few minutes of additional time.

There is one more part to this and I will finish the alignment in the next issue. This is such an important issue for us all, as we really do wish for our cars to run nicely. Persevere with the stages of alignment, as I can assure you that the outcome is worthwhile, and maybe talk with fellow members who have followed the above, such as John Castle - Editor

PS, If you wish for larger images, please email me and I will by return email send you two A4 size copies of Figure 1 & 2