Power Train Set-Up Guide

By Greg Frick of Inland Empire Driveline Service
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Having a little information at the beginning of your street rod project can make setting up power train angles one of the simplest steps in the building process. Not having, or ignoring this information can turn your dream car into a nightmare.

Here is what you need to know. The centerline of the crankshaft and transmission output shaft must be parallel to the centerline of the pinion shaft as shown in **Figure 1.** You will note that there is some distance between these parallel lines. The distance is caused by the angle of the components and their distance apart.

Figure 1

Planning these component angles is critical. Your task is to set the components up so their center lines are parallel and so that the angle made THROUGH the U-joints is 3-degrees or less as shown in **Figure 2.** While it is possible to run at zero degrees through the U-joints, something more than actual zero and less than three degrees seems to run smoothest.

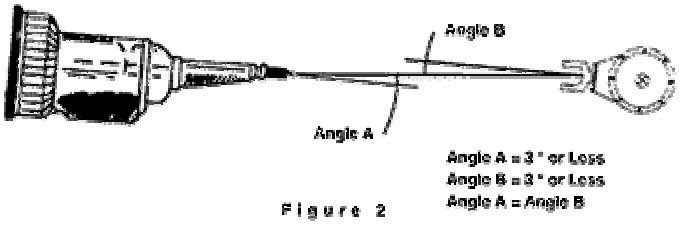


Figure 2

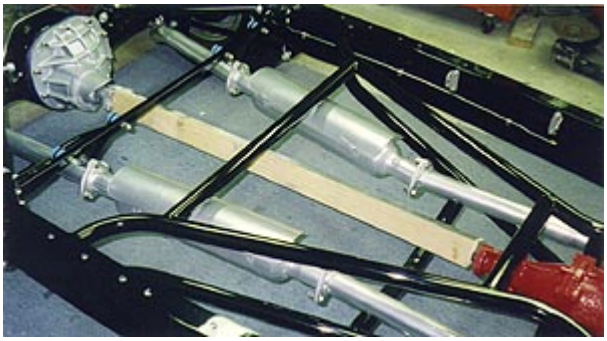
It will be worth the effort to set the engine and transmission in the frame and the axle under it to experiment. Fairly reliable angles can be measured from the starter motor case and of the pinion yoke. A piece of 2x4 (wood) can be cut to length to simulate the drive shaft for measuring its angle and to check for interference (or contact) with other chassis and body components. When you are satisfied that you have the proper angles in place you can mount the components. You will be married to the engine and transmission placement but must plan for adjustability at the rear axle.

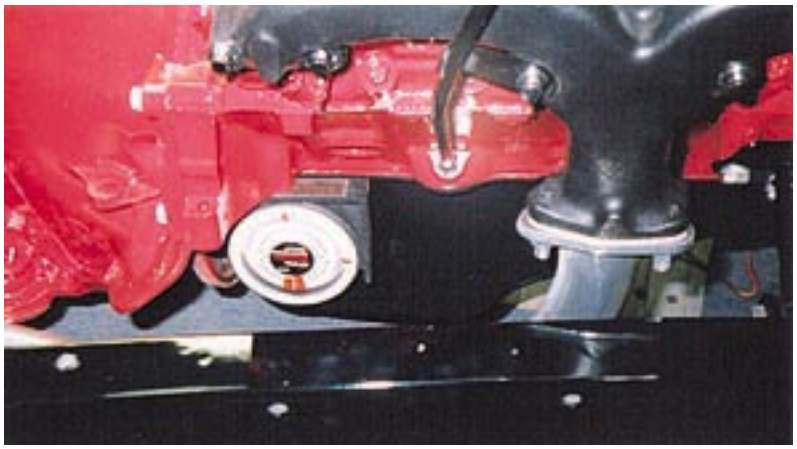
When the car is finished, recheck the pinion angle. If the body weight has changed the pinion angle, correct it. Leaf spring cars will need axle angle shims for adjustment. These are available at front end alignment shops or their suppliers. Now go for a ride. An angle induced vibration will be high frequency, twice engine RPM in direct drive. It may show up only on acceleration or deceleration. Adjust the pinion down to correct acceleration and up to correct deceleration vibrations, plus or minus one degree is usually enough. Before adjusting anything, make sure the U-bolts holding the driveshaft to the pinion

yoke are not overtightened. Correct torque is 17 foot pounds and no more.

In following this set up routine you may find parts of the car where the drive shaft should go. While this may require some redesign, it is better to learn this before the car is complete and is difficult to correct.

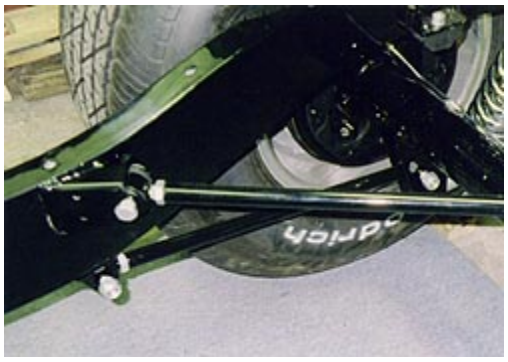
A length of 2x4, or similar material, can be installed between the transmission and the rear end pinion to check angles and to determine if any chassis or body components will interfere with the drive shaft. It's a lot easier to relocate an item now than later... and it does happen!





The engine/transmission should be set in the chassis with the rear approximately 3 degrees *below* horizontal. A magnetic-based protractor (shown) can be used to check the angle on the block where the starter mounts (or on the starter housing itself). Since the engine/trans mounts rarely are adjustable, the rear end housing will be adjusted to set the pinion angle. (See Figure 2.)

The magnetic protractor can be used on the rear driveline yoke to set the pinion angle at the same degree as the engine/transmission, except the yoke will be 3-degrees *above* horizontal.



Various methods are available to adjust for proper pinion angle. On a parallel leaf spring, wedge shaped shims can be added between the spring and spring pad. On triangulated 4-link, such as this, the upper and lower links can be lengthened or shortened as required.