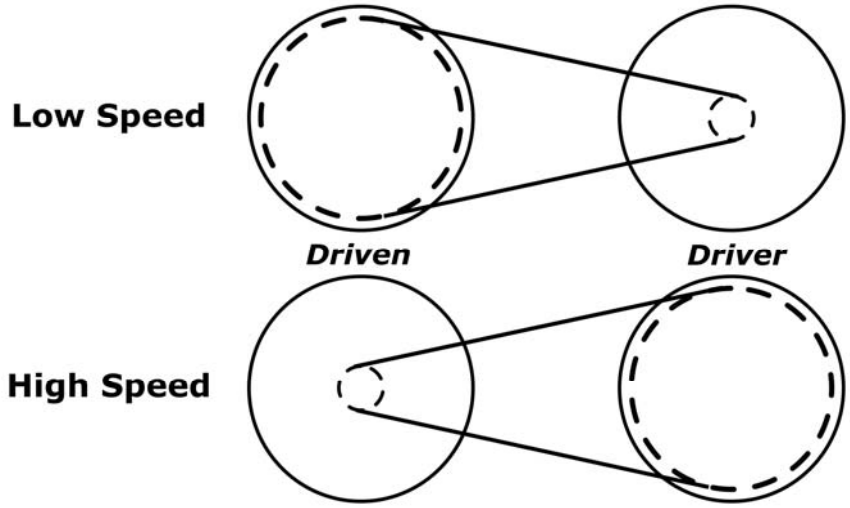
F-6 Comet Belt Alignment and Tension

By Bob Olbers

40/44 SERIES 500-780-790 SERIES 94C - "DUSTER"

COMET TORQUE CONVERTERS consist of three main components: a drive clutch connected to the engine crankshaft, a driven pulley connected to the transmission, and a drive belt. Four common versions are shown above with the driver clutch on the left and the driven on the right. Although we often simply refer to this system as a "clutch," it is actually a continuously-variable transmission (CVT) that matches the engine torque/RPM curve to the needs of the car.

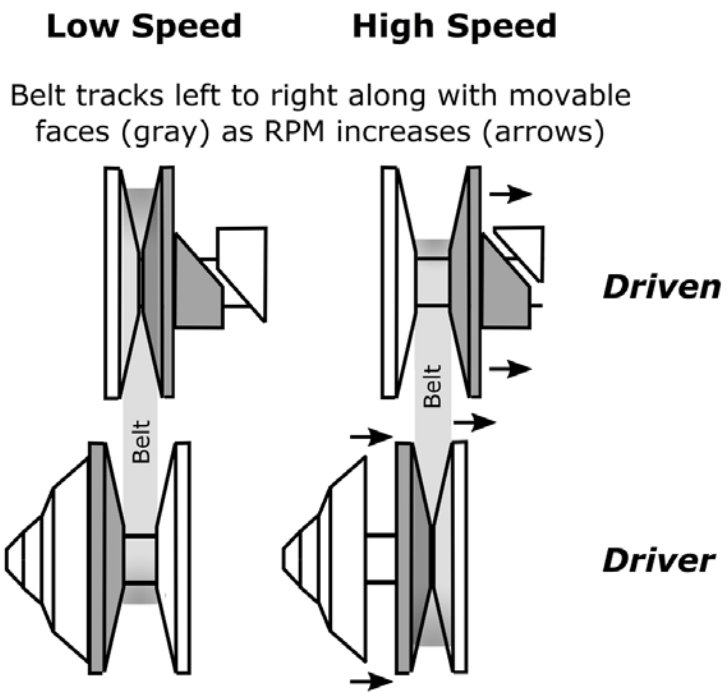
As the engine RPM increases, the centrifugal weights inside the drive clutch are thrown outwards, forcing the movable face of the pulley towards the fixed face and causing the belt to ride higher up on the pulley. The belt then forces the moveable face of the driven pulley away from its fixed face, allowing the belt to ride lower to maintain a constant length. At low RPM, the belt rides low in the driving pulley and high on the driven, mimicking a small gear driving a large one for a low (numerically high) ratio maximizing torque for low-speed acceleration. At high RPM, the situation is reversed, maximizing the wheel RPM and thus vehicle speed.



Compensating springs and ramps balance the forces from the centrifugal weights to maintain balance across the full RPM range. There are many variables that can be adjusted to fine-tune the response. But there are a few fundamentals that apply across all setups.

The Comet torque converter system is designed to have the fixed faces of the driving and driven pulleys opposite each other. See Belt Tracking figure, top of next page.

This arrangement maintains belt alignment as it tracks back and forth to maintain the appropriate ratio, and minimizing wear and power loss that occurs if the belt is "crooked." This setup also ensures that the spring and ramps in the driven pulley act to balance out the torque from the driven, in particular the torsion spring inside the driven hub.

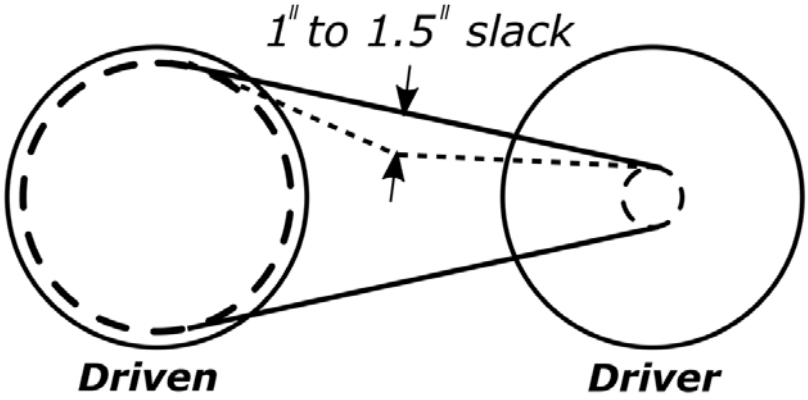


Sometimes it isn't practical to run the driven pulley in the optimal orientation, and we must drive it "backwards" (I did this in my own car for a number of years before finally rearranging things). If one must do this, it isn't possible to maintain proper belt alignment throughout the RPM range. The best compromise is to set things up such that the belt is straight at max RPM, as this is where most King Midgets (at least low-HP variants) spend most of their operating time.

Certified Products Corp. now offers a "reverse wound" torsion spring (p/n 204524A, "yellow") that helps to keep the system from "shifting to high gear" too quickly and adversely affecting low-end performance (I did not have this spring, and my belt frequently howled in protest when struggling to pull away from a stop).

Another critical matter is correctly setting the belt tension. Comet specifies their drive belts for a particular center-to-center distance between the two pulleys. But this can be very difficult to measure accurately.

An alternative is to measure the belt slack at a point halfway between the pulleys.



This should be between one and one-and-a-half inches. Too little slack may make it hard to shift from forward to reverse or even cause damage. Too much slack may prevent the belt from forcing

itself all the way down into the driven pulley at high RPM, causing a loss of top-end speed.*

It may be helpful to use a timing light to investigate whether the driven is fully opening as the engine revs up, or the pulley faces can be colored with a Sharpie® marker to check for belt travel over the full range.

Special thanks to Don Jackson at Certified Products Corp [(608-774-0481] for his assistance. Don is always willing to talk with us King Midget owners regarding application of Comet products.

*The author is chagrined to admit that he himself lost 5 MPH off his top end after swapping the engine cradle until he finally figured out the tension rod needed to be extended a couple of inches … ■

F. Comet