

## 2.0L LF and 2.3L L3 / L3 w/TC Engines

### Camshaft Timing

The 2.0L LF and 2.3L L3 / L3 w/TC (DISI) engines have keyless camshafts and a keyless crankshaft. The lack of keyways aligning the camshaft and crankshaft sprockets has made timing these engine correctly difficult. INCORRECT ENGINE CAMSHAFT TIMING CAN LEAD TO SEVERE ENGINE DAMAGE. ALWAYS RECHECK ENGINE CAMSHAFT TIMING USING ALL POSSIBLE METHODS DESCRIBED BELOW AND IN THE WORKSHOP MANUAL TO PREVENT SEVERE ENGINE DAMAGE. If after re-timing the crankshaft and camshaft sprockets, you experience symptoms that were not present previously, chances are the engine may not be timed correctly. Symptoms of an incorrectly timed engine may include:

- Contact between the pistons and valves causing no start condition and severe engine damage
- Pre-detonation on acceleration
- Code P0340 (CMP Sensor Circuit Problem)
- Misfire codes, P0301-P0304 (Cylinder No.1-4 Misfire Detected), P0300 (Random Misfire Detected)
- Hesitation, stumble, or lack of power

**NOTE:**

The 2001–2004 2.0L Tribute Zetec engine is a keyless camshaft and crankshaft engine that uses a timing belt not a timing chain. The SST Crankshaft TDC Setting Pegs shown below (303-507 & 303-574) are not interchangeable. However, the LF, L3 and Zetec engines use the same Camshaft Alignment Timing Tool (303-465). The L3 w/TC engine uses Camshaft Alignment Timing Tool 303-1061.



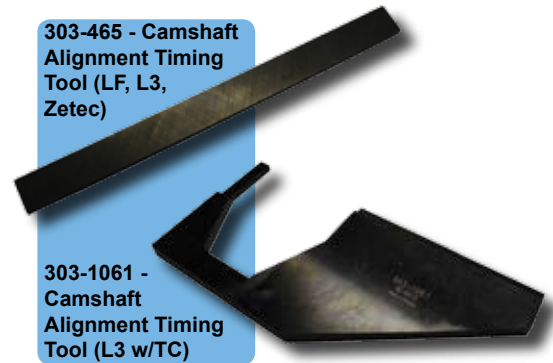
Note: 303-507 Has Slot In Head



Crankshaft TDC Setting Peg  
303-574 - For 2.0L Tribute  
Zetec Engines



Crankshaft TDC Setting Peg  
303-507 - For LF & L3 Engines



303-465 - Camshaft  
Alignment Timing  
Tool (LF, L3,  
Zetec)

303-1061 -  
Camshaft  
Alignment Timing  
Tool (L3 w/TC)

Log on to MS3. Go to “Training”. Under “Job Aids” click on “Engine Timing Verification and Correction LF 2.0L and L3/L3T 2.3L”. Print out the Job Aid for reference. Using MS3, navigate to the vehicle you are currently servicing and review the engine timing procedures. Print out the Workshop Manual procedure if necessary.

The following information is a supplement to the information above and is designed to be used in conjunction with these procedures.

- As part of engine timing diagnosis, verify the trigger wheel has not slipped in relation to the crankshaft balancer hub. To perform this check use Crankshaft Pin SST (303-507) and rotate the engine to TDC. Insert the 6mm bolt through the hole in the crankshaft balancer into the front cover as instructed. Look at the crankshaft position sensor and see if it is centered on the White tooth of the trigger wheel. If not, can it be centered on the White tooth? If not, the trigger wheel has slipped and the balancer will need to be replaced.
- After manually rotating the crankshaft to TDC using Crankshaft TDC Setting Peg SST (303-507), make sure the crankshaft remains against the crankshaft setting peg when loosening the crankshaft pulley bolt.
- Replace the crankshaft pulley bolt and the diamond friction washers on the camshafts since both are 1 time use components. The job aid instructs you to install friction washers if you remove the crankshaft pulley or camshaft gears and notice the absence of friction washers.
- After installing the front cover, rotate the engine 2 times. Place Crankshaft TDC Setting Peg SST (303-507) into the engine block and rotate the crankshaft up to the crankshaft pin. Attempt to install the camshaft alignment plate. Can the Camshaft Alignment Timing Tool be installed? If not, the engine timing is incorrect. Redo the engine timing until the camshaft alignment timing tool and the crankshaft TDC Setting Peg can be inserted and installed after rotating the engine from the initial repair position. If the camshaft alignment timing tool can be installed, continue the repair.
- Many of the crankshaft position sensors on the LF, L3, and L3 w/TC engines are slotted for adjustment and must be adjusted after setting base engine timing. Adjust the crankshaft position sensor if able.
- The crankshaft pulley bolt cannot be reused. Refer to Service Bulletin 01-040/07.

