



### 3 Valve Cam Phaser Limiters

These cam phaser limiters are designed to allow the use of aftermarket springs and camshafts while still retaining the stock phaser. The limiters are two piece anodized billet aluminum and designed to fit within the stock phaser.

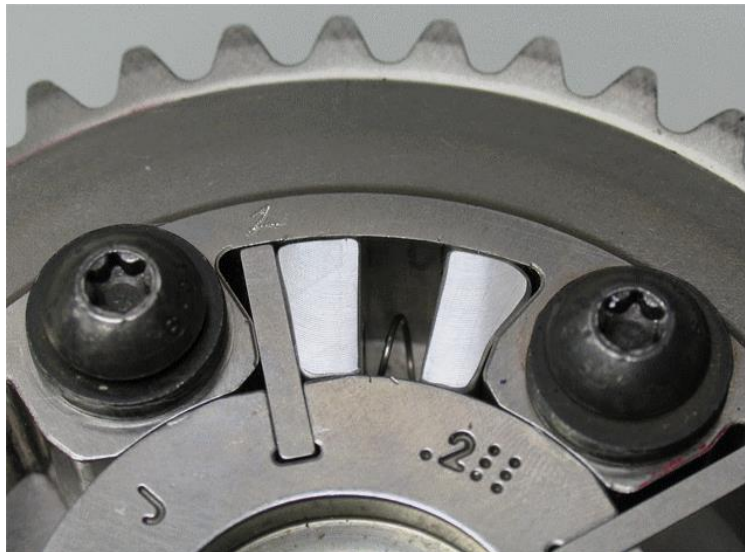
The use of aftermarket valvesprings with increased spring pressure, as well as aftermarket camshaft profiles do not allow the factory Ford cam phaser to function properly and may even cause it to fail. The increased spring pressures and more aggressive camshaft ramp rates cause the phaser to behave erratically. The factory phaser cannot control these added pressures, and in the majority of cases the phaser will emit a knocking noise as the phaser struggles to control the camshaft position.

These limiters are designed to limit the total travel of the cam phaser. They eliminate the noise and durability issues associated with the phasers and allow the use of larger aftermarket camshafts and springs. The following instructions will help to guide you through the installation. These instructions are based on having the camshaft phaser previously removed from the car.

1. Place the teeth of the gear loosely into a vice to hold the assembly in place as you remove the bolts.
2. You will remove the 4 bolts holding the phaser together and loosen the one long bolt. There is one long bolt that goes through the assembly and comes out the other side where it holds the spring for the phaser assembly in tension. This bolt will be left in place and only loosened to allow the rear cover to rotate out of the way.
3. After the bolts are loose, you can remove the phaser assembly from the vice and place it on a workbench, where the remaining bolts can be removed by hand. Remember to leave the long bolt in place but loose.
4. Rotate the backing plate of the phaser unit on the long bolt you left in place. When rotating this plate proceed slowly as there is a small spring that will force a small check valve out. Do not disassemble any further.

5. When you rotate the rear backing plate out of the way you will see that there are 5 inner vanes that are positioned against the outer portion of the gear. This position is where you want to install the limiters.
6. The limiters are precision machined to fit in one section better than the rest. The limiter should be installed into the void that has the vane sitting flush with the fixed outer portion of the gear. The little spring fits in the machined pocket on both pieces. Install the spring ahead of time and keep pressure on it as you slide in the unit. There is a small slot cut into the one piece that corresponds with the oil hole in the inner gear. Make sure this piece is installed and the oil hole is uncovered. At this point you are all done and can reinstall the small piston, spring and check seat. Then you can rotate the back plate back on the gear and reinstall the other bolts.

Here is how the finished installed limiter should look-



7. The torque for the bolts is 145 in lbs. We recommend using a small dab of blue thread locker on each bolt.

You should now have a fully assembled limited gear. You can now install the gear back into the engine and proceed with the rest of the reassembly.

If you have any questions at all please feel free to contact Livernois at 313-561-5500. We will be glad to assist you.