



## INSTRUCTIONS

### Timing Chain Installation

Thank you for choosing COMP Cams® products; we are proud to be your manufacturer of choice. Please read this instruction sheet carefully before beginning installation, and also take a moment to review the included limited warranty information.

#### **Kit Components:**

- Upper timing gear
- Lower timing gear
- Timing chain



#### **Tools and Supplies Needed:**

1. Basic hand tools as required for your particular camshaft balancer bolts.
2. Torque Wrench
3. Harmonic Balancer Installation Tool (Part #4920, for units with press on balancer).
4. Crankshaft Timing gear Installation Tool (Part # 4933 to be used in conjunction with #4920. For units with press on crankshaft gear only).
5. Pro Cam Lube (Part #153 or #154)
6. Camshaft Degree Kit (Part #4796 including degree video)
7. Crankshaft Socket (For your particular application)
  - Part #4793 Chevy Small Block 265-400, 90° V6, Pontiac and GM 4 cylinder
  - Part #4797 Chevy Big Block
  - Part #4798 Ford 289-351W, 429-460, Pontiac 389-455, and Buick
  - Part #4799 Chrysler V8, "LA", "RB", and Hemi
8. Thread Locking Compound
9. Engine Repair Manual for your particular engine

The following instructions begin after the timing cover and old timing set have been removed. Installing the timing set and degreasing the camshaft will be easier if you loosen the rocker arms so that the camshaft can turn freely. You should be able to turn the camshaft by hand. Make sure that the engine mounting surfaces and your new timing set has been thoroughly cleaned with a good solvent. If you are using a timing set with three keyways, select the appropriate keyway for your camshafts timing specifications. COMP Cams® recommends the standard timing position for most applications. This position uses the round or “O” timing mark and round or “O” keyway mark.

**Standard Timing Location:** This is the same as original O.E.M. setting. Use keyway marked “O” and crankshaft gear tooth marked “O”.

**4 Degree Advance:** Use keyway marked “Δ” (triangle) and the crankshaft gear tooth marked “Δ” (triangle). *Note: The “Δ” or advanced position should not be used without degreasing the camshaft. Many camshafts have the proper advance built into the camshaft. Advancing the camshaft will reduce the intake valve to piston clearance and increase exhaust piston to valve clearance.*

**4 Degree Retard:** Use keyway marked “□” (Rectangle or Square) and crankshaft gear tooth marked “□” (Rectangle or Square). *Note: The “□” or retarded position should not be used without degreasing the camshaft. Many camshafts have the proper advance built into the camshaft. Retarding the camshaft will reduce exhaust valve to piston clearance and increases intake piston to valve clearance.*

### **Step 1 – Lower Gear Installation**

Install your lower timing gear on the crankshaft making sure that the crankshaft timing gear is fully seated against the crankshaft flange and timing marks are facing out toward you. If your engine is one with a press on crankshaft timing gear, ***NEVER STRIKE THE GEAR WITH A HAMMER, CHISEL, OR PUNCH.***

### **Step 2 – Chain Installation**

Now that the lower timing gear has been installed, check the timing mark alignment in your engine manual. Rotate the crankshaft using your crankshaft socket until the timing mark on the gear is in the proper position. If your engine is equipped with a camshaft retaining plate or thrust plate, it should be installed at this time. Some engines have a spacer between the camshaft and the camshaft timing gear, and some camshaft timing gears have the spacer incorporated into the gear. To ensure that you have the right amount of camshaft endplay and the correct combination of parts check the endplay of the camshaft. It should be within .004” and .008” when the retainer plate is used. ***NOTE: To check camshaft endplay when using a camshaft retaining plate and camshaft timing gear onto the end of the camshaft. Use a feeler gauge to check the clearance between the camshaft retaining plate and front camshaft bearing journal. The proper clearance should be between .004” and .008”.*** Temporarily install your camshaft timing gear and rotate the camshaft until the timing mark on the camshaft gear is in the proper position according to your engines repair manual instructions. Remove the camshaft timing gear and loop the chain over the camshaft gear. Lift the camshaft gear into place on the camshaft. Install the camshaft bolt or bolts (finger tight for now). Check your manual again for the proper timing mark positions and make sure that both the camshaft timing mark and crankshaft timing mark are correct. If this procedure is missed by even one tooth engine damaged can result.

For a more accurate installation, we recommend that you degree your cam at this time using the instructions and video provided with your COMP Cams® degree kit (Part #4796). Then refer to your repair manual for proper torque specifications and torque specifications for all your attaching hardware. If camshaft bolts loosen up, severe engine damage can result. ***A good thread locking compound should be used on all bolts.*** Make sure that the engine oil has a clear path to the timing set through the lifter valley drain holes or some other means. Timing sets require plenty of oil to survive. When increasing timing chain speed (RPM’s), lubrication of the chain must also increase.

Before installing the timing cover and gasket pour plenty of Pro Cam Lube (Part #150 or #154) over the entire timing set. The proper lube will protect your timing set during final assembly and start up.

### **Step 3 – Final Assembly**

Install your timing cover, harmonic balancer, and torque your balancer bolt. If your engine uses a press on balancer use our balancer installation tool (Part #4920) to install the balancer bolt. ***Never strike your balancer with a hammer. This can cause serious damage to the balancer and internal parts.***