



## Camshaft Degree Kit for Ford 5.0L 4V Coyote #4943

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.

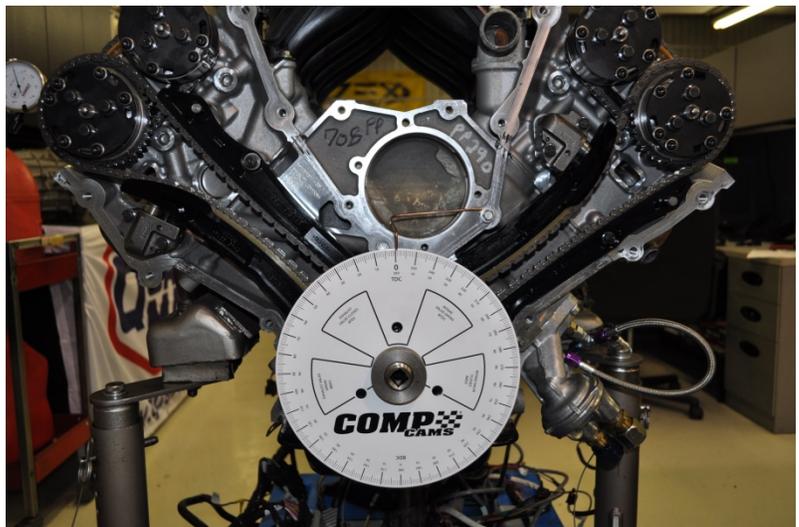
### **#4943 Parts List**

- (1) Crankshaft Socket
- (1) 9" Degree Wheel
- (1) Cam Checking Fixture
- (1) Metric Adapter
- (1) 0-1" Travel Dial Indicator
- (1) 5" Dial Indicator Extension
- (1) Wire Degree Wheel Pointer
- (2) Checking Springs
- (1) 14 MM Piston Stop



### **Initial Setup**

- 1) Prepare a clean work area and assemble the tools needed for the camshaft degreeding. It is suggested to use an automotive manual to help determine which items must be removed from the engine in order to expose the timing chains, camshaft phasers and camshafts. A good, complete automotive manual will save time and frustration during the installation.
- 2) Remove the engine valve covers.
- 3) Assemble the stand to hold the dial indicator, start by screwing the adapter piece to the bottom of the dial indicator stand.
- 4) Install the assembled stand with the metric adapter and dial indicator attached so that you can begin by degreeding the intake cam on cylinder 1 Tighten the assembly into the threads for mounting the valve cover.



## Camshaft Degreeing Instructions

1. The camshafts and timing chains have been installed. Make sure that the timing marks on both the camgears and crank gear are aligned properly per the cam installation instructions.
2. Your dial indicator and stand should already be installed and ready from the initial setup.
3. Attach the included pointer to the block. Many people will make a pointer out of some sort of rigid, yet manageable wire. A stiff metal coat hanger wire works well.
4. Attach the degree wheel to the crankshaft socket and install the assembly on the crankshaft. The crank may be rotated from either the front or from the flywheel end. Obviously, if the engine is in the car, you must rotate from the front. Remember, the greater the leverage, the smoother the crank rotation, will be with more accuracy. It is recommended to remove all spark plugs to aid in rotating the engine. **Note: Never use the starter to turn the engine while degreeing a cam.**
5. Before installing the piston stop, rotate the crankshaft to get the #1 piston in approximate TDC position with both the intake and exhaust valves closed. This can be a rough guess, but it can save you from making a mistake later. Adjust your pointer to zero or TDC on the degree wheel. Install piston stop in cylinder 1.
6. Turn the crankshaft opposite to the engine rotation approximately 15-20°. This will lower the piston enough to allow the TDC stop to be installed in the spark plug hole. Screw in the piston stop until it touches the piston. Continue to turn the engine in the same direction until the piston comes back up and touches the piston stop. Mark the degree wheel with a pen or pencil on the number the pointer is on. Turn the engine in the other direction (same as engine rotation) until the piston comes back up and touches the piston stop. Make a mark on the number the pointer is on.
7. Remove the piston stop after marking the two points on your degree wheel. Rotate the crankshaft to the midpoint of the two marks. This point is TDC for cylinder #1. Without rotating the crankshaft, adjust the degree wheel to read (0) zero degrees at the pointer. You are now ready to locate the intake lobe centerline relative to TDC. If you are not absolutely sure that your zero-degree mark is set at TDC, repeat this procedure. This step-by-step process is critical to proper cam alignment.



8. Position the dial indicator mount so the tip will contact the retainer of the intake valve. It is important that the indicator plunger be parallel to the valve stem. Any variance in the angle of the indicator will introduce geometric errors into the lift readings. Begin with the intake cam on Cylinder 1.



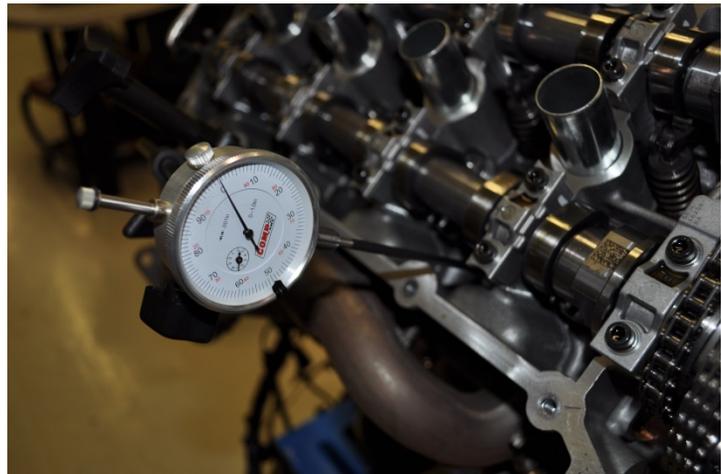
Cylinder 1 Intake

9. Rotate the engine in the normal direction of rotation until you reach maximum lift. The dial indicator will change direction at the point of maximum lift. At this point, set the dial to zero.

10. **Note:** The hydraulic lash adjuster will typically bleed down as you lift the valve, you can see this happening when you stop rotating the engine, but the dial indicator continues to move. Watch the dial indicator and make sure it has stopped moving, indicating the bleed down process has completed.

11. Back the engine up (opposite normal rotation) until the indicator reads .100". Next, turn the engine forward in the normal direction of rotation until the dial indicator reads .050" before maximum lift. Record the degree wheel reading.

12. Continue to rotate the engine over in its normal direction of rotation until the indicator goes past zero to .050" on the closing side of maximum lift. Again, record the degree wheel reading.



Cylinder 1 Exhaust

13. Add the 2 numbers together and divide by 2. That number will be the location of maximum lift of the intake lobe in relation to the crank and piston. This is the intake centerline. For example: The first degree wheel reading was 96°. The second reading was 116°. These two numbers (96 + 116) added together will be 212. 212 divided by 2 will equal 106. Your actual intake centerline is 106°. Reference back to your cam spec card and see what the recommended intake centerline is.

14. Now move the dial indicator to the Exhaust cam and repeat steps 8 through 13. When completed with both cams on Cylinder 1, reposition the dial indicator on the Intake Cam of Cylinder 6 repeating steps 8 through 13 for the intake and exhaust cams.

In the event that your camshafts did not degree in as per the manufacturer's specs, it will be necessary to either advance (move the cam ahead) or retard (move the cam back) the cam to meet the suggested intake centerline.

**Note: When degreing a cam, remember to look at the degree wheel as a full 360°, no matter how the degree wheel you are using is marked. Many degree wheels are marked in 90° or 180° increments. On wheels that are marked in 90° increments, keep in mind that you must continue to count the number of degrees on past 90°. Be sure all readings are taken from Top Dead Center.**

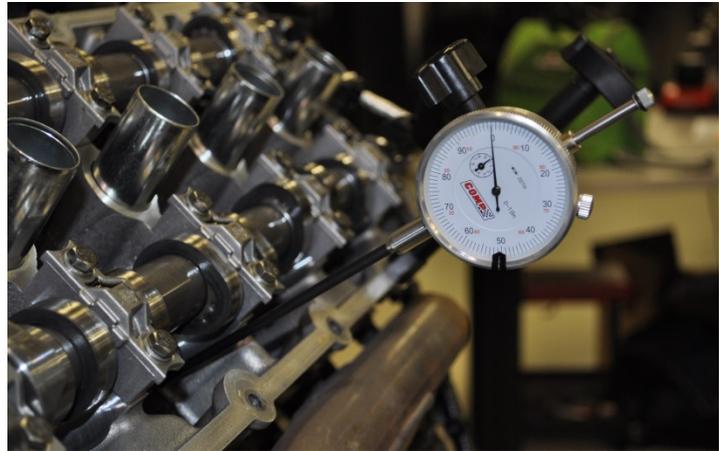


Cylinder 6 Intake

## Common Mistakes

**Note: To prevent broken or damaged valve train components, please read and follow these instructions completely.**

- COMP Cams® strongly recommends replacing valve springs on any engine with 60,000 miles or more. Stock (OEM) springs may be retained in our NSR (No Spring Required) Camshafts.
- If you do not use enough seat pressure, valve float will occur, causing damage to the entire valve train and the engine will not turn high enough RPM. If the open spring pressure is excessive, worn lobes will be the result. Please refer to your camshaft spec card or COMP Cams® Master Reference Catalog to determine the valve spring needed for your application.
- Always use plenty of cam lube on the lobes.
- Never continue cranking the engine if it doesn't start immediately.



Cylinder 6 Exhaust

## Limited Warranty

Competition Cams, Inc. warrants that all of its products are free from defects in material and workmanship, and against excessive wear for a period of (1) one year from the date of purchase. This **limited warranty** shall cover the original purchaser.

**Competition Cams, Inc.'s obligation under this warranty is limited to the repair or replacement of its product.** To make a warranty claim, the part must be returned within (1) one year of purchase to the address listed below, freight prepaid. Items covered under warranty will be returned to you freight collect.

**It is the responsibility of the installer to ensure that all of the components are correct before installation. We assume no liability for any errors made in tolerances, component selection, or installation.**

**There is absolutely no warranty on the following:**

- A) Any parts used in racing applications;**
- B) Any product that has been physically altered, improperly installed or maintained;**
- C) Any product used in improper applications, abused, or not used in conjunction with the proper parts.**

**There are no implied warranties of merchantability or fitness for a particular purpose.** There are no warranties, which extend beyond the description of the face hereof. Competition Cams, Inc. will not be responsible for incidental and consequential damages, property damage or personal injury damages to the extent permitted by law. Where required by law, implied warranties or merchantability and fitness are limited for a term of (1) one year from the date of original purchase.

This warranty gives you specific legal rights and you may also have other legal rights, which vary from state to state.



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Part #COMP4-170  
Revised 6/28/13