Part no. 68787
Universal Camshaft Degree Wheel Kit (Heads Off)

How to Use Your PROFORM® Camshaft Degree Wheel Kit, Heads Off

Your kit contains the most important specialty tools needed to degree your camshaft properly.

1 – 9” Degree Wheel
1 – Dial Indicator
1 – Aluminum Dial Indicator Mount
1 – Aluminum Top Dead Center Locator
1 – Wire Pointer
1 – Carrying Case

After the camshaft and timing set have been installed, with this kit you can align the position of the camshaft correctly with the position of the crankshaft by positioning the center (the point of maximum lift) of the #1 intake lobe with top dead center of the #1 piston.

Using chalk or a similar marker to enhance the marks’ visibility, check that the timing marks on the cam gear and the crank gear are aligned in accord with the cam installation instructions.

Attach the pointer to the block. **[See fig A.]**

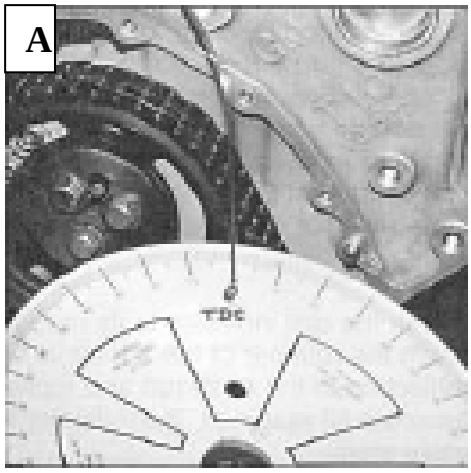
Attach the degree wheel to the balancer, and then install *both* onto the crankshaft, rotating it from the front (if the engine is installed in the car) or from the flywheel end, seeking as much leverage as possible to achieve smooth crank rotation and maximum accuracy. ***WARNING: NEVER USE THE STARTER TO TURN THE ENGINE WHILE DEGREEING THE CAM, OR SERIOUS INJURY COULD RESULT.***

By making a rough guess, rotate the crankshaft to move the #1 piston to the approximate top dead center position, with both the intake and exhaust valves closed. Adjust your pointer to top dead center (zero) on the degree wheel.

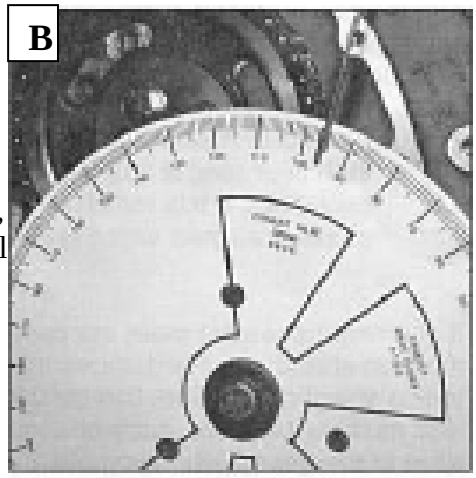
Rotate the crankshaft 15-20 degrees in the direction opposite of the motor rotation. Then put the top dead center locator over bore and screw the piston stop stud until it contacts the piston. Continue rotating the crankshaft in the same direction until the piston rises and contacts the piston stop.

Marking with a pen or pencil on the degree wheel, mark the degree number to which the pointer is pointing. **[See Fig. B.]** Then rotate the crankshaft back in the direction of motor rotation until the piston rises and contacts the piston stop. Then again mark the degree wheel to identify the degree number to which the pointer is pointing. **[See Fig. C]**

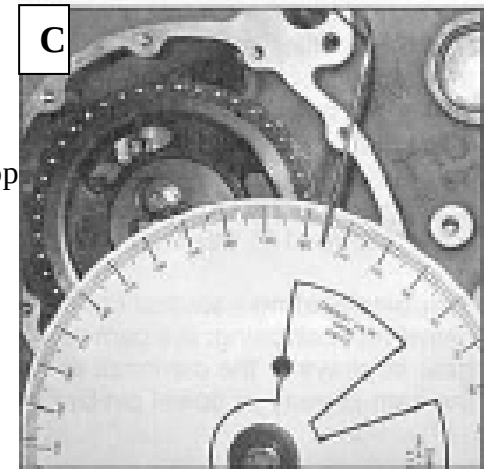
A



B



C



After marking these two points on the degree wheel, remove the piston stop, and turn the crankshaft to the mid-point between the two marks: this is top dead center for cylinder #1. Without turning the crankshaft, rotate the degree wheel to read 0° at the pointer. You will now be able to position the intake lobe centerline in relation to top dead center. If you have any doubt that your 0° mark is at top dead center, repeat the procedure because this positioning is essential to achieving proper cam alignment.

Attach the dial indicator to its mount with the 5" extension in place. Locate the top center of the lifter by extending the 5" extension down into the lifter bore until it touches the inside bottom of lifter.

Turn the crankshaft in the direction of normal motor rotation until the point of maximum lift. The dial indicator's needle will change direction at the point of maximum lift. At this point, reset the dial indicator's reading to zero. This can easily be done by loosening the check screw on the side of the gauge and rotating the dial face to zero.

Turn the crankshaft in the direction opposite normal motor rotation until the indicator reads .100", then turn the crankshaft in the normal motor rotation direction until the indicator reads .050" before maximum lift, and then record the degree wheel reading.

Continue to turn the crankshaft in its normal direction until the indicator passes zero and reads .050" on the closing side of maximum lift, and record this degree wheel reading also.

Add the two recorded numbers and divide by 2. The result will be point of maximum lift of the intake lobe relative to the crank and piston. You have now located the intake lobe centerline.

> **Example:** If your first reading was 95° and your second was 117°, then their total is 212°, which divided 2, is 106° - your actual centerline. If this matches your cam specs, then the camshaft is properly aligned with the crankshaft.

If your result does not meet the cam spec, you will need to advance (move the cam ahead) or retard (move the cam back) the cam to match the centerline specification. This can be done in several ways: using a crank gear with multiple keyways, each one located at a slightly different position relative to the gear teeth; using offset bushings that fit on the cam pin and in the cam gear, with the offset advancing and retarding the cam according to how the bushing is installed on the cam pin; using offset keys that fit into the crank gear keyway; using an adjustable timing gear. Ask your dealer which method will best suit your needs. To advance the cam, you must lower the intake centerline. For example, if your cam had a lobe separation of 112°, the cam is straight up when the intake centerline is 112°, so moving the centerline to 106° advances the cam 6°. If you changed the centerline to 114°, this would be 2° retarded.

Troubleshooting – several common errors may lead to improper camshaft positioning: the cam or gear being marked incorrectly; cam or gear keyways or the camshaft or gearshaft being incorrectly machined; the cam keyway or dowel pin being incorrectly indexed.

For additional tech supported related to this genuine PROFORM product, please call (586)774-2500
Monday-Friday, 9 a.m.-5 p.m. EST, or send an email to tech@ProformParts.com