#62192 – Moroso Degree Wheel with Intake Center Line Calculator Instructions:

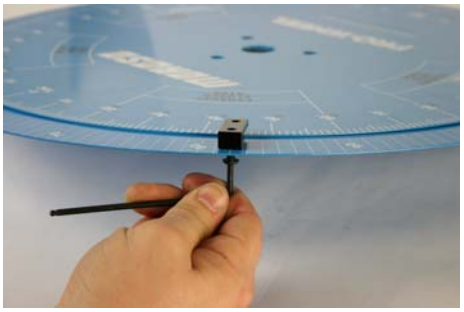
Items in Kit:

1- 18” Inner Degree Wheel
2- 20” Outer Degree Wheel
3- (4) Nylon thumb screws
4- (4) 10-32 Allen Head screws
5- (4) Aluminum Stands
6- .100” aluminum spacer

Not Included in kit, but required for completion:

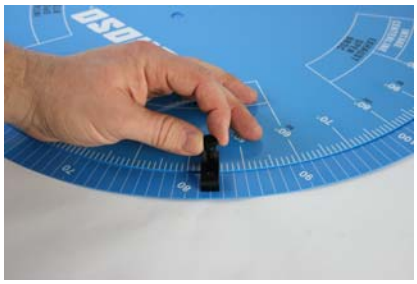
-Moroso “Crankshaft Socket Tool” based on the crankshaft application
-#61755 Fits: Small Block and 90degr. V-6 Chevy, Super Duty Pontiacs/GM 4 cyl.
-#61756 Fits: Big Block Chevy
-#61757 Fits: GM LS Series Engines with keyway

Assembly instructions:



1-Attach the aluminum stands to the holes provided in the outer wheel. Insert the 10-32 screws into the deeper threaded hole while maintaining the flat side of the stand upward.

The opening in the stand will face toward the middle of the outer-wheel, as the inner wheel will locate inside the four stand openings.



2– Place degree wheels on table as so markings are facing upward. The inner wheel will be held in place, but not centered yet by the four nylon set screws. Loosen the nylon thumbscrews so the outer wheel is free to turn.

3- Take your Moroso Crankshaft Socket Hub (not included) and slide aluminum spacer provided over the threaded portion. Locate the Crankshaft Socket Hub through the back opening of the 20” degree wheel and the 18” degree wheel so the keyed hub is on the backside of the wheels. The 20” degree wheel will center up on the aluminum spacer, and the 18” wheel will center up on the threaded part of the hub.

4- Place the Steel washer over the threaded portion of the hub, and screw on the knurled jam nut. The 20” outer degree wheel should turn independent of the hub and inner wheel. If it doesn’t turn freely, make sure the four thumb screws are lose, and the aluminum spacer is centered into the 20” outer wheel.

Using The Moroso Degree Wheel with Intake Centerline Calculator:

Step 1: Place the degree wheel assembly on the crankshaft snout and tighten down the brass tipped set screw provided in the Crankshaft Socket Tool Kit. Now find Top Dead Center (TDC) of the engine by using either method depending on the assembly condition of your engine:

Engine without cylinder heads on: Rotate your engine by hand CLOCKWISE until the piston face is about .250" to .375" from the deck surface. Install your TDC Stop (Not included) on the #1 cylinder on the intake side of the piston. Tighten down and check for any deflection. Screw the adjustment bolt inward until it makes contact with the flat of the piston face. Secure the bolt to prevent deflection.

Lightly rotate the engine against the TDC Stop as piston rock will cause the crankshaft to move slightly. Once you feel a positive stop, loosen the knurled nut on the crankshaft hub and rotate the inner wheel so the Zero degree mark is facing the 12 or 1 o'clock position. Tighten the knurled nut as to not allow the wheel assembly to move.

Using a rigid piece of wire, or a designated pointer, align the pointer to the right side of the Zero mark (20 degrees Before TDC will work). Now rotate the engine COUNTER CLOCKWISE until the piston comes up again and gets close to the stop. Slowly bring the piston up to the Piston Stop until you feel a positive stop.

Now read the value on the inner wheel. For example it could read 30 degrees (After TDC). Add the two values together (30 + 20 = 50 degrees) and divide by 2 (50/2 = 25 degrees). Loosen the knurled jam nut and rotate the inner wheel so the pointer now aligns with the 25-degree mark (After TDC).

To verify that you have found TDC for the piston, rotate the crankshaft CLOCKWISE until it hits the stop again. The pointer should read 25-degrees Before TDC. Making an alignment mark with a magic marker will ensure you that your wheel has not moved during the timing process.

Remove the Piston Stop and rotate the engine so the pointer is lined up with the Zero mark. Your piston is now at TDC.

Engine with Cylinder Heads on: By hand, turn the engine over until you just begin to feel air coming out the #1 cylinder spark plug hole. Install your Top Dead Center Stop (TDC Stop) (not included) into the spark plug hole and tighten. If it hits the piston before you can tighten it, turn the engine COUNTER CLOCKWISE until the piston is backed away from the TDC Stop.
Lightly rotate the engine against the TDC Stop as piston rock will cause the crankshaft to move slightly. Once you feel a positive stop, loosen the knurled nut on the crankshaft hub and rotate the inner wheel so the Zero degree mark is facing the 12 or 1 o'clock position. Tighten the knurled nut as to not allow the wheel assembly to move.

Using a rigid piece of wire, or a designated pointer, align the pointer to the right side of the Zero mark (20 degrees before TDC will work). Now rotate the engine COUNTER CLOCKWISE until the piston comes up again and gets close to the stop. Slowly bring the piston up to the Piston Stop until you feel a positive stop.
Now read the value on the inner wheel. For example it could read 30 degrees (After TDC). Add the two values together (30 + 20 = 50 degrees) and divide by 2 (50/2 = 25 degrees). Loosen the knurled jam nut and rotate the inner wheel so the pointer now aligns with the 25-degree mark (After TDC).
To verify that you have found TDC for the piston, rotate the crankshaft CLOCKWISE until it hits the stop again. The pointer should read 25-degrees Before TDC. Making an alignment mark with a magic marker will ensure you that your wheel has not moved during the timing process.
Remove the Piston Stop and rotate the engine so the pointer is lined up with the Zero mark. Your piston is now at TDC.

Step 2: *Since there are many ways of measuring the lift of the cam lobe, we will refer to the dial indicator measurement as "Lobe Lift". Either measuring with a Lifter Bore style gauge, or by a dial indicator measuring the push rod, or off the spring retainer, our measurements will be correct for our instructions.*

Once you have established a reliable way of measuring Lobe Lift, begin by turning the engine CLOCKWISE until the dial indicator reaches the highest reading of the cam lobe height. The dial indicator will climb in value and then stop moving and then begin to go backwards if you go to far. If this happens, turn the engine COUNTER CLOCKWISE and then turn CLOCKWISE to find the peak reading again

ALL VALUES FOUND MUST BE REACHED WHILE TURNING THE ENGINE CLOCKWISE! This ensures all the loading of the components is typical of the engine running.

Once peak has been found, adjust the dial indicator to read ZERO. This will be represented as the highest point of the Lobe Lift.

Turn the engine COUNTER CLOCKWISE until the dial indicator nears (in our example .050") your Lobe Lift Reference Value. Go past your Lobe Lift Reference Valve by .010". Then turn the engine CLOCKWISE and go to the Lobe Lift Reference Value

(.050"). Loosen the nylon screws on the outer wheel and rotate it until you match up the numerical value of the outer wheel reading with the inner wheel value (in our example we will use 80 degrees as our first value). The outer wheel is in one-degree increments, but laid out every two degrees. Double-check your setting. Lightly tighten the nylon screws so the two wheels turn together.

Turn the engine CLOCKWISE. The dial indictor value will go back to ZERO and then go back down as we are going down the backside of the camshaft lobe. Turn the engine until you reach the Lobe Lift Reference Value (.050"). In our example we will use 140 degrees for our as our second value.

Now read the value of the outer wheel and that is your intake centerline value! In our example it would be 110-degree centerline.

That's it…your all done…no math!