GP3-110 CAMSHAFT TIMING SPECIFICATIONS

Application: Triumph 6-cylinder 2498 cc. engine

Lobe Separation: 110 degrees

Recommended Spring Pressure: 65 – 80 lbs. seated, 170 – 180 lbs. open

	Duration @ 0.012" tappet lift	Duration @ 0.050" tappet lift	Cam lift	Valve lift*	Valve clearance	Center-line
Intake	281	232	0.282"	0.395"	0.017"	110 ATDC
Exhaust	281	232	0.282"	0.393"	0.019"	110 BTDC

* net valve lift with stock rockers and specified valve clearance.

Check timing at 0.050" tappet lift

intake open	6 BTDC	intake close	46 ABDC
exhaust open	46 BBDC	exhaust close	6 ATDC

Timing at 0.012" tappet lift (point of valve opening)

intake open	28 BTDC	intake close	73 ABDC
exhaust open	68 BBDC	exhaust close	33 ATDC

Time the cam using a degree wheel on the crank and a dial indicator on the push rod. Cam timing may be retarded a few degrees to increase top end torque or advanced a few degrees to increase low end torque. One tooth on the cam chainwheel is 8.5 camshaft degrees (17 crank degrees). Turning the chainwheel ¼ turn on the cam turns the cam ½ tooth or 4.25 cam degrees (8.5 crank degrees). Infinite adjustment may be made by using Good Parts adjustable cam sprocket.

Sample timing points at 0.050" lift at 4 degrees advanced are as follows:

intake open	10 BTDC	intake close	42 ABDC
exhaust open	50 BBDC	exhaust close	2 BTDC

Break-in: Clean the cam well before installing. Lube cam and tappets with cam lubricant when installing. Prime the oil system prior to startup per Good Parts instructions for SKU 191T Oil Pump Priming Tool. Evaluate the amount of oil flowing to the rocker assembly during priming. If the cam is in the priming position, as described in step 5 of the priming instructions, there should be oil flowing out at each rocker. Pay special attention to the front rocker as it is the last to receive oil. Add external oil feed line SKU 1899 if flow is insufficient. Start engine and run at 2000 – 2500 rpm for 20 minutes without stopping. Stop engine and change oil and oil filter.

WARNING: Do not insert the lifters until the camshaft locating plate is bolted in place. Do not bolt the camshaft locating plate onto the block without the main front engine plate in place.

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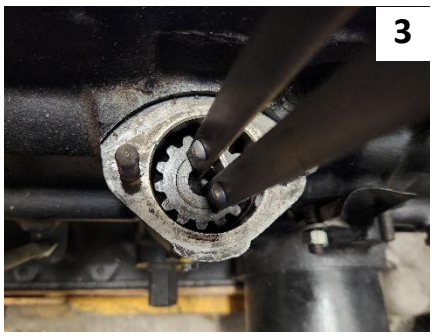
OIL PUMP PRIMING

Terms:

- TDC/BDC = Top/Bottom Dead Center. The crankshaft position at the highest/lowest point in a piston's stroke.
- TDC compression = Piston at its highest point on compression stroke (both valves closed).
- BTDC = Before Top Dead Center
- ATDC = After Top Dead Center
- Crankshaft Rotation = Clockwise as viewed from the front of the engine
- Piston/Valve #1 = The piston and intake/exhaust valves closest to the front of the engine.
- Piston/Valve #6 = The piston and intake/exhaust valves closest to the rear of the engine.

1) Turn the engine to Piston #1 TDC compression as a reference point for distributor alignment. You can confirm that piston is on compression stroke by holding your thumb over the spark plug hole. As the piston approaching TDC you will feel air pressure building up in the cylinder. Take a photo of the distributor position in relation to the block and a photo of the ¼" bolt holding the distributor clamp plate on to the pedestal showing where the bolt is located in the slot in the plate. Remove the bolt and pull the distributor out of the pedestal and move it to the side. Do not loosen the horizontal bolt clamping the plate onto the distributor.
2) Remove the two $^{5}/_{16}$" nuts and lock washers and carefully pull the pedestal out of the block, being careful not to tear the thin shim gasket.
3) Take a photo showing the orientation of the slot in the gear. It should be close to 1:00/7:00 position when 12:00 is toward the block. The slot should be offset toward the front of the engine. **See Photo 1**.
4) Use Good Parts SKU 2227T gear puller or an appropriate internal snap ring tool to grip inside the gear slot and lift the gear out while turning counter clockwise.
5) To align the oil grooves of the rear cam journal in the best position to allow oil flow to the rocker assembly, turn the crank until #1 exhaust valve (valve in the very front of the engine) is fully open. Another indicator that the cam is in the right position is when the two rockers you see through the valve cover oil fill hole (#4 exhaust and #5 exhaust) are "on the rock". One is just closing and the other is just opening. Neither will have valve lash. When both rockers are at the same height, the cam is in a good position for oil flow to the rocker assembly. This should be at about 110 BTDC of exhaust stroke, which is 250 degrees ATDC of compression stroke (plus or minus depending on your cam timing but close enough for our purposes here). With the Good Parts ATI damper this will be at the 110 degree mark. For an original damper, cut a piece of tape exactly 6-¼" long. Apply the tape to the outside diameter of the damper, starting at the TDC mark and continuing clockwise. The end of the tape will be your 110 degree mark. Starting from Piston #1 TDC compression, turn the crank clockwise (viewed from front) 250 degrees until you reach the 110 degree mark.
6) Clamp the solid end of the pump priming tool in a ½" drill and set to reverse in low speed. Oil the shank and insert the slotted end of tool into block where gear was, push down and rotate slowly until the slot engages the tang of oil pump. Run the drill in reverse slowly until oil pressure builds. Maintain pressure for about a minute to distribute oil. If you have the rocker cover off, check that oil is flowing from the rocker arms, including the front one. If the cover is on, check all the rockers you can see.
7) Pull the tool out of the block and remove it from the drill.

8) Insert the tool back into the block by hand, push down and rotate to engage the oil pump tang. Turn the tool until the machined groove on the end of tool is at 1:30/7:30 position or aligned about 15 degrees clockwise from where the gear slot was in your photo. **See photo 2**.
9) Turn engine to Piston #1 TDC compression.
10) Using your gear puller tool, insert the gear with the slot aligned at about 11:00/5:00 position and offset toward the front of the engine. **See photo 3**. Lower the gear down, rotating it slightly to engage the teeth of the cam gear. The angle of the teeth will rotate the gear clockwise as it goes farther in. If the alignment of the pump shaft happened to be perfect, the slot in the end of the gear shaft will engage the oil pump tang and the gear will continue in until fully seated. More likely it will hit up on the tang and you need to rotate the crank forward or backward slightly while pushing down on the gear until you feel it engage and the gear goes in another $^{3}/_{16}$". The top of the gear should be 1-$^{5}/_{16}$" below the block when fully seated.
11) If you had to turn the crank, reposition it to TDC. Make sure the gear is fully seated and check the orientation of the gear compared to your photo. If it is off, pull the gear back out and jump a tooth to re-align it as needed.
12) Replace the shim gasket if it is torn. Coat the gasket with sealer and bolt the pedestal back onto the block. If you did not change the number of shim gaskets the gear end float should not have changed. If it is a new build, test fit the pedestal with no gasket and carefully snug up the nuts. Using a screw driver, make sure the gear can rotate slightly against the backlash of the teeth. If it is free to move, adding one shim gasket will ensure that you have a minimum 0.005 inch end float since the gaskets are about 0.005 inch thick. If it was not able to move, add shim gaskets as needed to achieve 0.005 inch end float.
13) Slide the distributor into the pedestal, rotating the rotor to engage the slot in the gear. It only fits one way due to the offset of the slot. When it is fully seated, bolt the clamp plate onto the pedestal in the same position as your photo.
14) Start the engine soon as possible after priming.



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