



## Honda XR600/XR650L Camshaft Installation Instructions

Thank you, for your purchase of the Hot Cams Honda XR600 High Performance camshaft. This camshaft is the result of many hours of testing and is computer designed to give you the best all around performance for your motorcycle. Please read and understand all these instructions **before** any disassembly is started.

You need only to have basic knowledge of the working of an engine to install them properly. These instructions will assist you in the installation of the camshaft into the engine. With the XR600 it is possible to install this camshaft without removing the engine from the frame but for a much less frustrating time with the installation we recommend removal of the engine.

Break-in of this camshaft is **VERY** important and you should follow the recommended procedure. This camshaft is phosphate coated to assist with break-in, it will change color in the wear areas of the camshaft as it breaks-in. It is also very important to use plenty of a NON-molybdenum based engine assembly lubricant. Moly lubes will damage the clutch by coating the clutch plates and will result in clutch slippage. We recommend that, if you decide to leave the engine in the frame, you change the oil before the initial start-up of the engine **after** the assembly. We also recommend that you pour half the measured amount of oil into the oil tank and the other half into the left intake valve cap. These steps will help ensure that the camshaft breaks-in properly and that you have a long lasting product.

When installing the Hot Cams camshaft, please check the condition of the rocker arms for excessive wear. Replace if excessively worn. Maintaining the valve adjustment will be paramount to the durability and longevity of the camshaft, rocker arms, and valves. Following a regular maintenance schedule is always the best way to ensure durability and performance over the long run.

Before beginning we recommend the purchase of a new cylinder head cover gasket. Make sure the motorcycle is cleaned thoroughly before you start. It would be advisable to use an engine degreaser on the frame and the engine. This will ensure a clean engine during the assembly process and less of a chance of thread damage and/or dirt in the engine during reassembly. And as always replace any gasket that was moved in any way.

You will need basic hand tools and a torque wrench, access to a press, a spring installation tool or equivalent, machine towels (rags) and some cleaning solvent.

We will start by removing the tank and seat and the engine from the frame. It will be assumed that the engine is on a bench for the following procedures.



Remove the tappet covers. Remove the crankshaft cap and timing hole cap on the left engine case cover. Remove the spark plug. Rotate the engine in a counter clockwise direction. Position the engine at true top dead center (TDC) using the mark on the flywheel. True top dead center occurs when both the intake and exhaust valve are closed when the piston is at TDC. This is technically the end of the compression stroke and the beginning of the power stroke. The "artificial" TDC is during the overlap when both the intake and exhaust valves would be open. Since the rocker arms are located in the valve cover on an XR600, true TDC occurs when the cam lobes are pointed downward when the piston is at TDC.

Remove the cylinder head cover. Warning, do not drop the locating dowels into the cam chain cavity. There are two dowels, one on either side of the cover. Remove and discard the gasket.

Note the positioning of the cam lobes, this will help during installation of your new Hot Cams camshaft. Note also the location of the sealed bearing on the end of the camshaft and the direction in which it is facing.

Loosen the bolts that hold the camshaft sprocket. Remove the lower camshaft sprocket bolt first, it will be necessary to rotate the engine. Rotate the engine back to TDC. Release the spring tension on the cam chain tensioner by lifting the end of the spring out of its hole in the tensioner block. A spring tool is a good method. Be careful not to scar the cylinder head's gasket surface for the cylinder head cover. Remove the allen bolt that holds the end of the tensioner block shaft just to the inside of the tensioner block. Note the location of the tensioner block shaft cap ridge. Using a pair of pliers pull the shaft out by grasping the ridge and using a clockwise rotation of the shaft while pulling outward. Pull the tensioner block upwards, out of the cylinder head. Remove the top camshaft sprocket bolt. Pull the sprocket off the camshaft but maintain upward tension, do not allow the chain to sag, it is possible for the chain to "slip" on the bottom sprocket of the crankshaft and change the cam timing. Remove the camshaft. Remove the cam bearings. Set the stock camshaft with the auto-decompression aside. **It is not possible to use the auto-decompression on the Hot Cams so do not attempt to re-install.** Use a manual decompression. Install the bearings onto the new Hot Cam.

Put assembly lube in the center casting camshaft support in the cylinder head. Install the camshaft in the cylinder head as to represent the TDC positioning and install the camshaft sprocket and chain. Install the top sprocket bolt loosely and turn the engine over slowly for the lower sprocket bolt to be installed, tighten it fully. Rotate the engine back to TDC and tighten the top sprocket bolt fully.

Before installing the cam chain tensioner block into the cylinder head make sure the spring arm that will rest against the cylinder head is in line with the edge of the block's arm. Install the tensioner block. Install the tensioner block shaft, it may be necessary to move the block around in order to get the best positioning of the block for the block shaft to slide through into its hole in the cylinder head. It will be necessary to rotate the block shaft clockwise with inward pressure in



order for it to be installed. Turn the block shaft to the approximate angle and slowly align the threads in the end of the shaft with the hole in the cylinder head where the bolt goes in, install the allen bolt and torque to 75 in/lbs.

With a spring puller or other device grasp the loose end of the spring and pull it up to its hole in the tensioner block, make sure the end is fully seated in the block before proceeding any further. This spring has a lot of tension, make sure the engine is sufficiently held tight before attempting this procedure. Turn the crankshaft back and forth a couple of times to make sure the tensioner block is tight against the chain tensioner guide. Set the engine to TDC. Check the positioning of the cam lobes.

Clean the cylinder head cover gasket surfaces of the head and cover using a clean rag and a non-residue leaving cleaner (electrical contact cleaner sprayed onto a clean rag will work). Using the engine assembly lube liberally apply to all wear points of the camshaft and rocker arms and bearings. Install the cylinder head cover locating dowels and new gasket. Install the cylinder head cover being sure to get all the sub-rocker arms in the correct places and torque the cover bolts to 86 in/lbs.

With the engine at TDC set the intake valves' clearances to .005" (inch). Set the exhaust valves' clearances to .007" (inch). Rotate the engine slowly several revolutions to check for binding. If there is any binding stop and re-check the cam timing. Install the tappet covers, except for the left intake tappet cover. Install the spark plug.

Install the engine into the chassis. Pour half the measured amount of oil into the frame and the other half into the left intake valve tappet cover. Install the tappet cover. Install the tank and seat.

### **Break in procedure**

**Upon initial start up it is very important you DO NOT let the engine idle. The engine must run for at least 20 minutes at 3000 rpm or better. We recommend a light trail ride-to maintain the engine RPM above 3000 rpm. Only light engine loads are to be used. No excessive rpm or lugging. Let the engine cool. Check your valve clearances again.**

You are now free to explore the new limits your machine has in store for you, enjoy your new Hot Cams High Performance camshaft.

Thank you.