Camshafts Installation Instructions
Kawasaki KFX\KLX 400
Suzuki DRZ\LTZ 400

Thank you, for your purchase of the Hot Cams Suzuki DRZ400 High Performance camshafts. These camshafts are the result of using the latest technologies in materials, treatment and handling, are computer designed and modeled and have been extensively tested for performance and durability to give you the best quality and performance for you motor cycle. Please read and understand all these instructions ***before*** any disassembly is started. We recommend that you employ the skills of an experienced technician if you are not fully comfortable with this procedure. Do not try to change the degree of these cams if you are not an experienced technician.

You need only to have basic knowledge of the workings of an engine to install these camshafts properly. These instructions will assist you in the installation of them into the engine. With the DRZ\KLX 400 it is possible to install them without removing the engine from the frame.

Break-in of these camshafts is important and you should adhere to the procedure to the letter. 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 plates and will result in clutch slippage. We recommend you change the oil before the initial start-up of the engine *after* the assembly. These steps will help ensure that the camshafts break-in properly and that you have a long lasting product.

Maintaining the valve adjustment will be paramount to the durability, performance, and longevity of the camshafts, followers, and valves. Following a regular maintenance schedule is always the best way to ensure durability and performance over the long run.

Cleanliness is always a good place to start. 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 contamination in the engine during reassembly. And as always, replace any gasket that was moved in any way, i.e. cam chain tensioner.

You will need basic hand tools and a torque wrench, machine towels (rags), some cleaning solvent, and a cam chain tensioner gasket. The Hot Cams' Degree Wheel Kit is also strongly recommended.

We will start by removing the tank and seat, horn and bracket if so equipped, and the cam cover. Remove the bolt that holds the engine breather box in place and remove the hose from the engine, push the box back out of the way. Remove the crankshaft cap and timing hole cap on the left engine case cover. Remove the spark plug. Rotate the crank in a counter clockwise (CCW) direction. Position the crank on top dead center (TDC) using the mark on the flywheel. Be sure to notice that the intake valves were the last to move, this will ensure the engine of being on "true" TDC.

Note the positioning of the cam lobes (their included angle will be close to 170 degrees), this will help during the installation of your new Hot Cams camshafts, it may be advisable to measure the distance between the cam lobe‘s noses to the followers to get the best idea of their positioning. A vernier caliper will suffice. This will not be the definitive positioning of the new cams because of lift and duration differences between the stock and Hot Cams camshafts but will be a good starting point.

Remove the plug bolt from the back of the cam chain tensioner assembly. It is under pressure from the spring. Remove the spring and pin. Remove the bolts and tensioner assembly from the cylinder. Release the lock on the tensioner assembly and push the tensioner rod into the assembly so that it is fully retracted.

Remove the eight 5mm Allen headed bolts that hold the cam caps in place. Remove the cam caps; be aware of the locating dowels in the caps to keep them from falling into the engine. It may be necessary to pry very lightly on the caps to lift them off their dowel pins. Do not use the cam lobe as the pry point. Lift the intake camshaft out of its pocket in the cylinder head casting. Remove the cam chain from the sprocket, set the stock camshaft aside. Lift the exhaust cam out of its pocket in the cylinder head casting and remove the chain from the sprocket. Do not drop the cam chain; dangle it over the side of the engine while keeping slight upward pressure on the chain to maintain its position on the drive sprocket on the crankshaft.

Using assembly lube, lube the shim buckets and bearing surfaces for the camshafts in the cylinder head. Set the exhaust camshaft into the cylinder head casting while at the same time fitting the cam chain over the sprocket. Make sure that you keep all the cam chain slack to the back of the engine.

Repeat the above process for the intake camshaft. Again, make sure you keep the chain slack to the cam chain tensioner side of the engine. Check to be sure the crankshaft is still at TDC.

Check the location of the cam lobes. The camshafts are marked, and preset to 108-degree centers. If the lobes are not where they should be, adjust the positioning of the camshaft by rotating the sprocket one tooth on the chain. Do this until it is in the correct position as before you removed the camshafts. Check the positioning of the crankshaft for the TDC mark.

Using assembly lube, liberally apply to the lobes and bearing surfaces of the camshafts. Install the cam caps over the dowel pins in the cylinder head. Install the bolts into the caps and torque the cam cap bolts to 86 in/lbs, 7.2 ft/lbs, or 1.0 m/kg.

Re-install the tensioner assembly. Slide the spring and pin into the assembly. The plug bolt will take some effort to install because of the spring tension. You should be able to hear/feel the tensioner rod extending as you install the plug bolt. Tighten the plug bolt. “Rock” the crankshaft back and forth a few times to be sure the cam chain tensioner is extended all the way out (there

should be no delay from when you move the crankshaft and the time when the camshafts move, in either direction). Check the positioning of the camshaft lobes and the TDC mark on the flywheel. Install the cap bolt and gasket into the cam chain tensioner block, torque to 61.2 in/lbs. 5.1 ft/lbs or .7 m/kg.

Slowly rotate the crankshaft in a CCW direction feeling for valve - piston contact or valve - valve contact. The motor should roll over easily with no binding or catching. It will take some pressure though as you will have to overcome the valve spring pressures. Turning the crankshaft in a CW direction will take some effort too as you will have to overcome the starter motor and gear reduction. If everything up to this point was done correctly, the engine WILL turn over correctly with no valve/piston, valve/valve contact.

Place the engine at TDC and measure the valve clearances. The correct valve clearances should be .004”-.006” or .10-.15 mm on the intake valves and .006”-.008” or .15-.20 mm on the exhaust valves. The correctly adjusted valve will allow the feeler gauge under the smaller setting but not the next step larger setting, in other words, the .15 mm and the .20 mm will fit but not .16 mm or .21 mm. Conversely, if the .10 mm or the .15 mm feeler gauges don’t fit the valve is too tight. Measuring in metric will help you adjust easily if the clearances are off. Record the measurements on paper; left & right intakes and left & right exhausts.

If the measurements are off, remove the cams using the procedures described previously. Remove the camshaft followers, a pair of needle nose pliers will work fine, and remove the shims. More than likely the shims will stick to the bottom side of the follower so be careful to not drop the followers. Adjust the shim size to get the proper clearance.

Reinstall the camshafts as previously described and recheck your clearances.

The break-in procedure requires you to limit idle time to an absolute minimum, no over revving or lugging, try not to overwork the machine for the first hour after the installation of the Hot Cams High Performance Camshafts. After the 1-hour period, check the valve settings after the engine cools thoroughly. Now you are free to explore the new limits your machine has in store for you.

Enjoy your new Hot Cams High Performance Camshafts.

Thank you.