

## Engine Durability Kit Instructions



Thank you for purchasing our engine durability kit. This should not be your first time trying to work on an engine, if you do not have the necessary experience please consult a Polaris technician or dealership before proceeding. We recommend that you refer to the Polaris Service Manual part number 9921985 for technical assistance while installing this kit. Follow the disassembly section for the top end rebuild, you need to be very careful with the fuel injectors during this process. The injectors are damaged very easily, and will result in poor engine performance and or engine failure. You also need to pay close attention to the O-rings and the sealing rings on the injectors. These rings need to be put in their proper places for correct assembly with no damage or leaks, if this occurs; Mountain Tek Performance is not responsible for damages. After you have removed the cylinder and stock pistons you will need to thoroughly clean the crankcase of any coolant or foreign matter. You also need to clean the cylinder ports and gasket surfaces. Make sure there is no carbon build up in the exhaust ports or exhaust valve ports.

Next you need to carefully check the cylinder bores for damage and determine that the cylinder is good to reuse. If the cylinder is scored or nicked, you need to repair or replace it before proceeding any farther with the installation. If you fingernail can feel any scratches you will never have a good performing engine, even if it is below the port. If the cylinder is in good shape and can be reused, you need to hone the cylinder properly. We recommend that you hone the cylinder with a rigid stone hone. **DO NOT USE** a ball or flex bristle style hone! We recommend a Sunnen or Ammco rigid hone. There is no need to purchase this style of hone. A good engine machine shop or local dealer should be able to hone the cylinder for you. After the cylinder has been honed, wash the cylinder thoroughly with hot soapy water and dry with compressed air. This will help remove all the grit from honing the cylinder.

It is mandatory to check ring end gap installed in the cylinder along with piston to cylinder clearance. Failure to check these dimensions will result in failure of the piston and /or ring and is not a responsibility of Mountain Tek Performance. Ring end gap should be checked halfway between the exhaust port top to the top of the cylinder using the piston to square up the ring in the cylinder bore. If adjustment is required use an appropriate tool to file the end of the ring and properly remove burrs. Piston to cylinder clearance is to be measured .750" from the bottom of piston perpendicular to the wrist pin on the piston. On the cylinder it should be measured both at the top and bottom of the cylinder after honing. If piston to cylinder clearance is too tight a very slight amount can be honed out with the right hone. If re-plating the cylinder the proper cylinder bore size is 3.347" to allow .0045" piston to cylinder clearance.

### NATURALLY ASPIRATED ENGINES

**RING END GAP - .019"-.028"**

**PISTON TO CYLINDER CLEARANCE – NOT LESS THAN .004"**

### TURBOCHARGED ENGINES

**RING END GAP - .019"-.028"**

**PISTON TO CYLINDER CLEARANCE – NOT LESS THAN .0045"**

When you are ready to start assembling the engine, make sure that everything is very clean and free of foreign matter. Before the cylinder is installed, make sure it has been thoroughly washed with hot soapy water, to clean the original base gasket (if you are choosing to reuse) just wipe it off with a rag. Do not use parts or carburetor cleaner on the gasket. If you use cleaning solvents on the gasket it will ruin the rubber coating on the gasket. You need to pay close attention when installing the rings onto the pistons. Do not stretch the rings out

of shape more than necessary to install them onto the pistons. If they are stretched too far, the result will be broken rings. You also need to check that the rings are installed in the proper direction: the letters on the rings need to face up. If the rings are flipped over, they will not fit into the ring grooves on the pistons. When installing the pistons on the rods, make sure you lube the wrist pin bearing sufficiently. It also helps to put some oil onto the wrist pin when installing it. You need to pay close attention when installing the circlips. Improperly installed circlips will come out of the piston and damage the piston and cylinder. Once again, if this happens Mountain Tek Performance is not responsible for damages. You also will need to use the longer dowel pins that are supplied with the kit. The stock dowel pins are too short and will not align the cylinder, gaskets, cylinder shim, and the crankcase properly. After installing the pistons and circlips, install the new longer dowel pins into the crankcase. Next install the new base gasket onto a clean dry crankcase. Next install the cylinder shim. Then install the original (or another new) gasket onto the shim. The original gasket can be reused if a light coating of Permatex Copper Spray-A-Gasket is applied to both sides and allowed to dry.

Once all that is in place, you are ready to install the cylinder. You will then need to oil the cylinder walls with injection oil. When installing the cylinder, be very careful you do not break the rings or damage the gaskets; make sure that the rings are properly lined up with the locating dowels in the piston grooves. In the kit, we sent new cylinder hold down bolts and these will replace the stock bolts. If the stock bolts are used, the crankcase bot holes will strip out because the bolts are too short. If this occurs, Mountain Tek Performance is not responsible for damages. After you have installed the cylinder, make sure you use an accurate torque wrench to torque the NEW longer cylinder hold down bolts in the proper torque pattern as stated in the service manual. Lightly lubricate the bolts with engine oil. Installing the head and head cover is no different than installing them onto a stock motor. Make sure you also torque the head properly. If you are having trouble keeping the O-rings in place, a thin coating of grease on them will hold them in the grooves. We do not send a new exhaust gasket in the kit, we recommend using Permatex Ultra Black Gasket Maker for sealing the y-pipe to the cylinder. The part number for the sealant is PX82180. When installing the exhaust components it helps to use a small amount of the Ultra Black sealer on the joints to help seal them. We also strongly recommend switching injection oil to Redline Two Stroke Snowmobile Oil. We have had excellent results in engine durability using this oil and if possible would use it. It is not mandatory to use this oil but refrain from using the less expensive oils, because they do not contain the additives and properties desirable for a high brake specific horsepower engine. For engine break in please mix 32 oz. of two stroke oil in the fuel and for the first 100 miles use varied throttle and only short bursts to full throttle periodically. Watch the coolant level along with the engine temperature, making sure you have no air locks in the system. Wildly fluctuating engine temps would indicate low coolant or an air lock in the system.

## **ECU MAPPING**

**'08-10** - We have found thru extensive testing that after installing the "FIX KIT" the engine runs much stronger. We recommend changing the ECU fuel map to either the '08 flash (part numbers 4012137, 4012138, and 4012139) or the April released '10 flash (part numbers 4013134, 4013135, and 4013136). Both of these maps have a less sensitive detonation sensor setting as well as more favorable timing for power and throttle response. This does not mean you have to change your map if you do not want to. If you currently are running a power commander or similar piggyback fuel controller then changing the fuel map in the ECU will change the base fueling that the piggy back is adding upon thus changing the overall pulse width the injector is held open. This may cause unfavorable running characteristics (read burn down!) So if you are running modifications on your engine then you should stick with the current configuration and try it before changing the mapping. It does not necessarily mean you won't be making the most power possible. The "FIX KIT" itself does not really change the fuel requirements of the engine, but makes the most of what is available and reduces parasitic losses internally. Start with the ethanol select wires unplugged (because it gives it more fuel) regardless of whether you are running ethanol or not. If you need help determining what you should run please contact MTNTK.

**2011-CURRENT MODEL YEAR** – No programing required.