*****NOTE: If the following procedures are not followed, damage will occur to the cylinder bores and pistons. Warranty will be voided.*****

Cylinder/Piston Preparation:

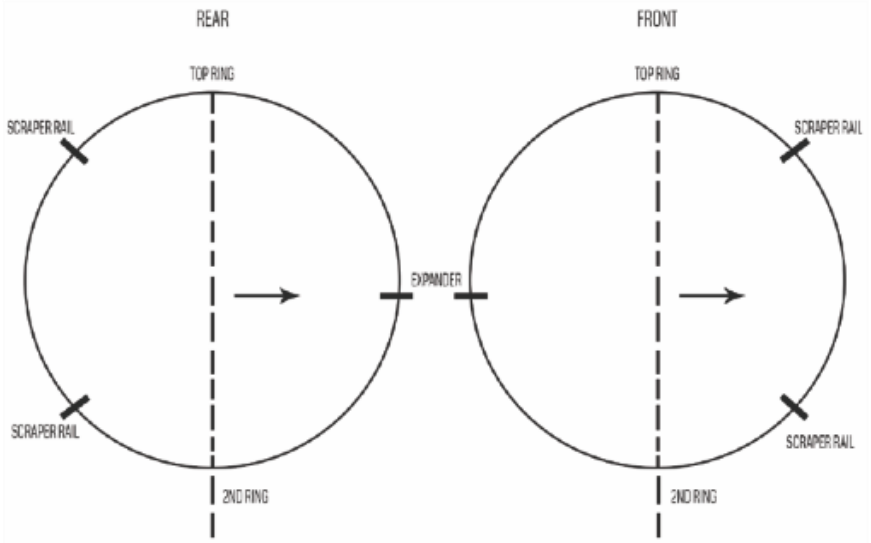
1. Inspect all components for any damage or missing items.
2. Clean cylinder bores completely with brake cleaner, until towel is no longer dirty.
3. Coat cylinders with red solvent oil.
4. Clean pistons and rings completely with red solvent oil.
5. Clean wrist pin bores with red solvent oil.
6. Clean wrist pin inside and out with red solvent oil.

Piston Ring Prep and Installation:

1. Piston ring gap should be a top ring minimum of .0045" and second ring to .0050" multiplied by per inch of bore.

*****NOTE: You can allow for up to +.004" over the minimum clearance (example: 3.938" x .0045" = .018"). *****

2. Clean rings with red solvent oil.
3. Expander rail (ENDS UP) (VVVVVV VVVVVV).
4. Install lower scraper rail.
5. Install upper scraper rail.
6. Second ring, dot or letter indication UP.
7. Top ring, dot or letter indication UP.



Cylinder/Piston Installation:

1. Prep and clean wrist pin area on flywheel assembly.
2. Prep and clean case surface and cylinder head surface prior to installation.
3. Coat cylinders and pistons generously with red solvent oil provided with the parts.
4. Install base gaskets or O Rings.

*****NOTE: If assembling twin cam 4.250" cylinders, use a case sealer with the base gaskets. Apply THIN layer of sealer to both sides of gasket before installing.*****

5. Install complete piston assembly on connecting rods.
6. Install Wrist pin clips using the appropriate wrist pin clip tool.
7. Using the proper ring compressor, squeeze the rings.
8. Slide cleaned cylinder over pistons and rings.
9. If any ring should pop out remove and begin again.

10. Clean off any residual assembly lube on surfaces.
11. Insert cylinder dowel pins provided with these cylinders
12. Place head gasket on cylinder, embossment toward exhaust ports, and place heads on cylinders.
13. Prep cylinder head bolts per manufacturer and torque as listed.

*****NOTE: If any component is damaged during this process please contact Revolution Performance as soon as possible for replacement parts. 1-866-892-2109.*****

Follow the service manual torque sequence
Cylinder Head Torque Instructions: XL, EVO, Twin Cam

Torque Sequence:
10 ft/lbs, 20 ft/lbs, 25 ft/lbs, 30 ft/lbs, finish at 35 ft/lbs
- ARP/FEULING STUDS: Finish at 35 ft/lbs
- S&S or OEM STUDS: Finish at 38 ft/lbs

*****NOTE: Revolution Performance utilizes an all metal gasket, and these do not require the same torque specification as the OEM fiber gaskets. OVER TORQUING THE CYLINDER STUDS AND HEAD BOLTS CAN CAUSE CASE FAILURES*****

Initial Break-In Guidelines for on the road:
Now that you have your engine assembled and ready to fire, there are a few initial startup guidelines that we encourage you to follow to insure proper break-in and long life for your engine. Before firing the engine, with the spark plugs out, turn the engine over several times (no longer than 6 second intervals) to build oil pressure. This may take 5-6 intervals. Our research has determined that at least three initial heat cycles produces the best all-around results for initial break-in and ring seal.
A heat cycle consists of starting the engine and bringing it up to normal operating temperature then, turn off and allowing it to cool to ambient temperature. This allows the material to stabilize without insult and promotes a much smoother overall break-in cycle. Once the heat cycle procedure is performed the engine is not broken in but is ready to be ridden. We highly recommend that your machine is in an adequate state of tune before riding. **We recommend professional tuning.**
Again, through extensive research, we have determined that the first fifty miles are the most crucial with the next four hundred fifty miles, following a close second.
Our recommended behavior for break-in is to not exceed 2500 to 3000 rpm for the first fifty miles with varying throttle input and no prolonged idling of the engine. A nice twisty back road works great to encourage this technique. At the end of the first fifty miles change your oil and filter to ensure that all initial break-in particles and fluids are removed. For the next four hundred fifty miles 3000 to 3500 rpm is a good limit and varying throttle input, especially on long highway trips, is encouraged.
After five hundred miles of riding, change your oil and filter again, using a synthetic lubricant and a quality filter. You should note the level of oil in your tank to ensure that oil consumption during break-in has not been excessive. A small amount of oil consumption during this time is normal but should stabilize following break in.
At 2500 miles oil and filter should be changed again and this routine can be followed for the life of your engine.

Initial Break-In Guidelines for Dyno:
Now that you have your engine assembled and ready to fire, there are a few initial startup guidelines that we encourage you to follow to insure proper break-in and long life for your engine. Before firing the engine, with the spark plugs out, turn the engine over several times (no longer than 6 second intervals) to build oil pressure. This may take 5-6 intervals. Our research has determined that at least three initial heat cycles produces the best all-around results for initial break-in and ring seal. A heat

cycle consists of starting the engine and bringing it up to normal operating temperature then, turn off and allowing it to cool to ambient temperature. This allows the material to stabilize without insult and promotes a much smoother overall break-in cycle. Once the heat cycle procedure is performed the engine is not broken in but is ready to be ridden. **We highly recommend that the machine has an adequate tune before making pulls on the dyno.**

Cycle 1 – Bring engine up to operating temp, perform three pulls at 50% throttle taking the bike from 1500 rpm to 3000 rpm then cool to ambient temperature.
Cycle 2 – Bring engine up to operating temp, perform three pulls at 75% throttle taking the bike from 2500 rpm to 5000 rpm then cool to ambient temperature.
Cycle 3 – Bring engine up to operating temp, perform three pulls at 100% throttle taking the bike from 3000 rpm to 5500 rpm then cool to ambient temperature.

*****Remember to let engine slow using the dyno wheel between pulls. *****