

## M8 Keith Black

**\*\*\*NOTE: This is an EXTREMELY IMPORTANT step in the installation process. If these steps are NOT followed, damage may occur to the cylinder bore.\*\*\***

### **Milwaukee 8 Cylinder/Piston Preparation:**

1. Inspect all components for any damage or missing items.

**Note: This piston has been coated with Line2Line Coating and are fitted as follows:**

2. Prepare the piston with wrist pin but without rings and locks.

3. Holding the wrist pin, insert the piston upside down into a dry cylinder.

A. If the piston has little of no resistance, no other action is required. Go to "D".

B. If the piston sticks in the bore, DO NOT FORCE IT THROUGH. Remove and look for witness marks from the interference.

Using Scotch-Brite, very lightly go over witness mark area and try fitting again. Continue until a very slight interference fit. (5-10 lbs drag).

C. Now lightly oil the cylinder and check again. After a few strokes the piston will abrade in and become looser.

4. Clean cylinder bores completely with brake cleaner, until towel is no longer dirty.

5. Coat cylinders with red solvent oil included in kit.

6. Clean pistons and rings completely with red solvent oil.

7. Clean wrist pin bores with red solvent oil.

### **Piston Ring Prep and Installation:**

1. Piston ring gap should be bore diameter x top (chrome) ring minimum of .0050" and second (black) minimum .0045" You can allow for up to +.004" over the minimum clearance (example: 4.500" x .0050" = .023").

2. Clean rings with red solvent oil.

3. Install support rail, DIMPLE FACING DOWN. Install the dimple end on the piston first, then spiral on holding second end away from piston to avoid damage. Push the support rail to the top of the groove.

4. Prep and clean wrist pin area on flywheel assembly.

5. Install piston on connecting rod.

6. Insert wrist pin clips, push the support rail back down to the bottom of the ring groove. You MUST make sure the dimple is in the groove cut out gap for the piston pin.

7. Install expander rail (ENDS UP) (VVVVV VVVVV).

8. Install lower scraper rail.

9. Install upper scraper rail.

10. Install second ring dot or letter indication UP.

11. Install top ring dot or letter indication UP.

12. Prep and clean case surface and cylinder head surface prior to installation.

13. Coat cylinders and pistons generously with red solvent oil provided with these parts.

14. Using the proper ring compression tool, squeeze the rings.

15. Slide cleaned cylinders over the pistons and rings.

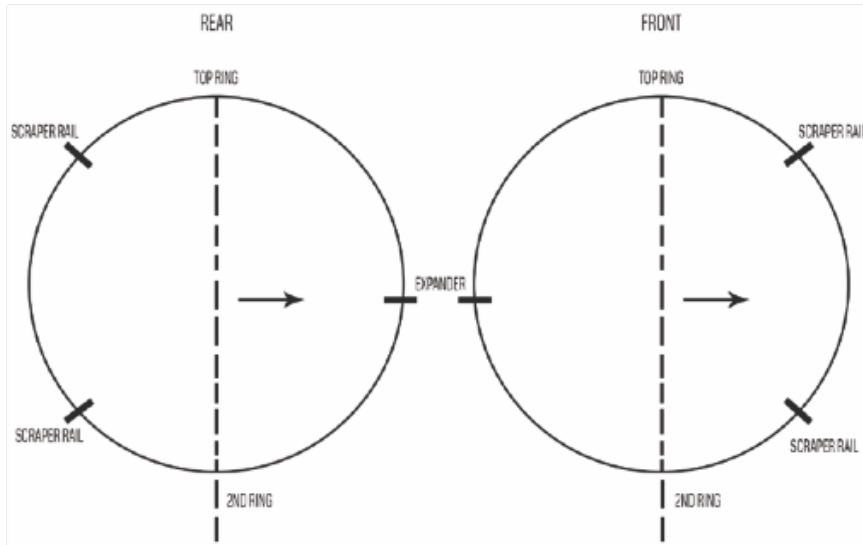
16. If any ring should pop out, remove and start over.

17. Clean off any residual assembly lube on surfaces.

18. Insert cylinder dowl pins provided with these cylinders.

**\*\*\*NOTE: If ANY component is damaged during this process, please contact Revolution Performance at #866-892-2109 for replacement parts. \*\*\***

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**Follow the service manual torque sequence.**

### Torque sequence:

10 ft/lbs, 20 ft/lbs, 25 ft/lbs, 30 ft/lbs, 35 ft/lbs, 40 ft/lbs., finish at 45 ft/lbs.

- ARP/FEULING, KIBBLEWHITE, S&S STUDS: Finish at 45 ft/lbs

- OEM STUDS: Finish at 48 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 mineral oil or semi-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.

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**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. \*\*\***