

**FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN ENGINE DAMAGE AND VOID YOUR WARRANTY!!**

NOTE: IF USING OEM HEADBOLTS, THEY ARE ONE-TIME USE, AND CANNOT BE REUSED

## INSTALLATION:

1. INSPECT ALL COMPONENTS FOR MISSING OR DAMAGED ITEMS
2. GAP THE RINGS, REFER TO PAGE 2 FOR MORE INFORMATION
3. CLEAN
  - CYLINDER BORES WITH BRAKE CLEANER, WIPE WITH CLEAN WHITE TOWEL REPEAT UNTIL TOWEL IS NO LONGER DIRTY
  - PISTONS, RINGS, WRIST PIN BORES, AND WRIST PINS (INSIDE AND OUT) WITH RED SOLVENT OIL
  - WRIST PIN AREA OF CONNECTING RODS
  - ALL GASKET SURFACES SHOULD BE CLEANED AND DRY DURING ASSEMBLY
4. COAT ALL COMPONENTS WITH RED SOLVENT OIL, INCLUDING CYLINDER BORE
5. INSTALL
  - BASE GASKET
  - PISTON ONTO CONNECTING ROD, VERIFY CIRCLIPS ARE SEATED
  - RINGS ONTO PISTONS, REFER TO PAGE 2 FOR MORE INFO
6. USING A RING COMPRESSION TOOL, COMPRESS THE RINGS
7. SLIDE CLEANED AND LUBRICATED CYLINDER OVER THE PISTON AND RINGS  
*NOTE: IF ANY RING SHOULD POP OUT, REMOVE THE CYLINDER AND START OVER*
8. APPLY ENGINE OIL TO THE THREADS AND UNDER THE HEAD OF ALL HEAD BOLTS BEFORE INSTALLATION
9. TORQUE CYLINDER HEAD USING FACTORY TORQUE SPECS (SEE PAGE 3 FOR MORE INFO)

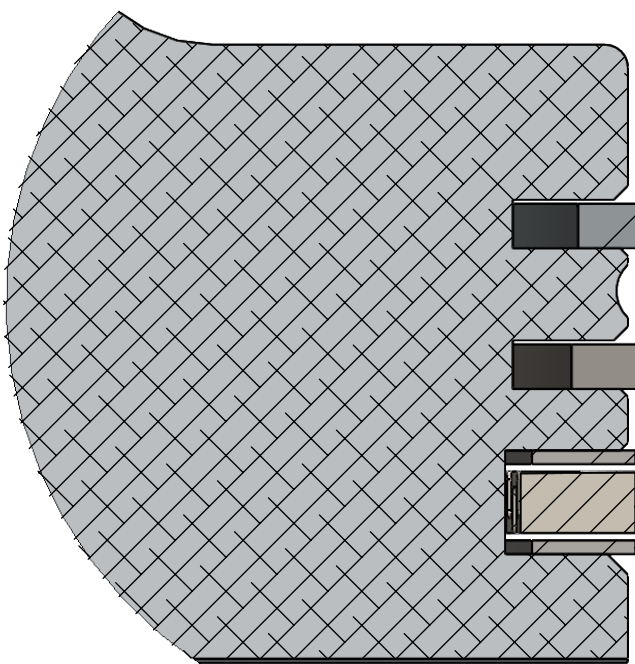
## ENGINE BREAK-IN GUIDELINES:

1. BUILD OIL PRESSURE: REMOVE THE SPARK PLUGS AND CRANK THE ENGINE FOR NO MORE THAN 6 SECONDS, REPEAT 5-6 TIMES
2. HEAT CYCLING: START THE ENGINE, BRING IT TO NORMAL OPERATING TEMPERATURE, THEN LET IT COOL TO ROOM TEMPERATURE, REPEAT 3 TIMES
3. TUNE ENGINE (A PROFESSIONAL TUNE IS RECOMMENDED AND REQUIRED BEFORE MAKING ANY DYNO PULLS). THE FINAL TUNE WILL NEED TO BE COMPLETED AFTER THE ENGINE IS BROKEN-IN.
4. **A.) IF BREAKING IN ON THE DYNO**, REEMEMBER TO LET ENGINE SLOW USING DYNO WHEEL ONLY BETWEEN PULLS  
CYCLE 1 - BRING ENGINE TO OPERATING TEMP, PERFORM 3 PULLS AT 50% THROTTLE FROM 1500-3000 RPM, ALLOW ENGINE TO COOL TO ROOM TEMPERATURE  
CYCLE 2 - BRING ENGINE TO OPERATING TEMP, PERFORM 3 PULLS AT 75% THROTTLE FROM 2500-5000 RPM, ALLOW ENGINE TO COOL TO ROOM TEMPERATURE  
CYCLE 3 - BRING ENGINE TO OPERATING TEMP, PERFORM 3 PULLS AT 100% THROTTLE FROM 3000-5500 RPM, ALLOW ENGINE TO COOL TO ROOM TEMPERATURE  
**B.) IF BREAKING IN ON THE STREET**  
RIDE 50 MILES, VARY THROTTLE INPUT, AVOID PROLONGED IDLING, DO NOT EXCEED 3000RPM
5. CHANGE OIL AND FILTER USING 20W50 BEL-RAY V-TWIN MINERAL OIL AND A HIGH FLOW FILTER (SUCH AS A FLO RESUSABLE FILTER)
6. RIDE 500 MILES, VARY THROTTLE INPUT, AVOID PROLONGED IDLING, AVOID EXCEEDING 5500RPM
  - USE THIS TIME TO COMPLETE TUNING THE ENGINE
  - A SMALL AMOUNT OF OIL USAGE DURING THIS TIME IS NORMAL AND WILL STABILIZE AFTER BREAK-IN
7. CHANGE OIL AND FILTER USING 20W50 BEL-RAY V-TWIN MINERAL OIL (SEMI OR FULL SYNTHETIC)
8. CHANGE OIL AND FILTER EVERY 2500 MILES FOR THE LIFE OF YOUR ENGINE

\*IF ANY COMPONENTS ARE DAMAGED DURING INSTALLATION, PLEASE CONTACT REVOLUTION PERFORMANCE AT 866-892-2109 FOR REPLACEMENTS



**REVOLUTION  
PERFORMANCE**



CROSS-SECTION OF PISTON & RINGS

**TOP RING (CHROME)**- INSTALL WITH DOT OR LETTER FACING UP  
 MIN RING GAP IS BORE x .0045" (FOR EXAMPLE: 4.25"x.0045"= .019" MIN GAP)  
 MAX RING GAP IS +.004" (FOR EXAMPLE: .019"+.004"=.023" MAX GAP)

**2ND RING (BLACK)** - INSTALL WITH DOT OR LETTER FACING UP  
 MIN RING GAP IS BORE x .005" (FOR EXAMPLE: 4.25"x.005"=.021" MIN GAP)  
 MAX RING GAP IS +.004" (FOR EXAMPLE: .021"+.004"=.025" MAX GAP)

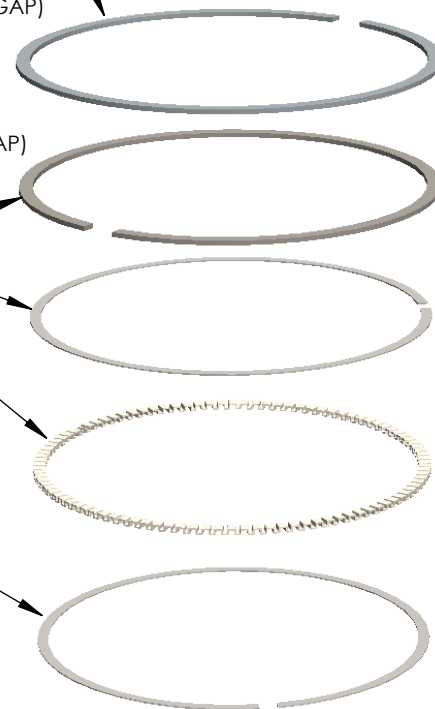
**TOP SCRAPER RAIL**  
 (NO GAPPING REQUIRED)

**EXPANDER RAIL**



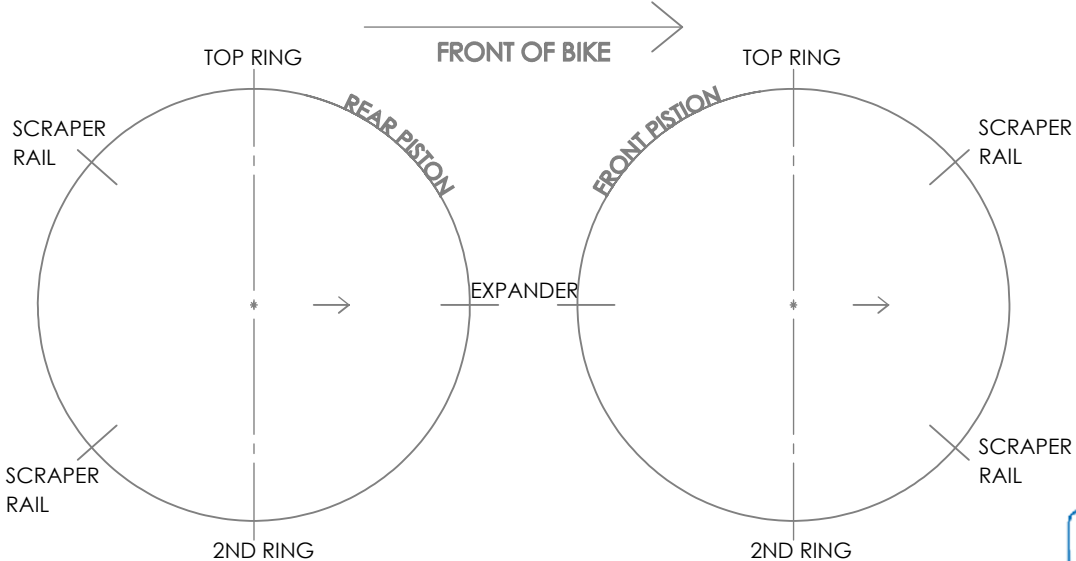
**BOTTOM SCRAPER RAIL**  
 (NO GAPPING REQUIRED)

↑  
UP

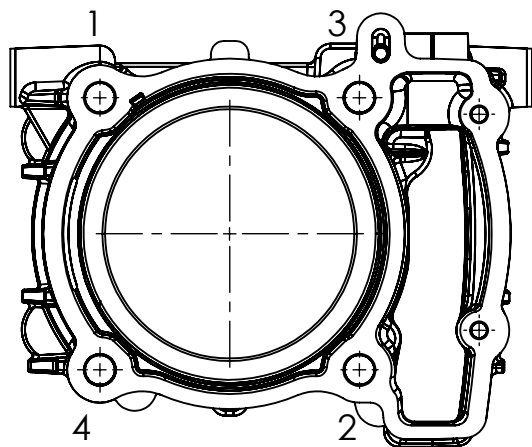
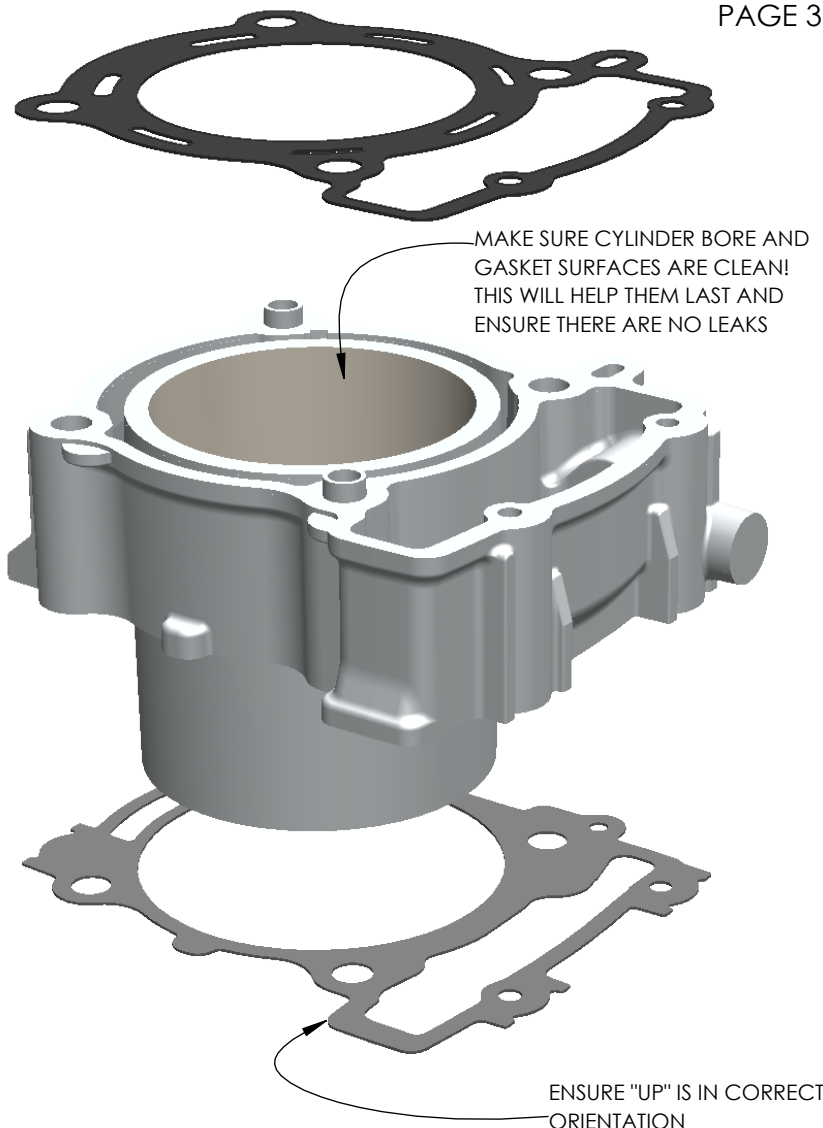


FRONT PISTON SHOWN

RING GAPS



- ALL COMPONENTS SHOULD BE THOROUGHLY CLEANED BEFORE BEGINNING ASSEMBLY (REFER TO PAGE 1)
- CYLINDER BORE, PISTON, RINGS, AND WRIST PIN SHOULD BE GENEROUSLY COATED WITH RED SOLVENT OIL BEFORE ASSEMBLY
- USE A RING COMPRESSOR FOR COMPRESSING RINGS DURING INSTALLATION
- APPLY ENGINE OIL TO THE THREADS AND UNDER THE HEADS OF ALL CYLINDER HEAD BOLTS
- TORQUE THE HEAD USING THE FACTORY SPECS AND SEQUENCE (SHOWN BELOW)



CYLINDER HEAD TORQUE PROCEDURE (ALL TO BE DONE IN SEQUENCE SHOWN TO LEFT)	
STEP 1	TORQUE ALL FASTENERS TO 18 FT*LB
STEP 2	TORQUE ALL FASTENERS TO 30 FT*LBS
STEP 3	LOOSEN ALL FASTENERS UNTIL THEY ARE UNSEATED
STEP 4	TORQUE ALL FASTENERS TO 15 FT*LBS
STEP 5	TORQUE ALL FASTENERS TO 26 FT*LBS
STEP 6	TIGHTEN ALL FASTENERS 180 DEG
STEP 7	TIGHTEN ALL FASTENERS ANOTHER 180 DEG

IF YOU HAVE QUESTIONS OR CONCERNS, PLEASE CALL 866-892-2109 AND DISCUSS THEM WITH OUR KNOWLEDGEABLE STAFF

