



# MERLIN X 16° CYLINDER HEADS

## Aluminum + CNC BBC Specifications and Instructions

Technical instructions for assembled & bare head part numbers:

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020750 Bare, 345cc intake runner  
020750C CNC ported, 350cc intake runner

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### Specifications:

Valves: 2.350" intake, with a 50° valve angle. Replacement part #830677  
1.880" exhaust, with a 50° valve angle. Replacement part #830598  
Valve Locks: -3 and -4 heads have 10° locks, replacement part #830310  
Valve Seals: -3 and -4 heads use a P.C. seal, replacement part #830410  
Valve Springs & Retainers: -3 heads: 1.550" diameter spring, with a seat pressure of 225 lbs. @ 1.910. Replacement part #830135. Retainer part #830230. -4 Heads: 1.640" diameter spring with a seat pressure of 250 lbs. @ 2.000. Replacement part #830140. Retainer part #830250 (Ti)  
Pushrods: To obtain proper rocker arm geometry, pushrod length will need to be determined by using an adjustable checking pushrod.  
Rocker Arms: Jesel part #KPS325131  
Combustion Chamber Volume: 80cc as cast, 90cc CNC ported  
Intake Runners: 345cc as cast, 350cc CNC ported  
Head Bolts: With a Mark IV block use: ARP bolts 135-3603. With a Mark V & VI block use: ARP bolts 135-3607  
Head Studs: With a Mark IV block use: ARP studs, World # 832540. With a Mark V & VI block use: ARP studs 235-4113  
Head Gaskets: When using Merlin heads on Mark IV blocks use the corresponding gasket that is compatible with the bore size of the engine. We use Fel Pro 1027 (4.370 gasket bore), 1017 (4.540 gasket bore), 1057 (4.630 gasket bore), When using the Merlin heads on a Mark V or VI block, you MUST use the head gasket for the Mark V or Mark VI (whichever block is used).  
Intake Gaskets: Mr. Gasket 121 or equivalent.  
Header Gaskets: Fel-Pro 1410 or equivalent  
Spark Plugs: 14mm, .750" reach plug such as Accel 416 or equivalent.  
Emissions: ALL MERLIN HEADS are intended for pre-emission vehicles and off road use.

### BEFORE FINAL ASSEMBLY:

1. Please inspect castings for defects or damage prior to modification, assembly or installation. Cylinder heads that have been modified, installed or used ARE NOT RETURNABLE. Then install the cylinder head with no head gasket and snug the bolts.
2. Due to different ratio rockers and different deck height blocks, now is the time to check for pushrod to cylinder head interference. If the pushrod has interference with the cylinder head, remove the cylinder head, grind the casting the needed amount, clean the head after grinding, reinstall the cylinder head using the mock up procedure and recheck the clearance. Repeat the procedure as necessary until the desired clearance is achieved.
3. The Merlin X head uses a 2.350" diameter intake valve. Because of the larger diameter intake valve it is VERY IMPORTANT to check piston-to-valve and valve-to-valve pocket clearance.
4. Once everything has been checked and all the desired clearances and specifications achieved, final assembly may begin.

### ATTENTION:

ALL EXHAUST, VALVE COVER, INTAKE AND ROCKER STUDS AND/OR BOLTS MUST HAVE SEALER APPLIED TO THEM AS SOME OF THEM GO INTO WATER.

Head Bolt Torque Specs: Torque all head bolts to 75 ft. lbs.(iron heads), 70 ft. lbs. (aluminum head and studs) Before torquing, coat the head bolts and rocker studs with ARP Thread Sealing Paste. NOTE: Refer to the factory service manual for proper head bolt tightening sequence.

### MACHINE SHOP SPECS:

NOTE: Specs are for reference only. Always measure before machining. REMEMBER: MEASURE TWICE, CUT ONCE.

Maximum Valve Diameter: 2.350" intake, 1.850" exhaust

Maximum Spring Seat Depth: Spring seat is cut to accept a 1.640" spring. IT IS NOT RECOMMENDED TO CUT THE SPRING SEAT DEEPER.

Maximum Spring Diameter: 1.650"

Maximum Flat Mill: Approximately .050"

Maximum Angle Mill: Approximately .180"

Approximate Milling Guidelines: .007" per 1cc

### Brackets and Accessories:

Merlin X heads have accessory bolt holes drilled in the factory locations.

**WARRANTY TERMS:**

World Products Inc. (World) manufactures parts to meet QS 9000 specifications. In addition, all parts go through several inspection procedures before shipping. However, YOU ARE THE FINAL INSPECTOR. Please note: Inspect all parts before doing any machine work or assembly. Remember the saying "measure twice and cut once." If any defects are found or suspected, call World before proceeding. World will replace or repair at its option any defective part which has not been modified or misused within one year of INVOICE purchase date. Any modification or marine use of parts will void all warranties.

WORLD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, REGARDING PARTS. THIS WARRANTY IS EXCLUSIVE AND IT IS EXPRESSLY MADE IN LIEU OF, AND WORLD HEREBY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

World's sole and exclusive obligation and liability with respect to parts sold is expressly limited to repair or replacement, at World's option, of parts. In no event will World be liable for any claim of any kind for direct or indirect incidental, consequential or special damages, whether known or unknown, including without limitation, cost of labor, installation, disassembly, lost revenues and profits, loss of property, production, or injury to persons and/or property. The maximum liability of World for any and all damages with respect to any part is limited to an amount not to exceed the original purchase price of the part. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. DO NOT CALL THE DEALER FROM WHICH YOU PURCHASED YOUR PARTS. If you have any questions, please contact Customer Service, World Products 631-981-1918 (Fax 631-734-0467).

**WARRANTY CLAIMS:**

Contact Customer Service to obtain a Return Material Authorization number directly from World Products for any warranty return. DO NOT CONTACT YOUR DEALER. DO NOT RETURN PARTS WITHOUT AUTHORIZATION. Returned product must be shipped prepaid. Collect shipments will be refused. Returned parts must have RMA number on the outside of the package, a copy of original bill of sale inside and a written explanation of the suspected defect. If the item is found defective, World Products will repair or replace it at its discretion and return it freight prepaid. No additional labor claims will be paid. There will be no exceptions to this rule.

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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

**ALL SALES FOB RONKONKOMA, NEW YORK**  
WORLD PRODUCTS  
51 Trade Zone Court · Ronkonkoma, NY 11779  
(631) 981-1918 · Fax (631) 981-1712  
[www.worldcastings.com](http://www.worldcastings.com)

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