

BMP SBF 18° SMALL BLOCK FORD ALUMINUM CYLINDER HEAD**Technical Instructions for assembled & bare head part numbers:****023005 WOR-O80B Bare head, 18° valve angle, 200cc intake runner, 64cc chamber****023005C WOR-O80B Bare head, 18° valve angle, 228cc intake runner, 64cc chamber**

023005, 023005C - 1 Assembled head, for Hydraulic flat tappet camshaft

023005, 023005C - 2 Assembled head, for Mechanical flat tappet or hydraulic roller camshaft

023005, 023005C - 3 Assembled head, for Solid roller camshaft

023010 WOR-O80A Bare head, 18° valve angle, 225cc intake runner, 64cc chamber**023010C WOR-O80A Bare head, 18° valve angle, 242cc intake runner, 64cc chamber**

023010, 023010C - 1 Assembled head, for Hydraulic flat tappet camshaft

023010, 023010C - 2 Assembled head, for Mechanical flat tappet or hydraulic roller camshaft

023010, 023010C - 3 Assembled head, for Solid roller camshaft

**Specifications:****Port Dimensions:** 023005 200cc Port Dimension: intake 2.190" x 1.310", Exhaust 1.365" x 1.265"

023005C 218cc Port Dimension: intake 2.255" x 1.310", Exhaust 1.530" x 1.465"

023010 225cc Port Dimension: intake " x ", Exhaust " x "

023010C 242cc Port Dimension: intake 2.435" x 1.310", Exhaust 1.520" x 1.350"

Port Locations: Intake Stock, Exhaust Stock**Combustion Chamber Volume:** 64cc.**Valve Guides:** Manganese Bronze**Valve Guide Spacing:** Ctr-Ctr 1.890"**Valve Seats:** Intake & Exhaust = Durabond Powdered metal seat .006" press fit**Valve Seat Dimension:** Intake 2.160" x 1.800" x .375" Exhaust 1.650" x 1.300" x .375"**Valve Seat Angles:** Intake = 35°-(45°(.040))-60°-75° Exhaust = 38°(45°(.060))-500radius-75°**Intake Valves:** 2.020" 11/32" x Std" Replacement part # 702810BP (For -1 Head assemblies)

2.020" 11/32" x Std Replacement part # 702810BP (For -2 Head assemblies)

2.020" 11/32" x .100 Replacement part # 702815RM (For -3 Head assemblies)

2.080" 11/32" x Std" Replacement part # 702820BP (For -1 Head assemblies)

2.080" 11/32" x Std Replacement part # 702820BP (For -2 Head assemblies)

2.080" 11/32" x .100 Replacement part # 702825RM (For -3 Head assemblies)

Exh. Valves: 1.600" 11/32" x Std Replacement part # 702705BP (For -1 Head assemblies)

1.600" 11/32" x Std Replacement part # 702705SF (For -2 Head assemblies)

1.600" 11/32" x .100 Replacement part # 702710RM (For -3 Head assemblies)

Valve Locks: 7 degree stamped steel locks. Replacement part # 702155-16 (for -1 & -2 head assemblies)

10 degree machined steel locks. Replacement part # 702156-16 (for -3 head assemblies)

Valve Seats: Umbrella valve seal. Replacement part # 702177-16 (for -1 & -2 head assemblies)

Metal clad viton valve seal. Replacement part # 702179-16 (for -3 head assemblies)

Valve Springs: 1.250" O.D. single valve spring. Seat pressure 100 lbs. @ 1.810 Replacement part # 702202-16 (for -1 head assemblies)

1.437" O.D. dual valve spring. Seat pressure 125 lbs. @ 1.810 Replacement part # 702204-16 (for -2 head assemblies)

1.550" O.D. dual valve spring. Seat pressure 200 lbs. @ 1.900 Replacement part # 702208-16 (for -3 head assemblies)

Spring Retainers: 1.250" O.D. valve spring Retainer Replacement part # 702102-8

1.437" O.D. valve spring Retainer Replacement part # 702104-8

1.550" O.D. valve spring Retainer Replacement part # 702116-8

Pushrod Guide Plates: BMP SBF style hardened steel guide plate. Replacement part # 702352-8.

NOTE: Hardened pushrods MUST be used with guideplates. The plates MUST be adjusted to obtain proper rocker/ valve tip alignment.

Pushrods: To obtain proper rocker geometry, pushrod length will need to be determined by using an adjustable checking pushrod. **Rocker Arms:** Manowar Alum. heads utilize a standard rocker arm designed for the Small Block Ford.

NOTE: When using rocker arms greater than a 1.63 ratio, it may be necessary to elongate the pushrod guide holes in the cylinder head.

Rocker Arm Studs: 3/8 Rocker arm stud. Screw in Style Replacement part# 702300-8 (for -1 head assemblies)

7/16 rocker arm stud. Screw in style Replacement part # 702302-8 (for -2 head assemblies)

7/16 rocker arm stud. Screw in style Replacement part # 702304-8 (for -3 head assemblies)

Rocker Stud Girdle: BMP 7/16" part# 702453**Head Bolts:** Stock or ARP equivalent. 289/302 stock blocks use a 7/16 thread bolt and 351W and SVO blocks use a 1/2 thread bolt. ARP Head bolt # 154-3607**Head Studs:** Std SBF head studs**Head Gaskets:** Std Ford head gaskets such as Felpro 1011-2

Intake Gaskets: Felpro 1262R or equivalent

Header Gaskets: Fel Pro 1415 or equivalent note: Use Felpro #1487 for wide bolt pattern

Pistons: Most 20" aftermarket pistons

Spark Plugs: Gasket Style, 14mm .750" reach, recommended starting point Accel #416

Head Bolt Torque Specs: (with oil) 289 - 302: Upper Row 80 ft. lbs. Lower Row 70 ft. lbs. **351W:** All bolts 100 ft. lbs. NOTE: Refer to the factory service manual for proper head bolt tightening sequence.

Rocker Arm Studs: 55 ft. lbs. w/oil

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

Maximum Valve Diameter: 2.080 Intake & 1.600 Exhaust.

Maximum Spring Seat Depth: Spring seat is cut to accept a 1.550 spring. IT IS NOT RECOMMENDED TO CUT THE SPRING SEAT DEEPER

Maximum Spring Diameter: 1.560

Maximum Flat Mill: .040

Maximum Angle Mill: .175

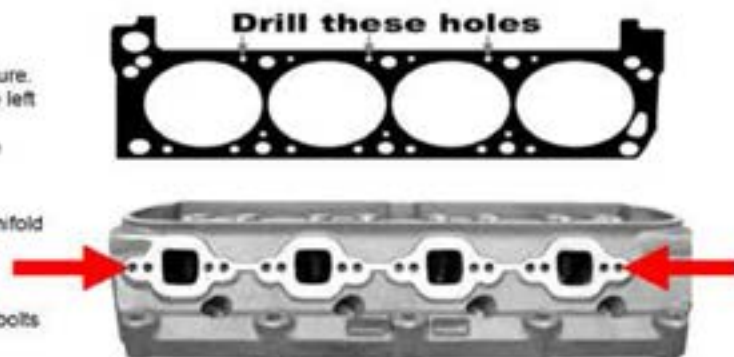
Approximate Milling Guidelines: .0065 per 1cc

Drilling Block Water Holes for OE 289 Ford Engines:

When using Windsor Jr. heads on original 289 blocks, follow this procedure. Using a 302/351W head gasket as a template, drill the small holes to the left of the top center head bolt holes in the block using a 1/4" drill bit. Also check the intake manifold for bolt pattern. Some early intakes used more bolts. Plug extra manifold holes.

BMP18" Head Modification:

If the outer exhaust flange bolt holes are not used with your exhaust manifold or header installation, it is advisable to plug those holes. Use a 3/8 - 16 threaded set screw with thread sealant and secure tightly.



If the holes are required for exhaust headers, use thread sealant on the bolts each time they are removed and installed.

Brackets and Accessories:

1. If you need to use the Smog Passage hole (AIR Reactor hole) in the cylinder head to mount your accessories, a reducer bushing will need to be used. The part is available from Ford part # F4ZZ6E086A.
2. Due to relocated cooling passages in the head, the accessory bolt hole closest to the exhaust side of the head has been moved approximately 1/8 inch. If this bolt hole is needed, the locating hole in the bracket will have to be slotted for proper alignment.

Before Final Assembly:

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. At this time install the cylinder head to the block with no head gasket and snug the bolts.

This assembly should be checked to assure that all components are compatible with your combination before assembling your engine. There is no warranty on valve springs of any type.

1. 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 head, grind the casting the needed amount. Clean the head after grinding then reinstall the head using the mock up procedure and recheck the clearance. Repeat the procedure as necessary until the desired clearance is achieved.
2. Once everything has been checked and all the desired clearances and specifications achieved, final assembly may begin.
3. If a new flat tappet camshaft is being installed with a-2 cylinder head, it is HIGHLY RECOMMENDED to remove the inner valve spring during the camshaft break in procedure. After the cam is broken in, reinstall the inner valve spring.
4. If you bought bare castings then remember, you must wash the heads before assembly.

WARRANTY TERMS:

No warranties of any nature (expressed, implied, fitness of usage or merchantability) are given on these products. Seller undertakes no responsibility for any product sold. Additional disclaimers are within and are binding upon this contract. Due to the intended usage of products offered, all products are sold on an "as-is" basis, and no warranties of any kind, whether written or oral are made by Bill Mitchell Products, its agents or employees. All implied warranties, including the implied warranties of merchantability and fitness are expressly excluded, and the buyer bears the entire risk as to quality performance and use of these products. Bill Mitchell Products will assume no responsibility of personal injury, labor or other injury arising out of the usage of high performance racing parts or products. Any defective part will be handled between the original manufacturer and the buyer. Bill Mitchell Products reserves the right to change specifications, prices and discontinue parts without notice. Installation of Bill Mitchell Products heads may adversely affect the vehicle manufacturer's warranties, and may violate State and Federal laws when vehicles so equipped are operated other than strictly off-highway. Bill Mitchell Products reserves the right to discontinue any product at its sole discretion and without any liability with respect to similar products already in the field. Some parts are not legal for sale or use on pollution controlled motor vehicles.

While our products are used in many applications using super-chargers, Turbos or Nitrous successfully, please be aware that there is a greater potential for engine damage due to the possibility of tuning errors.

PLEASE DO NOT CALL THE DEALER FROM WHICH YOU PURCHASED YOUR PARTS. If you have any questions, please contact BMP customer service at 631-737-0372 (Fax 631-737-0467).

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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