BMP
BILL MITCHELL PRODUCTS

Instruction Sheet

Manufacturer of the Highest Quality Engine Blocks, Heads & Manifolds. CASTING ID# WOR-081

10° SMALL BLOCK FORD ALUMINUM HEADS

Technical instructions for assembled and bare head part numbers:

023012 WOR-081B Manowar SBF x 10°valve angle, 275cc runner,64cc chamber bare casting
023012 – 3 Assembled head, solid roller, 1.550 dual spring assembly
023012 – 4 Assembled head, solid roller, 1.640 dual spring assembly
023015 WOR-081A Manowar SBF x 10°valve angle, 285cc runner,64cc chamber bare casting
023015C WOR-081A Manowar SBF x 10°valve angle, 310cc runner,64cc chamber bare casting
023015C - 3 Assembled head, solid roller, 1.550 dual spring assembly
023015C - 4 Assembled head, solid roller, 1.640 dual spring assembly

Specifications:

Port Dimensions: 023012 275cc Port Dimension: intake 2.090" x 1.895", Exhaust 1.810" x 1.895"
023015 285cc Port Dimension: intake 2.430" x 1.365", Exhaust 1.810" x 1.895"
023015C 310cc Port Dimension: intake 2.465" x 1.380", Exhaust 1.880" x 1.940"

Port Locations:

Combustion Chamber Volume: 64cc.

Valve Guides: Bronze Manganese

Valve Guide Spacing: 1.983"

Valve Seats: Intake and Exhaust seats, Durabond powdered metal

Valve Seats Dimensions: Intake 2.300"x 1.800"x .375" Exhaust 1.650"x 1.300"x .375"

Valve Seat Angles: Intake = 35°-(50°(.040"))-60°-75° Exhaust = 38°(50°(.060))-.500radius-75° (on assembled and cnc ported heads)

Intake Valves: 2.250"x 5.600"oal x 5/16 50° Severe Duty replacement # 702850SD5

Exhaust Valves: 1.625"x 5.630"oal x 5/16 50° Severe Duty replacement # 702725SD5

Valve Locks: 10˚ machined Steel Replacement # 702153-16

Valve Seals: 5/16" metal clad viton Seal Replacement # 702178-16

Valve Springs: -3 Heads use a 1.550 diameter spring. Seat pressure 200 lbs. @ 1.950 Replacement # 702206-16
-4 Heads use a 1.640 diameter spring. Seat pressure 275 lbs. @ 2.000 Replacement # 702212-16
Valve Spring Retainers: -2 & -3 Heads use a 1.437/1.550 diameter Retainer. Replacement # 702112-8
-4 Heads use a 1.640 diameter Retainer. Replacement # 702126-8
Pushrod Guide Plates: N/A

Pushrods: To obtain proper rocker geometry, pushrod length will need to be determined by using an adjustable checking pushrod.

Rocker Arms: Shaft mount system required, Jesel Part#KPS371149

Rocker Arm Studs: N/A

Head Gaskets: Cometic# C5132, C5133, C5134, C5134
IMPORTANT: We have included .003" shim washers to be placed in between the head and gasket on the outer most bolts or studs being used. These shims will help insure against the possibility of the heads cracking along the spark plug holes due to excessive leverage compressing the gasket more along the outside than the fire ring.
We have found that even with MLS gasket when using these outer bolt holes the gasket is being squeezed on average .004" and as much as .010" more than around the fire ring.
Copper Head gaskets with O-rings and receiver grooves are even worse. When this practice is being used you must pay very close attention and calculate how much the O-ring is being absorbed into the copper and receiver groove. If the head is being held up at all you must use a shim washer around the outer holes to keep the ears from being stressed. This is also why copper gaskets generally leak water. Fords inherently have this problem

even with cast iron heads which is why Felpro made the 1011-2 which has steel shim around the outside holes for the stock pattern.
Intake Manifold: Custom Sheet Metal or Edlebrock #2868. The Edlebrock will need some modifications to the intake face of the cylinder head to accept the Edlebrock bolt pattern.

Intake Gaskets: Felpro GM LS7 series gasket with some modification Part# 12082 or 12083

Head Studs: Manowar 10° head on Manowar block ARP# 154-4302 (6 bolts per cylinder)
Manowar 10° head on "other" Ford block block ARP# 154-3607 (4 bolts per cylinder)
IMPORTANT: When using the four additional bolt holes on each cylinder head, you must completely torque the original 10 bolt pattern first (Follow Hardware manufacturers instructions) before torqueing the 8 additional bolts. Once the original 10 bolts are completely torqued, torque the additional bolts starting in the center in a clockwise pattern to 50 lbs/ft. in 2 steps, 35 and then 50lbs.

Header Gaskets: Cometic EX1367043C

Pistons: Custom Pistons are required.

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

Emissions: Heads are intended for pre-emission vehicles and off-road use.

Maximum Valve Diameter: 2.250"
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: 1.650"
Maximum Flat Mill:
Maximum Angle Mill:
Approximate Milling Guidelines: Approximately .0065" per 1cc.

Brackets and Accessories:

1. The BMP SBF 10° heads have accessory bolt holes drilled in the factory locations.

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.

PLEAE DO NOT CALL THE DEALER FROM WHICH YOU PURCHASED YOUR PARTS. If you have any questions, please contact BMP customer service at 386-279-7131 (Fax 386-873-6431).

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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