



Instruction Sheet

Manufacturer of the Highest Quality Engine Blocks, Heads & Manifolds.

CASTING ID# **WOR-070B/C**

24° BIG BLOCK CHEVY ALUMINUM HEADS

Technical Instructions for assembled & bare head part numbers:

020650 WOR-070C Bare head, 24° valve angle, 310cc Intake runner, 119cc chamber

020650C WOR-070C Bare head, 24° valve angle, 345cc Intake runner, 119cc chamber

020650, 020650C - 2 Assembled head, for Mechanical flat tappet or hydraulic roller camshaft

020650, 020650C - 3 Assembled head, for Solid roller camshaft

020650, 020650C - 4 Assembled head, for Solid roller camshaft

020660 WOR-070B Bare head, 24° valve angle, 350cc Intake runner, 119cc chamber

020660C WOR-070B Bare head, 24° valve angle, 375cc Intake runner, 119cc chamber

020660, 020660C - 2 Assembled head, for Mechanical flat tappet or hydraulic roller camshaft

020660, 020660C - 3 Assembled head, for Solid roller camshaft

020660, 020660C - 4 Assembled head, for Solid roller camshaft

Specifications:

Port Dimensions: 020650 320cc Port Dimension: intake 2.300" x 1.830", Exhaust 1.650" x 1.945"

020650C 345cc Port Dimension: intake 2.510" x 1.860", Exhaust 1.840" x 2.040"

020660 350cc Port Dimension: intake 2.510" x 1.750", Exhaust 1.660" x 1.950"

020660C 375cc Port Dimension: intake , Exhaust

Port Locations: Intake Stock, Exhaust Raised .600"

Combustion Chamber Volume: 119cc.

Valve Guides: Manganese Bronze

Valve Guide Spacing: Ctr-Ctr 1.970" Stock Location

Valve Seats: Intake & Exhaust = Durabond Powdered metal seat .006" press fit

Valve Seat Dimension: Intake 2.450"x 2.000"x .375" Exhaust 2.000"x 1.600"x .375"

Valve Seat Angles: Intake = 35°-(45°(.040"))-60°-75° Exhaust = 38°(45°(.060))-500radius-75°

Intake Valves: 2.300" 11/32" x .100" Replacement part # 702860SM (For -1, 2 Head assemblies)

2.300" 11/32" x .100 Replacement part # 702860RM (For -3 Head assemblies)

2.300" 11/32" x .250 Replacement part # 702862SD (For -4 Head assemblies)

Exhaust Valves: 1.880" 11/32" x .100 Replacement part # 702735SM (For -1, 2 Head assemblies)

1.880" 11/32" x .100 Replacement part # 702735RM (For -3 Head assemblies)

1.880" 11/32" x .100 Replacement part # 702735SD (For -4 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,-4 head assemblies)

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

Metal clad Viton valve seal. Replacement part # 702179-16 (for -3,-4 head assemblies)

Valve Springs: 1.550" O.D. dual valve spring. Seat pressure 150 lbs. @ 1.810 Replacement part # 702208-16 (for -1,-2 head assemblies)

1.550" O.D. dual valve spring. Seat pressure 200 lbs. @ 1.900 Replacement part # 702210-16 (for -3 head assemblies)

1.640" O.D. dual valve spring. Seat pressure 275 lbs. @ 2.000 Replacement part # 702212-16 (for -4 head assemblies)

Spring Retainers: 1.550" O.D. single valve spring Replacement part # 702107-8 (for -1,-2 assemblies)

1.550" O.D. single valve spring Replacement part # 702113-8 (for -3 assemblies)

1.640" O.D. single valve spring Replacement part # 702126-8 (for -4 assemblies)

Pushrod Guide Plates: STD BBC style hardened steel guide plate. For best fit use Replacement part # 702466-8.

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: BMP BBC Aluminum heads utilize a standard rocker arm designed for the Big Block Chevy.

NOTE: When using rocker arms greater than a 1.7 ratio, it may be necessary to elongate the pushrod guide holes in the cylinder head.

Rocker Arm Studs: 7/16 rocker arm stud. Screw in style Replacement part # 702306-8 (for -2 head assemblies)

7/16 rocker arm stud. Screw in style Replacement part # 702306-8 (for -3 head assemblies)

7/16 rocker arm stud. Screw in style Replacement part # 702308-8 (for -4 head assemblies)

Rocker Stud Girdle: BMP part# 702455

Head Bolts: On an iron Mark IV block, standard BBC head bolt hardware (ARP bolts 135-3603). ON a Mark V & VI block ARP# 135-3607

Head Studs: On an iron Mark IV block, standard BBC head Stud hardware (ARP studs 235-4016). On a Mark V & VI block ARP# 235-4113

Head Gaskets: When using BMP BBC heads on Mark IV blocks use the corresponding gasket that is compatible with the bore size of the engine. 4.370" = Felpro 1027(excluding cnc ported heads), 4.540" = Felpro 1017 & 4.630" = Felpro 1057. When using a BMP BBC head on a Mark V or VI block, you must use Mark V or VI head gasket depending on which one was used

Intake Gaskets: Mr. Gasket 121 or equivalent

Header Gaskets: Fel Pro 1410 or equivalent

Pistons: Most 26° aftermarket pistons. Use of large cams may require fly cutting of existing valve notch. Depending on brand, Deck height, Dome size and shape slight modification of domes may be required.

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

Head Bolt Torque Specs: Torque all head bolts to 75 ft. lbs w/ oil. Before torquing, coat the head bolts and rocker studs with a thread sealing paste. **Note:** Refer to the factory service manual for proper head bolt tightening sequence

Rocker Arm Studs: 50 ft. lbs. w/oil

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

Maximum Valve Diameter: 2.300 Intake & 1.900 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 OR TO ENLARGE THE SEAT FOR A SPRING DIAMETER OVER 1.650.

Maximum Spring Diameter: 1.690"

Maximum Flat Mill: .050

Maximum Angle Mill: .180

Approximate Milling Guidelines: .065 per 1cc

Brackets and Accessories:

1. The BMP BBC 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.
5. WIPE DOWN ALL SEALING SURFACE WITH LAQUER THINNER TO REMOVE AND RESIDUE THAT MAY HAVE BEEN USED TO WIPE DOWN PART.

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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