Motown 220 / Motown 220 Lite Cylinder Heads

Technical Instructions for assembled & bare head part numbers:
014150- Bare (Angle Plug, 64 cc Chamber, Cast Iron)
014150-2 Mechanical Flat Tappet, Hydraulic Roller (Angle Plug, 64 cc Chamber, Cast Iron)
014150-3 Mechanical Roller (Angle Plug, 64 cc Chamber, Cast Iron)
014250 – Bare (Straight Plug, 64 cc Chamber, Cast Iron)
014250-2 – Mechanical Flat Tappet, Hydraulic Roller (Straight Plug, 64 cc Chamber, Cast Iron)
014250-3 – Mechanical Roller (Straight Plug, 64 cc Chamber, Cast Iron)
014350 – Bare (Angle Plug, 72 cc Chamber, Cast Iron)
014350-2 – Mechanical Flat Tappet, Hydraulic Roller (Angle Plug, 72 cc Chamber, Cast Iron)
014350-3 – Mechanical Roller (Angle Plug, 72 cc Chamber, Cast Iron)
024150 – Bare (Angle Plug, 64 cc Chamber, Aluminum)
024150-2 – Mechanical Flat Tappet, Hydraulic Roller (Angle Plug, 64 cc Chamber, Aluminum)
024150-3 – Mechanical Roller (Angle Plug, 64 cc Chamber, Aluminum)

Specifications:

Valves:
- 2.08 Int.–2 Head replacement valve part # 830625 (4.940 overall length) –3 Head replacement valve part # 830645 (5.026 overall length)
- 1.60 Exh. –2 Head replacement valve part # 830635 (4.951 overall length) –3 Head replacement valve part # 830655 (5.036 overall length)

Valve Locks:
- 2 Heads have 7 degree locks. Replacement part # 830305
- 3 Heads have 10 degree locks. Replacement part # 830310

Valve Springs & Retainers:
- 2 Heads use a 1.440 diameter spring. Seat pressure 125 lbs. @ 1.825 Replacement part # 830110. Retainer part # 830220
- 3 Heads use a 1.550 diameter spring. Seat pressure 200 lbs. @ 1.950 Replacement part # 830115. Retainer part # 830230

Pushrod Guide Plates: Motown 220 replacement guideplate part # 830450. Motown Lite replacement guideplate part # 830455. **Note:** Hardened pushrods MUST be used with guideplates. The guideplates MUST be adjusted to obtain proper rocker tip to valve tip alignment. For additional info regarding rocker tip alignment procedure, refer to World Products Tech Sheet WPP-TB1.

Pushrods: To obtain proper rocker arm geometry, pushrod length will need to be determined by using an adjustable checking pushrod. For info regarding on how to check for proper pushrod length, refer to World Products Tech Sheet WPP-TB1.

Rocker Arms: Motown 220 Iron heads utilize a standard offset rocker designed for the Small Block Chevy.

Motown 220 Lite heads use a standard offset exhaust rocker and an intake rocker with a .150 offset. This head uses a special stud girdle. Part # 832005

**Special Note:** When using rocker arms greater than a 1.5 ratio, it may be necessary to elongate the pushrod guide holes in the cylinder head. On the aluminum heads with the offset rocker arms, it may be necessary to relieve the back corner of the intake rocker arm to clear the valve cover.

Rocker Arm Studs:
- 2 Iron and Aluminum heads use a 3/8 rocker arm stud. Replacement part # 830475
- 3 Iron and Aluminum heads use a 7/16 rocker arm stud. Replacement part # 830480

Combustion Chamber Volume: 64 or 72 cc. See cylinder head part number list for chamber size.

Intake Runners: 220 cc

Exhaust Runners: 68 cc

Head Bolts: ARP bolts 134-3601

Head Studs: ARP studs 134-4001

Head Gaskets: Fel Pro 1003. If steam holes are needed for 400 engines, use a 1014 gasket.

**Note:** Motown iron and aluminum heads are not drilled for steam holes. If steam holes are desired, it is necessary to drill six 1/8 steam holes. To drill, invert the cylinder head with the deck side up. Using a head gasket as a template, center punch the head where the steam holes will be drilled. The three steam holes closest to the intake side of the head must be drilled at a 30 degree angle toward the exhaust side of the head. The remaining three steam holes that are closest to the exhaust side will be drilled straight down.

(over)
Intake Gaskets: Fel Pro 1206 or equivalent

Header Gaskets: Fel Pro or equivalent

Spark Plugs: Cast iron heads use a 5/8 reach plug such as an Accel 276 or equivalent. On cast iron heads with angle plugs, an Accel 276S may be used to gain additional header to spark plug clearance.

Aluminum cylinder heads MUST use a 3/8 reach plug such as an Accel 416 or equivalent.

Emissions: These 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.

2. At this time install the cylinder head to the block with no head gasket and snug the bolts. Refer to the World Products Tech Sheet WPP-TB1 for info regarding proper pushrod length and rocker tip to valve tip alignment.

3. 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.

4. The Motown 220 / Motown Lite use a 2.08 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.

5. Once everything has been checked and all the desired clearances and specifications achieved, final assembly may begin.

6. 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 broke in, reinstall the inner valve spring.

Head Bolt Torque Specs:

Torque all head bolts to 65 ft. lbs. Before torquing, coat the head bolts and rocker studs with a thread sealing paste available from ARP.

Note: Refer to the factory service manual for proper head bolt tightening sequence

Rocker Arm Studs: 55 ft. lbs.

Machine Shop Specs:

Note: Specs are for reference only. Always measure before machining.

Maximum Valve Diameter: 2.100 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 OR TO ENLARGE THE SEAT FOR A SPRING DIAMETER OVER 1.550.

Maximum Spring Diameter: 1.550

Maximum Flat Mill: .080

Maximum Angle Mill: .175

Approximate Milling Guidelines: .007 per 1cc

Brackets and Accessories:

1. The Motown 220 / Motown 220 Lite are have accessory bolt holes drilled in the factory locations.

2. The Motown 220 / Motown 220 Lite are drilled to accept either perimeter bolt valve cover or center bolt valve cover. However, because of the larger diameter of the valve springs used on these heads; there may be interference with the bolt supports when using centerbolt valve covers. It is Highly Recommended to use the perimeter bolt style valve cover to eliminate clearance issues.

3. When using Motown 220 / Motown Lite heads with the angle plug location, it is best to use an exhaust header designed for angle plugs.