



## Holley Gen 3 Hemi Hi-Ram Modular Intake Manifold Kits

| Holley P/N                            | Engine Application & Induction Configuration                                                   |
|---------------------------------------|------------------------------------------------------------------------------------------------|
| <b><u>Drive By WIRE Kits</u></b>      |                                                                                                |
| <b>300-658</b>                        | Hemi Gen. 3 Hi-Ram, EFI, 1 x 95mm Hemi Throttle Body                                           |
| <b><u>Drive By CABLE Kits</u></b>     |                                                                                                |
| <b>300-650</b>                        | Hemi Gen. 3 Hi-Ram, EFI, 1 x 95mm LS Throttle Body (longitudinal mount)                        |
| <b>300-651</b>                        | Hemi Gen. 3 Hi-Ram, EFI, 1 x 105mm LS Throttle Body (longitudinal mount)                       |
| <b><u>Modular Hemi Components</u></b> |                                                                                                |
| <b>300-653</b>                        | Hemi Gen. 3 Hi-Ram, EFI, Base Manifold Only with Fuel Rails (plenum top fab. flange available) |
| <b><u>Adapters</u></b>                |                                                                                                |
| <b>300-652</b>                        | Adapter, Hi-Ram Base to Early 2003-2008 Truck Engine Intake Ports                              |
| <b>300-660</b>                        | Adapter, LS Plenum Top to 80mm Hemi Throttle Body                                              |
|                                       | Add "BK" to the above part numbers for BLACK versions                                          |

### INSTALLATION INSTRUCTIONS 199R11961

(Before installation, please read these instructions completely.)

**NOTE:** The manifold and fuel rails are designed to accept Bosch Style EV-1 or most gen. 3 Hemi injectors.

**NOTE:** Works with one and two bolt Mopar MAP sensors to include the below:

| Manufacturer | P/N      | Range | Bolt Pattern |
|--------------|----------|-------|--------------|
| Mopar        | 05033310 | 1 Bar | One Bolt     |
| Mopar        | 68271094 | 1 Bar | One Bolt     |
| Standard     | AS217    | 1 Bar | Two Bolt     |
| Mopar        | 56041018 | 1 Bar | Two Bolt     |
| Mopar        | 5033224  | 2 Bar | Two Bolt     |

### APPLICATIONS:

The Holley Gen 3 Hemi Hi-Ram intake manifold series is designed for 2009-Current 5.7L, 2005-2010 6.1L, and 2011-Current 6.4L engines. Use intake adapters 300-652 for 2003-2008 5.7L. This intake manifold will work with OE or aftermarket cylinder heads as long as the head is configured with the intake flange bolt pattern and intake port opening locations matching the appropriate OE application.

The Hi-Ram style intake manifold is designed for high performance engine applications up to 440 cubic inch displacement and maximum engine speeds of 7500-8500 RPM, depending on the engine combination. The Hi-Ram intake manifolds are intended for maximum performance applications and will not accept stock components and hardware. A modified hood will be required for most vehicle applications.

## EMISSIONS EQUIPMENT:

Holley Hi-Ram intake manifolds do not accept any emission-control devices. This part is not legal for sale or use for motor vehicles with pollution-controlled equipment.

## DIMENSIONS:

**NOTE:** All heights measure to intake mounting flange on the engine.

**NOTE:** Unless otherwise stated, the dimensions and information applies to all Hemi Hi-Ram applications.

- A-B Height, (EFI, 2x4V Top Mount & Blank) – 10.35".
- T/R Base Plenum Top Mounting Flange Height – 7.69"
- Total Height with 80/92/95/105mm Long. Mount EFI Plenum Top – 11.59".
- Port Size: 1.7" X 1.88" Height X Wide.
- Mounting Flange Gasket Type:
  - .139" Round FKM O-rings, Size 2-229, 2.359" I.D. (included with the int. man. install kit).
- Plenum Top Gasket Type – 3/32" Round FKM O-ring Cord (included with the intake manifold installation kit).
- Throttle Valve Flange Location, with 80/92/95/105mm Long. Mount EFI Plenum Top: Height – 7.69", Longitudinal Location – 3.78 (forward from engine block front flange), Lateral Location – On-Center, Angle – 25 deg. (down from vertical).
- TR Runner Length and Runner As-cast Cross-Sectional Area:
  - Runner Length - 6.65"
  - As-cast Runner CSA - Tapered, 4.86 in<sup>2</sup> at the entry to 3.05 in<sup>2</sup> at the port flange.

## INSTALLATION KIT CONTENTS:

- ❑ 12 – 1/4-20 UNC x 7/8" Long 12 Point Cap Screws, Zinc Plated, Plenum Attachment Bolts
- ❑ 4.5 ft – O-ring Cord, 3/32" Dia. Round Section FKM, Plenum Flange Seal, Holley Service P/N 508-21
- ❑ 8 – O-ring, .139" Dia. Round Sect. FKM, Size 2-229, 2.395" I.D., Port Flg Seals
- ❑ 2 – O-ring, .139" Dia. Round Sect. FKM, Size 2-224, 1.734" I.D., PCV Flg Seals
- ❑ 10 – Stud, M6 x 1.0 Threads, Intake Manifold to Cylinder Head Mounting
- ❑ 10 – Washer, M6 x 12mm O.D x 1.6mm Thick, Intake Manifold to Cylinder Head Mounting
- ❑ 12 – Washer, 1/4", Plenum Top to Intake
- ❑ 10 – Nut, M6 x 1.0 Threads, Intake Manifold to Cylinder Head Mounting
- ❑ 1 – 1/8 NPT Hex Steel Pipe Plug
- ❑ 2 – 3/8 NPT Hex Steel Pipe Plug
- ❑ 1 - Cover, MAP Sensor Port
- ❑ 1 – O-ring size 2-012, Map Sensor Seal
- ❑ 2 – M5 x .08 x 14 Button Head Bolts, MAP Sensor Cover Mounting
- ❑ 1 – Oil Cap Assembly
- ❑ 2 – Straight 1/2" Hose Barb to 3/8 NPT Male
- ❑ 2 – Fuel Rail, High Volume, Configured with 3/4-16 O-ring Ports (AN-8)
- ❑ 4 – 1/4-28 UNF x 1-1/4" Long Socket Head Cap Screws, Zinc Plated, Fuel Rail Mounting
- ❑ 1 – Installation Instructions
- ❑ 1 – Warranty Card

## EFI PLENUM TOP, 1 x 80mm/92mm Hemi Throttle Body, KIT CONTENTS: (incl. in 300-658, 658BK)

- ❑ 2 – Gaskets, 80mm and 92mm Hemi Throttle Body

## EFI PLENUM TOP, 1 x 95mm/105mm LS Throttle Body, KIT CONTENTS: (incl. in 300-650, 300-650BK, 300-651 & 300-651BK):

- ❑ 1 – Gasket, 95mm/105mm LS Throttle Body, Holley Service P/N 508-20

## INSTALLATION INSTRUCTIONS:

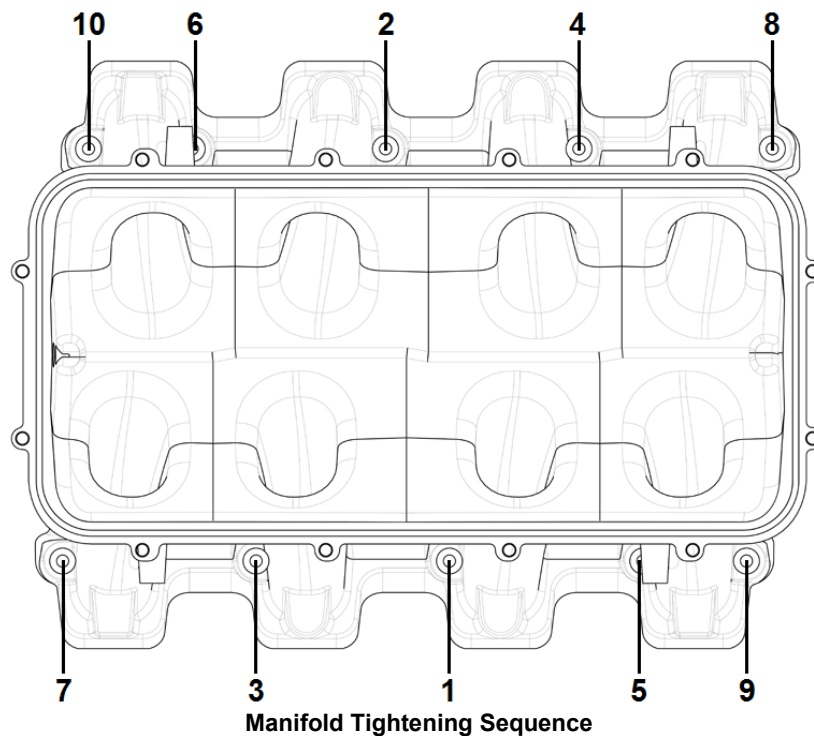
### Installation of the Intake Manifold Base –

**NOTE:** Studs are provided for the installation of Hi-Ram intake manifolds. (The studs have been provided, so that the threads in the cylinder heads are preserved during repeated assembly and disassembly.) If you choose to use these bolts, make sure the bolts have proper thread engagement, 12 turns minimum, and also do not bottom in the cylinder head threads.

1. Before installing the intake manifold base, perform a test fit of the intake manifold without the O-rings installed. Make sure that the mounting studs supplied can thread freely into the cylinder heads through the intake manifold mounting holes. The mounting flange should seat properly.
2. Check the port opening alignment. Test fit the plenum top, fuel and vacuum plumbing, throttle linkage, wiring, etc. to ensure there are not any fit issues before performing the final intake manifold installation.
3. For final installation, install the eight O-rings provided in the mounting flange O-ring grooves. Press firmly and work the O-ring in evenly all around. The O-ring should look smooth and even when done.
4. Install the two smaller O-rings in the grooves at the two head-oil-vents. Install as above described.
5. Install the mounting studs into the cylinder heads. The end with the shorter length of thread goes into the cylinder heads. Apply engine oil to the threads and thread in the stud until all of the threads are engaged by hand.
6. Put the manifold base into place on the mounting flange. Be sure that all of the O-rings are still in the grooves and are not being crushed between the flanges.

**WARNING! The M6 x 1 threads in the aluminum cylinder head will not withstand abuse. Care must be taken to have proper thread engagement and to tighten the fasteners to the proper specifications.**

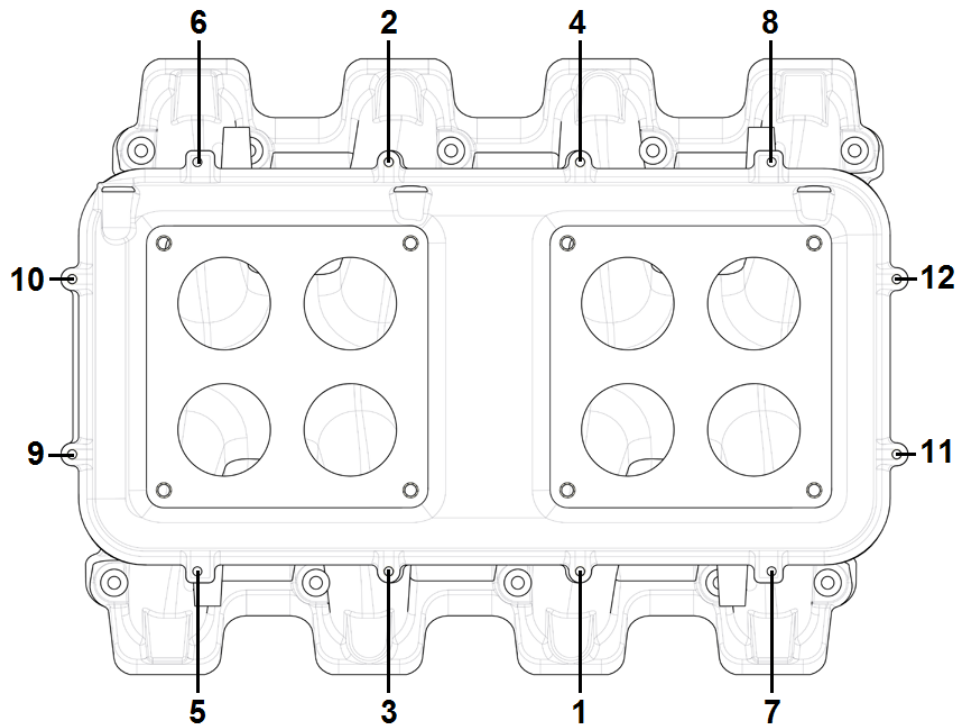
7. Install the washers and nuts provided. Engine oil should be applied to the threads. Gently tighten the nuts working side to side and out from center (see the tightening sequence diagram below), until manifold is seated on the mounting flanges and the O-rings have been compressed. In two steps, tighten the mounting nuts first to 50 in-lbs and then to 106 in-lbs following the tightening sequence diagram below.



8. There is a flange on the rear of the base manifold for vacuum source. There is one 1/8 and two 3/8 NPT ports and a port for a Hemi style MAP sensor (O-ring seal on the nipple and retained with one or two bolts). There is enough room on this flange area to drill and tap additional ports as desired.

## Installation of the Plenum Top –

1. Before installing the plenum top, the supplied O-ring cord will need to be cut to length and glued together.
2. Lay the O-ring cord into the groove on the plenum flange of the base manifold with the free end overlapped.
3. Mark the position of the cut to be made across both O-ring ends.
4. Lay the O-ring on a flat surface with the ends overlapped and the marks aligned as they were when the marks were made.
5. With a sharp razor blade, cut through both ends of the O-ring at the mark simultaneously.
6. With a drop of super glue (Cyanoacrylate), bond the ends of the O-ring together. The glued joint should be smooth, not offset or kinked.
7. To ensure sealing at the glued joint, apply a thin film of silicone sealer around the O-ring at the glued joint, allowing the silicone to partially cure before installation of the O-ring in the groove.
8. Install the O-ring in the groove on the base manifold plenum flange. Place the plenum top in place.
9. The plenum top flange is symmetrical so all tops will fit in either a forward or rearward orientation. For tops, 2 x 4500 and 2 x 4150, the side with the three bosses would go towards the side for the throttle linkage, normally on the left side of the car. For the EFI top with the Hemi or LS throttle body flange, the throttle body flange could go to the front or the rear, as desired.
10. Apply a drop of engine oil to and thread in the supplied 1/4-20 x 7/8" long 12 point capscrews through the plenum top with a washer.
11. Gently tighten the fasteners evenly - starting from the middle of the sides, crossing side to side, and moving towards the ends until the plenum top is seated and the O-ring is compressed. Tighten the fasteners in two steps using the tightening pattern shown in the figure below. Tighten to 75 in-lbs for the first step and 130 in-lbs for the second step.



Plenum Top Tightening Sequence

## Installation of the Fuel Rails –

The fuel rail mounting pads have two sets of holes. The top holes position the fuel rail to install a standard Bosch style EV-1 fuel injector. The bottom set of holes position the fuel rail to install the gen. 3 Hemi style fuel injector.

1. Apply a silicone lubricant to the O-ring on the inlet end of fuel injectors and insert the fuel injectors into the ports in the fuel rail. To insert the injector without tearing the O-ring, gently rock the injector in the inlet of the port while applying pressure to insert the injector.
2. Position the injectors to properly orient the wiring plugs, apply silicone lubricant to the injector outlet O-rings, and insert all four injectors into injector bosses in the base intake manifold applying gentle downward pressure on the fuel rail. The proper orientation for the fuel rail is with the logo facing outward.
3. Once the injectors are inserted into the intake manifold, place the ¼" washers on the ¼-20 x 1.75 long socket head cap screws.
4. Apply a drop of oil to the socket head cap screws, place the spacers between the fuel rail and the mounting bosses, and thread in the socket head cap screws.
5. Tighten the fasteners in two steps - 75 in-lbs for the first step and 130 in-lbs for the second step.
6. Check and make sure the injector is floating on the O-ring. Rotate the injector back and forth to confirm that there is no load on the injector body.
7. The fuel rail is designed to provide enough flow and volume to dampen fuel pressure oscillations and variations at the inlet of the fuel injectors. The fuel rails are machined to receive an adapter fitting for ¾-16 (AN-8) O-ring port.
  - For power levels below 700-750HP, AN-6 (3/8") plumbing to and from the fuel rails should be sufficient.
  - For power levels above 750HP, AN-8 (1/2") plumbing is recommended.
  - It is always recommended to only use tubular hose ends when a non-straight hose end is required.
  - The best configuration for plumbing the fuel rails is to split from the supply line with a "Y" type distribution block or fitting, then feed into the inlet end of each fuel rail. The hoses from the exit end of each fuel rail would then feed into each inlet port of a fuel pressure regulator with two inlet ports or into another "Y" type distribution block or fitting connecting to a hose leading to the fuel pressure regulator.

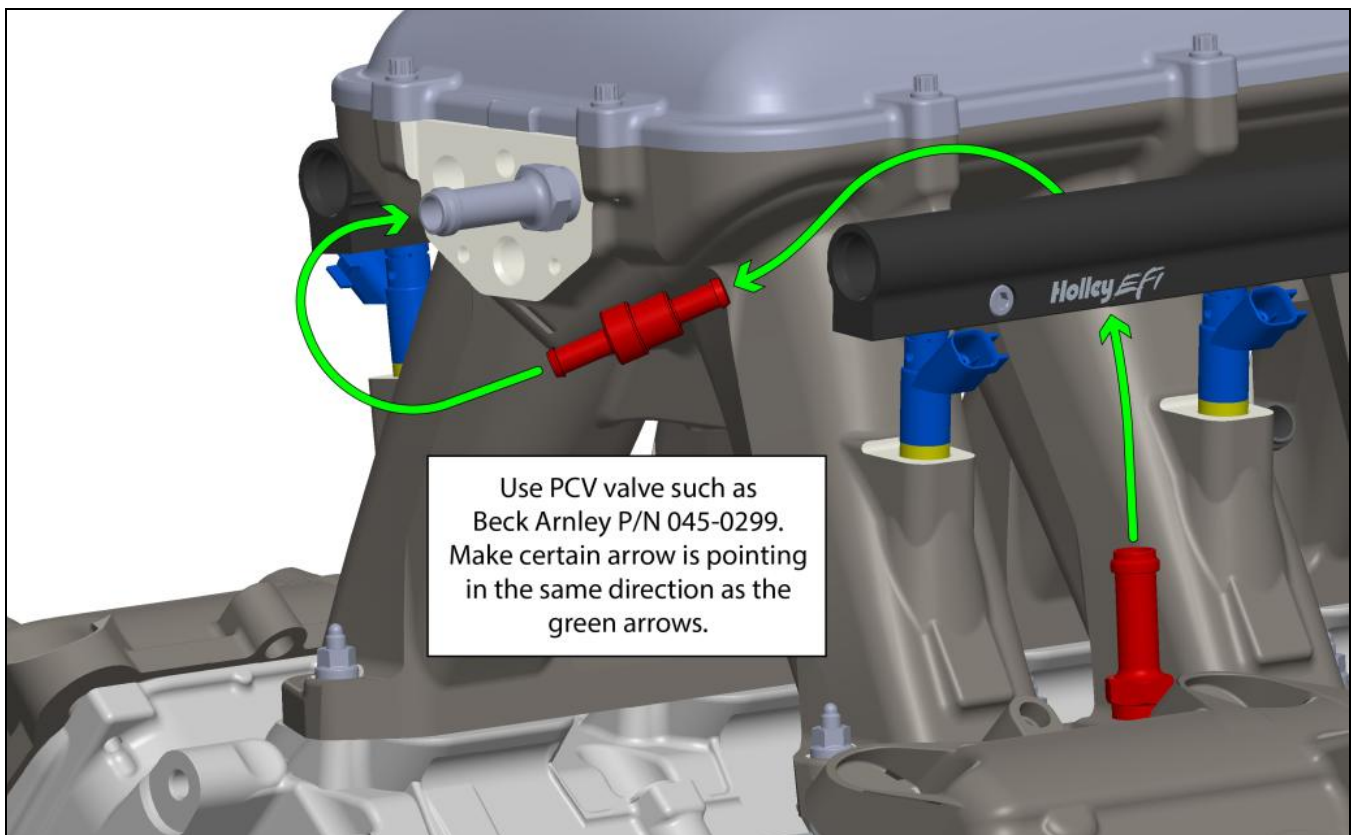
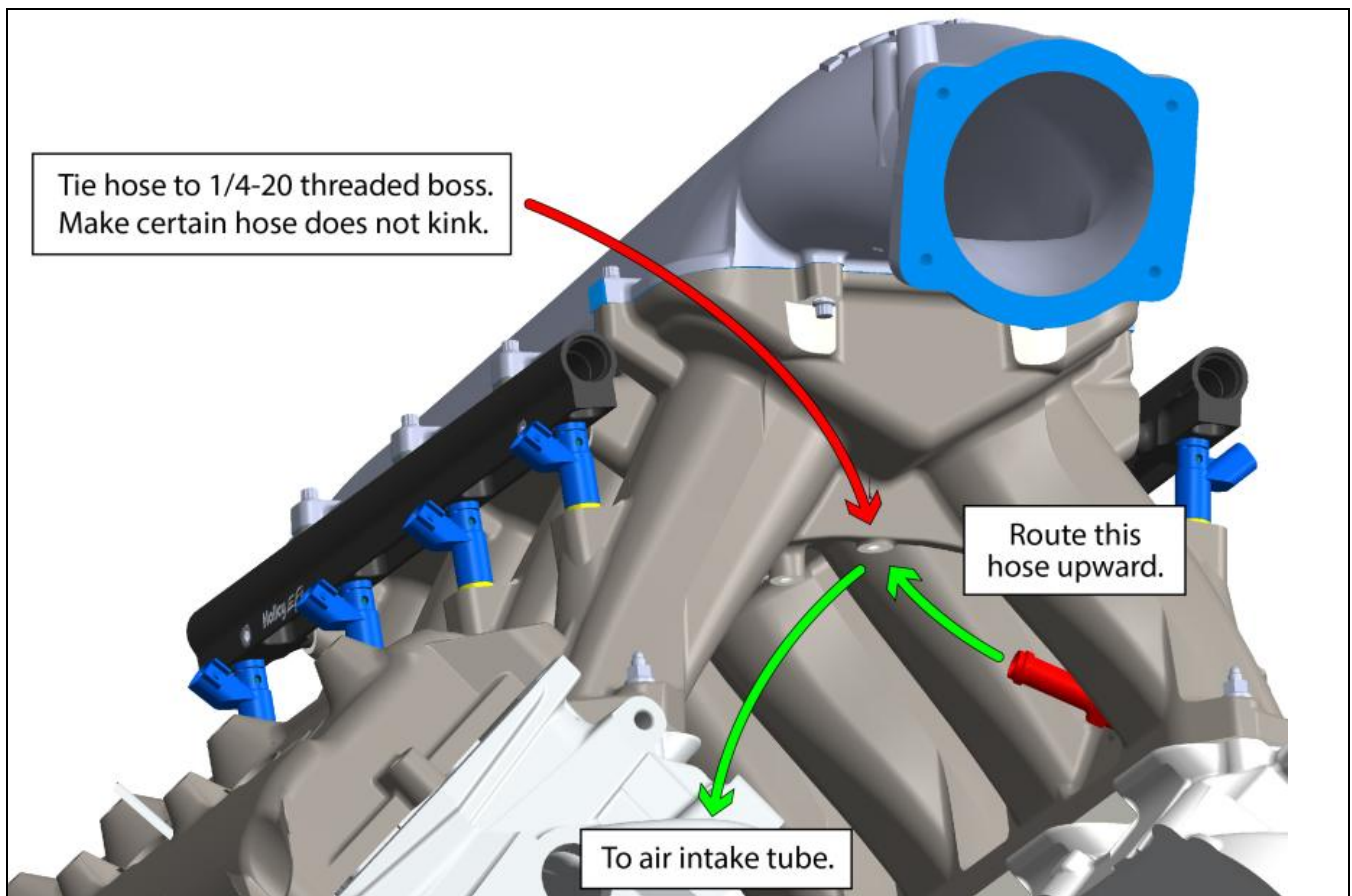
## Installation of the Throttle Bodies –

1. The EFI Mopar throttle body plenum tops are designed for drive-by-wire throttle bodies and have no provisions for a cable.
2. The EFI LS throttle body plenum tops provide bosses near the throttle body flange for the mounting of a throttle cable bracket. Throttle cable bracket P/N 20-149 works with Holley cable drive throttle bodies. A fabricated bracket will be required for other cable drive throttle bodies.
3. When installing 2 x 4500 and 2 x 4150 throttle bodies and the connecting throttle linkage, check to be sure that all throttle levers and linkage components have adequate clearance from the intake manifold and plenum top components.
4. The plenum tops for the 2 x 4500 and 2 x 4150 configurations have bosses for the mounting of throttle linkage. The three bosses are positioned for the mounting of heim joints that would carry a throttle linkage motion transfer shaft.

## PCV Plumbing and Routing -

The PCV system can be plumbed as shown. Both NPT intake ports should be plumbed. A catch can may be used as an alternative.

NOTE: It is critical that both hoses leaving the intake are routed upward 4" past the fitting barb. This is required to allow oil to drain back to the engine. If not routed upward, the engine may have higher than expected oil usage.





**NOTE:** Four 1/4-20 tapped bosses are provided under the Hi-Ram plenum if a custom oil/air separator tank is preferred.

## **HI-RAM PLENUM TOPS AND SERVICE PARTS AVAILABLE SEPARATELY:**

### ***Plenum Tops***

300-238 – 2 x 4500, 2" Throttle Bores, (sideways mount)  
300-207 – 2 x 4150, up to 1.75" bores, (sideways mount 4150, inline mount 4160)  
300-208 – Blank Flange Configurable Top  
300-245 – 1 x 95mm LS Throttle Body, Longitudinal Mount  
300-239 – 2 x 4500, up to 2.25" Throttle Bores, (inline mount throttle bodies)  
300-246 – 1 x 105mm LS Throttle Body, Longitudinal Mount

### ***Service Parts***

300-655 – Hemi Hi-Ram Complete Replacement Hardware Kit  
508-24 – Throttle Body Gasket 105mm  
508-20 – Throttle Body Gasket, 92mm or 102mm LS Throttle Body  
508-21 – Hi-Ram Plenum O-ring Cord, 3/32" Round, FKM, 4.5' Long

**Holley Technical Support  
1801 Russellville Road  
Bowling Green, KY 42101  
1-866-464-6553  
270-781-9741  
[www.holley.com](http://www.holley.com)**

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