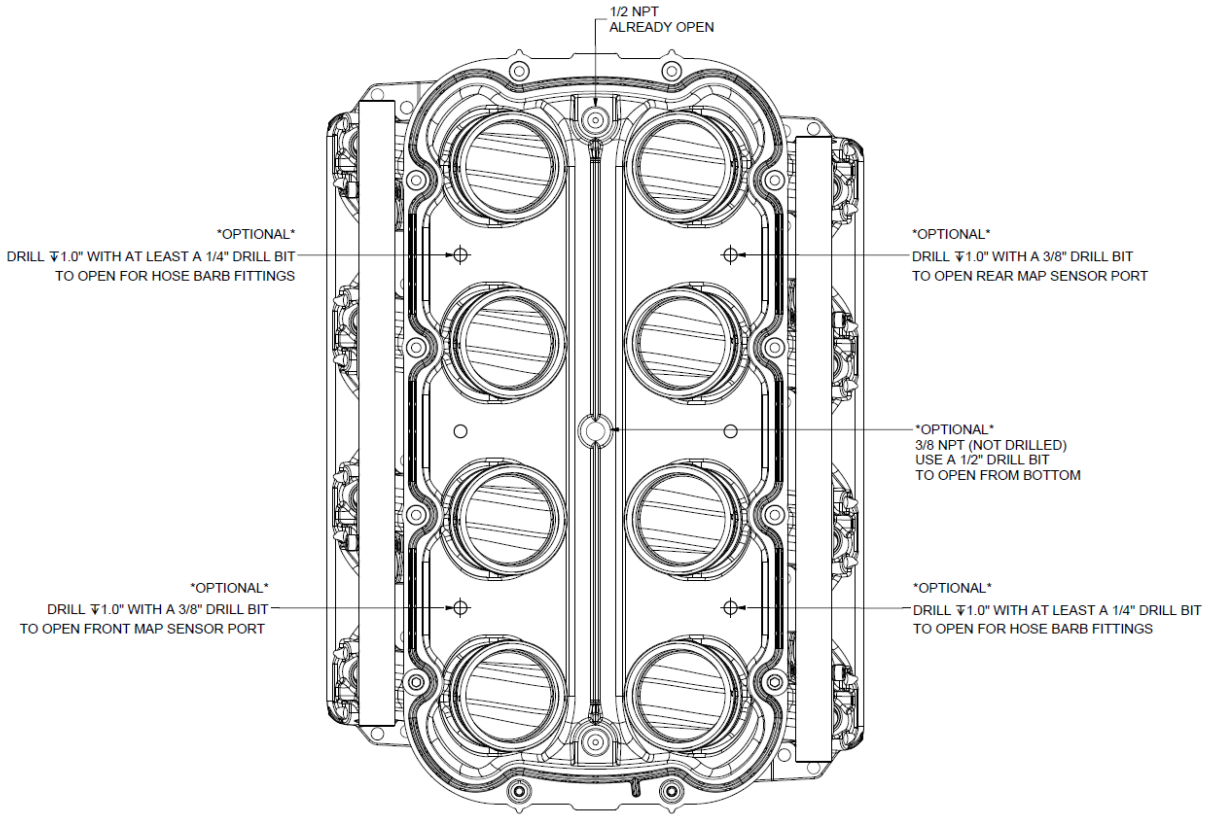
Carbon pTR Instructions	
Part Numbers	
• ASSEMBLY-INTAKE MANIFOLD, Carbon pTR LS7	70515.07.00
• ASSEMBLY-INTAKE MANIFOLD, Carbon pTR LS3	70515.03.00

Required Modifications Before Use:

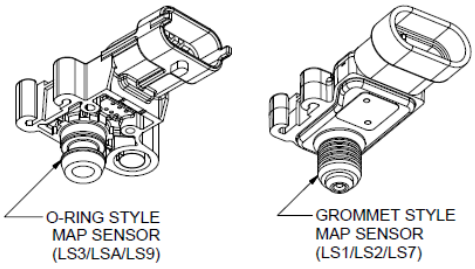
1. Coolant crossover lines modification and/or replacement may be required depending on application. Use GM Part #12602544 front crossover, and two (2) of Part #12602540 plugs if needed.

2. Remove the upper shell from the manifold. The Carbon pTR is designed to fit a wide range of applications, therefore, the MAP sensor location is required to be drilled. There are two locations provided. Both are intentionally shipped undrilled. Use a 3/8" drill bit to open your chosen MAP sensor location (see diagram below). It may be necessary to remove the runner velocity stacks if your manifold is equipped with the long runners (see section titled "Runner velocity stacks").



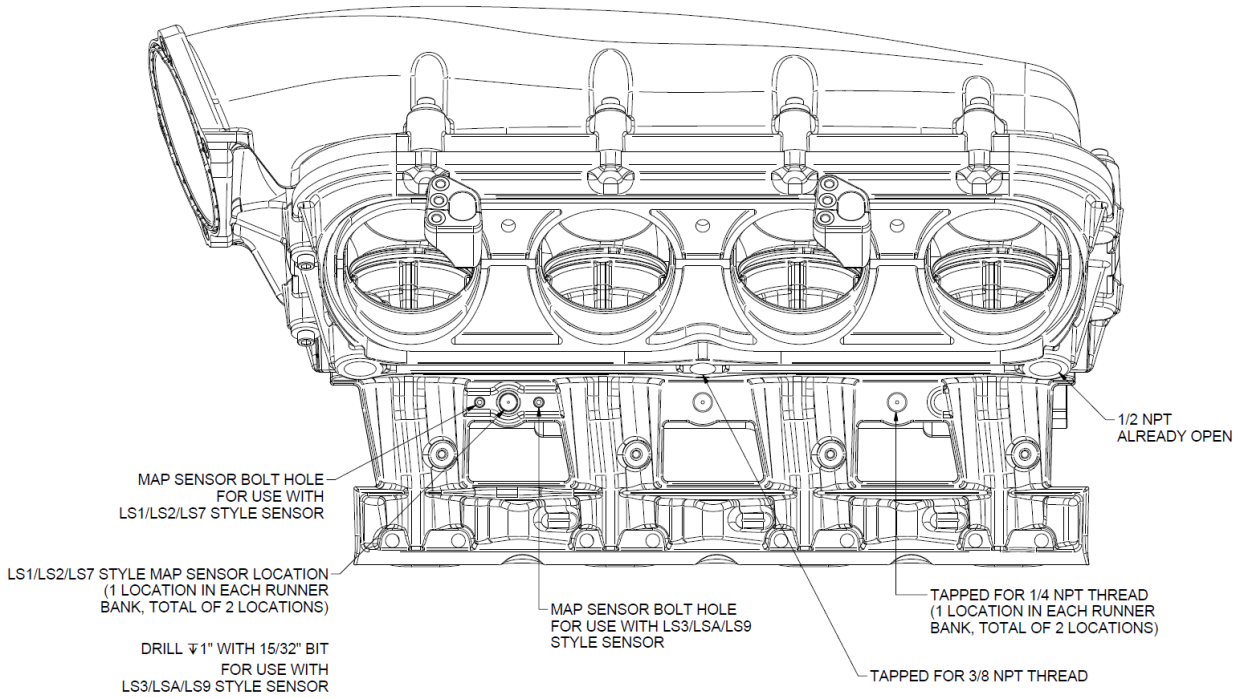
Front (Throttle Side)

3) There are two different MAP sensors that can be used. If your MAP sensor is O-ring style, you must drill out your desired MAP sensor location with a 15/32" drill bit. If your MAP sensor is grommet style, no extra drilling is required.



4) The Carbon pTR incorporates four optional vacuum ports in addition to the two dedicated MAP sensor ports.
   a. A 1/2 NPT port at the rear that is already open
   b. A 3/8 NPT port in the center of the manifold base that is shipped sealed
   c. Two ¼ NPT ports at the front and rear of the runner banks that are shipped sealed
   d. MAP sensor ports are located at the rear of the driver's side bank and the front of the passenger side bank.

   Refer to the diagram below and on the previous page for locations and how to open for use.



5) After drilling all desired vacuum port locations from the top, thoroughly remove any leftover shavings from the manifold.

6) Install all desired vacuum fittings and the MAP sensor at this time as it will be tough to install once the manifold is bolted to the cylinder heads.

Runner Velocity Stacks (Removal and Installation):

The Carbon pTR is designed with removable runner velocity stacks to provide optional tuning via changes in runner length. The runner velocity stacks are held in place with a twist-lock design and an O-ring.

In order to remove the runner velocity stacks, **you must remove the O-ring first *(damage will occur if this is not followed).* **

Removal (Please use the ¼" notch on both sides of the velocity stack):

1) Locate the ¼" slot in the velocity stack. Using a 90 degree pick or small flat blade screwdriver, place the pick against the velocity stack and on the backside of the O-Ring. **(See Figure 1.)**
2) Gently pry the O-ring up and over the lip on the velocity stack **(See Figure 2.)**
3) The velocity stack will be slightly loose now **(See Figure 3.),** Press down on the runner velocity stack, and twist counter-clockwise to release the locking mechanism. Follow the diagrams below for further help.
4) Please repeat this process for the other 7 runners.

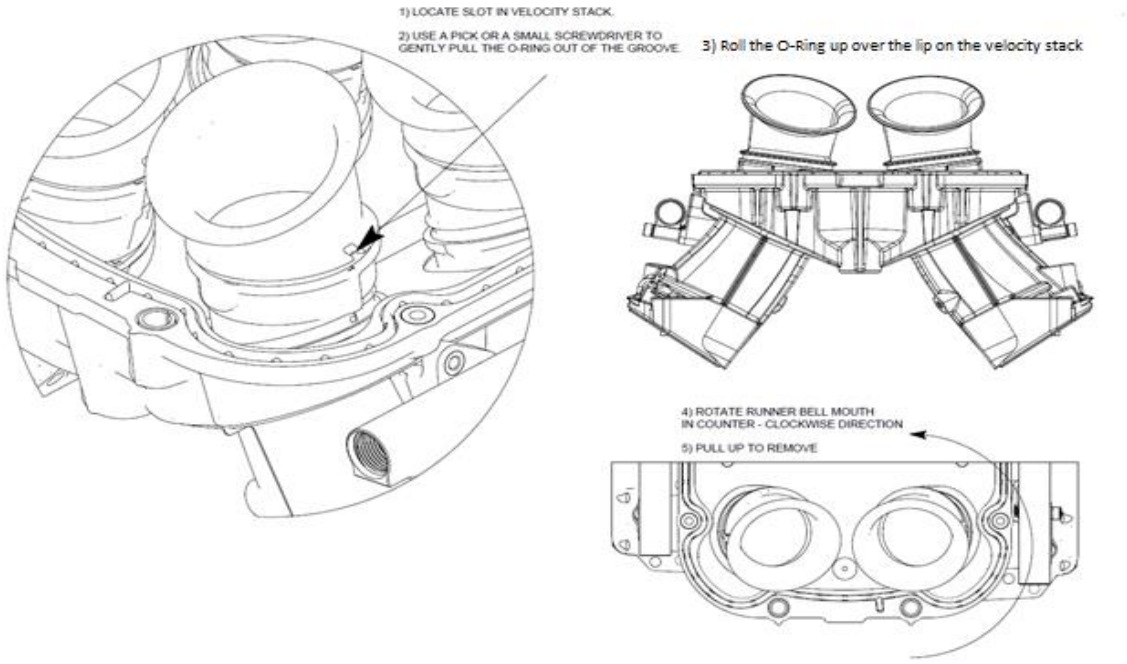
Figure 1 - Insert a 90 degree pick on the back side of the O-ring

Figure 2 – Pull the O-Ring over the lip on the velocity stack

Figure 3 – Photo of the O-Ring above the lip – The stack will be loose now.

Runner Velocity Stacks (Removal and Installation) Continued:

Additional Removal Info:



Velocity Stack Install:

1) Please slide the new O-Ring over the lip on the new velocity stack and prep for install. **(See Figure 4 on the next page.)**
2) Install the velocity stack into the bore aligning the pins with the internal groove in the runner. Push down and turn clockwise until the velocity stack is secure in the locks.
3) The velocity stack will be secure but still slightly loose. **(See Figure 5 on the next page before the next step.),**
4) With gentle force upwards on the velocity stack, roll the O-Ring down into the groove while pushing the O-Ring into place with your other hand. **(See Figure 6 on the next page.)**
5) Press firmly into the retaining groove 360° around the velocity stack. Verify that no part of the O-ring is protruding out.
6) Repeat process for the other 7 runners.

See Figures on next page

Runner Velocity Stacks (Removal and Installation) Continued:

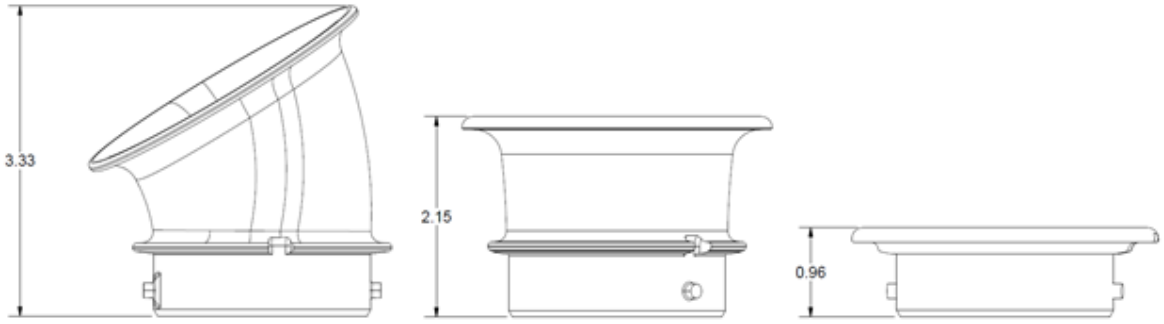
Figure 4 – Align tabs to the slot. See the O-Ring is above the lip.

Figure 5 – Holding the runner up in the locking tabs, roll down the O-Ring.

Figure 6- Press the O-Ring evenly in the groove, make sure it's even all the way around.

Different velocity stacks are available from Performance Design via the following part numbers:

P/N	DESCRIPTION
PD008-031	LONG RUNNERS (AS SHIPPED, Each)
PD008-302	MEDIUM RUNNERS KIT (O-Rings Included)
PD008-301	SHORT RUNNERS KIT (O-Rings Included)

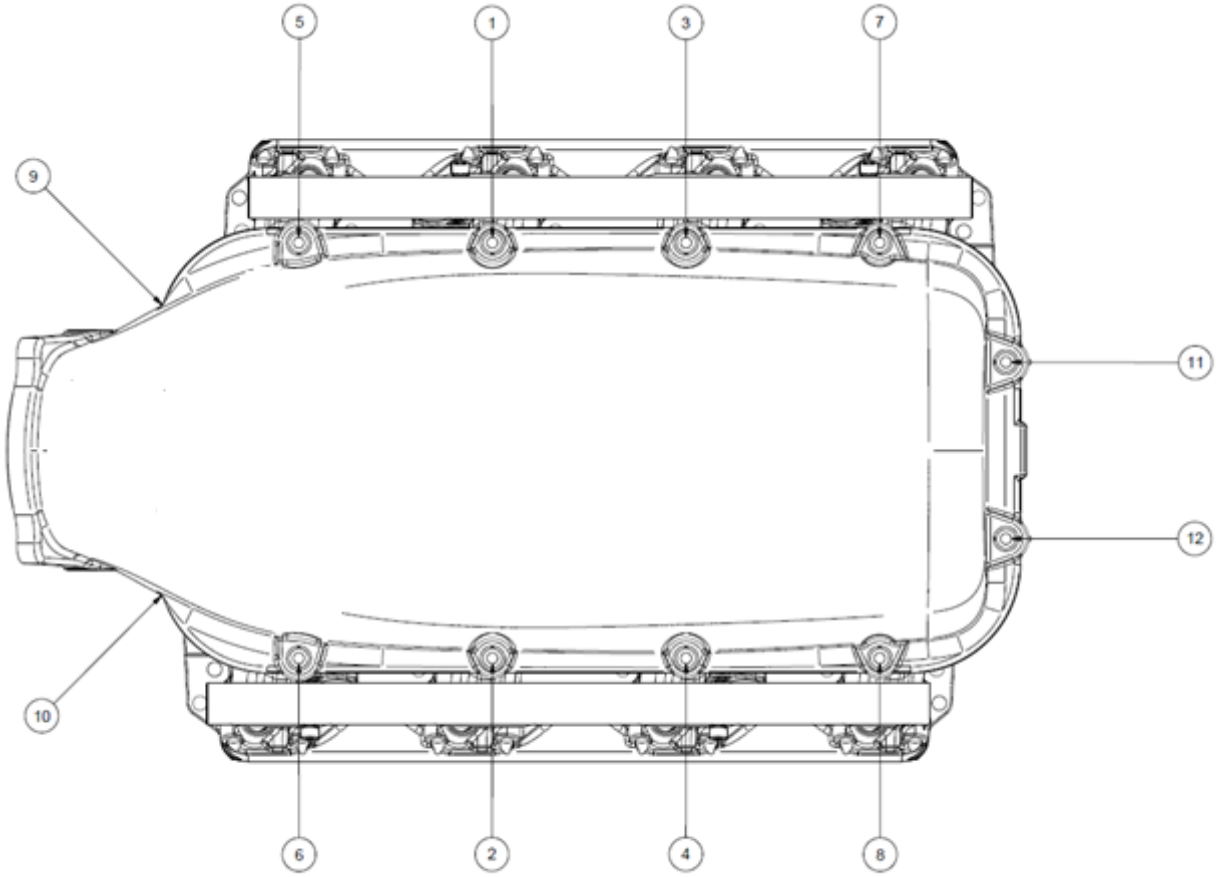


PD008-031 PD008-302 PD008-301

Installation:

1) The Carbon pTR is ready for installation once the desired vacuum ports have been opened and the runner changes (if desired) have been made.

2) Begin by replacing the upper shell. Torque all 12 bolts, using a small amount of medium strength thread locker. (Note: M6x1.0x40mm go in locations 9 and 10.)
   - **First Pass - Torque to 45 in-lbs** in the sequence below.
   - **Second Pass - Torque to 75 in-lbs** in the sequence below.



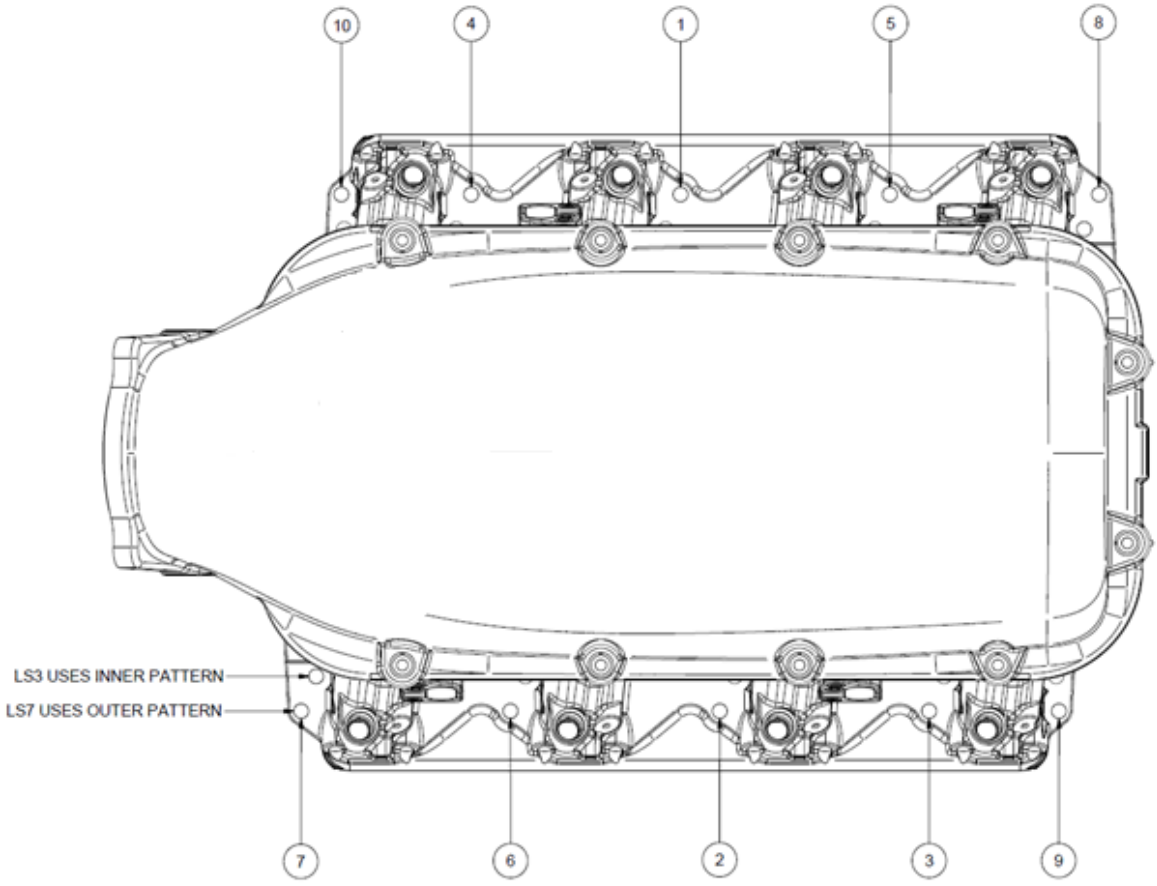
3) If already installed, remove the four fuel rail bolts (two per side).

4) Add a medium strength thread locker to the threads of the 10 intake manifold bolts.

5) Insert the 10 intake manifold bolts and set the intake manifold down on the cylinder heads. Hand start all the intake manifold bolts.
   - *LS3 intakes will use the **INNER PATTERN – LS3***
   - *LS7 intakes will use the **OUTER PATTERN – LS7***

6) Torque all 10 intake bolts
   - **First Pass - Torque to 45 in-lbs** in the sequence below.
   - **Second Pass - Torque to 89 in-lbs** in the sequence below.

CAUTION: Over-torquing the manifold will damage the manifold and cause improper sealing!

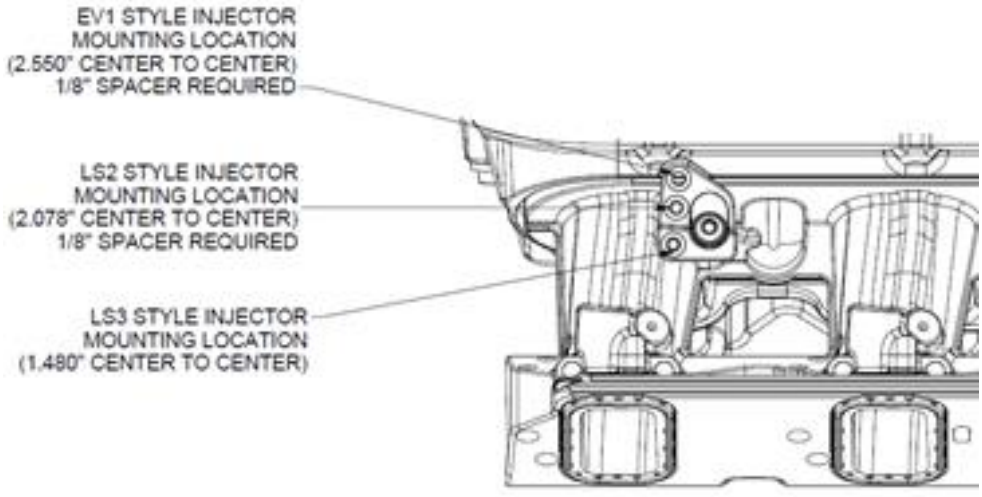


7) Install the desired injectors in the fuel rails that were removed in Step 3. Inspect the injector O-rings for damage. Lubricate all O-rings with clean engine oil.

8) Install the injectors and fuel rail assembly into the Carbon pTR manifold. Carefully start all injectors in the pockets, then firmly seat one side at a time.

NOTE: A 1/8" spacer must be used to space the fuel rail away from the fuel rail mounting bracket when using LS2 or EV1 style injectors. Failure to do so could result in misalignment of the fuel injectors.

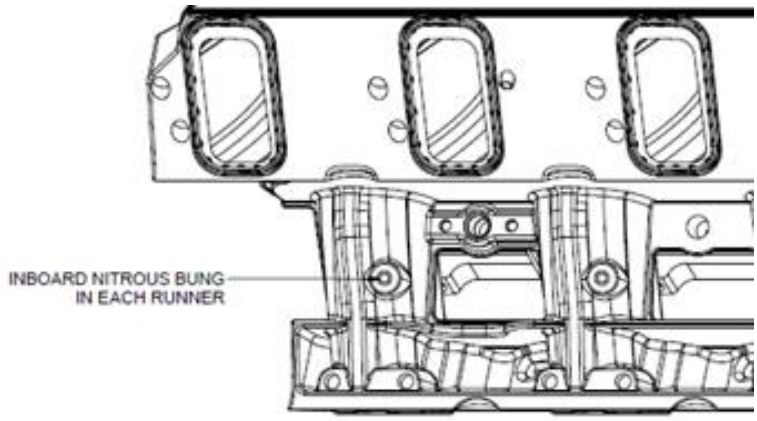
9) Torque the fuel rail mounting bolts to **75 in-lbs.**

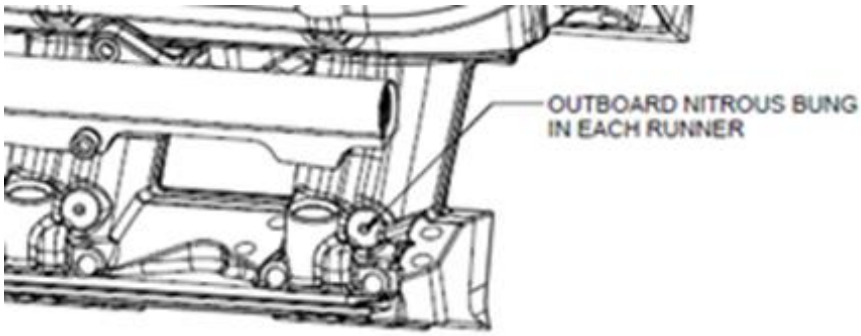


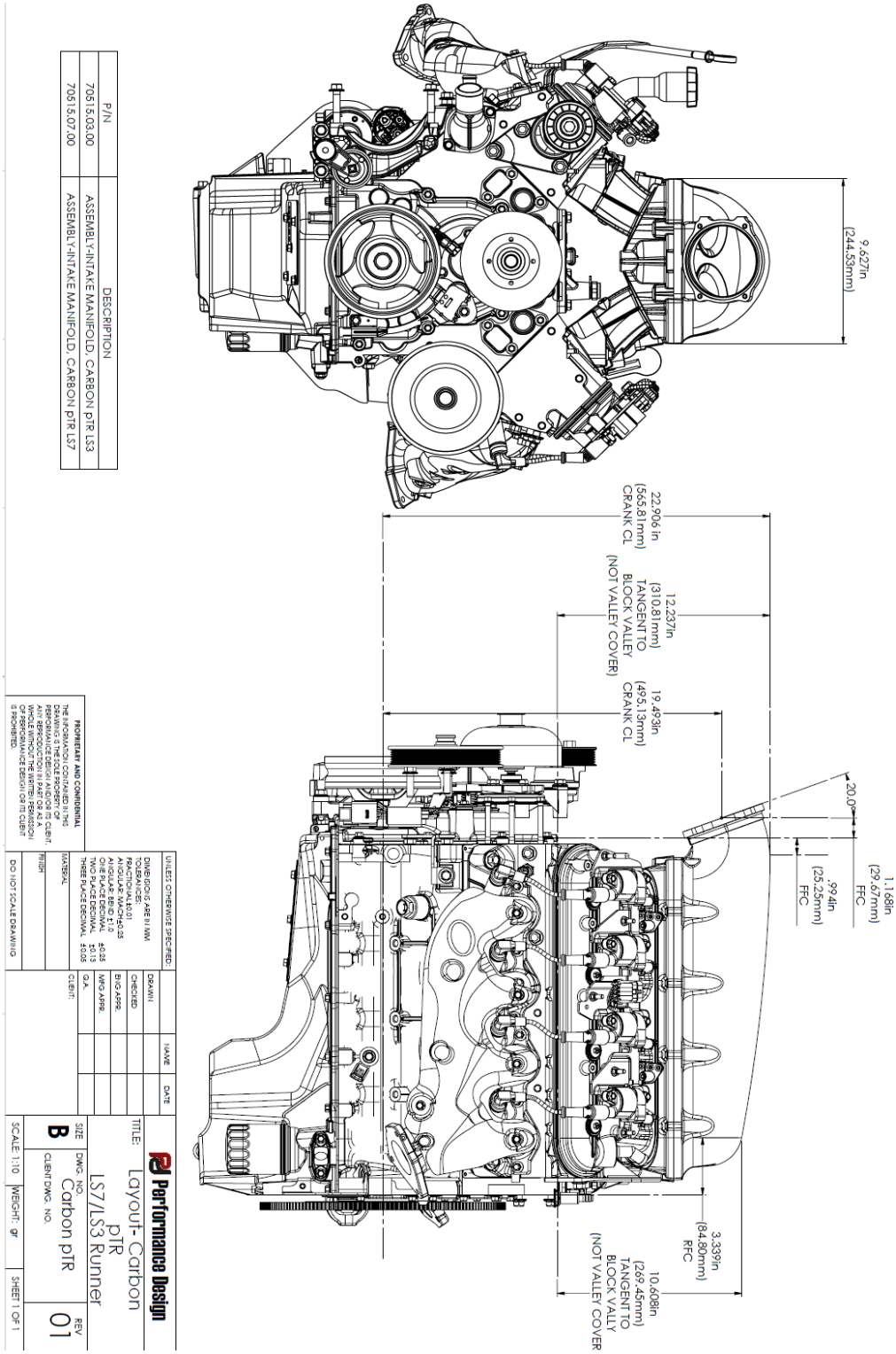
10) The Carbon pTR includes four M6 x 40mm bolts, which are to be used to attach a drive by wire throttle body. Ensure the Viton O-Ring included in the hardware kit is installed and mount the desired throttle body to the intake manifold. Torque the throttle body bolts to 89 in-lbs.

Other Features:

The Carbon pTR has provisions for outboard and inboard nitrous nozzles. See the locations in the diagram below.







P/N	DESCRIPTION
70515.03.00	ASSEMBLY-INTAKE MANIFOLD, CARBON pTR LS3
70515.07.00	ASSEMBLY-INTAKE MANIFOLD, CARBON pTR LS7

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	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
CLIENT:		

Performance Design

TITLE: Layout- Carbon pTR LS7/LS3 Runner

SIZE: B
DWG. NO. Carbon pTR
CLIENT DWG. NO.
REV 01

SCALE: 1:10 WEIGHT: gr SHEET 1 OF 1