Congratulations on the purchase of your new AFR Titan composite intake manifold! This part was designed to maximize performance as well as provide flexibility by virtue of the airflow passages being separated from the other typical functions of the intake. AFR offers a variety of performance “spiders” that can be used with the universal valley plate.

Valley Plate
#4500 SBC Valley plate

Spider Options
#4650 SBC Titan Race TXR Spider
#4651 SBC Titan Street TXS Spider
#4652 SBC Titan Dominator TXD Spider
#4653 SBC Titan Dual Plane Race DPR Spider
#4654 SBC Titan Dual Plane Street DPS Spider

Hardware:
#4600 Compression Limiters (8)
#6299  Intake Manifold Washer (12)
#6300  Intake Manifold Bolts (12)
#4603 Distributor Clamp (1)
6mm (5 mm hex) bolts & washers (6)
Vacuum nipple (1)
Vacuum nipple fastening screws (2)
Distributor Clamp Plate (1)

#4550 SBC Seal Kit
Distributor seal (1)
Head Port seals (2)
Coolant Port seals (4)
Valley Plate seals (2)
Heat riser/EGR insulator pad (2)
The following warnings are intended to ensure your AFR experience is a positive one. Please read the following warnings and the entire assembly instructions carefully before starting to install your new intake manifold on your engine.

**Warning:**
Do not over-torque any fittings beyond the specified torque specification. While this air intake manifold has been carefully engineered for use on your Small Block Chevy engine and uses a new high-strength polymer, the customer must recognize that this manifold can be damaged by exceeding the specified torque limits, and failing to follow these limits will void your warranty. Torque relaxation of fasteners joining plastic parts is normal however, when the customer uses a medium-strength thread-locker as instructed, this relaxation will have no detrimental affect on performance. Should the customer wish to remove the spider and reinstall it or if the customer wishes to retighten this joint after engine usage, new thread-locker should always be applied to the fasteners.

**Warning:**
Never remove or pull an engine by pulling/lifting from the inserts on the carburetor flange. This will break the spider and/or valley plate.

**Warning:**
If your head has an EGR/heat riser passage you MUST use the supplied EGR/heat-rise block-off gasket. Failure to do so may direct excessive heat towards the spider port seal gasket and will void your warranty (see picture).

**Warning:**
All brackets that attach to the manifold must make contact with the inserts. If the bracket isn’t pushing against the insert the insert can be pulled/jacked out from tightening the bolt or stud.

**Warning:**
Use extreme caution if you choose to port this part. Porting may irreversibly damage your manifold if great care is not used and doing so may void your warranty. Always leave at .080” between the port entrance and the gasket groove (see picture).

**Warning:**
Removal of gaskets sealing coolant and air from the cylinder head can cause small tears at the interface of the gasket to the mating Aluminum head after extended usage. With care in removal of gaskets, often gaskets can be reused multiple times, however, if you suspect that after removal a gasket is leaking, order a replacement and do not try to repair the gasket.
I. Intake Manifold Installation Preparation:

At this time, you should have your old intake manifold removed. If your cylinder heads aren’t new, you will need to conduct a thorough clean-up of the cylinder head mounting surfaces. If this is not already done, even if this seems self-explanatory, please take a few minutes to read the following.

Port Surface Cleaning:

To prevent debris (old gaskets & RTV) from falling into the ports and combustion chambers when cleaning your head surfaces, lay rags in lifter galley and stuff rags into the ports. After the heads have been cleaned, remove rags from the ports carefully making sure all particles fall onto the rags in lifter galley. Carefully remove rags from the galley. Wipe cylinder head surfaces clean with rags using lacquer thinner to remove any oil or grease. Do not forget rags in ports before assembling intake manifold.

NOTE: This step is a MUST to ensure proper sealing.

Gasket surface preparation:

Warning: Always use the supplied gaskets with your AFR intake manifold. These gaskets protrude beyond the sealing surface so take special care not to slide past sharp edges, such as cylinder head port openings.

1. Insure head surface is clean and dry.

2. For the ends of the block, commonly referred to as the china wall, you must use RTV High Temp silicone sealer instead of gaskets. Apply a ¼” thick ribbon of sealant across each end seal surface and in the 4 corners where the heads meet. Some installations could require oxygen sensor safe silicone.
II. Intake Manifold Installation:

Your new Titan intake manifold is shipped partially pre-assembled. Follow the rest of the steps to complete installation to your engine.

Step 1: Install compression limiters in valley plate.

Seals, compression limiters, bolts, vacuum fittings and other hardware will be shipped in separate bags.

Compression limiters protect the composite manifold from the high-torque (25 ft-lbs) used to bolt the manifold onto the cylinder heads.

At this stage, you only need to lightly press fit or start the compression limiter into the 8 oval openings. The limiters should be pushed in deep enough so that they will not fall out during handling prior to final manifold assembly.

To start the limiters, place the bottom of the valley plate on a flat surface and lightly tap the compression limiters until they each seat into their respective holes by at least 0.100”. In a later step, you will let the tightening of the 3/8” – 16 bolts to simply & easily push the compression limiters into their final and correct locations. While tapping on the limiters, use care not to damage the valley plate’s sealing surface or the surface of your cylinder head, if you elect to do this on-engine.

Once the compression limiters are in place they should stay fixed to the manifold and will not need to be removed for subsequent assembly or disassembly.
Step 2:
Drill and assemble the provided vacuum fitting (IF REQUIRED – THIS STEP IS OPTIONAL) to the manifold spider prior to installation.

A 3/8" vacuum fitting has been provided with the intake manifold. This can be used with a quick connect or with a simple hose and hose clamp.

The seal surface is pre-molded in the spider but a through-hole MUST be drilled in the spider to permit vacuum to be delivered from this fitting. Soapy water can be used to lubricate the o-ring to aid in installation.

Step 3:
Install (4) coolant port seals in the valley plate

Step 4:
Pre-assemble the spider to the valley plate

Position the logo/identification badges on the spider toward the front of the engine (coolant outlet side of valley plate).

Position the spider to the valley plate and hand start the (6) M6 socket head cap screws (use provided washers).

Note: the valley plate and cylinder head port seals are purposely not assembled at this time.

Before proceeding to next step the ‘china wall’ should have RTV placed on its surface (see page 3) as the valley plate will not be removed again.
Step 5:
Set-up alignment to engine

This step is to align the valley plate position based upon the best spider/port positioning.

Place the valley plate and spider on the engine at the same time. The valley plate should have the green coolant seals installed, however, do not install the orange valley plate seal and black port gaskets. Temporarily tighten (2) 3/8” bolts at the locations indicated by the arrows. do not torque; just tighten enough to restrict movement.

Step 6:
Tighten Valley Plate

Without loosening the 2 spider bolts which were hand-tightened in step 5, using the 12 point cylinder head bolts provided, tighten the (8) valley plate fasteners per the sequence below, using at least 3 passes to reach a final torque of 25 ft-lbs.

Note: Once the valley plate is properly mounted, the manifold spider can be removed without disturbing the coolant system or ignition timing.
Step 7:
Remove the spider (2 hand-tightened bolts) and install remaining seals as shown below. Apply RTV silicone to the two locations shown below.

Note: The seals provided are specifically engineered for composite manifolds; paper type gaskets will not seal properly against the cylinder head.

Valley Plate Seals - Orange (2)
Port Seals – Black (2)
Distributor Seal - Blue (1)

*Apply RTV to both center bolt locations to prevent oil seepage.

Note: If your distributor uses an adjustable slip-collet, you must use a dab of RTV on top of the distributor seal at the location where the ‘split’ exists in the collet or oil will seep out of the slot.
Step 8: Apply RTV to location where 3 seals come together

Before assembling the spider to the engine, you must apply a dab (~1/4” sphere) of RTV to the location where the coolant seal gasket, port seal gasket and valley plate seal congregate to seal oil vapors from escaping at this location.

Step 9: Start to mount the spider to the valley plate

Apply medium-strength thread-locker to the (6) M6 bolt threads. Hand start all the bolts for the manifold spider. Tighten in this sequence, using at least 3 passes. The (6) M6 (5mm hex) bolts should reach final torque of 36 in/lbs. Do not over-torque.
Step 10:

Finish remounting of the spider to the engine

Hand start all the bolts for the manifold spider. Tighten in the sequence shown below, using at least 3 passes. The final torque of the (4) center 3/8” bolts should not exceed 25ft-lbs.

As it will be very difficult to get a torque wrench on these fasteners, with your wrench that you plan to use for these 4 bolts, check the tightness of the previously assembled valley-plate bolts (previously tightened to 25 ft-lbs) to get a feel of what 25 ft-lbs feels like.
III. Attaching Other Parts to Your Intake Manifold

Directions on installing fittings, pipe plugs & studs:
1. Do not over-tighten or cross-thread fittings, pipe plugs, studs or bolts in your manifold. Damage to threads or a cracked mounting boss may result unless caution is used when installing accessories.
2. Use Teflon tape or PST thread sealer or equivalent for all coolant fittings.
3. Re-use carburetor studs from your stock manifold.
4. The brass pipe thread inserts are designed to rotate and include dual o-rings for sealing. While these brass inserts can rotate, it is recommended to keep rotation to a minimum as these are not intended to be dynamic seals. Use a 7/8” open end or line wrench to hold the fitting while the pipe threads are tightened.
5. Use medium-strength thread-locker on threaded fasteners to maintain bolt torque during extreme service applications.

Carburetor installation:
CAUTION: You MUST use a new paper gasket. For non-OEM carburetor, install according to manufacturer’s instructions. Use gaskets furnished with carburetor.
1. Connect all fuel lines, linkage and throttle springs.
2. Connect all vacuum lines. Refer to your drawing or tags for correct placement.
3. Follow torque recommendations from carburetor manufacturer to avoid damage to carburetor mounting flanges. Normally, recommended torque is 60-80 in-lbs. Regardless of manufacturer recommendation, do not exceed 180 in-lbs torque for 5/16” nuts regardless of carburetor manufacturer recommendation to avoid damage to the spider inserts.
**Wiring**
Connect all electrical wiring as directed by your service manual.

**Thermostat:**
1. To ensure proper function of your thermostat, place it in a pan of boiling water. If questionable, replace it with one for the correct year and model of your vehicle.
2. Install thermostat with proper orientation. Apply RTV silicone on manifold surfaces using a new gasket and place it in position aligning holes. Apply RTV silicone to water neck surface and bolt threads. Position water neck. Apply medium-strength thread-locker on 3/8”-16 bolts and start bolts by hand and tighten to 20 ft-lbs. Do not over-tighten.
3. Make sure radiator drain is closed. Replace coolant.
4. Re-connect battery.

**Distributor:**
1. Use the provided distributor seal.
2. Depending upon alignment of distributor and gasket, you may wish to use RTV at this joint for additional security. Also as previously mentioned, if your distributor has an adjustable collet, RTV must be placed at this split in this joint to ensure no leakage.
3. Use the supplied distributor clamp plate or your warranty will be void (picture below)
4. Start fastener.
5. Tighten hold down clamp to 12-15 ft-lbs. Do not overtighten.
IV. Service & Replacement parts:
The seals, coolant system pipe thread inserts, compression limiters and the vacuum fitting are designed to be serviced and replaced as needed.

#4601 Replacement 3/8” Brass Pipe Insert Assembly

#4602 Replacement 3/8” Vacuum Fitting

#4600 Valley Plate Compression Limiters
(Note: Valley compression limiters are silver in color, Spider compression limiters are gold/brass in color—do not interchange limiters between the spider and valley plate.)

#6300 Intake Manifold Bolts – 3/8” -16

#6299 Intake Manifold Bolt Washers

#4550 SBC Seal Kit