



VG30DE(TT) Top-Feed Fuel Rail Kit (Bolt-On) Early or Late Lower Plenum

revised 5/22/2022

Always verify you have the most current revision by comparing the date above to the date listed next to the links on our Downloads webpage: <https://www.bde-performance.com/downloads.htm>

Parts List

(Qty)	Description
(2)	Fuel Rail assembly
(2)	Mount assembly
(6)	Viton o-ring injector cushions (1/2" OD)
(6)	Viton o-ring for injector plenum adapters (1" OD)
(1)	OEM upper plenum replacement bolt for throttle cover mount
(4)	10-24 x1.125" machine screws for fuel rail to mount blocks
(6)	Plenum injector adapter clamps
(6)	Plenum injector adapters
(6)	M6x1.0x12 Allen bolts and washers for plenum injector adapter clamps
(4)	-6ORB to -6AN adapter fittings
(1)	Fuel temp sensor ground wire
(1)	Fuel temp sensor ground spade (installed on one fuel rail)

Tools needed for installation

- 10mm socket (ARP upper plenum)
- 5/32" Allen wrench (fuel rail to mount blocks)
- 4mm Allen wrench (throttle cable bracket)
- 5mm Allen wrench (plenum injector adapter clamps)
- 11/16" wrench (-6AN o-ring adapters)
- Vaseline or petroleum jelly
- Lubricating oil or assembly grease

Cores

Only completely stock cores will be accepted for core exchange; powder coated (PC'd), chromed, painted plenums, or ported plenums will not be accepted for core exchange. BDE can modify PC'd and throttle cable brackets, to be returned to the customer, but PC'd or chromed balance tubes cannot be modified due to the difficulty in removing either coating to allow for proper welding.

If your plenums have been PC'd, chromed, polished, ported or gasket matched, please send them in advance and BDE will modify and return your parts back to you. Note, the modifications will affect these surfaces; BDE does not re-PC, re-polish, or re-chrome the modified areas.

The cores needed are:

- Upper plenum
- Crossover/balance tube, Z32 TT or NA type only (NO J30 type)
- Throttle cable bracket

- ✓ Check for any stripped or damaged threaded holes and bosses in your core upper plenum, these include: throttle body/linkage mounts, coil mounts, balance tube bolt holes, idle air valve bolt holes – a \$15 charge per stripped bolt hole and \$30 per broken bolt boss will be deducted from the core charge refund, other damage may be accepted at BDE's discretion with a reduction of core charge refund depending upon the severity of the damage.

- ✓ Check all gasket surfaces for gouges or damage – gasket surfaces should only exhibit OE machining marks and should not have been cleaned with rotary abrasives. Damage to gasket surfaces may be accepted at BDE's discretion with a reduction of core charge refund depending upon the severity of the damage.

- ✓ Package everything with multiple layers of cardboard between parts to prevent them from damaging each other during shipping.

Modifications

Upper Plenum, Early and Late Types

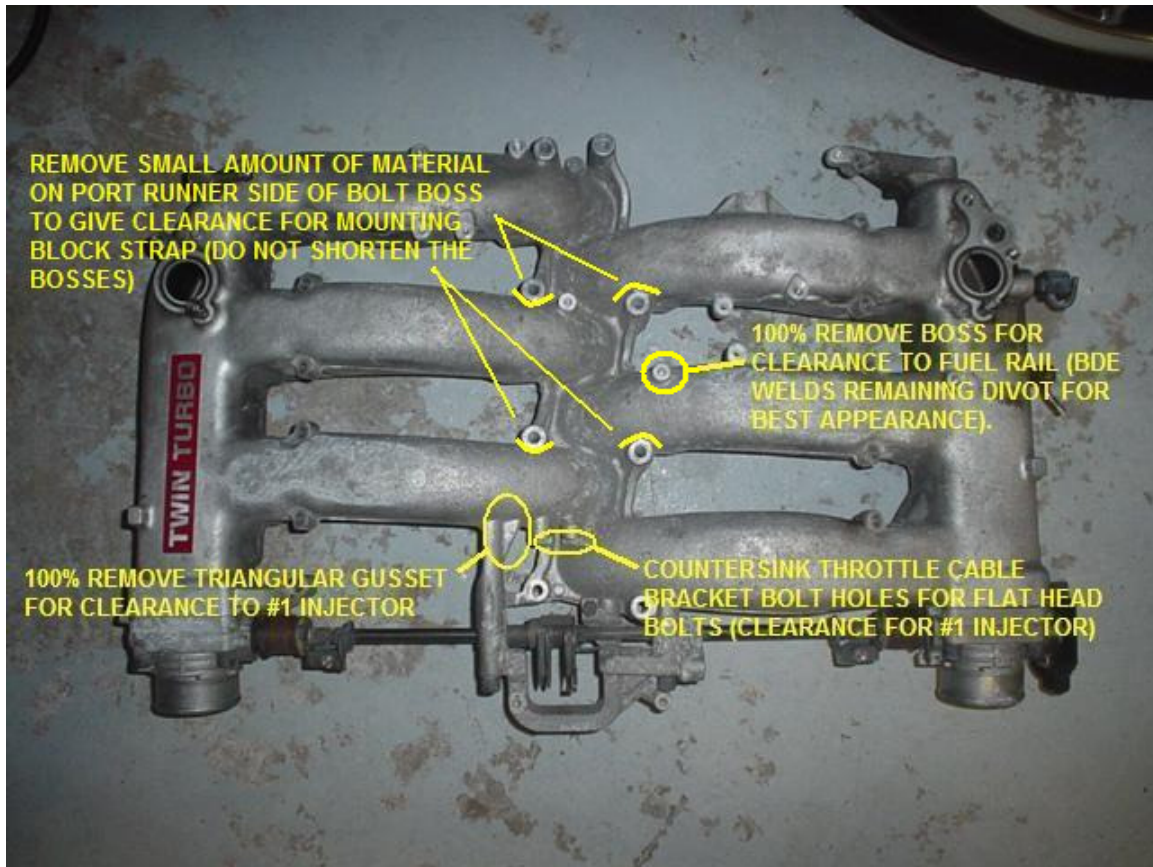


Figure 1A – Early type (90-93NA, 90-94TT) upper plenum modifications

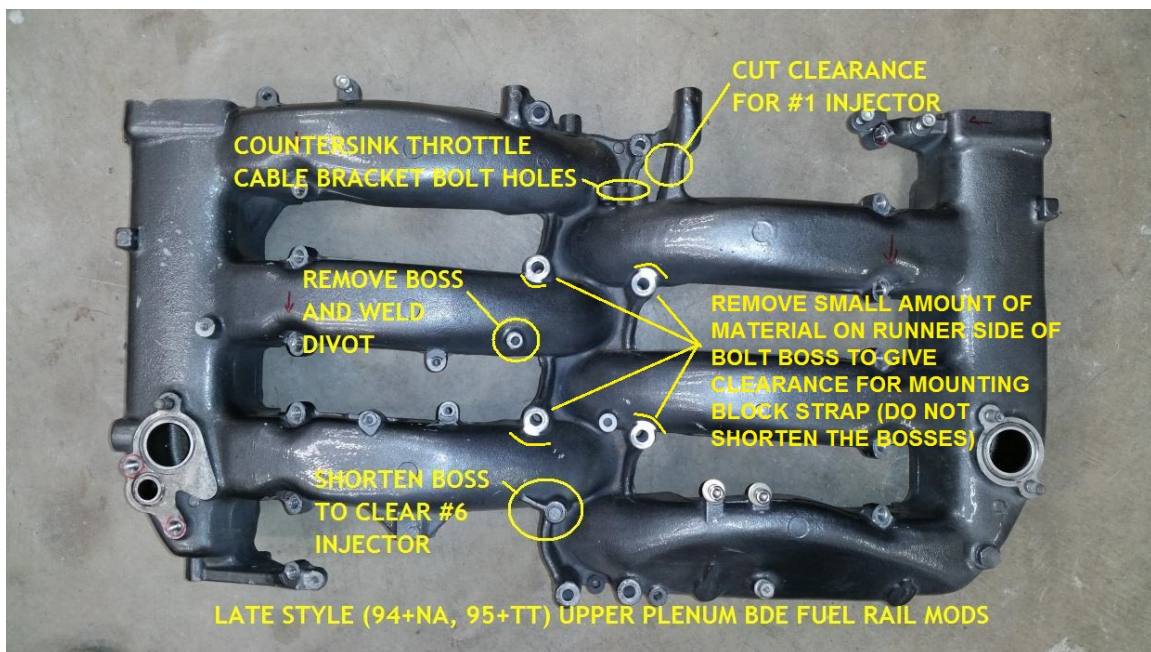


Figure 1B – Late type (94+NA, 95+TT) upper plenum modifications

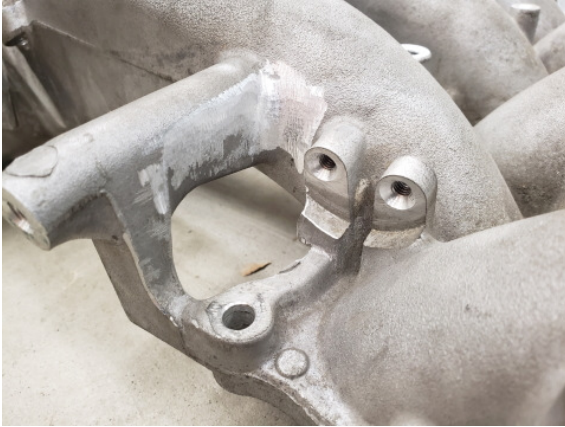


Figure 2 – Early mod for #1 injector clearance



Figure 3 – Late mod for #1 injector clearance



Figure 4 – Early and Late #3 runner boss removed



Figure 5 – Late #5 runner mod for #6 inj clearance

Crossover/Balance Tube Mods

The upper plenum crossover/balance tube needs to have its idle air inlets modified for clearance. BDE modified balance tubes feature -8 AN adapters to allow plumbing the idle air inlets (IACV and Air Regulator) with AN fittings and hose (see figures 6 and 7). Modified crossover tubes are available on a core exchange basis. Recommended AN fittings are: one -8 60° push-lock type hose end for the Air Regulator hose (note: -8 60° push-lock is unique and is only available from Fragola or XRP in various colors), one -8 straight and one -8 90° hose end for the IACV hose. These fittings and hoses are not included with the BDE fuel rail kit.

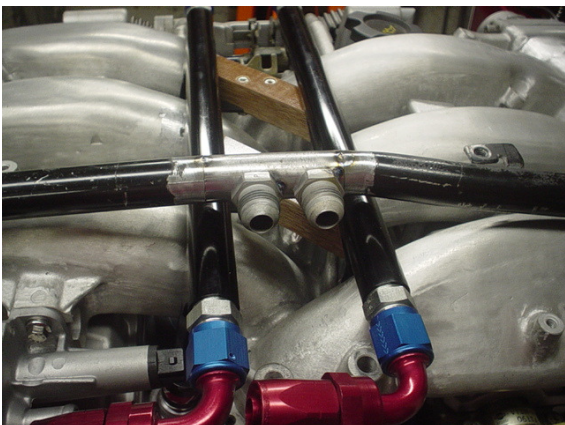


Figure 6 – Modified balance/crossover tube



Figure 7 – Idle air plumbed with AN hose fittings

Throttle Cable Bracket Mods

The stock throttle cable bracket cruise control cable and mount bolt interfere with the passenger side fuel rail and #1 injector; cruise control will not work with BDE Top-Feed fuel rails. The BDE modified throttle cable bracket has the cruise control cable slot deleted as in figure 9 and the bolt holes are enlarged to allow the use of flat head bolts. If you are DIYing the upper plenum, the holes in the upper plenum will need to be countersunk for clearance to the bolts supplied with the modified throttle cable bracket.



Figure 8 — countersunk bolt holes



Figure 9 — cruise control deleted

Installation

Lower Plenum Injector Adapters

It is important that you take the time to clean the lower plenum injector wells (figures 14 and 15) to allow the bolt-on injector adapters (figures 10 and 11) to be installed without dirt or debris getting trapped between. Plug all exposed holes and pipes with rags prior to using a spray cleaner or compressed air to keep dirt out of the engine.

Test fit the adapters without o-rings in every injector well to verify there are no burrs that could damage the o-rings or cause interference during installation.

Lubricate the o-rings and install one each onto the plenum adapters (figure 12 and 13).

Lubricate the plenum injector wells and press an adapter assembly into each well. The best way to press the adapters into place is to use a block of wood to push with. **DO NOT USE THE CLAMPS** to try to press the adapters in, they are only meant to hold the adapters in place after installation. After the adapter is fully seated in the injector well, install the clamp, lubricate the bolt threads, and tighten the bolt (figures 14 and 15).



Figure 10 – Early plenum injector adapter parts



Figure 11 – Late plenum injector adapter parts



Figure 12 – Early type o-rings installed



Figure 13 – Late type o-rings installed



Figure 14 – Early lower plenum injector adapters installed



Figure 15 – Late lower plenum injector adapters installed

Upper Plenum

Lubricate the threaded holes in the lower plenum and install the upper plenum loosely with the front and rear bolts to locate it and prevent movement.

Injectors

Always lubricate injector o-rings with Vaseline or petroleum jelly prior to assembly to prevent damage.

Rotate the injectors so that their electrical connector doesn't interfere with the intake valve cover.

The bolt-on version of BDE Top-Feed Fuel Rails will work with any top-feed injector with 14mm OD o-rings and 48mm length between o-ring ends (figure 16).

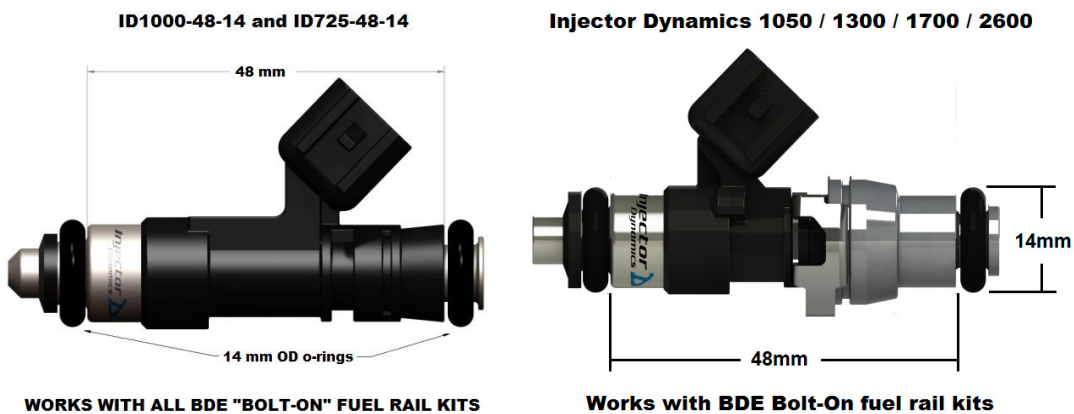


Figure 16 — ID 725/1000/1050X/1300X/1700X/2600X - 48mm long x 14mm OD o-rings

Mounting Blocks

The mounting block assemblies use a strap to bridge the upper plenum bolt bosses. Due to core shift and OEM machining tolerances, you may find the strap to have some interference with the adjacent port casting (see figure 18) which will not allow the mount face to be parallel to the fuel rails; BDE modified upper plenums are machined in this area for hassle-free installation, if you DIY'd the upper plenum mods, you can either grind the plenum or grind the strap to allow the assembly to be rotated so that the mounting faces are parallel to the fuel rails.



Figure 17 — billet mounting blocks

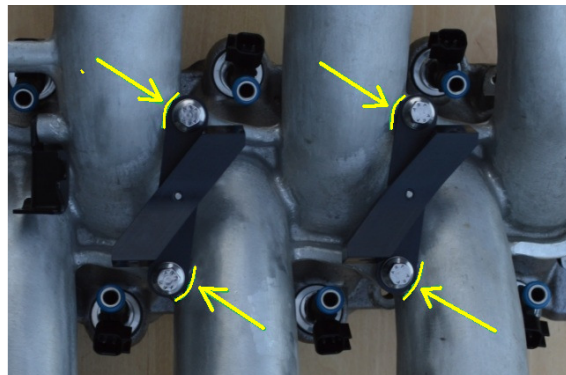


Figure 18 — grind for mounting block alignment

Fuel Rails

Apply Vaseline or petroleum jelly to the injector's top o-rings and inside the BDE fuel rail nozzle ends, then place the BDE fuel rail onto the injectors. It is easiest to first start one injector on the end and then “rock” the fuel rail onto the remaining two injectors.

Attach the fuel rails to the mounting blocks with the 10-24 stainless Allen head bolts.

Only one fuel rail is threaded for the temp sensor (figure 19) and it can be installed on either side of the engine; BDE recommends installing this fuel rail on the USDM driver side so the sensor is at the back of the engine. Attach the ground wire to the fuel rail spade opposite of the sensor hole and to the lower plenum M6 bolt hole located near the #6 port (figure 20).



Figure 19 — Fuel temperature sensor threaded hole

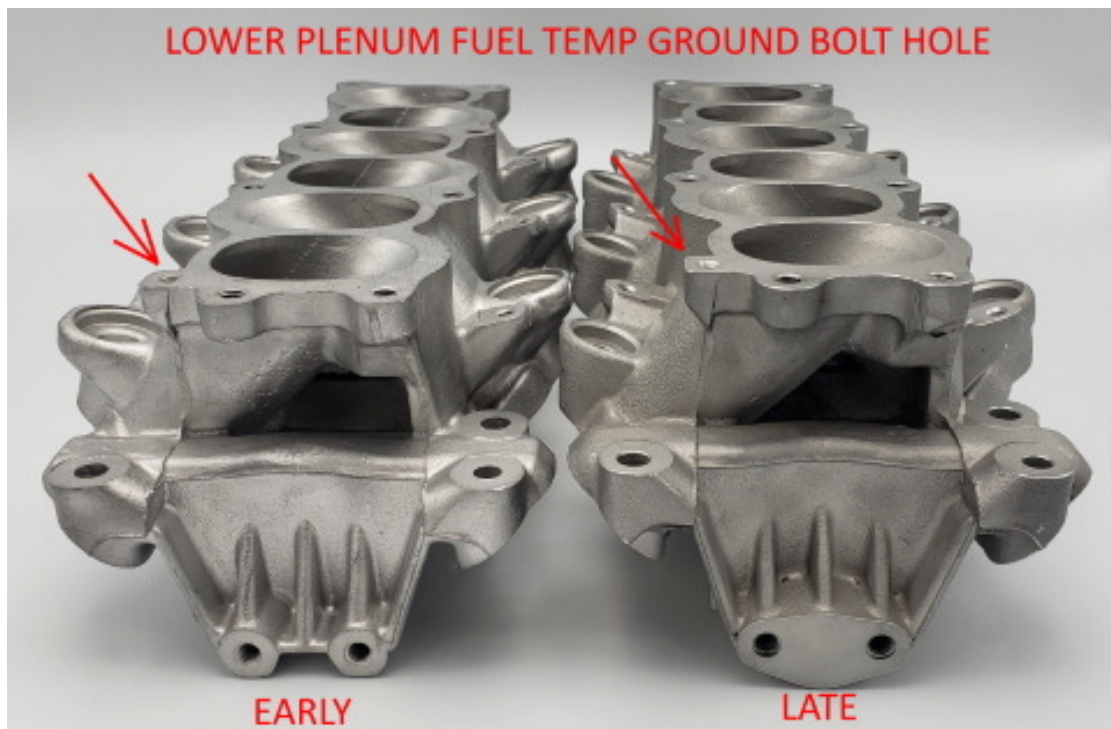


Figure 20 — Fuel temperature ground wire bolt hole

Throttle Cable and Bracket

Install the throttle cable bracket onto the upper plenum. To route the throttle cable, it is easiest to place it over the plenum in an “S” shape so that it goes under and behind the USDMM driver side fuel rail and comes up in between the fuel rails and on top of the mount blocks.

Plenum Crossover/Balance Tube

Install the crossover/balance tube after you have attached the injector wiring and installed the ignition coils. You will need to make an idle air hose using one each -8AN 90° and -8AN straight hose ends to attach to the idle air inlet/outlets (figure 7). If you’re still using the Air Regulator, you will also need a -8AN 60° push-lock type hose end and appropriate hose. The -8 push-lock hose will slide onto the Air Regulator if you lubricate it.

Hood Clearance

Hood clearance is less than with stock fuel rails, but BDE Top-Feed fuel rails will fit under the stock Z32 hood as long as you are using motor mounts that do not raise the engine height in the car. The tightest spot is the front of the fuel rails – using straight hose ends is the worst case scenario, using bent hose ends will provide more clearance. Keep in mind that stock motor mounts do allow some degree of engine movement under load. **BDE will not be held responsible for hood damage caused by poor plumbing installation or faulty motor mounts.**

Plumbing

The fuel rail’s inlets/outlets on each end are machined for -6 o-ring ports (9/16” -18 threads). -6 o-ring AN adapters are included. Use some oil on the threads and Vaseline or petroleum jelly to lubricate the o-rings prior to assembly. Always lubricate AN fittings when assembling them to their hose. Due to the endless configurations and color combinations that are possible with AN hose, BDE does not offer any plumbing kits.