



VG30DE(TT) Top-Feed Fuel Rail Kit (Bolt-On)

revised 6/2/2015

Parts List

(Qty)	Description
(2)	Fuel Rail assembly
(6)	Viton o-ring injector cushions (1/2" OD)
(6)	Viton o-ring for injector plenum adapters (1" OD)
(8)	ARP SS Upper plenum bolts w/washers (qty 7 @75mm long, qty 1 @35mm long)
(1)	OEM upper plenum replacement bolt (included only when no ARP bolt kit is selected)
(2)	Mount assembly
(4)	10-24 machine screws
(6)	Plenum injector adapter clamps
(6)	Plenum injector adapters
(6)	M6x1.0x12 Allen bolts and washers for plenum injector adapter clamps
(2)	SS Flat head 6mm bolts for modified throttle cable bracket
(1)	VG30DE upper plenum w/bosses removed for clearance
(1)	VG30DE throttle cable bracket with cruise control slot deleted
(1)	VG30DE crossover/balance tube w/idle air inlets modified for clearance
(6)	Injector Dynamics injectors, _____ cc/min with wire harness clips
(4)	-6 AN adapter fittings
(1)	Fuel temp sensor ground wire
(1)	Fuel temp sensor grounding lug (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, or ported cores will not be accepted for core exchange. BDE can modify PC'd plenums 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 will be deducted from the core charge refund, broken bosses 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 Mods

The upper plenum needs several bosses removed for clearance and the throttle cable bracket bolt holes need to be countersunk (see Figures 1 and 4).

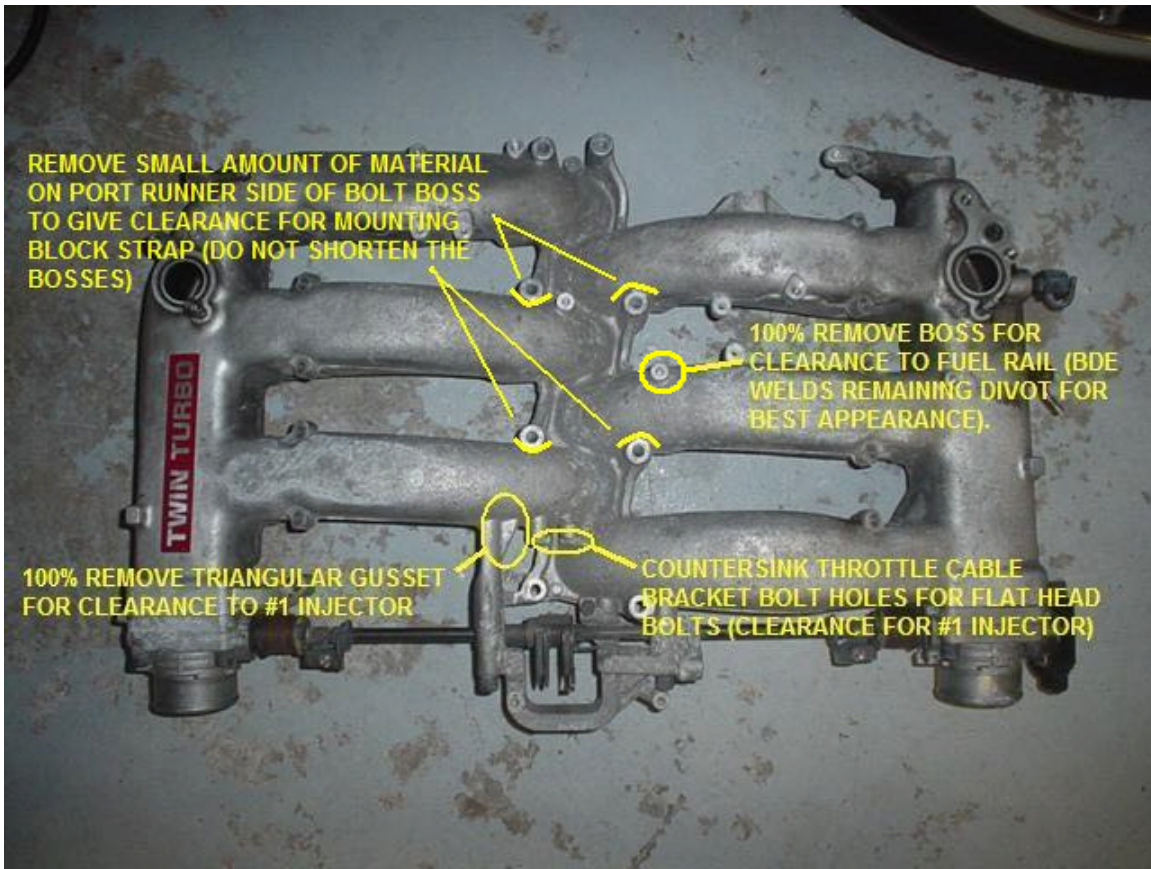


Figure 1 — Upper plenum modifications

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 2 and 3). 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 2 — Modified balance/crossover tube



Figure 3 — Idle air plumbed with AN hose fittings

Throttle Cable Bracket Mods

The stock throttle cable bracket also holds the cruise control cable; due to interference with the passenger side fuel rail and #1 injector, the cruise control cable will not work with BDE Top-Feed fuel rails. The BDE modified bracket has the cruise control removed as in figure 5 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 supplied bolts.



Figure 4 – countersunk bolt holes



Figure 5 – cruise control deleted

Installation

Plenum Injector Adapters

It is important that you take the time to clean the lower plenum injector wells (figure 6) to allow the bolt-on injector adapters (figures 7 and 8) 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 small (1/2" OD) o-ring cushions and install one into each adapter (figure 8, left side) – a good way to ensure the cushion is properly seated is to use the blunt end of a plastic pen to push the cushion into place.

Lubricate the large (1" OD) o-rings and install one each onto the plenum adapters (figure 8, right side).

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 (figure 9).

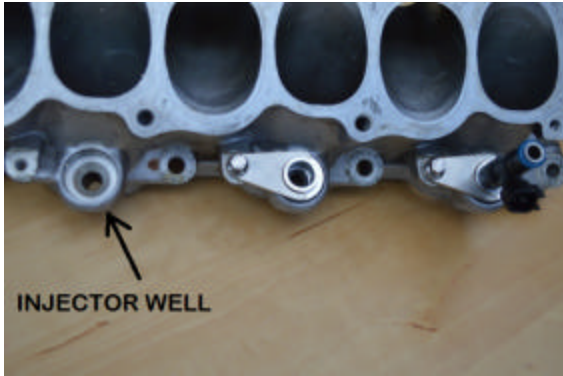


Figure 6 – plenum injector well



Figure 7 – plenum injector adapter parts



Figure 8 – o-rings installed



Figure 9 – plenum injector adapter 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.

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 (see figures 14 and 15).



Figure 14 – ID725/1000 - 48mm long



Figure 15 – ID850/1300/1700/2000 - 48mm long

Mounting Blocks

The mounting blocks are machined aluminum; as always, lubricate all threads prior to installing bolts to prevent damage and/or stripped threads.

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 11) 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 10 – billet mounting blocks

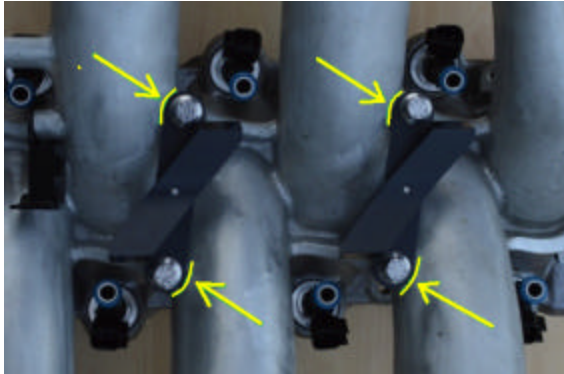


Figure 11 – mounting block alignment

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.

New for 2014 is the addition of a boss to mount the OE fuel temp sensor (figure 13). Only one fuel rail is threaded for the temp sensor 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. The fuel rail with the sensor boss also features a quick-connect spade on the other side of the rail to attach a ground wire – this wire will need to be grounded to the engine for the temp sensor to function properly.

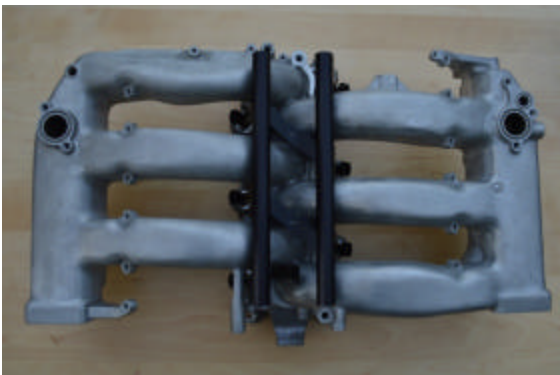


Figure 12 – Fuel rails/plenum assembly mocked up



Figure 13 – Fuel temperature sensor boss

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 USDM 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 a idle air hose using one each -8AN 90° and -8AN straight hose ends to attach to the idle air inlet/outlets (figure 3). 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 drastically raise the engine height in the car. The tightest spot is the front of the fuel rails – using -8 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.

With the fuel rails easily accessible now, plumbing scenarios are endless. Below are some possible scenarios for plumbing the rails.

