PRELUDE
ENGINEERING LLC
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88-91 Honda Prelude B-series AWD Swap Kit

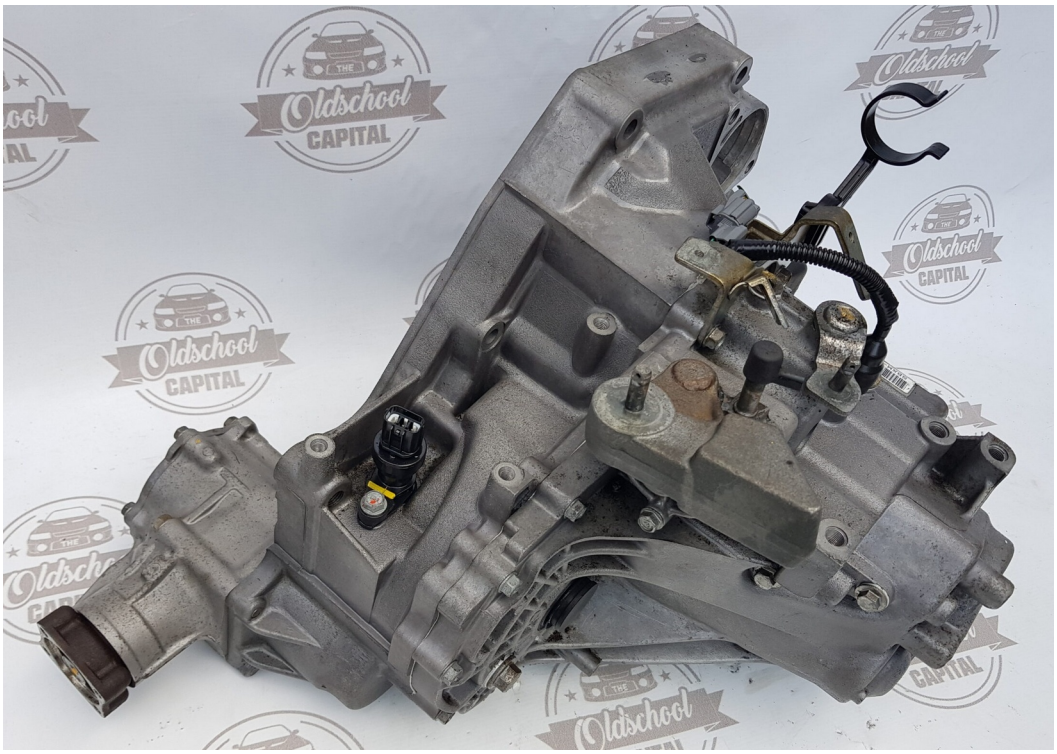
Installation Instructions

(V2 WIP)

These mount brackets work with the following B-series stuff:

Any VTEC or non-VTEC block/head combo. B20b, B20z, B16, B17, B18a, B18b, B18c, etc.
1996-2001 CRV AWD manual transmissions only. *The transmission code for this is **SBXM**, there may be other trans codes from some markets but this is the most common one.*

You can easily identify this transmission due to the transfer case and the fact that it uses shifter cables, not rods like FWD B-series transmissions:



Besides the engine/transmission what other stuff do you need?

OE Mounts:
You will use a complete set of OE 3g Prelude manual transmission mounts with these swap brackets. The timing side mount should be the 88-89 style.

Axles:
Use the 94-01 Integra or 97-01 CR-V intermediate shaft.

88-89 Prelude (Small hubs): Use 94-01 Integra LS, RS, GSR axles (Tested and working)

90-91 Prelude (Large hubs): Use 98-01 **JDM** Integra Type-R axles *(They must be from the JDM Type-R, because the USDM Type-R uses the smaller 88-89 style splines. Alternatively you can get regular Integra axles and just swap the outer CV joint from your 90-91 Prelude axles onto the Integra axles.)*

90-91 Additional: The following axles *should* fit according to listed lengths, but are not yet tested:

Right: 90-93 Accord, 97-01 Prelude Type-SH*
Left: 97-01 Prelude*, 02-06 RSX Type-S* (NOTE: You need the RIGHT RSX Type-S axle to fit the LEFT side on the Prelude, it must have a female inner CV.)

*Requires trimming or removing inner hub dust shield

Clutch Slave Cylinder:
97-01 CRV

Wiring Harness:
We recommend buying a B series harness from Rywire.

Radiator Hoses:
For the upper hose you need this one: **Gates 21229**
Alternatively, you can build an upper hose out of generic silicone pieces:
Order the following part numbers from Pegasus Auto Racing Supplies:
E135.32-BLACK (135 ° bend)
E45.32-BLACK (45 ° bend)
HJ32 (1 ¼" coupler)
You can replace "BLACK" with "RED" or "BLUE" if you want different colors.

Lower hose: Use one from a 98-01 CRV, the stock Prelude hose will probably work as well.

Power Steering Pressure Hose:
We can make you a hybrid power steering pressure hose for this swap:
prelude-engineering.com/engine-swap-hybrid-power-steering-line-service/

Fuel Setup:
This swap requires installing a fuel cell or custom gas tank.

Rear AWD Parts:

Hubs:
2000-2006 Honda Insight front hubs, use 3g Prelude rear wheel bearings
The new hubs require caliper bracket spacers to center them on the rotor. These are supplied with your swap kit.

Axles:
Set of 97-01 CRV rear CV axles. WARNING: If you are running in FWD mode (no rear axles) you MUST use rear axle stubs in the hubs and these are what hold the wheel bearing together.

Differential:
97 - 2011 CRV or Element rear differential. (Research this, the later year diffs have improvements)
OR
88 -91 Civic RT4WD aka. "Wagovan" rear differential.

You can chooses which differential mounts you want when ordering the swap kit.

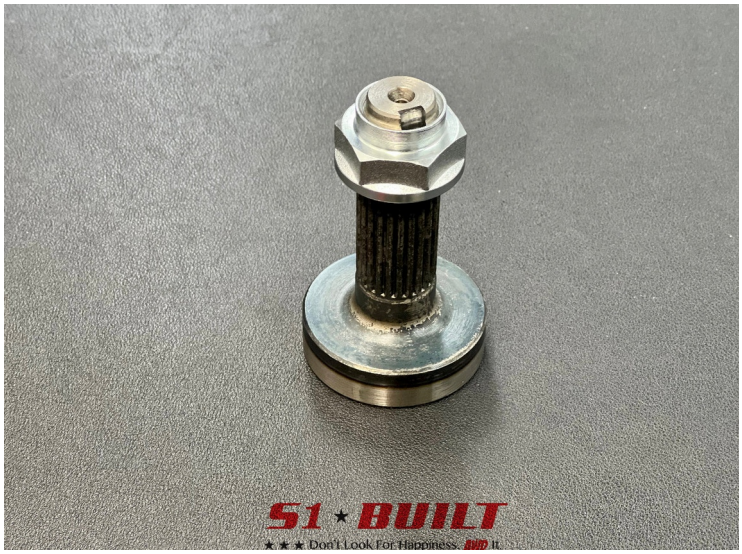
Driveshaft:

You will need a custom length driveshaft. Because there are a number of different ways you can go with this Prelude Engineering can not supply any parts for the driveshaft.

Please see the custom driveshaft info near the end of these instructions.

We suggest having the driveshaft made by S1 Built: s1built.com

S1 Built also makes billet carrier bearing mounts and axle stubs.

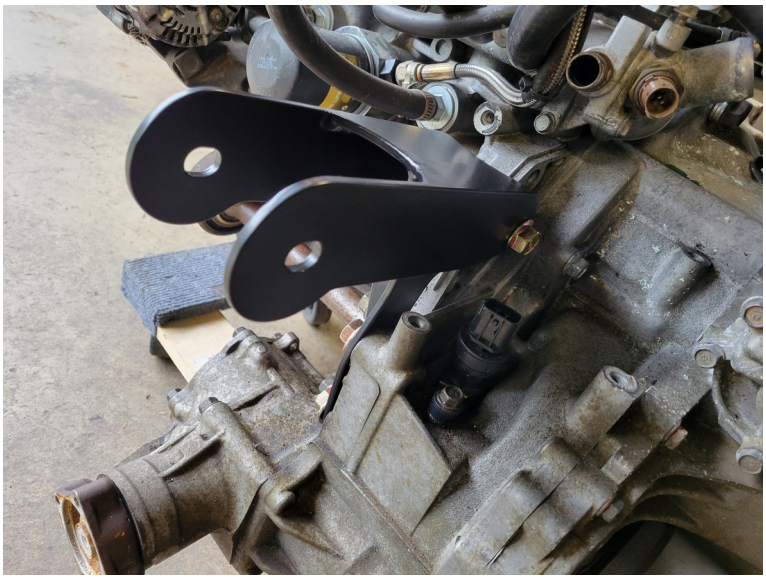


Basic Installation Procedure:

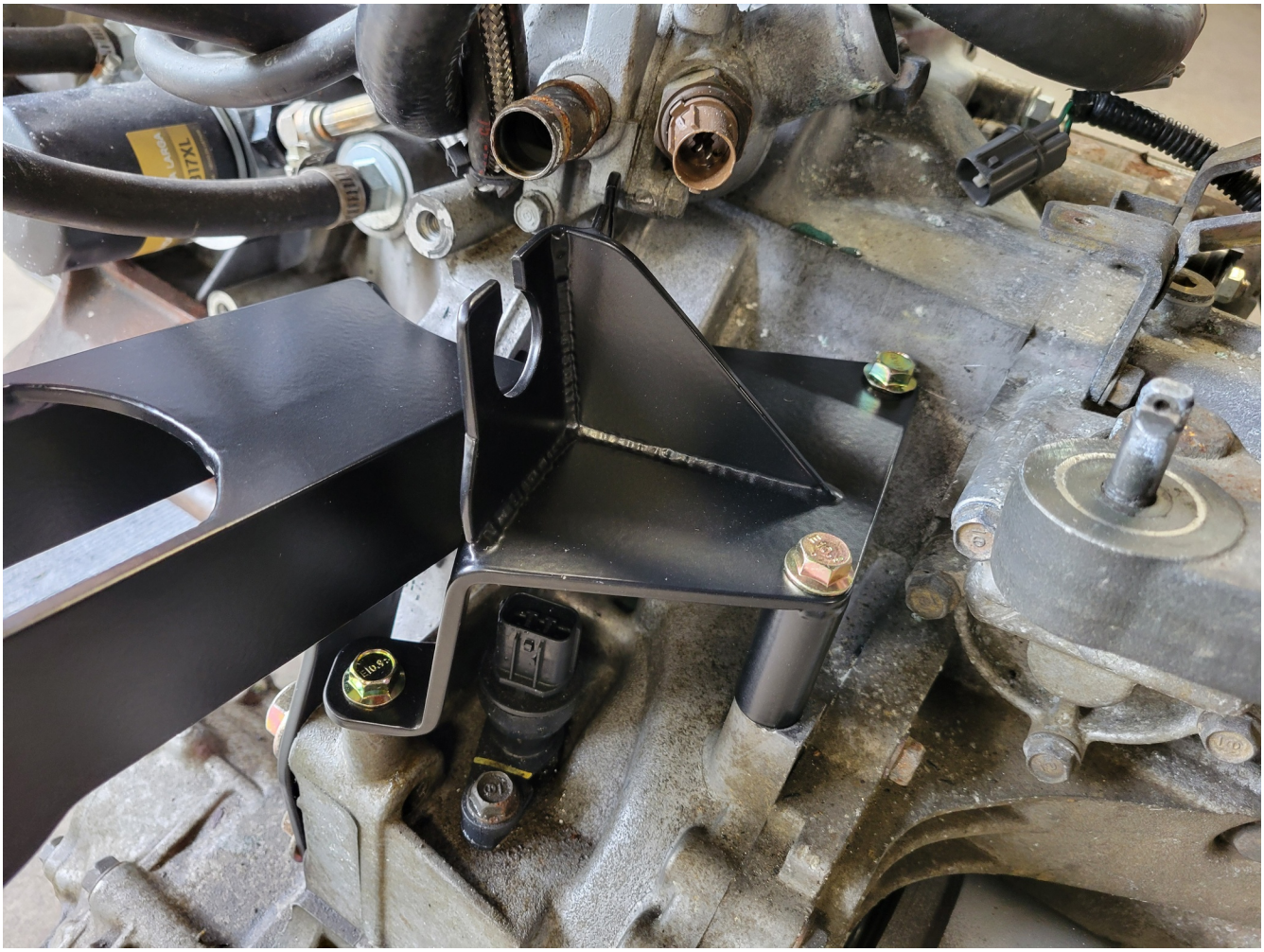
NOTE: These instructions are not meant to be a complete detailed B series AWD engine swap guide. They will hit the major points and most minor points but not necessarily every single detail.

Starting with an empty engine bay install your stock front and rear manual transmission B20a/B21a mounts onto the subframes. You will leave out the side mounts until the engine is in.

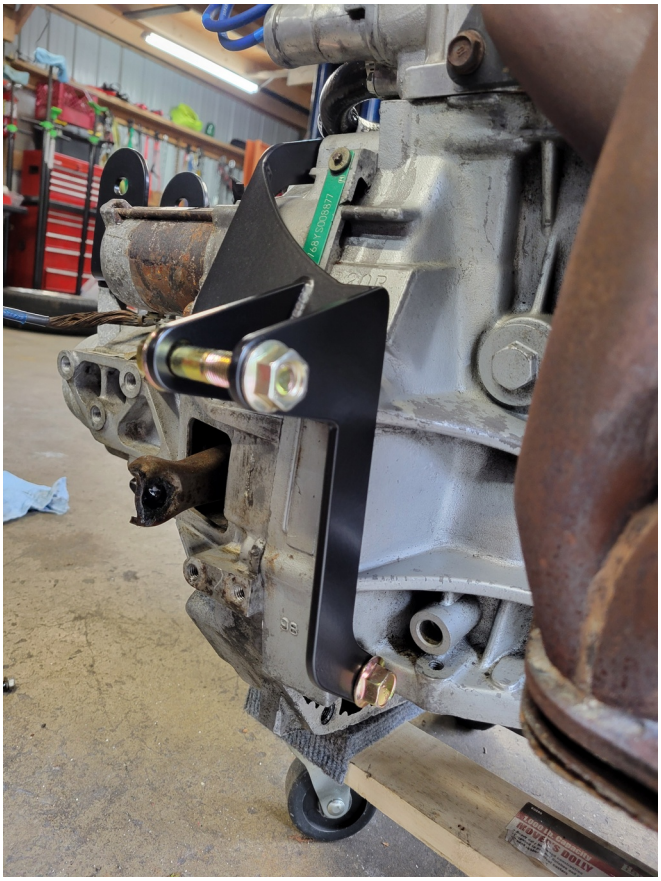
Install the rear mount bracket onto the motor. It goes on just like the stock bracket:



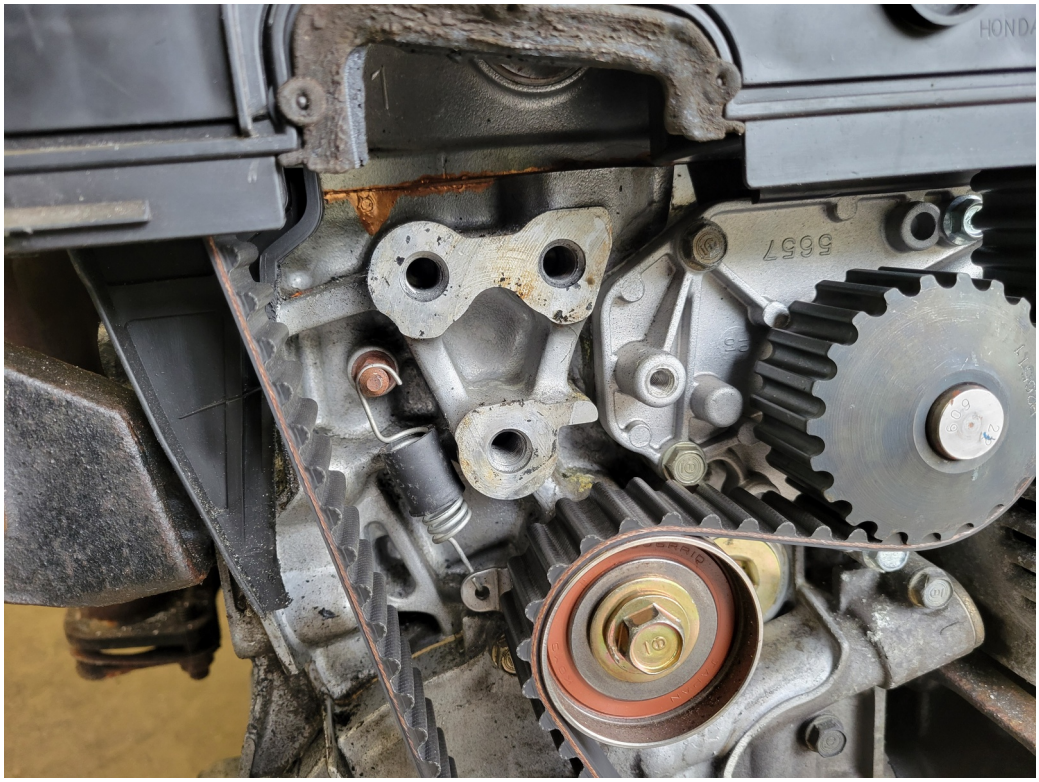
After installing the rear bracket install the new shifter cable bracket:



Install the front mount bracket onto the motor. Because B-series motors don’t use a front mount this bracket bolts onto the engine using 3 of the transmission bell housing bolts. There are 2 different front swap bracket styles, one that mates to the OE Prelude mount and one that mates to the Prelude Engineering traction bar:

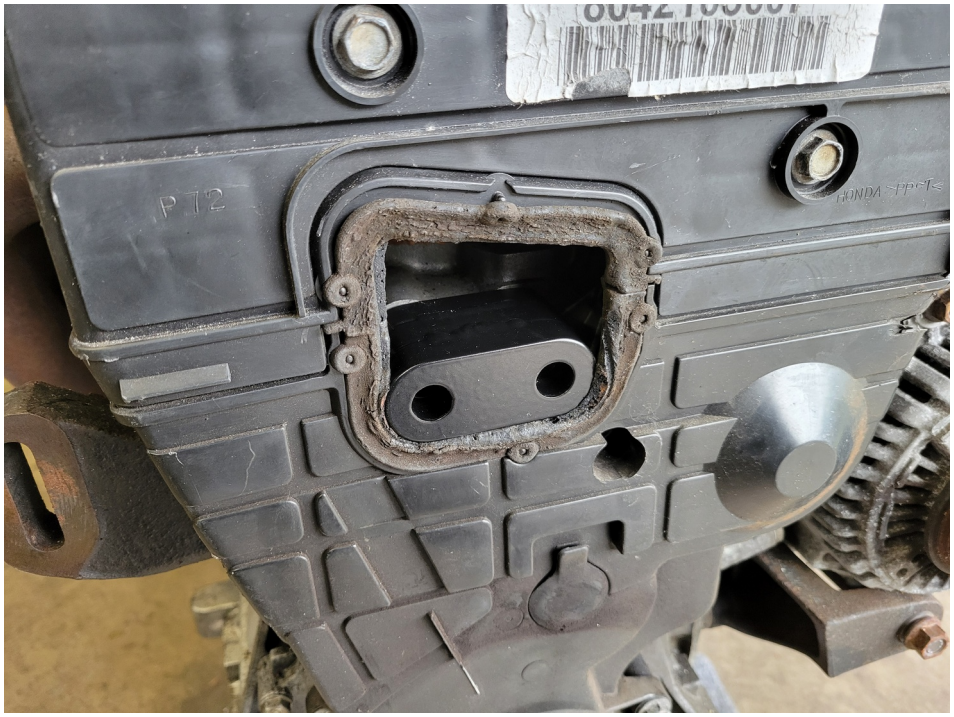


To install the timing side bracket start by removing the crank pulley and the lower timing cover. Next remove the factory mount bracket from the block, you should be at this point:



Install the timing bracket base onto the block with all 3 bolts:

Torque the bottom bolt and remove the 2 top bolts then install the lower timing cover:

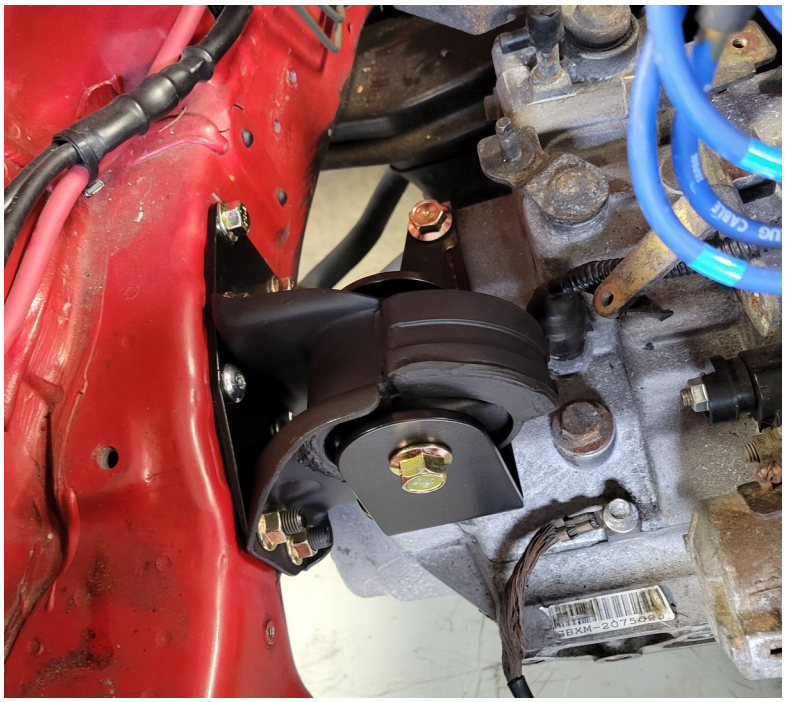


Install the mount side of the bracket using the 2 bolts you just removed:

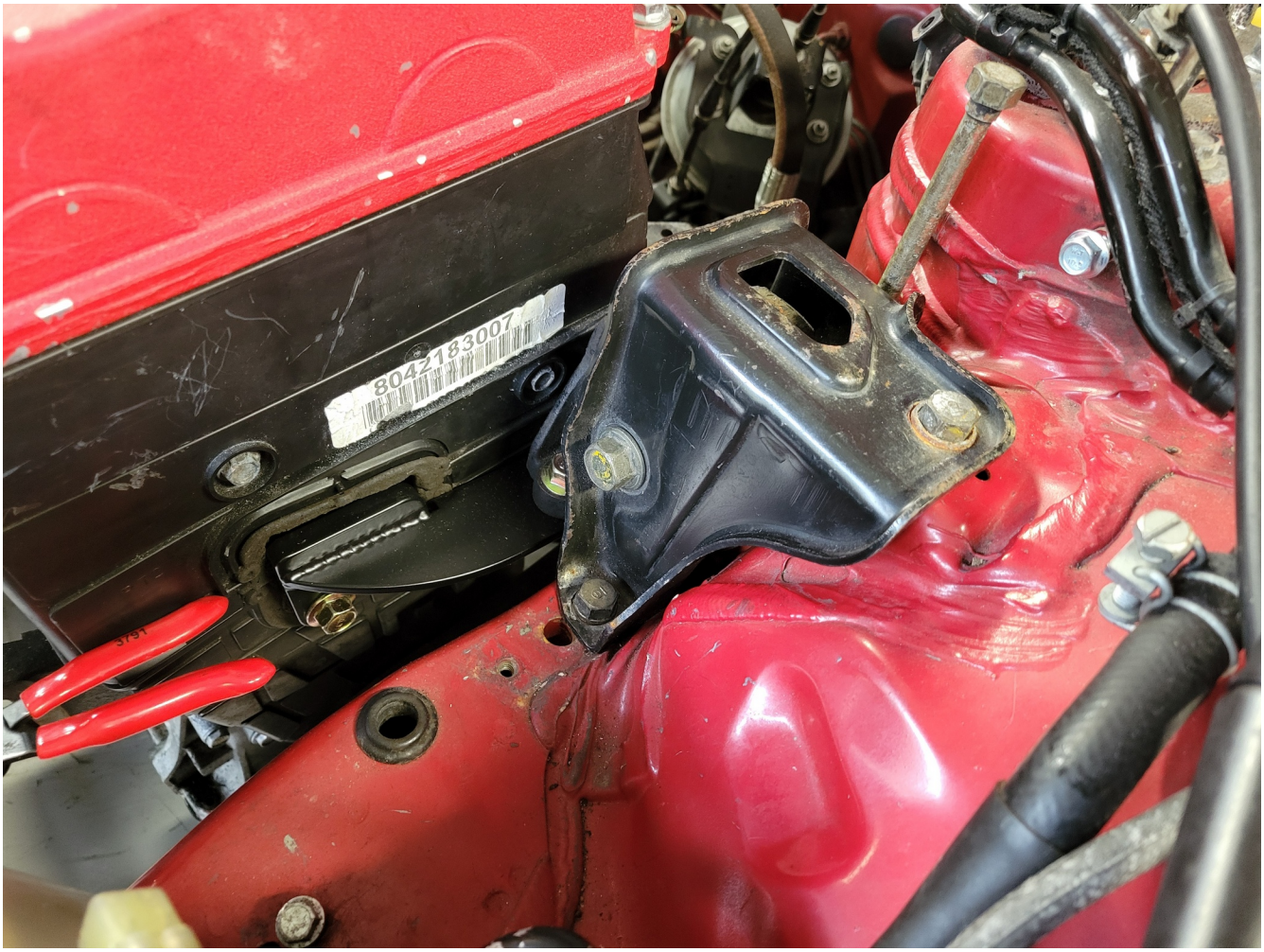
Leave the crank pulley and transmission mount bracket off until the motor is installed in the bay.

Drop the motor into the bay aligning the front and rear mount bracket holes with the holes in the front and rear mounts. Slip the mount bolts through but don't tighten them yet:

Install the transmission bracket onto the transmission and then install the 3g Prelude manual mount:



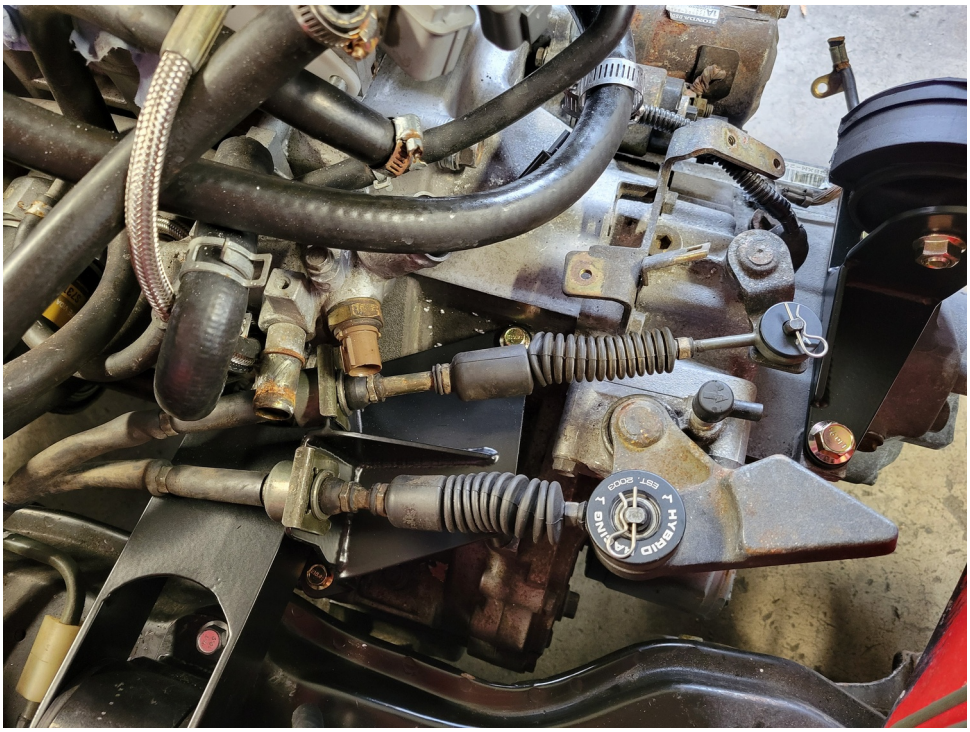
For the timing side install a B20a style mount and chassis side bracket. You can not use a B21 mount and chassis bracket:



Now tighten the front and rear mount bolts and the engine is installed.

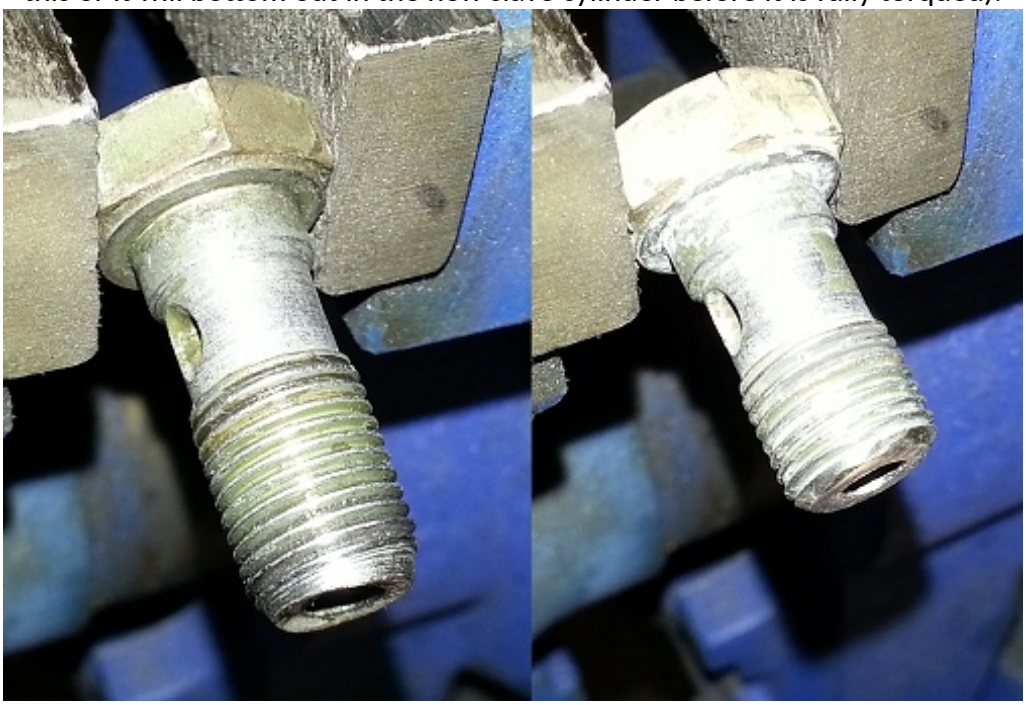
Shifter Cables:

Install your 3g Prelude shifter cables onto the new bracket as shown:



Clutch Hydraulics:

For the clutch hydraulic system you will use everything from the 3G setup except the clutch slave cylinder. First shorten the 3G slave cylinder bolt a few mm by cutting or filing it down (you must do this or it will bottom out in the new slave cylinder before it is fully torqued):



Now you can install the soft line onto the 94-01 Integra slave cylinder like this:

There is tight clearance between the slave cylinder and front mount bracket so you may need to install the soft line first, then bolt the slave cylinder onto the transmission.

Power Steering:

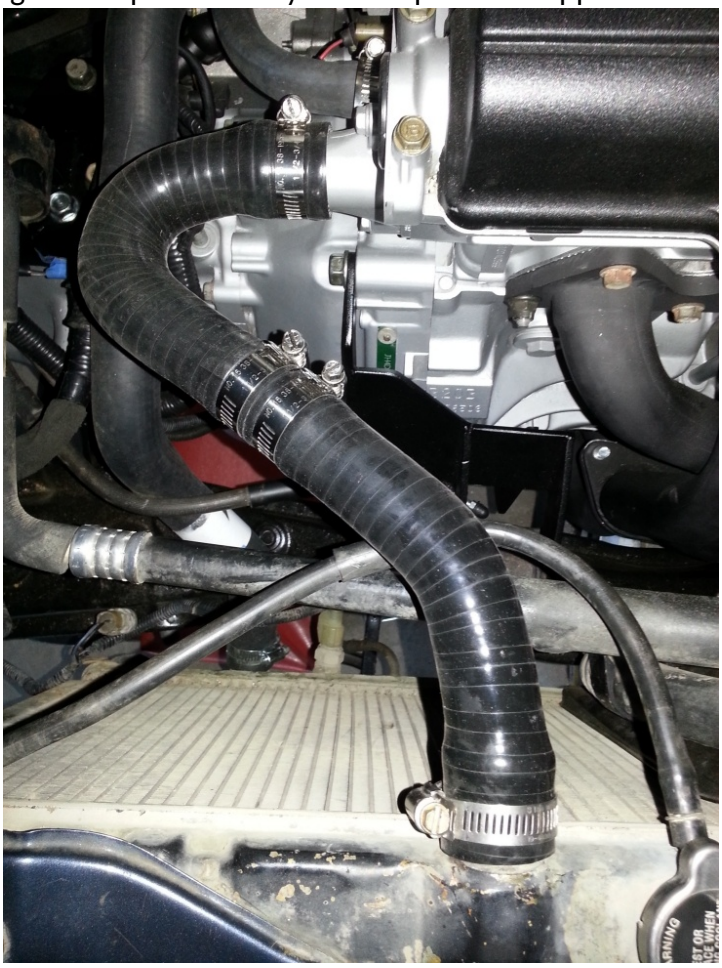
For power steering pulley clearance you will need to remove the reservoir from it's mounting bracket, remove the bracket, and zip tie the reservoir a little further to the front and side of the car (Like it's done on H-swaps).
For the feed line combine a 98-01 CRV feed hose with the stock 3G feed hose using a coupler like this:

You might need to do something different depending on which P/S pump you are using but this works for the B20b pump.

You will also need a shorter P/S belt for maximum clearance. Here are some part numbers:
VTEC/P72 Bracket and P/S Pump: **Gates K040353**
CR-V B20B/Z Bracket and P/S Pump: **Gates K040347**

Radiator Hoses:

Install the **Gates 21229** upper radiator hose (may need some trimming) or combine the Pegasus Auto Racing hoses using the coupler so that you end up with an upper hose that looks like this:



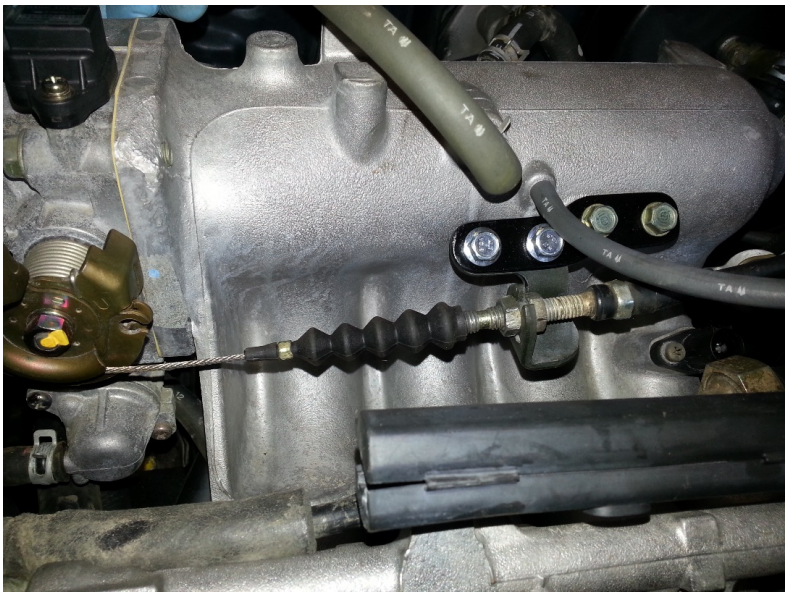
Speed Sensor:

There is no room to install the 3g Prelude speed sensor. Use the 97-01 CRV sensor and loop the small power steering hoses that were going to the 3g Prelude sensor. This will reduce the amount of assist you have under 20mph.

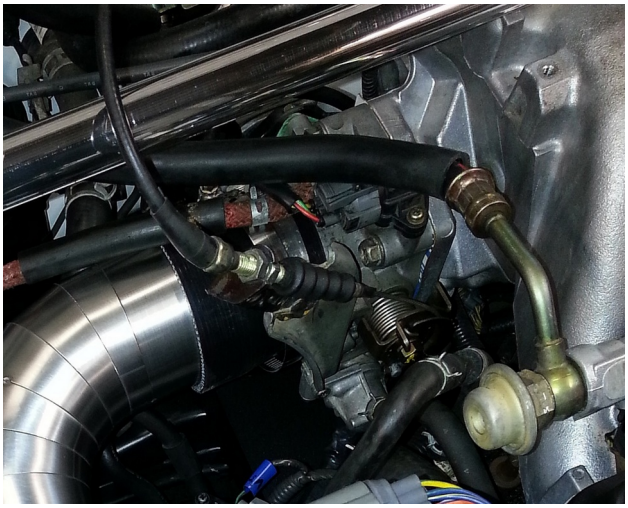
Other Connections:

All the other stock 3G lines should hook up to the motor with little tweaks and/or slightly longer sections. (Brake booster hose, heater hoses, fuel supply and return line, vacuum, etc.)

The throttle cable will most likely need an adapter. There are a number of different B-Series intake manifolds and each will probably require a different solution. Right now we can supply an adapter for B20b manifolds:



Here is what someone has done for their B18C swap with a GSR manifold. He welded the Prelude throttle bracket onto the GSR bracket. The throttle cable is just long enough:



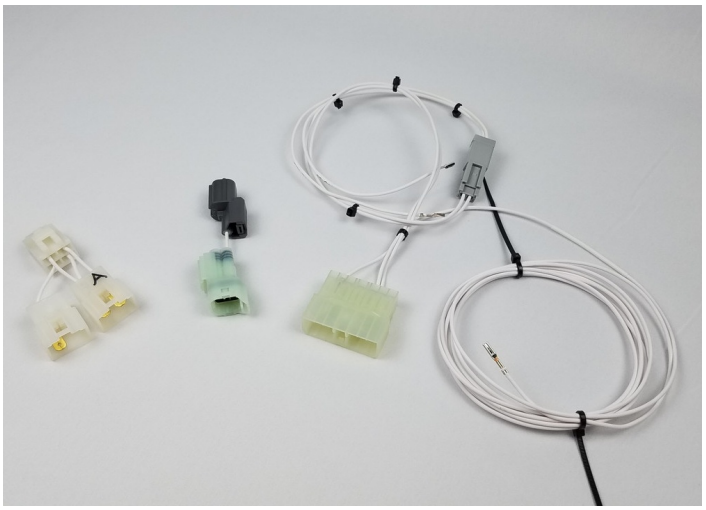
Intake:
Air intake will be the same DIY stuff we have been doing on 3Gs for years. Try a 94-01 Integra intake and cut it as needed for fit.

Header:
You need to use an AWD compatible B-series header. AWD headers have a slight “jog” that goes around the transfer case.

Air Conditioning:

In order to have enough clearance to fit the AC compressor a Prelude Engineering LLC traction bar is required:
prelude-engineering.com/traction-bar/

Prelude Engineering LLC sells AC lines that will work with this swap. We also sell a wiring conversion kit that will eliminate the 3G Prelude compressor control system and allow the engine swap compressor to work.
prelude-engineering.com/engine-swap-ac-lines-b-h-series-v2/
prelude-engineering.com/ac-compressor-control-unit-bypass-plug-and-play-kit/



The AC components you need to acquire are the AC compressor bracket + tensioner and AC compressor from a 97-01 CRV. Prelude Engineering LLC AC lines do not work with the earlier AC compressors.

Rear Suspension and Differential Mount Install:

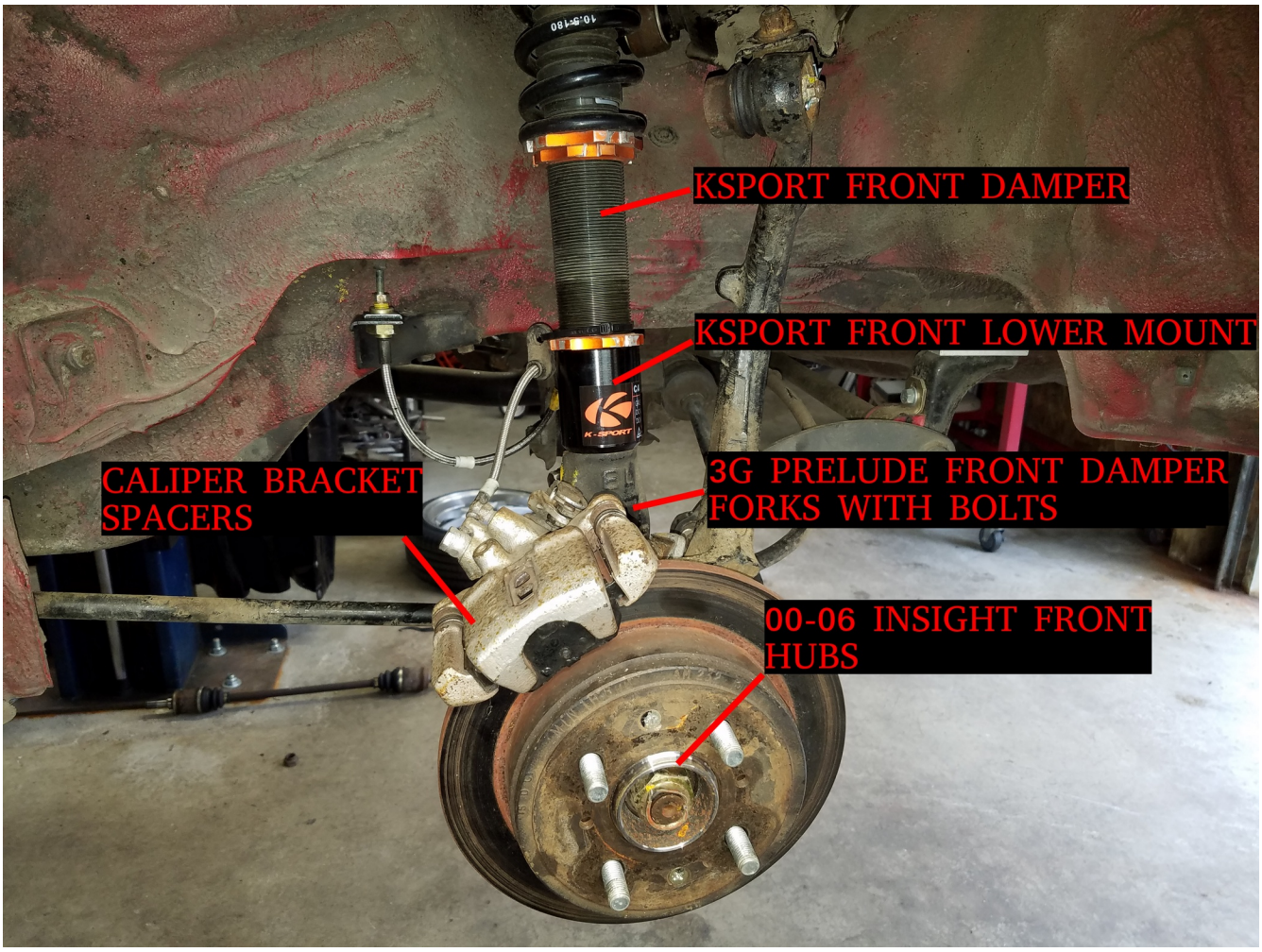
For the shock/damper you will need to run a shorter front shock with its lower mount, plus a 3g Prelude front lower fork. This is easiest to do by using a KSport coilover kit and buying the extra parts from KSport.

To install the new hubs remove the stock hub and wheel bearing. Install the new splined hubs using a new 3g Prelude rear wheel bearing. Make sure you support the bearing correctly when pushing it into the knuckle and when pushing the hub into the bearing. **Failure to do so will damage the new bearing.** Don't forget the snap ring on the back.

WARNING: If you are going to run in FWD mode (rear axles not installed) you MUST use an axle stub with these rear hubs. S1 Built sells new axle stubs:

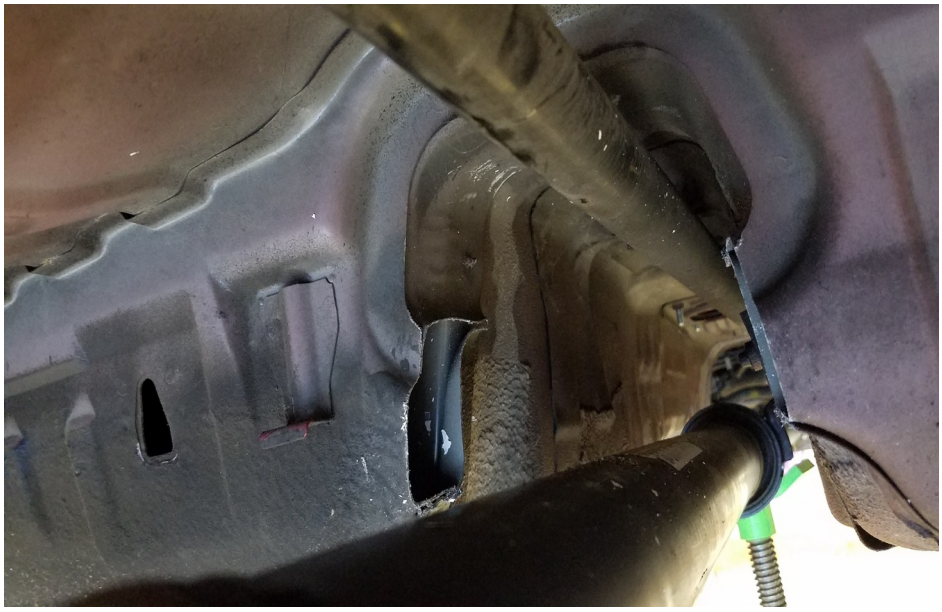
The new hubs push the rotor out. You will need to install the supplied spacers between the rear caliper bracket and knuckle to center the caliper on the rotor again.

Here is a reference image of what you need to change in the rear for the AWD conversion:



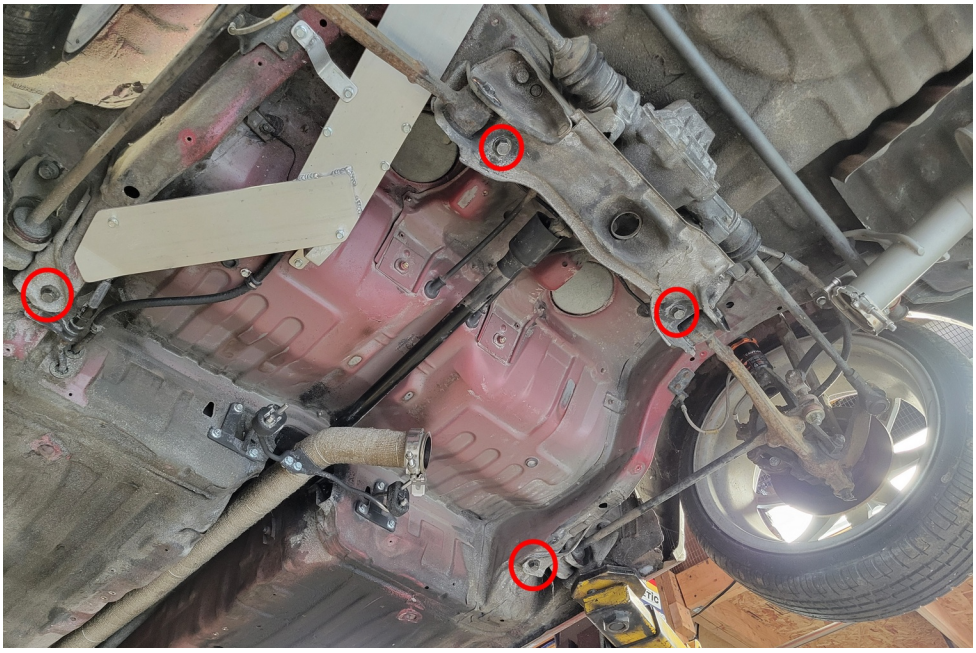
For driveshaft clearance you will need to trim or remove the chassis brace at the rear of the center exhaust tunnel. The amount to trim depends on your desired driveshaft and exhaust setup.

On our car we chose to remove the whole section so that we could run the exhaust at the top of the tunnel (if you do this make sure you ceramic coat and wrap the exhaust).



IMPORTANT: During first assembly only finger tight all bolts. Once the differential itself is mounted then you can tighten everything.

The rear differential mount will use these 4 bolts to mount to the chassis. Remove them to start:

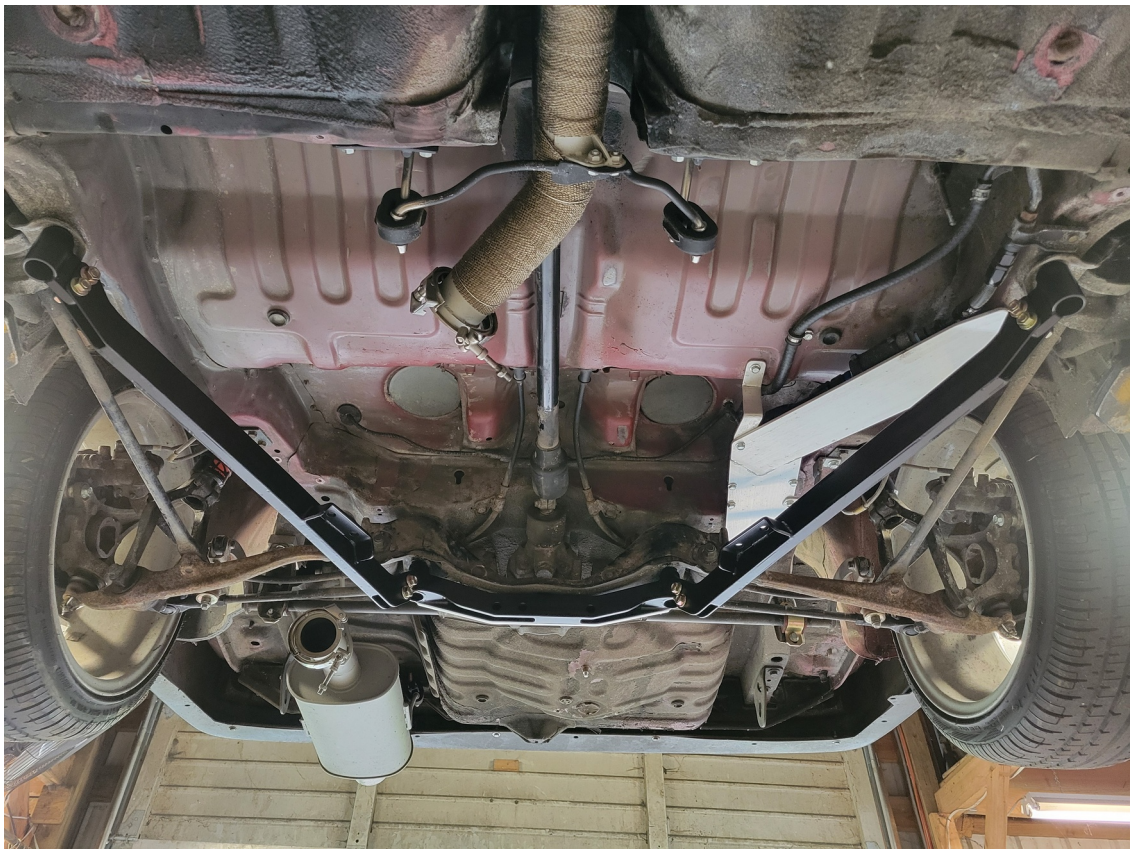


Install the new rear mount onto the stock rear subframe, reusing the stock bolts.

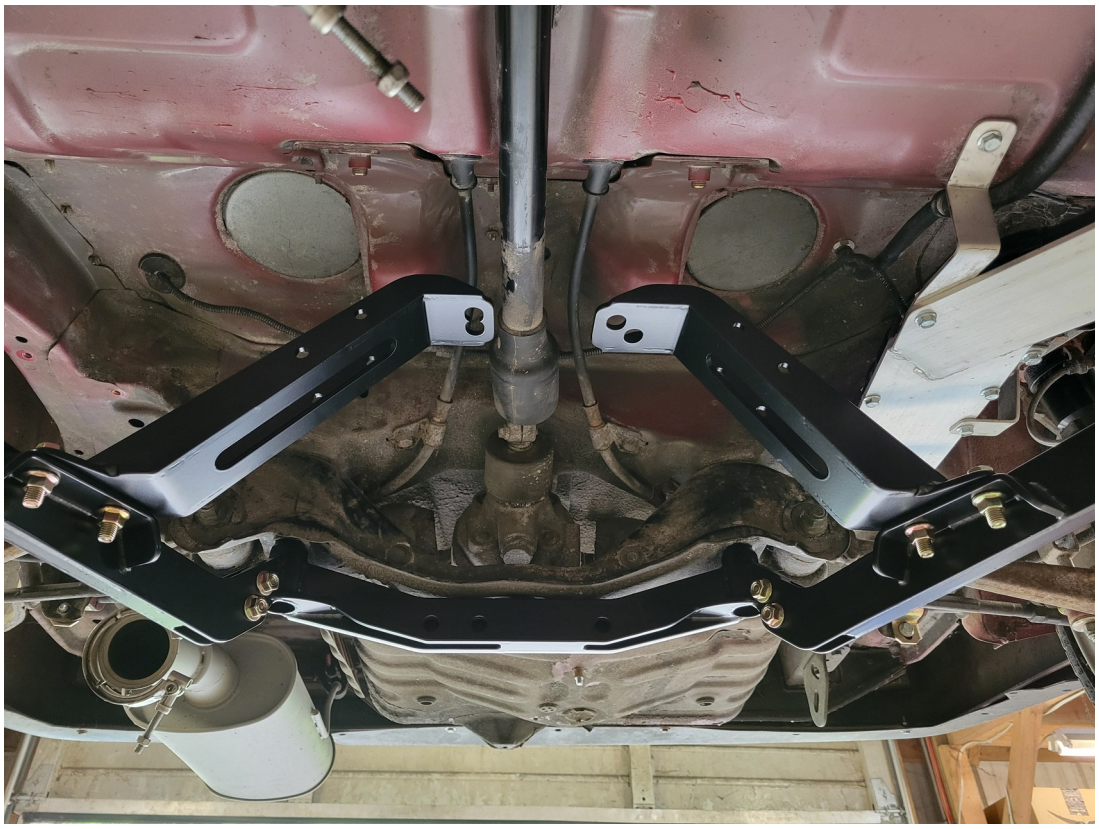
Install the front mounts. Again; leave the bolts finger tight so the front mounts can swivel:

Swivel the front mounts so they are aligned with the rear mount:

Install the side arms like this:



Install the upright differential mounts:



Install the uprights center brace. This part is asymmetrical; if the holes don’t line up flip it around:

Install the rear differential mounts onto the rear mount. There are multiple sets depending on which differential you are installing:

At this point some trimming of the OE rear subframe may be required, depending on your setup:

4WS with CRV diff: No trimming required

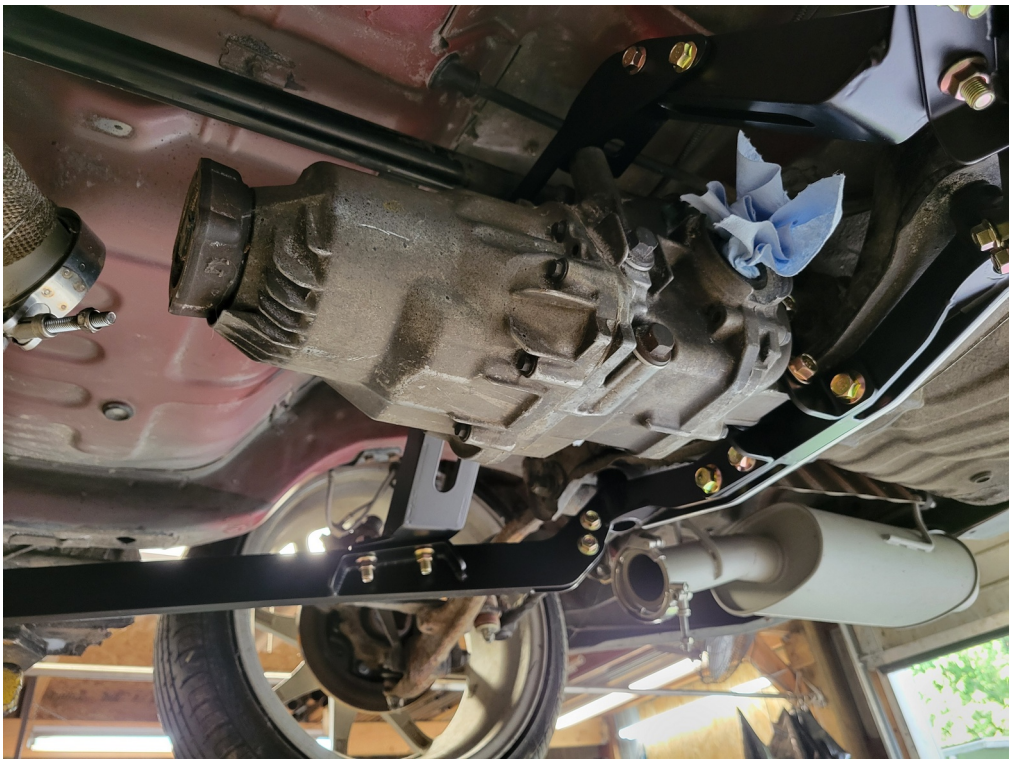
4WS with Wagovan diff: Trimming required

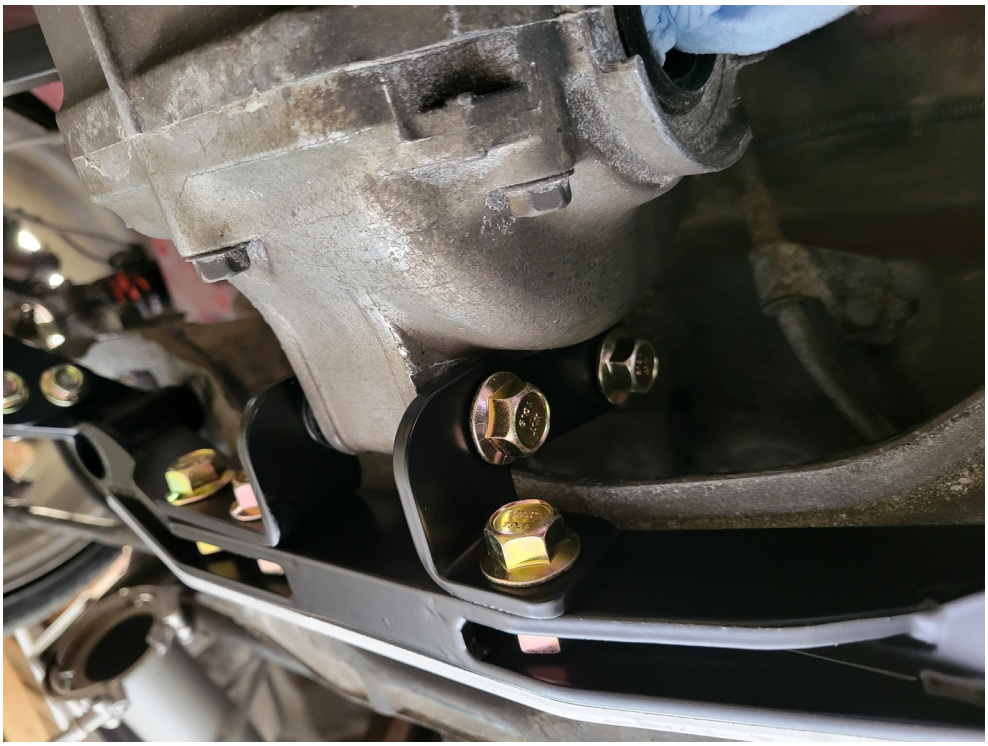
2WS with CRV diff: Trimming required

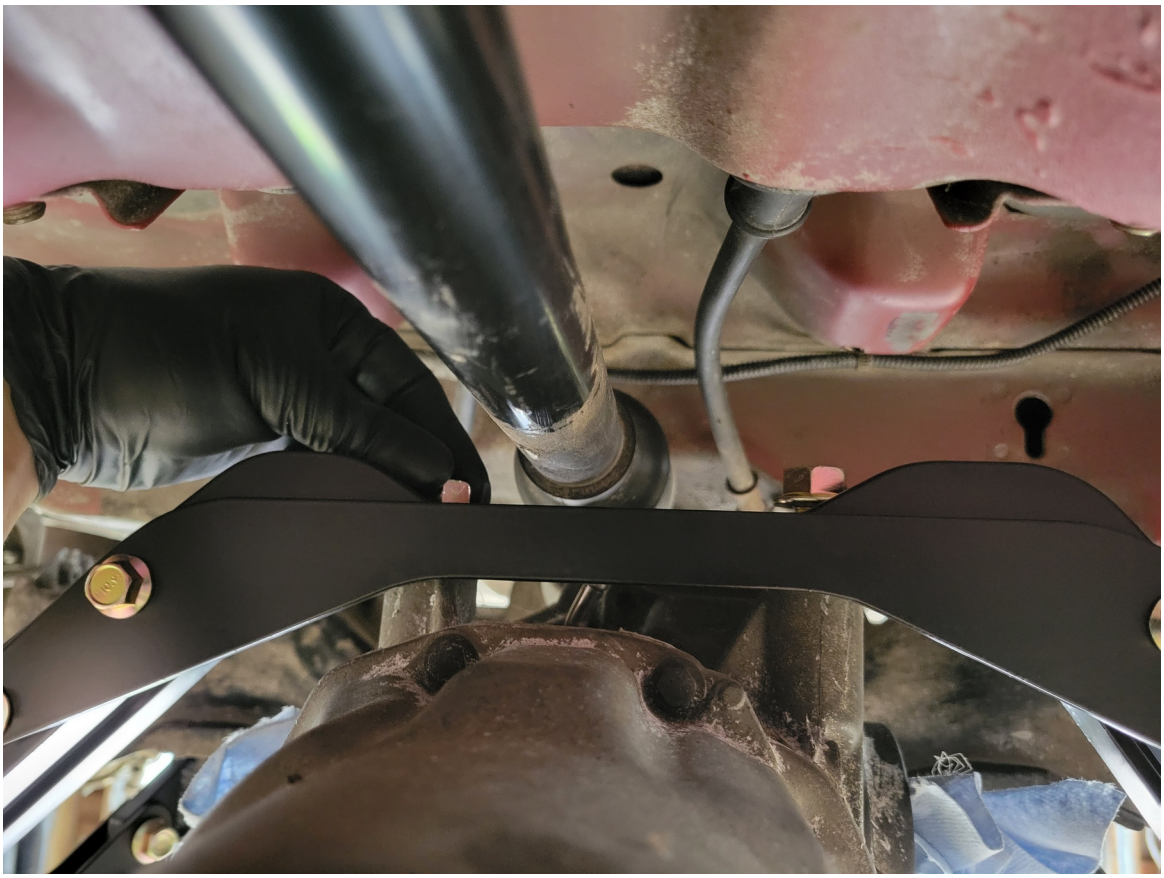
2WS with Wagovan diff: Trimming required

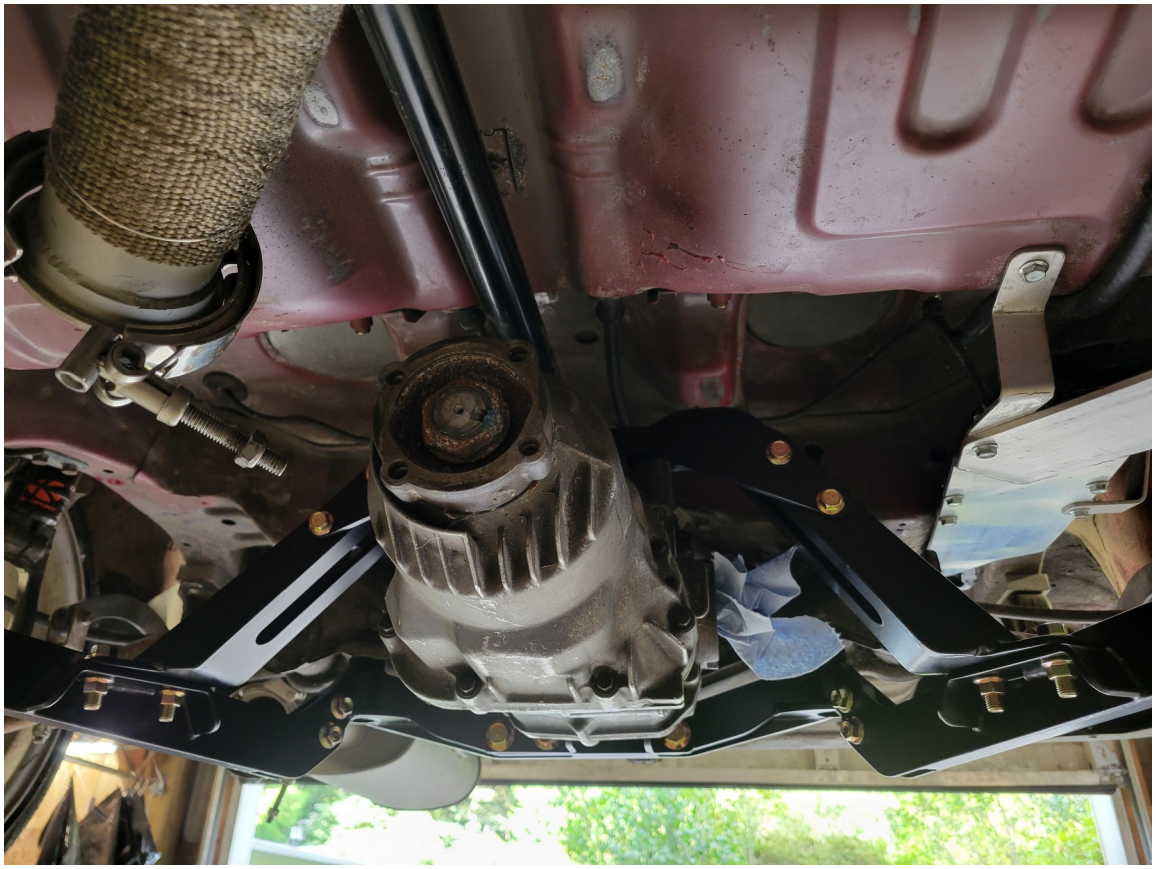
Trim as needed for your setup.

Now you can install the rear differential:





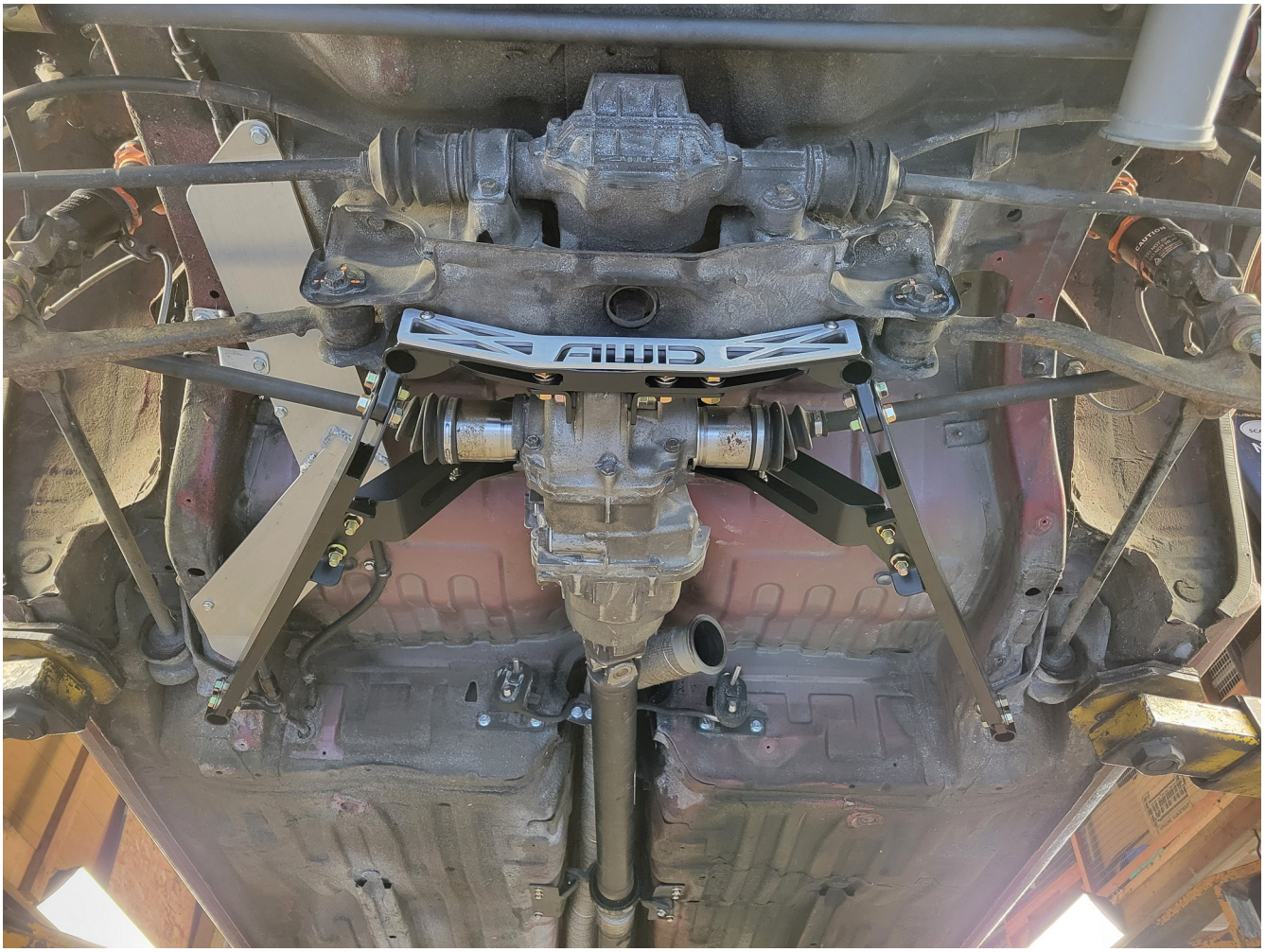




The final step is to tighten all bolts is this order:
Bolts that secure the differential (4)
Mounts at rear of differential (3)
Upright arms and center brace (8)
Side arms (8)
Main rear differential mount bolts (4)

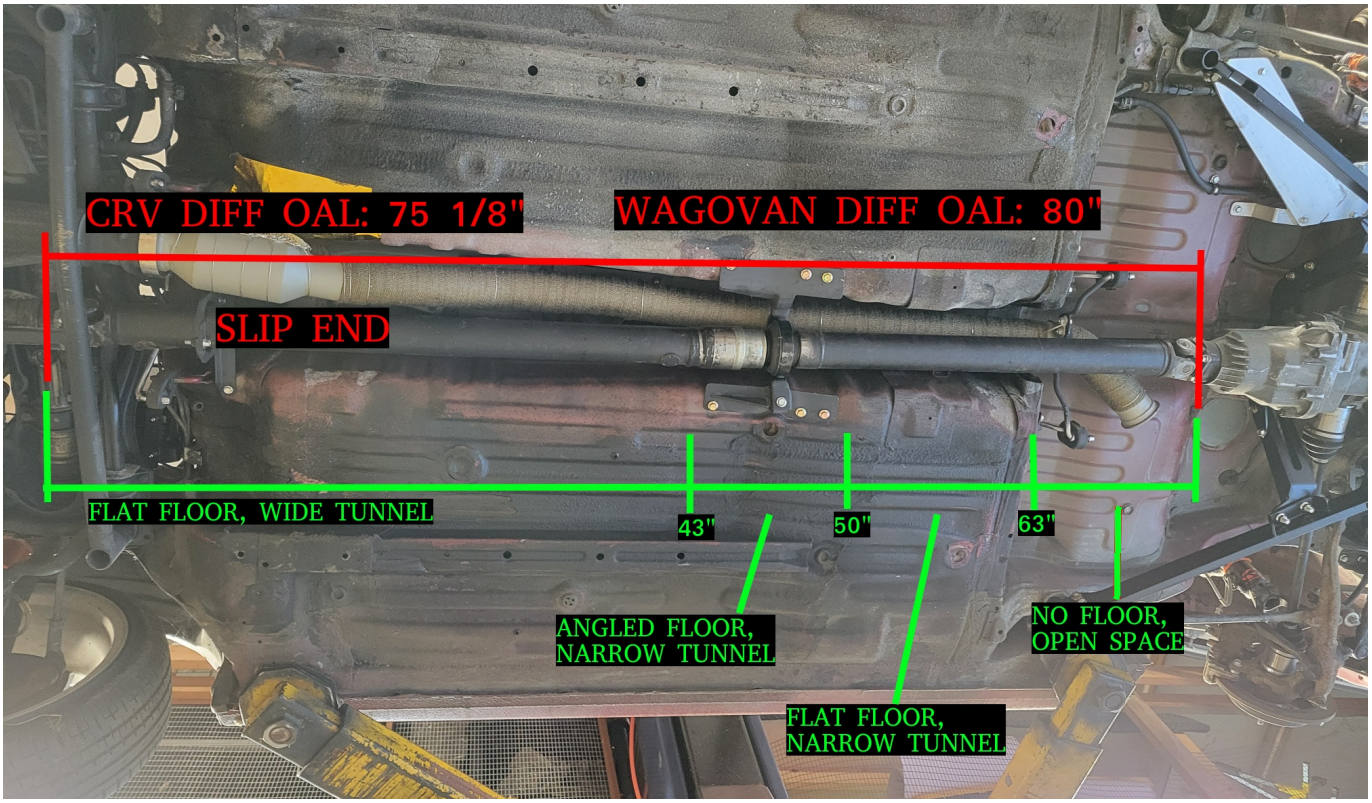
Install the 98-01 CRV rear axles. The shorter axle goes on the left side. Some of these axles come with a metal dust shield on the inner joint. Make sure this dust shield is correct and is not touching the differential. Make sure the axles are fully seating in the differential.

You can also install your driveshaft solution at this time.



Custom Driveshaft Information:

Refer to the following image or provide it to your builder when deciding how to build the driveshaft:



The overall length will be different depending on which style differential you are using.

The slip section need to be in the front half, before the carrier bearing or viscous coupler.

The green section describes the sheet metal/center tunnel. The front section of the tunnel is wide and has a flat floor. This is a good place to mount the carrier bearing or viscous coupler.

The center part (43”-50”) has an angled floor and the tunnel narrows. Avoid placing the carrier bearing or viscous coupler mounts here.

The next section (50”-63”) has a narrow tunnel and flat floor. The carrier bearing could work here but a viscous coupler will probably be too big.

The final section is open space before the diff. Plenty of room but you would need to build some kind of custom mounts to secure anything in this area.

Please contact us if you have any more questions about this swap.

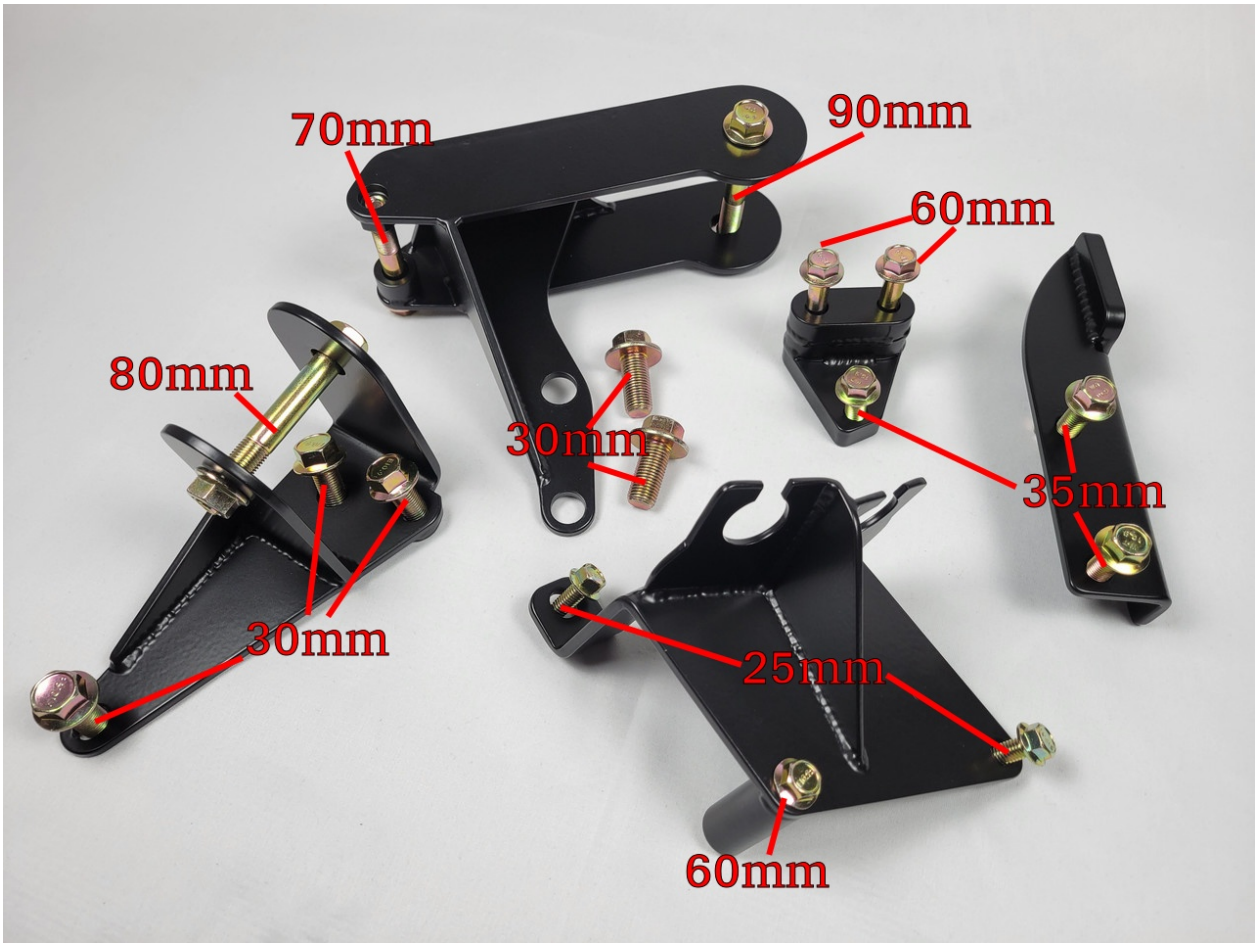
Swap Wiring:

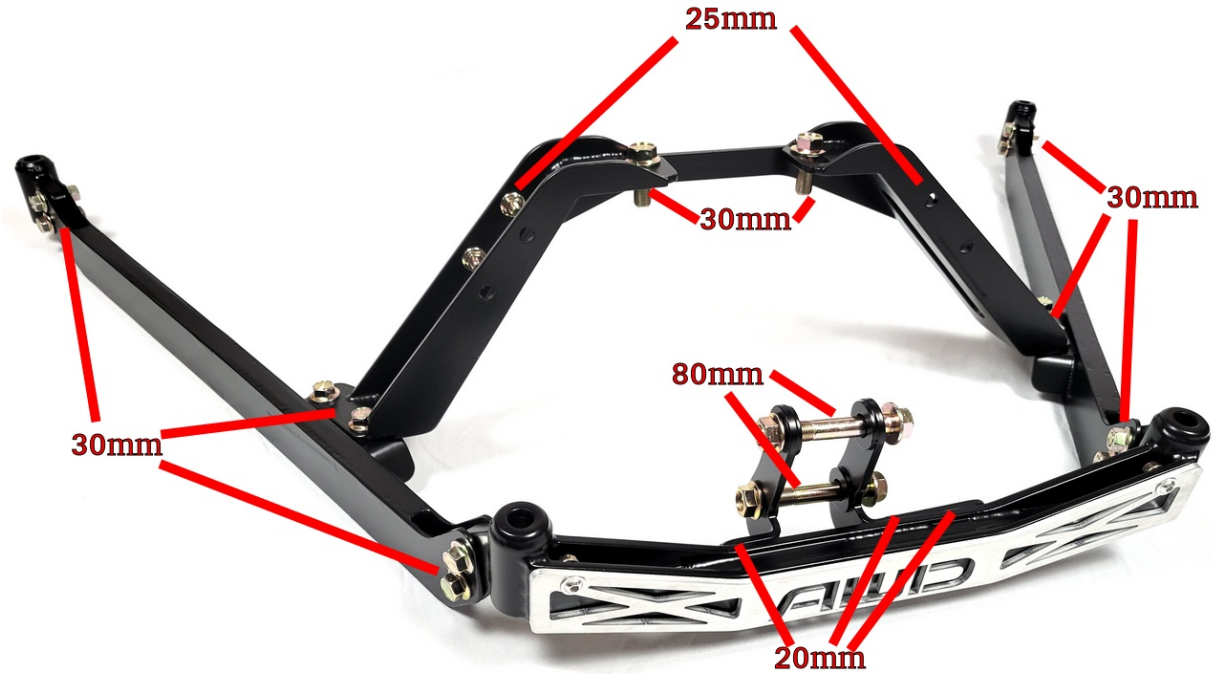
Prelude Engineering LLC does not officially support any engine harness but we do strongly recommend a Rywire.com swap harness. We have experienced quality and consistency issues with other brands. Here are 2 different harnesses from Rywire you can use for this swap:
https://www.rywire.com/product-p/b1-milspec.htm
https://www.rywire.com/product-p/b1-base.htm

Although we do not offer free support for any engine swap harness (please contact the company that made your harness). We do maintain a blog post about 3g Prelude specific engine swap wiring which should be very helpful when wiring up your swap:
prelude-engineering.com/blog/3g-prelude-engine-swap-wiring-information/

Bolt Information:

These are the bolt lengths in case you get them mixed up or need to buy a replacement. It's not common but supplied bolts may vary in length 5-10mm due to supply issues. When measuring bolts you measure from under the head to the end of the threads:


70mm
90mm
60mm
80mm
30mm
35mm
30mm
25mm
60mm


25mm
30mm
30mm
80mm
30mm
20mm