



Jeep JK GEN3 LS W/ 4L60E 4L80E



6-17-23

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Overview

Please Read Before You Start This LS Conversion

We recommend reading all instructions before beginning any work. These instructions assume you have a substantial amount of mechanical ability and therefore are not intended for a novice or someone without automotive repair experience. We assume no liability for installation. If you don't feel comfortable installing this kit please refer to a shop that is qualified doing engine swaps.

These instructions have been written for shops or DIY individuals with experience in general mechanics and welding. RpmExtreme also assumes that this kit will be installed in a shop environment with access to general shop equipment. If you are not familiar with JK systems, please reference the Jeep Service Manual.

The powertrain will sit in a different location and will require different driveshafts. We recommend you complete the install and then measure for new shafts with the vehicle at ride height.

You may wish to complete the outlined steps below in any order you so choose. We will try to lay them out in a logical order but you can jump around as your build progresses.

WHILE ALL CORRECT EMISSIONS EQUIPMENT IS DESIGNED TO BE INSTALLED WITH THIS KIT, THIS KIT MAY STILL NOT BE LEGAL FOR ON-ROAD USE IN ALL STATES OR COUNTRIES AND AS IS CURRENTLY INTENDED FOR OFF-ROAD USE ONLY. IT IS THE USERS RESPONSIBILITY TO COMPLY WITH ALL REGULATIONS.

WE DO NOT RECOMMEND ANY MODIFICATIONS TO ENGINE OR TRANSMISSION. TECH SUPPORT CAN NOT BE PROVIDED FOR ANY CONVERSIONS USING AFTERMARKET PERFORMANCE PARTS INCLUDING BUT NOT LIMITED TO CAMSHAFTS, HEADS, EXHAUST MANIFOLDS, AFTERMARKET EXHAUSTS, INTAKES, THROTTLE BODIES, PERFORMANCE ECU CALIBRATIONS, STROKER KITS, SUPERCHARGERS, TURBOCHARGERS, SHIFT KITS OR ANY OTHER NON PRODUCTION ITEM.

Prepping your Jeep

Start off with a good pressure wash. Clean everything in the engine bay and underneath. Verify that all your factory options are working prior to the conversion. If you have problems with the cruise control or clock spring stock you will end up with TAP shift and cruise issues after the swap. We rely on all the factory Jeep stuff working.

If you have a aftermarket tuner or supercharger system take the time now to restore the Jeep computer back to stock. Im sure if you have a supercharger/Turbo you will want to sell the unit with the tuner. As far as your Jeep goes, after the LS swap you will not need to adjust for any gear changes on the Jeep side but you will need to adjust for tire size. The speedometer is still ran thru the Jeep side so calibrating for tires size will correct the speedometer. This can be done with a simple flash cal or AEV pro cal. The correct gearing and tire size will need to be programed into the GM computer for proper operation. This is usually done when we program your ECU so please include your tires size and gear ratio. If you change tire or gear ratio the GM ECU can be adjusted. Contact us for info. Usually we see only minor shift point issues with incorrect info but they will do best with everything dialed in.

Go ahead and reset the oil life monitor and record your mileage prior to the conversion.

_____ Miles. _____ Date.

Take a look at any aftermarket items you have added especially wiring and lights. During the install will be a good time to clean up any wiring and route them with the frame or body. Our conversion is compatible with a sPod and is recommended if your running a lot of lights or 12 volt items.

Supported Powertrains

We are currently supporting most of the GEN3 GM engines from 2003-2006. We support the 4.8, 5.3, 6.0. Our conversion supports a 4L60E - 4L65E or 4L80E transmission depending on how you ordered it. If you have questions about this please contact us.

We support the factory Jeep 241J transfer case 214or Rubicon case well as an Atlas. .

GEN4 LS3 and 6L80E shown below. Yours will look different



Operation

Operating your new LS powered Jeep

Your new LS powered Jeep will operate very similar to what your used to but with a lot more power and drivability.

All of your gauges will operate as stock including the PRDNL.

The check engine light will illuminate if there is an issue on the GM side.

Tachometer and coolant temp are controlled from the smaller can box and will indicate current engine conditions. These signals come from GM ECU and the second GM coolant temp sensor you will install.

The fuel gauge is controlled from the Jeep side same as before.

The speedometer is controlled from the Jeep side same as before.

Your AC and heater will operate same as before.

Your remote start (if equipped) will operate same as before.

Your cruise control will operate same as before.

If you have a Rubicon your lockers will operate same as before

If you have factory NAV it will operate same as before and the speed indicated will be from the Jeep. So as long as the Jeep speedo is calibrated the NAV will be accurate.

You're factory backup camera will operate as before and any aftermarket radio can use the factory CAN messages for reverse.

If your converting from manual to auto the dash will indicate like a factory automatic and the shifter will plug in and operate like factory with shift interlock functional (07-11) only.

ABS will operate same as before

Traction control and ESP will not operate as there is no connection to the GM side to reduce throttle during wheel spin.

Fuel mileage indicator will not be accurate and will usually read much higher than actual.

The factory security system is intact and will still operate as well as the security key.

Option Programing

EZcanbus OBD2 Programing

Our system has the ability to reprogram special options thru the Jeep OBD2 port.

This will save you time and money by not having to send any Jeep parts to us for reprograming.

We recommend you do the EZcan option programing before you tear down the Jeep but you can do it after.

Start by connecting the supplied OBD2 connector harness to the X101 plug on the EZcanbus module.

Plug in the OBD2 connector the the port under the dash.

Turn on the key and wait 5 seconds.

Press the button on the connector and wait 5 seconds.

Press the button for a second time and the horn should begin to honk. (some vehicles may not honk)

Once the horn stops go ahead and turn off the key and remove the connector from the Jeep.

Remove the harness from the X101 plug and safe the harness for future use.



GM Tuning Options MPVI - RTD

HP TUNERS MPVI2+ MPVI3

The MPVI is a full calibration device with a top notch scanner software function. This is the same software that we use in house as well as 1000s of other tuners. You will need to purchase the HP Tuners MPVI2 or RTD from our website or have ordered it with your kit.

<http://www.rpmextreme.com/Product/267/HP-Tuners-MPVI2.aspx>

From there you can “tune” as many vehicles as you want by purchasing credits directly from HP Tuners website. Most vehicles require 2 credits at \$49 EA. Once you license a vehicle you can tune it as much as you want without purchasing any additional credits for it.

This software is not meant for a novice. It has the ability to make almost every change in the ECU-TCM and you could really mess stuff up if your not careful. With that being said we will walk you thru the first few tunes and will provide a “BASE” tune to get you started.

The scanner software can read every parameter in the vehicle and display it as gauges, graphs or charts. It comes in very handy when tuning or diagnosing a vehicle.

You can also save a data log and email it to us or a tuner of your choice for review.



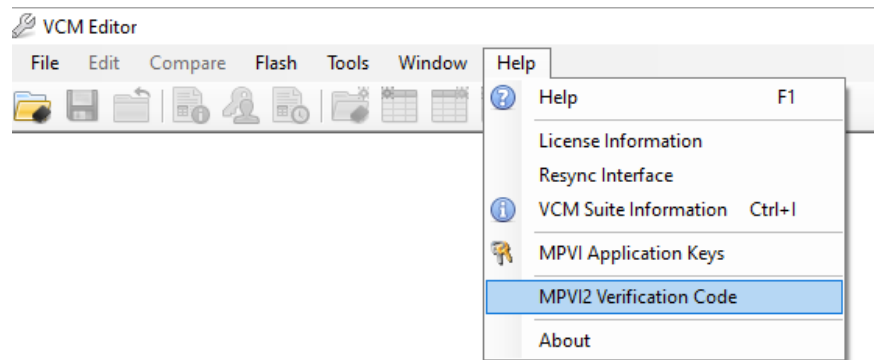
MPVI2+ MPVI3 ACCOUNT AND DEVICE SETUP

You will need to go onto HP Tuners website (www.hptuners.com) to create an account and download the software.

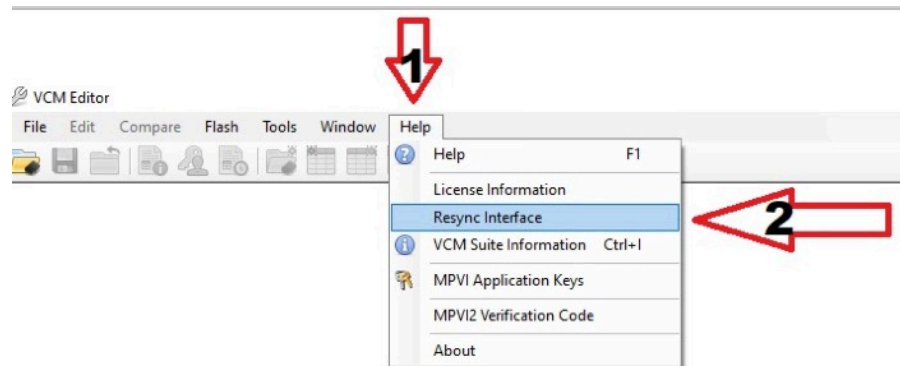
Once you have an account setup you will want to add your device. Click on your name at the top of the screen, this will take you to your account page. On the left side you will see a box called “MY DEVICES” click on it. From there you will scroll down and find the box labeled “MPVI2+/MPVI3” Input your serial number that is found on the back of the device, then input your Verification ID and then click “IMPORT” this will add the device to your account.

To find your Verification code you will need to have the software installed and the device plugged into your PC.

Open the Editor and click on help. From there click on MPVI2 Verification code. It will then show you the code. Take this code and input it into your account on the HP Tuners website.



Once that is complete and you have your device registered on the website you can “sync” the device. Click “Help” and then “Resync Interface”. Now the credits should be loaded and the device is ready to use.



RESYNC INTERFACE

MPVI2 READING AND WRITING CUSTOM TUNES

You will need to “READ” the stock tune from the vehicle first.

Make sure the battery is fully charged and everything is hooked up on the vehicle. Plug the HP Tuners device into the GM OBD2 port. Turn the key to “RUN”. Open the the EDITOR software and click on the icon with the computer chip with the up arrow and then the box that says “READ”. It will now read the tune file that is in the vehicle. Let it read both the ECU and TCM, once it is complete it will pop up and ask you to save the file. Save this file in a folder where it will be easy to find. Name it something like “stock-5.3-read” so you know its the stock read file. From there you will email the stock file to us (info@rpmextreme.com) along with your info, (TIRE SIZE), (GEAR RATIO) and a list of any mods you have done to the engine or trans. We will make a custom tune file and email it back to you. Once you get the custom file save it in the folder with your stock tune.

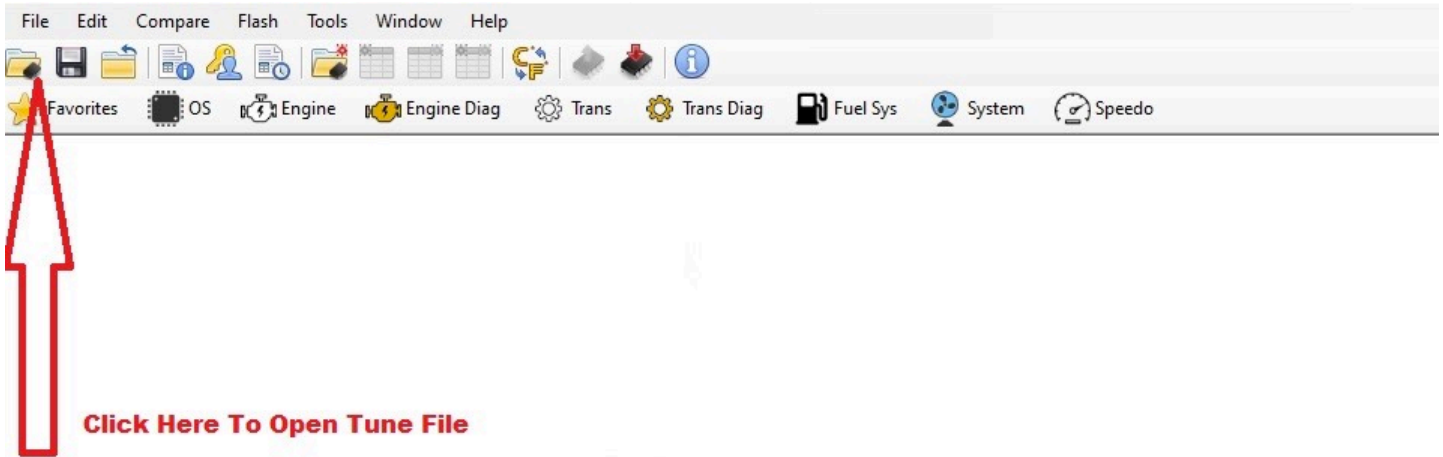
HOW TO READ TUNE FROM VEHICLE

1. Click the 'Read' button in the Vehicle Reader dialog box.

2. The Vehicle Reader dialog box displays vehicle information and hardware details.

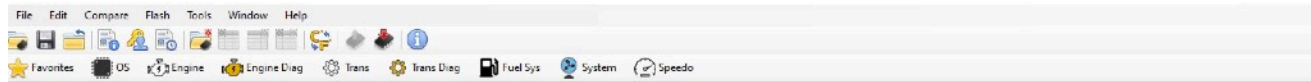
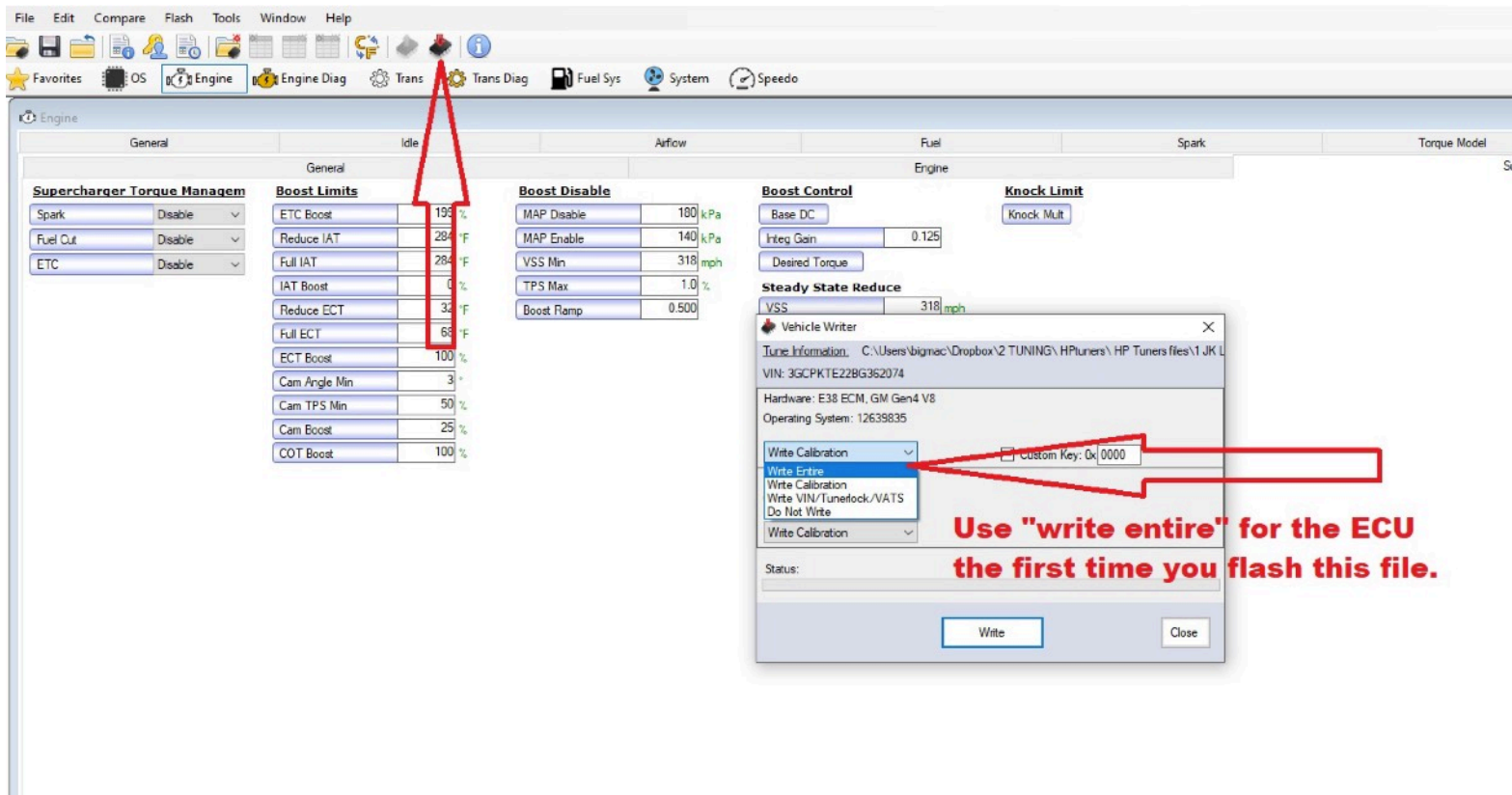
3. The Vehicle Reader dialog box shows the progress of reading the tune file, including the percentage read and time remaining.

To write the custom tune to the vehicle you will need to open the file in the HP Editor. At the top click "FILE" and "OPEN", select the custom tune. You will see it listed at the top of the page.



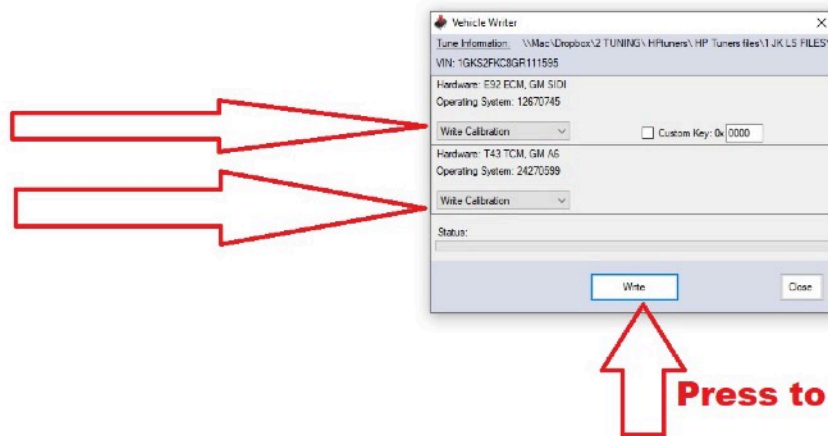
To write the custom tune to the vehicle you will click on the computer chip icon with the down arrow. A box will pop up asking to license the file. You will select to license it. You only have to do this once. Once it is licensed there will be a box showing the ECU and TCM with drop down boxes. In the ECU box use the drop down to select " Write Entire ". In the TCM box you will leave it on " Write Calibration " Once you have the correct selection make sure the key is on and the battery is fully charged and select "WRITE" it will then write the ECU and then the TCM. You can watch the progress in the status bar. Once it is finished you can click on "close" and turn the key off. Now that it is programed you should be able to start and run the vehicle.

Special note: You only need to select "WRITE ENTIRE" the first time you flash the ECU. Any further tunes will be done with a normal "Write Calibration" unless told otherwise.



WRITE CALIBRATION

Normal Process for flashing in a tune

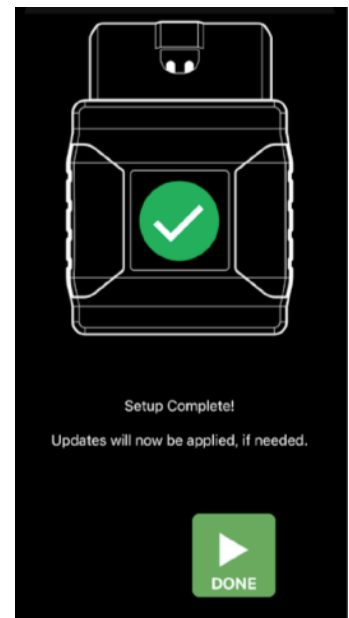


HP Tuners RTD Device Using TDN APP

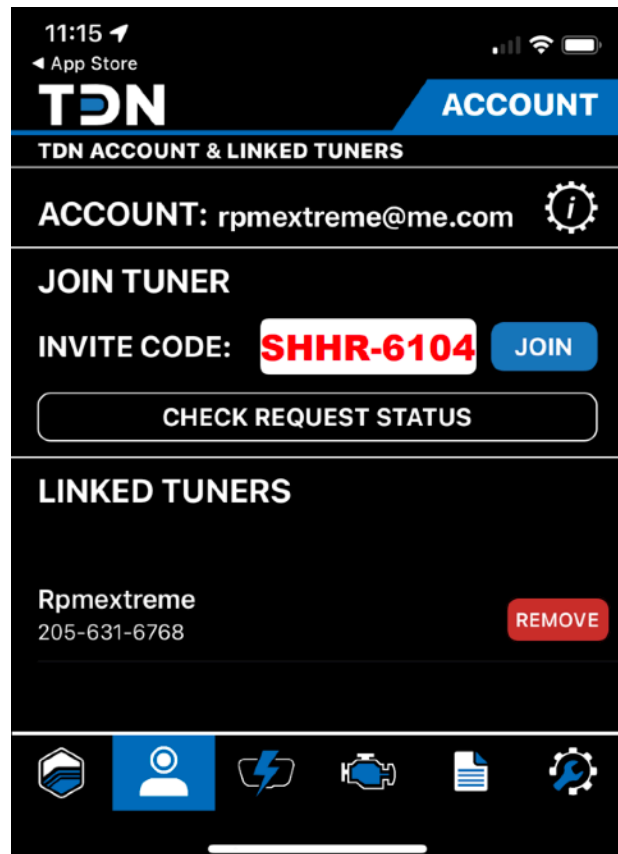
The RTD device is used with the TDN APP. The Tune Delivery Network (TDN) is an application that allows users to easily exchange tuning files and data logs with RpmExtreme. You will be using a APP on your Apple or Android cell phone to pair with the RTD device. This will allow you to read and write tunes to the vehicle as well as data log how the vehicle is running.



First you will need to go to the Apple APP Store or the Android APP Store and download the TDN APP. When you open the APP for the first time it will ask you to accept the privacy policy. Once that is done you will need to pair the RTD device with your phone using Bluetooth. Make sure your Bluetooth is turned on in your phone setting and then follow the prompts on the screen. After the RTD is linked to the phone it will attempt to synchronize the device with the server (your phone will need an internet connection). At this point it may prompt to update the device. Apply any updates at this time.



You will need to create an account with HP Tuners. Tap the ACCOUNT button and then tap REGISTER NEW ACCOUNT and follow the instructions. After your account is setup you will need to fill out the account profile and add in our INVITE CODE (SHHR-6104). This will link your device to our server and allow us to see your tune files and data logs.



Reading and Writing Tunes

Reading a Tune File

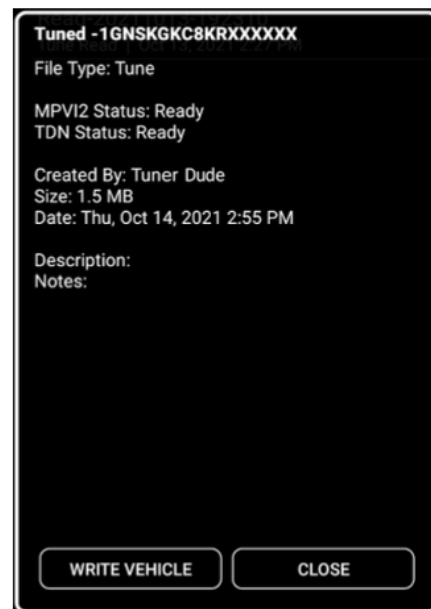
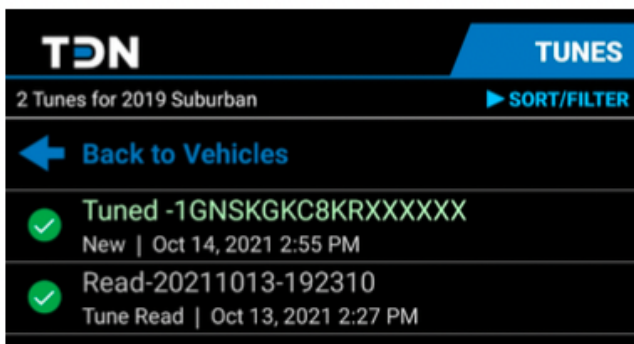
To read or write a file you will need to be sure that your vehicles battery is fully charged.

To begin tuning you will need to read the stock file from the vehicle. Do this by tapping the “FLASH” button. Once the tuning screen appears you will select the “READ VEHICLE” tab, follow the prompts and turn the key to the “RUN” position and tap OK to start the read process. Follow the prompts on the screen and when the read is finished you will want to send us a email letting us know that the tune has been read. Include in the email your details on the engine along with what tire size and gear ratio you are running. Send to INFO@RPMEXTREME.COM

Writing a Custom Tune File

Once we finish your tune we will send you an email letting you know its read to flash in.

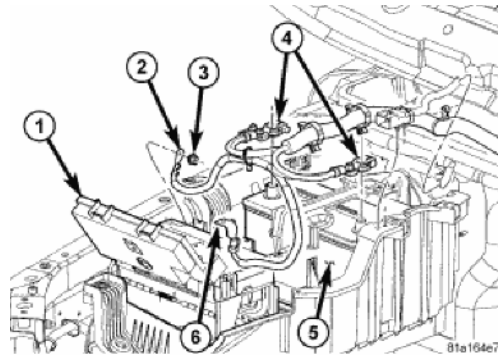
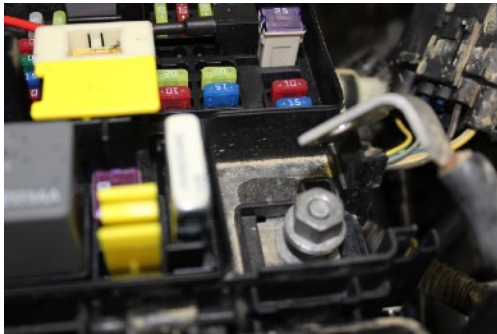
Open the APP and connect the device to the vehicle and tap the “FLASH” button. Then tap the vehicle you want to flash and then tap the new tune file that should be shown in the list. If a tune file does not show up you may need to tap the SYNC button so the device will go online and load any tune files that are on the server. Once you have the tune selected tap “WRITE VEHICLE” and follow the on screen prompts. Do not turn the key off or disconnect the device while it is writing the vehicle or it could damage the ECU-TCM



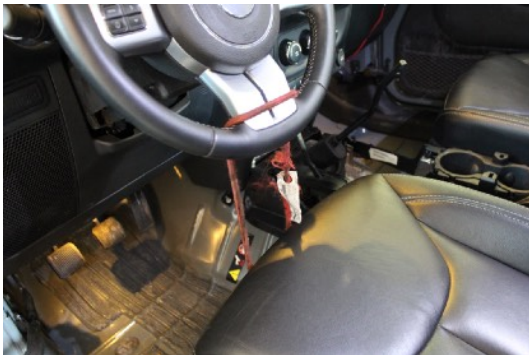
Body Removal

Although it is not required, We recommend using a two post hoist to remove the body from the vehicle. The general procedure is outlined below: and the instructions will be written as if you have the body removed. Right and Left is viewed from the drivers seat.

1. Disconnect the battery harness from the battery, firewall, and right front fender.
Always remove the negative first and connect it last to avoid damage to the computers.



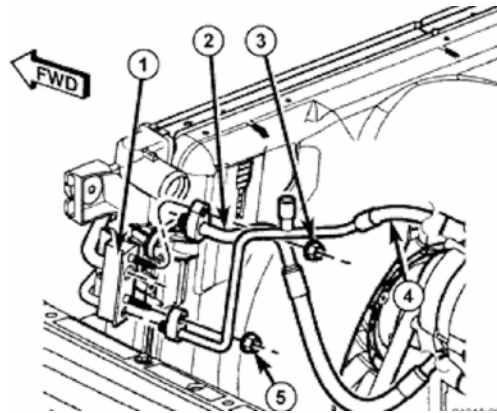
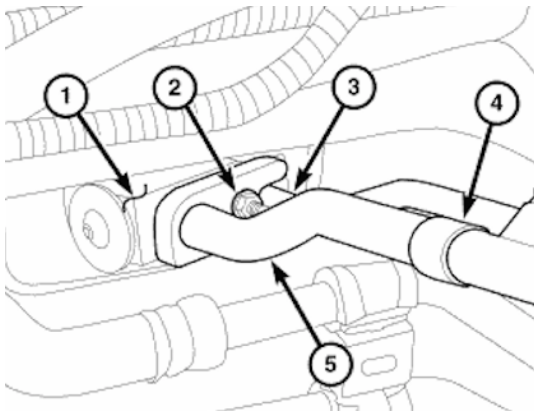
2. Disconnect the steering shaft at the firewall.
CAUTION with the shaft removed the steering wheel can rotate and damage the clock spring.
We recommend using a bungee strap hold the steering wheel centered and not allow it to turn.



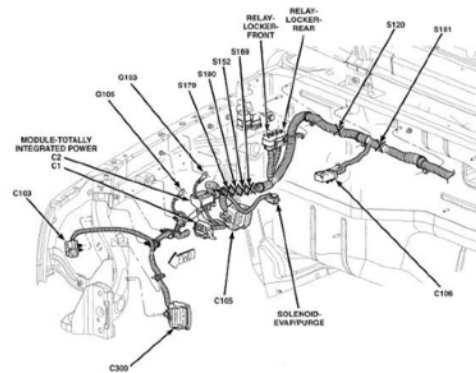
3. Disconnect the ABS Module electrical connector.
Remove the bolt holding the unit to the plastic tray and pull straight up on the ABS unit.
It should pop free from the rubber retainers. you do **not** disconnect brake lines.
Unbolt the master cylinder and be sure to save the o-ring behind it.
* Lay entire assembly in towards the engine and use a bungee cord to hold out of the way.



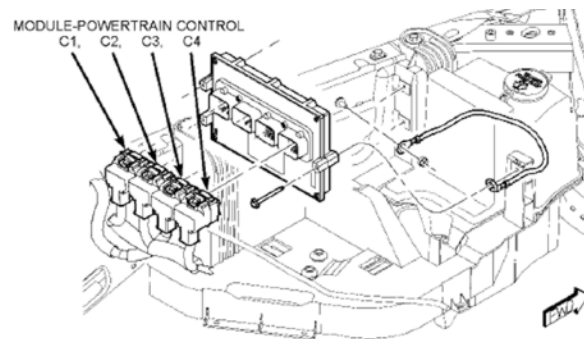
4. Discharge the AC system and remove hoses. Use proper equipment here guys.



5. Unplug the 34 way Chassis connector (C300) on the lower right hand side of the radiator.

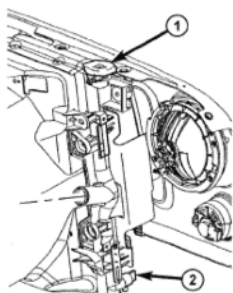


6. Unplug the Jeep computer connectors C1 C2 and C4 for 07-11 and C2 for 12+. One harness will stay with the body and the rest will go with the engine.

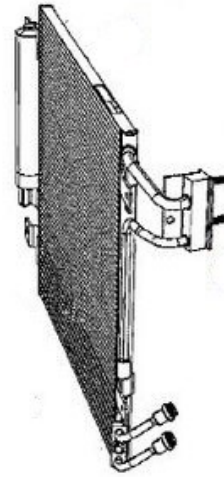
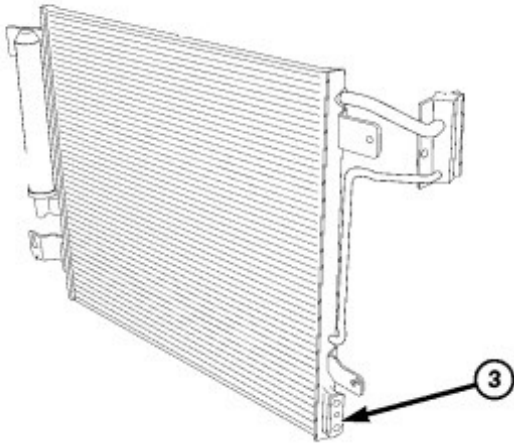


7. Disconnect the front left O2 sensor if attached to the body under the master cylinder.

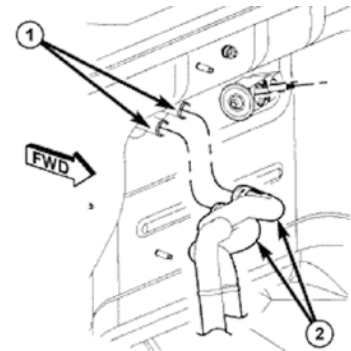
8. Drain and disconnect the radiator hoses. You will be reusing the lower hose.



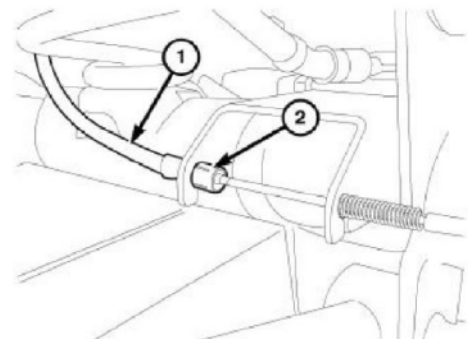
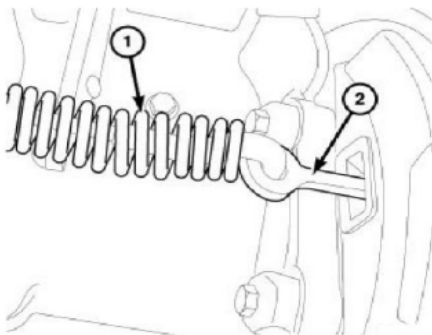
9. Disconnect the transmission cooler lines at the AC condenser (#3). (Auto only).



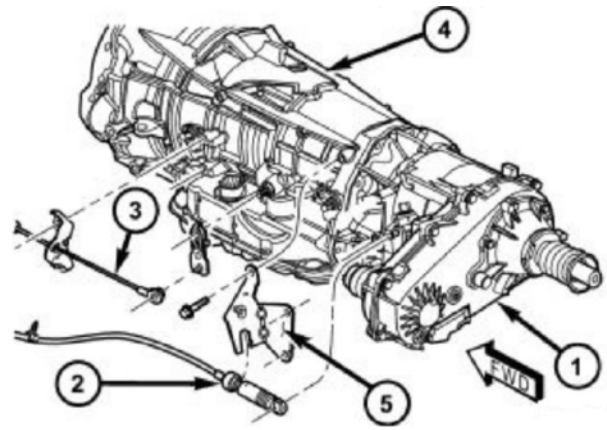
- 10. Remove the power steering reservoir from the body.
- 11. Lay PS reservoir on the engine so it will clear the body.
- 12. Disconnect the ground strap from the hood and firewall.
- 13. Remove the air filter and intake assembly.
- 14. Remove the heater hoses from the engine. You may be reusing these.



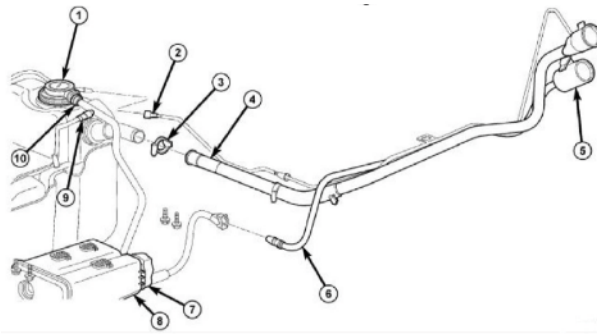
- 15. Remove the purge valve by the battery and vapor lines.
- 16. Remove the electric vacuum pump and hoses 2012+ only
- 17. Disconnect the parking brake cables at the rear axle.



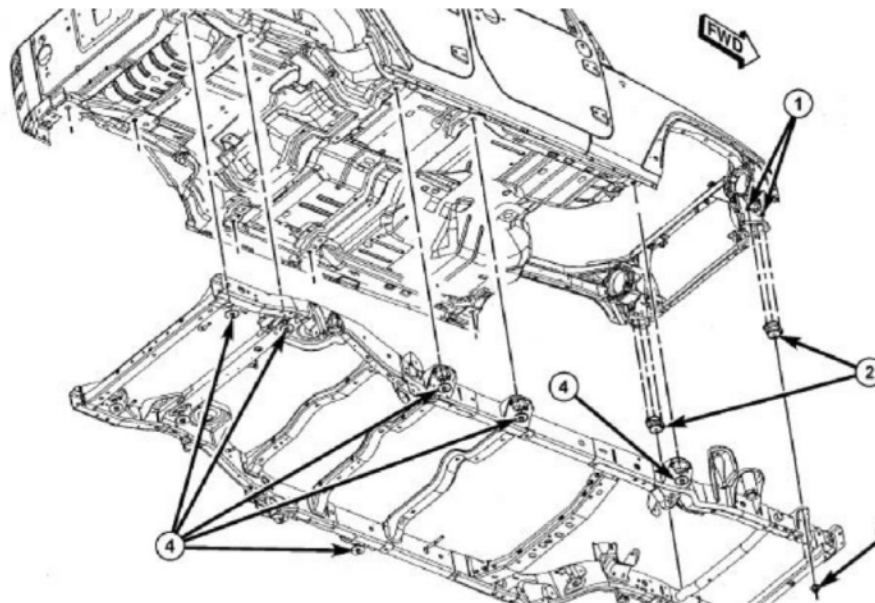
18. Disconnect the transmission and transfer case cables. #2 and #3 pictured below



- 19. Disconnect the transmission and transfer case cables.
- 20. Disconnect the fuel fill hose at #3 in the picture



- 21. Disconnect the EVAP hose between the canister and the body. (#7) pictured above.
- 22. Disconnect the top of the rear axle vent line.
- 23. Remove the 2 nuts at the front body mounts.
- 24. Remove the body mount bolts. Some years may not have all the bolts.



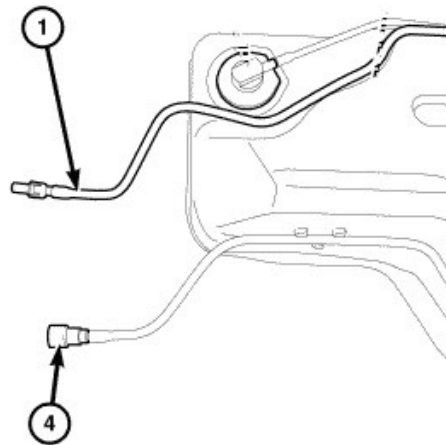


Once the body is unbolted set your 2 post lift along the factory pinch welds taking care to apply even pressure as to not bend the lower sheet metal. If you have a solid rock slider you can also lift from it. Slowly lift the body a little at a time and watch for anything you forgot to unplug or hanging up. Also watch the ABS unit to make sure it doesn't hang up or damage the brake lines during the body lift process. Keep an eye on the parking brake and shifter cables, you don't want to damage one.

Once the body is separated remove the stock powertrain and exhaust. We are not going to spell out how to do this as it should be pretty strait forward at this point.

We are not reusing anything from the engine or transmission.

You will be using a new fuel line. Its supplied in the kit and will plug in at the front of the fuel tank #1.



You will be modifying your EVAP canister and reusing it. We recommend relocating it to behind the axle on the right side.

You will be using your stock crossmember.

At this point you may want to roll the frame outside and pressure wash it in preparation for engine mount install. After you install the mounts grab some good chassis paint and go to town on the frame.

Engine Mount Install

After removing the powertrain, disconnect the front ABS connectors at the frame and remove RH side wiring harness bolts that are located on the frame behind the RH shock tower to protect from damage and heat.

Cut off the OE engine mounts and clean up the frame with a grinding wheel.

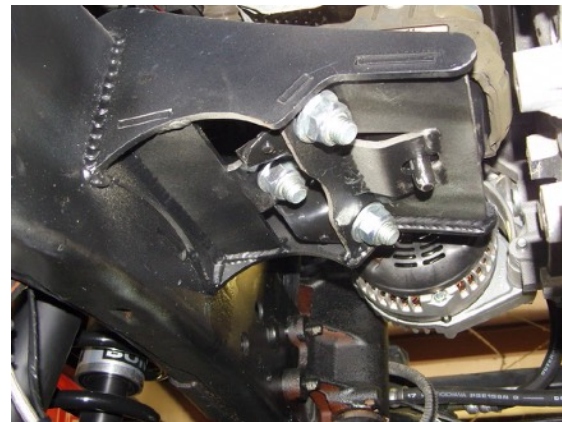
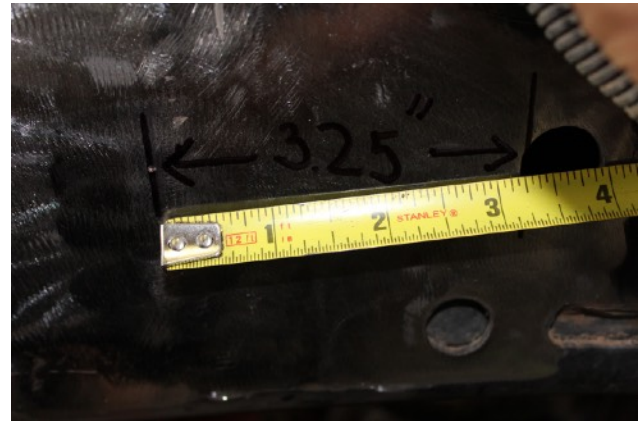


Each LS engine mount will have an “A” or “B” marked on them use Long mount “A” on the Left side (Driver) and the short “B” mount on the right (Passenger) side.

Align the mounts over the frame and hold in place with C clamps. You will see a few holes in the frame on each side, use these to measure back and set the distance for the mounts.

The “RIGHT SIDE” mount will be set back 3.5” from the rear edge of the smaller hole and the “LEFT SIDE” mount will be set back 3.25” from the rear edge of the smaller hole.

Again we are using the smaller size hole not the larger hole.



We have found this to be the perfect position for most of the swaps we have done and will clear all the GM accessories as well as Jeep accessories.

We recommend doing a test fit prior to welding the mounts in. It is advisable to drop the body back on the chassis and check clearances at the rear cylinder heads, upper rear intake manifold, exhaust manifolds to firewall, passenger rear coil pack stud and front accessories. When you are happy with the fitment of the powertrain. Remove it and fully weld in the mounts, Prep and paint

LS Engine Prep

We usually prep out most of the engine prior to installing it into the Jeep and finish dressing it out as it sits in the frame.

We are not going to cover every step involved as every engine will be different and you're skilled enough to handle this. We will hit some of the high points.

- Bolt together the engine, trans and transfer case. GM parts list is available on our website.
- Install torque converter bolts, flywheel covers and starter.
- Install LS3, Trailblazer SS exhaust manifolds or headers.
- install hydraulic motor mounts 15854939.
- Trim stud off at right rear coil mount so it wont hit the firewall.

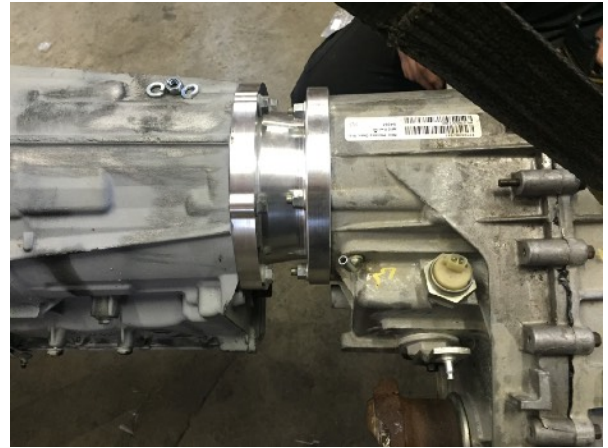


Transfer Case Adapter Install

Follow instructions that were provided with the adapter.

4L60E adapters will need the new transmission output shaft installed inside the transmission. These adapters will include a VSS vehicle speed sensor.

6L80E adapter shown but yours will be similar and have a Speed sensor on the side.



Install the Transfer case shifter bracket using the same nuts that hold the Transfer case onto the adapter (see pic) some light grinding may be needed to clearance the bracket.



Transmission Mount Install

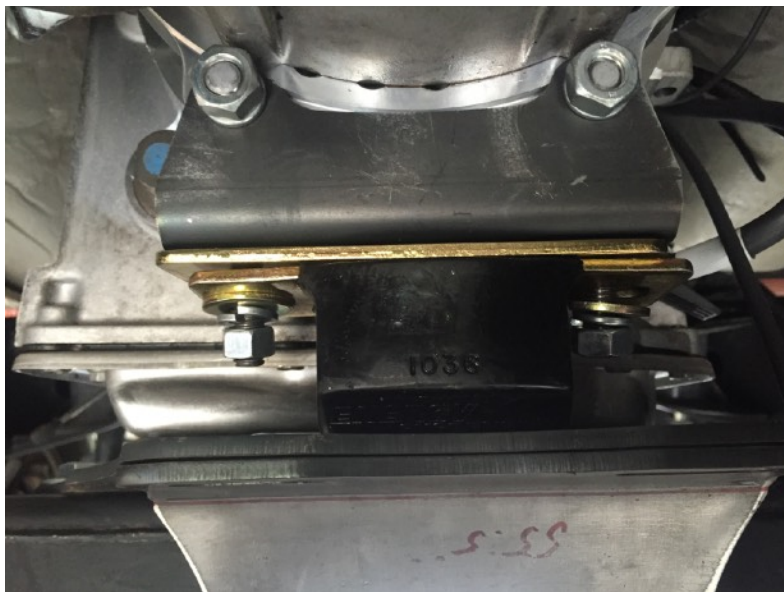
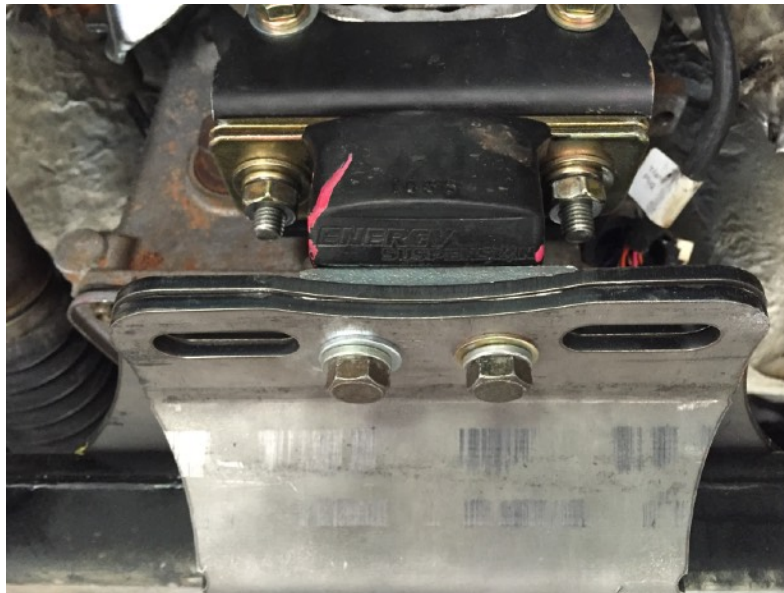
You will be fabricating your own transmission mounting plate. Most guys fab a L shaped bracket and weld it to the factory crossmember

Attach upper “L” shaped bracket to the transfer case adapter. This “L” bracket is universal and can be used several ways depending on where you position the powertrain.

Use the polly transmission mount to install between upper “L” bracket and lower bracket you made.

Try to center the driveshaft in the “hoop” area pointing to the rear differential yoke. Verify that the bolts do not rub on the bottom of the trans pan and secure all the hardware.

6L80E GEN4 Brackets show here just for reference



Powertrain Install

We usually install complete powertrain as an assembly.

We use factory GEN4 motor mounts (15854941) motor mounts will drop into position and have alignment pins to help them locate.

Install front accessory drive and check for clearance near the steering gear box.

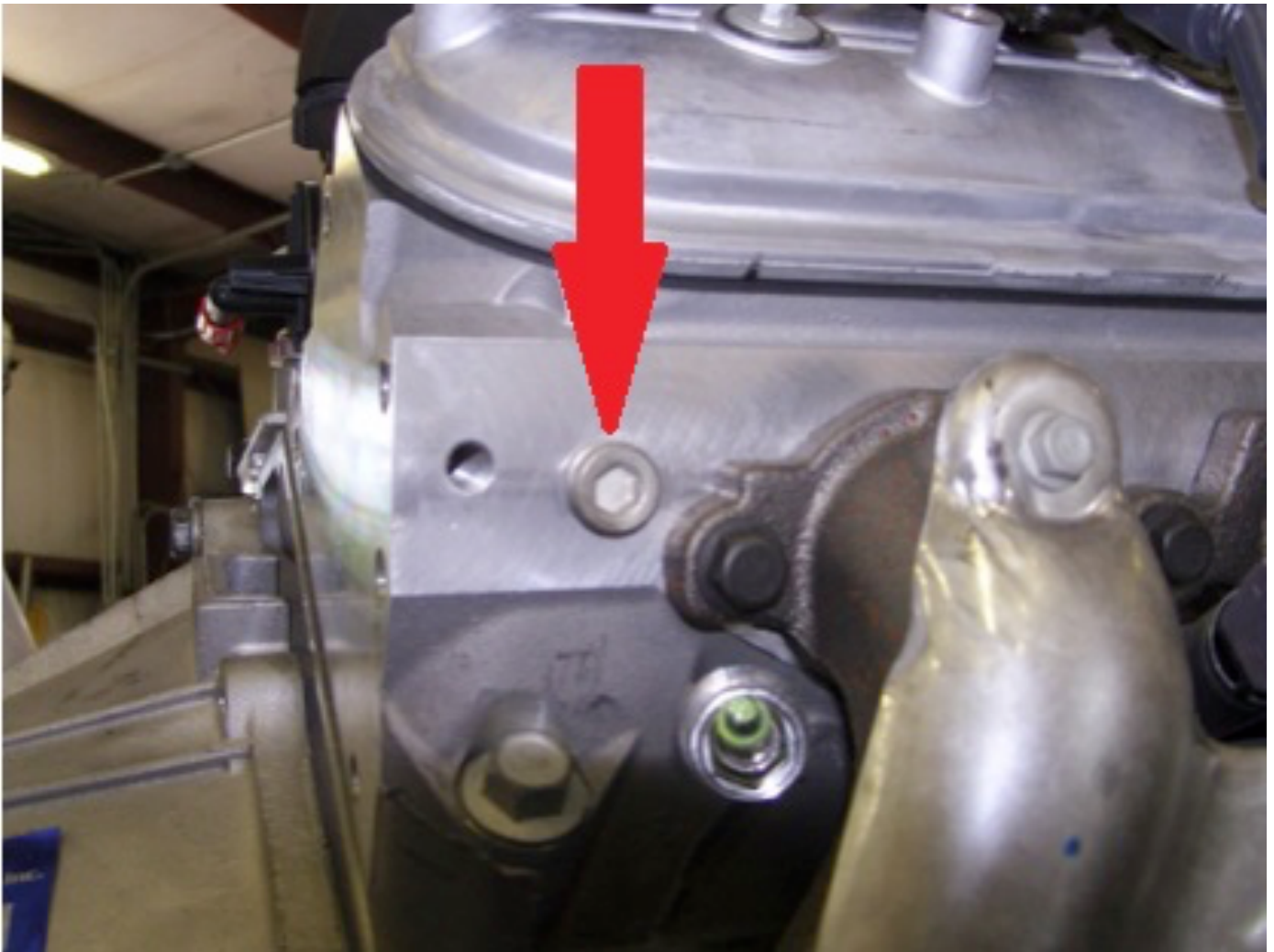
Once you have the powertrain aligned and looking good go ahead and tighten the bolts for the motor mounts and transmission mount.



Jeep coolant sensor install

We are going to install a second GM coolant (ECT) sensor and install it into the GM engine. This will run the temp gauge in the Jeep. AC Delco Part number 213-4333

Remove the allen head fitting from the rear of the passenger side cylinder head and install the new GM ECT sensor.



Fuel Line Install

We usually start off with the engine installed and the body off. If you're doing the swap with the body on it will be a little more difficult but can be done. You want to be very careful not to route the line near the exhaust system or anything sharp.

1. Starting at the front of the fuel tank there is a 3/8 male fuel line fitting, clip on the straight end of the supplied fuel line. You can reuse the Jeep blue clip or remove it and use the one supplied with the fitting.
2. Route the fuel line forward and towards the transmission keeping it high away from the exhaust.
3. Route the fuel line up the side of the transmission and secure it to the harness with zip ties.
4. Route it to the top of the back of the intake and run it along the top of the bell housing towards the driver's side of the engine.
5. Route it towards the fuel rail fitting and attach it making sure it has a nice smooth bend and doesn't kink.
6. Secure fuel line with zip ties or adel clamps.



CAUTION. Beware of heat and sharp edges. We cant be responsible if you incorrectly install the fuel line. If you wrap the fuel line around the exhaust pipe you will burn your Jeep down, Just saying...

We like to take extra time during our installs to add heat wrap to the fuel line and harness where it passes from the transmission to the fuel tank and near the exhaust. We also will add a heat shield in that area to help with heat and to hold the wires up.



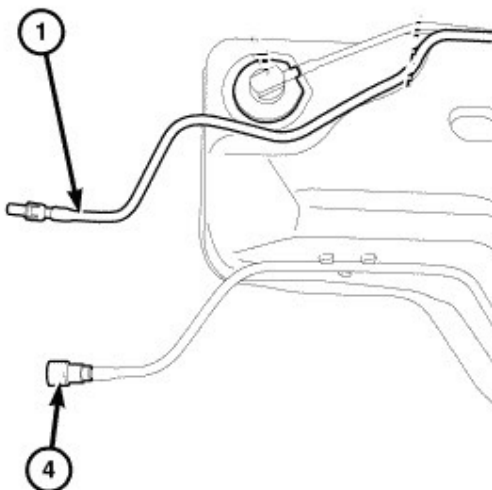
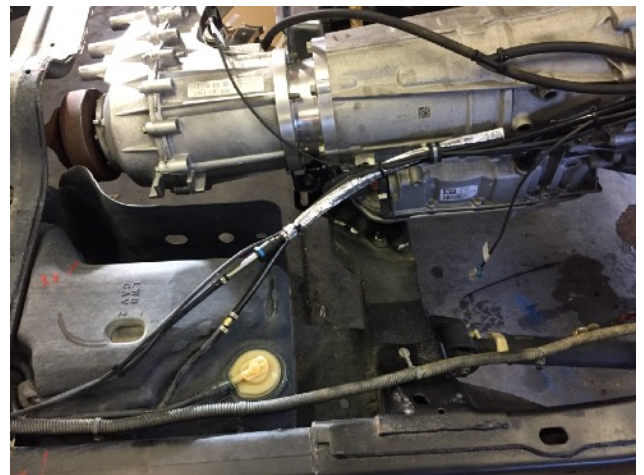
The extra time you take now will be very good insurance down the road when you have the Jeep stuck in a mud hole and the exhaust is glowing cherry red.

Route the fuel line up the back of the transmission and secure along with the wiring harness.

Be sure to watch for sharp corners and hot exhaust. You will want to secure this in a way that will protect it.

If you have a return type fuel rail you will need to convert it to a single line rail or get a return block off kit.

We usually fab up a heat shield or heat wrap the fuel and purge line as it passes from the fuel tank to the transmission. It would also be advisable to fabricate a heat shield for both catalytic converters.



#1 in this picture is the fuel feed line and #4 is the purge line

Purge Line Install

The purge valve can be located in a few different places depending on what engine you're using. Most trucks have the purge valve on the driver's side fuel rail or on top of the intake and LS car have the purge valve mounted to the front the the passenger cylinder head.

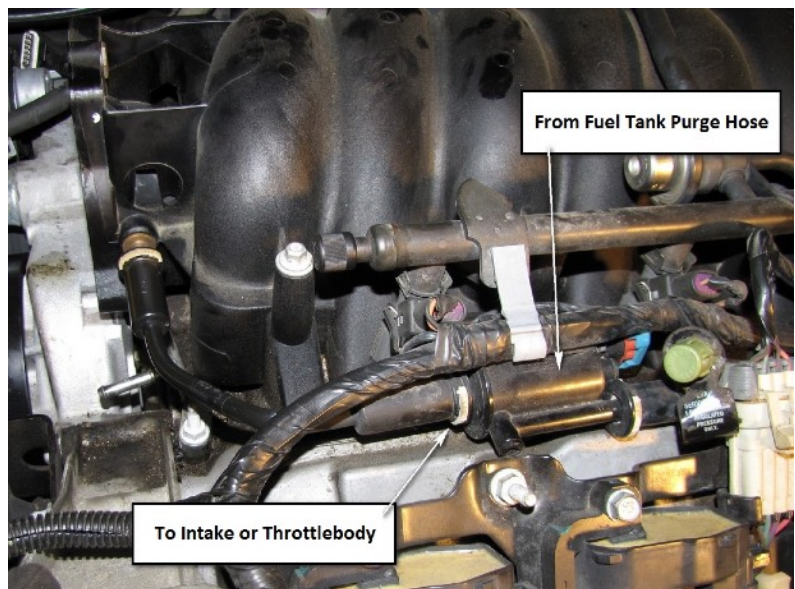
You will want to run a hose from the fuel tank purge line. It's the 5/16 plastic hose sticking out from the front of the fuel tank. Just run a rubber hose or fab up some nice plastic 5/16 line and route it to the purge valve. Be sure to use hose that is compatible with fuel vapor.

The other end of the purge valve will need to be run into the intake manifold or throttle body. Most engines already have this hose installed. Just be sure to verify which port is for the purge.

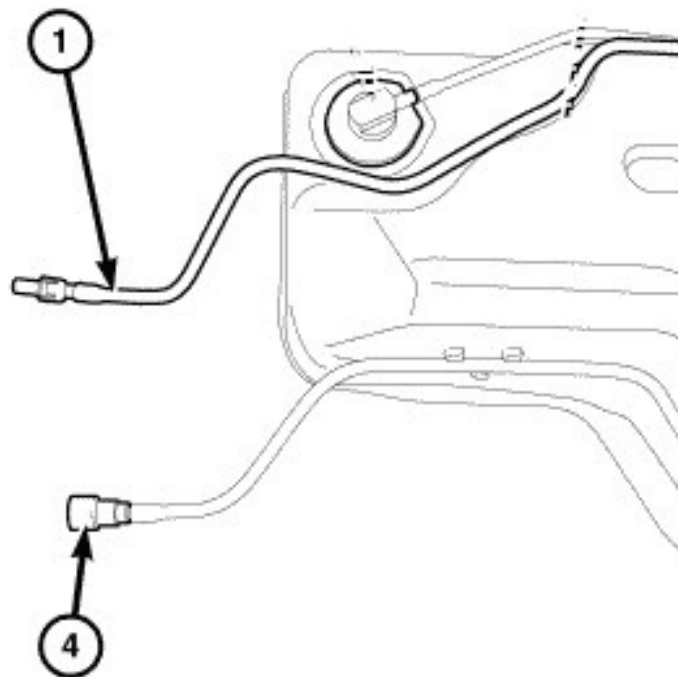
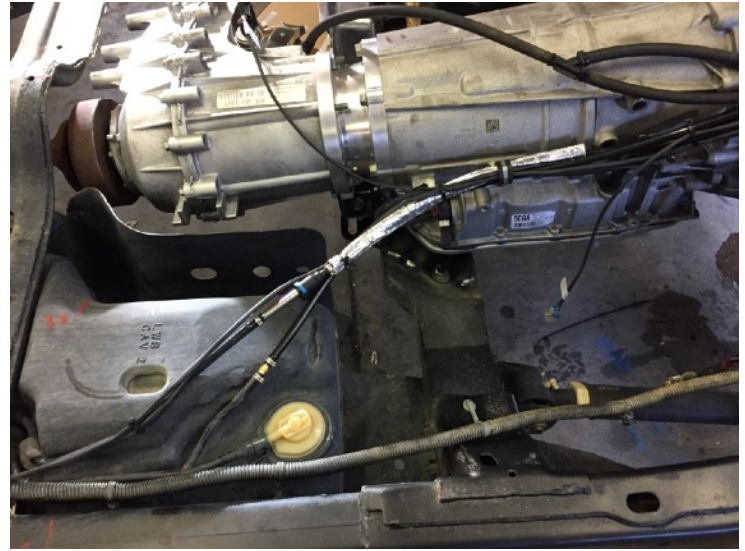
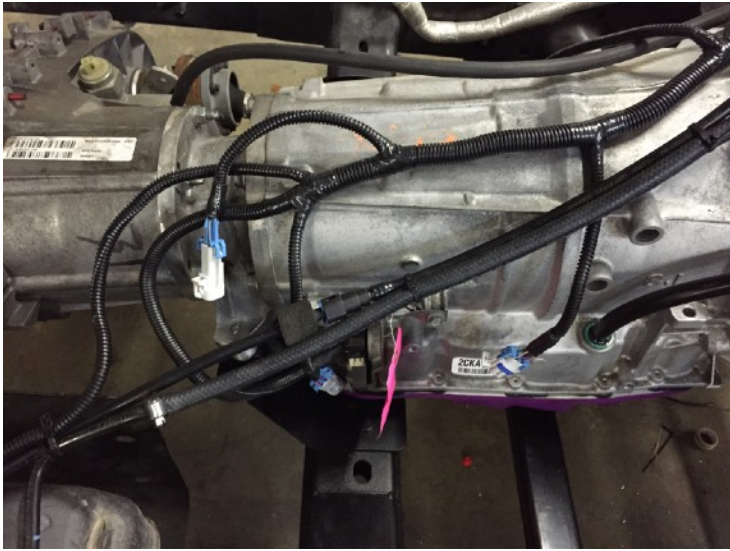
GEN3 Truck style purge valve



GEN4 truck style purge valve



Here you can see the purge line run along with the fuel line and connect to #4 in the picture below.



Harness Install (Under Hood)

Engine harness

1. Start with laying engine harness along the rear of the engine with the GM ECU connectors to the passenger side
2. Lay drivers side coil/injector harness along drivers side fuel rail and tuck under injectors for a cleaner look
3. Starting from the rear plug the injectors in from back to front
4. Plug drivers side coil connector in
5. Plug in drivers side GM coolant sensor plug
6. Plug in drivers side GM alternator
7. Continue routing harness along drivers side of engine and down the front
8. Plug in GM cam sensor
9. Route passenger side coil/injector harness along the passenger side fuel rail and tuck under injectors for a clean look
10. Starting from the rear plug the injectors in from back to front
11. Plug in passenger side coil connector
12. Plug in MAP sensor
13. Plug in throttle body
14. Plug in purge valve
15. Plug in Knock sensor wire at rear of intake
16. Plug in MAF (Mass Air Flow Sensor) in air intake tube
17. Route Transmission harness to rear of transmission and plug in (round plug)
18. Attach ground wire to drivers side rear cylinder head and secure
19. Route passenger side O2 sensor wires along passenger side of transmission
20. Route drivers side O2 sensor wire along drivers side of transmission
21. Route GM CKP (crank sensor) wiring along passenger side rear and above starter and plug in (be sure to keep it secured tight to the block and away from the heat of the exhaust manifold)
22. Plug the Secondary ECT coolant sensor plug into the GM sensor in the RH rear cylinder head.
23. Route Canister Vent valve wiring along trans harness and above fuel tank to the rear of the EVAP canister
24. Route Fuel tank pressure sensor along trans harness and above fuel tank to the FTP sensor
25. Route A/C compressor wire to A/C compressor
26. Route 4way & 8way & 14way plugs to the drivers side, they will be connected near the firewall factory connectors
27. Plug in TAC module jumper harness

Jeep ECU harness

1. Routing from rear of engine, lay harness with ECU plugs on the drivers side
2. Hook up Ground wire to same spot as GM harness ground (rear of drivers cylinder head)
3. Route starter wire to passenger side and hook up to GM starter (secure away from heat)
4. Route Jeep AC pressure transducer wire along drivers side fuel rail and to Jeep AC pressure transducer (round 3 pin).
5. Rout transfer-case position switch wires along top of transmission and plug into the top of the transfer-case

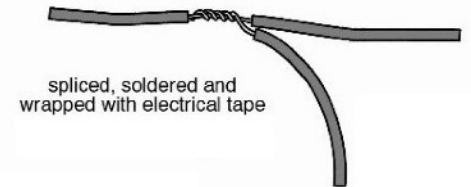
Wire Splicing Guide 2007-11

Cut and Splice wires 2007-11

You will be splicing in a few wires at the factory C3 Jeep computer plug, you will see these wires coming out of our harness near the ECU. 6 of the wires will be spliced into the C3 connector. Don't get overwhelmed here guys, its pretty strait forward.

Start with removing the back cover from the C3 Jeep ECU plug. You will be able to see some numbers cast into the plastic housing. Find #1 and use it as a reference. The picture shown is a diagram show from the front of the connector, you can use this as reference.

Follow the chart provided, find the wire you want to splice into and peel back a little insulation. Take the new wire and strip off a little insulation and wrap it around the exposed wire. Solder and tape up as seen in the picture below.



JEEP ECU CONNECTIONS

C3-18 Orange/Violet

C3-34 Violet/Orange

C3-14 Lt Blue/Dk Green

C3-11 Lt Blue/Orange

C3-38 Dk Green/Orange

C3-37 Brown

X102-2 Cruise

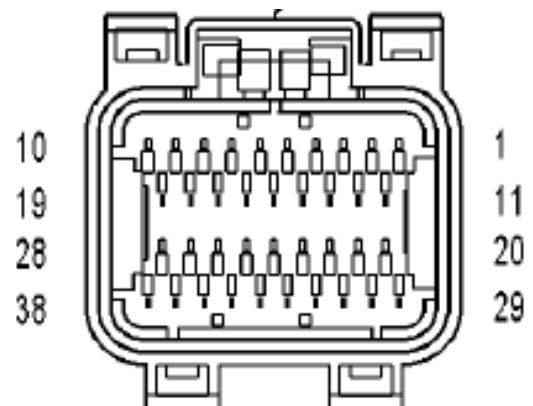
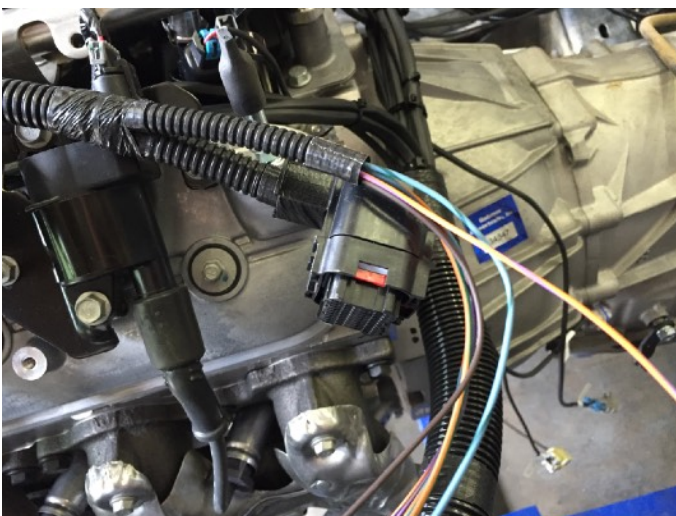
X102-1 Cruise

X102-7 Brake switch

X103-14 A/C Control

X103-1 Starter Control

Fuel Pump Relay Control



EVAP Modification

These are the parts you need to complete this step.

EVAP vent valve. GM 13575701 ———— NAPA CRB 2282696

Fuel Tank Pressure sensor. GM16238399 - NAPA CRB 221001

First locate your EVAP canister.

Unplug the wire connector from the white valve (#1 in the pic below)

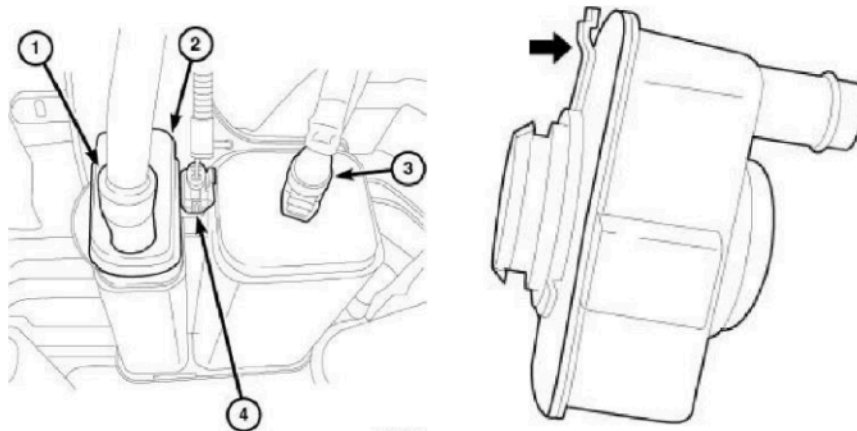
Twist the valve counter clockwise and remove it

Look inside the valve, you will see a small plunger. If you tilt the valve the plunger will open or close the port.

Put some superglue on the plunger and tilt it to the open position, let it cure.

Our goal is to lock open the valve so vapors will flow at all times.

Once you're done with that, reinstall it on the canister.

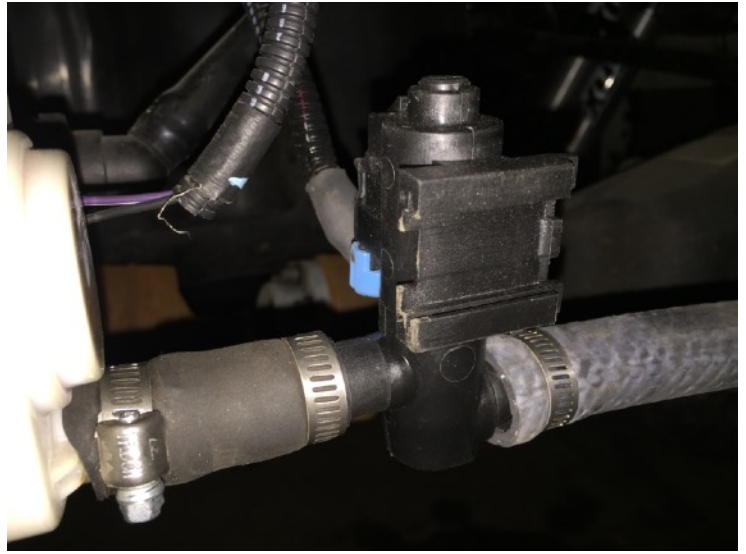


Take your new GM vent valve and install it on the port coming from the white valve we just glued open. You may need a small piece of hose to connect the two. Install the original hose to the other side of the GM vent valve. We are now using the GM valve to open and close the canister vent. Plug the connector in from our new harness.

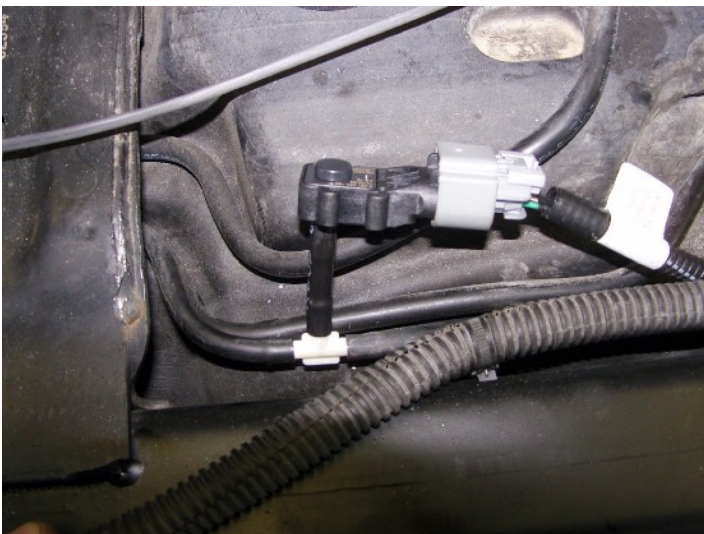
EVAP VENT 13575701

FUEL TANK PRESSURE SENSOR 16238399





YOU HAVE A FEW OPTIONS FOR INSTALLING THE FUEL TANK PRESSURE SENSOR. ONE WAY IS TO CUT THE PLASTIC VENT LINE AND INSERT A VACUUM "T" AS SHOWN IN THE PICTURES BELOW.



OPTIONAL YOU CAN CUT AND INSTALL IT IN THE SMALL TUBE THAT RUNS FROM THE FUEL TANK UP TO THE FILLER NECK. THIS IS USUALLY EASIER IF YOUR NOT REMOVING THE BODY FOR INSTALL.



REMOVE THE RUBBER SEAL ON THE FTP SENSOR AND ATTACH IT WITH A PIECE OF VAPOR HOSE OR 5/16 PLASTIC LINE.

ROUTE THE SENSOR IN A WAY THAT IT WONT GET SMASHED WHEN YOU DROP THE BODY. PLUG IN THE NEW HARNESS AND SECURE

IF YOU PLAN ON MOVING YOUR EVAP CANISTER NOW IS A GOOD TIME. JUST KEEP ALL THE HOSES RUNNING TO THE SAME PORTS AND YOU WILL BE FINE. WE USUALLY MOVE THE CANISTER TO THE RIGHT REAR SPRING PERCH AREA.

Battery Cables

2007-2011 3.8 Battery Cables

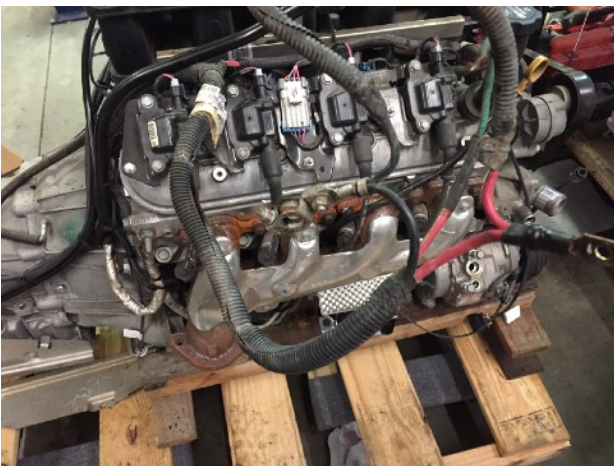
You will be reusing your original 3.8 battery cables. Remove them and clean them up. Starting at the GM starter, hook up the main positive cable to the starter stud and secure. You may have to trim the little locating tab off the terminal end to get it to sit flush.

Attach the main ground wire to the engine block or rear cylinder head. You probably don't want to use a stud to attach even though we did in this picture.

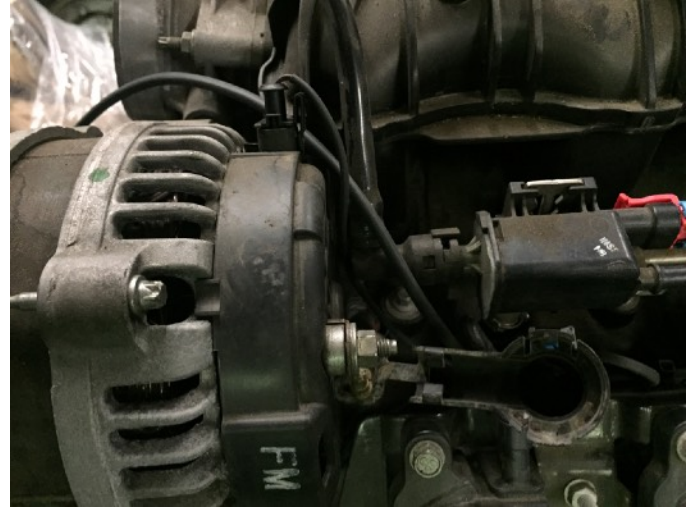
Route both wires up and over the starter to the rear of the engine and up the RH rear cylinder head. Be sure to insulate and secure the wires away from heat.



Continue running up the RH fuel injector rail and branch off the cables to the battery and TIPM.

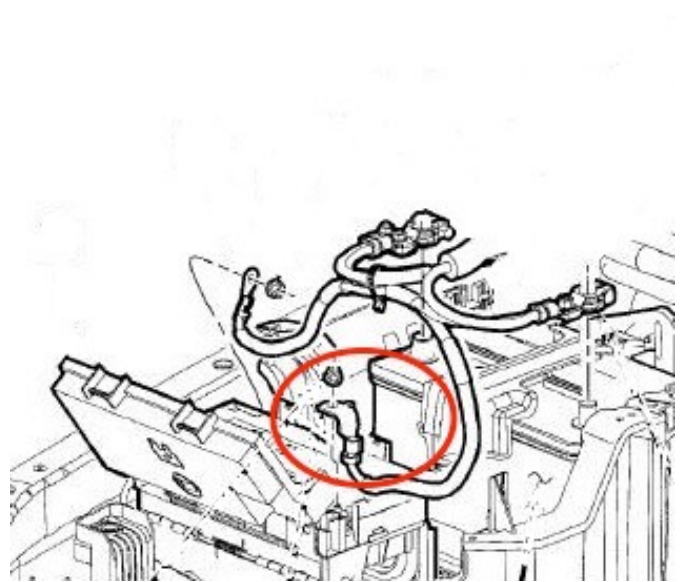
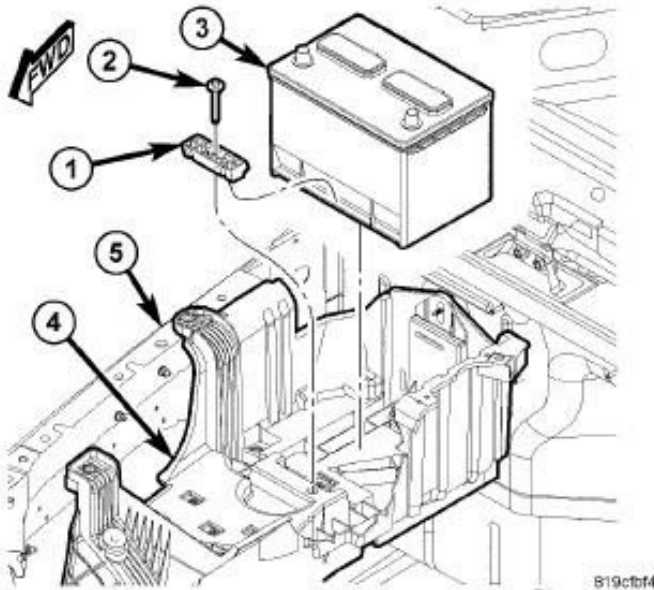


Continue routing the positive alternator to the alternator going along the right side fuel rail and under the throttle body being sure to insulate and secure it.

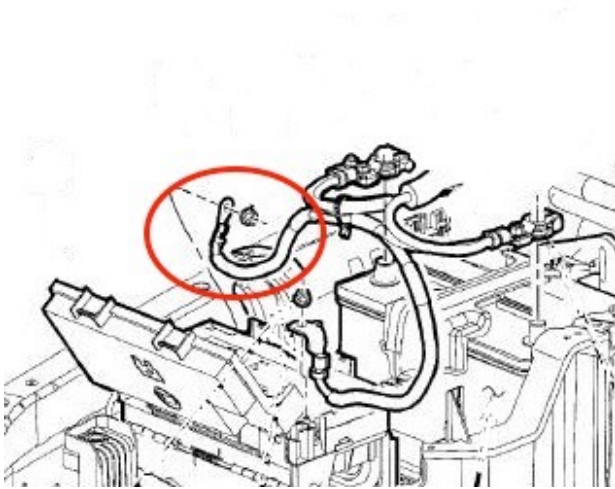


Attach the TIPM positive cable the TIPM (fuse box) stud and secure.

Attach the positive cable to the battery.



Attach the smaller ground wire to the inner fender stud where it was removed.



TECH TIP: Always remove the negative cable from the battery first and install it last. This will prevent arcing and will protect the computers and electronics.

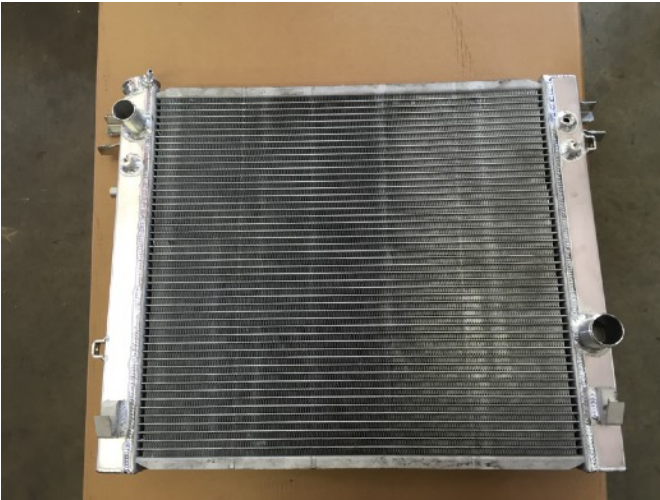
TECH TIP: Don't hook up the negative until your finished with the install and ready to power everything up.

TECH TIP: The horn may honk and the wipers may move when you hook up the battery, this is normal, although it will freak you out.

Radiator and AC Condenser

The radiators can be ordered a few different ways. If you have a Camaro water pump you will order a “**left**” side inlet and if you’re running a truck water pump you will order a “**right**” side inlet. Both have a steam port fitting and accept factory 3.8 or 3.6 fans and condensers.

We offer both the High Flow Single Pass and HD Dual Pass 52mm aluminum radiators in either configuration.

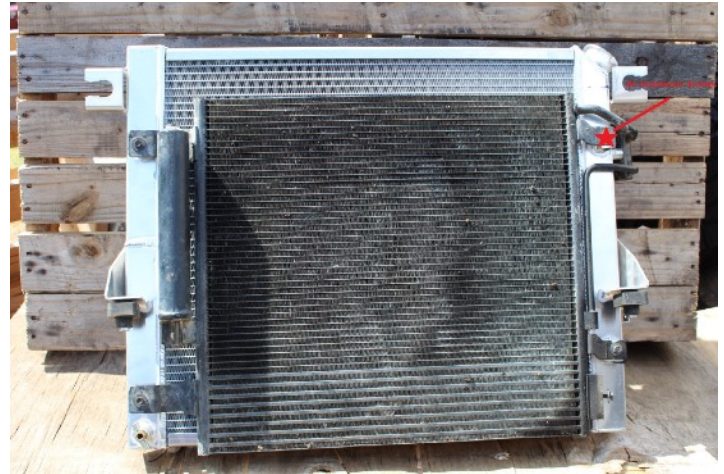


All radiators are equipped with a pressure cap. This cap is rated at 18-21 psi. The cap contains a spring loaded pressure relief valve. This valve opens when the pressure reaches the range of 18-21 psi. A rubber gasket seals the cap to the radiator neck. This is done to prevent leakage, hold pressure and maintain a vacuum as the engine cools down to recover coolant from the expansion tank.



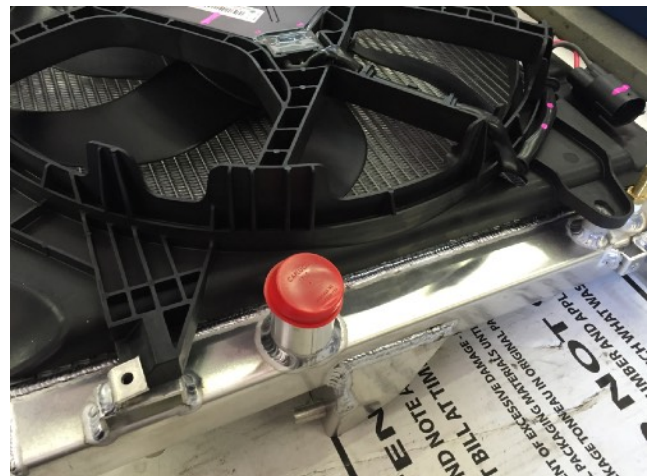
Assemble the fan and AC condenser to the radiator using original hardware. Be sure to reuse the rubber flaps on the sides.

The condenser tubes will attach a 4 places on the from and one place on the side. You may have to slightly bent the soft aluminum tubes to get it to line up perfectly.



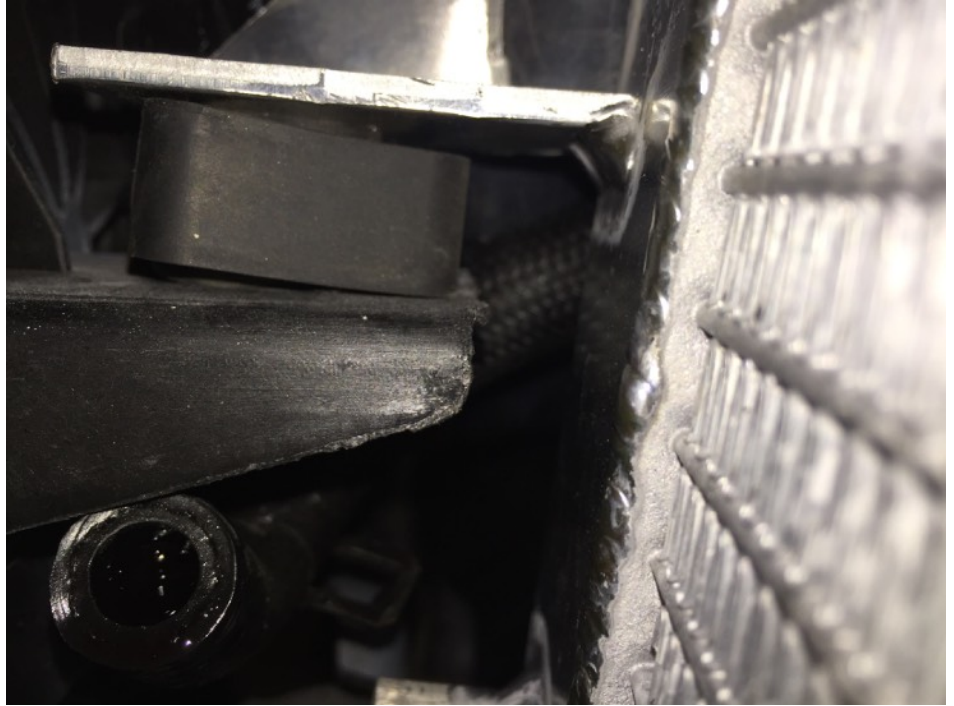
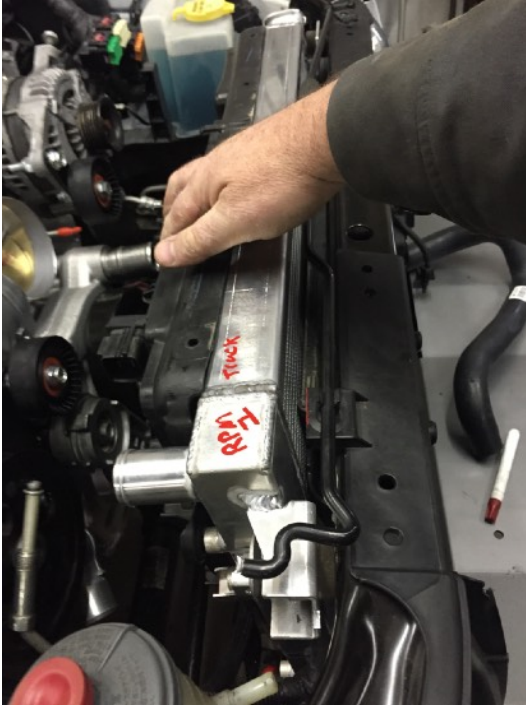
Check and make sure the condenser is not contacting the aluminum radiator. You can take a pry bar and lightly pry it away from the radiator so it wont rub thru. The metal tabs will keep it in place.

The fan shroud will slide into the lower tabs on the radiator and secure at the top with the original hardware. It may be necessary to clearance the plastic around the upper or lower radiator hose to allow room for the hose clamps.



Install all original plastic and rubber shields onto the radiator assembly. This will ensure the correct airflow. If you leave these out it could cause overheating and damage.

Install the radiator into the Jeep using the original rubber isolators and hardware.



You will reuse the lower Jeep radiator hose by cutting it down and bit and installing it onto the lower radiator outlet. Instructions to follow.

The upper hose will be NAPA 8637 for the Camaro pump and NAPA 8573 for the truck pump

Hook up the small coolant steam port tube from the engine to the small brass port on the radiator and route it away from any moving parts. This will allow air to purge from the engine and is necessary.

Lower Radiator Hose Modification

For the lower radiator hose you will be reusing your stock JK hose and cutting it down to fit. The 3.6 hose is shown but the 3.8 hose is similar.

Start by removing the clamps and mesh protector.

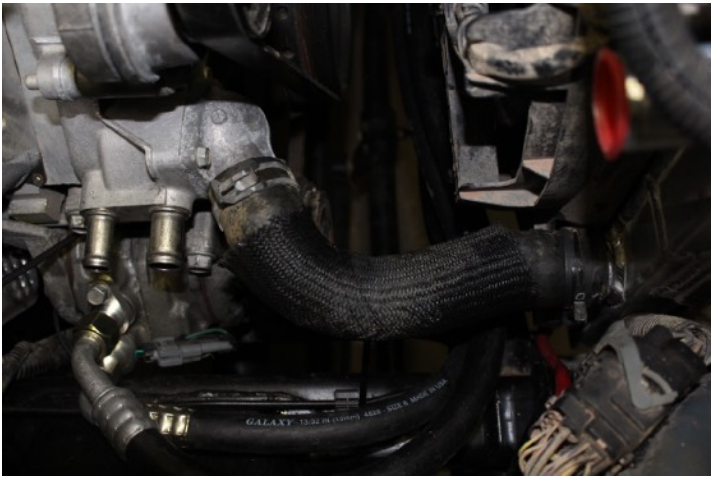
Install the hose on the lower radiator outlet and lay it out. Mark where you think it will fit and remove.



Cut the hose to size. We usually start with the hose a little long and trim a little at a time until it fits with no kinks.



Reinstall the mesh protector and clamps. Install modified hose and secure with clamps.



AC Hoses

We offer pre made AC hoses or you can modify your own.

For the GM accessories we will start with the AC compressor adapters.

Bolt on the high and low side adapters. Make sure the seal is installed between the fitting and compressor.

Bolt on our pre made hoses starting at the firewall making sure the seals are intact.

Run the smaller hose to the condenser (lower port) and bolt it up.

Run the larger hose over or under the fan shroud and down to the AC compressor, bolt it up to the larger adapter using a green o-ring.

The single hose will bolt up the the condenser on the driver's side (upper port), install your factory pressure sensor and run the hose along with the larger hose to the AC compressor.

Attach to the smaller adapter using a green o-ring.

If you're using a new compressor follow instructions for adding the proper amount of PAG oil.

Vacuum down the system down for 30 minutes to verify no leaks and to remove any moisture from the system

Charge the system with 525 grams of 134A. If you do a system test you should see 170-240 PSI on the high side. The high speed fan should be running when the pressures are above 220 psi.



Heater Hoses

We usually reuse the factory Jeep heater hoses. Be sure to route them away from heat and anything sharp. It will be tight but they will reach.

If you need to replace them or want longer hoses use NAPA 10084. They are a nice long hose with a larger end that works well with the LS water pump.

The picture will show the inlet and outlet of the pump. Run the outlet of the pump to the inlet of the heater core (lowest port).

Run the highest heater core port to the return side of the water pump fitting.

The small port on the water pump is the Inlet and the larger port is the outlet to the heater core.

Coolant will flow out of the larger port and return on the smaller one



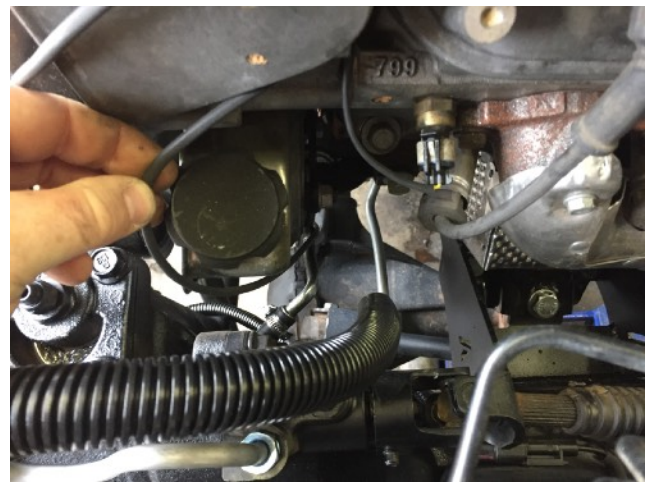
Power Steering Hoses

A power steering pressure hose may need to be fabricated or modified depending on what accessories you use and any other modification like PSC or hydro assist

If your running truck accessories use NAPA hose # 7-2745

If running a Camaro or CTS-V pump use NAPA hose # 7-2427

We have found that these hoses work great but require a little bending to get into the perfect shape.



We sometimes use the Camaro hose 22790848 with the GM truck and Camaro accessories. (shown here)



For PSC pumps we used Napa # 7-2427. The PSC JK pump will bolt up to the factory Camaro PS bracket. You will need to source the proper size pulley from PSC as you don't want to overspeed the pump. (shown here)



You will have to lay it out in a way that doesn't bind it. You may also have to tweak it a bit to get the bends just right. Use these pictures for reference

The return line is low pressure. we usually cut off the old fitting and attach a new piece of hose to it, run it back to the pump or reservoir.

Pentastar Fan Upgrade

If you are upgrading to a PWM Pentastar fan you will need to wire up your own harness from the fan to the battery or purchase our PWM fan harness. Also special programming is required so be sure that we have your EZcanbus module programmed for the PWM fan.

We usually start off by cutting the connector off the PWM fan and attaching new wires.

Find some heavy gauge 10awg red and black power wire and solder or crimp it to the two heavy fan wires. Be sure this is a very strong connection as this fan will pull a lot of current.

Use some smaller wire 14awg and attach to the smaller light green wire.

Route new fan harness along right side inner fender ending at the battery.

On the black wire attach a eyelet and secure to the negative battery terminal.

On the red wire attach a fusible link with a high current rating and a ring terminal and secure to the positive battery terminal.

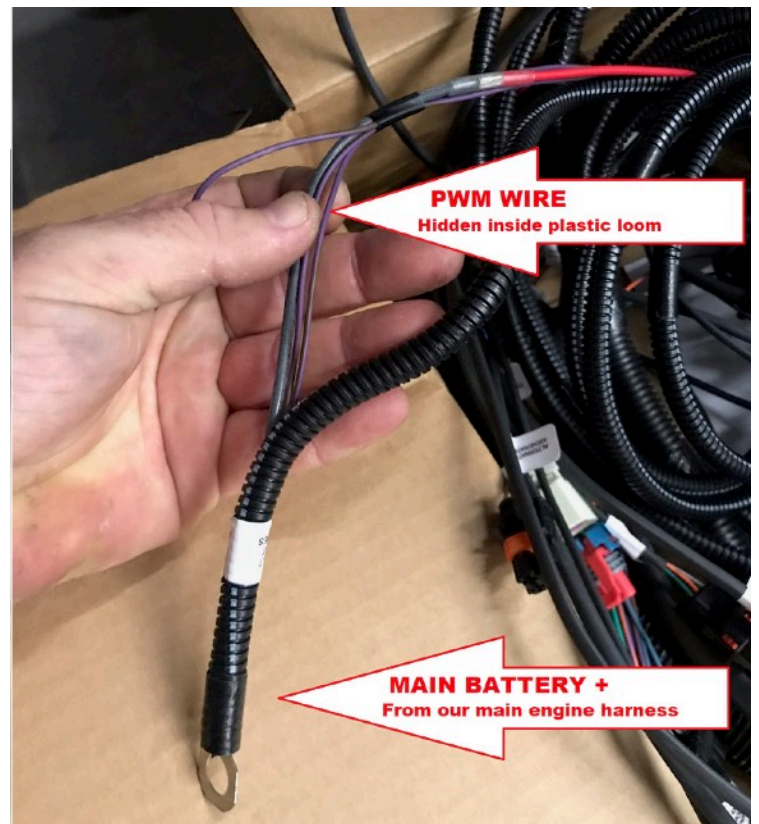
Attach the smaller "signal" wire to the Violet/Brown wire that is hidden with the main battery feed wire from our harness.

Look for our main battery feed wire, it has an eyelet. Open the plastic sleeve up a bit and you will find a Vio/Brn wire hidden in there.

We are using the EZcanbus module to control the pentastar fan.

The fan should run at 10% whenever the engine is running and will increase speed as the engine warms up or as the AC pressures increase.

Our PWM Harness is show below.

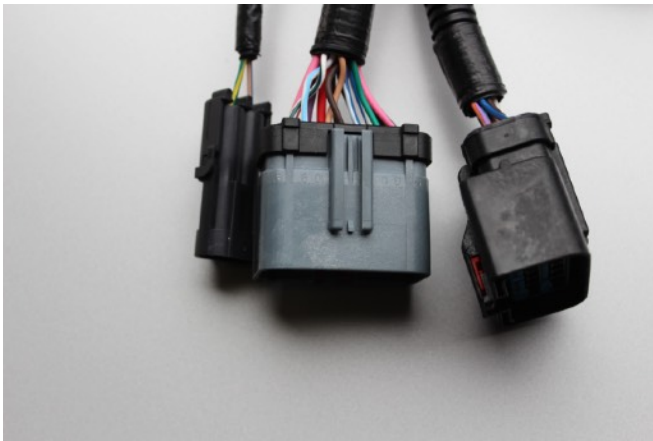


Harness Install (under dash)

Jeep Side Interior Harness

Route harness from inside and run both 14 way connectors and power wire thru firewall hole below brake booster.

You can either drill a new hole or drill out the hole where the Master cylinder would be on a manual transmission Jeep. Use supplied rubber grommet.



Run harness around the brake booster and plug into the two 14 way connectors on the main under hood harness.



Run single power wire along firewall and attach to positive battery terminal.

Mount your GM accelerator pedal . You will need to fab up a bracket

Remove and discard your original Jeep accelerator pedal. (Save hardware)

Find the connector marked accelerator pedal and plug into the GM pedal.

Route the pedal harness to the GM “TACH” Module. This is the small silver box that controls the throttle pedal. You should have this module from your donor engine.

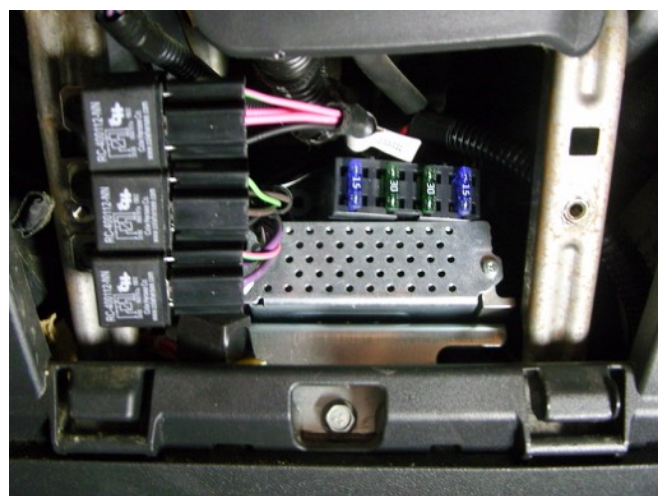
Secure harness up out of the way making sure it does not contact the steering shaft.

Locate the three white connectors labeled x101, x102 and x103. Plug these into the EZcanbus Module matching the positions on the labels.

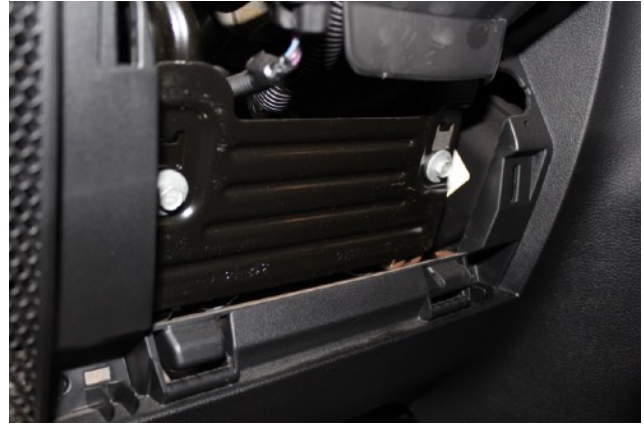
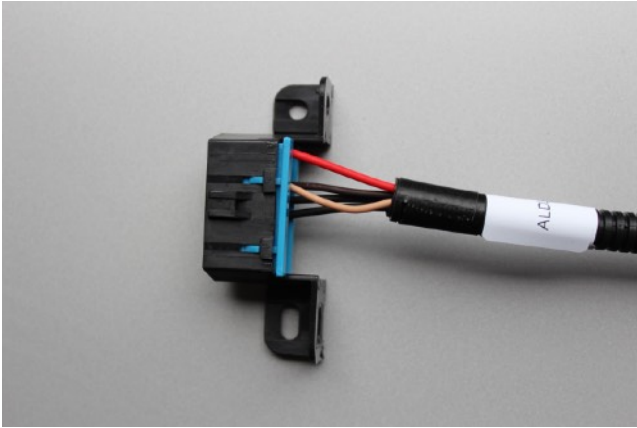
Attach the smaller EZcan module to the 10 way white connector.

Mount the modules under steering column or along the inner fender area making sure the harness does not rub the steering shaft or brake pedal. We like to keep it as high as possible just in case you get into high water.

Mount Fuses and relays under steering column or somewhere with easy access.



Mount (ALDL) OBD2 port under dash where you can reach it from the drivers seat. We usually mount it in front of the stock Jeep OBD2 port and screw it to the underside of the dash panel.



Air Intake

You will need to make your own air intake system.

Most GEN3 engines used a 3.5" diameter intake tube and MAF sensor.

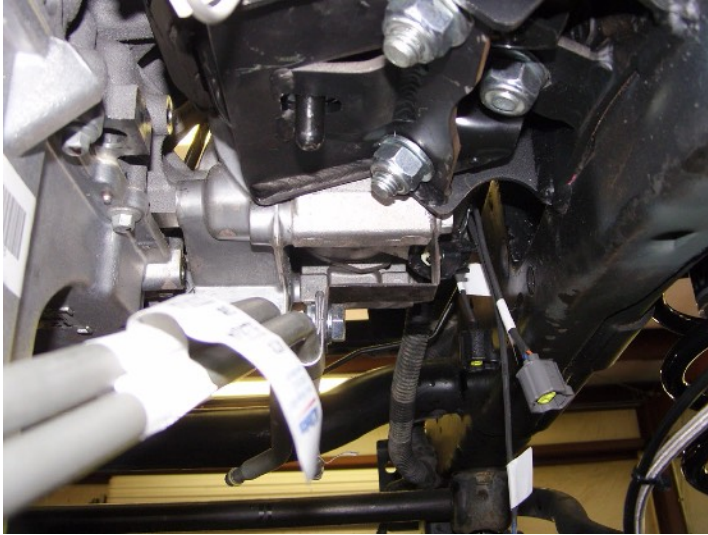
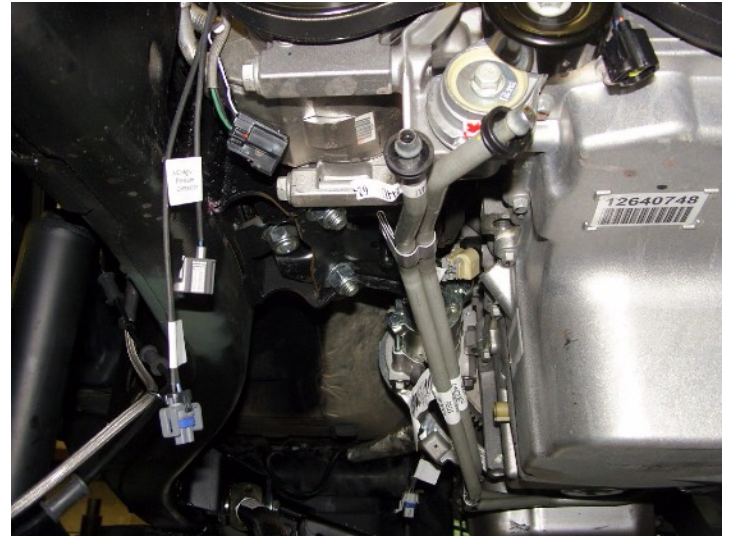
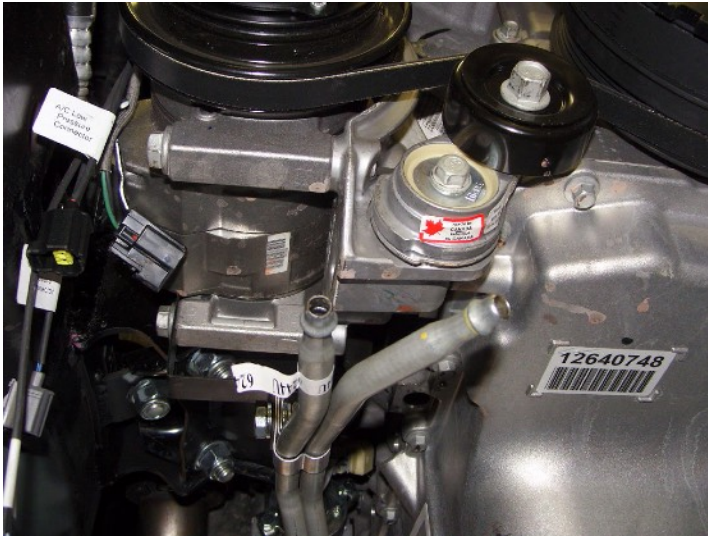
We recommend using the factory truck MAF sensor for the engine you are running. This will insure that your engine calibration matches the MAF sensor calibration.

You will also need to attach a small hose from the air intake to the port on the top of the RH valve cover. This is the fresh air supply for the PCV system. It should be routed to the air intake tube after the MAF sensor and before the throttle body.



Transmission Cooler & Lines

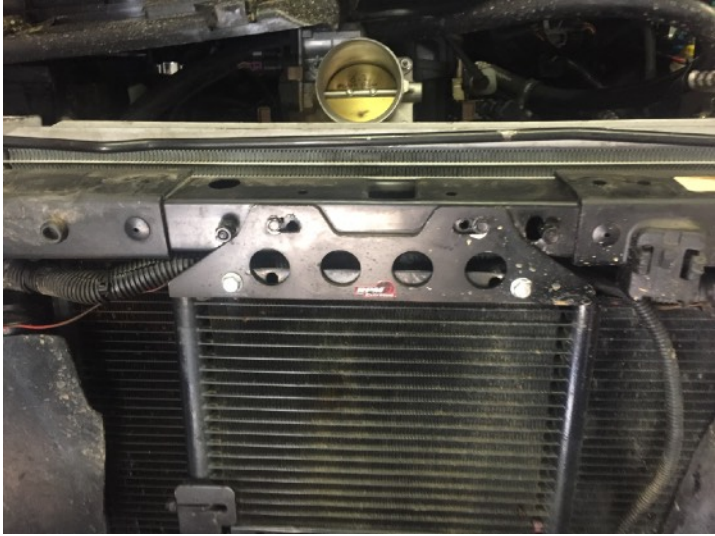
You can reuse the factory truck cooler lines. You will need to trim them back and flare the end so the hose clamp has something to grab.



Use a high quality universal transmission cooler with at least 20,000 BTU capacity.

Mount it in front of the condenser and secure it in place.

Run the hoses to the transmission cooler lines, clamp and secure.



Exhaust System

Every Jeep is different. A long arm suspension will need a different exhaust compared to a short arm.

The truck style exhaust manifolds usually wont clear the frame so you can run LS3 Camaro style manifolds, TrailBlazer SS manifolds or a set of our LS JK shorty headers.

We usually start with bolting on the flanges and working back from there.

The 1st 90 pipes are usually shortened up a bit to keep the exhaust up tighter to the floor.

From there you will work down thru the cats and the 90 pipe running under the T case.

Be sure to leave at least 2-3 inches of clearance between the catalytic converter and the floor of the Jeep.

Use the Y pipe to bring the whole mess together and get all the angles perfect.

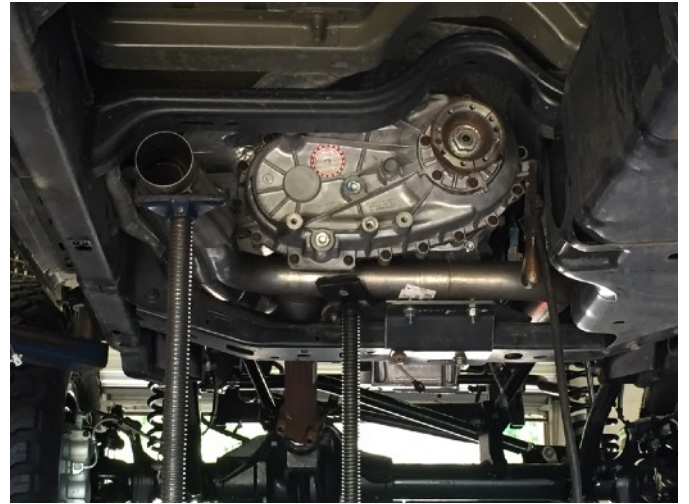
You will need a piece of 2.5" pipe to connect the Y pipe to the driver's side Cat.

Keep in mind when installing these parts to leave clearance for the driveshafts at full compression and pay close attention to wires and the fuel line. The last thing you want to do is melt through a fuel line.

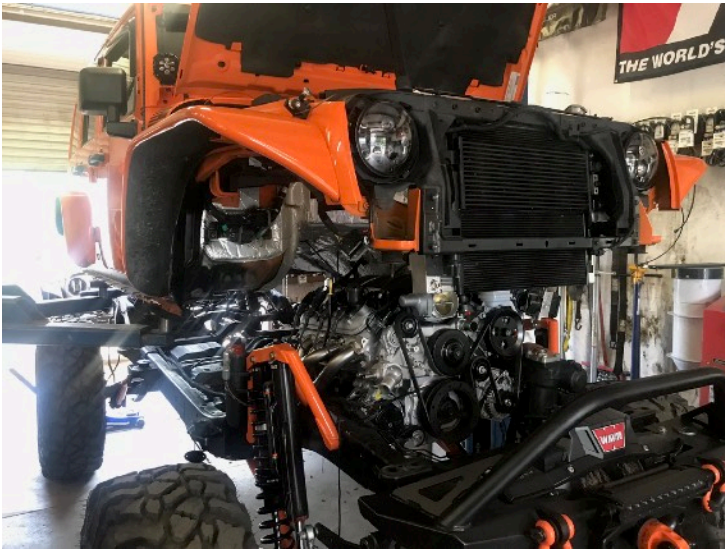
Attached are some pictures of previous installs to help give you some inspiration and guidance.



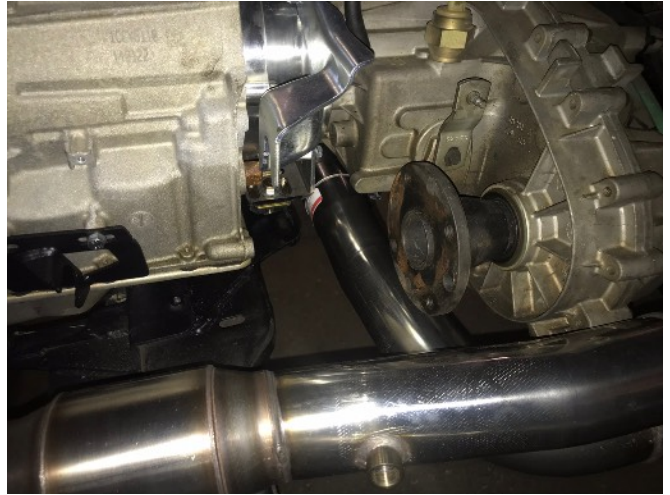




Long Tube Headers KOOKS



Stainless Y Pipe KOOKS



Stainless Cat Back KOOKS

