



1987-1995 JEEP WRANGLER GEN 3 HEMI SWAP ENGINE MOUNTING BRACKETS

BHS523

Installation Instructions



Thank you for choosing to use Hooker Blackheart products on your 1987-1995 Jeep Wrangler Gen 3 Hemi engine swap project. These engine mounting brackets are part of the most comprehensively designed engine swap system available for installing a Chrysler Gen 3 Hemi engine into this vehicle application. Installation of these engine mounting brackets requires that the stock 4 or 6 cylinder engine mounting brackets be removed/cut from the frame of the swap vehicle. It is highly recommended that the Hooker Blackheart 1987-1995 Jeep Wrangler Gen 3 Hemi Engine Swap Technical Guide be read fully before beginning the installation of these components, as the information contained within it will be helpful in understanding the overall scope of the project that will be undertaken by the user.

PRE-INSTALLATION CONSIDERATIONS:

IMPORTANT! Position and support your vehicle on a suitable surface. **USE CAUTION AND WORK ONLY ON A LEVEL SURFACE USING JACKS AND JACK STANDS OF SUFFICIENT CAPACITY TO LIFT AND SUPPORT YOUR VEHICLE. NEVER WORK UNDER A VEHICLE SUPPORTED BY A FLOOR OR BUMPER JACK.** Use of a two-post under arm lift or four-post drive-on lift will considerably reduce the time and effort required to complete the installation. **MAKE SURE LIFT LOCKS ARE ENGAGED BEFORE WORKING UNDER THE VEHICLE.**

These engine mounting brackets have been designed and validated to provide installation of a Chrysler 545RFE transmission into the vehicle, behind a 2003-2008 Gen 3 Hemi truck engine, without requiring a body lift (in installations using a stock engine inclination angle configuration and Hooker Blackheart Jeep Wrangler Hemi swap headers only), or a suspension lift. Installing the engine in a belly-tuck configuration, using a transmission other than a 545RFE, or using a transfer case other than a NP231J, will require a body lift in most instances, and possibly a suspension lift. Close attention should be given to ensure adequate operational clearances are provided between the front axle assembly and the oil filter/adaptor and the lower outlet hose of the radiator (if using a down flow radiator).

These brackets may be used as part of an emissions legal swap utilizing stock Jeep Grand Cherokee Hemi exhaust manifolds and catalytic converters obtained for a use/year model permissible Dodge 1500 Hemi truck engine application. Check with you local/state governmental authorities to determine what equipment is required to keep your Jeep Wrangler emissions legal. Emissions legal swaps will require the use of a body lift. Hooker Blackheart headers and Y-pipes for this this application are designed for off-road/ racing use only, on vehicles that will not be used, or registered for use on public roads or highways.

Installation should only be carried out by individuals with adequate welding skills and experience. 110V welding equipment is not recommended for use in installing these components.

The installed fore/aft location of the stock NP231J transfer case will be a couple of inches further rearward in the chassis from the factory stock position, when installing it behind a Gen3 Hemi/ Dodge Ram 545RFE (with Dodge Ram 545RFE transfer case adapter) combination. This change of geometry will require new drive shafts to be made. Installing a slip yoke eliminator kit on the transfer case and converting the rear drive shaft to a double Cardan type assembly is highly recommended.

INSTALLATION:

NOTE: Installation of a Gen 3 Hemi engine onto these engine mounting brackets will require the use of additional user-supplied parts. The specific parts needed are as follows:

Hooker Blackheart BHS514 Gen 3 Hemi engine mount clamshell (2 required), 71221016HKR (black) or 71221017HKR (red) polyurethane engine mount inserts (2 required) and 71223015HKR engine mount hardware kit (1 required).

Any questions? Please contact Technical Service: 1-866-464-6553 or 270-781-9741. For online help, please refer to: www.holley.com.

1. Disconnect the cables from the battery and remove the battery from the vehicle.
2. Recover the refrigerant from the A/C system, using suitable equipment.
3. Remove the A/C dryer and refrigerant lines.
4. Drain the coolant from the radiator/engine and remove the radiator.
5. Remove the stock wiring harness, including the fuse/relay center.
6. Remove the front and rear drive shafts.
7. Remove the engine, transmission and transfer case from the vehicle, using the prescribed steps in the Jeep YJ factory service manual.
8. Remove the throttle cable throttle pedal.
9. Clean the engine bay with a pressure washer, or by other suitable means.
10. Remove the front fenders/inner fenders.
11. Remove the factory fuel lines from the frame rail.
12. Remove the bolts that attach the brake lines to frame rails and move the brake lines a suitable distance away from the engine mounting brackets on the frame to allow you to work on the removal of the brackets.
13. Cut the engine mounting brackets off the frame and grind/sand all remnants of the brackets smooth and flat.
14. Thoroughly clean the shipping oil finish from the supplied engine mounting brackets using dish washing detergent or brake cleaning fluid and let them dry.
15. Measure and scribe a line across the top surface of the right side (passenger's) frame rail 7-1/8" from the front edge of the forward-most factory frame energy management hole on the inside upper corner of the frame rail. These are a series of in-line holes located in the corners of the frame rail where it bends just before turning under the body tube. See **Image 1** below for a visual reference.



Image 1

16. Place the supplied right-side engine mounting bracket (the shorter of the two brackets) onto the right frame rail and line up its rear edge with the line you've scribed into the top of the frame rail before clamping it in place with a 6" heavy-duty C-clamp.
17. Using another 6" heavy-duty C-clamp, loosely clamp the supplied left-side engine mounting bracket onto the left frame rail about 1-3/8" further forward on the frame than the right side engine mounting bracket. Exact positioning of this bracket is not needed at this time, as it will be adjusted to line up with the left side engine mount as the engine is being set in the chassis for the first time.
18. Attach a Hooker Blackheart BHS514 clamshell cage and 71221016HKR (black), or 71221017HKR (red) poly insert to both sides of the engine per the instructions included with those products.
19. Attach the 545RFE transmission and Dodge/Ram 1500 or 2500 truck transfer case adapter to the engine. Do not install the transfer case at this time.
20. Hoist the engine, transmission and transfer case adapter assembly into the vehicle frame and tilt the assembly to an approximately 5 down-angle to the rear before easing it down gently into the engine mounting brackets clamped to the frame. It is at this time that you will loosen the C-clamp on the left (driver's) side engine mounting bracket and slide it forward, or rearward, to align it with the motor mount on the left side of the engine.
21. Install the motor mount coupler bolts from the Hooker Blackheart 71223015HKR hardware kit, or equivalent, into the engine mounting brackets/motor mounts. Install the bolt in the passenger's side bracket first and then slightly raise/lower the engine, as needed, to allow installation of the bolt in the driver's side engine mounting bracket. Be sure the engine mounting brackets are bearing against the frame rails and both C-clamps are securely tightened before lowering the weight of the engine fully onto the engine mounting brackets.
22. Attach a Hooker Blackheart BHS537 mount adapter bracket onto the bottom of the transfer case adapter per its instructions, then install a Hooker Blackheart 71223029HKR (black) or 71223030HKR (red) transmission mount to the bottom of the adapter bracket.
23. Raise the rear of the transmission to a height that will allow the factory transmission skid plate to be installed and install the skid plate.
24. Lower the transmission/transfer case adapter/mount assembly down onto the skid plate, and attach the mount to the skid plate using the two rear slots present in the boxed section of the skid plate. Install only one of the mount bolts at this time.

If you are using one of the stock skid plates that did not come from the factory with a pair of slots in this location, you will need to mark the required fore/aft location of these slots on your skid plate and create them with suitable cutting tools. Determine the correct left/right location of the slots by projecting their centerlines rearward from the front pair of slots. You'll also need to cut a square access window on the underside of skid plate to be able to install the mount attachment bolts through the skid plate.

If you cannot easily line up the transmission mount with the slotted holes in the skid plate, it indicates that a fore/aft adjustment will need to be made to the position of the driver's side engine mounting bracket on the frame rail. Position a screw jack/stand under the engine to support it and loosen the C-clamp holding the bracket to the frame slightly (do not stand or lay under the engine while doing this) and tap the bracket slightly forward on the frame to provide more transmission shift adjustment towards the driver's side, or slightly rearward on the frame to provide more transmission shift adjustment towards the passenger's side. With the transmission mount assembly attached to the skid plate, re-tighten the C-clamp on the left side engine mounting bracket and ensure the bracket is bearing against the frame along both its top and side attachment surfaces. Check the clearance between the top right side of the 545RFE transmission case and the body sheet metal where indicated in **Image 2** below and mark where clearance needs to be increased, if at all, when the engine and transmission are removed to weld the engine mounting brackets in place.



Check clearance at this location and address if needed.

Image 2

25. Double-check that both engine mounting brackets are bearing against the top and inner vertical walls of the frame rails. If so, tack-weld the engine mounting brackets to the frame rails and then remove the drivetrain from the vehicle to permit welding and painting of the mounting brackets.
26. Fully weld the mounting brackets into place on the frame rails (use of 220/230V input welding equipment is recommended for this task), including plug welding the round holes on the vertical inner frame walls, and then paint them once they have cooled.
27. Use a dead-blow hammer and clearance the tunnel floor, where marked earlier for the transmission case, if needed.
28. Install the engine, transmission, transfer case adapter and transfer case into the vehicle and tighten all their attaching bolts/nuts.
29. This baseline installation mounts the drivetrain at the steepest inclination angle that is possible (6.5 degrees nominal, relative to the bottom of the frame rails) using the stock skid plate with no transfer case shims. From this point, the user has two options from which to configure the drivetrain to provide desirable U-joint working angles in the completed vehicle. These options are:
 - 1- Shim the skid plate down and/or rotate the rear pinion with wedge shims, as needed, to obtain desirable U-joint working angles.
 - 2- Use an aftermarket crossmember to raise the transmission mount about 1-5/16" from this baseline position to obtain a 5 degree inclination angle. This will allow an aftermarket skid plate to be used to increase ground clearance by up to 1-1/4" over the stock skid plate. A double-cardan type rear driveshaft set-up must be installed in order to take advantage of this benefit.
30. Install the front and rear driveshafts into the vehicle. **NOTE:** The stock NP231J transfer case is now approximately 1-3/8" to 1-1/2" further back in the vehicle than it normally is in a stock 4.0L/automatic installation, so new front and rear driveshafts will need to be made for the vehicle.
31. For those performing an emissions-legal Gen 3 Hemi engine change, install the OE Gen 3 Hemi exhaust manifolds and catalytic converters from your donor engine into the vehicle per the guidelines of the governing authority in your specific state (CARB or EPA). If the stock manifolds from your donor vehicle do not fit the chassis, be sure any optional ones you wish to use instead are allowable for use before adapting the catalytic converters to them.
32. For non-registered off-road/racing vehicles that may never be used on public roads or highways, Hooker Blackheart Jeep Wrangler Gen 3 Hemi swap headers and Y-pipe are available for use in this application.
33. Following the installation of the exhaust system components, install the radiator, fan and shroud, battery, A/C system components and engine/transmission controller and wiring harness.
34. Install the front fenders and any fender mounted components previously removed.
35. Refer to the Hooker Blackheart 1987-1995 Jeep Wrangler Gen 3 Hemi Engine Swap Technical Guide for more information that will assist you in completing the entire swap project.

COMPATIBILITY INFORMATION:

These engine mounting brackets replicate the stock 4.2L/4.0L engine crankshaft centerline offset to the passenger side of the vehicle, which is needed to be able to install the Hooker Blackheart BH2352 headers, BH2354 Y-pipe, and BH13226 exhaust system in this vehicle application. If needed, additional compatible Hemi engine swap components, such as EFI fuel control systems, fuel filters, fuel pumps, and plumbing hose/fittings can be found at www.holley.com.

LIMITATION OF LIABILITY – DISCLAIMER:

The regulation of emissions production, noise levels, and safety standards is undertaken by the federal government, each of the fifty state legislatures, and by many local municipalities, towns, and counties.

HOOKER™ makes no warranties of merchantability, of fitness for particular purpose, or that its products are approved for general use, or that its products comply with laws, regulations, or ordinances in the state where they may be sold to the ultimate purchaser, the consumer.

Unless expressly stated to the contrary in the catalog, instruction sheet; or price list, the entire risk as to the conformity of any company product in any such state and as to repair should the product prove to be defective or non-conforming, is on the retail purchaser, the buyer, the ultimate consumer, of such product and it is not upon the seller, distributor, or manufacturer.

In this connection, the retail purchaser, the buyer, the ultimate consumer assumes the burden of the entire cost of any and all necessary service, alterations, or repair.

THE FOREGOING STATEMENT LIMITS THE LIABILITY OF THE MANUFACTURER.

California vehicle code, sections 27156 and 38391, prohibits the advertising, offering for sale, or installation of any device, which modifies a vehicle's emission control system, unless exempted, unless otherwise noted. HOOKER™ Headers that have not received an Executive Order (E.O.) exemption from these code sections are not legal for sale or use in California on vehicles originally equipped with catalytic converters, except for racing vehicles, which may never be driven upon a highway. Check with your local authorities to determine if these headers are legal for use in your particular area.

Technical Service: 1-866-464-6553, Phone: 1-270-781-9741, or www.holley.com