



## P/N 12616HKR

### 1970-81 GM F-Body T56/T56 Magnum/4L80E\*/4L85E\*/TH400\*/2004R\* Transmission Crossmember

\*Requires the use of a separately available Hooker Blackheart adapter or spacer referenced in the text below to install.

### Installation Instructions

Thank you for choosing to use this Hooker Blackheart transmission crossmember as part of your engine/transmission swap project. This crossmember is part of the most comprehensively engineered system of mounting components, headers and exhaust systems available for this vehicle application. The entire Hooker Blackheart LS swap system for this application is designed to decrease your total swap installation effort and cost while increasing the engineered quality of your vehicle and compatibility of these components with other popular aftermarket components.



### IMPORTANT DESIGN AND INSTALLATION INFORMATION:

This crossmember is designed as part of a fully-engineered LS swap mounting system for GM 2<sup>nd</sup>-gen F-body vehicles. It has been CAD designed and FEA validated to provide maximized strength and stiffness along with high-clearance arches for exhaust system routing.

In addition to providing for direct installation of a GM 4<sup>th</sup>-gen F-Body/GTO T56, or T56 Magnum manual transmission, this crossmember can also be used to install a GM 4L80E, 4L85E, TH400 or 2004R transmission with the use of an available Hooker Blackheart **71223013HKR** adapter (4L80E/4L85E transmissions), or **12650HKR** spacer block kit (TH400 or 2004R transmissions).

Installation of this crossmember, with any of the above mentioned transmissions, requires the use of a Prothane™ **7-1604** (polyurethane) or Anchor Industries **2268** (rubber) transmission mount.

Due to its unique design geometry, this crossmember must be installed in conjunction with Hooker Blackheart **12512HKR** or **12613HKR** engine mounting brackets to provide correct engine offset geometry and U-joint working angles. This crossmember will provide for installation of an LS engine and Tremec™ LS F-body/GTO T56 transmission into this application without requiring any cutting or hammering of the vehicle body, with the exception of shifter hole that must be cut and the required clearance that must be provided for the reverse lockout solenoid. The location of the shifter hole dictates that it is necessary to cut into the floor mid-brace on some model year cars and will therefore require minor fabrication and/or welding to re-box the brace, if so desired. Installation of a Tremec™ aftermarket T56 Magnum transmission will require additional floor clearance modifications due to its physically larger size.

The installed geometry provided by this crossmember and the Hooker Blackheart 12512HKR and 12613HKR engine mounting brackets aligns the engine crankshaft and transmission output shaft axis with the center line of the chassis, like is the case with most pro-built cars and aftermarket subframes for 2<sup>nd</sup>-gen F-bodies (like DSE for example).

With these components installed, your driveline will be purposely configured with compound U-joint angles, due to the centered engine/transmission and the stock pinion offset of your rear differential. If you wish to check your U-joint working angles, detailed information on how to do so can be found at [www.spicerparts.com](http://www.spicerparts.com) (search for publication number J3311-1-DSSP).

A suitable lifting jack or stand will be required to install this crossmember with any of the transmissions listed in this document.

## **COMPATIBILITY:**

This crossmember was specifically designed for compatibility with Hooker Blackheart engine mounting brackets, cast iron LS exhaust manifolds, headers and exhaust systems and Holley® LS oil pans and accessory drive components for this application.

Oil pans that are directly installable with this crossmember include the Holley® **302-1**, **302-2** and **302-3** LS oil pans, the stock F-body, and various aftermarket fabricated steel pans.

The F-body, GTO and Corvette accessory drives are all installable with these mounts with the following exclusions:

- GTO alternators will need to be swapped to an F-body unit to clear the steering box pitman arm.
- Corvette power steering pump pulley will likely need to be swapped for a smaller diameter pulley/pump to clear the upper control arm.
- Stock low-mount A/C compressors are not installable with these mounts; compressor must be upper-mounted to right cylinder head with the use of a Holley® **20-133** (GM R4), **20-134** (Sanden SD508 or SD7), or similar bracket assembly.

If desired, a Holley® **20-135** upper-mounted Corvette style alternator/power steering bracket can be installed (swap to smaller diameter power steering pump pulley recommended for upper A-arm clearance) and is compatible with all F-body/GTO, Corvette and truck balancer/water pump offsets with the use of the following Holley® bracket spacer kits: Corvette - **21-1**, F-body/GTO - **21-2**, and Chevy/GMC truck/2010-up Camaro - **21-3**.

Two additional complete accessory drive bracket kits are available that include both the A/C and alternator/power steering brackets listed above. These kits are part numbers **20-131** (GM R4 compressor) and **20-132** (Sanden SD508 or SD7 compressor).

Hooker™ LS swap manifolds (**8501HKR**), and Hooker Blackheart mid-length headers (**2471HKR**, **2472HKR**, **70201307-RHKR** and **70201308-RHKR**) and long-tube headers (**2295HKR**, **2296HKR**, **2297HKR**, **2298HKR**, **70101309-RHKR**, **70101310-RHKR**, **70101311-RHKR** and **70101312-RHKR**) are all compatible with most stock A/C evaporator cases on the firewall, when installed with this Hooker Blackheart LS engine swap transmission crossmember.

More LS swap/engine performance components, such as EFI fuel control systems, fuel filters, fuel pumps, plumbing hose/fittings and valve covers can be found at [www.holley.com](http://www.holley.com).

Use of this crossmember with half-height body bushings is only possible if relief pockets are fabricated into the floor to clear the arched humps of the crossmember and may require further floor clearance operations to clear the transmission bellhousing/case.

## **INSTALLATION:**

**Pre-installation notice:** In all vehicles, this crossmember is to be installed with its mounting flanges resting in the scalloped pockets formed into the top of the subframe rails. On some earlier vehicles and depending on what transmission you are installing, the factory mounting holes present in the formed pockets will align with the holes in this crossmember and others will not. If the crossmember mounting holes line up with those in the subframe, use them to attach the crossmember using two bolts/nuts per side (**Figure 1**). If the crossmember mounting holes do not line up with the factory holes in the subframe for any reason, you will need to attach the crossmember to the subframe using the supplied angle brackets. The angle brackets will be positioned under the crossmember and be attached to the inside walls of the subframe through four drilled holes that you will need to mark off and drill for this purpose. See **Figure 2** for a visual reference. If you are removing your subframe for any reason, you can also use that opportunity to drill new attachment holes in the top of the subframe, and also nut access holes in the bottom of the subframe to be able to attach the crossmember as shown in figure 1.



**Figure 1**

**Top surface attachment method to top of subframe**



**Figure 2**

**Angle bracket attachment method on inside walls of subframe**

This crossmember is designed to provide an exhaust routing path with maximized ground clearance. Be aware that 1970-74 models have floor pans which are lower to the top of the subframe than those of 1975-81 models and require more careful maneuvering of the crossmember into position to reduce the possibility of marring of the underside finish of the floor. Worn or collapsed body bushings will further diminish the available installation space and may require increased force or leverage to be applied to the crossmember to

persuade it into proper position. It is highly recommended that new body bushings be installed prior to performing your engine/trans swap.

If you are installing a T56 Magnum, the included two-hole spacer must be installed between the crossmember and the isolator to compensate for the isolator mounting surface of the T56 Magnum being closer to the transmission output shaft centerline than the same surface on an LS F-Body/GTO T56.

**Notice:** **Leaving this spacer out during T56 Magnum installations will increase the engine inclination angle beyond that intended by Hooker™ and decrease the ground clearance of Hooker Blackheart headers designed for this application.**

1. Check that the hardware package includes the following:

- (2) Angle Brackets
- (4) 3/8-16 x 1" Flanged Head Bolts
- (4) 3/8" Flanged Nuts
- (4) 7/16-14 x 1" Flanged Head Bolts
- (4) 7/16" Flanged Nuts.

If any are missing, please contact Technical Service at 1-866-464-6553 or 270-781-9741.

2. Raise the tail shaft of the transmission to its highest possible point of lift.

3. Insert either end of the crossmember between the vehicle subframe and floor sheet metal

4. Shift the crossmember over far enough to allow the free hanging end to be pushed up above the height of the subframe then shift the crossmember over to center it on both mounting surfaces of the subframe. Depending on the state of condition of your body bushings, you may need to use a rubber mallet to assist in this effort.

5. Attach your chosen transmission mount to the transmission in the following manner:

A. For T56, T56 Magnum, TH400 and 2004R transmissions, attach the mount directly to the transmission case.

B. For 4L80E/4L85E transmissions, attach the optional Hooker Blackheart **71223013HKR** adapter bracket to the bottom of the transmission extension housing, per the instructions included with it, and then attach the transmission mount to the adapter bracket.

6. Lower the transmission on to the crossmember while performing the following:

A. For T56 Magnum installations, place the included spacer between the crossmember and the mount.

B. For LS F-Body/GTO T56 installations, discard the included spacer and lower the mount directly onto the crossmember.

C. For TH400 or 2004R installations, discard the included spacer and place the optional Hooker Blackheart **12650HKR** spacer block between the crossmember and the mount.

D. For 4L80E/4L85E installations, discard the included spacer and lower the mount directly onto the crossmember.

7. Loosely Attach the isolator to the crossmember with the hardware supplied with the isolator.

8. Attach the crossmember to the subframe rails using the included hardware. This will be accomplished by using pre-punched factory holes in the subframe if they line up with the holes in the crossmember feet, or by using the supplied angle brackets if they do not.

9. If using the two supplied angle brackets is required, attach them to the underside of the crossmember and seat each against the side of the frame rail; tighten the brackets against the crossmember and mark the center of all four holes located adjacent to the subframe for the purpose of drilling. Move the brackets and crossmember out of the way, pilot drill, and drill all four holes to 7/16" diameter. Move the crossmember and angle brackets back to their previous position and attach the brackets to the subframe with the supplied bolts and nuts.

**Tip:** While working through the open ends of the subframe rails, use a long box end wrench or paint stick with double-sided tape to capture the nuts against the inside of the subframe wall and slide them back into position at the drilled holes.

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

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