



Hooker 3rd-gen F-body LS Swap Tech Data

1982-92 GM F-body vehicles are a popular vehicle platform on which to base an LS engine swap project. Hooker/Holley has expended considerable effort and resources (i.e. CAD modeling/FEA analysis) to design a new system of LS swap components for these vehicles, which allow the user/installer to achieve better final geometric/performance results than has previously been possible in this LS swap application.

Due to the comprehensive nature of this system of parts, the following information has been compiled as a guide to help potential users determine how they may benefit from the use of these components in achieving the goals of their G-body LS swap project.

Hooker/Holley Component Data

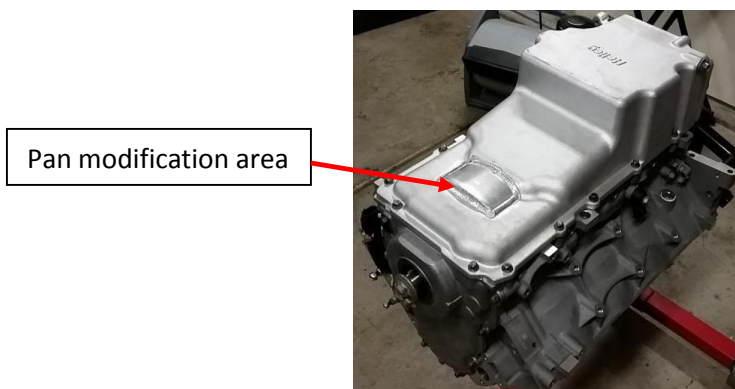
71221003HKR Engine mounting brackets-

The Hooker 71221003HKR engine mounting brackets were designed to take advantage of the low-profile geometry of the Holley 302-2 oil pan to install an LS engine into a 3rd-gen F-body chassis at the same crankshaft height/inclination angle that was used by GM to install the original SB Chevy V8 in these cars. As an additional benefit, transmission-to-tunnel clearances (especially those regarding GM 4L80/4L85 transmissions) are greatly improved by the use of these mounts and the supporting Hooker 71222005HKR transmission crossmember discussed later in this document.

The installed fore/aft engine placement incorporated into the the design of these mounting brackets was configured to provide compatibility with Holley, GM 4th-gen F-body, GTO, Corvette and GM Vortec truck accessory drives (Vortec truck alternator will not clear the stock hood) and for compatibility of all components with the stock A/C evaporator case.

The stock truck A/C compressor can be installed with these mounting brackets, but all others may require notching/modification to the vehicle K-member. Use of Holley 20-140(R4) or 20-134 (Sanden) compressor brackets are recommended for providing simplified top-mount A/C compressor installations in this LS swap application.

The Holley 302-2 oil pan is bolt-in installable with these engine brackets and is compatible with all LS engines that do not exceed crankshaft strokes greater than 3.62". The 302-2 pan can be modified with a pop-out section below the front crank throw to accommodate crankshaft strokes up to 4" without affecting the ability of the pan to be installed into a 3rd-gen F-body with these mounting brackets. The photo below is provided as a reference as to the type of modification necessary.





The Holley 302-1 oil pan is not compatible for installation with these Hooker engine mounting brackets as interference with the engine K-member will be experienced.

Installation of these mounting brackets requires the use of 1998-2002 4th-gen F-body LS1 engine mounts (stock GM, Anchor, Westar or equivalent brand) or aftermarket poly inserts available from Energy Suspension or Prothane. While poly inserts may be preferable for their function/performance, their installation is widely known, and should be expected to be, difficult.

71222005HKR Transmission crossmember-

The Hooker 71222005HKR 3rd-gen crossmember has been CAD designed to work in conjunction with the Hooker 71221003HKR engine brackets to provide bolt-in installation of a TH400*, 2004R*, T56, T56 Magnum, 4L60-4L70* or 4L80/4I85* transmission into any 1984-92 GM F-body vehicle. This crossmember can also be installed in a 1982 or 1983 model year F-body by modifying the location of the stock crossmember attachment holes in the vehicle subframe. This key component has been designed to provide a strong, stiff and low-weight transmission mounting foundation while providing dual arch passages for routing exhaust systems and a divorced, adjustable torque arm mounting provision; the lowest position on the bracket approximates the stock torque arm mounting position and moving it up from there raises the instant center of the rear suspension to increase the vehicle anti squat characteristics.

Installation of this crossmember requires the use of a Prothane 7-1604 poly mount or one of equivalent geometry.

*Installation of a TH400, 2004R, 4L60-4L70 or 4L80/4I85 transmission requires the use of the following additional bracket/spacer available from Hooker:

TH400 or 2004R- requires the use of a 12650HKR spacer kit

4L60-4L70- requires the use of a 71223003HKR adapter bracket

4L80/4I85- requires the use of a 71223004HKR adapter bracket

70101316-RHKR/70101315-RHKR LS swap headers-

Hooker LS swap headers for this application have been designed to provide maximum available ground clearance and are available with 1-3/4" primaries/2.5" collectors(70101316-RHKR), or 1-7/8" primaries/3" collectors (70101315-RHKR). These headers are constructed with water jet cut 3/8" thick, TIG welded, flat-finished flanges/ports. The O2 sensor bung locations have been optimized for



compatibility with all transmissions listed for the application and to provide reliable wide-band O2 sensor operation.

Although not required to install these headers, trimming the bellhousings of TH400, 2004R and 4L80/4L85 transmissions flush with the sides of the engine block will simplify the task of transmission and/or header removal in the future.

The collector location of these headers provides ample room for the installation/operation of automatic transmission shifter cables, including those for 4L80/4L85 applications.

The tube bend geometry of these headers requires that attention be given to the stock front metal brake lines following header installation to minimize their exposure to radiant exhaust heat. The use of heat wrap material or a brake line relocation strategy can be utilized to accomplish this.

Hooker 71223006HKR (fuel/brake line) and 71223007HKR (starter) heat shields have been designed to provide efficient and convenient header heat protection for the fuel/brake lines on the driver side subframe rail and the starter motor. These components, or others like them, are recommended for use in this swap application.

Hooker 8501HKR LS swap exhaust manifolds-

These components have not validated for fitment at this time

70501326-RHKR, 70501426-RHKR, 70501339-RHKR and 70501439-RHKR exhaust systems-

These 2.5" true dual systems with X-style crossovers are all designed to provide direct connectivity to the Hooker 3rd-gen LS swap headers and maximum available ground clearance with the specific transmission(s) that are listed for compatibility with. Installation of each is a bolt-in process without requiring purchase and installation of aftermarket rear suspension components. The adjustable rear tips are compatible with all variants of 3rd-gen F-body rear bumpers.

70501326-RHKR (304SS) & 70501426-RHKR (409SS) - for automatic transmissions

70501339-RHKR (304SS) & 70501439-RHKR (409SS) - for T56/T56 Magnum applications

Transmission and Vehicle Component Compatibility

Transmissions/shifters

Most GM automatic transmissions supported by the Hooker 71222005HKR crossmember can be installed without having to clearance the transmission tunnel; 4L80/4L85 installations may require minor hammer re-forming on the right side of the tunnel to provide adequate clearance for the rear band lugs on the transmission case and the cooler line fittings.



Installation of 4th-gen F-body LS1 T56 transmissions will require cutting/trimming to the tunnel to accommodate the shifter; cars originally equipped with a T5 manual transmission will only require a shallow $\frac{3}{4}$ " deep notch placed at the rear of the factory shifter opening to allow installation. 4L80/4L85 transmissions represent the worst-case scenario for providing suitable shifter cable/linkage connections due to the location of the shift selector shaft, which is positioned 2-1/4" further rearward than that of the other GM automatics; a fore/aft selector shaft position that deviates by no more than $\frac{1}{2}$ " is used on the other GM automatics. If you are intent on re-using the stock F-body 700R4 shifter, the following points must be taken into consideration:

- 1.) The 700R4 floor shifter can be used to operate the gear selector of a 4L80/4L85 transmission, but the stock cable will more than likely be too short to be able to be connected to the shift lever on a 4L80 transmission.
- 2.) The stock 4L80/4L85 shifter lever will need to be shortened through fabrication to match its arc sweep length to the shorter stroke of the stock 700R4 shifter assembly to be able to shift the transmission into the manual 1 position.
- 3.) The diameter of the cable connection pin on the stock 4L80 transmission shifter lever will need to be reduced to accept the smaller diameter eyelet of most transmission cables.

The above information should make it obvious that this is not a "plug and play" ordeal and the use of an aftermarket shifter may prove to be a more logical choice for some users.

Steering boxes-

Hooker 3rd-gen LS swap components are validated to be compatible only with the stock steering box.

Air conditioning-

The easiest (and usually cheapest) method of providing A/C system functionality in this LS swap application is to use a Holley 20-140(R4) compressor bracket to mount the stock R4 compressor to the swap engine.

For those who prefer using Sanden compressors, the Holley 20-134 bracket can be utilized in lieu of the R4 style bracket.

As a final option, the fixed-displacement OE truck A/C compressor can be installed and utilized to create a functioning A/C system.



OE LS Engine Component Compatibility

The design geometry of the Hooker 3rd-gen F-body headers and engine mounting brackets provide installation compatibility with the following stock OE LS engine components:

Valve covers

Ignition coils and brackets

Spark plug wires

Starter motor

Gen IV block mounted knock sensors

Oil cooler lines

Holley LS Engine Component Compatibility

A multitude of LS engine performance and appearance upgrade products are available from the Holley family of brands, which enable the user to achieve their G-body LS swap project goals. Included in this list of components are:

Holley carburetors, EFI systems, fuel pumps/regulators, injectors, ignition coils, valve covers and A/C compressor brackets

Weiand Intake manifolds

Earl's plumbing fittings/hoses

NOS nitrous oxide kits