# OIL PAN
# P/N 302-3, 302-3BK, & 302-5

## Instruction Sheet 199R11351

**CONGRATULATIONS** on your purchase of a Holley® **LS Retro-fit Oil Pan**! We feel that you have purchased the finest performance oil pan manufactured today. Should you need information or parts assistance, please contact our Technical Service Department at 1-866-464-6553 or 1-270-781-9741, Monday through Friday, 8 a.m. to 6 p.m. CST. Please have the part number of the product you purchased on hand when you call.

**WARNING! These instructions must be read and fully understood before beginning installation. Failure to follow these instructions may result in poor performance, vehicle damage, personal injury, or death. If these instructions are not fully understood, installation should not be attempted.**

**Requires use of Holley 302-15 Dipstick and Tube Kit or LS3 dipstick (GM P/N 12669528) and tube (GM P/N 12625031).**

## INTRODUCTION:

Holley® Performance Products has written this instruction sheet for the installation of the **LS Retro-fit Oil Pan**. This instruction sheet contains all the information needed to install the oil pan. Please read all the **WARNINGS** and **NOTES**, as they contain valuable information that can save you time and money. Holley® Performance Products cannot and will not be responsible for any alleged or actual engine or other damage, or other conditions resulting from misapplication of the oil pan described herein. However, it is our intent to provide the best possible products for our customer; products that perform properly and satisfy your expectations.

## APPLICATIONS:

These Holley® LS Retro-fit oil pans are designed specifically for LS engine retrofit in 1967-69 F-body, 1982-92 F-body, 1968-74 X-body, 1964-72 A-body, 1978-88 A/G-body, 1979-2004 Ford Mustangs, or 1979-1986 Mercury Capri II vehicles. These oil pans may also service other popular muscle/classic car and truck chassis where more engine-to-chassis clearance is required near the front half of the oil pan.

## IMPORTANT APPLICATION NOTES:

- These pans provide OEM fitment and oil filter mounting provisions.
- These pans are not intended to be used with engines that originally utilized a dry sump system.
- May not be used on LS7 engines or engines with a stroke longer than 4.00”.
- You have two options for which windage tray to use:

**1)** GM “F-body” windage tray, GM P/N 12558253. A modification to the windage tray is required to provide clearance to the pick-up tube. See the instructions showing the windage tray modifications required.

**OR**

**2)** A full-length windage tray may be used if the tray is shortened and also cut to provide clearance to the pick-up tube. See the instructions showing the windage tray modifications required.

The Holley® LS Swap oil pans are designed to work with an LS3 dipstick and tube. Below are the part numbers:

- LS Dipstick – GM P/N 12669528
- LS tube – GM P/N 12625031

**NOTE:** There are LS engine applications that have a plug installed in the dipstick hole location to be used with this oil pan. This plug will need to be removed before the oil pan is installed on the engine to allow the installation of the proper dipstick tube.

## PAN CAPACITIES:

| | |
|---|---|
| Sump Oil Capacity – | 5.6 Qts |
| Total Oil Capacity w/ stock filter – | 6.1 Qts |

## PARTS NEEDED:

- Oil Pan Gasket (Mr. Gasket P/N 6665G, GM® 12612350, or equivalent)
- High Quality RTV sealer
- Oil
- Oil Filter (AC Delco® PF48 or PF48E, Mobile M1-113, Wix 57060, K&N HP-1017, or equivalent)
- Oil Pan Bolts (2 required – GM #12554990)

## REMOVAL:

1. Drain the engine oil. Remove oil filter.
2. Remove the starter motor.
3. Disconnect the oil level sensor electrical connector (if equipped).
4. Remove the oil level sensor from the oil pan and set aside. The sensor will not be utilized in the Holley® pan.
5. Remove the RH transmission cover and bolt.
6. Remove the LH transmission cover and bolt.
7. Remove the bottom two transmission bellhousing bolts.
8. Remove the oil pan bolts.
9. Rotate the oil pan until it can be removed from around the oil pump pickup screen. Removal of the oil pan may not be possible with the engine in the vehicle).

**NOTE: Holley® does not recommend or condone the use of the old pan gasket. A new gasket is highly recommended.**

**WARNING! Use extreme care when drilling the oil pan rivets to not gouge, score or damage the oil pan gasket.**

10. If reusing the oil pan gasket, carefully drill out the oil pan gasket rivets (x2) if necessary (**Figure 1**).

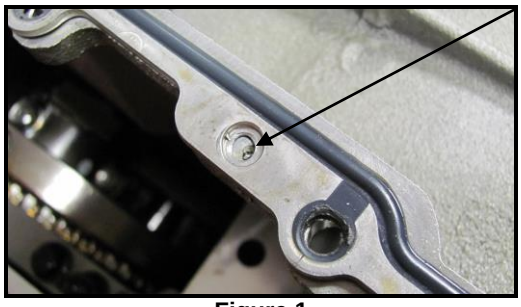


**Figure 1**

11. Remove oil pan gasket.
12. Remove the oil pump pickup screen retaining bolt and nut.
13. Remove the oil pump pickup screen and O-ring, discard O-ring and set the pickup aside as it will not be re-used.
14. While the oil pan is removed, check the dipstick hole on the right side of the engine below cylinder #6 to assure that there is no plug installed and that the dipstick tube will fit in the hole.

**IMPORTANT: Ensure that a helicoil has been installed in your pan by installing the drain plug.**

**IMPORTANT: All gasket surfaces should be free of oil or other foreign material during assembly. Inspect the engine block oil gallery passages to make sure they are free from any debris or restrictions.**

**IMPORTANT: The oil pan on LS engines is a structural member. The alignment of the pan is critical to provide the proper mounting points for the transmission bellhousing. The rear of the oil pan must never protrude from the rear of the block. The rear of the block and oil pan are to be flush (Figure 2).**

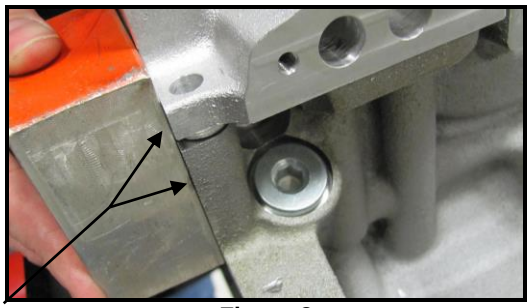


**Figure 2**

**IMPORTANT: It is advisable to wash all of the new parts well before installing to remove any dirt or debris from the packing and shipping process.**

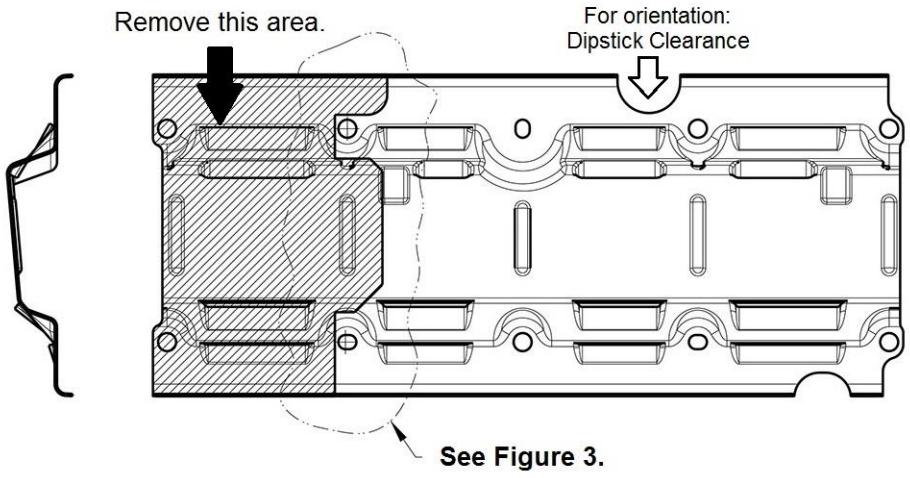
**IMPORTANT: It is advisable to test-fit the oil pan to the engine before installation to ensure that the crankshaft and connecting rods clear the windage tray, oil pump pick-up screen, and the oil pan, making a full revolution of the rotating assembly by hand.**

**IMPORTANT: It is advisable to mock up the engine and oil pan in the intended vehicle to ensure there is no contact of the pan to the frame or cross-members.**

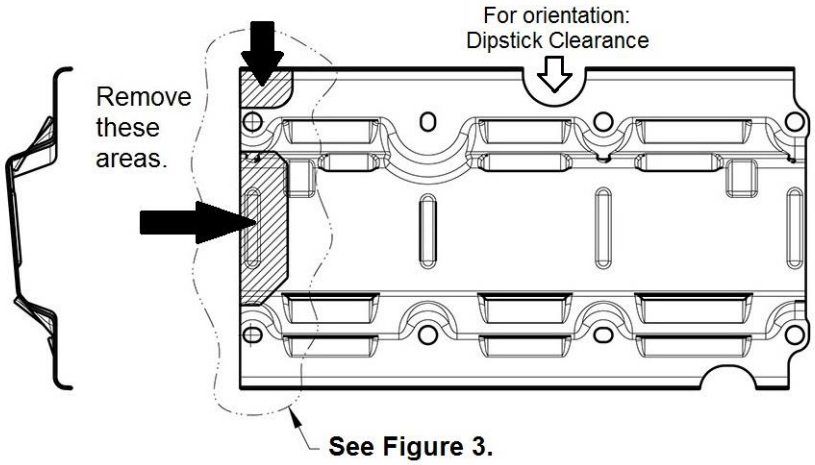
## WINDAGE TRAY MODIFICATIONS AND INSTALLATION:

**IMPORTANT:** A modification to the windage tray must be made to provide clearance for both the oil pickup tube and a portion of the oil pan. The following drawings show how to modify the tray depending on which type you have. After modifications are made thoroughly clean, dry and reinstall the windage tray to the engine.

**Modifications required for full length windage tray**



**Modifications required for F-body windage tray - GM P/N 12558253**



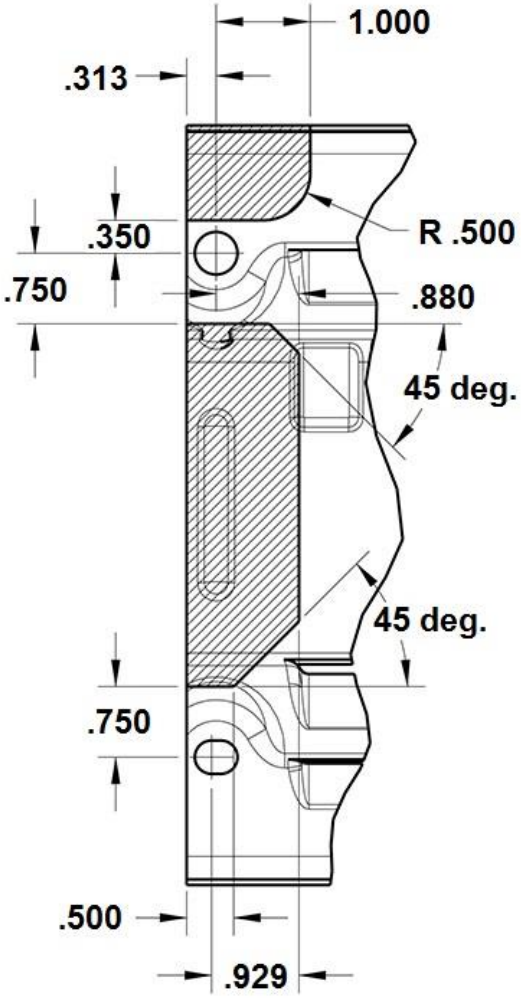




**Figure 3**

## INSTALLATION:

1. Remove the new Holley® oil pan, parts kit, pickup screen and baffle from the box.

**IMPORTANT: Ensure that a helicoil has been installed in your pan by installing the drain plug.**

2. Install the supplied O-ring onto the oil pump pickup screen assembly and lubricate with clean engine oil (**Figure 4**).

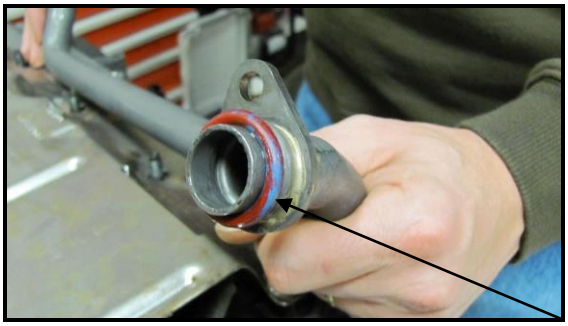


**Figure 4**

3. Install the new Holley® oil pump pickup screen assembly ensuring that oil pump pickup screen tube is pushed completely into the oil pump before tightening the bolts (**Figure 5**). Do not allow the bolts to pull the tube into the pump. Attach using the two M6 x 16mm long flanged socket head capscrews included in the installation parts kit.

**NOTE:** Ensure the O-ring has not been pinched during installation.

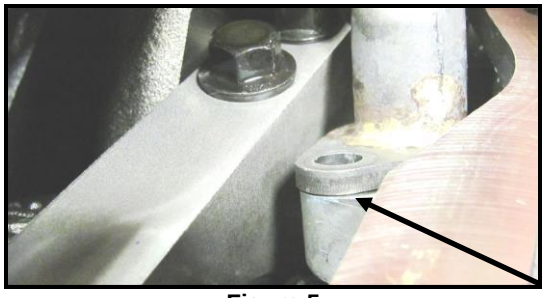


**Figure 5**

4. Install the oil pump screen nut and bolt(s). You may need to slightly bend the tab to provide precise alignment of the hole in the tab to the mounting stud.

5. Rotate the crankshaft by hand to ensure there is adequate clearance between the pickup tube brace, oil deflector, and the crankshaft counterweights.

6. Tighten the oil pump pickup screen bolt(s) to 106 in./lbs. and the nut to 18 ft./lbs**.**

7. Pre-assemble the oil pan.

8. Apply a drop of blue Loctite® to the threads of the (x4) supplied 1/4-20 x 1/2 long cap screws and use them to install the baffle into the oil pan. Torque the (x4) baffle bolts to 8-10 ft./lbs.

9. Install the supplied oil passage cover, gasket and M6 x 1.0 x 30mm long bolts to the oil pan just above the oil filter. Tighten the oil passage cover bolts to 106 in./lbs.

10. Install the new oil pan gasket to the oil pan and install the oil pan bolts to the pan through the gasket. The gasket is designed to hold the bolts in place.

11. Apply a 5mm bead of RTV sealant 20mm long to the engine block (**Figure 6**) directly onto the tabs of the front cover gasket that protrude into the oil pan surface.

**Figure 6**

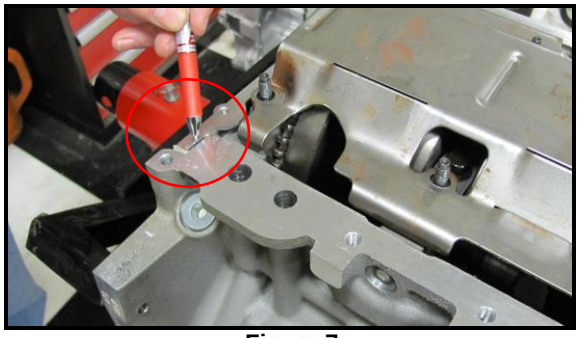


**Figure 7**

12. Apply a 5mm bead of RTV sealant 20mm long to the engine block (**Figure 7**) directly onto the tabs of the rear cover gasket that protrude into the oil pan surface.

13. Install the oil pan assembly to the engine block.

14. Snug all the oil pan bolts by hand (do not overtighten).

15. Install the two lower transmission bellhousing bolts until snug (do not overtighten).

16. Tighten the oil pan to block and oil pan to front cover bolts to 18 ft./lbs. (work from the center out).

17. Tighten the oil pan to rear cover bolts to 106 in./lbs.

18. Tighten the two transmission bellhousing-to-oil pan bolts to 37 ft./lbs. for either a manual or an automatic transmission.

19. Install the LH side transmission cover and bolt. Torque to 106 in./lbs. Install the RH side transmission cover and bolt. Torque to 106 in./lbs.

20. Install the supplied oil pan drain plug and tighten to 18 ft./lbs.

21. Install the supplied oil filter adapter and tighten to 40 ft./lbs.

22. Before installing the new oil filter, apply a thin film of oil to the filter gasket. Install the new engine oil filter and follow the manufacturer's recommendation for tightening procedures.

23. Fill the crankcase with the proper quantity and grade of oil.

24. Be careful not to overfill with oil.

25. Start the vehicle and check for leaks and adequate oil pressure. Use the original dipstick to verify the oil level. This should read full after 6 quarts of oil with a new filter.

**Holley® Technical Support**
**866-464-6553**
**www.holley.com**



**199R11351**
**Revision Date: 10-11-21**

# 8502HKR (no coating), 8502-1HKR (silver ceramic), 8502-3HKR (black ceramic), 8502-4HKR (titanium ceramic), & 8502-5HKR (light charcoal gray ceramic) Hooker™ Cast Iron Exhaust Manifolds for GM LS Engines
# 8503HKR (raw) & 8503-1HKR (polished) Hooker™ Stainless Steel Exhaust Manifolds for GM LS Engines

**NOTE: Not compatible with 2004-2006 GTO starters/bellhousings.**

Thank you for making HOOKER™ HEADERS your choice in high-performance exhaust system components.

These Hooker™ cast exhaust manifolds have been designed to fit into a wide variety of replacement and engine-swap applications, with final outlet connections to be fabricated by the installer. The design of the manifold passages and the position of the exit flange provide excellent performance in street/performance applications. However, this product does not have a C.A.R.B. Executive Order Exemption and therefore may or may not be legal for any particular pollution controlled application. The casting is of a High-Silicon-Moly ductile iron material and will provide trouble-free service for street/performance LS engines. Intended applications for this product are the retro-fit installation of LS engines into popular passenger car and truck chassis.

The nickel plated steel mating flanges that have been included with these manifolds are intended to be utilized "as-needed" to satisfy your particular installation requirements; their featured geometric dimensions will assist in the fabrication of a tightly-quartered connection between the manifolds and your exhaust system. A single 2.5" x 2.5" radius U-bend (not included) can usually provide sufficient bend material to route the exhaust around any close-proximity components such as lower control arm frame perches. Once clear of these obstructions, transition to a larger tube diameter, if desired, can easily be accomplished by expanding the 2.5" tubing with a pipe expander, or welding on a tapered transition.

**WARNING! Breaking in an engine with ceramic-coated versions of these manifolds will most likely result in damage to the coating and VOID all warranties providing coverage to it. HOOKER™ recommends using bare cast-iron manifolds or an old set of headers to break-in engines to avoid coating damage.**

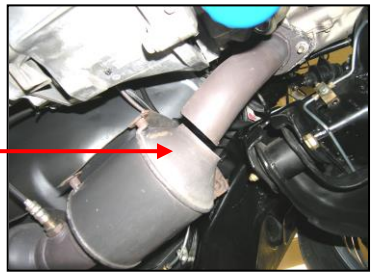
**Ceramic-coated manifolds require several heat cycles to fully cure before they will withstand extreme heat, so care should be taken to provide a series of 4 to 5 intermittent heat cycles to "set" the coating prior to putting the vehicle into service. An incremental increase in run duration and throttle angle should be added to each successive cycle; initial and final run durations between approximately 1 and 7 minutes will be sufficient to set the coating.**

**CAUTION! When working under your car, be sure to properly support it with jack stands or ensure the locks on your vehicle lift are engaged if using one. NEVER WORK UNDER A CAR SUPPORTED BY A BUMPER JACK OR HYDRAULIC LIFTING JACK!**

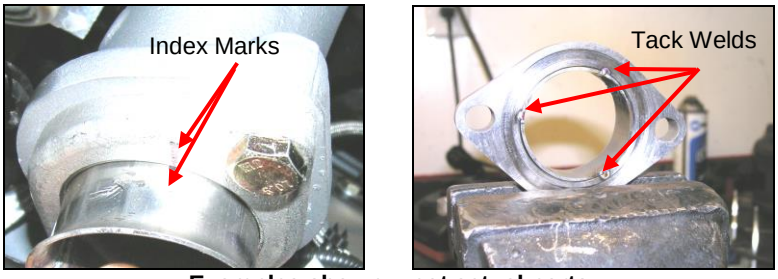
## INSTALLATION PROCEDURE

1. Disconnect the negative battery cable.
2. Remove spark plug wires.
3. Remove spark plugs, if it appears necessary to be able to remove existing manifolds/headers from vehicle.
4. Remove engine oil dipstick tube from the passenger side of engine.
5. Disconnect any exhaust components connected to outlet of existing manifolds/headers.
6. Remove the existing manifolds/headers from the engine.
7. If an entirely new exhaust system will be constructed to attach to your Hooker™ manifolds, remove all existing exhaust components.
8. If adapting your Hooker™ manifolds to connect to an existing exhaust system, choose a convenient interface connection point and cut and/or remove all exhaust componentry forward of that point and dress all joints for proper welding execution, as needed. An example of this step is shown in the photo below.

**The Hooker manifolds being installed on this sample application will be connected to the existing converter pipes. The chosen interface connection point was at the inlet of the converter so the pipe coming from the existing manifold was cut here as indicated by the arrow.**



9. Install the Hooker™ cast iron manifolds to the engine. Stock GM gaskets and bolts are recommended for this purpose and are listed by part number at the end of this document for reference.
10. Temporarily attach the included flanges to the outlets of the manifolds with the four included 10mm x 1.5 bolts to determine the appropriate amount of U-bend or straight pipe to use for the first pieces of the outlets coming off the manifolds.
11. Use a marking pen and place an index mark on the flanges and tube sections to indicate any specific rotation, as shown in the left photo below. Once satisfied with the marked position, remove the parts from the vehicle for welding.

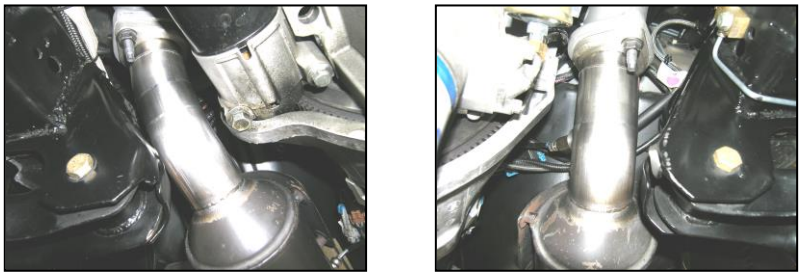



**Examples shown – not actual parts**

12. On the welding bench, line up the index marks on the parts and place a minimum of three tack welds around the circumference of the flange, as shown in the right photo above.
13. Deposit a continuous weld around the flange while observing the following guidelines:

- The connecting weld bead can be deposited as a fillet around the exterior of the flange, or around the I.D. of the face of the flange for a cleaner appearance. For welding of these flanges to mild/low carbon steel pipe, ER70S-2 filler rod is recommended. If welding to 409 or 304 stainless steel pipe, 309 filler rod is recommended.

14. Reattach the flange assemblies to the manifold outlets and complete the mock-up of the adapters to the existing exhaust or a complete exhaust system before removing for final welding. Be sure to mark the location of O2 bungs, if needed. The photos below depict the final parts fabricated from U-bends to connect the Hooker™ manifolds to the existing converters in the sample application.



**Examples shown – not actual parts**

15. Install the finished welded parts into the vehicle for the final time and fully tighten all fasteners.
16. Reinstall the engine oil dipstick tube and spark plug wires/spark plugs.
17. Reconnect the negative battery cable to the battery.
18. Start the vehicle and check for leaks. If installed manifolds are ceramic coated, perform coating set thermal cycling procedure recommended previously in this document.

**Stock GM Part Number Reference List:**

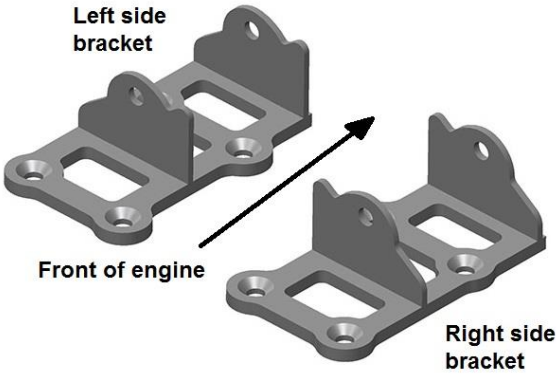
Exhaust manifold to cylinder head gasket - **12617944** (2 required)
Exhaust manifold to cylinder head bolts - **11518860** (12 required)

**Hooker Technical Support**
**1-866-464-6553**



**199R11213**
**Revision Date: 9-28-224-27-20**

# 1978-87 GM G-Body LS Swap Engine Mounting Brackets
# 12643HKR
# Installation Instructions 199R10708




Thank you for choosing to use Hooker Blackheart engine swap mounting brackets as part of your LS swap project. This mounting bracket kit is part of the most comprehensively engineered system of mounting components, headers and exhaust systems available for this application. The entire Hooker Blackheart swap system 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. Please read these instructions thoroughly before attempting installation.

## PRE-INSTALLATION CONSIDERATIONS:

Installation of these brackets requires the installation of new stock OE style clamshell engine mounts as installed on all 1978-87 G-body vehicles equipped with Chevrolet small block V-8 engines (Anchor brand P/N 2292 stock rubber replacement clamshell mounts, or Hooker/Holley 71221004HKR clamshell mount cages and 712210014HKR / 71221015HKR poly inserts are recommended). Do not reuse old clamshell mounts as part of this installation.

When used with the related Hooker Blackheart **12644HKR** transmission crossmember, this CAD designed engine swap mounting bracket kit will replicate the stock small block Chevy engine/transmission inclination angle in order to minimize the need to shim/adjust the rear pinion angle in stock to moderately lowered chassis applications.

Due to the unique design geometry of this engine swap mounting bracket kit, attempts to install it with headers and/or transmission crossmembers not developed by Hooker Blackheart engineering for this application will more than likely not be successful.

An engine hoist will be required to position the engine/trans into the vehicle in the proper orientation. Use of an adjustable-angle engine sling will greatly ease the hoisting/loading operation and negate the possible need to reposition the lifting chains mid-operation. An automotive lift or a jack and jack stands will be required to safely raise and support the vehicle.

If you plan to retain the functionality of the stock A/C system, it is highly recommended that you install the engine and transmission into the vehicle separately to minimize the chance of damaging the evaporator case on the firewall when positioning the engine in the chassis. Due to the extremely large production tolerances across all year models of these vehicles, clearance between the right side valve cover and the evaporator case can range from 1/2” to 0 distance between these components. Some installations will provide a surplus of coil/coil bracket clearance while others will be tight and require the rear coil to be relocated away from the evaporator case for clearance.

**CAUTION! WORK ONLY ON A LEVEL SURFACE. USE JACKS /JACK STANDS OF SUFFICIENT CAPACITY TO LIFT AND SUPPORT YOUR VEHICLE. NEVER WORK UNDER A VEHICLE SUPPORTED BY A FLOOR OR BUMPER JACK.**

## COMPATIBILITY INFORMATION:

These engine swap mounting brackets were specifically designed for bolt-in compatibility with the Hooker Blackheart transmission swap crossmember, cast iron LS exhaust manifolds, headers and exhaust systems also designed/validated for this application. Various other OE and Holley® brand LS components have also been validated and/or designed for use with this system of components as follows:

The engine/transmission position provided by this engine swap mounting bracket kit has been developed to be compatible with the Holley® **302-2** or **302-3** LS oil pans; other OE/aftermarket oil pans may also be compatible.

The stock GM 4th-gen F-body and GTO* engine accessory drive systems are both compatible with this LS swap engine bracket kit (excluding the A/C compressors) if installed into a vehicle equipped with the Saginaw quick-ratio 700 series power steering box (OE equipment on Monte Carlo SS and Buick Turbo Regal/Grand National vehicles). F-body and GTO accessory drive systems are not compatible with the Saginaw 605 power steering box installed as original equipment in a greater number of G-body vehicles. This fitment information is only valid when these engine mounting brackets are installed in conjunction with the Hooker Blackheart **12644HKR** transmission crossmember developed for use with these mounting brackets.

*The tip of the GTO alternator pulley or steering box may require dressing/grinding to provide adequate operational clearance due to the wide production build tolerances found in these vehicles.

The GM Vortec truck engine accessory drive system is compatible for use with the OE Saginaw 605 series power steering box, the Saginaw quick-ratio 700 series power steering box (OE equipment on Monte Carlo SS and Buick Turbo Regal/Grand National vehicles) and the Delphi 600 series power steering box. Use of the stock truck A/C compressor requires notching of both the engine crossmember and the stock cast aluminum compressor engine mounting bracket.

The OE Corvette and Holley accessory drive systems can be used with these engine mounting brackets, provided that the PS pump pulley is swapped out with a replacement pulley of smaller diameter and custom PS hydraulic hoses are made with low-profile fittings at the steering box connection ends. This has been verified to be the case with the Saginaw 700-series power steering box only. Compatibility with the 605 power steering box, or any manual steering box is unknown.

Hooker™ LS swap manifolds **(8501HKR)** and Hooker Blackheart mid-length headers **(70201503HKR & 70201504HKR),** and long-tube headers **(70101305-RHKR/70101505HKR & 70101306-RHKR/70101506HKR)** are all compatible with the stock A/C evaporator case when installed with this engine mounting bracket kit and related Hooker Blackheart **12644HKR** transmission crossmember.

More LS 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.

## TIPS FOR A SUCCESSFUL ENGINE SWAP:

1. Check that the hardware package includes the following**:** (8) M10 x 1.5 x 30 Bolts.
   If these are missing, please contact Technical Service at 1-866-464-6553 or 270-781-9741.
2. Mark all hoses, wires, and vacuum lines, according to their function. Use masking tape and a pen for this.
3. Whenever possible, utilize the existing wiring and lines.
4. Get a wiring diagram of your vehicle and one for the vehicle from which the new motor was removed. Make photocopies of both systems. Add your modifications to these copies, so you will have accurate records for future reference.
5. Think carefully before removing or defeating any emissions device. A legal engine swap requires the emissions components to be intact, especially when you try to sell the vehicle.
6. Save as much hardware that is removed from the donor engine as possible. You may need some of these items later.
7. Taking the time to do it right is cheaper than taking short cuts and having to do it again. Make sure you pay close attention to critical areas like fuel systems and brake lines. Neglecting to double-check your work could have life or death consequences.
8. Do not overstress components that are designed for stock four or six cylinder engine torque by over-abusing a motor of greater horsepower.
9. Don't forget to upgrade your radiator, fan(s), and hoses to accommodate the cooling requirements of your LS engine.

## VEHICLE PREP:

1. Remove the hood from the vehicle.
2. Disconnect the battery and fuel lines.
3. Remove the existing wiring harness and set aside for later re-use of connectors, as needed, to complete electrical connections to the swap engine harness.
4. Drain all coolant and remove the radiator/hoses from vehicle.
5. Remove the driveshaft, engine, transmission/crossmember and existing engine mounts from the vehicle.

## SWAP ENGINE/TRANS PREP:

1. Carefully remove the following components from the engine: spark plug wires exhaust manifolds/O2 sensors, wiring harness/computer, MAF sensor, starter motor/plate and dust covers, A/C compressor and bracket, the oil dipstick/tube, and engine mounts/brackets.

2. Clean and paint parts to be re-used, if desired.

3. Secure engine/trans assembly to lifting sling and engine hoist.

4. Attach the left and right side Hooker engine brackets to the engine using the supplied M10 flat head screws.

## ENGINE/TRANS INSTALL:

1. Install a new set of clamshell engine mounts (aftermarket rubber replacement clamshell mounts, or the Hooker/Holley clamshell mount cages and poly inserts previously mentioned on page 1) onto the vehicle chassis as shown in **Figures 1**, **2 and 3** below.

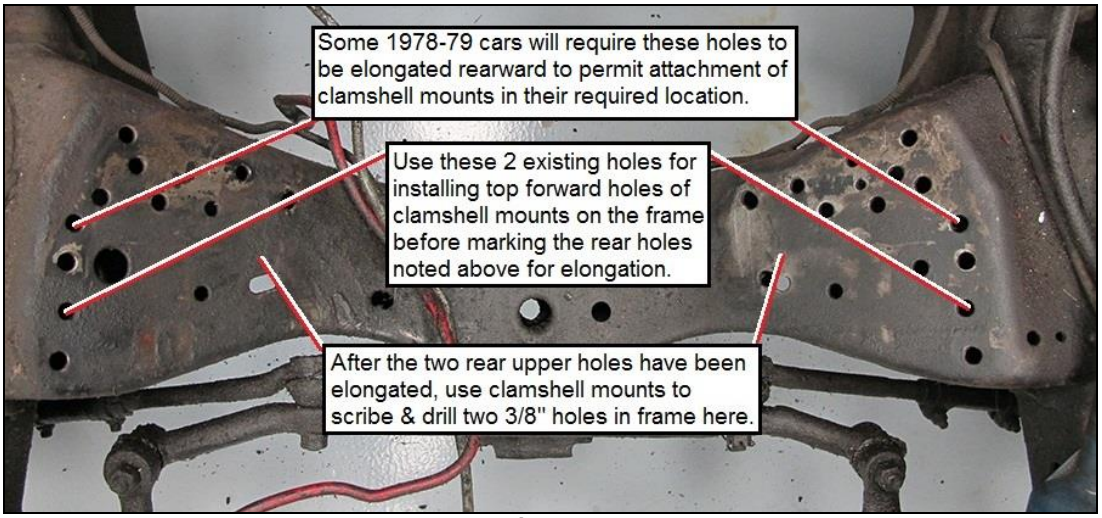



**Figure 1**


**Figure 2**

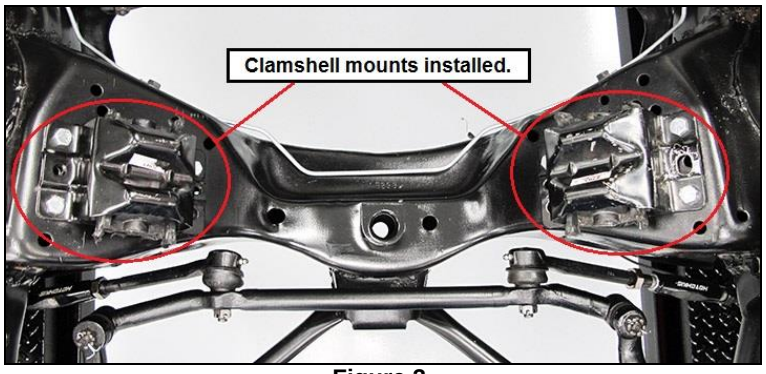



**Figure 3**

1. Raise engine or engine/transmission assembly on engine hoist high enough to clear the vehicle body. Then, carefully lower it/them down onto the clamshell mounts and install the engine mount through-bolts/nuts. If you are installing the engine and transmission together as an assembly, the use of an adjustable-angle engine sling is highly beneficial as it can ease the difficulty of getting the engine into proper position over the mounts and can greatly reduce the possibility of damage to vehicle components (i.e. the A/C evaporator case).

2. Install the transmission from under the vehicle, or position a floor jack under the transmission tail shaft and raise it up if you have installed the engine and transmission as an assembly.

3. To complete the installation of the engine/transmission assembly in your vehicle, install the Hooker Blackheart **12644HKR** crossmember per the instructions included with its packaging.

**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.**

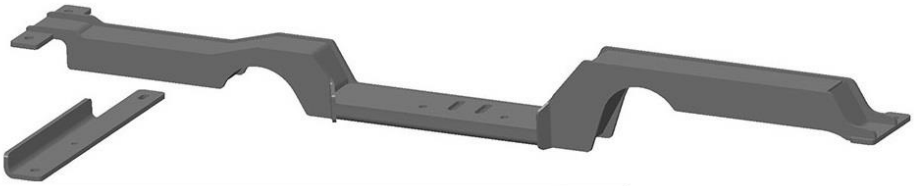
California vehicle code, sections 27156 and 38391, prohibits the advertising, offering for sale, or installation of any device, which modifies a vehicle's emission control system, unless exempted, unless otherwise noted. HOOKER™ Headers that have not received an Executive Order (E.O.) exemption from 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.



**199R10708**
**Revision Date: 6-12-19**

# 1978-1988 GM A/G-Body LS Swap T56/T56 Magnum/4L60-4L70*/4L80-4L85*/TH400*/2004R*/TKX*/6l80/90*/8l90*/10l80/90* Transmission Crossmember
# 12644HKR-1
# Installation Instructions

*** Installation requires the use of a separately available Hooker transmission adapter kit.**



**12647HKR Adapter kit - required for installation into vehicles without factory 2004R frame extension.**

Thank you for choosing to use this Hooker™ transmission crossmember as part of your LS swap project. This crossmember is part of the most comprehensively engineered system of mounting components, headers and exhaust systems available for this application. The entire Hooker™ swap system 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. Please read these instructions in their entirety before attempting installation.

## PRE-INSTALLATION CONSIDERATIONS:

This crossmember is designed as part of a fully-engineered LS swap mounting system for 1978-88 GM A/G-body vehicles. It has been CAD designed and FEA validated to provide an optimized balance of weight, stiffness and strength. The dual-arch exhaust passages are provided for installation of available Hooker 2.5" and 3" exhaust systems for this application, or any custom system of your choice. This crossmember provides direct installation capability for 4th-gen F-body/GTO T56 and aftermarket Tremec T56 Magnum transmissions. Installation of a 4L60-4L70, 4L80/4L85, TKX, 6l80/90, 8l90, 10l80/90, TH400, or 2004R automatic transmission can also be accomplished using this crossmember and the Hooker **12650HKR**, **12655HKR, BHS5182, BHS5183,** or **12656HKR** adapter kits referenced later in this document.

Vehicles that were not originally factory configured with a left side 2004R frame extension will require the use of a **12647HKR** frame adapter kit to enable installation of this crossmember into them.

Due to the approximate 1/4" forward re-positioning of the transmission required for proper fitment of this crossmember, it may be necessary to lengthen any driveshaft intended to be re-used from a previous stock transmission location installation. This presents an opportunity to increase the size of your driveshaft to 3" or 3.5" diameter for increased strength and RPM capabilities.

Installation of this crossmember, with any of the above mentioned transmissions, requires the use of Hooker Blackheart **71223029HKR** (black), **71223030HKR** (red), aftermarket Prothane™ 7-1604, or an equivalent polyurethane mount or stock/aftermarket rubber mount of equivalent installed height.

Due to the unique design geometry of this transmission crossmember, attempts to install it with headers and/or engine mounting plates/brackets other than those developed by HOOKER™ for this application will more than likely not be successful.

When used with the related Hooker™ **12643HKR** engine mounting bracket kit, this CAD designed transmission crossmember will replicate the stock small block Chevy engine/transmission inclination angle and eliminate or minimize the need to adjust the rear pinion angle in stock to moderately lowered chassis applications.

A suitable lifting jack will be required to install this crossmember with the appropriate transmissions for which it is intended. An automotive lift or a jack and jack stands will be required to safely raise and support the vehicle.

**CAUTION!** **WORK ONLY ON A LEVEL SURFACE. USE JACKS /JACK STANDS OF SUFFICIENT CAPACITY TO LIFT AND SUPPORT YOUR VEHICLE. NEVER WORK UNDER A VEHICLE SUPPORTED BY A FLOOR OR BUMPER JACK.**

## COMPATIBILITY INFORMATION:

This transmission crossmember was specifically designed for bolt-in compatibility with the HOOKER™ LS swap engine mounting brackets, headers, and exhaust systems developed specifically for this application. In addition, the Hooker **8501HKR** LS cast iron exhaust manifold and **8510HKR** turbo manifold kits are also compatible with this LS swap application. Various other Holley® and OE LS components have been designed and/or validated for use with this system of components, as follows:

The engine/transmission positioning provided by this crossmember is compatible with the Holley® **302-2 and 302-3** LS oil pans; compatibility with other aftermarket/OE engine oil pans is unknown. The Holley 302-1 LS engine oil pan is not bolt-in compatible with this transmission crossmember.

All Hooker LS swap mid-length and long-tube headers listed for this application are compatible with the stock A/C evaporator case when installed using this Hooker LS engine swap transmission crossmember and the related Hooker **12643HKR** engine mounting bracket kit.

This crossmember was intentionally designed with high-tuck geometry to optimize the ground and dual exhaust routing clearances of this application. As such, installation of new body/frame bushings may be required for successful installation. Worn body/frame bushings have been verified to decrease body-to-frame clearances by as much as ½".

More LS swap/engine performance components, such as accessory drives, EFI fuel control systems, fuel filters, fuel pumps, plumbing hose/fittings, and valve covers can be found at www.holley.com.

## INSTALLATION:

**NOTE:** These instructions have been written with the assumption that you have already installed an LS engine into your vehicle using the Hooker **12643HKR** engine swap bracket kit. Satisfactory engine and transmission installation with any other type or brand of engine mounts is not intended with this crossmember.

1. Check that the hardware package includes the following**:**

| Qty. | Description | Qty. | Description |
|---|---|---|---|
| 1 | Crossmember Assembly | 1 | 3/8-16 x 3/4" Flanged Head Bolts |
| 1 | Frame Angle Bracket | 3 | 3/8-16 x 1" Flanged Head Bolts |
| 1* | T56 Magnum Spacer | 1 | 3/8-16 x 1-1/4" Flanged Head Bolts |
| 8 | 3/8" Flat Washers | 4 | 3/8" Flanged Nuts |

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

*If you are installing a T56 Magnum transmission, the included two-hole spacer is to 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 4th-gen F-Body/GTO T56. Leaving this spacer out will increase the engine inclination angle beyond that intended by Hooker™ and decrease the ground clearance of Hooker™ headers designed for this application.

2. Raise the tail shaft of the transmission to its maximum height against the vehicle floor.

3. Position the crossmember on top of the vehicle frame crossmember mounting perches and loosely attach it to the right side frame perch using two supplied 3/8 x 1" bolts and flanged nuts.

4. **1983-88 2004R chassis cars**- Position the frame angle bracket under the left mounting foot of the crossmember and attach them both to the left side frame perch using the supplied 3/8 bolts, washers and flanged nuts as shown in Figures 1 and 2. Once all brackets and fasteners have been configured and aligned as directed in **Figure 1**, tighten all the nuts and bolts across the entire crossmember assembly.

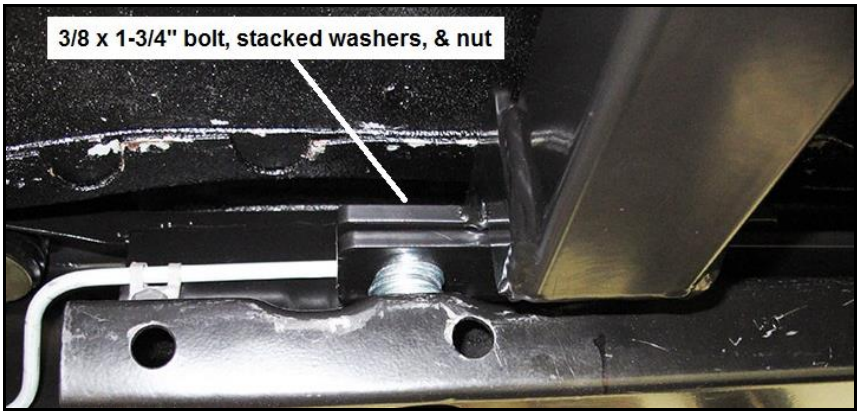



**Figure 1 – 1983-87 2004R chassis cars only**

4A. Attach the crossmember and angle bracket to left frame perch using the supplied 3/8 x 1-3/4” bolt and one flanged nut in the rear holes of both components (**Figure 1**). During installation of the bolt through the components, place the supplied 3/8 washers between the crossmember and frame perch, as needed, to level the angle bracket with the bottom of the vehicle floor. This leveling operation is needed to account for the broad production tolerances and road/collision damage that is common with the frames of these vehicles. Some vehicles will need more washers than others to achieve the same result. Notice that the rear-most hole in the vehicle frame perch is not used for attaching the crossmember.

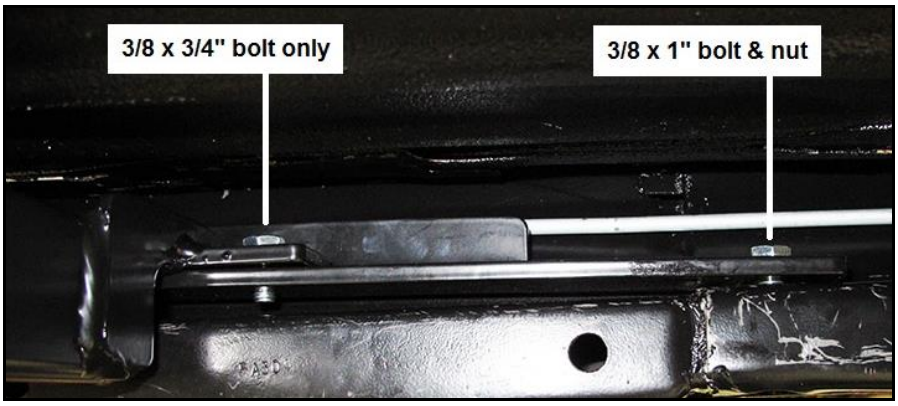



**Figure 2 - 1983-87 2004R chassis cars only**

4B. Attach the front of the angle bracket to the vehicle frame perch use a supplied 3/8 x 1” bolt and nut (**Figure 2**). Attach the crossmember to the mid-point of the angle bracket by installing the single supplied 3/8 x 3/4" bolt into the threaded hole at that position (**Figure 2**).

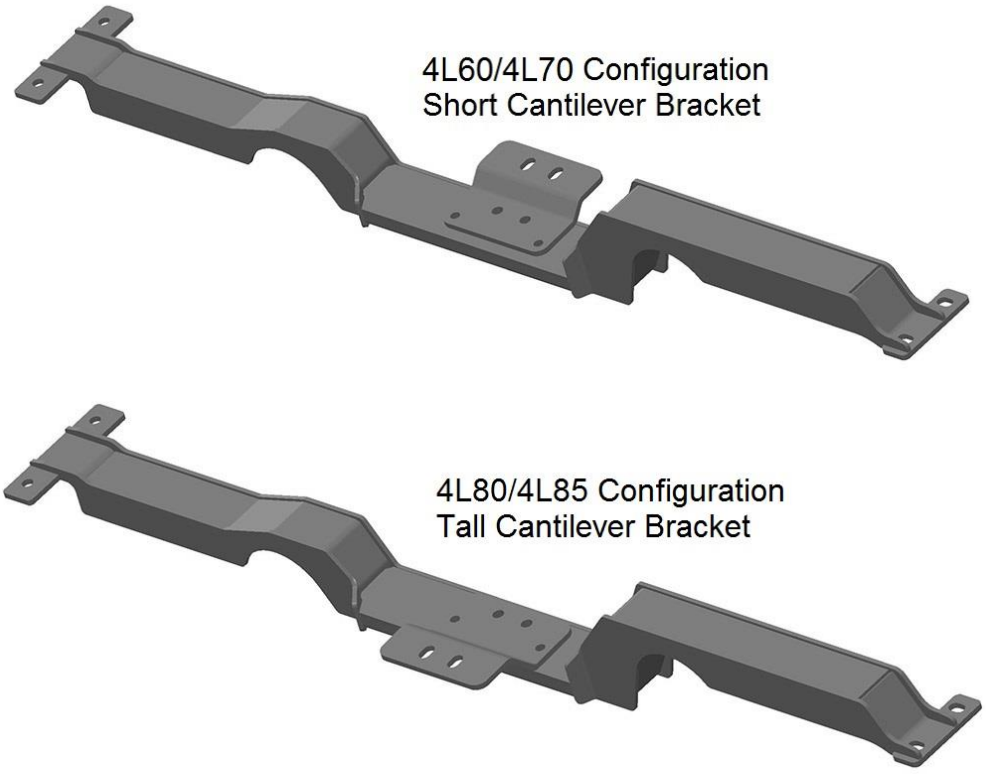
4C. **For vehicles without 2004R factory frame extension**- Position the frame angle bracket under the left mounting foot of the crossmember and loosely attach it to the rear-most hole in your left side frame perch using a supplied 3/8 x 1” bolt and flanged nut. Now, position the frame adapter Z-bracket supplied in the **12647HKR** (frame adapter kit) under the angle bracket and couple the crossmember, angle bracket, and frame adapter bracket together using the 3/8 x 1-1/4” bolts and nuts supplied with the adapter kit. Transfer and scribe the location of the lower holes in the frame adapter bracket onto the lower frame rail of the vehicle and drill the holes out with a 3/8” drill bit.

If the lower rail of your frame **does not** exhibit upward bending/damage in the area of the crossmember that is typical on these vehicles, install the two-hole spacer between the frame and the adapter bracket before installing the two 3/8 x 1-1/4” bolts (threaded ends pointed up) and nuts included with the adapter kit though the holes. If the lower rail of your frame **does** exhibit upward bending/damage, you can leave out the two-hole spacer and/or bend the lower frame rail, as needed, to enable the installed angle bracket to sit level with the floor panel with all the parts installed. Once completed, tighten all nuts and bolts across the entire crossmember assembly.

5. Attach the transmission mount (Hooker Blackheart **71223029HKR** (black), **71223030HKR** (red), Prothane 7-1604, or equivalent to the transmission and install the optional Hooker adapters listed below (if needed) between the transmission mount and crossmember with the nuts and bolts supplied with the adapters. With the adapter installed, lower the transmission and attach the mount to the crossmember with the fasteners supplied with the transmission mount.

- **4th-gen F-body/GTO LS T56** – no adapter needed, attach transmission mount directly to the crossmember
- **Tremec aftermarket T56 Magnum** – no adapter needed, install T56 Magnum spacer between mount and crossmember
- **4L60-4L70** – Install **12655HKR** with old style mounts (12643HKR) or **71223003HKR** with premium mounts (BHS5179) or (BHS5180) between mount and crossmember (cantilevered forward of the crossmember)
- **4L80/4L85** – Install **12656HKR** cantilever bracket between mount and crossmember (cantilevered reward of the crossmember)

- **TH400 and 2004R** – Install spacer block in Hooker **12650HKR** transmission adapter kit between mount and crossmember
- **6l80 8l90 10l80/90** use **BHS5182** follow instructions included with adapter
- **Tremec TKX** use **BHS5183** follow instructions included with adapter




**NOTE: INSTALLATION OF T56/T56 MAGNUM, TH 400, & TH 2004R REQUIRES NO CANTILEVER BRACKET.**

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

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**199R10707**
**Revision Date: 10-25-23**

# Hooker 12644HKR A/G-Body Transmission Crossmember Adapter Bracket Kits
# Part numbers 12647HKR, 12655HKR, & 12656HKR
# Installation Instructions

Thank you for choosing to use a Hooker™ transmission crossmember as part of your LS swap project. The components contained in this package are designed and intended for installation with the Hooker 12644HKR A/G-body LS swap crossmember. Please follow the instructions included with the crossmember to obtain proper installation of these parts.

No other use of these components is intended, implied or recommended by Holley Performance Products.

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**199R10723** **Revision date: 10-24-14**


# Hooker 12644HKR A/G-Body Transmission Crossmember Adapter Bracket Kits
# Part numbers 12647HKR, 12655HKR, & 12656HKR
# Installation Instructions

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**199R10723** **Revision date: 10-24-14**

# 1968-1972 GM A-BODY LS ENGINE SWAP HEADERS
# 70101318-RHKR (1-7/8") & 70101319-RHKR (1-3/4")
# Installation Instructions

Thank you for purchasing/using a Hooker Blackheart brand product. These headers are part of the complete Hooker Blackheart LS engine swap solution for 1968-72 GM A-body vehicles. These instructions have been written with the assumption that you have already installed an LS engine and transmission into your A-body vehicle using associated Hooker Blackheart engine mounting brackets.

Automotive work can be dangerous. Work only on a clean, dry and level surface and use lifting/supporting equipment specifically designed for automotive work. If you are unsure of your capability, or that of your equipment, seek professional assistance to install these components.

These headers are designed for off-road/competition use only and carry no CARB E.O. exemption to permit legal installation/use on pollution controlled motor vehicles.

**NOTE:** An O2 bung is included on each header collector for providing O2 sensor compatibility/operation. The beyond-horizontal clocked position of the bungs will provide reliable use of wide-band O2 sensors, if desired. Trimming the 4L80/4L85 transmission case bell housing inspection cover mounting flanges, and the cover itself, flush with the sides of the LS engine will reduce the effort required to R&R these transmissions from the vehicle in the future. At a minimum, the tip of the left side ears of the bellhousing and inspection cover of 4L80/4L85 transmissions will need to be trimmed off (approximately 3/4") to provide compatibility with these headers.

## BEFORE BEGINNING…

Check that the hardware package includes the following**:**

| Qty. | Description |
|---|---|
| 12 | M8 x 1.25 Header Bolts |

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

## INSTALLATION:

1. Disconnect the negative terminal on the battery, if connected.

2. Remove the spark plug wires, spark plugs, and engine oil dipstick/tube from the engine.

3. Working from the bottom of the car, place a stock (new or used) GM multi-layer steel manifold gasket between the left side header assembly and the cylinder head. Attach the header assembly to the cylinder head with (x6) supplied header bolts. Tighten the bolts to approximately 15 ft./lbs.

4. Place a stock (new or used) GM multi-layer steel manifold gasket between the right side header assembly and the cylinder head. Attach the header assembly to the cylinder head with the remaining (x6) supplied header bolts. Tighten the bolts to approximately 15 ft./lbs.

5. Reinstall/re-connect the spark plugs, plug wires, engine oil dipstick/tube, and negative battery cable.

## COMPATIBILITY INFORMATION:

These headers are installable/compatible with all GM TH350, TH400, 700R4, 2004R, 4L60E-4L70E and 4L80E/4L85E automatic or Tremec OE LS 4th-gen F-body T56 and aftermarket T56 Magnum manual transmissions.

These headers are designed for installation with Hooker Blackheart LS engine swap brackets and 2.5" and 3" dual exhaust system co-developed for this vehicle application. Factory column shift linkage may require modifications to enable compatibility with these headers; an aftermarket column shift linkage rod, such as those available from Lokar, may be preferable/required for use in column-shift applications.



**Technical Service: 1-866-464-6553**




**199R10920**
**Revision Date: 4-24-20**

# GM LS/LT Engine Mount Components
## 71221016HKR, 71221017HKR, 71221018HKR, 71221019HKR, 71223015HKR, & 71223016HKR
## Installation Instructions


**71221016HKR**


**71221019HKR**


**71223015HKR**


**71223016HKR**

Thank you for choosing to use Hooker Blackheart LS/LT engine mount components as part of your performance vehicle project. These mounts may be used as direct replacement parts on any 1998-02 V8 equipped GM F-body vehicle (with 71221018HKR),, or to perform an LT engine swap in a 1998-02 V8 equipped GM F-body vehicle (with 71221019HKR) using the factory frame stands. Additionally, they may be used to mount an LS or LT engine into a GM 1983-93 F-body or 1964-72 A-body vehicle using specific Hooker LS engine swap brackets developed for those applications. Please read these instructions thoroughly before attempting installation.

## PRE-INSTALLATION CONSIDERATIONS:

These components were designed in conjunction with one another to eliminate the rivet-drilling operation typically required to install polyurethane inserts in 1998-2002 GM F-body vehicles.

Hooker Blackheart LS and LT clamshell housings are both stamped from thicker gauge steel than is typically used to manufacture clamshell housings of stock replacement LS engine mounts, which means they provide a stronger mounting foundation for high horsepower applications.

While easy to install, careful attention should be paid to the installation steps within this document to ensure the insert is not installed into the clamshell upside-down or backwards, which would cause in-car installation issues.

## COMPATIBILITY INFORMATION:

Although Hooker Blackheart clamshell housings (LS and LT versions) were CAD designed specifically for use with Hooker Blackheart polyurethane inserts, they will physically accept GM 1998-02 F-body LS polyurethane inserts from Energy Suspension™ and Prothane™ also.

## BEFORE BEGINNING…

Check that the hardware package includes the following**:**

**71221016HKR-** (1) **black** LS/LT polyurethane insert
**71221017HKR-** (1) **red** LS/LT polyurethane insert
**71221018HKR-** (1) **LS** engine mount clamshell (upper and lower halves), (4) 5/16 bolts, (4) 5/16 washers and (4) 5/16 lock nuts
**71221019HKR-** (1) **LT** engine mount clamshell (upper and lower halves), (4) 5/16 bolts, (4) 5/16 washers and (4) 5/16 lock nuts
**71223015HKR-** (2) M12 x 150mm flanged head, Grade 10.9, LS/LT engine mount/bracket couple-bolts, (2) M12 flanged nuts
**71223016HKR-** (4) 5/16 bolts, (4) 5/16 washers, and (4) 5/16 lock nuts (this is a replacement hardware kit for the fasteners included with the 71221018HKR and 71221019HKR engine mount clamshell kits).

## INSTALLATION:

1. Install the insert between the upper and lower clamshell halves while ensuring that the following conditions of orientation are met:

   A. The metal tangs protruding from the ends of the insert are offset towards the top of the clamshell halves (the side with a straight edge compared to the slight “V” shaped edge of the bottom side).

   B. The longer end of the insert protrudes from the right side of the clamshell housing. This is the case with both mounts to be installed on an engine, which means when installed on the engine, the longer end of the inserts will point towards the front of the car on the passenger’s side of the engine, and towards the rear of the car on the driver’s side of the engine.

2. With the above conditions met, fasten the upper and lower clamshell halves together using the 5/16” hardware included with each clamshell housing. Install the fasteners in the orientation shown in **Figure 1** on the next page (LT clamshell shown, LS clamshell similar).

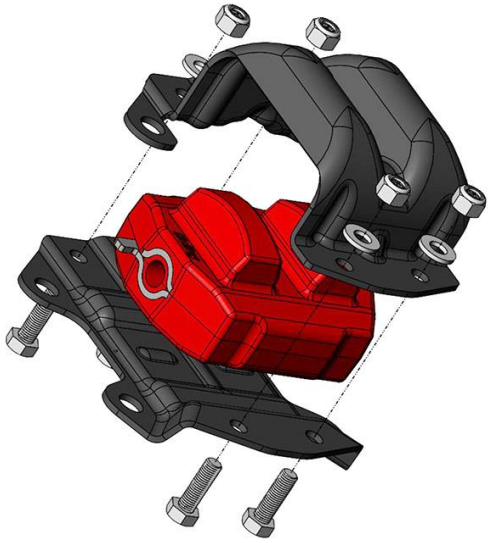

**Figure 1**

3. Ensure the two large holes in the bottom of the upper and lower halves are aligned to allow unobstructed insertion of M10 bolts through each of them and then torque the 5/16 bolt/washer/nut assemblies to approximately 29 ft./lbs.

4. Attach the clamshell/insert assemblies to the intended engine with user-supplied M10 fasteners with the straight edge of the clamshells facing up as depicted in **Figure 2**.

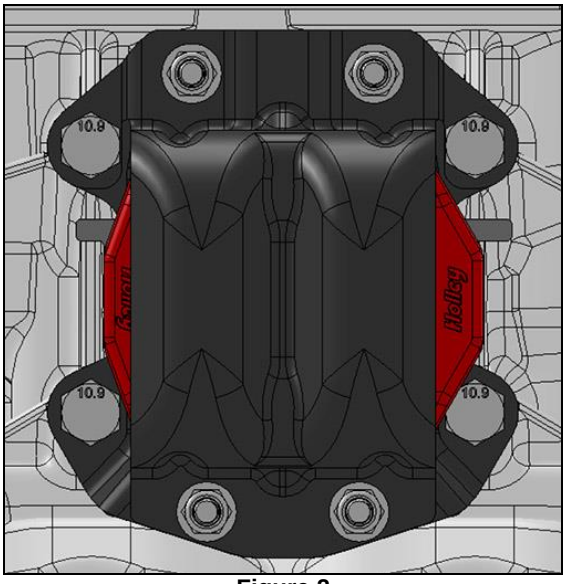


**Figure 2**

5. Lower the engine onto the vehicle engine mounting brackets and couple the engine mounts to the brackets using the M12 bolts and nuts included in the Hooker Blackheart 71223015HKR hardware kit, or with similar fasteners. Tighten bolt/nut assemblies

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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.



**199R11359**
**Revision Date: 8-2-19**

# Transmission Polyurethane Mount - GM

## 71223029HKR & 71223030HKR

## Installation Instructions

Thank you for choosing to use the Hooker BlackHeart™ transmission mount as part of your performance vehicle project. Please read thoroughly and understand these instructions before attempting installation.

## PRE-INSTALLATION CONSIDERATIONS:

These polyurethane transmission mounts may be used as a direct replacement for stock GM rubber mounts that measure 1.75” in height. Replacement of mounts with a greater height than 1.75” can be accomodated with the use of shim washers between the crossmember and the mount.

The polyurethane construction is capable of high horsepower applications while preserving vibration dampening and the safety interlock design of the inner components ensures that even if the polyurethane fails the mount will not separate. These polyurethane mounts are capable of fitting either a one or two stud type of crossmember interface.

## BEFORE BEGINNING:

Check that the package contains the following hardware:

| 71223029HKR | |
|---|---|
| **Qty.** | **Description** |
| 1 | Black Polyurethane Transmission Mount |
| 2 | 7/16”-14 x 1.5” Studs |
| 2 | 7/16”-14 Hex Nuts |
| 2 | Flat Washers |
| 2 | Lock Washers |

| 71223030HKR | |
|---|---|
| **Qty.** | **Description** |
| 1 | Red Polyurethane Transmission Mount |
| 2 | 7/16”-14 x 1.5” Studs |
| 2 | 7/16”-14 Hex Nuts |
| 2 | Flat Washers |
| 2 | Lock Washers |

## INSTALLATION:

1. Determine if your application requires a one or two stud crossmember interface. Install the supplied stud(s) (7/16”-14 x 1.5”) into the appropriate threaded holes in the polyurethane mount with a 7/32” hex key. If no hex key is available, the studs can also be installed into the mount by “double nutting” the end of the stud with the supplied hex nuts. Install the stud(s) until firmly seated in place.

2. Install the mount onto the crossmember with hardware provided (shown in **Figure 1**). Do not tighten the hex nuts at this time.

3. Install the factory transmission bolts (user supplied). Do not tighten the bolts at this time.

4. Confirm alignment of the polyurethane mount with the transmission and crossmember. Tighten and torque the transmission bolts to factory torque specifications. Also tighten and torque the crossmember hex nut(s) to 49 ft./lbs.

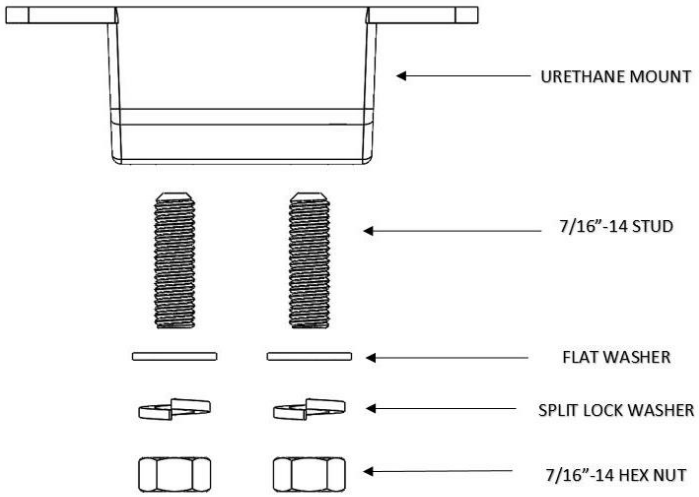


**Figure 1**

## LIMITATION OF LIABLILITY – DISCLAIMER:

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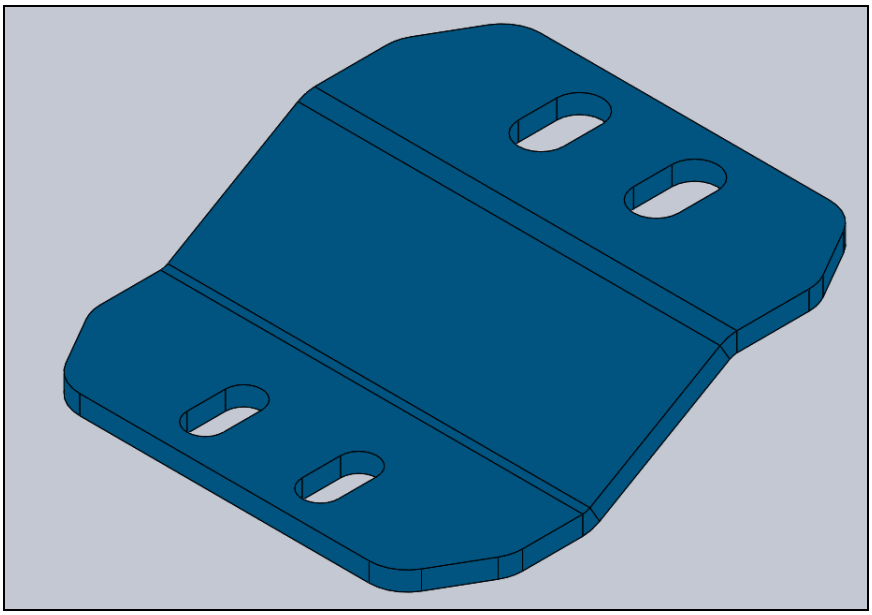
**199R11754**
**Date: 1-24-19**

# 1978-88 GM A/G Body - 1970-81 Camaro
# BHS5183 TKX Transmission Mount Adapter
# Installation Instructions



Thank you for choosing to use HOLLEY™ swap products as part of your LS/LT Swap project. This transmission adapter is part of the most comprehensively engineered system of mounting components, headers, and exhaust systems available for this application. Please read these instructions thoroughly before attempting installation.

## PRE-INSTALLATION CONSIDERATIONS:

- Requires the use of a urethane or rubber mount – Hooker 71223029HKR (black) 71223030HKR (red) or equivalent required
- Designed to be used with Hooker G-Body 12644HKR-1 swap crossmember and Holley BHS5180, BHS5179, or 12643HKR engine mounts
- Designed to be used with Hooker Camaro 12616HKR-1 swap crossmember and Hooker 12613HKR, or 12512HKR engine mounts.

More LS/LT engine performance components, such as EFI fuel control systems, fuel filters, fuel pumps, plumbing hose/fittings, intakes, and valve covers can be found at www.holley.com.

## BEFORE BEGINNING:

Check that the hardware package includes the following**:**

| Qty. | Description |
|---|---|
| 2 | M10 x 25mm Bolts |
| 2 | M10 Flange Nuts |

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

## INSTALLATION:

1. Using a TKX transmission install your Hooker transmission mount to the tail housing (**Figure 1**).
2. Install adapter bracket facing forward and up from the crossmember using hardware supplied with mount and tighten.
3. Install your crossmember using the included hardware to fasten adapter to crossmember and tighten.
4. Your trans adapter install has now been completed and ready to be outfitted with Hooker Blackheart exhaust system that is specifically designed for use with this crossmember.


**Figure 1**

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**199R12412**
**Revision Date: 12-14-23**