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**).

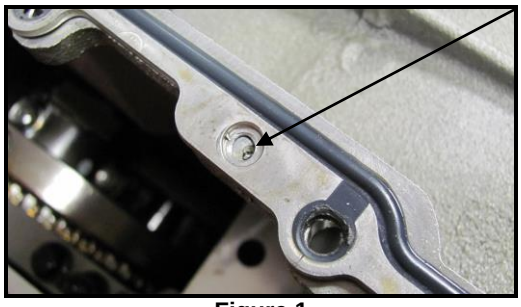


Figure 1

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).

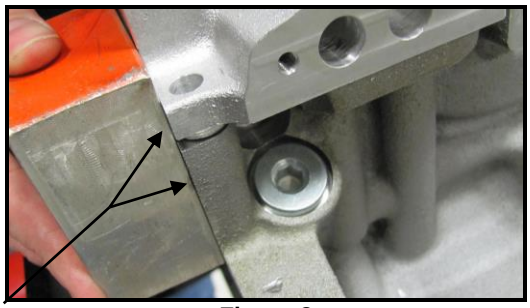


Figure 2

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.

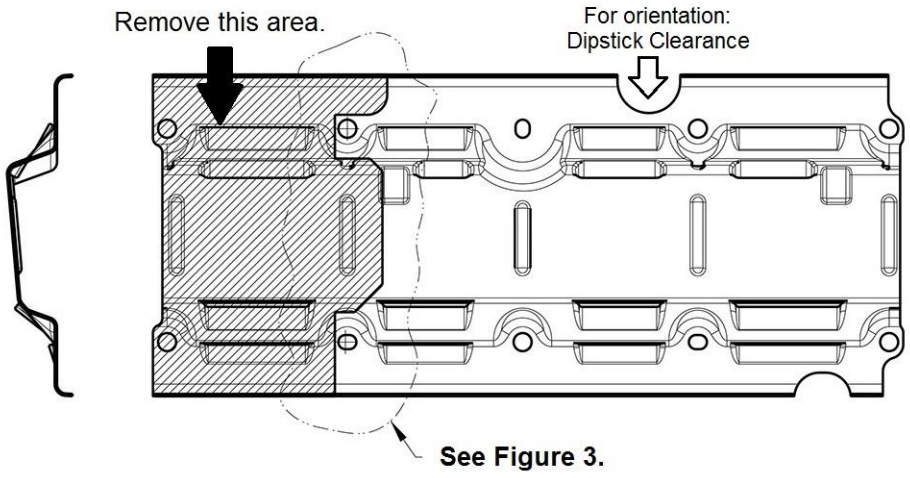
IMPORTANT: It is advisable to test-fit the oil pan to the engine before installation to ensure that the crankshaft and connecting rods clear the windage tray, oil pump pick-up screen, and the oil pan, making a full revolution of the rotating assembly by hand.

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.

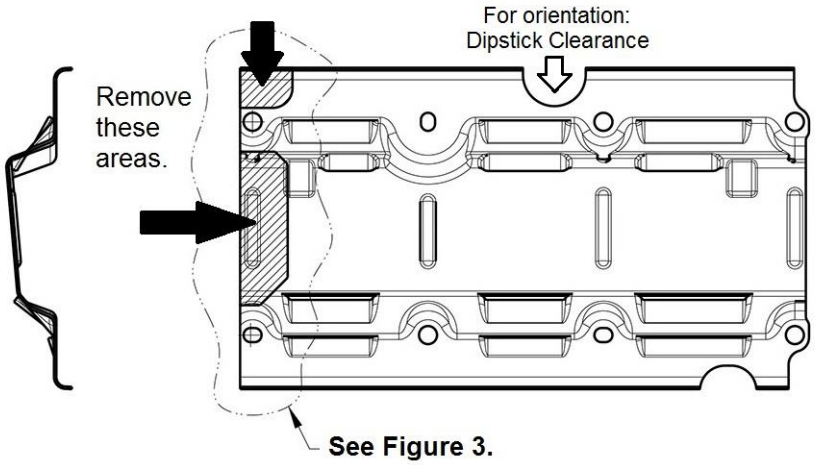
WINDAGE TRAY MODIFICATIONS AND INSTALLATION:

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



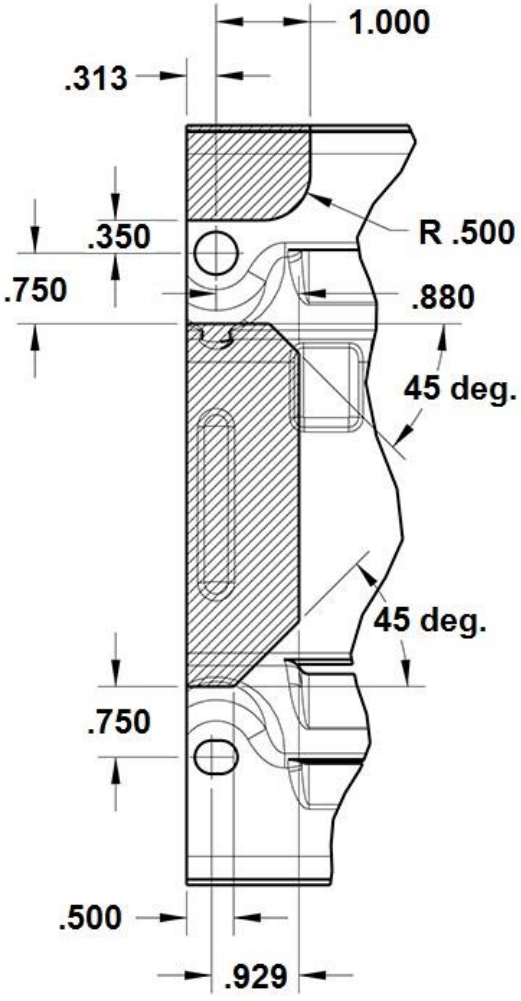


Figure 3

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**).

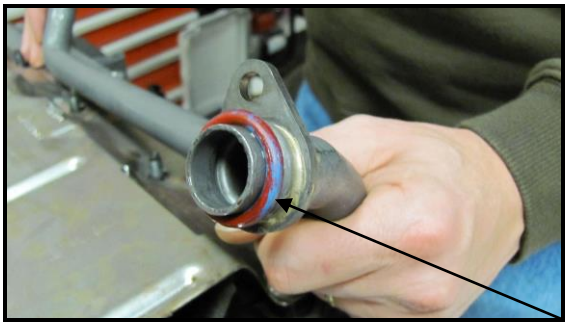


Figure 4

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.

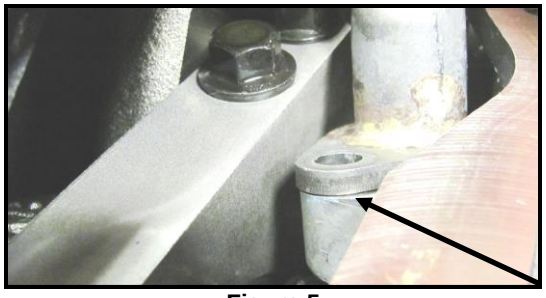


Figure 5

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

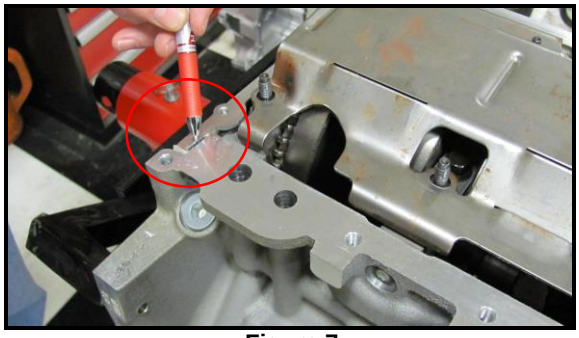


Figure 7

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

P/N 12628HKR
GM 1967-69 F-Body/1968-72 X-Body LS Swap Powerglide*/TH350*/7004R* Transmission Adapter Kit
*Requires the use of a Hooker 12625HKR 4L60-4L75 transmission crossmember

P/N 12650HKR
TH400 / 2004R Transmission Mount Adapter Kit

Installation Instructions 199R10685

Thank you for choosing to use Hooker Blackheart products as part of your engine/transmission swap project. These products are designed as part of the most comprehensively engineered systems of mounting components, headers, and exhaust systems available for LS engine swaps. Hooker Blackheart LS swap systems are 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 PRE-INSTALLATION INFORMATION:

These components have been designed for use in multiple Hooker Blackheart LS engine swap system applications. They have been CAD designed and FEA validated to provide optimized strength and fitment geometry for each application they are called out to be used with.

Installation of these products requires the use of a **Prothane™ 7-1604** poly mount, or an **Anchor™ 2268** rubber transmission mount for as-designed installation geometry to be achieved.

Use of the 12628HKR adapter kit with a 12625HKR 4L60-4L70 crossmember to install a Powerglide, TH350 or 700R4 transmission into an LS swapped GM 1st-gen F-body/3rd-gen F-body (using Hooker Blackheart 12618HKR LS swap engine brackets only) requires modifications (cutting and welding) be performed on the 12625HKR crossmember to complete the installation. The increased exhaust passage and ground clearance gained by using the 12625HKR crossmember as part of your LS swap project will more than justify the extra effort required for this operation.

Use of the 12650HKR spacer block kit with a 12626HKR T56 crossmember to install a 2004R transmission into an LS swapped GM 1st-gen F-body/3rd-gen X-body (using Hooker Blackheart 12618HKR LS swap engine brackets only) requires slight modification/welding to be done to the 12626HKR crossmember to fit around the case and pan of a 2004R transmission. The steel gusset bracket included within the 12650HKR kit is intended for this purpose and its use is outlined in these instructions. The increased exhaust passage and ground clearance gained by using the 12626HKR crossmember as part of your LS swap project will more than justify the extra effort required for this operation.

Use of the 12650HKR spacer block kit with any other Hooker Blackheart transmission crossmember to install a 2004R or TH400 transmission will not require any modifications to be done to the crossmember, or the use of the steel gusset bracket included in the 12650HKR adapter kit. Discard the gusset bracket in such cases.

These instructions are intended to supplement the basic installation steps outlined in various Hooker Blackheart transmission crossmember instruction sheets that call out the use of these parts. The drawings below can be seen in color by going to www.holley.com and searching for either 12628HKR or 12650HKR.

INSTALLATION OF 12628HKR

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

Qty.	Description	Qty.	Description
1	Adapter Bracket Assembly	2	7/16” Nuts
2	7/16” Bolts		

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

2. Cut a notch as wide as the 12628HKR bracket into the front of the 12625HKR crossmember. Place the notch in the center of the crossmember and cut it back 1-1/8” from the face of the crossbeam front flange (**Figure 1**).
3. Attach the bracket to the crossmember placing the supplied bolts and nuts in the holes that pass through both the bracket and crossmember (**Figure 2**).
4. If you are using this kit to install a 700R4 transmission, trim the front of the bracket off so that it is even with the front edge of the bracket gusset plate (**Figure 2**) and slightly notch the top edges of the upright crossmember gussets to clear the isolator mount base plate (**Figure 3**). If you are using this kit to install a Powerglide or TH350, leave the bracket length as-is, as you will be attaching the transmission mount to the forward set of holes in the bracket.
5. Once notching/clearancing is complete, clean parts and weld them together using either a MIG or TIG welder (**Figure 2**) and spot-paint as desired to match.

6. Install the crossmember per the instructions contained in its packaging.

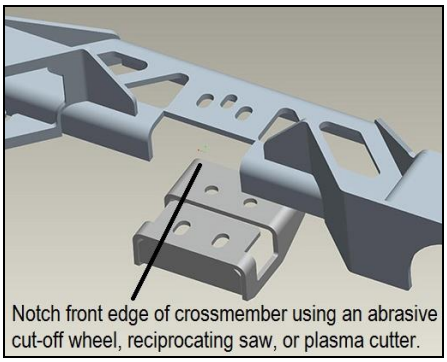


Figure 1

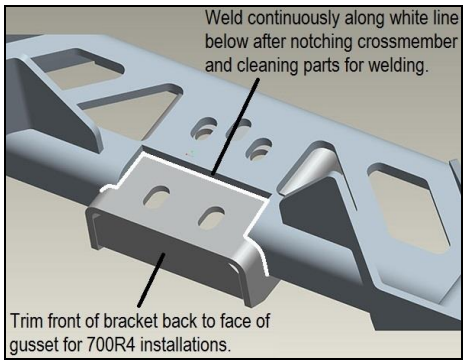


Figure 2

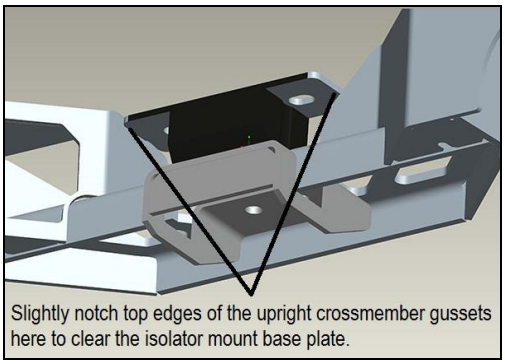


Figure 3

INSTALLATION OF 12650HKR

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

Qty.	Description	Qty.	Description
1	Aluminum Spacer Block	2	7/16” Bolts
1	Steel Gusset Bracket	2	7/16” Washers

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

2. If you are using this spacer block kit to install a 2004R into a GM 1st-gen F-body or 3rd-gen X-body using the Hooker Blackheart 12626HKR T56 crossmember, modify/cut the inside left upright wall of the crossmember to match what is shown in **Figures 4** and **5** below. Once modifications are complete, clean parts and weld them together using either a MIG or TIG welder, as indicated in **Figure 6** below and spot-paint as desired to match. Install the crossmember per the instructions contained in its packaging while installing the spacer block included in this kit between the crossmember and transmission isolator. Use the included long fasteners to attach the transmission mount to the crossmember.

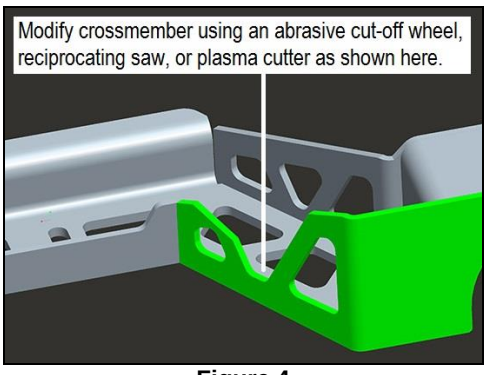


Figure 4

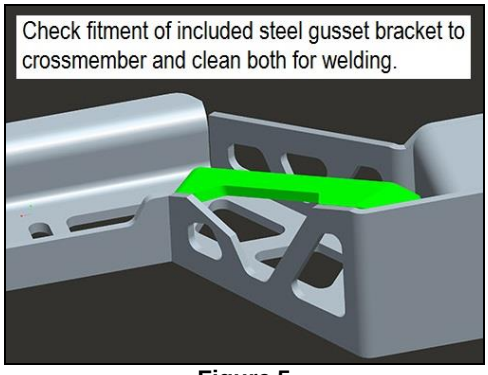


Figure 5

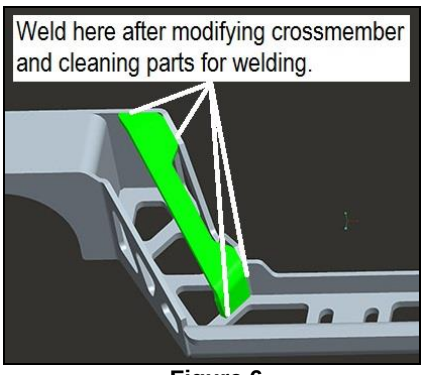


Figure 6

3. If you are using this spacer block kit and a Hooker Blackheart transmission crossmember to install a 2004R or TH400 transmission into any other vehicle besides a GM 1st-gen F-body or 3rd-gen X-body, do not modify the crossmember in any way. Install the crossmember per the instructions contained in its packaging while installing the spacer block included in this kit between the crossmember and transmission mount. Use the included long fasteners to attach the transmission mount to the crossmember. Discard the included gusset bracket as it is not needed in these applications.

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

199R10685
Revision Date: 8-22-18

Hooker Transmission Crossmember Spacer Block Kit
12657HKR
Installation Instructions

Thank you for choosing to use this Hooker product as part of your LS swap project. This component has been designed specifically for use with multiple Hooker LS swap transmission crossmembers, as referenced on Holley's website, and within various Hooker transmission crossmember instruction sheets.

Installation of these products requires the use of an **Energy Suspension™ 3-1158** poly mount, a **Prothane™ 7-1604** poly mount, or an **Anchor™ 2268** rubber transmission mount for as-designed installation geometry to be achieved.

PRE-INSTALLATION CONSIDERATIONS:

Attachment bolts needed to connect the transmission mount to the crossmember are not included and are to be user sourced.

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.

INSTALLATION:

NOTE: These instructions have been written with the assumption that your transmission and Hooker transmission crossmember has been installed into the vehicle.

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

   (1) Machined aluminum spacer

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

2. Raise the rear of your transmission and install this spacer block, and any other supplemental spacer(s) called out for in specific Hooker transmission crossmember instruction sheets, between the transmission crossmember and the transmission isolator mount.

3. Attach the transmission mount, spacer, and crossmember together with user-supplied hardware of your choice (Grade 8 recommended).

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.

199R11211
Revision Date: 1-18-18

FLOWMASTER INC.
THE PERFORMANCE TECHNOLOGY COMPANY

SCAVENGER SERIES ELITE HEADERS

409S® Stainless Steel

Installation Instructions

814116

1964-72 CHEVROLET CHEVELLE, WAGON, BUICK GRAN SPORT, SKYLARK, WAGON, PONTIAC GTO, LEMANS, OLDSMOBILE CUTLASS, 442, LS1/LS6 SB ENGINE

WARNING: The product accompanying this document is legal only for off-highway use (except in California or states that have adopted California emission standards), racing use or for use on pre-emission-controlled motor vehicles/motor vehicle engines (pre-1966 domestic vehicles certified to California standards, pre-1968 domestic vehicles certified to federal standards and all pre-1968 foreign vehicles), per the manufacturer's application guide.

Note: Installation of this product requires an adequate work space, general mechanic's tools, general mechanical "know how" and a reasonable level of experience. Most auto enthusiasts with these resources will have little difficulty installing these headers. However, you should carefully read these instructions before attempting to install these headers. If in doubt, consult a professional mechanic. (Better to do it now than to get stuck halfway through the installation.)

Check to make sure that you have received the proper parts for your installation. The header number will be stamped on the engine flange. If you are unsure you have received the proper parts call before you start work.

Be sure to work safe! Whenever you work under the vehicle be sure that it is located on level, solid ground and is supported by adequate safety stands. **Remember: Hot asphalt will not support most jack stands!**

Many factors affect the installation of headers, some of which are; broken or aftermarket motor mounts, accidents that impact the configuration of the frame, and/or the installation of different engines or aftermarket cylinder heads. If you are not comfortable with welding operations, we recommend that you contact a professional exhaust system specialist to install your new headers.

Attention Customers breaking in new engines: Due to the extreme heat generated during the break-in process, the appearance of the ceramic coating may be altered in certain areas. The protection characteristics and thermal barrier properties of the coating is never compromised. It is recommended that a cast iron manifold or old set of headers be used for this process.

The purchaser is responsible for following all installation instructions and safety guidelines supplied with your new Flowmaster Performance Exhaust Product. Flowmaster Performance exhaust assumes no responsibility for damages resulting from improper operation, misuse, abuse, or lack of reasonable care, or any problems resulting from incompatibility with other manufacturer's products.

Flowmaster uses sealing beads on its headers. We have found that when installed correctly, the raised bead around each port increases the pressure exerted on the gasket directly adjacent to the port and effectively prevents leaking gaskets. It is normal for the flange to be raised off the cylinder head the thickness of the sealing bead. It is important when installing the header to install all bolts loosely, and then tighten evenly to ensure the flat installation of the flange. The torque sequence from one flange to another will vary, but generally every bolt on a header should be first fit snug, starting from the inside of the flange working out, alternating from top to bottom so that the bolt connects the flange to the manifold to the point where they barely touch. Second, using the same inside-out pattern, tighten each bolt until finished. This method will help prevent leakage and will give the user the best possible performance out of their new set of headers.

DISASSEMBLY

1) Place the vehicle in a location where the floor is solid and flat, with adequate lighting. Do not attempt to work on a hot engine. Heat causes metal to expand and makes removal of fasteners difficult at best. **Disconnect the negative battery cable from the battery.** Raise the front of the vehicle to obtain adequate access to the bottom exhaust manifold flanges. Use large base jack stands to support the vehicle. Do not rely on the jack! Block the tires to prevent the vehicle from rolling off of the jack stands.

2) Spray WD-40 or some type of penetrating lubricant on all accessible exhaust manifold fasteners and fittings before attempting to remove them.

3) Remove the bolts connecting the head pipes from the exhaust manifolds

4) Note the spark plug wire locations and remove them from the spark plugs. Use a twisting motion while pulling the spark plug wire off of the plugs. Do not pull on the wires!

5) Brush or blow off any debris which may have collected around the manifolds or spark plugs. This will help prevent foreign matter from entering the combustion chamber when the manifolds are removed.

6) Remove the spark plug wire looms, plugs and any other brackets attached to the manifolds.

7) Disconnect the O2 sensor wiring and then remove the O2 sensors.

8) Remove the oil dipstick and tube.

9) Remove both of the exhaust manifolds.

10) Remove the starter.

11) Replace the spark plugs finger tight so that no debris will get into the cylinders during the cleaning the head surface. We recommend the use of a gasket scraper, wire brush or sanding block to adequately clean the surface.

12) After cleaning has been completed, remove the spark plugs again.

13) Remove the oil filter.

14) Apply a THIN film of Ultra Copper Hi-Temp Sensor Safe Silicone Sealer to the header side of the header gaskets and stick the gaskets to the header flanges. Masking tape can be used to help hold the gaskets to the header.

ASSEMBLY

RIGHT SIDE:

1) Apply a THIN film of Ultra Copper Hi-Temp Sensor Safe Silicone Sealer to the engine side of the header gasket.

2) Apply anti-seize to all header bolts being used.

3) Starting from below, work the header and gasket up through the chassis and into position.

4) Start all header bolts. Then tighten all of the header bolts evenly (starting with the most restricted first) to 35 ft/lbs.

5) Reinstall the right side spark plug wires, wire looms, starter, dipstick tube and dipstick.

6) Using the hardware provided, install the Flowmaster Ball flange connector to the back of the header and determine the connection to the exhaust. Weld the exhaust system to the ball collector.

7) Reinstall the O2 sensor to the reducer and then reconnect the O2 sensor to the O2 harness with the supplied extension.

LEFT SIDE:

1) Apply a THIN film of Ultra Copper Hi-Temp Sensor Safe Silicone Sealer to the engine side of the header gasket.

2) Apply anti-seize to all header bolts being used.

3) Starting from below, work the header and gasket up through the chassis and into position.

4) Start all header bolts. Then tighten all of the header bolts evenly (starting with the most restricted first) to 35 ft/lbs.

5) Reinstall the oil filter.

6) Reinstall the left side spark plug wires, wire looms and any brackets.

7) Using the hardware provided, install the Flowmaster Ball flange connector to the back of the header and determine the connection to the exhaust. Weld the exhaust system to the ball collector.

8) Reinstall the O2 sensor to the reducer and then reconnect the O2 sensor to the O2 harness with the supplied extension.

9) Re-connect the negative battery cable.

START THE ENGINE

Start the engine and allow it to warm up to operating temperature. Check for any unusual noises or exhaust leaks. If everything is OK, stop the engine and tighten all bolts while the engine is still warm. **Note:** Recheck the header bolts periodically to make sure they have not loosened. Re-tighten after the first 500 miles and then again at 1000 miles.

IMPORTANT CHECK LIST

- **Be sure that all brake lines and fuel lines are clear of headers and/or connector pipes.**
- **All spark plug wires, battery cables or other electrical components should be clear of headers and/or connector pipes.**
- **If dipstick tube has been removed, make sure it is installed properly and that the dipstick has been replaced.**
- **Double check the tightness of all bolts including brackets and accessories.**

PARTS LIST

Qty:	Description
(1)	Drivers Side Header Assembly.
(1)	Passenger Side Header Assembly
(2)	Header Gaskets
(2)	3” to 2½” Header Reducer Tube W/O2 Sensor
(12)	M8-1.25x25MM Header Bolts
(4)	3/8”-16 x 2¼” Ball Collector bolts
(4)	3/8”-16 Hex Nuts
(16)	3/8” Lock Washers
(4)	3/8” Flat Washers
(2)	O2 Sensor Extension
(1)	Flowmaster Decal

1968-1972 GM A-Body LS Swap Engine Mounting Brackets
71221006HKR & 71221007HKR
Installation Instructions

Thank you for choosing to use Hooker Blackheart engine swap mounting brackets as part of your LS swap project. These mounting brackets are 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:

Successful installation of an LS engine using these components is more highly ensured by installing new body bushings prior to installation of these components.

Installation of these engine mounting brackets requires the use of 1998-2002 GM Camaro/Firebird LS1 engine motor mounts. GM replacement rubber mounts (part number 22179268) or Hooker Blackheart polyurethane motor mounts – 71221018HKR clamshell housings and 71221016HKR (black) or 71221017HKR (red) inserts are recommended. Aftermarket poly motor mount inserts from other sources have been found to deviate from factory design specifications and will cause installation issues.

The long horizontally installed through bolts/nuts that couple the engine mounts to the Hooker Blackheart engine brackets are to be user supplied. Stock GM bolts/nuts or the Hooker Blackheart 71223015HKR hardware kit are recommended to be used.

COMPATIBILITY INFORMATION:

When used with a stock 68-72 Chevelle transmission crossmember, or the Hooker Blackheart **71222007HKR** transmission crossmember, each or these engine swap mounting bracket sets will provide the most geometrically optimized LS engine/transmission mounting solution available for this vehicle platform.

These engine swap mounting bracket kits are designed for use with a Holley® **302-2** or **302-3** oil pans and have been validated to be compatible with the following engine accessory drive systems and vehicle components:

71221006HKR Forward-Bias Engine Brackets – **Holley** or stock **Corvette** (excluding the A/C compressor/bracket, which must be relocated), **Truck** (must use smaller 5” diameter power steering pump pulley and stock Denso A/C compressor without rear pressure sensor), **F-body/GTO** (excluding the alternator, which must be relocated) FEAD systems. These brackets **ARE** compatible for use with the stock vehicle A/C evaporator case.

71221007HKR Rear-Bias Engine Brackets – **Holley** or stock **F-body/GTO** (GTO alternator not compatible, must be relocated or replaced with an F-body alternator), **Corvette** (excluding the A/C compressor/bracket, which must be relocated), or **Truck** (must use smaller 5” diameter power steering pump pulley and stock Denso A/C compressor without rear pressure sensor) FEAD systems. These engine brackets **ARE NOT** compatible for use with the stock vehicle A/C evaporator case.

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

BEFORE BEGINNING…

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

Qty.	Description	Qty.	Description
8	3/8 x 1” Bolts	1	3/16 Trans Mount Spacer
8	M10 x 1.5 x 25mm Bolts	2	Crossmember Spacers
8	3/8 Nylon Lock Nuts		

INSTALLATION:

1. Remove the factory engine mounts from the K-member and clean the bracket mounting surfaces.

2. **Loosely** attach the Hooker Blackheart engine mounting brackets to the K-member, as depicted in **Figures 1, 2 and 3**, using the supplied 3/8" bolts/nuts. The driver's side bracket is identifiable by the triangular shaped notch located on its outer profile. The passenger's side bracket has a semi-circle shaped notch located along its outer profile.

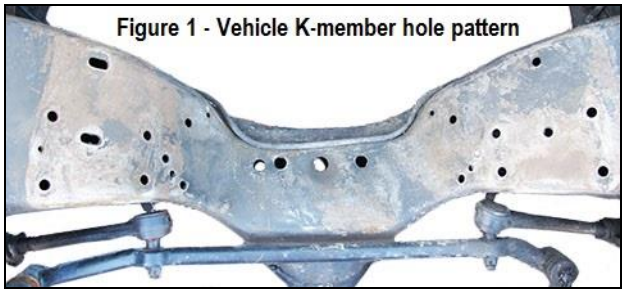


Figure 1 - Vehicle K-member hole pattern

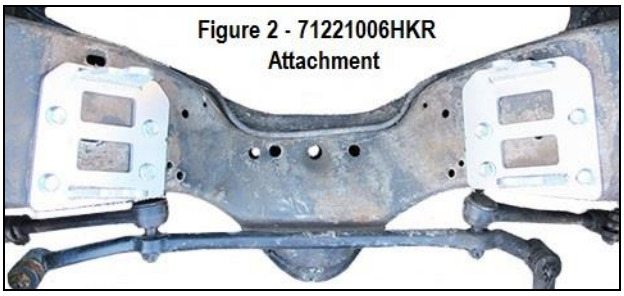


Figure 2 - 71221006HKR Attachment

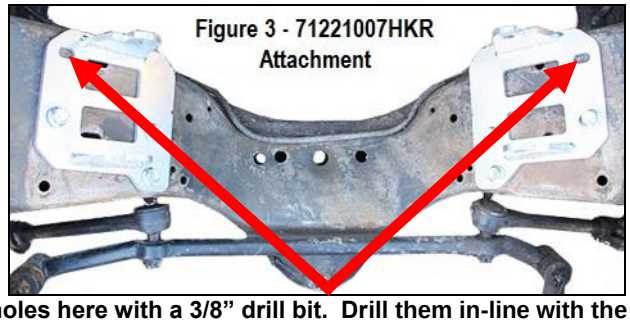


Figure 3 - 71221007HKR Attachment

NOTE: Drill two holes here with a 3/8" drill bit. Drill them in-line with the forward top holes so that the brackets maintain the adjustability provided for by the slots.

3. Install new motor mounts onto the LS engine to be installed.

4. Install the engine/transmission assembly onto the Hooker Blackheart engine brackets and couple the engine mounts to the engine brackets using the user-sourced bolts/nuts.

5. Raise the rear of the transmission as high as it will go and install a stock 1967-72 Chevelle or Hooker Blackheart **71222007HKR** transmission crossmember, depending on your transmission application. If you are using a stock Chevelle crossmember, the supplied 3/8" and 3/16" thick spacers must be installed with the crossmember to maximize exhaust clearance under the crossmember and provide the intended optimized drivetrain geometry designed into the Hooker Blackheart engine brackets.

   Each set of Hooker Blackheart A-body engine swap brackets provides the user with unique fitment/compatibility advantages that determine the amount of effort required to install a particular transmission and/ or engine accessory drive system in the swap vehicle. The type and amount of work to be expected when installing either set of engine brackets with a particular transmission is condensed as follows:

71221006HKR Forward Bias Engine Brackets:

4L60-4L70 installations -

- No floor cutting required, but slight, focused impact clearancing (hammering) of the floor may be required around the upper left bolt boss at the bellhousing/transmission case interface, at the top left corner of the transmission extension housing where it attaches to the transmission case and above the U-joint yoke, depending on the size of the U-joint/yoke used.

- Install using a stock 1968-72 Chevelle transmission crossmember, which will bolt right onto the vehicle frame using pre-existing holes in the frame rails.

- Install the included 3/8" spacers between the ends of the crossmember and vehicle frame. Install the included 3/16" spacer between the crossmember center pad and transmission mount if you are using a stock rubber or Hooker Blackheart **71223029HKR** (black) or **71223030HKR** transmission mount.

TH350, TH400 and 2004R installations -

- No floor cutting or floor modifications are required to install these transmissions, except for possible U-joint/yoke clearance, which can be accomplished through focused impact (hammer) clearancing of the floor just above the yoke.

- Install using a stock 1968-72 Chevelle transmission crossmember – this will require 2 new **13/32"** holes be drilled in-line with the existing holes in each frame rail to attach the crossmember to the frame. Drill one hole 1/2" **REARWARD** from the center of the hole with the arrow pointing to it in **Figure 4** and a second hole 2-1/4" **REARWARD** from the first drilled hole.

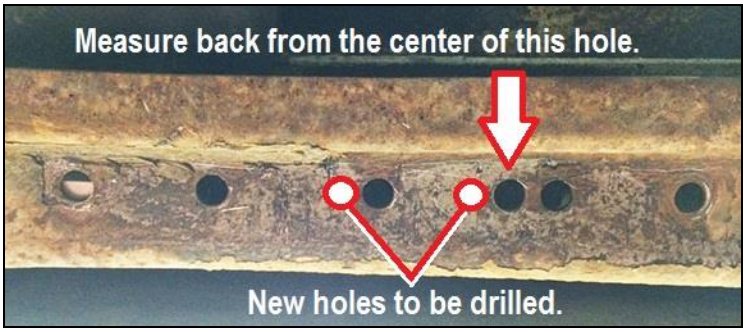


Figure 4

- Install the included 3/8" spacers between the ends of the crossmember and vehicle frame. Install the included 3/16" spacer between the crossmember center pad and transmission mount if you are using a stock rubber or Hooker Blackheart **71223029HKR** (black) or **71223030HKR** transmission mount.

T56/T56 Magnum installations -

- **Moderate** floor cutting/modification is required. Cut a long slit down the center top of the tunnel and remove all of the tunnel sheet metal directly above the transmission extension housing. After slitting/cutting of the floor, install the transmission per the instructions included with the Hooker Blackheart crossmember and pry open the tunnel on either side of the slit until sufficient clearance above the transmission is obtained. Close up the slit with a narrow patch panel and rebuild the tunnel surrounding the extension housing once the transmission is solidly mounted to the crossmember. Any additional U-joint/yoke clearance needed can be obtained through focused impact clearancing of the floor just above the yoke.

- Install using a Hooker Blackheart **71222007HKR** transmission crossmember, per the instructions included in its packaging.

4L80/4L85 installations -

- No floor cutting required, but slight, focused impact clearancing (hammering) of the floor may be required around the output speed sensor and electrical plug on the left side of the transmission, around the cooler fittings/lines on the right side of the transmission and above the U-joint yoke, depending on the size of the U-joint/yoke used.

- Install using a stock 1968-72 Chevelle transmission crossmember, or Hooker Blackheart **71222007HKR** transmission crossmember. The use of a stock 1968-72 Chevelle crossmember will require drilling new holes in the frame rails and will not be compatible with bolt-in installation of related Hooker Blackheart 2.5" or 3" A-body exhaust systems.

- Install the included 3/8" spacers between the ends of the crossmember and vehicle frame and Install the included 3/16" spacer between the crossmember center pad and transmission mount if you are using a stock rubber or Hooker Blackheart **71223029HKR** (black) or **71223030HKR** transmission mount.

71221007HKR Rear-Bias Engine Brackets:

4L60-4L70 installations -

- **Extensive** floor cutting/modification is required. The area of the sheet metal that will need to be removed will extend from the tail end of the transmission all the way up into the base of the firewall. Remove enough sheet metal covering the transmission to enable the installation of a stock Chevelle transmission crossmember.

- Install using a stock 1968-72 Chevelle transmission crossmember attached to the frame using the frame holes indicated in **Figure 5.** Once done, use a rat-tail file or rotary file to elongate the two center slots on the crossmember towards the front of the vehicle, as needed, to be able to attach the transmission mount to the crossmember.

Figure 5

- Install the included 3/8" spacers between the ends of the crossmember and vehicle frame and Install the included 3/16" spacer between the crossmember center pad and transmission mount if you are using a stock rubber or Hooker Blackheart **71223029HKR** (black) or **71223030HKR** transmission mount.

- Rebuild the floor over the transmission as needed to close up the floor.

TH350, TH400, & 2004R installations -

- No floor cutting or floor modifications are required to install these transmissions, except for possible U-joint/yoke clearance, which can be accomplished through focused impact (hammer) clearancing of the floor just above the yoke.

- Install using a stock 1968-72 Chevelle transmission crossmember attached to the frame in the stock location for a TH350 or TH400 transmission. Use the TH400 attachment position for 2004R installations.

- Install the included 3/8" spacers between the ends of the crossmember and vehicle frame and Install the included 3/16" spacer between the crossmember center pad and transmission mount if you are using a stock rubber or Hooker Blackheart **71223029HKR** (black) or **71223030HKR** transmission mount.

T56/T56 Magnum installations -

- **Extensive** floor cutting/modification is required. The area of the sheet metal that will need to be removed will extend from the tail end of the transmission all the way up into the base of the firewall. Remove enough sheet metal to allow the transmission to be installed using the Hooker Blackheart **71222007HKR** transmission crossmember, per the instructions included in its packaging.

- Rebuild the floor over the transmission as needed to close up the floor.

4L80/4L85 installations -

- **Moderate** floor cutting/modification is required. The section of the tunnel immediately above the transmission case extension housing will have to be removed/rebuilt. Any additional U-joint/yoke clearance needed can be obtained through focused impact clearancing of the floor just above the yoke.

- Install using a Hooker Blackheart **71222007HKR** transmission crossmember, per the instructions included in its packaging.

6. With the engine and transmission in place on the engine brackets and transmission crossmember, sight across the bottom of the engine K-member and use a pry bar to level the engine oil pan and transmission crossmember with the bottom of the engine K-member. Once level, tighten all eight bolts attaching the engine brackets to the engine K-member.

7. Your LS swap engine and transmission are now mounted and ready to be outfitted with headers and an exhaust system. Hooker Blackheart 1967-72 A-body LS swap headers and exhaust systems are specifically designed for use with these engine mounting brackets.

199R10933
Revision Date: 4-24-20

1968-1972 GM A-Body Convertible/El Camino LS Swap Transmission Crossmember
71222021HKR
Installation Instructions – T56/T56 Magnum/4L60-4L70*/4L80-4L85/TH400* and 2004R*

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

Thank you for choosing to use this Hooker Blackheart 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 vehicle 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 in their entirety before attempting installation.

PRE-INSTALLATION CONSIDERATIONS:

This crossmember is designed as part of a fully-engineered LS swap mounting system for 1968-72 GM A-body convertible/El Camino vehicles and will also install on any other A-body model that was/has been equipped with a factory boxed frame. It has been CAD designed to provide an optimized balance of weight, stiffness and strength. The dual-arch exhaust passages are provided for installation of available Hooker Blackheart 2.5" and 3" exhaust systems for this application, or any custom system of your choice.

This crossmember provides for direct installation of a 4th-gen F-body/GTO T56, aftermarket Tremec T56 Magnum or 4L80/4L85 transmission. Installation of a 4L60-4L70, TH400 or 2004R automatic transmission can also be accomplished using this crossmember and a Hooker Blackheart **12650HKR (TH400/2004R)** or **12657HKR (4L60-4L70)** adapter kit.

Installation of this crossmember, with any of the above mentioned transmissions, requires the use of a stock rubber, or Hooker Blackheart **71223029HKR** (black), or **71223030HKR** (red) transmission mount.

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 Engineering for this LS swap application will more than likely not be successful. When used with the related Hooker Blackheart **71221006HKR or 71221007HKR** engine mounting bracket kits and Holley **302-2** or **302-3** oil pans, this CAD designed transmission crossmember will provide desireable component clearances and U-joint operation angles.

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.**

INSTALLATION:

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

Qty.	Description	Qty.	Description	Qty.	Description
1	Crossmember Assembly	1	Right Side Foot Bracket	8	3/8-16 Nuts
1	T56 Magnum Spacer	4	3/8 Flat Washers	8	3/8-16 x 1" Bolts

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

NOTE: These instructions have been written with the assumption that you have already installed an LS engine into your vehicle using one of the Hooker Blackheart A-body engine mounting bracket kits.

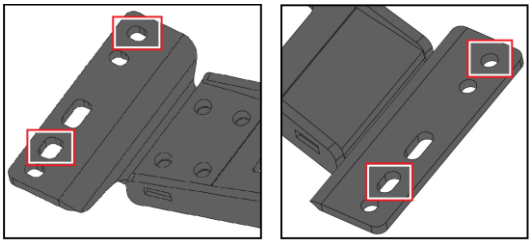
NOTE: If you are installing a T56 Magnum transmission, the included two-hole spacer is to be installed between the crossmember and transmission mount to compensate for the isolator mounting surface of the T56 Magnum being closer to the transmission output shaft centerline than the same surface on an LS 4th-gen F-Body/GTO T56. Leaving this spacer out will increase the engine inclination angle beyond that intended by Hooker Engineering and decrease the ground clearance of Hooker Blackheart headers designed for this application.

NOTE: 4L80/4L85 transmissions will be installed using the rearward set of holes located behind and above the cantilevered shelf in the center of the crossmember; all other transmissions will be installed using the forward set of holes located in the cantilevered shelf.

2. Raise the tail of the transmission to its maximum height against the vehicle floor and attach the transmission mount to the transmission (user supplied). If you are using the Hooker Blackheart **71221007HKR** engine brackets and are installing any transmission other than a TH400 or 2004R, or using the **71221006HKR** brackets and are installing a T56 or T56 Magnum transmission, you must modify and/or rebuild the transmission tunnel to provide clearance, as needed, to carry out the remaining installation steps below.

3. Position the left side of the crossmember on top of the lower left side vehicle frame rail followed by raising the right side of the crossmember above the right side vehicle frame rail. Insert the supplied foot bracket between the crossmember and the right side frame rail and attach the bracket to the crossmember using four each of the supplied 3/8" bolts and nuts. Torque to 44 lb./ft.

   If using the Hooker Blackheart **71221006HKR** engine mounting brackets, attach the crossmember to the frame using the holes indicated in **Figures 1** and **2** below. As indicated, 4L60-4L70 installations will use the 3rd and 6th holes along the stock 8-hole frame pattern (counting forward from the rear-most hole in the pattern) and TH400,2004R,4L80/4L85 or 4th-gen F-bodyT56/T56 Magnum installations will use the 2nd and 4th holes along the stock 8-hole pattern (counting forward from the rear-most hole in the pattern).



Crossmember Holes to Use

Figure 1

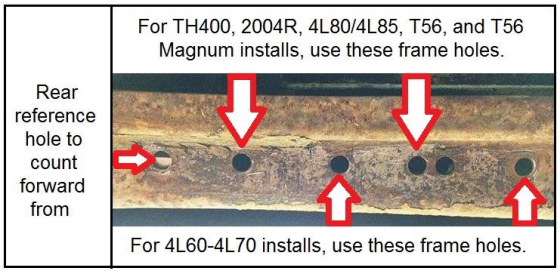


Figure 2

4. If using the Hooker Blackheart **71221007HKR** engine mounting brackets, move the crossmember along the frame rails until an aligned, and squared, pattern of holes is revealed that allows attachment of the crossmember to the vehicle frame rails and also to the transmission mount. If a suitable pattern cannot be found, loosely attach the transmission mount to the crossmember using user supplied fasteners and mark and drill new holes in each frame rail after squaring the crossmember accross the frame rails.

5. Attach the crossmember to the frame rails with the included 3/8" hardware; torque to 44 lb./ft.

6. Attach the transmission mount to the crossmember. Install a **12650HKR** or **12657HKR** spacer between crossmember and mount for 4L60-4L70, TH400, or 2004R installations.

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

COMPATIBILITY INFORMATION:

This transmission crossmember was specifically designed for bolt-in compatibility with the Hooker Blackheart LS swap engine mounting bracket kits, headers and exhaust systems also developed for this application and Hooker LS cast iron manifolds. 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 was designed specifically for compatibility with the Holley® **302-2** & **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.

Hooker™ LS swap manifolds **(8501HKR)** and Hooker Blackheart A-body LS swap headers are compatible with the stock A/C evaporator case when installed using this Hooker Blackheart LS engine swap transmission crossmember and the related Hooker Blackheart **71221006HKR or 71221007HKR** engine mounting bracket kits.

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

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.

LIMITATION OF LIABILITY – DISCLAIMER:

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.

199R11416
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).

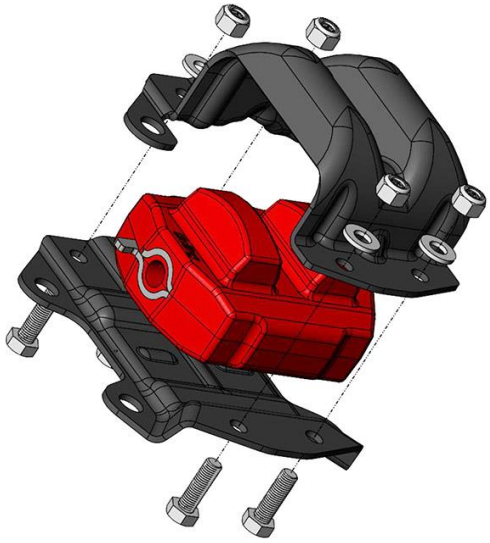


Figure 1

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**.

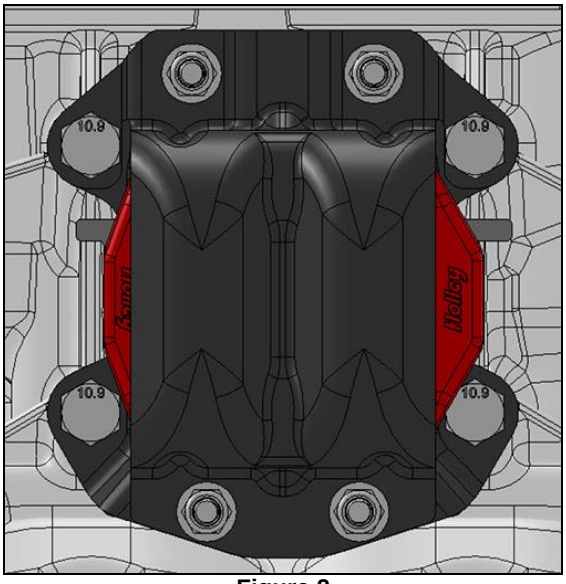


Figure 2

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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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.

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.

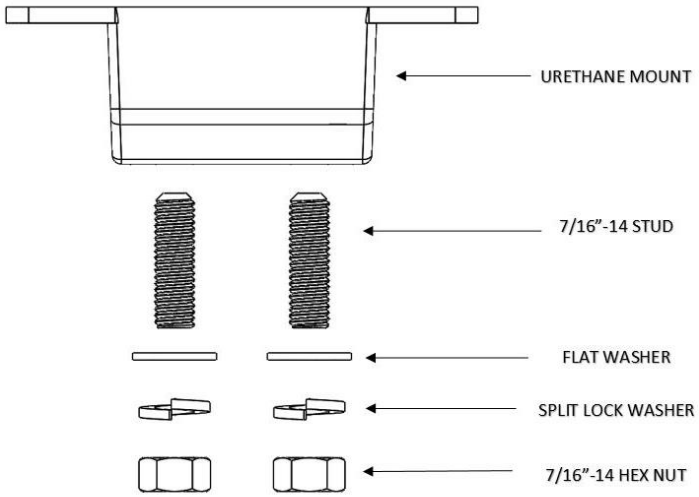

Figure 1

LIMITATION OF LIABLILITY – DISCLAIMER:

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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.

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Date: 1-24-19