



OIL PANS P/N 302-1 & 302-2



Instruction Sheet 199R10566

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:

302-1 – The Holley® P/N 302-1 LS Retro-fit oil pan is designed for LS engine retrofit installation in a wide range of popular GM muscle/classic car and truck chassis.

302-2 – The Holley® P/N 302-2 LS Gen 1 F-Body Retro-fit oil pan is designed specifically for LS engine retrofit installation in 1967-69 Camaro/Firebird (Gen 1 F-body), 1968-1974 Nova/Apollo/Omega/Ventura (Gen 1 X-body) vehicles. The 302-2 oil pan 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:

- Both oil pans provide OEM fitment and oil filter mounting provisions.
- 302-1 & 302-2 are not intended to be used with engines that originally utilized a dry sump system.
- 302-1 is designed to use a GM full length windage tray. Depending on which full-length windage tray is used, some modification to the tray may be required. See the instructions showing the modification which may be required.
- 302-2 is designed to use a 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. A full-length windage tray may be used if the front quarter of the tray is removed. See the instructions showing the windage tray modifications required.
- 302-2 may not be used on LS7 engines or engines with a stroke longer than 3.62”. The internal rotating assembly to oil pan clearance provided in the front half of the oil pan is patterned after a GM 98-02 LS1 oil pan.

The Holley® LS Swap oil pans are designed to work with an LS3 dipstick and tube (if desired). 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:

	<u>302-1</u>	<u>302-2</u>
Sump Oil Capacity –	5.5 Qts	5.7 Qts
Total Oil Capacity w/ stock filter –	6 Qts	6.2 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)

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: 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**).

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

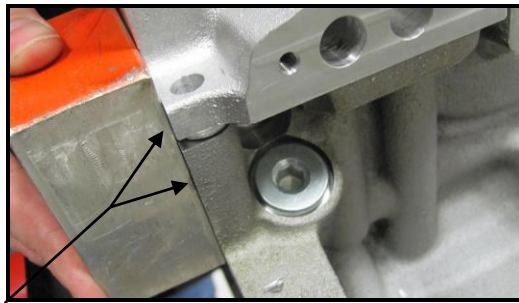


Figure 2

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.

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 3**).



Figure 3

WINDAGE TRAY INSTALLATION AND MODIFICATIONS:

P/N 302-1 OIL PAN:

WARNING! Due to the design of the Holley® oil pump pickup screen, slight modifications may have to be made to the oil deflector before the pickup screen will sit flush (**Figures 4 & 5**). Be sure to inspect this area before bolting the pickup screen into place as modifications may have to be made. GM offers an oil deflector that has the necessary clearance for the mounting bracket of the pickup screen. The GM P/N is 12611129, if modifications to the oil deflector are not desired.

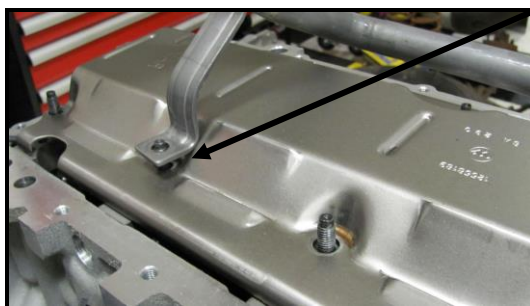


Figure 4

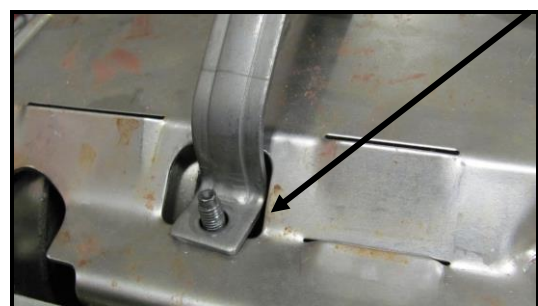


Figure 5

P/N 302-2 OIL PAN:

WARNING! The 302-2 oil pan is design to use a GM LS "F-Body" windage tray, GM P/N 12558253. Due to the design of the Holley® oil pump pickup screen, a modification to the windage tray must be made. A cut to provide clearance to the oil pick-up tube must be made as shown in **Figure 6**. The cut-out below may be used as a template for the cut.

A full-length windage tray may be used if it is modified to remove the front quarter of the tray and the required cut is made to provide clearance to the pick-up tube (**Figure 6**). A very careful check should be made to ensure that the oil pick-up tube has clearance to the windage tray and that the oil pick-up tube mounting bracket seats down properly on the mounting stud and windage tray without interference.

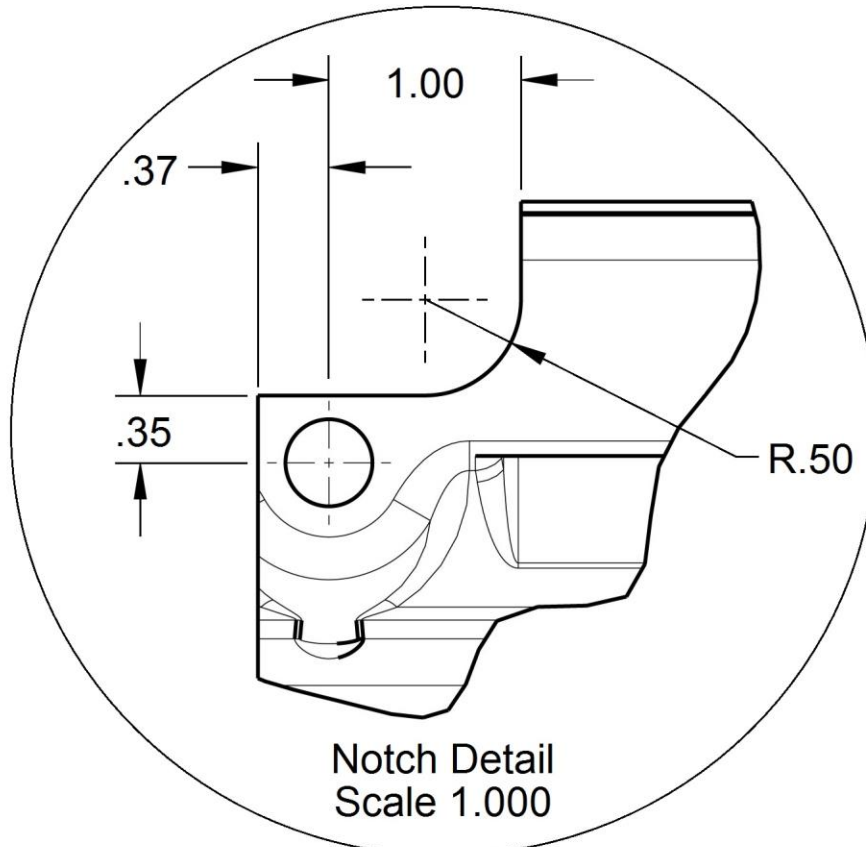
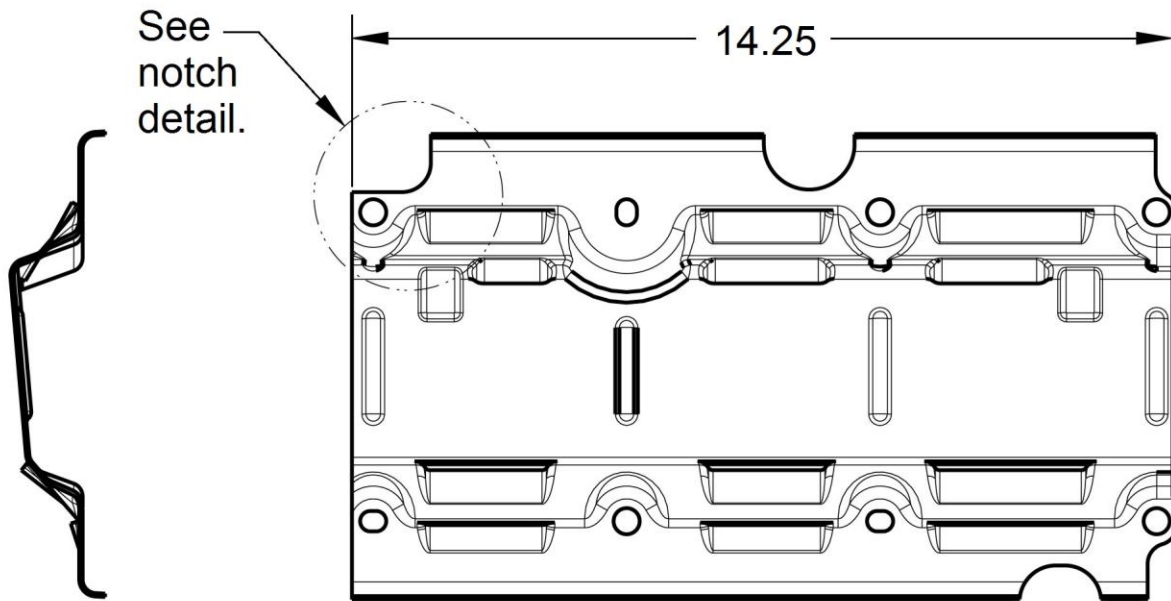


Figure 6

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 bolt (**Figure 7**). Do not allow the bolt to pull the tube into the pump.

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



Figure 7

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

NOTE: The 302-2 oil pump screen/pick-up tube features a two bolt oil pump mounting flange. There are two M6 x 16mm long flanged socket head capscrews included in the installation parts kit. Use one or both of these cap screws when installing the 302-2 pickup screen. One screw is sufficient to retain the pickup screen, the second screw is optional.

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 8**) directly onto the tabs of the front cover gasket that protrude into the oil pan surface.



Figure 8



Figure 9

12. Apply a 5mm bead of RTV sealant 20mm long to the engine block (**Figure 9**) 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.

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**8501HKR (no coating), 8501-1HKR (silver ceramic),
8501-3HKR (black ceramic), 8501-4HKR (titanium ceramic),
& 8501-5HKR (light charcoal gray ceramic)
Hooker™ Cast Iron 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, while also providing OE performance with regard to emissions and catalytic converter function. 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 emissions-legal crate engines, such as the GM E-Rod crate-engine line and for 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 2-1/4” 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 2-1/4” tubing with a pipe expander, or welding on a tapered transition.

If you so choose, and if the geometry of your chassis will allow, a 2-1/2” I.D. step can be machined into the outlet side of the flange to allow welding of 2-1/2” diameter tubing directly to the flange.

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.

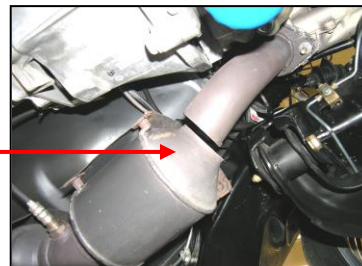
Ceramic-coated manifolds require several heat cycles to fully cure before they will withstand extreme heat, so care should be taken to provide a series of 4 to 5 intermittent heat cycles to “set” the coating prior to putting the vehicle into service. An incremental increase in run duration and throttle 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!

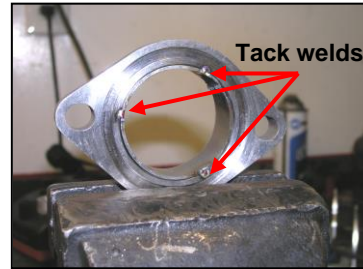
INSTALLATION PROCEDURE

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 four 10mm x 1.5 bolts (not included) 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.



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. Welding of these flanges to any connected pipes should only be performed with either an austenitic grade stainless steel filler metal (308L for welding to 409 or 304 stainless materials, and 309L for welding to mild/low-carbon steel materials) or nickel based filler rod, such as Inconel FM 82™ or Hastelloy W™. The use of low-carbon steel fillers, such as ER70S-2 and ER70S-6 is not suitable for this application.
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.



15. Install the finished welded parts into the vehicle for the final time and fully tighten all fasteners. For an OE appearance, stock GM studs and nuts can be used at the manifold/flange connections; their part numbers are provided at the bottom of this page.
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)
Exhaust manifold outlet seal	- 92202326 (2 required)
Exhaust manifold outlet studs (10mm x 1.5)	- 11589264 (4 required)
Exhaust manifold stud nuts (10mm x 1.5)	- 15032594 (4 required)

Hooker Technical Support
1-866-464-6553



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).

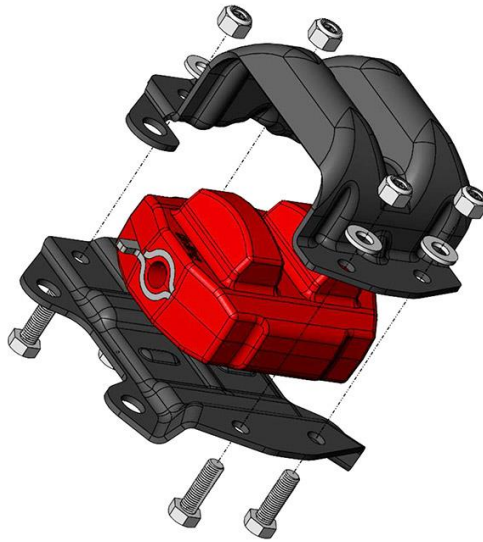


Figure 1

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**.

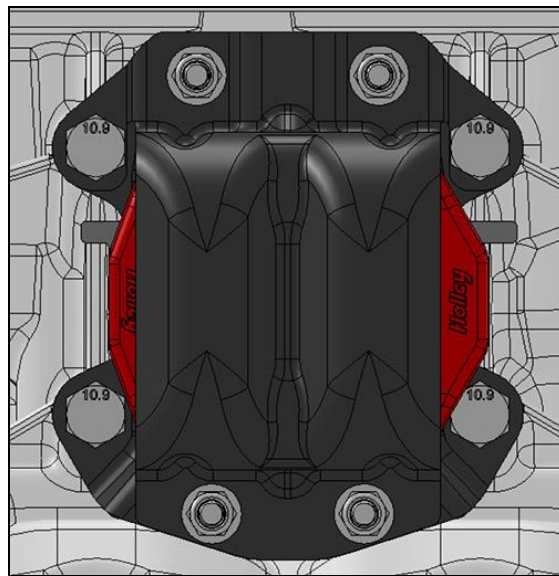


Figure 2

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

LIMITATION OF LIABILITY – DISCLAIMER:

HOLLEY/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.

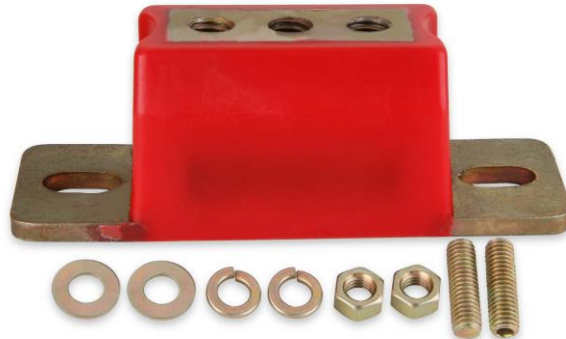
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199R11359

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 accommodated 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.

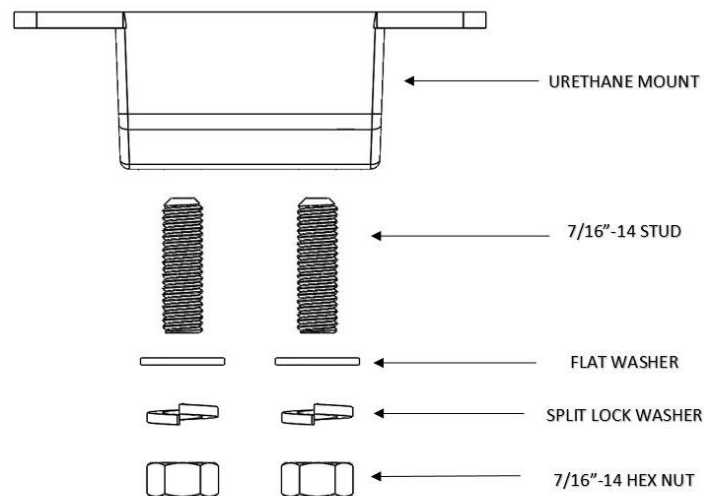


Figure 1

LIMITATION OF LIABILITY – 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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199R11754

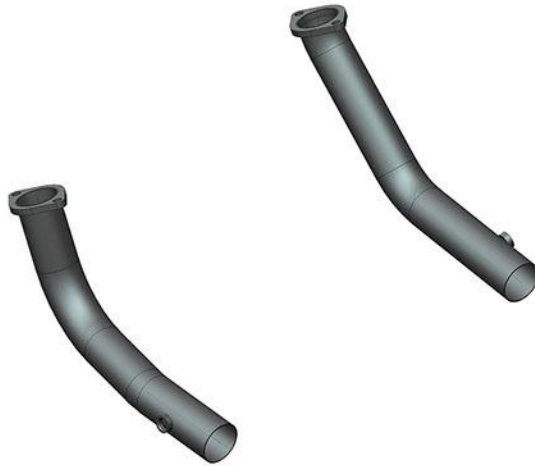
Date: 1-24-19



1975-1987 GM C10 TRUCK EXHAUST ADAPTER KIT

P/N BH13257

Installation Instructions



BH13257

Thank you for choosing to use HOOKER™ exhaust components as part of your C10 truck LS swap project. These components are part of the most comprehensively engineered collection of LS swap 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. These adapters were designed to connect Hooker LS engine cast iron exhaust manifolds to the Hooker 2.5" exhaust systems for the same application, but can also be used with these same manifolds as the basis from which to build a custom exhaust system built to your own specifications.

PRE-INSTALLATION CONSIDERATIONS:

Check that the hardware package includes the following:

Qty	Description
4	Flange bolts
2	Flange gaskets

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

NOTE: The tube routing of these adapters were designed specifically for bolt-in compatibility with the Hooker **12646HKR** C10 truck LS swap transmission crossmember; compatibility with any other type or brand of crossmember is not implied or guaranteed.

NOTE: These adapters are geometrically compatible for fitment with ANY GM automatic transmission or Tremec manual transmission.

The instructions contained in this document assume you have already installed related or Hooker cast iron LS manifolds on an LS engine/transmission assembly that has been mounted in your vehicle using the Hooker **12621HKR** engine bracket kit and **12646HKR** transmission crossmember.

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. Attach the adapter tubes to the installed left and right side Hooker LS cast iron manifolds using the included bolts and gaskets. The proper left/right orientation of the adapters is achieved by ensuring they are installed so that the O2 sensor bungs are pointing to the outside of the vehicle and not inward towards the transmission. Reverse their orientation, if needed.
2. Continue with the installation of the Hooker exhaust system per the instructions included in its packaging.

LIMITATION OF LIABILITY – DISCLAIMER:

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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.

THE FOREGOING STATEMENT LIMITS THE LIABILITY OF THE MANUFACTURER.

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

Technical Service: 1-866-464-6553

Phone: 1-270-781-9741

For online help, please refer to the Tech Service section of our website: www.holley.com

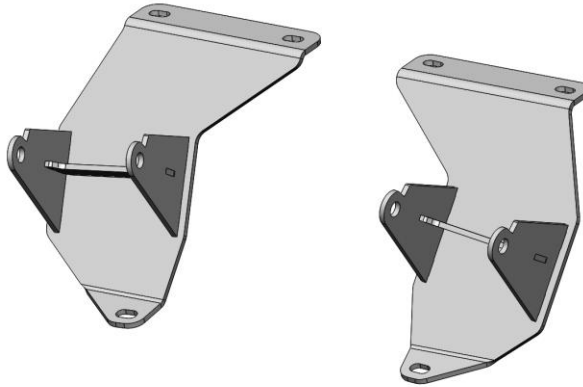
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199R12125

Date: 8-3-20



1973-1987 GM C10 LS/LT Swap Engine Mounting Brackets BHS540 Installation Instructions



Thank you for choosing to use HOOKER™ 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:

Installation of these brackets requires the use of new stock OE 4th-gen F-body LS engine mounts (ex: GM 22179268 or Anchor 3064) or aftermarket polyurethane inserts (Hooker Blackheart LS/LT Polyurethane Inserts – P/N's 71221016HKR (Black) or 71221017HKR (Red) along with Hooker 71221018HKR LS heavy duty clamshells or 71221019HKR LT heavy duty clamshells.

In addition, a pair of metric motor mount through-bolts and a pair of locking flange nuts will need to be sourced for connecting the Hooker engine brackets to the motor mounts. Specification requirements are 10.9 M12 x 1.75 x 140mm or Hooker Blackheart 71223015HKR engine mount bolt kit.

COMPATIBILITY INFORMATION:

These LS/LT swap brackets have only been tested on 2-wheel drive applications.

This engine swap mounting bracket kit requires the use of a Holley® **302-1**, **302-2**, and **302-3** oil pan for installation and provides engine compatibility with Holley accessory drive system equivalent in all spacings.

More LS and LT 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.

BEFORE BEGINNING:

Check that the hardware package includes the following:

Qty.	Description
6	3/8 x 16 x 1 Bolts
6	3/8 x 16 Nuts

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

INSTALLATION:

1. Remove the factory engine mounts from the frame and clean the bracket mounting surfaces.
2. Attach the Hooker engine mounting brackets to the frame (**Figure 1**) using the supplied 3/8" hardware, leave the hardware loose at this time.

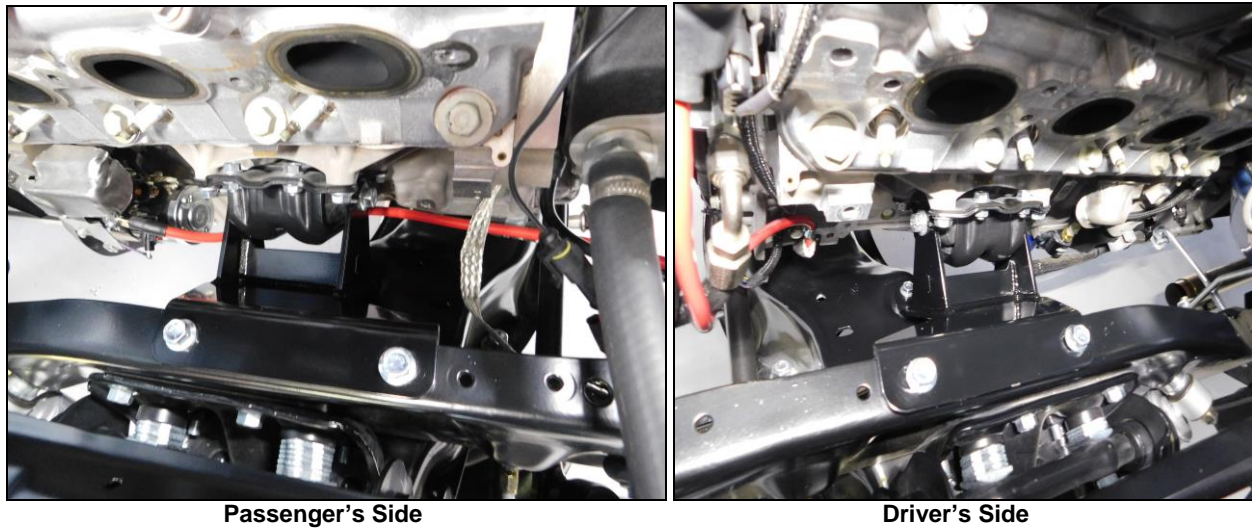


Figure 1

3. Install new OE rubber or aftermarket polyurethane mounts on the LS or LT engine to be installed.
4. Install the engine/transmission assembly onto the Hooker engine brackets and couple the engine mounts to the engine brackets using the Hooker Blackheart 71223015HKR engine mount bolt kit or user-sourced metric cap screws and flanged locking nuts.
5. Once the engine is sitting in the engine bay as it should, use a wrench to tighten the (x6) mounting bolts and through bolt.
6. Raise the rear of the transmission as high as it will go and install the Hooker LS/LT swap transmission crossmember per the instructions included with its packaging.
7. Your LS swap engine and transmission are now mounted and ready to be outfitted with headers and an exhaust system. Hooker Blackheart LS/LT 1973-87 C10 swap headers and dual exhaust systems are specifically designed for use with these engine mounting brackets.

LIMITATION OF LIABILITY – DISCLAIMER:

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**GM 1973-1987 C10/15 2wd, 1979-87 C20 Crossmember
1973-1982 K5 Blazer 2WD LS/LT Swap
Installation Instructions
BHS548, BHS549, & BHS550**



Thank you for choosing to use this Hooker™ transmission crossmember as part of your LS/LT 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.

COMPATIBILITY INFORMATION:

- This transmission crossmember was specifically designed for bolt-in compatibility with the HOOKER™ LS/LT swap engine mounting bracket kit, cast iron LS or LT exhaust manifolds, headers, and exhaust systems also developed for this application. Various other Holley® 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 for compatibility with the Holley® 302-1, 302-2, and Holley 302-3 LS oil pans and Holley 302-20 LT oil pans.
- Hooker™ LS swap manifolds, LT swap manifolds, and long tube headers are compatible when installed using this Hooker LS/LT engine swap transmission crossmember and the related Hooker BHS540 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.
- More LS/LT 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.
- Hooker recommends using a Hooker 71223029HKR, 71223030HKR, or Anchor 2268 transmission mount.
- Designed for use with GM T56 Magnum, 4L80, or 4L60 transmissions
- If drilling is required, simply attach the center crossmember to the transmission and lower to slightly below frame rails, at this point you can attach the frame rail feet to the center crossmember for marking holes on the bottom of the frame.
- It is recommended to install new body bushings before installing the new larger case transmissions.

BEFORE STARTING:

Your vehicle must be raised a minimum of 36 inches. A floor hoist is ideal. If no hoist is available, we strongly urge the use of axle stands as a safety measure. Please read these instructions in their entirety before attempting installation.

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.

NOTE: These instructions have been written with the assumption that you have already installed a LS or LT engine into your vehicle using the Hooker BHS540 engine swap bracket kit. Satisfactory engine and transmission installation with any other type or brand of engine mounts is not intended with this crossmember.

INCLUDED HARDWARE:

Qty.	Description
1	Center Crossmember
1	Left Side Mounting Bracket
1	Right Side Mounting Bracket

Qty.	Description
4	1/2" Bolts and Nuts
4	3/8" Bolts and Nuts

Depending on which crossmember you order, there may be a supplied spacer for your specific transmission. Figure 1 shows a sample stack up of the spacer and transmission mount. Information below

BHS550 - T56	No spacer required – frame feet will mount with the long angle of the plate facing rearward.
BHS549 - 4L80	Uses supplied 1" spacer – frame feet will mount with the long angle of the plate facing forward.
BHS548 - 4L60E	Uses supplied 11/16" spacer – frame feet will mount with the long angle of the plate facing rearward.

Check the hardware package. If anything is missing, please contact Technical Service at 1-866-464-6553 or 270-781-9741.

INSTALLATION:

1. Raise the tailshaft of the transmission to its maximum height near the vehicle floor for installation.
2. Attach the two frame plates to the frame rails using the supplied 1/2" bolts and nuts according to the chart above and hand tighten. If your frame doesn't have 2-1/2" attachment holes on each side, drilling will be required once your crossmember is mocked up in position.
3. Install the center crossmember on top of the frame plates and attach using the supplied 3/8" hardware.
4. Depending on the transmission used now is the time to install the spacer on top of the crossmember under the transmission mount.
5. Slowly lower the transmission down to the spacer or crossmember, once close install the user supplied transmission mounting bolts loosely.
6. After all hardware is installed lower transmission down on the crossmember and inspect.
7. Tighten all hardware using hand tools for completion of installation.



Figure 1

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Date: 7-29-20