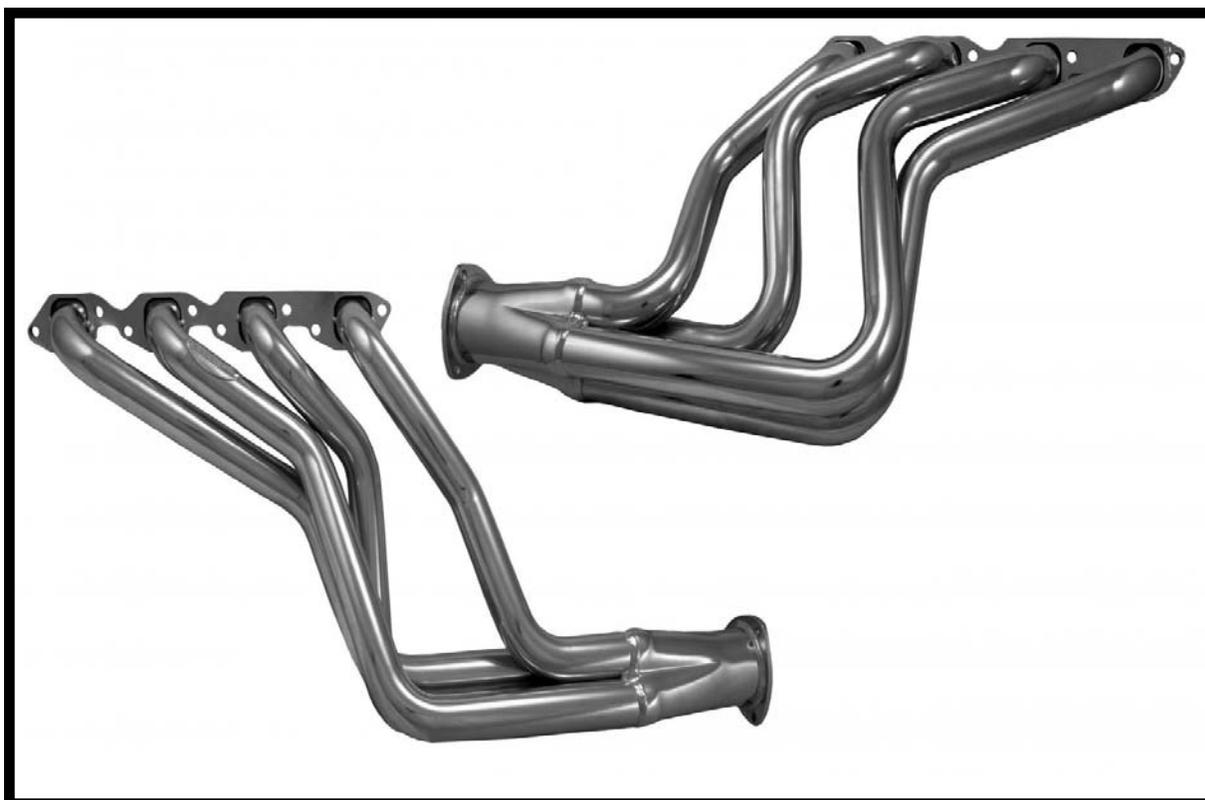


CHEVROLET 396, 402, 427, 454, 502  
67-74 CAMARO, 68-74 NOVA,  
68-74 BEL-AIR, 65-72 CHEVELLE,  
65-72 EL CAMINO



## PARTS INCLUDED

|    |                       |   |
|----|-----------------------|---|
| 1) | Right side header     | 1 |
| 2) | Left side header      | 1 |
| 3) | 3" x 2-1/2" reducers  | 2 |
| 4) | 1-1/2" hot air pickup | 1 |
| 5) | 3" collector gaskets  | 2 |
| 6) | Header gaskets        | 2 |

**THY-313 / THY-313-S**

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67-74 CAMARO, 68-74 NOVA,  
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**HARDWARE INCLUDED**

|    |                                 |    |
|----|---------------------------------|----|
| 1) | 3/8"-16 x 1" Header bolts       | 16 |
| 2) | 3/8"-16 x 1-1/4" Hex head bolts | 6  |
| 3) | 3/8"-16 Hex nuts                | 6  |
| 4) | 3/8" Flat washers               | 6  |

**TOOLS REQUIRED**

|    |   |     |  |
|----|---|-----|--|
| 1) | 3/8"-drive sockets - 5/16" through 13/16"   | 9)  | Appropriate jacks/jackstands/ramps                   |
| 2) | Ratchet and extensions                      | 10) | Engine hoist   |
| 3) | Torque wrench                               | 11) | Engine oil collection system                         |
| 4) | Slotted and phillips screwdrivers           | 12) | Replacement oil filter and oil                       |
| 5) | Gasket scraper/remover                      | 13) | Welding and cutting equipment as required            |
| 6) | Combination wrenches - 5/16" through 13/16" | 14) | Replacement engine mounts as required/desired        |
| 7) | Battery clamp puller                        | 15) | Starter wire wrap and starter heat shield as desired |
| 8) | Flare nut wrenches - 3/8" through 11/16"    |     |  |

**WARRANTY NOTES**

- 1) The utmost care is taken at Thorley Headers to maintain the highest standards of quality. However, Thorley Headers cannot control the installation of the product. For this reason, the Thorley Headers warranty covers only the replacement of the components - not the labor for the installation.
- 2) The use of any type of "header wrapping" voids the warranty. Using any sort of wrapping material on the headers destroys the tubing's ability to dissipate heat, causing very rapid deterioration of the metal and the subsequent failure of the headers.
- 3) The chrome plating applied to all Thorley headers is a high-nickel chrome finish applied to retard corrosion. This is a "heat" chrome to preserve the metal. This finish is not "show chrome" intended for the sake of appearance. This high-nickel chrome turns colors and approaches black as it cooks into the metal. The brilliance of the chrome finish is not covered under the warranty. Contamination of the surface by foreign substances may produce other color patterns. This can be prevented by routine cleaning.

## THY-313 / THY-313-S

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### WARRANTY NOTES

- 4) Retain all paperwork pertaining to the purchase of your Thorley product. Save your receipt!  
**Your limited warranty is not valid without a receipt of purchase.**

### LEGALITY NOTE

The installation of headers onto any vehicle must be performed in accordance with all governmental regulations that might pertain to the particular vehicle receiving the headers. Please call your Thorley Headers distributor if there are any questions regarding the legality of the installation. This part number is considered a legal replacement part on vehicles that do not have a catalytic converter, as long as all original emission control devices are connected and functioning properly. As a result, **this part number does not require an Executive Order (“E.O.”) number.**

### INSTALLATION NOTES

- 1) It is important that you read the entire instruction sheet before initiating any installation.
- 2) Thorley headers are designed to fit only factory installed engine and transmission combinations. We cannot guarantee that Thorley headers will fit in the case of “engine swaps” or “transmission swaps”.
- 3) Due to restricted room in the engine compartment, your headers may come close to certain body and chassis components. This is normal for an installation of this type. However, a careful inspection must be completed to insure that the distances and placement are reasonable and logical, especially with regard to electrical, fuel, and brake components.
- 4) Because of the requirement to raise the engine to facilitate header installation, the engine mounts should be carefully inspected at that point of the installation. It is highly recommended that questionable or deteriorated engine mounts be replaced during the installation of the headers. In some cases, the engine mounts need to be loosened and repositioned to provide optimum header clearance from some components.
- 5) Because of car-to-car variations, Thorley Headers strongly recommends that these headers be installed by a competent exhaust shop that has welding and fabrication capabilities.

## THY-313 / THY-313-S

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67-74 CAMARO, 68-74 NOVA,  
68-74 BEL-AIR, 65-72 CHEVELLE,  
65-72 EL CAMINO

### INSTALLATION PROCEDURES

**WARNING!** - Do not rely on bumper jacks or chassis jacks for support during header installation. The subject vehicle should be raised and supported with jacking equipment and jackstands or ramps intended for undercarriage auto maintenance. It is extremely dangerous to work under an improperly raised and/or supported vehicle.

**WARNING!** - Make certain there is ample clearance around components such as brake lines, brake proportioning valves, fuel lines, hoses and pumps, and electrical components and wires. In some cases it may be necessary to relocate items that may be adversely affected by exhaust system heat.

**NOTE:** These procedures are documented on factory standard-equipped vehicles with original configuration compliance. Any modification of the subject vehicle may dictate modification to these procedures.

**NOTE:** All Thorley headers featuring air injection options are designed to accept the most readily available original equipment manufacturer's looms. Should your stock looms not match the fittings on the headers, or should you suspect that your original looms will not survive the re-installation onto the Thorley headers, your local GM parts department may be able to provide replacements using these part numbers: driver side - 333827, passenger side - 357106.

- 1) Assemble all tools, equipment, and parts necessary to facilitate installation prior to disabling the subject vehicle.
- 2) Disconnect the battery cable to avoid damage to the electrical system. If the subject vehicle has air conditioning, consider removing the battery to allow the air conditioning compressor to be set in the battery tray. If doing so, remove the ground terminal first to reduce the risk of electric shock.
- 3) Remove the spark plug wires and spark plugs. Because the engine may be raised to facilitate installation of the headers, consider removing the distributor cap from the distributor. If this is done, it is recommended that the distributor be covered to prevent contamination.
- 4) Remove the alternator wiring and alternator. Note that the B2 lead will be hot if the battery has not been disconnected or removed.

## THY-313 / THY-313-S

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67-74 CAMARO, 68-74 NOVA,  
68-74 BEL-AIR, 65-72 CHEVELLE,  
65-72 EL CAMINO

- 5) Consider the removal of the power steering pump. If this is done, caution must be exercised to prevent fluid leakage and damage to the flare nuts. Protect the open lines and ports from contamination as appropriate.
- 6) If the vehicle has a manual transmission, remove the clutch linkage.
- 7) Starting at the outer bolts and alternating from front to back, loosen but do not remove all the bolts on the existing exhaust manifolds. Once all bolts are loosened, remove all but one bolt at each end of the exhaust manifolds.
- 8) Remove the oil dipstick and dipstick tube.
- 9) Remove the bolts attaching the fan shroud to the radiator or core support wall. Slide the fan shroud toward the rear of the vehicle, over the fan. This will allow the engine to be raised two-to-four inches without extensive component removal.
- 10) Raise the vehicle at least ten inches using proper equipment. (**WARNING!** - Do not rely on bumper jacks or chassis jacks for support during header installation. The subject vehicle should be raised and supported with jacking equipment and jackstands or ramps intended for undercarriage auto maintenance. It is extremely dangerous to work under an improperly raised and/or supported vehicle.)
- 11) From underneath the vehicle, detach the head pipes or exhaust pipes from the existing exhaust manifold.
- 12) Remove the existing head pipes or exhaust pipes from the vehicle.
- 13) Remove the oil filter.
- 14) On a manual transmission vehicle, remove the undercarriage portion of the clutch linkage.
- 15) Remove in sequence the electrical cables attached to the starter, the starter support bracket, and the starter retaining bolts. (Note: Removing the torque converter dustpan on automatic transmission vehicles, or the clutch dustpan on manual transmission vehicles, may ease removal of the starter.) Starter wire wrap and a starter heat shield are available from your Thorley Headers distributor to prevent starter failure caused by exhaust heat.

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67-74 CAMARO, 68-74 NOVA,  
68-74 BEL-AIR, 65-72 CHEVELLE,  
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- 16) If the engine/transmission assembly must be raised to install the headers, loosen but do not remove the two bolts from the rear engine mount, allowing the engine/transmission assembly to pivot on the rear engine mount and crossmember. Do not loosen or remove any bolts from the crossmember support to the chassis. Remove the nuts from mount through bolts on the forward left and right engine mounts.
- 17) If required, raise the engine/transmission assembly two-to-four inches from the front using the engine hoist. As the engine/transmission assembly is raised and weight is relieved from the forward left and right engine mounts, remove the engine mount through bolts. (**WARNING:** Raising the engine may shift the weight and balance of the vehicle. No one should be under the vehicle while it is being lifted.)
- 18) Remove the remaining bolts from the existing exhaust manifolds and remove the manifolds.
- 19) Thoroughly clean the mating surfaces of the heads and headers, ensuring that all traces of carbon deposits are removed from the cylinder head exhaust port surfaces.
- 20) If new engine mounts are to be installed, do so at this time.
- 21) Using the supplied header bolts and header gaskets, install the new headers from beneath the vehicle. (One person supporting the header from underneath while another attaches the headers to the heads is suggested.) Do not fully tighten at this time.
- 22) If the engine has been raised, visually ensure that there is adequate clearance and slowly lower the engine/transmission assembly into position. Re-install the engine mount through bolts in the forward engine mounts. Re-attach the nuts and tighten them to the manufacturer's specified torque values.
- 23) Re-install the starter, starter support bracket, starter wiring, and starter wire wrap and heat shield (if applicable). Tighten all hardware to the manufacturer's specified torque values.
- 24) Install the new oil filter.
- 25) On a manual transmission vehicle, re-install the undercarriage portion of the clutch linkage.

## THY-313 / THY-313-S

CHEVROLET 396, 402, 427, 454, 502  
67-74 CAMARO, 68-74 NOVA,  
68-74 BEL-AIR, 65-72 CHEVELLE,  
65-72 EL CAMINO

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- 26) Re-install the dustpan if applicable.
- 27) Adapt head pipes or exhaust pipes to the supplied reducers and weld in place.
- 28) Lower the vehicle.
- 29) Torque the header flange bolts to 20-25 ft/lbs, tightening incrementally from the center of the flange to the ends.
- 30) Transfer the original A.I.R. looms or install new ones if desired. (313-S)
- 31) Re-install all remaining components to the top side of the engine. Reconnect or re-install the battery.
- 32) It is recommended that the headers be cleaned at this time to prevent any discoloration caused by skin oils, petroleum products, soil, grime, etc. These contaminants may cause unsightly yellow spots or other non-uniform coloring as the chrome "blues" from exposure to exhaust heat.
- 33) Start the engine and check for exhaust leakage. If a leak is detected, shut the engine off immediately and resolve the problem.
- 34) It is critical that all bolts be retightened after approximately twenty minutes of engine operation to prevent possible gasket failure and associated leaks.
- 35) Because the header bolts will initially stretch when hot, we recommend adhering to the following steps:
  - a) Retighten the header bolts to 20-25 ft/lbs after approximately 20 minutes of operation. (Note: Remember the engine will be hot at this time. Protect yourself accordingly.)
  - b) Check and retighten the header bolts to 20-25 ft/lbs after the first month of operation.