



# WARHAWK LS7X ENGINE BLOCK

## Aluminum LS Series Chevrolet Specifications and Instructions

Technical Data and Specifications for block part numbers:

Part #	Bore Size	Main Housing Bore	Deck Height	Stage of Readiness
086505	3.990	2.750	9.240	Needs finish machine work to complete
086515	4.115	2.750	9.240	Needs finish machine work to complete
086525	4.115	2.750	9.800	Needs finish machine work to complete
086505 - 4000	4.000	2.750	9.240	Prepped Block
086505 - 4030	4.030	2.750	9.240	Prepped Block
086515 - 4125	4.125	2.750	9.240	Prepped Block
086515 - 4155	4.155	2.750	9.240	Prepped Block
086525 - 4125	4.125	2.750	9.800	Prepped Block
086525 - 4155	4.155	2.750	9.800	Prepped Block

**Additional Required Parts:**

- 832800 - Camshaft retainer plate
- 832820 - Rear seal cover
- 832821 - Rear seal cover gasket
- Z216-85950 - Rear main seal
- Z216-85951 - Rear seal cover gasket
- 061075 - Valley cover plate

**Required Part Kits:**

- Includes: seal plate, gasket, cam plate, valley plate, stud kits, rear main seal
- 832875 - 9.240 Deck-4 stud per cylinder kit
- 832876 - 9.240 Deck-6 stud per cylinder kits
- 832877 - 9.800 Deck-4 stud per cylinder kit
- 832878 - 9.800 Deck-6 stud per cylinder kits

**Block Applications:** The Warhawk blocks are designed to be a replacement block for Chevrolet / Pontiac LS1, LS2, LS6, LS7 and C5R applications.

**Block Material:** 357-T6 High Density Aluminum

**Deck Height:** 9.240, 9.800 (depending on part number)

**Deck Thickness:** .600, 9.24 or 9.800 decks

**Reluctor Wheel:** All Warhawk short block assemblies, kits, rotating kits and complete engines use the 24 tooth reluctor. 58 tooth is optional.

**Cam Bearings:** Dura Bond # CH23

**Main Bearings:** Clevite #MS 2199H or HX

**Rear Main Seal:** Fed Mogul # BS 40640

**Main Caps:** Billet steel, 4 bolt with cross bolts. Torque values: main studs, 75 lb-ft w/ oil, crossbolts, 20 lb-ft

**Lifter Bores:** .844 diameter. The OE plastic lifter retainers cannot be used. **USE AFTERMARKET LIFTERS ONLY.** Lifter must have spacer between the body and the tie bar if you are using the six-bolt attachment.

**Maximum Bore:** 4.155 with .0625 sleeve thickness

**Cylinder Bores:** 4.00 or 4.125

**Cylinder Wall Thickness:** At least .280 of material including sleeve thickness.

**Head Gaskets:** Fel Pro # 1185. Special for 4 and 6-bolt head. MLS .053 compressed.

**Water Jackets:** Expanded

**Lubrication:** Priority main oiling. Please refer to information on oil restrictors on back page. We recommend oils designated SM/SL/SJ, 15W-40 or 20W-50.

**Oil System Features:** Dry sump capable. Oil pressure can be drawn from rear of block, at the top of the bellhousing.

**Oil Pan Gasket:** Fed Mogul # OS30693R

**Timing Cover Gasket:** Fed Mogul #TCS45993

**Filtration:** Stock-style filter

**Camshaft:** Stock location. Can be machined to accept 60mm bearings.

**Camshaft Housing Bores:** #1 & 5 2.347; #2 & 4 2.329; #3: 2.3095;

**Motor Mounts:** Stock late model or retro SBC back to 1958. A spacer washer must be used for the retro motor mounts.

**Cylinder Head Stud Holes:** 7/16 - 14 UNC Torque values: 75 lb-ft w/oil. Mandatory ARP stud kits contain one short stud which is to be located at the 11 O'clock position of # 1 cylinder. LS7X heads require the tightening sequence as illustrated with the following additional torque values: Stud #'s 5, 6, 13, 14 torque to 55 lb-ft. Bolt #'s 19 - 23 torque to 25 lb-ft.

**DEFINITIONS AND DIMENSIONS:**

**Bare Block**

Due to a vast difference of opinion among professional builders regarding specifications and procedures, all blocks when purchased bare, are finished within GM +/- tolerances. Warhawk blocks are supplied with the following specs.

**Block Weights:** 9.24 Deck: 133Lbs (Caps and sleeves)

**Deck Height:** 9.240 or 9.800

**Cylinder Bore:** 3.990 or 4.115

**Main Bearing Housing Bore:** 2.750

**Lifter bores:** .8440

**Stroke Notch:** 4.250. Minor clearance needed for 4.500 steel rods.

**Prepped Block**

WARHAWK blocks when purchased prepped, will be sized to the above specs with the following exceptions: Cylinder Bores: 4.000 or 4.125. All prepped blocks

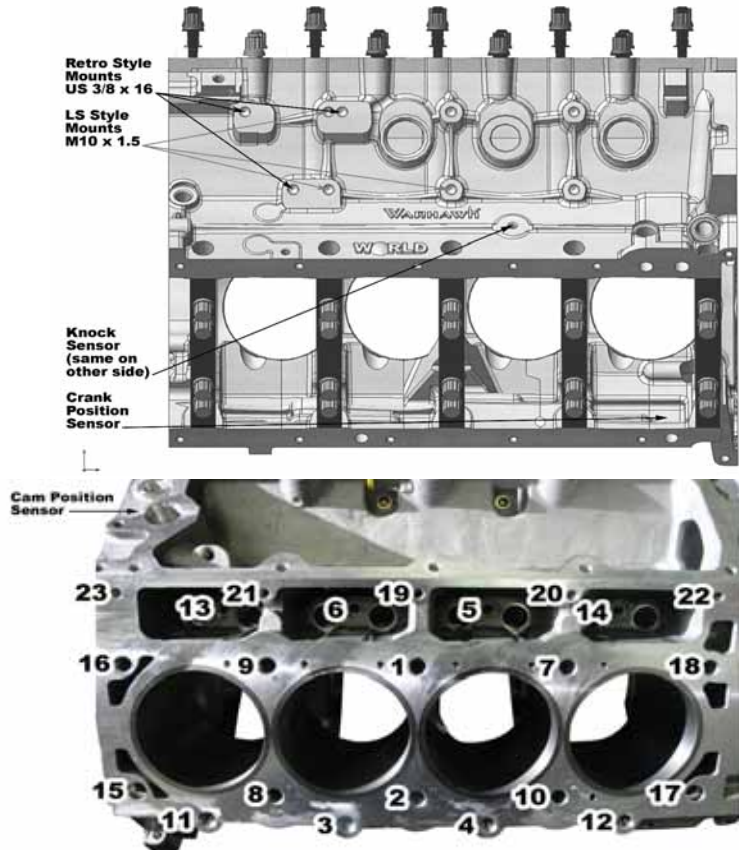
will have dowel pins, ring dowels, freeze plugs, cam bearings and oil gallery plugs installed. The block will just need a final cleaning and be ready for assembly.

**Before Final Assembly:**

1. Before any machine or assembly begins, thoroughly inspect the block for any defects. Remember you are the final inspector. Once machine work has begun, the block is **NON-RETURNABLE**.
2. Due to the nature of aluminum blocks with ductile iron sleeves we highly recommend that the sleeves be pressed down to ensure that they are bottomed in the block prior to decking. You may find that after decking and cleaning the block that the sleeves may rise .001" to .002" above the deck. You can proceed with assembly as this will not affect the operation of the block. This condition will be corrected by the torquing of the cylinder heads.
3. Make sure block is free of debris. Clean block thoroughly.
4. Lifter bores are machined to the factory spec of .844. Lifter diameters vary by manufacturer. Slight honing of the lifter bores may be needed for proper lifter to lifter bore clearance.
5. Long rod and stroker applications need to be dry assembled and checked for connecting rod to block interference. Grinding of the oil pan rail may be necessary. Clearance needs to be kept at a .050 minimum
6. WARHAWK blocks come with a deck height of 9.240 (standard deck) or a 9.800 deck height (tall deck). If a lower deck height is desired, **PLEASE** measure the deck before any cutting is done.

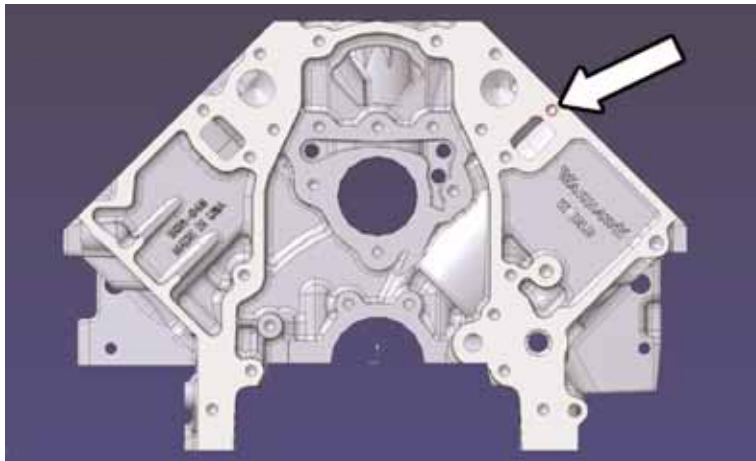
**Dual Engine Mounts:**

The Warhawk block is drilled for two different style engine mounts. The retro mounts will fit all GM SBC compatible chassis to 1958. The bolt holes are tapped US 3/8 x 16. The LS mounts are tapped M10 x 1.5. **SENSOR POSITIONS** also shown here.



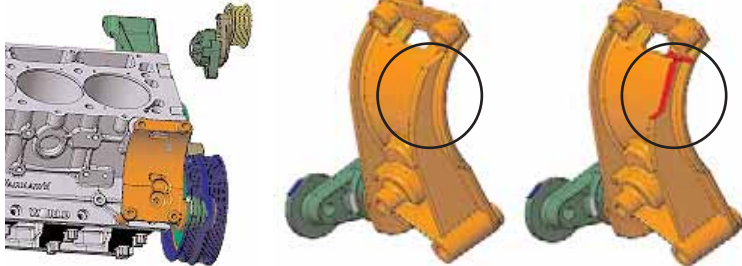
**Water Pump Bolt Sealant:**

The bolt hole pictured runs into the water jacket on the driver's side of the block. Teflon thread sealant **MUST** be used on this bolt.



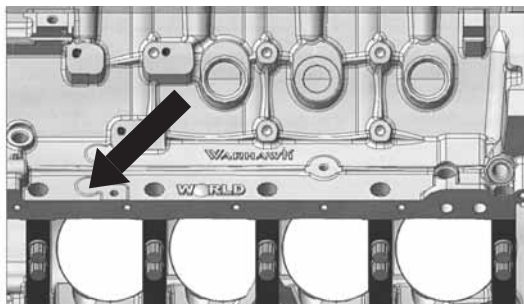
**Accessory Bracket:**

An OEM accessory bracket will need to be modified as shown to fit Warhawk into an LS chassis. If this bracket is used in a retro mount chassis it will have to be modified as needed.



Due to block design differences, some of the bolt holes in WARHAWK may not be drilled and tapped deep enough to allow factory fasteners to completely seat against their heads. It is advisable before final assembly to verify whether the OE fasteners may need alteration.

The tapped hole adjacent to the motor mount pad on the driver's side of block will need to have sealant applied and a bolt installed if it is unused in your application.



**Warhawk Sleeve Installation:**

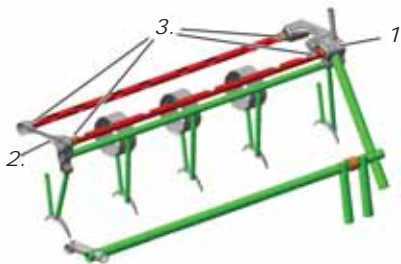
The sleeves in the Warhawk block are pressed into the block with a .0015" interference fit and are retained by a step in the bore at the TOP of the block, NOT the bottom. An O-ring completes the oil seal.



**Front Cam Cover Modification for Jesel Belt Drive**  
When using the Jesel # KBD-31630 Belt Drive, the front cam cover must be trimmed in the indicated areas.

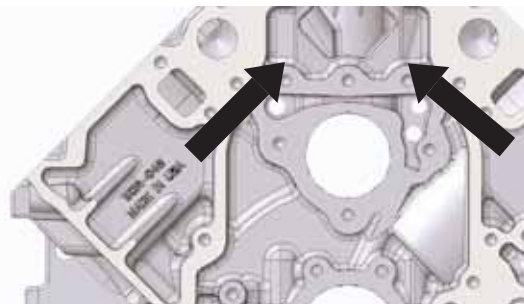
**Oil Restrictors**

A priority main oiling system is employed that directs oil to an oil reservoir located at the rear of the block. This reservoir (1) feeds the rod and main bearings first, thru their own designated oil galley, then upward to the two oil galleys that feed the lifters. These three oil galleys travel forward to another oil reservoir (2) located at the front of the block. These two reservoirs provide a perfect location to insert four restrictor plugs (.050 to .075 recommended) (3) to decrease the oil to the top end, and have no effect on the delivery of oil to the crankshaft. **The restrictor is a standard 1/4" NPT pipe plug which can be purchased from any hardware store. You must drill the appropriate size diameter hole for the application.** Due to the extremely efficient and advanced design of the oiling system of the WARHAWK block, we use on our own engine builds a STANDARD VOLUME PUMP and a .150" oil restrictor in all 4 locations.



**IMPORTANT NOTICE:** Due to crank flange design, sealant must be applied to threads of flywheel bolts or oil leaks will develop. The bolt holes in the crank flange are open to the crankcase.

On the camshaft retainer plate, the upper right and left button head cap screws cause interference when a double roller timing chain is used. Therefore flat heads instead of button heads must be used and the retainer plate must then be countersunk in these two positions.



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