



## TA PERFORMANCE 455 ALUMINUM BLOCK INSTRUCTIONS

---

Your Serial Number

*Keep this serial number with your records*

**This sheet contains important information about your new TA Performance Aluminum Cylinder Block. Keep for future reference.**

### **OVERVIEW**

This cylinder block is based on the Buick 455 production block, utilizing important features while incorporating modern design and feature improvements. The intent was to make this block as universal as possible to accommodate most stock and aftermarket parts and accessories. This block is designed to be used for street/strip and full race combinations, as well as a replacement block for stock applications. Serial numbers are stamped on the front side of the starter mounting pad and on the front of the block along the top edge of the timing cover (underneath the Tomahawk logo). Blocks can be identified by their serial numbers; the first three digits represents the block number, and the last 4 digits represent the production date.

### **BLOCK PREP**

This is a brand new cylinder block. Unlike rebuilding a used cylinder block, there will be additional tasks to be performed as well as a very thorough inspection of the entire block. The block is fully machined in regards to the manufacturing process, but machining operations related to engine building are still required. TA Performance quality inspects each block prior shipment to ensure that there are no casting or manufacturing defects, but it is still required that the engine builder inspect each block before proceeding. We have outlined many of the areas that need to be addressed below:

- Main line needs to be honed to size for desired bearing clearance.
- Cylinder bores need to be bored/honed to size for pistons being used.
- Lifter bores need to be checked and honed based on the diameter of your lifters. Clearance of .0015" is recommended.
- Block needs to be decked. See "*SEATING THE SLEEVES*" below first.
- Check crankshaft fitment around the mains. On blocks prior to Serial Number 093, when using a stock crankshaft, the block or the crankshaft will need to be clearance on the backside of #4 main.
- Deburr, blend machined areas, and remove casting flashing as required.
- Remove all plugs from the block and THOROUGHLY clean all passages of any debris created by the machining, manufacturing, or preparation process.
- Inspect and clean the all of the plug threads in the block until the plugs will screw in by hand. Look for any steel shot that might have gotten in the threads left over from the manufacturing process. All plugs must install smoothly before tightening. If the plugs don't screw in smoothly, they will gall when tightened, making removal difficult.
- Ensure all coolant passages are clear and will not obstruct coolant circulation.
- Ensure all oil passages are clear and unobstructed.

### **MAIN BEARING CAPS & SADDLES**

The main bearing caps register off of the main studs, not the sides of the block. The portion of the main stud at the parting line acts as a dowel to positively locate the caps. Some caps will require little effort to remove, other will require the use of a slide hammer. Attach the slide hammer to the threaded hole in the center of the cap for cap removal. Inspect the fitment of the bearing tangs to the locations on the main saddle and main caps. Also check bearing shell alignment. We recommend cycling the caps on and off the block, cleaning the aluminum residue from the registration area of the block and cap each time. Do this 2 or 3 times, or until no more aluminum residue is found.

### **SEATING THE SLEEVES**

This block utilizes dry sleeves that are fully supported by the casting. Sleeves can be replaced in the same manners as current production aluminum engine blocks. The cylinder sleeves will need to be seated prior to assembly. Using a torque plate or iron cylinder head, torque to spec with no gasket to seat the sleeves. After the seating process, if the sleeves are above the deck surface .001"-.002", no additional work is necessary. If the sleeves are higher than .002", either deck the sleeves only so that they are .002 above the deck surface, or deck the entire surface. When rebuilding the engine AFTER the initial build, it is recommended to deck the block because the sleeves will settle some during operation and the sleeves may become recessed. Replacement sleeves are available from TA Performance.



## **TA PERFORMANCE 455 ALUMINUM BLOCK INSTRUCTIONS**

---

### **BORE & HONING**

The nominal bore size is 4.340" with 4.300" bores available (for an additional fee); bore and hone to your piston size as required. The largest recommended bore is 4.500". When over-boring, you first need to bore the cylinders, then polish and radius the sharp edge at the bottom of the sleeve. Then you can final hone the bore. Failing to polish and radius the sharp edge could result in **severe** scuffing of the piston skirt.

### **OIL PUMP FEED LINE**

The oil pump feed line from the timing cover is not machined all the way through on the front of the block. This is done intentionally so that people using an external oil pump do not need to plug the hole in the block. The location is spot faced, so if you are going to use the factory oil pump in the timing cover you need finish drilling the hole through using a drill bit ranging from 1/2" to 9/16". You don't have to drill very far, only 1/4"-1/2". If you are going to drill the hole by hand, we recommend starting with a 1/2" drill bit and working your way up to the final size. Drilling it by hand tends to wallow the hole out a bit, so it will be larger than the drill bit you are using. If you have a mill that is large enough to drill the block on (preferred method) you can go straight to a 9/16" drill bit.

### **CAMSHAFT & CAM BEARINGS**

Oil is transferred from the passenger side of the block to the driver side by a passage at the rear of the block. Unlike the original Buick configuration, it is not transferred across the front of the cam journal. Oil is delivered into the cam journals at the 6 o'clock position from the mains. The use of TA's grooved cam bearings is HIGHLY recommended. For cylinder blocks with a 54mm cam tunnel, use cam bearings P/N: TA 1565.

### **CYLINDER HEADS**

All cylinder head bolt bosses are dry, no sealant is required. The block will accommodate all cylinder heads without modification. We do not recommend using stock head bolts, please use TA head bolts & studs for best results. TA Performance carries head bolts & studs for most combinations.

### **OIL PAN & PICKUP TUBE**

To incorporate 4 bolt splayed main caps, the oil pan rail was straightened on the passenger side of the block. All available oil pans will not fit; modification to current oil pans or an aluminum block specific oil pan is required. Use Part # TA 1511TA oil pan & pick up tube kit. The pickup tube location was moved from the mid-back of the block, to the front to make room for the splayed main studs. If using a wet sump oil system, the pick up tube will be different than production ones. Use Part # TA 1511G pick up tube.

### **GASKETS & SEALS**

TA Performance "Orange Crush" head gaskets P/N: TA 1723C are preferred when using a standard size bore. When using Cometic multi-layer steel head gaskets, ensure the cylinder sleeves are no more than .0015" above the deck of the block (if not decked level). A 1/8" thick cork oil pan gasket is available from TA Performance, P/N: TA 1700-455AL. Blocks machined with a 3.0" main require the use of P/N: TA 1515 or TA 1515B (1 piece) rear main seal.

### **TRANSMISSION BOLT PATTERN(S)**

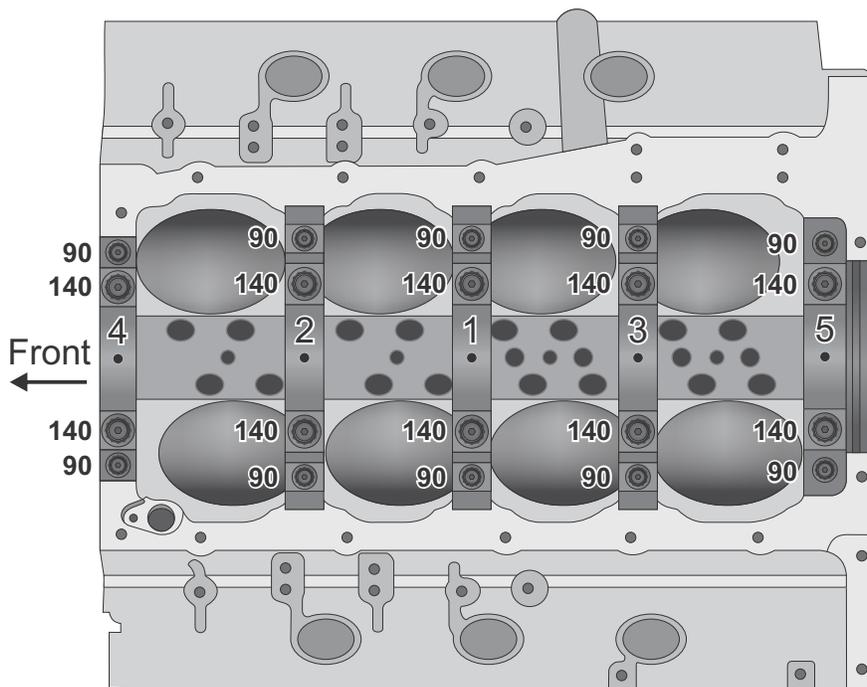
This block incorporates multiple GM transmission bolt patterns. Most popular Chevrolet and Buick-Oldsmobile-Pontiac-Cadillac transmissions should bolt to this block.

### **MATERIAL SPECS & CARE**

This block is made from 356-T6 cast aluminum with ductile iron sleeves and 11L17 billet steel main caps. The block should be stored in a dry environment to protect against corrosion of the aluminum and/or steel components. Aluminum and steel components can be kept oiled or coated in WD-40 to prevent from rusting. When in service we recommend the use of distilled water with the addition of RMI-25 coolant conditioner, available from TA Performance, for the best corrosion protection and cooling. Do not expose the block to an environment that could cause the water in the block to freeze if you are not using a coolant with anti-freeze protection. Drain plugs are incorporated into the water jackets to drain the fluid during storage if desired.



## TA V8 Aluminum Block Main Cap Torque Specs



This block includes ARP fasteners for the main caps. Replacement hardware can be obtained through TA Performance. Follow the recommended torque sequence below to torque the main caps in three increments, working from the inside-out (1-5 in above figure):

- Increment #1: Torque inner bolts to 50 ft/lbs and outer bolts to 50 ft/lbs.
- Increment #2: Torque inner bolts to 100 ft/lbs and outer bolts to 90 ft/lbs (outer bolt max/final torque).
- Increment #3: Torque inner bolts to 140 ft/lbs (inner bolt max/final torque).
- Increment #4: Verify torque outer bolts to 90 ft/lbs.

### MISCELLANEOUS

Recommended Main Bearing Clearance: .025" - .027"

Recommended Rod Bearing Clearance: .025" - .027"