SUPERCHARGERS (BILLET OR CAST?)

Kenne Bell was first to introduce the Twin Screw billet case concept for Mustangs in 1990. To this day, all Kenne Bell superchargers utilize a billet case. We prefer it to the cheaper less durable sand cast finned aluminum case. Our customers love that sophisticated hi-tech billet clean appearance - and it's distinctive sound that only a billet case emits when in boost. So do we. It has a billet ring that is just different from the more muffled sound of the sand cast case. There are lots of theories, opinions, "yours is hotter than mine" etc. Hopefully, the following answers some of the questions you may have.

APPEARANCE

We never really liked the "heat sink" look of cast fins (rings, waffle iron or the rib cage look) on a modern day supercharger case. To us it says "Low cost OEM cast aluminum supercharger." However, we recognize there are some who prefer this look. And we don’t subscribe to rear facing or upside down superchargers covered by the intercooler, intake manifold and shrouds. In our opinion, a supercharger is an impressive and intimidating power adder that should be visible and on top of the engine - where all superchargers belong. At Kenne Bell, our signature is visible, rear inlet - on top of the engine - billet supercharger kits. Who covers up a trick set of wheels? And if rear inlet supercharger kits don’t make more HP, then why did Ford use the design on the Ford GT, Cobra Jet, Shelby GT500, Cobra sand Lightning. Even the COPO Camaro is rear inlet. That aside, let’s discuss some basic engineering as there are some sound reasons, other than appearance, that we’ve standardized on the billet hard anodized case.

CASE MECHANICAL PROPERTIES

The mechanical properties (ultimate tensile, shear and elongation, yield and hardness) of aluminum are always important, but the most crucial consideration is whether the case is foundry cast aluminum or billet extrusion. The Kenne Bell supercharger uses the highest quality 6082 T6 extruded billet aluminum rotors and case which is twice as strong and hard as cast aluminum right out of the dies. And extruded billet is more consistent. There are no surface or internal soft and hard spots and "0" sand pits and loose sand to worry about. Finally, the more consistent extruded material surface is ideal for polishing or hard anodizing. No bead blasting or grinding off casting slag is required. Today, does anyone use cast pistons, rods, rocker arms, cranks, gears, pumps, etc. in racing engines? If cast was really better than billet, the performance world has wasted billions of dollars on all those more expensive billet products we all believed were superior.

“BIG BORE” 4x6 LOBE ROTORS

The structural superiority of the billet case allows us to use larger case bores and the accompanying larger OD 4x6 lobe rotors. Same as big bore engines. The competition uses smaller OD 3x5 lobe rotors that are not as efficient at high RPM and boost. No question about that one.

SUPERCHARGER FINS OR “HEAT SINKS”

“Cooling fins,” as seen on other applications such as heat sinks and air cooled engines, absorb heat which in turn is dissipated by cool air flow from fans or vehicle speed. Unlike air cooled engine cylinder fins, supercharger fins don’t enjoy cool ambient fan air blowing on them. They’re confined to the car’s underhood. But superchargers also need the fins to strengthen the case - a necessary evil. Unfortunately, this added fin mass acts as a heat sink and actually absorbs AND stores more heat from the hot boosted supercharger air and/or heat from the engine block and heads. Even hot underhood air stream. It’s what “heat sinks” do. They COLLECT heat. More fin and case mass means MORE heat absorption. Webster Dictionary: HEAT SINK - “A device for the absorption or dissipation of heat.” Another example are ceramic coated or “wrapped” headers. They trap the 1600° heat in the tubes and ultimately decarbonize and disintegrates the steel.

HARD ANODIZING vs. PAINT & TEFLON

Want a real experience? Put your hand on a Kenne Bell LC after a dyno run. You’ll be surprised how cool it is. Liquid Cooling really WORKS. No, we never paint our manifolds or superchargers. Powder painting a case only helps seal in more of the supercharger heat. Kenne Bell goes through the added expense polishing the entire supercharger case (black and polished) before hard anodizing BOTH the inside and outside case and rotors. This provides extremely hard and durable surfaces that resist abrasion, wear and corrosion. The hard anodizing and rich black color impregnates the aluminum and becomes a part of the polished metal itself. And it doesn’t chip, flake or crack as paint coatings can. The cast case supercharger bores are softer uncoated cast aluminum. The equally "soft" aluminum rotors are Teflon or soft coated to resist corrosion from water, salt water, alcohol, etc. But neither the rotors or case bores provide much protection against abrasives. Again, both the Kenne Bell billet case bores and rotors are hard anodize coated to resist corrosion and abrasion. Powder coating or chrome paints (every manufacturer has their own name for it), are more durable than enamels, seal in more of the supercharger heat and increase heat soaking. Would you want a jacket on in 125° Death Valley summer heat? A supercharger must “breathe” to perform at maximum efficiency. Cooler is always better. That’s why there are those Patented record breaking Liquid Cooled Kenne Bell superchargers.

SUPERCHARGER INLET MANIFOLD DESIGN & HP POTENTIAL (ONE PIECE vs. TWO PIECE CASE)

Any superchargers potential is ALWAYS limited by the inlet system. If the inlet manifold is too small, it becomes the restriction to higher HP. Imagine an engine block and inlet manifold cast as a "one piece" casting that cannot be separated. An integral supercharger - inlet manifold casting is used by the OEM because it costs less to manufacture. Unfortunately, most manifolds cannot be replaced or upgraded for the latest big cfm/HP throttle bodies for additional air flow capacity. Porting, machining, a sheet metal manifold and a larger throttle body are possible, but an expensive compromise, at best. So if it is too small for your HP requirements, you are stuck as both the manifold and supercharger are too small. Kenne Bell billet superchargers and cast inlet manifolds are independent of each other and larger than the competition. They may cost more, but higher cfm manifolds coupled to larger and/or more efficient superchargers means more HP for your dollar up front - and more room to grow.

TVS 2.3L, KB 2.8L

Note the huge replaceable MAMMOTH™ inlet manifold vs. the smaller integral cast TVS manifold. You can’t make big HP with smaller displacement Roots type superchargers and little manifolds. As HP demand rises, the “smaller” supercharger and/or manifold simply lower the efficiency of both.