



## MUFFLER DESIGN



There are as many different theories and designs of mufflers as there are companies making them. The science of muffler design revolves around three major areas: 1) sound, 2) flow, 3) and durability. For the team at Billy Boat Exhaust, we have taken our 25 years of experience, our racing background, and our practical approach to design a product that has a signature tone and provides a lifetime of driving enjoyment.



tube design. This tube design allows for more volume in the muffler tube and also allows for more perforated surface area inside the tube. More volume means better flow and less restriction, while the increased surface area means more perforated material to absorb sound waves. We also use perforated arrows inside the tubes to direct the exhaust flow in a lazy S pattern, helping to increase the efficiency of the absorption side of the muffler.



component to it. We use internal Helmholtz chambers in each muffler, which are dead-end tubes branched off of the main muffler core. The name comes from a device created in the 1850s by **Hermann von Helmholtz**, which he used to identify various **frequencies** and sound waves. As the exhaust flows by these tubes, pressure is reduced and the sound waves reflect back in the opposite direction. We use these internal tubes to reflect and cancel the high pitched sound waves which cause "drone" in the exhaust.



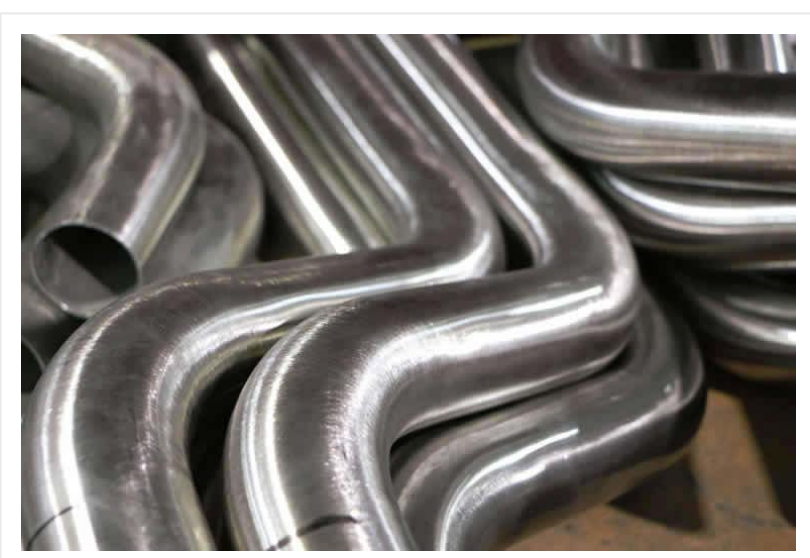
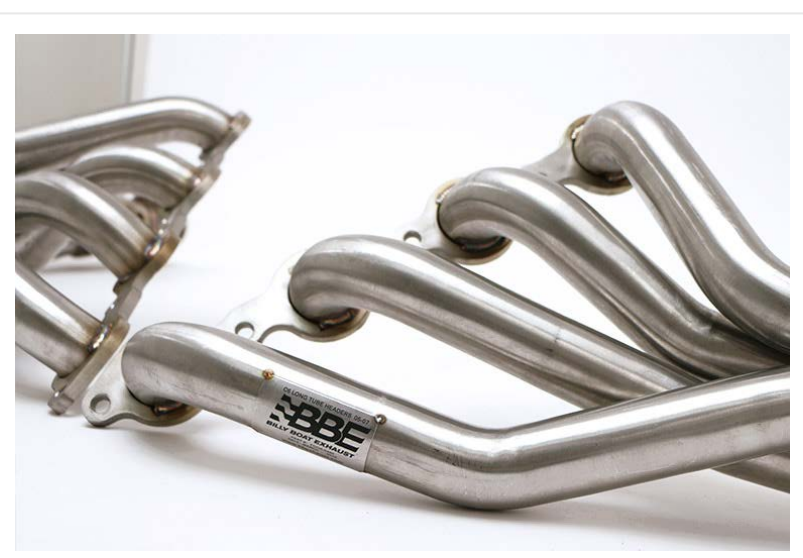
Durability is also an important component of each muffler. We use only 18 or 20 gauge 304 stainless steel for our muffler cases, and the muffler endplates are all 14 gauge 304 stainless steel. Each muffler is hand built according to exact design specifications for each application, and then either hand TIG welded or welded in our robotic welding cell. Our goal at Billy Boat Exhaust is to build the best performing, best sounding and highest quality exhaust systems on the market. Our manufacturing techniques and our signature tone is unique in the industry in order to provide our customers with a "moment of adrenaline and a lifetime of performance."



## MANUFACTURING PROCESS



Each Billy Boat Performance Exhaust system incorporates 3-generations of fabrication skill and racing talent. Every system starts with T-304 stainless steel, known throughout the industry as the highest quality material practical for after-cat exhaust applications. All exhaust tubing is mandrel bent on sophisticated CNC machinery for a precise fit and uninterrupted exhaust flow. What's more, the use of T-304 stainless steel flanges offers high strength and complete resistance to harsh elements. All hangers, resonators, and tips are T-304 stainless steel as well.



## PRT NO-DRONE TECHNOLOGY



The Billy Boat Performance Exhaust PRT after-cat system employs exhaust technology unique to the aftermarket. So unique, in fact, it doesn't use a muffler at all. The Billy Boat Performance Exhaust PRT system is simple in design, though more complex in theory, which suggests that you can have a mellow sound at cruising speeds and a sport note when you're tearing up the streets. It allows true straight through exhaust passage under aggressive driving conditions.



**Construction:** Billy Boat Exhaust mufflers are manufactured from high quality T-304 stainless steel, and are completely TIG welded. By using stainless steel packing with a perforated inner liner and internal baffling, Billy Boat Exhaust mufflers have a robust sound while allowing the highest possible flow. Each muffler features single inlet (1975 to 1989 models) with 3" or 4.5" oval outlets, single or twin outlet design.

**Performance:** Billy Boat Exhaust mufflers drastically decrease exhaust back-pressure, allowing quicker throttle response and increased acceleration. Horsepower increases of 10 to 15 horsepower can be expected over the stock muffler. Most mufflers weigh only thirteen pounds, reducing weight off the rear wheels for improved handling.

**Sound Level:** Touring sound level and a race version is available. The touring muffler provides a deep, robust performance sound, while the race muffler was designed for heavy duty race track use and is not recommended for street use.

**Installation:** After removal of existing system, align the supplied mounting bracket and tighten in place. Align the new muffler with the existing flange placing the supplied gasket between the two flanges. Hand tighten the nuts and bolts at this time. Slip the mounting large band clamps over the muffler and tighten the flange nuts and bolts, mounting bracket nuts and bolts, and large band clamps. Slip the small band clamp onto the tip pipe and slide onto the muffler. Adjust tip pipe and tighten small band clamp. Start vehicle and check for exhaust leaks.

**Safety:** Appropriate disassembly, assembly methods and procedures are essential to ensure the personal safety of the individual performing the kit installation. Improper installation due to the failure to correctly follow these instructions could cause personal injury or death. Read each step of the installation manual carefully before starting the installation.

- Always wear safety glasses for eye protection.
- Place the ignition switch in the OFF position.
- Always apply the parking brake when working on the vehicle.
- Block the front and rear tire surfaces to prevent unexpected vehicle movement.
- Operate the engine only in well-ventilated areas to avoid exposure to carbon monoxide.
- Do not smoke or use flammable items near or around the fuel system.
- Use chemicals and cleaners only in well-ventilated areas.
- Batteries can produce explosive hydrogen gas which can cause personal injury. Do not allow flames, sparks or flammable sources to come near the battery.
- Keep hands and any other objects away from the radiator fan blades.
- Keep yourself and your clothing away from moving parts when the engine is running.
- Do not wear loose clothing or jewelry that can be caught in rotating or moving parts.

**VEHICLE SUPPORT WARNING:** Should the purchaser decide to install this exhaust product at home, be warned that car or light duty truck/van "bumper" jacks are intended for emergency use only. The use of frame contact jack stands in conjunction with a floor jack as main support is highly recommended to minimize accidental dropping of a vehicle while the installation proceeds. We recommend the use of a shon hoist if possible. Please use caution!

RPM	Stock Horsepower	BBE Horsepower	Gains
2250	61	66	+4
2750	88	99	+11
3250	122	158	+36
3750	175	223	+48
4250	222	253	+31
4750	240	278	+38
5250	247	282	+35
5750	244	283	+39

RPM	Stock Torque	BBE Torque	Gains
2250	142	154	+12
2750	167	189	+22
3250	196	255	+59
3750	245	312	+67
4250	275	313	+38
4750	266	308	+42
5250	247	283	+36
5750	223	258	+35

Check out an excellent selection of performance exhaust systems on our website.