Callaway GenThree™ Supercharging

Callaway Cars enjoys an extensive history of manufacturing systems and components for high performance turbocharged and supercharged applications. From the first BMW turbocharger systems developed by Reeves Callaway in the mid-1970’s, to the latest GenThree™ supercharger systems for current GM models, Callaway engineers have established a formidable technological base, unmatched by anyone in the aftermarket.

Callaway’s third generation, GenThree™ supercharger system was originally developed for the C7 Callaway Corvette. The design is now utilized across Callaway’s Chevrolet, GMC and Cadillac product lines.

Callaway engineers designed the new supercharger housing and integrated intake manifold to reduce charge air temperature and to increase airflow quality for increased power, and for more consistent power. The supercharger rotor pack assembly was rotated 180° to direct charge air up, toward the top of the housing, through a primary intercooler and then around the sides of the housing. This intercooler conducts heat from the charge air to the intercooler coolant. The coolant is circulated through a heat exchanger in front of the radiator, where the heat is radiated into the atmosphere. The cooled air exiting the intercooler then flows through the upper section of the supercharger housing. As the charge air passes over the internal surface, convective heat transfer removes additional heat. In Corvette and Camaro applications, the housing extends through the hood and is exposed to ambient temperature, increasing this effect. Finally, just before reaching the cylinder heads, the inlet air passes through a set of auxiliary intercoolers – one for each bank – and still more heat is removed. This three element, TripleCooled™ design allowed the engineers to utilize very low restriction intercoolers, to maintain desired manifold pressure.

During dynamometer testing, inlet air temperature increased by less than 10°F during dyno pulls, compared to increases of at least 35°F with other supercharger systems. Eliminating the “heat soak” phenomenon inherent with supercharging, GenThree™ provides more consistent lap-to-lap performance at the track and run-to-run performance at the dragstrip, as well as eliminating power loss during extended towing or hauling.

Eaton’s 2300cc TVS rotor pack is used in GenThree™ systems for its high thermal efficiency, OEM-certified quality, and service-proven reliability. Since it doesn’t have to fit under a stock hood, the rotor pack’s displacement is 32% larger than the stock Z06’s 1740cc supercharger.

To reduce power-robbing parasitic drag, an internal bypass diverts the inlet air flow path during idle, low-load cruising and deceleration, allowing the supercharger internals to spin freely. Consequently, fuel mileage is practically unchanged from stock fuel mileage. In fact, GenThree™ technical features are significant enough that certain design aspects of the system are patented and other patents are pending with the US Patent and Trademark Office.