

The Ecotec 2.0L Loved the Bonneville Salt Flats

A race-ready version of the 2.0L Ecotec powered the ION Red Line quad coupe to a new land speed record.

On October 17, 2003, the Saturn ION Red Line sport compact raced into the Bonneville Salt Flats record book with a new mark of 212.684 mph in the G/Blown Fuel Altered class, bettering the previous record by nearly 30 mph. The engine was a modified 2.0L Ecotec, with a turbocharger in place of the supercharger. The GM Performance Division launched the Saturn land speed record project to demonstrate the performance capabilities of the ION Red Line package under extreme conditions so a close connection was kept between the Bonneville-modified and production versions of the ION Red Line.

A Modular Design Pays Off

The supercharged variant of the Ecotec works superbly because the Ecotec was designed from its inception to work with a supercharger.



Ecotec 2.0L I-4 SC

The design charter for the Ecotec specified a modular architecture that could excel as either a normally aspirated, supercharged or turbocharged engine. So consumers benefit from the economies of scale of a high-production-volume engine with the power of a high-performance specialty engine.

Ecotec 2.0L I-4 Supercharged

Specifications

Configuration:	2.0L I-4 Supercharged
Displacement:	1998 cc
Bore x Stroke:	86 mm x 86 mm
Valvetrain:	Dual overhead camshafts 4 valves per cylinder
Valve Lifters:	Hydraulic roller finger follower
Compression Ratio:	9.5:1
Firing Order:	1-3-4-2
Fuel System:	Sequential port fuel injection with high pressure (56 psi) Unleaded regular
Recommended Fuel:	Unleaded regular
Peak Horsepower:	205 hp (153 kW) @ 5600 rpm
Peak Torque:	200 lb-ft (271 Nm) @ 4400 rpm
Manufactured:	Kaiserslautern, Germany

MATERIALS:

Cylinder Block:	Cast aluminum with cast iron cylinder liners
Cylinder Head:	Cast aluminum
Crankshaft:	Forged steel with induction hardened fillets
Camshaft:	Cast iron
Connecting Rods:	Forged steel
Intake Manifold:	Aluminum
Exhaust Manifold:	Cast iron

COMPONENT DESCRIPTIONS:

Throttle Type:	Electronic throttle control
Ignition System:	Coil-on-plug

All specifications listed are based on the latest product information available at time of publication. The right is reserved to make changes at any time without notice.



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GM

Ecotec 2.0L I-4 Supercharged Engine

One of the most advanced four-cylinder engines ever built



A Popular, Global 4-Cylinder Engine Gets an Extra Kick

This supercharged, intercooled version of the popular 2.2L Ecotec needs less displacement to provide more power.

The design of the new 2.0L Ecotec SC is based on the highly successful 2.2L normally aspirated Ecotec, with features such as four valves per cylinder, maintenance-free, chain-driven dual overhead camshafts, counter-rotating balance shafts, and an integrated oil cooler. By adding an intercooled supercharger, the power from the new 2.0L Ecotec SC jumped from 140 to 200 hp.

Before going into production, every Ecotec engine variant is subjected to the toughest and most comprehensive validation process ever carried out at GM. One example is the Thermal Cycle test, where the supercharged engine was run up to maximum operating temperature and then flushed with ice-cold coolant, shocking the powerplant and its components into sudden contraction. The procedure was performed for 1,000 hours.



Even though this 2.0L Ecotec SC has the efficiencies associated with having less displacement than the 2.2L version of the Ecotec, it can deliver outstanding power the instant the driver requests it.

Key Features



Supercharger

The Eaton supercharger adds 40 percent more power to the Ecotec 2.0L engine compared to a naturally aspirated version by pumping more air into the combustion cylinder.



Intercooler

Cooler air is denser, so before the pressurized air from the supercharger enters the combustion chamber it is cooled by these air-to-liquid cores integrated into the intake manifold.



Electronic Throttle Control (ETC)

By eliminating the mechanical linkage, ETC is able to deliver outstanding throttle response, improved reliability and better integration with cruise control electronics.

Additional Features

- Compact, lightweight, all-aluminum design
- Dual balance shafts, housed in the cylinder block, provide smooth and quiet engine operation by offsetting the vibrations inherent in an inline 4-cylinder engine.
- Coil-on-plug ignition system produces a strong, efficient spark and eliminates spark plug wires.
- Sodium-filled exhaust valves have stems that are filled with a sodium compound that becomes liquid at normal operating temperatures. This liquid has improved conductivity, which promotes heat transfer away from the valve face and valve guide, resulting in longer life and improved combustion.
- Sequential port fuel injection system has a returnless fuel delivery system that helps keep fuel cooler for more efficient combustion.
- Drop forged steel crankshaft has induction heat-treated fillets for added strength and durability.
- Roller finger followers have self-adjusting hydraulic lash adjusters for reduced wear and improved fuel efficiency.
- Piston-cooling oil jets help to cool the underside of the piston bowl and the piston rings.

Application



2004 Saturn ION Red Line

The supercharged 2.0L Ecotec will provide the Saturn ION Red Line with powerful 200 hp and 205 lb-ft of torque, combined with good fuel economy and low emissions.