

Mitsubishi's 2009 Ralliart Lancer powered by new version of 4B11 T/C Turbo/Intercooled Engine

Contributed by Johnathan Bodily

The 2009 Lancer Ralliart is powered by a unique, modified version of the 4B11 T/C turbocharged and intercooled engine that debuted in the new-generation Lancer Evolution. Beginning with a Lancer Evolution long block assembly, the turbocharger, intercooler and valve timing are adapted for impressive street-oriented performance in the Ralliart application. The Lancer Ralliart engine produces 237 hp at 6,000 RPM (Evolution: 291 @ 6,500 RPM) and 253 lb.-ft. of peak torque at 3,000 RPM (Evolution: 300 lb.-ft. @ 4,400 RPM). With nearly 250 lb.-ft. of torque available from 2,500 RPM to about 4,700 RPM, the Ralliart engine provides a "sweet spot" that yields accessible everyday performance. "The Lancer Ralliart engine is not simply a lower-horsepower Evolution engine," said Dan Kuhnert, executive vice president, sales and marketing, Mitsubishi Motors North America. "We specifically tuned the Ralliart engine to provide strong low-end and mid-range torque to make the car's performance more accessible and enjoyable in everyday driving situations. With Lancer Evolution, engine tuning has to take into account the many owners that use the car for ultra-performance driving."

The Ralliart engine's redline is 6,500 RPM compared to 7,000 RPM for the Evolution. As in all Lancer engines, the Mitsubishi Innovative Valve-timing Electronic Control (MIVEC) system controls valve timing on both the intake and exhaust camshafts to optimize performance at all engine speeds.

High-Strength Aluminum Construction

The 4B11 T/C is an intercooled-turbocharged 2.0-liter DOHC inline four-cylinder engine built with a cast-aluminum cylinder block and cylinder head. Although based on the architecture as the 4B11 naturally aspirated engine, the 4B11 T/C starts with a unique semi-closed deck block casting and is reinforced for turbocharging. Likewise, the internal components are reinforced to withstand high levels of boost. An integrated die-cast ladder frame contributes to engine block strength and also helps reduce noise, vibration and harshness (NVH) levels. High internal rigidity helps ensure smoothness, and so the 4B11 does not use a balancer shaft.

The 4B11 T/C features a cross-drilled forged steel crankshaft that rotates in 4-bolt main bearing caps. Also unique to this engine are reinforced forged steel connecting rods that are attached to pistons unique for the application. The pistons are gravity castings made of a high strength aluminum material designed for durability and quiet operation, and also include a unique ring package optimized for this engine.

The 2.0-liter (1,997 cc) engine's bore and stroke both measure 86.0 mm (3.4 in.), making it a "square" design with a bore-stroke ratio of 1.0. Fully floating pistons improve reliability while reducing frictional loss. Compression ratio is 9:1, same as in the Lancer Evolution.

The Lancer Ralliart engine employs a smaller, single-scroll turbocharger compared to the twin-scroll turbo used in the Lancer Evolution engine. The intake tract and airbox are unique to the Ralliart, and the intercooler setup and plumbing differs slightly from the Evolution, as well (see illustrations below.)

Using a timing chain instead of a belt allows for a more compact design and also helps ensure reliability. Iridium spark plugs contribute to lower emissions and help extend major service intervals. Premium-grade (91 AKI) fuel is required. The 2009 Lancer Ralliart is certified to the LEV II / Tier 2, Bin 5 emissions standard. Aluminum is also used for the timing chain case and cylinder head cover, the latter being resin in the normally aspirated 4B11 used in other Lancer models.

Mitsubishi Innovative Valve Timing and lift Electronic Control (MIVEC)

The double overhead-cam (DOHC) 16-valve cylinder head also is aluminum and carries built-up (hollow) camshafts and a direct-acting valvetrain. Such a design yields a lighter, more compact layout than a rocker arm assembly, and reduced weight at the top end of the engine also contributes to a lower center of gravity.

The Mitsubishi Innovative Valve Timing Electronic Control (MIVEC) – a continuously variable valve timing system – works on both the intake and exhaust valves, contributing to optimal power, high fuel efficiency and low emissions across the engine's operating range.

- Variable valve timing systems optimize engine performance in response to operating conditions. In the Mitsubishi 4B11 T/C engine's MIVEC system, intake and exhaust cam timing is independently controlled to provide four optimized engine-operating modes:
- Under most conditions, to ensure highest fuel efficiency, valve overlap is increased to reduce pumping losses. The exhaust valve opening timing is retarded for a higher expansion ratio, enhancing fuel economy.
- When maximum power is demanded (high engine speed and load), intake valve closing timing is retarded to synchronize the intake air pulsations for larger air volume.
- Under low-speed, high load, MIVEC ensures optimal torque delivery with the intake valve closing timing advanced to ensure sufficient air volume. At the same time, the exhaust valve opening timing is retarded to provide a higher expansion ratio and improved efficiency.
- At idle, valve overlap is eliminated to stabilize combustion.

MIVEC System Configuration

Exhaust System

The 2009 Lancer Ralliart shares essentially the same free-flowing exhaust system as the Lancer Evolution. The Ralliart has a slightly wider-bore center pipe (65 mm vs. 60.5 mm for the Evolution). In both models, the large muffler, along with the twin-pipe outlet with elliptical tips, yields a deep, powerful sounding exhaust note.

Lancer Ralliart Warranty

Lancer Ralliart is covered by a bumper-to-bumper, New Vehicle Limited Warranty of 36 months or 36,000 miles (whichever comes first). The restraints system and the highly technical powertrain are covered by a 5-year or 60,000 miles Powertrain Limited Warranty, an Anti-Corrosion Perforation Limited Warranty for 7-years or 100,000 miles and a generous 5-year, unlimited-miles timeframe for roadside assistance. All warranties are transferable to subsequent owners; coverage time begins on the original in-service date (does not start over with resale.)