



Rod Millen Special Vehicles develops hybrid drivetrain for Mitsubishi Eclipse Concept-E

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HUNTINGTON BEACH, CA ([PRWEB](#)) April 3, 2004 --Mitsubishi Motors North America, Inc. (MMNA) unveiled the Concept E at the 2004 Detroit Auto Show hinting at the future shape of the Mitsubishi Eclipse. Mitsubishi contacted ROD MILLEN SPECIAL VEHICLES (RMSV) of Huntington Beach, California to develop a drivetrain for Concept E composed of an internal combustion engine and high performance electric motor. This would provide the vehicle with unsurpassed all-wheel-drive (AWD) performance for a Hybrid Electric Vehicle (HEV).

After researching a variety of different motor constructions including permanent magnet and brushless DC motors, RMSV selected a high performance 150-kW AC-induction motor. This motor provided maximum power output in a simple, air-cooled package that would fit within the tight bodylines of Concept-E. RMSV mated the motor to a Mitsubishi Evo VIII rear axle assembly through a 180-degree gear reduction. New final drive gears were sourced from Japan to provide the necessary ratio for ultimate motor performance. Supplying power to the motor was a sophisticated drive control system that included a regenerative power recovery system and 100 Lithium Ion cells mounted beneath the cockpit floor. Performance requirements dictated that the output of the 3.8-liter V-6 engine be increased by 10% to maintain the proper balance with the rear drive electric propulsion system. RMSV accomplished this with a few engine modifications including a free flowing intake and exhaust system. The V-6 engine drivetrain, including an Eclipse automatic transmission, was fitted to the front of a donor Eclipse, while the electric drive system was integrated at the rear of the vehicle. The only mechanical coupling between the front and rear drivetrains was the ground. Suspension upgrades, new Brembo brakes and custom 245/40R20 front and 275/35R20 rear performance tires ensured that Concept-E would provide maximum driving performance on the street and at the track.

Racing legend Rod Millen was the first to pilot the +400HP Concept-E around the Streets of Willow Springs racecourse. RMSV engineers reviewed telemetry data to fine-tune the electric drive control algorithms to match the performance of the gasoline drivetrain. Applying the proper amount of torque from the electric motor would ensure maximum acceleration out of the corners, too much and the tires would break loose. Similarly, regenerative braking had to be matched to the brake system and dynamic weight transfer of the vehicle to insure maximum braking performance. After several days of development testing Mr. Millen and the team were satisfied that the vehicle would deliver an exhilarating ride.

“The electric drive system is very powerful and smooth, providing constant acceleration even during shifts of the front engine drivetrain,” Brian Miller, RMSV Project Manager, said with a smile as he unbuckled the 5-point racing harness. “It feels like a jet taking off; it just keeps forcing you back into the seat.”

Rod Millen Special Vehicles designs and develops vehicles and advanced mobility solutions for the U.S. armed



forces and commercial customers. Headquartered in Huntington Beach, California the Rod Millen Group is principally engaged in the research, design, development, manufacture and integration of advanced technology solutions for manned and unmanned military vehicles, high performance concept cars, race vehicles and rides for major theme parks.



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ROD MILLEN SPECIAL VEHICLES

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