

Safety & Technology
POWERTRAIN

**Chrysler Canada: Under the Hood -
More Power, Greater Efficiency and Exceptional Value**

- **Introducing HEMI® Hellcat – Chrysler Group’s most powerful V8 ever; 18th new engine added to Company lineup in less than five years**
- **Celebrated TorqueFlite® family grows by one with the most robust 8-speed automatic in Chrysler Group history; 15th new transmission**
- **TorqueFlite transmissions – projected to save current Chrysler Group customers more than 2 billion litres of gasoline – now available across entire Dodge full-size car lineup**
- **Debut of new, high-efficiency, lightweight axle family**
- **Expansion of fuel-saving Engine Stop-Start (ESS) technology**
- **North American powertrain portfolio further enriched by Alfa Romeo 4C’s 1750-cc turbocharged I4 and Twin-Clutch Transmission**
- **Breakthrough nine-speed automatic transmission, unique rear-axle disconnect system migrates to new applications – each a segment-first**

Power, efficiency and value are essential to maintaining powertrain leadership in today’s new-vehicle market. Chrysler Group checks all three boxes – with authority – for model-year 2015.

“From the dyno lab to the test track, we have been relentless,” says Bob Lee, Vice President and Head of Engine, Powertrain and Electrified Propulsion Systems. “Our engineers don’t just strive for excellence; they seek to redefine it by continually raising the bar.”

This is evidenced by Chrysler Group’s aggressive support for advanced powertrain development. It began as soon as the Company was established in 2009. Today, investment is approaching \$2.5 billion (USD) – nearly half its total manufacturing outlay.

From model-year 2011 to the present, Chrysler Group has introduced 15 new transmissions and 18 new engines.

The new supercharged 6.2-litre V8 HEMI® Hellcat best symbolizes this march forward. Its 707 horsepower (hp) rating is unparalleled in the Company's matchless history of eight-cylinder prominence.

The HEMI Hellcat, with 91 per cent new content compared with the 392 HEMI, is the heart and soul of the 2015 Dodge Challenger SRT Hellcat. It is, in a word, extreme. Consider:

- Its forged-steel crankshaft is so well-engineered it can withstand firing pressures of 1,595 psi (110 bar) – the equivalent of five family sedans standing on each piston, every firing event
- Its twin-screw supercharger, which has polymer-coated rotors, boasts a drive ratio of 2.36:1 and a maximum speed of 14,600 rpm
- A low-temperature cooling circuit with two air/coolant heat exchangers integrated into the supercharger housing, keeps charge air temperatures below 60° C (140° F) while enabling air flow of up to 30,000 litres per minute
- Its power is not degraded due to cooling demands, even after 20 laps of a grueling 5 kilometre road course at an ambient temperature of 37 degrees Celsius (100 degrees Fahrenheit)
- Eight injectors served by 12.7 millimetre fuel lines, each capable of delivering a flow rate of 600 cc/min

And, of course, its block is HEMI Orange.

But an extreme engine deserves an equally extreme transmission. Enter the newest member of Chrysler Group's celebrated TorqueFlite® family of eight-speed automatic transmissions, the HP90. Its maximum engine-torque capacity is greater than any previously offered TorqueFlite.

This is accomplished by adding pinion gears, one each in the 1st and 3rd gear sets, and five additional clutch disks, incorporated into 4 of the 5 clutch packs. Its ratio spread is an impressive 7.03.

"A wide ratio spread is one of the characteristics of all TorqueFlite transmissions," says Jeff Lux, Vice President and Head of Transmission Powertrain. "It enables superior fuel economy to benefit our customers and affords Chrysler Group a key competitive advantage."

The advanced-technology TorqueFlite eight-speed automatics – first of their kind ever made available to mainstream-brand customers – now are powering more than one million vehicles, worldwide. And their combined effect is staggering.

Over their lifetimes, these vehicles are projected to save their owners more than 2 billion litres of fuel, compared with their predecessors that featured five- or six-speed automatics. That quantity of gasoline is worth approximately \$2.5 billion (USD) at the pump, based on current fuel-price forecasts.

Replacing their conventional transmissions with TorqueFlites also promises to reduce their combined CO₂ emissions by more than six million metric tonnes over the same timeframe.

In addition, TorqueFlite eight-speed transmissions contribute to best-in-class fuel-efficiency standards such as the EcoDiesel-powered Ram 1500's 8.4 L/100km (34 mpg)* highway fuel-economy rating, the best ever recorded for a full-size pickup; and the 7.7 L/100km (37 mpg)* highway rating for the Dodge Charger, best among full-size sedans equipped V6 engines. (*5-cycle rating shown, see last page for 2-cycle comparison)

For 2015, TorqueFlite does even more for the iconic Charger and its legendary Dodge stablemate, the Challenger. The technology can now be paired with any of their available V8 engines, the 5.7-litre HEMI, 6.4-litre HEMI, or 6.2-litre Supercharged Hemi.

These cars and the Challenger SRT further benefit from the introduction of a new family of efficient, lightweight axles. It will account for vehicle applications previously served by two axle families.

The new axle family, which has three variants, affords weight reductions of up to three kilograms, compared with the components they replace. Additional efficiency benefits include spin-loss reductions.

Distinguished by a die-cast aluminum housing and a four-point mounting system with integrated mounting arms and bosses, the new axles deliver greater refinement.

The SRT versions, with their unidirectional limited-slip differential, feature unique bias-ratio tuning for on- and off-throttle performance. This affords greater flexibility to tune the vehicle for maximum grip, stability and steering response.

The new axles smoothly deliver power during hard acceleration on corner-exit. On corner-entry trail-braking, the differential further tightens to stabilize the car and prevent oversteer.

Model-year 2015 also marks the debut of two new applications of Engine Stop-Start (ESS) technology.

Availability in the popular Jeep® Cherokee is scheduled for third quarter. ESS arrives the following quarter in the all-new Chrysler 200. It will account for fuel-economy gains and CO₂ reductions of up to three per cent.

The technology made its NAFTA-region debut in the Ram 1500 full-size pickup, the most fuel-efficient truck in its segment.

At the heart of ESS is a high-speed/high-durability starter that reduces crank time for quicker restarts. Its function is regulated by algorithms that act on a vehicle's powertrain and chassis components. As a result, acceleration is always aligned with driver inputs. Passive accelerator application is met with measured throttle response; hard inputs trigger aggressive starts. And there's no waiting for either.

ESS works this way:

- Engine controls constantly monitor vehicle speed
- When vehicle brakes to a stop, fuel flow is cut and engine turns off – events that save gas and reduce emissions
- Beefier batteries maintain other vehicle systems so in-cabin comfort is unaffected
- When brake pedal is released, engine automatically restarts and the transmission is engaged – all within 0.3 seconds

Lending greater diversity to Chrysler Group's powertrain landscape in North America is the return of Alfa Romeo. The two-seat Alfa Romeo 4C will be powered by a 237-hp 1750-cc direct-injected turbocharged intercooled I4.

The high-performance powerplant features dual (intake and exhaust) continuous variable-valve timing (VVT). Intake and exhaust systems for the Alfa Romeo 4C's mid-engine layout were optimized for maximum responsiveness. For added refinement, this high-output engine includes a crankshaft with eight counterweights.

A new generation turbocharger features a pulse-converter exhaust manifold to exploit pressure waves to boost torque at low-engine speeds. Additionally, a waste gate valve adjusts turbo pressure and improves the 1750 cc engine's efficiency by minimizing pumping losses.

Advanced scavenging technology enables the all-new Alfa Romeo 4C to maximize torque at low-engine speeds and deliver more response to driver input. The resulting air flow from the inlet manifold to the exhaust manifold increases combustion efficiency and turbine speed, all while eliminating turbo lag. The outcome: 258 lb.-ft. of torque, 80 per cent of which is available at 1,700 rpm.

An automatic after-run pump cools down the system.

The 1750 cc turbo charged engine is mated to specifically tuned Alfa twin-clutch transmission (TCT). Paddle shifters accommodate aggressive driving.

Another milestone for model-year 2015 is the proliferation of Chrysler Group's innovative nine-speed automatic transmission. It is offered in the all-new Chrysler 200 mid-size sedan, Jeep Renegade small SUV and the Ram ProMaster City commercial van, and passenger wagon.

In each, the transmission's availability marks a segment-first.

With its unique 9.81 ratio spread, the nine-speed automatic delivers efficiency and refinement. In the all-new Chrysler 200, it contributes to a fuel-economy gain of up to 26 per cent, compared with the model it replaces.

In Sport mode, the transmission's shift schedule is altered for firm, quick engagement – a level of responsiveness further intensified by paddle-shifter activation.

In addition, the launches of the Chrysler 200 and Jeep Renegade are distinguished by their respective applications of Chrysler Group's innovative rear-axle disconnect technology. It uniquely disconnects and reconnects the rear axle – automatically and seamlessly – as needed and at any speed.

When driving conditions warrant only front-wheel-drive, the rear axle disconnects at both the PTU and rear-drive module, which improves fuel economy by reducing the parasitic loss that occurs with conventional systems.

For the all-new 200, the result is the most advanced all-wheel-drive system in its class.

For the ground-breaking Renegade, two levels of 4x4 capability are offered, both of which live up to the Jeep brand's legendary off-road reputation.

Jeep Active Drive is fully automatic and delivers seamless operation in and out of four-wheel drive, and at any speed. This system requires no driver intervention, delivers yaw correction during dynamic events and improves both understeer and oversteer conditions.

Jeep Active Drive can provide up to 1,475 lb.-ft. of the engine's available torque to the rear wheels, enabling optimal grip in low-traction conditions. A fully variable wet clutch housed in the rear-drive module utilizes the Jeep brand's proprietary algorithms to provide the proper amount of torque for any driving condition, including low-traction surfaces, aggressive starts and dynamic driving.

Jeep Active Drive Low is available in the Renegade Trailhawk and delivers best-in-class off-road performance. Building off Jeep Active Drive, the system affords a 20:1 crawl ratio for 4x4 Trail Rated capability.

Also new for model-year 2015, the Fiat 500L, 500 Turbo, Abarth and Abarth Cabrio will feature an available new six-speed automatic transmission.

The 500L and 500 Turbo upgrades are designed to deliver greater refinement, while Abarth enhancements make more accessible the driving experience for which the athletic brand is famous. To accommodate the torque-rich 1.4-litre MultiAir® turbocharged I-4, the new six-speed transmission has been upgraded with additional clutch plates to match the engine's sporty attributes.

A Sport mode further augments driver engagement through aggressive pedal-mapping and capabilities such as fuel-cut upshifts, rev-matching downshifts and corner gear-hold.

About Chrysler Canada

Founded as the Chrysler Corporation in 1925, Chrysler Canada Inc. is based in Windsor, Ontario, and celebrates its 89th anniversary in 2014. Chrysler Canada is a wholly owned subsidiary of Chrysler Group LLC, one of the world's leading automotive companies. Chrysler Canada has approximately 440 dealers and markets Chrysler, Jeep®, Dodge, Ram, Fiat and Mopar vehicles and products. In addition to its assembly facilities, which produce the Chrysler Town & Country, Dodge Grand Caravan, Ram Cargo Van (Windsor), and the Chrysler 300, Dodge Charger and Dodge Challenger (Brampton), Chrysler Canada operates an aluminum casting plant in Etobicoke, a research and development centre in Windsor, and has sales offices and parts distribution centres throughout the country.



*** FUEL ECONOMY**

Based on 2014 EnerGuide fuel consumption ratings. Government of Canada test methods used. Your actual fuel consumption will vary based on powertrain, driving habits and other factors. Energuide fuel economy ratings for **2015** models will be calculated using the NEW (5-cycle) Government of Canada test method. This NEW test method will apply to all 2015 model-year vehicles. 2015 model year fuel economy ratings not available at time of publication.

For comparison purposes only, ratings for the 2014 Ram 1500 4x2 with 3.0L EcoDiesel V6 and 8-speed automatic using the NEW (5-cycle) and OLD (2-cycle) Government of Canada test methods would be:

NEW: 11.6 L/100 km (24 mpg) city, 8.4 L/100 km (34 mpg) highway
OLD: 10.2 L/100 km city (28 mpg), 7.1 L/100 km (40 mpg) highway

For comparison purposes only, ratings for the 2014 Dodge Charger V6 using the NEW (5-cycle) and OLD (2-cycle) Government of Canada test methods would be:

NEW: 12.4 L/100 km (23 mpg) city, 7.7 L/100 km (37 mpg) highway
OLD: 10.9 L/100 km city (26 mpg), 6.4 L/100 km (44 mpg) highway

For more information please visit the Government of Canada Web site: www.vehicles.nrcan.gc.ca