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Chrysler Canada: Chrysler Group LLC's Belvidere Assembly Plant Prepares for Production of the All-new Dodge Dart

- Plant is first to build new Chrysler Group vehicle based on Fiat-derived architecture
- \$700 million (USD) manufacturing investment provides complete two architecture flexibility
- Plant's transformation makes it capable of producing future models on new architecture

April 27, 2012, Windsor, Ontario - Chrysler Group LLC's Belvidere Assembly Plant (BVP) in Belvedere, Illinois (U.S.A.) has been tasked with building the first of a new generation of vehicles that highlights the partnership between Chrysler Group and Fiat.

The all-new Dodge Dart, based on a Fiat-derived architecture adapted from the award-winning Alfa Romeo Giulietta, will trace its roots to the plant located about an hour outside of Chicago, Illinois. The more than 2,700 employees at the plant have been preparing for Dart's arrival for nearly three years.

"It was not by chance that we chose Belvidere to build the new Dodge Dart," Chrysler Group Chairman and CEO Sergio Marchionne told employees during a celebration event at the plant on Feb. 2, 2012. "Our decision is evidence of the faith we have in your level of commitment and your passion to deliver great products for our customers. You have been essential in our ability to author a remarkable story of recovery.

"With the help of this dedicated workforce, we are creating a work environment in Belvidere that is committed to quality, and with the flexibility to compete with the best plants anywhere in the world," said Marchionne.

The plant's transformation began in June 2009 with the implementation of World Class Manufacturing (WCM), a methodology that focuses on reducing waste, increasing productivity, improving quality and safety, and restoring dignity to the employees. In the past three years, BVP has been transforming itself into one of the safest and most efficient assembly plants in the company. In 2011, Belvidere employees submitted more than 20,000 suggestions and implemented more than 3,400 projects that have a potential annualized savings of \$32 million (USD). BVP is on a path toward achieving Bronze status, the first milestone on the WCM journey, later this year.

"WCM has transformed the way we run the business and given us a defined route map to follow," said Kurt Kavajecz, Plant Manager, Belvidere Assembly Plant. "The employees here are committed to the implementation of WCM. Their suggestions are key to continuously improving the quality of the products built at this plant."

In recognition of those efforts, the Company announced that it would invest \$600 million (USD) in a new 638,000-square-foot, state-of-the-art body shop and for new machinery, tooling and material handling equipment exclusively for the production of an all-new vehicle. That total investment grew to nearly \$700 million by the time the facility was dedicated in February 2012.

Body shop: designed for flexibility and increased quality

Because the all-new Dodge Dart differs significantly from the two vehicles currently built in Belvidere – the Jeep® Compass and Jeep Patriot – the plant had to make a number of changes in the build process to accommodate the new vehicle architecture. The most visible change is the addition of a new body shop.

"Because the body-in-white architectures for the vehicles built at Belvidere are totally different, we knew that trying to create one body-in-white process to meet the needs of the Dart, as well as the current models, would have been difficult and inefficient," said Scott Garberding, Senior Vice President, Head of Manufacturing — Chrysler Group LLC. "It would have led to a very complex body-in-white process that would not have allowed us to continue building

two full shifts of the Compass and Patriot while trying to launch Dart. This became especially important as the demand for the current products continued to increase. Therefore, the practical solution was to create a new body shop that would be standard with Fiat.”

The new Belvidere body shop sets the benchmark for future Chrysler Group body shops in terms of design, efficiency and flexibility. By standardizing body shop design across the company, it will allow for greater flexibility to build several platforms based off of the same architecture at more than one plant.

The body shop uses a new standard equipment design that was developed jointly between Chrysler Group and Fiat on many of the welding and sealing processes. This design, referred to as a BRIC (Basic Robot Integrated Configuration), reduces the installation time of equipment because the robots, equipment and associated electrical control panels are shipped as a complete unit. The BRIC eliminates the need to disassemble equipment at the OEM and reassemble at the plant. A welding or sealing station can be installed at the plant in approximately an hour, compared with several days in the past. In addition, this design provides other advantages, such as being able to mount robots overhead, which reduces model changeover time as the station is accessible; eliminates potential tripping hazards and allows for easier maintenance and up keep.

Compared to traditional industrial building designs, the Belvidere body shop was built without load bearing trusses, which typically add to a building’s cost. This change resulted in a savings of about \$5 million (USD) in construction costs and greatly reduced construction time as building material was easy to obtain.

In addition, the body shop is environmentally friendly. Skylights and large windows were installed to provide natural sunlight, reducing the need for artificial lighting. Energy efficient lighting and building ventilation is controlled by computers to reduce energy usage. Whenever production is halted, the building lighting, supply fans and building exhausts are set back to reduce natural gas and electricity costs.

Of the 967 robots in the new body shop, 550 robots – or more than 50 per cent – were repurposed from Chrysler’s St. Louis (Missouri) Assembly Plants, which closed in 2008 and 2009. Roller tables and elevators were also refurbished from St. Louis, saving the company \$29 million (USD).

The basic premise of WCM is to eliminate anything that could cause waste or downtime. To ensure that the equipment in the body shop is kept in “like-new” condition, robots are hung from above, equipment is foil wrapped, and wires are encased and covered, which allows for easy cleaning, inspection and lubrication. These initiatives also improve safety by reducing or eliminating tripping hazards caused from cables and utilities that traditionally would have been on the floor.

One of the unique aspects of the body shop is the Marketplace concept. There are a total of five Marketplaces throughout the body shop, which feed appropriate parts to specific areas of the line. Operators load the pallets with the parts for each unique body style, which in the future could number as many as four. Once the pallets are loaded by the operators, the pallet travels to the welding station where robots unload the appropriate part at the optimal point for installation. The layout of Belvidere’s new body shop is much more efficient than traditional body shops because all material and processes are manned from the same side of the line. This condenses the line side inventory and the number of operators required to load the equipment.

Some innovative assembly techniques for the 2013 Dodge Dart design include the extensive use of lasers for various measurement and welding applications. One of the applications is a roof laser braise welding process. The laser braise welding process uses an intense laser-light beam to melt a piece of silicon wire, applied by four robots, into a predetermined location between the body side aperture and roof panel. This allows for a seamless transition between these mating surfaces, eliminating the need to cover the attachment area with a secondary trim component. Laser braise, widely used by Fiat, was first introduced at Chrysler Group’s Brampton Assembly Plant for the launch of the 2011 Chrysler 300 and Dodge Charger. This fully automated technology gives the new Dart a best-in-class sculptural appearance, while improving customer quality and achieving optimal process cost reductions.

On the automated closure panel installation line, the Dart’s body shell enters the cell and four robots, utilizing measurement lasers, precisely measure critical aspects of each body. The data is then used to tell the panel installation robots exactly how the decklid, doors, fenders and hood panels should be installed. This process ensures each Dart meets the exacting fit and finish specifications. As the Dart continues to move through the process, these

measurements are again utilized to robotically guide lasers to precisely cut the front rails of the car to length. This provides a precision mounting surface for the front-end module that is installed in the final assembly area.

Another area that was jointly developed by Chrysler Group and Fiat is where the Dart body is framed, called the Open Gate Framer. This area is capable of building four different car models. There are 18 robots, eight on the floor and 10 hung from above, which precisely weld the panels to the body, ensuring a consistent and dimensionally repeatable build of each vehicle.

Chrysler Group invested \$12.5 million (USD) to add a Metrology Center to the Belvidere plant. Now located in most of Chrysler Group's assembly plants, the Metrology Centers reflects the company's heightened dedication to quality. The Belvidere Metrology Center employs 30 people, who are responsible for the measurement and validation of the vehicle's body geometry. The tools within the Metrology Center include state-of-the-art inspection equipment, like a Meisterbock gauge and white light laser scanners that allow for the measurement and certification of both plant processes and incoming supplier parts. The aim is to identify possible deviations before customer vehicles are built.

With the addition of the new body shop, the square footage of the plant increased to nearly 5 million square feet, making it the largest Chrysler Group facility.

Trim, chassis, final: making room for the Dart

While the new body shop is dedicated to the Dart, the assembly line is shared with the Compass and Patriot, and changes needed to be made to accommodate the Dart's unique architecture. For example, more stations were added on the Chassis line to facilitate the installation of the Dart's front-end module, which comes to the plant already assembled and is installed later in the process. As a result, line operators can work in the engine compartment without having to navigate the front end module or bending underneath the vehicle as they have to do with the Jeep Compass and Jeep Patriot.

The new Dart requires a number of operations to be performed in the engine compartment. To ensure the safety of the line operators, the line was altered to move the cars at a 45 degree angle to allow the operator to work on the car without the hazard of walking backwards or getting their foot trapped under the carrier.

Extensive benchmarking of ergonomic assist devices, both internally and at Fiat plants, resulted in the implementation of multiple assist devices for handling of parts and tools to reduce the burden on operators. One such device, the "happy seat," reduced the most awkward posture positions for the installation of the side air bags on the Compass and Patriot and was carried over to allow operators easier entry into the Dart for installation of overhead consoles.

The plant also insourced production of the front and rear suspensions for the all-new Dart, so there are now two new lines feeding the decking line where there were previously none.

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