

Contact: Jodi Tinson  
Amy Delcamp

## **Chrysler Group LLC's Toledo Assembly Plant Readies itself for Production of Jeep® Cherokee**

- \$500 million investment adds state-of-the-art body shop, introduces changes throughout facility
- Body shop follows footprint established at Belvidere (Ill.) Assembly Plant
- Implements improvements in paint shop
- Toledo first Chrysler Group plant to utilize flex decking system
- Toledo challenging for silver as it ramps up implementation of World Class Manufacturing (WCM)

September 8, 2013, Auburn Hills, Mich. - Toledo, Ohio, has been the proud "home of Jeep®" for more than 70 years. The first Jeep vehicles were built in the former Parkway Plant until the new Toledo North facility began assembling the Jeep Liberty in 2001. With the launch of the all-new 2014 Jeep Cherokee, a new chapter in the decades-old story of Jeep and Toledo is being written at Chrysler Group LLC's Toledo Assembly Complex.

That chapter began in November 2011 when Chrysler Group Chairman and CEO Sergio Marchionne announced that the Company would invest \$500 million in the Toledo Assembly Complex and add 1,100 jobs on a second shift for the production of the next-generation Jeep SUV.

"Over many decades, Chrysler has become a part of this community's fabric," Marchionne said during the announcement. "With this investment and the addition of more than a thousand jobs, we continue to play our part in contributing to the city's industrial and social development."

With that announcement, work on the body shop expansion and production preparations began for the all-new vehicle. Production of the Jeep Liberty ended on Aug. 16, 2012, after more than 11 years and nearly 1.7 million vehicles.

"Many generations have proudly built Jeep vehicles here in Toledo, so our employees were excited when it was announced that Jeep production would remain here and that they were being given the responsibility of assembling the new Jeep Cherokee," said Zach Leroux, Toledo Assembly Complex Plant Manager. "This workforce has risen to the task, meeting every challenge head on. They understand that they are the keepers of the legacy. For them, there is nothing more important than earning the trust of the millions of Jeep enthusiasts waiting for their Toledo-built Jeep vehicles."

### **Body shop — designed for flexibility and increased quality**

Because the all-new Jeep Cherokee differs significantly from its predecessor, 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 252,000 square-foot building expansion to the existing body shop.

As soon as production of the Jeep Liberty ended, work began to tear out the old body shop. It took about three weeks and nearly 80 trucks a day to remove all of the old equipment. The new equipment began arriving over 60 days in about 40 trucks a day.

The revamped Toledo body shop has been standardized with the body shop recently built at the Company's Belvidere (Ill.) Assembly Plant. By standardizing body shop designs across the company, it allows for greater flexibility to build several platforms based off of the same architecture at more than one plant. With all of the changes, the new Toledo body shop now has the flexibility to build up to four different models on the same line.

The expansion also allowed the plant to insource the production of underbody subassemblies, which will help maintain quality.

The body shop uses 963 robots and a standard equipment design for many of the welding and sealing processes developed jointly by Chrysler Group and FIAT. This design, referred to as 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 Toledo body shop expansion was built without load bearing trusses, which typically add to a building's cost. This change resulted in a savings of about \$1.35 million in construction costs and greatly reduced construction time as building material was easy to obtain.

In addition, the body shop expansion 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.

The basic premise of World Class Manufacturing (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 in the BRIC design, 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.

Some innovative assembly techniques for the 2014 Jeep Cherokee design include the extensive use of lasers for various measurement and welding applications. One of the applications is a roof laser braze welding process. The laser braze 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 braze, widely used by FIAT, was first introduced at Chrysler Group's Brampton (Ont.) Assembly Plant for the launch of the 2011 Chrysler 300 and Dodge Charger, and is being used at the Belvidere Assembly Plant on the 2013 Dodge Dart. This fully automated technology gives the new Jeep Cherokee a best-in-class sculptural appearance, while improving customer quality and achieving optimal process cost reductions.

The new Jeep Cherokee also has an automated closure panel installation line. In this assembly system, each body shell is precisely measured on critical dimensional aspects. The data is then used to tell the panel installation robots exactly how the liftgate, doors, fenders and hood panels should be installed. This process ensures that each vehicle meets the exacting fit and finish specifications. As the vehicle 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 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.

The Chrysler Group also added a 25,000 square-foot Metrology Center to the plant. Now located in most of Chrysler Group's assembly plants, the Metrology Centers reflect the company's heightened dedication to quality. The Toledo 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.

### **Toledo Assembly Complex Paint Shop updated for new vehicle**

Three processes in the paint shop have also been upgraded to improve the overall appearance and quality of each vehicle.

- For application of the underbody sealing and coating, the vehicle is turned upside down to apply the sound deadening and corrosion material
- The traditional paint guns were changed to bell/bell technology for application of the base and clear coats. The applicator change means better atomization and enhanced appearance
- Sound deadening material is injected into body cavities for improved noise, vibration and harshness

### **Assembly line changes for the new Jeep**

The dimensional differences of the new vehicle also necessitated changes to the assembly line. To ensure that the 2014 Jeep Cherokee launches with the best possible quality, the Toledo Assembly Complex is implementing and aligning all of the best practices and technologies from other Chrysler Group and FIAT facilities.

In preparation for the production of the new vehicle, the plant set up a Work Place Integration (WPI) room to continue advancing the plant's progress in WCM, even as it launches a new vehicle. In the WPI room, every operation in every work station was reviewed, best practices evaluated and processes verified before a single vehicle was built using the ICIDO.

Using ICIDO virtual technology, the movements of each operator were simulated and evaluated to ensure that he or she is working with "surgeon-like" precision and to attack ergonomic concerns upfront. With such information, the plant made decisions about whether a "kitting" strategy or a process design change was necessary to improve a specific operation.

Team leaders were hand selected to help with the integration of workplace improvements, leading to the implementation of best practices in more than 4,800 operations. As a result, the team eliminated waste and improved the efficiency of the assembly process.

One of the other significant process changes was the installation of a flexible decking line. Toledo Assembly Complex is the first Chrysler Group assembly plant, and one of only four FIAT facilities, to install a flex decking line for production of the new Cherokee. The flex decking line uses pallets to move components, which provides the flexibility to build different vehicle architectures on the same line.

An enormous structure located in the middle of the plant, the flex decking line operates on three levels. On the lower level, the built-up front and rear suspension pallets are loaded by gantry robots on to a main pallet. The main pallet travels along the line where all of the additional components are assembled to complete the chassis.

Once complete, the chassis pallet enters an elevator to be transported to the second level where it is married to the body. Robots automatically fasten the chassis to the body in two stations, making 24 connections. Operators complete the motor mounts in the next three stations. Before moving down the line, the system verifies that all connections have been completed to the proper specifications. If not, corrections can be made automatically or manually.

Under the flex decking line is a complete underground conveyor system that never existed prior to the production of the Cherokee. Because the system was being installed in an existing facility, the team needed to find a way to move the completed front and rear suspensions to the flex decking line without interrupting material flow to those assembly lines. (For the first time, both suspension systems are being built in-house on two separate lines that run parallel to the flex decking line in order to control dimensional quality.) The underground conveyor system, which is 10 feet underground and took 12 weeks to install, takes the completed front suspension directly to the flex decking line. The rear suspension is transported first to a rear alignment station by automated guided vehicles (AGVs), then travels underground to the flex decking line.

The unique DNA of the Jeep Cherokee's Fiat architecture required other changes in some of the plant's processes, including the fuel fill area, the electrical test and the front alignment machines, which have ultimately made the plant much more flexible:

- Past Chrysler vehicles had the fuel fill door on the left side; it is on the opposite side on FIAT-derived

vehicles. The pits in the fuel fill area had to be redesigned in order to allow the operation to be conducted from the opposite side

- During the electrical test, the vehicle is running which creates exhaust, but the exhaust pipe for the Jeep Cherokee is on the opposite side from the Liberty. The plant had to install new ventilation equipment in order to properly vent the test area
- The front alignment machines needed to be rehabilitated, reset and recalibrated in order to accommodate the increased amount of technology in the new vehicle

The plant also installed a new water test booth that will allow for 100 percent of the vehicles to be water tested as part of their final quality checks.

### **Toledo Assembly Complex achieves bronze, sets sights on silver**

For all of Chrysler Group's manufacturing facilities, the implementation of the World Class Manufacturing (WCM) system has been fundamental to the Company's transformation and success. First implemented by Fiat in 2006 and introduced to Chrysler Group as part of the alliance between the two companies in June 2009, WCM is a methodology that focuses on reducing waste, increasing productivity, and improving quality and safety in a systematic and organized way. WCM engages the workforce to provide and implement suggestions on how to improve their jobs and their plants.

As preparations for production of the new Jeep Cherokee began, the Toledo Assembly Complex was also working hard toward achieving a WCM milestone – the bronze award, the first award level on the way to world-class status.

In July 2012, the Toledo facility received the bronze designation 27 months after adopting the WCM operating system, earning a score of 52. Bronze is awarded after earning a minimum of 50 points in 10 technical and 10 managerial pillars by demonstrating clear WCM know-how and competence through pillar presentations and shop-floor project reviews.

With bronze firmly in hand, the Toledo Assembly Complex will be challenging for silver – the next WCM award level – in 2013. Needing a minimum of 60 points, the plant has a very aggressive plan that includes being forklift free in all work stations, implementing visual management processes and focused activity on the autonomous and professional maintenance pillars.

"I am so proud of what the Toledo team has accomplished in a very short time," said Leroux. "They have dedicated themselves to making this one of the top assembly plants in the Company and to ensuring that the launch of the Jeep Cherokee is flawless. This workforce earns my respect and that of the rest of the company for the pace at which they've accelerated the rate of improvement here. They are a remarkable group of car builders."

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