



## Ford Reduces Production Line Injury Rate by 70 Percent for Its More Than 50,000 'Industrial Athletes'

- Since 2003, Ford has reduced its assembly line employee injury rate by 70 percent through the latest ergonomics research, assembly improvements and lift-assist technologies
- Ford ergonomists play a key role in reducing worker injuries by generating data to predict the physical impact of building vehicles; on average, more than 900 virtual assembly task assessments are made for each new-vehicle launch
- Ford uses virtual manufacturing to certify the vehicle assembly process before the first vehicle rolls off the line; the most recent launches to benefit from the technology include the 2015 Ford Mustang, F-150, Edge and 2016 Explorer

**DEARBORN, Mich., July 16, 2015** – Since 2003, Ford has reduced the injury rate by 70 percent for its more than 50,000 “industrial athletes” in the U.S., and many more around the world, through new ergonomics technology, lift-assist devices, workstation redesign and data-driven process changes.

“We refer to our assembly line employees as ‘industrial athletes’, due to the physical nature of the job,” said Allison Stephens, technical leader for assembly ergonomics at Ford. “We have made data-driven decisions through ergonomics testing that has led to safer vehicle production processes and resulted in greater protection for our employees.”

While automotive designers focus on a vehicle’s look and the customer experience, Ford virtual manufacturing experts focus on two key areas – design feasibility and the safety of employees on the production line.

Two to three years in advance of a new-vehicle launch, Ford ergonomists virtually simulate the build process using both human and virtual test subjects to assess the physical labor needed to build a vehicle. In an effort to reduce and help prevent employee fatigue, strain and injury, the data collected is used to guide engineering solutions prior to implementing tasks on the production floor.

### **Core virtual manufacturing technologies**

On average, Ford ergonomists complete more than 900 virtual assembly task assessments per new-vehicle launch, centered on three core technologies – full-body motion capture, 3D printing and immersive virtual reality. Each provides critical data used to evaluate the overall safety of the assembly process for employees, while maintaining high vehicle quality for customers.

Virtual manufacturing experts at Ford use the following tools:

- **Full-body motion capture** provides data on how an employee uses his or her body to move and complete tasks. Through more than 52 motion-capture markers placed on an employee’s arms, back, legs and torso, ergonomists can record more than 5,000 data points to evaluate muscle strength and weakness, joint strain and body imbalance. Similar technology is used across professional sports to improve athletes’ techniques and help them avoid injury
- **3D printing** is used by an ergonomist to validate hand clearance in the vehicle assembly process in those instances in which virtual simulation yields unclear results. Employees with various hand sizes use the 3D-printed model to test how tight the space will be in vehicle assembly – which helps to drive better production decisions
- **Immersive virtual reality** uses a 23-camera motion-capture system and head-mounted display to virtually immerse an employee in a future workstation. Then, the employee’s movements are evaluated to determine task feasibility and proficiency

“Motion tracking technology has been used for more than 30 years to quantifiably assess the technique of athletes and reveal where they may be susceptible to injury from overuse or from forces that will damage tissues,” said Gary Scheirman, vice president for applications engineering, Motion Analysis Corporation. “Using similar technology, Ford can develop state-of-the-art, safe working environments for its employees and produce better vehicles for its customers.”

### **Virtual manufacturing program results**

To date, Ford ergonomists have worked on more than 100 new-vehicle launches globally using virtual manufacturing tools – most recently the 2015 Ford Mustang, F-150, Edge and 2016 Explorer. Through significant investments in the program, not only has Ford achieved a reduction in employee injury rates, it has seen a 90 percent reduction in such ergonomic issues as overextended movements, difficult hand clearance and tasks involving hard-to-install parts.

“Our goal is to provide a healthy, safe and productive work environment at our Ford manufacturing facilities worldwide,” said Michael Torolski, Ford executive director, Vehicle Operations Manufacturing Engineering. “The ergonomics and virtual manufacturing processes support our injury reduction strategy and enable early validation of production-technology changes.”

### About Ford Motor Company

Ford Motor Company is a global company based in Dearborn, Michigan. The company designs, manufactures, markets and services a full line of Ford cars, trucks, SUVs, electrified vehicles and Lincoln luxury vehicles, provides financial services through Ford Motor Credit Company and is pursuing leadership positions in electrification, autonomous vehicles and mobility solutions. Ford employs approximately 199,000 people worldwide. For more information regarding Ford, its products and Ford Motor Credit Company, please visit [www.corporate.ford.com](http://www.corporate.ford.com).