

## Ford, exoskeleton company address strain in overhead tasks

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Credit: Ekso Bionics

Ford workers are testing a wearable exoskeleton at an assembly plant and their shoulders, and backs, can benefit from the program.

EksoVest is a collaboration between Ford and California-based Ekso Bionics. In a video posted back in November, EksoWorks and Ford partnered to prove out the possibility of power—without the pain. In this instance, it has been a bid to give power to the automotive assembly worker without having to cope with stressed shoulders and backs.

The [shoulder](#) is seen as a weak link in most physical assembly tasks. Some workers are affected by physical demands of repetitive overhead work resulting in aches and pains. Some workers on the [assembly line](#) lift their arms an average of 4,600 times per day, or about 1 million times per year, said reports, increasing the possibility of fatigue or injury.

S. C. Stuart in *PCMag*: " Despite advanced virtual [ergonomics](#) planning, the shoulder remains the weak link in most physical assembly tasks for the 3,500 people work here. This is where robotics come in via the EksoVest—not as a replacement (yet), but as an adjunct to human operators."

This upper body exoskeleton technology elevates and supports a worker's arms, making the performance of assembly line jobs easier.

A viewer comment on the video said that "anyone who has worked under their car on jackstands knows how tiring lifting your hands up gets just after a few hours of lifting tools and parts, let alone someone who does this all day,/everyday."

Wearing the vest means less strain on the shoulders and back. Results? According to the video, Ford saw a 90 percent reduction in ergonomic issues such as tasks involving hard to install parts.

EksoVest provides assistance to each arm as they are lifted overhead and, extrapolated over a full shift, after thousands of overhead reaches, it

is a big deal, in relieving the shoulder of a heavy load, as noted in *ExtremeTech*.

The video said support has come from the United Automobile Workers and Ford; the vest is being piloted in two US plants. Tests are planned in other regions, including Europe and South America.

Considering shoulders are costly joints to repair, why wouldn't a car company depending on an assembly line work force be interested? Marty Smets, technical expert, human systems and virtual manufacturing, was quoted in *PCMag*: "We don't want people retiring after 25 years at the plant and not being able to swing a golf club, or a grandchild, because their [bodies](#) are so worn out."

The vest can be adjusted to custom fit each worker. Bill Howard, *ExtremeTech*, had some further notes about the vest. It fits [workers](#) from 5 feet tall to 6-foot-4. "It's somewhat unusual that it's not powered; instead, the force comes from springs," Howard wrote.

The company site said the [worker](#) will get a noticeable level of support for [overhead](#) tasks (1) that [require](#) either no tools at all or (2) tasks requiring tools that weigh up to approximately 8 pounds.

[Smets](#): "We'd seen so many exoskeletons being developed, but nothing purpose-built for automotive manufacturing."

A prototype vest from Ekso Bionics weighed more than 15 pounds. The lighter version used in the tests was 3D-printed, said *ExtremeTech*.

What's next? Currently, a production study is going on where operators can choose to wear the vest and participate in the study. Next comes the lab phase, where data to compare levels of injury and strain for those wearing, or not wearing, the exoskeleton support can be captured.

Interestingly, Ekso Bionics at one time was largely known for its presence in the medical sector, as the company behind an exoskeleton to enable paraplegics to walk.

But Russ Angold told *IEEE Spectrum* last year that he had found a demand in the industrial sector. "In 2015 we started getting a lot of inquiries, cold calls coming in, with people asking, 'Where's our construction exoskeleton, where's our industrial [exoskeleton](#)?'"

**More information:** [eksobionics.com/eksoworks/ford/](https://eksobionics.com/eksoworks/ford/)

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