Connection Correction

A creative alternative to stock hub actuators

When someone with a Ford F-150, Ford Expedition or Lincoln Navigator comes into the shop, complaining about a grinding sound from the fourwheel drive, there's a common diagnosis: a bad vacuumactivated front axle hub actuator. The internal diaphragm on these parts wears out from regular use, or cracks from lack of use, as well as poor internal lubrication. The grinding happens when the splined actuator doesn't have the vacuum it needs to fully engage the axle shaft. Eventually the vacuum leak expands, preventing the system from working at all.



600-405

Ford Expedition 2015-03, F-150 2015-04,
Lincoln Mark LT 2008-06, Navigator 2015-03

"This is a good example where we were able to give vehicle owners more freedom to fix their vehicle however they choose."

– Steve Butcher, Product Manager (Undercar)
Dorman Products

Knowing how commonly they fail, we made a direct replacement, but our engineers wanted to find another solution. They wanted a different method for activating the hub locks. The thing is, with the actuator sandwiched between the hub and axle, designing a whole new system would be impractical.

However, most people assume that locking the hubs also engages the four-wheel drive. That's actually not the case. They're two dependent, but separate, operations.

The hub actuators connect the axle shaft to the wheel hub automatically when 4WD is selected. More





Grease Fittings
allows end user to easily lubricate the gear

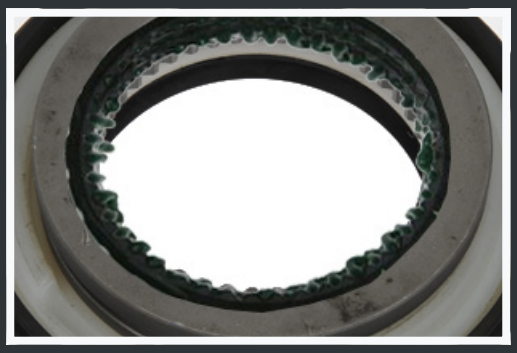
Staked Plugs
allow for original vehicle vacuum lines to connect without the need to cut or splice hoses

accurately, they disconnect the axle and hub when the 4WD system is not engaged, reducing driveline loss caused by spinning an otherwise non-rotating axle.

So, while the hubs must be locked for 4WD to be engaged, they can also be locked when the vehicle is in 2WD. Doing that sacrifices a small amount of driveline efficiency, in exchange for greater dependability, by eliminating the troublesome functionality.

With that realization, our engineers built a first-of-its-kind independent wheel end coupler vacuum delete kit. Designed to be replaced as a pair, this patent-pending product looks and fits like the original, but simply establishes a robust, permanent connection between the two components. It also includes vacuum caps on the hub, for holding the remnant vacuum lines, in case the owner ever wants to revert to the original design in the future.

"We have a lot of respect for OEMs. It's just that sometimes they make engineering tradeoffs for various reasons, and the designs can be more trouble than they're worth," said Steve Butcher, a Product Manager in our Undercar unit. "This is a good example where we were able to give vehicle owners more freedom to fix their vehicle however they choose."



OE Problem:

The original wheel end actuator on certain vehicles is highly failure prone, leading to a loss of vacuum, and an inoperable 4WD system.



OE FIX

We found that the hub locking actuator created significant problems without adding much value for many owners. This patent-pending vacuum delete kit restores critical operation, while eliminating failure-prone features, and adding increased durability and serviceability.

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