

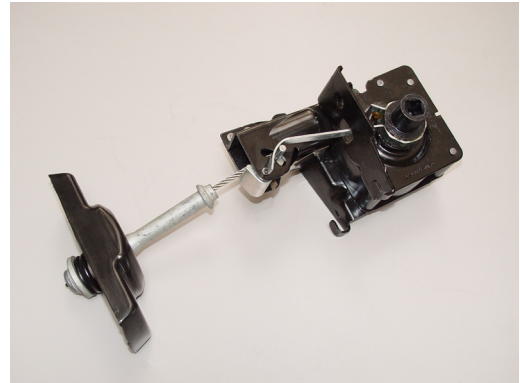
# SPARE TIRE CARRIER ASSEMBLY

## Challenge

In the manufacturing of the Spare Tire Carrier Assembly used in trucks and vans, the final assembly goes through an end of line effort/functional test. The spare tire carrier is used to lift, lower and hold the spare tire on the vehicle. In this application, the torque on the lift mechanism is measured to determine if the assembly is within the product specifications.

### Application Requirements:

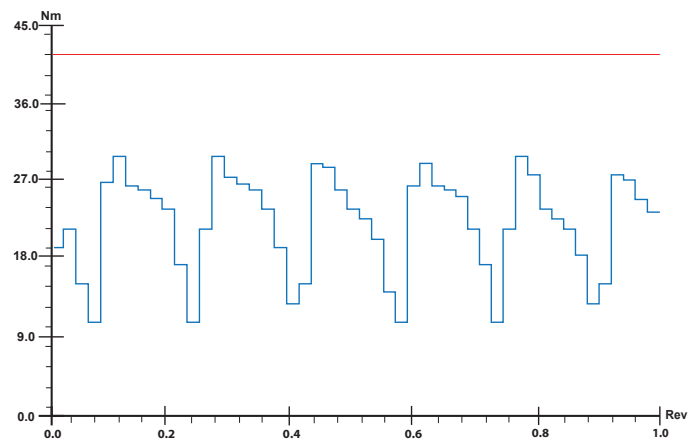
- Torque Range of 50Nm
- Measure and gauge the peak torque per product specifications
- Set the cable length to 800mm, shipping position
- Measure and gauge the force from an external load cell
- Data Acquisition for part traceability
- A Plug and Play torque monitoring system



## Solution

The TorquePRO system was used because it can do both the motion control and the monitoring (torque and force) for the entire effort testing process. The process starts with the TorquePRO winding up the cable until the torque reaches 20Nm. At this point the tire support on the end of the cable comes in contact with a fixed stop on the machine. The TorquePRO then rotates an additional 3 revolutions and during this motion the Promess Motion Controller acquires the torque data. From the data acquired, the system then retrieves and gauges the peak torque. If the peak torque exceeds the process limits, the system will fail the part.

The Promess Motion Controller also monitors an external load cell mounted within the fixturing of the machine. The load cell is used to measure a characteristic called tire squash and indicates that there is tension applied to the carrier cable. From the data acquired from the load cell, the peak force is measured and gauged. The torque and the force values are stored after every test into a data file for later process analysis.



Torque vs. Revolution Signature