

Bulletin 013-01/2013 Revised March 17 2014

Subject: Failure of Front Wheel Spindles on Large Motor Graders.

Affected Product: 16G, 16H, 16M, 24H, 24M Motor Graders.

Risks Identified: Failure to apply the recommendations in this bulletin may increase the risk of spindle failure.

Problem Overview:

Fractures have occurred in front wheel spindles on large motor graders used in mining applications. The images below show the two types of failure mode that have been observed.



If a front wheel spindle fractures, the front wheel assembly may separate from the machine with the potential to cause personal injury, and/or property damage.

Caterpillar has provided the following advice regarding this issue:

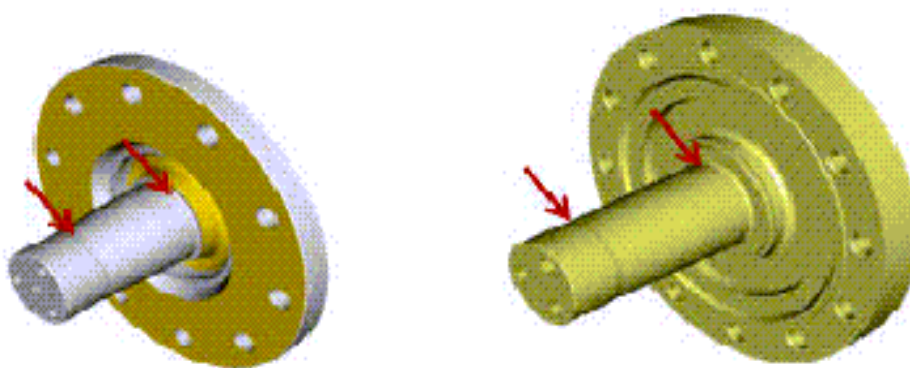
“The front wheel spindles will fail in certain applications due to impact or overload conditions. The anticipated design life of the front wheel spindles is 24,000 hours. Actual life achieved will vary according to outside influences such as site conditions, machine operation, machine application, and optional attachments fitted to the specific machines.”

Caterpillar has published two Service Magazine articles announcing improved parts:

Media number SEPD1533 announcing the availability of a more robust 383-1185 front wheel spindle for 24H and 24M motor graders. This new spindle became effective in production from serial number B9K654-UP, and is adaptable to 24H and 24M machines, serial numbers 7KK1-UP and B9K1-653.

Media number SEPD1701 announcing the availability of a more robust 437-8983 front wheel spindle for 16G, H & M series motor graders. This new spindle became effective in production from serial number R9H893-UP. It is adaptable to the following 16G, 16H and 16M machines: 93U1-UP, 6ZJ1-UP, ATS1-UP, B9H1-UP and R9H1-892.

Front wheel spindle fractures have been occurring at the base of the spindle behind the outer tapered roller bearing, and also near the bottom of the tapped holes in the spindle retaining bolt hole area. These locations are identified in the illustration below.



16G/H/M spindle

24H/M spindle

To reduce the risk of an unexpected spindle failure, this bulletin outlines recommendations for additional inspections of the spindle, and replacement of the spindle after 24,000 hours service. It is recommended that the outcome of all spindle inspections be recorded in the machine's maintenance log.

Recommendations:

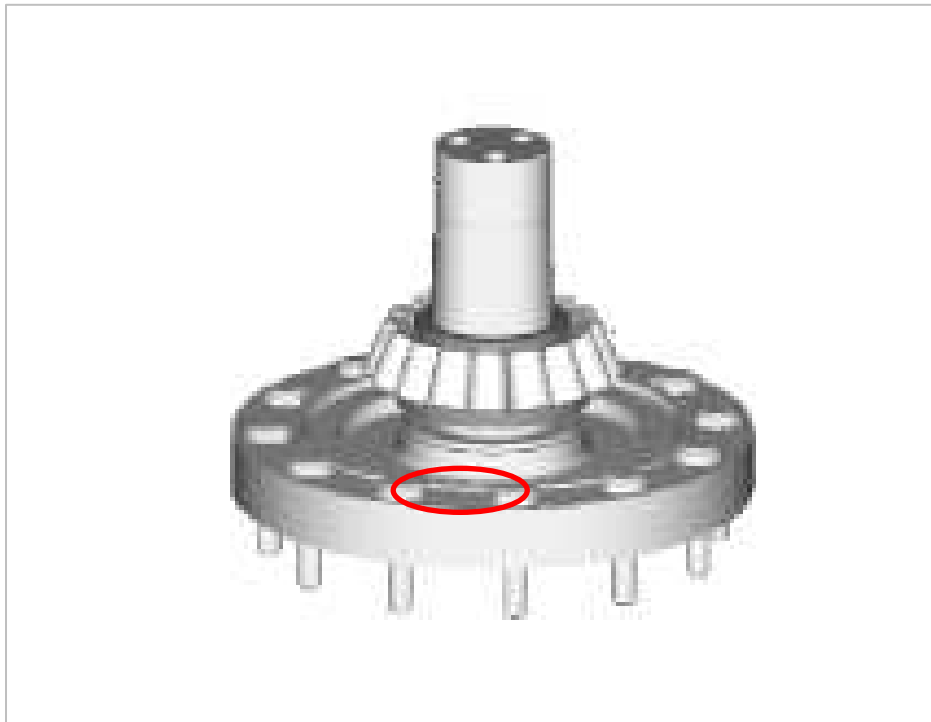
At 12,000 part hours or first life overhaul, remove and inspect the front wheel spindles. Perform a visual inspection and a magnetic particle examination of the spindle. Also, perform ultrasonic testing in the area around the retaining boltholes. Do not reuse spindles that have crack indications at any location.

At 24,000 part hours or second life overhaul, replace the spindles with the latest part available.

Perform the above NDT inspections immediately, and at 6,000 hour intervals thereafter, if any of the following occur:

1. **The machine is involved in an incident** where the spindle has been subjected to impact forces significantly greater than those encountered in normal operation.
2. **There is impact damage evident** on the following components: the front axle assembly e.g. arm assembly, spindle housing, lower spindle housing pivot pin (kingpin) retainer bolt and washer.

If a crack is detected during any inspection, discard the front wheel spindle and replace with new, using the latest part available. Replace any other damaged parts. If no cracks are detected, mark the front wheel spindle as an acceptable reusable part with an air engraver or steel stamp set. Mark all front wheel spindles on the inboard face of the rim flange as per the illustration on page 3.



If "1 - 12" was marked on a front wheel spindle, the "1" would indicate the first inspection, and the "12" would indicate that there were 12,000 hours on the part at the time of inspection.

Contact Details:

For more information concerning this bulletin, including inspection procedures, please contact your Hastings Deering Product or Mining Support Representative.

This bulletin is to inform you of the recommendations of the supplier in respect of issues dealt with in the bulletin and should not be used as specific advice in respect of any particular events. Advice from a qualified repairer should be sought in respect of any particular events and Hastings Deering (Australia) Ltd accepts no responsibility for any loss or damage occasioned by a party using this general bulletin.