

Reference Number	Bulletin 02 – 2018
Affected Product	All Terex/Unit Rig MT3700 & MT4400 trucks with 1"-14TPI front wheel studs
Risks Identified	Potential separation of front tyre and rim from wheel hub, or rim rotation on hub.
Release Date	November 20 2018

MT3700 & MT4400 front wheel fasteners: potential for insufficient rim clamping

Introduction

In some circumstances, there is the potential for a front wheel to be insufficiently clamped to the wheel hub when a wheel is removed and replaced. Contributing factors can be:

- The use of incorrect procedures and torques to tighten wheel nuts
- Failure to recheck wheel nuts as per the OEM procedure
- Incompatible clamps and studs
- Distortion, wear and corrosion of individual components.

There have been several previous changes and improvements made to Terex and Caterpillar wheel studs and wheel clamps. These changes include improvements to the strength, material grade and resistance to distortion under load. Hastings Deering is aware of a number of aftermarket fastener providers, which further increases the risk of a mixture of incompatible components.

If incompatible, worn, or distorted components are used during wheel installation, there is the potential for the wheel nut to be wound up to the unthreaded shank area of the stud before the clamp can fully secure the wheel to the hub. If this occurs at several stud positions, there is the potential for the wheel to loosen and separate from the machine, or for the wheel to index relative to the wheel hub and cause deflation of the tyre. Worn, distorted, or incompatible components may include clamps, studs, wheel rims and hubs.

NB. Insufficient clamping can be difficult to detect if the wheel installer is not alerted to this potential issue.

Suggested Actions

1. Only compatible current part number wheel fasteners should be used in any wheel change-out, repair or overhaul.
2. Remove former part number fasteners from on-site parts stores and replace with current parts.

3. Ensure only the correct, current part number front wheel studs, clamps and nuts are used. The current Caterpillar part numbers are the 431-5755 stud, 431-5754 clamp and 450-7323 nut. There is also a service replacement stud that has extended length threads at the wheel hub end, part number 519-5807 - refer Service Magazine* M0077574. The extended thread length at the hub end is used when the hub end threads have been damaged due to corrosion or thread wear.
4. The reuse of previous part number studs and clamps, or a mixture of aftermarket fastener components is not recommended. Some former parts have lower mechanical properties than current parts, and there is a risk of incompatible parts being used together. If aftermarket wheel fasteners are to be used or reused, the responsibility to ensure these parts are equivalent to the currently specified Caterpillar fasteners, and compatible with the other mating parts falls on the supplier and installer.
5. Whenever a wheel is replaced, all studs, clamps and nuts should be subjected to critical inspection to determine whether they can be safely reused:

Clamps: Check for wear and corrosion at the contact feet, galling wear at the nut seating surface, and distortion or flattening of the clamp. Current clamps, part number 431-5754 are made of improved material and will better withstand galling and higher loads before distortion occurs. To assist in evaluation of used clamps, a new clamp should be used for comparison purposes.

Studs: Inspect shank and threads for foreign material, corrosion, damage and thread wear. Replace studs with surface defects, thread damage and pitting corrosion. Pitting damage and surface dents in shank area can lead to fatigue cracking. Ensure the stud is installed using the OEM specified procedure and that the shoulder is seated against the wheel hub mounting face.

Nuts: Replace nuts with worn or damaged threads or galling on seating face.
6. When the clamp is placed over the stud at wheel installation, ensure there is enough stud thread available below the flanged nut seating face of the clamp at all positions. As the wheel rim seats on the hub taper during the tightening process, ensure the rim is evenly seated on hub and that there is enough thread available to securely clamp the wheel at all locations. Use light engine oil on nut and stud threads. Do not use grease or anti-seize compounds – these will result in excess loads on all components affected by the assembly, including excess tensile loads on studs. These excess loads have the potential to cause distortion or failure of components.
7. Do not exceed OEM specified front wheel nut torque: 525 to 550 foot-pounds (712 to 746 Nm).
8. Remove any loose corrosion or paint on the mating surfaces of the wheel and hub.
9. The wheel nuts need to be retorqued after the machine has returned to work, as per the Unit Rig service advisory* T11081 rev 01**, or any superseding published Caterpillar bulletin.

10. After a repair, brake testing should not be conducted until the truck has been driven, manoeuvred and the wheel nuts retorqued at least once. Failure to do this may result in the front wheel indexing on the hub causing damage to the associated components and deflation of the tyre due to valve stem damage. This initial retorque before brake testing does not replace the need to retorque nuts after the truck has returned to work as per item 9 above.

* *Click on document number to open.*

** *T11081 rev 01. Please note, all part numbers listed in the Terex advisory have been superseded by Caterpillar part numbers. All other procedures are current.*



Figure 1 - Note the thread projection on wheel stud closest to camera is greater than the adjacent stud. The nut seating surface of the clamp appears flattened. The wheel nut in this position may be binding on the unthreaded stud shank, reducing the clamp force imparted to the wheel.

As a guide, if there is 10mm or more of stud thread projection above the nut, the clamp and the stud should be inspected to ensure the nut can NOT bottom-out at the end of the threaded section of the stud before the clamp can be effective.

If the nut can bottom-out, the defective stud, nut or clamp must be replaced. It is good practice to replace all components at an individual wheel position with new components as a set.



Figure 2 - UNACCEPTABLE stud and clamp combination, the stud thread ends above the nut seating surface of the clamp.

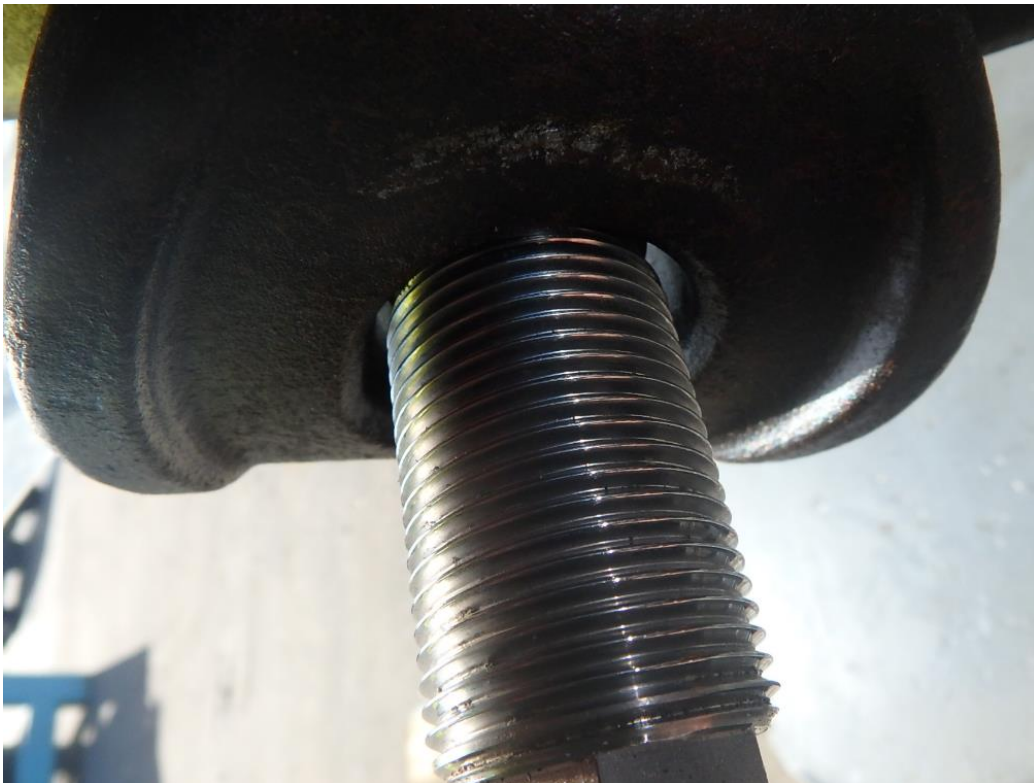


Figure 3 - ACCEPTABLE stud and clamp combination, the stud threads extend below the nut seating surface of the clamp.

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