

**Workplace Health and Safety Queensland**  
**Yongmao Hoist Rope Swivel Incident**  
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## Purpose

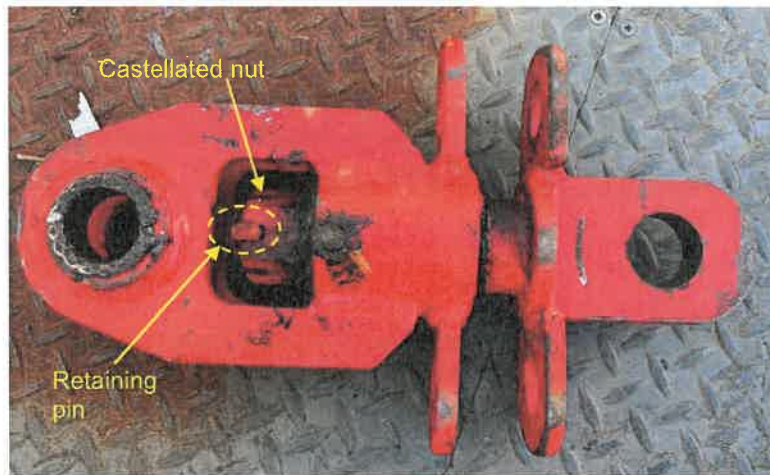
1. To report on an incident involving a Yongmao STL 420 tower crane and to provide initial guidance on how to avoid similar incidents on other tower cranes. Investigations into the exact cause of the incident are continuing.

## The Incident

2. The tower crane was attempting to lift an 11 tonne precast concrete panel when the hoist rope termination assembly detached from the tip of the boom. The panel dropped a short distance onto the semi-trailer that had delivered the panel. However, the hook block dropped approximately 10 m to the ground along with approximately 80 metres of hoist rope. Although no one was injured, the incident had potential for major consequences, especially if the precast panel had dropped from height.
3. The hoist rope was found to be intact, however early inquiries indicate the retaining nut from the rope termination swivel appears to have unwound so that the swivel and rope termination disconnected. Normally, assuming the swivel is operating as intended, a split pin would pass through a castellated retaining nut and the male threaded section of the swivel (refer Figure 1) to prevent the nut winding off. One type of hoist rope swivel termination assembly used on Yongmao tower cranes is shown in Figure 2 (design differs to that involved in the incident).
4. A serious fatal incident occurred on a tower crane in Victoria in 2018 due to a similar cause.



**Figure 1** – Intact male threaded section on swivel (split pin passes through hole)



**Figure 2** – One example of a hoist rope termination swivel showing castellated nut

### Action required

#### Yongmao tower cranes

5. All hoists rope terminations on Yongmao tower cranes need to have their hoist rope anchorages inspected and split pins replaced as a ***matter of urgency***. This includes both two and multiple fall examples irrespective of whether the hoist rope is terminated at the boom tip or on the hook block.
6. The inspection should be carried out by riggers experienced at working at height on tower cranes. As with any rigging work associated with tower crane erection, riggers should work in pairs with a rescue procedure in place.
7. Split pins should be replaced with brand new split pins that comply with the tower crane manufacturer's specifications (i.e. size, material type and grade and protective coating).
8. A photograph should be taken of the brand new installed split pin. A signed inspection certificate completed by the senior rigger involved in the inspection should also be provided to site management. Figure 3 shows a new split pin installed on a castellated nut.



**Figure 3** – Photograph showing new split pin installed through castellated nut

Other tower cranes with similar rope terminations

9. Many other tower cranes have similar design hoist rope end anchorages that incorporate a swivel and nut assembly. Documented evidence that the swivel assembly, including the split pin (or similar secondary locking device specified by the crane manufacturer), has been inspected should be available and be provided to WHSQ Inspectors upon request. The inspection is to be in accordance with the crane manufacturer's instructions at an inspection interval not exceeding that specified by the crane manufacturer. In addition, there needs to be documented evidence that the swivel assembly has been inspected at the time the tower crane was erected (i.e. commissioning inspection) and at each subsequent annual crane inspection (where the tower crane is erected for more than 12 months). Where there is any doubt about the integrity of the hoist rope end anchorage assembly the assembly should be inspected as a matter of urgency following the same procedure as detailed for Yongmao tower cranes above.

**Johanna Sutherland**  
Executive Director  
Specialised Health and Safety Services  
Office of Industrial Relations

