

TOW COUPLING AND BOLT IN TOW-EYE SECURITY

Tow couplings can cause problems when they are not serviced or maintained correctly and neglect in this area could eventually lead to failure because of the significant cyclic loads imposed upon them during normal service.

Generally, truck-mounted tow couplings are bolted onto the truck drawbeam through a mounting flange. The tow coupling is secured by a single large securing nut which is torqued to manufacturer's specification. The nut is then locked using a split pin.

'Bolt in' drawbar tow eyes, while not overly common, can be a cause for concern if not installed and maintained correctly.

It cannot be stressed enough that the manufacturer's preparation and installation methods for tow couplings and bolt in toweyes should be strictly followed.

In the case of an incorrectly fitted or maintained tow coupling or bolt in toweye the large number of stress reversal cycles they are subjected to can cause thread pitches to become worn, loosening the coupling shank or nut, which in turn allows the nut to be pulled over the thread on the shank resulting in the trailer becoming detached.

TENSIONING

The difficulty with tow couplings as with any other bolted fixture is in ensuring that the fixture is correctly tensioned (or preloaded/torqued) when assembled. Insufficient preload caused by an inaccurate tightening method, is a frequent cause of bolted joint failure. A properly torqued bolt is one that is stretched such that it acts like a very rigid spring pulling mating surfaces together. The rotation of a bolt (torque) at some point causes it to stretch (tension). Several factors affect how much tension occurs when a given amount of tightening torque is applied. This highlights the importance of installing and tensioning coupling security nuts in accordance with manufacturer's advice. That would include adhering to recommendations regarding future re-tensioning and inspection intervals.

RECOMMENDATION

When inspecting either the mounting nut on the tow coupling or the bolt in tow eye, ensure full and complete security of these items. Any looseness, witness marks or rust signs on the nut or washer, or that the washer is showing signs of "cupping" indicates that the coupling is loose would immediately be cause for rejection and replacement.

Pictures of this failure mode are provided on the right. Note in the top image that there is clearance between the retaining nut, washer and tow-eye boss. The retaining nut to washer interface shows cupping of the washer and signs of rust inclusion. As mentioned, these are signs that the tow-eye is not fully secure in its boss. The retaining nut is still locked in the position that it was originally tensioned to by use of a split pin. That suggests that checking the nut and split interface is not a reliable indicator of coupling security.

REPLACEMENT RATHER THAN REPAIR

The seemingly obvious repair (as with other bolted fixtures that come loose) would be to remove the split pin and re-tension the retaining nut. On less critical parts and components that might be an option, however, in the case of bolt in tow couplings that practice is unacceptable as **just tightening the assembly is not adequate to provide continued safety.**

In the top image the bolt in tow-eye has come loose without the retaining nut backing off which suggests that the retaining nut and tow-eye shank threads have worn significantly. Attempting to retention those worn threads would be impractical and potentially inviting later failure.



Picture showing signs of unserviceable tow-eye.



Fairly typical example of fitment into a drawbar.



Picture showing the securing nut on a typical pin type coupling fitted to a drawbeam.

1
November
2014

VIRM amendment

On 1 November 2014 the next amendment to the **VIRM: In-service certification (WoF and CoF)** comes into force.

This will be a fairly sizeable amendment, taking in changes brought about by vehicle licencing reform, updates due to Land Transport Rule amendments and a few other changes.

Keep an eye out on the news section of the **Vehicle inspection portal** and the amendments page so you can download your List of changes and screenshots package.

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