



Technical Bulletin / Safety Alert

Unique ID No: GEN2010-TBSA-01

Rev: 1

Subject: Refurbished Steering Arm Failure

Date: 8/04/2011

Applicable to: Refurbished Steering Arms on Dana Axles model No. 278 & 211.

Details of Revision: 0. Original Issue
1. Revised flanged nut installation tension in line with OEM designation.

Note: Minimum PPE required to carry out any inspections contained in this TBSA shall be protective clothing & footwear, safety glasses, hearing protection & any site specific requirements. A JSA or equivalent should be carried out prior to performing these tasks.

Occurrence:

An ODS steering tie rod arm dislocated from the front axle steer arm on a Driftrunner whilst in operation at a Southern District Mine. Investigation into the steering linkage failure was conducted solely on the examination of the front axle as delivered to VLI Tomago branch.

Investigation & Cause:

Listed below are the results from the investigation:-

- The initial inspection revealed steering control had been compromised due to failure of a refurbished steer arm which retains the ball joint/tie rod assembly. As a result of the dislocation the tie rod shaft was also damaged.



Dislocated left hand side steering arm and tie rod linkage.



Enlargement of the dislocated steering components

- The steer arm had been refurbished through fitment of a machined bush. Internal records did not identify a date of modification.
- As shown in the photos below the bush has a flanged lip on the top outer edge with mating recess machined into the upper surface of the steer arm.
- The retaining nut is visibly smaller than the outside diameter of the bush and no washer is evident.



Flanged bush still fitted to the ball joint



Machined recess in steering arm

- In this configuration the ball joint/tie rod assembly has relied solely on the interference fit of the bush in the steer arm.
- A breakdown of the bush/arm joint has resulted in the bushed assembly being dislocated from the steer arm.

Results:

- VLI Diesel have developed a flanged nut and split pin arrangement that effectively retains the ball joint in the steer arm and eliminates the need to fit a washer. The flanged nut and split pin are suitable for use on both new and refurbished steer arms.



Flanged nut and lock split pin



Flanged nut fitted to a new ball joint/ tie rod

Recommendations:

Immediate Action:

- All Driftrunner steer axles should be inspected for steer joint integrity.
- Axles identified with refurbishment bushes installed in the steer arms should replace the existing retaining nut with the new flanged retaining nut and split pin arrangement. The nut (Part No. 5-04235601) should be tensioned to 260-290Nm (192-214 ft-lb) and lock split pin installed.
- For existing steer assemblies a hole may be required to be drilled through the ball joint for fitment of the split pin. The flanged retaining nut should be correctly tensioned and opposing slots in the castellated flange nut used as a drill guide. Drill 5mm diameter hole halfway through threaded shaft and through from opposing side. The split pin should then be installed.



Future Action:

- All newly refurbished steer arm assemblies are to be fitted with new ball joints and the flanged retaining nut arrangement.
- All replacement tie rod arms are to be fitted with the flanged retaining nut prior to stock entry.
- All new steer arm assemblies to be fitted with flanged retaining nut arrangement.
- Steer arm assembly inspection to be included in routine maintenance schedule.

Conclusion:

Ensure all OEM components supplied through the VLI store are quality checked for all recommended modifications.
Only OEM components should be used.

Please ensure this document is circulated to all relevant personnel within your organisation.

Should you have any further queries please contact your VLI Diesel Representative.

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