

TECHNICAL BULLETIN

DOCUMENT NUMBER:- 913-6 TB 1- 0908

Document name:- “Failure of Differential mounting bolts on bolster”

Date: - 16/09/08

This document was produced to inform the owners and operators of Anderson Industries 913-6 LHD vehicles about an incident that occurred on a mine site that caused a fire on board the vehicle.

Applicable to:-

This is applicable to all 913-6 Anderson Industries LHD vehicles or similar bolster designs

Description of the incident

An operator was cleaning the boot end of a section panel with the 913-6 LHD vehicle and while driving the vehicle he heard one large “bang” noise under the vehicle. He continued driving the vehicle until he noticed some smoke coming under the covers on the vehicle.

He grabbed the fire extinguisher on board and put the flames out immediately.

The incident happened within the hazardous zone of the mine.

Investigation

The incident occurred on a 913-6 LHD vehicle where the failure of the differential mounting bolts snapped, allowing the differential to lift from the bolster cradle and therefore become misaligned allowing the small drive shaft between the transmission and the rear differential to rub on the mainframe of the LHD causing heat and igniting external oil and coal dust in the immediate area.

The 3 bolts out of 4 appear to have failed in tension due to the necking noticed on the area just below the bolt head. The fourth bolt has evidence of the nut being stripped on the bolt.

The evidence also shows that the differential was not sitting down correctly inside the bolster cradle as evidence of dirt was found between the faces. Approximately 2 to 3 months before this incident about July, 2008, during a routine inspection it was identified that 2 differential mounting bolts out of the 4

were broken on this occasion. The mine site personnel installed 2 new bolts and replaced the other nuts on the other 2 bolts as a precaution. It was possible coal dust/loose dirt had been caught between the 2 mounting surfaces and differential has worked itself loose during further operation causing additional stress loading on bolts



As can be see from this photo the top end of the bolster appears to have some compression marks on the face between the differential and the bolster, while the bottom end only had loose dirt sitting on the faces indicating no compression between the faces.

Recommendations and further inspections

1. It is recommended that all 913-6 LHD's with similar design bolsters check all differential mounting bolts for tension as recommended by the OEM's as soon as possible and record information in safety file. Action to be taken as identified.
2. All bolts to be high tensile in grade 8 or better
3. All washers are to be high tensile
4. All nuts should be a nyloc nut with consideration for a high tensile nut double locked if nyloc nuts not available. No evidence shows that a nyloc nut is any weaker in construction than a standard high tensile nut. Both nuts have the following characteristics according to the bolt manufacturing charts
 - Tensile strength – 150,000 lb
 - U Yield – 130,000 lb
 - Proof test – 120,000 lb
5. All faces to be checked to ensure no movement is evident between the bolster frame and the differential as shown in photo below.
6. Monitor the free movement of bolts in the differential housing and repair or replace as required if movement becomes too excessive due to wear.



Check for no movement in this area and also dirt built up under the faces

7. All bolts to be checked for tension every 250 hours of operation. This could be done by simply a tap with the hammer. Every 1000 hours should use a tension wrench.
8. If bolts found loose faces between the bolster frame and the differential are to be cleaned before re-tensioning.

For any more information please contact Dominic Posavec of Anderson Group of Companies