



Anderson Industries

BULLETIN NO: TBSA (0504)
DATE 25.06.07

Technical Bulletin

This safety bulletin is an update to the original safety bulletin number NSW 01-07 that was sent out to the industry after the incident mentioned below. The Department of Primary Industries placed a section 91 notice on Anderson's in regards to the incident.

After the investigation it was identified that this modification must be carried on all machines fitted with the Anderson/Elgin system, therefore this alert to the end user.

Relevant Approvals and Schematic References

913-6. DES 16012 –AIQDWG 244 Rev 2 or AIQDWG 245 Rev 2

Wright HD 356 LHD. DES 5401 - AIQDWG 220 Rev 2 or AIQDWG 221 Rev 2

Wright 120G Grader. DES 15026 - AIQDWG 246 Rev 3 or AIQDWG 247 Rev 3

INCIDENT:

It was identified by a NSW U/G coal mine and by the investigation following, that a 913-6 LHD vehicle with a DES approval held by Anderson Industries PTY LTD was driven underground in a service bay area with the engine running for 4 to 5 minutes without any water in the scrubber. It was found as part of the investigation that the plastic floats in the scrubber were melted as a result. At the time the machine was fitted with an “Out of Service Tag” stating that there were repairs in progress and the machine was waiting for parts.

The investigation concerning this report is “how was the machine able to be started without any water in the scrubber?” It is also being assumed (as reported) that no adjustment was made by the operator to the safety circuit system and that the machine started without interference.

CIRCUMSTANCES:

The LHD in question had been experiencing recent reliability issues with the low water shut down protection system and a number of authorised and unauthorised personnel had been adjusting the safety system pressure to attempt to rectify the problem.

INVESTIGATION:

The investigation focused on two areas, one being possible mechanical component failure and the other being adjustment by unauthorised personnel.

To determine if there was component failure a check list was developed as below

1. Verify the integrity of the existing pressure regulator gauge. This was done by fitting an additional gauge between the pressure regulator and the flow control and one after the flow control valve.
2. Regulated pressure stability to be confirmed to ensure the pressure was not creeping up or down on its own.
3. Adjustment of flow control valve to be confirmed to match the approval specifications
4. Set and check the complete system to ensure it is compliant as per the approval.
5. Evaluate to determine the upper pressure setting required to render the safety system inoperable, to be done with all other related parts/components in their existing state. This would effectively override the circuit at a certain high setting by supplying more air to the system than the system could exhaust in the shutdown mode.
6. Once the system was evaluated the original pressure regulator was to be replaced and then stripped and internally inspected.

To prevent adjustment of the safety circuit by unauthorised personnel

Limit/restrict access to operators or unauthorised personnel by modifying the cover over the top of the safety circuit adjusting valves by replacing the hexagon headed bolts with button head bolts.

To further restrict access under this cover, fit raised rings welded around the button head bolt areas, therefore requiring different tools than those regularly carried by the majority of personnel underground.

Results

1. The pressure gauge was verified as serviceable but slightly inaccurate as the original gauge pressure was showing 26 psi (185 kPa) and the two new gauges fitted were showing 24 psi (170 kPa), therefore 2 psi (15 kPa) lower. This setting was still within approval specifications.
2. Regulated pressure set at 26 psi (185 kPa) was checked for creep over 10 minutes and the pressure did not change within this period, therefore the regulator was operating correctly.
3. Flow control valve was adjusted to as per the procedure. No problems with flow control valve found.
4. A complete check of the system components was carried out and confirmed there was no incorrect hosing or unapproved items fitted.
5. The pressure regulator and the flow control valve were replaced, disassembled and showed some evidence of contamination, but it was not determined that any of the contamination actually caused a system failure.
6. Machine had a very recent Code D mechanical inspection completed and a 1000 hour service prior to delivery to the mine. This included inspection and verification of the shutdown system, scrubber floats and the DES system.

7. Two separate 913-6 vehicles with the same DES system were also tested to check the upper pressure to make the safety system inoperable. With the flow restrictor set in a similar position, it was confirmed once the regulated pressure was at 38 psi (270 kPa) and above the system becomes inoperable and was not able to be shut down.

Summary:- The findings did conclude that if the pressure regulator was set at 38 PSI (270 kPa) or above, the safety system could be rendered inoperative and therefore not shut the engine down if a fault occurred in the safety system. Recommended pressure is and always was 26 psi (185 kPa) therefore allowing 30 % variance as a minimum.

RECOMMENDATIONS AFTER THE INCIDENT:

1. Anderson's as the designers of the system are to review the design risk assessment and come up with solutions to reduce the risk of unauthorised personnel tampering with safety system. **(Completed)**
2. Anderson's as designers to carry out a design risk assessment (FMEA) on the control circuit and implement the outcomes. **(Completed)**

Outcome and recommendations after the completed risk assessments and FMEA's.

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Wright HD 356 LHD. DES 5401 - AIQDWG 220 Rev 2 or AIQDWG 221 Rev 2

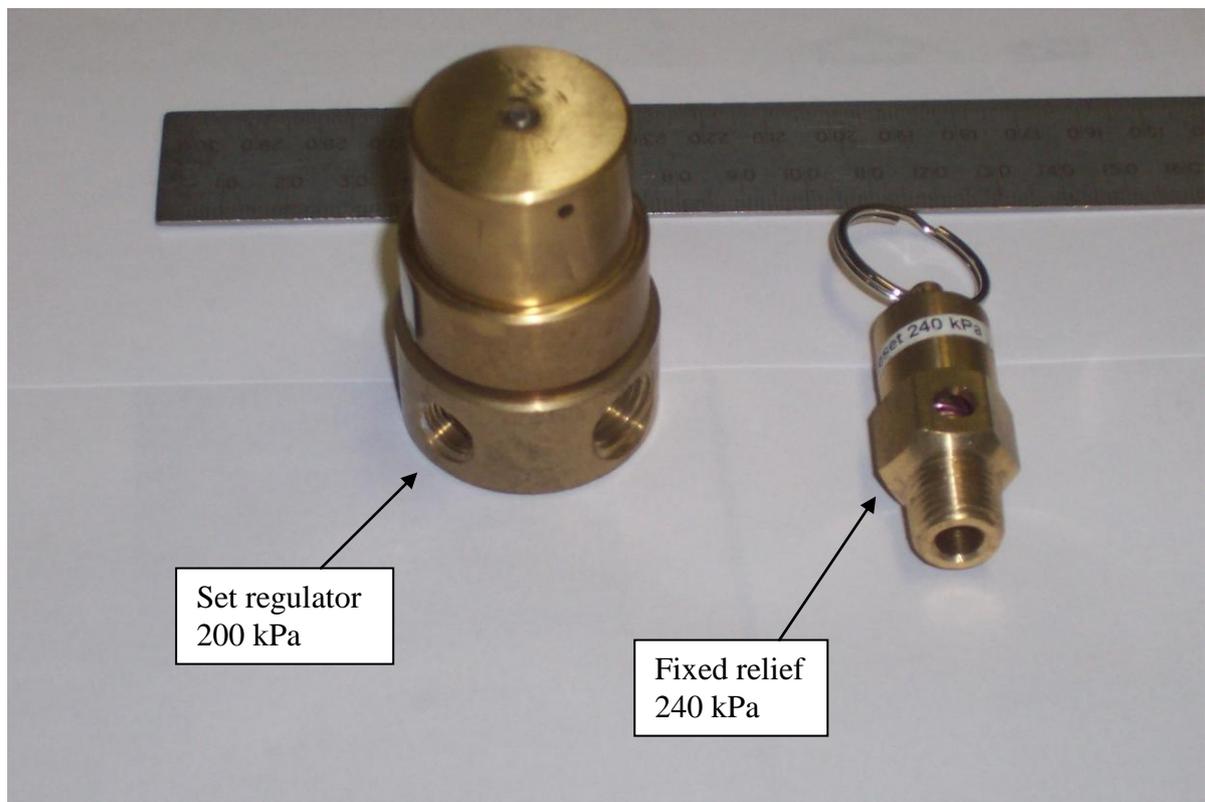
1. All 913-6 machines are to have socket headed cap screws replace the hexagon headed bolts on the cover over the top of the compartment containing the regulator
2. Install welded rings around the cap screws on the 913-6 machine.
3. Replace the existing adjustable regulator with a tamper proof low pressure pre-set regulator (29 psi, 200 kPa) Part number – AIQ 00741.
4. Install a fixed relief valve (35 psi, 240 kPa) Part number – AIQ 00742 to the safety circuit as per relevant schematic for each machine
5. Relocate the fixed restrictor Part No.AIQ00253 to a position prior to the low water shut down valve as per the relevant schematic. For the 913-6 LHD it is Item 14 and the Wright HD 356 LHD it is Item 9.
6. All end users to introduce and train their personnel on the Workplace instruction “WI-WSHOP 19 A1”.

Wright 120G Grader. DES 15026 - AIQDWG 246 Rev 3 or AIQDWG 247 Rev 3

7. Replace the existing adjustable regulator with a tamper proof low pressure pre-set regulator (29 psi, 200 kPa) Part number – AIQ 00741 – Item 7.
8. Install a fixed relief valve (35 psi, 240 kPa) Part number – AIQ 00742 to the safety circuit – Item 31
9. On early machines if not already done is recommended to remove check valve and flow control restrictor on park brake circuit and use engine oil to supply pilot pressure to 3/2 valve. Plumb circuit as per above Schematics. This eliminates need for ongoing adjustments.
10. If experiencing water contamination on brake circuit it is recommended to install individual water separators/lubricators on each brake circuit as per TBSA -0500.
11. All end users to introduce and train their personnel on the Workplace instruction “WI-WSHOP 19 B1”.

All Machines

12. End user to carry out Tool Box talk on the modifications as per this document.
13. Personnel are not to operate machinery, equipment fitted with “Out of service Tag” unless they are competent and understand the consequences in doing so and the mine isolation procedure allows them to do it. (End user responsibility)
14. Controllers of work premises, are reminded of their responsibilities under the “Occupational Health and safety Act, 2000”, section 10 “ Duties of controllers of work premises, plant or substances”
15. Employees are also reminded of their responsibilities under section 20 ‘Duties of employees’ of the Occupational Health and Safety Act, 2000.
16. All persons are reminded of the responsibilities under the Occupational Health and safety Act, 2000, Section 21 “Persons not to interfere with or misuse things provided for health, safety and welfare”



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