

OVERHEATING RADIATOR – BURN INJURY

INCIDENT

An operator received serious burn injuries to the face and right arm while attempting to remove the radiator cap of an overheating front end loader. The radiator cap central attachment bolt was noted to have a narrowed and tapered thread at the end. This was sufficient to release the cap in an uncontrolled manner when partially opened under high pressure.

CONTRIBUTORY FACTORS

The following factors are considered to have contributed to this incident.

- There was no safe work procedure available for the removal of the radiator cap under circumstances where the coolant was hot.
- The operator who attempted to remove the radiator cap was not trained in the removal of a radiator cap and this function was not included in the operators' training module.
- A pre start checklist document for the operators of the machinery was not available to report hazardous situations for rectification.
- The radiator cap blew off as a result of the stored energy in the high temperature coolant system being released in an uncontrolled manner as summarised below.
 - (a) Worn thread on the centre bolt of the radiator cap assembly.
 - (b) No manual pressure relief mechanism available prior to partially opening radiator cap assembly.
 - (c) Radiator cap not secured to prevent it becoming a projectile during pressure relief.
 - (d) No warning signs displayed on the radiator to warn of the hazard of hot coolant under pressure.

RECOMMENDATIONS

Mines which have similar central attachment radiator caps should take the following measures to prevent a similar accident occurring.

- Provide a safe work procedure for the removal of a radiator caps where the coolant level is at a high temperature and pressure. The procedure should include methods whereby the temperature level can be reduced to a safe level prior to commencing any maintenance work.
- Allow only trained and competent persons such as maintenance personnel to carry out the work.
- Provide an operator checklist which is completed by the operator each shift so that hazardous conditions can be brought to the attention of the employer and be rectified.
- Ensure that radiator caps fitted to all vehicles are provided with the following:
 - (a) A pressure relief mechanism with overflow pipe to safely direct hot coolant away from personnel.
 - (b) A securing device to prevent it being released before excess pressure due to the hot coolant has been dissipated.
- Warning information signs should be provided on all radiators to warn of the potential hazard from the sudden release of hot coolant under pressure.

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