

# BRIDON

High-quality steel wire ropes for surface mining applications

## Inspection of Wire Rope



Carefully conducted inspections are necessary to ascertain the condition of wire and strand during its working life on the machine. The primary objective of inspection is to detect conditions that could be detrimental to continued normal operation of the product.

The individual making the inspection should be familiar with the product and the operation, as his judgment is important. Various codes, regulations, and publications provide inspection requirements for specific applications.

All operating ropes and strands should be visually inspected at least once each working day and a record made of the inspection. A visual inspection consists of the observation of all rope or strand and end connections which can reasonably be expected to be in use during daily operations. The visual observations should be concerned with discovering gross damage such as those listed below, which may be an immediate concern:

- Distortion of rope or strand such as kinking, crushing, unlaying, birdcaging, main strand displacement, or core protrusion
- Corrosion
- Broken or cut strands
- Number, distribution, and type of broken wires
- Lubrication

Special care should be taken when inspecting sections or areas subjected to rapid deterioration such as the wedge sockets on drag and hoist ropes, areas adjacent to sockets on strand pendants, pick-up points on drums and sheaves, and areas operating through fair-lead sheaves. Special care should be given to the boom hoist ropes, where present.

There are no precise rules provided for retirement of wire ropes used on mining equipment based on number of broken wires per lay. Continued use depends largely upon good judgment of the inspector in evaluating the remaining strength and useful life of the rope. However, it is considered to be good practice to consider retirement, or conduct more frequent and detailed inspections, when there are

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more than six wire breaks per lay or more than three wire breaks per strand, per lay. Valley breaks should be given careful consideration, as this is an indication of core deterioration.

A good practice when broken wires are found early in the rope life is to cut off the broken wires in the valley so that the wires do not come out of position and fold over and damage adjacent wires during operation. This can then lead to additional wire breaks in the same area. The location of the broken wires should be recorded to help future inspections.

Strand pendants should be removed from service when more than 30% of the outer wires or more than 10% of the total number of wires are broken.

Radiographic inspection is required to detect broken internal wires. Outer-wire breakage can be detected by using special inspection techniques.

Conditions that should alert the inspector to interior-wire breakage are a reduction in strand diameter in an area up to 12 inches from the nose of the socket, evidence of corrosion, or corrosion products at and adjacent to the socket nose.

Lubrication is important to the performance of all wire rope and strand products used in surface mining applications. Important factors to consider are:

- A dirty rope cannot be relubricated. The rope and rope valleys must be clean so that the lubricant applied will penetrate into the core.
- The rope should be relubricated with a solvent cutback or liquid lubricant.
- Strands should be relubricated by using the lube nozzle provided in the basket of the socket to relubricate the interior of the strand at the nose of socket. An anti-wear and anti-corrosion water displacing grease such as Castrol Molub-Alloy 860/220-0 ES® or equivalent lithium grease should be used for this purpose. The exterior of the strand should be lubricated with a solvent cutback or liquid lubricant in a 4- to 6-foot area adjacent to the socket.
- Used motor oil should never be used to relubricate wire rope or strands.

All statements, technical information and recommendations contained herein are believed to be reliable, but no guarantee is given as to their accuracy and/or completeness. The user must determine the suitability of the product for his own particular purpose, either alone or in combination with other products and shall assume all risk and liability in connection therewith.

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