

LIFTING HOOKS AND SLINGS

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INTRODUCTION

It is possible that hooks and slings in suspension and haulage operations can be overloaded, with a resultant plastic deformation significantly, therefore it is imperative that regular examinations are carried out.

The Rigger/Rope man uses lifting hooks and slings in almost every job he does in his daily duties. Defective and damaged hooks and slings can cause accidents, and accidents cause pain and suffering and possibly death. It is therefore your responsibility to keep the equipment in a sound condition. Properly maintained equipment is also a sign of a good worker.

GAUGING OF HOOKS

Gauging of lifting hooks is very important because you can immediately see when the hook has been subjected to an overload or that the hook has lost its strength.

RECORDS

All your lifting equipment should be on record in a book provided and examined once a month. The findings must be entered in this book. For example, the book must show the following:

Make: Kato
Type: Example, Chain or Rope block
Tonnage: 2 ton
Number: No. 3
Hook gauge when new: 50mm
Hook to be discarded when gauge is 57,50 mm.
This Section to be filled in monthly:

DATE EXAMINED	HOOK GAUGE	UNIT NO	REMARKS	SIGNATURE
10-06-2001	50,1	12	In Order	

SLINGS

Part of A Rigger/Rope man's work involves the moving, loading and off-loading of heavy equipment in his day-to-day tasks. For this purpose, he will make extensive use of slings of different types, diameters and sizes. We will discuss the various aspects of slings such as:

- © Types
- © Regulations
- © Identification and load colour coding
- © Selection and use
- © Included angles
- © Safety

TYPES

There are two types of slings used on the mines, namely chain slings and steel wire rope slings. As the names suggest the chain sling is made of chain and the steel wire rope sling from steel wire rope.

Chain and steel wire rope slings are sub-divided again into different types to form a large variety of slings which are used in many different applications.

We can obtain more variations by changing the end fittings on these slings.

REGULATIONS

Although we are dealing with lifting hooks and slings in this module, we have included the regulations for lifting machines as hooks and slings are always used with them. The following are regulations which specifically govern the use of lifting equipment:

- © Use of lifting machines
- © Factors of safety
- © Suitability of rope
- © Raising of persons prohibited

Use of Lifting machines

No lifting machine or lifting tackle shall be used unless:

It is:

- © Of good construction
- © Sound material
- © Adequate strength
- © Free from any patent defects

It is provided:

- © With a brake or other device which prevents downward movement of load when raising effort is removed.
- © With a limiting device which will cut off automatically the power when the load reaches its highest safe working position.
- © The maximum load it is designed to carry with safety, is marked conspicuously and clearly on it.

EXAMINATION OF SLINGS

Slings, chain and wire rope, must be inspected weekly by an appointed Rigger/Rope man and the results must be logged in the sling record book.

The record must show:

- © Serial number
- © Size, type and reach
- © Data when placed into service
- © Date of each inspection and signature of responsible Rigger/Rope man
- © Date of any repairs
- © Date of return to service
- © Date of discard
- © Remarks

For proper inspection of chain slings the chain should be cleaned so that marks, nicks, wear and other defects can be seen. A link-by-link inspection should be made with emphasis on detecting the following:

- © Twisted or bent links
- © Nicks or gouges
- © Excessive wear at bearing points of links
- © Stretched links
- © Spread in throat opening of links
- © Distorted or damaged master links, coupling links or attachments.

A stretched chain indicates overloading. This can be avoided by the use of the proper size chain. Sometimes only a portion of a chain sling is stretched. When considered by overall length, the percentage of stretch may be well within the allowable limit, but individual links may be elongated dangerously. Therefore, a link-by-link inspection is the best way of detecting dangerously stretched links. If a link is of good appearance and swings freely with adjoining links, it may be considered fit for further use.

The least sign of lack of free movement between links indicates collapse in the sides of the link due to stretch. Such a condition is dangerous and the chain must be removed from service and destroyed. Wear will be detected mainly at the points of interlink contact. Although side barrel wear may also become significant under particular conditions of usage. If chain slings become worn to the extent indicated in the following table:

TABLE FOR CHAIN WEAR ALLOWANCES

SIZE IN MM	MAXIMUM ALLOWABLE WEAR AT ANY POINT OF THE LINK IN MM
5,6	1,0
7,1	1,4
9,5	1,9
12,7	2,5
15,9	3,0
19,0	3,8
22,2	4,4
25,4	5,0
31,8	6,0

IDENTIFICATION AND COLOUR CODING

In order to carry out a thorough examination, the steel wire rope sling should be cleaned. This will reduce the chances of any defect going unnoticed. An approved cleaning agent must be used.

Slings must be inspected for broken wires, corrosion, physical damage, core protrusion, wear and the condition of the splice.

Any defect must be rectified or the sling must be discarded and destroyed.

While examining a sling for broken wires, a cloth must be pulled across the surface of the sling. Any loose wires will hook on the cloth. If a person should use his hands instead of a cloth, bare wires may puncture the skin, causing cuts which may result in infection.

When you have to use a sling to raise a heavy object, it could be dangerous if you have to guess the right size sling to be used for that specific load. To eliminate any guesswork, a system has been developed whereby you can identify the correct sling.

For wire rope slings a colour system is used whereby the diameter and load carrying capacity of the sling is indicated by specific colour.

COLOUR CODING	NOMINAL ROPE DIAMETER MM
Orange	8
Green	9,5
White	13
Grey	14
Blue	16
Aluminium	18
Black	20
Red	22
Yellow	24
Brown	26

All wire rope slings spliced by the Rigger/Rope man must have either a disc, a washer or a short length of pipe spliced above the eye of the sling or onto the body length of the sling.

An identification number and the date the sling went into service shall be stamped onto the washer or pipe spliced into the sling and the colour coding must be painted on this washer or pipe.

The chain slings used on the mines are mostly purchased from outside companies. The manufacturers supply the chain slings with an identification disc on each sling. This disc can be used for identification and selection because onto it is stamped a serial number and the safe working load of the sling.