5. Inspection

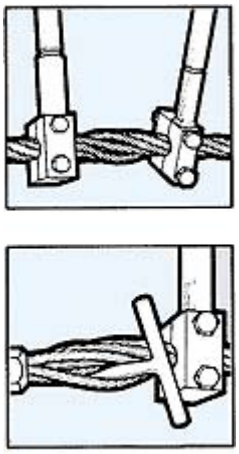

fig 3

5.1 Inspect the rope and related equipment at the beginning of every work period at least daily in most instances and particularly following any incident which could have damaged the rope or installation.

The entire length of rope should be inspected and particular attention paid to those sections that experience has proven to be the main areas of deterioration. Excessive wear, broken wires, distortion and corrosion are the usual signs of deterioration. For a more detailed examination special tools are necessary which will also facilitate internal inspection (see Fig. 3.)

In the case of ropes working over drums or sheaves it is particularly necessary to examine those areas entering or leaving the grooves when maximum loads (i.e. shock loads) are experienced, or those areas which remain for long periods in exposed places such as over a jib head sheave.

On some running ropes, but particularly relevant to standing ropes (e.g. pendant ropes) the areas adjacent to terminations should be given special attention (see Fig. 3).

Note: *Shortening the rope re-positions the areas of maximum deterioration in the system. Where conditions permit, begin operating with a rope which has a slightly longer length than necessary in order to allow for periodic shortening.*

When a non-preformed rope or multi-layer rope is used with a wedge socket and is required to be shortened, it is essential that the end of the rope is secured by welding or brazing before the rope is pulled through the main body of the socket to its new position.

Slacken the wedge in the socket. Pass the rope through the socket by an amount equivalent to the crop length or sample required. Note that the original bent portion of the rope must not be retained within the wedge socket. Replace the wedge and pull up the socket. Prepare and cut in accordance with section 4.12. Ensure that the rope tail cannot withdraw through the socket, see section 4.13.

Failure to observe this instruction will result in a significant deterioration in the performance of the rope and could render the rope completely unfit for further service.

In cases where severe rope wear takes place at one end of a wire rope, the life of the rope may be extended by changing round the drum end with the load end, i.e. turning the rope Œend for end¹ before deterioration becomes excessive.

5.2 Remove broken wires as they occur by bending backwards and forwards using a pair of pliers until they break deep in the valley between two outer strands. Wear protective clothing such as overalls, industrial gloves, helmet, eye protectors and safety footwear during this operation.

Do not shear off the ends of broken wires with pliers as this

will leave an exposed jagged edge which is likely to damage other wires in the rope and lead to premature removal of the rope from service. Failure to wear adequate protective clothing could result in injury.

Note: *Broken wires are a normal feature of service, more so towards the end of the rope's life, resulting from bending fatigue and wear. The local break up of wires may indicate some mechanical fault in the equipment.*

Record the number and position in the rope of any removed broken wires.

5.3 Do not operate an appliance if for any reason (e.g. rope diameter, certified breaking force, rope construction, length or strength and type of rope termination) the wire rope and its termination is considered unsuitable for the required duty.

5.4 Do not operate an appliance if the wire rope fitted has become distorted, been damaged or has deteriorated to a level such that discard criteria has been reached or is likely to be reached prior to normal expected life based on historical performance data.

Rope distortion is usually a result of mechanical damage and can significantly reduce rope strength.

5.5 An authorised competent person must examine the rope in accordance with the appropriate Regulations.

5.6 Do not carry out any inspection, examination, dressing/lubrication, adjustment or any other maintenance of the rope while it is suspending a load, unless otherwise stated in the OEM's instruction manual or other relevant documents.

Do not carry out any inspection or maintenance of the rope if the appliance controls are unattended unless the surrounding area has been isolated or sufficient warning signs have been posted within the immediate vicinity.

If the appliance controls are attended, the authorized person must be able to communicate effectively with the driver or controller of the appliance during the inspection process.

5.7 Never clean the wire rope without recognizing the potential hazards associated with working on a moving rope.

Failure to pay attention or take adequate precaution could result in injury.

f cleaning by cloth/waste, the material can be snagged on damaged surfaces and/or broken wires. If cleaning by brush, eye protectors must be worn. If using fluids it should be recognized that some products are highly inflammable. A respirator should be worn if cleaning by a pressurized spray system.

Failure to take adequate precaution could result in injury or damage to health.

Only use compatible cleaning fluids which will not impair the original rope lubricant nor affect the rope associated equipment.

The use of cleaning fluids (particularly solvent based) is likely to Œcut back[1] the existing rope lubricant leading to a greater quantity of lubricant accumulating on the surface of the rope. This may create a hazard in appliances and machinery which rely on friction between the rope and the drive sheave (e.g. elevators, friction winders and ski lifts).

5.8 Lubricants selected for in-service dressing must be compatible with the rope manufacturing lubricant and should be referenced in the OEM's instruction manual or other documents approved by the owner of the appliance.

If in doubt contact the rope supplier or Bridon.

If in doubt contact Bridon.

5.9 Take particular care when applying any in-service lubricant/dressing. Application systems which involve pressure should only be operated by trained and authorized persons and the operation carried out strictly in accordance with the manufacturer's instructions.

Most wire ropes should be lubricated at regular intervals (including cleaning) in order to extend safe performance.

Ensure that any in-service lubricant dressing penetrates into the core of the rope.

Ensure that the in-service lubricant dressing is not applied excessively so that the amount of lubricant on the rope will hinder rope examination.

A 'dry' rope unaffected by corrosion but subject to bend fatigue, is likely to achieve only 30% of that normally attained by a 'lubricated' rope.

Note: *The authorized person carrying out a rope inspection must be capable of recognizing the potential loss of safe performance of such a rope in comparison with lubricated rope.*

Clean the rope before applying a fresh dressing/lubricant if it is heavily loaded with foreign matter e.g. sand, dust.

5.10 TThe authorized person responsible for carrying out wire rope maintenance must ensure that the ends of the rope are secure. At the drum end this will involve checking the integrity of the anchorage and ensuring that there are at least three dead wraps tightly spooled. At the outboard end the integrity of the termination must be checked to ensure that it is in accordance with the OEM's manual or other documents approved by the owner of the appliance.

Adjust the lengths of ropes in multi-rope systems in order that equal forces (within approved limits) are evident.

5.11

Damage to, or removal of component parts (mechanical or structural) caused by abnormal contact with wire rope can be hazardous to the safety of the appliance and/or the performance of the rope (e.g. damage to the drum grooving, such that spooling is erratic and/or the rope is Œpulled down[1]

into underlying layers, which might cause a dangerous condition or, alternatively, cause localized rope damage at Œcross-over¹ positions, which might then radically affect performance; loss/removal of wear plates protecting the structure leading to major structural damage by cutting and/or failure of the wire rope due to mechanical severance).

5.12 Following any periodic examination or routine or special inspection where any corrective action is taken the Certificate should be updated and a record made of the defects found, the extent of the changes and the condition of the rope.

.**5.13** Apply the following procedures for the selection and preparation of samples, from new and used lengths of rope, for the purpose of examination and testing to destruction.

Check that the rope end, from which the sample will be taken, is secured by welding or brazing. If not, select the sample length further away from the rope end and prepare new servings.

Handle the rope in accordance with the instructions given in section 4. Serve the rope, using the buried wire technique and apply a rope clamp or grip as close to the cut mark as practically possible. Do not use solder to secure the servings.

Ensure that the sample is kept straight throughout the whole procedure and ensure that the minimum sample length is 10' unless otherwise specified.

The rope should be cut with a high speed abrasive disc cutter or an oxyacetylene torch. Weld the rope ends of the sample as described in section 4.12, after which the clamp or grip can be removed.

The identification of the rope must be established and the sample suitably marked and packed. It is recommended that the 10' sample is retained straight and secured to a wood pallet for transportation.

Failure to comply with these procedures will result in measured breaking force values which are not truly representative of the actual strength of the rope.