Technical Literature

Cat® Synthetic Rope Body Cable Manual

Cat® approved accessory for replacement of OEM steel wire rope body cables

CORTLAND
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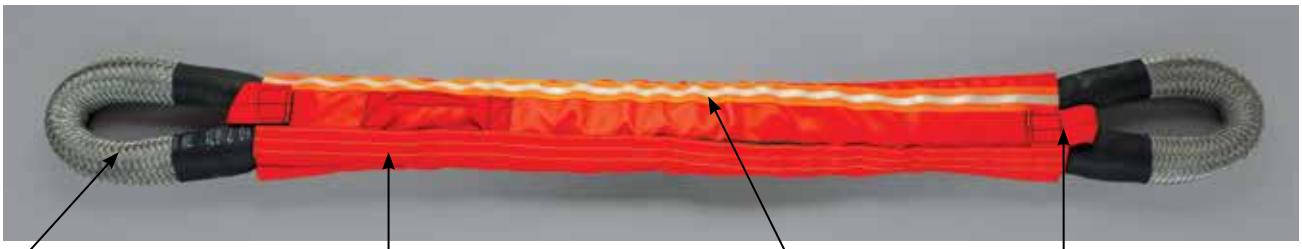
Cat® Synthetic Rope Body Cables

This usage guideline provides information intended for the safe use of Synthetic Rope Body Cables, which are a Cat® approved accessory replacement for steel wire rope body cables. Just as with the steel wire rope body cables, these synthetic body cables are only approved for use on the indicated Cat truck with a Cat body. Any use of these components with non-approved configurations as provided by Cat® is beyond the scope of this document. These components have been validated to the performance requirements within ISO 13333:1994.

These lightweight assemblies are designed for durability and personnel safety. Careful routine inspections must be made on all Synthetic Rope Body Cables, prior to use. To ensure the safety of all personnel using these Body Cables, please thoroughly read the following instructions and inspection guidelines.

Using Technora® (aramid) synthetic fiber rope, this product is designed to provide long-term service life when used as in-shop or on-site maintenance.



Braided HMPE cut-resistant eye termination protection sleeve with shrink tube covering

Orange high visibility body chafe sleeve with hook-and-loop type clasp system. This is replaceable.

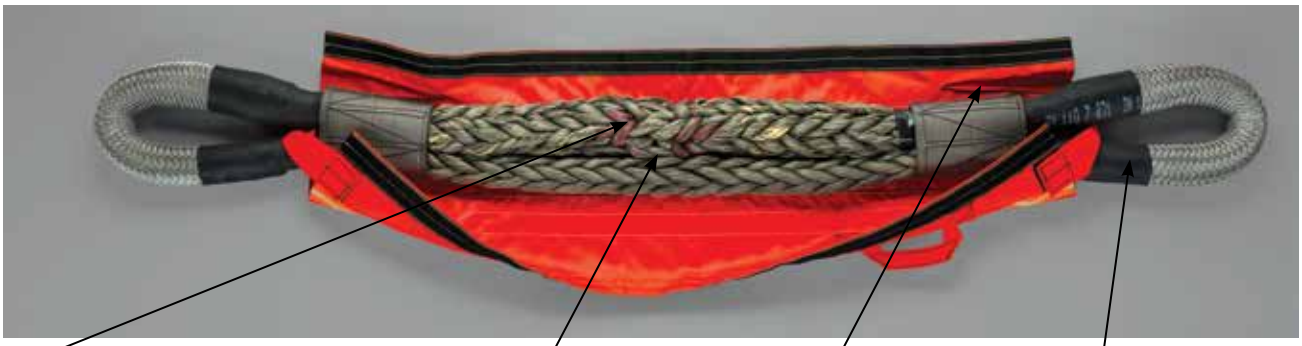
Safety reflective stripe sewn on body chafe sleeve

Retention “flaps” sewn in place to prevent body chafe sleeve from slipping

Interior View of Cat Synthetic Rope Body Cable

Inside view (under the orange body chafe sleeve) of Technora® synthetic fiber rope strength member (coated black).

- Endless loop (grommet) fabrications with one end-to-end splice connection termination on one leg



Area where the two “ends” of the strength member rope are splice-terminated together to form an endless loop (grommet) fabrication; one side of the rope grommet will be larger in circumference size at the splice area—this is normal. The splice termination is conducted by braiding the rope back into itself.

12 strand braided synthetic rope strength member; mustard colored fiber coated black/grey color

Woven and sewn “binding sleeve to hold the formed eye terminations in place

Black shrink tubing over ends of SX HMPE chafe sleeves in eye terminations

Installation Instructions

Installation of the Synthetic Rope Body Cable:

1. Use shackle for attachment to bottom underside of mining truck body for each cable.
2. Other end of Synthetic Rope Body Cable is attached without shackle hardware to the truck body tow pin
   Note: The Synthetic Rope Body Cable should be stored in a protective bag or protected environment when not in use.

Inspection Guidelines

General Summary

- The rated strength of the Synthetic Rope Body Cable is designed to prevent rupture or failure during a single hoist “power-down” event.
- The Synthetic Rope Body Cable should be regularly inspected by maintenance personnel
- Severe abrasion or cut strands are key inspection points of braided rope strength member
  - Body chafe sleeve can be replaced if cut or worn
  - Internal braided strength member inspection must be performed

Recommended Inspection Procedure

Step 1 Place Synthetic Rope Body Cable on flat surface for inspection

Step 2 Visually inspect the entire surface of the Synthetic Rope Body Cable cable for any abnormalities
- Excessive abrasion or cutting wear on eye terminations of body chafe sleeve
- Unusual “bulges” or shape changes from the Synthetic Rope Body Cable in its new product form
  – e.g. gaps in length or changes in outside circumference in different areas of body cable

Step 3 Unfasten the body chafe sleeve to expose the inner strength member rope

Step 4 Visually inspect for:
- “Loosening” or “undoing” of splice termination; strands which may be pulled out
- Cuts through one or more adjacent strands of the 12 strand braided rope strength member
- Excessive abrasion or cutting wear on the synthetic rope strength member

Each synthetic body cable is constructed using (12) primary “strands”. To splice-terminate the strength member assembly, the strands are interwoven back into the braided rope construction. These strand splices may become “un-tucked” from the braid if mishandled or dislodged by the hook-and-clasp body sleeve securement system. *If this occurs, the body cable must be removed from service and replaced.*

Recommended Inspection Procedure

Step 5 Choose a short area of the braided rope length and, by compression, “open up” the braid to expose the inner hollow core of the rope. This inspection is to determine if there is inner abrasion or cutting wear caused typically by ingress of dirt or particulate.

Step 6 After inspection procedures, and assuming no damage or extreme wear to chafe sleeve or rope strength member, securely re-fasten the body chafe sleeve around the rope component.

Special considerations to inspections

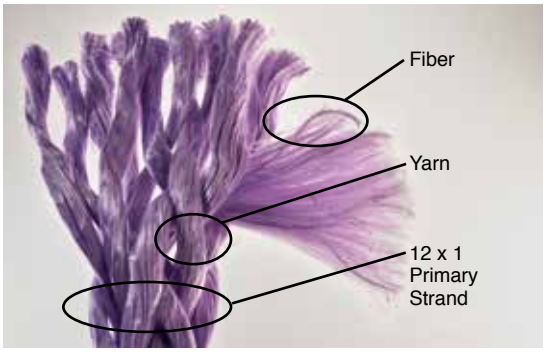
- Assuming that the Synthetic Rope Body Cable will not be left on the off highway vehicle during mining or construction work, thereby susceptible to excessive wear and cutting from the road environment, the Synthetic Rope Body Cable should really NOT see any wear abnormalities.
- The orange woven nylon body chafe sleeve is a replaceable item. The woven SX HMPE eye termination chafe gear is not replaceable.
  – In the SX HMPE chafe gear eye termination, the inner surface of the grey chafe sleeve may appear to be melted or heat-fused. Typically, this is simply fiber and braided rope construction compression and not melting. The method of inspection is compressing the area of concern to see if melting has occurred.

- The Synthetic Rope Body Cable can be washed in warm or cold water with a neutral Ph cleanser to clean off grit, dirt or other particulate. While the rope strength member of the body cable is resistant to most chemicals in cleansers, e.g. citrus-based cleansers with D-Limonene as the active chemical agent, it is not recommended in use. Again, a neutral Ph cleanser works better.
  – If washed, Synthetic Rope Body Cables should be “hanged-dry”; NOT put in a dryer
  – Water does not affect the strength or performance of the Synthetic Rope Body Cable
- Synthetic Rope Body Cables provide full strength and performance in warm or cold ambient temperature environments without strength or performance loss.
- Length tolerance: Technora® synthetic fiber has negligible creep (permanent elongation). However, the braided construction and splice termination of the Technora® rope can have some “constructional elongation”. Synthetic Rope Body Cables are fabricated to length tolerances after proof-loading the assemblies. This proof-loading should eliminate most if not all of the “constructional elongation”. When stored or not-in-use, the Synthetic Rope Body Cables could flex but when put back under load in the application, return to the length tolerance of the proof-loaded product.

Condition		Action
1	Power-down occurrence on Synthetic Rope Body Cable	Retire Cable
2	Wide body shackle wear	Replace Shackle
3	Product tag illegible or missing	Retire Cable
Chafe gear		
4	Cutting of grey colored braided HMPE chafe gear in eye terminations	Retire Cable
5	Cutting, burning, or severe wear of orange chafe sleeve	Replace with New Chafe Sleeve
Internal braided rope assembly		
6	Cuts—(yarn, strand, rope)	Retire Cable
7	Internal braid wear or abrasion—many fused or cut yarns—powdery or brittle fibers	Retire Cable
8	Heat damage—localized areas of melted or fused fibers	Retire Cable
9	Braided rope splice termination connection damage – splice tucks pulling out	Retire Cable
10	Discoloration on rope areas	Wash and Air Dry

Yarn and Strand Inspection

Repeated lateral abrasion wear against sharp edges is the primary cause of damage to braided synthetic ropes; i.e., cut yarns or strands. Partial cutting of yarns and/or strands can create an imbalance in load-sharing leading to significantly lower strength and body cable performance. **Visual and hand inspection for strand cuts is the key inspection method for these body cables; discard or retire if cuts in the rope are visible.**



The synthetic rope depicted in these (3) pictures are colored with a purple coating. While the construction of the body cable is the same as the pictures depicted here, the coating of the body cable is a grey/black color. The coating/color on the synthetic rope does not affect strength and may "lighten" as the rope gets older from use.

Example of cuts:

Visual inspection of interior yarns shows one partially cut yarn.

Visual inspection of interior yarns shows three fully cut yarns.

Example of abrasion:

Rating	Visual Example – External	Visual Example – Internal
1 – Like New (good to use)		
2 – Light (good to use)		
3 – Moderate (in this condition, body cable must be destroyed and replaced)		

Cortland is a global designer, manufacturer, and supplier of technologically advanced ropes, slings, and strength members. Collaborating with customers, our team uses its experience in high performance materials and market knowledge to transform ideas into proven products.

For more than 35 years, our custom-built solutions have been developed for work in the toughest environments and to overcome some of the world's greatest challenges. They consistently enable our customers to meet the demands of the aerospace, defense, medical, research, subsea, marine, and energy industries.

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