April 2017

A&H ENG Information

Incident involving an SKA-10-8 Gunnebo fitting (clamping sleeve with pin)

During a material control it was assessed that the mobility of a low-torque swivel (SKLI-10-8) and of a suspension link (SKO-10-8) was strongly compromised and a scratching noise could be heard. The problem could not be solved by lubrication with WD40.

In the course of disassembly (reverse engineering) of the clamping sleeve (SKA-10-8) it became clear that the pin had seized the inner spring at its pointed (flattened) end and, passing through the washer, had driven it slightly out of its intended position. Consequently, the spring then scratched the fitting.

Our analysis revealed that the pin was being pushed out by the flattened end of the bush, but it was impossible to ascertain why or how it could have seized the spring and expelled it. A possible explanation might lie in a combination of factors, i.e. the spring's geometry (square spring steel) plus the pin not being lubricated. An additional factor may be that the washer consists of softer material than the bush and the pin.

The incident, however, raises the question whether the clamping sleeve's design would require special handling during assembly. Indications to this effect given by the manufacturer, Gunnebo, are contradictory. In one of the flyers issued by Gunnebo, the following information can be found: "*Mount the pin on the washer side of the bush*". The washer rests in a cavity which is recognizable from the outside by the sleeve's curved edge. Contradictorily, in the Gunnebo illustration (see pictures) the bush appears to be upside down (with the curved edge below), hence the pin is not mounted as described, i.e. "on the washer side".

The functionality and safety of the connection, however, were not compromised at any time: the clamping sleeve is designed and built in such a way as to maintain the spring's functionality even in the event of its breakage, since the coils of the spring are made of square steel, so tight as not to be able to interlock.

Illustration of damage and example

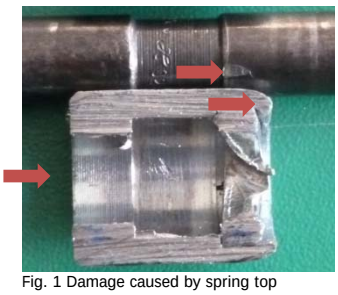

Fig. 1 Damage caused by spring top

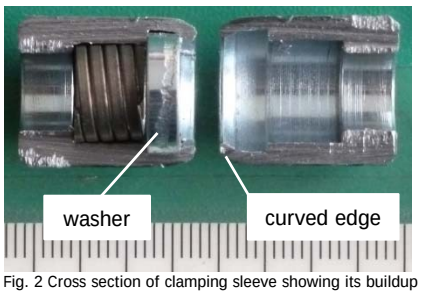

Fig. 2 Cross section of clamping sleeve showing its buildup

Fig. 3 Position of clamping sleeve and function of spring

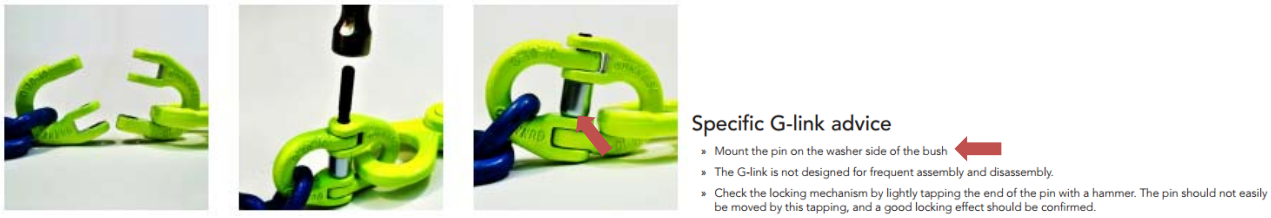

Fig. 4 Gunnebo instructions of assembly with clamping sleeve upside down (red arrow)

Measures to be taken

- The pin must be mounted on the sleeve side containing the cavity in which the washer is positioned.
- Before the pin is mounted, both pin and spring must be lubricated, e.g. with WD40.
- Function check after mounting of pin: the pin must have a clearance of approximately 1 mm along the axis; the bush must be able to rotate freely even after the pin is mounted and secured; all components must be perfectly free to move.

A&H ENG keep their customers informed about any incidents by publishing reports on their website and will add a note to their Instructions for use and maintenance (AWA), part 2 (M-R-O of steel ropes and components).

Please also check the links and documents under the menu item A&H ENG of our website.

www.linkedin.com