Morris Line ABSDs

Morris Line have recently notified SPEN of a manufacturing anomaly which may affect up to 40 Cat. 1 ABSD's (30982848) with Serial No.'s 4730/007/1 to 4730/007/40 delivered into SPD stores at Bonnybridge in July.

This anomaly is due to Morris Line outsourcing manufacture of the folded clevis component pictured in figures 1 & 2.

A small number of this batch have been identified as being installed or issued out to District stores / contractors and Standards will contact them directly.

Visual inspection of all ABSDs requires to be carried out prior to installation to identify all affected ABSDs.

The issue is that the galvanised steel cones which clamp the operating rod within the clevis will butt up against each other, resulting in lack of clamping force, as shown in figure 1.

Morris Line have manufactured stainless steel cones to different dimensions (see figure 2) to allow the outsourced clevis to achieve the correct clamping pressure on the operating rod. These are being sent to SPD Logistics in Bonnybridge.

The attached Morris Line report gives further images and information to assist in identifying affected units and gives guidance on the rectification procedure.

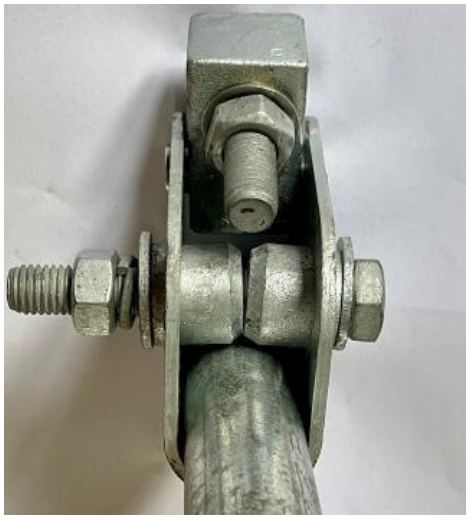


Figure 1 – Outsourced Clevis

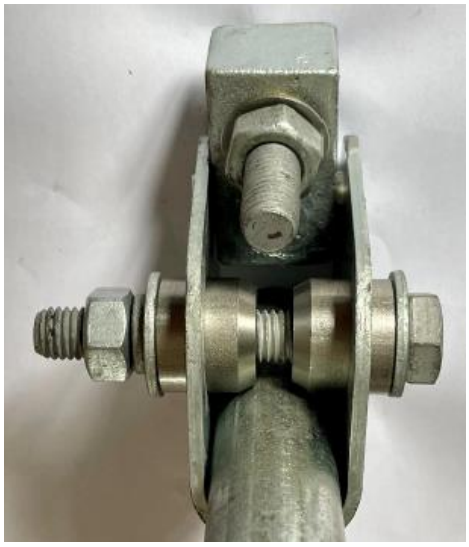


Figure 2 – Replacement cones

Recommendations and action points

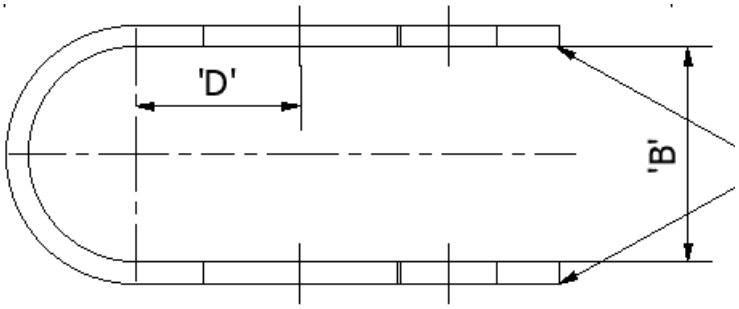
- Staff and contractors involved in erecting and commissioning ABSDs shall be made aware of this issue and briefed on this express and attached report.
- Staff and contractors to visually inspect all ABSDs prior to installation.
- Any ABSDs with the incorrect clevis require the galvanised steel cones to be replaced with the stainless steel version prior to erection, and Jamie McDonald to be notified.
- The replacement stainless steel cones can be obtained by contacting Stephen Molseed in SPD Logistics.

IR638/2 – Clamp Clevis' Slipping

Root Cause

Upon investigation, it has been discovered that the folded clevis has always been manufactured in-house using MLE's own press tools. However, due to a tool failure in June they were outsourced for a period of a few weeks while the repairs were undertaken.

Unfortunately, it has been established that there has always been a typographical error in the folded view of the drawing (which was originally drawn in 1984), meaning that it does not reflect exactly what the in-house tooling outputs.



By way of explanation, when manufactured in-house, the tool first punches out a developed (i.e., 'flat form') part which is subjected to dimensional checks before being inserted into another tool (where the holes are placed over lugs) for bending, after which alignment checks are conducted.

When outsourced, the sub-supplier manufactured to the dimensions of the folded view, meaning that the holes for the clamp cones (dimension 'D') are approximately 2mm further out than the in-house tooling would output. As MLE's Quality Inspector could only conduct dimensional checks against the folded view dimensions, the parts were found to comply.

When coupled with the permissible tolerance on the diameter operating tube itself, which is -0.8mm +0.4mm, there is the possibility of the clamp cones not being able to bite sufficiently into the operating tube to allow proper clamping.

Batches Affected

There is the possibility that the following batches of 12kV ABSD's could be affected by this issue: -

- 40 off. Cat. 1 ABSD's supplied against 4505832113 (Serial No.'s 4730/007/x)

Unfortunately, it is not possible to confirm this without visual inspection as sub-assemblies using both the in-house and outsourced versions of the clevis had been stored in bins together in the factory.

However, visual identification can be made simpler by referring to Figures 1 to 4, below.



Figure 1: In-house manufactured clevis.
Note rounded material edges and some splaying of sides from top to bottom.



Figure 2: Outsourced clevis.
Note sharp material edges and parallel sides.



Figure 3: Side view of outsourced clevis.
Note linear tooling mark from top to bottom on one side.

Remedial Action

Slippage of the operating tube is caused by lack of bite by the clamp cones, resulting in lack of clamping force. This can be seen in Figure 4 below, where the galvanised mild steel cones meet in the middle after being tightened.

As a remedial action, stainless steel cones of a slightly larger diameter have been manufactured. When fitted, these correctly bite into the operating tube to give sufficient clamping force once tightened. This can be seen in Figure 5 below, where the cones are prevented from meeting after tightening by the operating tube.



Figure 4: Outsourced clevis assembly before fix applied. Note cones meeting after tightening Following operating tube being inserted.



Figure 5: Outsourced clevis assembly after cones replaced with stainless steel version. Note cones cannot meet.

To replace the cones, simply: -

- Remove the M12 nut (19mm spanners if necessary), spring washer and plain washer.
- Slide the M12 bolt and cones out of clevis.
- Remove M12 bolt from galvanised mild steel cones and insert into replacement stainless steel cones.
- Slide the M12 bolt and replacement cones back into clevis.
- Re-fit M12 plain washer, spring washer and nut.

