Safety Bulletin		
No: SB080	**Rev: 2**	**Date: September 23, 2014**
Failure of Torque Bushing Extend Arm Pin		
☐ **Internal Use Only** ☑ **External Use**		☑ **Mandatory** ☐ **Recommended**

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Note: All numbers in parentheses are TESCO part numbers unless otherwise noted.

BACKGROUND INFORMATION:

A recent incident occurred where a torque bushing extend arm pin (3384) fell approximately 35 feet onto the rig floor. No injuries were reported. Upon inspection it was discovered that the capscrew (5008246) securing the pin had broken (Figure 1), allowing the pin to back out and fall.

Figure 1: Recovered torque bushing extend arm pin

After further investigation it was found that the retention bolts for the extend arm pins were being over-tightened onto the pin, causing them to be overstressed and bent. This shortened the fatigue life of one of the capscrews, causing it to fail prematurely.

AFFECTED PRODUCTS:

All TESCO torque bushing extend frames on a torque arrest (excluding those with integrated designs such as dogbones).

ACTION REQUIRED:

A means of secondary retention is achieved by adding a hole to the extend arm pin; a safety lanyard ensures that the pin will not fall to the rig floor under any circumstance. Improved retention of the pin is achieved by adding a collar that includes flat surfaces for the bolt to be tightened without bending, and for the bolt to be acting in shear with the collar instead of contacting the torque bushing arms directly.

To prevent dropped object incidents from occurring again, operators should upgrade their pins to the new versions that implement better retention using a collar and a safety lanyard.

Version	Date (D/M/Y)	ECN	Description of changes
Rev 0	27/05/2013	210-0026	Initial release of document
Rev 1	14/11/2013	210-0029	Release kits for each type of torque bushing pin for retrofitting pins
Rev 2	23/09/2014	157-0058	Add Appendix instructions on how to crimp wire rope and adjust crimping tools

For assemblies using 1-1/2” OD x 8-1/4” pins (3383) and 1-1/2” OD x 5-1/4” pins (3384), see Figure 2:

1. Replace the pins or rework with the latest drawing version (3383Rev6 / 3384Rev6) which includes lanyard holes.
2. Discard the retention bolt.
3. Tether the pins in pairs using wire rope (5033806) and crimps (5033807). See Appendix I for instructions on crimping the 3/16” wire rope.
4. Retain the pins in place using a 1-1/2” collar (5038326) and 3/8” x 2-3/4” screw (5008246), nylon lock nut (4333) and cotter pin (15608).

For assemblies using 2” OD x 8-13/16” pins (5007796):

1. Replace the pins or rework with the latest drawing revision (5007796Rev1) which includes lanyard holes.
2. Discard the retention bolt.
3. Tether the pins in pairs using wire rope (5033806) and crimps (5033807). See Appendix I for instructions on crimping the 3/16” wire rope.
4. Retain the pins in place using a 2” collar (5038327) and 3/8” x 3-1/4” screw (1410005), nylon lock nut (4333) and cotter pin (15608).

The retrofit kits are released for each type of torque bushing pin for retrofitting in the field. They include:

- One torque bushing extend arm pin
- One collar
- One 3/8” capscrew
- One nylon lock nut
- One cotter pin
- One pair of crimps
- 4-ft section of wire rope

Retrofit kits (5038441, 5038442 and 5038443) are recommended for the following top drives:

Top Drive Model	Number of Retrofit Kits Required		
	5038441 (for 3383 pin)	5038442 (for 3384 pin)	5038443 (for 5007796 pin)
150-HXI-700	2	6	n/a
250-HXI-700	n/a	8	n/a
250-EMI-400	n/a	8	n/a
250-HMIS-475	2	6	n/a
350-EXI-600	4	4	n/a
400-EXI-600	4	4	n/a
500-HCI-750	4	4	n/a
500-HCI-1205	4	4	n/a
650-HCI-1205	4	4	n/a
500-HCI-1200	4	4	n/a
650-HCI-1200	4	4	n/a
500-ECI-900	4	4	n/a
500-ECI-1350	4	4	n/a
650-ECI-900	4	4	n/a
650-ECIS-1350	4	4	n/a
750-ECIX-1350	4	4	n/a
500-ESI-1350	n/a	4	4
750-ESI-1350	n/a	4	4

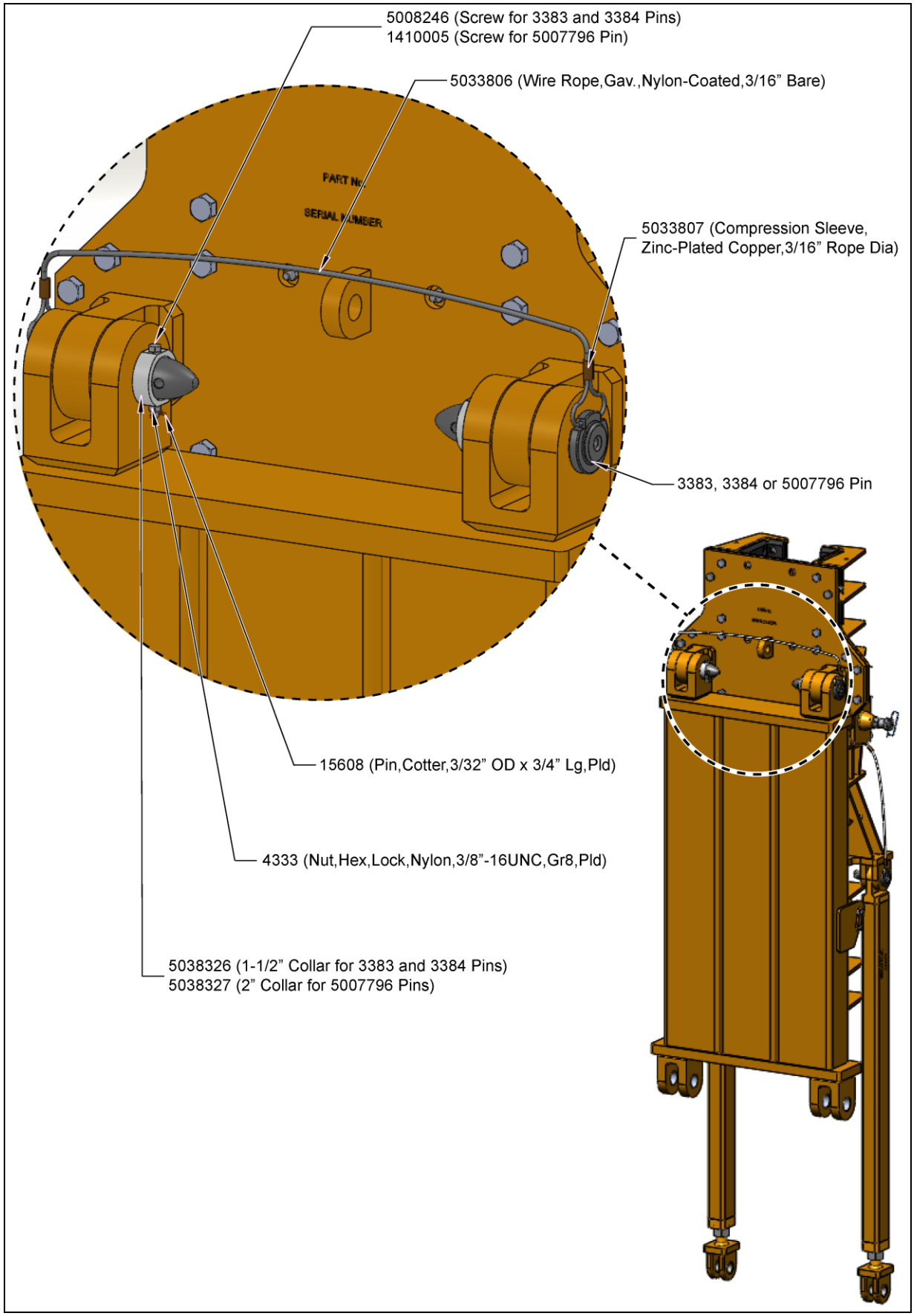

Figure 2: Torque bushing showing extend arm pin, steel wire safety lanyards, and crimp sleeve

APPENDIX I: CRIMPING WIRE ROPE

Note: Always wear safety glasses when a tool is being used.
Note: Proof testing is recommended whenever the possibility of personal injury or property damage exists.

The instructions below outline the proper method to crimp the 3/16" wire rope:

1. Using an X-Acto or similar type cutting knife, cut off approximately 8" of the thin protective coating from the wire rope to expose the wire.
2. To make an eye splice, slide the section of 8" exposed wire rope through one open slot of the compression sleeve, form a loop and pull it through the other open slot of the sleeve so that the end will still protrude after crimping (Figure 3).

Figure 3: Making an eye splice from wire rope

3. Using the proper Nicopress tool, line up the sleeve between the tool jaws with the long axis crosswise to the jaws. Swage the sleeve with the correct number of presses, spacing the presses evenly on the sleeve. If more than one compression is required per sleeve, use the pressing sequence shown in Figure 4.

Figure 4: Using a bench tool to swage a compression sleeve

4. Space crimps apart as shown, except where overlapped crimps are specified. Overlapped crimps are specified for sleeves that need more than one crimp, but do not have room for two complete crimps. Overlapped crimps should compress all of the sleeve.
5. Ensure the sleeve is fully and correctly pressed. To check this, use the go-type gauge furnished with the tool on a completed sleeve press (Figure 6). Sleeves should enter the slot freely.
6. Adjust the tool if sleeve does not enter the gauge.

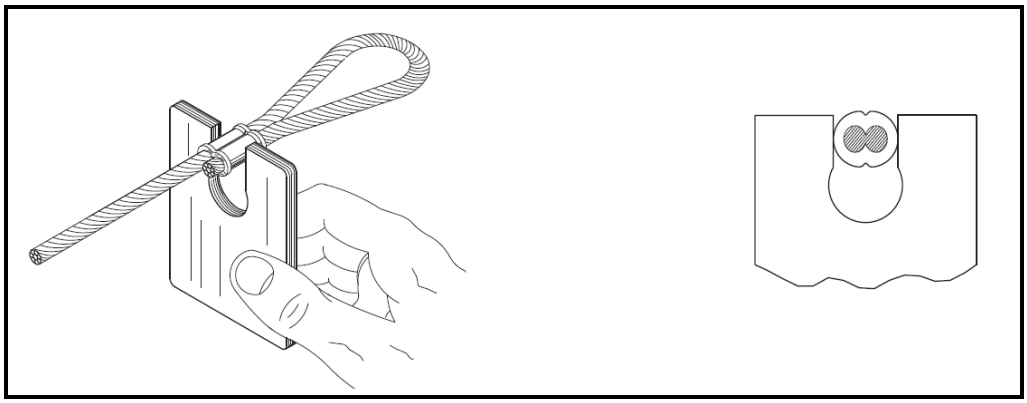

Figure 6: Use a go-type gauge to check that a sleeve is correctly pressed

APPENDIX II: ADJUSTING HAND AND BENCH TOOLS

Note: It is recommended that the compression tools and sleeves to crimp the 3/16” wire rope be ordered direct from McMaster-Carr online parts catalog (www.mcmaster.com).

McMaster-Carr Part No.	Description
3898T16	Zinc-Plated Copper Oval Compression Sleeve for 3/16" Rope Diameter, 15/16" Sleeve Length
35155T16	Single Diameter Compression Tool for Oval Sleeve for 3/16" Aluminum, Copper, Tin & Zinc Plated Copper
3582T3	Multi-diameter Compression Tool, 1/8", 5/32" & 3/16" Aluminum & Copper Oval Sleeve

Wire Rope Size	Sleeve Number	Hand Tool Number	Bench Tool Head Number	Tool Groove	Crimps Required
3/16”	28-6-X	51-X-850 63V-XPM	51-X-850 Head 63V-XPM Head	Oval X	4

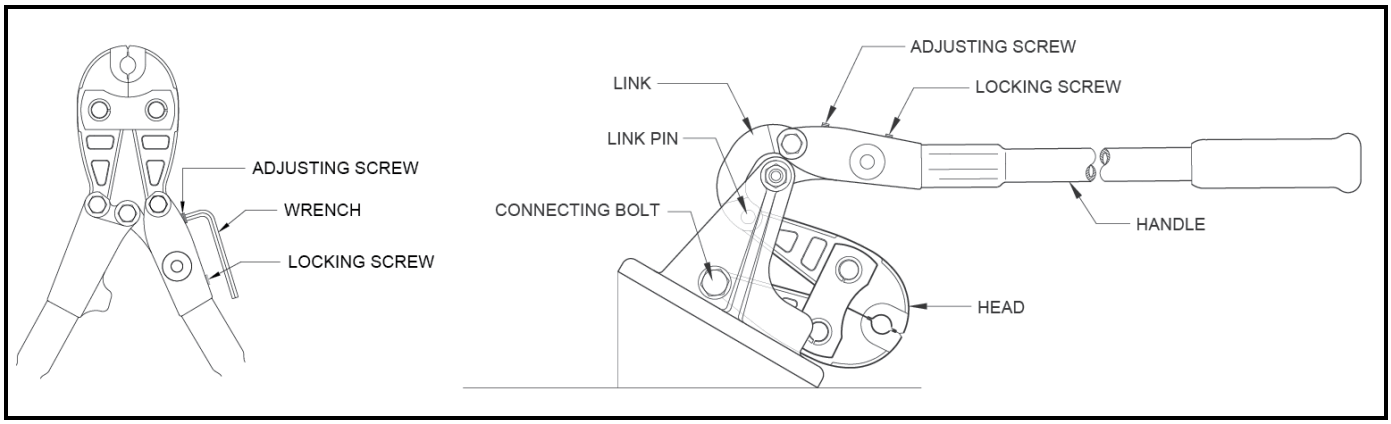

Figure 7: Hand tool (left) or bench tool (right) can be used to crimp a compression sleeve

Hand tool (Figure 7):

1. Open handles and loosen the locking screw two turns.
2. Turn the adjustment screw 1/4 of a turn clockwise. After adjustment, tighten the locking screw.
3. Swage the sleeve on the wire rope and check with the gauge. Repeat if necessary.
4. Clean and oil periodically.

Bench tool (Figure 7):

1. Before adjusting the bench tool, the tool head must be removed:
    a. Raise the handle to a fully open position.
    b. Remove the connecting bolt.
    c. Pull out the head of the tool to expose the link pin and remove it.
    d. To install a tool head, follow the reverse of this procedure.
        Note: Always check tool adjustment when changing heads.
2. To adjust the bench tool:
    a. Raise the handle to a fully open position and loosen the locking screw two turns.
    b. Turn the adjustment screw 1/4 of a turn clockwise. After adjustment, tighten the locking screw.
    c. Swage the sleeve on the wire rope and check with the gauge. Repeat if necessary.
    d. Clean and oil periodically.