



Front Chain Drive Shaft Inspection

Issue

On TAC-45 Catwalks, fatigue or shock loading may cause cracks to form on the Front Chain Drive Shaft (P/N: 5050303) and may ultimately cause the shaft to fail. The Front Chain Drive Shaft and the two exposed ends of the center key slot (See Figure 1) should be part of a regular inspection schedule. See "Recommendation" below.

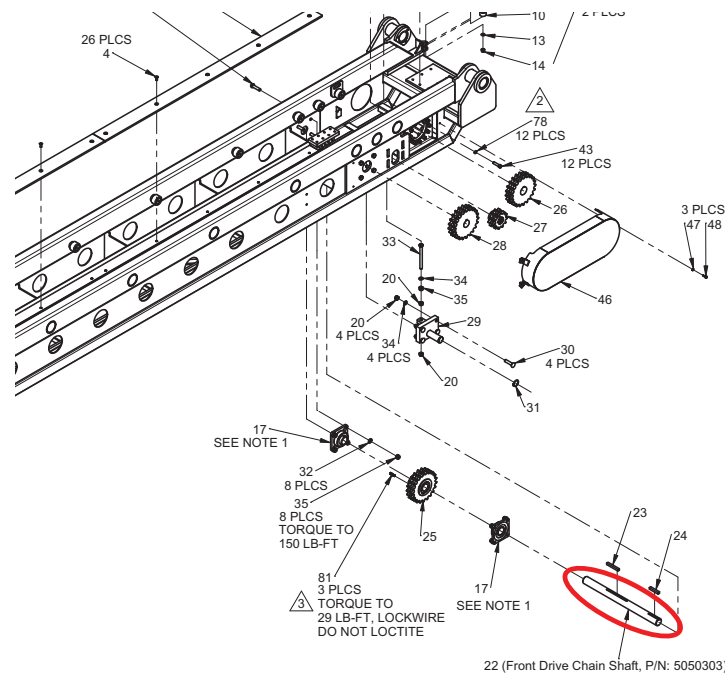


Figure 1: TAC-45 Front Chain Drive Shaft

Recommendation

- **Perform an MPI immediately.** Set the TAC-45 Catwalk into maintenance position and ensure maintenance bars are securely in position. Conduct an MPI of the Front Chain Drive Shaft and the two exposed ends of the center key slot. If any signs of cracks or other wear are found, stop operation and contact RIGLINE 24/7™ Support for replacement parts.
- **Perform a visual inspection daily.** Set the TAC-45 Catwalk into maintenance position and ensure maintenance bars are securely in position. Conduct a visual inspection daily of the Front Chain Drive Shaft and the two exposed ends of the center key slot for signs of cracks, or other signs of damage or wear. If any signs of cracks or other wear are found, stop operation and contact RIGLINE 24/7™ Support for replacement parts.



Model: TAC-45	May. 14, 2018
Serial #: All	
Alert	

- Perform **BOTH a Visual Inspection and an MPI after any impact event**. Set the TAC-45 into maintenance position and ensure maintenance bars are securely in position. Visually inspect the Chain Drive Shaft and MPI the exposed ends of the center key slot after any impact event.
- **Strictly enforce the Red Zones** (Figure 2) as described in the TAC-45 Operation Guide on pages 38 and 39 (Document # 5041566).

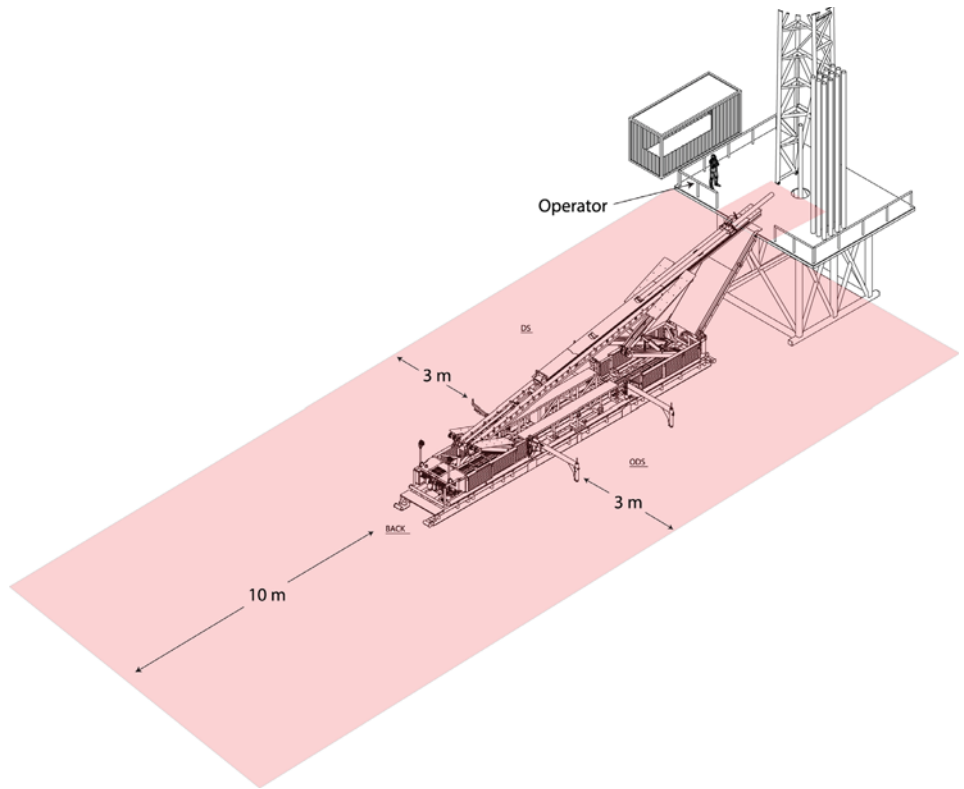



Figure 2: TAC-45 Red Zone

- Canrig recommends including the Front Chain Drive Shaft in the regular inspection of the TAC-45 Catwalk to identify cracks and other signs of damage and wear. A product bulletin will be issued at a later date when the optimum inspection schedule has been determined and an upgrade kit is made available.

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SUMMARY

Magnetic Particle Inspection (MPI) is a nondestructive testing method that is used to detect surface cracks and some sub-surface discontinuities in ferromagnetic materials such as steel or iron. All inspection shall be accepted by a Level II in accordance with Canrig Drilling Technology Limited Engineering Specification.

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REVISION HISTORY

Revision History

<i>Revision Number</i>	<i>Description</i>	<i>Prepared/ Changed By (Name)</i>	<i>Effective Date of Change</i>	<i>Approved By (Name)</i>	<i>Approval Date</i>
Rev. 02	Added sub-paragraph specifics to 3.3.3.	F. Yousef	2006/03/03	John Morris ASNT ID: 65835	2010/02/28
Rev. 03	Updated to current format.	F. Yousef	2015/01/26	ASNT ID: 65835	2015/01/26
Rev. 04	Deleted paragraph 3.1.2 and added non-machined welds to 3.1.1. Added paragraph 3.2.	F. Yousef	2017/07/01	ASNT ID: 206165	2017/07/01

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1.0 OBJECTIVE

Magnetic Particle Inspection (MPI) is a nondestructive testing method that is used to detect surface cracks and some sub-surface discontinuities in ferromagnetic materials such as steel or iron. All inspection shall be accepted by a Level II in accordance with Canrig Drilling Technology Limited Engineering Specification.

2.0 SCOPE

This specification describes the applicable method and acceptance criteria when performing MPI to the following:

- 2.1. Castings
- 2.2. Wrought Material
- 2.3. Structural or Pressure Containing Welds

3.0 PROCEDURE

3.1. Types of MPI

- 3.1.1 Wet Fluorescent MPI to be used on castings, machined surfaces, and non-machined welds. When using this method, the surfaces must be free of grease, oil and other moisture that could prevent the suspension from wetting the surface and preventing the particles from moving freely.

3.2. Demagnetization

Upon MPI completion, the part shall be demagnetized.

3.3. Method

MPI shall be performed in accordance with ASME BPVC, Section V, Sub-section A, Article 7, and Sub-section B, Article 25 or ASTM E 709.

3.4. Acceptance Criteria

- 3.4.1 For castings of primary-load carrying components or as called for on the engineering drawing, the acceptance criteria for MPI shall be as specified in Table 4 for PSL1 and Table 5 for PSL 2 of API 8C Specification. ASTM E 125 shall be applied as a reference standard for the evaluation of magnetic particle indications on castings.
- 3.4.2 For wrought materials, no relevant indications are acceptable.
- 3.4.3 For structural and pressure containing welds, the acceptance criteria shall be as follows:



- 3.4.3.1 No relevant, linear indications having a length of at least three times the width.
- 3.4.3.2 No rounded indications with a major dimension greater than 4 mm (1/8”), for welds whose depth is 17 mm (5/8”) or less
- 3.4.3.3 No rounded indications with a major dimension greater than 5 mm (3/16”) for welds whose depth is greater than 17 mm (5/8”).
- 3.4.3.4 No more than three relevant indications in a line separated by less than 2 mm (1/16”) edge to edge.

4.0 REFERENCES

- 4.1. API 8C Specification
- 4.2. ASME BPVC Section V
- 4.3. ASTM E 1444
- 4.4. ASTM E 709 Process Specification
- 4.5. ASTM E 125 Process Specification
- 4.6. Engineering Drawing

5.0 RECORDS

- 5.1. MPI Test Reports shall be supplied to Canrig Drilling Technology Limited.
 - 5.1.1 All equipment used in the testing shall be traceable and calibrated as per NIST standards.
 - 5.1.2 Testing reports shall include the date of test, reportable indications, geometry of indications, the location of indications and test parameters. The size, shape and the location of indications shall be characterized using sketches.

6.0 NOTES
