



Recommended Practice 5.0

INSPECTION AND CERTIFICATION OF MANUAL ROTARY TONGS

A Recommended Practice for the Canadian
Land-Based Drilling and Well Servicing Industry

Developed by the Canadian Association of Energy Contractors
Engineering & Technical Committee

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This edition supersedes all prior
editions of this recommended practice

Purpose

This document contains practical recommended operating practices for manual rotary tonges used in the Canadian land-based drilling and well servicing industry.

Disclaimer

The recommendations contained in this document should be considered in conjunction with the requirements of the original equipment manufacturers (OEM). Companies should operate and maintain the equipment within the operating limitations defined by the OEM. If the OEM stipulates levels of inspection or accelerated inspection/certification cycles beyond those outlined in this recommended practice, the contractor must follow the OEM guidelines unless granted approval to follow this CAOEC recommended practice by a professional engineer.

The CAOEC produced this recommended practice based on industry experience. However, this document should be considered in conjunction with requirements of the local jurisdictional regulator.

This document should not be construed as a legal opinion and users are advised to seek legal counsel to address their specific facts and circumstances.

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Revisions

CAOEC recommended practices are reviewed and revised, reaffirmed or withdrawn at least every three years. A one-time extension of up to two years may be added to this review cycle. Email any comments or items of concern to rpfeedback@caoec.ca. Edition history can be found in Appendix 1.

Range of Obligation

Throughout this recommended practice the terms 'must', 'shall', 'should', 'may' and 'can' are used as follows:

- **Must** A specific or general regulatory and/or legal requirement that must be followed.
- **Shall** An accepted industry practice or provision that the reader is obliged to satisfy to comply with this recommended practice.
- **Should** A recommendation or action that is advised.
- **May** An option or action that is permissible within the limits of the recommended practice.
- **Can** Possibility or capability.

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1. Scope

This recommended practice (RP) describes the inspection and certification schedule for manual rotary tongs currently used in the Canadian land-based drilling and well servicing industry and is intended to ensure safe and reliable operation by emphasizing training, inspection, handling and repairs.

2. Equipment

For purposes of this RP, the manual rotary tong equipment for drilling and service rigs includes:

- Rotary Tongs
 - Lever
 - Jaws
 - Hanger
- Accessory jaws

3. Personnel Descriptions and Training

It is the responsibility of equipment owners to ensure that individuals involved in the inspection, repair and certification of drilling and service rig manual rotary tongs are properly qualified, trained and competent in their respective roles based on documented education, training or experience. The personnel referenced in this RP are defined below.

3.1 Professional Engineers

Professional engineers (P.Eng) shall have:

- Previous experience and training in structural and/or mechanical analysis
- A practical working knowledge of equipment referenced in this RP
- Previous experience and training in the repair of the equipment referenced in this RP
- Experience with general quality control standards
- Professional status in Canada

3.2 OEM and OEM Agent

The original equipment manufacturer (OEM) is the company who built the piece of equipment to be inspected.

An OEM agent is a designate of the OEM that has practical working knowledge of the specific equipment to be inspected.

3.3 Certifying Party

The certifying party performs/provides the certification. They must be either a professional engineer or an OEM agent.

3.4 Inspection Personnel

Inspection personnel are designated by the company and typically have:

- Knowledge of working principles of the equipment referenced in this RP
- Mechanical competency in the disassembly and reassembly of the equipment type and model
- Experience and knowledge in drilling and/or service rig maintenance

Examples of inspection personnel include:

- Professional engineers
- OEM agents
- Journeymen heavy duty mechanics and/or millwrights
- Mechanical and/or maintenance managers
- Senior operations personnel such as:
 - Rig managers
 - Field superintendents
 - Technologists
 - Rig-up superintendents
 - Shop foremen
 - Operations managers

3.5 Operating Personnel

Operating personnel are typically members of the rig crew and have:

- Knowledge of working principles of the equipment referenced in this RP
- Experience and knowledge in drilling and/or service rig maintenance

3.6 NDT Technicians

At a minimum, non-destructive testing (NDT) technicians must have Level II Canadian Government Standards Board (CGSB) certification or other approved certification/training at the discretion of the certifying party.

3.7 Welders

Welders must hold a valid Journeyman Welder certificate and have experience in drilling rig maintenance.

3.8 Training

Inspection and operating personnel shall be adequately trained to conduct inspections (including visual inspections) in accordance with this RP in order to satisfy provincial regulations and ensure that equipment will operate in the manner for which it was designed.

At a minimum, training should outline the inspection criteria for all components as outlined in this RP.

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Companies shall have a process in place to document and retain all training administered to company designated personnel referenced in this RP. Documentation should include the date of training and the attendees.

4. Inspection Types

All manual rotary tong equipment used during drilling and well servicing should be subject to an inspection and certification program to ensure all equipment is properly maintained and operable. Four levels of inspection should be performed:

- Level I inspection
- Level II inspection
- Level III inspection
- Level IV inspection and certification

When scheduling an inspection, the certifying party should be contacted to ensure any related safety or product bulletins are included in the scope of work.

All repairs shall be in performed following the requirements outlined in section 6 – Repairs, Maintenance and Documentation.

4.1 Inspection Frequency

At minimum, the inspection frequency for manual rotary tong equipment shall be in accordance with the schedule below. Inspections may be conducted more frequently if deemed necessary (e.g., by the OEM or site/personnel specific experience).

Note: For drilling rigs, one operating day = 24 accumulated operating hours from spud to rig release.

For service rigs, one operating day = 24 accumulated operating hours consisting of time over the well, mast standing, crew active and transportation time (the same as a billable hour).

Table 1. Inspection Frequency for Manual Rotary Tong Equipment

| Documentation | Inspection Frequency | | | |
|--------------------------------------|----------------------|--------|----------|----------|
| | Daily | Weekly | 250 Days | 500 Days |
| Tour Sheet | I | II | | |
| Mast and Overhead Equipment Log Book | | | III | IV |

4.2 Level I Inspections

A Level I inspection is a visual observation of the equipment before operations begin, during operations or during routine maintenance. This should include, but is not limited to, inspection for mechanical defects and proper operating condition.

Level I inspections shall be performed by operating personnel and should be included as part of the daily rig walk around carried out by the driller/operator or rig manager.

Level I inspections shall be recorded on the tour sheet.

4.3 Level II Inspections

A Level II inspection is a Level I inspection with a more thorough inspection of the load bearing components for:

- Obvious external cracks or paint chips
- Damage, distortion and/or premature wear or deterioration (including cables and chains)
- Missing parts or guards
- Proper function

Level II inspections should be performed by the driller/operator or rig manager.

Level II inspections shall be recorded on the tour sheet.

4.4 Level III Inspections

A Level III inspection is a thorough visual inspection of the following for structural and mechanical operating defects:

- All load bearing components
- Pick-up points
- Pins (e.g., for wear tolerances)

Level III inspections should be performed by inspection personnel.

Level III inspections must be documented in the CAOEC Mast and Overhead Equipment Log Book (or suitable equivalent).

4.5 Level IV Inspection and Certification

A Level IV inspection and certification is a complete inspection of the equipment. Disassembly may be required. NDT, magnetic particle, wet fluorescent or equivalent inspection of all critical areas must be performed.

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At a minimum, the following procedure must be performed during the inspection:

Note: Additional procedures may be performed at the discretion of the owner and certifying party.

- With tongs hung normally (or on a winch line), operate the latch mechanism to test for proper engagement, any interference between moving parts or excessive clearances.
- Disassemble tongs. Include all accessory jaws and pins for inspection.
- Clean tongs so that all surfaces are visible down to bare metal or undamaged paint (as directed by the certifying party).
- Visually inspect tong parts for cracks, distortion, corrosion and abnormal wear.
- Perform NDT on all load bearing surfaces, including pin areas, handles and latch parts.
- Measure pin bores and pin bore heights (hinge face to face) and compare with manufacturer tolerances.
- At the discretion of the certifying party, perform hardness testing in the region of pin bores, jaw faces, lever faces and previous repairs.
- Inspect die slot condition and orientation.

Level IV inspections shall be performed by a professional engineer or OEM Agent.

Inspection requirements are at the discretion of the certifying party.

Certification documentation is to be provided by the certifying party and should include the following:

- Document author
- Date and period of certification
- Serial number (if available)
- Name of manufacturer (if available)
- Date of manufacture (if available)
- Results of the Level IV inspection
- Description of the repair and where on the equipment the repair took place
- Location where repairs were completed (e.g., facility, on site, shop)

Level IV inspections must be documented in the CAOEC Mast and Overhead Equipment Log Book (or suitable equivalent) and signed by the certifying party.

5. Equipment Transportation

It is important to prevent damage to equipment transportation. To prevent damage during transportation:

- Proper handling procedures must be observed.
- Affected personnel must be trained accordingly.

6. Repairs, Maintenance and Documentation

Repairs and/or maintenance may be required after any Level III or Level IV inspection to retain the operating integrity of the equipment.

6.1 Repair Category

Any damage that requires repair shall be categorized as minor or major.

A professional engineer or an OEM agent must be consulted if there is any question as to whether the damage is minor or major.

All major damage must be repaired.

6.2 Repairs for Minor Damage

Repairs for minor damage include repairs to correct damage to:

- Non-loaded attachments
- Hangars
- Wire ropes

The rig manager (or higher authority) can determine the personnel to complete minor repairs.

Minor repairs do not require repair certification.

6.3 Repairs for Major Damage

Repairs for major damage include repairs to correct geometrical distortion or structural damage including:

- Repair or replacement of any component or surface found to be outside manufacturer's allowable tolerances
- All weld repairs to any load bearing component
- Any modification to load bearing components such as oversizing or undersizing pin fits
- Replacement of any load bearing pieces such as jaws, levers or pins

Post-repair inspections must follow the requirements set out in section 4.5 – Level IV Inspection and Certification for the equipment repaired.

All repairs for major damage shall be completed using procedures approved by a certifying party. The certifying party is responsible for providing the repair procedures and notes on the repair certification to the repair facility.

6.4 Repair and Maintenance Documentation

All repairs and maintenance shall be documented in the CAOEC Mast and Overhead Equipment Log Book (or a suitable equivalent) and include the following information:

- Date of repairs and/or maintenance
- Description of repairs and/or maintenance completed
- For minor repairs, the personnel that completed the repair and/or maintenance and signoff by the repair supervisor
- For major repairs, the name and signature of the certifying party of the repair

All components, where practical, should have serial numbers or unique identifiers stamped on them for traceability of the maintenance to the equipment.

6.5 Major Repair Documentation (Recertification)

The certifying party shall supply the repairing party with a certification document for the equipment requiring major repairs.

Repair certification is issued for the repair of damage and is intended to maintain Level IV certification. It does not extend the Level IV certification requirements unless a complete Level IV inspection is conducted in accordance with section 4.5 – Level IV Inspection and Certification.

Appendix 1: Revision History

Table 2. RP 5.0 Revision History

| Edition | Date | Revision Details |
|----------------|---------------|---|
| 7 | March 2022 | Revised <ul style="list-style-type: none">• For reformat to new style |
| 6 | June 2021 | Revised <ul style="list-style-type: none">• For logo and name change |
| 5 | August 2019 | Revised <ul style="list-style-type: none">• Operating day definition, revised (see CAOEC Technical Information Bulletin T-19-04 for more information) |
| 4 | October 2016 | Revised <ul style="list-style-type: none">• Content standardized and reformatted for alignment |
| 3 | August 2012 | Revised |
| 2 | November 2006 | Revised |
| 1 | 1999 | New RP sanctioned |