



RP 5.0: INSPECTION AND CERTIFICATION OF MANUAL ROTARY TONGS

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

CANADIAN ASSOCIATION OF OILWELL DRILLING CONTRACTORS
RECOMMENDED PRACTICE 5.0
INSPECTION AND CERTIFICATION OF MANUAL ROTARY TONGS (DR/SR)

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INTRODUCTION

The Canadian Association of Oilwell Drilling Contractors (CAODC) Engineering & Technical (E&T) Committee has developed a Recommended Practice (RP) for manual rotary tongs. This document dated October 2016 supersedes all prior editions of this Recommended Practice.

The information contained herein is a recommendation only of certification schedules for manual rotary tongs currently utilized in the Canadian drilling and well servicing industry. An attempt has been made to establish some practical recommended operating practices for manual rotary tongs in the Canadian drilling and well servicing industry.

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, such as load ratings, as designed by the OEM.

If the OEM stipulates increased levels of inspection or accelerated inspection/certification cycles, the contractors must follow the OEM guidelines unless granted approval to follow this CAODC Recommended Practice by a Professional Engineer (P. Eng).

CAODC has produced this Recommended Practice based on industry experience. However, this document should be considered in conjunction with all relevant legislation and the requirements of provincial regulatory authorities. 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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REVIEW PROCESS

CAODC Recommended Practices are reviewed and revised, reaffirmed, or withdrawn at least every three years.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@caodc.ca.

RP REVISION SCHEDULE

Revision Date	Revision Details
October 2014	Introduction revised to standardize all RP's.
October 2016	Content standardized for alignment and reformatted into new RP template.

1. SCOPE – MANUAL ROTARY TONGS

The equipment for drilling and service rigs covered in this Recommended Practice is as follows:

- Rotary tongs:
 - Lever;
 - Jaws, and
 - Hanger;
- Accessory jaws.

2. INSPECTION TYPES

To ensure that equipment is properly maintained and serviceable, four levels of inspection are recommended:

2.1 LEVEL I INSPECTION

A Level I inspection is a visual observation of the equipment prior to, and/or during operation, and/or during routine maintenance to check for mechanical defects and ensure proper operating conditions.

2.1.1 LEVEL I INSPECTION PERSONNEL

Level I inspections are to be performed by the rig crew.

2.1.2 LEVEL I INSPECTION DOCUMENTATION

Level I inspections shall be recorded in the tour sheet.

2.2 LEVEL II INSPECTION

A Level II inspection is a Level I inspection that includes a more thorough inspection of, but not limited to, load bearing components that includes checking for:

- Proper lubrication;
- Obvious external cracks;
- Damage and/or premature wear or deterioration;
- Missing parts or guards;
- Non-standard operation.

2.2.1 LEVEL II INSPECTION PERSONNEL

Level II inspections should be carried out by the Driller or Rig Manager.

2.2.2 LEVEL II INSPECTION DOCUMENTATION

Level II inspections shall be recorded in the tour sheet.

2.3 LEVEL III INSPECTION

A Level III inspection requires the equipment to be thoroughly checked in the field to determine serviceability and shall include Non Destructive Testing (NDT) techniques on critical areas.

Upon reaching the required number of operating days, as outlined in [Section 3 - Inspection Frequency](#), manual rotary tongs shall be Level III inspected. At a minimum, a thorough visual inspection of the following assembly and parts for structural and mechanical operating defects is required to determine the condition of the equipment:

- All load bearing components;
- Pickup points;
- Pins;
- Wear tolerances.

Any repairs required will be done as described in [Section 4 – Repairs, Maintenance and Documentation](#).

2.3.1 LEVEL III INSPECTION PERSONNEL

Personnel qualified to supervise and/or provide technical assistance for Level III inspections include:

- Inspection Personnel as described in [Section 5.1.1](#);
- NDT Technicians as described in [Section 5.1.3](#);
- Professional Engineer's as described in [Section 5.1.4](#).

2.3.2 LEVEL III INSPECTION DOCUMENTATION

Level III inspections, including NDT inspections, must be documented in the CAODC Mast and Overhead Equipment Log Book, or suitable alternative.

2.4 LEVEL IV INSPECTION AND CERTIFICATION

A Level IV inspection requires the equipment to be disassembled as required to do a complete inspection, and includes an NDT, magnetic particle, wet fluorescent or equivalent inspection of all critical areas.

Upon reaching the maximum number of operating days, as outlined in [Section 3 - Inspection Frequency](#), manual rotary tongs shall be Level IV inspected. At a minimum, the following is required during the inspection/certification process (**Note:** *additional procedures are 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 or 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's tolerance;
- At the discretion of the certifying party, perform hardness testing as required in the region of pin bores, jaw faces, lever faces and previous repairs;
- Inspect die slot condition and orientation.

Any repairs required will be done as described in [Section 4 – Repairs, Maintenance and Documentation](#).

2.4.1 LEVEL IV INSPECTION AND CERTIFICATION PERSONNEL

Personnel qualified to perform a Level IV inspection typically include:

- Professional Engineer's as described in [Section 5.1.4](#);

- OEM Agents as described in [Section 5.1.6](#).

2.4.2 **LEVEL IV INSPECTION AND CERTIFICATION DOCUMENTATION**

A certification document will be provided by the certifying party and should include the following:

- Document author;
- Date and period of certification;
- Overhead equipment serial number (if available);
- Name of manufacturer (if available);
- Date of manufacture (if available);
- Results of the Level IV inspection;
- Location of repairs (if applicable).

Additionally, Level IV inspections must be documented in the CAODC Mast and Overhead Equipment Log Book, or suitable equivalent, and signed by the certifying party.

3. **INSPECTION FREQUENCY**

At a minimum, the inspection frequency of overhead equipment shall be conducted in accordance with the schedule below. Should the tongs be subjected to loads in excess of the manufacturer's ratings, a Level III inspection is required immediately, before being returned to service.

Note: *should circumstances, OEM recommendations or individual experience dictate otherwise, CAODC member companies may conduct these inspections at greater frequencies.*

EQUIPMENT	DAILY	WEEKLY	250 DAYS	500 DAYS
Manual rotary tongs	I	II	III	IV

Note: *a well spudded prior to the expiry of the original 500 operating days may be completed.*

Note: *one operating day = any day or part of a day between spud and rig release.*

4. **REPAIRS, MAINTENANCE AND DOCUMENTATION**

Occasionally repairs and/or maintenance following a Level III or IV inspection may be required to retain the operating integrity of the equipment. Any damage that requires repair will be categorized as minor or major as follows:

4.1 **MINOR DAMAGE**

Minor damage includes:

- Repair of:
 - Guards;
 - Non-loaded attachments;
 - Hangars;
- Replacement of wire ropes.

4.1.1 **MINOR DAMAGE REPAIR PERSONNEL**

Minor repairs may be completed by Operating Personnel (as described in [Section 5.1.2](#)) at the discretion of the Rig Manager or higher authority, and do not require re-inspection.

If there is any question as to whether the damage is minor or major, one of the following must be consulted:

- Professional Engineer as described in [Section 5.1.4](#); or
- OEM Agent as described in [Section 5.1.6](#).

4.2 **MAJOR DAMAGE**

Major damage includes:

- 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;
- Any replacement of load bearing pieces such as:
 - Jaws;

- Lever;
- Pins, etc.

All major damage must be repaired and upon completion, requires a Level IV inspection specific to the equipment that was repaired.

Note: *all major repairs shall be done following a Professional Engineer or OEM Agent procedure. The certifying party would supply the repair facility with an engineering procedure and so note on the repair documentation.*

4.3 REPAIR AND MAINTENANCE DOCUMENTATION

All repairs and maintenance performed shall be documented in the CAODC Mast and Overhead Equipment Log Book, or suitable alternative, and include the following information:

- Date repairs and/or maintenance was conducted;
- Description of repairs and/or maintenance that was completed;
- For minor repairs:
 - Operating Personnel (as described in [Section 6.1.2](#)) that performed the repair and/or maintenance;
- For major repairs:
 - Certifying party of the repair, including signature.

Note: *all components, where practical, should have serial numbers or unique identifiers stamped on them to verify the documentation.*

4.3.1 MAJOR REPAIR DOCUMENTATION (RECERTIFICATION)

The certifying party will provide a certification document for the equipment requiring major repairs.

Any repair certification issued is for the repair of actual 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 2.4 - Level IV Inspection and Certification](#).

5. PERSONNEL QUALIFICATION, TRAINING AND DOCUMENTATION

5.1 PERSONNEL QUALIFICATIONS

5.1.1 INSPECTION PERSONNEL

Typical Inspection Personnel are considered to be senior operations personnel designated by the company that have:

- Knowledge of working principles of the equipment referenced in this RP;
- Mechanical competency in the disassembly of the equipment type and model;
- Experience and knowledge in drilling and/or service rig maintenance (as applicable).

Examples of senior operations personnel include: Rig Managers, Field Superintendents, Technologists, Rig-up Superintendents, Shop Foremen, and Operations Managers).

5.1.2 OPERATING PERSONNEL

Typical Operating Personnel are considered to be members of the rig crew that have:

- Knowledge of working principles of the equipment referenced in this RP;
- Experience and knowledge in drilling and/or service rig maintenance (as applicable).

5.1.3 NDT TECHNICIANS

At a minimum, NDT Technicians are required to have Level II, Canadian Government Standards Board (CGSB) certification or other approved certification at the discretion of the owner/inspector.

Note: *for the purposes of this Recommended Practice, an NDT Technician may include a drill collar inspector.*

5.1.4 PROFESSIONAL ENGINEERS

Professional Engineer's 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.

5.1.5 ORIGINAL EQUIPMENT MANUFACTURERS (OEM)

The company who built the original piece of equipment under inspection.

5.1.6 ORIGINAL EQUIPMENT MANUFACTURER AGENT

A designate of the OEM that has a practical working knowledge of the specific equipment under inspection.

5.1.7 WELDERS

Welders must hold a valid Journeyman Welder certificate and have previous experience in drilling and/or service rig maintenance (as applicable).

5.2 PERSONNEL TRAINING

To satisfy provincial regulations and ensure that equipment will operate in the manner for which it was designed, Inspection and Operating Personnel (as described in [Section 5 - Personnel Qualification, Training and Documentation](#)) should be adequately trained to conduct inspections (including visual) in accordance with this Recommended Practice. At a minimum, training should outline the inspection criteria for all critical components outlined in this Recommended Practice.

5.3 PERSONNEL DOCUMENTATION

Companies shall have a process in place that documents and retains all training administered to company personnel referenced in this Recommended Practice and should include:

- Date training took place;
- Who was in attendance.