



Recommended Practice 11.0

INSPECTION AND CERTIFICATION OF CARRIER MOUNTED EQUIPMENT

A Recommended Practice for the
Canadian 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 carrier mounted equipment used in the Canadian 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CAOEC recommended practices are reviewed and revised, reaffirmed or withdrawn at least every three years.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 carrier mounted equipment currently used in the Canadian 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 equipment includes load path components on trailer and self-propelled mobile carrier rigs, from mast pins to the ground, and typically includes:

- Free standing packages
- A-legs
- Headache rack
- Outrigger;
- Cylinder mounts
- Deadline anchors (if applicable)

This RP does not replace the regulatory requirements of provincial vehicle inspection programs (i.e., Commercial Vehicle Inspection Programs (CVIP) or Periodic Motor Vehicle Inspection (PMVI)).

Refer to CAOEC RP 10.0 – Inspection of Drawworks Brake Load Path components for information about drawworks braking components.

Figure 1. Self-Propelled Mobile Carrier

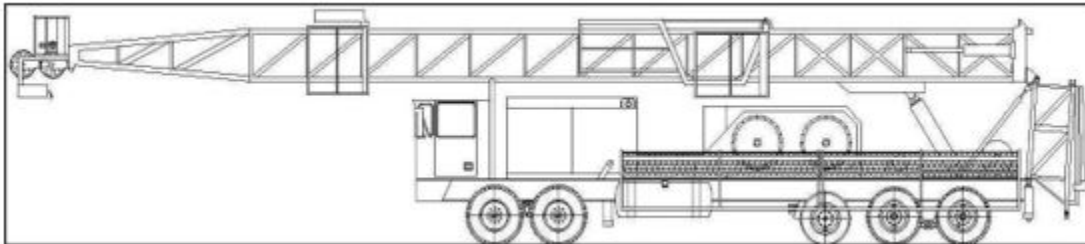
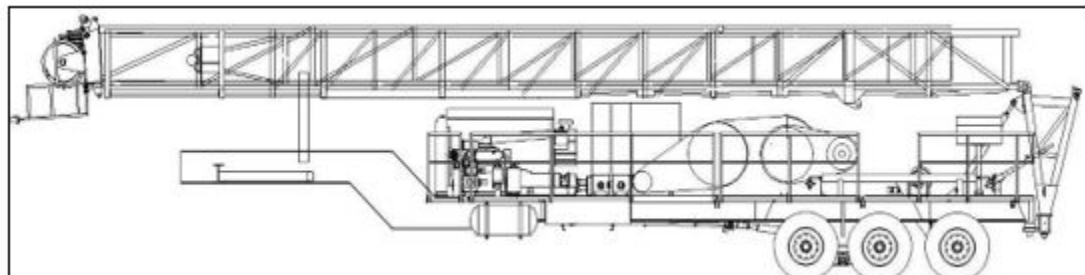


Figure 2. Rig Trailer



3. Personnel Descriptions and Training

It is the responsibility of equipment owners to ensure that individuals involved in the inspection, repair and certification of carrier mounted equipment 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 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

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- 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 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 service 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 outlined in this RP.

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. Not-In-Service Status

For the purposes of this RP, not-in-service status is a carrier that is not in active service. This is not the same as the Commercial Vehicle Safety Alliance definition of out-of-service status as outlined in the North American Standard Out-of-Service Criteria.

5. Inspection Types

All carrier mounted equipment used during 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

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

5.1 Inspection Frequency

At minimum, the inspection frequency for carrier mounted 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: 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 Carrier Mounted Equipment

Equipment	Documentation	Inspection Frequency			
		Daily	Weekly	Annual	24,000 Operating Hours
Free-standing packages	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	IV
A-legs	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	IV
Headache rack	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	IV
Outriggers	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	IV
Cylinder mounts	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	III
Deadline anchors (if applicable)	Tour Sheet	I	II		
	Mast and Overhead Equipment Log Book			III	IV

Note: Level III inspections shall be completed every calendar year from the date of the last Level III or IV inspection (whichever was most recent).

Note: When returning a carrier to service, a Level III inspection is not required if the last Level III inspection was within the last 12 months.

5.2 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.

5.3 Level II Inspections

A Level II inspection is a Level I inspection with a more thorough inspection of the equipment for:

- Proper lubrication
- 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.

5.4 Level III Inspections

A Level III inspection is a thorough check of the equipment to determine operability. It is performed in the field. It may, at the discretion of the inspector, include or require:

- NDT techniques on critical areas and load bearing components
- Some minor disassembly of guards
- Outside technical assistance
- Inspection of the carrier frame, paying particular attention to the torque tube (raising ram connection) and carrier frame between rear axles

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).

When returning a carrier to service from not-in-service status, a Level III inspection is not required if the last Level III inspection was within the last 12 months.

5.5 Level IV Inspection and Certification

A Level IV inspection and certification is a complete inspection of the equipment. Disassembly may be required. NDT of all critical load bearing components may be included at the certifying party's discretion.

The following procedure is should be followed to complete this inspection:

- Clean the carrier to a state that allows the inspection to be performed (e.g., remove built up mud or snow).
- Disassemble components on the carrier (e.g., mast, wheels, raising ram) and clean if required.
- Inspect the carrier frame, paying particular attention to the torque tube (raising ram connection) and carrier frame between rear axles.

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Level IV inspections shall be performed by inspection personnel.

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
- Carrier 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 inspection personnel.

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 or distortion of non-structural components such as:
 - Oblong pinholes
 - Minor scarring of components
 - Rust pits
- Damage that requires cosmetic welding

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 any repair that requires:

- Weld repairs and/or modifications to:
 - Structural load-bearing components (e.g., a-legs welded to the carrier)
 - Torque tubes (raising ram connection)
- Hot work to any structural or load-bearing component
- Modifications to load-bearing components such as oversizing and/or under-sizing pin fits
- Repairs and/or modifications to axle attachment points

NDT inspection must be performed after the repair of major damage.

Repairs may be completed in a field environment provided they can be performed adequately and are accessible for NDT inspection.

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 (e.g., material test reports (MTR), NDT reports, weld procedures)
- 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

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 5.5 – Level IV Inspection and Certification.

6.6 Provincial Vehicle Inspection Programs

All major damage identified during mandated commercial vehicle inspections (i.e., CVIP or PMVI) must be repaired.

All major repairs performed as a result of or during commercial vehicle inspections must be documented in the CAOEC Mast and Overhead Equipment Log Book (or suitable equivalent).

A copy of this RP should be made available to third-party vendors performing commercial vehicle inspections to ensure proper documentation for major repairs.

Appendix 1: Revision History

Table 2. RP 11.0 Revision History

Edition	Date	Revision Details
4	April 2023	Reviewed
4	March 2022	Revised <ul style="list-style-type: none"> • For reformat to new style
3	June 2021	Revised <ul style="list-style-type: none"> • For logo and name change
2	August 2019	Revised <ul style="list-style-type: none"> • Operating day definition, revised (see CAOEC Technical Information Bulletin T-19-04 for more information)
1	May 2016	New RP sanctioned <ul style="list-style-type: none"> • In November 2003 all content relevant to substructures was removed from RP 3.0A Inspection and Certification of Substructures, Drawworks, and Carriers and the practices of RP 1.0A - Inspection and Certification of Substructures were adopted. The rationale for this decision was due to the small number of substructures currently utilized in the Canadian service rig industry. • In May 2016 all content relevant to drawworks was removed from RP 3.0A Inspection and Certification of Substructures, Drawworks, and Carriers and the practices of RP 10.0 - Inspection of Drawworks Brake Load Path Components were adopted. The rationale for this decision was the lack of inspection standards specific to drawworks brake load path components. • Upon formal release to industry, RP 11.0 — Inspection and Certification of Carrier Mounted Equipment replaced RP 3.0A Inspection and Certification of Substructures, Drawworks, and Carriers which rendered RP 3.0A obsolete.