

# Reclamation Safety and Health Standards—2024 Edition

Chapter 3: Materials Handling | Appendix 3.05-A Reclamation-Owned and Contractor-Owned Performance Inspection Checklist

Applicability: Reclamation Employees, Facilities, Operations, and Contractors

## Appendix 3.05-A: Reclamation-Owned and Contractor-Owned Performance Inspection Checklist—Off-Highway Wheel-Type Construction Machines

### 1. General Information

Date of Test	Specifications No.:
Contractor	Subcontractor:
Description (Make and Model):	
Serial No. or Contractor's No.:	Year of Manufacture:

### 2. General Equipment Safety Requirements

#	Item	Description	Available/ Acceptable
1	Manufacturer's Safety Inspection & Maintenance Records	Completed manufacturer's equipment-specific inspection checklist and maintenance records. NOTE: The Reclamation CO may waive this requirement when manufacturer information is not available due to the age of equipment.	
2	Manufacturer's Operating & Maintenance Manuals	Shall be available for all off-highway, rubber-tired equipment covered by this section	
3	Reverse Signal Alarm	Ensure automatic reverse signal alarm operates properly when the equipment is placed in reverse gear and is moving in reverse.	
4	Audible Warning Device	Ensure all operator-controlled machines are equipped with an audible warning device having the control lever(s) within reach of the operator(s) when seated in the operating position(s).	
5	Head Lights	A minimum of two head lamps mounted symmetrically on the front of the equipment. Head lamps must provide adequate illumination for a distance that exceeds machine maximum stopping distance at maximum speed.	
6	Stop Lamps / Taillights	Two stop lamps at rear of machines for day operation, plus two tail lamps and one backup lamp for night operation.	

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#	Item	Description	Available/ Acceptable
7	Floodlamps	Work area floodlamps for night operation, including scraper bowl lamp, motor grader blade and front lamp, bucket lamps, ripper lamps.	
8	Rotating Amber Lamp	One rotating amber lamp visible in all directions on motor graders, front-end loaders and similar slow-moving machines used on public or haul roads or in borrow or fill areas.	
9	Cabs	Cabs are provided with safety glazed windows, heaters, defrosters, windshield wipers, door restraints, and rearview mirror on bidirectional machines.	
10	Access	Walking surfaces are skid resistant. Platforms are provided with guardrails. Access systems incorporate a three-point support method; one foot- two hands; one hand-two feet on handholds or ladders.	
11	Portable Fire Extinguishers or Fire Suppression Systems	Two 2A 40 B:C extinguishers are required on vehicles transporting flammable or explosive materials. Two 2A 40 B:C extinguishers and a fixed nozzle fire suppression system are required on all diesel-powered equipment operated underground. All other equipment must be equipped with the type and number of extinguishers or suppression systems deemed necessary by Reclamation.	
12	Fenders	Machines with a maximum speed exceeding 15 mph shall be equipped with fenders or operator tire guards conforming to SAE J321 or devices providing equivalent protection.	
13	Seatbelts	Operable seatbelts conforming to criteria set forth in applicable SAE standards. Only seatbelts permanently and legibly marked or labeled with: (1) year of manufacture; (2) model and style number; (3) trademark of manufacturer, distributor, or importer; and (4) design and test data certification are acceptable	

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#	Item	Description	Available/ Acceptable
14	Rollover Protection System (ROPS)	ROPS has a permanently attached label that certifies the structure conforms to applicable SAE standard. Non-labeled structures must not be used without a manufacturer's or PE's written confirmation that the structure meets the aforementioned criteria. ROPS showing signs of damage, repair, or modification must not be used on equipment unless recertified.	
15	Falling Object Protective Structure (FOPS)	Equipment shall be equipped with FOPS unless the contractor representative notes on this inspection report that the equipment will not be loaded and/or used in a manner that would subject the operator to falling material. Installed FOPS will be certified as conforming with SAE J/ISO 3449 criteria by a permanent label on the structure or the contractor has a written certification from the manufacturer or PE.	
16	Operator Enclosure	Tractors, loaders, or forestry machines used in tree clearing operations, winching operations, or other operations where objects may intrude into the operator's shall be equipped with enclosures conforming to SAE J1084. Equivalent protective enclosures deemed acceptable by the COR or delegated representative meet this requirement.	
17	Emergency Steering	Wheeled earthmoving machines such as tractors, scrapers, wheel loaders, graders, and dumpers manufactured in or after 1980 using a power steering system shall be equipped with emergency steering provisions meeting SAE J1511.	
18	Exhaust Systems	Engine exhaust gases are piped outside of cab and/or discharged away from operator. Exhaust pipes are guarded or insulated to protect operating and maintenance personnel.	

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#	Item	Description	Available/ Acceptable
19	Dump Truck Safety Devices	<p>Dump trucks of all descriptions shall be equipped with:</p> <ul style="list-style-type: none"> <li>• Trip handle or dump-body operating levers, safety latches, of an equivalent protective system for preventing accidental movement of the lever.</li> <li>• Permanently mounted device for preventing accidental lowering of dump body or bed during inspection or maintenance operations.</li> <li>• Operator protective cab shield or canopy to protect operator during machine loading or unloading operations. Machines without this protection will display a suitable warning sign directing the operator to leave the cab during the loading or unloading process.</li> </ul>	

### 3. Brake System Requirements

All equipment shall have an effective service braking system. The service braking system must have the capability equivalent to holding the respective equipment under the following conditions:

Machine	Grade	Condition
Loaders	30%	Loaded to manufacturer's gross weight rating and distribution with bucket in SAE carry position.
Dumpers and tractor scrapers	25%	Loaded to manufacturer's gross weight rating and distribution.
Graders	30%	Cutting edge to be in the transport position.
Tractors with dozers	30%	Lowest part of cutting edge to be 18 inches above test surface

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#	Item	Description	Available/ Acceptable
20	Brake Release	The service braking system shall be of the type that can be applied or released by the operator while sitting in the operating position.	
21	Wheel Brakes	All tractor scrapers and dumpers must have braked wheels on at least one axle of the prime mover and one axle of each trailing unit. All other machines may have only two braked wheels (one right hand, one left hand) if the system meets stopping distance requirements of part IVB.	
22	Brake System Power	With the equipment stationary, the service braking system's primary power source shall have the capability of delivering at least 70 percent of maximum brake pressure when the brakes are fully applied twelve (12) times at a rate of four (4) applications per minute with the engine at maximum governed speed for dumpers and tractor scrapers and twenty (20) times at the rate of six (6) applications per minute for loaders, graders, tractors with dozer, compactors, and rollers.	
23	Braking System Warning Device	The service braking system using stored energy shall be equipped with a warning device that activates before system energy drops below 50 percent of manufacturer's specified maximum operating energy level. The device shall be readily visible and/or audible to the operator and provide a continuous warning. Gages indicating pressure or vacuum do not meet these requirements.	

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#	Item	Description	Available/ Acceptable
24	Emergency Stopping System	<p>All equipment, unless exempted elsewhere, shall be equipped with an emergency stopping system capable of the following:</p> <ul style="list-style-type: none"> <li>• The emergency stopping system shall be capable of bringing the equipment to a stop within the distance and under the conditions specified in Part IV-B outlined below.</li> <li>• The equipment emergency system shall be capable of being applied from the operator's position. The system shall be arranged so that it cannot be released by the operator unless immediate reapplication can be made from the operator's seat to stop the machine or combination of machines.</li> <li>• In addition to the manual control, the emergency stopping system shall also be applied automatically. If an automatic system is used, the automatic application shall occur after the warning device is actuated.</li> </ul>	
25	Parking Brake Systems	<p>All equipment shall be equipped with a parking system capable of:</p> <ul style="list-style-type: none"> <li>• Being applied from the operator's position. The brake must be such that it cannot be released unless immediate reapplication can be made by the operator.</li> <li>• The parking system, when applied, must maintain the parking performance despite any contraction of the brake parts, exhaustion of energy, or leakage of any kind.</li> </ul>	
26	Accessories	<p>Braking systems utilizing stored energy or vacuum assist devices shall be equipped with a gage that indicates the pressure or vacuum available for braking.</p>	

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### 4. Brake System Test Methods and Procedures

All off-highway, wheel-type equipment shall undergo braking performance testing.

The COR or delegated representative may exempt emergency braking systems requirements for compactors and rollers manufactured prior to 1976 if such systems are not available from the manufacturer. Additionally, compactors and rollers intended for use on 3 percent or less grades can be Reclamation exempted from brake performance test requirements.

If available, manufacturer-recommended brake testing procedures specific to the make and model of equipment may be substituted for brake testing procedures listed below. Attach documentation of manufacturer-recommended brake testing results to this completed form.

All tests shall be conducted with applicable braking systems fully charged.

Equipment failing brake tests shall not be placed into service until the parking system has been repaired and satisfactorily tested.

#### a. General Braking Performance Testing

Equipment will be tested under the following conditions

Machine	Condition
Loaders	Unloaded with bucket in carry position (The vertical distance from ground to centerline of bucket hinge pin, with the angle of approach at 15 degrees.
Dumpers and Tractor Scrapers	Loaded to manufacturer's gross machine weight rating and distribution.
Tractors with Dozers	Lowest part of cutting edge 18 inches above test surface.
Compactors or Rollers	Maximum fuel, oil, sprinkler system water, and ballast as actually in use when operating.
Graders	Cutting edge to be in the transport position.

Notes:

- All dynamic stopping tests shall be conducted from 20 mph, except compactor and roller stopping tests shall be conducted from 10 mph or the maximum rated speed, if less than 10 mph.
- Stopping tests shall be conducted with the transmission in the gear range commensurate with 20 mph testing speed. The power train may be disengaged prior to completing the stop. On machines using hydrostatic drives, the drive train shall be disengaged to eliminate the retarding torque of the transmission.

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- Auxiliary retarders shall not be used in the test unless the retarder is simultaneously activated by the applicable brake control system.
- Stopping distances shall be measured from the point at which the brake control is applied to the point at which the machine stops.
- Means shall be provided to determine weight of equipment and stopping distances with an accuracy of plus or minus 2 percent and test speeds with an accuracy of plus or minus 5 percent.

### **b. Services and Emergency Braking Systems**

Service and emergency dynamic braking tests shall be conducted on a level (less than 1 percent grade in direction of travel and 3 percent at right angles to travel) clean swept dry surface. The course length will be sufficient for accelerating from 0 to 20 mph (10 mph for compactors and rollers) and providing a stopping distance equal to 1-1/2 times that shown for the emergency braking system. Static service brake holding tests shall be conducted on the greater of 15 percent grade or maximum grade of intended travel.

Service and emergency braking systems shall have the following stopping capabilities in feet when traveling at 20 mph (10 mph for compactors and rollers):

Equipment	Equipment Weight (lbs)	Service Braking	Emergency Braking
Loaders tractors with dozers	Up to 36,000	45	135
	Over 36,000 to 70,000	61	183
	Over 70,000 to 140,000	75	225
	Over 140,000 to 280,000	89	267
	Over 280,000	111	333
Dumpers	Up to 100,000	59	153
	Over 100,000 to 200,000	74	173
	Over 200,000 to 400,000	96	202
		118	231
Combination dumpers and dumper trains	Up to 100,000	59	153
	Over 100,000 to 200,000	89	192
	Over 200,000 to 400,000	125	241
	Over 400,000	177	310
Tractor Scrapers	Up to 50,000	58	151
	Over 50,000 to 100,000	73	170
	Over 100,000 to 150,000	88	190
	Over 150,000	102	209



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Equipment	Equipment Weight (lbs)	Service Braking	Emergency Braking
Graders	Up to 35,000	42	126
	Over 35,000 to 70,000	54	162
	Over 70,000	75	225
Compactor rollers	Up to 12,000	23.7	56.5
	Over 12,000 to 30,000	27.4	60.2
	Over 30,000	31.1	63.9

### c. Parking Brake Systems

Parking brake systems shall be tested on a dry, 15-percent grade surface. The tests must be conducted with the unit facing both up and down the slope. Once the unit is in place and the parking brake set, all other holding devices and braking systems must be released and the transmission placed in the neutral position. Any stored energy assist sources (air, vacuum, hydraulic) must be depleted. The unit must remain in this condition without movement for 5 minutes.

### d. Energy Recovery Test

Energy recovery tests must be conducted as follows: Equipment shall be placed on the stopping test surface. The engine speed shall be increased to the maximum governed revolutions per minute. The system storage pressure or vacuum shall be set to increase until gages indicate the system is at the manufactured full rated level. The brakes on dumpers and tractor scrapers shall be fully applied four times per minute for 3 consecutive minutes. During this test procedure, the pressure/vacuum gage must never read less than 70 percent of full rated reading. The brakes on loaders, graders, tractors with dozer, compactor, and rollers must be fully applied 6 times per minute for 3-1/2 consecutive minutes. During this test procedure, the gage must never read less than 70 percent of full rated reading.

## 5. Service Brake System Test

TYPE (air, vacuum, mechanical, hydraulic, combination)	No. of axles with brakes R.H. L.H.
Condition of test course (surface and grade)	
Weight of equipment (manufacturer's gross vehicle weight rating—GVWR)	

Test	Satisfactory	Deficient
Pressure or vacuum maintained during braking.		
Pressure or vacuum recovery.		
Warning device for energy systems.		

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Test	Satisfactory	Deficient
Stopping distance (See IV-B for acceptance criteria)		
Feet traveled – First trial:		
Feet traveled – Second trial:		
Holding performance on grade (See IV-B for acceptance criteria)		

If brake testing was conducted using manufacturer’s recommendations, attach a signed copy by the contractor/equipment owner.

### 6. Emergency Stopping System

Type Manual Only Manual/Automatic

Test	Satisfactory	Deficient
Stopping distance (See IV-B for acceptance criteria)		
Feet traveled – First trial:		
Feet traveled – Second trial:		

### 7. Parking Systems Tests

See 4.c. for acceptance criteria

Holds on 15% grade: Forward and Reverse

Remains Applied for Five minutes: Forward and Reverse

### 8. Certification

TESTED/INSPECTED BY (contractor/Equipment Owner)

Signature, Title, Date

TEST/INSPECTION WITNESSED BY (Contracting Officer Representative or Delegated Official)

Signature, Title, Date