

**MCO P11262.2**

**INSPECTION, TESTING, AND  
CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT**



**U.S. MARINE CORPS**

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From: Commandant of the Marine Corps  
To: Distribution List

Subj: INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT

Ref: (a) MCO P11240.106A

Encl: (1) LOCATOR SHEET

1. Purpose. To publish policy and procedures for the inspection, testing, and certification of Marine Corps tactical ground load lifting equipment.

2. Cancellation. MCO 11262.2.

3. Summary of Revision. This revision contains a substantial number of changes and should be completely reviewed.

4. Applicability. This Manual is applicable to each unit owning or using tactical ground load lifting equipment. Included is all mobile equipment commonly referred to as cranes, wreckers, forklifts, and aerial personnel devices which are used to lift loads vertically. Cranes, derricks, hoists, winches, monorails, etc., which are permanently installed in facilities; i.e., are not tactical and do not fall under the provisions of this Manual. Hydraulic jacks and jack stands shall be maintained and inspected per the instructions in their technical manuals (TM). Such items will be permanently marked with their rated load capacity. The reference provides the subject procedures for Garrison Mobile Equipment.

5. Responsibilities

a. Commanding officers (CO) and officers in charge (OIC) shall ensure that inspections, testing, and certifications are conducted per this Manual and appropriate TM's. CO's/OIC's shall ensure that the weight capacity and test data are properly stenciled on the equipment and that equipment records are properly annotated before placing load lifting equipment into service.

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b. Commanding Generals (CG) shall designate specific 3d Echelon capable organizations to provide inspection and testing services for units without the organic resources/maintenance authority to conduct those inspections and tests.

c. Commanders of Marine Corps bases (MCB) and stations shall make the facilities referred to in chapter 3 available to tenant/geographically proximate Fleet Marine Force organizations.

d. Operators assume direct responsibility for equipment when it is assigned or dispatched to them. This responsibility includes safe operation, proper use, performance of such periodic maintenance as may be prescribed, and collection of operational data as may be required.

6. Recommendations. Recommendations concerning the contents of this Manual are invited and will be submitted to the CMC (LPP-3) via the CG, Marine Corps Research Development and Acquisition Command and the appropriate chain of command.

7. Reserve Applicability. This Manual is applicable to the Marine Corps Reserve.

8. Certification. Reviewed and approved this date.

  
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LOAD LIFTING EQUIPMENT

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CHAPTER 1

INTRODUCTION

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## CHAPTER 1

## INTRODUCTION

1000. BACKGROUND

1. The Secretary of Defense requires all components, including the Marine Corps, to conform with the Department of Labor's Occupational Safety and Health Administration (OSHA) regulations (with some exceptions predicated by Defense missions). Extracts of pertinent safety instructions set forth in OSHA-29 Code of Federal Regulations (CFR) 1910 have been consolidated in this chapter. For many years most of the Department of Defense agencies concerned have been much more stringent than OSHA requires with regard to industrial safety when load lifting equipment is involved. Load testing has been performed, especially in the Marine Corps, when not required by OSHA. This has resulted in considerable unnecessary expense of time, manpower, and material. This Manual provides the standard procedures that will be used for the inspection, testing, and certification of tactical ground load lifting equipment.

2. CO's/OIC's will ensure that inspection, testing, and certification programs are implemented per this chapter.

1001. GENERAL INFORMATION

1. Tables 1-1 and 1-2 list requirements for inspection, testing, and certification of load lifting equipment.

2. Operators of load lifting equipment will perform a daily inspection of their assigned equipment. The equipment operator's daily checklist (table 4-1) will be produced locally, filled in as appropriate, and used for this purpose. The form will be filed with trip ticket and retained with same.

3. When set forth in TM's as a scheduled maintenance (SM) check, condition inspections will be conducted at the same times as SM using the Condition Inspection Record shown in Table 4-2. When no general inspection is specified as part of SM services, or where inspection requirements are not adequately covered, it will be conducted annually as set forth herein.

4. Only cranes and aerial personnel devices require load testing. Aerial personnel devices are defined as any mechanically, hydraulically, or electrically operated device used to lift a person in the air. Scheduled periodic load testing is not required. Prior to initial use, however, all newly manufactured, 1/ extensively repaired 2/ or altered cranes/aerial personnel devices shall be load tested.

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5. Condition inspection and/or load test is required prior to initial use and all new items being fielded will be inspected/ tested as part of the equipment acceptance inspection unless the item of equipment has the requirement certifications which are current within the past 12 months.

6. Load tests required for extensively repaired or altered cranes/ aerial personnel devices 3/ will be the responsibility of the organization doing the repairs prior to returning the equipment to its owner. Therefore, upon receipt of a mobile crane/aerial device, the CO/OIC will determine if a load test has been accomplished by examination of the equipment records. If no certification is present, the CO/OIC may elect to refuse to accept the equipment or accept it and arrange to have it locally load tested.

7. Annual Condition Inspection. It is the purpose of the annual condition inspection to ensure that the overall structural, mechanical, hydraulic, and electrical components of the equipment have been maintained in a safe and serviceable condition and are functioning properly.

8. Certification. The certifying officer is responsible for ensuring the safety and reliability of all load lifting equipment. The certifying officer shall be designated in writing by the CG/CO. Certifying officers shall either be Marine officers or qualified civilians. 4/ The Marines will possess Military Occupational Specialties 1310 (Engineer Equipment Officer), 3510 (Motor Transport Maintenance Officer), or 2110 (Ordnance Vehicle Maintenance Officer). The certifying officer shall, in turn, designate the authorized test directors and inspection and test personnel. Certifications shall be based on the condition inspection and availability of load test certification.

1/ All contracts for the purchase of new mobile cranes/aerial personnel devices include a requirement for a manufacturer's load test certification to accompany the vehicle on delivery.

2/ Load testing is only required if the lifting portion of the crane/aerial personnel device has been repaired or altered; i.e., repairs to the truck portion of a mobile crane will not require load testing of the crane portion. Outriggers will be considered as part of the lifting portion of a crane/aerial personnel device.

3/ It is mandatory that contracts with repair contractors for rebuilt or significantly repaired mobile cranes/aerial personnel devices contain a load test requirement/ certification clause. Depots are required to furnish the same.

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- 4/ Certification officers should be qualified at an appropriate Marine Corps school or Labor Department approved civilian-run schools.

Certification of condition inspection and/or load test shall be signed by the test director, inspection and test personnel, and certifying officer.

9. Certification Frequency. Each item of load lifting equipment shall be certified as condition inspected at least once annually.

10. Waivers

- a. The requirements of this Manual are waived for any unit under extended combat conditions.

- b. The requirements of this Manual may be waived for items of equipment that are placed in administrative storage as delineated in paragraph 3002.8 (Deferred Preventive Maintenance Service) of MCO P4790.2. Under no circumstances will a waiver for administrative storage extend beyond a 2-year period. This waiver does not apply to items placed on administrative deadline or low usage items, both of which are also addressed in the aforementioned reference. Local procedures must be addressed in the major command maintenance management standard operating procedure.

- c. The requirements of this Manual may be waived for items of equipment that are placed in Prepositioned War Reserve (PWR). This waiver is contingent upon the following:

- (1) That the asset has met the requirements of this Manual prior to induction into PWR.

- (2) The asset will meet the requirements of this Manual prior to issue to a using unit.

- d. During peacetime, CG's of the 4th Division Wing Team (DWT) are authorized to waive the requirements of this Manual for a 1-year period. Equipment records will be so annotated. Copies of waivers will be maintained in the applicable equipment record jacket. At no time will an item of the 4th DWT equipment be allowed to go without inspection, testing, and certification for two consecutive years. CG's of the 4th DWT are encouraged to establish Interservice Support Agreements (ISA) or commercial contracts to comply with these requirements if appropriate organic/Marine Corps personnel are not available or due to geographical location. Inspection, testing, and certification by agencies outside the Marine Corps should clearly state that they are made per the provisions of this Manual.

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11. Marking. Load lifting equipment shall be stenciled, in a position clearly visible to the operator, with certification data indicating the test status.

EXAMPLE: CAP. 3,000 lb certified 10 November 1980.

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Table 1-1.--Inspection, Testing, and Certification Requirements  
by Type Equipment (Less LVS).

	PAR. REF.	RETRIEVERS	EQUIPMENT PERMANENTLY INSTALLED IN FACILITIES	AERIAL PERSONNEL DEVICE	CRANES	WRECKERS	FORKLIFTS	WINCHES	HOISTS	HYDRAULIC JACKS	JACK STANDS	ONE
NO ACTION REQUIRED	2005											
REQUIREMENT DO NOT FALL UNDER PROVISIONS OF THIS ORDER	4, 2005	•										
PERMANENTLY MARKED W/RATED LOAD CAPACITY	4									•		
CONDITION INSPECTION	1001.3, 2000 2001, 4002.3	•	•									
HOOK INSPECTION	2002	•										
WIRE ROPE, FASTENERS, TERMINAL HARDWARE	2003	•										
HOIST, WINCHES & STRUCTURAL METAL COMPONENTS	2004	•										
NO LOAD TEST	4001, 4002.1											
LOAD TEST	1001.4, 4000 4001											
STABILITY TEST	4000, 4001.3B											
PREOPERATION CHECK	4002											
STABILITY TEST & RANGE OF MOVEMENT	4002.4											
ANNUAL CONDITION INSPECTION CERTIFICATION	1001.4, 1001.6 2006, 2008											
LOAD TEST CERTIFICATION	1001.5											
OPERATOR'S DAILY CHECKLIST	1001.2	•										

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Table 1-2.--Inspection, Testing, and Certification Requirements  
for the LVS MK15/17 Crane.

<u>Requirement</u>	<u>Paragraph Reference</u>
Operator's Daily Checklist	1001.2
Condition Inspection	2000, 2001
Scheduled Maintenance Check	1001.3
Hook Inspection	2002
Wire Rope, Fastenings, Terminal Hardware	2003
Hoists, Winches & Structural Metal Components	2004
Lift Capacity and Motion Test	5002
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CHAPTER 2

INSPECTIONS

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HOISTS, WINCHES, AND STRUCTURAL METAL COMPONENTS	2004	2-6
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CHAPTER 2

INSPECTIONS

2000. ANNUAL CONDITION INSPECTION. In addition to those inspections required by load lifting equipment TM's or commercial manuals, the inspections in paragraph 2001 (as applicable) will be performed.

2001. ALL LOAD LIFTING EQUIPMENT

1. Check all mechanical controls for proper adjustments and check the entire control mechanism for excessive wear of components and contamination by leaking lubricants or foreign matter.
2. Check hydraulic system seals, hoses, lines, fittings, pumps, and valves, for deterioration, leaks, and wear.
3. Check mast and lift carriage assemblies including forks and chains, for cracks, broken welds, distortion, improper fit, and excessive wear.
4. Check the brake and steering systems for excessively worn or defective moving parts to include seat switches, parking brakes, and brake interlock switches.
5. Check electrical, gasoline, and diesel systems for signs of malfunction, excessive deterioration, dirt or moisture accumulation, and compliance with applicable safety regulations.
6. Check protective motor control circuit devices, battery cable connectors, battery compartment insulation, thermo protectors, compartment covers, filters, and emergency switches. Ensure that type EE (electrical equipment enclosed to prevent emission of sparks in potentially hazardous atmospheres) electric trucks have static electricity discharge straps properly installed, immediately adjacent to the drive wheels, to effect contact with road or floor surfaces, when such trucks are used in areas where an explosive dust potential exists. Specification MIL-T-21862 (refer to latest revision) provides procedures for testing the discharge straps and requires a resistance between chassis and floor, through the straps, of no more than 250,000 ohms.
  - a. Ensure that all electrical cables are appropriately mounted and protected to prevent damage by abrasion, cutting, or catching on stationary objects.
  - b. Ensure that batteries are securely fastened in place to prevent spillage of electrolyte onto electrical cables.

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c. Ensure that battery compartments provide ample ventilation and have openings properly guarded to prevent contact of foreign objects with cell terminals.

d. Equipment must be clean and free of excessive oil and grease accumulations, particularly within the confines of the motors and on electrical contacts.

7. All deficiencies observed shall be corrected and repairs made prior to load testing (if required).

2002. HOOK INSPECTION

1. General Inspection. Hooks shall be inspected annually for wear in swivels and pins, other wear, cracks or gouges, and proper operation and condition of safety latches, where installed. Cracks and gouges parallel to the contour of the hook shall be removed by surface abrasion and shall result in a smooth surface retaining the profile of the hook. Where cracks and gouges cannot be removed by surface abrasion, the hook shall be discarded. Where cracks and gouges are transverse to the contour of the hook, the hook shall be evaluated for retention or disposal. Defects in the unstressed portion of the hook do not affect strength. No attempt shall be made to correct hook deficiencies by use of heat or welding. Where normal wear or removal of cracks or gouges results in a reduction in the original sectional dimension of 10 percent or more, the hook shall be discarded. If the hook is visually bent or twisted, it shall be discarded. No attempt shall be made to straighten bent or twisted hooks.

2. Hook Throat Spread. Hooks shall be measured for hook throat spread upon receipt. A throat dimension base measurement shall be established by installing two tram points and measuring the distance between these tram points (+/-1/64-inch). See figure 4-1. This base dimension shall be retained in the "remarks" section of the Record Jacket (form NAVMC 696D) or the Ordnance Vehicle Preventive Maintenance Record (form NAVMC 10395) for the life of the hook. The distance between tram points shall be measured quarterly. Hooks showing an increase in the throat opening by more than 15 percent from the base measurement shall be discarded.

3. Hook Block Inspection and Nondestructive Test. The hook, retaining nut, and bearings shall be thoroughly inspected annually. The hook and retaining nut shall be visually examined for thread wear and corrosion damage. The block bearing plate shall be visually inspected for cracks, wear, or other damage. Bearings shall be inspected for unusual wear and free rotation. All components shall be lubricated as required. The entire hook and retaining nut assembly shall be nondestructively tested for structural defects. The nondestructive test of general-purpose service crane hooks is valid for five certification periods. The

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effective date of hook inspection and nondestructive test shall be the crane certification date. Nondestructive tests shall be performed during load tests (see paragraph 4001.3a(2)). Five years after crane certification, a hook that has been with said crane that entire time will be subject to a new nondestructive test.

2003. INSPECTION OF WIRE ROPE, FASTENINGS, AND TERMINAL HARDWARE

1. General Procedures. Remove the wire rope dressing from those areas exposed to maximum wear, exposure, and abuse. Inspect for crushing, kinks, corrosion, or other damage, broken wires, and proper lubrication. Check the wire rope sockets, swage fittings, eyes swivels, trunnions, stays, pendants, and securing hardware for wear, cracks, corrosion, and other damage. The drum end fittings need only be disconnected and/or disassembled when visible evidence of deterioration deems it necessary.

2. Wire Rope Rejection Criteria. Remove the damaged portions, or replace all wire rope exceeding the following:

a. Kinks or Crushed Sections. Severe kinks or crushed rope in straight runs where the core is forced through the outer strands or wires are damaged. (This does not apply to runs around eyes, thimbles, and shackles.)

b. Flattened Sections. Flattened sections where the diameter across the flat is less than five-sixth of original diameter. (This does not apply to runs around eyes, thimbles, and shackles.)

c. Wear. Not to exceed 30 percent of any individual outer wire diameter.

d. Broken Wires

(1) Running Ropes. The number of broken or torn wires exceeds six randomly distributed broken or torn wires in one lay or three broken wires in one strand in one lay. Replace the end connection if there is one or more broken wires adjacent to the end connection.

(2) Standing, Guy, and Boom Pendant Ropes. More than two broken wires in one lay in sections beyond the end connection or one or more broken wires at an end connection.

e. Loss in Diameter. Not to exceed 10 percent of the nominal diameter of the wire rope.

f. Accumulation of Defects. An accumulation of defects which in the judgment of the inspector creates an unsafe condition.

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g. Rated Capacity. The rated capacity of the replacement wire rope for all cranes shall be per the manufacturers' stated requirements.

2004. HOISTS, WINCHES, AND STRUCTURAL METAL COMPONENTS

1. Operation Check. The operator shall perform an operation check as prescribed in the appropriate TM's. For equipment where such checklist is not included in the TM, the following inspection shall be conducted as a minimum requirement:

- a. Inspect all control mechanisms for maladjustment which could interfere with proper operation.
- b. Inspect all control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.
- c. Inspect all safety and locking devices for malfunction.

2. Condition Inspection. During each annual certification, inspect for the following, as applicable:

- a. General Information
  - (1) Check for proper marking.
  - (2) Check for evidence of mishandling and/or damage.
  - (3) Check for excessive wear on brake and clutch system linings, pawls, and ratchets.
  - (4) Check for rope reeving for nonconformance with manufacturer's specifications.
- b. Frames. Check for bends, distorted sections, broken welds, excessive corrosion, and loose bolts or rivets.

2005. RECORDING REQUIREMENTS. The form contained in table 4-2 shall be used for recording (as applicable) the annual condition inspection of load lifting equipment. Load tests, when required, will be recorded and certified as shown in the form contained in table 4-3. Annual condition inspection of load lifting equipment will be filed in the equipment record jacket and retained until successful completion of the next inspection/test. Load test certification forms will be filed in the equipment record jacket and retained until successful completion of the next inspection/test; however, the load test certification which documents the completion of the nondestructive tests shall be retained until completion of the next nondestructive test. Additionally, the date of the nondestructive test will be annotated in the "remarks" section of forms NAVMC 696D and NAVMC 10395.

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CHAPTER 3

FACILITIES

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CHAPTER 3

FACILITIES

3000. GENERAL. When local load testing of cranes/aerial personnel devices are required, paragraph 3001 applies.

3001. FACILITIES REQUIRED. The following facilities are required for load testing mobile cranes and aerial personnel devices:

1. A sufficiently large, level hardstand.
2. A deadman strong enough to withstand at least 150 percent of the area's largest mobile crane's capacity. 1/
3. A calibrated Baldwin SR-4 load cell, or its equivalent, with a capacity of measuring at least 150 percent of the area's largest mobile crane's capacity.
4. Calibrated weights heavy and dense (compact) enough to be used in the load tests described.

1/ MCB, Camp Pendleton, California and MCLB, Barstow, California presently possess well-designed deadman/load lifting measuring devices. Liaison with these installations is encouraged to determine data required to build similar facilities at other Marine Corps installations.

3002. LOCATION OF FACILITIES. The CG's of the following installations will provide the aforementioned facilities for the load testing of tactical equipment for all Marine Corps units in their geographical vicinity:

1. MCCDC, Quantico, Virginia.
2. MCB, Camp Lejeune, North Carolina.
3. MCAS, Beaufort, South Carolina.
4. MCB, Camp Pendleton, California.
5. MCAS, Cherry Point, North Carolina.
6. MCAS, El Toro, California.
7. MCLB, Albany, Georgia.
8. MCLB, Barstow, California.
9. MCAS, Kaneohe Bays Hawaii.

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10. MCB, Camp Butler, Japan.
11. MCAS, Iwakuni, Japan.

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CHAPTER 4

LOAD TESTS

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CHAPTER 4

LOAD TESTS

4000. GENERAL

1. Prescribed tests are overload tests, and extreme caution should be observed at all times. When testing lattice-boom cranes, personnel shall watch the outrigger(s) opposite the boom for any indication of the outrigger(s) leaving the ground. This condition indicates that the lifting device is approaching a tipover condition, and testing shall be immediately terminated by lowering the test load to the ground. When testing hydraulic boom cranes, an outrigger opposite a load positioned at a swing angle of 45 degrees, 135 degrees, 225 degrees, and 315 degrees (measured from the front of the vehicle as 0 degrees) may rise off the ground. This is not tipping. At no time during testing should two outriggers of a hydraulic boom crane rise off the ground. If this condition occurs, testing should immediately be terminated by lowering the test load to the ground. A condition inspection per the instructions contained in paragraph 2000, preceding, will be conducted prior to load testing.

2. Personnel shall remain clear of suspended loads and areas where they could be struck in the event of boom failure.

3. The test load should be raised only to a height sufficient to perform the test.

4. Items of Marine Corps equipment shall not be used as load testing weights.

5. Safety chains attached to outriggers on the side opposite the lift are recommended to preclude accidental rollover during maximum (overload) testing.

6. Wooden cribbing under the crane's counterweight is recommended to prevent rear rollover in the event a wire rope or hook fails during maximum (overload) testing.

4001. CRANES

1. For truck cranes, extend outriggers and raise the crane carrier off the ground to completely unload tires or wheels. Level the crane as required by the manufacturer's load chart. Rotate the boom 90 degrees from the longitudinal axis of the crane carrier, and position the boom at the minimum working radius.

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2. No-Load Tests

a. Hoist

(1) Raise and lower the hook through the full working distance of hook travel.

(2) Run the hoist block into the limit switch(es) (where installed) at slow speed.

(3) Run the hoist block beyond the limit switch(es) (where installed) by using the bypass switch.

b. Boom

(1) Raise and lower the boom through the full working range.

(2) Raise the boom into the upper limit switch (where installed). Raise the boom past the boom upper limit switch, using the bypass switch.

(3) Test the lower limit switch (where installed) by the same procedure prescribed for testing the upper limit switch.

(4) Extend and retract the telescoping boom sections the full distance of travel.

(5) Check the radius indicator by measuring the radius at the minimum and maximum boom angle.

(6) Other motions, including swing, shall be operated through one cycle (one full revolution of major components).

3. Load Test. The load test consists of two parts: a maximum load test and a stability test. The tests will be performed in the following sequence:

a. Maximum Test

(1) Position the crane with the boom at maximum prescribed lift angle, hook attached to the load lifting measuring device, with the position of the boom 90 degrees to the right or left of the lower carrier frame, outriggers must be at full horizontal extension and vertical jacks lowered to level the turntable bearing. Check level with carpenter's level. Place level in direction of boom and at 90 degrees to direction of boom to establish a level turntable. Tires must be free of ground for test, and the wire rope connecting the hook to the boom in a vertical configuration (check wire rope with carpenter's level).

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(2) Exert 110 percent of the crane's rated capacity on the load lifting measuring device and hold for one minute. Slowly decrease load until wire rope is barely slack. Repeat foregoing once. Hook will be inspected as in paragraph 2002.3. This will serve as the nondestructive hook test.

b. Stability Test

(1) Choose any load from the load chart not in the black (shaded) structural strength area of the rated load 360 degrees chart. Chosen test load must be able to clear outriggers during full 360 degrees rotation.

(2) Position for the lift is to be either right or left side at 90 degrees to side of the lower carrier frame.

(3) Outriggers at full horizontal extension and vertical jacks lowered to level the turntable bearing. Check level with carpenter's level. Place level in direction of boom and at 90 degrees to direction of boom to establish a level turntable. Tires must be free of ground for test.

(4) Position the hook block in a manner to obtain the appropriate operating test radius for test boom length. Confirm by actual measurement the operating radius to center of rotation. Adjustment may be necessary to obtain the specified radius.

(5) Mark the operating radius with a line of sufficient length to ensure its visibility when the load is suspended over it. The line should be on an arc about the axis of rotation for the tested radius.

(6) Position the test load inside the selected operating radius. The rated load is equal to the test weight plus hook block weight (approximately 620 pounds) plus sling weights.

(7) Boom up 2 degrees to 4 degrees to position the hook block over the load and to compensate for boom deflection. Lift the rated load. Boom down while keeping load close to ground until the rated load is hook block centered over the selected operating radius and suspends the rated load 2 to 4 inches above the ground.

(8) Swing the crane through the 360-degree rotation.

(9) Lower load.

4002. AERIAL PERSONNEL DEVICES

1. General Information. The sequence of inspection shall be condition inspection, no-load test, and load test.

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2. Preoperation. The operator shall perform a preoperation check as prescribed in the appropriate TM's. For equipment where such a checklist is not included in the manual, the following shall be conducted as a minimum requirement:
  - a. Position the vehicle on the test site.
  - b. Check for proper markings.
  - c. Carefully inspect all safety devices, including all specialized features.
3. Condition Inspection. This inspection shall be conducted per the instructions contained in paragraph 2000, preceding.
4. Load Test (Stability and Range of Movement). The load test shall be conducted with the vehicle not fastened to any artificial base and the outriggers in place. All tests shall be conducted using the ground level controls. At no time will personnel be permitted to ride on the platform (basket). The platform shall be loaded with an evenly distributed load equal to twice the rated working load and exercised through the full range of horizontal and vertical positions, to include at least the following:
  - a. The upper and lower arms are moved to a horizontal or their most horizontal plane and extended to the maximum reach.
  - b. The lower arm is moved to a horizontal or near horizontal position over the side of the vehicle, and the upper arm is moved to the most vertical position possible.
  - c. With the lower arm at the maximum travel from the towed position and the upper arm both horizontal and 45 degrees to the side of the vehicle, or over the four corners of the vehicle, rotate the turntable both clockwise and counterclockwise with the test load through 360 degrees for a minimum of 15 minutes.

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT

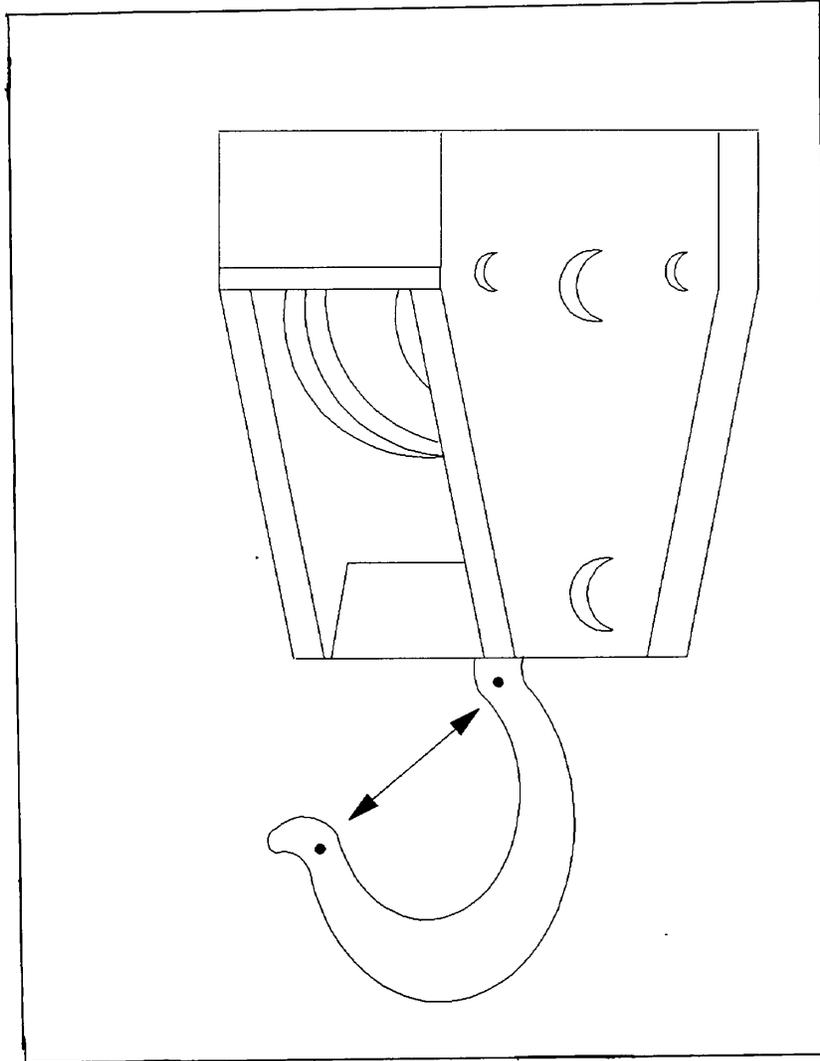


Figure 4-1.--Tram Points.

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT

Table 4-1.--Operator's Daily Checklist.

USMC NO.	TYPE/CAP	UNIT	HOUR METER		HOURS OPERATED	DATE	
			START	STOP			
OPERATOR'S NAME							
INSTRUCTIONS - Check all items indicated. Inspect and indicate an unsatisfactory (U), unsatisfactory (S), or not applicable (NA).							
1 walk around inspection		2 MACHINERY HOUSE INSPECTION		3 OPERATOR CAB INSPECTION		4 OPERATION INSPECTION	
a	Bulbly Shields & Plates	a	Hydraulic Oil	a	Overhaul	a	Arm Safety
b	Carrier Frame/Plate Base	b	Engine/Component	b	Warning/Indicator Lights	b	Unusual Noises
c	Ground Hook/Frame	c	Lubrication	c	Control/Buttons	c	Control Action
d	Wire Ropes	d	Hydraulic	d	Visibility	d	Steady/Smooth/Lift/Retards
e	Hoists	e	Lights	e	Load Rating Checks	e	Control Sensitivity
f	Hooks	f	Emergency Stop	f	Safety Devices	f	Max Load Test
g	Shims	g	Emergency Stop	g	Emergency Stop	g	Flashing Beepers
h	Shims	h	Chock/Block/Straps	h	LIFT/Free Indicators	h	Lift Switches
i	Shims	i	Electric Motors	i	Beepers/Angular/Position Indicator		
j	Shims	j	Warning Tapes				
k	Shims	k	Fire Extinguishers				
l	Shims	l	Warning Tapes				
m	Shims	m	Warning Tapes				
n	Shims	n	Warning Tapes				
o	Shims	o	Warning Tapes				
p	Shims	p	Warning Tapes				
OPERATOR'S SIGNATURE							
INSTRUCTIONS - Inspect all applicable items indicated, such as: (1) unsatisfactory condition of any item indicated above with an asterisk, (*) in addition, unsatisfactory condition when any unsafe condition is observed and immediately notify supervisor. (2) unsatisfactory condition of any item indicated above with an asterisk, (*) in addition, unsatisfactory condition when any unsafe condition is observed and immediately notify supervisor. (3) unsatisfactory condition of any item indicated above with an asterisk, (*) in addition, unsatisfactory condition when any unsafe condition is observed and immediately notify supervisor.							
REMARKS							
DATE							
SUPERVISOR'S SIGNATURE							
DATE							

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INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT

Table 4-2.--Condition Inspection Record.

USMC No.	Type	Location	Operator Names	Operator License Nos.		
Purpose of Inspection:			Date Started	Date Completed		
Item No.	Item Description			P	F	Insp/Init.
1	Bent, cracked, or corroded structural members.					
2	Cracked or corroded welds.					
3	Loose, broken, missing, or deteriorated rivets or bolts.					
4	Inspect all wire rope for wear, broken wires, corrosion, kinks, damaged strands, crushed or flattened sections, condition of sockets, and dead end connections. Check for proper lubrication and evidence of proper inspection of idler sheaves and saddles.					
5	Inspect hooks for cracks, sharp edges, and distortion. Verify disassembly, inspection, and NDT as applicable.					
6	Inspect all brakes and clutches for proper operation. Spot check components for proper adjustment and acceptable wear.					
7	Check all controls for proper condition and operation.					
8	Check all control components for proper condition and operation.					
9	Inspect all limit switches for condition and proper operation.					
10	Ensure each drum has minimum of two complete wraps of wire rope at lowest working level.					
11	Check load indicators for condition and working accuracy.					
12	Inspect all mechanical equipment which is reasonably accessible for wear, cracks, and alignment.					
13	Inspect, where practical, for worn, defective, or misaligned bearings, bushings, shafts, pins, and gears.					
14	Check components for excessive heat, vibration, noise, and oil leaks.					

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INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
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Table 4-2.--Condition Inspection Record--Continued.

Item No.	Item Description	P	F	Insp/Init.
15	Inspect sheaves for wear, roughness, free-turning, and alignment. Gauge sheave groove, where possible.			
16	Inspect for excessive wear of wheels, tires, rollers, and roller paths or rails.			
17	Inspect for excessive wear of chains and sprockets. Measure chain stretch of load chains.			
18	Verify that correct certified capacity charts or hook load rating data is in view of operator and/or rigging personnel.			
19	Inspect operator's cab for cleanliness and operation of all equipment.			
20	Check machinery house for cleanliness, proper safety guards, warning signs, and storage of tools and equipment.			
21	Check operation of all indicators, warning devices, and lights.			
22	Check for proper type and condition of all fire protection equipment.			
23	Check condition and function of outriggers, pads, boxes, wedges, and cylinder mountings. Check level indicators.			
24	Check center pin nut and steadiment by observing operational behavior during load test.			
25	Check travel, steering, braking, and locking devices for condition and proper operation.			
26	Check radius indicator for accuracy by measuring actual radius in at least two boom positions.			
27	Check pawls, ratchets, and spuds for proper engagement and operation of interlocks.			
28	Inspect tanks, lines, valves, drains, filters, and other components of air systems for leakage and proper operation.			
29	Inspect reservoirs, pumps, motors, valves, lines, cylinders, and other components of hydraulic systems for leakage and proper operation.			
30	Check engines and engine generator sets for proper performance, safety, and system leakage.			
31	Inspect for bent, cracked, corroded, or dented boom members.			

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
 GROUND LOAD LIFTING EQUIPMENT

Table 4-2.--Condition Inspection Record--Continued.

Item No.	Item Description	P	F	Insp/ Init.
32	Check condition of counterweights, ballast, and securing fasteners.			
33	Check all compartments (voids) for water tightness.			
34	Check accuracy of list and trim indicators against design data or previous test data.			
Remarks:				
Signature		Date		
1. Inspector				
2. Test Director				
3. Certifying Officer				

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
GROUND LOAD LIFTING EQUIPMENT

Table 4-3.--Certification of Load Test.

USMC No.	Type	Rated Cap lbs.	Boom Length feet	Test Site	Test Date																																																																																																																																																									
Reason for Test																																																																																																																																																														
<p>This is to certify that Certificates for have been conducted in accordance with the crane test procedures set forth in MCO P11262.2A or P11262.100A.</p>																																																																																																																																																														
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<p>It is certified that the crane identifier above is satisfactory to lift the rated load.</p>																																																																																																																																																														
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INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL  
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CHAPTER 5

LOGISTICS VEHICLE SYSTEM SPECIAL INSTRUCTIONS

	<u>PARAGRAPH</u>	<u>PAGE</u>
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MK15, MK17 MATERIAL HANDLING CRANE (MHC)	5001	5-3
LIFT CAPACITY AND MOTION TEST	5002	5-4
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TABLE

5-1	LVS MHC LOAD TEST CERTIFICATION RECORD	5-7
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CHAPTER 5

LOGISTICS VEHICLE SYSTEM SPECIAL INSTRUCTIONS

5000. GENERAL

1. The MK15 and MK17 variants of the Logistics Vehicle System (LVS) are equipped with a MHC which is unique and requires the special load testing procedures explained below.
2. Paragraphs 1001.3, 2000 through 2004, and 2006 are applicable to the LVS MHC.

5001. MK15, MK17 MATERIAL HANDLING CRANE (MHC)

1. The MK15 and MK17 MHC must be capable of:
  - a. Lifting a container on and off the cargo bed using crane controls, remote and mounted, to position the container for locking on the cargo bed.
  - b. Holding a 9,000-pound load suspended while allowing no more than 2 inches vertical creep per hour.
  - c. Holding a 9,000-pound load with a drop of no more than 6 inches in case of a hose failure.
  - d. Minimum working traverse of 350 degrees. The crane shall not operate above the left side panel.
  - e. Lifting a 9,000 pound load at 15 feet extension. Minimum full reach of the crane shall be 19.3 feet.
2. The MHC has independent hydraulic controlled outriggers for leveling and stabilizing. The stabilizing system allows for operation with the LVS on a 5-degree lateral slope. The outriggers will not interfere with LVS operation.
3. The crane controls are mounted on the left side of the MK15 and MK17.
4. The MHC is equipped with a remote control capable of full range operations at any location within 40 feet of the crane base.
5. Load testing of the MK15 and MK17 MHC shall include the following:
  - a. Lift capacity and motion test.

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL GROUND LOAD LIFTING  
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- b. Overload shutdown test.
- c. Stability Test.
- d. Remote control test.

5002. LIFT CAPACITY AND MOTION TEST

1. Park LVS on level hard surface.
2. Fully extend and position outriggers. Raise LVS only enough to take tension off springs. DO NOT RAISE WHEELS OFF GROUND.
3. Find approximate center of the base pivot by using a plumb line dropped from the pivot hole center (viewed from under LVS). Mark the hole center location on the ground.
4. Unstow the MHC and fully extend the folding boom. With the folding boom horizontal and the main boom as close to horizontal as possible, measure the horizontal full reach of the crane. Use a plumb bob dropped from the hook if necessary. Minimum full reach shall be 19.3 feet from the hook to center of the base pivot.
5. With the main boom at 45 degrees, lift a test load of 9,000 pounds. When the folding boom reaches the horizontal position, extend until the hook is at 15 feet from the center of the crane base.
6. Rotate the crane and load through the full 350 degree swing. Crane will not swing for 10 degrees over control panel.

5003. OVERLOAD SHUTDOWN TEST

1. Park LVS on level hard surface.
2. Fully extend and position outriggers. Raise truck only enough to take tension off springs, DO NOT RAISE WHEELS OFF GROUND.
3. Find approximate center of the base pivot (viewed from under LVS). Mark the hole center location on the ground.
4. Lifting a 9,000 pound weight at a 15-foot radius, raise the main boom to 45 degrees and folding boom to slightly lower than horizontal.
5. While holding the extension valve wide open, extend the extension boom until the overload system activates and completely stops further extension.

INSPECTION, TESTING, AND CERTIFICATION OF TACTICAL GROUND LOAD LIFTING  
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6. Measure the horizontal distance from the crane base center to the crane hook. The overload system should activate between 15 and 17.5 feet with a 9,000 load. If not, crane requires servicing. With crane in overload, the main boom may be able to raise but not lower, boom extension should retract but not extend further, and folding boom should lower but not raise. Crane swing should function normally.

NOTE: The angle sensor which determines whether the folding boom goes up or down during overload is set between horizontal and 10 degrees above horizontal.

7. To reset overload function, retract load to a minimum radius until function resets.

8. Lifting a 9,000 pound weight at a radius of less than 15 feet, raise the main boom to 45 degrees and the folding boom to 10 degrees or more above horizontal.

9. Holding the extension valve wide open, extend the extension boom until the overload system activates and completely stops further extension.

10. With crane in overload, the main boom should be able to raise but not lower, boom extension should retract but not extend, and folding boom should raise but not lower. Crane swing should function normally.

NOTE: The angle sensor which determines whether the folding boom goes up or down during overload is set between horizontal and 10 degrees above horizontal.

5004. STABILITY TEST

1. Ensure LVS is parked on level hard surface.
2. Extend boom to 15 feet while lifting a 9,000 pound load. Slew boom through full 350-degree rotation to check stability.

5005. REMOTE CONTROL TEST

1. Attach 40 feet remote control cable (refer to TM 9-2320-297-10 page 2-145 for MK15 and page 2-257 for MK17). Check remote operation and identify hand controller to the vehicle, by serial number.
2. Cycle MHC through full range of motion.

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5006. RECORDING. Table 5-1, MHC Load Test Certification Record, will be used to record testing of the MK15 and MK17 LVS MHC. Certification will be filed in the Equipment Record Jacket and retained until successful completion of the next inspection/test.

