

**INCH-POUND**  
MIL-PRF-29250C  
24 June 1997  
SUPERSEDING  
MIL-L-29250B(YD)  
9 May 1994

## PERFORMANCE SPECIFICATION

### LOADING JACK SYSTEM, ISO CONTAINER

This specification is approved for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers the International Organization of Standardization (ISO) container loading jack system (ILJS) which is used to provide level loading and unloading on aircraft. The ILJS also is used to provide on and off loading of 102-inch (2 591 millimetre (mm)) wide flatbed trailers and all 25K-loaders, and mobility and maneuverability for freight containers having ISO corner fittings (hereinafter referred to as ISO containers).

1.2 Classification. The ILJS will consist of four corner jack assemblies attachable to top and bottom ISO corner fittings for ISO containers (see 6.1).

#### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as samples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 15E2), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

- MIL-P-15024/6 - Plates, Identification, Equipment.
- MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.
- MIL-P-53022 - Primer, Epoxy Coating, Corrosion Inhibiting, Lead and Chromate Free.

STANDARDS

MILITARY

- MIL-STD-210 - Climatic Information to Determine Design and Test Requirements for Military Systems and Equipment.
- MIL-STD-642 - Identification Marking of Combat and Tactical Transport Vehicles.
- MIL-STD-810 - Environmental Test Methods.
- MIL-STD-1336 - Transportability Criteria.
- MIL-STD-1472 - Human Engineering Design Criteria for Military Systems, Equipment and Facilities.
- MIL-STD-1791 - Design for Internal, Aerial Delivery in Fixed Wing Aircraft.
- MS51336 - Lunette-Coupler, Drawbar, Ring.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

- ANSI - Z1.4 - Procedures, Sampling and Tables for Inspection by Attributes.

## MIL-PRF-29250C

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42<sup>nd</sup> Street, New York, NY 10036.)

### AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.1 - Structural Welding Code-Steel.

(Application for copies should be addressed to the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.)

### INTERNATIONAL ORGANIZATION OF STANDARDIZATION (ISO)

ISO 1161 - Series 1 Freight Containers-Corner Fittings.

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42<sup>nd</sup> Street, New York, NY 10036.)

### SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J534 - Lubrication Fittings, Standard.  
SAE J753 - Maintenance Interval Chart, Recommended Practice.

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

### STEEL STRUCTURES PAINTING COUNCIL (SPCC)

SSPC-SP19 - Surface Preparation Specification No.10, Near White Blast Cleaning.

(Application for copies should be addressed to the Steel Structures Painting Council, 40 24<sup>th</sup> Street, 6<sup>th</sup> Floor, Pittsburgh, PA 15222-4643.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Description. The ILJS shall consist of four corner jack assemblies attachable to the top and bottom of ISO corner fittings of 4.25 feet (ft) by 8 ft by 20 ft (1 295 mm by 2 438 mm by 6 096 mm), 8 ft by 8 ft by 20 ft (2 438 mm by 2 438 mm by 6 096 mm) and 8.5 ft by 8 ft by 20 ft (2 591 mm by 2 438 mm by 6 096 mm) ISO containers. The ILJS shall provide level loading and unloading of containers on C-130 and C-141 aircraft, 102-inch (2 591 mm) wide flatbed trailers,

and all 25K-loaders. The ILJS shall include a towing assembly which will allow mobility and maneuverability for loading/off loading and positioning the ILJS/container combination. The ILJS shall be designed to meet all requirements as defined herein.

3.2 First article. When specified (see 6.2), a sample loading jack system shall be subjected to first article inspection in accordance with 4.1.1.

3.3 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term “recovered materials” means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt materials is allowed under this specification.

3.4 Design. The ILJS structure and all of its components shall be designed to a safety factor of not less than 2.5 based on the material yield stress, applied to the ILJS rated load of 25,000 lb (11 340 kilograms (kg)).

3.5 Construction.

3.5.1 Attachment points. The ILJS attachment points shall be restricted to the container side and end wall apertures of the ISO corner fittings (ISO 1161), located at the top and bottom of the container. The ILJS shall be capable of being attached and removed while the four bottom ISO corners of the containers are sitting on the ground.

3.5.2 Corner jack assemblies. Four corner jack assemblies shall be provided. Each corner jack assembly shall connect to the ISO container at the top and bottom corner fittings. Each corner jack assembly shall be capable of being attached to any of the top and bottom corner fittings. Each corner jack assembly shall be mounted on a two-wheel pneumatic-tired caster assembly. When tested, each corner jack shall withstand a static load of 20,000 lb (9 072 kg) without showing signs of deterioration or permanent deformation. The jacks shall be marked at one-inch (25 mm) increments; each sixth increment shall be highlighted and numbered.

3.5.3 Assembly components. All assembly components of the ILJS shall be identical to like components to ensure interchangeability of component parts of the ILJS. Assembly components shall meet the weight requirements specified in 3.7.

3.5.4 Caster assembly. Each caster assembly shall caster in 360-degree rotation in any direction (fully articulating). The caster assembly shall not have any side-to-side tilting capability. A mechanism shall be provided to lock the caster assembly at 90-degree positions in line with container side walls and ends.

3.5.5 Tires. The type and size of tires furnished shall have adequate capability for the ILJS operation as specified in this specification when loaded in accordance with 3.8. The tires shall be pneumatic.

3.5.6 Brakes. Each corner jack wheel assembly shall be provided with a single hand operated brake that will have the capability to perform as both a parking brake, when fully engaged, and have a partial (dynamic) braking action as an interim operation which would allow partial braking in any intermediate position. Brake actuation forces shall be not greater than 270 inch pounds (30 483 Newton metre (N·m)) (15 lb on an 18-inch (7 kg on a 457 mm) handle). Brake devices of shoes bearing on the tire or ground are not acceptable.

3.5.7 Towing assembly. The towing assembly shall enable the ILJS to be positively steered and towed in the forward direction, and positively steered and pushed in the reverse (backing up) direction. The towing assembly shall be attached to the corner jack assemblies when they are either in the inboard or outboard configurations. The towing assembly shall have a lunette eye conforming to MS51336 and shall attach to any tow vehicle with a pintle hook height of 10 inches to 40 inches (254 mm to 1 016 mm) from the ground. The towing assembly shall attach to either end of the container. The towing assembly shall be attachable/detachable in any operational configuration of the ILJS.

3.5.8 Caster swiveling bars. Four caster swiveling bars shall be provided. Each bar shall enable an individual caster assembly to be rotated. Each bar shall swivel any caster.

3.6 Dimensions and clearance. The ILJS, when attached to an ISO container, shall conform to the following measurements:

- a. The ILJS shall pick up the container off the ground (container not resting on skids or dunnage) and raise the container to a height of 66 inches (1 676 mm) as measured from ground surface to the bottom of the container.
- b. The ILJS shall allow not less than a 10.5 feet (3 200 mm) space between the offset jacks during flatbed loading.
- c. The ILJS shall be designed and configured to meet the requirements of 3.9.7. When straddling the aircraft loading ramp, the ILJS shall maintain not less than a 3-inch (76 mm) clearance between the jack legs and each side of the ramp.

3.7 Weight. The ILJS shall be the minimum weight possible with a weight of not greater than 500 lb (227 kg) per corner assembly and overall system weight of 2,200 lb (998 kg) including tow bar and caster swiveling bars. No individual unit of the ILJS shall weigh more than 227 lb (103 kg) (see 3.15.1).

3.8 Payload. The ILJS shall transport a 4.25 ft by 8 ft by 20 ft (1 295 mm by 2 438 mm by 6 096 mm), 8 ft by 8 ft by 20 ft (2 438 mm by 2 438 mm by 6 096 mm), or 8.5 ft by 8 ft by 20 ft (2 591 mm by 2 438 mm by 6 096 mm) ISO container with corner fittings conforming to

ISO 1161. The payload (container and contents) shall be not greater than 25,000 lb (11 340 kg) gross weight. The center of gravity (CG) of the container may vary longitudinally and laterally 5 percent. The vertical CG shall be not greater than 2.5 ft (762 mm) above the 4.25 ft by 8 ft by 8 ft by 20 ft (1 295 mm by 2 438 mm by 6 096 mm) container floor; 4 ft (1 219 mm) above the 8 ft by 8 ft by 20 ft (2 438 mm by 2 438 mm by 6 096 mm) and 8.5 ft by 8 ft by 20 ft (2 591 mm by 2 438 mm by 6 096 mm) container floor. The design of the ILJS shall be able to accommodate the variable CG. Any test payload shall be in an 8 ft by 20 ft (2 438 mm by 6 096 mm) ISO container weighing 25,000 lb (11 340 kg).

3.9 Performance characteristics. The following performance criteria shall be applicable to the ILJS configured in both the inboard and the outboard mode. Inboard mode is defined as the ILJS configured with the corner jack assemblies attached to the end walls of the ISO container. Outboard mode is defined as the ILJS configured with the corner jack assemblies attached to the side walls of the ISO container.

3.9.1 Lifting with ILJS. The ILJS shall be designed so that no mechanism shall require external power or externally renewed power other than the manpower provided by the crew to position, attach, lift, and prepare the container for movement. The container shall be lifted manually to 66 inches (1 676 mm) in not more than 15 minutes by four people.

3.9.2 Steering and turning ability. The ILJS, when fully loaded (see 3.8), raised to a towing height of 18 inches (457 mm), and with prime mover operating, shall turn right and left without damage or interference with towed container or prime mover. The 18-inch (457 mm) towing height shall be measured from ground surface to the bottom of the container.

3.9.3 Controllability over surfaces. The ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall exhibit stability when towed over surfaces specified in 3.9.11 and table I. The 18-inch (457 mm) towing height shall be measured from ground surface to the bottom of container.

TABLE I. Towing mobility requirements.

Surface course	Maximum speed	Average speed	Distance
Paved surfaces	5 mph (8.05 km/h)	2.5 mph (4.02 km/h)	1.0 mile (1.609 km)
Unpaved surface	2 mph (3.33 km/h)	1.0 mph (1.60 km/h)	0.5 mi. (0.805 km)

3.9.4 Longitudinal inclines. The ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall follow the towing vehicle without weaving to an extent which would adversely affect the controllability of the ILJS when ascending or descending longitudinal inclines having a 7 percent slope.

3.9.5 Side slope. The ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall follow straight behind the prime mover without slipping or upsetting when operating either left or right on a surface having a 5 percent slope.

3.9.6 Backing of ILJS. The ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, and towing assembly shall provide sufficient control to the container so that the prime mover can move the container backwards for a distance of 50 ft (15 240 mm) in a 10-ft (3 048 mm) wide lane.

3.9.7 Level loading. The ILJS, when loaded in accordance with 3.8, and in the outboard mode, shall be capable of level loading the ISO container on and off a C-130 and C-141 aircraft. At no time during level loading using the ILJS shall the container be greater than aircraft floor loading limits in accordance with MIL-STD-1791. Level loading shall be accomplished in 20 minutes or less for each container. Loading shall commence when the fully loaded container (see 3.8), with pallets and loading jack attached, is raised to the required loading height and is backed up to within one-foot (305 mm) of the aircraft cargo platform. Loading is complete when the container is in position to tiedown within the aircraft. Pallet dimensions shall be 88 inches by 108 inches (2 235 mm by 2 743 mm) which is commonly referred to as a 463L pallet.

3.9.8 Flatbed truck and 25k-loader loading. The ILJS shall be configurable in the outboard position for loading ISO containers onto and off flatbed trucks and 25K-loaders. The ILJS shall be attachable from the ground to a truck-mounted or 25K-loader-mounted container. Loading shall be accomplished in 45 minutes or less. Loading shall be accomplished manually by no more than four personnel. Loading shall commence when the container is resting on the ground and jacks and all hardware are removed. Loading is complete when container is resting on the flatbed truck or 25K-loader and all jacks and hardware are removed. Unloading shall be accomplished in 45 minutes or less. Unloading shall be accomplished manually by no more than four personnel. Unloading shall commence when the container is resting on the flatbed truck or 25K-loader and jacks and all hardware are removed. Unloading is complete when the container is resting on the ground and all jacks and hardware are removed.

3.9.9 Wind load. The ILJS shall be capable of safely performing all functions in each operational cycle with not less than a 30 mile per hour (mph) (48.3 kilometre per hour (km/h)) wind load on the 20-ft (6 096 mm) length of the container, when the jacks are at the 66-inch (1 676 mm) height and the wheels are restrained.

3.9.10 Parking brake performance. The parking brakes shall be sufficient to hold the container/ILJS when loaded in accordance with 3.8, and on slopes defined in 3.9.4 and 3.9.5.

3.9.11 Mobility requirements. The ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall be capable of towing mobility requirements as specified in table I. The test mileage shall be accumulated with a fully loaded ISO container. In addition, the ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall be tested for backing up (see 3.9.6) on a level paved surface for a distance of not less than 50 ft (15 240 mm). An unpaved surface is defined as an unpaved graded dirt road having a California Bearing Ratio of 40.

3.10 Towing vehicle (prime mover). The ILJS shall be compatible with all military tactical wheeled vehicles of 5-ton (4 536 kg) rating or greater with a pintle. Compatibility shall be determined by the ability of the ILJS to meet all the requirements stated herein.

3.11 Maintenance characteristics. The ILJS design, together with components and accessories, shall permit ready access to all items requiring scheduled service or maintenance in the field. Scheduled service and maintenance shall be accomplished with the use of common tools. The adjustment of components and accessories shall be accomplished with no disturbance to other components. Grease fittings shall be easily accessible.

3.12 Transportability. The ILJS shall be capable of being contained on one pallet with dimensions of 88 inches by 108 inches (2 235 mm by 2 743 mm) (commonly referred to as a 463L pallet) and of being transported without damage on the ramp pallet position on the C-130 and C-141 aircraft. It shall also be capable of being transported by worldwide highway, rail, and ship as specified herein and established by MIL-STD-1366.

3.13 Environmental conditions. The ILJS shall be capable of withstanding and operating in the following natural environmental conditions:

- a. Ambient temperature conditions-storage, transport, operation, and nonoperation shall be - 30 degrees Fahrenheit (°F) to + 120 °F (1 Celsius (°C) to 49 °C).
- b. Relative humidity - a relative humidity of not greater than 100 percent.
- c. Sand and dust - when exposed to sand and dust as specified in MIL-STD-210 for operation in close proximity to aircraft.
- d. Salt fog - when exposed to any salt fog atmosphere.

3.14 System safety requirements. The ILJS shall have an automatic self-locking fail-safe device that will prevent an inadvertent or accidental lowering of the ILJS. The fail-safe device must provide positive stop action in the event of a mechanical as well as a procedural accident and should activate within 0.0625-inch (1.59 mm). Failure modes to be considered must include failure at the point of contact between the lifting mechanism and the container (i.e., rack and spur gear, rack and ratchet pawl, or chain and chain attachment, etc.).

3.15 Human performance engineering. The ILJS design for operation and maintenance shall provide an environment which fosters effective task performance and personnel safety with minimum training. The ILJS shall be designed such that all operational and scheduled maintenance tasks can be completed by personnel from the 5th to 95th percentile male/female wearing arctic garments which conform to MIL-STD-1472.

3.15.1 Lifting limits. No component of the ILJS shall be greater than the three-man design weight limits of 227 lb (103 kg) in accordance with MIL-STD-1472. The ILJS shall have handles, or grasp areas, or both which conform to MIL-STD-1472.

3.15.2 Attachment/detachment of ILJS. At no time shall the attachment/detachment of the ILJS from the container and during any operational scenario require an individual to be on top of or beneath the container. The following human engineering requirements shall apply to ISO containers located on the ground.

3.15.2.1 Attachment of ILJS. Each corner jack assembly shall be attached to the container in not more than ten minutes. The attachment of the ILJS to the container shall not require an individual on top of or beneath the container.

3.15.2.2 Detachment of ILJS. Each jack shall be detached from the container and broken down to the shipping mode with common hand tools in not more than ten minutes.

3.16 Reliability. The ILJS shall have a specified reliability of not less than 0.98 when subjected to the operational cycle specified in 3.9.7 and 3.9.8. A failure analysis shall be performed in accordance with test requirements specified in 4.4.4.9.

3.17 Maintainability. Total active maintenance, including driver/crew checks and services, shall be not greater than 15 minutes per operational cycle (see 3.9.7 and 3.9.8). Preventive maintenance shall not be required at intervals of less than 12 months or 55 cycles, whichever comes first.

3.18 Cleaning, treatment, and painting. ILJS surfaces shall be blast cleaned in accordance with SSPC-SP19, treated and painted as specified herein. Surfaces to be painted shall be cleaned and dried to ensure that they are free from contaminants such as oil, grease, welding slag and splatter, loose mill scale, water, dirt, corrosion products, or any other interfering substances. As soon as practicable, after cleaning, and before any corrosion product or other coating-interfering material can result, the surface shall be prepared or treated to ensure adhesion of the coating system.

3.18.1 Painting. Painting of ILJS surfaces shall consist of at least one coat of primer and at least two finish coats. The primer shall conform to MIL-P-53022 and shall be applied to a clean dry surface as soon as practicable after cleaning and treating. The dry film thickness of the primer shall be not less than 1.5 mils (0.0381 mm) over the entire surface. Paint for the finish coat shall conform to MIL-C-46168, green 383, type IV. The dry film thickness of each applied coat shall be not less than 1.8 mils (0.0457 mm) over the entire surface. The dry film thickness of the finish coat shall be not less than 3.6 mils (0.0914 mm) over the entire surface. The total dry film thickness of the finish coat shall be not less than 5.1 mils (0.1295 mm) over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.19 Lubrication. Unless otherwise specified (see 6.2), means for lubrication shall be in accordance with the manufacturer's standard practice. The lubricating points shall be easily visible and accessible. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high-pressure lubricating equipment, 1,000 pound-force per square inch (psi) (6 895 kilopascal (kPa)) or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location.

3.20 Nameplates and identification marking.

3.20.1 Exterior marking. Exterior marking paint shall conform to MIL-C-46168; color shall be black, 37030. Paint shall be applied in accordance with MIL-STD-642 and as follows:

- a. Safety and instructional markings, such as tire pressure, shall be letters or numbers no larger than 0.75-inch (19.05 mm) high.
- b. Paint type and application date in letters/numbers shall not be more than 0.75-inch (19.05 mm) high in a location near the identification plate.

3.20.2 Exterior stampings. Identification numbers and assembly markings shall be low-stress stamped on all sides of all sections or assemblies of the ILJS. Characters shall be uniform, Gothic, continuous, and as large as possible but no larger than 0.75-inch (19.02 mm) high.

3.20.3 Assembly and disassembly plate. A plate shall be provided giving instructions for the assembly and disassembly of the ILJS. The plate shall be attached by screws, bolts, or rivets in a conspicuous place readily accessible during all stated procedures.

3.20.4 ISO container loading plate. A plate shall be provided giving instructions for the coupling of ILJS to the container, container lifting/lowering, and ILJS uncoupling. The plates shall be attached by screws, bolts, or rivets in a conspicuous place readily accessible during all stated procedures.

3.20.5 Identification plates. Identification plates shall be in accordance with MIL-P-15024/6. Any transportation, instruction, safety, warning, caution, and notice plates shall be provided by the manufacturer. Identification plates shall be suitable for the life of the equipment. The size of the plates shall not exceed the area of the structure to which it is attached and shall be legible and readily viewable to service personnel standing on ground level.

3.21 Workmanship.

3.21.1 ILJS fabrication. The material used in fabrication shall be free from kinks, sharp bends, and other conditions which would be deleterious to the finished product. Manufacturing processes shall not reduce the strength of the steel to a value less than intended by design. Manufacturing processes shall be done neatly and accurately. All bends shall be made by controlled means to ensure uniformity of size and shape.

3.21.2 Forgings. Forgings shall be properly shaped and free from fins, cracks, nicks, flaws seams, and any other injurious defects which might affect the serviceability of the forgings. Tolerances and gages from metal fits shall conform to standards of commercial practice. Finished contact and bearing surfaces shall be true and exact.

3.21.3 Bolted connections. Bolt holes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight.

3.21.4 Riveted connections. Rivet holes shall be accurately punched or drilled and shall have the burrs removed. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads, when not countersunk or flattened, shall be of approved shape and of uniform size for the same diameter of rivet. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the member.

3.21.5 Welders and welding.

3.21.5.1 Welders. Before assigning any welder to manual welding work covered by this specification, the contractor shall provide the contracting officer with certification that the welder assigned to perform welding responsibilities covered by this specification has passed the qualification test as prescribed by AWS D1.1, section 5, for the type of welding operations to be performed and that such qualifications are effective as defined by the code.

3.21.5.2 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

3.21.6 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the casting's ability to perform its intended function.

#### **4. VERIFICATION**

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.1.1).
- b. Quality conformance inspection (see 4.1.2).

4.1.1 First article inspection. The first article inspection shall be performed on one complete ILJS when a first article is required (see 3.1 and 6.2). This inspection shall include the examination of 4.3, the tests of 4.4.4 and 4.4.5, and the inspections of 4.5 and 4.6 specified in table II. The first article may be either a first production standard item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.1.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, the test of 4.4.5, and the inspections of 4.5 and 4.6. This inspection shall be performed on the samples selected in accordance with 4.2.

TABLE II. Completed first ILJS inspection.

Paragraph number/title	I <sup>1/</sup>	A <sup>1/</sup>	D <sup>1/</sup>	T <sup>1/</sup>
3.5.1 Attaching points		X	X	
3.5.2 Corner jack assemblies	X	X	X	4.4.4.1
3.5.5 Tires	X	X		
3.5.6 Brakes		X	X	
3.5.7 Towing assembly	X	X	X	4.4.4.2
3.6 Dimensions and clearance			X	
3.7 Weight			X	4.4.4.3
3.9.1 Lifting with ILJS		X	X	
3.9.3, 3.9.4, 3.9.5 Controllability and slope		X	X	4.4.4.4
3.9.7 Level loading		X	X	4.4.4.5
3.9.8 25K-loader loading		X	X	4.4.4.6
3.9.9 Wind load		X		4.4.4.7
3.9.10 Parking brake performance		X	X	
3.9.11 Mobility requirements			X	4.6.4
3.10 Towing vehicle			X	
3.11 Maintenance characteristics		X	X	
3.12 Transportability			X	
3.13 Environmental conditions		X	X	4.4.4.8
3.14 System safety requirements		X	X	
Paragraph number/title	I <sup>1/</sup>	A <sup>1/</sup>	D <sup>1/</sup>	T <sup>1/</sup>
3.15 Human factors		X	X	
3.15.1 Lifting limits		X	X	
3.15.2.1 Attachment of ILJS			X	
3.16 Reliability		X	X	4.4.4.9
3.17 Maintainability		X		
3.18, 3.18.1 Painting	X			
3.19 Lubrication	X	X		
3.20, 3.20.1 Nameplates and markings	X			
3.21 Workmanship	X			
3.21.1 ILJS fabrication through 3.21.6	X	X		

NOTE <sup>1/</sup> I=Inspection; A=Analysis; D=Demonstration; T=Test.

4.2 Sampling. Sampling and inspection procedures shall be in accordance with ANSI-Z1.4. The unit of product shall be one complete ILJS. All ILJS offered for delivery at one time shall be considered a lot for the purpose of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using a tightened inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separate from new lots and shall be clearly identified as reinspected lots.

4.2.1 Sampling for examination. Guidance for inspection is provided in 6.3.1.

4.2.2 Sampling for tests. Guidance for inspection is provided in 6.3.2.

4.3 Examination. Each ILJS shall be examined for compliance with the requirements in section 3 of this document. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirement shall constitute one defect.

4.4 Tests. The first article shall receive the tests of 4.4.4 through 4.4.5. Failure to pass any test shall constitute cause for rejection.

4.4.1 Test configuration. During the inspections and tests, except in-process inspections, the ILJS shall be fully assembled.

4.4.2 Acceptance testing and in-process inspection. Each production ILJS shall be subjected to complete acceptance testing and in-process inspection by the contractor in accordance with contractor-prepared Government approved plans. The Government at its option may elect to witness/participate in the acceptance testing and in-process inspection.

4.4.3 Methods of testing. The examinations and tests specified herein are the minimum required to determine conformance to the requirements delineated in section 3 of this specification. Additional testing by the contractor may be required to determine conformance to specification requirements. Testing shall be performed with a fully loaded ISO container as specified in 3.8.

4.4.4 First article tests.

4.4.4.1 Corner jack assemblies. To determine conformance with 3.5.2, the corner jack assemblies shall withstand a static load of 20,000 lb (9 072 kg) without showing signs of deterioration or permanent deformation.

4.4.4.2 Towing assembly. To determine conformance with 3.5.7, the towing assembly shall be demonstrated and inspected to ensure the lunette eye conforms to MS51336 and that it is capable of attaching to a prime mover (see 3.10) at any height between 10 and 40 inches (254 mm and 1 016 mm) above the ground.

4.4.4.3 Weight test. To determine conformance with 3.7, the ILJS shall be weighed to ensure that the weight requirements are met.

4.4.4.4 Controllability and slope test. To determine compliance with the controllability and slope requirements contained in 3.9.3, 3.9.4, and 3.9.5, the ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.9, shall be tested and operated in the surface/slope specified.

4.4.4.5 Level loading. To determine conformance with level loading requirements (see 3.9.7), the ILJS with a fully loaded ISO container shall be backed up and the container loaded onto a loading ramp of a C-130 and C-141 aircraft. Unless otherwise specified (see 6.2), the contractor shall provide a mock-up version of the ramp loading areas of the C-130 and C-141 aircraft, which meet all dimensional and load requirements of each aircraft.

4.4.4.6 25K-loader and unloading test. To determine conformance with 25K-loader loading requirements (see 3.9.8), the ILJS with a fully loaded ISO container shall be backed up and the container loaded onto a 25K-loader, and the jacks and hardware removed. To determine conformance with 25K-loader unloading requirements (see 3.9.8), the ILJS shall be attached to a fully loaded ISO container, shall be backed up and the container loaded onto a 25K-loader, and the jacks and hardware removed. Contractor shall demonstrate the capability of loading and unloading a fully loaded container (see 3.9.8) onto and off a 25K-loader. Unless otherwise specified (see 6.2), the contractor shall provide a mock-up version of the 25K-loader.

4.4.4.7 Wind load analysis. To determine compliance with 3.9.9, the contractor shall have available to the Government an analysis of the effect of a 30 mph (48.3 km/h) wind load on a fully loaded container (see 3.9.8) while loading/unloading when the ILJS is at full height extension.

4.4.4.8 Environmental conditions. To determine compliance with 3.13, the ILJS shall be tested in accordance with MIL-STD-810, as specified in table III.

TABLE III. Test methods for environmental conditions.

Specification requirements	MIL-STD-810 Method Test
Ambient temperature	501.2, 502.2, Procedure II
Relative humidity	507.2 Procedure II
Salt fog	509.2
Sand and dust	510.2

4.4.4.9 Load/unload reliability. To determine compliance with 3.9.7 and 3.9.8, all operational cycles shall be performed twice and a failure analysis of all parts shall be done using the test data to demonstrate one year's usage (i.e., 55 cycles).

4.4.5 Structural integrity of the ILJS. To determine compliance with 3.5, the ILJS with the container jacked to 66 inches (1 016 mm) above the ground shall be statically tested with a

44,800 lb (20 321 kg) eccentric payload (see 3.8). This latter test shall be conducted three times, with the eccentric payload located in a different position each time.

4.5 In-process inspection. During fabrication of the first production ILJS, in-process inspections shall be conducted to evaluate conformance of materials and workmanship to requirements of specified documents. The ILJS and all components shall be available for inspection. These inspections shall be made at the contractor's facilities prior to application of primer and paint. Processing and welding quality procedures shall be reviewed during in-process inspections. Deficiencies reported on this inspection shall be corrected by the contractor prior to completion of the first ILJS production.

4.6 Completed ILJS inspection.

4.6.1 Contractor inspection. The first article ILJS shall be tested and inspected by the contractor. The first article ILJS inspection shall include as a minimum the requirements referenced in table III of this specification. The contractor shall retain the first article unit until delivery of the last production unit. The first article unit shall be available for inspection and comparison with production units by Government inspectors. The contractor may deliver the first article unit to the Government as the final ILJS contract deliverable. If delivered, the first article test unit shall be refurbished to like new condition. The Government at its option may elect to witness and/or participate in contractor testing.

4.6.2 Repair of defects. Defects found as a result of testing shall be corrected by the contractor at no cost to the Government. Failure of the contractor to promptly correct defects shall be cause for suspension of acceptance of production ILJS until corrective action has been accomplished.

4.6.3 Approval and acceptance. Approval and acceptance by the Government of the first article ILJS shall be withheld until the first article testing has been completed and a final determination has been made regarding conformity of the ILJS to meet requirements including, but not limited to, workmanship and materials.

4.6.4 Mobility requirements. To show compliance with 3.9.11, the ILJS, when at an 18-inch (457 mm) towing height and loaded in accordance with 3.8, shall be tested for towing mobility over distance and courses specified in table I; and shall be tested for reverse (backing up) mobility, as specified in 3.9.11.

## **5. PACKAGING**

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military

Department's or Defense Agency's automated packaging files, CD-ROM products or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The ILJS is intended for use with ISO containers as a lifting and loading jack system, and mobility and maneuverability of ISO containers.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- c. When a first article is required (see 3.2 and 4.1.1).
- d. When lubrication is other than as specified (see 3.19).
- e. When the contractor will not provide a mock-up version of aircraft ramp loading areas (see 4.4.4.5).
- f. When the contractor will not provide a mock-up version of the 25K-loader (see 4.4.4.6).
- g. Packaging requirements (see 5.1).

6.3 Sampling procedures.

6.3.1 Sampling for examination . Recommended inspection level is S-2 (see 4.2.1).

6.3.2 Sampling for tests. Recommended inspection level is S-2 (see 4.2.2).

6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.1.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Supersession data. This specification replaces Military Specification MIL-L-29250B(YD) dated 9 May 1994.

6.6 Classification cross reference. Classifications used in this specification (see 1.2) are identical to those found in MIL-L-29250B(YD).

6.7 Subject term (keyword) listing.

Aircraft loading  
ISO container  
Lifting jack system  
Loading system

6.8 Changes from previous issues. Marginal notations are not used in this revision to identify changes with respect to previous issue.

Custodians:  
Navy - YD1  
Air Force - 99

Preparing Activity:  
Navy - YD1

(Project 3950-N050)

Review Activities:  
Navy - SH  
Air Force - 84  
DLA - CS

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>I RECOMMEND A CHANGE:</b>	<b>1. DOCUMENT NUMBER</b> MIL-PRF-29250	<b>2. DOCUMENT DATE (YYMMDD)</b> 970624
<b>3. DOCUMENT TITLE</b> LOADING JACK SYSTEM,ISO CONTAINER		
<b>4. NATURE OF CHANGE</b> <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>		
<b>5. REASON FOR RECOMMENDATION</b>		
<b>6. SUBMITTER</b>		
<b>a. NAME</b> <i>(Last, First, Middle Initial)</i>	<b>b. ORGANIZATION</b>	
<b>c. ADDRESS</b> <i>(Include Zip Code)</i>	<b>d. TELEPHONE</b> <i>(Include Area Code)</i> (1) Commercial (2) AUTOVON <i>(if applicable)</i>	<b>7. DATE SUBMITTED</b> (YYMMDD)
<b>8. PREPARING ACTIVITY</b>		
<b>a. NAME</b> G.M. KRALIK	<b>b. TELEPHONE</b> <i>Include Area Code</i> (1) Commercial (805)-982-5741 (2) AUTOVON 551-5741	
<b>c. ADDRESS</b> <i>(Include Zip Code)</i> COMMANDING OFFICER, NCBC CODE 15E2R 1000 23RD AVENUE PORT HUENEME, CA 93043-4301	<b>IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:</b> DEFENSE QUALITY AND STANDARDIZATION OFFICE 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22401-3466 Telephone (703) 756-2340 AUTOVON 289-2340	