

INCH - POUND

MIL-PRF-32181B

24 APR 2015

SUPERCEDING

MIL-PRF-32181A

17 DEC 2009

PERFORMANCE SPECIFICATION TRUCK, FORKLIFT, 4,000 AND 6,200 POUND CAPACITY, LOADING, INTERNAL COMBUSTION ENGINE

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

1. SCOPE.

1.1 Scope. This specification covers a commercial, sit-down rider, diesel-engine-driven, counter-balanced forklift truck (hereinafter called "forklift"). The forklift will have a telescopic mast, front wheel drive, power steering, hydraulic brakes, pneumatic tires, and an overhead guard.

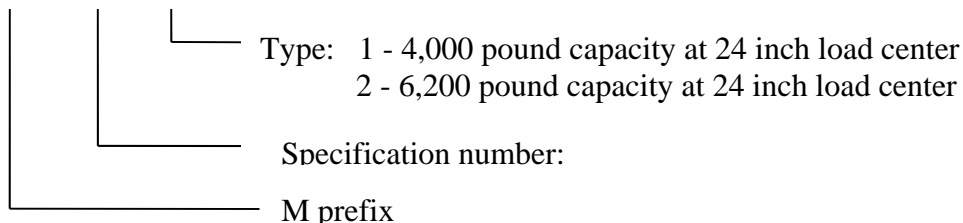
1.2 Classification. Forklifts will be one of the following types as specified (see 6.2).

1.2.1 Types. The types of pound capacity at load center are as follows:

Type 1	4,000 pound capacity at 24 inch load center
Type 2	6,200 pound capacity at 24 inch load center

1.3 Part or Identifying Number (PIN). The following PIN procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for this forklift acquired to this specification is created as follows:

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Comment, suggestions, or questions on this document should be addressed to:
WR-ALC [AFLCMC/WNZEB], 235 Byron Street, Suite 19A, Robins AFB, GA 31098-1813 or
emailed to SPEC99@us.af.mil . Since contact information can change, you may want to verify
the currency of this address information using the ASSIST Online database at:
<https://assist.dla.mil> .

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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 cited in other sections of this specification or recommended for additional information or as examples. 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.

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. The issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF - 83282 - Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric,
NATO Code Number H – 537
MIL-DTL - 83133 - Turbine Fuels, Aviation, Kerosene Types, JP-8

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130 - Identification marking of U.S. Military Property
MIL-STD-209 - Lifting and Tie down Provisions for Lifting and Tying down
Military Equipment
MIL-STD-461 - Requirements for the Control of Electromagnetic Interference
Characteristics of Subsystems and Equipment
MIL-STD-889 - Dissimilar Metals
MIL-STD-1791 - Designing for Internal Aerial Delivery in Fixed Wing Aircraft

(Copies of these documents are available online at <http://quicksearch.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. The issues of these documents are those cited in the solicitation or contract.

COMMERCIAL ITEM DESCRIPTIONS (CID)

A-A-52557 - Fuel Oil, Diesel; For Posts, Camps and Stations
A-A-59295 - Corrosion Preventative Compounds, Cold Application

(Copies of these documents are available online at <http://quicksearch.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. The issues of these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Boiler/Pressure Vessel Code Section IX - Qualification Standard for
Welding/Brazing Procedures, Welders, Brazers, & Welding & Brazing Operators

(Copies of this document are available online at www.asme.org/ or from the American Society of Mechanical Engineers (ASME) Information Central Orders/Inquiries, P.O. Box 2300, Fairfield, NJ 07007-7300.)

AMERICAN WELDING SOCIETY (AWS)

AWS B2.1 – Specification for Welding Procedure and Performance Qualification

(Copies of this document are available online at www.aws.org/ or from the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126.)

INDUSTRIAL TRUCK STANDARDS DEVELOPMENT FOUNDATION (ITSDF)

ANSI/ITSDF B56.1 - Safety Standard for Low Lift and High Lift Trucks

(Copies of this document are available online at <http://itsdf.org/>.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO 3411 - Earth-moving machinery - Physical dimensions of operators and minimum operator space envelope

(Copies of this document are available at <http://www.iso.org/iso/home.htm> or from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56 CH-1211 Geneva 20, Switzerland.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J1176 - External Leakage Classifications for Hydraulic Systems,
Recommended Practice April 1977 R(1986)

SAE J386 - Operator Restraint System for Off-Road Work Machines.

SAE J98 - Personnel Protection for General Purpose Industrial Machines

SAE J985 - Vision Factors Considerations in Rearview Mirror Design

SAE J994 - Alarm – Backup – Electric Laboratory Performance Testing

(Copies of these documents are available online at <http://www.sae.org/> or from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

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TIRE AND RIM ASSOCIATION, INC. (TRA)

Tire and Rim Association Yearbook

(Copies of these documents are available online at <http://www.us-tra.org/> or from the Tire and Rim Association, Inc., 3200 West Market Street, Akron, OH 44313.)

UNDERWRITERS LABORATORIES, INC. (UL)

UL 558 - Standard for Safety Industrial Trucks, Internal Combustion Engine-Powered Ninth Edition; Reprint with Revisions Through and Including 09/02/1998

(Copies are available from online at www.ul.com/ or from the UNDERWRITERS LABORATORIES, INC., 333 Pfingsten Road, Northbrook, IL 60062-2096.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 specified exemption has been obtained.

3. REQUIREMENTS.

3.1 Description. The forklift shall be the supplier's standard, commercial forklift modified to meet the requirements of this specification. The forklift shall have a diesel, internal combustion engine. The forklift shall be a pneumatic-tired sit-down rider, counterbalanced, loading truck with front wheel drive, and rear wheel steer. The forklift shall be equipped with instruments, components, and accessories required for the operation of the forklift. The forklift shall be equipped complete with all components that are standard with the contractor's products, whether stipulated herein or not, together with such accessories as may be specified herein. The forklift shall be air transportable in C-130, C-17 and C-5 aircraft. Refer to MIL-STD-1791 as a guide only.

3.2 First article. When specified (see 6.2), the contractor shall furnish one complete forklift for first article inspection and demonstration and test in accordance with this document (see 4.2 and 4.3). The forklift shall be a pre-production unit that shall be identical to all forklifts produced on this contract. If the contractor determines it is necessary to make configuration changes during production, pre-approval must be obtained from the Contract Officer's Technical Representative (COTR). All testing shall be observed and approved by Government representatives. The approved first article forklift shall be refurbished to a like new condition and delivered as soon as possible.

3.2.1 First article report. The first article inspection report shall include a detailed description of the inspection (see 4.2) and demonstration and test (see 4.3) performed. The report shall be submitted in digital format, and every effort shall be made to keep the file size reasonable while maintaining image quality. All deficiencies encountered and actions taken to correct the deficiencies shall be included in the report. Approval of the first article test report shall not

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relieve the contractor of his responsibility to furnish forklifts that meet the requirements of this document.

3.3 Materials. Materials shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Recycled, recovered, environmentally preferable, or bio-based materials. The components, pieces, and parts incorporated in the forklifts may be newly fabricated from recycled, recovered, environmentally preferable, or bio-based materials and should be used to the maximum extent practicable, provided the forklifts produced meet all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the forklift.

3.3.2 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be in intimate contact with each other. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.3.3 Drain holes. Structures shall be designed to eliminate pockets where debris and water might accumulate. All structural configurations shall allow water run-off or shall have adequate sized and placed drain holes.

3.4 Operating temperature. The forklift shall be capable of operating in temperatures ranging from 0° F to +125° F. The forklift with type C winterization system (see 3.20.2 and 6.2) shall be capable of operating in temperatures ranging from -25° F to +125° F. The forklift with type A winterization system (see 3.20.1 and 6.2) shall be protected in storage down to -65° F and shall allow for the vehicle starting/operation down to -40° F.

3.5 Design. The forklift shall be capable of safely handling the rated capacity load at all lift heights, mast pivot and side shift positions specified herein. Forklifts covered by this document and components incorporated therein shall conform to accepted commercial design practices. Forklifts shall be constructed and equipped to meet all requirements specified herein. Component parts of the unit need not be products of the same manufacturer. However, the manufacturer shall be so established that prompt and continuing service and delivery of repair parts will be assured. The forklift shall be equipped with all other components and parts not specifically mentioned but necessary to provide a functional machine and shall conform in quality to that normally provided to the commercial industry.

3.6 Safety. The forklift shall conform to the applicable requirements of ANSI/ITSDF B56.1, UL 558, SAE J98, and OSHA standards in effect at the time of issue of the solicitation. The forklift shall be tested in accordance with UL 558 to prove that it meets the safeguards required for a Type DS rating. The results of this test shall be included in the First Article Test Report. Upon completion of these tests, all production forklifts shall be marked with corrosion resistant plates as required by UL 558 for Type DS forklifts. Forklifts with winterization shall meet all Type DS requirements except for winterization components, and the forklifts do not have to be marked as being Type DS rated. All surface areas subject to personnel standing or walking shall have a nonskid, tread-plate, or expanded metal surface.

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3.6.1 Seat belt. An operator's seat belt with a retractor shall be installed on both Type 1 and Type 2 forklifts. The seat belt must conform to SAE J386, Type 1. However, the installation of a lap belt alone will not be considered as adequate occupant restraint. Additional restraint devices designed to ensure the operator's body remains entirely within the protection of the frame and overhead guard in the event of tip over will also be provided. The restraint system shall not interfere with operator access or mobility, or the vehicles operation. (i.e. special seat, shoulder belt, etc.) A warning decal shall be provided advising of the hazards of tip over and the importance of using the restraint system.

3.6.2 Fire extinguisher. A commercial fire extinguisher shall be mounted on the forklift in an easily accessible location. The fire extinguisher shall be a minimum 2 ½ pound capacity ABC type or equivalent. The fire extinguisher shall be UL listed.

3.6.3 Horn. The manufacturer's standard horn shall be provided.

3.6.4 Backup alarm. An audible backup alarm shall be furnished. The alarm shall automatically activate when the transmission selector is placed in reverse. The backup alarm shall conform to SAE J994.

3.7 Human factors. The forklift shall provide for operation and maintenance by personnel ranging from a small person normally clothed, through large person arctic clothed, in accordance with ISO 3411. This shall include, but not be limited to, all travel, load motion, and steering controls; entry to the operator's seat, and access to all fluid level check points.

3.8 Structure.

3.8.1 Chassis and frame. The frame and related structure shall be capable of withstanding three times the rated load or two times the dynamic load, whichever is greater, without permanent deformation, evidence of cracks, or structural failure of the frame, body assembly, and all connecting parts. Frame members, bracing, and all their joints shall provide a rigid unit structure. The frame and related structure shall not crack, deform, or fail under the testing specified in Section 4 of this document.

3.8.2 Fork lifting overload. The fork lifting mechanism shall be capable of lift, lowering, and full side shifting a rated load 100 times with no permanent deformation, malfunctions, leakage, binding, jerking, uneven operation, wearing, galling, or gouging.

3.8.3 Operator's overhead guard. An overhead guard shall be furnished. The overhead guard shall meet all of the requirements of ANSI/ITSDF B56.1 including falling object protective structure (FOPS) and vertical clearance between operator's seat.

3.8.4 Welding. All welds shall be smooth, continuous, with complete heat penetration and shall transmit stress without permanent deformation or failure when the forklift is subjected to normal service and the testing in section 4 of this specification. The contractor's welders, welding

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operators, and welding procedures shall be qualified to meet the welding requirements of the AWS B2.1 or ASME Boiler/Pressure Vessel Code Section IX.

3.9 Rated load. The rated load capacity for the Type 1 shall be a 4,000 (+100, -0) pounds at a horizontal and vertical load center of 24 inches. The rated load capacity for the Type 2 shall be 6,200 (+100, -0) pounds at a horizontal and vertical load center of 24 inches.

3.10 Engine. The forklift shall be powered by a standard, commercial diesel engine. Horsepower and torque characteristics shall be sufficient to provide the performance specified herein. Engine torque and horsepower shall be provided at an RPM which will assure performance with an adequate margin of safety. Emergency manual shutdown provisions shall be furnished when recommended by the engine manufacturer. The diesel engine shall operate on diesel fuel in accordance with A-A-52557. Either the engine or forklift manufacturer shall certify that the diesel engine is capable of operating on JP-8 and JP-8 SPK conforming to MIL-DTL-83133 for 400 hours, during normal commercial or military situations within the operating temperature ranges, without detrimental effect on the engine. Some power loss is expected, but the forklift shall be able to perform normal operations. All lubricity and viscosity parameters shall be documented. A certification letter shall be included in the first article test report. An example of a previous certification letter is shown in Figure 1.

3.11 Fuel Tank. The capacity of the fuel tank shall be adequate to allow at least 10 hours of continuous operation as defined in section 4. If the fluid level of the tank is above the engine, the tank shall be provided with a hand-operated fuel shutoff valve attached directly to the tank. The fuel tank cap shall be an approved DS cap. A data plate shall be furnished near the fill pipe marked "Diesel Fuel" in not less than 1-inch high letters. The tank filler neck shall be designed to operate with an OPW (<http://www.opw-fc.com>) fuel nozzle model 295AF. The dimensions for the OPW 295AF are available on their web site.

3.12 Engine exhaust. The exhaust system shall incorporate a muffler, and shall terminate at a location clear of the operator's station. A means shall be furnished to prevent rain water intrusion into the exhaust system. Muffler and exhaust piping shall conform to the requirements of UL 558.

3.13 Transmission. The transmission shall be the full torque, power-shift type in combination with a torque converter capable of meeting the travel speed requirements (see 3.35.13). Selective forward and reverse directional controls activated by the operator's foot are not acceptable. The transmission shall provide for positive inching or declutch control throughout the entire engine rpm range, in both forward and reverse directions. The inching or declutch control shall permit lifting of rated load, at maximum engine speed, while the transmission is in a forward or reverse gear, with no vehicle motion. A transmission oil cooler shall be furnished.

3.14 Steering. Power steering shall be furnished. With no load on the forklift (engine idle speed and forklift not moving), the tangential force on the steering wheel required to cause the forklift steering wheels to turn shall not exceed 10 pounds. In the event of a power failure, the forklift shall be controllable while moving.

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3.15 Hydraulic system. The hydraulic system shall consist of all hydraulic components necessary for operation of the forklift, including a filter. All hydraulic hoses shall have a working pressure equal to or greater than the hydraulic system maximum relief valve setting. The hydraulic fluid fill point shall be properly labeled. The hydraulic fluid shall comply with the requirements of MIL-PRF-83282.

3.15.1 External leakage. During all testing, the degree of external hydraulic system leakage shall not exceed a Class 3 D for dust-free conditions and a Class 3 D for dusty conditions of SAE J1176. External hydraulic system leakage shall not exceed a Class 3 for production forklifts under normal operation.

3.15.2 Hydraulic reservoir. The hydraulic reservoir filler shall be of sufficient inside diameter to accept a filler tube of at least 1.56 inches outside diameter.

3.15.3 Fail-safe hydraulic lift system. The forklift shall be equipped with a fail-safe hydraulic lift system which will automatically prevent load lowering and fork forward tilting in the event of electrical, hydraulic or pneumatic failure; hydraulic or pneumatic failure includes any component, line or hose. Check valves have been used in the past to prevent load lowering. Pressure relief valves or regulators shall be provided in the hydraulic and pneumatic systems to prevent overpressure. In addition, a means shall be provided to manually override the system to allow safe and slow lowering and tilting (not more than 10 feet per minute) of loaded or unloaded forks.

3.16 Brakes.

3.16.1 Service brakes. Full air, air-over-hydraulic, or hydraulic-over-hydraulic type, foot controlled, service brakes shall be provided. The service brakes shall stop the forklift with rated load, within the distance specified in the Stopping Distance Method of ANSI/ITSDF B56.1, with not more than 80 pounds of force on the brake pedal. The service brakes shall meet the Drawbar Drag Method of ANSI/ITSDF B56.1, except a drawbar drag equal to 25% of forklift gross weight shall be produced with not more than 80 pounds of force on the brake pedal.

3.16.2 Parking brake. The parking brake actuation shall be independent from the service brakes. The control shall be located within reach of the seated operator and in a position to permit easy and safe movement on and off the vehicle. Not more than 35 pounds of force shall be required to apply the parking brake. The parking brake shall hold the forklift with rated load on a 20% grade in both the forward and reverse direction.

3.17 Electrical components and circuits. The electrical system shall consist of all electrical components necessary for operation of the forklift. The forklift shall have sufficient electrical grounding to prevent static discharge. Electrical system voltage shall be 12 volts.

3.17.1 Battery. Except when Type A Winterization is specified (see 6.2), the battery(ies) shall be the maintenance-free type.

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3.17.2 Electrical disconnect switch. A keyless master switch with an identification plate shall be installed in a convenient location to permit disconnect of the battery from all electrical load.

3.17.3 Ignition switch. A key operated ignition switch shall be furnished. It shall have not less than three positions; off, on and start. The ignition switch shall not activate the engine starter while the engine is running, nor when the engine is not running and the transmission is in any forward or reverse gear.

3.17.4 Alternator. The alternator shall have sufficient output at normal engine operating RPM to supply full electrical operating load, including all lights, and still provide electrical current to charge the battery.

3.18 Instruments. In addition to the instruments supplied on the standard commercial forklift, an hour meter shall be installed in the instrument panel. All instruments, except the hour meter shall be lighted when the front floodlights (see 3.19) are illuminated.

3.19 Lighting. There shall be provided with not less than two flood lamps for forward illumination and not less than two flood lamps for rearward illumination. The manufacturer shall make available an additional floodlight that is adjustable from the operator's compartment. Front flood lamps shall be adjustable. Tail light(s), and brake stop light(s) shall be installed. All lights shall be protected by location or guards. Individual operator controlled switches shall be provided for the front lights, the rear lights, and the adjustable lights.

3.20 Winterization. (Minimum Requirements)

3.20.1 Type A winterization. When specified (see 6.2), the forklift shall be furnished with winterization that shall protect the vehicle in storage down to -65° F, and shall allow for vehicle starting/operation down to -40° F. All fluids required to meet this requirement shall be listed. The system shall consist of at least the following:

3.20.1.1 Power plant heaters. Engine coolant, engine oil, and battery heaters shall be provided. All heaters shall operate on either (110 volts @ 60 Hz) or (220 volts @ 50 Hz) alternating current. A three wire, 25 feet long weatherproof cable of adequate capacity for all heaters being used simultaneously shall be provided. The cable shall be able to connect to NATO and American connectors. A stowage place shall be provided on the forklift to keep the cable when not in use. The heaters shall be as follows:

a. The coolant heater shall be installed in the engine block or lower coolant inlet hose. A coolant circulating pump, driven by a 110 volt or 220 volt alternating current motor shall be provided when a coolant inlet hose heater is furnished. The heater shall have adequate capacity to maintain engine coolant at a temperature of 10° F in an ambient temperature of -40° F. It shall be controlled to limit engine coolant to not more than 150° F.

b. An engine oil heater with adequate capacity to maintain engine oil at a temperature of at least +10° F in an ambient temperature of -40° F shall be furnished. It shall be controlled to limit engine oil temperature to not more than 150° F.

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c. A battery heater shall be provided. It shall have adequate capacity to maintain battery electrolyte at a temperature of at least +10° F in an ambient temperature of -40° F, and shall have a thermostat to limit temperature of the electrolyte to not more than +80° F.

3.20.1.2 Cab. Thermal insulation shall be installed on the floor, cab sidewalls, and cab ceiling, with washable covering over all insulation. Boots are required for insulation to close all openings where attachments and controls enter the cab. The cab shall be equipped with two fully opening or removable doors. Each door shall have a safety latch, opening stop, and hold-open catch. All hardware shall be of the heavy-duty or industrial type, resistant to corrosion. The cab shall be equipped with at least one ventilation fan not less than six inches in diameter. The fan shall be directionally adjustable to direct airflow toward all glazing. The fan shall have an on/off switch. There shall be a dome light in the ceiling of the cab controlled by a separate switch. The guard shall meet the requirements of ANSI/ITSDF B56.1, including FOPS. The overall height to the top of the cab shall not be more than the collapsed mast (see 3.35.3). There shall be windshield wipers on the front windshield, rear window, and roof window.

3.20.1.3 Heater and defroster. The heater shall be of sufficient capacity to maintain a temperature of +40° F at cab floor level in an ambient temperature of -40° F.

3.20.1.4 Cold starting aid. A starting aid such as glow plugs shall be furnished to allow -40° F starting.

3.20.1.5 Anti-freeze engine. To protect the engine from freezing, the coolant system shall be protected to -40° F with antifreeze.

3.20.2 Type C winterization. When specified (see 6.2), the forklift shall be furnished with Type C winterization that shall protect to -25° F and shall consist of the following:

3.20.2.1 Starting aid. A starting aid such as glow plugs shall be furnished to allow -25° F starting.

3.20.2.2 Cab. The cab shall meet the requirements as specified (see 3.20.1.2).

3.20.2.3 Cab heater and defroster. The heater shall have sufficient capacity to maintain a temperature of at least +40° F at cab floor level in an ambient temperature of -25° F.

3.21 Maintainability. Provisions shall be made for adjustment, servicing, and replacement of all electrical assemblies and components, hydraulic system components, battery, wearing parts of lift and tilt mechanism, brakes and components, wear parts of steering assembly, tires, wheels, lights, and horn. If hand access openings are required to perform maintenance, the edges of each opening shall be smooth, the opening shall be provided with a removable or hinged cover, and the dimensions should accommodate a mittened hand. The engine hood shall be capable of being opened by one man using one hand and shall be securely held open by a counterbalance or positive locking device.

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3.21.1 Maintenance operations. The forklift shall be capable of being mechanically maintained by one person not to exceed 1 hour using common tools. The following items are provided as examples:

- a. Remove, replace and adjust all engine-driven belts - 3/4 hour.
- b. Remove and replace alternator - 3/4 hour.
- c. Remove and replace all hydraulic system filters, screens, and strainers - 1 hour.
- d. Remove and replace engine coolant system hoses - 1 hour.
- e. Drain engine oil, remove and replace engine oil filter, and refill crankcase - 1/2 hour.
- f. Remove and replace fuel filter elements - 1/2 hour.
- g. Remove, replace and connect battery - 1/2 hour.
- h. Drain transmission fluid, remove and replace all transmission filters and refill transmission - 1 hour.
- i. Remove and replace starter - 1 hour.
- j. Bleed and adjust brakes and refill master cylinder (if applicable), 2 men - 1 hour.
- k. Remove and replace floodlights and taillight bulbs - 1/4 hour each bulb.
- l. Lubricate all lubrication fittings with 2 strokes per fitting - 1 hour.

3.21.2 Special tools. The contractor shall supply any special tools or equipment peculiar to, and only used on this forklift. One set of tools is required for each forklift. The manufacturer will provide a means of storing these tools on the vehicle when not in use.

3.21.3 Lubrication. Means shall be provided to lubricate all moving parts that require lubrication, except where sealed permanent lubrication is provided. Fittings shall be accessible to a standard, commercial grease gun, equipped with a 10-inch flexible extension. Accessibility to fittings shall be provided without the removal of accessories or parts. Panels and plates equipped with hand-operated fasteners may be removed to provide accessibility. Each forklift shall be serviced and run-in with lubricants standard to the contractor's commercial practice. A lubrication schedule shall be provided on a durable material and stored in the cab. For example: A book with hard plastic pages (tear resistant & smear resistant).

3.22 Tires and tire loadings. Tire loadings shall not exceed the values specified by the tire manufacturer or the TRA Yearbook. The forklift shall be equipped with pneumatic tires with an industrial tread pattern. All tires on the same axle shall be new and of same rated size and

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construction. Tires shall be not more than 12 months old on date of acceptance by the Government. Tire changes shall be pre-approved by WR-ALC (AFLCMC/WNZEB).

3.22.1 Wheels. Wheel rims shall be in accordance with the TRA Yearbook and all rims on the same axle of the forklift shall be the same size.

3.23 Rearview mirror. The forklift shall be equipped with an adjustable rearview mirror mounted within the operator's field of view as described in SAE J985. The exact mounting location shall be determined by the manufacturer and shall increase the driver's field of vision.

3.24 Data plate. A corrosion resistant plate shall be permanently installed on the instrument panel, or another visible protected location. The data plate shall contain a Unique Identifier (UID) bar code according to MIL-STD-130. The following information shall be on the plate:

- Nomenclature
- Make and model
- Manufacturers serial number (VIN)
- Registration number
- Asset NSN number
- Vehicle curb weight (lbs)
- Payload, maximum (lbs)
- Gross weight, max (lbs)
- Date of delivery
- Warranty () month () miles ()
- Contract number
- US Property

3.25 Painting. All external surfaces and all surfaces normally painted by the forklift manufacturer shall be prepared and primed using material compatible with the final paint. A primer shall be used on all external and internal steel surfaces normally primed by the forklift manufacturer. The paint finish shall show no evidence of uneven application, curtains, runs, snags, orange peel, lack of adhesion, or other defects. The final top-coat shall be the manufacturer's standard commercial automotive grade paint coat. The final color shall be the manufacturer's standard commercial color.

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3.26 Marking. Markings shall be made with paint or self-adhesive labels. Markings for green forklifts shall be black, and desert sand forklifts shall be white. The following markings shall be applied in the indicated locations in Table I:

Table I. Forklift marking.

LOCATION	MARKING
1 ½ inch high letters on each side of the mast, or front of forklift for Vehicle capacity	4,000 POUNDS” for Type 1
	6,200 POUNDS” for Type 2
2 inch high letters on each side of forklift	NO RIDERS

3.28 Emissions. The vehicle emissions shall comply with the EPA regulations in effect at the time of vehicle manufacture. When there is a change in EPA regulations during a contract, EPA provisions shall be consulted to determine which regulations apply (e.g. TIER 1 or TIER 2 or TIER 3). The vehicle shall comply with the emissions requirements of the destination state at the time of vehicle manufacture.

3.29 Noise limits. The sound level measured at the operator’s station shall not exceed 84 dB(A). If the sound level is above 84 dB(A), the contractor shall provide a hazardous noise warning plate stating that operator’s hearing protection is required when operating this forklift. The plate shall be made of a corrosion resistant material and shall be at least 4.0 inches square. It shall have black lettering on a yellow background and shall be located to be visible to the operator as he enters the cab, or is seated. Sound level shall not exceed 92 dB(A).

3.30 Slings and tie-downs. Permanently installed slinging and tie-down devices that enable the forklift to be lifted in its normal travel position, and to be tied down to the floor of a transportation medium shall be provided. All devices should be easily accessible and minimize the need to crawl under the vehicle when securing it. All devices shall be capable of accepting a chain and hook with an outside diameter of 3.00 inches through its opening, and shall have a structural safety factor of 2.3 to 1, based on static load. The notation “LIFT HERE” or “TIE-DOWN” shall be stenciled in black paint near each lifting and tie-down device. The manufacturer shall submit digital drawings (in Tagged Image File Format, or TIFF) showing the center of gravity location in air-transport mode and tie down instructions on C-130, C-5, and C-17 aircraft. There shall be a corrosion resistant, metal plate permanently installed on the vehicle that shows the center of gravity location in the air-transport mode, and tie-down instructions in C-130 and C-17 aircraft. Refer to MIL-STD-1791 as a guide only.

3.31 Transportability. The forklift shall be capable of being transported by water, highway, and rail. The forklift shall be air transportable in C-130, C-5, and C-17 aircraft. Refer to MIL-STD-1791 for guidance only.

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3.32 Electromagnetic interference (EMI). The forklift shall comply with the EMI requirements from MIL-STD-461 shown in table II.

TABLE II. Electromagnetic interference (EMI).

Name	Description	Parameters
RE-102	Emissions	(Frequency Range: 2 MHz to 1 GHz)
RS-103	Susceptibility	(Frequency Range: 30 MHz to 18 GHz) 10 V/m (30 MHz to 1 GHz) 50 V/m (above 1 GHz)

3.33 Uprights and carriage assembly. Uprights shall be the high-visibility, telescopic-roller type. Rollers shall be the permanently lubricated-for-life type or equipped with lubrication fittings. The drive tires shall not interfere with the uprights or the carriage assembly travel at any upright tilt angle. The lift cylinder shall be mounted and positioned so that it does not protrude forward of the plan outline of the uprights. Uprights and carriage assembly shall be removable from the forklift without requiring permanent modification (such as cutting or welding) to the forklift. Cross members of the mast structure, when in a lowered position, shall not interfere with the operator's horizontal or downward line of sight to the front of the forklift. The collapsed mast height with no load on forks, measured from the ground to the top of the uprights, in a vertical position, shall not exceed that specified in 3.35.3. Positive means such as a stop shall be provided to prevent over travel of the carriage or channel in both upper and lower positions. Each fork shall be removable without removing the load backrest.

3.33.1 Load backrest. A metal backrest shall be provided without disturbing any other component. There shall be no protruding bolts or appendages beyond the side plane of the load backrest. In conjunction with the fork and hanger design, it shall provide a vertical rear guard 48 inches high, measured from the load carrying surface of the forks, and equal to the width of the carriage or side shift. Spacing between vertical members shall not be more than 6 inches. Load securing rings or eyes shall be provided on both left and right sides of the backrest and located not more than 15 to 25 inches above the load carrying surface of the forks. Safety factor for load securing devices shall not be less than 3 times the rated load, based on yield strength, assuming that each device is loaded equally. Ring or eye opening shall be determined using MIL-STD-209. The load securing device, when not in use, shall not extend forward of any surface on front face of backrest. The backrest assembly/load securing device combination shall be capable of withstanding a horizontal force (at load securing devices) equal to three times the forklift capacity without failure or permanent deformation of carriage assembly (see 4.3.13). Direction of force is forward.

3.34 Retrieval device. A rear mounted pin-type retrieval device shall be provided. The drawbar pin shall be located on the vertical centerline of the forklift not less than 12 inches nor more than 24 inches above ground level. The drawbar pin mounting shall be of sufficient strength to withstand, without permanent deformation or damage, a drawbar pull of at least 3 times the maximum drawbar pull of the forklift.

3.35 Performance.

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3.35.1 Slope ascension. The forklift shall be able to perform the following requirements on a dry concrete surface.

3.35.1.1 Longitudinal slope. The forklift, with rated load, shall be capable of ascending and descending a 20 % slope (11.3°) at a minimum of 2 mph when the load is in the uphill direction during both ascent and descent. The slope surface shall be asphalt, concrete, or equivalent. It shall also be capable of accelerating upslope from a complete stop to at least 2 mph on a 20% slope (11.3°).

3.35.2 Fork tilt. When unloaded, forks shall have at least 3.0 degrees of forward tilt, and not less than 6.0 degrees of rear tilt.

3.35.3 Collapsed mast height. The collapsed mast height of the forklift with capacity load measured from the ground to the top of the uprights in a vertical position shall not exceed 91 inches for the 4,000 pound forklift and shall not exceed 86 inches for the 6,200 pound forklift.

3.35.4 Maximum fork height. The maximum fork height of a forklift with capacity load, with the uprights fully extended, measured from the ground to the load-carrying surface of the forks at the capacity load center, shall be at least 144 inches and not more than 147 inches for the 4,000 pound forklift and shall be at least 130 inches and not more than 133 inches for the 6,200 pound forklift.

3.35.5 Dimensions. The overall forklift height, with mast collapsed, shall not exceed that specified in 3.35.3. The overall width of the forklift, at the widest point, shall not exceed 80.0 inches.

3.35.6 Under clearance. The forklift with rated load shall have sufficient under-clearance to permit operation from one horizontal plane to another, up or down a 20 percent slope, and over the obstacle course described in Test Method No. 1. Minimum under-clearance beneath the mast assembly, when in true vertical position, shall not be less than 4 inches when the forklift is loaded.

3.35.7 Fork dimensions. The fork dimensions (see 4.3.18) shall be as follows in Table III:

Table III. Fork dimensions.

TYPE	FORK SIZE	DIMENSIONS
I	Thickness	1.8125 inches maximum
	Width	5.0625 inches maximum
	Length	42 inches (+0/-0.50 inch)
II	Thickness	2.375 inches maximum
	Width	6.0625 inches maximum
	Length	42 inches (+0/-0.50 inch)

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3.35.8 Fork spacing. All measurements are made to the outside edges of the forks. The 4,000 pound forklift shall have manual fork positioning. In the closed position, the fork spacing shall be less than or equal to 12 inches. In the open position, the fork spacing shall be more than or equal to 32 inches. The 6,200 pound forklift shall have hydraulically powered fork positioning. In the closed position, the fork spacing shall be less than or equal to 14 inches. In the open position, the fork spacing shall be more than or equal to 45 inches.

3.35.9 Side shift. Forklifts shall be equipped with a side shift mechanism hydraulically operated and capable of moving the forks to a minimum of 4 inches to both the left and right of the vehicle centerline with capacity load at all lift heights.

3.35.10 Lifting speed. Lift speed with rated load on the forks shall not be less than 60 feet per minute over the entire distance from ground level to maximum fork height.

3.35.11 Lowering speed. Speed of lowering of unloaded forks shall not be less than 40 feet per minute over the entire distance from maximum fork height to ground level. Speed of lowering forks with rated load shall not be more than 80 feet per minute over the entire distance from maximum fork height to ground level.

3.35.12 Turning radius. The 4,000 pound forklift, carrying rated load, shall be capable of backing through a turn in either direction between two parallel walls no further apart than 166 inches (add 4 inches when side-shift is used). The 6,200 pound forklift, carrying rated load, shall be capable of backing through a turn in either direction between two parallel walls no further apart than 196 inches (add 4 inches when side-shift) is used.

3.35.13 Travel speed. While carrying the rated load on a level surface, 4,000 pound forklifts shall be capable of attaining a speed of at least 10.0 mph in both forward and reverse directions. While carrying the rated load on a level surface, 6,200 pound forklifts shall be capable of attaining a speed of at least 11.0 mph in both forward and reverse directions.

3.35.14 Forklift operations. The forklift shall complete not less than a cumulative total of 40 hours, when tested as described in Test Method No.1 (see Appendix). Only routine maintenance as prescribed by the manufacturer is allowed and only at the end of each operational period. The forklift shall show no signs of unusual or detrimental wear. No failure shall occur during the 40 hour operational test. A failure is defined as any malfunction that cannot be corrected within 30 minutes by adjustment, repair, or replacement, which may cause cessation of operation, degradation of performance capabilities below specified levels, damage to the forklift by continued operation, or personnel safety hazard (see 4.3.24).

3.35.15 Fork visibility. Without leaving the seat, the operator shall be able to see the tip of at least one fork tip at any lift height and with the tines in any fork spacing when there is no load on the forks. Also, the forklift manufacturer shall furnish a side-view of the forklift showing sight lines for a 95th percentile male and a 5th percentile female. The manufacture shall furnish a digital image of this drawing.

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3.35.16 Drift. The lift assembly shall be capable of holding the rated load at maximum lift height for 10 minutes with not more than 0.75 inch of vertical load lowering and not more than 1.0 degrees of mast rotation.

3.35.17 Stability. The forklift shall meet the “forward stacking”, “forward travel”, “lateral stacking”, and “lateral travel” stability requirements of ANSI/ITSDF B56.1.

4. VERIFICATION

4.1 Classification of inspections. The inspections shall be classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article shall be submitted in accordance with 3.2. The first forklift and its components, contractor drawings and literature, and vendor literature shall be compared to section 3 of this document to verify conformance. Unless otherwise specified (see 6.2), the forklift shall then be subjected to the conformance inspection specified in 4.3 and the examination of product inspection in 4.4.1.

4.3 Conformance inspection. Unless otherwise specified (see 6.2), the following conformance inspection may be performed in any order, as determined by the contractor. Occurrence of any of the following conditions during the testing specified (see 4.3.1 through 4.3.27) shall be cause for rejection of the forklift:

- a. Inability to meet specified performance requirements or inability to complete any test (see 4.4.2 and 4.4.3).
- b. Permanent deformation, over-heating, malfunctions, leakage of water, transmission fluid, engine oil, fuel, lubrications, hydraulic fluid, etc, in excess of Class 3, for dust free conditions and Class 3D for dusty conditions in accordance with SAE J1176.
- c. Any binding, jerking, or uneven operation of any component or system.
- d. Any wearing, galling, gouging or other material removal.

4.3.1. Conformance testing and demonstration. Unless otherwise specified herein, demonstrations and tests shall be conducted at the ambient temperature and climatic conditions existing at the place of demonstration and test. Only that maintenance scheduled by the contractor and submitted as a maintenance schedule prior to commencement of the demonstration and test shall be performed during the demonstration or testing. All distance and time measurements, and other required data obtained during the testing shall be recorded and included in the first article test report.

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4.3.2 Fail-safe hydraulic lift system. Raise the rated load 4 to 10 feet above ground level with the mast approximately vertical. Measure vertical distance to one fork tip. Disconnect a hydraulic line that supplies pressure to the lift system to simulate a line failure. When fluid stops draining, re-measure vertically to same point on fork tip. A drop of more than 0.5 inch shall be cause for rejection. Measure the mast tilt. Disconnect the hydraulic lines that supply pressure in both directions, to all tilt cylinders. When fluid stops draining, re-measure mast tilt. A change of more than one degree shall be cause for rejection. Lower the forks to ground level using the override system.

4.3.3 Overload. Perform a stress analysis of the forklift to determine all critical stress points. Apply strain gauges or other suitable instrumentation at all critical stress points to measure stress during test. Place forklift on level surface. If necessary, support the forklift with blocks under the axle or frame to relieve the load on the tires. Secure the forklift to the floor in a manner to compensate for the additional test load. The cylinders may be hydraulically locked for this test. With the mast in straight-ahead position gradually apply load to the forks until three times the rated capacity is on forks. Leave this load on the forks for at least 10 minutes. Remove load and inspect forklift structure, frame, mast assembly and hydraulic system for deformation, cracks, broken welds, hydraulic system leaks, etc. Inspect forks at least six inches each side of heel by magnetic particle method. Record readings from strain gauges and convert to, and record, the corresponding stresses. Failure to meet these requirements shall be cause for rejection. Include results of the stress analysis that determined the stress caused by the static and dynamic loads in the first article test report. The entire stress analysis is not necessary just the location of critical stress points.

4.3.4 Fork lifting. Raise the rated load from ground to maximum lift height and lower. Fully side shift the load left and right and return to center. This shall be considered one cycle. Repeat until 100 cycles have been completed. This is a severe test of the hydraulic system, testing may be stopped as needed to allow cooling of the hydraulic fluid. The occurrence of any condition listed in 3.8.2 shall be cause for rejection.

4.3.5 Service brakes. Perform the drawbar and stopping distance service braking tests specified in ANSI/ITSDF B56.1 as modified by service brake (see 3.16.1). Nonconformance shall be cause for rejection.

4.3.6 Parking brake. Drive the forklift forward, while carrying rated load, onto a 20% ramp. Measure the force at the handle required to fully apply the parking brake. Using only the parking brake, hold the forklift for 15 minutes. Repeat this test, except test with the forklift up the ramp in reverse. The forklift may be driven up on the ramp in reverse with no load on the forks and the load applied with the forklift stationary on the ramp. Any movement of the forklift while the parking brake is applied shall be cause for rejection. Nonconformance with parking brake (see 3.16.2) shall be cause for rejection.

4.3.7 Cold starting. Place the forklift in an ambient temperature of -25 degrees F or cooler, until all components are stabilized at the ambient temperature. The engine shall start within five minutes and run smoothly at idle speed without continued engine control adjustment within 15 minutes. At this time all travel, braking, and load handling mechanisms, shall be operated. The

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forks shall be raised to maximum lift height allowed by the test chamber, and side shifted and adjusted laterally between extreme positions. Starting aides such as the ether injection or glow plugs furnished with the forklift may be used to assist starting; however, no external power or heat source shall be used. The test chamber shall maintain the ambient temperature as close to – 25 degrees F as possible during the entire test. Failure to meet any of these requirements shall be cause for rejection.

4.3.8 Emissions. The manufacturer shall provide a letter certifying the vehicles conform to the EPA regulations in effect at the time of manufacture. If the emissions regulations change during production, a subsequent certification letter must be provided.

4.3.9 Noise level. Measure noise level at operator's ear with the engine operating at maximum rpm and while lifting rated load. Nonconformance with noise limits (see 3.29) shall be cause for rejection. If noise level is between 84 and 92 dB(A), the noise warning plate described in 3.29 shall be on all forklifts delivered on this contract.

4.3.10 Slinging and tie-down provisions. Test the slinging provisions by applying the load for the time period specified in MIL-STD-209. Test the tie-down provisions by applying the ultimate load for the time period specified in MIL-STD-209. Nonconformance to 3.30 shall constitute failure of this test.

4.3.11 Air transportability verification. Using the air transportability information, verify that the forklift can meet all air transport requirements. Weigh front and rear axles with the forklift in air transport configuration and at least 25 percent of a full fuel tank. Measure the overall height, and any other dimensions needed to verify the air transport requirements. For reference only refer to MIL-STD-1791. Nonconformance to (see 3.31) shall constitute failure of this test.

4.3.12 Electromagnetic interference (EMI). Test the forklift to verify that it meets the EMI requirements of (see 3.32). Failure to meet these requirements shall be cause for rejection.

4.3.13 Load backrest securing devices. Apply a total forward, horizontal load of 3 times rated capacity (divided equally between all load securing devices (see 3.33.1)). The load shall be applied for 5 minutes. Any deformation, broken welds, etc. shall be cause for rejection.

4.3.14 Retrieval device. Apply a total rearward, horizontal load of 3 times the drawbar pull of the forklift on the retrieval device (see 3.34) for a minimum of 5 minutes. Nonconformance to 3.34 and 4.3, deformation, broken welds, etc. shall be cause for rejection.

4.3.15 Slope ascension. The test (see 4.3.15.1) shall be performed on a dry concrete surface.

4.3.15.1 Longitudinal slope. Drive the forklift forward with rated load along a horizontal approach and onto a 20% slope and bring to complete stop. Start from a dead stop and proceed up the ramp. Remove rated load and repeat above test. Nonconformance to 3.35.1.1 shall be cause for rejection.

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4.3.16 Upright tilt. Place forklift without load on flat level surface. Raise forks to an elevation of 2 to 4 feet. Tilt forks to full forward position and record angle of tilt. Tilt forks to full rearward position and record angle of tilt. Nonconformance with 3.35.2 shall be cause for rejection.

4.3.17 Collapsed mast height, maximum fork height, dimensions, under clearance. With the vehicle on a level and flat surface, no load on the forks, and mast in true vertical position, measure and record collapsed mast height, the overall forklift height (with mast collapsed), and the overall forklift width. With the vehicle on a level and flat surface, rated load on the forks, and mast in true vertical position, measure and record maximum fork height and under clearance. Nonconformance to 3.35.3, 3.35.4, 3.35.5, or 3.35.6 shall be cause for rejection.

4.3.18 Fork dimensions. Measure the length, width, and thickness of the fork tine to determine compliance with paragraph 3.35.7.

4.3.19 Fork spacing. With no load on the forks, move forks together to the most closed position. Measure to outside edges of the forks. Move forks to most spread apart position and measure to outside of forks. Nonconformance with 3.35.8 shall be cause for rejection. The occurrence of any condition listed in section 4.3 shall be cause for rejection.

4.3.20 Fork side shift. With no load on the forks, side shift to extreme left position. Side shift to extreme right and measure total travel. Nonconformance with 3.35.9 shall be cause for rejection. With the rated loads on the forks the side shift shall be operated through 100 complete, continuous cycles. A cycle shall consist of starting at extreme right, side shift to extreme left, then side shift back to extreme right. The occurrence of any condition listed in section 4.3 shall be cause for rejection.

4.3.21 Lifting speed and lowering speed. With the forklift on a level and flat surface, measure and record the distances and times (inches and seconds) shown below. Repeat the procedure three times. Nonconformance with 3.35.10 and 3.35.11 shall be cause for rejection.

- a. Dimension from floor to top surface of forks in fully lowered position.
- b. Time required to raise rated load to maximum fork height.
- c. Dimension from floor to top surface of forks raised to maximum fork height.
- d. Difference between maximum fork height and height of the forks in lowered position.
- e. Time required to lower rated load at maximum speed (full open lowering control) to an intermediate fork location (between 3 to 4 foot height). The load shall be abruptly stopped at this intermediate fork location.
- f. Dimension from the floor to the intermediate fork location.

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g. Difference between maximum fork height and height of forks in the intermediate fork location.

h. Time required to lower unloaded forks from maximum lift height to lowered position.

4.3.21.1 Fork lifting mechanism. The fork lifting mechanism shall be operated through 100 complete continuous cycles (from ground level to maximum lift height and back to ground level) with no load and 200 cycles with rated load on the forks. The test shall be performed at a rate of not less than two cycles per minute. Any failures to lift mechanism components, overheating of engine coolant system or hydraulic system, inability to complete the test or any other failure shall be cause for rejection.

4.3.22 Turning radius. With rated load on forks, operate forklift in clockwise direction, at maximum steering angle, for at least one complete full circle. Determine turning radius by measuring to outside of tires. Repeat in counterclockwise direction. Nonconformance with 3.35.12 shall be cause for rejection.

4.3.23 Travel speed. Operate the forklift at maximum governed speed in both forward and reverse directions with rated load in the load carry position. Inability to obtain the speed specified in 3.35.13, failure of any component, over-heating, malfunctioning, or leaking of fluid shall be cause for rejection.

4.3.24 Forklift operations. Perform Test Method No. 1, Forklift Operations (see figure 2). Nonconformance with 3.35.14 shall constitute failure of this test.

4.3.25 Fork visibility. With no load on the forks, vary the lift height, side shifting, fork spacing, and mast pivoting to verify compliance with the visibility requirements of 3.35.15.

4.3.26 Drift. Exercise the lift and tilt functions to heat the hydraulic fluid to operating temperature. Raise the rated load to maximum lift height with mast approximately vertical. Measure vertical distance from ground to bottom of load at the 24-inch load center. Measure mast tilt from vertical. Shut off engine and let sit for 10 minutes. Re-measure vertical distance to same point on bottom of load. Re-measure mast tilt. Nonconformance with the drift requirements of 3.35.16 shall be cause for rejection.

4.3.27 Stability. Perform applicable stability tests of ANSI/ITSDF B56.1 specified in 3.35.17. Inability to pass the ANSI/ITSDF B56.1 tests shall be cause for rejection.

4.4 Production forklifts inspection. All forklifts produced by the contractor shall be inspected and subjected to the tests contained in 4.4.1, 4.4.2, and 4.4.3. Occurrence of any of the conditions listed in 4.3 shall be cause for rejection.

4.4.1 Examination of product. Each forklift shall be examined to verify compliance with the requirements herein prior to accomplishing any other demonstrations or tests listed in 4.3. A contractor-generated, Government-approved checklist (part of the test procedure) shall be used to identify each requirement not verified by an analysis, certification, demonstration, or test, and

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shall be used to document the examination results. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each forklift function shall be verified. Each production forklift shall be inspected to a Government-approved reduced version of the checklist.

4.4.2 Travel. The forklift shall be driven at least 1.0 miles at varying speeds, including maximum speed. At least five right and five left turns shall be made at maximum turn angle, and operate horn, windshield wipers, lights, heater, defroster, and other components during this one mile drive. Occurrence of any conditions listed in 4.3 shall be cause for rejection.

4.4.3 Material handling. With rated load on forks, raise forks to maximum light height, then lower at maximum lowering speed and quickly stop at one to two feet above ground level. Repeat at least five times. If the forklift has side shift capability, side shift rated load from one extreme to the other and back to original position. Repeat at least five times. Occurrence of any conditions listed in 4.3 shall be cause for rejection.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military services' system commands. 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. Forklifts described herein are intended for stacking, unstacking, and moving cargo in and around warehouses, loading platforms, and docks within the military supply system; also for moving cargo and other palletized loads in and out of transport carriers such as highway trailers and vans, cargo containers, railroad cars, and cargo vessels. The forklifts will be operated in and out of earth covered ammunition storage facilities and in other uses where internal combustion powered forklifts are operated. The forklifts will be used in close proximity to C-130, C-17, and C-5 cargo aircraft. The forklifts are intended for operation over paved, semi-prepared and other hard surfaces for short distances.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification (see 1.2)
- b. Classification of forklift to be provided (see 1.2)
- c. When a first article is to be furnished (see 3.2)
- d. Type A winterization, when specified (see 3.20.1 and 3.4)
- e. Type C winterization, when specified (see 3.20.2 and 3.4)
- f. First article inspection, if required (see 3.2 and 4.2)
- g. When conformance inspection is required (see 4.3)
- h. Packaging requirements (see 5.1).

6.3 Subject term (key word) listing.

Material handling

Pivot mast

Swing mast

6.4 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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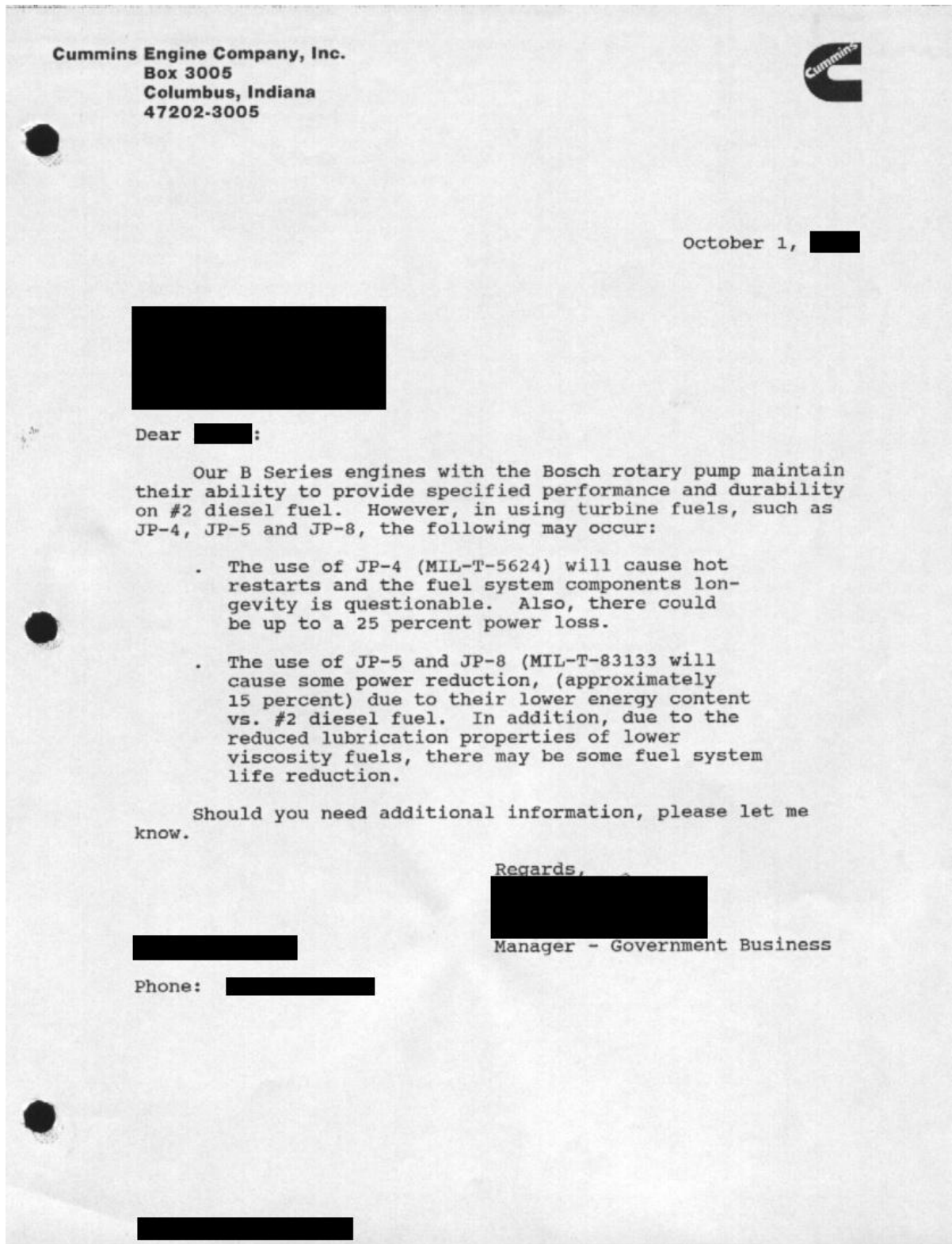


FIGURE 1. Alternate Fuel Certification Letter

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TEST METHODS NO. 1 FORKLIFT OPERATIONS

1. Demonstration course:

- (a) The test course shall be a level, improved surface laid out in accordance with Figures 3-A and 3-B. Station 1 and Station 3 shall be platforms that are not less than 8 feet in height and capable of supporting rated load. Station 2 shall be at ground level.
- (b) Pick up load from Station 1; back up forklift being sure all wheels travel over obstacles; travel forward to Station 2. Before reaching Station 2, stop forklift and pivot mast with load 90 degrees to right, then pivot mast back to straight ahead position.
- (c) Deposit load to Station 2; back out; then travel forward to Station 3. Prior to engaging load at Station 3, raise mast to maximum lift height to activate relief valve. Lower forks and engage load.
- (d) Pick up load at Station 3; back out; then travel forward and deposit load at Station 1, being sure all wheels travel over obstacles.
- (e) Disengage load at Station 1; back out, being sure all wheels travel over obstacles; then travel forward to Station 2.
- (f) Pick up load at Station 2; back out; then travel forward and deposit load at Station 3.
- (g) Steps 2 (b) through 2 (f) shall constitute one circuit. For 50 percent of the circuits, Station 2 and Station 3 shall be interchanged so that they are in clockwise position rather than in their initial counterclockwise position. Stations shall be changed at the end of each 8-hour operating day.

FIGURE 2. Test Method No. 1

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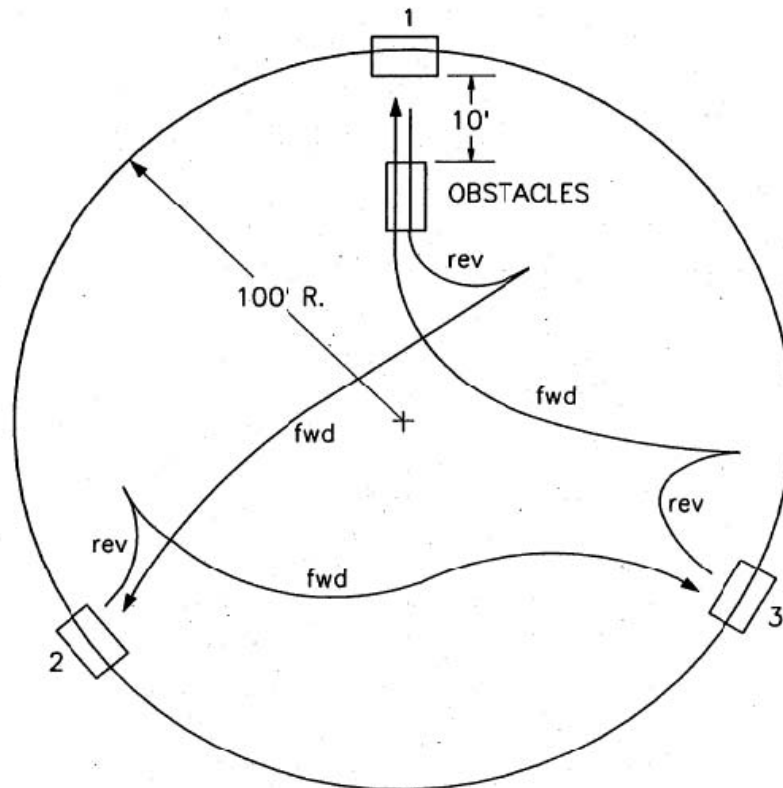
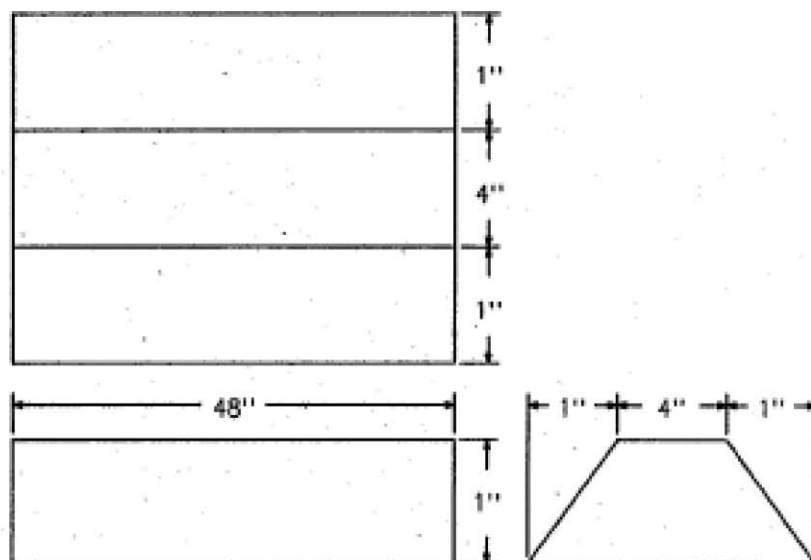
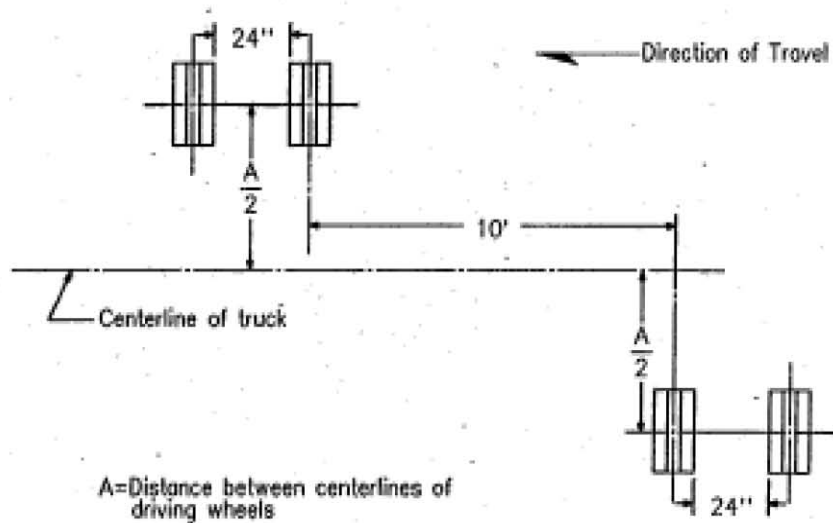


Figure 3-A. Forklift operations course

MIL-PRF-32181B**CONSTRUCTION OF OBSTACLE S****OBSTACLE COURSE LAYOUT****FIGURE 3-B. Obstacles**

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MILITARY INTERESTS:

Custodians:
Air Force - 184

Preparing Activity:
Air Force - 184

Reviewer:
Air Force - 99

Agent:
Air Force – 99
(Project 3930-2014-007)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST online database at <https://assist.dla.mil/>.