

INCH-POUND

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 SUPERSEDING  
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## MILITARY SPECIFICATION

## COMPRESSORS, AIR, RECIPROCATING AND ROTARY

## DIESEL ENGINE DRIVEN

This specification is approved for use within the USA Belvoir Research, Development and Engineering Center Department of the Army, and is available for use by all Department and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers skid-mounted, and trailer-mounted, diesel-engine-driven reciprocating and rotary air compressors.

1.2 Classification. The air compressors shall be of the following types, classes, and sizes (rated capacity) as specified (see 6.2):

Type I	Reciprocating
Type II	Rotary
Class 1	Skid-mounted
Class 2	trailer-mounted, pneumatic-tired
size	125 cfm at 100 psig
size	250 cfm at 100 psig

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: STREE-TSE, Fort Belvoir, VA 22060-5606 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4310

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## SPECIFICATIONS

## FEDERAL

- A-A-52152 - Isulation Sleeving, Thermal, Tubular.
- O-A-548 - Antifreeze/Coolant, Engine: Ethylene Glycol, Inhibited. considered
- W-F-800 - Fuel oil, Diesel.
- W-C-633 - Couplings, Hose, (Half), Pneumatic , Universal Type.

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- MIL-V-173 - Varnish, Moisture- and-Fungus-Resistant (for Treatment of Communications, Electronic, and Associated Equipment).
- MIL-P-514 - Plates, Identification, Instruction and Marking, Blank.
- MIL-T-704 - Treatment and Painting of Materiel.
- MIL-L-2104 - Lubricating Oil, Internal Combustion Engine.
- MIL-C-360C - Compressor, Rotary, Power-Driven; and Compressor, Reciprocating, Power-Driven: Air and Gas (Except Oxygen and Refrigerant), Packaging of.
- MIL-G-3859 - Grease Guns, Hand, High Pressure, Lever-Operated; Cartridge and Bulk Loading (14 Ounce and 21 Ounce Capacity).
- MIL-G-10924 - Grease, Automotive and Artillery.
- MIL-H-17672 - Hydraulic Fluid, Petroleum, Inhibited.
- MIL-G-23827 - Grease, Aircraft and Instrument, Gear and Actuator Screw.
- MIL-C-45 150 - Chassis, Trailer, 2-Wheel Cart Type, 1/4 to 3-1/2 Ton.
- MIL-A-46153 - Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package.
- MIL-L-46167 - Lubricating Oil, Internal Combustion Engine, Arctic.
- MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.
- MIL-B-4617 6 - Brake Fluid, Silicone, Automotive All Weather Operational and Preservative.
- MIL-A-52363 - Air Cleaners, Intake: Dry-Type (for Internal-Combustion Engine).
- MIL -C-52437 - Chassis Trailer Single and Multi-Axle.
- MIL-E-52649 - Engine Cold Starting Aids, Ether Fuel Primers.
- MIL-T-83133 - Turbine Fuel, Aviation, Kerosene Type, Grade JP-8.

## STANDARDS

## FEDERAL

- FED-STD-H2 8 - Screw Thread Standards.

## MILITARY

- MIL-STD-130 - Identification Marking of US Military Property.
- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.

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MIL-STD-461	- Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference.
MIL-STD-642	- Identification Marking of Combat and Tactical Transport Vehicles.
MIL-STD-669	- Loading Environment and Related Requirements for Platform Rigged Airdrop Material.
MIL-STD-810	- Environmental Test Methods and Engineering Guidelines.
MIL-STD-814	- Requirements for Tiedown, Suspension and Extraction Provisions on Military Materiel for Airdrop.
MIL-STD-889	- Dissimilar Metals.
MIL-STD-1400	- Engines, Gasoline or Diesel, Methods of Test.
MIL-STD-1410	- Methods for Selection of Industrial Engines for End Item Application.
MIL-STD-1472	- Human Engineering Design Criteria for Military Systems, Equipment and Facilities.
MIL-STD-1474	- Noise Limits for Military Materiel.
MIL-STD-1791	- Designing for Internal Aerial Delivery in Fixed Wing Aircraft.
MS35000	- Battery, Storage, Lead-Acid, Waterproof.
MS35341	- Filter, Fluid, Pressure: Oil, Heavy Duty, By-Pass Type, Senior Size (Non-Base Mounted).
MS35342	- Filter, Fluid, Pressure: Oil, Heavy Duty, By-Pass Type, Senior Size (Base Mounted).
MS35343	- Filter, Fluid, Pressure: Oil, Heavy Duty By-Pass Type, Junior Size.
MS35802	- Filter Elements, Fluid, Pressure-Oil, Full-Flow.
MS35829	- Hinge, Continuous (Piano), .075 Thickness, .187 and .250 Pin Dia.
MS35840	- Cap, Radiator; Pressure, (7 PSI), 2-1/2 Inch, Assembly.
MS39254	- Cartridge, Engine Starting (Engine Cold- Starting Aid).
MS49006	- Plug, Pipe, Magnetic-Headless; Aluminum, Iron or Steel.
MS51062	- Cap, Radiator, Pressure (7 PSI), Assembly.
MS51389	- Rain Cap, for Air Cleaner Intake for Industrial Engines.
MS2131	- Connector, Plug, Electrical Intervehicle Power Cable.
MS53063	- Indicator, Air Cleaner, Intake Restriction Mechanical Type.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins, Philadelphia, PA 19111-5094.)

2.1.2 Other Government publication. The following other Government publications form a part of this document to the extent specified herein. Unless otherwise specified, the issue is that cited in the solicitation.

## NORTH ATLANTIC TREATY ORGANIZATION (NATO)

STANAG 2175	- Classification and Designation of Flat Wagon Suitable for Transporting Military Equipment.
STANAG 2832	- Restrictions for the Transport of Military Equipment by Rail on European Railways.

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(Copies of STANAGs are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document(s) 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. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Pressure Vessels.

Boiler and Pressure Vessel Code, Section IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.

Performance Test Code - Displacement Compressors, Vacuum Pumps and Blowers, PTC9.

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 320 - Alloy Steel Bolting Materials for Low Temperature Service.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.)

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.1, Structural Welding Code - Steel.

(Application for copies should be addressed to the American Welding Society, Inc., 2501 North West Seventh Street, Miami, FL 33125.)

ASSOCIATION OF AMERICAN RAILROADS (AAR)

Manual of Standards and Recommended Practice, Section J.

(Application for copies should be addressed to the Association of American Railroads, 50 F Street, NW, Washington, DC 20001.)

COMPRESSED AIR AND GAS INSTITUTE (CAGI)

CAGI Fuel Consumption Test for Portable Air Compressors.

(Application for copies should be addressed to Compressed Air and Gas Institute, 122 East 42nd Street, New York, NY 10017.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

J429 - Mechanical and Material Requirements for Externally Threaded Fasteners.

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- J492 - Rivets and Riveting .
- J534 - Lubrication Fittings.
- J541 - Voltage Drop for Starting Motor.
- J678 - Speedometers and Tachometers - Automotive.

(Application for copies should be addressed to the society of Automoti'Ve Engineers, 400 Commonwealth Drive, Warrendale, PA 15086.)

**TIRE AND RIM ASSOCIATION (TRA)**

Tire and Rim Association Yearbook

(Application for copies should be addressed to the Tire and Rim Association, Inc., 3200 West Market Street, Akron, OH 44313.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, (except for related associated detail specifications, specification sheets or MS standards), 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 air compressor shall consist of a diesel engine, a compressing unit, safety equipment, a housing, a receiver, cooling and regulating systems and related piping, gauges, instruments and controls, assembled on either a single unified steel sub-base skid frame or a trailer. Commercial items may be substituted for those items described by Federal or Military specifications or standards provided that the substitute item is one commercially used within the industry. All proposed substitutions will be identified by the offers in their proposals. Use of substitute items shall not relieve the contractor from meeting specification requirements.

3.2 First article Unless otherwise specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification. All rubber parts shall be not more than 12 months old on date of acceptance by the Government.

3.3.1 Material deterioration prevention and control. The compressor shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable operating and storage environments to which the compressor may be exposed.

3.3.2 Dissimilar metals Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

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3.3.3 Identification of materials and finishes. The contractor shall identify the specific material, material finish or treatment for use with component and subcomponent, and shall make information available upon request to the contracting officer or designated representative.

3.3.4 Recovered materials. For the purpose of this requirement, recovered materials are those materials which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The components, pieces and parts incorporated in the compressor may be newly fabricated from recovered materials to the maximum extent practicable, provided the compressor produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the compressor.

### 3.4 Environmental requirements.

- a. Temperature. The air compressor shall start and operate as specified herein at any temperature ranging from -25 to +120 °F.
- b. Precipitation. The compressor shall operate as specified herein in rain falling at a rate of 3 inches per hour.

3.5 Safety. Compressor components that are subject to high temperatures, or are energized electrically, shall be shielded to avoid hazards to operating or maintenance personnel. All moving parts shall be guarded when such parts are exposed to contact by personnel or otherwise create a hazard. Fuel tanks shall be located in a manner which will not allow spills or overflows to run onto engine, exhaust, or electrical equipment. Sharp edges, projecting points and excessive length of fastening devices shall be avoided.

#### 3.5.1 Safety devices. Safety devices shall be provided to:

- a. Shut down engine when the coolant temperatures exceeds engine manufacturer's recommended limits.
- b. Shut down engine when the engine oil pressure drops below 15 pounds per square inch (psi).
- c. Shut down the engine when the engine speed exceeds the engine manufacturer's recommended maximum speed.
- d. Prevent the engine from starting when the air receiver pressure is 10 psi or greater on rotary-vane type compressors.
- e. Shut down engine when compressor discharge exceeds the manufacturer's recommended limit.

If the safety devices are not of the automatic reset type, a reset button shall be mounted on the instrument panel and shall be clearly marked as to its function.

3.6 Noise limits. The noise produced by the compressor shall conform with MIL-STD-1474 requirements with the exception of 5.2, 5.3, and 5.4 when tested in accordance with 4.5.2.16. The provisions of MIL-STD-1474, 4.2 and 4.3 shall be provided if and only if MIL-STD-1474, 5.1.1.2 procedures have been pursued and documented to the satisfaction of the procuring activity and written permission to exceed the 85 dB(A) limit is obtained from the procuring activity. Hazard signs shall conform with MIL-STD-1474, 4.2 and be readable at the distance indicated on the sign.



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3.7 Human factors engineering. The compressor shall conform to human factors engineering design criteria as described in MIL-STD-1472. Special design emphasis shall be given, but not limited to general requirements (4), control/display integration (5.1), visual displays (5.2), audio displays (5.3), controls (5.4), labeling (5.5), anthropometry (5.6), design for maintainer (5.9), operational and maintenance ground/shipboard vehicles (5.12.9), and hazards and safety (5.13) of MIL-STD-1472, as applicable.

3.8 Maintainability. The air compressor shall operate as specified herein without maintenance other than the contractor's recommended normal scheduled maintenance, as established by a schedule submitted by the contractor prior to test. All assemblies, installed attachments, wiring, and tubing shall be accessible for servicing, repair and replacement without the removal of other major assemblies and installed attachments. Covers, safety guards and plates which must be removed for component adjustment, repair, replacement, or maintenance shall be equipped with quick-disconnect fastenings. Access covers shall be labeled to indicate the items accessed through them (i.e., oil fill, batteries, etc) in accordance with 3.7. Unit maintenance, assembly or disassembly operations shall be accomplished with common tools and special tools furnished with the compressor. Design for maintainability shall be in accordance with 3.7.

3.8.1 Fasteners. Fastening devices such as screws, bolts, pins, nuts, washers, and similar items shall be of a minimum number of types and sizes. Self-tapping screws shall not be used. Choice of fasteners shall be based on consideration for the intended application, load requirement, and ease of maintenance or replacement. Bolts shall be securely installed with locking devices to prevent loosening. Fastener threads shall conform to FED-STD-H28 while fastener material shall conform to ASTM A 320, class 1A except for B8FA..

3.9 Engine. The diesel engine shall conform to MIL-STD-1410, class I and shall be capable of operating on diesel fuel conforming to VV-F-800 and turbine fuel conforming to MIL-T-83133, and lubricating oil conforming to MIL-L-2104 and MIL-L-46167. Only full-flow-type oil filters shall be utilized in the engine lubricating system. The temperature of the oil in the engine oil gallery shall not exceed 230 °F when tested as specified herein. When an oil cooler is provided, the temperature of the oil in the engine sump, or entering the cooler, shall not exceed 250 °F when tested as specified herein. The temperature of the coolant in the top tank of the radiator shall not exceed 210 °F when tested as specified herein. The coolant temperature when operating at an ambient temperature of -25 °F shall be not less than +140 °F after a 15 minute warm-up at not more than one-fourth of the maximum continuous load rating. An auxiliary priming system conforming to MIL-E-52649, type III and MS39254 shall be furnished.

3.9.1 Power and speed rating. The power and speed rating of the engine shall be such that operation of the compressor under any of the operating conditions specified herein will not require horsepower in excess of the continuous horsepower rating of the engine as previously published by the engine manufacturer, or 85 percent of the engine manufacturer's published maximum horsepower rating, at the applied speed, whichever is less.

3.9.2 Fuel system. A fuel tank of sufficient capacity for not less than 8 hours operation under any conditions specified herein shall be furnished. There

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shall be no leakage from the tank when it is full, or when operating or transported under all condition specified herein. The fuel tank fill port shall be labeled "DIESEL OR JP-8 FUEL ONLY" in accordance with 3.7. Primary and secondary fuel filters shall be furnished and may be of the spin-on type.

3.9.3 Radiator. The radiator shall be a standard commercial type. The front of the radiator shall be provided with a removable steel guard to protect it from damage by underbrush. A label stating "DANGER - DO NOT OPEN WHEN HOT" shall be placed on or near the radiator fill cap in accordance with 3.7.

3.9.4 Cranking and charging system. Unless otherwise specified herein, a 12-volt cranking and battery charging system shall be furnished. Provisions shall be included for converting this to a 24-volt system (see 3.9.6). The cranking motor shall be of the heavy-duty type approved by the engine manufacturer. The battery charging system shall be of the heavy-duty-type DC generator or alternator of not less than 35 ampere capacity. The battery charging system shall be protected against reverse polarity conditions.

3.9.5 Storage batteries and battery box. Storage batteries conforming to MS35000-3 shall be furnished and shall be connected to provide 12 volts for a 12 volt cranking system and 24 volts for a 24 volt cranking system. The batteries supplied shall be of quantity sufficient to start the compressor under all operating conditions specified in 3.4. A weather-tight enclosure or enclosures shall be provided for the batteries. The enclosure(s) shall: (1) have not less than 30-inches ground clearance (class 2 compressors only); (2) hold the batteries level when the compressor is in its normal operating position; (3) provide gas venting to the outside, at or near the top of the enclosure; (4) provide accessibility for servicing and removal of batteries; and, (5) include drains for water or electrolyte spilled within the enclosure. Drainage shall be to a container without draining over other parts or components. Clear vision shall be provided for checking of the electrolyte level in each cell of the batteries. The batteries shall be fastened to the enclosure(s) to prevent damage from movement and vibration. The interior of the enclosure(s) shall be treated to minimize deterioration resulting from contact with the battery electrolyte. There shall be not less than a 1-inch clearance between the inside of the enclosure and each side and top of the battery cases. The cover shall overlap the sides and ends of the enclosure(s), and shall be either removable or hinged to permit vertical removal of batteries. A device shall be provided to hold the cover open when hinged. Tension-type latches with strikers shall be furnished to keep the cover closed. A pictorial diagram showing battery connections shall be provided which is visible when the battery box is in the open position. A negative ground shall be provided for the batteries.

3.9.6 Slaving components. The compressor shall be equipped with a 24 volt slave receptacle conforming to MS52131. The slave receptacle shall permit charging of the batteries and slave starting of the engine from an external power source. The slave receptacle shall also provide a power source for charging and slaving other equipment. The slave receptacle shall be installed on the exterior of the compressor near the battery compartment and shall be accessible to personnel standing on the ground. The voltage function and potential of the slave receptacle shall be identified on a plate mounted adjacent to the receptacle. The plate shall be in accordance with the requirements of 3.27. (This slave receptacle shall be compatible with NATO Slave Cable, NSN 2590-00-148-7961.)



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3.9.7 Battery and receptacle cables. Battery and receptacle cables shall satisfy the SAE J541 starter voltage drop for heavy duty use and maximum current requirements. Cable lengths shall be as short as practicable. The positive battery cable shall be coded red and marked with a "+" and the negative cable shall be coded black and marked with a "-". The battery terminals shall be insulated with rubber covers.

3.9.8 Fuels and lubricants. The engine shall be serviced and shall operate with the applicable military fuels, lubricants and antifreeze (see table I).

TABLE I. Military fuels, lubricants, and antifreeze for diesel engines.

Product	Specification
Antifreeze, ethylene glycol, inhibited	O-A-548
Fuel oil, diesel	VV-F-800
Fuel, JP-8	MIL-T-83133
Lubricating oil, internal combustion engine, heavy-duty	MIL-L-2104
Lubricating oil, internal-combustion engine, arctic	MIL-L-46167
Grease, automotive and artillery	MIL-G-10924
Hydraulic fluid, petroleum, inhibited	MIL-H-17672
Grease, aircraft and instrument gear and actuator screw	MIL-G-23827
Antifreeze, ethylene glycol, inhibited, heavy duty, single package.	MIL-A-46153

3.9.9 Fuel consumption. The fuel consumption rate as determined by 4.5.2.20 shall not exceed 4.0 gallons of fuel per hour.

### 3.10 Air receiver and manifold.

3.10.1 Air receiver. The air receiver shall be of sufficient volume to eliminate pulsations from the discharge line and to provide a non-pulsating source of air pressure to correctly actuate the compressor controls. The receiver shall be provided with a drain valve, a safety relief valve set at 125 psig constructed in accordance with the ASME Boiler and Pressure Vessel Code, and an automatic blowdown valve to fully discharge the receiver whenever the engine stops. Discharging of the receiver from 100 psig to 10 psig shall be accomplished in not more than 1 minute. The receiver shall be constructed in accordance with the ASME Boiler and Pressure Vessel Code. Presence of the ASME official code U-symbol stamped or marked on the receiver and the furnishing of a copy of the ASME data sheet may be accepted as evidence that the receiver conforms to the ASME Rules for Construction of Pressure Vessels.

3.10.2 Manifold. The air receiver discharge line shall be equipped with an air service manifold having individually controlled service outlets and a moisture drain valve. All 3/4-inch outlets shall be fitted with lever-handle, 1/4-turn plug valves, and couplings conforming to WW-C-633, type II or III. Unless otherwise specified (see 6.2), the air service manifolds of each size of compressor shall be fitted as specified in table II. When specified (see 6.2), the air receiver discharge line shall have a check valve between the receiver and

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the manifold to prevent reverse flow of air from any service outlet to the air receiver. All discharge valves and manifolds shall not extend beyond the sides or back of the housing

TAKE II. Fitting

size	NuxxiEr of 3/4-iKx51 Clklets	m1. number of 1-1/2- iltit ' UxtlEts w/globe valve
125	2	-
250	2	1

3.11 Instruments and controls. The panel instruments and controls shall be vibration dampened and illuminated. Separate instrument control panels shall be adjacent and in line with one another. Instrument and controls shall be in accordance with 3.7. A moisture separator shall be provided to automatically dump accumulated moisture from the air supply line for all air-actuated controls and gauges upon compressor shutdown.

3.11.1 Engine instrumentation and control systems. The control systems shall be of the engine shutoff type (see 3.5.1). Unless otherwise specified (see 6.2), the following additional engine instruments and controls shall be furnished:

- a. Gauge, fuel pressure.
- b. Control, starter button.
- c. Control, throttle and shutoff.
- d. Starting aid control (cold-start system).
- e. Gauge, engine oil pressure.
- f. Combination tachometer-hourmeter in accordance with SAE J678.
- g. Gauge, engine coolant temperature.
- h. Ammeter, battery charging.
- i. Gauge, fuel quantity.

3.11.2 Compressing unit. The following compressing unit instrumentation shall be furnished:

- a. Gauge, air receiver pressure.
- b. Gauge, lubricating oil pressure (pump pressure lubrication).
- c. Gauge, lubricating oil temperature (type II only).
- d. Gauge, coolant temperature (type I, liquid-cooled only).

3.12 Regulation. Unless otherwise specified (see 6.2), regulation of the air compressor shall be accomplished by an adjustable automatic air-operated control for establishing the working modulation range of the compressing unit and engine speed. This device shall be capable of selecting an engine speed and a compressor air-intake valve opening to suit any air demand by the air compressor within the established range of modulation in a smooth steeples manner, without hunting. The regulating system shall unload the compressor when the air receiver pressure attains a predetermined maximum pressure and shall load the compressor when the air receiver pressure falls to a predetermined minimum pressure. During unloading periods, the engine speed shall be not less than 700 revolutions per

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minute (rpm) nor greater than 1400 rpm. A moisture separator shall be provided to automatically dump accumulated moisture from air supply lines for the regulation system upon compressor shutdown.

### 3.33 Air-induction system.

3.13.1 Air cleaners. Individual air cleaners shall be provided for the engine and compressing unit. The air cleaners shall be of the dry type, conforming to MIL-A-52363, class II or III. Each air cleaner shall be provided with a restriction indicator conforming to MS53063-3 which shall be located either at the air cleaner or at the instrument panel in a position visible to the operator

3.13.2 Air intakes. The inlet of the engine and compressor air-induction systems shall be fitted with a rain cap conforming to MS51389. Each inlet shall be located in such a manner as to avoid engine exhaust smoke and heat from being drawn into either intake opening. The piping section of the air-induction systems shall be of corrosion-resistant metal and shall be routed so as not to interfere with the function and maintenance of adjacent components. Piping bends shall have as large a radius as possible. All connections shall be air-tight.

3.14 Housing. Unless otherwise specified (see 6.2), a housing constructed of sheet steel not less than 0.075-inch nominal thickness shall be provided to enclose the engine, compressing unit, and instrument panel(s), except for openings that permit entrance of cooling air for the radiator and compressor oil cooler. Each side of the housing shall be provided with hinged panels which shall provide maximum accessibility to the compressor components or instrument panels housed therein. Each panel shall be equipped with hinges conforming to MS35829, with brass pins of 0.25-inch diameter, a means to safely position and hold the panel in a fully open position, and not less than two handles and two latches for each panel for securing the panel when closed. Housing access covers shall be provided for maintenance of components other than those accessible by way of the housing side panels. Covers shall be equipped with quick-disconnect fasteners. Access covers shall be labeled to indicate the items accessed through them in accordance with 3.7.

### 3.15 Type I. reciprocating (compressing unit).

3.15.1 Compressing unit. Unless otherwise specified (see 6.2), the compressing unit shall deliver its rated air capacity in cubic feet of free air per minute (cfm) against an air receiver pressure of not less than 100 pounds per square inch gauge (psig) during and at the completion of 500 hours operation. The compressing unit shall operate as specified herein when tilted 15 degrees at any position from the horizontal.

3.15.2 Lubricating system. The compressing unit lubrication system shall be of the full force-feed or a combination force-feed and splash type, and shall incorporate a positive-displacement oil pump, a pressure regulating valve, and full flow or bypass oil filters (see 3.22.7). Crankcase ventilation, filling, draining, and checking provisions shall be as specified in 3.22.4. Lubricating oil temperature in the crankcase shall be not more than 250 °F with the compressor running under any of the operating conditions specified in 3.4.

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3.15.3 Lubricating oil. Unless otherwise specified (see 6.2), oil conforming to MIL-L-2104 shall be used as a lubricant for the compressing unit in ambient temperatures greater than -10 °F and MIL-L-46167 in ambient temperatures less than -10 °F.

3.15.4 Cooling system. The compressing unit cooling system shall be either the air- or liquid-cooled type, designed so that the air discharge temperature from the air receiver shall be not more than 250 °F when the compressor is continuously operating at specified rated capacity under any of the operating conditions specified in 3.4. The liquid cooling system shall be of the pressure type, incorporating a radiator with pressure cap conforming to MS51062 or MS35840, thermostat, fan, and circulating pump. The liquid cooling system shall insure a top tank cooling liquid temperature not greater than 210 °F.

3.15.5 Clutch. When a clutch is provided, it shall be of the snap-over-center, manually operated type and shall withstand not less than 130 percent of the maximum torque developed by the engine at governed speed.

### 3.16 Type II, rotary (compressing unit).

3.16.1 Compressing unit. The compressing unit shall be rotary of the sliding-vane or axial-screw type and, unless otherwise specified (see 6.2), shall deliver its rated air capacity in cubic feet of free air per minute (cfm) against an air receiver pressure of not less than 100 pounds per square inch gauge (psig) during and at the completion of 500 hours of operation. The compressing unit shall operate as specified herein when tilted 15 degrees at any position from the horizontal,

3.16.2 Cooling and lubricating system. The compressing unit shall be cooled and lubricated by injecting filtered lubricating oil into the compression chamber. The temperature of the discharge air at the receiver outlet shall be not more than 250 °F when the compressor is operating continuously at rated capacity under any of the operating conditions specified in 3.4. The system shall be provided with a thermally actuated bypass valve when equipped with an oil cooler. For sliding-vane compressing units, a means shall be provided to drain the compression chamber of all oil which could cause hydraulic lock and vane failure.

3.16.2.1 Lubricating oil reservoir. Filling, draining, and checking provisions shall be as specified in 3.22.4. When the lubricating oil reservoir is located outside of the air receiver, the reservoir shall be provided with a moisture drain fitted with a globe valve.

3.16.2.2 Compressor oil. Unless otherwise specified (see 6.2), oil conforming to MIL-H-17672 symbol 21 LOT-H, shall be used as a lubricant for the compressing unit in ambient temperature greater than -10 °F, except that for metallic vane- or axial-screw type compressors, oil conforming to MIL-L-2104 may be used. Oil conforming to MIL-L-45167 shall be used in ambient temperatures less than +0 °F.

3.16.2.3 Oil separator. The compressor shall be equipped with an oil separator. When the separator is located within the air receiver, the outlet for the oil return line to the compressing unit shall be not less than 1-inch above the bottom of the receiver.

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3.16.3 Minimum-pressure valve. The air receiver discharge line shall be equipped with a minimum-pressure device to prevent the air receiver pressure from dropping below 40 psig when the compressor is operating.

3.16.4 Coupling. The engine shall be aligned with and directly connected to the compressing unit through a flexible coupling

3.17 Class 1, skid mounted. The class 1 compressor shall be assembled and mounted on a sub-base skid frame of welded construction. The sub-base skid frame shall incorporate two longitudinal structural-shape skids with renewable strip-plate runners, necessary braces and gussets to prevent frame distortion, and a sheet-metal full bottom enclosure of not less than 16 gauge mounted between the frame skids not less than 2-inches above the strip-plate runners. Both ends of the frame shall be provided with pulling attachments. The pulling attachments may also be used for lifting or tiedown purposes when such attachments meet the requirements specified in 3.24 or 3.25.

3.17.1 Mobility. The class 1 compressor and skid shall not show snubbing, deformation, structural failure, or damage when pulled over level dry ground at speeds up to 5 mph in a series of five "S" curves for a linear distance of 300 feet.

3.17.2 Wet weight. Maximum wet weight will not exceed those shown in table III.

TAE3u UI. !!!@m.m Wetweight for class 1 axpmMrs.

SiJze	Pounds
125	4000
250	7CM30

3.18 Class 2, trailer mounted. Class 2 air compressors shall conform to the dimension and weight requirements and shall be mounted on the trailers specified in table IV. When specified (see 6.2), for compressors using the M-200 trailer only the first article compressor(s) shall be mounted by the contractor; one mounting kit, containing all parts, hardware and instructions necessary for mounting of the compressor by the Government on the applicable trailer so that it conforms to the requirements for class 2, 2-wheel mounted compressors, shall be furnished with each production compressor. M-200 trailers conforming to MIL-C-45150, when required, will be furnished by the Government, one for each compressor to be mounted by the contractor (see 6.4).



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TABLE IV. Class 2 air compressor maximum weights (wet) and dimensions, with trailer.

Size (Cfm)	TEKikr	Weight (W)	13im2m3iorks ( ~ )	1
			Width	height
P~	M-200 (2-wheel)	7410	Em	96
/ 250	~52437, size 11	MaxmWRo f	244	98
		trailer ~ W		50
		* W ~		

1/ 'Weight includes pneumatic tool outf it.

3.18.1 Vehicular electrical system. The air compressor shall be equipped with a waterproof 24-volt electrical system. The compressor/trailer combination shall be waterproof 12 volt commercial and 24 volt blackout. All components and wiring shall be located and guarded so as to provide maximum protection from vibration and damage from road hazards.

3.18.2 Size 125 trailer mounting. The compressor shall be attached to the Government-furnished trailer with bolts and locknuts at not less than three trailer crossmembers. The weight at the trailer lunette eye shall be no less than 500 pounds and not greater than 800 pounds with the compressor level and not supported by the landing gear.

3.18.2.1 Size 250-trailer mounting. Unless otherwise specified (see 6.2), the class 2, size 250-cfm compressor shall be equipped with toolboxes and special airdrop suspension provisions.

3.18.2 .1.1 Toolboxes The toolboxes shall be capable of containing one pneumatic tool outfit one pneumatic tool and compressor outfit (NSN 3820-00-950-8584 ) will be loaned to the contractor by the Government for equipment layout and tool compartment size determination (see 6.5) . One or more toolboxes shall be mounted on each side of the compressor and one box on the rear center or trailing end of the compressor. Toolboxes shall be bolted to and supported by structural steel members welded to or cantilevered from the steel sub-base frame , but not the trailer upon which the frame rests. The toolboxes shall be fabricated of sheet steel of not less than 0.125-inch nominal thickness. Covers for all toolboxes shall be at the same height, shall be fabricated of raised medium pattern, safety-plate steel, and shall have rolled edges that make the boxes rain-tight when closed. Each toolbox and cover shall be provided with a steel hinge conforming to MS35829 having a 0.25-inch diameter brass pin not less than two hook-type clamps a rigid U-type handle, a hasp accommodating a padlock shackle of 3/8-inch diameter, and devices to hold the covers in the fully opened position, all welded or through-bolted in such a manner that they will not constitute an obstruction to closing or projecting hazard to operating personnel. The toolboxes shall provide compartments , drawers or tie-downs for securing all components of the tools outfit, Fuel- and Oil-resistant elastomer sheet material shall be permanently affixed to the bottom of the toolboxes to prevent contact of the tools with the metal surface. Tie-downs shall be designed to prevent movement of tools in excess of 1/2-inch in any direction. A portion of the toolbox may be utilized to accommodate the compressor engine-starting batteries when it meets the requirements of 3.9.5. The conduit and receptacles for the lighting system



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may also be housed in the toolbox. These accessories shall be separated from the tool compartments by steel partitions of welded construction and all compartments shall be provided with drain holes in the bottom corners. An instruction plate(s) (see 3.30) depicting the arrangement of and identifying each tool shall be permanently affixed to the underside of the toolbox cover(s). A continuous wrap-around bumper of 3-inch 6-pound-per-foot steel channel shall be welded or bolted along the exterior lower portion of the rearmost-side and rear-center toolboxes from fender-well to fender-well. Padlocks shall be provided to secure the toolboxes.

3.18.2 .1.2 Airdrop suspension provisions . unless otherwise specified (see 6.2), four integral-item suspension provisions conforming to MIL-STD-814 shall be provided. Suspension provisions shall withstand the stresses in the amount and directions of pull specified without weld failure deformation of the compressor or the provisions.

3. 18.2. 1.3 Airdrop provision Unless otherwise specified (see 6.2), the type II, class 2, size 250 cfm compressor complete with Government-loaned tool cut-fit (see 3.18.2.1.1), secured in the toolboxes shall conform to MIL-STD-665 for airdrop from C-130 and G-141 a i r d r o p deformation of any structural member or component or loss of the compressor to perform and functions specified herein When rigged for airdrop in accordance with MIL-STD-669, the compressor shall meet the established tip-off curves for the C-130 and C-141 aircraft as defined in MIL-STD-1791. Tires or wheels shall not be removed for airdrop. The compressor mounted on a trailer shall be capable of withstanding the force imposed by a vertical impact velocity of not more than 28.5 feet per second (fps). The 22-foot-long, 8 foot, 4-inch-wide platform assembly (NSN 167 0-00-377-6976) shall be cushioned with 80 (0) 1/2 EDF, grade 3, 3- inch-thick h o n e y c o m b compressor does not exceed 19.5 gs. As a result of a drop at 24 to 26 fp, there shall be no breakage, or permanent deformation of any structural member, component, or attachment

3.18.2.1.4 Extraction parachute provisions. A single fitting shall be provided for attachment of the parachute extraction system for low velocity airdrop. The fitting shall conform to MIL-STD-814 and shall withstand stresses in the amount and direction of pull specified without weld failure or permanent deformation of the compressor or the provisions. Low altitude parachute extraction system (IAPES) fittings shall be provided unless compressor design permits platform extraction as specified in MIL-STD-814.

3.18.3 Chock blocks Tow chock blocks having dimensions as shown on figure 1 and constructed of aluminum or semirigid elastomer shall be furnished Each chock block shall weight not more than 11.5 pounds and shall be equipped with a handle or line tp allow it to be carried in one hand. Cradles, brackets or storage boxes shall be mounted on the trailer to securely hold the chock blocks When not in use.

3,18.4 Storage provisions. Unless otherwise specified (see 6.2), the c o m p r e s s o r with storage Space for the detachable intervehicular air hose lines electrical harness, and any maintenance tools and manuals furnished with compressor. In addition storage space, two dummy couplings for the air hose lines and a spring clip for the electrical harness shall be mounted on the compressor. The dummy coupling and clip shall prevent dragging of the air and electrical lines on the ground When one end of each lines is

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connected to its service connection and the other end is connected to a dummy coupling or spring clip, as applicable.

3.18.5 Brake fluid. Silicon brake fluid, in compliance with MIL-B-46176, will be used for hydraulic brake systems or trailer mounted units.

3.18.6 Hubodometer. Hubodometers as specified in MIL-C-52437 are not required.

3.18.7 Spare tire. The spare tire shall be mounted at the towed end of the trailer and secured same size padlocks which will secure the toolboxes.

3.19 Mobility. The compressor shall be towable over paved highways at speeds up to 55 mph, off-road terrain up to 15 mph and over trails and unimproved roads at speeds up to 20 mph without bottoming, weaving or sidesway, and without evidence of malfunction, permanent deformation or damage. The compressor shall negotiate side slopes up to 20 percent and approach, negotiate, and depart from a ramp having a 30 percent slope. Compressor components that could be damaged by water immersion shall either be waterproof or located a minimum of 30 inches above ground level to allow fording in water to that depth.

3.20 Hose reels. Unless otherwise specified (see 6.2), the sizes 125-cfm and 250-cfm compressors shall be equipped with revolving hose reels, each capable of handling not less than one 50-foot length of air hose 3/4-inch nominal size. When specified (see 6.2), each hose reel shall be capable of handling not less than three 50-foot lengths of air hose 3/4-inch nominal size with coupling. One hose reel shall be provided for the size 125-cfm compressor and two hose reels shall be provided for the size 250-cfm compressor. The air hose shall be attached to the reel by a coupling conforming to WW-C-633 type II or III. The coupling shall be located so that when the hose is spooled onto the reel no sharp bends will occur in the hose. Each reel shall be provided with a takeoff-shutoff valve. Reel shall be located so as to be accessible to a 5th percentile female soldier standing on the ground yet high enough to be protected from underbrush. A 3/4-inch size spud or dummy coupling conforming to WW-C-633 shall be attached to a fixed pipe nipple for securing the free end of the hose when not in use. Each reel shall be equipped with a device to prevent reel rotation when not operational.

3.21 Electromagnetic interference. The electromagnetic interference emission characteristics of the compressor shall conform to MIL-STD-461, class C1, group II.

3.22 Lubrication. All surfaces requiring lubrication shall be provided with a means for lubricating.

3.22.1 Lubricants. The compressor shall operate as specified herein when lubricated with military lubricants (see table I).

3.22.2 Lubricating fittings. Lubricating fittings shall conform to SAE J534. Fittings shall be located in a protected position and shall be accessible to a grease gun conforming to MIL-G-3859 with flexible extension. Accessibility to fittings shall be provided without the removal or adjustment of accessories or parts. Panels and plates equipped with hand-operable quick-disconnect fasteners

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may be remove to provide accessibility. location of fittings which are not readily apparent shall be prominently labeled near each fitting.

3.22.3 Pressure-release device. A pressure-release device shall be provided where the use of pressure lubricating equipment could damage grease seals or other parts.

3.22.4 Filling, draining and checking provisions. Enclosures such as gear-cases that contain a reservoir of lubricants for the lubrication of parts enclosed shall be equipped with dipsticks, check plugs, or gauges to determine the level of the lubricant. Each enclosure shall be equipped for filling the enclosure with a lubricant and for draining. The drain outlet shall be fitted with a magnetic drain plug, size conforming to A-A-52152 or MS49006. The drain outlet shall be located so that removal of the plug will result in complete drainage of the lubricant from the enclosure. Reservoirs that must be drained before the compressor can be transported shall be designed such that tools are not required to drain the reservoir. Drainage shall be to a container without contacting other components when the compressor is in its normal position. Integral tubes or troughs may be used to convey the lubricant from the drain outlet to a container.

3.22.5 Grease lubrication. All grease lubrication, including lubrication of sealed bearings, shall be with grease as follows:

- a. MIL-G-23827 - For instruments all sealed bearings, and **other bearings** when operating temperatures do not exceed 250°F.
- b\* MIL-G-10924 - For bearings where operating temperatures do not exceed 175 °F.

. . .

The compressor shall be assembled run-in (broken-in), tested and delivered with these greases The bearings shall be cleaned before lubrication, **because** military greases are not always compatible with othe greases. A tag shall be attached in a compsciuos place to indicate which military grease has been used.

3.22.6 oil lubrication. Unless otherwise specified herein all **components** shall be filled to the operating level with military oils designated for use in the temperature range as specified herein A tag shall be attached in a conspicuous place to indicate the temperature *range and grade of lubricant used*.

3.22.7 Oil filters. Filter of either the bypass or full-flow type shall be provided on the engine and compressing unit. Unless otherwise specified (see 6.2) , **bypass filter~ elements shall conform to MS35341, MS35342 or MS35343, and full-flow filter elements shall conform to MS35802.**

3.23 Fungus and moisture resistance The electrical circuitry, including all c o m p o n e n t s except as specified below, shall be p r o t e c t e d effects of fungus growth and moisture by an overall treatment with varnish conforming to MIL-V-173 **with 1 percent copper 8-quinolinolate (by weight) based on the nonvolatile content of the varnish:**

- a. Component or circuit elements that are **inherently fungus and moisture resistance or which are hermetically sealed need not be treated.**
- b. **Components** or circuit elements whose functions will be adversely affected by the varnish coating shall not be treated

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When used, the varnish shall be applied by spray, brush, or a combination of both to give a minimum dry-film thickness of 1 mil to component or element surfaces previously cleaned and prepared so that the surfaces are free from all foreign matter which would interfere with the adherence of function of the varnish.

3.24 Tiedown provisions \* The compressor shall be provided with integral provisions to permit tiedown of the compressor to the floor or deck of the transportation medium or the airdrop platform. The tiedown provision shall conform to MIL-STD-209 type II equipment class 2 or 3. The class 1 or 2 compressor shall conform to MIL-STD-814 for both low velocity airdrop and LAPES.

3.25 Slinging provisions. The slinging provisions shall conform to MIL-STD-209, class 1 or 3, type IV. The provisions shall enable the complete compressor to be lifted in the normal operating position. The provisions shall be located so that not less than one inch clearance is maintained between slings and all exterior parts and shall be fastened to members which will withstand stresses in the amount and direction of pull specified for the provisions without weld failure, permanent deformation, cracks, loosening, or breaking of the provision or its connecting structural components. Slinging provisions may also be used as tiedown provisions when such provisions meet the requirements specified in 3.24. All slinging/tiedown provisions shall be labeled "LIFT", "TIEDOWN", or "LIFT TIEDOWN", as appropriate, in 1-inch (2.54 cm) high letters. The compressor shall conform to MIL-STD-814 for both low velocity airdrop and LAPES.

3.26 Rail transportability. The compressor shall be rail transportable in CONUS and NATO countries without restrictions. The compressor shall meet dimensional requirements of Gabarit International de Chargement (GIC) gauge shown in STANAG 2175 and STANAG 2832 when loaded on a 50-inch (127 cm) high rail car. The compressor shall be capable of withstanding shock loads resulting from rail impact testing in accordance with 4.5.2.12 without failure, damage, or permanent deformation.

3.26.1 Air transportability. The compressor, at maximum gross weight, shall be transportable in operational configuration by C-130 and C-141 aircraft and medium lift helicopter. Criteria for transport in U.S. Air Force cargo aircraft are defined in MIL-STD-1791.

3.27 Identification marking. The compressor shall be identified in accordance with MIL-STD-130. The marking shall be applied to the compressor on plates conforming to MIL-P-514, type I, style 1, composition C, of type I, grade A, class 1 or composition A (etched), class 2, material. Each plate shall be attached by screws, bolts or rivets in a conspicuous protected location.

3.28 Shipping data plate. A shipping data plate conforming to MIL-P-514, type III, composition C, of type I, grade A, class 1 or composition A (etched), class 2, material shall be provided. The plate shall also show the silhouette of the compressor in transport position, indicating the center of gravity and the location and capacity of the lifting and tiedown attachments. Each plate shall be attached by screws, bolts or rivets in a conspicuous protected location.

3.29 Instruction plates. Each compressor shall be equipped with instruction plates, including diagrams, warnings and cautions, describing any special or

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important procedures to be followed in assembling, operating or servicing the compressor. Instruction plates shall conform to MIL-P-514, type III, composition C, of type I, grade A, class 1 or composition A (etched), class 2, material. Each plate shall be attached by screws, bolts or rivets in a conspicuous protected location.

3.30 Treatment and painting. The portions of the compressor normally painted shall be cleaned, treated and painted in accordance with MIL-T-704, type F or G as applicable. Unless otherwise specified (see 6.2), top coat color shall be camouflage green 383 conforming to MIL-C-46168. Unless otherwise specified, (see 6.2), the compressor shall then be overcoated in accordance with the Government furnished camouflage patterns with MIL-C-46168 top coat of the colors specified in the camouflage patterns.

3.30.1 Data for camouflage patterns. The contractor shall generate the camouflage pattern data (see 6.2).

3.30.2 Government-furnished property. The following property will be furnished by the Government (see 6.4):

<u>Item No.</u>	<u>Description</u>	<u>Identification</u>	<u>Quantity</u>
1	Pattern drawings	Camouflage patterns	As required

3.31 Stenciling. Registration numbers shall be marked on the compressor in accordance with MIL-STD-642 (see 6.7). The correct tire pressure shall be marked on the side, above each tire TP (specify pounds) per the Tire and Rim Association recommended tire pressure, in one inch high lettering of a color and style in accordance with MIL-STD-642.

3.32 Secured lighting Electric lighting for the control panel and for the compressor compartment shall be provided. Electric lights shall be provided for blackout operation of the control panel. Incandescent lamps shall be shielded so that the bare lamp is not visible from aerial or ground observation. Arrangement of the blackout lamps shall be such that all instruments control bobs, and switches are identifiable and readable. The type to be used shall have an adjustable lens cover which will vary the light from off to full intensity.

### 3.33 Workmanship.

3.33.1 Casting and forgings. All parts, components and assemblies of the compressor which include castings and forgings shall be clean of harmful extraneous material such as sand, dirt, pits, sprues, scale, and flux. Rework shall be limited to procedures which do not reduce strength or affect function.

3.33.2 Metal fabrication. Metal used in fabrication shall be free from kinks and sharp herds. The straightening of material shall be done by methods that will not cause injury to the material. Corners shall be square and true. Flame-cutting using tips suitable for the thickness of the steel, may be employed instead of shearing and sawing. All bends shall be made with controlled means to insure uniformity of size and shape. Precaution shall be taken to avoid overheating. Heated steel shall be allowed to cool slowly. External surfaces shall



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be free of burrs sharp edges and corners, except when sharp edges or corners are required or where they are not detrimental to safety.

3.33.3 Welding. The surfaces of parts to be welded shall be free from rust, scale, paint, grease, mill scale that can be removed by chipping and wire brushing, and other foreign matter. Welds shall transmit stress without permanent deformation or failure when the parts connected by the welds are subjected to proof and service loading. Parent materials, weld filler metals, and fabrication techniques shall be as required to enable the compressor to conform to the examination and test requirements specified in section 4. Parts to be jointed by fillet welds shall be brought into as close contact as possible and in no event shall be separated by more than 3/16-inch, unless appropriate bridging techniques are used. Unless otherwise specified (see 6.2), the welding process used in fabrication of the compressor shall be at the option of the contractor. Welding procedures and welds shall be in accordance with ASME and AWS codes.

3.33.4 Welders and welding operators. Before assigning any welder or welding operator to manual welding work covered by this specification, the contractor shall obtain certification that the welder or welding operator has passed qualification tests as prescribed by either of the following listed codes for the type of welding operations to be performed and that such qualification is effective as defined by the particular code:

AWS D1.1, Structural Welding Code - Steel.

ASME Boiler and Pressure Vessel Code, Section IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.

The certification shall be made available upon request for review by the contracting officer or the contracting officer's representative. Contractors who make only horizontal welds need not qualify welders for "all position welding". In event of poor welds, the Government reserves the right to require the recertification of any welder or welding operator.

3.33.5 Bolted connections. Boltholes shall be accurately formed and shall have the burrs removed. Washers or lockwashers shall be provided where necessary. Matching thread areas securing bolts conforming to SAE J429 or capscrews shall be of sufficient strength to withstand the tensile strength of the bolt. All fasteners shall be correctly torqued and shall have full thread engagement.

3.33.6 Riveted connections. Rivets shall fill the hole completely. The upset rivet heads shall be full, neatly made concentric with the rivet holes, and in full contact with the surface of the member and shall be in accordance with SAE J492.

3.33. / Machine work. Tolerances and gauges for metal fits shall conform to the limits specified herein, and in applicable drawings, and to the standards of the industry.



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## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. Inspections Shall be classified as follows :

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Comparison test (see 4.6)
- d. Inspection of packaging (see 4.7).

4.3 First article inspection.

4.3.1 Examination. Prior to testing, the first article compressor(s) shall be examined for defects marked "X" in column 1 of table V. Presence of one or more defects shall be cause for rejection of the first article compressor(s) .

4.3.2 Test. The first article compressor(s) shall be subjected to the tests marked "X" in column 1 of table VI. Failure of any test shall be cause for rejection of the first article compressor(s) . A first article test log, similar in format to figure 2, shall be kept, recording all appropriate test data. A copy of the test log shall be included in the test report, JP-8 fuel shall be used for all first article tests.

4.4 Quality conformance inspection.

4.4.1 Examination. Each compressor shall be examined for the defects marked "X" in column 2 of table V. Presence of one or more defects shall be cause for rejection.

4.4.2 Test. Each compressor shall be subjected to the tests marked "X" in column 2 of table VI. Failure of any test shall be cause for rejection. JF-8 or DF-2 fuel can be used for the quality conformance tests .

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4.5 Inspection procedure.4.5.1 Examination. Examination shall be in accordance with table V.TABLE V. Examination schedule.

First article	Individual	Defects	Requirement Paragraph
1	2	3	4
X	-	101. Components missing or not as specified.	3.1
X	-	102. Material not as specified.	3.3
X	-	103. Materials not resistant to corrosion and deterioration, or treated to be resistant to corrosion and deterioration for the applicable storage and operating environments.	3.3.1
X	-	104. Dissimilar metals as defined in MIL-STD-889 are not effectively insulated from each other.	3.3.2
X	-	105. Contractor does not have documentation available for identification of material, material finishes or treatment.	3.3.3
X	-	106. Used, rebuilt or remanufactured components, pieces or parts incorporated in the compressor.	3.3.4
X	X	107. Safety provisions or equipment missing or not as specified.	3.5 and 3.5.1
X	-	108. Human factor engineering not as specified.	3.7
X	-	109. Maintainability provisions not as specified.	3.8
X	-	110. Fasteners not as specified.	3.8.1
X	-	111. Engine, components or accessories not as specified.	3.9
X	-	112. Fuel tank construction not as specified.	3.9.2
X	-	113. Radiator not as specified.	3.9.3
X	-	114. Cranking system not as specified.	3.9.4
X	X	115. Batteries missing or not as specified.	3.9.5
X	-	116. Battery box not as specified.	3.9.5
X	-	117. Slaving components not as specified.	3.9.6
X	-	118. Cables not as specified.	3.9.7
X	-	119. Engine fuels and lubricants not as specified.	3.9.8
X	X	120. Air receiver not as specified.	3.10.1
X	-	121. Air service manifold not as specified.	3.10.2
X	-	122. Instruments and controls not as specified.	3.11, 3.11.1, 3.11.2

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TABLE V. Examination schedule. (continued)

First article	Individual	Defects	Requirement Paragraph
1	2	3	4
X	-	123. Air line moisture separator(s) missing or not as specified.	3.11, 3.12
X	-	124. Air cleaners not as specified.	3.13.1
X	-	125. Air intakes not as specified.	3.13.2
X	-	126. Housing not as specified.	3.14
X	-	127. Compressing unit not as specified.	3.15.1, 3.16.1
X	-	128. Compressing unit lubrication system not as specified.	3.15.2 and 3.15.3 or 3.16.2 thru 3.16.2.3, as applicable
X	-	129. Cooling system not as specified (type I).	3.15.4
X	-	130. Clutch not as specified (type I).	3.15.5
X	-	131. Coupling not as specified (type II).	3.16.4
X	-	132. Skid mounting not as specified (class 1).	3.17
X	-	133. Weight or dimensions not as specified.	3.17.2, 3.18, 3.18.2
-	X	134. Mounting kit missing or inadequate (class 2, 2-wheel for Government mounting).	3.18
X	-	135. Electrical system inoperative or not as specified (class 2).	3.18.1
X	-	136. Trailer mounting not as specified.	3.18.2
X	-	137. Toolboxes not as specified (class 2, 2-wheel).	3.18.2.1.1
X	-	138. Airdrop suspension provisions not as specified.	3.18.2.1.2
X	-	139. Airdrop rigged height not as specified.	3.18.2.1.3
X	-	140. Class 2, size 250 cfm compressor does not meet tip-off curve as specified.	3.18.2.1.3
X	-	141. Extraction parachute provisions not as specified.	3.18.2.1.4
X	-	142. Chock blocks not as specified (class 2).	3.18.3
X	-	143. Storage space not as specified.	3.18.4
X	X	144. Brake fluid not as specified.	3.18.5
X	X	145. Spare tire not mounted as specified.	3.18.7
X	-	146. Fording provisions not as specified (class 2).	3.19
X	-	147. Hose reels not as specified (size 125 cfm and 250 cfm).	3.20
X	-	148. Lubrication provisions not as specified.	3.22 thru 3.22.7

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TABLE V. Examination schedule. (continued)

First article	Individual	Defects	Requirement Paragraph
1	2	3	4
X		149. Fungus and moisture resistance not as specified.	3.23
X		150. Tiedown and slinging attachments not as specified.	3.24, 3.25
X		151. Rail transportability not as specified.	3.26
X		152. Air transportability not as specified	3.26.1
X	X	153. Identification marking not as as specified.	3.27
X	X	154. Shipping data plate not as specified.	3.28
X	X	155. Instruction plates not as specified.	3.29
X		156. Treatment and painting not as specified.	3.30
X		157. Paint color not as specified.	3.30
X		158. Camouflage pattern not as specified.	3.30.1
X		159. Camouflage pattern data not as specified.	3.30.1
X		160. Stenciling not as specified.	3.31
X		161. Workmanship not as specified.	3.33 thru 3.33.7
X		162. Welding not as specified.	3.33.3
X		163. <del>Welder</del> or welding operator qualifications not as specified.	3.33.4

4.5.2 Tests.

4.5.2.1 Test conditions. Prior to test, the compressor shall be serviced with military fuels, oils and greases. Oils shall be those designated for use in the ambient temperature at the place of test. The compressor shall operate as specified herein without maintenance other than the contractor's recommended normal scheduled maintenance, as established by a maintenance schedule prepared and submitted by the contractor prior to test. Unless otherwise specified herein, tests shall be conducted without shelter or protection and at ambient temperature of test site with all compressor components and accessories installed and functioning normally. Specified capacity measurements shall be made at a receiver pressure of 100 psig, in accordance with ASME Performance Test Code PTC 9, utilizing a flow-nozzle differential pressure meter.

4.5.2.2 Test schedule. Tests shall be in accordance with table VI. It is not required that tests be performed in the order listed, except that the engine performance, compressing unit power consumption, and relief valve tests shall precede all other tests, and the compressor performance test shall be the last test performed.

4.5.2.3 Engine tests. Prior to installation of the engine in the compressor and examination and test of the first article model, the engine shall be tested

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in accordance with MIL-STD-1400, test method series 2000, except test method 2400 shall not apply. Nonconformance to 3.9 and 3.9.1 shall constitute failure of this test. Upon successful completion of this test and prior to installation of the engine in the first article model, the fuel system and governor shall be sealed by a Government representative at the settings established by this test. Seals shall also be installed to prevent separation of the oil pan and the cylinder head or valve covers from the cylinder block. Any changes made to these settings or removal or alteration of the seals or adjustments by other than, or without the expressed consent of, a Government representative, will invalidate all tests previously performed.

4.5.2.3.1 Production engine tests. Each engine shall be tested in accordance with MIL-STD-1400, test method series 4000, except that the engine manufacturer's standard production tests may be substituted provided they equal or exceed test method series 4000.

4.5.2.3.2 Slave receptacle (NATO compatible). The compressor engine shall start utilizing an external 24-volt power source through the slave receptacle. Voltage and potential shall be checked, at the compressor batteries, for proper battery charging and starting as specified in 3.9.4.

TABLE VI. Test schedule.

First article	Individual	Test	Test paragraph	
1	2	3	4	5
x	X	Test conditions.	4.5.2.1	3.8
X		Engine performance.	4.5.2.3	3.9.1
X		Slave receptacle (NATO compatible)	4.5.2.3.2	3.9.6
x		Compressing unit power consumption.	4.5.2.4	3.9.1, 3.15*1, 3.16.1
x		Relief valve.	4.5.2.5	3.10.1
X		Tilted position.	4.5.2.6	3.15.1, 3.16.1
			4-5.2 .6.1	
			4.5.2 .6.2	
x		Endurance and cycling.	4.5.2.7 thru 4.5.2.7.4	3.9.2, 3.10.1, 3.12, 3.15.1, 3.16.1, 3.16.3
x		High temperature.	4.5.2.8 thru 4.5.2.8.3	3.4, 3*9
x		Low temperature.	4.5.2.9, 4.5.2.9.1, 4.5.2.9.2	3.4, 3.9
x		Precipitation.	4.5.2.10, 4.5.2.10.1., 4.5.2s10.2	3.4
x		Tiedown and slinging attachments.	4.5.2.11	3.24, 3.25
X		Rail impact.	4.5.2.32	3.26
x		Electromagnetic interference.	4.502.13	3.21

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TABLE VI. Test schedule. (continued)

First article	Individual	Test	Test paragraph	Requirement paragraph
1	2	3	4	5
X		Mobility. tiility class I Mobility class II	4.5.2.14 4.5.2 .14.1 4.5.2 .14.2 thru 4.5.2 .14.2.2	3.17.1 3.19
X		Control systems.	4.5.2.17	3.5.1, 3.11.1
X		Airdrop suspension provisions (class 2, size 250 cfm).	4.5.2.15	3.18.2.1.2
X		Noise.	4.5.2.16	3.6
X	x	Compressor performance.	4.5.2.18	3.15.1, 3.16.1
X		Simulated airdrop.	4.5.2.19	3.18.2.1.3
X		Fuel consumption.	4.5.2.20	3.9.9
x	-	Secured lighting.	4.5.2.21	3.32

4.5.2.4 Compressing unit power consumption. The compressing unit shall be driven by a dynamometer, and the brake horsepower (bhp) and speed required to produce rated capacity shall be determined. Continuous bhp in excess of that established by the engine performance test shall constitute failure of this test.

4.5.2.5 Relief valve. Slowly increase pressure on the relief valve by overriding the compressor pressure regulating system or by connecting the relief valve to a separate pressure source. Failure of the relief valve to unseat at a pressure of 125 psig,  $\pm 10$  psig, shall constitute failure of this test.

#### 4.5.2.6 Tilted position.

4.5.2.6.1 Test procedure. Operate the compressor in four tilted positions, each of which shall be 15 degrees from the horizontal plane about the compressor transverse and longitudinal axes. The test shall be conducted operating the compressor for 1 hour at rated capacity in each of the four positions, in a sequence whereby the compressor is operated first in the position least likely to adversely affect the lubrication or fuel system and lastly in the position most likely to adversely affect these systems. The fuel tank shall be full at the start of each position run. Upon completing the last position run, stop the engine and allow the compressor to stand in this tilted position for 4 hours, then operate the compressor for 30 minutes at rated capacity. Capacity measurement shall be made at least once during each of the five phases of the test.

4.5.2.6.2 Failure criteria. Inability of the compressor to produce rated capacity, evidence of compressor air or fluid leaks, or any malfunction shall constitute failure of this test.



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4.5.2.7 Endurance and cycling. Subject the compressor to 500 hours of operation, entailing 375 hours of endurance and 125 hours of cyclic operation, as follows .

4.5.2.7.1 Endurance phase. The compressor shall be operated continually (see 6.8.1), at rated capacity. Test data shall be recorded every 4 hours,  $\pm 0.5$  hour, and a capacity computation shall be made every fifth set of data readings. A graph shall be prepared plotting capacity and corresponding air receiver discharge temperature for each capacity computation made. The following shall also be checked at least once during the endurance phase, as applicable:

- a. Fuel tank capacity for conformance with 3.9.2.
- b. Blowdown valve for conformance with 3.10.1.
- c. Minimum-pressure valve for conformance with 3.16.3.

4.5.2.7.2 Cycling phase. The compressor shall be cycled automatically to operate the compressor through a complete loading-unloading cycle every 5 minutes. Unloading shall be for not more than 1 minute duration, and engine idle speed shall be as specified in 3.12. At the end of the cycling test phase, remove the compressor from cycling operation and operate the compressor at rated capacity for 1 hour. After 1-hour operation, make a capacity computation.

4.5.2.7.3 Test data. The following data shall be recorded during endurance and cycling tests:

- a. Air temperature, ambient.
- b. Air temperature at compressor intake ( F).
- c. Air temperature at receiver discharge
- d. Air pressure at compressor intake (psia) .
- e. Air receiver pressure (psig) .
- f. Barometric pressure (inches mercury) .
- g. Compressor speed (rpm).
- h. Compressor capacity (cfm) , computed.
- i. Nozzle coefficient.
- j. Pressure drop across nozzle.
- k. Down-time data:
  - (1) start-time.
  - (2) Stop-time
  - (3) Down-time hours and minutes
  - (4) Total accumulated operating hours.
  - (5) Reason for each stop, such as:
    - (a) Normal services typical of replenishing fuel, add or change lubricants, add radiator coolant, clean or change filters, etc.
    - (b) Adjustment (character
    - (c) Mal function (nature and cause) -
    - (d) Part replacement, such as fan belt.
  - (6) Quantities of compressor lubricants used (qt.), add or change.

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4.5.2 .7.4 Failure criteria. Any one or more of the following shall constitute failure of this test:

- a. Inability of the compressor to produce rated capacity.
- b. Inability to meet the performance requirements specified in 3.15.1 or 3.16.1.
- c. Fuel tank capacity not as specified in 3.9.2.
- d. Damage to or malfunction of the compressor.
- e. Engine idle speed not as specified during unloading.
- f. Blowdown valve not as specified in 3.10.1.
- g. Minimum-pressure valve not as specified in 3.16.3 (type II only).

4.5.2.8 High temperature.

4.5.2.8.1 Test procedure. Subject the compressor to an ambient temperature of  $120 \pm 5$  °F, until the engine coolant liquid, the fuel tank liquid, and the engine and compressing unit lubricating oil temperature are stabilized. Start the compressor and operate at rated capacity for not less than 7 hours while maintaining  $120 \pm 5$  °F, ambient temperature. No adjusting or replacing of the engine or compressor components shall be permitted after the first hour of operation.

4.5.2.8.2 Test data. Record the following data at 30-minute intervals during the last 7 hours of test:

- a. Engine coolant liquid temperature (top tank).
- b. Engine lubricating oil temperature (gallery).
- c. Compressor air discharge temperature (measured at the compressor receiver discharge).
- d. Compressor air receiver pressure.
- e. Compressor discharge capacity.
- f. Compressing unit lubricating oil temperature (type I only).
- g. Compressing unit coolant liquid temperature (type I, liquid cooled only) .
- h. Ambient temperature.

4.5.2 .8.3 Failure criteria. Any one or more of the following shall constitute failure of this test:

- a. Engine coolant liquid temperature higher than 210 °F.
- b. Engine lubricating oil temperature higher than 250 °F.
- c. Compressor air discharge temperature higher than 250 °F.
- d. Compressor air receiver pressure less than 100 psi.
- e. Compressor discharge capacity less than that specified
- f. Compressing unit lubricating oil temperature higher than 250 °F (type I only) .
- g. Compressing unit coolant liquid temperature higher than 210 °F (type I, liquid cooled only) .

4.5.2.9 Low temperature.

4.5.2.9.1 Test procedure. Subject the compressor to a temperature no greater than -25 °F for a period of not less than 12 hours. At the end of the 12 hour period, start the compressor three times with all recorded temperatures

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stabilized at  $-25 \pm 5$  °F, and allow it to run until a receiver pressure of 100 psig has been reached. After the third start, operate the compressor through 5-minute loading-unloading cycles as specified in 4.5.2.7.2 until all recorded temperatures have stabilized from cycle to cycle. Throughout the test, the ambient temperature shall be maintained at  $-25 \pm 5$  °F. Test data recorded shall be that specified in 4.5.2.8.2 at intervals as required.

4.5.2.9.2 Failure criteria. Any one or more of the following shall constitute failure of this test:

- a. Inability of the engine start **three times**.
- b. Incorrect operation or inaccessibility of instruments or controls.

4.5.2.10 Precipitation.

4.5.2.10.1 Test procedure. The compressor shall be exposed to simulated rain, falling toward the compressor at an angle of approximately 45 degrees from the horizontal at a rate of not less than 3-inches per hour. Simulated rain shall be uniformly distributed over the left side, front, right side, rear, and top of the compressor. The apparatus for producing the spray shall emit water in the form of droplets rather than a fine mist. The spray shall continue while the compressor is operated as follows:

- a. Engine off -5 minutes.
- b. Start engine within 2 minutes (without removing internal moisture) .
- c. -- compressor under load - 1 hour.

4.5.2 .10.2 Failure criteria Evidence of any of the following shall constitute failure of this test:

- a. Inability to start within 2 minutes.
- b. Water in the air intake filter *providing a restriction in excess of 25 inches* of water (manometer reading).
- c. Faulty operation of any electrical switch or gauge.
- d. Leakage of water into internal components such as (but not limited to) the compressing unit engine crankcase, and fuel tank.

4.5.2.1.1 Tiedown and slinging.

4.5.2 .11.1 Tiedown provision test Each provision shall be tested to prove conformance to 3.24. Weld failure or permanent deformation of the compressor or tiedown provision shall constitute failure of this test.

4.5.2 .11.2 Slinging provisions test. Each slinging provisions shall be test to prove conformance to 3.25. The test procedure shall be as follows:

- a. Lift the compressor and hold in suspension in its normal travel position using slings that converge not more than 24 feet above the lowest extremity of the tractor. Determine the force and angles of application for each provision. Measure the clearance between each sling and the compressor.
- b. Restrain the compressor by anchoring the main frame and subject each slinging provision to a force equal to the working load specified in

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MIL-STD-209. This force shall be applied in the direction as determined in a. above. Hold each load for a minimum of 30 seconds.

**Nonconformance to 3.25**, weld failure, or permanent deformation of the compressor or the slinging provisions shall constitute failure of this test.

**4.5.2.12 Rail impact test.** The first article compressor shall be tested in accordance with MIL-STD-810 to prove conformance to 3.26. Inability to meet the requirements of 3.26 shall constitute failure of this demonstration.

**4.5.2.13 Electromagnetic interference** The compressor shall be subjected to the tests specified in MIL-STD-461 for class C1, group II equipment. The tester shall furnish the contractor with the test report for evaluation within the time frame specified (see 6.2). Disapproval of the report shall constitute failure of this test.

**4.5.2.14 Mobility.** Perform the following applicable mobility test(s).

**4.5.2.14.1 Mobility class 1** Pull (skid) the compressor over level dry ground at speeds of up to 5 mph in a series of five "S" curves for linear distance of 300 feet. Evidence of snubbing, deformation or structural failure of the compressor shall constitute failure of this test.

**4.5.2.14.2 Mobility class 2. two-wheel mounted.**

**4.5.2.14.2.1 Travel test.** The travel test will be a total of 3000 miles as follows. Tow the compressor over a smooth hard-surface highway at speeds up to 55 mph, averaging not less than 45 mph, for a total distance of not less than 1000 miles. Tow the compressor over off-road terrain (see 6.8.2), at speeds up to 15 mph, for a total distance of not less than 1000 miles. Tow the compressor over trails and unimproved roads (see 6.8.3) at speeds up to 20 mph. During the tests, all tools shall be in place in the toolboxes. Completion of this test, conduct the performance test as specified in 4.5.2.18. Evidence of bottoming, weaving or sidesway, inability of the trailer to follow the towing vehicle, interference between the trailer and towing vehicle, any other hazardous towing characteristics, malfunction, permanent deformation or damage to the compressor, trailer, tools or components or failure of the performance test shall constitute failure of this test.

**4.5.2.14.2.2 Slope test.** Tow the compressor on a side slope of 20 percent. Repeat the procedure with the compressor traveling in the opposite direction. A physical test or design layout shall be made to determine the ability of the equipment to move up and down a ramp of 30 percent. The bottom and slope of the ramp shall end in horizontal landings forming sharply defined 30 degree angles with the ramp. Inability of the compressor to negotiate the slopes as specified or contact of any compressor component (except tires) with the ramp shall constitute failure of this test.

**4.5.2.15 Airdrop suspension provisions (class 2, size 250 cfm).** Apply and test the limit load as specified in MIL-STD-814 to each of the suspension provisions in the direction specified in MIL-STD-814. When airdrop suspension provisions are used as lifting attachments, this test may be used in lieu of the upward static load required by the lifting and tiedown attachments test.

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Permanent deformation or damage to any one or more of the airdrop suspension provisions shall constitute failure of this test.

4.5.2.16 Noise level test. Noise levels shall be measured in accordance with MIL-STD-1474 requirements and reported in the format indicated by MIL-STD-1474 , figure 11. As a minimum, noise levels shall be measured when equipment is operating under full load. MIL-STD-1474, 5.1.2.1.4 contains shall be taken at not fewer than 12 equal (horizontal) arc increments ; one increment shall include data from the noisiest position. Additionally, the noise level at the typical operating position shall be provided as dB(A) level. Failure to comply with MIL-STD-1474 provisions shall constitute failure of this test.

4.5.2.17 Control systems. Each of the control systems shall be actuated by making the necessary temporary alterations to compressor operation wherever such alterations will not result in a risk of damage to the compressor. Where a damage risk is present, this test may be conducted with the control completely or partially removed from the compressor subjecting \*-- sensor to other sources of temperature or pressure. Operation of any one or more control systems not in accordance with 3.5.1 or 3. 11.1 shall constitute failure of this test.

4.5.2.18 Compressor performance. Each compressor shall be run for 8 hours; the first 7 hours shall be run-in period, and the capacity shall be determined during the final hour of this test. Inability of the compressor to produce the rated capacity or malfunction of the compressor shall constitute failure of this test.

4.5.2.19 Simulated airdrop. The class 2, size 250 cfm compressor shall be drop tested as specified in 3.18.2.1.3 with tools in toolboxes, its fuel tank containing a weight of water equivalent to fuel for 8 hours rated loaded operation (see 3.9.2), radiator filled with coolant, and lubricating oil reservoir, when supplied, filled with oil to the suppliers recommended level. After the drop test, drain and fill the tank with the proper fuel and operate as specified in 4.5.2.18. After testing, inability of the compressor to produce the rated capacity; breakage or permanent deformation of any structural member, component, or attachments; or not conforming to the criteria of MIL-STD-669, MIL-STD-814, and MIL-STD-1791, rigged height, and tipoff curves shall constitute failure of this test.

4.5.2.20 Fuel consumption. The compressor fuel consumption rate shall be determined by the "Compressed Air and Gas Institute Recommended Fuel Consumption Test Procedure For Portable Air Compressors", developed in 1981.

4.5.2.21 Secured lighting. A radiometric spectral test shall be conducted to determine conformance to 3.32. Nonconformance to 3.32 shall constitute failure of this test.

4.6 Comparison test. The Government may select compressors at any time during the contract production period and subject these compressors to the examination and tests specified in 4.4 to determine conformance to the requirements of this specification. The inspection will be performed by the Government, at a site selected by the Government, on compressors selected at random from those which have been accepted by the Government and will not include the previously inspected first article model. In addition to any test specified as part of the

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**inspection comparison**, the **Gocernment** reserves the right to conduct any and all other test contained in the specification as part of the inspection comparisons , and failure of such additional tests shall have the same effect as failure of those tests specified as inspection comparison.

4.6.1 Inspection failure. Failure of a comparison test to meet any requirement specified herein during and as a result of the examination and tests specified in 4.6 shall be cause for rejection of the inspection comparison compressor and shall be cause for refusal by the Government to continue acceptance of production compressors until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies. Correction of such deficiencies shall be accomplished by the contractor at no cost to the Government on compressors previously accepted and produced under the contract. Any deficiencies found as a result of the inspection comparison will be considered prima facie evidence that all compressors accepted prior to the completion of inspection comparison are similarly deficient unless evidence to the contrary is furnished by the contractor and such evidence is acceptable to the contracting officer.

4.7 Inspection of packaging. The preservation, packing and marking shall be examined and tested to determine compliance with the applicable quality assurance provisions of MIL-C-3600 and the requirements of section 5 herein.

## 5. PACKAGING

5.1 Preservation, packing and marking. Each complete compressor, with components, repair parts, tools and technical publications, as applicable, shall be preserved, packed and marked in accordance with level A, B or C requirements of MIL-C-3600 as specified (see 6.2). When level A or B is specified, the skid mounted compressors shall be prepared as specified for boxed or crated compressors and the trailer-mounted compressors shall be prepared as specified for unboxed (mobile) shipment.

## 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 compressors are intended for use as portable sources of compressed air.

6.2 Acquisition requirements. Acquisition documents should specify the following

- a. Title, number , and date of the specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. Type, class and size required (see 1.2).
- d. Time frame required for submission of first article (see 3.2)
- e. When the Government will conduct any or all of the first article examination and tests. When the Government will conduct some but not all of the first article examination and tests, the contracting officer should specify Which examination and tests will be conducted by the



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- Government**, and which **examination** and tests shall be conducted by the contractor (see 3.2).
- f. When service outlets as specified in table II are not required (see 3.10.2).
  - g. When an air receiver check valve is required (see 3.10.2).
  - h. When additional engine instruments are not required (see 3.11.1).
  - i. When regulation of the compressor other than as specified is required (see 3.12).
  - j. When a housing other than as specified (see 3.14).
  - k. When a compressing unit other than as specified is required (see 3.15.1 or 3.16.1).
  - l. When lubricating oils other than as specified may be used (see 3.15.3 or 3.16.2.2).
  - m. When mounting kits shall be furnished for Government mounting of compressors or trailers in lieu of mounting by the contractor (see 3.18).
  - n. When toolboxes are not required for mounting on class 2, size 250-cfm compressor (see 3.18.2.1).
  - o. When special airdrop provisions are required (see 3.18.2.1.2).
  - p. When airdrop requirements do not apply for the class 2, size 250-cfm compressor (see 3.18.2.1.3).
  - q. When storage provisions are not required (see 3.18.4).
  - r. When hose reels are not required for sizes 125-cfm and 250-cfm compressors (see 3.20).
  - s. When hose reels capable of handling not less than three 50-foot lengths of 3/4-inch air hose with coupling are required for sizes 125-cfm and 250-cfm compressors (see 3.20).
  - t. When bypass filters other than as specified are required (see 3.22.7).
  - u. Color required when other than specified (see 3.30).
  - v. - - - - - to be overcoated with camouflage patterns (see 3.30).
  - w. When the welding process will not be at the option of the contractor (see 3.33.3).
  - x. Time frame required for submission of the electromagnetic interference test report (see 4.5.2.13).
  - y. level of preservation and packing required (see 5.1).
  - aa. When the property in 3.18 and 3.30.2 will be furnished by the Government.
  - m. When the property listed in 3.18.2.1.1 will be loaned by the Government.

**6.2.1 Consideration of data requirements.** The following data requirements must be listed, as applicable, on the Contract Data Requirements List (DD Form 1423) when this specification is applied on a contract, in order to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Paragraph No.	Data requirements	Applicable DD No.
a. 3.30.1	Color photograph prints	DI-MISC-80192
b. 3.30.1	Camouflage line art data	DI-MISC-80176

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The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.3 First article. When a first article inspection is required, the item(s) should be a preproduction model. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results and disposition of the first articles. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specified requested to do so in the solicitation.

6.4 Government-furnished property. The contracting officer should arrange to furnish the property specified in 3.18 and 3.30.2, when required.

6.5 Government-loaned property. The contracting officer should arrange for the loan of property specified in 3.18.2.1.1, when required.

6.6 Engine. The contracting officer should obtain from all bidders a copy of their commercial literature indicating engine models used in similar compressor application (see 3.9) .

6.7 Registration numbers. When the compressors are not to be mounted on Government-furnished trailers, the contracting officer should furnish a list of registration numbers to be applied to the compressors (see 3.31).

6.8 Definitions. The following definitions shall apply throughout this specification.

6.8.1 Continually. Operation in increments of not less than 4 hours, except for interruptions required for normal servicing of the compressor. Down-time shall not be considered as operation time.

6.8.2 Off road terrain. Off-road terrain shall include virgin terrain as found in nature without any paths or roadway. The terrain includes natural undulating weathered surface over which the driver selects the straightest route off-road that has the least possibility of resulting in immobilization of the vehicle.

6.8.3 Trails and unimproved roads. Trails and unimproved roads shall include woodland and powerline trace roadways having very low if any maintenance. The roadway is normally dirt or gravel having a undulating road surface with pot holes and humps.

6.9 Provisioning. The contracting officer should include provisioning requirements for repair parts and maintenance tools as necessary (including any special tools), and instructions on shipment of compressors. A suggested paragraph is as follows:

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"Shipment of compressors shall include repair parts, maintenance tools, operational instructions, and accessories, unless exceptions are provided elsewhere in the contract."

6.10 First article pack. Approval of the first article pack will not relieve the contractor of his obligation to preserve, pack and mark the compressors in accordance with this purchase specification. Any changes or deviation in production packs from the approved first article pack will be subject to the approval of the contracting officer.

6.1.1 Transportability report. When specified (see 6.2) , the contracting officer should arrange for the contractor to furnish a transportability report in accordance with AR 70-47 and S.O. P. 70--38 for the compressor 95 days prior to delivery of the first article compressor.

6.12 Subject term (key word) listing.

Air compressor  
 Diesel-engine-driven  
 Equipment, construction  
 Pneumatic powered  
 Skid mounted  
 Trailer mounted

6.13 Changes from previous issue Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensive of the changes.

Custodians:  
 Army - ME

Preparing activity:  
 Army -ME

User activity:  
 Army - CE

Project 431 0-0188

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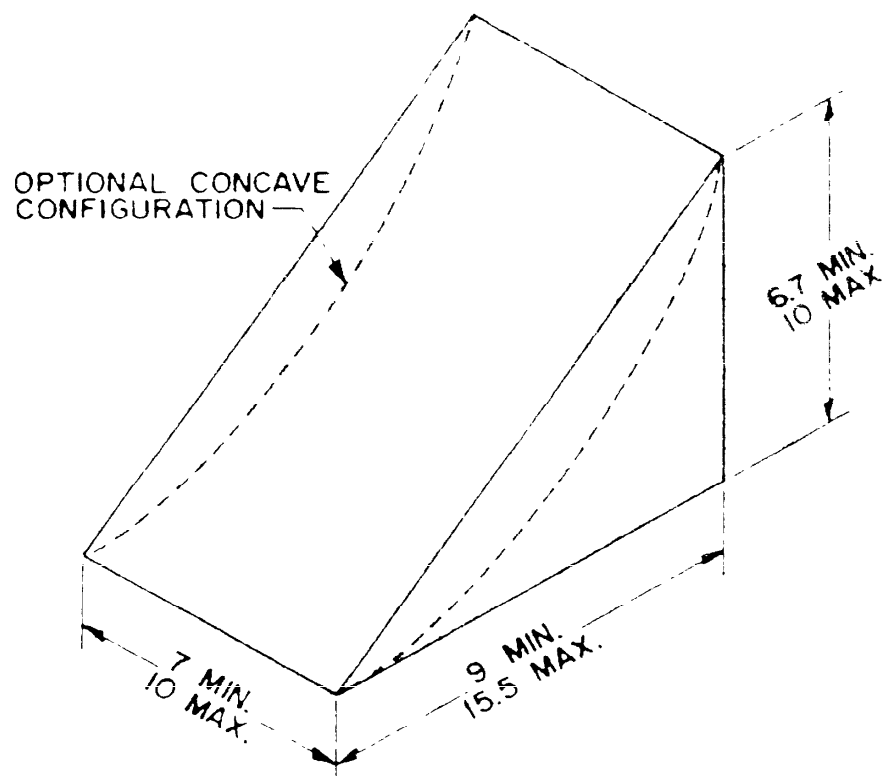


FIGURE 1. CHOCK BLOCK ASSEMBLY

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DATA SHEET						1. Engine Oil Added Sheet ___ of ___ Record Time & Amount of 2. Compressor Oil Added								
P/N _____	MFG NAME _____					Run No.	Date							
Test Title:		Sym	Units	Readings										
				1	2	3	4	5	6	7	8	9	10	...
1. Line Start, Readings, Stop		R <sub>t</sub>	HRS., MIN.	(IF STOP IS UNSCHEDULED GIVE REASON FOR STOP AND DOWN TIME)										
2. Temp. (Ambient) Dry Bulb		T <sub>a</sub>	*F											
3. Temp. (Ambient) Wet Bulb		T <sub>wb</sub>	*F											
4. Pressure (Ambient)		P <sub>b</sub>	*F											
5. Temp., Engine Coolant		T <sub>e1</sub>	*F											
6. Temp., Engine Lubricant		T <sub>e2</sub>	*F											
7. Temp., Compressor Lubricant		T <sub>L</sub>	*F											
8. Temp., Receiver Discharge		T <sub>r</sub>	*F											
9. Pressure, Rec.		T <sub>r</sub>	*F											
10. Pressure, Compressor Intake		P <sub>s</sub>	*F											
11. Temp., Compressor Intake		T <sub>i</sub>	*F											
12. Temp., Upstream of Nozzle		T <sub>2</sub>	*F											
13. Pressure Differential Across Nozzle		dP	In. H <sub>2</sub> O											
14. Compressor Speed		N	PPM											

FIGURE 2. Test 108.

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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

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 this letter.

NOTE: This form may not be used to request copies of documents, nor to request waives requirements in 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.

RECOMMENDED CHANGE:	1. DOCUMENT NUMBER MIL-C-555L(ME)	2. DOCUMENT DATE (YYMMDD) -910828
3. DOCUMENT TITLE Compressors, Air, Reciprocating and Rotary, Diesel Engine Driven		
4. NATURE OF CHANGE (Identify paragraph number and include proposed if possible. Attach extra sheets as needed).		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (LAST, FIRST MIDDLE INITIAL)	b. ORGANIZATION	
c. ADDRESS (Include zip code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. Name  Betty Taylor	b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (703) 664-1866 354-1866	
ADDRESS (Include zip code)  Belvoir RDE Center ATTN: STRBE-TSE Fort Belvoir, VA 22060-5606	If you do not receive a reply within 45 days, contact. Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403 Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	