

INCH-POUND

MIL-P-53132 (ME)

4 November 1993

SUPERSEDING

(See 6.12)

MILITARY SPECIFICATION

POWER PLANT/POWER UNIT,

TACTICAL QUIET GENERATOR SET, TRAILER-MOUNTED

3kW THROUGH 60kW

GENERAL SPECIFICATION FOR

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 Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for tactical, quiet, trailer-mounted power plants from 3 kilowatts (kW) through 60kW; 400 hertz (Hz), 50/60 Hz and 60 Hz alternating current (ac) and tactical, quiet, trailer-mounted power units from 5kW through 60kW; 400 Hz, 50/60 Hz and 60 Hz ac. The power plant shall consist of two Department of Defense (DoD) tactical, quiet, diesel-fueled, skid-mounted generator sets, various equipment, brackets and hardware mounted on one or more modified Government-furnished trailer chassis. The power unit shall consist of one DoD tactical, quiet, diesel-fueled, skid-mounted generator set, various equipment, brackets and hardware mounted on one modified Government-furnished trailer chassis.

1.2 Classification. The power plants/power units shall be of the following sizes and modes.

Mode I 50/60 Hz

Mode II 400 Hz

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Mode III 60 Hz

Size	3	3kW, Mode III - Power plant only
	5	5kW, Mode III
	10	10kW, Mode II and III
	15	15kW, Mode I and II
	30	30kW, Mode I and II
	60	60kW, Mode I and II

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA BELVOIR RDE CTR, ATTN SATBE TSE, FT BELVOIR VA 22060-5818 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 6115

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## 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).

## SPECIFICATIONS

## FEDERAL

A-A-55057	- Panels, Wood/Wood Based: Construction and Decorative.
PPP-B-601	- Boxes, Wood, Cleated Plywood.
PPP-B-636	- Box, Shipping, Fiberboard.
PPP-P-291	- Paperboard, Wrapping and Cushioning.
PPP-T-76	- Tape, Pressure Sensitive Adhesive, Packaging/Paper.

## MILITARY

MIL-P-116	- Preservation, Methods of.
MIL-E-10062	- Engine, Preparation for Shipment and Storage of.

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- MIL-B-22191 - Barrier Material, Transparent, Flexible, Heat Sealable.
- MIL-G-28554 - Generator Sets, Mobile Electric Power and Supplemental Equipment; Packaging of.
- MIL-A-46153 - Antifreeze, Ethylene Glycol, Inhibited, Heavy duty, Single Package, Type I (Tactical), Class 2 (Utility).

(See Supplement 1 for list of associated specification sheets).

## STANDARDS

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.
- MIL-STD-454 - Standard General Requirements for Electronic Equipment.
- MIL-STD-642 - Identification Marking of Combat and Tactical Transport Vehicles.
- MIL-STD-705 - Generator Sets, Engine & Driven, Methods of Tests and Instructions.
- MIL-STD-810 - Environmental Test Methods and Engineering Guidelines.
- MIL-STD-889 - Dissimilar Metals.
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking and Waterproofing, with Appropriate Test Methods.
- MIL-STD-1474 - Noise Limits for Military Materiel.
- MIL-STD-1791 - Designing for Internal Aerial Delivery in Fixed Wing Aircraft.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from: STDZN DCMNT ORDER DESK, BLDG 4D, 700 ROBBINS AVE, PHILADELPHIA PA 19111-5094.)

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

- D 3953 - Strapping, Flat Steel and Seals.

(Application for copies should be addressed to: AMERCN SCTY & MTRLS, 1916 RACE STRET, PHILADELPHIA PA 19103.)

## AMERICAN WELDING SOCIETY (AWS)

- D1.1 - Structural Welding Code, Steel.
- D1.2 - Structural Welding Code, Aluminum.

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(Application for copies should be addressed to: AMERCN WELD SCTY, 550 NW LEJEUNE RD, PO BOX 351040, MIAMI FL 33135.)

ASSOCIATION OF AMERICAN RAILROADS (AAR)

Section 6 - Rules Governing the Loading of Department of Defense Materiel on the Open Top Cars.

(Application for copies should be addressed to: ASS OF AMERCN RR, 50 F STRET NW, WASHINGTON DC 20001.)

(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 information services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated specification sheets), the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Description. The power plants shall consist of two generator sets, one or more modified military standard trailers, a power plant switchbox, and other devices required to achieve a complete power plant assembly. The power unit shall consist of a generator set, modified military standard trailer, and other devices required to achieve a complete power unit assembly.

3.1.1 Detail requirements for individual power plant/power unit size and mode. The individual power plant/power unit requirements shall be as specified herein (see 6.2) and in accordance with the applicable specification sheets. In the event of any conflict between the requirements of this document and the detail specification sheet, the latter shall govern.

3.1.2 Drawings. The drawings forming a part of this document are as listed on the applicable military specification sheet and product drawings. No deviation from the prescribed drawing requirements is permissible without prior approval of the contracting officer. Any data (e.g. shop drawings, layouts, flow sheets, processing procedures, etc.) prepared by the contractor or obtained from a vendor to support fabrication and manufacture of the production item shall be made available, upon request, for inspection by the contracting officer or the designated representative.

3.1.2.1 Safety. Any proposed changes, deviations, and waivers to the drawings shall conform with the following requirements: All rotating or reciprocating parts and other parts subject to high operational temperatures that are of such a nature or are so located as to be a hazard to operating personnel, shall be guarded or insulated to the extent necessary to eliminate the hazard. Electrical equipment shall be effectively guarded and grounded to protect all persons and objects from electrical shock hazard.

3.2 First article. Unless otherwise specified (see 6.2), two each power

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plants/power units shall be furnished for examination and testing within the time frame specified (see 6.2). Each first article shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Materials. Materials shall be as specified herein and on the applicable drawings. Use of any material not specified shall require Government approval, but such materials, if approved, shall be subject to all provisions of this specification.

3.3.1 Material deterioration prevention and control. The power plants/power units 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 operational and storage environments to which the power plant/power unit 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.

3.3.3 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 component, pieces and parts incorporated in the power plants/power units may be newly fabricated from recovered materials to the maximum extent practicable, provided the power plants/power units produced meet all other requirements of this description. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the power plants/power units.

3.4 Government-furnished equipment. As required by the detailed specification sheets, modified trailer chassis and DoD generator set(s) will be furnished by the Government, to be used in the assembly of power plants/power units.

3.5 Vehicle marking. Registration numbers and other marking of the power plant/power unit shall be in accordance with MIL-STD-642 (see 6.6).

3.6 Audio noise. Audio noise sound-pressure levels emanating from the power plant/power unit with all doors closed shall not exceed 70 dBA at 7 m (22.9 feet) from the perimeter of the trailer when measured at 1.2 m (3.9 feet) above the ground. In addition, audio noise emanating from the power plant/power unit with the control panel door(s) open shall not exceed 85 dBA at the operator's station, defined to be 0.7 m (2.3 feet) from the control panel. These requirements apply with the power plant/power unit operating at all loads from no-load to rated load.

3.7 Load transfer for power plant. When tested as specified in 4.6.1, the switchbox shall switch the load from one generator set to the other while both sets are running.

3.8 Camouflage pattern. When specified (see 6.2), a three-color camouflage pattern shall be applied to the power plant/power unit, as required by the drawings.

3.9 Transportability. The power plant/power unit shall be capable of being transported (see 6.13) by military or commercial trailers, trains, vessels,

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aircraft and can withstand the impact forces encountered in shipment without damage or permanent deformation. The power plant/power unit shall be equipped with tiedown and slinging provisions.

3.9.1 Tiedown provisions. The tiedown provisions shall conform to MIL-STD-209, class 2 or 3, type II equipment, and to MIL-STD-1791 for equipment resistant criteria. The tiedown provisions shall satisfactorily complete the pull testing as specified without weld failure, permanent deformation, cracking, loosening, or breaking of the provision or its connecting structural components.

3.9.2 Slinging provisions. The slinging provisions shall conform to MIL-STD-209, class 1 or 3, type II. The provisions shall enable the complete power plant/power unit to be lifted, in the normal operating position. The provisions shall be located so that not less than 1-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, cracking, 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 3.9.1. All slinging/tiedown provisions shall be labeled "LIFT", "TIEDOWN", or "LIFT TIEDOWN", as appropriate, in 1-inch (2.54 cm) high letters.

3.9.3 Air transportability. The power plant/power unit shall meet the requirements of MIL-STD-1791 for air transport. The power plant/power unit being supplied can be loaded, transported in the C-130, C-141, C-6A aircraft, and lifted by helicopters (see 6.13).

3.9.4 Rail transportability. The power plant/power unit shall be rail transportable in CONUS and NATO countries without restrictions. The power plant/power unit shall have a dimensional profile within the Gabarit International de Chargement (GIC) in accordance with the AAR manual, outline diagram when loaded on a 50-inch (127 cm) high rail car. The power plant/power unit shall be capable of withstanding shock loads resulting from rail impact testing in accordance with 4.6.3 without failure, damage, or permanent deformation.

3.9.5 Highway transportability. The power plant/power unit, when loaded on a semitrailer/tractor, shall be within the highway permit limits of all states.

3.10 Workmanship. Workmanship shall be of a quality to assure that the power plant/power units are free from defects resulting from defective material, incorrect manufacturing or assembly practices, incorrect treatment and painting, incomplete welds, rust, cracks, and other defects that could impair their operation or serviceability. MIL-STD-454, requirement 9, shall apply. External surfaces shall be free from burrs, sharp edges, and corners except when sharp edges and corners are specified on the applicable drawing.

3.10.1 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 has passed qualification tests as prescribed by either AWS D.1, D 1.2, or the ASME code for the materials joined and the type of welding operation to be performed and that such qualification is effective as defined. Contractors who only make horizontal welds need not qualify

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welders for "all position welding". The contractor is responsible for determining that automatic welding equipment operators are capable of producing quality welds in accordance with AWS and ASME codes. In the event of evidence of poor welds, the Government reserves the right to require retesting of any welder or welding operator (see 6.13).

#### 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 and unless disapproved by the Government, the contractor's own facilities or any other, suitable for the performance of the inspection requirements specified herein, may be used. 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 must 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.

4.1.2 Disassembly inspection. Failure of any examination or test of the first article shall be cause for disassembly, in the presence of a Government representative, of the first article to the extent necessary to determine the cause of the failure. Each disassembled part shall be examined in detail for compliance with this specification and referenced drawings in regard to materials, dimension tolerances, and workmanship. Parts not complying with such requirements shall be rejected and shall be cause for rejecting the first article. Reassembly with replacement parts and retesting shall be the responsibility of the contractor.

4.1.3 Component and material inspection. The contractor is responsible for ensuring that components and materials are manufactured, examined, and tested in accordance with referenced specifications, standards, and drawings.

4.1.4 Parts and components. Parts and components detailed on the drawings shall be inspected in accordance with the Quality Assurance Provisions (QAPs) and requirements of the drawings.

4.1.5 Acceptability criteria. Power plants/power units that conform to all requirements in sections 3 and 5 and pass all applicable examinations and tests in section 4 of this specification shall be considered acceptable by the Government.

4.2 Classifications of inspections. The inspection requirements specified herein are classified as follows:

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

4.3 First article inspection.

4.3.1 Examination. The first article power plant/power units shall be examined as specified in 4.5.1.

4.3.2 Tests. The first article power plant/power units shall be tested as specified in 4.6.1 and 4.6.2.

4.3.3 Examination or test failure. Presence of one or more defects, as specified in 4.5.1, shall be cause for rejection or for performing the disassembly inspection specified in 4.1.2. Detection of any power plant failure, as specified in 4.6, shall be recorded (see 6.13), corrected or retested as determined by the Government.

4.4 Quality conformance inspection.

4.4.1 Examination. Each power plant/power unit shall be examined for the defects specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.5 Inspection procedure.

4.5.1 Examination. The power plants/power units shall be examined for the characteristics listed in table I.



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TABLE I. Examination schedule.

Number	Characteristic	Requirement Paragraph
101.	Materials not as specified.	3.3, drawings
102.	Materials not resistant to corrosion or deterioration or treated to be made resistant to corrosion or deterioration for the applicable storage and operating environment.	3.3.1, drawings 3.3.2
103.	Dissimilar metals, as defined in MIL-STD-889, not effectively insulated from each other.	3.3.3
104.	Used, rebuilt, or remanufactured components, pieces or parts incorporated in the power plants/power units.	3.1.2.1
105.	Safety not as specified.	3.5
106.	Vehicle registration marking and identification plate missing, incomplete, improper location or size.	3.8, drawings
107.	Treatment, painting, and camouflage pattern not as specified.	3.1.2
108.	Dimensions not as shown on drawings.	3.1.2
109.	Components missing or not as specified.	3.1.2
110.	Assembly not as shown on the drawings.	3.10
111.	Workmanship not as specified.	

4.6 Tests.

4.6.1 Load transfer for power plants. The following procedures shall be followed for testing load transfer of the 3kW power plants, 5kW & 10kW power plants, and 15kW - 60kW power plants, respectively.

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TEST PROCEDURES

FOR 3kW POWER PLANT

LOAD TRANSFER

Prior to performing the following procedures, ensure that the generator sets are in operating condition and properly serviced and that the "GND" terminal of the switchbox is connected to an earth ground.

1. The rotary switch of the switchbox shall be placed in the generator no. 1 position.
2. Start and operate the generators in accordance with the operator's manual at the rated load through the rotary switch for a minimum of 5 minutes. This test shall be performed at the load terminals of the switchbox.
3. At the conclusion of the generator no. 1 position test, the rotary switch shall be placed in the generator no. 2 position.
4. Repeat the test.

Inability of the switchbox assembly to maintain or transfer a rated load shall constitute failure of this test. Failure of the GFE generators to operate in accordance with the operator's manual shall not constitute failure of the test. The contracting officer shall be notified immediately of any such failure.

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## TEST PROCEDURES

FOR 5kW &amp; 10kW

## POWER PLANT LOAD TRANSFER

Prior to performing the following procedures, ensure that the generator sets are in operating condition and properly serviced and that the "GND" terminal of the switchbox is connected to an earth ground.

1. The generator set located on the tongue end of the trailer is designated as the LEFT set and the other set is designated as the RIGHT set.
2. Start the LEFT set, adjust the frequency and voltage to rated values, and close the AC circuit interrupter.
3. At the switchbox, verify that the "STATUS" light for the LEFT set is illuminated and no other lights are illuminated.
4. At the switchbox, close the contactor switch for the LEFT set and observe that the LEFT set "ON LINE" light and "STATUS" light are both illuminated.
5. At this time the LEFT set is powering whatever load is connected to the switchbox output terminals. Adjust this load to rated value for a single set.
6. Record all instrument readings and verify that the load terminals on the RIGHT set are de-energized by using a volt-ohm meter.
7. At the switchbox, open the contactor switch for the LEFT set.
8. At the LEFT set, open the AC circuit interrupter and shut the set off.
9. Start the RIGHT set, adjust the frequency and voltage to rated values, and close the AC circuit interrupter.
10. At the switchbox, verify that the "STATUS" light for the RIGHT set is illuminated and no other lights are illuminated.
11. At the switchbox, close the contactor switch for the RIGHT set and observe that the RIGHT set "ON LINE" light and "STATUS" light are both illuminated.
12. At this time the RIGHT set is powering whatever load is connected to the switchbox output terminals. Adjust this load to rated value for a single set.
13. Record all instrument readings and verify that the load terminals on the LEFT set are de-energized by using a volt-ohm meter.
14. Start the LEFT set, adjust the frequency and voltage to rated value and close its AC circuit interrupter.
15. At the switchbox the following lights should be illuminated:
  - a. Both "STATUS" lights.
  - b. The "ON LINE" light for the RIGHT set.
16. At the switchbox, momentarily place the transfer switch in the "TRANSFER" position. Both synchronizing lights should start going on and off together. If not, check wiring for proper phase sequence.
17. At the LEFT set, slowly decrease the frequency until the synchronizing lights are going off and on at a rate of once every three or four seconds (not critical).
18. Set the oscilloscope to automatically capture the transient voltages during the load transfer. At the switchbox, close the contactor switch for the LEFT set when the synchronizing lights are at their darkest. The load should automatically transfer from the RIGHT set to the LEFT set.

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Verification of the transfer is provided by the "ON LINE" light for the LEFT set being illuminated, and the "ON LINE" for the RIGHT set not being illuminated. However, the "STATUS" light for the RIGHT set should still be illuminated.

19. At this time the LEFT set is carrying the load.
20. At the LEFT set re-adjust the frequency and voltage to the desired value (they are probably a little bit low and will need to be increased).
21. The load can now be transferred back to the RIGHT set by proceeding as follows:
  - a. At the switchbox momentarily place the TRANSFER switch in the "TRANSFER" position.
  - b. The synchronizing lights should start going off and on together.
  - c. At the RIGHT set slowly increase the frequency until the synchronizing lights are going off and on at a rate of at least once a second (not critical).
  - d. At the RIGHT set slowly decrease the frequency until the synchronizing lights are going off and on at a rate once every three or four seconds.
  - e. Set the oscilloscope to automatically capture the transient voltages during the load transfer. At the switchbox close the contactor switch for the RIGHT set when the synchronizing lights are at their darkest. The load should automatically transfer from the LEFT set to the RIGHT set. Verification of the transfer is provided by the "ON LINE" light for the RIGHT set being illuminated, and the "ON LINE" for the LEFT set not being illuminated. However, the "STATUS" light for the LEFT set should still be illuminated.
22. At this time the RIGHT set is carrying the load.
23. At the RIGHT set, re-adjust the frequency and voltage to the desired value (they are probably a little bit low and will need to be increased).
24. At LEFT set, open the set AC circuit interrupter and then stop the set.
25. At the switchbox open the contactor for the RIGHT set.
26. At the RIGHT set, open the set AC circuit interrupter and then stop the set.

Inability of the switchbox assembly to maintain or transfer a rated load shall constitute failure of this test. Failure of the generator sets to operate in accordance with the operator's manual shall not constitute failure of the test. The contracting officer shall be notified immediately of any such failure.

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## TEST PROCEDURES

FOR 15kW, 30kW &amp; 60kW

## POWER PLANT LOAD TRANSFER

Prior to performing the following procedures ensure that the generator sets are in operating condition and are properly serviced and that the "GND" terminal of the switchbox is connected to an earth ground:

1. The power unit with the switchbox is designated "A" and the other unit is designated "B".
2. Start the "A" unit, adjust the frequency and voltage to rated values, and close it's on-board AC circuit interrupter.
3. At the switchbox, the "STATUS" light for the "A" unit should be illuminated.
4. At the switchbox, close the contactor switch for the "A" unit, this should illuminate the "ON LINE" light in addition to the "STATUS" light.
5. Unit "A" is now delivering power to any load (not to exceed rating of a single set) connected to the switchbox output terminals.
6. Adjust the load to rated value.
7. Record all instrument readings and verify that the load terminals on the "B" unit are not energized by using a volt-ohm meter.
8. At the switchbox, open the contractor switch for the "A" unit.
9. At the "A" unit, open the set AC circuit interrupter and then stop the set.
10. Start the "B" unit, adjust the frequency and voltage to rated values, and close its on-board AC circuit interrupter.
11. At the switchbox, the "STATUS" light for the "B" unit should be illuminated.
12. At the switchbox, close the contactor switch for the "B" unit, this should illuminate the "ON LINE" light in addition to the "STATUS" light.
13. Unit "B" is now delivering power to any load (not to exceed rating of single set) connected to the switchbox output terminals.
14. Adjust the load to rated value.
15. Record all instrument readings and verify that the load terminals on the "A" unit are not energized by using a volt-ohm meter.
16. To transfer the load from the "B" unit to the "A" unit and then back to the "B" unit proceed as follows:
  - a. Start the "A" unit and place the UNIT-PARALLEL switch in the "PARALLEL" position. DO NOT CLOSE THE SET AC CIRCUIT INTERRUPTER SWITCH AT THIS TIME.
  - b. At the "B" unit place the UNIT-PARALLEL switch in the "PARALLEL" position.
  - c. At the switchbox, close the contactor switch for the "A" unit.
  - d. At the "A" unit, the two synchronizing lights should be going on and off together. If not, check wiring for improper phase sequence.
  - e. Slowly increase the frequency on the "A" unit until the synchronizing lights are going off and on at a rate of at least once a second.
  - f. Set the oscilloscope to automatically capture the transient voltages during the load transfer.
  - g. Slowly decrease the frequency of "A" unit until the synchronizing lights are going off and on at a rate of about once every three or four seconds (not critical). When the lights are of their darkest, close the "A" unit set AC circuit interrupter.

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- h. The sets are now in parallel and should be dividing the load equally.
  - i. At the "B" unit, open the AC circuit interrupter.
  - j. The "A" unit is now carrying the total load.
  - k. Adjust the "A" unit frequency and voltage to rated values.
  - l. At the "B" unit, slowly increase the frequency until the synchronizing lights are going off and on at a rate of at least once a second.
  - m. Set the oscilloscope to automatically capture the transient voltage during the load transfer.
  - n. Slowly decrease the frequency of the "B" unit until the synchronizing lights are going off and on at a rate of about once each three or four seconds (not critical). When the lights are at their darkest close the "B" unit set AC circuit interrupter.
  - o. The sets are now in parallel and should be dividing the load equally.
  - p. At the "A" unit, open the set contactor and then stop the set.
  - q. Set "B" is now carrying the load.
  - r. Adjust the "B" unit frequency and voltage to rated values.
17. At the switchbox, open the contactor switch for the "B" unit and then stop the set.

Inability of the switchbox assembly to maintain or transfer a rated load shall constitute failure of this test. Failure of the generators to operate in accordance with the operator's manual shall not constitute failure of the test. The contracting officer shall be notified immediately of any such failure.

4.6.2 Audio noise 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 at no-load and rated no-load. MIL-STD-1474, 5.1.2.1.4 contours 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 or nonconformance to 3.6 shall constitute failure of this test.

#### 4.7 Transportability tests.

4.7.1 Tiedown provisions. The tiedown provisions shall be tested in accordance with MIL-STD-209 to prove conformance to 3.9.1. Inability to meet the requirements of 3.9.1 shall constitute failure of this demonstration.

4.7.2 Slinging provisions. The slinging provisions shall be tested in accordance with MIL-STD-209 to prove conformance to 3.9.2. Inability to meet the requirements of 3.9.2 shall constitute failure of this demonstration.

4.7.3 Rail impact test. The first article power plant/power unit shall be tested in accordance with MIL-STD-810 to prove conformance to 3.9.4. Inability to meet the requirements of 3.9.4 shall constitute failure of this test.

4.7.4 Air transport test. The power plant/power unit shall be tested in accordance with MIL-STD-1791 to prove conformance to 3.9.3. Inability to meet the requirements of 3.9.3 shall constitute failure of this test.

4.7.5 Highway transport test. The power plant/power unit shall be tested to

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conform to 3.9.5. Inability to meet the requirements of 3.9.5 shall constitute failure of this test.

4.7.5.1 Road test. The first article power plant/power unit shall undergo 10 road cycles as defined in 6.14. The set shall be in operating condition and all fluids shall be at normal level, except the fuel tank shall be one-half fuel. Each set shall be towed by an appropriate vehicle. TM 608.1 of MIL-STD-705, shall be conducted at the beginning of the test at the end of every two road cycles. These tests shall be conducted at rated load only. Prior to assembly and at the conclusion of the road test, the generator sets shall be subjected to an audio noise tests (see 4.6.2). Any rough handling damage (see 6.4.1), and nonconformance to 3.9.5 shall constitute a failure.

#### 4.8 Inspection of packaging.

4.8.1 First article pack inspection. The first article pack (see 6.7) shall be examined for the applicable defects listed in the quality assurance provisions of MIL-G-28554 and for the additional defects listed in 4.8.2.3 of this specification. The presence of one or more defects shall be cause for rejecting the first article pack. Any defect(s) shall be corrected and the first article pack re-examined.

#### 4.8.2 Quality conformance inspection of packaging.

4.8.2.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.8.2.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.8.2.3 Examination. Sample power plants/power units, selected in accordance with 4.8.2.2, shall be examined for the applicable defects listed in the quality assurance provisions of MIL-G-28554 and the following defects. Presence of one or more defects shall be cause for rejection.

				LEVEL
				C
				A
				B
112.	Preservation not as specified.	5.2.1	5.2.2	5.2.3
113.	Bottom of the generator set not protected with plywood shields as specified.	5.2.1		
114.	Cooling system not preserved as specified.	5.2.1	5.2.2	5.2.3
115.	Box type housing not as specified.	5.3.1	5.3.2	
116.	Box type housing not secured to generator set or trailer bed.	5.3.1	5.3.2	
117.	Metal strapping not as specified.	5.3.1	5.3.2	
118.	Ancillary equipment not packed as specified.	5.3.1	5.3.2	5.3.3
119.	Ancillary equipment not cushioned, blocked and braced as specified.	5.3.1	5.3.2	
120.	Landing gear not in raised position			

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	as specified for all levels.	5.3.1	5.3.2	5.3.3
121.	Marking not as specified.	5.4	5.4	5.4
122.	Depreservation guide not as specified.	5.5	5.5	5.5
123.	Depreservation guide not preserved as specified.	5.5	5.5	5.5

## 5. PACKAGING

5.1 First article pack. The contractor shall furnish a first article pack for examination within the time frame specified (see 6.2) to prove prior to starting production packaging that the applied preservation, packing and marking comply with the packaging requirements of this specification. Examination shall be as specified in section 4 and shall be subject to surveillance and approval by the Government (see 6.7). The first article pack may be prepared utilizing either the first article model or a production model. When the first article model is utilized, any preservation and packing shall be removed by the contractor at no expense to the Government, when requested by the Government, to facilitate comparison between the first article model and production model.

5.2 Preservation. Preservation shall be level A, B or level C (see 6.2).

5.2.1 Level A. The power plant/power unit, the generator set and ancillary equipment, shall be preserved in accordance with level A preservation requirements of MIL-G-28554. Each generator set shall be further preserved in accordance with the requirements for method IIa of MIL-P-116 as specified in MIL-G-28554 for sheathed crated sets. The generator set shall be secured directly through the barrier material to the chassis using the required mounting bolts. Any openings in the trailer bed, through which an object may enter from below and cause damage to the method IIa barrier material, shall be completely closed off by the application of a plywood shield(s). Such shield(s) shall be constructed of 0.50-inch (1.27 cm) thick plywood meeting the requirements of A-A-55057 type A, C-D interior with exterior glue, and shall be securely attached to the bottom of the trailer bed. Internal type humidity indicators are required with inspection windows located in the barrier material for ease of access to the indicator. Cooling systems for engines with liquid coolant systems shall be preserved in accordance with the preservative and drain procedure of MIL-E-10062 and tagged accordingly. Before sealing the barrier material, the sides, ends and top of each generator set shall be wrapped with a double thick wrap of cushioning material conforming to PPP-P-291, type I, style 2, to protect the barrier material from any sharp edges or protrusions.

5.2.1.2 Fire extinguisher. The fire extinguisher shall be removed from the bracket and packaged in a box conforming to PPP-B-636, type CF, variety SW, grade 125, style optional and shall be secured within the confines of the generator set.

5.2.1.3 Ancillary equipment. The ancillary equipment (ground rods, ground rod driver/puller, sledge hammer, fuel drum adapter) shall be placed in the accessory box.

5.2.1.4 Technical publications. Technical publications shall be preserved in accordance with MIL-P-116, method IC-1 and shall be secured to the generator set outside the method II barrier.



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5.2.1.5 Trailer chassis. The trailer chassis components shall be preserved in accordance with MIL-G-28554, level A.

5.2.2 Level B. The power plant/power unit and ancillary equipment shall be preserved in accordance with level B requirements of MIL-G-28554. Cooling systems for engines with liquid coolant systems shall be filled with equal portions of antifreeze conforming to MIL-A-46153 and clean water.

5.2.3 Level C. The power plant/power unit and ancillary equipment shall be preserved in accordance with level C requirements of MIL-G-28554. Cooling systems for engines with liquid coolant systems shall be filled with equal portions of clean water and antifreeze conforming to MIL-A-46153.

5.3 Packing. Packing shall be level A, B or C (see 6.2).

5.3.1 Level A. Each power plant/power unit and ancillary equipment, preserved as specified in 5.2, shall be packed in a box type housing consisting of ends, sides and top, constructed in accordance with PPP-B-601, overseas type, style I. For each power plant and ancillary equipment the sides and ends shall be constructed of 0.25-inch (0.636 cm) thick plywood and the top shall be 0.50-inch (1.27 cm) thick plywood. For each power unit and ancillary equipment sides and ends shall be 0.50 inches (1.27 cm) thick plywood. The housing shall be secured to the trailer bed, or generator set as applicable, with mechanical fasteners, wood wedges and metal strapping. Such means of fastening shall not damage the method IIa barrier material. Metal strapping shall conform to ASTM D 3953, type I, finish B. The PPP-B-601 housing may be of the size necessary to encompass both generator sets (if applicable) as a single housing or it may consist of two separate housing each of the size necessary to encompass an individual generator set. The preserved ancillary equipment shall be cushioned, blocked and braced in accordance with MIL-STD-1186. The accessory box's lid shall be closed and secured.

CAUTION: Landing gear(s) on the trailer(s) are subjected to damage during shipment. Do not ship trailer(s) with landing gear(s) down.

5.3.2 Level B. The power plant/power unit and ancillary equipment, preserved as specified in 5.2, shall be packed for level B in the same manner as specified for level A in 5.3.1 except for the following:

- a. The PPP-B-601 housing shall be domestic type.
- b. The ASTM D 3953 metal strapping may be finish A.

CAUTION: Landing gear(s) on the trailer(s) are subjected to damage during shipment. Do not ship trailer(s) with landing gear(s) down.

5.3.3 Level C. The power plant/power unit, preserved as specified in 5.2, shall be packed in accordance with MIL-G-28554, level C. The ancillary equipment shall be placed in the accessory box. The box's lid shall be closed and secured.

CAUTION: Landing gear(s) on the trailer(s) are subjected to damage during shipment. Do not ship trailer(s) with landing gear(s) down.

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5.4 Marking. In addition to any special or identification marking required by the contract or purchase order (see 6.2), each power plant/power unit shall be marked in accordance with MIL-STD-129.

5.5 Depreservation guide. When a depreservation guide is required (see 6.2 and 6.8), it shall be preserved in accordance with MIL-P-116, method IC-1. However, barrier material shall be in accordance with MIL-B-22191, type I, and heat sealed. It shall be secured on the generator set with tape in accordance with PPP-T-76.

## 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 power plant/power unit is intended for use by the Armed Services to supply electrical power for military use.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. Appropriate specification sheets (see 3.1.1).
- d. When a first article is not required (see 3.2).
- e. Size, mode, and quantity of first article to be furnished (see 3.2).
- f. Which paint color code is to be used for the camouflage pattern (standard, desert, winter/snow (see 3.9).
- g. Time frame required for submission of the first article pack  
(see 5.1).
- h. Level of preservation and packing required (see 5.2 and 5.3).
- i. Any special markings (see 5.4).
- j. When a DA Form 2258 is used (see 5.5).

6.3 First article. When a first article inspection is required, the first article is defined as 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 specifically requested to do so in the solicitation.

6.4 Definitions.

6.4.1 Rough handling damage. Rough handling damage is defined as any condition resulting in malfunctioning of the power plant/power unit, liquid leakage, deformation, loosening, breakage, or change of fit of any component.

6.4.2 Operational weight. The operational weight of the power plant/power

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unit, as required in each specification sheet, is a wet weight and includes the weight of the fuel, lubricating oil, electrolyte, coolant and hydraulic oil at full capacities and the ancillary equipment. The wet weight does not include any packaging that may come with the power plant, generator set or power unit.

6.4.3 User equipment allowance. See specification sheet.

6.4.4 Maximum weight (see specification sheets). The maximum weight includes the operational weight plus a user equipment allowance. Maximum weights are listed on the specification sheets.

6.4.5 Towing vehicle. See specification sheets for recommended towing vehicles.

6.5 Government-furnished property. The contracting officer should arrange to furnish the property specified (see 3.4 and appropriate slash sheet).

6.6 Registration numbers. The contracting officer should arrange to furnish a list of registration numbers to be applied to the power plant/power unit.

6.7 First article pack. Any changes or deviations of production packs from the approved first article pack will be subject to the approval of the contracting officer. Approval of the first article pack will not relieve the contractor of obligations to preserve, pack and mark the power plant/power unit in accordance with this specification.

6.8 Depreservation Guide. The requirement for a depreservation guide should be considered when this specification is applied on a contract. If the guide is required it must be prepared on DA Form 2258 "Depreservation Guide for Vehicles and Equipment". The contracting officer should arrange to furnish the record copies of DA Form 2258, when requested by the contractor. The depreservation guide must be acquired under separate contract line item and listed on the Contract Data Requirements List (DD Form 1423) in the contract.

6.9 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD FAR Supplement 27.475-1) exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title
a. 3.10	DI-MISC-80875	Welding Procedures
b. 3.10	DI-MISC-80876	Welding Procedure Qualification Test Report
c. 3.9	DI-PACK-80880	Transportability Report
d. 4.3	DI-T-4901	First article Inspection Report

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e. 4.3 DI-T-4902 First article Inspection Report

The above DIDs 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 DIDs are cited on the DD Form 1423.

6.10 Truck or trailer transportation. Truck or trailer transportation is defined as the conditions encountered during four cycles of a road test, each cycle consisting of the following, with the set mounted on an Army truck or trailer:

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ROAD CONDITION	DISTANCE	SPEED
	km (Mi)	km/h (MPH)
Paved Highway	161 (100)	up to 80.5 (50)
Level Cross-country	161 (100)	up to 32.2 (20)
Hilly Cross-country	80.5 (50)	up to 32.2 (20)
Belgian Block	9.7 (6)	up to 32.2 (20)

6.11 Subject term (keyword) listings.

Generator set  
Power generation  
Skid Mounted

6.12 Supersession data. This specification supersedes PD 6115-0096, slash sheets 1 through 9, dated 15 January 1992 and 6115-0097, slash sheets 1 through 10, dated 15 January 1992.

Custodian:

Army - ME

Preparing activity

Army - ME

Project 6115-A588