15 April 1969

Materiel Test Procedure 10-2-151
General Equipment Test Activity

U. S. ARMY TEST AND EVALUATION COMMAND
COMMODITY ENGINEERING TEST PROCEDURE

CLOTHING REPAIR SHOP, TRAILER-MOUNTED

1. OBJECTIVE

This document provides test methods and techniques to determine the technical performance and safety characyeristics of trailer-mounted clothing repair shops, and their associated tools and equipment, as described in Qualitative Materiel Requirements (QMR's), Small Development Requirements (SDR's), Military and/or Technical Characteristics (MC's or TC's), and to determine the item's suitability for service tests.

2. BACKGROUND

A requirement exists for a mobile, self-powered clothing repair shop capable of repairing military clothing in the field. The trailer-mounted clothing repair shops contain fabric sewing machines, button sewing machines, and a gasoline engine-driven electrical generator. The repair shop is designed for field use where, normally, the machines, tables, and chairs are removed and set up in a tent or in a temporary shelter. The generator normally is removed from the trailer and operated at a distance from the machines allowed by its cable length. The clothing repair shops are normally towed from one field site to another. Certain models are equipped with a waterproof cabinet designed to protect the components during transport and storage.

3. REQUIRED EQUIPMENT

a. Platform Scales
b. Steel Measuring Tape
c. Still Camera and Film
d. Ohmmeter
e. Industrial Analyzer
f. Stop Watch
g. Sound Level Meter and Octave Band Noise Analyzer
h. Meteorological Instrumentation:

    1) Temperature recording equipment
    2) Humidity recording equipment
    3) Anemometer
    4) Rain gage

i. Stroboscope
j. Recording Accelerometers
k. Cranes, Hoists, and associated equipment
l. Highway Test Course (paved and gravel roads)
m. Cross-Country Course
n. Environmental Test Chambers (-65°F to 155°F, 100 R.H. at 85° F)

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4. REFERENCES

A. USATECOM Regulation 385-6, Safety Release.
B. USATECOM Regulation 700-1, Value Engineering.
C. USATECOM Regulation 705-4, Equipment Performance Report.
D. USATECOM Regulation 750-15, Maintenance Portion of the Service Test.
E. Federal Specification 00-S-256d, Sewing Machines, Industrial.
F. Federal Standard No. 751a, Stitches, Seams, and Stitching.
G. Military Specification MIL-C-40153D, Clothing Repair Shop, Trailer-Mounted.
H. Military Specification MIL-G-52367, Generator Sets, Gasoline-Engine-Driven, 3.0 KW, Alternating Current, Air Cooled, Portable, Tubular Frame, Skid-Shock-Mounted.
I. AR 705-15, Operation of Materiel under Extreme Conditions of Environment with Change 1.
J. HEL Standard S-1-63B, Maximum Noise Level for Army Materiel Command Equipment.
K. MTP 2-2-520, Logistics-Over-The-Shore (LOTS).
L. MTP 2-2-613, Broadband Radio Interference Testing for Vehicles and Electrical Equipment - Noncommunication.
M. MTP 2-2-800, Center of Gravity.
N. MTP 7-2-515, Air Transportability, Internal.
O. MTP 10-2-500, Physical Characteristics.
P. MTP 10-2-501, Operator Training and Familiarization.
Q. MTP 10-2-502, Durability.
R. MTP 10-2-503, Surface Transportability (General Supplies and Equipment).
S. MTP 10-2-505, Human Factors Evaluation.
T. MTP 10-2-507, Maintenance Evaluation.

5. SCOPE

5.1 SUMMARY

This MTP describes the following tests:

a. Preparation for Test - An inventory of components, a determination of the condition of the test item upon arrival, its physical characteristics, and operator training and familiarization requirements.

b. Electrical Tests - A verification of electrical continuity of all cabling and a test to determine proper generator operation and load characteristics.

c. Electromagnetic Compatibility - A test to determine electromagnetic interference generated by the test item.

d. Performance Tests - An evaluation of the technical adequacy of the sewing machines.

e. Durability Tests - A study to determine the trailer's durability during transportation.

f. Trailer Brake Test - A determination of the braking capability of the trailer under load.

g. Transportability Test - An evaluation of the test item's ability to be moved by the various means of transportation used by the Army.

h. Cabinet Assembly Water Leakage Test - A determination of the ability of the waterproof cabinet assembly to protect the components of the clothing repair shop.

i. Environmental Storage Test - A study to determine whether the clothing repair shops can withstand storage under extreme conditions of heat, cold, and humidity.

j. Safety - An evaluation to determine whether the test item contains any unwarranted hazards.

k. Maintainability and Reliability Evaluation - That portion of the test which is concerned with the following: verification and appraisal of failures; determination and appraisal of maintenance characteristics and requirements; appraisal of design-for-maintainability; appraisal of the maintenance test package; and, calculation of indicators which express the effects of the preceding aspects.

l. Human Factors Evaluation - An evaluation of the man-item relationship during installation, operation, maintenance and transportation of the test item, to include the noise level generated by the equipment, the adequacy of the design and layout of the controls, and any operability and accessibility design deficiencies.

m. Value Analysis - An evaluation to determine whether the clothing repair shops have unnecessary, costly, or "nice-to-have" features, as stated in USATECOM Regulation 700-1.

5.2 LIMITATIONS

None

6. PROCEDURES

NOTE: During equipment set-up and operation, the operating techniques provided in the manufacturer's instruction manual shall be used. Any change or deviation from these instructions shall be recorded in the test item logbook.

6.1 PREPARATION FOR TEST

6.1.1 Initial Inspection

Upon receipt at the test site, the test item shall be subjected to the following procedures:

a. Visually inspect the assembled test item and, if applicable, the blocking used for shipment, and record the following:

1) Evidence of damage or deterioration to both the test item and blocking.
2) Identification markings, including:

a) Name of manufacturer
b) Number and date of contract
c) Date of manufacture

NOTE: Make use of photographs, diagrams, and narration to document the condition of the test item.

b. Unload the test item, as required, visually inspect each of the components, both on and off the trailer and record the following:

1) Evidence of defects in:

a) Manufacturing
b) Material
c) Workmanship

2) Evidence of deterioration
3) Evidence of damage
4) Component identification markings, including:

a) Identification, name, model and serial number
b) Caution instructions
c) Service instructions
d) Manufacturer's name and date of manufacture

5) Evidence of shortages

NOTE: Make use of photographs, diagrams, and narration to document the condition of the test item components.

6.1.2 Physical Characteristics

Determine and record the physical characteristics of the shoe repair shop as specified in the applicable sections of MTP 10-2-500 and the following:

a. For the assembled test item:

1) Weight.
2) Length, width and height.
3) Cubage.
4) Center of gravity as described in MTP 2-2-800.
5) Dimensions of all access openings, storage compartments, and material for operator or passenger use.

b. For the test item major components:

1) Weight
2) Length, width and height
3) Cubage

6.1.3 Operator Training and Familiarization

Test personnel shall be oriented in all aspects of the shoe repair shop as described in the applicable sections of MTP 10-2-501 and the following:

a. All members of the test team shall receive a review of safety precautions listed in the technical manuals or developed from previous test experience. The safety precautions will, as a minimum, include the following:

1) Vehicle and cabinet assembly
2) Generator operation
3) Serving machine operation
4) Button attaching machine operation
5) Handling during transport operations

b. The set up, operating, and maintenance procedures for the generator, fabric sewing machine and button sewing machine will be presented. Methods of securing the components for transport will be reviewed. The technical manuals will be made available for study.

c. Record the following for each member of the test team:

1) For civilian personnel:

a) Rating
b) Job title
c) Job description

2) For military personnel:

a) Rank
b) MOS
c) Training time in MOS
d) Experience in MOS

6.1.4 Preparation

Prepare the shoe repair shop for test as follows:

a. Set up the components of the test item in a normal operating arrangement as described in the manufacturer's instructions or draft technical manual.

b. Remove all protective material and preservatives.

c. Lubricate all components of the test item following the procedures of the applicable lubrication order.

6.2 TEST CONDUCT

NOTE: 1. All equipment failures shall be reported in accordance with USATECOM Regulation 705-4.
2. Before the test of the shoe repair shop is begun, the following precautions shall be taken:

a) Trailer brakes set and trailer stable
b) Tape covering generator ventilator opening removed

c) Air intake shutter set to proper position.
d) No fuel leakage or fuel vapors present.
e) All sewing machine switches and the generator circuit breaker switch in the "off" position.
f) Generator and sewing machines properly grounded.
g) Proper exhaust for engine.
h) Personnel clear of sewing machines before starting generator.

3. At all times during the test, normal safety precautions such as the following shall be observed:

a) Refuel the generator set only when off.
b) Insure power is shut off prior to maintenance on sewing machines.
c) Keep hands, fingers, and face clear of needles while sewing.
d) Operate generator set with proper ventilation.
e) Keep loose material such as scissors, etc. off the sewing tables while sewing.

6.2.1 Electrical Tests

6.2.1.1 Continuity Test

Perform the following:

a. Determine that all electrical cables supplied with the test item are correctly wired and marked by checking continuity with an ohmeter and record the presence and location, as applicable, of the following:

1) Short circuits
2) Open circuits
3) Incorrect wiring
4) Defects in materials, i.e., frayed insulation
5) Defects in workmanship

b. Plug each sewing machine electrical power cord into a 115 volt, 60 cycle, 1 phase source of power and verify that each sewing machine motor operates and record the manufacturer, model and serial number of any defective motor.

6.2.1.2 Generator Test

NOTE: The ambient temperature for this test shall exceed 40 degrees F.

a. Install an industrial analyzer (or equivalent instruments capable of measuring voltage, current, power factor, and wattage) in the cable leaving the generator.

b. Remove the needles and bobbins from all sewing machines.

c. With all sewing machines and other electrical equipment off, start the generator and allow it to warm up for the specified time.

d. Measure and record the maximum and minimum voltage obtainable by varying the voltage control.

e. Set the voltage to 120 volts and measure and record the generator rpm.

f. Place the generator circuit breaker in the "on" position.

g. Start one fabric sewing machine.

h. Record the following power line(s) conditions:

1) Voltage
2) Current
3) Power factor
4) Wattage

i. Record the following for the generator:

1) Generator output voltage
2) Generator speed

j. Repeat steps g and h with two fabric sewing machines in the "on" position.

k. Start all remaining machines one at a time, including work lights, and repeat steps g and h for each machine and their work lights.

l. After replacing needles and bobbins and threading the machine repeat steps g and h under the following conditions:

1) Operating under load (sewing) for:

NOTE: 1. Load shall be applied by depressing the operating treadles.
2. Load shall be applied to all sewing machines for a period of less than four minutes.

a) Each individual machine
b) Button sewing machines only
c) All machines

2) Machine in stalled condition for:

a) Each individual machine
b) Button sewing machines only
c) All machines

m. Repeat steps g through l two times.

6.2.2 Electromagnetic Compatibility

Determine the electromagnetic compatibility of the test item as described in the applicable sections of MTP 2-2-613 with the clothing repair shop operated as follows:

a. Ambient temperature shall be above 40 degrees F.

b. All sewing machines shall be properly lubricated as described in the applicable lubrication order.

c. All sewing machines shall be operated normally with sample fabric and thread installed.

d. All sewing machines and the generator shall be properly grounded with wiring harness and grounding rods.

6.2.3 Performance Tests

6.2.3.1 Fabric Sewing Machines

Evaluate the performance of each sewing machine as follows:

a. Sew a suitable length of test fabric at minimum threads per inch for 6 seconds (0.1 minute). Record the following for each machine:

1) Machine type, model and serial number.
2) Length of stitch.
3) Stitches per inch.
4) Observe and record any stitch defects such as skip stitches, broken needles, thread breakage, etc.
5) Size of thread and needle.
6) Type of test fabric.

b. Repeat step a for nominal and maximum stitch setting (threads per inch) and each applicable type fabric.

c. Repeat steps a and b for each thread and needle combination appropriate to the machine and type of repair being made.

6.2.3.2 Button Sewing Machines

a. Attach a minimum of 10 two-hole buttons to a piece of test fabric utilizing the button sewing machine. Record the following:

1) Machine model and serial number
2) Size of thread and needle
3) Type of test fabric
4) Observe and record any defects in attached buttons

b. Repeat step a for the following types of buttons:

1) Four-hole buttons
2) Stay buttons
3) Metal shank buttons

c. Repeat steps a and b using various types of fabrics as specified in the test plan.

6.2.4 Durability Tests

Determine the durability of the test item as described in the applicable sections of MTP 10-2-502 and as follows:

NOTE: Durability Tests when applicable, shall be conducted in conjunction with the Transportability Tests of paragraph 6.2.6.2.

6.2.4.1 Preparation for Test

Prepare the clothing repair shop as follows:

a. Install all components of the clothing repair shop and secure for transport in accordance with instructions.

b. Attach and record the location of recording accelerometers to the repair shop so as to obtain shock readings along the longitudinal, transverse, and vertical axis.

6.2.4.2 Test Procedure

a. Tow the fully loaded clothing repair shop over paved roads for a minimum of fifty (50) miles at speeds up to 50 mph and perform the following:

1) Conduct a minimum of five quick starts on each of the following:

a) Ascending grades between five and 10 percent
b) Descending grades between five and 10 percent

2) Conduct a minimum of five quick stops from varying speeds on each of the following:

a) Ascending grades between five and 10 percent
b) Descending grades between five and 10 percent

b. Record the following for each quick start and stop:

1) Speed before stop, if applicable
2) Accelerometer recording readings
3) Grade and type of slope (10% ascending, 7% descending, etc.)

c. Record the ambient weather conditions.

d. Disassemble the test item and visually inspect for and record any damage.

e. Ensure proper functioning of each sewing machine by performing the procedures of paragraph 6.2.3.

f. Repeat steps a through d for 50 miles of gravel road at speeds averaging 35 mph.

g. Tow the fully loaded clothing repair shop over a minimum of 50 miles of open terrain and cross-country at speeds averaging five mph. The test course shall have surface irregularities such as pot holes, mounds, rocks, and brush. Perform the following:

1) Conduct a minimum of 10:

a) Abrupt stops from varying speeds
b) Abrupt starts
c) Sharp left hand turns
d) Sharp right hand turns

2) Record:

a) Speed before stops
b) Accelerometer recording readings

h. Repeat steps d and e.

6.2.5 Trailer Brake Tests

This subtest shall be conducted in conjunction with the applicable procedures of paragraph 6.2.4.

6.2.5.1 Preparation

Prepare the clothing repair shop as described in paragraph 6.2.4.1, step a.

6.2.5.2 Test Procedure

Determine and record the maximum grade on which the fully loaded trailer will not roll or slide with brakes locked.

6.2.6 Transportability

6.2.6.1 Preparation

Prepare the clothing repair shop as described in paragraph 6.2.4.1.a

6.2.6.2 Land Tests

Determine the following as described in the applicable sections of MTP 10-2-503:

a. Rail transportability including rail car operation and rail humping.
b. Highway transportability including carrier operations and emergency stopping.

6.2.6.3 Marine Tests

a. Load the test item aboard a suitable ship simulating facility capable of simulating actual ship loading conditions, hold and deck space, and ship's pitch and roll, using normal materiel handling equipment and record the following:

1) Ship type simulated
2) Equipment used for loading

3) Location of storage
4) Difficulties encountered loading
5) Materials used for securing

b. Apply a roll of 30°, with a period of 30 seconds, and a pitch of 5° with a period of 30 seconds, and a pitch of 5° with a period of 20 seconds for a minimum of one hour and record the following:

1) Pitch and roll period
2) Accelerometer recording readings
3) Damage to test item or bracing

6.2.6.4 Air Transportability Tests

NOTE: This subtest shall be performed by the designated Test Activity.

Determine and record internal air transportability of the test item as described in the applicable sections of MTP 7-2-515.

6.2.6.5 Logistics-Over-the-Shore (LOTS)

Determine the LOTS characteristics of the test item as described in the applicable sections of MTP 2-2-520 and the following:

a. Load the test item and a suitable towing vehicle aboard a landing craft from a ship anchored offshore using normal ships handling equipment; couple the test item to the towing vehicle, and record the following:

1) Sea state and duration
2) Wind direction and speed
3) Equipment used for loading
4) Difficulties encountered loading or coupling
5) Materials used for securing
6) Damage to test item or towing vehicle

b. Transport the test item to the shoreline, off load and tow through sea and surf up to 20 inches, including vehicle-sinkage depth and wave height, for a minimum of 15 minutes. Tow the test item over the sand to a point not less than two miles from the shoreline, and then disassemble, inspect and set-up for normal operation. Determine the optimum tire pressures for both the test item and the towing vehicle and record the following:

1) Water depth.
2) Difficulties in towing.
3) Test item and towing vehicle tire pressures.
4) Any deficiencies in operation or damage to the components of the test item.

c. Secure the test item for transport, tow it to the shoreline and reload it onto the landing craft by both driving and backing into the craft. Record any difficulties encountered in reloading or damage to the test item.

6.2.7 Cabinet Assembly Water Leakage Test

6.2.7.1 Preparation

Prepare the clothing repair shop for a test as described in 6.2.4.1, step a.

a. Subject the test item to simulated rainfall at the rate of three inches per hour for a minimum of one hour. Expose each side of the test item for a minimum of 15 minutes with exposure including exposure of the top.

NOTE: The direction of rainfall shall include all angles from vertical to 45 degrees from vertical.

b. At the completion of the test, determine and record the following:

1) Amount of water present in the cabinet interior.
2) Damage to components due to water penetration or moisture contamination.
3) Location and reason for water leakage.

6.2.8 Environmental Storage Tests

6.2.8.1 Preparation

Prepare the test item as described in paragraph 6.2.4.1.a.

6.2.8.2 High Temperature Storage

a. Store the test item for four hours in a test chamber producing an air temperature of 155°F at an absolute humidity of 13 grains ft^3 without benefit of solar radiation and with neglible air movement.

b. At the completion of the storage period, perform the following:

1) Disassemble the test item and record any damage or deterioration to the test item or test item components.
2) Ensure proper functioning of the test item by performing the procedures of paragraph 6.2.3 at normal operating atmospheric conditions.

6.2.8.3 Low Temperature Storage

a. Store the test item for 12 hours in a test chamber producing an air temperature of -65°F without benefit of solar radiation and with neglible air movement.

b. Repeat the procedures of paragraph 6.2.8.2.b.

6.2.8.4 Humidity Test

a. Store the test item (packed for storage) for 12 hours in a test chamber producing an air temperature of 85°F at a relative humidity of 100%.

b. Repeat the procedures of paragraph 6.2.8.2.b.

6.2.9 Safety

a. Record the following throughout the test:

1) Normal safety precautions followed on operating the clothing repair shop as indicated in Notes 2 and 3 of paragraph 6.2.
2) Any special precautions required for operating and maintaining the test item.
3) Any condition that might present a safety hazard, cause of the hazard, and steps taken to alleviate the hazard.

b. Check for and record any evidence of ground voltage in machine frames, etc.

6.2.10 Maintainability and Reliability

Evaluate the maintenance-related factors of the test item as described in MTP 10-2-507 with emphasis on the following:

a. Organizational (O), Direct Support (F), and General Support (H) Maintenance requirements.
b. Operator through General Support Maintenance Literature.
c. Repair parts.
d. Tools.
e. Test and handling equipment.
f. Calibration and maintenance facilities.
g. Personnel skill requirements.
h. Maintainability.
i. Reliability.
j. Availability.

6.2.11 Human Factors Evaluation

NOTE: This subtest is conducted to evaluate the man-item relationship during normal trailer use and to compare the test item with a standard or control trailer as to operational characteristics; the man-item relationship, such as ease of assembly, dismantling, and transporting and to determine whether the trailers are safe in operation from the standpoint of electrical transmission. Where test standards do not exist, suitability of the trailers will be based upon the observations and comments of the test supervisory personnel. Comparisons between the characteristics of the test and standard trailers will be considered in determining the suitability of the trailers. Criteria for acceptable noise level will be in accordance with standard noise testing procedures in appropriate QMR.

Human factors evaluation shall be conducted as described in the applicable sections of MTP 10-2-505 and the following:

a. Throughout all testing, observe and record the user's comfort and his capability to operate and maintain the sewing machines.

b. Measure and record the sound level of a fully operating clothing repair shop (all sewing machines operating) at an operator's station and record any adverse effects on test personnel due to noise.

c. Comment on mobility, accessibility, assembling, dismantling, transporting, safety, dependability and noise, as regards human factors.

d. Observe and record any difficulties such as excessive pressure or awkwardness in the operation of controls.

e. Record the environmental conditions both inside and outside the trailer.

f. Throughout the test, observe and record difficulties in accessibility to or operation of the individual components of the test item.

6.2.12 Value Analysis

During equipment set-up, operation, and maintenance of the clothing repair shops, the test personnel shall observe and record any design features that can be eliminated, modified, or simplified without compromising the technical characteristics and safety of the repair shops.

6.3 TEST DATA

6.3.1 Preparation for Test

6.3.1.1 Initial Inspection

Record the following:

a. For the assembled test item:

1) Evidence of damage or deterioration
2) Identification markings:

a) Name of manufacturer
b) Number and date of contract
c) Date of manufacture

b. For each component:

1) Evidence of defects in:

a) Manufacturing
b) Material
c) Workmanship

2) Evidence of deterioration
3) Evidence of damage
4) Identification markings:

a) Identification, name, and serial number

b) Caution instructions
c) Service instructions
d) Manufacturer's name and date of manufacture

5) Evidence of shortages

6.3.1.2 Physical Characteristics

Record the data collected as described in the applicable section of MTP 10-2-500 and the following:

a. For the assembled test item:

1) Weight, in pounds
2) Overall dimensions, in feet and inches, of:

a) Length
b) Width
c) Height

3) Cubage, in ft^3
4) Center of gravity
5) Dimensions, in feet and inches, of:

a) Access openings
b) Storage compartments
c) Material for operator or passenger use

b. For the test item components:

1) Weight, in pounds
2) Overall dimensions, in feet and inches, of:

a) Length
b) Width
c) Height

3) Cubage, in ft^3

6.3.1.3 Operator Training and Familiarization

Record the following:

a. Data collected as described in the applicable sections of MTP 10-2-501.

b. For civilian personnel:

1) Rating (GS or WB)
2) Job title
3) Job experience

c. For each member of the test team:

1) Rank
2) MOS
3) Training time in MOS, in months
4) Experience in MOS, in months

6.3.2 Test Conduct

6.3.2.1 Electrical Tests

6.3.2.1.1 Continuity Tests -

Record the following:

a. Cable identification markings, if applicable.
b. Defects in cables:

1) Shorts
2) Opens
3) Incorrect wiring
4) Frayed insulation
5) Other defects

c. Manufacturer, model, and serial number of defective sewing machine motors.

6.3.2.1.2 Generator Tests -

a. Record the following for the generator with no load:

1) Minimum generator output voltage, in volts
2) Maximum generator output voltage, in volts
3) Generator speed, in rpm at 120 volts output

b. Record the following for each power line:

1) For each load condition:

a) Number and type machine(s) on line
b) Type load (operating, sewing, stalled)

2) Voltage
3) Current
4) Power factor
5) Wattage

c. Record the following for the generator under load:

1) For each load condition:

a) Number and type machine(s)

b) Type load (operating load, stalled)

2) Generator output voltage, in volts
3) Generator speed, in rpm

6.3.2.2 Electromagnetic Compatibility

Record data collected as described in applicable sections of MTP 2-2-613.

6.3.2.3 Performance Tests

6.3.2.3.1 Fabric Sewing Machines -

Record the following for each test run:

a. Machine type, model and serial number
b. Stitch length, in inches
c. Number of stitches per inch
d. Evidence of any of the following:

1) Loose stitches
2) Poorly formed stitches
3) Crowded stitches
4) Tight stitches
5) Crooked stitches
6) Slipped stitches
7) Broken needles
8) Thread breakage

e. Needle and thread size
f. Type of fabric

6.3.2.3.2 Button Sewing Machine -

Record the following for each test run:

a. Machine model and serial number
b. Type of button attached
c. Size of needle and thread
d. Type of test fabric
e. Defects in attached buttons

6.3.2.4 Durability Tests

6.3.2.4.1 Preparation -

Record the location of recording accelerometers

6.3.2.4.2 Test Procedure -

Record the following:

a. Data collected as described in the applicable sections of MTP 10-2-502.
b. For each quick start and stop:

1) Road condition (paved, gravel, cross-country)
2) Speed before stop, if applicable, in mph
3) Accelerometer recording readings, in G's
4) Grade and type of slope

c. Weather conditions (clear, raining, etc.)
d. Any damages incurred
e. Any malfunctioning of sewing machines

6.3.2.5 Trailer Brake Test

Record the maximum grade, in percent, on which the fully loaded trailer will not roll or slide with brakes locked.

6.3.2.6 Transportability

6.3.2.6.1 Preparation -

Record location of accelerometers.

6.3.2.6.2 Land Tests

Record the following:

a. Rail transportability data collected as described in the applicable sections of MTP 10-2-503.
b. Highway transportability data collected as described in the applicable sections of MTP 10-2-503.

6.3.2.6.3 Marine Tests -

Record the following:

a. Ship type simulated
b. Equipment used for loading
c. Location of storage
d. Difficulties encountered loading
e. Materials used for securing
f. Pitch and roll period, in seconds
g. Accelerometer recording readings, in G's
h. Damage to test item or bracing

6.3.2.6.4 Air Transportability Tests -

Record data collected as described in the applicable sections of

MTP 7-2-515.

6.3.2.6.5 Logistics-Over-the-Shore (LOTS) -

Record the following:

a. Data collected as described in the applicable sections of MTP 2-2-520.

b. During loading:

1) Sea state (1, 5, etc.) and duration, in seconds
2) Wind direction and speed, in knots
3) Equipment used for loading
4) Difficulties encountered loading or coupling
5) Materials used for securing
6) Damage to test item or towing vehicle

c. During off-loading and towing operations:

1) Water depth, in inches.
2) Difficulties in towing.
3) Test item and towing vehicle tire pressures, in psi.
4) Any deficiencies in operation or damage to the components of the test item.

d. During reloading operations:

1) Difficulties encountered reloading
2) Damage to the test item

6.3.2.7 Cabinet Assembly Water Leakage Test

Record the following:

a. Simulated rainfall rate, in inches per hour.
b. Direction of rainfall, in degrees from vertical.
c. Time of application, in minutes.
d. Amount of water in cabinet interior, if applicable.
e. Damage to components such as sewing machines, stored thread, etc., due to water penetration or moisture contamination.
f. Location and reason for water leakage, if applicable.

6.3.2.8 Environmental Storage Tests

Record the following for each test:

a. Type of storage
b. Temperature of storage, in °F
c. Relative or absolute humidity, as applicable
d. Damage to test item component
e. Data collected as described in paragraph 6.2.3

6.3.2.9 Safety

Record the following throughout the test:

a. Normal safety precautions followed in operating the clothing repair shop.
b. Any special precautions required for operating and maintaining the test item.
c. Any condition that might present a safety hazard, cause of the hazard, and steps taken to alleviate the hazard.
d. Evidence of ground voltage in machine frames, etc.

6.3.2.10 Maintainability and Reliability Evaluation

Record data collected as described in the applicable sections of MTP 10-2-507.

6.3.2.11 Human Factors Evaluation

Record the following:

a. Data collected as described in the applicable sections of MTP 10-2-505.
b. Evaluation of the using personnel concerning their comfort.
c. Noise level in decibels for all noise measurements, position and distance from each machine of each measurement, and any adverse effects on test personnel.
d. Comments on mobility, accessibility, assembling, dismantling, transporting, safety, dependability, and noise.
e. Difficulties such as excessive pressure or awkwardness in the operation of controls.
f. Difficulties arising from man-item relationships and actions taken to overcome them.

6.3.2.12 Value Analysis

Record the following:

a. Non-functional features
b. Costly features
c. Nice-to-have features
d. Possible design eliminations, simplifications, or modifications

6.4 DATA REDUCTION AND PRESENTATION

6.4.1 General

A preliminary report shall be submitted in accordance with USATECOM Regulation 385-6, based on the data collected related to Safety.

Data shall be summarized to reveal significant discrepancies between

specified and observed performance, and presented in chart, tabular, or graphic form, as appropriate, presented as described in the applicable sections of the appropriate MTP's, and as follows:

6.4.2 Electrical Tests

6.4.2.1 Generator Tests

Perform the following calculations:

a. Average the three readings of:

1) Voltage
2) Current
3) Power factor
4) Wattage

b. Calculate the load on each generator coil using the following formula:

$$\text{Load} = \frac{I}{\sqrt{3}}$$

I = average current in one power line

c. Determine the maximum, minimum and average fuse loads for each machine.

d. Tabulate the measured data and calculated generator coil loads.

6.4.3 Sewing Machine Tests

Calculate the maximum stitches/min. for each test run using the following formula and the measured data:

Stitches/Min = 10 x Stitches/inch x inches/0.1 minute

Tabulate the measured and calculated data.

6.4.4 Durability Tests

Tabulate the accelerometer readings for each axis of the test item during each test run. Plot a graph which will show shock level as a function of speed before stopping for each axis of the test item. Summarize the damages sustained to the equipment as a result of the durability tests.

6.4.5 Transportability Test

a. Data shall be reduced and presented as described in the applicable sections of:

1) MTP 10-2-503 for surface transportability tests

2) MTP 7-2-515 for internal air transportability tests
3) MTP 2-2-520 for logistics-over-the-shore-tests

b. Marine test accelerometer data shall be tabulated for each axis for each indicated test condtion and the results, along with a summary of damage sustained due to test conditions and time, presented in chart form.