JCP-I, DPG

RDTE PROJECT NO/FSN_____

USATECOM PROJECT NO. 1-VG-120-151-036

INITIAL PRODUCTION TEST (SURFACE TRANSPORTABILITY) OF TRUCK, UTILITY: 1/4-TON 4x4, M151A2

TEST PLAN

BY

JOSEPH J. FRANK

JANUARY 1970

U S ARMY
GENERAL EQUIPMENT TEST ACTIVITY
FORT LEE, VIRGINIA

FOR [illegible]

ACTION BY [illegible] PENDING

701530

JCP-I, DPG

DEPARTMENT OF THE ARMY Mr McNeil/4996/mmr
HEADQUARTERS, U. S. ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND 21005

AMSTE-BB

11 MAR 1970

SUBJECT: USATECOM Approved Test Plan for Initial Production Test (Surface Transportability) of Truck, Utility: 1/4-Ton, 4X4, M151A2, USATECOM Project No. 1-VG-120-151-036

Commanding General
U.S. Army Tank-Automotive Command
ATTN: AMSTA-QKP
Warren, Michigan 48090

1. Reference letter, USATECOM, AMSTE-BB, subject: USATECOM Approved Test Plan of Initial Production Test of Trucks, Utility: 1/4-Ton, 4X4, M151A2, USATECOM Project No. 1-VG-120-151-036, 29 January 1970.

2. Revised plans of test by U.S. Army General Equipment Test Activity are forwarded for your information and retention. Concurrence and/or comments are requested within 30 days.

FOR THE COMMANDER:

JOHN P. WHEELER, JR.
Colonel, GS
Dir, Arm Mat Test Dir

1 Incl
as(2 cys)

Copies furnished:
CG, USAMC, ATTN: AMCRP-L, 3 cys
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CG, USATACOM, ATTN: AMSTA-REB, 3 cys

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USATECOM PROJECT NO. 1-VG-120-151-036

INITIAL PRODUCTION TEST (SURFACE TRANSPORTABILITY) OF TRUCK, UTILITY: 1/4-TON 4x4, M151A2

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Transportability Test Division

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SECTION 1. INTRODUCTION

1.1 BACKGROUND

a. The safety of the M151 series vehicles has been found lacking under certain driving conditions, and the vehicles produced under the current 3-year contract have demonstrated a number of deficiencies.

b. A modified independent rear suspension consisting of trailing arms to replace the lateral swing arms has been tested and evaluated. The trailing arm design has eliminated oversteer and produces sufficient body roll to provide a warning of impending danger during turns.

c. Three successive but separate test programs all performed on nineteen vehicles of the current 3-year contract have accumulated a total of 340,000 miles. Major deficiencies include the transmission-transfer case, rear axle differentials, and rear axle drive shaft universal joints. The first two test programs, an initial inspection test and a product improvement test, established the serious nature of these deficiencies. The third test, an extended inspection comparison test, disclosed correction of certain problems in the deficient components, but that other problems still persisted requiring additional testing to establish the merits of further improvements. The quality of the vehicles was poor; fasteners were improperly tightened and were incapable of maintaining torques or adjustments.

d. The M151A2 vehicle provided for this test will incorporate the modified independent rear suspension and other safety features as well as improvement of deficient components and will be evaluated for surface transportability movement.

1.2 DESCRIPTION OF MATERIEL

a. While the overall configuration of the Truck, Utility: 1/4-Ton, 4x4, M151A2 remains basically the same as previous models, most of the changes are identificable by inspection. There are 23 areas where changes are expected. Readily noticeable are the larger one-piece windshield and rear window, the deep dish steering wheel, the windshield washer and wipers, and the larger class "A" lights. The mechanical fuel pump is located on the right side of the engine and the trailing arm suspension at the rear and underside of the body.

b. The M151A2 vehicle dimensions, capacities, and weight remain unchanged. The vehicle is still powered by the four cylinder, water

cooled, gasoline engine, a four-speed forward transmission, and selective front wheel drive. Performance characteristics, such as gradeability, maximum speed, braking, water fording and cross-country mobility, are the same as previous M151 series vehicles although overall safety of the vehicle is improved.

1.3 TEST OBJECTIVES

a. To provide information to support a USATECOM position on suitability for release (Surface Transportability) as required by AMC Regulation 700-34.

b. To establish whether surface transportability characteristics are adversely affected by the changes constituting the M151A2 vehicle.

1.4 SCOPE

a. The Truck, Utility: 1/4-Ton, 4x4, M151A2, will be tested at Fort Lee and Fort Eustis, Virginia, during the period Februray - June 1970. One test vehicle is to be furnished and is scheduled for arrival in February 1970. The test criteria used in this plan were adopted from AR 705-8. Upon approval, these criteria will be used for determining the degree to which the M151A2 has met the test objectives and constitute the basis for the Headquarters, USATECOM determination of suitability of the M151A2 for surface transportability.

b. Evaluation of the lifting and tiedown eyes on the M151A2 will be in accordance with MIL-STD-209C.

c. Prior to actual testing, a thorough inventory and a visual pre-operational inspection will be made on the M151A2. All services and preventive maintenance procedures will be accomplished as outlined in the technical manual. All equipment faults and inventory shortages will be recorded throughout the inspection and subsequent testing. Equipment performance reports (EPR's) will be prepared as required, and photographs taken when applicable.

d. Following the preoperational inspection, testing will be initiated and conducted, and USAGETA will, in the time frame programmed, accrue maximum test mileage, but not less than a 1,000-mile break-in run for the M151A2 prior to initiation of transportability testing. Mileage and operational hours will be recorded during movement between test sites and during all subtests. Maintenance, safety, and human factors data generated during testing will be obtained, assessed, and reported.

SECTION 2. DETAILS OF TEST

2.1 PREOPERATIONAL INSPECTION

2.1.1 Objective

To determine any damage which may have occurred during transport and whether the M151A2 is in proper condition to begin test operations.

2.1.2 Criteria

The M151A2 shall satisfactorily conform to the provisions of the applicable technical manuals in regard to operational condition (App. II, Item 1).

2.1.3 Method

A visual technical inspection will be performed on the M151A2 upon arrival at Fort Lee, Virginia. The M151A2 will be prepared for operation as required by the applicable technical manuals. If not previously operated, the M151A2 will be subjected to preliminary break-in operation to insure that it is in proper condition for test operation. If any deficiencies or shortcomings are found during the technical inspection, the commodity command or contractor will be notified prior to repair or replacement and prior to initiation of testing. Maintenance accomplished will be recorded as to man-hours, personnel, equipment, and tools required.

2.1.4 Data Required and Analytical Plan

a. Description of damage occurring during transport.

b. Description of any deficiencies and shortcomings existing at the time of the technical inspection, and required personnel, man-hours, and actions to correct them.

c. Man-hours, personnel, tools, and equipment required to service the M151A2 for operation.

d. Mileage on the odometer and hours on the hourmeter if so equipped at time of receipt of the test item.

2.2 FAMILIARIZATION AND TRAINING

2.2.1 Objective

To determine that test personnel with MOS of 63A10, 64A10, 63B, 63G, or 63H are capable of operating and maintaining the M151A2, or preparing the M151A2 for transport without special training.

2.2.2 Criteria

a. Operational Personnel. The number of personnel required to operate the vehicle (driver) shall not exceed one under all duty conditions. All operator tasks to be performed shall be within the capability of personnel possessing MOS 64A10, Light Vehicle Driver (App. II, Item 2).

b. Maintenance Personnel. The number of personnel required to perform operational maintenance shall not exceed one under duty conditions. (App. II, Item 3).

c. Training Consideration. Operators and mechanics will not need any special training other than familiarization with the vehicle in the unit (App. II, Item 4).

d. Training Devices. The vehicle and its components will be the only training device required (App. II, Item 5).

e. Personnel Prerequisites. Personnel prerequisites shall not exceed those included in the following MOS's (App. II, Item 6):

63A10, Automotive Maintenance Apprentice

64A10, Light Vehicle Driver

63B, Wheel Vehicle Mechanic

63G, Fuel and Electrical System Repairman

63H, Automotive Repairman

2.2.3 Method

a. Personnel with MOS 64A10 will be assigned as vehicle operators for the test. These personnel will be furnished copies of the technical manuals for the M151A2 which they will study prior to operating and

performing daily maintenance on the M151A2. After studying the manuals, using the M151A2 as a training aid where necessary, the operators will demonstrate to the project director their ability to perform required operator maintenance and then will drive the M151A2 over a course containing paved roads, secondary roads, and cross-country terrain. The project director will record any tasks which cannot be adequately performed without special training.

b. One Automotive Maintenance Apprentice, MOS 63A10, and a Wheel Vehicle Mechanic, MOS 63B, will be assigned to the project to maintain the M151A2. These personnel will study the technical maintenance manual of the M151A2. Whenever maintenance is required to be performed during the test, the wheel vehicle mechanic, with the assistance of the Automotive Maintenance Apprentice, will accomplish the required tasks. The project director will record those tasks which the maintenance personnel are unable to perform without special training.

2.2.4 Data Required and Analytical Plan

a. Operator and maintenance tasks which cannot be performed without special training.

b. Operator or maintenance instructions in the technical manuals that require change.

c. Features of the M151A2 that are difficult to learn to operate or maintain.

d. Daily mileage and operational hours. Total man-hours required to train operators and mechanics.

2.3 1,000-MILE VEHICLE BREAK-IN OPERATIONS

2.3.1 Objective

To assure adequate break-in of the M151A2 1/4-ton utility truck.

2.3.2 Criteria

a. The vehicle will be given a 1,000-mile break-in run over hard surface and gravel roads at road speeds not in excess of 50 mph (App. II, Item 7).

b. The MIL-L-2105B grade SAE 140W gear oil supplied with the vehicle in the differential carriers will remain in the carriers during the 1,000 miles of operation. (Any oil added during the 1,000 miles will be the SAE 90W oil) (App. II, Item 8).

c. No payload or trailed load will be carried during the break-in operation (App. II, Item 9).

2.3.3 Method

The M151A2 truck, without payload or trailed load, will be operated over hard surface and gravel roads at speeds of less than 50 mph for 1,000 miles during the break-in operation. Ten 100-mile cycles and one cycle, consisting of 50 miles over hard surface and 50 miles over gravel roads will be conducted to achieve break-in mileage of the test vehicle. The work day will consist of 10 hours per day, with 2 hours utilized for vehicle-preoperational and after-operation service and maintenance.

2.3.4 Data Required and Analytical Plan

a. Mileage and time required to traverse each cycle over hard surface and gravel roads.

b. Deadline time during this operation.

c. Maintenance man-hours, both scheduled and unscheduled during break-in period.

d. Fuel and oil consumed.

e. Grease and repair parts used.

f. Observations on all phases of the operation including mobility, maximum speed obtained on each cycle and portion of course, maneuverability, and any difficulties experienced.

2.4 HIGHWAY TRANSPORTABILITY

2.4.1 Objective

To determine the suitability of the M151A2 for transport over highways (self-propelled, carried, and towed).

2.4.2 Criterion

The test item shall be capable of being transported by highways (App. II, Item 10).

2.4.3 Method

a. At Fort Lee, Virginia, the M151A2 will be loaded aboard and tied down on an M127 or M172A1 semitrailer and transported over the movement adaptability course for 7.5 miles. To test the adequacy of the tiedowns and the ability of the M151A2 to withstand the shock forces which could occur under this mode of transportation, three emergency stopping tests will be conducted at each speed of 10, 20, 30, and 45 mph on a level dry highway. Prior to the performance of the emergency stopping tests, the transporter and the test item will be instrumented with recording accelerometers to record longitudinal, transverse, and vertical shock forces imposed during the emergency stops. A device consisting of a detonator which fires a marking charge when the brake pedal is depressed will be used to eliminate driver-reaction time from the stopping distance. After each emergency stopping test, the load and tiedowns will be inspected to determine the amount of load shift, condition of blocking and bracing, and evidence of improper stowage of equipment or any displacement of or damage to components. Stopping distances between point marked by the detonator charge and cessation of movement will be recorded. After completion of all emergency stopping tests, an operational checkout test will be conducted. Measurement of the test item and semitrailer will be obtained for any highway restrictions encountered.

b. The empty M151A2 in a free-wheeling condition, and with its front end and then its back end lifted off the ground will be towed, using a standard 5-ton towbar, by an M62 5-ton wrecker over the movement adaptability course.

2.4.4 Data Required and Analytical Plan

a. Man-hours and personnel utilized to load and secure the M151A2 on military standard semitrailers.

b. Number, size, and type of lashing, chock blocks, or bracing utilized to secure the M151A2 on military standard semitrailers.

c. Measurement of physical characteristics of the M151A2 when transported on military standard semitrailers.

d. Speed of transporting vehicle and stopping distance at each speed during emergency stopping tests.

e. Shock forces encountered on the transporter and M151A2 during emergency stopping tests.

f. Deficiencies and shortcomings noted on the M151A2 or tiedowns as a result of emergency stopping tests.

g. Man-hours and personnel utilized to remove tiedowns and unload the M151A2 from transporting vehicles.

h. Observations regarding restrictions when towed by the M62 wrecker and using the standard 5-ton towbar.

2.5 RAIL TRANSPORTABILITY

2.5.1 Objective

To determine the suitability of the M151A2 for transport by railcar.

2.5.2 Criteria

a. The vehicle shall be capable of safe transport without major disassembly over principal U.S. and foreign, standard, and narrow gage main line railways at normal speeds (App. II, Item 11).

b. The Association of American Railroads (AAR) Publication entitled "Rules Governing the Loading of Commodities in Open-Top Cars", Section 6, Figure 51A, shall be used to select the applicable car-loading procedure for the vehicle (App. II, Item 12).

2.5.3 Method

a. The M151A2 will be loaded crosswise aboard a 50-ton USAX Military Standard railway flatcar equipped with AAR couplers. The M151A2 will be blocked, braced, and tied down in accordance with procedures outlined in AAR, Rules Governing the Loading of Department of Defense Materiel on Open Top Cars. The flatcar with the M151A2 will then be subjected to one impact test at speeds of 4, 6, and 8 mph in one direction of travel of the railcar, and one at 8 mph in the opposite direction, into one or more railcars having a weight of 169,000 pounds, with the brakes set. Prior to performance of the impact tests, the deck of the flatcar and the M151A2 will be instrumented with recording accelerometers to

record longitudinal, transverse, and vertical shock forces imposed by the impact tests. An electrical timing device actuated by the passage of the flatcar will be mounted on the tracks approximately 10 feet ahead of the point of impact to record the exact speed of the striking car. The striking car will be accelerated to the desired impact speed by a locomotive equipped with a 5th wheel calibrated in increments to 1/10th mph and released approximately 50 feet ahead of the buffer railcars and allowed to coast until it impacts into the buffer railcars. After each impact, the M151A2 and tiedowns will be inspected to determine the amount of load shift, condition of blocking and bracing, or evidence of possible failure or damages. Once the test has begun, there will be no readjustments of load, or reconditioning of bracing or chock material and tiedowns. When testing must be stopped due to impending failure and possible damage to the M151A2 or outright failure of the loading method, the impact tests will be considered a failure. Tests will be rerun if a revised loading method is considered feasible. Following completion of all impact tests, the M151A2 will be examined for any displacement of, or damage to components, and proper stowage of equipment, and an operational checkout test will be conducted.

b. The M151A2 placed on an 80-ton foreign service flatcar, will be passed through the rail clearance device to determine any restrictions within AAR, International Universal Gage, and Composite (Broad Gage) clearance diagrams. If the M151A2 fails to clear the devices, the amount of disassembly and the organizational level needed to disassemble to achieve clearance will be accomplished.

c. From the data obtained in the rail operations, a comparison will be made of the physical dimensions and weight of the M151A2 with the size of military standard railway cars, flat, and foreign service (MIL-STD-435A) against Composite (Narrow Gage) rail clearance (Standard MS-35832) to determine transportability by the foreign service narrow gage flatcar.

2.5.4 Data Required and Analytical Plan

a. Man-hours and personnel utilized to secure the M151A2 on a 50-ton USAX Military Standard railway flatcar.

b. Number, size, and type of lashing, chock blocks, and bracing utilized to secure the M151A2 on the 50-ton USAX Military Standard railway flatcar.

c. Speed of railcar during impact tests.

d. Shock forces encountered on railcar and the M151A2 during rail impact tests.

e. Deficiencies and shortcomings due to the crosswise loading, the modified suspension system, and relocated tiedown positions, as a result of rail impact tests.

f. Man-hours and personnel utilized to remove tiedowns and unload the M151A2 from the 50-ton USAX Military Standard railway flatcar.

g. Measurement of restrictions, if any, of the M151A2 when loaded on a railcar with a 4-foot 5 3/8-inch car deck height within the restrictions of the AAR, International Universal Gage, and Composite (Broad Gage) Clearance Diagrams.

h. Measurement of restrictions, if any, of the M151A2 when loaded on a railcar with a 3-foot 7-inch or 4-foot 2 5/8-inch car deck height within the restrictions of the Composite (Narrow Gage) Clearance Diagrams (MS 35832).

2.6 MARINE TRANSPORTABILITY

2.6.1 Objective

To determine the suitability of the M151A2 for transport by water-craft (ocean and inland waterways).

2.6.2 Criterion

The vehicle shall be suitable in all respects for loading into and transporting in applicable cargo ships and landing vessels (App. II, Item 13).

2.6.3 Method

a. At Fort Eustis, Virginia, the M151A2 will be loaded aboard the Landship, SS Neversail, using the ship's stevedore crew and gear. The standard 5-ton sling with spreader bars will be used for slinging the M151A2 for loading and unloading operations. The M151A2 will be lifted aboard by the ship's gear and lowered into the hold of the Landship where it will be secured as for shipment, using available ships' tiedown material. Upon completion of all securing operations, the restraint media will be removed and the M151A2 will be off-loaded onto the dock. Throughout the test, all individual operations will be timed and personnel and equipment will be recorded. Any difficulties encountered during any of the operations will be noted and recorded.

b. At Fort Eustis, Virginia, the M151A2 will be driven over the lowered ramp and into a Landing Craft Mechanized, Mark VIII (LCM-8) with the vessel's loading ramp extended to the most critical angle. The M151A2 will be driven onto, backed off, backed on, and driven off to check the angles of approach, departure, and break.

2.6.4 Data Required and Analytical Plan

a. Ramp angle of the LCM-8 when the M151A2 was driven onto and off the inland water vessel.

b. Time and number of personnel utilized to install the 5-ton standard sling for marine lift of the M151A2.

c. Time and number of persons utilized to lift the M151A2 from dockside and position in the hold of the Landship.

d. Time and number of persons used to remove the 5-ton sling from the M151A2.

e. Time and number of persons utilized to secure the M151A2 in the hold of the Landship using the ship's lashing gear.

f. Time and number of persons utilized to remove the lashing gear and then install the 5-ton sling for off-loading.

g. Time and number of persons utilized to lift the M151A2 from the ship's hold and lower it onto dockside.

h. Time and number of persons utilized to remove the 5-ton sling.

i. Any difficulties encountered in adapting the 5-ton sling or loading the M151A2.

2.7 LIFTING AND TIEDOWN ATTACHMENTS

2.7.1 Objective

To determine the suitability of the lifting and tiedown devices and their compliance with MIL-STD-209C.

2.7.2 Criterion

Vehicle tiedowns and lifting shackles shall be provided and shall withstand the forces, and shall be in accordance with MIL-STD-209C.

With the objective of maximizing personnel safety, the lift points shall be so located as to be accessible when the vehicle is confined in restricted spaces. The lift points shall be so oriented that when the vehicle is suspended, the vehicle shall not come into contact with the sling legs. The lifting device design shall take into account dynamic and impact loadings which occur under adverse handling conditions during amphibious operations. Wheel hub lifting is not acceptable. The lift points shall be so designed and oriented as to be capable of being utilized with spreader bars and slings (5-ton) of MIL-S-22824 (App. II, Item 14).

2.7.3 Method

Throughout all transportability testing, the suitability of the lifting and tiedown devices will be observed and any difficulty encountered in their use will be recorded. The devices will be measured for conformance to the dimensional standards and subjected to the static load requirements specified in MIL-STD-209C.

2.7.4 Data Required and Analytical Plan

a. Observations regarding restrictions in the use of tiedown and lifting devices during all transportability testing.

b. Measurements of lifting and tiedown devices, including number and location.

2.8 MAINTENANCE EVALUATION

2.8.1 Data Acquisition

2.8.1.1 Objective. To accumulate data during 1,000-mile break-in and transportability testing from which the following maintainability and availability characteristics of the test item can be computed:

(1) Mean time to repair (MTTR).

(2) Mean time between failures (MTBF).

(3) Maintenance Ratio (MR).

(4) Mean downtime (MDT).

(5) Mean active maintenance downtime ($\overline{M}$).

(6) Mean time between maintenance (MTBM).

(7) Inherent availability (A_i).

(8) Achieved availability (A_a).

2.8.1.2 Criterion. Not applicable for USAGETA test responsibilities.

2.8.1.3 Method

a. Data will be collected and recorded by maintenance observer/recorders only on actual maintenance requirements during the 1,000-mile break-in period and during conduct of the Transportability Test (per telephone conversation between USAGETA/USATECOM 5 Jan 70). Maintenance evaluators will evaluate collected data for analysis and computation of the maintainability and availability characteristics.

b. Equipment Performance Reports (AMSTEForm 1025) will be initiated on all inadequacies discovered during testing.

2.8.1.4 Data Required and Analytical Plan

a. Collected data will include:

(1) Each scheduled and unscheduled maintenance action, maintenance tasks performed, total man-hours expended, number and MOS of personnel used, and total downtime in clock hours.

(2) Identification of the failed component or assembly and the accumulated operating time of the test item and accumulated operating time of the failed component or assembly.

(3) The time required in man-hours and clock hours (down-time) to correct chargeable system failures.

(4) Identification of all parts repaired or replaced by noun nomenclature, FSN, functional group number, or manufacturer's part number.

(5) Record of administrative and supply downtime.

b. Raw maintenance data will be presented on Maintenance Analysis Charts (USATECOM Reg. 750-15, App. C) and described in narrative form in the body of the report.

2.8.2 Tools and Test Equipment

2.8.2.1 Objective. To determine the allocation and to assess the adequacy of the common and special tools and test equipment as provided in the maintenance test package.

2.8.2.2 Criterion. Common and special tools and test equipment used during the test shall be suitable and needed for their intended purpose and prescribed maintenance level (USATECOM Reg. 750-15) (App. II, Item 15).

2.8.2.3 Method. Maintenance personnel will utilize common and special tools and test equipment in the proper manner following the instructions contained in the equipment publications provided for the test equipment.

2.8.2.4 Data Required and Analytical Plan

a. Collected data will include the following:

(1) Maintenance level.

(2) Adequacy and simplicity of tools and test equipment used.

(3) Adequacy of instructions contained in equipment publications for use of tools and test equipment.

(4) Whether tools and test equipment are excessive based on experience with similar items.

(5) Whether special tools could be replaced with common tools.

(6) Whether the tools and test equipment perform their intended tasks.

(7) Identification of special tools or test equipment which are required, but not available, in the TOE or maintenance test package.

b. Collected raw data will be presented on Special Tools and test Equipment Charts (USATECOM Reg. 750-15, App. F) and described in a narrative form in the test report.

2.8.3 Equipment Publications

2.8.3.1 Objective. To determine the adequacy of the equipment publications as provided in the maintenance test package for conduct of the 1,000-mile break-in and transportability testing.

2.8.3.2 Criteria

a. The equipment publications must completely and adequately reflect the system they support and be easily and completely understood by maintenance personnel (USATECOM Reg. 750-15) (App. II, Item 16).

b. The equipment publications must be consistent within themselves (USATECOM Reg. 750-15) (App. II, Item 16).

c. The equipment publications must contain all essential operating and maintenance information (USATECOM Reg. 750-15) (App. II, Item 16).

2.8.3.3 Method

a. All maintenance actions performed will be closely observed by a representative of the Maintenance Evaluation Division.

b. The format of equipment publications will be reviewed in accordance with AR 310-3.

c. Equipment publications will be analyzed for all applicable operations to determine whether the instructions for clear and sequence of operations are adequate for the training level possessed by appropriate maintenance personnel. Lubrication orders will be analyzed for completeness and clarity.

2.8.3.4 Data Required and Analytical Plan

a. Results of the analysis of the equipment publications will be presented on the maintenance package literature charts (USATECOM REG. 750-15, App. E) and described in narrative form in the body of the report.

b. Inadequacies or suggested improvements will be reported by Equipment Performance Reports (AMSTE Form 1025 and by use of DA Form 2028).

2.8.4 Repair Parts

2.8.4.1 Objective. To assess the requirement for and determine the adequacy of the repair parts as provided in the maintenance test package during 1,000-mile break-in and transportability testing.

2.8.4.2 Criterion. Repair parts must be replaceable at the authorized maintenance level indicated in the equipment manuals (USATECOM Reg. 750-15) (App. II, Item 17).

2.8.4.3 Method. Replacement of repair parts will be closely monitored to insure that the common or special tools required for installation are compatible with the authorized maintenance level of the repair part.

2.8.4.4 Data Required and Analytical Plan. Collected raw data will be presented on the Parts Analysis Chart (USATECOM Reg. 750-15, App. D) and described in narrative form in the body of the report.

2.8.5 Design for Maintainability

2.8.5.1 Objective. To determine whether the test item meets the maintainability design requirements as specified by established criteria during the 1,000 mile break-in and transportability testing.

2.8.5.2 Criterion. The test item shall demonstrate good maintainability design principles and characteristics using USAMC Pamphlet 706-34 as a guide (USATECOM Reg. 750-15) (App. II, Item 18).

2.8.5.3 Method. Maintenance operations will be monitored by maintenance evaluators to determine the design of the test item for maximum utilization of interchangeable components; for ease of maintenance; to minimize maintenance and supply requirements; to enable removal of major components as individual units; and for maximum capability of maintenance operations with common tools.

2.8.5.4 Data Required and Analytical Plan. Discrepancies will be recorded and reported in narrative form in the body of the report.

2.8.6 Storage Compartments and Storage Components

2.8.6.1 Objective. To determine whether the storage compartments and storage components are adequate for their intended purpose during 1,000-mile break-in and transportability testing.

2.8.6.2 Criterion. The storage compartments and storage components shall be suitable and needed for their intended purpose (USATECOM Reg. 750-15) (App. II, Item 19).

2.8.6.3 Method. Storage components and compartments will be evaluated and examined to determine whether they:

a. Provide adequate protection against weather, grease, oil, dirt, and physical damage.

b. Are of adequate size, strength, and durability.

2.8.6.4 Data Required and Analytical Plan. Discrepancies will be recorded and reported in narrative form in the body of the report.

2.9 HUMAN FACTORS EVALUATION

2.9.1 Objective

To determine the adequacy of the test item design with regard to its capability to be transported by user personnel.

2.9.2 Criteria

a. The test item design must provide accessible and usable tiedowns to enable the user to secure the item on the carrier (USAGETA Document: Human Factors Evaluation Data for General Equipment - HEDGE).

b. Instructional labels must be provided on the item to warn the user of potential hazards during transport, to specify proper tiedown locations, and to clarify special maintenance procedures required before, during, and after transport (HEDGE).

c. Instructional documents must provide clear and complete illustrated procedures for preparing the item for transport, on-board status checks of tiedown and preoperational item preparation and check-out.

d. The three human factors criteria above shall apply to the item for each mode of transport utilized during the test (HEDGE).

2.9.3 Method

a. Trained human factors specialists will observe selected test transport operations. Human factors technical checklists will be completed

by the specialists to record the potential problem areas observed. Follow-up personnel interviews will be conducted to obtain user reactions and subjective data to clarify and further define the observed human factors problems.

b. Throughout testing, all test personnel will observe any difficulties that may be encountered in performing the man/tasks required in transporting the test item via the carriers. All observations will be recorded in the test logbook.

c. All significant human factors findings will be documented and illustrated using motion pictures and black-and-white still photographs.

2.9.4 Data Required and Analytical Plan

a. Completed human factors technical checklist along with follow-up interview data collected from test personnel will be obtained.

b. User comments and reported problem areas rendered by test operating personnel will be recorded.

c. Photographs and motion pictures will be obtained which illustrate and document the observable human factors findings.

2.10 SAFETY EVALUATION

2.10.1 Objective

To determine if there are any safety hazards when transporting, operating, or maintaining the M151A2 during all transportability testing.

2.10.2 Criteria

a. All handling surfaces and the immediate surrounding area of assemblies or components which are intended for replacement shall be designed without sharp edges or corners to reduce any possible injury to maintenance personnel (App. II, Item 24).

b. Maximum safety shall be provided for personnel and equipment during the operation, transportation, and maintenance phases of the testing of the equipment. Such items as hand holds, safety straps, guards around heat sources, moving parts and warning signs or decals must be provided (App. II, Item 24).

c. The test item shall demonstrate its compliance with the safety release indicated in paragraph 7 of the Test Directive (App. II, Item 24).

2.10.3 Method

a. During the conduct of all subtests, observations will be made by the project director and operating crew to determine if any safety hazards exist relative to transporting, operating, and maintaining the M151A2. All safety hazards will be noted and recorded. No special tests will be performed.

b. Inclosure No. 1 of USAGETA Memorandum 385-8 will be used as a safety checklist throughout the conduct of all tests.

c. Representatives of the GETA Safety Division will intermittently observe the conduct of the test to insure that no undue safety hazards exist in the test item and that no unsafe procedures are employed during the test.

2.10.4 Data Required and Analytical Plan

Any existing or potential safety hazards.

SECTION 3. APPENDICES

APPENDIX I - TEST DIRECTIVE

APPENDIX II - TEST CRITERIA

APPENDIX III - SUPPORT REQUIREMENTS

APPENDIX IV - TEST SCHEDULE

APPENDIX V - REFERENCES

APPENDIX VI - DISTRIBUTION LIST

APPENDIX I. TEST DIRECTIVE

DEPARTMENT OF THE ARMY Mr. McNeil/mt/4997
HEADQUARTERS, U. S. ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND 21005

S-15 January 1970

AMSTE-BB

19 DEC 1969

SUBJECT: Directive for Initial Production Test of Trucks, Utility: ¼-Ton, 4X4, M151A2, USATECOM Project Nos. 1-VG-120-151-033/-034/-035 and -036

Commanding Officer, Aberdeen Proving Ground, ATTN: STEAP-MT-D, Aberdeen Proving Ground, Maryland 21005
Commanding Officer, Yuma Proving Ground, ATTN: STEYP-TPC, Yuma, Arizona 85364
Commanding Officer, U. S. Army General Equipment Test Activity, ATTN: STEGE-PO, Fort Lee, Virginia 23801
President, U. S. Army Armor and Engineer Board, ATTN: STEBB-PS, Fort Knox, Kentucky 40121

1. References: See inclosure 1.

2. Background:

a. The safety of the M151 series vehicles has been found lacking under certain driving conditions, and the vehicles produced under the current three year contract have demonstrated a number of deficiencies.

b. A modified independent rear suspension consisting of trailing arms to replace the lateral swing arms has been tested and evaluated. The trailing arm design has eliminated oversteer and produces sufficient body roll to provide a warning of impending danger during turns.

c. Three successive but separate test programs all performed on nineteen vehicles of the current three year contract have accumulated a total of 340,000 miles. Major deficiencies included the transmission-transfer case, rear axle differentials and rear axle drive shaft universal joints. The first two test programs, an initial inspection test (reference para 6 thru 12 of inclosure 1) and a product improvement test (reference para 4 and 5 of inclosure 1), established the serious nature of these deficiencies. The third test, an extended inspection comparison test (reference para 13 of inclosure 1), disclosed correction of certain problems in the deficient components

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but that other problems still persisted requiring additional testing to establish the merits of further improvements. The quality of the vehicles was poor; fasteners were improperly tightened and were incapable of maintaining torques or adjustments.

d. The M151A2 vehicles provided for this test will incorporate the modified independent rear suspension and other safety features as well as improvement of deficient components. Availability of the vehicles for test is estimated February 1970.

3. Description of Materiel:

a. While the overall configuration of the Truck, Utility: ¼-Ton, 4X4, M151A2 remains basically the same as previous models, most of the changes are identifiable by inspection. Inclosure 1 is a list of 23 areas where changes are expected. Readily noticeable are the larger one-piece windshield and rear window, the deep dish steering wheel, the windshield washer and wipers and the larger class "A" lights. The mechanical fuel pump is located on the right side of the engine and the trailing arm suspension at the rear and underside of the body.

b. The M151A2 vehicle dimensions, capacities and weight remain unchanged. It is still powered by the four cylinder, water cooled, gasoline engine, a four speed forward transmission and selective front wheel drive. Performance characteristics, such as gradeability, maximum speed, braking, water fording, and cross-country mobility, are the same as previous M151 series vehicles although overall safety of the vehicle is improved.

4. Test Objectives:

a. To provide evidence of contractor conformance to contractual requirements, capability of manufacturing methods, adequacy of quality assurance procedures and ability to maintain the required level of quality throughout the production cycle.

b. Provide information to support a USATECOM position on suitability for release as required by AMCR 700-34.

c. To provide verification of safety of the vehicles with particular regard to vehicle stability.

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d. Establish that land and water transportability characteristics are not adversely affected by the changes constituting the M151A2 vehicle.

5. Responsibilities:

a. Aberdeen Proving Ground.

(1) Responsible for planning, conduct and reporting of initial production tests in accordance with reference paragraphs 1 and 2 of inclosure 1. These tests will be accomplished using engineering techniques. Inspections will be made to establish the condition and adjustments of the vehicles initially and the quality of construction and workmanship. The tests will include, as a minimum, determination of speeds, longitudinal and side slope gradeability, fording, braking, maneuverability, electromagnetic compatibility and 20,000 miles per vehicle durability-reliability operations. Additional testing will be performed as deemed necessary to determine suitability for issue.

(2) A final inspection will be made at the conclusion of tests. Removal and complete disassembly of components will be made at the discretion of the test agency or as specifically requested by AMSTA-QKP to verify or support decisions regarding status of failures.

(3) Three each M151A2 vehicles will be provided for tests.

b. Yuma Proving Ground.

(1) Responsible for planning, conduct and reporting of initial production tests in accordance with reference paragraphs 1 and 2 of inclosure 1. These tests will be accomplished using engineering techniques. Inspections will be made to establish the condition and adjustments of the vehicles initially and the quality of construction and workmanship. The tests, as a minimum, will determine power plant and power train cooling characteristics, fuel handling capability, suitability for extreme dust conditions and 20,000 miles per vehicle durability-reliability operations. Additional testing will be performed as required to determine suitability for operations under the desert hot-dry environment.

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(2) A final inspection will be made at the conclusion of test. Removal and complete disassembly of components will be made at the discretion of the test agency or as specifically requested by AMSTA-QKP to verify or support decisions regarding status of failures.

(3) Three each M151A2 vehicles will be provided for tests.

c. Armor and Engineer Board.

(1) Responsible for the planning, conduct and reporting of initial production tests in accordance with reference paragraphs 1 and 2 of inclosure 1. These tests will be accomplished using service test techniques. Inspections will be made to establish condition and adjustments of the vehicles initially and the quality of construction and workmanship. The testing will include, as a minimum, 20,000 miles per vehicle durability-reliability operation. Evaluation of maintainability to include adequacy of the maintenance package, parts usage, maintenance ratio and availability will be prime objectives of the tests. Additional testing as required to satisfy the test objectives will be included in the test plan.

(2) A final inspection will be made at the conclusion of tests. Removal and complete disassembly of components will be made at the discretion of the test agency or as specifically requested by AMSTA-QKP to verify or support decisions regarding status of failures.

(3) Three each M151A2 vehicles will be provided for tests.

d. General Equipment Test Activity.

(1) Responsible for the planning, conduct and reporting of initial production tests in accordance with reference paragraphs 1 and 2 of inclosure 1. Testing will be made using service test techniques to determine highway, rail and water transportability. The effect of shock and vibration on the vehicle attributable to the modified independent rear suspension will be determined for rail transport.

(2) One vehicle is currently planned for tests.

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6. Special Instructions:

a. These tests are suitability tests with an 02 SEA priority. Project numbers and test titles to be used in all planning, reporting and correspondence are as follows:

USATECOM PROJECT NOS.	USATACOM PROJECT NOS.	TITLE	TEST AGENCY
1-VG-120-151-033	QKP-ICT-69-A23	Initial Production Test, Trucks Utility: ¼-Ton 4X4, M151A2	APG
1-VG-120-151-034	QKP-ICT-69-Y08	Initial Production Test, Trucks Utility: ¼-Ton 4X4, M151A2	YPG
1-VG-120-151-035	QKP-ICT-69-FK01	Initial Production Test, Trucks Utility: ¼-Ton 4X4, M151A2	ARENBD
1-VG-120-151-036	QKP-ICT-69-FTL02	Initial Production Test, Trucks Utility: ¼-Ton 4X4, M151A2	GETA

b. Criteria for test plans will be as given in reference paragraph 3 of inclosure 1. Specific criteria regarding durability-reliability will be resolved later; however, all agencies will prepare plans and conduct tests using standard terms, definitions and procedures for determining various parameters set forth in reference paragraph 14 of inclosure 1.

c. All vehicles will be given a 1,000 mile break-in run over hard surface and gravel roads at road speeds not in excess of 50 mph. The MIL-L-2105B grade SAE 140W gear oil supplied with the vehicle in the differential carriers will remain in the carriers during the first 12,000 miles of operation. Add-oil during the 12,000 miles will be the SAE 140W oil. The SAE 140 oil will be drained at 12,000 miles and replaced with MIL-L-2105B GO 90 oil. No payload or trailed load will be carried during the break-in operation.

d. The 20,000 mile durability test (not including break-in run) will consist of 30% highway, 30% secondary and 40% cross-country

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operations as required for Group I tactical trucks, Materiel Test Procedure 2-2-506, 18 May 1966. For highway operation the payload is 1,200 lbs and trailed load is 2,000 lbs. For secondary roads and cross-country the payload is 800 lbs and the trailed load is 1,500 lbs. The trailed load will be towed 50% of miles on each course. At least 1,000 miles of operations will be made with the front axle drive engaged, preferably when required, during cross-country, snow and ice, or other marginal traction conditions.

e. Aberdeen Proving Ground, Yuma Proving Ground and U. S. Army Armor and Engineer Board will include operations to test and evaluate the effect of the trailing arm suspension on vehicle stability, maneuverability, steering, ease of handling and riding characteristics. Of particular interest is the effect of the trailing arm suspension on overall safety of operations. Test plans will include a subtest entitled "Safety Evaluation". These tests will consider various road and terrain conditions, standard vehicles, unloaded and the various payload and trailer load conditions. The U. S. Army Armor and Engineer Board will determine the need for special training requirements and the possible hazard for drivers trained and accustomed to the M151A2 vehicle suddenly changed to the M151A1 vehicle.

f. Spare parts will be supplied by the contractor.

g. Each test agency will be responsible for providing support equipment, i.e., payloads and towed loads. Unusual logistic support required for test which cannot be obtained through normal supply channels will be reported to the appropriate directorate of the headquarters with information copies to this office, ATTN: AMSTE-BB.

h. Characteristic photographs of the M151A2 truck will be the responsibility of Materiel Test Directorate, Aberdeen Proving Ground. One set of characteristic photographs of quality suitable for reproduction will be provided to Yuma Proving Ground, General Equipment Test Activity and Armor and Engineer Board as soon as possible to satisfy the reporting requirements.

i. Disposition of vehicles in an "as is" condition will be made through normal military channels.

7. Safety: Safety release of the vehicles as established during tests reported by reference paragraph 5 of inclosure 1 is sufficient unless some unforeseen characteristics affecting safety are disclosed during these tests.

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8. Test Plans and Reports:

a. Each agency will prepare a test plan covering assigned areas of responsibility in conformance with USATECOM Regulation 70-24, 1 July 1969. The test plans will be forwarded to this headquarters for approval by 15 January 1970.

b. Estimated funding required for the tests will be prepared and forwarded to this headquarters as soon as possible.

c. The following reports are required:

(1) Significant events which affect either the conduct or the timely completion of tests (major incidents and/or failures) will be immediately reported by telephone and confirmed by message to this headquarters and U. S. Army Tank-Automotive Command. Contacts are:

(a) Headquarters, U. S. Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland, R. W. McNeil, AUTOVON 234-3350, ext 4008/4996/4997.

(b) Headquarters, U. S. Army Tank-Automotive Command, Warren, Michigan, Mr. H. Lindsay, AMSTA-QKP, AUTOVON 925-2437/2439.

(2) Notify addressees of para 8c(1)(a) and 8c(1)(b) above by message of the arrival of vehicles at the test sites by registration numbers.

(3) Equipment performance reports will be furnished in compliance with directions contained in USATECOM Regulation 70-23.

(4) It is expected that the telephone, message and equipment performance reports will satisfy most interim reporting requirements; therefore, only two interim progress reports are required--one at 10,000 miles or middle of test and one at 20,000 miles or termination of tests. The final interim progress report is intended to satisfy the need for final narrative reporting immediately after completion of tests.

(5) The final reports will be prepared and forwarded within 30 work days after completion of tests to USATECOM Headquarters for review and processing prior to release and distribution in accordance with USATECOM Regulation 70-24.

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(6) Manufacturers' names and/or product trade names will not appear in interim and final reports of tests. The use of manufacturers' names or product trade names will be coded when identification of equipment or components cannot be otherwise adequately recognized.

d. Distribution of test plans and reports is contained in inclosure 2. Foreign addressees will not be included in any distribution list.

9. Coordination:

a. Sufficient time is not available for normal coordination of test plans. Currently a test plan coordination meeting is under consideration by this headquarters. Notification of location, date and agenda for meeting will be forwarded as soon as possible.

b. These tests will be made concurrently; therefore, coordination during execution of tests among the test agencies is directed for the purpose of eliminating test duplication, timely dissemination of test results and resolution of common problems.

c. Direct coordination with AMSTA-QKP is authorized.

10. Security: This is an unclassified project.

FOR THE COMMANDER:

JOHN P. WHEELER, JR.
Colonel, GS
Dir, Arm Mat Test Dir

4 Incl
1. References
2. List of Changes
3. Distribution List
4. TRMS Form

Copies furnished:
CG, USATACOM, ATTN: AMSTA-QKP
AMSTA-REB

APPENDIX II. TEST CRITERIA

Item	Source	Requirements	Applicable Subtest	Remarks
1	USAGETA	The M151A2 shall satisfactorily conform to the provisions of the applicable technical manual as regard to its operational condition.	2.1	
2	USAGETA	Operational Personnel The number of personnel required to operate the vehicle (driver) shall not exceed one under all duty conditions. All operator tasks to be performed shall be within the capability of personnel possessing MOS 64A10, Light Vehicle Driver.	2.2	
3	USAGETA	Maintenance Personnel The number of personnel required to perform operational maintenance shall not exceed one under duty conditions.	2.2	
4	USAGETA	Training Considerations Operators and mechanics will not need any special training other than familiarization with the vehicle in the unit.	2.2	
5	USAGETA	Training Devices The vehicle and its components will be the only training device required.	2.2	
6	USAGETA	Personnel Prerequisites Personnel prerequisites shall not exceed those included in the following MOS's: 63A10, Automotive Maintenance Apprentice 64A10, Light Vehicle Driver 63B, Wheel Vehicle Mechanic 63G, Fuel and Electrical System Repairman 63H, Automotive Repairman	2.2	

Item	Source	Requirements	Applicable Subtest	Remarks
7	Test Directive	The vehicle will be given a 1,000-mile break-in run over hard surface and gravel roads at road speeds not in excess of 50 mph.	2.3	
8	Test Directive	The MIL-L-2105B grade SAE 140W gear oil supplied with the vehicle in the differential carriers will remain in the carriers during the 1,000 miles of operation. (Add-oil during the 1,000 miles will be the SAE 90W oil.)	2.3	
9	Test Directive	No payload or trailed load will be carried during the break-in operation.	2.3	
10	AR 705-8	The test item shall be capable of being transported by highways.	2.4	
11	AR 705-8	Transport by Rail The vehicle shall be capable of safe transport without major disassembly over principal U. S. and foreign, standard, and narrow gage main line railways at normal speed.	2.5	
12	AR 705-8	Vehicle Carloading Requirements The Association of American Railroads Publication titled, "Rules Governing the Loading of Commodities in Open-Top Cars," Section 6, Figure 51A, shall be used to select the applicable carloading procedure for the vehicle.	2.5	
13	AR 705-8	Transport by Water The vehicle shall be suitable in all respects for loading into and transporting in applicable cargo ships and landing vessels.	2.6	
14	MIL-STD-209C	Vehicle Tiedowns and Shackles Vehicle tiedowns and lifting shackles shall be provided and shall	2.7	

Item	Source	Requirements	Applicable Subtest	Remarks
		withstand the forces, and shall be in accordance with MIL-STD-209C. With the objective of maximizing personnel safety, the lift points shall be so located as to be accessible when the vehicle is confined in restricted spaces. The lift points shall be so oriented that when the vehicle is suspended, the vehicle shall not come into contact with the sling legs. The lifting device design shall take into account dynamic and impact loadings which occur under adverse handling conditions during amphibious operations. Wheel hub lifting is not acceptable. The points shall be so designed and oriented as to be capable of being utilized with spreader bars and slings (5-ton) of MIL-S-22824.		
15	USATECOM Reg. 750-15	Common and special tools and test equipment used during the test shall be suitable and needed for their intended purpose and prescribed maintenance level.	2.8.2	
16	USATECOM Reg. 750-15	a. The equipment publications must completely and adequately reflect the system they support and be easily and completely understood by maintenance personnel. b. The equipment publications must be consistent within themselves. c. The equipment publications must contain all essential operating and maintenance information.	2.8.3	
17	USATECOM Reg. 750-15	Repair parts must be replaceable at the authorized maintenance level indicated in the equipment manuals.	2.8.4	

Item	Source	Requirements	Applicable Subtest	Remarks
18	USATECOM Reg. 750-15	The test item shall demonstrate good maintainability design principles and characteristics using USAMC Pamphlet 706-34 as a guide.	2.8.5	
19	USATECOM Reg. 750-15	The storage compartments and storage components shall be suitable and needed for their intended purpose.	2.8.6	
20	USAGETA HEDGE	Particular attention shall be directed to the design and location of the controls and instruments at the operator's station. Special consideration shall be given to increasing the simplicity of those maintenance operations which cannot be completely eliminated.	2.9	
21	USAGETA	a. All handling surfaces and the immediate surrounding area of assemblies or components which are intended for replacement shall be designed without sharp edges or corners to reduce any possible injury to maintenance personnel. b. Maximum safety shall be provided for personnel and equipment during the operation, transportation, and maintenance phases of the life of the equipment. Such items as hand holds, safety straps, guards around heat sources, moving parts and warning signs or decals must be provided.	2.10	
	Test Directive Par. 7	c. The test item shall demonstrate its compliance with safety release indicated in paragraph 7 of Test Directive.		

APPENDIX III. SUPPORT REQUIREMENTS

QUANTITY	ITEM
1	Truck, Utility: 1/4-Ton 4x4 M151A2
1	Standard 5-Ton Sling Assembly

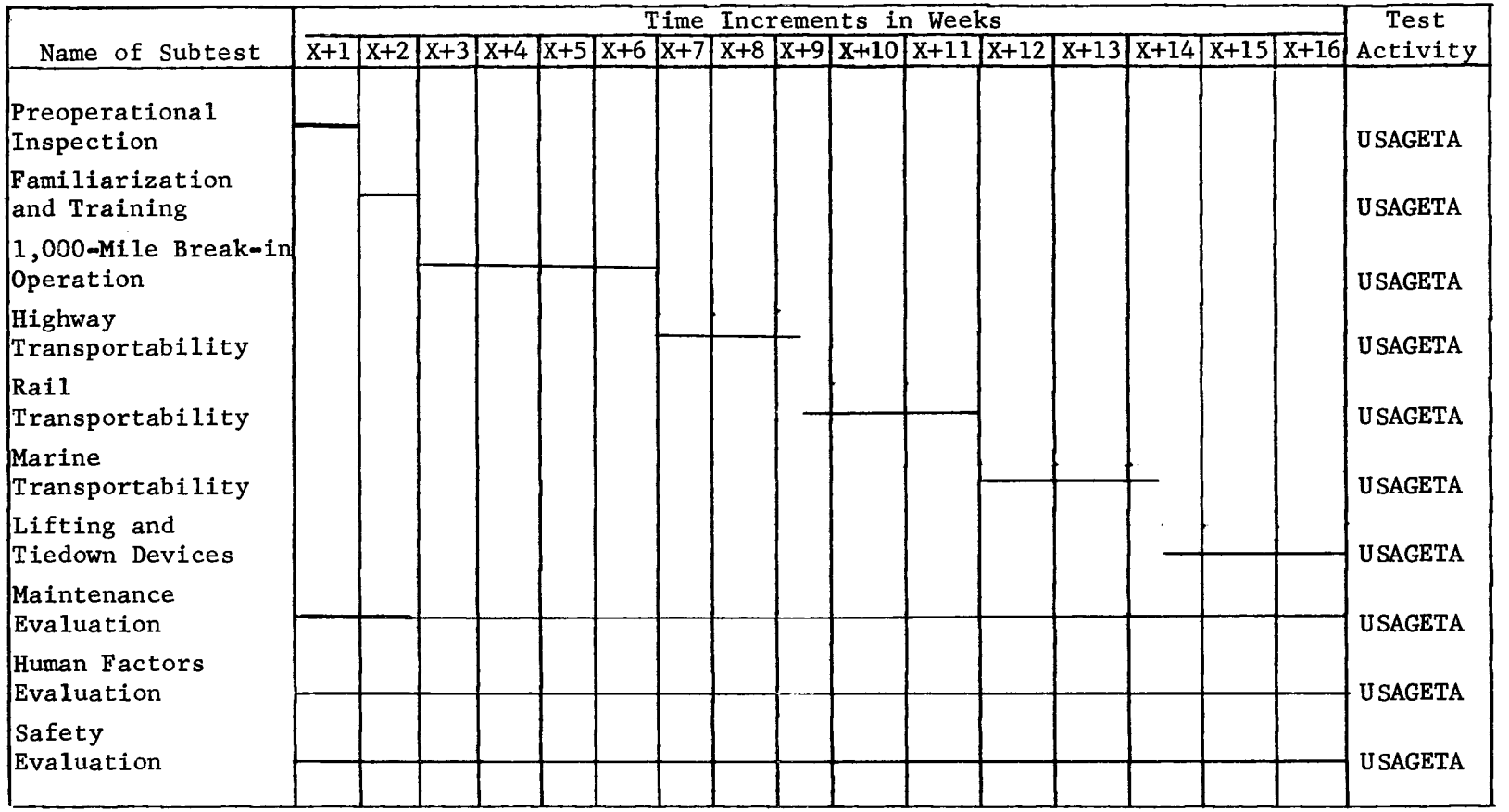
APPENDIX IV. TEST SCHEDULE

1. Schedule of Events

Test Directive Issued	19 December 1969
Preliminary Planning	1-15 January 1970
Test Plan Submission	January 1970
Test Item Delivery Target Date	February 1970
Test Beginning Target Date	February 1970
Test Completion Target Date	June 1970
Final Report	July 1970
Test Completed	August 1970

APPENDIX IV

2. Detailed Test Schedule



APPENDIX V. REFERENCES

1. Letter, AMSTE-BB, USATECOM, 19 December 1969, subject: "Directive for Initial Production Test of Trucks, Utility: 1/4-Ton, 4x4, M151A2, USATECOM Project Nos. 1-VG-120-151-033/034/035 and 036".

2. Letter, AMSTE-BB, USATECOM, 31 December 1969, subject: "Initial Production Tests of Trucks, Utility: 1/4-Ton, 4x4, M151A2, USATECOM Project Nos. 1-VG-120-151-033/034/035 and 036".

3. MIL-T-45331C(MO), 4 February 1966 Military Specification, Truck, Utility: 1/4-Ton, 4x4, M151A2 and M151A1c, Truck Ambulance: Front Line, 1/4-Ton, 4x4, M718 as modified by EO FM-C-5507.

4. USATECOM Regulation 750-15, Maintenance Evaluation during testing, 1 December 1969.

5. AMC Regulation 700-34, 3 April 1967, Release of End Item for Issue.

6. Army Regulation 705-8, 29 December 1964, DOD Engineering for Transportability Program.

7. Military Standard, MIL-STD-209C, 1 August 1968, Slinging Eyes and Attachments for Lifting and Tying Down Military Equipment.

8. USATECOM Regulation No. 70-24, 1 July 1969, Documenting Test Plans and Reports.

9. USATECOM Regulation No. 70-23, 22 October 1969, Research and Development, Equipment Performance Reports (EPR's).

10. Association of American Railroads, Rules Governing the Loading of Commodities on Open Top Cars, 1 February 1960.

11. Letter, CDCMR-O, HQ, USACDC, 24 November 1969, subject: Final Reports on Product Improvement Test of Truck, 1/4-Ton, M151 Series w/Modified Independent Rear Suspension (MIRS) System, USATECOM Project Nos. 1-7-4030-25/33 (USACDC ANC: Unk).

12. Letter, STEGE-SS-T, HQ, USAGETA, 23 Jan 70, subject: Proposed Plan of Test of Initial Production Test (Surface Transportability) of Truck, Utility: 1/4-Ton, 4x4, M151A2, USATECOM Project No. 1-VG-120-151-036 and 1st Ind AMSTE-BB, HQ USATECOM, 11 Feb 70, same subject.

APPENDIX VI. DISTRIBUTION LIST

USATECOM PROJECT NO. 1-VG-120-151-036

Agency	Test Plan	EPR	Interim Reports	Final Reports
Commanding General U. S. Army Test and Evaluation Command ATTN: AMSTE-BB Aberdeen Proving Ground, Maryland 21005	30	1	1	12
Commanding General U. S. Army Materiel Command ATTN: AMCRD-GV	1*			1*
AMCRD-R	1			1
AMCRD-U				1*
AMCMA	1			1
AMCQA-E	1			1
AMCSF				1
AMCRD-L Washington, D. C. 20315	3*			3*
Assistant Chief of Staff for Force Development Department of the Army Systems Staff Officers (DASSOs) Washington, D. C. 20310	1	1	1	1
Office of the Chief of Research and Development Department of the Army ATTN: CRDME-1	7		1	7
CRDPE-S Washington, D. C. 20310	1			1
Commanding Officer U. S. Army Logistic Doctrine Systems and Readiness Agency ATTN: LDSRA-ME New Cumberland Depot, P. O. Box 2947 Harrisburg, Pennsylvania 17105	1*	1		1
Commanding General U. S. Army Combat Developments Command ATTN: USACDC LnO USATECOM Aberdeen Proving Ground, Maryland 21005	12*	4	12	12

*Copies furnished by Headquarters, USATECOM.

APPENDIX VI

Agency	Test Plan	EPR	Interim Reports	Final Reports
Commanding General U. S. Army Ordnance Center and School Aberdeen Proving Ground, Maryland 21005				1
Commanding General U. S. Continental Army Command ATTN: ATIT-RD-MD Fort Monroe, Virginia 23351	4*			4
Commanding General U. S. Army Tank Automotive Command ATTN: AMSTA-R Warren, Michigan 48090	5	3	3	15
Commandant U. S. Army Command & General Staff College ATTN: Library Division Fort Leavenworth, Kansas 66027				1
Commandant U. S. Army Armor School Fort Knox, Kentucky 40121	1			1
Commandant U. S. Army Infantry School Fort Benning, Georgia 31905	1			1
Commandant U. S. Army Artillery and Missile School Fort Sill, Oklahoma 73503	1			1
Commandant U. S. Army Air Defense School Fort Bliss, Texas 79906	1			1
Commandant U. S. Army Quartermaster School Fort Lee, Virginia 23801	1			1
Commandant U. S. Army Transportation School Fort Eustis, Virginia 23604	1			1

*Copies furnished by Headquarters, USATECOM.

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Agency	Test Plan	EPR	Interim Reports	Final Reports
Commandant U. S. Marine Corps ATTN: Code AX Washington, D. C. 20380			1	1
Commanding Officer Aberdeen Proving Ground ATTN: STEAP-MT Aberdeen Proving Ground, Maryland 21005	1	1	1	1
Commanding Officer Yuma Proving Ground Yuma, Arizona 85364	1	1	1	1
Commanding Officer U. S. Army Tropic Test Center APO New York 09827	1	1	1	1
Commanding Officer U. S. Army Aberdeen Research and Development Center ATTN: AMXBR-WB Aberdeen Proving Ground, Maryland 21005	2	2	2	2
Commanding Officer U. S. Army General Equipment Test Activity Fort Lee, Virginia 23801	1	1	1	1
Commanding Officer U. S. Army Arctic Test Center APO Seattle 98733	1	1	1	1
Commanding Officer U. S. Army Transportation Engineering Agency Military Traffic Management and Terminal Service ATTN: MTT-TG Fort Eustis, Virginia 23604	1		1	1
Commanding General U. S. Army Combat Development Experimentation Command ATTN: Technical Library, Box 22 Fort Ord, California 93941	1		1	1

APPENDIX VI

Agency	Test Plan	EPR	Interim Reports	Final Reports
President U. S. Army Infantry Board Fort Benning, Georgia 31905	1	1	1	1
President U. S. Army Armor and Engineer Board Fort Knox, Kentucky 40121	1	1	1	1
President U. S. Army Artillery Board Fort Sill, Oklahoma 73504	1	1	1	1
President U. S. Army Air Defense Board Fort Bliss, Texas 79906	1	1	1	1
President U. S. Army Airborne, Electronics and Special Warfare Board Fort Bragg, North Carolina 28307	1	1	1	1
President U. S. Army Maintenance Board Fort Knox, Kentucky 40121	1			1
Commander Defense Documentation Center for Scientific and Technical Information ATTN: Document Service Center Cameron Station Alexandria, Virginia 22313				20
Commander Military Traffic Management and Terminal Service ATTN: MTMTS-RSE Washington, D. C. 20315				1
Director Development Center MCDEC Quantico, Virginia 22134	1	1	1	1

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Agency	Test Plan	EPR	Interim Reports	Final Reports
U. S. Army Transportation Engineering Agency MTMTS Liaison Officer U. S. Army Airborne, Electronics and Special Warfare Board Fort Bragg, North Carolina 28307				1
U. S. Marine Corps Liaison Officer Headquarters, USATECOM Aberdeen Proving Ground, Maryland 21005	1		1	1
Commanding General U. S. Army Tank-Automotive Command				
ATTN: AMSTA-QKP	2	2	2	2
AMSTA-QKW	1	1	1	1
AMSTA-QB	2	2	2	2
AMSTA-BSL				1
AMSTA-REB	3	3	3	3
Warren, Michigan 48090				
Commanding General U. S. Army Tank-Automotive Command Dir, DCASR, Detroit ATTN: DCRD-QM Warren, Michigan 48090		6		6
Dir of Procurement and Production HQ, USAMC ATTN: AMCPP Washington, D. C. 20315	1	1	1	1
Fort Motor Co. Military Truck Operations ATTN: Mr. W. Keiser 15050 Woodward Ave. Highland Park, Michigan 48203		2		2
Ford Motor Co. Military Truck Operations ATTN: Mr. E. Reinecker, QAR 15050 Woodward Ave. Highland Park, Michigan 48203		2		2

APPENDIX VI

Agency	Test Plan	EPR	Interim Reports	Final Reports
Fort Motor Co. Special Military Vehicles Operations ATTN: USATACOM M151 Resident Engineer Garrison Place Building 19855 Outer Drive Dearborn, Michigan 48124		3		3

JCP-I, DPG

DEPARTMENT OF THE ARMY
U.S. ARMY GENERAL EQUIPMENT TEST ACTIVITY
FORT LEE, VIRGINIA 23801

STEGE-SS-T 9 April 1970

SUBJECT: Approved Change to Plan of Test of Initial Production Test (Surface Transportability) of Truck, Utility: 1/4-Ton 4x4, M151A2, January 1970, USATECOM Project No. 1-VG-120-151-036

Commanding Officer
U. S. Army Tropic Test Center
APO New York 09827

Subject document is forwarded for appropriate action.

FOR THE COMMANDER:

C. J. LESKO
MAJ, QMC
Adjutant

1 Incl
as

JCP-I, DPG

DEPARTMENT OF THE ARMY
U.S. ARMY GENERAL EQUIPMENT TEST ACTIVITY
FORT LEE, VIRGINIA 23801

STEGE-SS-E

SUBJECT: Change to Plan of Test of Initial Production Test (Surface Transportability) of Truck, Utility: $\frac{1}{4}$-Ton 4X4, M151A2, January 1970, USATECOM Project No. 1-VG-120-151-036

See Distribution

The following changes are made to subject plan of test:

a. Page 2-11, paragraph 2.8.1.3, Method, add subparagraph "c". (Incl 1)

b. Page 2-14, paragraph 2.8.6. Delete, and reinsert as paragraph 2.8.8.

c. Page 2-14, add paragraph 2.8.6, Safety Aspects of Maintenance Operations. (Incl 2)

d. Page 2-14, add paragraph 2.8.7, Human Factors Aspects of Maintenance Operations. (Incl 3)

e. Page 2-15, paragraph 2.9.2b, line 3, delete the word "maintenance."

f. Page 2-16, paragraph 2.10.1, add the word "or" after transporting, and delete "or maintaining".

g. Page 2-16, paragraph 2.10.2a, line 4, delete the word maintenance.

h. Page 2-16, paragraph 2.10.2b, delete the first sentence and substitute the following: "Maximum safety shall be provided for personnel and equipment during the operation and transportation of the testing of the equipment."

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1. Page 2-17, paragraph 2.10.3a, delete the first sentence and substitute the following: "During the conduct of all subtests, observations will be made by the project director and operating crew to determine if any safety hazards exist relative to transporting and operating the M151A2.

FOR THE COMMANDER:

3 Incl
as

C. J. LESKO
MAJ, QMC
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DISTRIBUTION:
As indicated in the Test Plan

CHANGE NOTICE NO. 1

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2.8.1.3 Method

c. For the purpose of computing mean-time-between-failure (MTBF) for maintainability, a failure is defined as any malfunction which the operator cannot remedy by adjustment, repair, or replacement action using the controls, OEM tools and OEM parts within 30 minutes (USAGETA) and which causes or may cause:

(1) Failure to commence operation, cessation of operation or degradation of performance capabilities of the system/subsystem below designated levels.

(2) Serious damage to the system/subsystem by continued operation.

(3) Serious personnel safety hazards.

2.8.7 Human Factors Aspects of Maintenance Operations

2.8.7.1 Objective To determine the effectiveness of the man-item relationship during the performance of maintenance of the test item.

2.8.7.2 Criterion The man-item relationship must be adequate for maintenance operations. (USATECOM Reg 750-15).

2.8.7.3 Method After selected maintenance action, maintenance personnel will be interviewed and favorable or unfavorable opinions will be recorded for the following areas:

a. Adequacy of hoisting, lifting, and towing facilities.

b. Ease of operations.

c. Physical effort required for performing maintenance duties.

d. Effects of engine fumes on mechanics.

e. Simplicity in servicing and performing maintenance duties.

f. Adequacy of working space.

g. Accessibility to components.

h. Freedom of the mechanic to reach and work adequately, as influenced by the configuration or replacement of components, or by his clothing size.

i. Servicing factors such as lubrication of equipment and replenishing tanks and reservoirs.

2.8.7.4 Data Required and Analytical Plan Collected data will be recorded and presented in narrative form in the body of the report.