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US ARMY
TEST & EVALUATION COMMAND



COUNTED IN

REPORT ON USATECOM PROJECT NO. 1-3-4050-01-D

INITIAL PRODUCTION TEST (FPVT) OF TRUCK,

UTILITY, 1/4-TON, 4X4, M151

REPORT NO. DPS-1111

OCTOBER 1963

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PROVING GROUND, MARYLAND

BEREDEEN PROVING GROUND, MD
MD

27 NOV 1963

ABSTRACT

Three initial production models of the Truck, Utility, 1/4-ton, 4x4, M151, were subjected to 20,000-mile endurance tests. The purpose of these tests was to provide proof of acceptability of manufacturing methods, quality control procedures, and to determine acceptability of vehicles produced under contract DA-33-019-ORD-3941. Test incidents indicate nine problem areas. It is concluded that the vehicles are generally unsatisfactory. It is recommended that defects cited in this report be corrected.

The contents of this report resulted from tests conducted for military purposes under specific military test conditions and the results represent neither approval nor disapproval of the test materiel for other uses. Dissemination of the contents for private gain is a violation of the conditions under which this report is released.

REPORT ON USATECOM PROJECT NO. 1-3-4030-01-D

INITIAL PRODUCTION TEST (FPVT) OF TRUCK,

UTILITY, 1/4-TON, 4X4, M151

REPORT NO. DPS-1111

OCTOBER 1963

Test Director: A. C. Miller
Automotive Division
Development and Proof Services
Aberdeen Proving Ground, Md.

AMC/MIS Code No. 4030.14.3101.2.53
Authorized By: U.S. Army Mobility Command

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TRUCK, UTILITY: 1/4-Ton, 4x4, M151

ANGLE OF APPROACH:.....66 Deg.
 ANGLE OF DEPARTURE:.....39 Deg.
 BRAKES:.....Hydraulic
 CREW:.....1
 CRUISING RANGE:.....300 miles
 DIMENSIONS O/A:
 Height.....71 in.
 Length.....132 in.
 Width63 in.
 ELECTRICAL SYSTEM:.....24 volt
 ENGINE:..Four cylinder, liquid cooled,
 valve-in-head, 71 HP at 4000 RPM,
 128 lb-ft torque at 1800 RPM, 141.5
 cu. in.
 FUEL CAPACITY:.....17.7 Gal.
 GROUND CLEARANCE:.....9-1/8 in.
 PAYLOAD (Including Crew):
 Cross-country.....800 lb.
 Highway.....1200 lb.
 SPEED (Max.):.....60 mph

STEERING:..Worm and double roller,. 16.4:1 ratio
 SUSPENSION:....Independent coil spring
 TIRE SIZE:7:00 x 16
 TOWED LOAD CAPACITY:
 Cross-Country.....1500 lb
 Highway2000 lb
 TRANSMISSION w/TRANSFER CASE:
 Selective synchromesh w/4 forward and
 1 reverse speed
 TRANSMISSION GEAR RATIOS:

Gear	Ratio
1	5.7 :1
2	3.10:1
3	1.67:1
4	1:1
R	7.5 :1
Differential	4.85:1

TREAD (front and rear):.....53 in.
 TURNING RADIUS (left and right):..17 ft.

Figure 1: Characteristics Photograph.

DEVELOPMENT AND PROOF SERVICES

REPORT ON USATECOM PROJECT NO. 1-3-4030-01-D

INITIAL PRODUCTION TEST (FPVT) OF TRUCK,

UTILITY, 1/4-TON, 4X4, M151

28 MARCH TO 12 SEPTEMBER 1963

PART I - GENERAL

1.1 Authority

1.1.1 Directive. This test was authorized by AOS 20, dated 22 October 1962 (Appendix B).

1.1.2 *Under P.J.* Purpose of Test. The purpose of this test was to provide proof of acceptability of manufacturing methods, quality control procedures, and to determine acceptability of vehicles produced under contract DA-33-019-ORD-394.

1.2 Description of Materiel

The Truck, Utility, 1/4-ton, 4x4, M151 (Figure 1), is a general purpose personnel or cargo-carrier which is capable of operating with a trailer over all types of terrain during adverse weather conditions.

The vehicle design incorporates independent coil spring suspension, 4-wheel drive, unitized steel body-frame structure, lightweight steel wheels, 700 x 16 tires, and a power train composed of the following components:

- a. Four-cylinder, overhead valve, liquid-cooled engine with a piston displacement of 141.5 cubic inches. Manufacturer's rating: 71 hp at 4000 rpm; 128 ft-lb torque at 1800 rpm.
- b. Four-speed, selective type transmission with a single-speed (1:1 ratio) transfer case serving as a power divider for transmitting power to the front axle during 4-wheel-drive operation.
- c. Conventional propeller shafts using cardan type universal joints.
- d. Drive-through differentials with a ratio of 4.86:1.
- e. Wheel drive shafts using cardan type universal joints at the inboard and outboard ends.

The brake system is composed of 9.125-inch-diameter hydraulic, internal-expanding brakes using a 1.00-inch-diameter master cylinder and 0.75-inch-diameter wheel cylinders. The parking brake is a mechanically-actuated, external-contracting type located on the transmission rear output shaft.

Identification of the vehicles selected for test is as follows:

- a. USA Reg No. 2D5742, serial No. 10002.
- b. USA Reg No. 2D5743, serial No. 10003.
- c. USA Reg No. 2D5997, serial No. 10425.

1.3 Background

The 1/4-ton, 4x4, utility truck, M151, was developed, under government contracts, by Ford Motor Company. Initial production contracts were awarded to Ford Motor Company. In 1962, production contract DA-33-019-ORD-3941 was awarded to another manufacturer. Two initial production vehicles were scheduled for expedited tests; however, as a result of an accident involving one vehicle, an additional vehicle was added to the program. To further expedite testing of the initial production vehicles, general view photographs and engineering performance and radio suppression tests were conducted on the first comparison test (ICT) vehicle, USA Reg No. 2D6356, received at Aberdeen Proving Ground.

1.4 Summary of Findings

Basic problem areas were as follows:

- a. Fuel tank gaskets.
- b. Air cleaner cover.
- c. Fan belts.
- d. Transmission input bearing.
- e. Differentials.
- f. Axle U-joint cross shafts.
- g. Wheel cylinder boots.
- h. Front suspension.
- i. Seals, entire power train.

Engineering performance and radio suppression tests results were satisfactory. Maintenance engineering analysis indicates that maintenance time was not excessive.

1.5 Conclusion

Because of an excessive number of incidents, the vehicles are considered to be generally unsatisfactory (ref par. 2.2).

1.6 Recommendation

It is recommended that defects cited in this report be corrected.

SUBMITTED:

A. C. Miller
A. C. MILLER
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WILLIAM B. ROBINSON
Lt Col, Ord Corps
Deputy Director for Engineering Testing

PART II - DETAILS OF TEST

2.1 Procedure

The test was conducted within the requirement stated in the directive and Reference 1.

2.1.1 Break-In. The vehicles were operated in excess of 500 miles break-in enroute from the manufacturer to Aberdeen Proving Ground.

2.1.2 Initial Inspection. Upon arrival at Aberdeen Proving Ground, each vehicle was inspected to insure that it was in proper condition to begin endurance operations.

2.1.3 Endurance Operation. Each vehicle was operated over specified test courses with rated payloads and towed loads as shown in Table I.

Table I. Endurance Summary, Miles

<u>Course</u>	<u>Towed Load</u>	Vehicle No.		
		2D5742	2D5743	2D5997
Break-in	No	500	500	500
Paved without payload	No	107	110	119
Paved	No	2023	1754	1805
Paved	Yes	1639	1842	1850
Level cross-country	No	4070	3802	3800
Level cross-country	Yes	3530	3812	3800
Hilly cross-country	No	3685	3952	3802
Hilly cross-country	Yes	3915	3629	3798
Belgian block	No	284	299	311
Belgian block	Yes	300	301	289
Total	-	20053	20001	20074

2.1.4 Mid-Test Inspection. The vehicles were scheduled for a mid-test inspection which was to be approximately the same as the initial inspection. However, because of loss of engine oil pressure in vehicle 2D5742 and an accident with vehicle 2D5743, the mid-point inspections for these vehicles were more comprehensive.

2.1.5 Final Inspection. Upon completion of the endurance phase, the vehicles were completely disassembled for final inspection. Selected engine measurements were recorded.

2.1.6 Engineering Performance. The engineering performance tests were conducted in accordance with Automotive Laboratory procedures. The radio-interference suppression test was conducted by US Army Electronics Research and Development Laboratory personnel. The test was conducted to determine conformance with specification MIL-S-10379.

2.1.7 Maintenance Engineering Analysis. Data recorded during the test operations were analyzed by personnel of the Maintenance Engineering Office, D&PS. Their report (Appendix F) relates to MIL-STD-1228, dated 27 September 1962. This standard cites as a goal that total maintenance man-hours shall not exceed 7% of operating hours.

2.2 Results

2.2.1 General.

2.2.1.1 Test Incidents. All test incidents are listed in Appendix C. The vehicles accrued 112, 77, and 79 incidents, respectively. The summary indicates recurring incidents and thus major problems as follows:

- a. Fuel tank gasket leaks (ref par. 2.2.2.3).
- b. Air cleaner cover cracks (ref par. 2.2.2.3).
- c. Fan belt deterioration (ref par. 2.2.2.5).
- d. Transmission input bearing failure (ref par. 2.2.2.7).
- e. Differential failures (ref par. 2.2.2.11).
- f. Axle U-joint cross shaft breakage (ref par. 2.2.2.11).
- g. Wheel cylinder boot leakage (ref par. 2.2.2.12).
- h. Front suspension failures (ref par. 2.2.2.16).
- i. Seal leakage, entire power train (ref pars. 2.2.2.1, 2.2.2.11, and 2.2.2.13).

2.2.1.2 Engineering Performance. As indicated in Appendix D, the comparison test vehicle performed satisfactorily except for the vehicle curb weight. The vehicle exceeded the maximum curb weight (2300 pounds) specified in specification MIL-T-45331 by 100 pounds. The US Army Electronics Research and Development Laboratory report (contained in Reference 4) indicates that the vehicle met the radio suppression requirements.

2.2.1.3 Maintenance Engineering Analysis. The maintenance engineering analysis (Appendix F) revealed that maintenance man-hours were 11% of operating hours.

2.2.1.4 Fuel and Oil Consumption. Fuel and oil consumption data are shown in Table II.

Table II. Fuel and Oil Consumption

Characteristics	Vehicle No.		
	2D5742	2D5743	2D5997
Fuel consumption, mpg	13.1	12.8	13.5
Oil consumption, mpg	a	3333	4007
Fuel/oil ratio, gal/gal	..	1042:1	1187:1

^aOil data are considered irrelevant due to excessive wear of the original engine and subsequent engine replacement.

2.2.2 Specific. This section presents the test incidents in the groups used in the vehicle maintenance allocation chart. It deals generally with recurrent incidents but is not limited to them. Additional details are contained in Appendix C and Reference 3.

2.2.2.1 Engine. The engine (serial No. 4700055) in one vehicle (No. 2D5742) suffered a loss of oil pressure at 10,113 test miles. The crank-shaft and camshaft bearing journals were worn beyond wear limits (Appendix F). This is attributed to entrance of dirt through the rear crank-shaft seal. The engine was replaced.

Three intake valve-spring retainer seats failed after 14,861 test miles in engine No. 4700423, vehicle No. 2D5997 (Figure 2).

Broken oil level indicators were found on two vehicles.

Engine wear data (Appendix F) show that wrist pin clearances exceeded the wear limit on both 20,000-mile engines and also on two pins in the replacement engine (10,000 miles) in vehicle No. 2D5742.

2.2.2.2 Clutch. Six clutch release rods failed in vehicles 2D5742 and 2D5743 during the first 10,000 test miles. The failures occurred in the right-angle bend at the upper end of the rod. Changes in production methods eliminated this type of failure.

2.2.2.3 Fuel System. Repeated failures of gaskets at the fuel pump and fuel tank filler cap, and cracking of the air cleaner cover at the outlet were encountered throughout the test on all vehicles (Figures 3, 4, and 5).

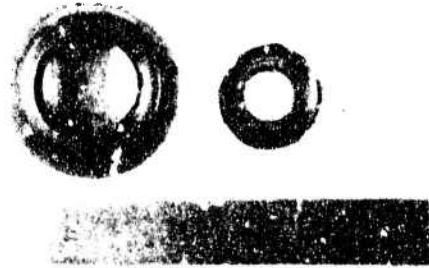


Figure 2: Broken Valve-Spring Retainer Seat.



Figure 3: Fuel-Pump
Gasket Failure.



Figure 4: Fuel-Tank Filler
Cap Gasket Failure.

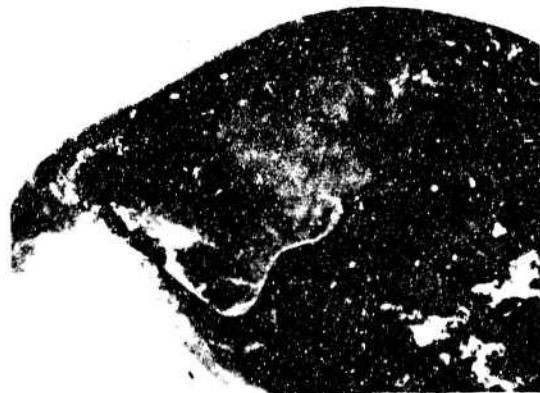


Figure 5: Air-Cleaner Cover Failure.

2.2.2.4 Exhaust System. Incidents were limited to the muffler and tail-pipe support clamps on one vehicle (No. 2D5997).

2.2.2.5 Cooling System. Several fan belt failures were encountered. Initial failures were attributed to excessive belt tension. Later failures, with proper belt tension, were characterized by cracking and separation of the belts (Figure 6).



Figure 6: Water Pump V Belt. Typical Late Failure.

2.2.2.6 Electrical System. Early in the test, entrance of dirt into the flywheel housing led to frequent cleaning of the starter drive mechanisms on the first two vehicles. The failure of the starter drive gear on vehicle No. 2D5742 at 16,882 test miles is attributed to malfunction caused by that dirt (Figure 7).



Figure 7: Starter Drive Gear.

Also early in the test, there were numerous generator mount failures on the first two vehicles. These also are attributed to excessive fan belt tension (ref par. 2.2.2.5).

Failure of horn wires and switches, and several instances of wiring harness chafing were noted (Figures 8 and 9).



Figure 8: Chafing Point
at Air Cleaner Bracket.



Figure 9: Chafing Point
at Right Kick Panel.

2.2.2.7 Transmission. The only recurring incident was the failure of the spacer cage in the input shaft bearing. One such failure was found during the 10,000-mile inspection of vehicle 2D5742. The other was not found until 10,268 test miles (vehicle No. 2D5997) when damage to all main shaft components was evident (Figure 10).

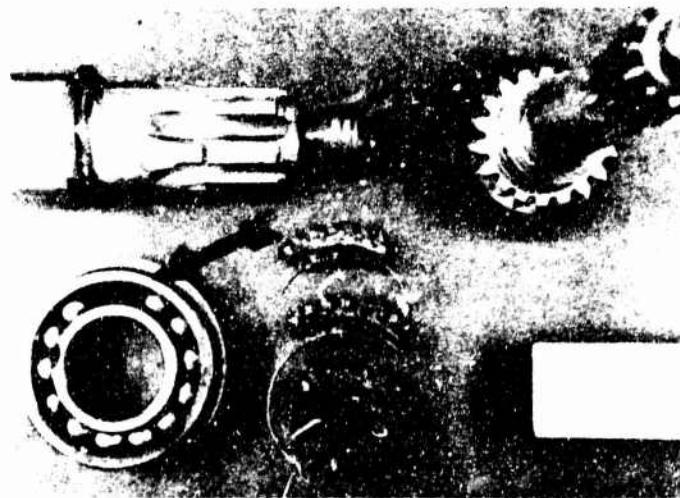


Figure 10: Transmission Main Shaft Components. Arrow Indicates Missing Spacer.

2.2.2.8 Transfer. During the final inspections, it was noted that surfaces of the intermediate gear shafts in two of the three transfer cases (vehicles No. 2D5742 and 2D5997) were spalled in the areas of the front and rear roller bearings. The front bearing spacer on this shaft in one vehicle (No. 2D5997) was broken. This accounts for the heavier spalling of that shaft and damage to the bearing rollers and gear (Figures 11 and 12).



Figure 11: Intermediate Gear Shaft (Vehicle No. 2D5742).

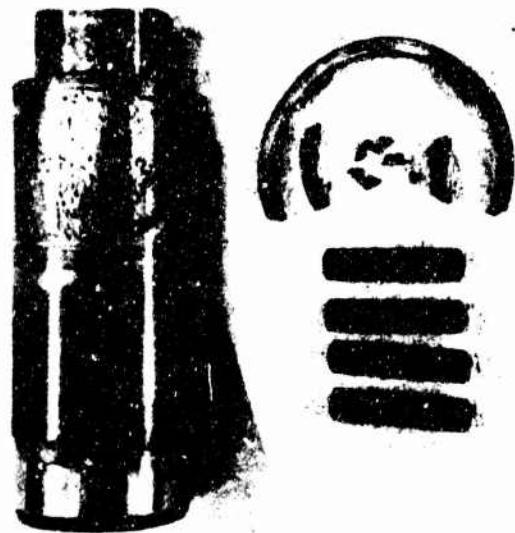


Figure 12: Intermediate Gear Shaft, Spacer, and Typical Rollers (Vehicle No. 2D5997).

2.2.2.9 Propeller Shafts. Some brinelling of universal joint cross shaft journals was evident at final inspection (Figure 13).



Figure 13: Brinelled Propeller Shaft Universal Joint Cross Shaft.

2.2.2.10 Front Axle. The incidents in this group are chiefly concerned with differential output (axle drive) yokes and ball-joint socket assemblies.

2.2.2.11 Rear Axle. Repeated loosening of center plugs in the differential output yokes, with resultant lubricant leakage, abnormal seal and seal journal wear, and lubricant contamination, was encountered throughout the test on both differentials of all vehicles. Improper staking of the plugs and loose fit of the yoke splines were factors contributing to this defect. Initial incidents at each location occurred at the test mileage shown in Table III.

Table III. Initial Incident Mileage of Differential Output Yokes

Position on Vehicle	Vehicle No.		
	2D5742	2D5743	2D5997
Right front	27388	4869	6160
Left front	10114	-	8444
Right rear	6088	5513	4727
Left rear	6088	3768	7989

^aNot a center plug incident.

Wheel drive-shaft universal-joint cross shaft failures were common. Changes in the heat-treating process altered but did not eliminate the failures. Figure 14 shows a later failure.



Figure 14: Cross Shaft Failure, Wheel Drive Shaft Universal Joint.

Three differential side gears failed at the undercut, and one pinion shaft failed at the pinion gear shoulder (Figures 15 and 16). Both failures are attributed to rough machining of the undercuts. Contaminated lubricant and resultant bearing wear are also considered factors contributing to the pinion shaft failure and the cracking of teeth on three other rear differential pinion gears (Figure 17).

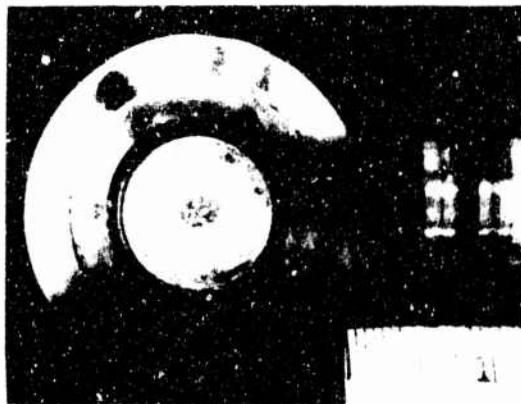


Figure 15: Typical Side Gear Failure.



Figure 16: Failure of Pinion Shaft Showing Damaged Pinion Gear.



Figure 17: Cracked Pinion Gear.

2.2.2.12 Brakes. Abnormal wheel-brake lining wear is attributed to two causes. Initially, two vehicles were operated, for a time, through an $\frac{1}{8}$ -mile "mud-bypass" on the 5-mile level cross-country course. Entrance of dirty water accelerated brake wear during that period. However, later experience, when not using the bypass, showed that pin holes and other defects in the wheel cylinder boots were causing internal corrosion and sticking of the cylinders (Figure 18).

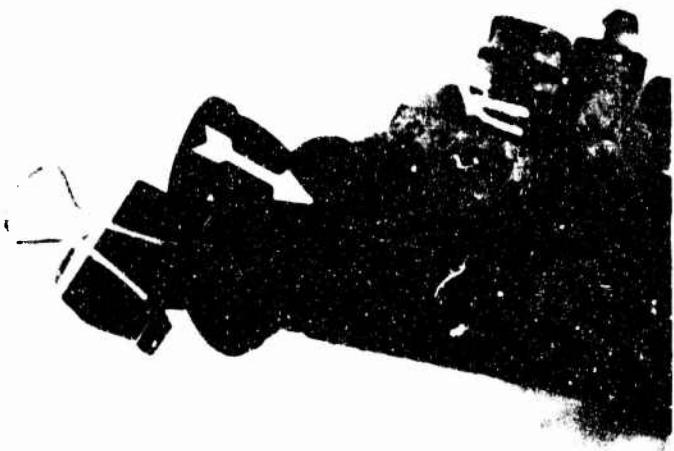


Figure 18: Tear in Wheel Cylinder Boot.

To further illustrate this effect, one wheel brake, with no history of "mud-bypass" operation or sticky wheel cylinders, had 1/32 inch useful lining material remaining after 18,606 test miles (vehicle No. 2D5997, left front).

2.2.2.13 Wheels, Hubs, and Drums. Several wheel-spindle seals failed with resultant lubricant contamination and bearing failure.

2.2.2.14 Controls. One tie rod end failure was noted.

2.2.2.15 Frame. Cracking of the front engine mount brackets on all three vehicles and distortion at the idler-arm bracket mounts on two vehicles were noted (Figures 19 and 20).



Figure 19: Typical Front Engine-Mount Bracket Failure.



Figure 20: Typical Idler-Arm Bracket Mount Distortion.

2.2.2.16 Suspension. Rear suspension failures were as follows:

- a. Deterioration of suspension-arm mounting bushings.
- b. Cracking of suspension arm members and spring seat plates (Figures 21 and 22).
- c. Several instances of low shock absorber life.



Figure 21: Location of Cracks in Rear Suspension Arm (Left Hand) Front Member.



Figure 22: Typical Crack in Rear Suspension Arm Spring Seat Plate.

The front suspension on all three vehicles showed the same basic pattern of failures as follows:

- a. Lost alignment shims.
- b. Loose or stripped bolts and nuts.
- c. Suspected bowing of the front cross member.
- d. Cracking of lower suspension arms at the shock absorber mount and spring seat (Figures 23 and 24).
- e. Cracking of the front cross member at the lower suspension-arm front mounts (Figure 25).



Figure 23: Lower Suspension Arm at Shock Absorber Mount (Worst Failure).



Figure 24: Lower Suspension Arm at Spring Seat (Worst Failure).



Figure 25: Front Cross Member at Lower Suspension-Arm Front Mount (Typical Failure).

These failures were accompanied by shock-absorber bracket failures and shock-absorber lower mounting stud wear, cracking of upper arm ball-joint sockets and over extension and cocking of one shock absorber (Figures 26 and 27). These items suggest suspension over-travel.

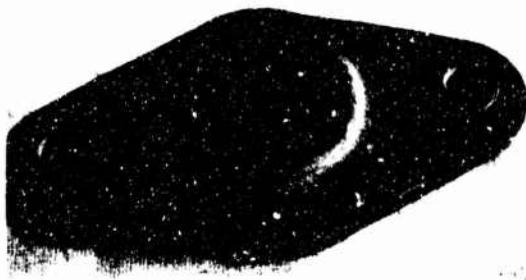


Figure 26: Shock-Absorber
Bracket Showing Crack and Hole
Near Wear.



Figure 27: Ball-Joint
Socket, Upper Arm, Showing Typical
Cracks.

2.2.2.17 Hood. One incident of hood misalignment was noted.

2.2.2.18 Body. Deformation of the spare-tire mounting clamp was encountered on all three vehicles early in the test.

2.2.2.19 Bumpers and Guards. Three cracks were found in the brush guard (grille) of one vehicle (No. 2D5742) (Figure 28).



Figure 28: Cracks in Brush Guard.

2.2.2.20 Miscellaneous Accessories. There were recurrent incidents in the slide fasteners and curtain windows.

PART III - APPENDICES

APPENDIX A

References

1. OPM 60-285, Ordnance Proof Manual, Quality Assurance Testing, Aberdeen Proving Ground, June 1956.
2. Technical Manuals, Truck, Utility: 1/4-Ton, 4x4, M151, FSN 2320-542-4783, TM 9-2320-218-10 through -34P, May through November 1960.
3. Miller, A. C. "USATECOM Project No. 1-3-4030-01-D, IC (FPVT) of Three Each Truck, Utility: 1/4-Ton, 4x4, M151, USA Reg No. 2D5742, Mfr Serial No. 10002, Reg No. 2D5743, Serial No. 10003, and Reg No. 2D5997, Serial No. 10425, Contract No. DA-33-019-ORD-3941, Tenth and Final Letter Report." Aberdeen Proving Ground, 24 September 1963.
4. Mackey, D. "USATECOM Project No. 1-3-4030-01-D, Comparison Test (ICT) of Truck, Utility. 1/4-Ton 4x4, M151, Reg No. 2D6356, Serial No. 7405-1088, Contract No. DA-33-019-ORD-3941. Fourth and Final Letter Report," Aberdeen Proving Ground, 16 September 1963.

APPENDIX B

Correspondence

HEADQUARTERS

U.S. ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND

AMSTE-BB

14 DEC 1962

SUBJECT: USATEC Project No. 1D-3403-01, Quality Assurance Tests on Truck,
Utility, $\frac{1}{4}$ -Ton, 4x4, M151

TO: Commanding Officer
Aberdeen Proving Ground
ATTN: STEAP-US
Aberdeen Proving Ground, Maryland

1. Quality Assurance Tests on Truck, Utility, $\frac{1}{4}$ -Ton, 4x4, M151 outlined in the attached AOS-20 from Commanding General, U. S. Army Tank-Automotive Center, ATTN: SMAOTA-IQK.3 is directed.
2. This project is being assigned USATEC Project No 1D-3403-01, which should appear in all official correspondence relating to the program.
3. Two copies of the final reports will be forwarded to this headquarters, ATTN: AMSTE-BB, for informational purposes.

FOR THE COMMANDER:

1 Incl
as

EARL A. HICKS, JR
Lt. Col, Arty ✓
Asst Admin Officer

1 6				WORK ORDER				Mr McFaul/346																																											
3. TO CG, USAAPG				4. FROM: CG, USATAC ATTN: SMOTA-1QX.3				5. DATE PREPARED 22 Oct 62 99																																											
6. OEM TITLE Truck, Utility, 1/4 Ton 4x4, M151, WO/W				7. ANTR. CODE: 2292				8. OEM CODE: 4030.14.3101.2.53****																																											
9. CHASSIS NO. EH 2 40424 01				10. SERIAL NO. K2				11. ACCOUNTING CLASSIFICATION OF FUNDS (TO BE MADE AVAILABLE) 21X2030-***-264-3111-P4031-***-18-001																																											
12. PERFORMANCE OF THE FOLLOWING WORK IS AUTHORIZED (SUBJECT TO AVAILABILITY OF FUNDS) QA TESTS M151 TRUCK**																																																			
<p>1. The purpose of this AOS-20 is to furnish Aberdeen Proving Ground program authority to perform the following Quality Assurance Tests on Truck, Utility, 1/4 Ton, 4x4, M151 produced by Contract DA-33-019-ORD-3941.</p> <p>a. Six (6) each First Production Vehicles in November 1962.</p> <p>b. Four (4) Inspection Comparison Test Vehicles in March, May, July and Sept 63.</p> <p>2. Tests will commence approximately Dec 62 with completion date Nov 63.</p> <p>NOTE: This AOS-20 converts AOS-20 dtd 14 Mar 62, Index 4147348 into the new AMC Pron Number.</p>																																																			
13. QUANTITATIVE AND CHANGE DATA																																																			
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<p>JOHN L. DUNAS Major, Ord Corps Chief, SMOTA-10</p> <p>RS Edwards</p>																																																			
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Army-OTAC- Detroit

SUPPORTING SCHEDULE ANALYSIS		
CG, USAAPG	APPROVED BY (TYPE NAME AND DATE)	Page 2 of 6 Pages ATTACHED TO DD FORM: AOS: 20 IOS: SS:
FROM CG, USATAC ATTN: SMOTA-IQK.3		
CWS CODE & TITLE 4030.14.3101.2.53**** Truck, Utility, 1/4 Ton, 4x4, M151 WO/W		DOCUMENT CONTROL NUMBER: PRON NR: EH-2-YQY2Y -01-EH-K2
<p>3. Tests are to be conducted in accordance with Test Directive and Services outlined herein.</p> <p>4. Project No. IF-ICT-221 has been assigned this test and all reports and correspondence issued as a result of this Order will include IF-ICT-221 and the PRON NR of this AOS-20 Form.</p> <p>5. Part support for those vehicles designated FFVT is the responsibility of Willys Motors, Inc.</p> <p>6. Part support for those vehicles designated ICT will be purchased by Aberdeen utilizing project funds.</p>		
<u>PROJECT NO. IF-ICT-221</u>		
<p>1. <u>Purpose</u> - The purpose of this test is to provide proof of acceptability of manufacturing methods, quality control procedures and to determine acceptability of vehicles with all contractual requirements.</p> <p>2. <u>Scope</u> - (a) During the scheduled 20,000 miles of operation for each FFVT vehicle, evaluation will be made for performance and endurance characteristics. Test is to be completed, including detail and analysis and compilation of results, within ninety (90) days from date vehicles are delivered to Aberdeen Proving Ground.</p> <p>(b) During the scheduled 5000 miles of operation for each ICT Vehicle, evaluation will be made for performance and endurance characteristics to ascertain compliance with contractual requirement at intervals during production contract. Test is to be completed including detail and analysis of completion of results within 60 days from date vehicle is delivered to APG.</p> <p>3. <u>Test Procedure</u></p> <p>a. <u>Initial Inspections</u></p> <p>(1) Check for damage from shipment.</p> <p>(2) Perform visual and operational check of engine, transmission, brakes and suspension components.</p> <p>(3) Check electrical system with instrumentation.</p> <p>(4) Lubricate vehicle in accordance with LO-9-2320-218-10, and prepare vehicles in accordance with TB ORD-385.</p> <p>b. <u>Break-in-run</u></p> <p>(1) Each vehicle shall be given a 500-mile break-in run over hard</p>		

SUPPORTING SCHEDULE ANALYSIS

TO: CG, USAAPG FROM: CG, USATAC ATTN: SMOTA-IQK.3	APPROVED BY (TYPE NAME AND DATE)	Page 3 of 6 Pages
		ATTACHED TO DD FORM: ADS: 20 IDS: SS:

DD FORM 6 TITLE 4030.14.3101.2.53*** DOCUMENT CONTROL NUMBER:
Truck, Utility, 1/4 Ton, 4x4, M151 PROJ NR: EH-2-4942/-G1-EH-K2

surface and gravel roads at speeds not in excess of 35 mph for the first 100 miles. Thereafter, the speed may be increased to 50 mph for the balance of the break-in.

- (a) Caution against excessive gear speeds
- (b) Avoid skipping gears
- (c) Avoid rapid acceleration or deceleration
- (d) Avoid loading to capacity
- (e) Avoid prolonged operation resulting from overheating
- (f) Avoid sudden or forced engagement of controls.
- (g) Avoid constant-speed operation. During this operation, all necessary adjustments shall be accomplished.

c. Endurance - Each vehicle shall be driven over the test course specified in Table I, four complete series alternately in accordance with mileage, speeds and loads specified for each course.

TABLE I (One Series) FPVT

<u>Course</u>	<u>Mileage and Speeds</u>	<u>Vehicle Loading</u>
Hard Surface	925 miles paved at varying speed up to maximum	1200 pounds
Level Cross Country	1900 miles at speeds applicable to conditions of terrain	800 pounds
Hilly Cross Country	1900 miles at speed applicable to conditions of terrain	800 pounds
Belgian Block	150 miles at speeds dependent upon characteristics of vehicle	800 pounds

The second and fourth cycles shall be performed with vehicle towing loads specified as follows in addition to carrying payloads specified in Table I.

- (a) Hard Surface - 2000 pounds
- (b) Cross country and Belgian Block - 1500 pounds

SUPPORTING SCHEDULE ANALYSIS

TO: CG, USAAPG	APPROVED BY	Page 4 of 6 Pages
FROM CG, USATAC ATTN: SMQTA-IQK.3		ATTACHED TO DD FORM: AOS: 20 IOS: SS:
(TYPE NAME AND DATE)		

GMS CODE & TITLE 4030.14.3101.2.53**** **DOCUMENT CONTROL NUMBER:**

Truck, Utility, 1/4 Ton, 4x4, M151

PRON NR: EH-2-44Way-01-EH-K2

TABLE II (ICT) 5000 MILES

<u>Course</u>	<u>Mileage</u>	<u>Vehicle Loading</u>
Break-In	500	No Load
Hard Surface	550	1200 pounds
Level Cross Country	1900	800 pounds
Hilly Cross Country	1900	800 pounds
Belgian Block	150	800 pounds

50% of mileage will be with applicable towed loads

d. Specification Requirements

(1) Two vehicles shall be subjected to the following tests to determine compliance with the engineering requirements of Specification MIL-T-45331. These tests may be performed prior to or in connection with any beginning series of the reliability test as determined by Aberdeen Proving Ground.

(a) Speeds. The vehicles, including 800 pounds payload each, and with 1,500 lbs towed load, shall be capable of sustaining a speed of not less than 60 mph; a slow speed of not more than 2½ mph in low gear, when operated on smooth, dry, level, hard surfaced roadway.

(b) Grades. The vehicles, including 800 pounds payload and with 1,500 pounds towed load shall be capable of negotiating grades up to 6½ percent at a speed of 30 mph when operated over a smooth, dry, hard-surfaced roadway. Without towed load, truck, including 800 lbs payload, shall be capable of negotiating grades up to 60 percent at a speed of 2½ mph when operated over a smooth, dry hard surfaced roadway.

(c) Slopes. The vehicles, including 800 lbs payload, shall operate on side slopes, sloping right or left, up to 40 percent.

(d) Fording. The vehicles shall ford hard-bottom, approximately level crossing in fresh or salt water of at least a twenty (20) inch depth.

(e) Braking ability. The fully equipped vehicle, including 1200 lbs payload, but excluding towed load, tire chains or modification kits, shall have the braking ability as follows:

1. Service brakes shall stop the vehicle within 30 feet from a speed from a speed of 20 mph, on dry, hard approximately level, smooth road, free from loose material. Brakes should be properly burnished prior to this test.

2. The parking brake shall hold the vehicle on a dry, concrete incline of 60 percent with 800 lbs payload.

SUPPORTING SCHEDULE ANALYSIS

TO: CG, USAAPG	APPROVED BY (TYPE NAME AND DATE)	Page 5 of 6 Pages
		ATTACHED TO DD FORM: ADS: 20 IDS: SS:

DMS CODE & TITLE 4030.14.3101.2.53***

DOCUMENT CONTROL NUMBER:

Truck, Utility, 1/4 Ton, 4x4, M151

FROM NR: EH-2-499ay-01-EH-K2

(f) Maneuverability. The vehicle shall demonstrate a maximum turning radius of 18 feet, measured from the centerline of the outside front wheel, when negotiating full turns to right and left.

(g) Weight. The net weight of the vehicle, less payload and tire chains, but including full complement of fuel, coolant, lubricant and equipment, shall not exceed 2,300 pounds.

(h) Dimensions. Major clearance dimensions shall conform to Table II.

TABLE II - DIMENSIONS

LOCATION	DIMENSION
Length, overall, maximum (without winch)	132 inches
Width, overall, maximum (not including pioneer tools)	65 inches
Height, overall, maximum	72 inches
Height, overall readily reducible to	52 inches
Approach, angle minimum	45 degrees
Departure, angle, minimum	35 degrees

(i) Radio interference suppression. A radio suppression test shall be conducted by the Coles Signal Laboratory to assure compliance with Specification MIL-S-10379.

(j) Toxic fume test. Vehicles shall be subjected to the toxic fume tests in accordance with OPM 60-i05.

(k) On Vehicle Material. All OEM equipment installed shall be checked for condition, fit, weight and operation.

(l) Frame test. Each vehicle shall be run over the frame twister course for a total of six (6) times. Vehicle speeds shall not exceed 2½ mph for this portion of the test.

4. Final Inspection. Upon completion of tests specified in paragraph 3 above, vehicles shall be given a final inspection. All deficiencies shall be noted and analyzed for inclusion in test report.

SUPPORTING SCHEDULE ANALYSIS			
TO: CG, USAAPC	APPROVED BY <i>R.S. Edwards</i>	Page 6 of 6 Pages	ATTACHED TO DD FORM:
FROM: CG, USATAC ATTN: SMOTA-IQK.3	(TYPE NAME AND DATE)	AOS: 20	IOS:
CWS CODE & TITLE 4030.14.3101.2.53*** Truck, Utility, 1/4 Ton, 4x4, M151		DOCUMENT CONTROL NUMBER:	PRON NR: EH-2-4944-01-EH-K2
<p>a. A complete teardown of two engines shall be a part of this inspection. All engine components shall be checked for wear factors. This phase shall not delay publication of the final test report; a separate report may be submitted.</p> <p>5. <u>Maintenance.</u> a. Maintenance shall be performed in accordance with TM's 9-2320-218-10 and 9-2320-218-20.</p> <p>b. Maintenance personnel shall consist of military MOS trained automotive mechanics of average field level.</p> <p>6. <u>Reports.</u></p> <p>a. Deficiencies of a serious nature shall be brought to the immediate attention of the Industrial Directorate representative at Aberdeen Proving Ground. All deficiencies found during entire course of test shall be reported daily in accordance with feedback system defined in ORD-M608-T16.</p> <p>b. A weekly narrative summary report of deficiencies shall be forwarded to Army Tank Automotive Command, ATTN: SMOTA-IQK.3 (Test Section). The report shall be submitted in ten (10) copies.</p> <p>c. An interim report will be submitted after each vehicle has completed ten thousand (10,000) miles of operation reflecting only deficiencies which have occurred during first 10,000 miles.</p> <p>d. A final formal report shall be prepared and twenty five (25) copies shall be submitted to the Army Tank Automotive Command, ATTN: SMOTA-IQK.3 for distribution. No other distribution of final report or weekly report shall be made to any agency or contractor without written approval of Industrial Directorate, ATAC.</p> <p>(1) Final report shall contain a summary of all deficiencies and probable causes.</p> <p>(2) Final report shall contain recorded data pertaining to:</p> <ul style="list-style-type: none"> (a) Fuel consumption (b) Oil consumption (c) Hours of maintenance required (d) Specific difficulties in maintenance (e) Abnormal or unusual tire tread wear (f) Recommended changes to technical manuals or lubrication order. 			

APPENDIX C

Summary of Defects

USATECOM PROJ. NO. 1-3-4030-01-D
 IP (FPTV) of TRUCK, UTILITY: 4-Ton,
 TEST: 4x4, M151, USA Reg. No. 2D5742
 PROJECT NO IF-ICT-221

SUMMARY OF DEFECTS

Stamp No. 1-(R)
 18 Sep 64 TYPES OF DEFECTS

- A - DEFICIENCY D - DESIGN
- B - SHORTCOMING M - MANUFACTURING
- C - SUGGESTED IMPROVEMENT

SNL GRP	VEH NO.	APC NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS	
01	10	A/D	ENGINE Indicator, engine oil level	8754192	3122	Broken		
	35	A/M	Seal, crankshaft rear	7017014	10113	Worn, dirt entered engine		
	37	A/M	Bolt: head assy to block	96906-35303-95	10114	Cracked		
	112	C/M	New engine installed	-	9939	Piston rings and wrist pin bushings worn		
	5	B/H	CLUTCH Screw, cold start detent cover	424208	664	Missing		
02	9	B/D	Cotter pin, clutch release rod	-	3110	Sheared, upper end of rod		
	18	A/M	Rod, clutch release	8754535	7481	Broken		
	75-2	A/M	Rod, clutch release	8754535	9461	Broken		
03	2	A/M	FUEL SYSTEM Air cleaner	7044861	664	No oil in air cleaner		
	4	B/M	Cap, filler, fuel tank	83333722	664	Gasket cut by outer edge of cap		
	86-2	B/M	Cap, filler, fuel tank	83333722	20054	Gasket shifted and caught under inner cap		
	82	B/M	Gasket, mounting, fuel Pump	7331156	18805	Leaking, cracked		
	83	B/M	Pump, fuel, elec: w/filter	7017601	13805	Filter supports rods broke loose		
	87	B/M	Cover, engine air cleaner	7044861 assy	20054	Cracked at outlet		
	14	A/M	COOLING SYSTEM Radiator	8754957	5619	Leaking, broken soldered joint		
05	85	A/M	Radiator Belt, V, Matched Set	7033756	11153	Cracked badly (ref.group 06, APG No. 28-3)		

STAN 100-1
18 Sep 1

TYPES OF DEFECTS

A - DEFICIENCY

D - DESIGN

B - SHORTCOMING

M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

USATECON PROJ. NO. 1-3-4030-C-D
IP (PVT) of TRUCK, UTILITY, $\frac{1}{4}$ Ton,
TEST: 4X4, MI51, USA Reg. No. 2D5742
PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS				
SNL GRP NO.	YEN NO.	APC NO.	TYPE	ITEM
<u>ELECTRICAL SYSTEM</u>				
06	1	-	Distributor	
	17	A/D	Drive, engine, elec.starter	7044048
	21-2	A/D	Drive, engine, elec.starter	7017648
	29-3	A/D	Drive, engine, elec.starter	7017648
	31-4	A/D	Drive, engine, elec.starter	7017648
	71-5	A/D	Drive, engine, elec.starter	7017648
	19	A/D	Screw, gen.arm to block	96906-35297-61
	20-2	A/D	Screw, gen.arm to gen.	96906-35297-61
			Bolt, gen.bracket to block	96906-35297-60
	24-3	A/D	Screw, gen.arm to block	96906-35297-61
	26-4	A/D	Bolt, gen.bracket to block(2 ea.)	96906-35297-60
	34	B/M	Lamp; instrument panel	454732
	84	B/M	Lamp; instrument, panel (2 ea.)	454732
	53	B/M	Seal, oil: generator(drive end)	7374863
	72	A/D	Spring, contact: horn switch	8754115 assay
	73	A/M	Regulator, engine Generator	8689216
	74	B/M	Indicator, liquid quantity:fuel	8380960
	88	B/M	Terminal lug: engine ground cable	7056713
	89	C/H	Wiring harness: main	8754888
	90	C/H	Lead: battery to starter switch	8754884
<u>TRANSMISSION</u>				
07	47	A/N	Bearing: input shaft	7368812
	B1	A/N	Shaft, shifter	8754143

Ball cage failed
Third and fourth gear shift shaft cracked

10114
18168

Rotor interference (CANCELLED)
Dirty
Dirty
Dirty
Gear, stripped
Broken
Broken
Missing
Broken
Both lost, fan belt broken (was 28-3)

664
7457
7625
8998
9208
16882
7520
7559
7559
341
8957
9918
18805
12255
16882
16923
15516
20054
20054

18 Sep '58 (H) TYPES OF DEFECTS:
 A - DEFICIENCY D - DESIGN
 B - SHORTCOMING M - MANUFACTURING
 C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS

USATECOM PROJ. NO. 1-3-4030-D
 IP (FPVT) of TRUCK, UTILITY: 1/4-Ton,
 TEST: 4x4, MIL-S, USA Reg. No. 205742
 PROJECT NO. IF-ICT-221

SNL GRP NO.	VEH NO.	APG NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS
08	91	B/H	TRANSFER Seal: shifter shaft(front drive)	7979499 7536192	20054 20054	Leaking Spalled	
	92	B/H	Shaft, intermediate				
09	36	A/H	PROPELLER SHAFTS Shaft, propeller: front	7368809	10114		
	93	C/H	Shaft, propeller: rear	7368801	20054		
10	39-1	A/H	FRONT AXLE Yoke, U-joint: axle drive	7340696	10114	L.F., plug loose, restaked	
	79-4	B/M	Yoke, U-joint: axle drive	7340696	17388	R.F., seal journal worn, leaking	
	80-5	A/H	Yoke, U-joint: axle drive	7340696	17504-6	R.F., plug loose, restaked twice	
			See also Group 11				
	40	B/H	Yoke, U-joint: pinion shaft(front)	8359972	10014	Seal journal worn excessively	
	45	A/H	Socket, assy: ball joint, lower	8342320	10114	R.F., retainer loose in socket	
	68-2	B/M	Socket, assy: ball joint, lower	8342320	15278	L.F., worn excessively	
	69	A/H	Socket, assy: ball joint, upper	8342319	15278	R.F., cracked	
	95-2	A/H	Socket, assy: ball joint, upper	8342319	20054	L.F., cracked	
			REAR AXLE				
	8	A/H	Yoke, U-joint: axle shaft	7340693	2723	L.R., broken cross-shaft	
	50-2	B/M	Yoke, U-joint: axle shaft	7340693	8220	L.R., relief plug lost	
	52-3	A/H	Yoke, U-joint: axle shaft	7340693	524	L.R., broken cross-shaft	
	12	A/N	Gear: side, short (left)	8754294	4267	Sheared at undercut	
	77-2	A/N	Gear: side, long (right)	8754295	17141	Sheared at undercut	
			11				

15c-1) TYPES OF DEFECTS
 15c-2) TEST
 A - DEFICIENCY D - DESIGN
 B - SHORTCOMING M - MANUFACTURING
 C - SUGGESTED IMPROVEMENT

USATECOM PROJ. NO. 1-3-4030-C-D
 IP (FVT) of TRUCK, UTILITY, 1/4 Ton,
 TEST: 9X4, M151, USA Reg. No. 2D5742
 PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS				ITEM	PART NO.	PART NUMBER	MILEAGE	REMARKS
ENCL	VEN	APG NO.	TYPE					
REAR AXLE (Continued)								
11	15	A/M	Yoke, U-joint: axle drive	7340696	6088	Both sides, loose plugs, restaked		
	33-2	A/M	Yoke, U-joint: axle drive	7340696	9739	RR & RF, loose plugs, restaked		
	38-3	A/H	Yoke, U-joint: axle drive	7340696	10114	L.R., plug stripped, replaced		
	78-4	B	Yoke, U-joint: axle drive	7340696	17141	R.R., broken alignment lug, replaced		
	99-5	A/M	Yoke, U-joint, axle drive	7340696	20354	Both sides, front and rear, loose plugs, only one original yoke		
	32	B/M	Yoke, U-joint: pinion shaft(front)	8359972	9739	Dirt slinger loose and noisy		
	41	B/M	Differential assy.	7536140	10114	Front and rear, water in lubricant		
	55	A/M	Seals, side gear and pinion shaft	7331280	12672	Dirt in lubricant, pinion bearings worn, pinion cracked		
	49	A/M	Shaft, propeller w/U-joint:axle	8754659	10526	L.R., broken cross-shaft		
	51-2	A/H	Shaft, propeller w/U-joint:axle	8764659	637	L.R., broken bearing cap		
	98	B/M	Pinion gear	8754219 assy	7381	All teeth showed slight cracks		
BRAKES								
12	6	B/D	Brake assy, wheel	-	1688			
	26	B/M	Shoe, wheel brake: w/lining(4 ea)	7025868	8614			
	102-2	B/H	Shoe, wheel brake: w/lining(2 ea)	7025868	11679	R.R., dirt entrance caused uneven braking		
	58	A/H	Boot, cylinder, wheel brake	7548610	13471	Front secondary shoe lining worn to rivets, rear secondary shoe linings worn to shoes, drum scored.		
	65-2	A/N	Boot, cylinder, wheel brake	7548610	15235	Rear secondary lining worn to rivets		
	101-3	A/H	Boot, cylinder, wheel brake	7548610	20054	LF, nicked sealing edge		
						RR, Torn		

DATE: 10-10-68
 TYPES OF DEFECTS
 A - DEFICIENCY D - DESIGN
 B - SHORTCOMING M - MANUFACTURING
 C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS				TEST: IP (FFVT) of TRUCK, UTILITY: 1/4-Ton. TEST: IP (FFVT) , USA Dog. No. 20544 PROJECT NO: JF-JCT-221			
SNL GRP NO.	VEH NO.	APG NO.	TYPE	ITEM	PART NO.	PART WILLAGE	REMARKS
13				<u>WHEELS, HUBS AND DRUMS</u> Bearing, roller, tapered Seal: wheel bearing, outer Seal: wheel bearing, inner	7536131 7996801 7996804	10114 20054 20054	R.F., wheel, inner bearing "cage" failed R.R., spring mislocated and worn through R.F., seal and spindle seal journal worn L.F., spring mislocated, worn through and caught in bearing
15	42	B/H	A/H	<u>FRAME</u> Reinforcement, shock absorber mount -	-	10114	Left rear shock mount reinforcement not properly welded
	105	C/D	C/D	Bracket, engine support, front	-	20054	Both cracked.
	106	C/N	C/N	Mount, idler arm bracket	-	20054	Bolt holes distorted.
16				<u>SUSPENSION</u> Front suspension	-	664	Misalignment, initial insp.
	3	A/M	A/M	Bolt and nut, lower arm to front	8754892	96906-35690-723	Rear bolt, left arm had loosened
	22	A/M	A/M	crossmember	Same	7799	Same as 22
	23-2	A/M	A/M	Same as 22	Same	8451	All bolts on left arm were loose, arms lost
	27-3	A/H	A/H	Absorber, shock: front	8359994	7997	Leaking, no resistance
	25	B/H	B/H	Absorber, shock: front	8359994	20054	Both shocks, lower studs worn
	110-2	E	E	Crossmember, front	8754456	8998	Misalignment, bowing suspected
	30	B	B	Crossmember, front	8754456	14525	Cracked, both lower arm front mount, and
	63-2	A	A	Crossmember, front	8754456	14525	right arm, rear mount
	48	C/D	C/D	Nut, self-locking	503357	10197	Lost after reinstallation at mid-test Inspection

13a-(B) TYPES OF DEFECTS
 A - DEFICIENCY D - DESIGN
 B - SHORTCOMING M - MANUFACTURING
 C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS

USATECON PROJ. NO. 1-3-4030-01-2
 IP (FPTV) of TRUCK, UTILITY: /4-Ton,
 TEST: 4000 MILS, USA Reg. No. 2D5742
 PROJECT NO. IF-ICT-221

S/NL GRP NO.	VEN NO.	APO NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS	
							SUMMARY (Continued)	
16	54	S/M	Bushing, shock absorber, front	83599998	12377	Split (right lower)		
	56	P	Bolt, upper arm to front cross-member	8754891	13471	Loose at rear mount, right arm		
	59	A	Arm assy: front, lower	8754415(LH)	14249	Cracked at shock bracket rear bolt		
	64-2	A	Arm assy: front, lower	8754416(RH)	14525	Cracked at shock bracket rear bolt		
	60	P/H	Absorber, shock: rear	8359993	14249	RR, no resistance		
	66-2	P/H	Absorber, shock: rear	8359993	15235	LR, no resistance		
	61	P/H	Bushing, shock absorber, rear	7343032	14249	RR, severe damage (ref. APG No. 60)		
	67-2	P/H	Bushing, shock absorber, rear	7343032	986	RR, damaged		
	62	P/D	Bushing, rear susp. arm mount	8342303	14488	Excessive wear, 4 pl.		
	76	A	Bracket, shock absorber, front	7331162	17032	Left, center hole elongated.		
	94-2	A	Bracket, shock absorber, front	7331162	20054	Right, cracked from center hole		
	96	C/M	Arm assy, rear, LH & RH	8754453 6	20054	L.H., rear member bent, front member cracked 2 pl. Both arms, spring plate cracked		
	97	C/M	Insulator, anti-squeak, rear 'spring	8754264	20054	Out of location		
	17	44	S/M	HOOD	10114	Misaligned		
				HOOD, engine compartment	8754805			
	18			BODY				
				7	8754703	1953	Deformed	
				16-2	8754703	6814	Deformed	
				43	-	10114	Typical cracks under rear lights.	
				107	C/M	20054	Cracked at yield undersides rear corners of transmission pan to wheel well spot welds cracked	
				108	C/M	20054	Five pan to wheel well spot welds cracked	
				109	C/M	20054	Distorted	

STAN. NO. 132-B
10 Sep

TYPES OF DEFECTS
A - DEFICIENCY D - DESIGN
B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS

USATECOM PROJ. NO. 1-3-4030-01-D
IP (PPVT) OF TRUCK, UTILITY, $\frac{1}{4}$ Ton
TEST: 4x4, MI51, USA Reg. No. 2D5742

PROJECT NO. IF-ICT-221

SNL VEH CAP NO.	APG NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS	
						BUMPERS AND GUARDS	MISCELLANEOUS ACCESSORIES
21	111	C/M	Brush guard	-	20054	Cracked 3 pl.	
22	11	B/M	Fastener, slide: right door	7345097 assy	3399		Fastener on horizontal slit in right front door failed.
	13	B/M	Fastener, slide: left door	7345100 assy	5619		Both fasteners failed in left door.
	57	B/D	Window, left: back curtain	8754963 assy	13471		Cracked

USATECOM PROJ. NO. 1. 3-4030-D
IP (FPVT) of TRUCK, UTILITY : 1/4-Ton,
4x4, M151, USA Reg. No. 205743

TEST: PROJECT NO: IP-ICT-221

SUMMARY OF DEFECTS

QRCN "D" 16 Sep. 70
SA-100 TYPES OF DEFECTS

A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING
C - SUGGESTED IMPROVEMENT

SNL GRP	VEH NO.	APC NO.	TYPE	ITEM	PART NO.		PART MILEAGE	REMARKS
					PART NO.	MILEAGE		
01	43	B	ENGINE Seal: crankshaft, rear	7017014	3820	New seal installed at midtest inspection		
	63	C/M	Gasket: cylinder head	8754617	20001	Leakage of gases and water between cylinder Nos. 2 and 3		
	77	C/H	Engine, general	-	20001	Wear of wrist pin bushings and piston pin holes		
02	11	A/M	CLUTCH Rod, clutch release	8754535	3403	Broken, upper end		
	16-2	A/M	Rod, clutch release	8754535	2940	Broken, upper end		
	21-3	A/M	Rod, clutch release	8754535	1045	Broken, lower end		
	22-4	A/M	Rod, clutch release	8754535	1053	Broken, upper end		
	10	B/M	FUEL SYSTEM Cover, engine air cleaner	7044861	3388	Cracked at outlet, replaced later.		
03	29-2	B/H	Cover, engine air cleaner	7044861	1872	Cracked at outlet		
	34-3	A/H	Cover, engine air cleaner	7044861	1377	Cracked at outlet		
	39	B/H	Cap, filler, fuel tank	83333722	10867	Gasket cut on outer edge		
	49-2	B/H	Cap, filler, fuel tank	83333722	3872	Gasket cut on outer edge		
	54	B/M	Gasket, mounting, fuel pump	7331166	15897	Leaked, cracked at bolt holes		
	64	B/N	Pump, fuel, elec: w/filter	7017601	20001	Filter support rods (2) loose at upper end		
	17	A/M	COOLING SYSTEM Belt, V, matched set: water pump	70333756	6741	Broken		
05	26-2	A/M	Belt, V, matched set: water pump	70333756	1158	Broken frayed		
	44	B/M	Radiator	8754957	11962	Overflow tube broke loose from side.		

QMC/Po
16 Sep 68
S/N (R) TYPES OF DEFECTS

A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

USATECOM PROJ. NO. 1-3-4030-^D
IP (FPVT) OF TRUCK, UTILITY: 2/4-Ton,

TEST: 4X4, N151, USA Reg. No. 205743

PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS							
SNL GRP NO.	VEN NO.	ARC NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS
<u>06</u>				<u>ELECTRICAL</u>			
	1	-	Distributor	7044048	664		Rotor interference (CANCELLED)
	58-2	-	Distributor	7044048	15897		Rotor interference (CANCELLED)
	5	A/D	Switch, push: horn, w/cable	8754115	1537		Wire broke at lower end of column
	19	A/D	Drive, engine, elec. starter	7017648	7162		Dirty
	20	A/H	Generator & Regulator	7524310	6	7369	Armature, current limiter and reverse
	24-2	A/M	Generator	8689216	7369		current relay burned out
	27	A/H	Screw, gen. to bracket, and Nut, gen. to bracket	752431C	371		Commutator bars lifted
	55	B/H	Terminal lug, engine ground cable	96906-35304-89 7056713	8075 15897		Loose Broken at ground end
	65	B/M	Indicator, pressure: oil	8380687	15897		Reading low (20 - 30 psi.)
			<u>TRANSMISSION</u>				
	61	A/M	Gear, cluster, countershaft	7536154	18925		Two teeth broken, fatigue
			<u>TRANSFER</u>				
	23	B/M	Bolt, w/washer: output seal ret.	5306-042-4209	7447		Two of three loose.
	66	C/M	Shaft, intermediate: transfer	7536192	23001		Showed pattern but no spalling (Ref veh 1)
			<u>PROPELLER SHAFTS</u>				
	67	C/M	Shaft, propeller: front	7368808	20001		One U-joint cross-shaft journal brinelled
		C/M	Shaft, propeller: rear	7368801	20001		One U-joint cross-shaft journal lubricant contaminated
	68	C/M					Three U-joint cross-shaft journal showed similar pattern. One of these was contaminated.

C-9

Def. No.
13 Ser.

TYPE(S) OF DEFECTS

A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS

USATECOM PROJ. NO. 1-3-4030-21-D
IP (FFVT) of TRUCK, UTILITY,
1/4-Ton,

TEST - 484-A151, USA Reg. No. 25743

PROJECT NO. IP-INT-221

SNL GAP NO.	APC NO.	TYPE	ITEM	PART NO.		PART MILEAGE	REMARKS
				PART NO.	MILEAGE		
<u>FRONT AXLE</u>							
10				7340694	664		No bearing needles in one journal
	2	A/M	Yoke, U-joint: axle shaft	8342320	2480	L.F., retainer loose in socket	
	8	A/M	Socket assy: ball joint, lower	8342320	11745	Excessive wear	
	42-2	B/H	Socket assy: ball joint, lower(2 ea)	8342320	15006	Cracked	
	52	A/M	Socket assy: ball joint, upper	8342319			
			See also Group 11				
<u>REAR AXLE</u>							
11				7340693	1810		L.R., broken U-joint cross-shaft
	7	A/M	Yoke, U-joint: axle shaft	7340696	4869	R.F., center plug loose	
	12	A/M	Yoke, U-joint: axle drive	7340596	5513	R.R., center plug loose	
	14-2	A/X	Yoke, U-joint: axle drive	7340696	3768	L.R., center plug loose	
	15-3	A/M	Yoke, U-joint: axle drive	7340696	8518	R.R., two bearing cups, two bolts broken	
	32	A/M	Shaft, propeller w/U-joint:axle	8761559	9519	L.R., broken U-joint cross-shaft	
	35-2	A/M	Shaft, propeller w/U-joint:axle	3764659		Lubricant contaminated. All parts	
	38	A/M	Seal, side gear (2 ea) and	7331280	10664	excessively worn.	
	47	A/M	Seal, pinion shaft (2 ea)	7996802	2267	Sheared at undercut	
	47	A/M	Gear, side: short (left)	8754294			
<u>BRAKES</u>							
12	28	B/M	Shoe, wheel brake: w/lining(8 ea)	7025868	8142	All secondary linings worn to rivets, drums scored	
	37	B,M	Connector, tee: brake line	-	9674	Ter fitting at front was leaking	
	48	A/M	Cylinder: assy, wheel brake	8328443	13712	K.F., corroded, seized	
	53	A/M	Boot, cylinder: wheel brake	7548610	7287	One rear nicked, other rear not seated properly	

10 SEP 1968 TYPES OF DEFECTS
 A - DEFECTS
 B - SHOCK ABSORBING
 C - SUSPENSION IMPROVEMENT

USATECOM PROJ. NO. 1-3-4030-D
 IP (FPTV) OF TRUCK, UTILITY,
 4x4, M151, USA Reg. No 2DS743
 TEST
 PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS					
SNL	VEH GRP	ART N.	ITEM	PART NO	PART MILEAGE
					REMARKS
<u>WHEELS, HUBS AND DRUMS</u>					
13		3	A/M Nut: wheel spindle	73331296	664
		30	B/M Seal: wheel spindle, inner(4 ea)	7996804	8142
		31	B/M Seal: wheel spindle, outer(2 ea)	7996801	8142
		56-2	B/M Seal: wheel spindle, outer(2 ea)	7996801	15897
					6 7755
					All four inner seals were worn. LR & RF, worn, lubricant contaminated Both front spindle seals failed, lubricant contaminated.
<u>CONTROLS</u>					
14		62	B Tie rod, end, steering	8754485	19435
					RH, excessive wear, overtraveled
<u>FRAME</u>					
		25	B/H Screw, cap: pintle mount(2 ea)	96908-35298-116	664
			Screw, cap: pintle mount(2 ea)	96906-35298-116	2835
		50	B/M Bracket, rear differential	-	Misaligned Shock absorber mount damaged by protrusion on test course
		71	C/D Bracket, engine support, front	-	Stripped
		72	C/M Mount, idler arm bracket	-	Stripped
					RR, lower, worn excessively
					LF, no resistance
					RF, no resistance
					LR, no resistance
					RR, no resistance
					Lower studs worn
					Cracked at spring seat rear weld, and shock mount
					Worn center hole
					Cracked at right arm front mount
					Rear member bent.
<u>SUSPENSION</u>					
15		4	A/M Front suspension	8754795	664
		9	B/D Arm assy: rear, RH		2835
		36	A/M Nut, lower arm mtg.bolt(2 ea.)	96906-35690-723	10129
		41-2	A/M Nut, lower arm mtg.bolt	96906-35690-723	11538
		40	B/M Bushing, shock absorber, rear	7343032	Stripped
		45	B/M Absorber, shock: front	8359994	Stripped
		46	B/M Absorber, shock: front and Absorber, shock: rear	8359994	RR, lower, worn excessively
		59	B/M Absorber, shock: rear	8359993	11538
		76	B Absorber, shock: front (2 ea)	8359993	11962
		51	B Arm assy, front, lower RH	8359994	LF, no resistance
				12687	RF, no resistance
		60	B Bracket, shock absorber, lower	87331162	12687
		69	A Crossmember, front	8754456	15897
		70	C/M Arm assy: rear, L.H.	8754453	8096
				15006	Lower studs worn
				16547	Cracked at spring seat rear weld, and shock mount
				20001	Worn center hole
				20001	Cracked at right arm front mount
				20001	Rear member bent.

USATECOM PROJ. NO. 1-3-4030-01-D
IP (PVT) OF TRUCK, UTILITY, /4-Tc.,
TEST: 4x4, M151, USA R&R No 2EE743

PROJECT NO.: IP-ICT-221

SUMMARY OF DEFECTS

(S-1) TYPES OF DEFECTS
A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

SNL GRP NO	Y-E-H NO	APC NO	TYPE	ITEM	PART NO.		PART NUMBER	PART MANUFACTURER	REMARKS
					ITEM	ITEM			
<u>BODY</u>									
18		13	B/D	Clamp, mounting: spare tire	8754703		5377		Deformed
		18-2	B/D	Clamp, mounting: spare tire	8754703		6781		Deformed
		33	B/D	Panel, rear	-		9519		Cracked under tail lights
		73	C/M	Floor pan, front	-		20001		Cracked, underside rear corners of transmission access
		74	C/M	Floor pan, rear	-		20001		Cracked two pan-to-wheel well spot welds
		75	C/M	Bracket, door hinge rod (2 ea)	-		20001		Distorted
<u>MISCELLANEOUS ACCESSORIES</u>									
22		6	B/D	Curtain, vehicular: left door	7345100		1725		Window cracked
				Curtain, vehicular: back	8754963		1725		Right hand window cracked
		57	B/H	Grommet, speedometer cable	10885538		15897		Twisted, not sealing

USATECOM PROJ. NO. 1-3-4030-A-D
IP (FPVT) OF TRUCK, UTILITY: 4-Ton.

TEST: 4x4, M151, USA Reg. No. 2D5997

PROJECT NO: IF-ICT-221

SUMMARY OF DEFECTS

- A - DEFICIENCY D - DESIGN
- B - SHORTCOMING M - MANUFACTURING
- C - SUGGESTED IMPROVEMENT

S/N GRP C	VEH NO.	APG NO.	TYPE	ITEM	PART NO.	MILEAGE	REMARKS	
							PART NO.	MILEAGE
<u>01</u>				<u>ENGINE</u>				
	34	B/M	Gasket, valve cover		8754182	10564	Leaking, broken	
	35	B/M	Indicator, engine oil level		8754192	10564	Broken	
	37	B/M	Bolt: cylinder head		96906-35303-95	11510	Head broken	
	50	A	Seat, spring: valve, retaining(3 ea)	8712381		14861	Broken	
	51	B/M	Boot: engine, intake valve(4 ea)		8754646	14861	Cracked 3 pl. ea.	
	66	C/M	Engine, general	-		20074	Wear of piston pin holes	
<u>03</u>				<u>FUEL SYSTEM</u>				
	5	B/M	Gasket: mtg., fuel pump		7331166	1346	Leaking, cracked at bolt holes	
	6	A/M	Pump, fuel, elec: w/filter		7017601	3849	Piston scored and seized	
	36	B/M	Cap, filler, fuel tank		8333722	10564	Gasket cut at outer edge	
	58-2	B/M	Cap, filler, fuel tank		8333722	5636	Gasket cut at outer edge	
	39	A/M	Screw: idle speed regulating		29092-5R-357	10577	Lost	
	40	B/M	Bracket, assy: choke control		29092-49-R277A	11764	Cracked at mounting hole	
	57	B/M	Choke cable		8754129	14550	Core wire broke six inches from carburetor	
	60	B/M	Cover, engine air cleaner		7044861 assy	18279	Cracked at outlet	
				<u>EXHAUST SYSTEM</u>				
	29	B/M	Strap, retaining: muffler mtg.		7331269	10004	Broken	
	31	B/M	Clamp, tailpipe hanger		7331271,	10423	Both clamps broken	
<u>04</u>				<u>COOLING SYSTEM</u>				
	55	A/M	Belt,V, matched set: water pump		7033756	14947	Cracked, separating evident	
	65	A/M	Belt,V, matched set: water pump		7033756	5127	Segment missing	

DATA FOR U.S.A. (R) 18 Sep TYPES OF DEFECTS

A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

USATECOM PROJ. NO. 1-3-4030-QL-D
IP (FPT) of TRUCK, UTILITY: 4-Ton.
TEST: 4x4, M151, USA Reg. No. 2D5997

PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS

IP (FPT) of TRUCK, UTILITY: 4-Ton.

TEST: 4x4, M151, USA Reg. No. 2D5997

PROJECT NO. IF-ICT-221

SNL GRP NO.	VEH NO.	APG NO.	TYPE	ITEM	PART NO.	PART MILEAGE	REMARKS
ELECTRICAL SYSTEM							
06		3	B/M	Switch assy: light	7368702	945	Binding in main (upper) switch
		4	B/M	Lens, panel lights	735851	1135	Not seated properly
		19	B/M	Indicator pressure: oil	8380687	8794	One coil overheated
		33	A/M	Coil, ignition: distributor	8328027	10564	11 circuits open
		42	B/M	Lamp, sealed beam (2 ea)	7998618	11764	Both high beams burned out
		49	B-	Lead and conduit assy: spark			
				Plug No. 3			
		54	B/M	Spark Plug: 14mm, suppressed(4 ea)	96906-51011-1	14550	Engine miss only partially corrected
					96906-35909-1	14939	Engine miss corrected, Nos 1 & 4 open through center
		67	C/M	Wiring harness: main	8754888	20074	Chafed on air cleaner bracket
		68	C/M	Lead: battery to starter switch	8754884	20074	Chafed on kick panel channel and screws
		69	B/M	Screw, drive end head: starter(4 ea)	19728-19Z-878	20074	Broken near heads
TRANSMISSION							
07		30	A/M	Bearing: input shaft	7368812	10268	Ball spacer missing, entire mainshaft damaged
TRANSFER							
08		41	B/M	Flange assy: output	10885037	11764	Turn seal journal
		70	B/M	Spacer, roller bearing	7536194	20074	Broken, shaft and gear damaged
FRONT AXLE							
09		8-2	A/M	Yoke, U-joint: axle drive	7340696	6160	R.F., center plug loose, replaced
		12-3	A/M	Yoke, U-joint: axle drive	7340696	1013	R.F., center plug loose
		18-5	A/M	Yoke, U-joint: axle drive	7340696	8444	R.F., center plug loose
		32-7	A/M	Yoke, U-joint: axle drive	7340696	10457	L.F., center plug loose
		42-9	A/M	Yoke, U-joint: axle drive	7340696	13774	L.F., center plug loose, replaced
		59-10	A/N	Yoke, U-joint: axle drive	7340696	2745	L.F., center plug loose
				See Also Group 11			
		71	A/M	Socket assy, ball joint, upper	3542319	20074	Both cracked, R.H. worse

STAN FORM 101 (2)

18 Sep TYPES OF DEFECTS

A - DEFICIENCY D - DESIGN

B - SHORTCOMING M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

SUMMARY OF DEFECTS

USATECOM PROJ. NO. 1-3-4030-11-D
IP (PVT) OF TRUCK, UTILITY /4-Ton,
TEST. 4x4, M151, USA Reg. No. 2D5997

PROJECT NO. IF-ICT-221

S/N	VEH. GRP NO.	APC NO.	TYPE	I.T.F. NO.	PART NO.	PART MILEAGE	REMARKS	
11 REAR AXLE								
7	A/H Yoke, U-joint: axle drive				7340696	4727	RR, center plug loose	
15-4	A/H Yoke, U-joint: axle drive				7340696	7989	LR, center plug loose	
21-5	A/H Yoke, U-joint: axle drive				7340696	9234	LR, center plug loose	
36-8	B/H Yoke, U-joint: axle drive				7340696	10795	LR, Seal journal grooved	
23	A/H Yoke, U-joint: axle shaft				7340693	9800	RR, U-joint cross-shaft broken	
27-2	B/M Yoke, U-joint: axle shaft				7340693	10004	LR, U-joint cross-shaft brinelled	
56-J	A/H Shaft, propeller w/U-joint: axle				8764659	15423	LR, U-joint cross-shaft broken	
61-4	A/H Shaft, propeller w/U-joint: axle				8764659	8568	LR, journal bearing damaged	
64-5	A/H Shaft, propeller w/U-joint: axle				8764659	15279	LR, U-joint cross-shaft broken	
28	B/M Yoke, U-joint: pinion shaft				8359972	10004	Nut on front yoke was three turns loose	
46	A/H Shaft, pinion: differential				8754219	13749	Broke at shoulder, all parts damaged	
12 BRAKES								
20	A/M Boot, cylinder: wheel brake				7548610	8794	Hole in boot, cylinder stuck (RF)	
24-2	A/M Boot, cylinder: wheel brake(3 ea)				7548610	10004	1210 Hole in boot, cylinder stuck (RF, LR, RR)	
25	B/M Shoe wheel brake: w/lining(2 ea)				7025868	10004	Secondary shoe linings, both rear wheel worn to rivets.	
48-2	B/M Shoe wheel brake: w/lining(2 ea)				7025868	14169	RF, secondary lining worn to rivets	
62-3	B/M Shoe wheel brake: w/lining(2 ea)				7025868	8602	LR, RR, secondary lining worn to rivets	
	Shoe wheel brake: w/lining				7025868	18606	LF, secondary lining worn to 1/32 inch above rivet	
13 WHEELS, HUBS AND DRUMS								
11	B/M Seal, wheel bearing, inner				7996804	6726	L.R., fa: 1/2d	
16	A/H Cone, wheel bearing				7536131	1518	L.R., Spacing cage distorted	
26	A/H Cone, wheel bearing				7536131	10004	R.R., damaged, grease appeared non-standard	
15 FRAME								
74	C/D Bracket, engine support, front				-	20074	Both cracked	

C-15

MAP Part 13 Sep 1968

TYPES OF DEFECTS

A - DEFICIENCY

D - DESIGN

B - SHORTCOMING

M - MANUFACTURING

C - SUGGESTED IMPROVEMENT

USATECOM PROJ. NO. 1-3-4030-01-D
IP (FPT) OF TRUCK, UTILITY 1/4-Ton.
TEST: 4X4, M151, USA Reg. No. 2D5997

PROJECT NO. IF-ICT-221

SUMMARY OF DEFECTS

IP (FPT) OF TRUCK, UTILITY 1/4-Ton.

TEST: 4X4, M151, USA Reg. No. 2D5997

SNL GRP NO.	VEN APC NO.	TYPE	ITEM	PART NO.	PA. T MILEAGE	REMARKS	
						DEFICIENCY	MANUFACTURING
<u>16</u>							
	9	A/M	Skin, stack	8754402, 3.4	6426	Rear of right lower arm, shins lost.	
	10	A/M	Nut, lower arm to front cross-member	96906-35690-723	6426	Center of right lower arm, stripped	
	13	B	Bolt, upper arm to crossmember	8754891	7264	Loose at left arm rear mount	
	14-2	B	Bolt, upper arm to crossmember	8754891	1704	Loose at left arm front mount	
	17-3	B	Bolt, upper arm to crossmember	8754891	8333	Loose at left arm rear mount	
	44-4	B	Bolt, upper arm to crossmember(2 ea.)	8754891	12062	Loose at left arm, both mounts	
	22	A	Arm Assy: front, lower, L.H.	8754415	9240	Cracked at shock mount and spring seat	
	72	A	Arm Assy: front, lower, R.H.	8754416	20074	Small crack at shock mount	
	38	A/M	Bolt, lower arm to crossmember	8754892	11747	Loose at right arm rear mount	
	45	A	Absorber, shock: front	8359994	12777	L.F., over extended	
	52	B/D	Bushing, rear susp. arm	8342303	14861	Right arm, front mount, worn through	
	53	B/M	Absorber, shock: rear	8359993	14861	L.R., no resistance	
	63-2	B/M	Absorber, shock: rear (2 ea.)	8359993	3745	L.R., leaking; R.R., weak	
	73	C/M	Arm assy: rear, R.H.	8754795	20074	Cracked spring seat plate	
<u>16</u>							
	1	B/D	Clamp, mtg., spare tire	8754703	572	Deformed	
	2	B/M	Weatherstrip: Windshield to cowl	73331385	572	Leakage over driver's feet	
	75	C/M	Floor pan, front	-	20074	Cracked at rear of transmission access,	
	76	C/H	Bracket, door hinge rod	-	20074	Distorted	
	77	C/H	Nut, cover, transmission access(3 ea.)	-	20074	Nuts welded to underside of floor pan	
	78	C/M	Windshield assy.	-	20074	Missing	
<u>22</u>							
	43	B/M	Speedometer assy	7760396	11767	Cracked 3 pl, center boulding nut lost	
						Drive socket rounded out	

APPENDIX D

Field Engineering Laboratory Report

AERDENB PROVING GROUND, MARYLAND

FIELD ENGINEERING SECTION

PROJECT NO: 1-3-4030-01-D

DATE: 7 August 1963

REPORT NO: 63-137

QUALITY ASSURANCE TEST OF

TRUCK, 1/4 TON, 4X4, MQ51

USA REG. NO. 2D6356

DATES OF TEST: 30 July thru 2 August 1963

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1. INTRODUCTION

1.1 Object of Test

To determine if the production ML51 will meet pertinent performance requirements as stated in specification MIL-T-45331A (ORD).

2. RESULTS

2.1 Vehicle With Highway Payload (3660 Lb Gross Vehicle Weight)

Both the parking and service brakes held the vehicle stationary in both the ascending and descending positions on the 60% forward slope.

Engine idling and restarting was satisfactory in both attitudes on the 60% longitudinal and 40% side slopes.

The average stopping distance was 24.5 feet with full brake application from a road speed of 20 mph. Specifications require not more than 30 feet from this road speed.

2.2 Vehicle With Cross-Country Payload (3310 Lb Gross Vehicle Weight)

A sustained road speed of 8.2 mph was obtained while negotiating a 60% forward slope. Specifications require a speed of not less than 2.5 mph.

The minimum turning radii of the vehicle was 17 feet both left and right, satisfying the requirement of 18 feet or less.

No appreciable carbon monoxide concentration was observed with the vehicle buttoned-up and idling for approximately 1-1/2 hours. The vehicle exhaust was oriented into the wind to direct exhaust fumes at the vehicle.

2.3 Vehicle With Cross-Country Payload and 1500 Lb Towed Load

Maximum and minimum sustained speeds of 60 mph and 1.5 mph, respectively, were obtained on level paved surface. The requirement is for a maximum speed of 60 mph and a minimum speed not greater than 2.5 mph.

Based on the 29 mph speed on the 10% slope and 34 mph on the 5% slope, the vehicle should meet the 30 mph specification for operation on a 6-1/2% slope.

3. DETAILS OF TEST

3.1 Description

The Truck, Utility, 4x4, M151 is a general purpose carrier designed to transport personnel and equipment. The vehicle is powered by a four cylinder, liquid cooled, gasoline engine coupled to four speed conventional type transmission. The wheels are individually suspended and utilize coil springs. The weight distribution for the test conditions were as follows:

<u>Wheel Position</u>	<u>Without Payload - Lb</u>	<u>W/Cross-Country Payload - Lb*</u>	<u>W/Highway Payload - Lb*</u>
Left Front	680	720	765
Right Front	660	740	780
Left Rear	515	930	1055
Right Rear	545	920	1060
Total Weight	2400	3310	3600

* Includes 2 Crewmen

Clearance dimensions with requirements where applicable were as follows:

<u>Dimensions</u>	<u>Requirement</u>	<u>Vehicle Dimension</u>
Length, Overall, Maximum (W/O Winch)	132 In.	132 In.
Width, Overall, Maximum (Not Including Pioneer Tools)	65 In.	63 In.
Reducible Height	52 In.	52 In.
Approach, Angle, Minimum	45 Deg.	66 Deg.
Departure, Angle, Minimum	35 Deg.	39 Deg.

4. CONCLUSIONS

The test vehicle satisfactorily met the requirements set forth in MIL-T-45331A (ORD) with the exception of vehicle curb weight.

SUBMITTED:

T. J. WALSH
Engineer

REVISED:

R. A. WILKES
Chief, Field Engineering Section

APPROVED:

R. W. JOHNSON
Chief, Automotive Engineering Laboratory

APPENDIX E

Engine Wear Data

Measurement	Veh. No. 2D5742	Engine Wear Data		Mileage 9939	Wear Limit
		Engine No. 4700136			
<u>Cylinder Block:</u>					
Piston Bore:					
Dia. - top of travel		<u>2</u>	<u>3</u>	<u>4</u>	
Dia. - bottom of travel		3.878	3.878	3.878	
Taper		3.877	3.877	3.877	
Out of Round		0.001	0.001	0.001	
Piston Dia. - bottom of skirt		0.001	0.001	0.001	
Clearance - top of skirt		3.8745	3.8745	3.8745	
bottom of skirt		0.003	0.003	0.003	
Bore Dia.		0.002	0.002	0.0015	
Valve Tappets:					
Tappet No.:					
1		<u>Bore Dia.</u> <u>0.5005</u>	<u>Tappet Dia.</u> <u>0.499</u>	<u>Clearance</u> <u>0.0015</u>	
2		.5001	.499	.0011	
3		.5001	.4982	.0019	
4		.5001	.499	.0011	
5		.5001	.499	.0011	
6		.5001	.4984	.0017	
7		.5001	.499	.0011	
8		.5001	.499	.0011	
Wear Limit		.503	.4969	.0055	
<u>Crankshaft:</u>					
Main Bearing Journals:					
Diameter		<u>Front</u> <u>2.2485</u>	<u>Center</u> <u>2.2485</u>	<u>Rear</u> <u>2.2485</u>	
Bearing clearance		.0035	.002	.0035	
Out of Round		0	0	0	
Taper		0	0	0	
Connecting Rod Journals:					
Diameter		<u>1</u>	<u>2</u>	<u>3</u>	
Bearing Clearance		1.1985	1.1985	1.1985	
Out of Round		.002	.002	.002	
Taper		0	0	0	

Measurement	Veh. No.	Engine No.	Mileage ³	Wear Limit
Connecting Rods:	2D5742	4700136	9939	
Side play at crankshaft	1	2	3	
Wrist pin dia.	0.006	0.007	0.006	.005
Wrist pin hole dia. (piston)	.9122	.912	.912	.9123
Clearance (piston - pin)	.913	.9125	.9125	.913
Wrist pin bushing dia (rod)	.0008	.0005	.0005	.0007
Clearance (rod - pin)	.913	.913	.913	.9126
Piston Rings:				
Side Clearance:				
Top Ring	0.003	0.0035	0.003	0.004
Second Ring	.003	.003	.003	.003
Ring Gap				
Top Ring	0.035	0.035	0.033	0.032
Second Ring	.032	.032	.028	.031
Oil Ring, Top	.060	.065	.061	.066
Oil Ring, Bottom	.050	.062	.058	.053
Camshaft Bearing Journals:				
Journal Diameter	Front	Center	Rear	
Bearing Bore Diameter	2.009	2.009	2.009	2.007
Clearance	2.011	2.0113	2.011	2.0135
	.002	.0023	.002	.005
Valve Guides:				
Exhaust:	Stem Dia.	Guide Dia.	Clearance	
Cyl No. 1	0.3089	.3115	.0026	
2	.3089	.3120	.0031	
3	.3089	.3120	.0031	
4	.309	.3116	.0026	
Wear Limit:				
	.307	.3157	.006	

Veh. No.	Engine No.	Mileage	Wear Limit
2D5742	4700136	9939	
Intake: Cyl. No.	Stem Dia.	Guide Dia.	Clearance
1	0.310	0.312	.002
2	.310	.312	.002
3	.310	.312	.002
4	.310	.312	.002
Wear Limit:			
Crankshaft End Play		0.007	-
Timing Gear Backlash		.003	0.009
Flywheel Clutch Face Runout		.002	-
Oil Pump Drive Gear Backlash		.004	.008

Cylinder Block:

Piston Bore:
 Dia. - top of travel
 Dia. - bottom of travel
 Taper
 Out of Round
 Piston Dia. - bottom of skirt
 Clearance - top of skirt
 bottom of skirt

Measurement	Feb. No.	Engine Wear Data	Engine No.	Mileage	Year Limit
Cylinder Block:	2D5743	2000057	4700057	20001	
Piston Bore:					
Dia. - top of travel	1	<u>3.8825</u>	<u>3.8815</u>	<u>3.8825</u>	<u>4</u>
Dia. - bottom of travel	2	<u>3.8765</u>	<u>3.877</u>	<u>3.877</u>	<u>-</u>
Taper	3	<u>.006</u>	<u>.0045</u>	<u>.0055</u>	<u>.008</u>
Out of Round	4	<u>.001</u>	<u>.0005</u>	<u>.0005</u>	<u>.005</u>
Piston Dia. - bottom of skirt	5	<u>3.8745</u>	<u>3.874</u>	<u>3.874</u>	<u>-</u>
Clearance - top of skirt	6	<u>.0055</u>	<u>.0085</u>	<u>.009</u>	<u>.0045</u>
bottom of skirt	7	<u>.002</u>	<u>.003</u>	<u>.003</u>	<u>.003</u>
Valve Tappets					
Tappet No.:					
1	<u>0.50075</u>	<u>0.499</u>	<u>0.0015</u>		
2	<u>.501</u>	<u>.499</u>	<u>.002</u>		
3	<u>.50175</u>	<u>.499</u>	<u>.00175</u>		
4	<u>.501</u>	<u>.499</u>	<u>.002</u>		
5	<u>.501</u>	<u>.499</u>	<u>.002</u>		
6	<u>.5005</u>	<u>.499</u>	<u>.0015</u>		
7	<u>.5005</u>	<u>.499</u>	<u>.0015</u>		
8	<u>.50075</u>	<u>.499</u>	<u>.00175</u>		
Wear Limit					
	9	<u>.503</u>	<u>.4969</u>	<u>.0055</u>	

Crankshaft:

Main Bearing Journals:	Front	<u>2.2489</u>	<u>2.2487</u>	<u>2.2495</u>
Diameter		<u>.003</u>	<u>.003</u>	<u>.004</u>
Bearing clearance		<u>0</u>	<u>0</u>	<u>-</u>
Out of Round		<u>0</u>	<u>.0003</u>	<u>.0005</u>
Taper		<u>0.0002</u>	<u>.0003</u>	<u>.001</u>
Connecting Rod Journals		<u>1</u>	<u>2</u>	<u>3</u>
Diameter		<u>1.9989</u>	<u>1.9969</u>	<u>1.9987</u>
Bearing clearance		<u>.003</u>	<u>.0028</u>	<u>.0033</u>
Out of Round		<u>0</u>	<u>0</u>	<u>.0005</u>
Taper		<u>0.0002</u>	<u>0</u>	<u>.0005</u>

Measurement	Front	Center	Rear
	<u>2.2489</u>	<u>2.2487</u>	<u>2.2495</u>
	<u>.003</u>	<u>.003</u>	<u>.003</u>
	<u>0</u>	<u>0</u>	<u>-</u>
	<u>0.0002</u>	<u>.0003</u>	<u>.0005</u>
	<u>1</u>	<u>2</u>	<u>3</u>
	<u>1.9989</u>	<u>1.9969</u>	<u>1.9987</u>
	<u>.003</u>	<u>.0028</u>	<u>.0033</u>
	<u>0</u>	<u>0</u>	<u>.0005</u>
	<u>0.0002</u>	<u>0</u>	<u>.0005</u>

Measurement	Veh. No. 2D5743	Engine No. 4700057	Mileage		Wear Limit
			20001	4	
Connecting Rods:					
Side Play at crankshaft	0.005	0.005	0.0065	0.006	0.012
Wrist Pin dia.	.912	.912	.912	.912	-
Wrist pin hole dia. (piston)	.913	.913	.913	.913	-
Clearance (piston - pin)	.001	.001	.001	.0012	.0008
Wrist Pin bushing dia. (rod)	.913	.913	.913	.913	-
Clearance (rod - pin)	.003	.003	.003	.003	.0008
Piston Rings:					
Side Clearance:					
Top Ring	0.006	0.006	.0065	0.007	
Second Ring	.004	.004	.005	.005	
Ring Gap					
Top Ring	0.043	0.057	0.056	0.056	
Second Ring	.091	.100	.114	.126	
Oil Ring, Top	.063	.078	.090	.100	
Oil Ring, Bottom	.057	.066	.074	.060	
Camshaft Bearing Journals:					
Journal Diameter	<u>Front</u> 2.0095	<u>Center</u> 2.009	<u>Rear</u> 2.0092	2.007	
Bearing Bore Diameter	2.0112	2.0115	2.0108	2.0135	
Clearance	.0017	.0025	.0016	.005	
Valve Guides:					
Exhaust:	St. #	Guide Dia.	Dia.	Clearance	
Cyl No. 1	1	<u>0.309</u>	<u>0.312</u>	<u>0.0032</u>	
2	2	.309	.312	.003	
3	3	.309	.312	.0032	
4	4	.309	.312	.003	
Wear Limit:					
	.307	.3157	.006		

	Veh. No. 2D5743	Engine No. 4700057	Mileage 20001	Year Limit
Intake:	Stem	Guide	Clearance	
Cyl. No. 1	.310	.312	.002	
2	.3098	.3122	.0024	
3	.310	.3122	.0022	
4	.310	.312	.002	
Wear Limit:	.3080	.3157	.005	
Crankshaft End Play		0.007		-
Timing Gear Backlash		.004		0.009
Flywheel Clutch Face Runout		.004		-
Oil Pump Drive Gear Backlash		.004		.008

Measurement	Engine Wear Data			Wear Limit
	Veh. No. 2D5997	Engine No. 4700423	Mileage 20074	
Cylinder Block:				
Piston Bore:				
Dia. - top of travel	1	2	3	4
Dia. - bottom of travel	3.879	3.878	3.878	3.878
Taper	3.878	3.877	3.877	-
Out of Round	.001	.001	.001	.008
Piston Dia. - bottom of skirt	.0005	.0005	.0005	.005
Clearance - top of skirt	3.874	3.874	3.873	-
bottom of skirt	.005	.004	.005	.045
	.004	.003	.004	.003
Valve Tappets				
Tappet No.:				
1	Bore Dia.	Tappet Dia.	Clearance	
2	0.501	0.499	.002	
3	.5015	.499	.0025	
4	.501	.499	.002	
5	.5015	.499	.0025	
6	.5015	.499	.0025	
7	.501	.499	.002	
8	.501	.499	.002	
Wear Limit				
Crankshaft:				
Main Bearing Journals:				
Diameter	Front $\frac{2.248}{2.248}$	Center $\frac{2.248}{2.248}$	Rear $\frac{2.248}{2.248}$	-
Bearing clearance	.003	.003	.003	.004
Out of Round	0	0	0	.0005
Taper	0	0	0	.001
Connecting Rod Journals				
Diameter	1.798	1.799	1.798	-
Bearing Clearance	.002	.002	.002	.0038
Out of Round	0	0	0	.005
Taper	0	0	0	.001

<u>Measurement</u>	<u>Veh. No.</u>	<u>Engine No.</u>	<u>Mileage</u>	<u>Wear Limit</u>
	2D5997	4700423	20074	4
Connecting Rods:				
Side play at crankshaft	1	2	.005	0.012
Wrist pin dia.			.912	-
Wrist pin hole dia. (piston)			.913	-
Clearance (piston - pin)			.001	.0008
Wrist pin bushing dia. (rod)			.9125	-
Clearance (rod - pin)			.0005	.0008
Piston Rings:				
Side Clearance:				
Top Ring		0.004	0.003	0.004
Second Ring		.003	.0015	.002
Ring Gap				-
Top Ring		0.041	0.042	0.054
Second Ring		.043	.043	.050
Oil Ring, Top		.071	.067	.069
Oil Ring, Bottom		.068	.070	.067
Camshaft Bearing Journals:				
Journal Diameter		Front 2.0095	Center 2.0095	2.007
Bearing Bore Diameter		2.0125	2.011	2.0135
Clearance		.003	.0025	.005
Valve Guides:				
Exhaust:				
Cyl No. 1		Stem Dia. 0.309	Guide Dia. 0.312	Clearance 0.003
2		.308	.312	.004
3		.308	.3125	.0045
4		.308	.3125	.0045
Wear Limit:		.307	.3157	.006

Veh. No.	Engine No.	Mileage	Wear Limit
2D5997	4700423	20074	
Intake:	Guide		
Cyl. No. 1	Dia.	Clearance	
2	0.309	0.3125	0.0035
3	.309	.312	.003
4	.309	.3125	.0035
	.309	.312	.003
Wear Limit:			
Crankshaft End Play		-	
Timing Gear Backlash		-	0.009
Flywheel Clutch Face Runout		-	
Oil Pump Drive Gear Backlash		.003	.008

Micrometer Measurements Taken on 14 May 1963
Engine, Ser. No. 4700055, From M151, 2D5742.
USATECOM Proj. No. 1D-3403-01

Test Mileage on Engine - 10,114

Crankshaft Main Bearing Journals:

	Diameters	
	Vertical	Horizontal
Front	2.2479	2.2472
Center	2.2480	2.2480
Rear	2.2475	2.2470

Wear Limits:

Allowable out-of-round 0.0005
Allowable taper 0.001

Size and Fit of New Parts: 2.2482 - 2.2490

Clearance Between Crankshaft and Bearings: (plastigaged)

Front 0.005
Center 0.004
Rear 0.005

Wear Limit: 0.004

Size and Fit of New Parts: 0.0005 - 0.003

Connecting Rod Journals:

Rod No.	Diameters	
	Vertical	Horizontal
1	1.9975	1.9987
2	1.9970	1.9987
3	1.9970	1.9985
4	1.9972	1.9983

Wear Limit:

Allowable out-of-round 0.0005
Allowable taper 0.001

Size and Fit of New Parts: 1.9982 - 1.9990

Clearance Between Bearing and Crankshaft (vertical): (plastigaged)

Rod No. 1 0.004
2 0.006
3 0.006
4 0.006

Wear Limit: 0.0038

Camshaft Bearing Journals:

	<u>Diameter</u>	
	<u>Front Surface</u>	<u>Rear Surface</u>
Front	2.0090	2.0090
Center	2.0089	2.0090
Rear	2.0088	2.0088

Wear Limit: 2.0070

Size and Fit of New Parts: 2.009 - 2.010

Camshaft Bearings:

	<u>Vertical</u>	<u>Horizontal</u>	<u>Inside Diameter</u>	<u>Out-of-Round</u>
Front	2.0130	2.0140	2.0140	0.0010
Center	2.0200	2.0145	2.0145	0.0055
Rear	2.0143	2.0123	2.0123	0.0020

Wear Limit: 2.0135 (no out-of-round limit)

Size and Fit of New Parts: 2.011 - 2.0115

Clearance Between Camshaft and Bearings: (difference between above figures)

Front	0.0040
Center	0.0055
Rear	0.0035

Wear Limit: 0.005

Size and Fit of New Parts: 0.001 - 0.0025

APPENDIX F

Maintenance Engineering Report

MAINTENANCE ENGINEERING OFFICE

AUTOMOTIVE DIVISION

DEVELOPMENT AND PROOF SERVICES

ANNE ARUNDEL PROVING GROUND, MARYLAND

PROJECT No: 1D-3403-01

DATE: 17 September 1963

REPORT No: MDO-42-63

MAINTENANCE EVALUATION OF

INITIAL PRODUCTION (PPVT) OF

3 EACH TRUCK, UTILITY 1/4 TON, 4x4, M151,

REG No. 2D5742, REG No. 2D5743, AND REG No. 2D5997

PERIOD OF TEST: April 1963 thru September 1963

ME of M151
Nos. 2D5742,
2D5743, 2D5997

1. INTRODUCTION

The object of this evaluation was to determine the amount and types of maintenance required by the M151s while undergoing a 20,000 mile endurance test and to recommend changes in design or procedure to reduce maintenance.

Table I, Maintenance Data Summary, lists the frequency, amount and types of maintenance required.

Figure I, Maintenance vs Operating Hours is a graph showing the ratio of maintenance versus operating hours as outlined in MIL-STD-1228.

2. DESCRIPTION OF MATERIEL

The vehicles evaluated were 3 Truck, Utility 1/4-ton, 4x4, M151, Reg Nos. 2D5742, 2D5743, and 2D5997.

3. DETAILS OF TEST

3.1 PROCEDURE

The M151s were operated over level and hilly cross country, paved and belgian block courses. The vehicle operating time was compiled from a service recorder which measures vehicle movement. Engine idle time is not considered as vehicle operating time.

Maintenance deficiencies and defects were gathered by reading the daily operational and maintenance logs and by personal contact with the drivers and mechanics at the test and maintenance areas.

Additional information concerning maintenance was gathered by observing maintenance pertinent to the endurance test. During the course of the test the vehicles were lubricated every 500 miles and maintenance inspection services were performed.

A complete inspection of the vehicles was made at the completion of the test. This maintenance time has not been included in the maintenance data for the 20,000 mile endurance test.

3.2 RESULTS

ME of M151
Nos. 2D5742,
2D5743, 2D5997

3.2.1 GENERAL

The maintenance criteria for wheel vehicles, as outlined in MIL-STD-1228 dated 27 September 1962 is that the total scheduled and unscheduled maintenance shall not exceed seven per cent of the operational hours.

The average maintenance manhours required were .11% of the operating hours. A total of 0.04 manhours of non-scheduled maintenance was required on the three vehicles.

The three vehicles evaluated required field maintenance. Vehicle No. 2D5742 required field maintenance for differential and engine replacement. No. 2D5743 required field maintenance for differential, transmission repairs and engine main oil seal replacement. It was also necessary to replace a transmission and differential on vehicle No. 2D5997.

The primary causes of non-scheduled maintenance on all three vehicles were universal joint axle drive shaft failures and repairs on the brakes.

3.2.1.1 VEHICLE No. 2D5742

Vehicle No. 2D5742 required a total of 100.9 manhours of maintenance during the test. This consisted of 17.4 manhours of driver servicing, 22 manhours of organizational scheduled maintenance, 38 manhours of organizational non-scheduled maintenance, and 23.5 hours of field maintenance.

The 22 manhours of scheduled maintenance were expended for periodic lubrication, inspection and servicing.

The 38 manhours of organizational non-scheduled maintenance consisted of 16 hours for the repair of brakes, universal joint cross and drive shaft repair or replacement, and 22 hours for miscellaneous repairs.

In field maintenance 23.5 hours were used for engine, transmission, and differential replacement or repairs.

The total maintenance manhours required were .11 per cent of the operating hours using the rule 1 hour of operation equals 20 miles.

ME of M151
Nos. 2D5742,
2D5743, 2D5997

3.2.1.2 VEHICLE No. 2D5743

Vehicle No. 2D5743 required a total 89.55 manhours of maintenance during the test. 16.3 manhours of driver servicing, 23 manhours of organizational scheduled maintenance, 35.25 manhours of organizational non-scheduled maintenance, and 15 hours of field maintenance.

The 23 manhours of organizational scheduled maintenance were expended for periodic lubrication, inspection and servicing.

The 35.25 manhours of organizational non-scheduled maintenance consisted of 14 hours for the repair of the brakes, universal joint bearings, drive shaft flange repair and 21.25 hours for miscellaneous repairs.

In field maintenance 15 hours were used for engine, transmission and differential replacement or repairs.

The total maintenance manhours required were 11 per cent of the operating hours using the rule 1 hour of operation equals 20 miles.

3.2.1.3 VEHICLE No. 2D5997

Vehicle No. 2D5997 required a total of 102.5 manhours of maintenance during the test. This consisted of 16.5 manhours of driver servicing, 33.5 manhours of organizational scheduled maintenance, 43.5 manhours of organizational non-scheduled maintenance, and 9 hours of field maintenance.

The 33.5 manhours of organizational scheduled maintenance were expended for periodic lubrications, inspection and servicing.

The 43.5 manhours of organizational non-scheduled maintenance consisted of 31.30 minutes for the repair of the brakes, universal joint bearings and drive shaft flange repairs.

15 hours were used in field maintenance for transmission, differential, and engine valve spring replacement.

The total maintenance manhours required were 11 per cent of the operating hours using the rule 1 hour of operation equals 20 miles.

ME of M151
Nos. 2D5742,
2D5743, 2D5997

3.2.1.4 MAINTENANCE DATA

The total maintenance manhours required on vehicle No. 2D5742 for each operating hour was 11% of which 0.04 were for non-scheduled maintenance. The vehicle downtime per operating hour was 0.03.

The maintenance manhours required by vehicle No. 2D5743 per operating hour was 11% of which 0.04 were for non-scheduled maintenance. The vehicle downtime was 0.03 per operating hour.

The total maintenance manhours required by vehicle No. 2D5997 for each operating hour was 11% of which 0.04 were for non-scheduled maintenance.

The vehicle downtime per operating hour was 0.03 per operating hour. A summary of all compilations are listed in Table I below.

Table I. MAINTENANCE DATA SUMMARY

	Vehicle #20742	Vehicle #20743	Vehicle #20741	Average
1. Velocity: average test speed in miles per hour	22.4	24.3	21.8	22.8
2. Reliability				
a. % time in use and maintenance 100%	95%	87.6.0	980.5	937
b. % time in use	89.5	821.5	921	879
c. % of time in use	93.8%	93.8%	93.9%	93.8%
d. % time in use and scheduled maintenance	92.3	849.8	954.5	909
e. % of time in use and scheduled maintenance	96.8%	97.0%	97.3%	97%
f. Non-scheduled maintenance	30.8	26.3	26	27.7
g. % of time in non-schedulad maintenance	3.2%	3.0%	2.7%	3%
h. Average open hours between non-sched maint:	29.8	25.7	24.2	26.6
(1) Organizational	127.9	205.4	307	213
(2) Field				
3. Amount of Maintenance				
a. Maintenance manhours per operating hours	0.11	0.11	0.11	0.11
(1) Driver (1st ech)	0.02	0.02	0.02	0.02
(2) Organizational scheduled maint (2nd ech)	0.02	0.03	0.04	0.03
(3) Organizational non-scheduled maint (2nd ech)	0.04	0.04	0.04	0.04
(4) Field (3rd ech)	0.03	0.02	0.01	0.02
b. Maint manhours per 100 miles	0.50	0.45	0.51	0.49
c. Average open hours between scheduled maint:				
(1) Driver (1st ech)	4.5	4.2	4.6	4.4
(2) Organizational (2nd ech)	44.8	43.2	38.4	42.1
4. Maintainability				
a. Average length of each stoppage:				
(1) Driver servicing (1st ech)	0.1	0.1	0.12	0.1
(2) Organizational scheduled maint (2nd ech)	0.6	0.7	0.7	0.7
(3) Organizational non-sched maint (2nd ech)	0.6	0.6	0.6	0.6
(4) Field (3rd ech)	1.7	1.9	1.5	1.7
b. Total vehicle and component downtime per oper hour	0.03	0.03	0.03	0.03
c. Total vehicle maint hours per oper hour	0.07	0.07	0.06	0.07
5.. Test Course mileage				
Total	4269	4306	4274	
Local cross country	7600	7614	7600	
Hilly cross country	7600	7581	7600	
Bogies block	524	600	600	
TOTALS				20,054
				20,054

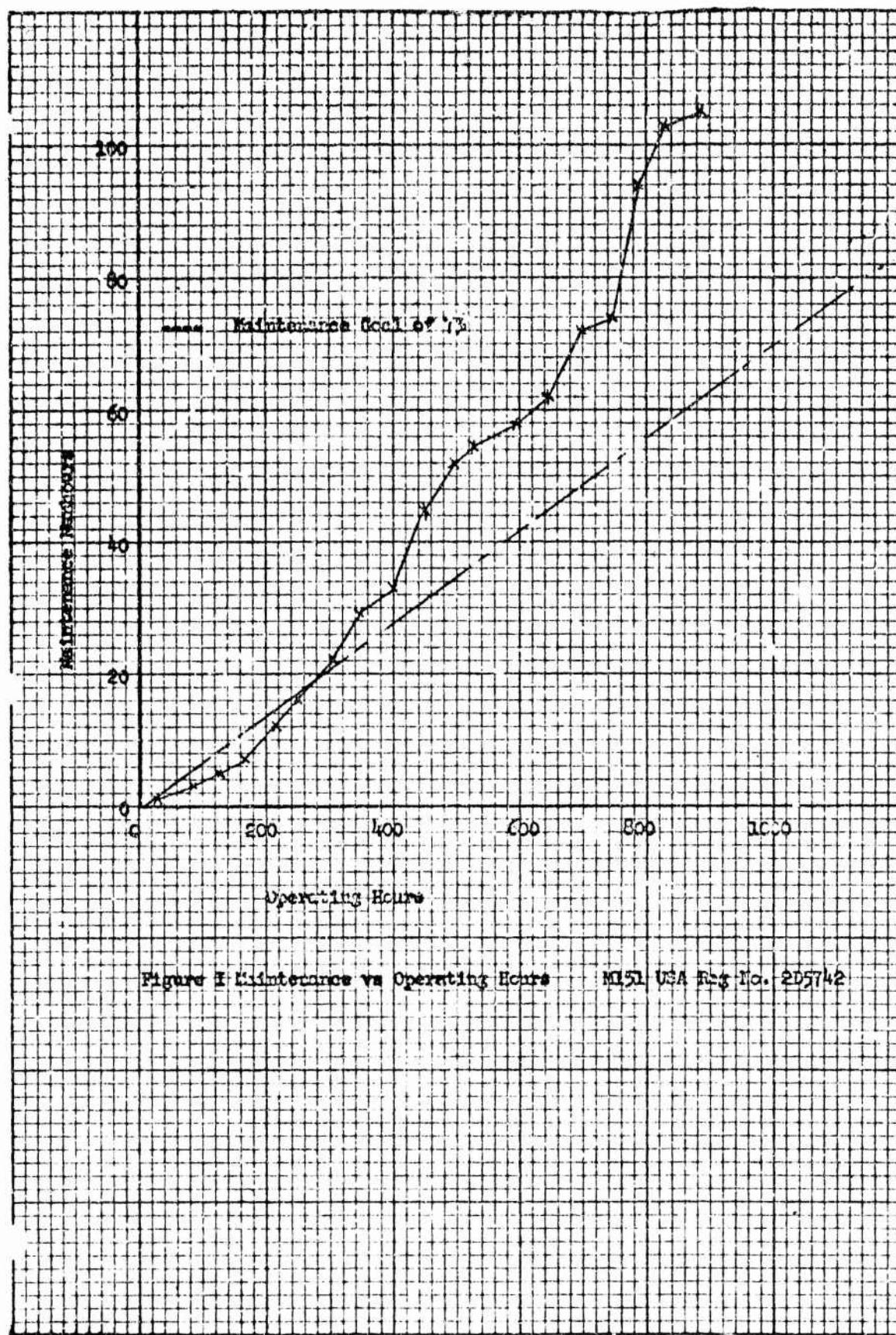
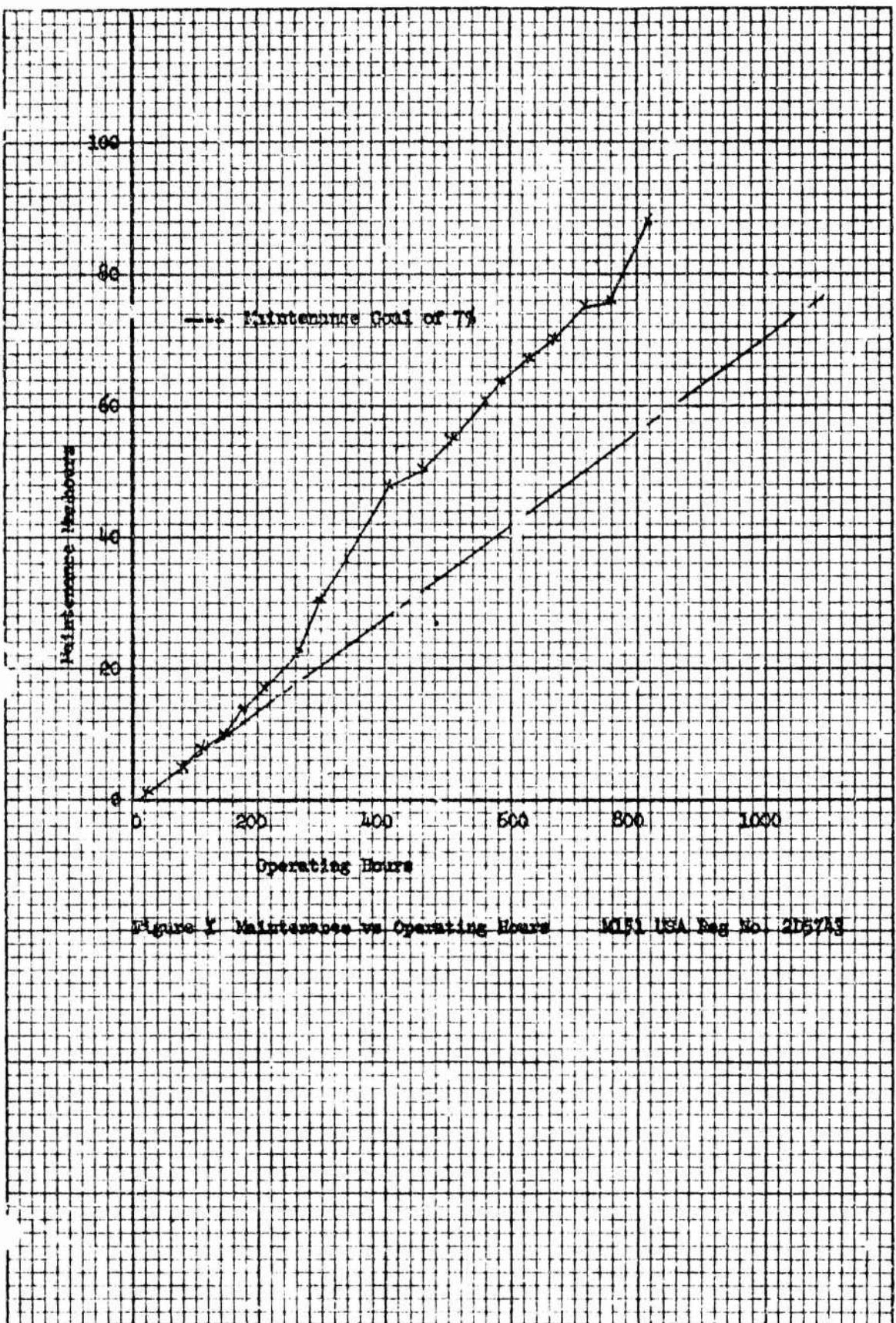


Figure F: Maintenance vs Operating Hours MI52 USA Reg No. 2D5742



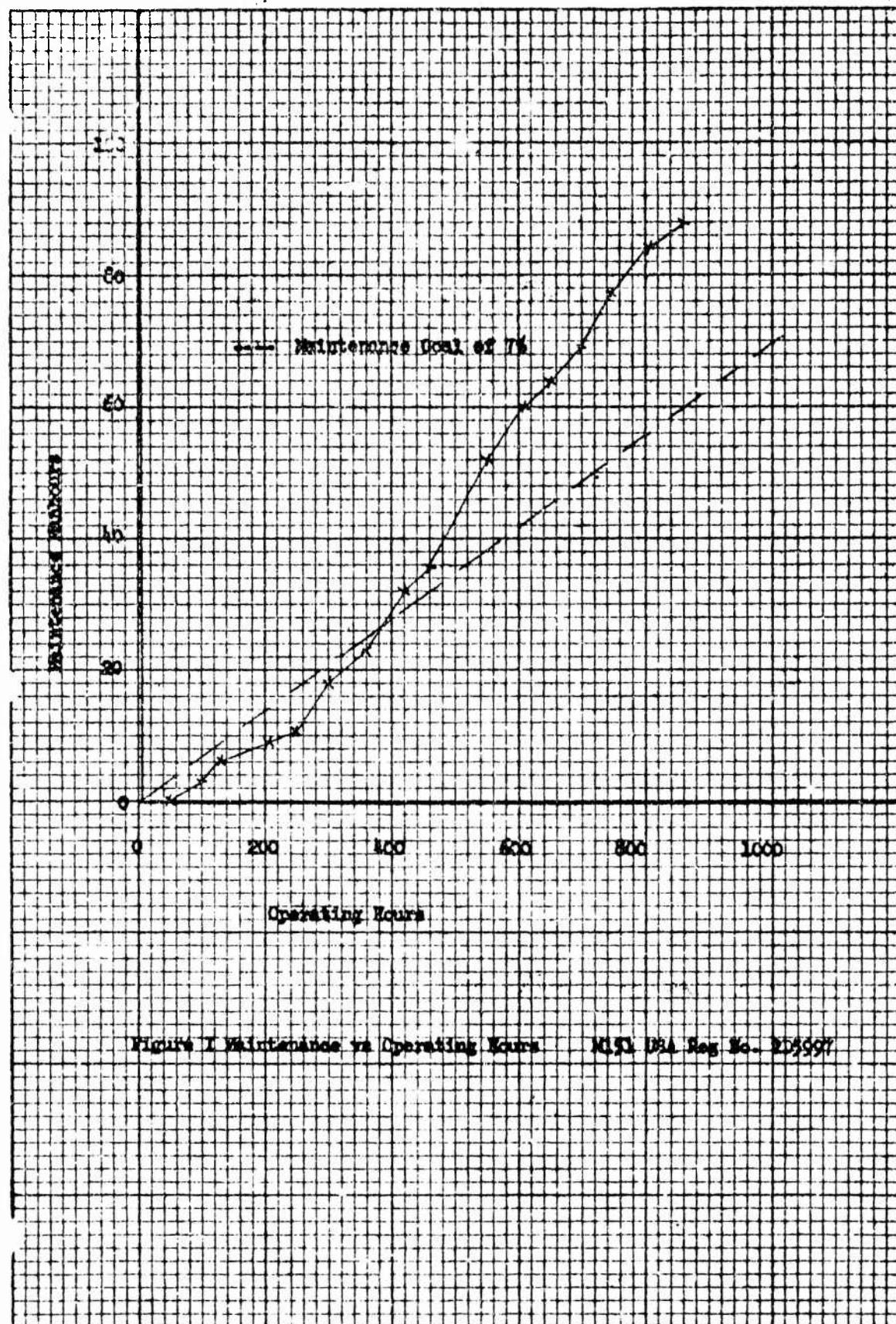


Figure 1 Maintenance vs Operating Hours MSL USA Reg No. 2D9997

ME of M151
Nos. 2D5742,
2D5743, 2D5997

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UTILITY, 1/4-TON, 4X4, M151 - A. C. Miller

Report No. DPS-1111, October 1963
AMCMS Code No. 4030.14.3101.2.53
Unclassified Report

Three initial production models of the Truck,
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of these tests was to provide proof of ac-
ceptability of manufacturing methods, quality
control procedures, and to determine accepta-
bility of vehicles produced under contract
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nine problem areas. It is recommended that
defects cited in this report be corrected.

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