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YPG REPORT 0049

INITIAL PRODUCTION TEST

OF

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

M151A2

FINAL REPORT

BY

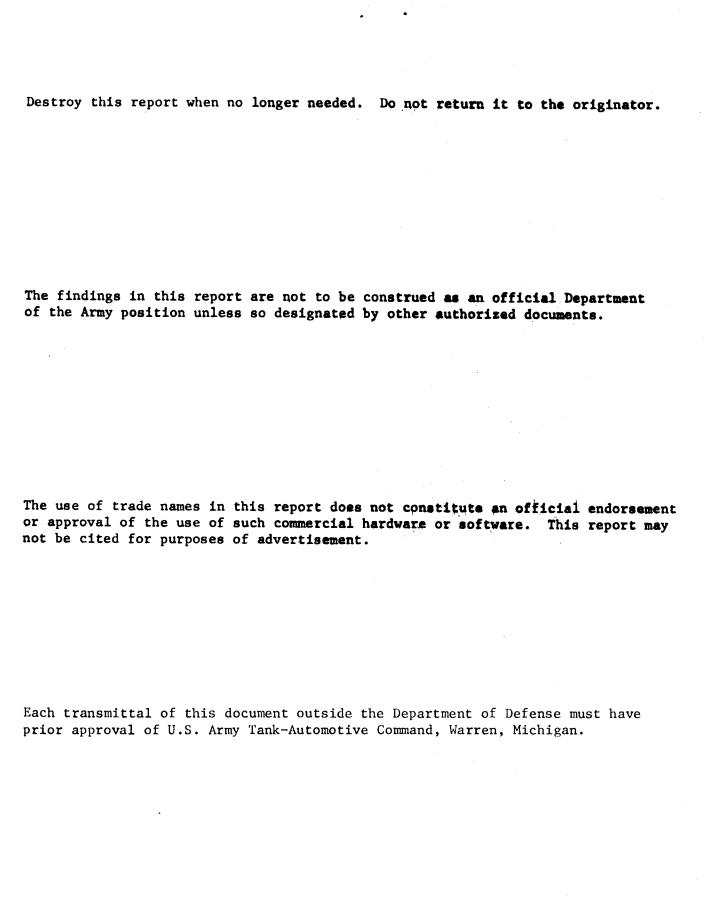
JOHN SHOEMAKER, SP4 SCIENTIFIC AND ENGINEERING OCTOBER 1970

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Yuma Proving Ground Yuma, Arizona 85364

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SUBJECT:

Final Report of Initial Production Test of Truck, Utility, 1/4-Ton,

4x4, M151A2, USATECOM Project No. 1-VG-120-151-034, YPG Report

No. 0049

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FOR THE COMMANDER:

1 Incl as

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COL, Inf

Director of Materiel Test

USATECOM PROJECT NO. 1-VG-120-151-034

INITIAL PRODUCTION TEST

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TEST REPORT

BY

JOHN SHOEMAKER, SP4 SCIENTIFIC AND ENGINEERING OCTOBER 1970

> YUMA PROVING GROUND YUMA, ARIZONA

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ABSTRACT

An initial production test of three Trucks, Utility, 1/4-Ton, 4x4, M151A2 was conducted by Yuma Proving Ground during the period 6 April to 3 August 1970.

The purpose of the test was to determine contractor conformance to contractual requirements, investigate adequacy of quality assurance procedures and provide verification of safety of the vehicles with particular emphasis on vehicle stability.

After 1000 miles of break-in, each truck completed approximately 20,000 miles of durability operation. Cooling, dust, toxic hazard and various performance tests were run, and safety and maintenance evaluations were made. Tests were also undertaken to determine the effect of the new semi-trailing arm rear suspension on vehicle stability and handling.

It was concluded that:

- a. Vehicle was not adequately suppressed for radio interference radiation.
- b. The design and/or quality of the A-frame control arms and propeller shaft yokes are inadequate.
- c. Uneven application and brake pulling observed throughout test constitutes a safety hazard.
- d. The rear suspension redesign has substantially improved vehicle stability and handling.

It was recommended that the brake and A-frame problems be corrected and that all deficiencies and as many shortcomings as possible be corrected.

FOREWORD

Yuma Proving Ground was responsible for test planning, test execution, and test reporting.

SECTION 1. INTRODUCTION

1.1 BACKGROUND

The M151 series vehicles have been found unsafe under certain driving conditions, and have demonstrated a number of deficiencies.

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

Three successive but separate test programs, performed on 19 vehicles, 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 comparison 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; however, 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.

The M151A2 vehicles provided for this test have incorporated the modified independent rear suspension and other safety features as well as improvements to deficient components.

1.2 DESCRIPTION OF MATERIEL

The overall configuration of the Truck, Utility, 1/4-Ton, 4x4, M151A2 remains basically the same as previous models, but includes the modifications listed in Appendix I.ll. Readily noticeable are the larger one-piece windshield and rear window, the deep dish steering wheel, the windshield washer and wipers, the larger class "A" lights, the mechanical fuel pump located on the right side of the engine and the trailing arm suspension at the rear and underside of the body.

The M151A2 vehicle dimensions, capacities, and weight remain unchanged from the M151A1. It is still powered by a 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. Characteristics are shown in Figure 1.

The test vehicles, USA Reg No. 02DU8170, 02DU8370 and 02DU8670, will hereafter be referred to as U81, U83 and U86, respectively.

1.3 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. To 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.

1.4 SCOPE

An initial production test of three M151A2 trucks was conducted from 6 April to 3 August 1970. Approximately 1000 miles of break-in operation and durability-reliability miles were completed by each vehicle. Cooling, dust, toxic hazard and various performance tests were run, and safety and maintenance evaluations were made. Tests were also undertaken to determine the effect of the new semi-trailing arm rear suspension on vehicle stability and handling.

1.5 SUMMARY OF RESULTS

1.5.1 Preparation for Test (Para. 2.2)

The three vehicles were received at Yuma Proving Ground on 1 April 1970. In the receiving inspection the seal on the truck van was found to be improperly secured. Batteries in U81 and U83 were connected and the latter was discharged because the ignition switch had been left on. One shortcoming was observed during the initial technical inspection; the toe-in for the front wheels was between 19/32 inch and 3/4 inch for all vehicles. No problems were observed during break-in operation, and a post break-in inspection was not deemed necessary.

1.5.2 Performance (Para. 2.3)

The cramping angle of one vehicle was 1 degree in excess of the specification. Two vehicles failed the radiation phase of the radio interference suppression tests in the lower frequency range.

1.5.3 Cooling Tests (Para 2.4)

The engine coolant or oil temperatures exceeded specified or desireable limits in all runs in first gear.

The coolant temperature to the radiator exceeded the specified 232°F (7 psi radiator cap) at 1000 and 1800 rpm engine speed. The engine oil sump temperature exceeded the desirable maximum value of 270°F at 4000 rpm.

1.5.4 Dust Tests (Para. 2.5)

Service of the air cleaners under normal dust conditions was not required more frequently than the 1000-mile interval specified in the vehicle lubrication order. No serious dust contamination or damage to the engine or other vehicle components was observed as a result of normal dust operation.

In extreme dust tests the air cleaner reached maximum restriction in 3.75 hours. During this period the air cleaner ceased to function properly and only oil wetted dust was left on the air cleaner oil cup. Pullover of oil to the engine occurred. The inside of the intake air hose connecting the carburetor to the air cleaner was covered with dust. Dust deposits were observed on all spark plug electrodes and engine cylinder compression had dropped an average of 30 psi from pretest checks.

1.5.5 Toxic Hazard Tests (Para. 2.6)

There was no discernable concentration of carbon monoxide at any crewmember position.

1.5.6 Maintainability (Para. 2.7)

The ratio of total maintenance man-hours to operating hours (assuming 20 miles per operating hour) was 10.4 percent. Based on actual operating hours, this ratio was 12.3 percent.

No maintenance was required at the direct support level.

The manuals were generally adequate as were the tools. Maintenance presented no unusual problems.

1.5.7 Durability and Reliability (Para. 2.8)

The three vehicles completed a total of 63,164 miles over all courses as summarized in Table 1.

TABLE 1. Total Accumulated Mileages

	<u>U81</u>	<u>U83</u>	<u>U86</u>
Break-in	1,001	998	1,012
With trailer	10,001	10,027	10,034
Without trailer	10,023	10,023	10,045
Total overall	21,025	21,048	21,091

All of the reported mileages are higher than actually run because the odometers of all vehicles were reading high by 6 to 8 percent.

The overall fuel and oil consumption data are presented in Table 2.

TABLE 2. Fuel and Oil Consumption

<u>Vehicle</u>	Fuel Consumption (miles/gallon)	Oil Consumption (miles/quart)
U81	15.1	4205
U83	15.1	4210
U86	14.8	3515

There were two deficiencies observed during durability-reliability operation. The first was a propeller shaft failure on vehicle U83 at 17,170 test miles. The rear yoke broke and disabled the vehicle. The second was extensive brake pulling and uneven application experienced by all vehicles after 12,000 to 15,000 miles.

Twenty-five of the 28 shortcomings reported during the test were discovered during durability-reliability test. The most significant are summarized below.

- a. There were three incidents of broken radio interference suppression wire mesh insulation on spark plug leads. (Two more leads were replaced for the same reason during the final inspection.)
- b. The ignition coil retainer fasteners lost torque on two vehicles. There was also one instance of a broken retainer tab.
 - c. Four turn signal control assemblies failed.
- d. Thirteen tire inner tubes failed due to separation at the seam.
- e. The bushings in the front upper and lower A-frame control arms were badly worn on all vehicles.
 - f. Six shock absorbers were replaced because of leaks.
- g. A hole was discovered at a spot weld in the oil cup of one vehicle's air cleaner.
- h. The front suspension upper ball joint boots were cracked on all three vehicles.
- i. All vehicles exceeded two or more steering geometry specifications.

- j. The rear differential of one vehicle had spalled rollers in the right output roller bearing. Both the bearing and its race were considered unserviceable.
- k. The wheel cylinder boots had been cut by burrs on the piston skirts.

1.5.8 Safety and Vehicle Stability (Para. 2.9)

The only safety hazard observed was brake pulling and uneven brake application experienced on all vehicles. The problem was accordingly classified as a deficiency.

A comparison of stability and handling between an M151Al vehicle and an M151A2 revealed greater stability, increased control and easier handling with the M151A2 truck.

1.6 CONCLUSIONS

- a. Vehicle preparation and security for shipment were not satisfactory.
- b. Vehicles are not adequately suppressed for radio interference radiation.
- c. Design and/or quality control of the front A-frame control arms is unsatisfactory.
 - d. Durability of the propeller shaft is not adequate.
 - e. Tire inner tubes are of poor quality.
 - f. Air cleaner is not adequate in extreme dust conditions.
 - g. Front suspension upper ball joint boots are not durable.
- h. The brake pulling and uneven brake application constitutes a safety hazard.
- i. The rear suspension redesign has substantially improved vehicle stability and handling feedback to the driver.

1.7 RECOMMENDATIONS

- a. Quality control be improved.
- b. A-frame control arm bushing wear and propeller shaft breakage be further investigated and corrected.
 - c. Brake problems be corrected.
 - d. As many of the shortcomings as possible be corrected.

SECTION 2. DETAILS OF TEST

2.1 INTRODUCTION

Test vehicles, USA Reg No. 02DU8170, 02DU8370 and 02DU8670 will hereafter be referred to as U81, U83 and U86, respectively.

2.2 PREPARATION FOR TEST

2.2.1 Objectives

- a. To determine the adequacy of the blocking and packaging during shipment and to determine if any damage had been incurred during shipping.
- b. To insure that the vehicle and all components are properly serviced, secured, and adjusted prior to test.
 - c. To record component serial numbers and other pretest data.
 - d. To install the necessary instrumentation.
- e. To payload the test vehicle to the proper gross vehicle weight.
 - f. To conduct break-in operation.
 - g. To determine the curb and gross weights of the vehicles.

2.2.2 Griteria (Ref 6, App V)

- a. Materials. The materials used shall be as specified in the applicable specifications and drawings.
- b. Construction. Vehicle, components, sub-assemblies, and assemblies shall be fabricated and assembled into a complete vehicle in accordance with drawings listed or referred to in the applicable Engineering Parts List. All parts, sub-assemblies, and assemblies shall be identified in accordance with MIL-STD-130.
- c. Performance. Trucks shall conform to the performance requirements specified herein after a break-in run of 2 miles (road). Vehicle shall be serviced as specified herein after a break-in run of 2 miles (road). Vehicle shall be serviced as specified in Reference 6, Appendix V.
- d. Marking. Registration numbers and other markings shall be applied in accordance with MIL-STD-642. Color shall be lusterless white enamel, matching color chip 37875 of Federal Standard No. 595. Data plates and part number marking shall be in accordance with MIL-STD-130.

- e. Workmanship. The workmanship shall produce vehicles free from fabrication defects which would affect the appearance, functioning, or operating life of the vehicle or any of its components. All seals and gaskets shall be so installed and retained that fluid seepage is minimized, and so that exhaust gases are prevented from escaping. All welds, rivets, bolts, nuts or other fasteners shall be torqued as indicated on drawings, or where not specifically detailed on drawings, to the extent consistent with their respective application in commercial vehicles of similar construction.
- f. Preservation, packaging, and vehicle processing inspection. Each vehicle shall be inspected for conformance to Section 5 requirements of Reference 6, Appendix V and the contract as applicable.
- g. Vehicle processing. Vehicle and equipment shall be processed for shipment and storage in accordance with MIL-STD-281 to the extent indicated on the applicable vehicle preservation data sheet or other implementation document, as specified by the procuring activity.

2.2.3 Method

A receiving inspection was performed to determine the effect of transporting on the vehicle components. Any damage incurred due to shipping or shipping procedures was reported and corrected during the initial technical inspection.

The initial inspection was performed in accordance with USATECOM MTP 2-2-502 and was limited to the receipt inspection described in vehicle technical manuals. Identifying data on major components were recorded.

An annual scheduled maintenance was performed in accordance with the technical manuals supplied with the vehicle. Lubricant samples were drawn from all sumps and analyzed.

Instrumentation required for subsequent testing and the on-equipment-material were installed on the vehicle.

A 1000-mile break-in run was conducted over hard surface and gravel roads at road speeds not in excess of 50 mph. No payload or trailed load was used during the break-in operation. After break-in operations were completed, the vehicle was payloaded and the weight recorded.

2.2.4 Results

During the receiving inspection, the truck van security seal was found to be improperly closed and therefore ineffective. The batteries were connected on vehicles U81 and U83; the ignition switch of the latter was on, and battery discharged. Detailed results of the receiving inspection are contained in Appendix I-1.

As a result of the visual and functional inspection during the initial technical inspection, no component teardown or discussembly was deemed necessary. The analyses of the oil samples taken at this time are presented in Appendix I.3. The major problems discovered during this inspection were as follows:

- a. Toe-in was 19/32 inch to 3/4 inch for the front wheels of all vehicles. It was adjusted to 1/8 inch specification.
- b. U81 and U86 had the old style rear windows rather than the modified full view rear window.
 - c. None of the vehicles had the new inside rear view mirror.
- d. No Processing Forms (Form 1397) were received with the vehicles.

The excessive toe-in was classified as a shortcoming (App III, Sec 2, Group 10). A complete summary of the initial inspection is presented in Appendix I.2.

A list of instrumentation installed on the vehicles is included as Appendix I.4.

The initial break-in was accomplished. A spot break-in inspection was not considered necessary.

The curb and payloaded weights of the vehicles were as shown in Table 3.

TABLE 3. Vehicle Weights

Vehicle	Curb Weight	Payloaded Gross	Vehicle Weight (1b)*
No.	(1b)	Highway	Cross-country
U81	2520	3600	3200
U83	2480	3610	3210
U86	2520	3600	3200

^{*}Includes driver

2.2.5 Analysis

The excessive toe-in might have caused difficulty in steering and increased tire wear otherwise all other criteria were met.

Curb weights were taken with a roll bar installed, accounting for the additional curb weight shown in Table 3. The vehicles were payloaded to a GVW of 3200 pounds or 3600 pounds, including driver, rather than adding 800 or 1200 pounds to the curb weights for cross-country or highway payloads, respectively.

2.3 PERFORMANCE TESTS

2.3.1 Objectives

- a. To determine the maximum and minimum road speeds.
- b. To obtain data on the service and parking brakes.
- c. To determine the turning diameter.
- d. To determine the shallow water fording capabilities.
- e. To determine the ascent grade speed.
- f. To conduct fuel supply capability tests during longitudinal and side slope operations.
 - g. To conduct radio interference suppression tests.

2.3.2 Criteria

- a. Payload. Truck payload shall include driver and personnel and shall be as specified in Table 4.
- b. Towing Load. Towed load performance requirements for the M151A2 shall be met when coupled to a M416 tactical-type trailer, and shall be as specified in Table 4.

TABLE 4. Weights and Loads, Pounds

	M151A2
Curb weight	2400
Rated payload (including personnel): Highway Cross-country	1200 800
Gross vehicle weight (GVW): Highway Cross-country	3600 3200
Rated towed load: Highway Cross-country	1300 1000

c. Level road speeds. The truck, including cross-country payload and with cross-country towed load, shall be capable of sustaining a speed of not less than 60 miles per hour (mph); a low speed of not more than 2-1/2 mph in low gear, when operated on smooth, dry, level, hard-surfaced roadway. Drumming, shimmy or tramping shall not occur throughout this speed range.

- d. Grade speeds. The truck, including cross-country payload and with cross-country towed load, shall be capable of negotiating grades up to 6-1/2 percent at a speed of 30 mph when operated over a smooth, dry, hard-surfaced roadway. Without towed load, truck, including cross-country payload, shall be capable of negotiating grades up to 60 percent at a speed of 2-1/2 mph when operated over a smooth, dry, hard-surfaced roadway.
- e. Slopes. The truck, including cross-country payload, shall be operated on side slopes, sloping right or left, up to 40 percent.
- f. Shallow water fording. The vehicle, without fording equipment and with rated cross-country payload and towed load, shall ford a hard-bottomed, relatively level crossing in fresh or sait water to a depth of at least 21 inches. The vehicle without fording equipment, or modification, shall meet all requirements of 3.5.7.1 of MIL-T-45331C, except the depth shall be 21 inches.
- g. Service brakes. Service brakes shall stop the vehicle within 30 feet from a speed of 20 mph, on dry, hard, relatively level, smooth road, free from loose material. Service brakes shall control and hold the vehicle on an incline of 60 percent.
- h. Parking brake. The parking brake shall hold the vehicle on a dry, concrete incline of 40 percent with highway payload; and on a dry, concrete incline of 60 percent with cross-country payload.
- i. Maneuverability. The vehicle shall demonstrate a maximum turning radius of 18.5 feet, measured from the center line of the outside front wheel, when negotiating full turns to right and left.
- j. Radio interference suppression. Each vehicle shall be radio interference suppressed in accordance with the tactical vehicle requirements of MIL-E-55301.

2.3.3 Method

- 2.3.3.1 Maximum and Minimum Speeds. The vehicle, with cross-country payload (800 pounds) and cross-country towed load (1000 pounds) was operated at reduced speeds until all components reached normal operating temperature. The vehicle was then operated at full throttle in the highest gear (fourth) until maximum road speed was attained. The minimum speed was determined in the lowest gear range at the lowest engine speed in which vehicle would operate smoothly without application of the brakes. All speeds were measured using a calibrated fifth wheel.
- 2.3.3.2 Stopping Distance. The brake performance test was conducted with highway payload (1200 pounds) at a road speed of 20 mph. The distance from the point of brake application to complete stop was measured with a fifth wheel and pousometer. Six stops were attempted and the results averaged.

2.3.3.3 Slopes. The vehicle, with highway payload (1200 pounds), was stopped and held on a 60 percent incline by the service brakes.

The vehicle, with cross-country payload (800 pounds), was operated on side slopes of up to 40 percent, sloping right or left.

The holding ability of the parking brake was checked on the 40 percent incline with the vehicle highway payloaded, and on the 60 percent incline with the vehicle cross-country payloaded.

Since an actual 6-1/2 percent slope was not available, it was simulated using the field dynamometer to measure drawbar pull or reserve power for climbing hills. To determine if the vehicle could meet the specified criteria, the drawbar pull of each truck was measured at 30 mph. The drawbar pull figures were then converted to determine the maximum slope each vehicle would ascend at 30 mph.

The vehicles with cross-country payloads were driven up a 60 percent grade and the road speeds were measured.

- 2.3.3.4 Cramping Angle and Turning Radius. The vehicle negotiated full 360-degree turns at slow speeds to the right and left, with the turning diameter measured from the center line of the outside front wheel. Degree plates were used in determining the maximum swing-arc of the front wheels.
- 2.3.3.5 Shallow Water Fording. The vehicle, without fording equipment and with rated cross-country payload and towed load when applicable, forded a hard-bottom, relatively level crossing in fresh water to a depth of 21 inches. The fording operation covered a period of 15 minutes.
- 2.3.3.6 Radio Interference Suppression. The vehicle was checked for radio interference suppression in accordance with tactical vehicle requirements of MIL-E-55301.

2.3.4 Results

2.3.4.1 The maximum and minimum vehicle speeds are presented in Table 5.

TABLE 5. Maximum and Minimum Road Speeds

Vehicle No.	Maximum Speed (mph) (4th gear)	Minimum Speed (mph) (lst gear)
U81	61.9	2.1
U83	60.9	1.6
U86	60.5	2.0
Criteria	60.0 Minimum	2.5 Maximum

Maximum speed tests were first run just prior to a 12,000-mile maintenance. Although U86 passed at that time, U81 and U83 failed with average speed of 58.2 and 57.0 mph, respectively. After a tune-up at the 12,000-mile maintenance, U81 and U83 met the criteria with results shown in Table 5.

2.3.4.2 The average stopping distances at 20 mph are shown in Table 6.

TABLE 6. Stopping Distance

Vehicle No.	Stopping Distance (ft)
U81	18.8
U83	19.6
U86	19.3
Criteria	30.0 Maximum

2.3.4.3 Slope Operations. All vehicles were successfully held on a 60 percent incline with the service brakes when loaded with a highway payload (1200 pound).

The parking brakes held all vehicles on both the 60 percent and 40 percent slopes under the specified loading conditions.

The vehicles negotiated the side slopes without difficulty, and ascended the 60 percent slopes at the speeds shown in Table 7.

TABLE 7. Road Speeds Ascending 60 Percent Slope

Vehicle No.	Speed (mph)
U81	5.6
U83	6.2
U86	5.2
Criteria	2.5 Minimum

The simulated grades that each vehicle would ascend at 30 mph are summarized in Table 8.

TABLE 8. Simulated Slope Performance at 30 MPH

Vehicle No.	Percent Slope		
U81	8.2		
U83	7.9		
U86	8.0		
Criteria	6.5 Minimum		

2.3.4.4 Cramping angles and turning radii are presented in Table 9.

TABLE 9. Cramping Angles and Turning Radii

	Cramping Angle (°)		Turning Radii (ft)	
Vehicle No.	Left	Right	Left	Right
U81	31	31	17.6	17.5
U83	32	30	17.9	17.8
U86	29-1/2	28-1/2	18.0	18.3
Specification	31 Max.	31 Max.	18.5 Max.	18.5 Max.

- 2.3.4.5 Fording operations and post-fording checks were satisfactory for all vehicles.
- 2.3.4.6 Radio Interference Suppression. All vehicles passed the conduction test. In the radiation test, U81 exceeded the passing limit at frequencies of 3, 5 and 8 megacycles. U83 similarly exceeded the passing limit at frequencies of 3 and 5 megacycles. Complete test data are contained in Appendix $I_{\circ}.7$

2.3.5 Analysis

All performance tests met the specified criteria except for the radiation phase of the radio interference suppression tests. It is believed that the generators were responsible for the excessive noise on the two failing vehicles. Two check tests were attempted with the generator disconnected, but the ambient noise level was too high to obtain valid readings.

The rolling resistance of the trailer in the slope simulation test was calculated to be 37 pounds and is included in the results.

The cramping angle of the left wheel on vehicle U83 was 1 degree in excess of the specification. Cramping angles in excess of the specification can result in damage to the steering gear.

2.4 COOLING CHARACTERISTICS

2.4.1 Objective

To determine the cooling characteristics of the engine and power train under full load conditions.

2.4.2 Criteria

a. Engine. The engine shall conform to MIL-E-45332, except that the section covering preparation for delivery shall not apply. The vehicle shall meet all performance requirements specified herein with engine installed.

- b. Extreme climatic operation. The vehicle shall be capable of having the engine started and normal operation maintained, in still air having any ambient air temperature from -25°F to +120°F, without external aid, in altitudes from sea level to a 3000 feet elevation above sea level.
- c. High temperature operation. The vehicle shall be capable of having the engine started and normal operation maintained, in still air having ambient air temperatures and altitudes specified in Table I, without external aids, and with a relative humidity as low as 5 percent. The vehicle fuel system shall function without evidence of vapor lock, and the engine coolant temperature shall remain below the boiling point. The engine coolant temperature limit specified at Paragraph 3.5.1.3 of MIL-T-45331C considers coolant boiling point with a pressurized system.

TABLE I. Elevation Temperature Chart

Elevation	Minimum Ambient Air Temperature
4000 feet	108°F
5000 feet	100°F
6000 feet	97 ° F
7000 feet	93°F
8000 feet	90 ° F

2.4.3 Method

- 2.4.3.1 Road Load Cooling. During operation on all test courses, the following temperatures were monitored: coolant from the engine, engine oil sump, transmission oil sump, front and rear differential oil sumps, and ambient air temperature. The maximum temperature reached by each component was recorded on every shift. The coolant temperature drop across the radiator was also monitored, but not recorded.
- 2.4.3.2 Full Load Cooling. One vehicle, payloaded to the maximum gross vehicle weight (3600 pounds) was operated with a mobile field dynamometer at the engine speeds and corresponding road speeds shown in Table 10. All tests were conducted on a paved, near level (0.8 percent upgrade from south to north), 2-mile course.

TABLE 10. Full Load Cooling Engine and Road Speeds

Gear	Engine Speed (rpm)	Road Speed (mph)
1	1000	2.9
1	1800	6.2
1	4000	11.6
2	1800	9.6
2	2600	14.2
2	2900	15.9
2	3300	17.9
2	3 600	20.0
3	1800	18.3

The cooling runs were made after completion of the 20,000 miles of durability reliability operations, and with the thermostat blocked open. Each run was continued until temperature stabilization was reached, temperatures exceeded the maximum allowable limits, or imminent failure was apparent (the criteria for stability if a component temperature are that the three temperature readings taken in each of two directions of the test course vary by no more than 5°F and that any reading taken in one direction vary no more than 10°F with any reading taken in the other direction). An attempt was made to stabilize engine oil and engine coolant temperatures on all runs. In addition, stabilization of the transmission was attempted at an engine speed of 1800 rpm in second and third gear ranges, and stabilization of the differential temperatures was attempted at 1800 rpm in first gear. Cooling runs were made in ambient temperature of not less than 95°F. Individual component temperatures were then extrapolated to 120°F by adding 1 degree to the recorded ambient temperature for each degree of that temperature below 120°F.

2.4.4 Results

2.4.4.1 Road Load Cooling. The maximum component temperatures are summarized in Table 11, along with the environmental conditions present at the time the temperature was recorded.

TABLE 11. Road Load Cooling Data (Not Extrapolated)

		\mathtt{Max}_{\circ}		
		Temp	Amb	
<u>Vehicle</u>	Component	Recorded	Temp	Course
U81	Coolant from engine	210°	100°	Hilly cross-country with trailer
	Engine oil	225°	100°	Paved without trailer
	Transmission oil	230°	100°	Paved without trailer
	Front differential	180°	100°	Paved without trailer
	Rear differential	300°	90°	Winding gravel (break-in)
U83	Coolant from engine	205°	105°	Level cross-country without trailer
	Engine oil	225°	102°	Tank gravel without trailer
	Transmission oil	200°	108°	Paved without trailer
	Front differential	185°	107°	Hilly cross-country with trailer
	Rear differential	275°	95°	Paved with trailer
U86	Coolant from engine	205°	100°	Level cross-country without trailer
	Engine oil	200°	105°	Winding gravel without trailer
	Transmission oil	300°	105°	Winding gravel without trailer
	Front differential	195°	105°	Winding gravel without trailer
	Rear differential	305°	95°	Winding gravel (break-in)

In the early stages of full load cooling, the rear differential overheated after an extremely short period of operation. Since this did not appear normal, brief road load cooling runs were made. The temperature of the rear differential could not be stabilized to 4-wheel drive on paved road, even at speeds as low as 30 mph. In 2-wheel drive the temperature of the rear differential stabilized at 342°F, 92° above the sustained temperature limit. A check at 50 mph on gravel roads resulted in temperature of the rear differential stabilizing at 260°F and front differential at 175°F (4-wheel drive).

In view of the difference in temperatures experienced between operation on paved and gravel road, the rolling circumference of the tires was measured. One tire was found to have about 2 inches less rolling circumference per revolution than the other three. The mismatched tire was replaced, and road load cooling tests were run once again on paved road in 4-wheel drive and at 50 mph, the temperature of the front and rear differentials stabilized at 180° and 212°, respectively. In 2-wheel drive on the same course, the temperature of the rear differential stabilized at 237°. With the overheating problem solved, the vehicle was returned to full load cooling operation.

2.4.4.2 Full Load Cooling. The data for the cooling tests are included in Table 1 of Appendix I.5. Extrapolated temperature versus time curves for component temperatures that did not stabilize are presented in Figures 1, 2, and 3 of Appendix I.5. Points which do not lie on the curves may be attributed to sudden changes in wind direction or velocity.

During these tests, a run was started at 1800 rpm, second gear, for which it was desired to stabilize the transmission oil sump temperature. During this test the transmission failed at a temperature of 393°. A teardown revealed that the rear output seal and the throwout bearing had failed. The transmission input gear which is on the helical spur gear shaft had many chipped teeth (Fig. 6, App I.9), the second speed helical gear was heavily surface fatigued, and the transfer input shaft helical gear had four sheared teeth (Fig. 7, App I.9). It is hypothesized that the excessive temperature damaged the rear seal, resulting in a loss of lubricant. The vehicle was running at maximum torque (1800 rpm) in second gear, and the force and minimal lubrication on the transmission input gear caused it to chip away. These chips probably jammed other gears, causing the transfer input gear teeth to shear.

Eight full load cooling tests were conducted prior to the transmission failure mentioned above. At this time it was discovered that the transmission oil and differential oil sump thermocouple leads had been unknowingly damaged prior to the start of these tests, such that these thermocouples gave incorrect readings. Thus the transmission was probably at a high temperature during these runs as well, for three were unsuccessful runs at 3300 rpm, first gear. Upon replacement of the transmission, the runs mentioned above were repeated. The data for these final runs appear in Table 1, of Appendix I.5. During an inspection after completion of full load cooling tests, engine dry compression was observed to have dropped from the specification of 135 psi, pressured before test, to an average of 86 psi. Wet compression after test was about 50 psi higher than the dry compression, indicating worn piston rings.

2.4.5 Analysis

2.4.5.1 Road Load Cooling. The engine coolant ran consistently at the upper end of the 170° to 190°F operating range for all vehicles throughout the test. Several times temperatures exceeded 200°F, but checks at those times revealed no problems in the system. These coolant temperatures are not considered serious.

The engine, transmission and oil temperatures remained consistently below critical limits. Although temperatures were high in a few instances (the U86 transmission in Table 11, for example), the overall road load cooling of these components was satisfactory.

The rear differential shows some improved road load cooling performance over that in previous M151A1's where temperatures of 503°F were obtained (Ref 13, App V). The only excessive temperatures recorded in durability operation occurred during break-in.

The abnormal differential temperatures observed in road load cooling check during full load cooling operations emphasize that the differentials cannot tolerate a major difference in tire rolling circumferences. In the case of the present test where overheating occurred, the two tires causing the problem were of the same nominal tire size, same tread pattern, produced by the same tire manufacturer, and had approximately the same tread wear, but had a rolling circumference difference of more than 2 inches. This is a serious consequence because a 3-inch difference in rolling circumference between a new and worn tire can easily be realized.

2.4.5.2 Full Load Cooling. The engine coolant or oil temperatures exceeded specified or desirable limits in all runs in first gear.

The coolant temperature to the radiator exceeded the specified $232\,^\circ\mathrm{F}$ (7 psi radiator cap) at 1000 and 1800 rpm engine speeds. The engine oil sump temperature exceeded the desirable maximum value of $270\,^\circ\mathrm{F}$ at 4000 rpm.

The transmission oil sump operated at 300 to 340°F except at high engine speeds (4000 rpm). The transmission temperatures were stabilized on four runs. The temperature difference between the front and rear differential sumps was quite apparent (100° or more) in all runs and the difference increased as each run continued. This may have been caused by more hot air from the engine reaching the rear differential than the front, increased loading on the rear differential due to weight transfer of the vehicle as it pulled the dynamometer truck, or a breakdown of the lubricant during previous tests. The rear differential exceeded its temperature limitations several times but only two occasions were recorded since the others were caused by a leaking output seal and a set of tires with different rolling radii. The rear differential overheated at 1800 rpm in first gear and 2600 rpm in second gear. Both of these tests were run the same day (14 July 1970) with a third test following. Coolant and engine oil

temperatures stabilized on this third run, but not before the rear differential reached its limit. Curves of the temperature rise for the front and rear differentials may be found in Figures 1, 2 and 3 of Appendix I.5. They indicate a temperature rise of 6°F/minute in the rear differential.

During one run at 1000 rpm in first gear the vehicle began to exhibit signs of vapor lock. This occurred in a turn and some recirculation of hot air through the radiator was occurring. The vehicle was stopped and the engine nearly died. About 3 minutes earlier, temperature of the fuel after the pump was only 100°F and fuel pump pressure was 4.5 psi. After a cool-down period the test was resumed without difficulty.

The temperatures from top to bottom and side to side of the radiator varied little except in the lower left corner. Air at this point was 10 to 20° hotter than at the other points in front of the radiator. Some hot air from the engine probably recirculated to the front of the radiator. After the air passes through the radiator the upper left corner becomes 10° hotter than the other points behind the radiator. This is due to the coolant entering the radiator at the upper left corner.

At the end of the test the engine was observed to have low compression pressures (Para. 2.8.3). The effect of the low engine compression would be less power, hence less generated heat. Thus, some of the engine temperatures taken in the latter part of the test may be slightly lower than would be observed with an engine having satisfactory compression.

In summary, the engine coolant temperature exceeded its limit. There was one occasion of vapor lock. The transmission and rear differentials lubricants of one vehicle exceeded their limits thus did not meet the criteria set down in Paragraph 3.5.1.3 of MIL-T-45331C.

2.5 DUST TESTS

2.5.1 Objective

To determine the operating life of the air cleaner between required service intervals under normal and extreme dust conditions.

To determine the effect of dust contamination on vehicle components.

2.5.2 Criteria

- a. Servicing. Design and construction of the air cleaner shall permit quick and convenient disassembly for cleaning and servicing of the oil cup and filter element without removing or disturbing the clean air chamber or its connections to the engine and without the use of special tools (Ref MIL-A-13488A (Ord)).
- b. Resistance to Air Leakage. The air cleaner shall not leak air when properly assembled and tested to a vacuum of 50 inches of water (Ref MIL-A-13488A (Ord)).

2.5.3 Method

- 2.5.3.1 Normal Dust Conditions. Air cleaner servicing requirements were recorded during durability test operations. After completion of the durability mileage an inspection was made to determine if dust had caused any damage to on-equipment-material, controls or other components. The cylinder head of vehicle U81 was removed to facilitate a visual inspection of the valves, cylinder walls and combustion chambers.
- 2.5.3.2 Extreme Dust Conditions. The oil bath air cleaner for the M151A2 truck has two major components. The upper element consists of the cover and attached filter element, and the weathercap. It excludes the air duct hose and hose clamp. The lower element includes the oil cup, removable wire mesh filter and the canister body. The two major components were washed and dried. The oil cup in the lower element was filled to the proper level and then both components were weighed.

The air cleaner was installed on vehicle U83 and an initial restriction taken. The vehicle then began dust operations behind a lead vehicle, pulling off to the side of the course every 15 minutes to take restriction readings. All restriction readings were taken in second gear at 4000 rpm while accelerating (maximum air demand).

After a restriction of 24 inches water was attained, the air cleaner was removed, and the unserviced upper and lower elements were individually weighed in the same manner as before. The lower element was disassembled and thoroughly cleaned in a solvent bath, while the upper element was shaken, but not washed, to clean. The air cleaner was reassembled, weighed and reinstalled on the vehicle. A restriction reading was taken to compare with initial restriction data.

Air leakage tests were conducted both before and after the dust operation by covering the air intake to the air cleaner while the engine was idling to determine if stalling would result.

2.5.4 Results

2.5.4.1 Normal Dust Conditions. The original air cleaners installed in the vehicles were not airtight and were leaking dust into the engines. New assemblies were obtained and installed. No additional dust leakage was observed during the remainder of the test.

Service to the air cleaner under normal dust conditions was not required more frequently than the 1000-mile interval specified in the vehicle lubrication order.

An inspection of the vehicles not involved in the extreme dust tests at the end of durability-reliability operation revealed no detrimental effects of dust to any component.

Traces of dust were found in the combustion chamber of U81, but the valves and cylinder walls were in excellent condition.

2.5.4.2 Extreme Dust Condition. The air cleaner reached maximum restriction after 3.75 hours of operation in extreme dust. The air cleaner component weights before and after test are presented in Table 12.

TABLE 12. Air Cleaner Dust Capacity

	Weight Quantity			
Component	Before Test	After <u>Test</u>	Collected (gm)	After Servicing
Upper element	1215	1340	125	1280
Lower element	36 30	6865	3235	3760
Total assembly	4845	8205	3360	5040

The plot of restriction versus time is presented in Figure 1. Detailed data are included in Table 1 of Appendix I.6.

The quantity of dust that the air cleaner failed to remove could not be accurately determined since an absolute filter was not used. The engine was damaged by dust ingestion during this short period of operation as indicated by a loss of engine compression as shown in Table 13.

TABLE 13. Engine Compression Before and After Dust Test

	Compression (psi)		
	Before Test	After Test	
Cylinder No. 1	120	75	
Cylinder No. 2	115	95	
Cylinder No. 3	115	105	
Cylinder No. 4	120	75	

Dust deposits were also observed on the electrodes of all four spark plugs. The inside air duct hose from the air cleaner to the carburetor was covered with dust and a sample was analyzed to determine the size of the particles that were being ingested into the engine. A graph of the distribution by size of these particles is shown in Figure 2. Detailed data are presented in Table 2 of Appendix I.6.

The upper wire mesh element was saturated with dry dust (Fig. 4 and $5_{\,\mathrm{s}}$ App I.9).

As a result of the extensive residues in the lower element, it had to be removed from the vehicle for cleaning.

Total removal, cleaning, and installation time was approximately 55 minutes.

There was no air leakage observed during the stall tests conducted before and after operation in extreme dust.

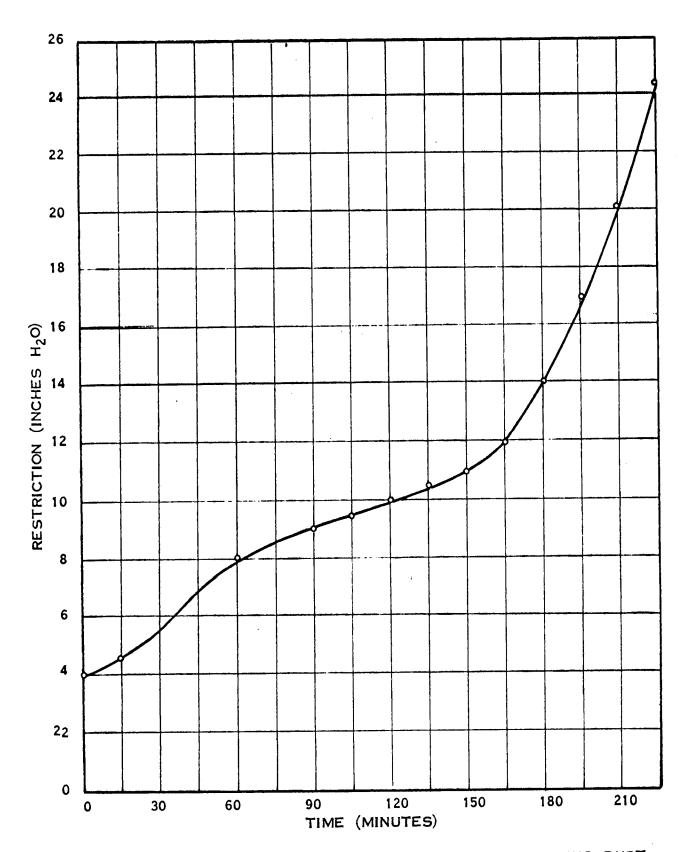
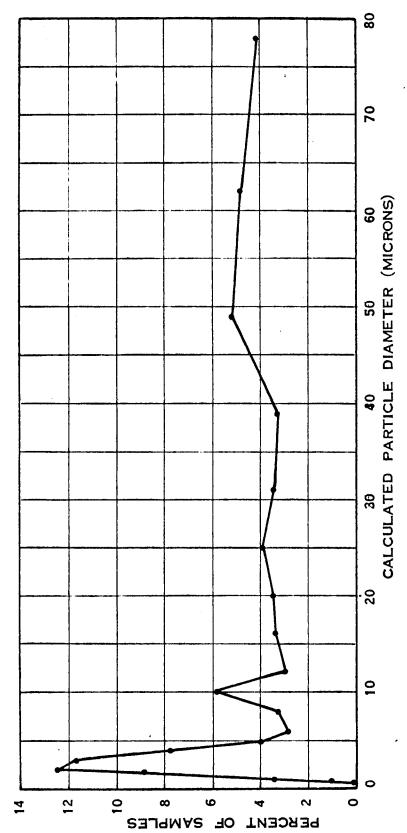


FIGURE 1. AIR CLEANER RESTRICTION CHARACTERISTICS DURING DUST TESTS, VEHICLE NO. 02DU8370, 27 JUNE 70.



SIZE OF DUST PARTICLES IN INTAKE AIR DUCT HOSE, DISTRIBUTION BY PARTICLE 5. FIGURE

During the post-test inspection it was also observed that the inside of the distributor was covered with dust. There was no liquid oil left in the oil cup, only oil wetted dust.

2.5.5 Analysis

2.5.5.1 Assembly Problem. Apparently the vendor of the air cleaner was matching upper and lower canister elements to provide an airtight seal for the air pressure acceptance testing. The contractor was not retaining the match during his assembly, however, so that a different top and bottom were being installed on the vehicle. The assembly method was changed by the contractor to retain matched pieces, and new air cleaners were shipped and installed.

The change in assembly methods resulted in a significant improvement in air cleaner effectiveness for normal dust operation.

2.5.5.2 Air cleaner Functioning. Military Standard MIL-A-13488A(Ord) specifies a test of 24 inches of water to determine dust capacity. The extreme dust test was run to simulate the laboratory test condition. The lack of oil in the cleaner at the end of test indicates that the air cleaner had ceased to function properly sometime before the 24-inch restriction was attained, and unfiltered air was entering the engine. The oil level was such that oil was lost by being "pulled over" into the engine. The restriction versus time graph in Figure 1 indicates the possibility that the air cleaner probably lost its effectiveness after 2.5 hours of operation at a restriction of 11 inches of water, as evidenced by the rapid rate of rise after that point.

The post-test servicing required removal of the air cleaner chamber from the vehicle, rather than the oil cup and filter element alone.

These observations indicate that the service interval during extreme dust operation would actually be about 2-1/2 hours.

Dust tests during initial production and inspection comparison tests of the M151Al truck produced results similar to those experienced in this test, i.e., oil pullover, channelling of airflow, and dust ingestion into the engine with severe damage to the engine after periods of operation as short as 1 hour in extreme dust conditions.

Product improvement tests of a dry-type air cleaner for the M151Al truck conducted at Yuma Proving Ground (Ref 14, App V) indicated improved filtering with reduced engine wear and in addition provides "fail-safe" protection to the engine in the event that the dust capacity is exceeded.

2.6 TOXIC HAZARD TEST

2.6.1 Objective

To identify hazardous carbon monoxide concentrations in the personnel compartment of the vehicle.

2.6.2 Criteria

While in the cruise condition the maximum carbon monoxide concentration in any occupied part of the vehicle shall not exceed 0.005 percent (Ref MTP 2-2-614).

2.6.3 Method

The vehicle was operated on a figure 8 paved course at approximately 25 mph without side curtains, but with top installed. Air samples were then taken with a Saf-Co-Meter carbon monoxide tester (manufactured by Mine Safety Appliance Co., PN 47113) at each crew member position. The procedure was repeated at 15 mph.

2.6.4 Results

There was no perceptible concentration of carbon monoxide at any crew member position.

2.6.5 Analysis

The vehicle met the toxic hazard criteria.

2.7 MAINTAINABILITY

2.7.1 Objective

To determine the maintainability of the vehicle when operated over the test courses.

2.7.2 Criteria

Failure of either test vehicle to comply with any of the requirements specified or any deficiency of workmanship of materials nature during or as a result of the 20,000-mile test, shall be cause for rejection of the vehicle. Further, the government may refuse to continue acceptance of production vehicles until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during or as a result of 20,000-mile test shall be prima facie evidence that all vehicles already accepted prior to completion of the 20,000-mile test are similarly deficient unless evidence satisfactory to the government is furnished by the contractor that they are not similarly deficient. Such deficiencies on all vehicles shall be corrected by the contractor at no cost to the government regardless of location.

2.7.3 Method

A maintenance evaluation, in accordance with USATECOM Regulation 750-15, was conducted throughout the initial production tests.

The amount, frequency and level of maintenance required was recorded. A record of the amount of operation and maintenance during each shift was kept. Where more than one type of maintenance was required, a separate job was shown for each type.

Throughout the test, maintenance instructions in the technical manuals and manuscripts, maintenance charts, and lubrication orders were analyzed for adequacy at the intended maintenance level. The adequacy of the tools and the need for special training were also recorded.

2.7.4 Results

A summary of maintainability data is presented in Table 14.

TABLE 14. Maintainability Data Summary

	<u>U81</u>	<u>U83</u>	<u>U86</u>	Total
Test miles	21025	21048	21091	63164
Actual operating hours	857.2	940.9	872.0	2670.1
Maintenance man-hours	108.9	104.3	116.2	329.4
Active maintenance downtime	79.0	74.6	78.0	231.6
Scheduled maintenance hours	54.9	55.2	69.1	179.0
Unscheduled maintenance hours	54.0	49.1	47.1	150.4
Scheduled maintenance actions	17	21	23	61
Unscheduled maintenance actions	35	23	37	95
Total chargeable component failures	58	38	49	145
Operating hours (assuming utilization of 20 mph)	1051.2	1052.4	1054.6	3158.2

Maintenance indicies derived from the data in Table 14 are shown in Table 15.

TABLE 15. Maintainability Indicies*

	<u>U81</u>	<u>U83</u>	<u>U86</u>	<u>Total</u>
Average speed (mph)	24.5	22.3	24.2	23.7
Mean time between maintenance (hr)	16.5	21.4	14.5	17.1
Mean miles between maintenance (mi)	404.3	478.4	351.5	404.9
Mean active maintenance downtime (hr)	1.5	1.7	1.2	1.5
Maintenance ratio (%) MMH/actual operating hr	12.7	11.1	13.3	12.3
Achieved availability (%)	91.6	92.6	92.7	92.0
Maintenance ratio, MMH/operating hr (assuming avg speed of 20 mph)(%)	10.4	9.9	11.0	10.4
Maintenance ratio criteria, (less than)	-	-	-	7.0

^{*}For definitions, see USATECOM Regulation 750-15

The manuals and tools were generally adequate. However, the specification for the torque on the wheel lifting eye and locking nut is not included in the maintenance manual.

No special training was required.

The vehicles met the maintainability criteria.

2.8 DURABILITY AND RELIABILITY

2.8.1 Objective

To determine component reliability and general durability of the vehicle when operated over the test courses.

2.8.2 Criteria

Failure of any test vehicle to comply with any of the requirements specified or any deficiency of workmanship of materials nature during or as a result of the 20,000-mile test, shall be cause for rejection of the vehicle. Further, the government may refuse to continue acceptance of production vehicles until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during or as a result of 20,000-mile test shall be prima facie evidence that all vehicles already accepted prior to completion of the 20,000-mile test are similarly dificient unless evidence satisfactory to the government is furnished by the contractor that they are not similarly deficient. Such deficiencies on all vehicles shall be corrected by the contractor at no cost to the government regardless of location.

2.8.3 Method

Subsequent to a 1000-mile break-in operation, the vehicle underwent durability cycles consisting of the following:

Course	<u>Miles</u>
Paved	750
Level cross-country	500
Hilly cross-country	500
Secondary road (gravel)	350
Winding secondard road (gravel)	325
Belgian block (equivalent)	75
Total	2500

The vehicles completed eight cycles of 2500 miles each, for a total of 20,000 miles over the durability test courses. For highway operation the payload was 1200 pounds and trailed load was 1300 pounds. For secondary roads and cross-country the payload was 800 pounds and the trailed load was 1000 pounds. The trailed load was towed approximately 50 percent of the miles on each course. At least 1000 miles of operation were to be made with the front axle drive engaged, preferably when marginal traction conditions existed.

Scheduled organizational maintenance was performed in accordance with the maintenance directive. This included servicing, preventive maintenance, and adjustments prescribed therein.

The vehicles were given a thorough visual and functional inspection. Teardown on one differential and one transmission was accomplished, and the cylinder head was removed from one engine. Observations on wear, corrosion and loss of adjustment were made and recorded.

2.8.4 Results

A summary of mileage accumulated by test course is presented in Table 16.

TABLE 16. Summary of Course Operation (mi)*

	Ve	ehicle	
Test Course	U81_	<u>U83</u>	U86
n 1			
Paved			
with trailer	3001	3010	3003
without trailer	3000	3008	3018
Level cross-country			
with trailer	2000	2001	2005
without trailer	2010	2005	2003
Hilly cross-country			
with trailer	2000	2009	2016
without trailer	2005	2007	2007
Straight secondary			
with trailer	1400	1407	1400
without trailer	1406	1400	1410
Winding secondary			
with trailer	1300	1300	1305
without trailer	1303	1300	1307
Belgian block equivalent			
with trailer	300	300	305
without trailer	300	303	300
Break-in (without trailer)	1001	998	1012
Total with trailer	10001	10027	10034
Total without trailer	10023	10023	10045
Total accumulated mileage	21025	21048	21091

NOTE: At least 1500 miles, both with and without trailer, was run in 4-wheel drive by each vehicle on hilly and level cross-country courses.

^{*}All mileages are higher than actual because the odometers of all vehicles were reading high by 6 to 8 percent (see App III, Sec 2, Group 47).

A summary of fuel consumption by test course is presented in Table 17.

TABLE 17. Fuel Consumption by Test Course*

Test Course		Consumption	
Test Course	<u>U81</u>	<u>U83</u>	<u>U86</u>
Paved			
with trailer	16.0	15.2	
without trailer	18.7	18.5	16.6
Level cross-country			-0.0
with trailer	13.9	13.2	13.0
without trailer	13.7	15.4	12.9
Hilly cross-country			
with trailer	11.4	11.8	11.9
without trailer	13.4	14.0	13.5
Straight secondary			43.3
with trailer	17.8	15.9	15.6
without trailer	17.3	17.7	20.1
Winding secondary		_,,,	2011
with trailer	14.4	15.4	15.5
without trailer	16.8	17.5	17.8
Belgian block (equivalent)			27.0
with trailer	14.6	16.6	13.3
without trailer	19.5	21.4	14.2
			14.2
Total with trailer	14.5	14.1	14.1
Total without trailer	15.9	16.4	15.5
		∪ • T	ر.رــ
Total overall	15.1	15.1	14.8

*Fuel (and oil) consumption figures have not been corrected for the 6 to 8 percent odometer error.

The oil consumption of U81 was 4205 miles per quart, U83 was 4210 miles per quart, and U86 was 3515 miles per quart.

Oil samples were taken from all reservoirs during each 6000-mile maintenance. The analyses are presented as Appendix I.3.

There were two deficiencies observed during durability-reliability operation. A rear yoke on the propeller shaft of vehicle U81 broke at 17,170 miles, diasbling the vehicle. This was the only mission failure observed during the test, and it required two men 1.5 hours to make the necessary repairs. All vehicles experienced extensive brake pulling (uneven application) to the left or right after 12,000 to 15,000 miles had been accumulated. For complete information on these deficiencies, see Appendix III, Section 1, Deficiencies.

Of the 28 shortcomings reported, 25 were discovered during durability-reliability operations. All shortcomings are presented in Section 2, Shortcomings, of Appendix III. The most important are summarized below, with the reference relating to the standard government group under which the shortcoming is located in Appendix III.

- a. There were three incidents of broken radio interference suppression wire mesh insulations on spark plug leads (Group 06).
- b. Ignition coil retaining tabs broke on vehicle U83. The retaining tab fasteners came loose on vehicles U81 and U83 (Group 06).
- c. Four turn signal control assemblies failed for mechanical or electrical reasons (Group 06).
- d. At the end of test on vehicle U81, the right output roller bearing and race in the rear differential were considered unserviceable (Group 11) (Fig. 1, App I.9).
- e. There were 13 tire inner tube failures due to separation at the seam (Group 13).
- f. The bushings in the front upper and lower A-frame control arms were badly worn on all vehicles (Fig. 3, App I.9). Problem was discovered about 17,500 test miles (Group 13).
 - g. Six shock absorbers were replaced (Group 16).
- h. The odometers of all vehicles were found to be reading higher mileage than actual by 6 to 8 percent (Group 47).

The results of the limited engine teardown on U81 to check for dust damage are included in Section 2.5.4.

Detailed results of the final inspection are presented in Appendix I.10. The most important observations are summarized below:

- a. A hole was discovered at a spot weld in the air cleaner oil cup (see App III, Sec 2, Group 3).
- b. The disassembled transmission from vehicle U81 was in good condition.
- c. The front suspension upper ball joint boots were cracked on all vehicles.
- d. U81 had a castor of -1 1/2° on the left front wheel. U86 had -3/4° and +2° castor angles on the front wheels.
- e. U83 had 0° and -1/2° camber and U86 had -1 1/2° and -1 3/4° camber.

- f. U83 had a swing arc of 32° on the left wheel.
- g. The toe-in measurements for U81, U83 and U86 were $\pm 1/2$ inch, $\pm 5/8$ inch and $\pm 3/8$ inch, respectively.
- h. The disassembled rear differential had spalled rollers in the right output roller bearing (Fig. 1, App I.9). The bearing and race were considered unserviceable (see App III, Sec 2, Group 11).
- i. All vehicles pulled to the left or right while braking during pre-inspection road tests (Para. 2.9.4 and 2.9.5).
- j. The rear brake cylinders and pistons in U81 were found to be in good condition. One front cylinder had a trace of rust. The pistons were tarnished and their skirts were slightly rough. The front boots had cuts occurring where they roll back over the piston skirt.
- k. The front brake cylinders from U86 were also torn down and inspected. The cylinder, pistons and boots were all in good condition.

2.8.5 Analysis

The specified durability mileage (20,000) was not completed by 1200 to 1600 miles because of the odometer errors in all vehicles. The vehicles had an advantage because the test was shortened. For example, the rear differential could have failed over that period because of the spalled bearings found during final inspection, and would have thereby been classified as a deficiency.

The overall fuel consumptions of the three vehicles were within 0.3 mile/gallon of each other. The fuel consumption inconsistencies for any given course, such as level cross-country, are the result of varying driver habits, and inaccuracies in fuel usage per course reporting. These factors tend to balance out over all of the courses, resulting in consistant overall figures.

The broken yoke on the propeller shaft was classified as a deficiency because the vehicle was disabled. The brake pulling, although not a serious hazard on YPG's dry pavement and gravel courses, would be extremely dangerous on wet or icy roads. This safety hazard is the basis for deficiency classification.

The single mission failure over the 63,164 miles and 2,670 hours accumulated by all three vehicles results in the reliability figures shown in Table 18. Repair of the failure took 1.5 hours, thus the mean-time-to-repair figure is 1.5 hours/failure.

TABLE 18. Reliability Data

	Confiden	ce Level
	90 Percent	95 Percent
75-mile mission reliability Mean time between failures at 20 mph	.995 809.9	.994 664.0
utilization Mean miles between failure	16197	13280

Although the worn A-frame control arm bushings were not discovered until about 17,500 test miles, it is likely that the problem had existed for several thousand miles. It had been theorized that the excessive negative camber (up to -5° on one vehicle) resulting from the worn bushings was responsible for the brake pulling problems which began between 12,000 and 15,000 miles. Two vehicles were shimmed back into correct camber, but the problem persisted. By the end of test, all vehicles had shims in the front control arms in excess of 5/8 inch. The result of this excessive negative camber was very poor tire wear.

The lack of a torque specification for the wheel lifting eye is particularly important because insufficient torque on the eye can result in water leakage into the hub during fording, even if the self-locking nut is tight.

The hole in the air cleaner oil cup resulted in a loss of about one-third of the oil in the cup, and thereby significantly reduced the effectiveness of the cleaner. The problem was not classified as a deficiency because some degree of filtering was occurring.

Since the steering arm ball joints are lubricated for life at the time of manufacture the cracks in the ball joint boots could result in damage to the joints by allowing dust contamination of the grease.

Even though all vehicles had in excess of 5/8 inch of shims because of the worn control arm bushings at the end of test, only U81 was within camber specifications. All vehicles were either above or below toe-in specifications by 11/32 to 15/32 inch. Vehicles U81 and U83 were castor specifications by 1/4 to 1-1/2 degrees.

The purpose of correct castor, camber and toe-in is to provide good handling and ride characteristics, optimum tire wear, and to minimize stresses on the front suspension. The failure of the vehicles to meet these specifications is correspondingly detrimental to those characteristics.

The cramping angle on the left wheel of vehicle U83 was 1 degree in excess of specifications. Cramping angles in excess of the specification can cause damage to the steering gear.

It is probable that the spalled roller bearings in the rear differential of vehicle U81 would have resulted in a differential failure within another 1000 miles.

2.9 SAFETY EVALUATION AND VEHICLE STABILITY

2.9.1 Objective

- a. To determine if any safety hazards exist
- b. To test and evaluate the effect of the trailing arm suspension on vehicle stability, maneuverability, steering, ease of handling and riding characteristics.

2.9.2 Criteria

USATECOM Regulation 385-6.

2.9.3 Method

Throughout all testing, observations were made with respect to difficulties experienced in operation of the test vehicles and safety hazards encountered.

Eleven persons were used to test the stability, handling and ride characteristics of one of the M151A2 test vehicles which had accumulated approximately 5000 test miles against an M151A1 which had undergone a 4000-mile inspection comparison test. Test personnel consisted of regular drivers, as well as project engineers who had been previously been involved with M151A1 testing.

The test course was a composite of five individual test courses, consisting of sections of the hilly cross-country, level cross-country and winding gravel course. In addition, one course was laid out in a dry wash to emphasize maneuvering characteristics, and another consisted of a paved figure 8 around a two-block area. All courses were run without a trailer and in addition, the paved and level cross-country courses were negotiated with a trailer. A questionnaire as contained in Appendix I.10 was completed by each driver at the end of each run. A summary of these driver comments is contained in Paragraph 2.9.4.2.

2.9.4 Results

2.9.4.1 Brake Problems. All vehicles encountered braking problems in the form of a pull or uneven application to the left or right after completing 12,000 to 15,000 miles of durability operation. The brake shoes were sanded, cleaned with a variety of cleaners, and replaced. Drums were checked for concentricity, and drum-to-shoe clearance was measured. Brake cylinders were removed and examined. The negative front wheel camber, resulting from worn A-frame control arm bushings, was corrected by shimming to determine if it was a contributing factor. None of these efforts provided a complete answer to the problem and further investigation was undertaken after the final inspections had been completed.

In this effort one factor at a time was checked on a vehicle exhibiting brake pulling characteristics. For example the front brake shoes were replaced. The pulling persisted so the original shoes were reinstalled. By this process of elimination, the problem was isolated to the wheel cylinder.

All front wheel cylinder boots had small cuts resulting from metal burrs which had not been removed from the rear of the piston skirts. These cuts allowed dust and moisture to contaminate the cylinders, thereby hindering their operation.

Detailed results are shown in the Final Inspection Data in Appendix I.8, Group 12.

- 2.9.4.2 Safety and Handling Evaluation Without Trailer.
- a. <u>Hilly Cross-Country</u>. This course consisted of very uneven virgin terrain and steep, washboarded gravel roads which were traversed at 5 to 15 mph. The M151Al pitched more over the virgin terrain as the vehicle traversed the abrupt rises and depressions, and it "walked" slightly sideways on the washboarded hills. The former occurrence was somewhat disconcerting to many of the drivers. The M151A2 exhibited neither of these characteristics. Over all courses the drivers preferred the larger grip and smaller diameter of the M151A2 steering wheel.
- b. Level Cross-Country. This course consisted of winding, bumpy roads covered with loose gravel and sand. It was one of the more revealing courses in terms of comparison because of the high speeds attained (15 to 45 mph). The M151A2 provided a more positive feeling of stability and control for three principal reasons. First, when the M151A2 was set into a turn, it would track perfectly without wandering or trying to break away. At the same speeds the M151A1 would consistently slide, with the rear end sliding to the outside of the turn. Second, at these higher speeds over washboarded roads, the drivers did not feel that the M151A1 was making secure contact with the road. A few described it as a feeling of being partially airborne. Finally, over very bumpy portions of the course, the rear end of the M151A1 tended to hop, instead of hugging the road as the M151A2 did. This was deemed particularly dangerous when a large bump was encountered during, or immediately prior, to a turn.

It should be noted that this was the only test course over which the drivers preferred the ride of the M151Al. This may be due in part to a weak suspension in the particular M151A2 vehicle used (U86) causing it to "bottom out." Later, it was found that U86 had front springs 1/4 inch shorter than specification.

c. Gravel Road, Winding. This course was run at slower speeds (15 to 35 mph) than normal to determine if a difference could be detected between the vehicles when they were driven well below critical stability limits. The concensus was that the M151A2 still gave a greater feeling of confidence.

- d. Dry Wash. This was a test of manuvering over virgin, sandy terrain. Drivers found that there was excessive feedback to the steering wheels of both vehicles, but because the steering wheel in the M151A2 was smaller, the overall effect was worse in the M151A2. The oversteer characteristics of the M151A1 were advantageous in negotiating sharp turns in the soft sand, but the overall stability and ride in the M151A2 somewhat balanced these overall evaluations.
- e. Paved Figure 8. In the turns around the paved figure 8 course, the M151A2 was felt to have greater adhesion to the road, giving a feeling of much greater stability. The M151A2 leaned much more than the M151A1. The M151A1 did not lean, but the front end oversteered and the rear end seemed to want to slide. The result was that the M151A1 tires started to squeal through many of the turns while the M151A2 tires did not. The brakes on the M151A1 were very hard requiring much more effort than those on the M151A2. Course speeds were 15 to 25 mph.
- 2.9.4.3 Safety and Handling Evaluation with Trailer. The drivers indicated that no comparative differences in stability and handling with or without the trailers were evident.

2.9.5 Analysis

The brake pulling was never serious enough to be considered a severe safety hazard on the dry pavement and gravel courses. However, such a condition could definitely be dangerous on wet or icy roads and was therefore classified as a deficiency.

The modified steering wheel and rear suspension have resulted in a greater stability, easier handling and more control over all types of terrain. The drivers higher confidence in the M151A2 was due to the leaning of the vehicle which indicated how fast they were negotiating a turn. The M151A1 does not have such a pronounced indicator and can break away or slide out unexpectedly, thus reducing the confidence in it. The leaning of the M151A2, then, is a definite advantage regarding safety of operation.

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APPENDIX I.1. RECEIVING INSPECTION

Item: Truck, Utility, 1/4-Ton,	1/4-Ton, 4x4, M151A2	Date Received: 1 April 1970 Shipper: ONC Hopper Truck L Tractor No. 1543; No. 20-7572	wed: 1 April 1970 ONC Hopper Truck Lines Tractor No. 1543; Trailer No. 20-7572
USA Reg No. Serial No. Odometer reading	02DU8170 24573 13.0	02DU8370 24575 12.9	02DU8670 24578 13.1
Vehicle blocking	In rear and front	In rear and front	In rear and front
Vehicle anchoring Damage due to lifting or rigging	None None	None None	wneels None None
Evidence of shock Seals of openings	None In fruck wan	None In twick non	None
Exposed metal coverings Locks: closed, locked, or	In truck van Seal not fastened	in truck van In truck van Seal not fastened	in truck van In truck van Seal not fastened
sealed Vehicle cover	In truck van	In truck van	In truck van
OVE anchor and blocking	Strapped in rear	Strapped in rear	Strapped in rear
OVE security and marking Oil or grease seal leaks	Adequate	Adequate None	Seac Adequate None
Battery disconnected	No	No. Switch on; battery dead	Yes
General appearance Maintenance package publication	New - good condition In vehicle	New In vehicle	New - good condition In vehicle

APPENDIX I.2. INITIAL TECHNICAL INSPECTION

		US	SA Registration	n No.
		02DU8170	02DU8370	02DU8670
SNI	Group: (01, Engine		
Idle speed (rpm)		525	450	600
Manifold vac at idle		20	21.5	21
	Engine			
	Speed			
	(rpm)	_		
Oil pressure (psi) at:	Idle	36	40	38
All oil pressures were	1000	40	44	41
taken at operating tem-	1500	42	45	42
perature. Specification	2000	43	45	45
is 35-45 psi at oper-	3000	46	49	48
ating speed	4000	48	51	51
ucing opecu	4000	40	J1	<i>)</i>
	Cylinder	•		
	No.			
		-		
Compression (psi) during	1	115	125	125
cranking at approximately	2	122	132	130
230 rpm. Specification is	3	124	132	130
135-145 psi.	4	130	130	130
Spark plug gap (in.)	1	0.030	0.032	0.030
Specification is 0.029	2	0.035	0.032	0.025
to 0.032 inch.	3	0.033	0.032	0.027
	4	0.035	0.032	0.025

All other engine components met the necessary specification requirements.

SNL Group: 02, Clutch

Satisfactory

SNL Group: 03, Fuel System

Fuel pressure (psig) 4.75 5
Specification is 5-6 psig

SNL Group: 04, Exhaust System

Satisfactory

US	SA Registration	No.
02DU8170	02DU8370	02DU8670

SNL Group: 05, Cooling system

Satisfacto

SNL Group: 06, Electrical System

Headlight adjustments (in.) Specification is 0 inch right, 5 inches down

Left	Right	Left	Right	Left	Right
5 L	5-1/2 D	2-1/2 L	5-1/2 L	7 L	7 L
7 D	9 D	2-1/2 D	10 D	10 D	10 D
	L = lef	t	D = d	.own	

The electrical

Headlamp and parking lamp wiring was poorly secured on all vehicles.

Lead to the oil pressure transmitter was too long.

cable from the starter foot switch was rubbing against the throttle linkage, thereby interfering with the throttle return. The loop in the cable which should clear the linkage had not been installed high enough to prevent contact.

SNL Groups: 07, 08 and 09

All items were satisfactory on all vehicles.

SNL Group: 10, Front Axle

Specifications for Left Right Left Right Left Right steering geometry are as follows: Caster, $-1/2^{\circ}$ to $+1/2^{\circ}$ 1/4° 3/4° 0° 0° Camber, $1/2^{\circ}$ to $1-1/2^{\circ}$ 1° 0° 1° 1° 1° ٥° Toe-in, 1/8 inch 5/8 in. 5/8 in. 19/32 in. 19/32 in. 3/4 in. 3/4 in. Swing arc, 31° 31° 31° 31° 30° 30°

All measurements were made on the vehicle without payload.

USA	Registration 1	No 。
02DU817 0	02DU8370	02DU8670

SNL Groups: 11 through 18

All items were satisfactory on all vehicles.

SNL Group: 22, Miscellaneous Body, Cab, Chassis, Hull and Accessories

The modified top with full view rear window was not received. The inside rearview mirror was not received with any vehicles.

PROJECT ENGINEER Shoemaker Vehicles Date Sample No. Sample No. Sample Source Obometer Engine Obometer Engine Obometer Engine Obometer Challe Specification MIL- TESTS API Gravity Corrosion (ASTM No.) FLASH Point (F) Sediment (I) Water (I) Water (I) Sulfateo Ash (I) Sulfateo Ash (I) Kinematic Viscosity (cs)	Арг. С. М. 151 Д2. Арг. 70. 24 Арг. 70. 2265 19. 10. 6001.0 25. 8 21.2 25. 8 21.2 400 400 3.89 1.22 1.22	14 Ma 20-23 120-1 120-1 150-23 150-23 150-23 172	USA Rec. 5 Jun 70 70=2464 Engine 16942.1 20.5 20.5 390 5.38 3.80	No.OZDURI70 1 Jul 70 70-2671 Engine 21058 23.3 1B+ 405 23.1 1 Jul 70 23.3 1 Jul 70 23.3 1 Jul 70 1 Jul 70 2 Jul	WORK ORDER No.	0850
E SOURCE TER TER HOURS ST ICATION MIL— SGRAVITY SSION (ASTM No.) H POINT (F) H POINT (F) ATTEO ASH (7) AATTE VISCOSITY (CS) AATTE VISCOSITY (CS) AATTE VISCOSITY (CS)	198 70–2 ne Eng 600 600 600 11	114 May 20-2367 Engine 12010 16-9 420 420 420 112-1	5 Jun 70 70-2464 Engine 16942.1 20.5 390 5.38 3.80	1 Jul 70 70-2671 Engine 21058 23.3 1B+ 405 2.11 1.79		
E SOURCE TER HOURS CT GRAVITY OSION (ASTM No.) H POINT (F) H POINT (F) ARESIDUE (T) AREC ASH (T) AATIC VISCOSITY (CS) A0PF	198 70–2 ne Eng 600 8 21 3 3 11	20–236' Engine 12010, 16.9 16.9 420 420 420 112.1	70-24.64, Engine 1694.2.1 20.5 390 5.38 3.80	70-2671 Engine 21058 23.3 18+ 405 2.11 2.11 1.79		
E SOURCE TER HOURS CT ICATION MIL- SGRAVITY OSION (ASTM No.) H POINT (F) H POINT (F) MENT (X) ON RESIDUE (X) ATTEO ASH (X) AATTE VISCOSITY (CS) AAOF	eu 8 00	Engine 12010 16.9 420 5.54 5.93 112.1	Engine 16942.1 20.5 390 5.38 3.80	Engine 21058 23.3 18+ 405 2.11 1.79		
HOURS TEATION MIL- S GRAVITY OSION (ASTM No.) H POINT (F) H POINT (F) MENT (R) ON RESIDUE (R) ATEO ASH (R) AATEO VISCOSITY (CS) AAOF	ω	12010 16.9 420 5.54 5.93 112.1	169/2.1 20.5 390 5.38 3.80	23.3 23.3 1B+ 405 2.11 2.11 1.79		
HOURS ICATION MIL- S GRAVITY OSION (ASTM No.) H POINT (F) H POINT (F) AENT (X) ALEO ASH (X) AATIC VISCOSITY (CS) AOF	ω ορ	16.9 420 5.54 3:93	20.5 390 5.38 3.80	23.3 1B+ 405 2.11 2.11 1.79		
GRAVITY OSION (ASTM No.) H POINT (F) AENT (7) N RESIDUE (7) ATEO ASH (7) AATIC VISCOSITY (CS) A0P		16. 3.9 3.9	20.5 390 5.38 3.80	23.3 1B+ 405 2.11 1.79		
GRAVITY OSION (ASTM No.) H POINT (F) AENT (Z) ON RESIDUE (Z) ATEO ASH (Z) AATIC VISCOSITY (CS) AOF		16. 5.5 3.9	20.5 390 5.38 3.80	23.3 1B+ 405 2.11 1.79		
GRAVITY OSION (ASTM No.) H POINT (F) NENT (X) ON RESIDUE (X) ATEO ASH (X) AATIC VISCOSITY (CS) A0P		16. 5.5 3.9	20.5 390 5.38 3.80	23.3 1B+ 405 2.11 1.79		
STM No.) (°F)) bue (%) sh (%) iscosity (cs)		112	20.5 390 5.38 3.80	23.3 1B+ 405 405 2.11 1.79 110.5		
AVITY ON (ASTM No.) L. (T.) T. (T.) (T.) RESIDUE (T.) O ASH (T.) IC VISCOSITY (CS.) OF		16. 5.5 3.9 11.2	20.5 390 5.38 3.80	23.3 1B+ 405 405 2.11 1.79 110.5		
ON (ASTM No.) DOINT ("F) T (1) (2) RESIDUE (1) O ASH (1) IC VISCOSITY (CS) OF		5.5 3.9 112	390 5.38 3.80	1B+ 405 2•11 1•79 110.5		
T (7) T (7) (2) Residue (7) O Ash (7) IC VISCOSITY (1) OF		3:9	390 5.38 3.80	405 2.11 1.79 110.5		
T (%) (%) RESIDUE (%) O ASH (%) IC VISCOSITY () OF		3:9	5.38 3.80	2.11 1.79 110.5		
RESIDUE (%) O ASH (%) IC VISCOSITY () OF		3:9	5.38 3.80 107.0	2.11 1.79 110.5		
RESIDUE (%) CO ASH (%) CO ASH (%)		3:9	5.38 3.80 107.0	2.11 1.79 110.5		
IC VISCOSITY (C)		3.9	3.80	1.79		
Viscosity (112	107.0	110.5		
1.		112	107.0	110.5		
1		112	107.0	110.5		
±₀0		112	107.0	110.5		
8		-	- >• - -			
AT 210°F 9.59		_	10.58	10.34		
VISCOSITY INDEX	78		87	79		
INSOLUBLES	4•59		68°5	र्ग8 ° 0		
an l	3.42	0.11	5.61	94.0		
SPECTROGRAPHIC ANALYSIS (PPM)						
Агимими	12	19	6	5		
Inon 14	89		105	38		
NO			2	0		
Соррея	110	15	8	9		
Снеоміци	9	9	16	3		
XXXX Magnesium			2	2		
O	400 <u>(</u>	4100	2900	1535		
Τıχ						
SILVER	0	0	0	0.		
FOAM TEST						
SEG, I (ML,)						
- 1						
Pour Fuel Diluction %	9		*			
SHARKSI	2	7.	2	₩• 1		

PROJECT ENGINEER Shoemaker	VEHIC	OIL ANALYSIS		SUMMARY USA Rec.	No. 02DU817	No. O2DU8170 WORK ORDER NO.	0850	
11	4 Apr 70	24 Apr 70	14 May 70		1 Jul 70			
SAMPLE NO.	2	70-2266	ľ	70-2506	0-26			
SAMPLE SOURCE Transmission	-#		-11	1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
ш '	17.0	6001.0	12010.3	17156.7	21058			
ENGINE HOURS								
51								
GRADE								
SPECIFICATION MIL-								
TESTS								
API GRAVITY	27.1	28.1	24.6		22,3			
CORROSION (ASTM No.)					1B+			
FLASH POINT ("F)		380	390		375			
SEDIMENT (%)								J
				27.2	Trace			CF
ESIDUE		1.13	97.		47.0			'-l.
о Asн (%								DF
								2G
AT 0°F								
AT 100°F	86*65	†8 • 11.	119.8		244.4			
AT 210°F	8.19	9.22	12,27		17.33			
Viscosity Index		111	101		81			
PENTANE INSOLUBLES (%)		0.10	94.0		1.28			
BLES		0.07	0.37		0.22			
SPECTROGRAPHIC ANALYSIS (PPM)								
ALUMINUM	7	11	13	2	3			
Ron	32	151	585	235	290			
SILICON	0	14	13	0	&			
Copper	19	135	310	38	32			
Снвомгим		7	12	~	2			
XXXXX Magnesıum	- (7	7	_	-			
LEAD	12	35	33	21	61			
Tıx								
ZINC								
SILVER	0	U	n	0	D.			
FOAM TEST								
SEG. I (ML.)								
Seg. II (ML.)								
III (ML.)								
CLOUD POUR POINT (PF)								
REMARKS								
Sirir-iis form 38, 18 Aug of								
() 曹二年皇帝帝,李 曹 皇帝,一年,一年,一年,七年,明,一年,一年,一年,一年,一年,一年,一年,一年,一年,一年,一年,一年,一年,	1						And the Control of th	

		OIL AN	IL ANALYSIS SU	SUMMARY				
PROJECT ENGINEER Shoemaker	VEHICLE	7	- 1	-USA REG.	No. 02DU8170 WORK	ORK ORDER NO.	0850	
DATE	4 Apr 70	24 Apr 70	14 May 70	1 Jul 70				Γ
No.	_	70-2267	70-2369	70-2673				Γ
	1			1 1 1 1 1 1				
Орометея	17.0	6001 0	12010.3	21058				
ENGINE HOURS								
Product								<u> </u>
GRADE								Γ
								Γ
TESTS				,				Γ
	25.0	25.9	23.2	22.6				ر
CORROSION (ASTM No.)				18+				CF
l		325	385	380				P-1,
								D
								PG
CARBON RESIDUE		2.17	1.86	2,11				<u></u>
SULFATED /								
X.								
ı. I								
AT OF							-	
AT 100ºF	181.5	209.0	229.4	243.0				Τ
AT 210°F	16,15	19.93	17,66	18,12				
Viscosity Index		113	06	68				
INSOLUBLES		0.57	0.59	2.14				
BENZENE		0.52	57.0	1.64				
S				•				
ALUMINUM	30	33	77	26				Γ
Iron	154	121	086	1750				Γ
	39	79	33	67				
	50	137	83	107				
CHROMIUM	2	17	39	69				
**************************************		7	3	5				Γ
· northead	2	12	1.7	28				Γ
ZING								Τ
	o	ο	0	0				T
ഥ								T
SEG, I (ML.)								Γ
- 1								
III (ML.)								
CLOUD POUR POINT ("F)								
KEMARKS.								
SIEIF-IIS FORM SA. 18 AUE 64								

η Β Project Engineer Shoemaker	VEHICLE	OIL 11-11	LYSIS	SUMMARY USA REG.	Nofizhii8170 Work O	Order No.	0850
	4 Apr 70	24 Ap	15	1 70			
LE No.	70-2201	70-2268	70-2370	70-2674			
SAMPLE SOURCE! Rear Different:	[a]		I				
	17.0	0.1000	12010.3	21058			
┵.			}				
Ркорист							
GRADE							
SPECIFICATION MIL-							
TESTS		- {					
- 1	25.0	24.9	22.0	22.7			
ION (AS				3B			
= 1		415	380	380			
S EDIME							
WATER (%)							
œ		2,76	2,66	2.14			-1,
SULFATED ASH (%)							
KINEMATIC VISCOSITY (CS)							
AT 40°F							
AT 0°F				i I			
1	180.4	•	268.4	243.3			
AT 210°F	16,10	23.35	24.48	18,63			
Viscosity Index		119	7	93			
PENTANE INSOLUBLES (%)		2.94	3.14	2.20			
INSOLUBLES		2.70	2.98	2.38			
SPECTROG							-
Агоміном	4.1	61	45	17			
Iron	275	3840	0009	1899			
	59	112	150	26			
Соррея	95	462	354	92			
CHROMIUM	2	15	26	10			
	2	17	11	~			
LEAD	5	18	17	11			
ZINC							
	0	0	0	0			
FOAM TEST							
=							
Seg. III (ML.)							
CLOUD POUR POINT (PF)							
REMARKS							
,							

		OIL AN		SUMMARY				
PROJECT ENGINEER SHOEMAKET	VEHICLE	LE M-15142		USA REG.	· Ž	CZDU8370 WORK	ORDER No.	0851
DATE	4 Apr 70	25 Apr 70	15 May 70	3 Jun 70	5 Jun 70	0 Im 70	22 1 20	1 11 70
SAMPLE No.	\sim	226	70-237	250	0.10	2/0	27.7	70-2670
SAMPLE SOURCE	Fron	Enor no	Francino	Frairo	Frairo	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1. 2. 0. 2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Engine
Орометея	23.2	6005.2		16,7.7	300	7007L	27081.6	21198.7
ENGINE HOURS						7		X7 : : ~
Product								
GRADE								
SPECIFICATION MIL-								
TESTS								
	25.7	23.3	18.7	21.5	22.3	21.3	25.3	2
ໄດ່								
FLASH POINT (F)		365	395	385	410	370	330	
								DF
ŀ			•		•			
ШΙ		2,48	5,35	4.15	4.36	4.23	3.58	2,86
		2,12	3.47	3,33	2.68	3.07	2.73	2.48
KINEMATIC VISCOSITY (CS)								
1. I								
AT 00F				,				
AT 100°F	85:50	126.4	1	92:56	98.95	101.7	97.30	95.20
	9.63	11.65	1	10.19	10.15	10.47	10.77	10.57
Y INDEX		85		76	68	26	-103	102
INSOLUBLES		2.98		5:96	4.40	5.72	4.91	1.80
BENZENE INSOLUBLES (%)		1.76	5.58	08*7	3.53	14.6	3.85	1.64
SPECTROGRAPHIC ANALYSIS (PPM)	·							
ALUMINUM	5	15	18	4	7	∞	2	917
RON	14	57	132	16	65	26	55	1025
SILICON	22	12	37	9	5	ο	5	9
Соррея	24	717	14	&	7	8	5	9
Снвоміим	-	7	10	25	9	6	33	11
NcXXX Magnesium	4	5	3	2	2	_	2	17
LEAD	143	3000	2700	1648	2500	3000	3000	1950
z.								
ZING								
SILVER	0	0	0	o	P.	O	0	0
FOAM TEST								
SEG, I (ML,)								
- 1								
SEG. III (ML.)								
DUR POINT (PF)	-							
REMARKS, FI		1.0	1.2	2•0	1.6	2.0	Q*	4.5

: :-	-	OIL ANA	L ANALYSIS SUMMARY	MMARY.			
G PROJECT ENGINEER_Shoemaker	VEHICLE	T	A2 .	USA REG.	No.02DU8370	ZO WORK ONDER No. 0851	
DATE	4 Apr 70	1 13	5 May 70	07 mil 6	22 Tun 70		
	70-2203	70-2270	70-2376	70-2482	70-2512		T
SAMPLE	Trans.	J.S.	Trans.	Trans.	Trans		
Орометея	23.2	6005.2	Γ	17836	21084.6		
							T
GRADE							
SPECIFICATION MIL-							T
TESTS					·		
API GRAVITY	27.3	28.0	22.7	22.6	22.5		
ION (AS							
		007	280	370	275		T
SEDIME							
$\overline{}$							JCI
		1 22	2 06	1 %0	- -		P-I
SULFATE		479	۹ .	4	4		, D
							PG
iı, I							
AT 0°F				•			
ΤΑ	63.40	81.86	211.9	248.1			
AT 210°F	8,35	9.79	16.26	19.18			
VISCOSITY INDEX	•	106	.85	1			
PENTANE INSOLUBLES (%)		0.10	0.92	06-0	1.28		
INSOLUBLES		0.07	0.54	69.0	0.23		
SPECTROG							T
	2	7	5	8	10		
	20	168	1460	260	279		
SILICON		10	10	23	37		T
_	14	122	260	31	31		
CHROMIL	1	3	34	~	77		
News Magnesium	1	1	7	-	-		
LEAD	6	25	25	51	39		
z-L							
ZINC							T
	0	0	0	0	0.		
FOAM TEST							
Sec. I (ML.)							
∑ I							
_							
KEMARKS.							
Sieir-iis form 3a, 18 Aug of							
				· · · · · · · · · · · · · · · · · · ·	And the first and the same of	· · · · · · · · · · · · · · · · · · ·	

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			Ō. >	IL ANALYSIS SUI				
	CI LNGINEER				Š	No. UKILLESTO WORK ORDER No.	DER No. 1021	T
	- 1	4 Apr 70	25 Apr 70	15 May 70	9 Jun 70	22 Jun 70		
	- 1	70-2204	70-2271	70-2377	70-2483	70-2513		
	SAMPLE SOURCEDIFFerential	Front.	Front		Front.	Front		Γ
	Орометек	23.2	6005.2		17836	210kl. K		Γ
	ENGINE HOURS				7777	٩ .		Τ
	Ркорист							Τ
i i	GRADE							Τ
	SPECIFICATION MIL-							Τ
								Τ
	API GRAVITY	25.0	24.7	22.7	22.0	22.2		J I
	S				N .			CF
/\s.	FLASH POINT (PF)		410	390		370		}-I,
	SEDIMENT (%)							DI
	WATER (%)				3.2	0.8		PG
	CARBON RESIDUE (%)		2.44	2.03	2.06	2,20		1
negar.	SULFATED ASH (%)							
	KINEMATIC VISCOSITY (CS)							Γ
	ı.							Τ
								T
	AT 1000F		220.3	234.1	271.1	257.2		Τ
	AT 210°F	16,18	20.70	17.72	23.51	19.79		Τ
	Viscosity INDEX		113	89		96		Τ
**	PENTANE INSOLUBLES (%)		0.82	2.32	3.42	76*4		
			0.70	1.34	1.7/4	2.07		Γ
	SPECTROGRAPHIC ANALYSIS (PPM)		•					Γ
	ı	21	36	50	12	24		Γ
	Ron	108	2500	1650	1673	21		
	SILICON	22	89	31	33	67		Τ
	Соррея	51	140	140	56			
	~		10	73	16	20		
	NEXTEX Magnesium		4	4	3	2		
	LEAD	2	20	22	84	07		
	Z-H							Γ
	Z INC							T
	Silver	0	0	0	0	0		Γ
e de la companya de l	FOAM TEST							
	SEG, I (ML.)							Γ
	- 1							Γ
	III (ML.)							
I-	CLOUD POUR POINT (F)							
11	REMARKS							
***	SIETP-IIS Form 3a. 18 Aug 64							1

STEYP-IIS Form 3a, 18 Aug 64

													J	JCF	JCP-I,	JCP-I, DI	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG	JCP-I, DPG
TO TO																																									
22 1.2 70	251	.1	21084.6	i .								22.4 375	22.4	22.4	22°4 375 2°24	22.4 375 2.24	22.4 375 2.24	22.4 375 2.24	22°4 375 2°24	22.4 375 2.24 246.8	22.4 375 2.24 246.8	22.4 375 2.24 2.46.8 19.80 100	22.4 375 2.24 2.46.8 100 2.52	22.4 375 375 2.24 2.6.8 19.80 100 2.52 2.52	22.4 375 375 2.24 2.54 2.52 2.52 2.52 2.52	22.4 375 375 2.24 2.24 2.52 2.52 2.52 2.10	22.4 375 375 2.24 2.46.8 19.80 100 2.52 2.10														
- - -	27.87		17836												25	25	25	25.2	225	22.5	52 52	22 25	22 25 22 25 25 25 25 25 25 25 25 25 25 2	22 22 22 22 22 22 22 22 22 22 22 22 22	22 22 2			22 25 23 - 25 25 - 25 25 - 25 25 - 25 25 - 25 25 - 25 25 - 25 25 - 25 25 - 25 2													
0 05 M 31 05	70-237	+-	L							22.2		22.		3 22		3 22 2	3 22 2	3 22 2	3 22 2	22.2 22.2 385 2.45 2.45	22. 22. 38. 2. 2.	22.2 22.2 385 259. 259. 259.	22.2 22.2 385 385 2.45 2.45 2.59 2.59	22.2 22.2 385 259. 259. 2.5 2.5 2.5	22.2 22.2 385 385 259. 259. 2.5 2.5 2.5	22.2 22.2 385 385 21. 21. 2.5 2.5 2.5 2.5 2.5 2.5	22.2 22.2 385 385 2.45 2.45 2.5 2.5 2.5 2.0 2.0 2.0 2.0 2.0	22.22 22.22 23.45 259. 259. 2.55 2.55 2.55 2.55 2.55 2.5	22.22 22.22 385 385 2.45 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.5	22.2 22.2 385 385 21. 21. 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.	22.2 22.2 385 385 2.45 2.45 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.5	22.2 22.2 23.5 385 259. 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.	22.22 22.22 22.22 259. 259. 2.55 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	22.22 22.22 22.22 259. 259. 259. 2.55	22.22 22.22 2.45 259. 259. 2.55 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	22.2 22.2 385 385 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.	22.2 22.2 385 385 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.	22.2 22.2 385 385 2.45 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.5	22.22 22.22 22.22 2.45 259. 259. 2.55 2.05 2.05 2.05 2.05 2.05 2.05 2.0	22.22 22.22 22.22 259. 259. 259. 259. 25	22.22 22.22 22.22 25.02 25.03
25.	70-02	+-		6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2	6005.2 24.8 375 375	6005.2 24.8 375 375 2.89	6005.2 24.8 375 375 2.89	6005.2 24.8 375 375 2.89	24.8 24.8 375 2.89	24.8 24.8 375 375 2.89	┍╸╏╸╏╸╏╸╏ ╌╏╌╏╼╏╼╏╼╏╌╏┈╏╼╏╼╏╼╏╼╏	┝═╋═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫	┝═╋═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫	┍╸┇╸┇╸┇╸┇ ╌┇╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏╼╏	┍╸┇╸┇╸┇╸┇╶┇ ╌┇ ╸╏ ╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏	┍═╋═╋═╋═╋═╃═╃═╃═╃═╃═╃═╃═╇═╇═╇═╇═╇ ═╇═╇═╇═╇═╇═╇═╇═	┝═╋═╋═╋═╂═╂═╂═╂═╂═┼═┼═┼═┼═┼═┼═┼═┼═┼═┼═┼═┼	┍╒╋╒╋╒╋╒╇╒╇╒╃╒╃╒╃╒╃╒╃╒╇╒╇╒╇╒╇╒╇╒╇╒╇	┝═╋═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═	┝═╋═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═╫═	┍═╋═╋═╋═╋═╋═╂═╏═╏═╏═╏═╏═╏═╏═╏ ═	┍═╋═╊═╋═╋═╉═╂═╏═╏═╏═╏═╏═╏═╏═╏ ═╂═╂═╂═╂═	┍═┇═┇═┇═╏╒┋ ═╉═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═	┍═╊═╊═╊═╂╒╏╒ ╃═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╂═╁═╁═╁═╂═╂═╂═╂═	┍═┇═┇═┇═┇╒╒ ┩╌╂═╏╌╃═╂╌╂╾╂┄╂┈╂┈╂╌╂╌╁┈╂┈╂╌╂┈╂┈╂┈╂┈╂┈╂┈╂┈╂┈╂┈╂┈╅┈╂┈╅┈	┍═╬═╬═╬═╬╌╬═┩╌╏┈╏┈╏┈╏┈╏┈╏┈╽┈╽┈╽┈╽┈╽┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏	┍═╋═┋═┋═┋╒╒┋╒┋╒╒┋╒┋╒┋╒┋╒┋╒┋╒┋╒┋╒┋╒┋╒	┍═╋═╬═╋═╂╌╂═╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈	┍═╋═╬═╋═╏╒┩═╏═┩═╃═╏═╃═╏╒╇ ╌╬╼┼ ╒╏╒ ┪═╁╼┼╼┼┈┼┈╂┈╁╼┼┈┼┈┼┈┼┈┼┈┼┈┼┈┼┈┼┈┼	┍═╋═╋═╋═╋═╂═╏═╏═╏═╏═╃═╂═╏╒ ╃═╇═╇═╇═╇═╇═╇═╇═╇═╇═╋═╋═╋═╋═╋═╋═╋═╋═╋═╋═	┍═╋═┋═┋═┋╒╒ ┩╌╏╌╏╌╏╌╀╌╀╌┼╌┼╌┼╌╁╌╁╌╁╌┼╌┼╌╁╌╁╌╁╌╏╌╏╌╏╌╏╌┧╌╁╌┧┈╁╌╅┈╂╌╅╼╂╼╋╼╂╾╂═
10 0C V	70-2205	Rear	7	75.6	43.4	43.4	43.6	43.4	43.44	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0 25.0 183.7 16.34	25.0 25.0 183.7 16.34 16.34	25.0 25.0 183.7 16.34 16.34 183 52	25.0 25.0 25.0 183.7 16.34 16.34 7.5	25.0 25.0 25.0 183.7 16.34 183 52 52 52 52 52	25.0 25.0 183.7 16.34 16.34 2 2 2 2 2	25.0 25.0 183.7 16.34 40 183 52 52 7 5 6	25.0 25.0 183.7 16.34 16.34 2 2 2 2 2 2 6 6	25.0 25.0 183.7 16.34 16.34 2 5.2 2 2 5.0	25.0 25.0 183.7 16.34 40 40 183 52 52 52 6	25.0 25.0 25.0 183.7 16.34 40 40 2 2 2 2 2 6	25.0 25.0 25.0 183.7 16.34 183 52 52 52 6	25.0 25.0 183.7 16.34 16.34 0 0	25.0 25.0 183.7 183.7 183.7 183.7 183.7 2 7 5 5 0	25.0 25.0 183.7 16.34 16.34 0 0	25.0 25.0 183.7 16.34 16.34 0 0
		Source Differential							-	- 11	IL- M No.)							N (x)		No.	No.	N (K)			No.	No.) 1TY (CS) 1TY (CS) S (%) S (%) S (%)	No,) No,) TY (cs) TY (cs) S (%) S (%)	No.) (7) (7) (1) (8) (7) (9) (1) (9) (1) (1) (1) (1) (1) (2) (1) (2) (3) (4) (4) (5) (4) (5) (6) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7	No.) 1TY (Cs) 1TY (Cs) ALYSIS (A)	No.) 1TY (Cs) 1TY (Cs) ALYSIS	1TY (CS) 1TY (CS) 1TY (CS) 1TY (CS) 1TY (CS)	No, No,	No.) ITY (CS) ITY (CS) ALYSIS (A)	No.) No.)	No.) 1TY (Cs) 1TY (Cs) 1TY (Lum	No.) ITY (S) S (%)	No.) ITY (Cs) ITY (Cs) S (%) S	No, No,	No, No,	No, No, No,	L- M No.) F CES (%) CES (%) ANALYSIS (PPM) SIUM
0	Street No.	1	(COOMETER	COOMETER ENGINE HOURS	ODOMETER ENGINE HOURS PRODUCT	ODOMETER ENGINE HOURS PRODUCT GRADE	DOOMETER ENGINE HOURS PRODUCT GRADE SPECIFICATION MILE	Hours of	DOOMETER ENGINE HOURS PRODUCT GRADE SPECIFICATION MIL TESTS API GRAVITY	HOURS TOT ICATION N GRAVITY OSION (AS	HOURS TEATION N GRAVITY OSION (AS-	HOURS TEATION M S GRAVITY OSION (AS H POINT (A)	HOURS CT CATION M CAVITY CSION (AS- H POINT (A) MENT (A)	HOURS TICATION N GRAVITY OSION (AS- H POINT (A) R (A) R (A) ON RESIDU	HOURS ICATION N GRAVITY OSION (AS H POINT MENT (7) R (7) R (7) R (7) ATED ASH	HOUF HOUSEN	HOURS TER HOURS GRAVITY OSION (AS H POINT (A) R (A) R (A) ON RESIDU ATED ASH WATIC VIS 40°F	HOUR HOUR REALL ON REALL ON REALL CATED AND THE CONTRED AND TH	HOUF HOUF HOUF HOUF HOUF HOUF HOUF HOUF HOUF HOUF	HOUF HOUSE HOUS HOUSE HOUSE HOUSE HOUSE HOUSE HOUSE HOUSE HOUSE HOUSE HOUSE HO	HOUF HOUSENT GRAVIICATIO OSION H POII MATICATICATION MATICATICATICATICATICATICATICATICATICATIC	HOUF HOUS GRAVIT GRAVIT GRAVIT MENT ANTIC	HOUF HOUF	HOURS TEATION M CT GRAVITY GRAVITY OSION (AST H POINT (L) NENT (L) ON RESIDUE ON RESIDUE ATEO ASH WATIC VISC AOF 100°F 11TY INDEX ME INSOLUB ME IN	TER HOURS ST GRAVITY GRAVITY OSION (AST MENT (7) RENT (7) RENT (1) ON RESIDUR ATTE AST ON RESIDUR ON RESIDUR ON RESIDUR ON RESIDUR ON RESIDUR ATTE NOF TOPE ITY INDEX ME INSOLUB M	TER HOURS ST CT GRAVITY OSION (AST WENT (2) NENT (2) ON RESIDUS ATEO ASH WATIC VISC A00F 1000F 1100 F LITY INDEX WE INSOLUB WE INSOLUB	HOURS TER HOURS ST GRAVITY GRAVITY GRAVITY OSION (AST H POINT (A) R (A) NATED ASH NATED ASH NATED ASH OF OF ITY INDEX ITY INDEX INUM ON ON ON ON ON ON ON ON ON O	HOURS CT GRAVITY SSION (AST MENT (1) NENT (1) NENT (1) NENT (1) NATIC VISC AOF OOF 100°F 210°F 1TY INDEX ME INSOLUB NOGRAPHIC INUM OON OON E OON OON OON OON OON	TER HOURS ST GRAVITY GRAVITY OSION (AST NENT (1) R (1) R (1) R (2) NENT (1) R (1) ON RESIDUE ON RETION ATE AST 100° TY INDEX VE INSOLUB ON ON ON ON ON ON ON ON ON O	TER HOURS ST GRAVITY GRAVITY OSION (AST MENT (1) NENT (2) NATIC VISC A0°F 100°F 100°F 110°F 11	HOURS ST CT CT CT CAVITY SSION (AST WENT (2) NENT (2) NENT (2) NATIC VISC ANDEX ANDEX ANDEX ITY INDEX INUM CON CON CON CON CON CON CON CO	HOURS ST CT CT CT CT CAVITY GRAVITY OSION (AST WENT (1) NENT (1) ON NATIC VISC AOF ITY INDEX LITY I	HOURS TER HOURS ST GRAVITY GRAVITY GRAVITY OSION (AST NENT (1) NENT (1) NATIC VISC AOF OOF ITY INDEX ME INSOLUB RE INSOLUB	HOURS TER HOURS ST GRAVITY GRAVITY OSION (AST WENT (1) R (1) NATIC VISC AOF OOF ITY INDEX INUM ON ON ON ON ON ON ON ON ON O	TER HOURS ST GRAVITY GRAVITY OSION (AST MENT (1) NENT (1) NATIC VISC AOF 100°F 100°F 110°F 110	TER HOURS ST GRAVITY GRAVITY OSION (AST MENT (1) R (1) NATIC VISC AOF 1000F 1000F 1000F 1100F 1100F 1100F 1100F 1100F 1100N MIUM SOGRAPHIC INUM IN	HOURS TER HOURS ST GRAVITY OSION (AST WENT (1) NENT (2) NENT (1) NATIC VISC AOF 1000F 1000F 1000F 1100M MIUM MIUM MIUM ER IR IR IR IR IR IR IR IR IR	STER HOURS ST. HOURS	SETTION MESTON (AST OSION (AST OS	TER HOURS ST GRAVITY GRAVITY OSION (AST H POINT (A) H POINT (A) NATIC VISC ATED ASH WATIC VISC AOF ITY INDEX HE INSOLUB WE INSOLUB WILL WILL WILL WILL WILL WILL WILL WIL

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Project Engineer Shoemaker	\ \frac{1}{2} \fra		OIL ANALYSIS SUMMARY	MMARY HSA Pro	OZBARGZO. ".		30 7	0852
	•	,			L	ш		
- 1	4 Apr 70	25 Apr 70	15 May 70	4 Jun 70	8 Jun 70	17 Jun 70	16 Jul 70	
- 1	70-2206	70-2273	70-2371	70-2466	70-21,77	70-2501	170-2766	
SAMPLE SOURCE	Encine	Engine	Engine	Engine	Engine	Engine	House	
ODOMETER	21.1	5007 7	1200/, 0	1701.6.3	18639	21123.1	00126 0	
ENGINE HOURS	•			74747	7787		•	
GRADE								
SPECIFICATION MIL-								
	,							
API GRAVITY	25.8	22.6	18.2	21.5	20.8	21.5	23.2	
CORROSION (ASTM No.)			2	٦.	2		1R+	JC
L		410	420	390	375	300	395	P-I
SEDIMENT (%)					,,,			, C
								PO
CARBON RESIDUE (%)		2.63	5.67	3.90	3.86	3.59	1.99) -
O ASH (%		1.19	3.68	3.29	3.53	2.61	1-61	
ī.								
	,							
	66*78	121.1	105.6	104.3	109.8	116.4	99.50	
	0,62	1_	10.27	10.86	10.76	10.75	9.65	
1 0	200	Q Q		90	244	1	78	
20.0		2,02	6.81	5.64	6.98	3.81	2.14	
1		1 20	5 70	5.05	5 76	3 06	99.1	
INSOLUBLES (A)		200	2)•7	7.00	200	20.0		
SPECTROGRAPHIC ANALYSIS (PPM)	•	70	16	7	4.5			
ALUMINUM	- 1	207	24	, ,	2	0	8	
RON	?	60	ō	73	81-	7.1	65	
SILICON	11	12	23	9	13	6	20	
Copper	11	150	16	6	12	7	10	
Снкоміим		7	58	14	56	53	23	
MKKKL Magnesium	77	2	2	2	7	2	2	
LEAD	194	3000	3000	2400	0057	1876	1350	
Z.								
ZING								
Silver	0	0	0	0	0	0	0	
FOAM TEST								
SEG, I (ML.)								
- 1								
III (ML.)								
CLOUD POUR POINT (F)								
L Remarks Fuel Dilution %		1.0	0.	1.2	8•1	2.2	2 2	
ı								

T-			OIL ANA	LYSIS SUN	AMARY		or an interpretation	,	
14	PROJECT ENGINEER Shoemaker	VEHICLE	- N	151.2usA	USA REG.	No. 02008	No. 02008670 WORK ORDER No.	DRDER No. 0852	2
	ü I	4 Apr 70	25 Apr 70	15 May 70	8 Jun 70	17 Jun 70	1 Jul 70	16 Jul 70	
	SAMPLE No.		70-22	-23	1-24	1-250	70-2542	1-27	
	1		1	Trans	Trans.	Trans	Trans.	Trans.	
大学を	1.1	21.4	5997.7	12094.9	18639	21123.4	21244	22136.8	
	ENGINE HOURS								
	Product								
	GRADE								
	SPECIFICATION MIL-								
- 1 () 1 (TESTS								
		27.3	27.5	24.7	23.0	22.7	22,3	24.1	
	ທີ			100		1 A	202	2.A	
	⊼!		390	395	385	375	445	250	
	SEDIMENT (A)								JC
	(4)		4 4 12	1 2	- 1	- 1	3 05	62	P-
***			1.12	1.44(10/4	00.	2005	30.0	1, [
***	٦,			À) T
	KINEMATIC VISCOSITY (CS)								G
	AT 40°F								
	ат 0 ⁰ F								
lert ex	AT 100°F	68•79	91.05	119.6	223.3	231.0	282.3	182.9	
	AT 210°F	22.8	10,21	11 • 84	17.40	19,68	21.98	15.01	
	Viscosity Index		101	95	90	104	102	98	
	PENTANE INSOLUBLES (%)		0.18	0.51	1.25	1.05	0.0	1.42	
	INSOLUBLES		0.10	0,21	0.79	87.0	5.28	0.76	
	SPECTROGRAPHIC ANALYSIS (PPM)								
	1	7	28	27	4	9	12	0	
	Ron	26	184	340	93	99	4200	77	
	SILICON	3	28	32	18	80	40		
	Соррев	17	138	240	35	35	200	17	
	- 31	2	3	8	2	-	38	0	
	NEKKK Magnesium	•	•	-	+-	0	0	0	
	LEAD	9	23	23	32	26	67	0	
	H _I N								
	ZINC								
	SILVER	0	0	0	0	0.	0)	
	FOAM TEST			:					
	SEG, I (ML,)								
	Seg. II (ML.)								
	III (ML.)								
	CLOUD POUR POINT (PF)								
	REMARKSA								
	STEYP-IIS Form 3a, 18 Aug 64							•	

PROJECT ENGINEER SHOOMAKET	VEHICLE		OIL ANALYSIS SUMMARY	MMARY USA REG.	Nopzini8670	1	WORK ORDER NO. 0852	52
H	4 Apr 70	~	15 May 70	8 Jun 70	17 Inn 70	16 111 70		
SAMPLE No.	70-2208	2	70-2373	70-2479	70-2503	70.27		
	Front	Front	Front	Rront	Front	Fror		
Орометея	21.4	5997.7	12094.9	18639	21123.4	221,36,8		
ENGINE HOURS								
Product								
GRADE								
SPECIFICATION MIL-							V.	
TESTS								
API GRAVITY	24.9	24.0	22.9	22.9	22.4	23.0		J
CORROSION (ASTM No.)					1A	1B		CP
_		380	385	375	375	420		-I,
SEDIMENT (%)								DP
WATER (%)				•		•		G,
RESIDUE		2.33	2.05	1.77	1.82	1.62		
1								
1			•	•				
lı.								
•	187.4		244.3	247.0	244.0	7.44.5		
AT 210°F	16.38	21.74	18,01	18,39	17.73	16,37		
Viscosity Index		117	28	68	78	20		
PENTANE INSOLUBLES (%)		0.88	0.72	ት ተ•0	0.30	90•4		
NSOLUBLES		29*0	87.0	66.0	0.23	3.58		
SPECTROGRAPHIC ANALYSIS (PPM)								
	. 39	53	19	14	8	5		
RON	189	2550	1327	672	465	046		
SILICON	28	82	28	17	22	29		
Соррея	100	161	150	4.5	35	50		
Снвомілм	2	2	39	15	9	9		
N. KKXX Magnesium	1	3	3	1	1	9 -		
LEAD	4	18	18	52	30	12		
TIN								
ZING								
SILVER	0	0	0	0	0.	0		
FOAM TEST								
SEG, I (ML.)								
SEG, II (ML.)								
III (ML.)								
CLOUD POUR POINT (F)								
0	-							

EYP_TIS FORM 38. 18 AUG

Pl-1		ō	IL ANALYSIS SUMMARY	MMARY DE	020118670	70 m 02	0850	9
	4 Any 70	1 5	15 May 70	8 1,11 70	- [4	Ш	
S. T. B.	70-2209	227	2371	70-27.80	70-2501	277		
1	Rear	REar		Rear	Rear	Rear		
1 5	21.4	5997.7	12094.9	18639	21123.4	22436.8		
ENGINE HOURS						ı ı		
SPECIFICATION MIL-								
•	7		CC	,	Q C	- 1		
	75.0	43.4	4077	23.1	٥٠٥٧	22.7		
CORROSION (ASIM No.)		7 507	375	}	380	3B+		JC
7_						224		P-
				1 .				I, D
		2 \$7	2 34	200	3.16	3.29		POPO
TO ASH (7		0		4	٦.			j
lı, l								
AT 00F								
AT 100°F	185.3	231.3	257.2	244.5	273.5	398.7		
AT 210°F	16,39	24.55	20,51	17,80	21,37	28.52		
Viscosity Index		123	101	85	100	105		
- i		3.53	2.38	9.36	3.50	3.21		
BLES (%)		3.02	1.86	7.47	2.95	2.90		
SPECTROGRAPHIC ANALYSIS (PPM)	C	C		2.	Ċ			
ALUMINUM	7	53	1.7	40	98	29		
RON	330	3630	2300	1 500	7500	(2)		
Sicicon	78	119	877	92	267	/01		
Соррея	130	200	380	52	96	523		
Снкоміим	~	17	29	12	50	33		
Nickra Magnesium	7	19	9	5	0			
LEAD	3	20	13	99	34			
Z								
ZINC								
SILVER	0	0	0	0	0	O		
FORM TEST								
SEG. 1 (ML.)								
i								
III (ML.)								
CLOUD POUR POINT (F)								
REMARKS								
STEYP-IIS Form 3a. 18 Aug 64.					•			

APPENDIX 1.4. THERMOCOUPLE LOCATIONS

	Thermocouples (IC)	Location
1.	Coolant to radiator	At engine coolant outlet
2 .	Coolant from radiator	At radiator coolant outlet
3.	Engine oil sump	At drain plug
4.	Transmission oil sump	At drain plug
5	Front differential oil sump	At drain plug
6.,	Rear differential oil sump	At drain plug
7.	Fuel from pump	In front of carburetor
8 .	Air inlet after air cleaner	In air horn
9	Air before radiator	4 inches down, 4 inches from right side, 1/2 inch in front
10	Air before radiator	4 inches down, 4 inches from left side, 1/2 inch in front
A 1	Air before radiator	4 inches up, 4 inches in from right side, 1/2 inch in front
1.2	Air before radiator	4 inches up, 4 inches in from left side, 1/2 inch in front
į ķ	Air before radiator	Center, 1/2 inch in front
14.	Asr after radiator	4 inches down, 4 inches in from right side, 1/2 inch to rear
45	Atm after radiator	4 inches down, 4 inches in from left side, 1/2 inch to rear
‡6.	Air after radiator	4 inches up, 4 inches in from right side, 1/2 inch to rear
17.	Air after radiator	4 inches up, 4 inches in from left side, 1/2 inch to rear
18	Air after radiator	Center, 1/2 inch in front.

APPENDIX 1.5. FULL LOAD COOLING DATA

	13 Jul 18.3 1800 550 3 +7 113 1430		213 206 248 289	237	149 171	120	120
	13 Jul 20 3600 775 2 +10 110 1230		205 199 262 302	243 372 ^c	151 175	119	119
noted.	14 Jul 17.9 3300 875 2 +13 107 1115		206 200 258 310 ^c	251c 412c	139	115	115
unless	10 Jul 15.9 2900 971 2 +15 105 1400		212 206 262 338	267	144	123	122
Temperatures in $^{\circ}F$; pressures in psi, unless noted. Data extrapolated to $120^{\circ}F$	14 Jul 14.2 2600 1125 2 +9 111 1300		214 ^b 207 ^b 259 ^b 300 ^b	262 ^b	148b 153b	117	117
ressures 120°F	1 Jul 9.6 1800 1129 2 +22 98 1115		220 214 261 344	334	152 174	122	122
n °F; p	1 Jul 11.6 4000 1300 1300 1 +30 90		213 207 280 356 ^c	297 ^c	138	122	122
Temperatures in °F; pressur Data extrapolated to 120°F	14 Jul 6.2 1800 1876 1 +25 95 0930		236 ^b 228 ^b 283 ^b 302 ^b	279 ^b	129 194	132	123
Tempera Data ex	8 Jul 2.9 1000 1725 1 +24 96 1430	iod	254a 245a 259a 273a	230a	140 ^a 116 ^a	154 ^a	147a
		Limits	232 270 300	300	8	top	top
Vehicle: M151A2	Date (1970) Road speed (mph) Engine speed (rpm) Drawbar pull (lb) Gear Extrapolation factor Ambient temperature (°F) Time (MST) THERMOCOUPLES	Short Period	t to radiator t from radiator oil sump ission oil	5. Front differential oil sump	oil sump 7. Fuel from pump 8. Air inlet after air	cleaner 9. Air before radiator, top richt	10. Air before radiator, top left
I-18							

Date (1970)	8 Ju1	14 Jul	1 Jul	1 Jul	14 Jul	10 Jul	14 Jul	13 Jul	13 Jul
THERMOCOUPLES (Concluded)									
11. Air before radiator,	157 ^a	130	122	123	118	124	115	119	121
bottom right 12. Air before radiator,	194a	156	139	132	129	135	127	132	123
bottom leit 13. Air before radiator,	150a	129	121	121	117	121	115	119	119
center 14. Air after radiator, top	220ª	187	162	181	162	164	155	157	171
right 15. Air after radiator, top	233a	204	171	189	177	176	168	168	182
lert 16. Air after radiator,	217a	185	159	174	159	164	154	158	172
bottom right 17. Air after radiator,	221a	186	159	175	161	165	154	158	172
bottom leit 18. Air after radiator, center	235a	206	177	189	176	179	173	172	179
PRESSURE GAGES									
1. Drop across air cleaner	0	3.0	4.5	3.9	4.0	4.0	5.0	5.0	2.0
$(1n. H_2U)$ 2. Engine oil	22	35	39	%	38	37	39.5	39.0	34
	4.5	4.0	4.5	4.0	0.4	4.0	4.0	4. 0	4.0
4. Radiator top tank	2.0	7. 0	9	3.0	3.0	3.3	7.4	 U	0.0

Date (1970)	8 Jul	14 Jul	1 Jul	1 Jul	14 Jul	10 Jul	14 Jul	13 Jul	13 Jul
METEOROLOGICAL DATA									
Temperature (°F) Relative humidity (%) Soil temperature (°F) Barometric pressure (in. Hg) Wind speed (mph)	96 32 114 29.75 8	101 30 128 29.68 3	90 40 116 29.74 3	98 44 130 29.74 6	111 22 146 29.67 6	105 25 140 29.73 11	107 31 124 29.69 3	110 23 145 29.69 7 SW	113 23 150 29.66 6 SW

NOTE: aCoolant overheated before temperatures stabilized.

bRear differential overheated before temperatures stabilized.

CDid not stabilize; highest temperature recorded.

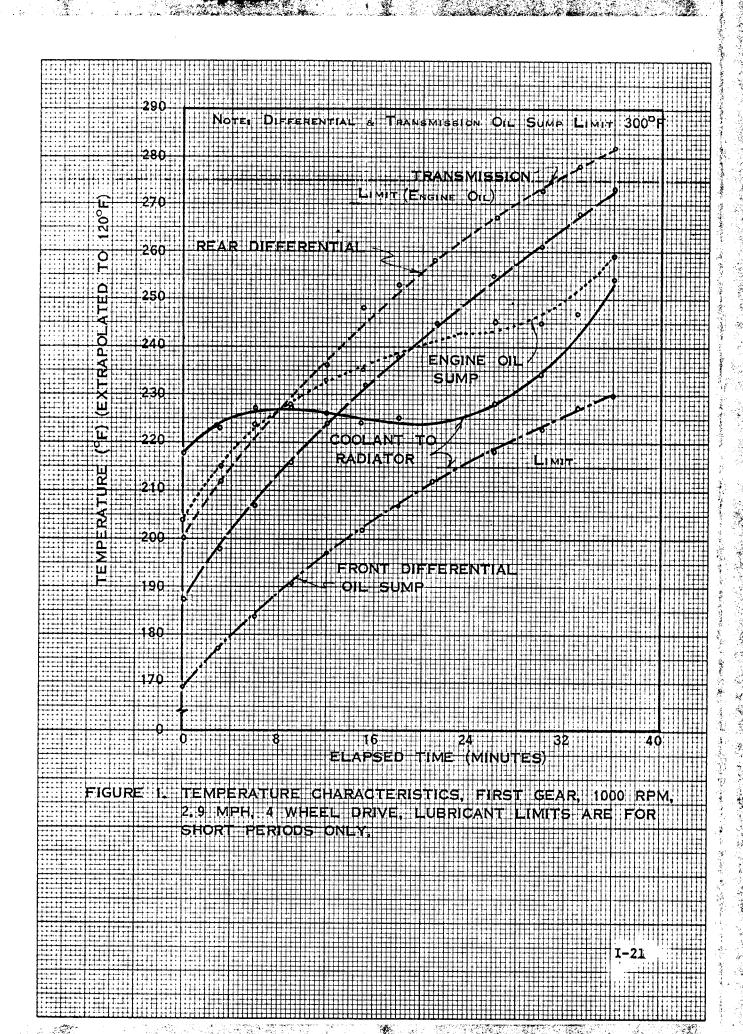
taken from a letter dated 24 October 1967 from AMXCC-FL (see Appendix V, References). They were Lubricant temperature limits for the various components are listed below.

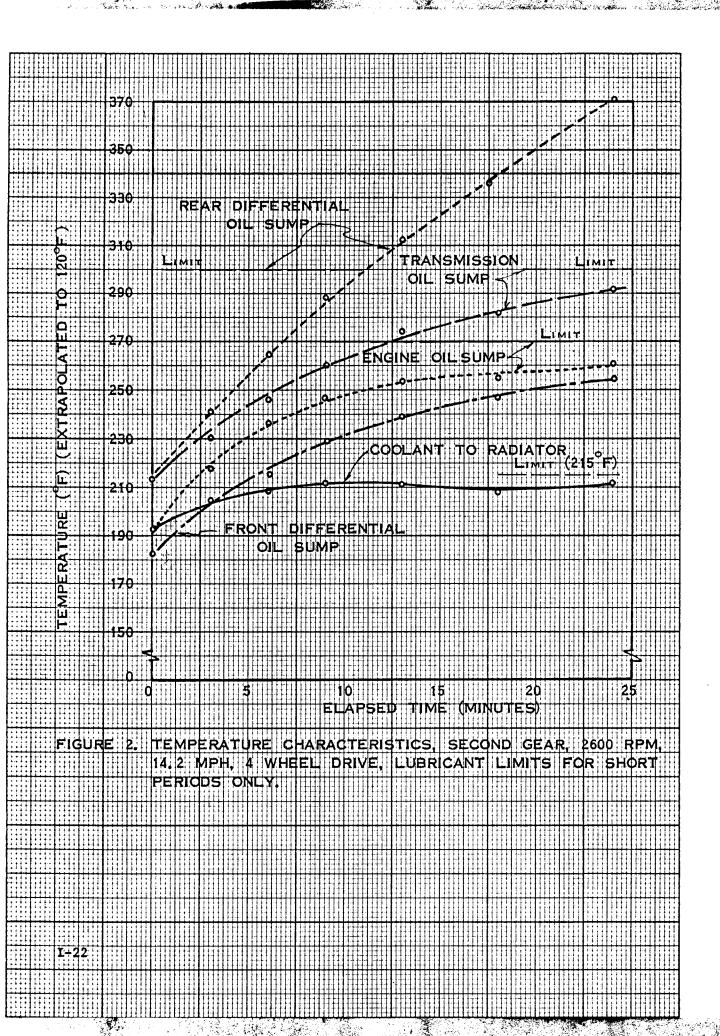
Short Period*

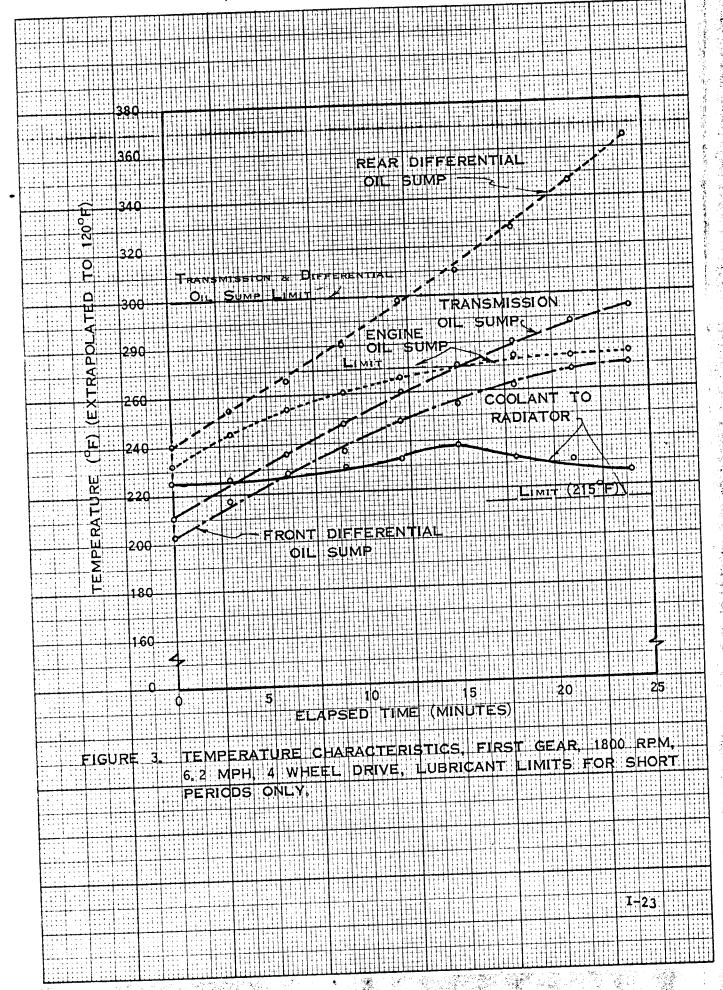
Sustained

270°		300
250°	215°	250°
	ш	d differentials
Engine oil	Radiator coolant	Transmission and differentials

*15 minutes or less.







APPENDIX 1.6. DUST TEST DATA

TABLE 1. Air Cleaner Restriction Data

TABLE 2. Dust Particle Size

Cumulative Operating Time (min)	Cumulative Miles	Restriction (in. H ₂ 0)	Particle Size (microns)*	Percent
0	0	4	Date: 1 July 19	
15	5.1	4-1/2		g No. 02DU8370 ken from in- cleaner, air
30	10.1	Broken gage		to engine.
45	15.8	Broken gage	78.0	4.1
60	21.0	8.0	62.0	4.8
75	25.3	8.5	49.0	5.2
90	30.8	9.0	39.0	3.3
105	36.1	9.5	31.0	3.5
120	41.2	10.0	25.0	3.9
135	46.4	10.5	20.0	3.5
150	51.7	11.0	16.0	3.3
165	55.8	12.0	12.0	2.9
180	59.7	14.0	10.0	5.8
195	63.9	17.0	8.0	3.3
210	68.0	20.5	6.0	2.8
225	72.0	24.5	5.0	3.9
After	72.0	4.0	4.0	7.3
servicir	ıg		3.0	11.8
			2.0	12.4
			1.7	8.7
			1.3	4.9
			1.0	3.5
			0.8	1.0
			0.7	$\frac{0.1}{100.0}$

*Particle diameter calculated; determined by Coulter Counter Model M.

APPENDIX I.7. RADIO INTERFERENCE DATA

Specification: MIL-E-55301

Test Area: 60 percent slope Test Equipment: AN/URM 85,

S/N 40

Radiation Test - DB*

.15 - 86 86 86 - 110 42 54 a 34 54 a 34	P a 54 a 40 44
.15 - 86 86 86 - 110 42 54 a 34 54 a 34	54 a 40 44
.15 - 80 - 00 - 00 - 00 - 00 - 00 - 00 - 0	40 44
.15 - 80 - 00 - 00 - 00 - 00 - 00 - 00 - 0	40 44
	44
335 - 86 80 60	
1.5 - 66 00 00	
3 64 66 817 60 60 814 8 66	52
5 60 60 63 59 60 81+ - 60 - 150 47 46 a 47	52
8 60 60 65 = 60 = 60	47
12 - 60 60 60 - 170 44 a 45 45	1
16 - 60 60 60 - 180 43 45 44 45	48 46
20 48 54 50 47 54 a 55 54 a 190 41 47 42 43	1
24 48 52 50 53 200 41 a 41 42	a
28 51 a 49 49 220 39 43 39	1 1
30 47 49 45 240 32 35 37	1 1
35 47 38 39 a 260 29 29 30	1 1
38 47 41 39 41 280 32 32 33	1 1
40 47 47 47 a 300 46 45 46	1 1
45 50 51 46 48 350 36 a 35 36	a
50 45 43 40 a 400 32 39 38 32	40
55 48 49 44 450 39 a 38 a 38	a
60 52 39 37 500 37 39 37 40 38	a
65 53 a 37 a 37 550 39 a 38 40 38	a
70 36 38 36 38 37 a 600 34 34 35	a
75 34 38 39 41 35 40 650 38 37 35	37
80 34 a 34 36 35 a 700 35 35 40 35	a
85 34 36 35 38 35 37 750 36 35 37 36	
90 35 a 35 42 35 a 800 36 34 36 35	
95 38 a 36 49 35 37 850 36 35 a 35	
100 40 54 48 37 54 49 35 54 a 900 35 35 37	a
950 40 39 38	40
1000 45 54 a 43 54 a 42	54 a

RECORD: A - Ambient noise level

P - Passing limit

a - Interference noise level at ambient

- - Ambient noise level to high

* Decibels above one microvolt per megacycle of bandwidth

NOTE: Vehicle USA Reg No. 02DU8170, 7 May 1970, mileage: 9410.0 Vehicle USA Reg No. 02DU8370, 6 May 1970, mileage: 9239.9 Vehicle USA Reg No. 02DU8670, 5 May 1970, mileage: 8523.9

Conduction Test - DB*

	_Vet	nicle	U81	Veh	icle	U83	Veh	icle	U86
Freq (mcs)	<u>A</u>	<u> P</u>	_ <u>a_</u>	<u>A</u>	<u>P</u>	<u>a</u>	<u>A</u>	_ <u>P</u> _	_ <u>a</u> _
.15	76	86	a	76	86	a	73	86	76
•35	73	86	a	76	86	а	- 79	86	a ·
1.5	57	83	72	63	83	75	78	83	а
3	59	83	· 70	65	83	74	75	83	а
5	50	80	70	65	80	72	· 76	80	а
8	51	80	67	63	80	a	- 77	80	a
12	55	- 74	61	61	74	64	73	74	a
16	61	74	a	64	74	a	64	74	а
20	61	74	8	52	74	а	52	74	а
24	48	74	55	40	74	46	40	74	46
28	35	74	55	30	74	51	35	74	40
30	31	74	50	20	74	46	29	74	34
35	25	74	51	20	74	46	32	74	35
38	25	74	53	20	74	42	32	74	38
40	31	74	33	36	74	39	34	74	40
45	33	· 74	a	39	74	а	35	74	39
50	30	74	38	30	74	33	30	74	32
55	26	74	28	30	74	а	30	74	32
60	26	74	a	25	74	а	26	74	а
65	26	74	a	25	74	a	26	74	а

APPENDIX 1.8. FINAL INSPECTION

_	V e hicle	Registration	No.
	02DU8170	02DU8370	02DU8670

SNL Group: 01, Engine

	Engine Speed (rpm)			
Oil pressure (psi) at:	Idle	38 (525	35 (650	36 (600
All oil pressures were		rpm)	rpm)	rpm)
taken at operating	1000	40	38	3 9
temperature. Specifi-	1500	41	39	41
cation is 35-45 psi at	2000	43	41	42
operating speed	3000	47	45	45
	4000	48	48	47
	Cylinder			
	No.			
Engine compression (psi)	1	125	120	135
Readings taken at cranking	2	125	115	140
speed of approximately 225	3	125	115	135
rpm. Specification is 135- 145 psi	4	120	120	130

Vehicle 02DU8170: Cylinder head pulled and intake valves removed to check for dust damage. Valves in good condition; cylinder walls in excellent condition. Traces of dust were observed in the combination chambers.

Two exhaust manifold fasteners were under-torqued 5 and 7 lb-ft, respectively.

Vehicle 02DU8370: All exhaust manifold fasteners were at 0 lb-ft torque.

Two intake manifold fasteners were under-torqued 5 and 7 lb-ft, respectively.

	Vehic	le Registration N	0.
	02DU8170	02D08370	02DU8670
	SNL Group: 02, C	lutch	
	Satisfactory	Satisfactory	Satisfactory
	SNL Group: 03, Fue	1 System	
	Satisfactory.	A hole was discovered at a spot weld in the air cleaner oil cup. Oil was leaking down into the bottom of the air cleaner canister. (See App III, Sec 2, Group 03)	There was excessive side play in the carburetor mixture adjustment crew. The rear tailpipe hanger bracket was broken.
		The tailpipe to muffler connection was loose. The rear tailpipe hanger bracket was bent and loose.	
	SNL Group: 05, Coo	ling System	
,	Satisfactory.	Satisfactory.	Satisfactory.
	SNL Group: 06, Elect	rical System	
eadlamp adjustment (in.)	Left Right	Left Right	Left Right
Specification is 0 inch left and 3 inches down.	4 L 2 L 10 D 10 D	2 R 0 L 10 D 10 D	1 R 1-1/2 R 9 D 9 D
40,000	L = left	R = right	D = down
	Right turn signal/stop- light bracket was broken:	The No. 1 and 3 sparkplug leads were replaced because of broken wire mesh insulations. Turn signal control would not move to the	The spring tension on the ignition points was only 10 ounces. They replaced. Specification is 18-20 ounces.
		left turn posi- tion smoothly.	

Headlamp adjustment

	Vehic	le Registration	No.
	02DU8170	02DU8370	02DU8670
	SNL Group: 07, Tr	ansmission	,
	Transmission was removed and disassembled. Rear output seal was worn and leaking, but overall, transmission appeared to be in very good condition.	Satisfactory.	Satisfactory.
	SNL Group: 08,	Transfer	
	Satisfactory.	Satisfactory.	Transfer rear seal was worn to the point of replacement.
SNL Group: 0	09. Propeller Shaft	and Universal Jo	int
	Satisfactory.	Satisfactory.	Satisfactory.
	SNL Group: 10, F	ront Axle	
	Both upper front suspen- sion ball joint boots were cracked.	Both upper front suspen-sion ball joint boots were cracked.	The upper right front suspension ball joint boot was cracked and and broken open.
	frame control ar	the front upper ms were badly wo to offset the we	rn. Arms were
Specifications for steering geometry are as follows:	Left Right	Left Right	Left Right
Caster, -1/2° to +1/2° Camber, 1/2° to 1-1/2° Swing arc, 31° maximum Toe-in, 1/32 to 5/32	-1 1/2° -1/2° 1-1/2° 3/4° 31° 31° 1/2 in. 1/2 in.	-1/2° +1/4° 0 -1/2° 32° 30° 5/8 in. 5/8 in.	-3/4° -2° -1 1/2° -1 3/4° 29-1/2° 28-1/2° 3/8 in. 3/8 in. I-29

02DU8370

Satisfactory.

02DU8670

Satisfactory.

SNL Group: 11, Rear Suspension

Rear differential was removed and disassembled. Right output bearing had several spalled rollers. Bearing and race were considered unserviceable. (See App III, Sec 2, Group 11).

Left and right control arm to body bracket bolts were at 20 and 35 lb-ft torques, respectively. Specification is 45-60 lb-ft.

SNL Group: 12, Brakes

Brakes pulled to the left during the preinspection road test but appeared to be satisfactory upon inspection.

Left rear brake line was not being retained by the outboard clip on the suspension arm.

The wheel cylinders were disassembled and and examined. The rear cylinders and pistons were in excellent condition. Front pistons were tarnished, and slight rust was observed in the forward bore of the right front cylinder. Piston skirts were rough and irregular. The front boots showed many small cuts, mostly at the point where the boot rolls over the piston skirt. Rear boots were in good condition.

Brakes pulled to the right during the preinspection road test but appeared to be satisfactory upon inspection.

The front wheel cylinders were torn down and inspected. The primary piston on the left side was found to be frozen as a result of dust and moisture contamination. All pistons and cylinders were similarly contaminated, but not frozen. The boots were cut in several places as a result of metal burrs on the piston skirts.

Brakes pulled slightly to the left during the pre-inspection road test but appeared to be satisfactory upon inspection.

Parking brake was is satisfactory condition, but out of adjustment attainable by the operators lever.

All pistons and cylinders showed dust and water contamination. The boots were cut in several places as a result of metal burrs on the piston skirts.

 USA Registration No.

 02DU8170
 02DU8370
 02DU8670

SNL Group: 13, Wheels, Hubs and Drums

Satisfactory.

Satisfactory.

Right front wheel was squeaking during the road test. The drive shaft seal was found to be very dry, but appeared to be in good condition. There was no shortage of grease, and the reason for the problem was not apparent.

SNL Group: 14, Steering and Controls

The steering gear assembly was seaping

lubricant.

SNL Group: 15, Frame and Brackets

Satisfactory.

Satisfactory.

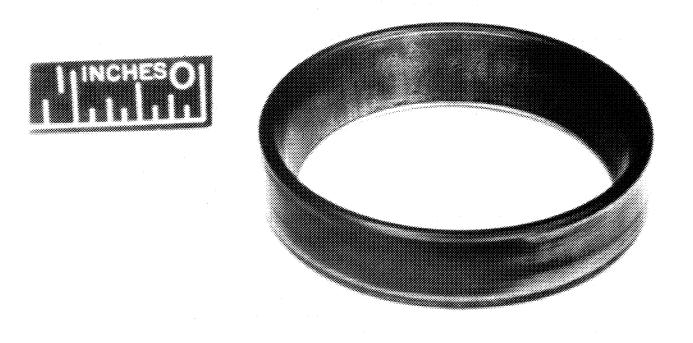
Satisfactory.

Satisfactory.

SNL Group: 16, Springs and Shock Absorbers

Left rear drive shaft and suspension spring showed they had experienced light contact. Satisfactory.

APPENDIX I.9. PHOTOGRAPHS



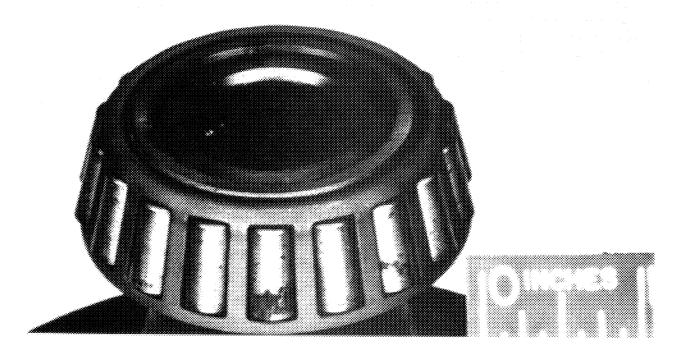


FIGURE 1. Spalled right output roller bearing and race (02008170).

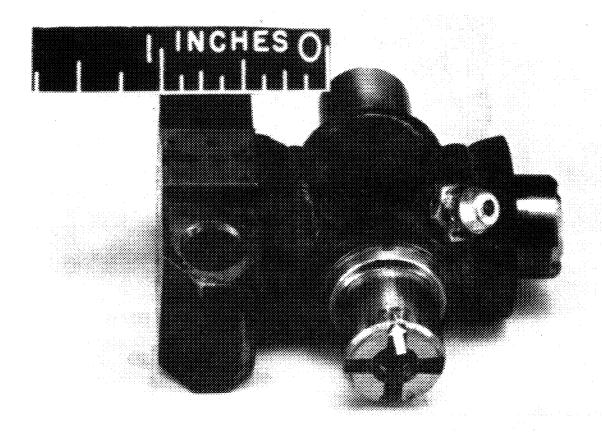
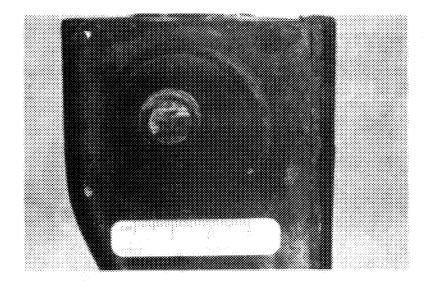




FIGURE 2. Railed rear yoke on propeller shaft (02008170).



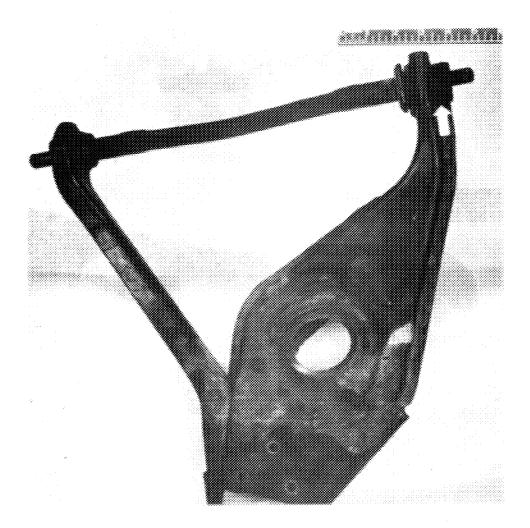


FIGURE 3. Failed A-frame control arm bushings (all vehicles).

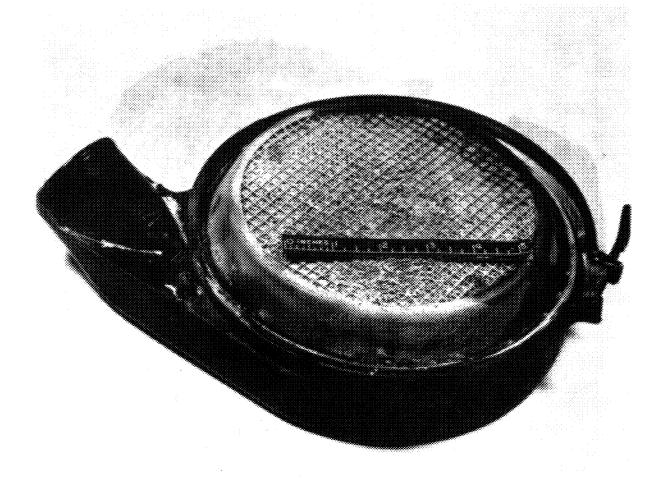


FIGURE 4. Air cleaner upper element after extreme dust operation (02DU8370).

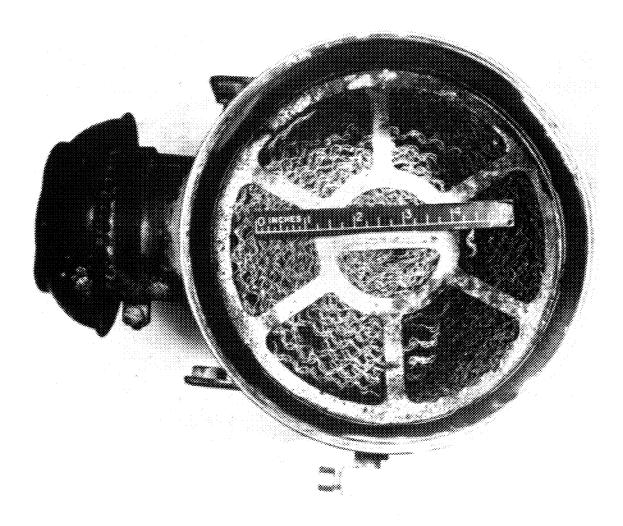


FIGURE 5. Air cleaner lower element after extreme dust operation (02008370).

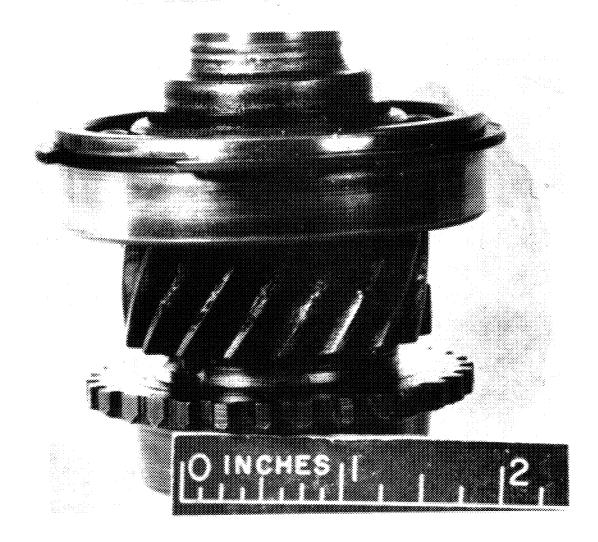


FIGURE 6. Chipped teeth on transmission input shaft helical gear after transmission overheated during full load cooling runs (02DU8670).



FIGURE 7. Sheared teeth on transfer input shaft helical gear after transmission overheated during full load cooling runs (O2DU8670).

JCP-I, DPG

APPENDIX I.10. SAMPLE QUESTIONNAIRE

M151	A2 Test Vehicle, USA Registration No.
M151	Al Comparison Vehicle USA Registration No. 02CL6169
	er's Name
Cour	se
	Test Vehicle Standard Both Vehicle Same
1.	Which vehicle has a more comfortable ride?
2.	Which vehicle steers the easiest?
3.	Which vehicle seems to lean more during turns?
4。	With which vehicle do you have the greatest stability and control during turns?
5.	With which vehicle do you have the greatest stability and control when braking?
6.	If you were required to travel this course as fast as possible, which vehicle would you choose?
	Why?
REMA	ARKS:

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APPENDIX I.11. LIST OF VEHICLE CHANGES

Truck, Utility, 1/4-Ton, 4x4, M151A2

- Modified independent rear suspension (trailing arm design)
- 2. Service brake wheel cylinders, front (3/4 inch to 1 inch diameter)
- 3. Mechanical fuel pump
- 4. Clutch cross shaft nylon bearings
- 5. Deep dish steering wheel
- 6. Steering linkage and suspension ball joint lube-for-life
- 7. Rag joint steering shaft
- 8. Spun steel crankshaft and water pump pulleys
- 9. Front cross member spacer-shims
- 10. Class "A" lights
- 11. Two speed electrical windshield wipers
- 12. Windshield washer
- 13. One piece windshield
- 14. Full view rear window
- 15. Inside rear view mirror
- 16. Rear lift points
- 17. Wheel studs, 1/2 inch
- 18. Scissors type jack, handle and wheel wrench
- 19. Side reflector, stick-on
- 20. Transmission-transfer case improvements
- 21. Differential improvements
- 22. Rear axle drive shaft improvements

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APPENDIX II. TEST FINDINGS

Item	Source (Para.)	Requirement	Met	Not Met	Subtest Paragraph	Remarks
	HIL-T-45331C					
1	3.3	<u>Materials</u> . The materials used shall be as specified in the applicable specifications and drawings.	x		2.2.5	
2	3.4	Construction. Vehicle, components, subassemblies, and assemblies shall be fabricated and assembled into a complete vehicle in accordance with drawings listed or referred to in the applicable Engineering Parts List and as supplemented herein. All parts, subassemblies, and assemblies shall be identified in accordance with MIL-STD-130.	X		2.2.5	
3	3.4.1	Engine. The engine shall conform to MIL-E-45332, except that the section covering preparation for delivery shall not apply. The vehicle shall meet all performance requirements specified herein with engine installed.		х	2.3.4.6	Failed radio interference suppression tests.
4	3.4.2	Soft top. The complete soft top furnished and installed in accordance with applicable drawings for the M151A2 shall provide the maximum protection for the personnel when vehicle is operating in adverse climatic conditions. The manufacturer shall provide at least the soft top and back panel for the M151A2.	x		2.2.4	The modified soft top with full view rear window was not provided for one vehicle.
5	3.5	Performance. Trucks shall conform to the performance requirements specified herein after a break-in rum of 2 miles (road). Vehicle shall be serviced as specified herein.	x			Vehicle performed satis- factorily during initial inspection.
6	3.5.1.1	Extreme climatic operation. The vehicle shall be capable of having the engine started and normal operation maintained, in still air having any ambient air temperature from minus 25 st to plus 120 st, without external aid, in altitudes from sea level to a 3000-foot elevation above sea level.		x	2.4.5	Engine coolant and oil, trans- mission, and rear differential overheat.
7	3.5.1.3	High temperature operation. The vehicle shall be capable of having the engine started and normal operation maintained, in still air having any ambient air temperature and altitudes specified in Table I, without external aids, and with a relative humidity as low as 5 percent. The vehicle fuel system shall function without exidence of vapor lock, and the engine coolant temperature shall remain below the boilin point. The engine coolant temperature limit specified at Paragraph 3.5.1.3 of MIL-T-4531C consider coolant boiling point with a pressurized system.		x	2.4.5	Engine coolant and oil, trans- mission, and rear differential overheated.
		Table I - Elevation Temperature Chart				
		Minimum Ambient Elevation Air Temperature				
		4000 feet 108°F 5000 feet 100°F 6000 feet 97°F 7000 feet 93°F 8000 feet 90°F				
8	3.5.2.2	Psyload. Truck payload shall include driver and personnel and shall be as specified in Table II.	x		2.2.4.4	
9	3.5.2.3	Towing load. Towed load performance requirements for the M151A2 shall be met when coupled to an M-416 tactical-type trailer, and shall be as specified in Table II.	х		2.2.4.4	
		Table II. Weights and Loads, Pounds				
		M151A2				
		Curb weight: 2400				
		Rated payload (including personnel): Highway 1200 Cross-country 800				
		Gross vehicle weight (GVW): Highway 3600				
		Cross-country 3200 Rated towed load: Highway 1300 Cross-country 1000				
10	3.5.3.1	The second secon	;		2.3.4.1	

Item	Source (Para.)	Requirement	Net	Not Met	Subtest Paragraph	Remarks
11	3.5.3.2	Orade speeds. The truck, including cross-country payload and with cross-country towed load, shall be capable of negotiating grades up to 6-1/2 percent at a speed of 30 mph when operated over a smooth, dry, hard-surfaced randway. Without towed load, truck, including cross-country payload, shall be capable of negotiating grades up to 60 percent at a speed of 2-1/2 mph when operated over a smooth, dry, hard-surfaced roadway.	X		2.3.4.3	
12	3.5.5	Slopes. The truck, including cross-country payload, shall be operated on side slopes, sloping right or left, up to 40 percent.	x		2.3.4.3	
13	3.5.7.2	Shellow water fording. The vehicle, without fording equipment and with rated cross-country payload and towed load, shall ford a hard-bottomed, relatively level crossing in fresh or sait water to a depth of at least 21 inches. The vehicle without fording equipment, or modification, shall meet all requirements of 3.5.7.1, except the depth shall be 21 inches.	х		2.3.4.5	
14	3.5.8.1	Service brakes. Service brakes shall stop the vehicle within 30 feet from a speed of 20 mph, on dry, hard, relatively level, smooth road, free from loose material. Service brakes shall control and hold the vehicle on an incline of 60 percent.	x		2.3.4.2	
15	3.5.8.2	<u>Parking brake</u> . The parking brake shall hold the vehicle on a dry, concrete incline of 40 percent with highway payload; and on a dry, concrete incline of 60 percent with cross-country payload.	х		2.3.4.2	
16	3.5.9	Maneuverability. The vehicle shall demonstrate a maximum turning radius of 18.5 feet, measured from the center line of the outside front wheel, when negotiating full turns to right and left.	x			See results in Paragraph 2.3.4.4.
17	3.8	Radio interference suppression. Each vehicle shall be radio suppressed in accordance with the tactical vehicle requirements of MIL-E-55301.		x	2.3.4.6 2.3.5	Failed the radiation phase in the low frequency range.
18	3.9.2	Marking. Registration numbers and other markings shall be applied in accordance with MIL-STD-642. Color shall be lusterless white enamel, matching color chip 37875 of FEDERAL STD No. 595. Data plates and part number marking shall be in accordance with MIL-STD-130.	x			
19	3.10	Workmanship. The workmanship shall produce vehicles free from fabrication defects which would affect the appearance, functioning, or operating life of the vehicle or any of its components. All seals and gaskets shall be so installed and retained that fluid seepage is minimized, and so that exhaust gases are prevented from escaping. All welds, rivets, bolts, nuts or other fasteners shall be torqued as indicated on drawings, or where not specifically detailed on drawings, to the extent consistent with their respective application in commercical vehicles of similar construction.		х	2.2.4	A male connector was not in- stalled on the No. 21 wire in the stoplight/taillight as- sembly of one vehicle (see App III, Sec 2, Group 06). The toe-in and headlight alignment did not meet speci- fication requirements on all vehicles.
20	4.2.2	Examination of vehicle. After a 2-mile break-in, (road test) each completed vehicle of each model shall be operated for a distance of not less than 5 miles, at the place of manufacturer, by the contractor and subjected to visual and dimensional inspection of characteristics listed in Table IV (including exhaust leaks) for conformance to applicable drawings and this specification. Vehicle shall be driven in reverse gear a minimum of 50 feet. Vehicle shall meet all performance requirements specified without malfunction.	х			
21	4.2.3.1	Test failure. Failure of either test vehicle to comply with any of the requirements specified or any deficiency of workmanship of materials nature during or as a result of the 20,000—sile test, shall be cause for rejection of the vehicle Further, the Government may refuse to continue acceptance of production vehicles until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during or as a result of 20,000—mile test shall be prima facie evidence that all vehicles already accepted prior to completion of the 20,000—mile test are similarly deficient unless evidence satisfactor to the Government is furnished by the contractor that they are not similarly deficient. Such deficiencies on all vehicles shall be corrected by the contractor at no cost to the Government regardless of location.		x	App III, Sec I	Propeller shaft failure and extensive brake problems were classified as deficiencies.
22	5.1	Vehicle processing. Vehicle and equipment shall be processed for shipment and storage in accordance with MIL-STD-281 to the extent indicated on the applicable vehicle preservation data sheet or other implementation document, as specified by the procuring activity.		x	App I.1, Receiving Inspection	Batteries were connected on two vehicles. One battery was discharged because the ignition switch had been left on.
H	IL-A-13488A (Or				•	
23	3.3.2	Servicing, design and contruction of the air cleaner shall permit quick and convenient disassembly for cleaning and servicing of the oil cup and filter element without removing or disturbing the clean air chamber or its connections to the engine and without the use of special tools.	;	х	2.5.4.2 2.5.5	Entire air cleaner had to be removed for cleaning after extreme dust testing.
24	3.4.1	Resistance to air leakage. The air cleaner shall not leak air when properly assembled and tested to a vacuum of 50 inches of water.	х		2.5.4.2	
11-2						

There were several scratches on the rear third of the pro-

peller shaft. However, they were rusted and evidently occurred well before the failure. A check showed the rear differential to be properly positioned and all fasteners to be

1. Deficiencies

Group 09: Propeller Shaft and U-Joints

1. The rear yoke on the propeller shaft of USI broke away
from the U-joint assembly at 17,170 test miles. One side
broke off completely and the other showed a small crack.

All vehicles exhibited extensive brake grabbing in the front brakes beginning between 12,000 and 15,000 test miles. In most cases the vehicles would pull to the left

Group 12: Brakes

None.

Investigation after the final inspection revealed that the rubber boots, which roll back over the wheel cylinder piston skirts, were being cut by burrs on the skirts. This led to dust and moisture contamination of the cylinders, causing the uneven application.

Shortcomings*

None

or right.

Fuel was leaking past the fuel tank filler cap. The filler cap gasket was observed to be cracked in several

2. A hole was discovered at a spot weld in the air cleaner oil cup on U83 at 21,048 miles. Oil was leaking through the hole into the bottom of the air cleaner canister.

None.

- An excessive length hose from the radiator to the engine water manifold was being chaffed by the rubber fuel line coming out of the fuel pump. Occurred on U83 at 2001 miles.
- A pin hole leak was found in the lower left corner of the radiator on vehicle U83 at 16,279 test miles.
- The radiator grille is insufficiently supported causing the headlamps on all three vehicles to be out of adjustment on receipt and again after 3300 test miles. U86 headlamps were also misaligned at 18,640 test miles.
- A male connector had never been installed on the No 21 wire in the stoplight/taillight assembly.
- 7. The radio interference suppression wire mesh insulation, which is a part of the electrical lead and conduit assembly from the distributor to the spark plug, was found to be broken. The problem occurred on U86, No. 1 lead at 3550 test miles, U86, No. 3 lead at 5998 test miles; U81, No. 4 lead at 17170 test miles; and U83, No. 1 and No. 3 lead at 21048 test miles.
- 8. The ignition coil assembly failed at 6012 miles on U83 causing the engine to surge and misfire. A similar prob-lem occurred on U81 at 12,934 test miles.

9. The turn signal assembly is not reliable. The directional turn signal control was sticking in the left turn position, and would not easily return to neutral. Problem occurred on U86 at 12,084 miles and on U83 at 21.048 test miles.

The brake lights would not operate on U86 at 14,936 test miles due to a faulty service brake circuit in the turn signal control assembly.

At 17,836 test miles the turn signal lamps on U83 would not operate when the turn signal control was activated.

10. The ignition points broke on engine in U86 causing misfiring at speeds above 55 mph at 13,452 test miles.

An ignition coil problem on U81 caused the engine to stop when idling. Problem occurred at 19,004 test miles.

Implement manufacturing process to eliminate burrs on wheel cylinder piston skirts.

> 2. Shortcomings Group 01: Engine Group 02: Clutch

Group 03: Fuel System

mprove welding and inspection techniques.

Group 04: Exhaust System

Group 05: Cooling System Radiator hose should be shortened or quality control improved.

Group 06: Electrical System

Install upper supports for the grille.

Improve quality control

during assembly. Provide better support for the leads, or design a more durable wire mesh insulation.

More positive fastening de

vice for the coil, and coil lead, retainer should be provided.

None

None None

It appeared that the gasket was being distorted when the cap was tightened. U86 - 8475 test miles and U81 - 17,158 test miles.

Since only about 1/3 of the oil was lost, this problem is not classified as a deficiency. The loss, however, would definitely affect the air cleaner's effectiveness. It had been tested for 4391 miles.

A repair was not successful and the radiator was replaced at 17,836 miles.

Alignment problems are due to the lack of support of the radiator grille, into which the lamps are mounted.

Shortly after break-in operation had been initiated, the left taillight was observed to be inoperative.

The failures appear to be due to fatigue of the wire mesh, caused by vibration.

The ignition coil retaining tabs had broken off on U83, and one of the retaining acrews was missing. This allowed the coil to bounce. The right side coil retaining screw was missing on U81 and the negative lead retainer and retainer screw had come unfastened. The negative lead retainer screw was bouncing on the breaker plate, periodically shorting out the ignition circuit.

None.

The assembly had been replaced previously. This one had operated for 2852 test miles when it failed.

The control was found to have open circuits to the left and right turn signal lamps. The control assembly was replaced.

The moveable arm side of the ignition points was found to be broken. A small mark was noted on that arm as if a screw-driver had been used to push the arm into alignment. Such action would account for breakage in a plane opposite that in which the points operate.

The coil was extremely hot after a short period of operation. Replacement solved the problem.

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*All test miles indicated are incorrect for odometer error. Actual mileages are 6 to 8 percent less then shown.

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Shortcomings	Suggested Corrective Action	Remarks
12. The low beam on the right headlamp of U83 was burned out at 17, 836 test miles.	None	A new unit was installed.
13. At 17,836 test miles the center boss in the bakelite distributor cap on wehicle U83 was found to have a minute crack. The crack had not developed to the point of affecting performance.	None	It is possible that the crack resulted from stresses set up by the screws which hold the bakelite cap to the external metal cover.
	Group 07: Transmission	
14. At 11,935 test miles a small ball bearing was found attached to the transmission drain plug of vehicle U83.	None	The transmission functioned perfectly both before and after discovery of the ball. It is conceivable that it might have been an extra ball left in the transmission during production.
	Group 08: Transfer	
None		
Group	09: Propeller Shaft and Univer	sal Joint
None		
	Group 10: Front Axle	
15. All three vehicles had excessive toe-in $(19/32 \text{ inch to } 3/4 \text{ inch)}$ upon receipt.	Improve quality control during vehicle assembly.	All were adjusted to the 1/8-inch specification.
16. The front differential right output seal on vehicle U86 was leaking at 6518 test miles.	Improve quality control during vehicle assembly.	The seal was a press fit, evidently sealed with a Permatex type sealant. The sealant had been applied to only 50 percent of the contact surface, and leakage was occurring around this nonsealed portion of the casing, rather than past the seal.
17. The front differential right output seal was worn to the point of replacement on vehicle U83 at 11,935 test miles. The left front output seal was similarly replaced on vehicle U81 at 19,004 test miles.	Improve quality of the seal or redesign the differential to result in lower temperatures.	The 11,935 test miles is an abnormally short seal life. Minor leakage was also observed at most differential output seals throughout the durability testing.
	Group 11: Rear Axle	
18. During final inspection on vehicle U81, the right output roller bearing in the rear differential was observed to have several spalled rollers. The bearing race was correspondingly worn from the spalled pieces.	None	Fatigue pattern on each roller was similar. Spalling began approximately two thirds of the distance toward the wide end of the bearing, and progressed toward that end. Both the bearing and the race were considered unserviceable and were replaced.
	Group 12: Brakes	
19. During unscheduled maintenance on vehicle U81 at 5196 test miles, grease was found on both right front brake shoes.	Improve quality control during vehicle assembly.	No damage was noted to the hub seal, so problem was evidently caused by careless original installation. The shoes were cleaned and reinstalled.
	Group 13: Wheels and Suspensi	on
20. Thirteen tire inner tubes failed during the test due to separation at the seam.	Improve quality control manufacture.	Tube reliability is 3149 miles between failures at 95 percent confidence limit.
21. During all durability operation, U86 seemed to give a rougher ride and bottom out more frequently than the other vehicles.	None	At 13,950 test miles the front springs were removed and the free length measured. Both were 1/4 inch below the 11.0-inch specification. They were replaced, and the ride seemed to be improved.
22. The bushings in the front upper and lower A-frame control arms were observed to be badly worn on all vehicles.	Improve bushing design or quality.	The problem was first noticed on U81 at 17,836 test miles. A check of the other vehicles at the time revealed the similar wear. New sets of arms were installed on U81 and U83, but the set on U83 had a repeated failure after only 200 miles, and were replaced. The arms on U86 were never replaced, but were shimmed instead to try to reach the camber specification. At the end of test each vehicle had 5/8 inch to 3/4 inch of shim for the front control arms. The reason for bushing failure has not been resolved.
Group	14 and 15: Controls, Frame and	l Brackets
None		

Group 16: Springs and Shock Absorbers

23.	Lasking shock a	bsorbers were re	eplaced as follows:	Improve seals to prevent leakage.	performance.
	Vehicle	Mileage	Location		

Vehicle	Mileage	Location
U81	5,120	RF
U86	14,800	LF
U81	19,204	RR and LR
U83	19,679	RR
U86	20,097	RR

III-2

Shortcomings Suggested Corrective Action Group 18: Hull, Body and Cab Group 22: Miscellaneous Accessories 24. The windshield washer pump fell apart on wehicle U81 at 7524 test miles. The pump handle pivot pin evidently worked loose, allowing the handle and plunger to fall out. A new assembly was installed. Group 31: On Equipment Material Provide torque values in TM's. The lifting eye torque is particularly critical since leakage into the hub during fording can occur if the torque is insufficient. 25. A torque specification for the wheel lifting eye and self-locking nut could not be located in the TM's. Group 47: Instruments The specified durability mileage (20,000) was not completed by 1200 to 1600 miles. The QMR should be revised to indicate allowable error (suggest ± 2 percent). 26. The odometers of all vehicles were found to be reading Change odometer drive gear to higher mileage than actual by 6 to 8 percent. 3. Corrected Shortcomings Corrected Shortcomings Discovered during the 6000-mile maintanance, the junction between the upper and lower sections of the air cleaner was sealed with tape to prevent further dust ingestion until the manufacturer could remedy the problem. New air cleaners were installed between 16,500 and 18,500 miles, and no further leakage was observed. 27. A mismatch of air cleaner components allowed dust to leak past the air cleaner seals thereby bypassing the filtering systems (all three vehicles). The contractor found that The contractor found that upper and lower sections were being matched by the vendor, but the match was not retained during vehicle assembly. Procedures were changed to the matched sections during the con-tractor's assembly.

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APPENDIX IV. MAINTENANCE EVALUATION

Chart 1A

							Chart	IA												
MAINTENANCE EVALUATION	EVALUA	TION	PROJE	PROJECT NO.		Ž	OMENC	NOMENCLATURE	1	Truck, Utility	Jei 11t	, Y.		DENTI	IDENTIFICATION	×				
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	inspection													
12	Brake adjustment			15182.5		2.6	0			2.6				
16	Right front shock absorber bracket	acket		16267.4		3.8	0			2.8	1.0			
	incorrectly installed													
03	Repair fuel leak and			16694		1.0	0			1.0				#
16	Tighten shock													
60	Repair U-joint			17156.7		51.3	0		1.0	50.3				
	18,000-mile maintenance	-4		18219		14.4	0			14.4				
ļ	Ignition, shocks and differential	tial		19203.4		7.4	0			7.4				
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	oil and thoroughly inspected	ט												
	vehicle for damage.													
03	Adjust carburetor and repaired	d fuel		20141		18.7	0			18.7				
	leak													
1	Performed final technical ins	inspection	}	21058	32.5	16.2	0			207.5			32.5	
					68.1	133.2	1	0	1.0	304.7	9.9	0	62.5	
SI	STEYP-TE Form 70, 8 Apr 70 (Rev).	Edition o	of 11 Dec	69 is	obsolete		(ST	(STEYP-TAU	AU SOP		2-06-07)			

IV-2

MAINTENANCE ANALYSIS CHART

STEYP-TE FORM 120

INSTRUCTION SHEET

COLUM:	
1	The sequence number of the Maintenance Operation.
2	Functional group number as indicated in the Maintenance Allocation Chart of the assembly or subassembly.
3	Component and related operation as indicated in the Maintenance Allocation Chart. Operation assigned to depot level maintenance are not normally shown.
4	Maintenance Level, <u>Prescribed</u> . By the Maintenance Allocation Chart is indicated by using the appropriate letter code.
5	Maintenance Level, Recommended. Use the appropriate letter code to indicate the level of maintenance recommended by the test agency.
ó	TM Instructions, Adequate. Place an X in this column to indicate that TM instructions covering this maintenance task are adequate.
.7	TM Instructions, Inadequate. When TM instructions are considered inadequate, insert test agency EPR number which transmitted the DA Form 2028.
8 - 9	Active Maintenance Time. Man-hours and Clock hours required for the maintenance operation to the nearest tenth of an hour. If the operation was not actually performed but was reviewed, the estimated active maintenance time is indicated by using the prefix E. (Unusual differences in the maintenance times for the same operation should be explained in the body of the test report.)
10	System Life. The number of operational hours, (essential) and miles, rounds, events, etc., as required in the test plan, accumulated during the test prior to the occurrence of the malfunction or scheduled service. (Under the life figure enter in parenthesis, the sequence number for which that particular operation was last performed.) "S" will be placed in this column if the operation was performed on a sampling basis and not because of an actual maintenance action.

COLUMN

- Reason Performed, Scheduled. An X in this column indicates that the operation was performed and recorded as a required portion of a scheduled maintenance service.
- Reason Performed, Unscheduled. An X in this column indicates that this operation was performed as a result of unscheduled maintenance. NOTE: If the operation was performed only to verify procedures or tool requirements, not to correct a malfunction, the symbol "SIM" will be used for simulated and record on separate Maintenance Analysis Chart.
- EPR No. Remarks. Enter EPR Number, if applicable. When operation is performed as result of a failure, as defined in USATECOM Reg 750-15, the notation (MCF) Mission Critical Failure will be inserted in this column. Enter other appropriate remarks to further explain operation.

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7-5		SIETY-IE FO	Form 120, 11 Dec 69 ((Rev).	Previous		edition	is obsc	obsolete.						
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IDENTHICATION NO.		NOTE:.	MCF - MISSION CRITICAL	FAILURE	EPR No REMARKS		During 6000-mile	maintenance	During 6000-mile	maintenance, L5-22			Serviced		Adjusted		Replaced right front				Replaced EPR L5-27		Replaced EPR L5-27		Repaired			·	Replaced EPR L5-30		Cleaned and adjusted		Replaced			- 1	Keplaced EPK L5-33			
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URE	Utility,		SALIAN TANAMAN	TIME	MAN- HOURS	1	0.3	4	0.3		1.0		0.4	1 man	0.7	2 men	0.9	2 men	1.0	1 man	1.0	1 man	1.0	1 man	0.5	1 man	6.0	1 man	0	I man	1.5	1 man	0.0	1 0 1	1 202	ין ק	٦.	I man		obsolete.
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- 1	02DU8170	NOTE:	MCF - MISSION CRITICAL FAILURE		EPR No. " REMARKS	13	Transmoston	1.5-62	20-02	L5-58 lower 1-2 men			Out of alignment		1-2 men				15-72	L5-70	L5-71, front differ-	al. 1-2						LJ-69, broken	Instrument namel	TOUGH AUGUST	1-2 men, by installing	ms			•			
	¥		REASON	RMED	UNSCD	12	×	×	4	×	×		X						×	×	×		×	×		X	\	4	×		×		×	×				
	M151A2		REA	PERFORMED	SCD	\top									X		×																	1			1	
	1/4-Ton, 4x4,	SYSTEM	M - MILES	HOURS	GUNDOW H	10	17156.7	17156.7		17156.7	17170		17446		18219		18989.8		19203.4	19203.4	19203.4		19420.3	19420.3		19520.4	10000	1222000	20083.2		20141		20141	20407.0				
			NANCE	E	CLOCK	6	0.5	0.2		1.7	0.5		4.0		5.6		8.0	,	2.5	1.0	1.4		0.5	9.0		8.0	7	;	0.2		2.0		0.3	1.0				79.0
oludes Ver	Utility,		MAINTENANCE		MAN- HOURS		0.5	0.2		3.3	0.5		4.0		9.6		8.0	,	2.5	2.0	2.4		0.5	9.0		8.0	7 0	;	0.2		4.0	1	0.3	1.0		+		1108.917
Charr 18 (Concluded)	Truck, U		ANUAL	_	NADQT	7																				1						+	+	+	1	+	+	7
NON			TECH M	INSTRUCTIONS	ADGT	9	X	X		×	×		×		×		×	;	×	×	×		×	×		×	×		×		X		×	×	+		+	
	1-034	MAINTENANCE LEVEL	ORG CREW	ERAL	RECM	5	0	0		0	0		0	1	0	,	ی	-	2	0	0		0	0	,	5	0		0		0	,	0)	0	+	+	1
NO.	1-VG-120-151-0	MAINTEN/ LEVEL			PRESB	4	0	0		0	0		0	,	9	,	اد	6	5,	0	0		ပ		-	>	0		0		0	+		> (0	+	+	
PROJECT				ON.	OPERATIONS		and flange	ller			y air		Wer	:	-mile		ure +		d points	shocks	output		h spare	ith new		replace	Spark		candes-				700	edn rec				
AMA! VOICE	CHART			COMPONENT	RELATED OPERA	က	1	Replaced fuel filler	gasket	- 1	aced assembly	cleaner			reriormed 18,000-mile	maintenance	Terrormed 1000-mile	arion	C011	rear	Seal	5	Replaced Hat with spare	S	and tube	rane and	ed No. 4		Replaced lamp incandes-		ted camber	* fire1 1001			rmed rinal	inspection		0, 11
MAINTENIANOE	S A S		•		Ř		Rep1	Repl	ga	Replaced	Keplaced	13	Kepl	00	rerr	na L		Porland	nept.	Replaced	кертасед	-	Kepik	Keplaced	Donoir	tire	Repla	plu	Repla	cent	Adjusted	Ponot	F1 at	Darfa	rerrormed	105	TOTAL	130
AINITE				×	°ON	2	_	03			63	1;						90	ot	dç	\perp	13	2 ;		13	2	90		90		13	03	13	} ;				CTPVD-TP D
L_	V-8			SEQ	o Z	-	41A	41B		410	747	!	4	**	*	1	1	77		444	400	1.7	֓֞֝֓֞֝֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	4/A	87		65		20		71	5.1 A	52	53.	3			

PARTS ANALYSIS CHART

STEYP-TE FORM 121

INSTRUCTION SHEET

GENERAL: This chart is a list of parts which were used in maintaining the test item. Parts will be grouped in this chart by functional groups and in Federal Stock Number (FSN) numerical order within each group.

COLUNN

- 1-2 Sequence Number and Group Number. Parts usage by maintenance operation is indicated by a cross reference to the sequence and group number from column 1-2 of the Maintenance Analysis Chart.
 - 3 Federal Stock Number. Record the Federal Stock Number, techmical service part number, manufacturers part number, or arawing number in this order of preference.
 - 4 Quantity. The number of identical parts used.
 - Noun Nomenclature. As listed in the parts manual.
 - Maintenance Level, Prescribed. The level prescribed by the parts list under review. Use letter code to indicate.
 - Maintenance Level, Recommended. Use appropriate letter code to indicate the maintenance level recommended by the test agency.
- Part Life. The number of operating hours (essential) and miles, rounds, events, etc. As required by the test plan, accumulated on this part. This is actual part life and should agree with part life reported on the EPR. Each entry in this column is followed by the appropriate life unit letter code.
- Reason Used, Scheduled. If the part was replaced as a required action of scheduled maintenance, an X will be placed in the sched column. NOTE: (1) If the part was used to satisfy a "Time Change Component" schedule the symbol "TCC" will be used in this column. (2) If the part was consumed to verify procedures or tools, not to correct a malfunction, the symbol "SIM" will be used.
- Reason Used, Unscheduled. An X in this column indicates that this part was used as a result of unscheduled maintenance.
- EPR No. Remarks. Enter EPR Number if applicable. When part was replaced to correct a failure, as defined in USATECOM Reg 750-15, it will be indicated by inserting the word "Failure."

RTS ANALYSIS CHART 1-VG-120-151-034 MISIA2, TRUCK, Utility MAINTERANCE MAINT				PROJECT	CN	BALLY CONTROL	30				DENTIFICATION
Checked Stock No. Checked Ch	PA			1-V	20-151-034	151A2, T	ķ,	tility			02DU8170
Color Federal Stock No. Color Color					•	MAINT C LE	ENANCE VEL P CREW RG	PART LIFE		,	
13 10 10 10 10 10 10 10	C L	0	- 40 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			1 1	FRECT		BEASON	I USED	•
2 3 4 5 6 7 8 9 10 06 5240-044-6914 2 Bulb, incandescent 0 0 2027.0 X Replaced 16 2540-678-2996 1 Nheel, right rear 0 0 5120.0 X Replaced 16 2540-678-2996 1 Shock absorber 0 0 5120.0 X Replaced 13 2610-269-7332 1 Inmer tube 0 0 2520.0 X Replaced 13 2610-269-7332 1 Inmer tube 0 0 9562.7 X Replaced 22 13 2610-269-732 1 Inmer tube 0 0 9562.7 X Replaced 23 2610-269-732 1 Inmer tube 0 0 978.0 X Replaced 24 1 Inmer tube 0 0 978.0 X Replaced 25 1 <	NO.	NO.	OR PART NO.	ΩŢ	NOMENCLA	PRESB	RECM		sco	UNSCD	
06 6240-044-6914 2 Bulb, incandescent 0 0 2027.0 X Replaced 13 2340-678-2996 1 Wheel, right rear 0 0 5120.6 X 15-20 16 2240-678-2996 1 Shock, absorber 0 0 7524.0 X 15-20 13 2610-269-733 1 Inner tube 0 0 863.3 X 15-27 13 2610-269-733 1 Inner tube 0 0 952.7 X 15-27 13 2610-269-733 1 Inner tube 0 0 952.7 X 15-27 13 2610-269-735 1 Inner tube 0 0 952.7 X Replaced 22 Inknewn 1 1 1 240-155-874 X Replaced 13 2610-269-753 1 Inner tube 0 0 1823.5 X Replaced 13 2610-269-753	H	2	3	4	2	9	7	∞	6	10	
13 Model, right rear 0 400.0 X Replaced 06 2520-843-1717 1 Khock, absorber 0 0 5120.6 X 15-20 18 2520-843-1717 1 Lead, spark plug 0 0 7524.0 X 15-20 13 2610-269-7532 1 Inner tube 0 0 38163.0 X 15-27 13 2610-269-7532 1 Inner tube 0 0 9562.7 X 15-27 13 2610-269-7532 1 Inner tube 0 0 9562.7 X Replaced 22 260-064-6914 1 Lamp, incandescent 0 0 9562.7 X Replaced 22 Unknown 1 Ling tube 0 0 9562.7 X Replaced 13 2610-269-753-2 1 Inner tube 0 0 11823.5 X Replaced 13 2610-269-753-2 1 Inner tube 0 0 12949 X Replaced <	44	90	6240-044-6914	2	1 1	0	0	2027.0		X	Replaced
16 2240-678-2996 1 Shock, absorber 0 0 5120.6 0 1,20.0 12 2240-678-2996 1 Shock, absorber 0 0 0 5000.1 X 15-22 13 2540-263-2996 1 Shock absorber 0 0 0 8163.0 X 15-27 13 2540-269-7332 1 Inner tube 0 0 0 8163.0 X 15-27 13 2540-269-7332 1 Inner tube 0 0 0 8163.0 X 15-27 13 2540-269-7332 1 Inner tube 0 0 0 9562.7 X Replaced 14 2540-155-8714 1 Lamp, incandescent 0 0 9562.7 X Replaced 15 2540-269-7532 1 Inner tube 0 0 11823.5 X Replaced 13 2540-155-8714 1 Lamp, incandescent 0 0 11823.5 X Replaced 14 2540-269-7532 1 Inner tube 0 0 11823.5 X Replaced 15 2540-269-7532 1 Inner tube 0 0 12949 X Replaced 16 2520-752-4288 4 Shark plue 0 0 12949 X Replaced 17 2540-269-7532 1 Inner tube 0 0 12949 X Replaced 18 2540-269-7532 1 Inner tube 0 0 12949 X Replaced 19 2540-269-7532 1 Inner tube 0 0 13919 X Replaced 10 2520-752-4288 1 Inner tube 0 0 13919 X Replaced 18 2540-269-7532 1 Inner tube 0 0 13919 X Replaced 19 2540-269-7532 1 Inner tube 0 0 13919 X Replaced 10 2520-678-1315 1 Inner tube 0 0 13919 X Replaced 10 2520-678-1164 1 Seal output, trans- 0 0 17156.7 X 15-53, in 17 2540-930-4113 1 Fange, transmission 0 0 17156.7 X 15-58, in 18 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X 15-58, in 19 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X 15-58, in 19 2530-678-4533 1 Arm, lower suspension 0 0 17156.7 X 15-58, in 19 2530-678-4533 1 Arm, lower suspension 0 0 17156.7 X 15-58, in 19 2530-678-4533 1 Arm, lower suspension 0 0 17156.7 X 15-58, in 19 2530-678-4533 1 Arm, lower suspension 0 0	8	13		1	4			4000.0		X	Replaced (bent)
06 2920-643-1717 1 Lead, spark plug 0 0 56000.1 X 15-27 16 2540-678-2936 1 Inner tube 0 0 7524.0 X 15-27 13 2610-269-7332 1 Inner tube 0 0 8163.0 X 15-27 13 2610-269-7332 1 Inner tube 0 0 9562.7 X Replaced 13 6240-155-8714 1 Lamp, incardescent 0 0 9562.7 X Replaced 13 2610-678-1362 1 Tire, pneumatic 0 0 9978.6 X Replaced 13 2610-678-1362 1 Tire, pneumatic 0 0 11823.5 X Replaced 13 2610-269-7532 1 Tire, pneumatic 0 0 12001 X Replaced 13 2610-269-7532 1 Tire, pneumatic 0 0 12049 X Replaced	11	16	2540-678-2996	1	1 1	0	0	5120.6		X	
16 2540-2692-2996 1 Shock absorber 0 0 0 0 0 0 0 0 0 1 13 2610-2692-732 1 Inner tube 0 0 0 0 0 0 0 0 0 13 2610-2692-732 1 Inner tube 0 0 0 0 0 0 0 0 0 13 2610-2692-732 1 Inner tube 0 0 0 0 0 0 0 0 0 13 2620-155-8714 1 Lamp, incandescent 0 0 0 0 0 0 0 0 22 Unknown 1 Windshield washer 0 0 0 0 0 0 0 0 3 2610-2692-7532 1 Inner tube 0 0 0 0 0 0 3 2610-2692-7532 1 Inner tube 0 0 0 0 0 3 2610-2692-7532 1 Inner tube 0 0 0 0 0 4 2920-752-4258 4 Spark plug 0 0 0 12949 X Replaced 5 2920-664-987 1 Entition point kit 0 0 0 12949 X Replaced 6 2920-752-4258 4 Spark plug 0 0 0 12949 X Replaced 7 2610-664-987 1 Inner tube 0 0 0 12949 X Replaced 8 2610-664-987 1 Inner tube 0 0 0 13949 X Replaced 9 2520-664-987 1 Inner tube 0 0 0 13949 X Replaced 9 2520-752-4258 1 Inner tube 0 0 0 13949 X Replaced 9 2520-678-136 1 Inner tube 0 0 13949 X Replaced 9 2520-678-136 1 Inner tube 0 0 13949 X Replaced 9 2520-678-136 1 Inner tube 0 0 13949 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-930-4113 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X Replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X 15-58, replaced 9 2520-678-136 1 Inner tube 0 0 1356.7 X 15	130	90	2920-843-1717	-	spark	0	0	6000.1		X	L5-22
13 2610-269-7332 1 Inner tube 0 0 8073.9 X 13 2610-269-7332 1 Inner tube 0 0 8163.0 X 13 2610-046-6914 1 Inner tube 0 0 0 9562.7 X X 22 Unknown 1 Windshield washer 0 0 0 9562.7 X X 13 2610-269-7532 1 Inner tube, tire 0 0 0 11823.5 X X 13 2610-269-7532 1 Inner tube, tire 0 0 12001, X X 13 2610-269-7532 1 Inner tube 0 0 0 12049 X X X X X X X X X	15B	16	2540-678-2996	-		9	0	7524.0		×	Replaced right front
13 2610-269-7532 1 Inner tube 0 0 8163.0 X 13 6240-0544-6914 1 Liamp, incandescent 0 0 9562.7 X 22 Unknown 1 Liamp, incandescent 0 0 9562.7 X 22 Unknown 1 Mindshield washer 0 0 9978.6 X 13 2610-678-1362 1 Tire, pneumatic 0 0 11823.5 X 13 2610-269-7532 1 Inner tube 0 0 12001. X 06 2920-752-4528 4 Spark plug 0 0 12949 X 06 2920-752-4528 4 Spark plug 0 0 12949 X 06 2920-766-4987 1 Inner tube 0 0 12949 X 13 2610-269-7532 1 Inner tube 0 0 12949 X 13 2610-269-7532 1 Inner tube 0 0 12949 X <t< td=""><td>7</td><td>13</td><td>2610-269-7332</td><td>-</td><td>Inner tube</td><td>0</td><td>0</td><td>8073.9</td><td></td><td>×</td><td>L5-27</td></t<>	7	13	2610-269-7332	-	Inner tube	0	0	8073.9		×	L5-27
13 6240-644-6914 1 lamp, incandescent 0 0 9562.7 X 22 Unknown 1 lamp, incandescent 0 0 9562.7 X 22 Unknown 1 Windshield washer 0 0 978.6 X 13 2610-269-7532 1 Tite, pneumatic 0 0 11823.5 X 13 2610-269-7532 1 Inner tube 0 0 12001. X 13 2610-269-7532 1 Inner tube 0 0 12049 X 13 2610-269-7532 1 Inner tube 0 0 12049 X 13 2610-269-7532 1 Inner tube 0 0 12949 X 13 2610-678-1363 1 Inner tube 0 0 12949 X 13 2610-269-7532 1 Inner tube 0 0 12949 X 13 2610-269-753	8	13	2610-269-7532	-	Inner tube	a	a	8163.0		×	L5-27
13 6240-155-8714 1 Lamp, incandescent 0 0 9562.7 X Replaced indicato 22 Unknown 1 Windshield washer 0 0 9978.6 X Replaced indicato 13 2610-678-1362 1 Tire, pneumatic 0 0 11823.5 X Replaced indicato 13 2610-269-7532 1 Inner tube, tire 0 0 12001. X Replaced indicato 13 2610-269-7532 1 Inner tube 0 0 12949 X Replaced indicato 06 2920-752-4258 4 Spark plug 0 0 12949 X Replaced indicato 13 2610-269-753-4258 4 Spark plug 0 0 12949 X Replaced indicato 13 2610-269-753-4258 4 Spark plug 0 0 12949 X Replaced indicato 13 2610-269-733-1 1 Inner tube 0 0 <	7		6240-044-6914	-	Lamp, incandescent	o	٥	9562.7		×	Replaced stoplight
13 2610-678-1362 Tire, pneumatic 0 0 11823.5 X Replaced 1 2460-832-6054 Ilement, engine oil 0 0 11823.5 X Replaced 1 2460-832-6054 Ilement, engine oil 0 0 11823.5 X Replaced 0 2940-832-6054 Ilement, engine oil 0 0 12091, X Replaced 0 2920-752-4258 4 Spark plug 0 0 12949 X Replaced 0 2920-66-4987 Ignition point kit 0 0 12949 X Replaced 1 2610-269-7532 Inner tube 0 0 12949 X Replaced 1 2610-269-7532 Inner tube 0 0 12949 X Replaced 1 2610-269-7532 Inner tube 0 0 12949 X Replaced 1 2610-269-7532 Inner tube 0 0 12929 X Replaced 1 2610-269-7532 Inner tube 0 0 17025 X Replaced 0 1683 2510-66-81532 Inner tube 0 0 17055 X Replaced 0 17056 X 15-53, rep 0 17056 X 17056	21	13	6240-155-8714	-	Lamp, incandescent	0	0	9562.7		X	Replaced turn signal
22 Unknown 1 Windshield washer 0 9978.6 X Replaced Replaced In the control of the control											- 1
13 2610-678-1362 Tire, pneumatic 0 0 0 11823.5 X Replaced, 1 2610-678-1362 1 Tire, pneumatic 0 0 0 11823.5 X Replaced, 1 2610-269-7532 1 Inner tube, tire 0 0 0 12001. X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 12949 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 12949 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 12949 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 12949 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 13919 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 0 13919 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17949 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17955 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17156.7 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17156.7 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17156.7 X Replaced, 1 2610-269-7532 1 Inner tube 0 0 17156.7 X Replaced, 1 2510-930-4113 1 Range, transmission 0 0 17156.7 X 15-53, rep 1 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 13 2530-678-3070 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 140-678-4253 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 140-678-4253 1 4rm, lower suspension 0 0 17156.7 X 15-58, rep 140-678-4253 1 4rm, low	47 2	22	Unknown	-	Windshield washer	0	0	9978.6		×	Replaced
13 2610-678-1362 1 Tire, pneumatic 0 0 11823.5 X Replaced. 13 2610-269-7532 1 Inner tube, tire 0 0 11823.5 X Replaced. 13 2610-269-7532 1 Inner tube 0 0 12949 X Replaced. 13 2610-269-753-4258 4 Spark plug 0 0 12949 X Replaced. 06 2920-056-4987 1 Ignition point kit 0 0 12949 X Replaced. 13 2610-269-753-4258 4 Spark plug 0 0 12949 X Replaced. 13 2610-269-753-1363 1 Inner tube 0 0 12949 X Replaced. 13 2610-269-753-1 1 Inner tube 0 0 15329 X Replaced. 14 1 Lamp, incandescent. 0 0 17025 X Replaced.					dle				·		
13 2610-269-7532 1 Inner tube, tire 0 0 11823.5 X Replaced, maintens 01 2940-832-6054 1 Element, engine oil 0 0 12001. X Replaced, maintens 13 2610-269-7532 1 Inner tube 0 0 12949 X Replaced, Replaced, Replaced, 13260-056-2458 X Replaced, Replaced, 13260-056-2458 X Replaced, Replaced, 13260-056-2458 X Replaced, 13260-056-2458 X Replaced, 13260-056-253-2 X Replaced, 13260-056-259-253 X Replaced, 13260-056-259-253 X Replaced, 13260-056-269-753 X Replaced, 13260-056-269-753 X Replaced, 13260-056-269-753 X Replaced, 13260-056-056-056-056-056-056-056-056-056-0	77	13	2610-678-1362	-	- 1	0	0	11823.5	X		Replaced L5-33
01 2940-832-6054 1 Element, engine oil 0 0 12001. X Replaced, maintena 13 260-269-7532 1 Inner tube 0 0 12949 X Replaced, Rep	24	13	2610-269-7532	Н	tube,	0	0	11823.5		×	Replaced, L5-33
13 2610-269-7532 1	52	10	2940-832-6054		<u>i</u>	0	0	12001.	×		Replaced, 12,000-mile
13 2610-269-7532 1 Inner tube 0 0 12949 X Replaced.A 06 2920-752-4258 4 Spark plug 0 0 12949 X Replaced.A 13 2610-664-987 1 Tire, pneumatic 0 0 12949 X Replaced.A 13 2610-678-1363 1 Tire, pneumatic 0 0 12987 X Replaced.A 13 2610-269-7532 1 Inner tube 0 0 15323 X Replaced.A 06 1683 1 Inner tube 0 0 17025 X Replaced.A 06 1683 0 0 17025 X Replaced.A 06 1683 0 0 17156.7 X L5-53, rep 07 2520-678-1764 1 Seal output, trans. 0 0 17156.7 X Replaced. 07 2520-678-1764 1 Flange, transmission											maintenance
06 2920-752-4258 4 Spark plug 0 0 12949 X Replaced. 06 2920-066-4987 1 Ignition point kit 0 0 12949 X Replaced. 13 2610-678-1363 1 Tire, pneumatic 0 0 12987 X Replaced. 13 2610-269-7532 1 Inner tube 0 0 13919 X Replaced. 13 2610-269-7532 1 Inmer tube 0 0 17025 X Replaced. 06 1683 1 Lamp, incandescent, 0 0 17025 X Replaced. 07 2520-678-3115 1 U-joint 0 0 17156.7 X L5-53, rep 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replaced 07 2520-678-1764 1 Flange, transmission 0 0 17156.7 X L5-53, rep	27	13	2610-269-7532	-	Inner tube	0	0	12937		×	Replaced
06 2920-066-4987 1 Lignition point kit 0 0 12949 X Replaced. 13 2610-678-1363 1 Tire, pneumatic 0 0 12987 X Replaced. 13 2610-269-7532 1 Inner tube 0 0 15323 X Replaced. 13 2610-269-7532 1 Inmer tube 0 0 15323 X Replaced. 06 1683 1 Lamp, incandescent, 0 0 17025 X Replaced. 07 2520-678-3115 1 U-joint 0 0 17156.7 X E-53, rep 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replaced 07 2520-678-113 1 Flange, transmission 0 0 17156.7 X 15-62, rep 03 2910-930-2060 1 Arm, lower suspension 0 0 17156.7 X 15-58	82	90	2920-752-4258	4	Spark plug	0	0	12949			Replaced, AR-75, L5-41
13 2610-678-1363 1 Tire, pneumatic 0 0 12987 X Replaced. 13 2610-269-7532 1 Inner tube 0 0 15323 X Replaced. 13 2610-269-7532 1 Inner tube 0 0 15323 X Replaced. 06 1683 1 Lamp, incandescent, 0 0 17025 X Replaced. 07 2520-678-3115 1 U-joint 0 0 17156.7 X L5-53, rep 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replaced 07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X L5-53, rep 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, rep 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X	78A	90	2920-066-4987		범	0	0	12949		×	Replaced, L5-41
13 2610-269-7532 1 Inner tube 0 0 15323 X Replace 13 2610-269-7532 1 Inner tube 0 0 15323 X Replace 06 1683 1 Lamp, incandescent, 0 0 17025 X Replace 09 2520-678-3115 1 U-joint 0 0 17156.7 X L5-53, 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replace 07 2520-678-1764 1 Flange, transmission 0 0 17156.7 X Replace 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-62, 13 2530-678-3230 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-4253 1 Assembly, air cleaner 0 0	2	13	2610-678-1363	-	Tire, pneumatic	0	0	12987	×		Replaced, L5-33
13 2610-269-7532 1 Inner tube 0 0 15323 X Replace 06 1683 1 Lamp, incandescent, 0 0 17025 X Replace 09 2520-678-3115 1 U-joint 0 0 17156.7 X L5-53, 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replace 07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X Replace 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17156.7 X L	g	13	2610-269-7532	-	Inner tube	0	0	13919		×	Replaced, L5-59
06 1683 1 Lamp, incandescent, larged and second	34	13	2610-269-7532	٦	Inner tube	0	0	15323		×	Replaced
09 2520-678-3115 1 U-joint 0 0 17156.7 X L5-53, 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replace 07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X Replace 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17176.7 X L5-58,	88	90	1683	-	incand	0	0	17025		×	Replaced
09 2520-678-3115 1 0-joint 0 0 1/156.7 X L5-53, 07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replace 07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X L5-62, 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,			0100 (10 0117	-	tail			17157		À	
07 2520-678-1764 1 Seal output, trans- 0 0 17156.7 X Replace 07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X Replace 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,		60	2220-678-31T2	4		D	>	1/9CT/T		4	LO-03, replaced
07 2520-930-4113 1 Flange, transmission 0 0 17156.7 X Replace 03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,	¥.	07	2520-678-1764	-	trans	0	0	17156.7		×	Replaced
03 2910-930-2060 1 Gasket, fuel filler 0 0 17156.7 X L5-62, 13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,	4.1 A	0.7	2520-930-6113	-	Flance transmission	c	c	17156.7		×	Renlaced
13 2530-678-3118 1 Arm, lower suspension 0 0 17156.7 X L5-58, 13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58, 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,	4.1B	03	2910-930-2060		Gasket, fuel filler	0	0	17156.7		×	L5-62, replaced
13 2530-678-3070 1 Arm, lower suspension 0 0 17156.7 X L5-58. 03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,	41C	13	2530-678-3118	-	Arm, lower suspension	_	0	17156.7		×	}
03 2940-678-4253 1 Assembly, air cleaner 0 0 17170.0 X L5-57,	7 1 1	13	2530-678-3070	1	Arm. lower suspension		0	17156.7		×	ł
	42	03	2940-678-4253	-	E		0	17170.0		×	1
						-					1
	SIEI	SIEYF-IE F	Form 121, 11 Dec by		(Rev). Frevious editions	are	obsolete.	•			

LV-10

Chart 1C (Concluded)

					Mark to	Concinaea	led)				
	Ď	DADTC A	ANAI VOIC CHADT	PROJECT	ON.	•					IDENTIFICATION
		·	ı	1-	1-VG-120-151-034 N15	M151A2, Tr	Truck, U	Utility			02DU81 70
						MAINTE LEV C - OP	MAINTENANCE LEVEL C - OP CREW	PART LIFE			
1. 24 ha 124 11 4					٠.	F - DIRE	ORG	M - MILES			
	SEQ	GROUP	FEDERAL STOCK NO.			H - GE	GENERAL		REASON USED	USED	
*	o Z	NO.	OR PART NO.	αTY	NOMENCLATURE	PRESB	RECM	-веммее-	SCD	UNSCD	EPR No REMARKS
	-	2	3	4	5	9	7	æ	6	10	11
	43	13	2530-678-3122	1	Control arm, left lower	0	0	17446.0 T		×	Replaced
	77	10	2940-832-6054		. •~	0	0	18219.0	×		18.000-mile maintenance
	94	90	2920-076-8993	1		0	0	19203.4		×	L5-72, replaced
	94	90	7059538	7		0	0	19203.4		X	
	46A	\dashv	2540-678-2978	2	Shock absorbers, rear	0	0	19203.4		X	
	46B	10	2520-887-1347	7	Seal, output, front	0	0	19203.4		Х	1
		\perp			differential, left						
	47A		2610-678-1363	-	Tire	0	0	19420.3		×	Replaced
	47A		2610-269-7332		Tube	0	0	19420.3			
	848		2610-678-1363			0	0	19520.4		×	Replaced
	67	90	2920-843-1717	7	1		0	19990.0		×	L5-69, replaced
	20	90	6240-266-9940	-1	inca	0	0	20083.2		×	Replaced (instrument)
	51	13	1095-0856-3	2	Shim, spacer	0	0	20141		×	For adjustment purposes
											only
	21	13	875404	m	Shim, spacer	0	0	20141		×	For adjustment purposes
											only
	52	13	2610-269-7332	-	Tube	0	0	20407.0		X	Replaced.
	53	0	2940-832-6054	-	Filter, engine, oil	0	0	21058	X		Final inspection
+ ,											
	\prod								+	1	
IV-									+		
-11	STE	STEYP-TE P	Form 121, 11 Dec 69	(Rev).	Previous editions	are obs	obsolete.				

JCP-I, DPG

MAINTENANCE PACKAGE LITERATURE CHART

STEYP-TE FORM 122

INSTRUCTION SHEET

COLUM

- Enter Army or manufacturer's publication or draft manual number.
- Number of copies received. Insert "0" if none were supplied. Use Chapter 9 of AR 310-3 as a guide to determine those publications that should accompany the test item. Publications contained in the maintenance package should cover operations and functions through general support maintenance and should specify the categories involved.
- 3 Complete title.
- Fill in date publication was received.
- 5 Fill in date test item or materiel was received.
- 6 & 7 Insert "X" in appropriate block. Minor errors noted on DA 2028 forms are not in themselves sufficient reasons to term a publication inadequate.
- 8 Insert EPR number and date DA Form 2028 was forwarded.
- In addition to appropriate remarks, explain if manuscript was not evaluated.

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MAINTENANCE	ANCE	Lda,	PROJECT NO.			•			DENTIFICATION
LITERATURE	TUR	E CHART	1-VG-120-151-034	M151A2,	Truck, Ut	Utility, 1/4-Ton,	1/4-T	on, 4x4	07 D0 D7 D
		MANUSCRIPT		DATE RE	RECEIVED	EVALUATION	TION	FORM 2028	
NUMBER	αтγ		TITLE	LIT.	MATERIAL	ADQT	NADQT	DATE FORWARD	REMARKS
	2		3	4	5	9	7	œ	6
TM 9-2320	1	Truck, Utility,	ty, 1/4-Ton, 4x4,	Mar 68	Apr 70	×		None	Not evaluated
218-10		M151							
TM 9-2320	1	Truck, Utility,	ty, 1/4-Ton, 4x4,	Dec 69	Apr 70	×		None	Not evaluated
218-10 C/1		1 1							
TM-9-2320	-	Truck Utility 1/4-Ton.	tv 1/4-Ton 4x4	Aug 68	Apr 70	×		None	Not evaluated
218-20	4	M151							
	,	- 1		•		Þ		N.	
TM-9-2320	_	Truck, Utility,	ty, 1/4-1on, 4x4,	Jan 10	Apr //	4		None	NOL EVALUACEU
218-20 C/1		MISLA2							
TM-9-2320	H	Truck, Utility,	ty, 1/4-Ton, 4x4,	Apr 68	Apr 70	X		None	Not evaluated
218-20P		1 1							
				- 1	- 1				- 1
TM-9-2320	П	Truck, Utility,	ty, 1/4-Ton, 4x4,	Jan 70	Apr 70	×		None	Not evaluated
218-20P C/2		M151A2						C	
0666 0 700	-	The 14 to	+++ 1 //- T/m //w/	11.1 68	Anr 70	×		None	Not evaluated
218-34	4	M151	1/4-1-0119	1					
								•	
TM-9-2320	г	Truck, Utility,	ty, 1/4-Ton, 4x4	Jan 70	Apr 70	X		None	Not evaluated
218-34 C/2		M151A2							
TM-9-2320	-	Truck, Utility,	ty, 1/4-Ton, 4x4	Apr 68	Apr 70	X		None	Not evaluated
218-34P		1 1							
		- 1		1	- 1	A		Mene	100 40 M
	-	Truck, Utility,	ty, 1/4-Ton, 4x4,	Jan /U	Apr /U	4		None	
218-34P C/1		MISTAZ							
							,		
	\perp								

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STEYP-TE Form 122, 11 Dec 69 (Rev).

Previsus editions are obsolete.

SPECIAL TOOL AND TEST EQUIPMENT CHART

STEYP-TE Form 123

INSTRUCTION SHEET

COLUMN	
1	Nomenclature or Description. Enter the nomenclature as shown in the manual or if none, enter nown nomenclature and brief description of item. (Enter in parenthesis the number of like items received, such as "(2 ea)").
2	Federal Stock Number or Part Number. Record one of the following: Federal Stock Number, Part Number or Drawing Number, in this order of preference.
3	Maintenance Level, Prescribed. Maintenance Level authorized the tool as prescribed by the technical publication.
4	Maintenance Level, Recommended. Indicate the maintenance level to be authorized the tool as recommended by test agency. If the tool is not required, enter none.
5	Date Received. Enter the date the tool or test equipment was received (Example 6/69). Enter "not rec" if tool or test equipment was not received.
6	Evaluation, Adequate. Enter an X if the tool was found to be adequate for use by the mechanics and for its intended purpose at the maintenance level recommended in Column 4. Make no comment on tools marked None in Column 4.
7	Evaluation, Inadequate. Enter an X if the tool was found to be inadequate for its intended use. Make no comment on tools marked None in column 4.
8	Required (RQR) Yes or No. A yes in this column indicates the tool or test equipment is required at the maintenance level indicated in column 4. A No in this column indicates the tool or test equipment is not required. This column should be marked No when None is marked in Column 4.
9	Listed in Technical Manual. Enter the number of the technical publication for the test item in which the tool or test equipment is listed.

COLUMN

Remarks. If an EPR is related to the tool, the EPR number will be entered. If the tool or test equipment was used only to verify the need for the item, this will be indicated. When it has been determined that a tool is not required, indicate the tool from the common tool set and the set number which will perform the required maintenance function.

											JC	۱۲-۱	l, L	ירנ	<i>-</i>												 		 	_
IDENTIFICATION	02DU8170				REMARKS	10	OEM								Organizational tools	available and utilized					Organizational tools	available and utilized								
	4x4, M151A2			TECHNICAL	REFERENCE	6	9-2320-218-	10					9-2320-218-	10	9-2320-218-	20P	9-2320-218-	20P	9-2320-218-	34P	9-2320-218-	34P								
	1/4-Ton,		REQ	YES	O Z	8																								
				EVALUATION	INADOT	7																	}							
TURE	Utility,			EVALU	ADQT	9	×		× ×	×	×	X	×		X		×		×	المارين الماري	×									obsolete.
NOMENCLATURE	Truck,			u + •	RECEIVED	5	Apr 70		Apr 70			Apr 70	Apr 70		Apr 70		Apr 70		Apr 70		Apr 70									
	51-034	ENANCE 'EL	OP CREW	DIRECT	RECM	4	ပ	,	ن د	ပ	၁	၁	ပ		0		0		0		0									edition
°O _N	20-151	MAINTENANCE LEVEL	0 0			3	ပ	,	ن د	U	၁	C	C		0		0		0		0							1		Previous
AND PROJECT NO.	CHART 1-VG-120-1				a.	2	5140-772-4142	0117 001 0010	5120-223-7397	5120-222-8852	5120-240-5328	5120-811-4114	5120-708-3364		4910-627-7048		4910-627-7049		4910-627-7049		4910-627-7044									69 (Rev).
SPECIAL TOOLS A	PMENT			BO BBILL TONEMON	Z		Rag, cotton duck	1-1.	Pliers, slip foint	iver	Wrench, adjustable	Wrench, socket handle	Handle, Jack		Tool kit, Set A		Tool kit, Set B		Tool kit, Set B		Sling, engine and	transmission								STEYP-TE Form 123, 11 Dec

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								Chart	ct 2A											
MAINTENANCE	∥ – .	LUAT	<u>N</u> O	PROJECT 1-1/C-	!I	NO.	7	NOMENCLATURE Truck, Util	CLATU.	ıRE İlity	TURE MISIA2 Utility, 1/4-Ton,		4×4,		02.	D2DU8370				
1 REPORTING PERIOD 2 ADITHRU 19	REPORT	Apr	RU 19	ے الـ	JUNTERIM No.	Š	∭⊓	FINAL		9	Vенісь	<u>U</u>	HR TH	II	REPORT	0.0		TOTAL	ر 0•0	l (
	REGULE	E020		HIS	REPORT	21.0	48 To⊤	OTAL 21,048	1,048	7.	ACCIDENT OR		ERROR	MAINT	TIME 1	ERROR MAINT TIME THIS REPORT	- 1	4.5	TOTAL	4.5
	REQUI	1RED1	- 000	HIS	REQUIRED 1,000 THIS REPORT 940.9	1 940	.9 To	FOTAL 940.9	6.04	<u>&</u>	SPECIAL		ENGR TEST TIME THIS REPORT	TIME	THIS RE	PORT _	0.0	Tot	TotalD_D	0
	ILY SER	VICES	THIS	REPO	ят	5.5	ř	TOTAL	26.5	6	INITIA	INITIAL TECH INSP TIME 13.3	INSP TI	ME 13	- 1	FINAL TECH INSP TIME	H INSP	TIME	29.7	
	OMIN DE	ר אַאַן	I ME 1	HIS R	EPORT	168	1	TOTAL 168.2	68.2	10.										
li .	11. NO PEOPE	Z	12. FAULT	FAULT	13. PREPA	13. PREPARATION	A 5.0	A. ODJUST OR CALIBRATE		15. FAULT CORRECTION		16, PART RE- PLACEMENT	17. CHECK	TUO	18. ACTIVE MMH	-	LOCK	H Z	SYSTEM	
TYPE OF	THIS	· · · · · · · · · · · · · · · · · · ·	PERIOD	JATOT	T	TOTAL		JATOT	SIHT	DOIR39	THIS	TOTAL TIME	EIHT GOIR39	JATOT JMIT	THIS	JATOT TNIAM 8H-NAM RIHT	COIRZ9	TIME	PERIOD	P-I, DPG saun -viva
OP CREW MAINT		12.9										0.3				13.2		13.2		
OP CREW MAINT												0.8				8.0		0.8		
ORG MAINT SCHEDULED		40.5				0.4						1.5				42.0		27.1		-
ORG MAINT		2.9		6.3		3.9		4.7	_	1	9.	17.3		5.2		47.9		33.1	1	
DIRECT MAINT SCHEDULED																				_
DIRECT MAINT						0.1				0	0.3					4.0		0.4		
GENERAL MAINT																	+			-
GENERAL MAINT					ļ															-
TOTALS		56.1		6.3		4.4		4.7		7	6.	19.7	 	5.2		104.3		74.6		
:	T AM G C G M	TAMO	I NO)	No.	3, 0	ased (in tac	hogr	aph i	Item No. 3, based on tachograph installed and	ed and	g	20 mph						
1			1		2		10,00	administrative delev time	are dr	Velo	fime i	is based	do	16 hours	ırs per	r day,	5 days		per week	
				Trei	Item No.	ĵ	מווודווד	בוומרי	ا د د	(575)								t		

(STEYP-TAU SOP 02-06-70)

Chart 2A (Concluded)

		Chart 2A	(Concluded)) (DE								,		
∑ v_1	EVALUATION	MAINTENANCE OR	DEI AY	TIME	(NON-CHARGEABLE)	CHAR	GEAB		NOMENCLA TURE	7. Y	푀	1A2		
	SUMMARY REPORT	,		ì					IDENTIFICATION	FICAT		02DU8370	0/	
			SYSTEM	DELAY MAINTEN TIME	DELAY OR Maintenance Time	ЕИЧИС					71			
GROUP No.	INCIDENT, COMPONENT AND OR RELATED OPERATIONS	ED AUTHORITY	X MILES HOURS ROUNDS	MAN- HOURS	CLOCK	MAINTI LEVEL	MODIEI VEHICE	SUPPLY SUPPLY	DEFYA	евнон ОВ Уссіре	SPECIA ENGINE TEST	INITIAI FINAL INSPEC		
-	2	3	4	2	9	7	8	6	10	11	12	13	14	
1	Initial Technical Inspection		13.3	13.3	7.2	0			3.7			13.3		
1	12,000-mile maintenance		11955		7.7	0			7.7					
12	Front brakes grab		13912		9.0	0		1.3	7.7					
05	Repaired radiator		16279.4		17.0	0			17.0					JC
12	Repair brakes and		16447		30.4	0			30.4					P-I,
03	Install cleaner assembly, air													DP
1	Perform 18,000-mile maintenance		17836		28.9	0		-	28.9					G
12	Front brake grabs, oil on lining		17836	3.5	1.7	0				3.5			Error	
	Replace outer seal (error)													
90	Engine stopped running during oper-	- I	18119	1.0	0.8	0				1.0			Error	ļ
	ation, ignition resistor burned					·								
	out (shop error)													
!	A maintenance (partial final)		21084	14.0	8.3	0			8.3			14.0		
	Final Technical Inspection		2116.0	15.7	7.8	0			63.2			15.7		1
														1
														1
														İ
				47.5	118.8	0		1.3	166.9	4.5		43.0		
SI	STEYP-TE Form 70, 8 Apr 70 (Rev). Ed	Edition of 11 Dec	69 is	obsolete	•	(ST	(STEYP-TAU SOP 2-06-07)	AU SOF	2-06	(70-				1

		PROJECT NO.		Chart 2B	T 2B	4 8 11.					OR NOTE ACTOR FUND	_
ш	MAINTENANCE ANALYSIS	7			 -				;			
- 1	7	-86-120-151	151-034			MISIAZ,	- 1	Truck, Utility			02DU8370	
		MA Z	MAINTENANCE LEVEL					SYSTEM			NOTE:	
		0 I OP	CREW			ACTIVE					MCF - MISSION CRITICAL	
GROUP	COMPONENT AND	P ORG	- ORG - DIRECT	TECH NINSTRU	TECH MANUAL	MAINTENANCE		M - MILES	REASON PERFORMED	REASON	FAILURE	
. '	œ	1 -	RECM	ADQT	ADOT NADOT	MAN-HOURS	CLOCK	R ROUNDS	3 CD	UNSCD	EPR No REMARKS	
1	3	4	5	9	7	æ	6	10	1.1	12		
1 1	Rerouted starter switch	о 43	0	×		0.2	0.2	13.3		Х	1.5-2	
١ ١												_
1	Adjusted headlights	0	0	×		0.5	0.5	13.3		X	L5-2	
	Adjusted toe-in	0	0	×		0.3	0.3	13.3		X	L5-2	OI.
	Performed 2000-mile	٥	ပ	×		1.0	1.0	2000.0	X			٠,
	lubrication	+					- 1					_
	Cleaned and lubricated	0 P	0	×		0.5	0.5	2000.9		×	L5-9	_
	accelerator linkage	4										-
05	Shortened radiator hose	_	0	×		1.0	0.5	2000.9		×	L5-10	
- [Performed 3000-mile	O	ပ	×		1.0	1.0	3000.0	X			_
- 1	lubrication		_									
	Adjusted headlights	0	0	X		0.7	0.7	3346.5		×	L5-16	
	Performed 4000-mile	ပ	ပ	×		1.1	1.1	3983.8	X			
- 1	lubrication)										
- [Replaced tire and tube	0	0	×		0.7	0.7	3988.7		X		
	(damaged)	-										
- 1	Adjusted brake light	0	0	×		0.1	0.1	4351.6		×		
- 1	Performed 1000-mile	ပ	ပ	×		1.0	1.0	5000.0	×			
- [lubrication							- 1				
	Performed 6000-mile		0	×		7.8	3.9	6031.1	×			
1	lance	4		3		,	6	1 1000		۵	- CC 31	
	Dorformed 1000-mile	o c	٥	< >		0.7	7.0	2000 5	Å	4	LD-23	
1	1 uhrication	,	,	•		2			•			
1	Performed 1000-mile	J _C	ပ	×		0.8	0.8	8000.0	×			
1	-											
	Flat tire, right rear,	0	0	×		8.0	8.0	8896.0		×	L5-27	
- 1	repaired							•				
- 1	Perform 1000-mile	ပ	၁	×		1.5	1.5	0.0006	Х			
	lubrication						1					
- {	Perform 1000-mile	ပ	ပ	×		0.7	0.7	10004.0	X			
1	l lubrication											

STEYP-TE Form 120, 11 Dec 69 (Rev).

Previous edition is obsolete.

FT 1-VC-120-151-034 H151A2, Truck, Utility Component And Component A	NA		PROJECT NO.		ÓN N	NOMENCLATURE	URE					IDENTERINATION NO.	_
Color Colo	핑	\dashv	/G-120-1	51-034	<u>-</u>	151A2.	Truck.		^		•	Orcollect	
Columbn Colu			MAIN	FENANCE VEL								NOTE:	
AND			1 1 1	با لا لا	TECH A	ANCAL	MAINTE	NANCE	ı	RE	NOS	NOISSIM -	
Second Second About Moore Mo	GROUP NO.	Z	H ~ GE	KERAL	INSTRU	CTIONS	MIT	IE	HOURE	PERF	ORMED		
Seed tube 0	-	Ш	PRESB	A FC	Abat	NADQT	HOURS	HOURS	R ROUNDS	9CD	UNSCD	No.	
Jaced tube 0	Ē			C	٥	/	8	6	10	11	12		11
1.2 1.2	F12	tire, replaced	_1_	0	×		1.0	1.0	10076		×	L5-31	11
The C C X 0.9 0.9 11414 X C C X 16.6 11.8 11955 X 15-45, C C C X C C C C C C	Por	rire, replaced	. [0	×		1.2	1.2	11284		×	L5-31	, -
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69 (Rev) Previous addates 12 16447	Rens	ir lower front	3 0		×:		2.0	-	16279		Х		
69 (Rev) Previous adtator 12	ns	spension			4		8.0	7.	16447		×		
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Ir-IE Form 120, 11 Dec 69 (Rev). Previous edition is obsolete.

Chart 2B (Continued)

CHART 1-00-151-024 Million Struck, Utility Struck Utility Struck Utility Struck Utility Struck Utility Struck Utility Struck	_		-120-15	51-034	CAISIM	Truck				_		
Sec Sec						1 707 (717	***	ı	ıty			02DH8370
Second Component And Com	о М			MAINT LEV			ACTI	Ε	SYSTEM LIFE			
No. No.			COMPONENT AND	0 F T		TECH MANUAL INSTRUCTIONS	MAINTE		•	REA	SON	FAILURE
1 2 3 4 5 6 7 8 9 10 11 12 13 23 03 Replaced all cleaner 0 0 X 0.5 0.5 16447 X L3-57 23 12 Encies grab, repaired 0 0 X 1.0 1.6575 X 24 13 Flat tire, replaced tube 0 0 X 1.0 1.6575 X 24 13 Flat tire, replaced tube 0 0 X 1.0 1.0 1.6575 X 24 13 Flat tire, replaced tube 0 0 X 1.0 1.0 1.000 X 24 13 Flat tire, replaced tube 0 0 X 1.0 1.0 1.000 X 25 2.4 1.0 1.0 1.0 1.0 1.0 26 1.0 1.0 1.0 1.0 1.0 1.0 26 0.0 1.0 1.0 1.0 1.0 26 0.0 1.0 1.0 1.0 1.0 27 0.0 0 X 1.0 1.0 1.0 36 0.0 Replaced tube 0 0 X 1.0 1.0 1.0 36 0.0 Replaced tube 0 0 X 0.2 0.2 1.7836 X 1.5-73 36 13 Left and right lower 0 0 X 0.2 0.2 1.7836 X 1.5-53 36 13 Left and right lower 0 0 X 0.4 0.4 1.835 X 1.5-53 37	Z			PRESB	RECM	ADGT NADGT		CLOCK	R - ROUNDS	ScD	UNSCD	No.
328 0.3 Replaced air cleaner 0 0 X 0.5 0.5 16447 X 1.5		2	3	4	5			6	10	11	12	
22 21 21 21 21 21 21 21	3		1	0	0	X	0.5	0.5	16447		X	L5-57
328 12 Brakes grab, repaired 0 0 X 2.4 1.5 1647 X X 3.1 13 Flat tire, repaired tube 0 0 X 1.0 1.0 16745 X X 3.4 13 Flat tire, repaired tube 0 0 X 0.8 0.4 16745 X X 3.4 13 Flat tire, repaired tube 0 0 X 0.8 0.4 16745 X X 3.4 13 Flat tire, repaired tube 0 0 X 0.8 0.4 16745 X X 3.4 1.5 1.0			_									
33 13 Flat tire, repaired 0 0 X 0.0 1.0 16575 X X 3.4 3.4 13 Elat tire, replaced tube 0 0 0 X 0.0 1.0 10043 X X 3.5 Partform 18.000-mile 0 0 X 1.0 1.0 1.000 X X 1.000 X 3.6 36				0	0	Х	2.4	1.5	16447		×	
34 13 Frat tire, replaced tube 0 0 X 0.8 0.4 16745 X 1.0 1.0 17000 X 2.5 1.0 1.0 17000 X 2.5 1.0 1.0 17000 X 2.5			Flat tire, repaired	0	0	Х	1.0	1.0	16575		×	
35 Perform 1000-mile C C X 1.0 1.0 17000 X 36 Perform 18000-mile O O X 16.1 9.9 17836 X 364 O		-	- 4		ı	×	0.8	0.4	16745		×	
14 14 15 15 15 15 15 15			Perform 1000-mile	ပ	ပ	X	1.0	1.0	17000	X		
16.			lubrication									
36A 05 Radiator leaking, 0 0 X 2.6 1.3 17836 X 15-77 16B 06 Replaced turn signal 0 0 X 0.2 0.2 17836 X 15-67 36C 06 Replaced turn signal 0 0 X 0.2 0.2 17836 X 15-73 36D 13 Left and right lower 0 0 X 2.0 0.2 17836 X 15-58 36D 13 Left and right lower 0 0 X 2.0 2.0 17836 X 15-66, and O-ring seal and O-ring seal 37 Perform 1000-mile C C X 0.4 0.4 18027 X 15-66, and O-ring seal 38 12 Cannot adjust hand brake 0 0 X 1.6 0.8 18639 X 15-55 39 Perform 1000-mile C C X 0.5 0.5 19003 X 15-55 40 1.3 Replaced right and left 0 0 X 1.1 1.1 19089 X 15-64 41 16 Right rear shock leaks, 0 0 X 0.5 0.5 19699 X 15-64 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 15-64 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 15-64 418 60 Replace turn signal 0 0 X 0.6 0.6 19699 X 15-64 418 60 Replace turn signal 0 0 X 0.6	i_	-	Perform 18,000-mile	0	0	X	16.1	6.6	17836	×		-
364 O5 Radiator leaking, O O X O O S O O O O O O O		[_	maintenance					- (
36B 06 Replaced turn signal 0 0 0 X 0.8 0.4 17836 X 15-73 36C 160 Low beam headlight 0 0 0 X 0.2 0.2 17836 X 15-73 36D 13 Left and right lower 0 0 0 X 0.2 0.2 17836 X 15-73 36D 13 Left and right lower 0 0 X 0.4 0.4 1836 X 15-66, 36E 06 Replaced distributor cap 0 0 X 2.0 2.0 17836 X 15-66, 37 Perform 1000-mile C C X 0.4 0.4 18027 X 15-66, 39 Perform adjust hand brake 0 0 X 1.6 0.8 18639 X 15-55 39 Perform 1000-mile C C X 0.5 19003 X 15-55 39 Perform 1000-mile C C X 0.5 19003 X 15-55 41 16 Right rear shock leaks, 0 0 X 0.5 0.5 19699 X 15-64 418 16 Replace turn signal 0 0 X 0.6 0.6 19699 X 15-64 418 16 Replace turn signal 0 0 X 0.6 0.6 19699 X 15-64 419 10 10 10 10 10 10 10	_1		Radiator leaking.	0	0	×	2.6	•	17836		×	L5-77
360 Replaced turn signal			replaced		·		,	,	7001		,	, r
36C 06 low beam headlight 0 0 X 0.2 0.2 17836 X L5-73 36D 13 Left and right lower 0 0 X 5.8 2.9 17836 X L5-58 36E 06 Replaced distributor cap 0 0 X 2.0 2.0 17836 X L5-66, 37 Perform 1000-mile C C X 0.4 18027 X L5-66, 38 12 Cannot adjust hand brake 0 0 X 1.6 0.8 18639 X L5-55 39 Perform 1000-mile C C X 0.5 0.5 19003 X L5-55 40 13 Replaced right and left 0 0 X 1.1 1.1 19089 X L5-64 41 12 Replaced right front 0 0 X 1.1 1.1 19699 X L5-64 418 10 Replace turn signal 0 0 X 0.6 0.6 19699 X C 418 10 Replace turn signal 0 0 X 0.5 0.5 0.5 0.5 0.5 0.5 418 10 Replace turn signal 0 0 X 0.5 0.5 0.5 0.5 0.5 0.5 418 10 Replace turn signal 0 0 X 0.5 0.5 0.5 0.5 0.5 0.5 418 10 Replace turn signal 0 0 X 0.5 0.5 0.5 0.5 0.5 0.5 418 10 Replace turn signal 0 0 0 0 0 0 418 10 Replace turn signal 0 0 0 0 0 418 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 418 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 418 0.5	<u>~</u>		Replaced turn signal	0	0	×	8.0	0.4	1/836		×	72-6/
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36D 13 Left and right lower 0 0 0	۰	_1_	replaced									
36E 06 Replaced distributor cap 0 0 X 2.0 2.0 17836 X 15-66, and O-ring seal 0 0 X 0.4 0.4 18027 X 15-66, and O-ring seal 0 0 X 0.4 0.4 18027 X 15-55 1			Left and right lower		0	×	5.8	2.9	17836		X	L5-58
37 Perform 1000-mile C C X 0.4 0.4 18027 X L5-66. 37 Perform 1000-mile C C X 0.4 0.4 18027 X L5-55 38 12 Cannot adjust hand brake 0 0 X 1.6 0.8 18639 X L5-55 39 Perform 1000-mile C C X 0.5 0.5 19003 X L5-55 39 Perform 1000-mile C C X 0.5 0.5 19003 X L5-55 40 13 Replace right and left 0 0 X 1.1 1.1 19089 X L5-64 41 16 Right rear shock leaks 0 0 X 0.5 0.5 19699 X L5-64 41 12 Replace right front 0 0 X 1.1 1.1 19699 X L5-64 41 41 42 43 44 44 45 45 45 45 45			suspension arm replace					,				
37 Perform 1000-mile					0	×	2.0	2.0	17836		×	
37 Perform 1000-mile		+	and O-ring seal									
1 1 1 1 1 1 1 1 1 1			Perform 1000-mile	O	S	X	0.4	0.4	18027	×		
10 Cannot adjust hand brake 0 0 X 1.6 0.8 18639 X 15-55		+	1ubrication									
Teplace brake band C C X O.5 19003 X		+			0	X	1.6	0.8	18639		×	L5-55
40 13 Replaced right and left 0 0 X 1.1 1.1 19089 X Worn 41 16 Right rear shock leaks, 0 0 X 0.5 0.5 19699 X L5-64 41 41 12 Replace, right front 0 0 X 1.1 1.1 1.1 19699 X 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 418 06 Replace turn signal 0 0 X 0.6 0.6 19699 X			replace brake band									
40 13 Replaced right and left 0 0 X 1.1 1.1 19089 X Worm 41 16 Right rear shock leaks, or replaced 0 0 X 0.5 0.5 19699 X L5-64 41A 12 Replace, right front or brake shoe 0 0 X 1.1 1.1 1.1 19699 X L5-64 41B 06 Replace turn signal 0 0 X 0.6 0.6 19699 X X	Д.	+	Perform 1000-mile	S	U	×	0.5	0.5	19003	×		
40 13 Replaced right and left 0 0 0 X 1.1 1.1 19089 X Worm rear tires 41 16 Right rear shock leaks, 0 0 0 X 0.5 19699 X L5-64 41A 12 Replaced 41B 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 41B 06 Replace turn signal 0 0 X X 0.6 19699 X 41B 06 Replace turn signal 0 0 X X 1.1 1.1 1.1 19699 X 41B 06 Replace turn signal 0 0 X X 1.1 1.1 1.1 19699 X 41B 06 Replace turn signal 0 0 X X 0.6 19699 X												
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41 16 Right rear shock leaks, 0 0 0		_	rear tires									
41 16 Right rear shock leaks, 0 0 0 X 0.5 0.5 19699 X L3-64 41A 12 Replace right front 0 0 X 1.1 1.1 1.1 19699 X 41B 06 Replace turn signal 0 0 X 0.6 0.6 19699 X 5 Indicators Indicators Description of the control of		+		. (,		,		00001		*	4) 44
41A 12 Replace, right front 0 0 X 1.1 1.1 1.1 19699 X 41B 06 Replace turn signal 0 0 X 0.6 0.6 19699 X	<u></u>	+		9	0	×	3.0	3.0	19699		×	L3-64
41B 06 Replace turn signal 0 0 X 0.6 0.6 19699 Indicators I	<u> </u>	ĺ		0	0	×	1.1	1.1	19699		×	
41B 06 Replace turn signal 0 0 X 0.6 0.6 19699		İΙ										
CTEVP-TF Pow 120 11 Pag 60 (Page) Page 4211				0	0	×	9.0	9.0	19699		×	
The state and the state of the	IV		indicators									
Sirit-in rolm 120, it nec 03 (kev). Frevious edition is	-2	STEYP-TE	Form 120, 11 Dec 69 (Rev).			edition is ob	obsolete.					

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					REA	90.0	-		×																							+	
		lty	SYSTEM	LIFE	M - MILES	HOOKS		21	20003	21084		21085																					
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(1	U R.E	Truck,		ACTIVE	MAINTEN	MAN-		, c	2:0	0.2		4.0			104.3								1			1	-	+	1	1	+		obsolete.
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L	-Z				SEQ	o Z		42		43A	44	45																					STEY

Chart 2C

		9		NOMENCLATURE	TURE			1	SENTIFICATION
SPECIAL TOOLS AND		É		,	۰ م				02 68 Hd CO
PMFNT	CHART 1-VG-120-	120-151-034	-034	M151A2,	Truck,	Utility			0200030
1	1	MAINTENANCE	NANCE						
		1	OP CREW				RED		
·		0 - ORG	U				YES	TECHNICAL	
	, H	1 1	DIRECT	DATE	EVALUA TION	NOIL	0	MANUAL	
NOMENCLATURE OR	FEDERAL SICCA NO. OR PART NO.	PRE		RECEIVED	ADQT	INADGIT	ON	REFERENCE	REMARKS
	2	3	4	5	9.	7	8	6	10
•	6117-622-0713	C	C	Apr 70	×			9-2320-218-	OEM
Bag, cotton duck	7140-117-0416	,	,					10	
المارا	2120-729-5779	ပ	၁	Apr 70	×				
Pliers slin ioint	5120-223-7397	ပ	S	Apr 70	×				
J .£	5120-222-8852	S	O	Apr 70	×				
Wrench adjustable	5120-240-5328	S	9	Apr 70	×				
	5120-811-4114	U	ပ	Apr 70	X			0 2200 230	MAIO
Handle jack	5120-708-3364	O	ပ	Apr 70	×			-077-0767-6	
								0 2220 210	Owner and found tools
Tool kit, Set A	4910-627-7048	0	0	Apr 70	×			300	j -
								202 016	Available and detrices
Tool kit. Set B	4910-627-7049	0	0	Apr 70	X			9-2320-218-	Organizational coors
								202	GYGLEGE GMY COLOR
Tool kit, Set B	4910-627-7049	0	0	Apr 70	×			9-2320-218- 34P	available and utilized
,	7701 107 0107		6	Anr 70	×			9-2320-218-	Organizational tools
Sling, engine and	4910-179-016 4	1		21 470				34P	available and utilized
rransmission									
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		-							
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STEYP-TE Form 123, 11 Dec 69 (Rev).

Previous edition is obsolete.

Chart 2D	1	-YSIS CHART 1-VG-120-151-034 M151A2, Truck, Utility 02DU8370	MAINTENANCE PART LIFE LEVEL C - OP CREW	1 1	H - GENERAL HINDRAS - REASON USED	OR PART NO. GTY NOMENCLATURE PRESB RECM R ROUNDS SCD UNSCD EPR No REMARKS	3 4	10-678-1363 1 Time 0 0 3988.7 X	1 Tube, pneumatic 0 0 3988.7	1 Kit. i	1 Points, ignition 0 0 6031.1 X	4 Spark plugs 0 0 6031.1 X	1 Tube, pneumatic 0 0 10076 X	1 Tube, pneumatic 0 0 11284	1 Filter, oil 0 0 11955 X	4 Spark plug 0 0 11955 X	1 Seal 0 0 11955 X	1 Tube 0 0 12466 X	1 Tire 0 0 12466 X	1 Tire 0 0 13659 X	2 Spring retainer 0 0 13912	-1348 2 Seal, wheel 0 0 13912	1 Tire 0 0 14555	1 Tire 0 0 15278	1 Lamp, instrument panel 0 0 15850	1 Air cleaner assembly 0 0 16447	1 Tube, pneumatic 0 0 16745 X	1 0il filter 0 0 17836 X	1 Radiator assembly 0 0 17836 A	1 Turn signal control 0 0 17836 X	1 Light, low beam 0 0 17836 X	1 Arm assembly 0 0 17836 X	1 Arm assembly 0 0 17836 X	1 Distributor cap 0 0 17836 X	1 Seal, O-ring 0 0 17836 X	1 Brake band 0 0 18639 X L5-55	2 Tire 0 0 19089 X	1 Shock absorber 0 0 19699 X	2 Brake	
	1	ANALYSIS CHART				אַ גָּ		2610-678-1363	2610-269-7332	2920-089-3607	7059538	2920-287-9135	2610-269-7332	2610-269-7332	2940-832-6054	2920-287-9135	2520-887-1347	2610-269-7332	2610-678-1363	2610-678-1363	702-5883	2530-887-1348	2610-678-1363	2610-678-1363	6240-019-0877	2940-678-4253	2610-269-7332	2940-832-6054	2930-064-5979	11613632	6240-686-4168	2530-678-3118	2530-678-3070	2920-353-2216	5330-054-6880	2530-678-1284	2610-678-1363	2540-678-2978	2530-678-3111	
	i	PARTS A				SEG GROUP	∤ -	7 113	+	10 06	-		-	-	19 01	19 01		21 13	-		_	13	25 13	B		A	34 13	36 01	36A 05	36B 06	36C 06		13	36E 06		38 12	\vdash	-		

STEYP-TE Form 121, 11 Dec 69 (Rev). Previous editions are obsolete.

				Chart 20 (Cor	(Concluded)					NOSHAOLIBILINGO	
l	1		PROJECT	NO.	NOMENCLATURE	3 2					
Ā	PARTS A	ANALYSIS CHART	1-V	1-VG-120-151-034	M151A2, Truck,	Truck,	Utility			0ZDU83/0	
					MAINT	MAINTENANCE	PART LIFE				
					000	OP CREW					
				•	1 1	DIRECT	M - MILES				
					U I	GENERAL	- HOURS	REASON USED	USED		
SEQ	GROUP	FEDERAL STOCK NO.	οTΥ	NOMENCLATURE	PRESB	RECM	ROUNDS-	sco L	UNSCD	EPR No REMARKS	- 11
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										新聞の一次が通用に関いて限期に関する場合の表現した。 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4	東京 三

										JCP	-I, L	JPG	ر_ن	معيدات													 	 	•
IDENTIFICATION	020II8370		REMARKS	6	Not evaluated		Not evaluated		Not evaluated		Not evaluated		Not evaluated		Not evaluated		Not evaluated	1 1	- !	Not evaluated		Not evaluated		Not evaluated					
	Ton. 4x4	FORM 1598	DATE FORWARD	æ	None		None		None		None		None		None		None			None		None		None					
	Utility, 1/4-Ton.	EVALUATION	NADQT	7																						-			
)tilit	EVALI	ADQT	9	×		×		×		×		×		×		×			×		×		×					
1186	uck.		MATERIAL	5	Apr 70		Apr 70		Apr 70		Apr 70		Apr 70		Apr 70		Apr 70	1 1		Apr 70		Apr 70		Apr 70					obsolete
L ZE	M151A2.	DATE RE		4	Mar 68		Dec 69	1 [Aug 68		Jan 70		Apr 68		Jan 70		111 68	1 1		Jan 70		Apr 70		Jan 70					a T a
Undirect NO.	20-151-034		TITLE	3	7, 1/4-Ton, 4x4,	ì	7. 1/4-Ton. 4x4.		7, 1/4-Ton, 4x4		7, 1/4-Ton, 4x4,	•	7, 1/4-Ton, 4x4		7, 1/4-Ton, 4x4,		, 1/4-Ton 4×4			7, 1/4-Ton, 4x4,		7, 1/4-Ton, 4x4,		7, 1/4-Ton, 4x4,					(Rev) Previeus doitions
- 1	PACKAGE E CHART	1 -			Truck, Utility,	M151	Truck, Utility.	1 1	Truck, Utility,	M151	Truck, Utility,	M151A2	Truck, Utility,	M151	Truck, Utility,	M151A2	Truck Heility	1 1	. 1	Truck, Utility,	707671	Truck, Utility,	M151	Truck, Utility,	M151A2				11 Per 69
	ANCE		410	2	-		F		1		П		7		1	ام	-			Н		1		Н					135
	MAINTENANCE		NUMBER	-	TM-9-2320	218-10	TM-9-2320	218-10 C/1	TM-9-2320	218-20	TM-9-2320	218-20 C/1	TM-9-2320	218-20P	TM-9-2320	218-20P C/	TM-9-2320	218-34		TM-9-2320	210-24	TM-9-2320	218-34P	TM-9-2320	218-34P C/1				CTPVD-TP Porm

				Chart	t 3A							,		
ш		PROJECT N	NO.	NOME	NOMENCLATURE	ĨĒ.			<u>ā</u>	IDENTIFICATION	NOIL			
MAINTENANCE E	EVALUATION	(11+11++1	1 //-Ton /	LX . 4x4	M1 51 A2	02DU8670	. 029			
SUMMARY	REPORT	1-VG-12	1-VG-120-151-03	34 LFUCK,	- 11	H	11	66						
1. Reporting Period Anthrull	DOI ADITHRUIZ	Juninterim No.	□.ºº	FINAL K		6. VEH	VEHICLE MOD	MOD HR THIS	S REPORT	ì	O		TOTAL	9
T. 22	REQUIRED 20000 THIS REPORT 21091	THIS REPORT		ToTAL 21091	1091	7. Acc	ACCIDENT OR		ERROR MAINT TIME	IME TH	THIS REPORT		_ IOTAL	
	BECHIEF 1000 THIS REPORT 872.0 TOTAL	THIS REPOR	T 872.0	TOTAL_	872.0	8. SPE	SPECIAL EN	ENGR TEST TIME THIS REPORT	TIME T	HIS REP	DRT 0	_	OTAL)
OP/CREW DAIL	DAILY SERVICES THIS REPORT	REPORT	91.7	TOTAL	91.7	9. Init	INITIAL TECH	TECH INSP TIME	ME 12.5		FINAL TECH INSP TIME	SP TIME	77	g
2 × 3	IN DELAY TIME	THIS REPORT	70.7	TOTAL	70.7	10.								
- H	12. F.	12. FAULT 13.		Abjust on		15. 16 FAULT P	16. PART RE- PLACEMENT	T CHECK	500	ACTIVE MMH	CL.OCK	Ξ	SYSTEM FAILURE	
ž	INSPECTION LOCA		NO LI	5			a				H.	7		
TYPE OF	TOTAL TIME THIS	TOTAL TIME THIS	TOTAL	THIS PERIOD	TIME THIS PERIOD	JATOT BMIT	THIS PERIOU	TIME THIS OIRE	TOTAL	SIHT OIRBE JATOT	H-NAM EIHT	IATOT BM IT	SIHT OIR39	PATOT PABLES
 -	14.8	•					0.5	2		7	15.3	14.7		
OP CREW MAINT						0.5	0.6	9			9.0	0.6		
ORG MAINT	52.9						o	0.8			53.7	24.6		
Ong MAINT	5.0	1.1	3.2	7	6.	10.2	14,	4.	1.5		43.8	35.1		
DIRECT MAINT								·		1				
DIRECT MAINT	0.5		1.5						1.0		3.0	3.0		
GENERAL MAINT														
GENERAL MAINT														
TOTALS	73.2	1.1	4.7	7	6.	10.7	16.	.3	2.5		116.4	78.0		
ADDITIONAL TEST	INFORMATION -	Item No.	3 is based		tachogi	on tachograph installed	talled							
1 1		Item No. 5 admini	5 admin	istrati	ve del	strative delay time	is based	o	hours	16 hours per day, 5		days per week	. week	

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Chart 3A (Concluded)

	Chart	3A (Concluded,	nded)						74940	Sent A LONGWOOM				
Σ		VANCE OR	DELAY 'T	TIME	(NON-CHARGEABLE)	CHAR	GEAB		T N I N I N I N I N I N I N I N I N I N	12.4019	2 2	MISIAZ		1
	SUMMARY REPORT		1	i		3		7	DENT	3	17 N	07 98 0		
			SYSTEM	DELAY OR MAINTENANCE TIME	OR NANCE	ЕИ¥ИСІ			,		ובא יר			
GROUP No.	INCIDENT, COMPONENT AND OR RELATED OPERATIONS	AUTHORITY	X MILES HOURS ROUNDS	MAN- HOURS	CLOCK	MAINT!	MODIEI VEHICE	SUPPLY	DEFYA YDWIN	ЕВВОВ ОВ У ССІDЕ	SPECIA ENGINE TEST	INITIAI FINAL INSPEC		1
-	2	3	4	5	9	7	8	6	10	=	12	13	14	a 11
	Initial Technical Inspection		13.6	12.5	7.0	0						12.5		,
	Check front end and adjust headlights		14840.		4.4	0			4.4					1
16	Replace left rear shock and brake,		14999		7.4	0			7.4					1
	adjust dust covers													JO
12	Replace brake linings		15263		2.5	0			2.5					CP-I
														, DF
	18,000-mile maintenance		18639		14.8	q			8.7					PG _,
,			20002		u C			,	,					1.
10	Keplace snock absorber		75007		4			4	4					
	Perform A maintenance (partial final)		21123	8.5	4.8	0			16.2			8.5		
														ı
	Complete final technical inspection		22420	19.1	10.1				24.9			19.1		ı
	TOTALS			40.1	51.5	ı	0	0.2	70.5	0	0	40.1		i 1
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S	STEYP-TE Form 70, 8 Apr 70 (Rev). Edition o	n of 11 Dec	69 is	obsolete		IS)	(STEYP-TAU	AU SOP		2-06-07)				ì

MAINTENANCE ANALYSIS							00 31010							
CLARIT 1-W-120-151-034 Truck, Utility, 1/4-Ton, 444, M15140 Order	Σ	AINTE	NANCE ANALYSIS	PROJEC			Ö Z	MENCLAT	URE					IDENTIFICATION NO.
Maintenance Maintenance Maintenance Maintenance Life			CHART	1-VG-	120-15	1-034	Tı		:11ity	, 1/4-1		(151A2		02DU 867 0
Second S					MAINT	ENANCE								NOTE:
COMPONENT AND COMPONENT AN					1010	CREW			ACT	3/1	1 F			ī
No. No.	8 G		COMPONENT AND		ORC I ORC	ECT	TECH	MANUAL	MAINTE		•	REA PERFO	SON	FAILURE
1 2 3 4 5 6 7 8 9 10 11 12 1 06 Corrected spark plug gap 0 0 X 0.3 0.3 0.3 13.6 X 1 01 Corrected torque on 11 0 0 X 0.2 0.2 0.2 13.6 X 1 12 Corrected torque on 11 0 0 X 0.3 0.3 0.3 13.6 X 1 12 Corrected torque on 0 0 X 0.2 0.2 0.2 13.6 X 1 13 Corrected torque on 0 0 X 0.3 0.3 0.3 0.3 1 14 Corrected torque on 0 0 X 0.2 0.2 0.2 1 15 Corrected torque on 0 0 X 0.3 0.3 0.3 1 10 Corrected torque on 0 0 X 0.1 0.1 1 10 Corrected torque on 0 0 X 0.3 0.3 2 15 15 15 15 15 3 15 15 15 15 4 15 15 15 15 5 16 Replaced lamp, left tail. 0 0 X 0.4 0.4 1306.6 X 5 16 Replaced lamp, left tail. 0 0 X 0.3 0.3 0.3 6 19 19 10 10 10 10 10 10	O Z			SNC		RECM	ADGT	NADQT		CLOCK		SCD	UNSCD	EPR No REMARKS
1 0.6 Corrected spark plug_gap 0 0 X 0.3 0.3 13.6 X 14 0.1 Corrected spark plug_gap 0 0 X 0.2 0.2 0.2 13.6 X 18 12 Corrected hand brake 0 0 X 0.3 0.3 13.6 X 18 18 12 Corrected hand brake 0 0 X 0.2 0.2 13.6 X 18 19 Corrected hand brake 0 0 X 0.2 0.2 13.6 X 19 Corrected lorgue on 0 0 X 0.1 0.1 13.6 X 19 Corrected lorgue on 0 0 X 0.1 0.1 13.6 X 19 Corrected lorgue on 0 0 X 0.1 0.1 13.6 X 19 Corrected lorgue on 0 0 X 0.1 0.1 13.6 X 19 Corrected lorgue on 0 0 X 0.1 0.1 13.6 X 19 Corrected lorgue on 0 0 X 0.4 0.4 136.6 X X 19 Corrected lorgue on left tail.et 0 0 X 0.4 0.4 136.6 X X 19 Corrected brake light 0 0 X 0.3 0.3 2011.0 X X 19 Corrected starter switch 0 0 X 0.3 0.3 2011.0 X X 19 Corrected fan belts 0 0 X 0.4 0.4 2650.0 X X 19 Corrected fan belts 0 0 X 0.4 0.4 2650.0 X X 19 Corrected lond-mile C C X 0.7 0.7 3840.0 X X 19 Corrected lond-mile C C X 0.7 0.7 3840.0 X X 19 Corrected lond-mile C C X X 0.5 0.5 2041.8 X X 19 Corrected lond-mile C C X X 0.5 0.5 2041.8 X X 19 Corrected lond-mile C C X X 0.7 0.7 3840.0 X 19 Corrected lond-mile C C X X 0.7 0.7 3840.0 X 19 Corrected lond-mile C C X Corrected lond-mile C C C C C Corrected lond-mile C C C C C C C Corrected lond-mile C C C C C C C C C	-	2	3		4	ည	9	7	111	6		11	12	1 1
14 01 Corrected torque on in- 0 0 X 0.2 0.2 13.6 X 15 Corrected torque on in- 0 0 X 0.3 0.3 13.6 X 16 11 Corrected hand brake 0 0 X 0.2 0.2 13.6 X 17 11 Corrected hand brake 0 0 X 0.2 0.2 13.6 X 18 12 Corrected torque on 0 0 X 0.2 0.2 13.6 X 19 10 Replaced lamp in turn 0 0 X 0.9 0.9 91.8 X 10 12 Replaced lamp in turn 0 0 X 0.9 0.9 91.8 X 10 12 Replaced lamp in turn 0 0 X 0.9 0.9 91.8 X 10 13 Replaced lamp in turn 0 0 X 0.9 0.9 91.8 X 10 13 Replaced lamp in turn 0 0 X 0.9 0.9 91.8 X 11 12 13 13 13 13 14 14 15 13 13 13 12 14 15 14 14 14 14 14 14	-	90	spark	le gab	0	0	X		0.3	0.3	13.6		Х	L5-3
In	1.4		tordue	fur-	0	0	×		0.2	0,2	13.6		X	L5-3
18 12 Corrected hand brake 0 0 X 0.3 0.3 13.6 X 10 In corrected togue on			take manifold bol	ts										
10 10 20 20 13.6 1	F		Corrected hand brak	e	0	0	×		0.3	0.3	13.6		X	L5-3
10 11 Corrected torque on 0 0 X 0.2 0.2 13.6 X			adjustment								•			
December December	Ĕ		Corrected torque on		0	0	×		0.2	0.2	13.6		×	L5-3
December Polts P			differential moun	ţ										
10 0.6 Replaced lamp in turn 0 0 0 X 0.1 0.1 13.6 X			bolts											
2 Grand handle 0 0 0 91.8 X 2 06 Replaced electrical fer- control of the control	F		Replaced lamp in tu	E	0	0	×		0.1	0.1	13.6		×	L5-3
2 0.6 Replaced electrical fer- on left taillight 0 X 0.9 91.8 X 3 0.6 Replaced lamp. left tail. 0 X 0.4 0.4 1306.6 X 4 0.6 Replaced lamp. left tail. 0 0 X 0.1 1754.9 X 5 0.6 Adjusted brake light 0 0 X 0.1 0.1 1754.9 X 5 0.6 Cleaned starter switch 0 0 X 0.3 2011.0 X 6 Cleaned starter switch 0 0 X 0.3 2011.0 X 7 O.6 Cleaned starter switch 0 0 X 0.5 0.5 2041.8 X 6 Performed 1000-mile C C X 0.4 2650.0 X 7 O.5 Adjusted fan belts 0 0 X 0.1 0.4 2650.0 8 Performed lood-mile			signal handle			•								
Trule on left taillight Sepleced lamp, left tail. O	2	90	Replaced electrical	fer-	0	0	×		0.9	0.9	91.8		×	L5-4
1			rule on left tail	11ght										
4 O6 Adjusted brake light 0 X 0.1 0.1 1754.9 X 5 O6 Cleamed starter switch 0 0 X 0.3 0.3 2011.0 X 6 Cleamed starter switch 0 0 X 0.3 0.3 2011.0 X 7 O5 Performed 1000-mile C C X 0.4 0.4 2650.0 X 8 Performed 1000-mile C C X 0.4 2650.0 X 9 Adjusted feadlight aim 0 0 X 0.4 0.4 2650.0 X 10 13 Replaced right rear tire 0 0 X 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	3	90	- 1	tail	0	0	×		7.0	7.0	1306.6		×	
4 06 Adjusted brake light 0 0 X 0.1 1754.9 X 5 06 Cleaned starter switch 0 0 X 0.3 2011.0 X 6 Cleaned starter switch 0 0 X 0.3 2011.0 X 6 Parformed 1000-mile C C X 0.5 2041.8 X 7 05 Adjusted fan belts 0 0 X 0.4 0.4 2650.0 X 8 Parformed 1000-mile C C X 0.6 0.6 3280.0 X 9 Adjusted headlight rear tire 0 0 X 0.7 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.6 0.6 3280.0 X 11 Performed 1000-mile C C X 0.7 0.7 3840.0 11 Performed			and	ņ										
4 06 Adjusted brake light 0 0 X 0.1 0.1 1754.9 X 5 Occleaned statter switch 0 0 X 0.3 0.3 2011.0 X 6 Cetacking) C C X 0.5 0.5 2041.8 X 7 O5 Adjusted fan belts 0 0 X 0.4 0.4 2650.0 X 8 Performed 1000-mile C C X 1.1 1.1 3000.0 X 9 O6 Adjusted headlight aim 0 0 X 0.6 0.6 3280.0 X 10 13 Replaced right rear tire 0 0 X 0.6 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.7 3840.0 X 1			switch											
5 0.6 Cleaned starter switch 0 0 X 0.3 2011.0 X 6 Csticking) 0 0 X 0.5 0.5 2041.8 X 7 0.5 Adjusted fan belts 0 0 X 0.4 0.4 2650.0 X 8 Performed 1000-mile C C X 1.1 1.1 3000.0 X 9 0.6 Adjusted headlight aim 0 0 X 0.6 3280.0 X 10 13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 11 Performed 1000-mile C C X 0.6 0.6 3280.0	4	90	Adjusted brake ligh	ţ	0	0	×		0.1	0.1	1754.9		×	
5 06 Cleaned starter switch 0 0 X 0.3 2011.0 X 6 (sticking) 0			switch										•	
6 (sticking) C X 0.5 0.5 2041.8 X 7 0.5 1ubrication 0 0 X 0.4 0.5 2650.0 X 8 Performed 1000-mile C C X 1.1 1.1 3000.0 X 9 0.6 Adjusted headlight aim 0 0 X 0.6 0.6 3280.0 X 10 1.3 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 10 1.3 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 11 Performed 1000-mile C C X 1.0 4000.0 X 1.0 12 Performed 1000-mile C C X 0.8 5000.0 X 1.0 13 Performed 6000-mile C C X 0.8 5000.0	2	90	Cleaned starter swi	tch	0	0	×		0.3	0.3	2011.0		×	L5-7
6 Performed 1000-mile C C X 0.5 2041.8 X 7 O5 Adjusted fam belts 0 0 X 0.4 2650.0 X 8 Performed fam belts 0 0 X 0.4 2650.0 X 9 Performed 1000-mile 0 0 X 0.6 3280.0 X 10 13 Replaced right rear tire 0 0 X 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.7 3840.0 X 10 13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 11 Performed 1000-mile C C X 1.0 4000.0 X 12 Performed 1000-mile C C X 0.8 0.8 5000.0 X 13 Performed 6000-mile <t< td=""><td></td><td></td><td>(sticking)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			(sticking)											
1	٩				S	ပ	×		0.5	0.5	2041.8	×		
Name			lubrication											
National 1000-mile C C X 1.1 1.1 3000.0 X	1	4	Adjusted ran belts		0)	× I		4.0	4.0	7,0502		4	LD-8
9 06 Adjusted headlight aim 0 0 X 0.6 0.6 3280.0 X 10 13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X 11 Performed logo-mile C C X 1.0 4000.0 X 0 12 Performed logo-mile C C X 0.8 0.8 5000.0 X 0 13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 X 1 13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 X 1 13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 X 1 13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 X 1	∞		Performed 1000-mile		ပ	ပ	×		1:1	7:1	3000.0	×		
10 13 Replaced right rear tire 0 0 0 X 0.0 5 3280.0 X (damaged) 11 Performed 1000-mile C C X 1 man	1	,	- 1	1	1		 - -		,	,			;	
13 Replaced right rear tire 0 0 X 0.7 0.7 3840.0 X	9	90	headlight	aim	0	0	×		9.0	9.0	3280.0		×	L5-17
11 Performed 1000-mile	9	13		- 1	0	0	×		0.7	0.7	3840.0		×	L5-14
11 Performed 1000-mile			(damaged)		·									
12 Performed 1000-mile	크	-	Performed 1000-mile		C	၁	×		1.0	1.0	40000	×		
12 Performed 1000-mile C C X 0.8 5000.0 13 Performed 6000-mile 0 X 10.7 5.4 5997.7 STEXP-TE Form 120, 11 Dec 69 (Rev). Previous edition is obsolete.			lubrication	1					. 1					
13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 STEXP-IE Form 120, 11 Dec 69 (Rev). Previous edition is obsolete.	12		Performed 1000-mile		ပ	ပ	×		8.0		5000.0	×		
13 Performed 6000-mile 0 0 X 10.7 5.4 5997.7 maintenance 2 men]		-	1		1			1 man	- 1				
STEYP-IE Form 120, 11 Dec 69 (Rev). Previous edition is obs	13	-			0	0	×		10.7		5997.7	×		
STEYP-TE Form 120, 11 Dec 69 (Rev). Previous edition is	_		maintenance						2 men					
		YP-TE 1	69	(Rev).	Prev	gno	ittion	18	solete,					

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					Chart	3B (Cc	(Continued)	ig)						_
\$	NATION	PA SISY INVESTIGATION	PROJECT	° O		Σ Ο Z	NOMENCLATURE	UR 타					02018670	
Σ			1-VG-120-151-034	0-151	-034	M	M151A2						0200000	_
			Ž	MAINTENANCE	ANCE					SYSTEM			NOTE:	
			1 0	LEVEL OP CREW	 			ACTIVE	VE	W L			MCF - MISSION CRITICAL	
			- O <u> -</u>	ORG		TECH MANUAL		MAINTENANCE		M - MILES	8 8 EA	REASON PFREORMED	FAILURE	
S G A	GROUP	Ž	<u> </u>	- 7 -		NS I KU		MAN-	CLOCK		SCD	UNSCD	EPR No REMARKS	
NO.	°°	RELATED OPERATIONS		PRESB	R C M		1		HOURST	10	-	12	13	Ţ
-	2	3		4	2	٩	1	ρ	2	li .	-	<u>.</u>		1
14	12	Cleaned front brake s	shoes	0	0	×		2.0	2.0	5997.7		×		η-
								1 man	c	7 2003		Δ	15-74 renlaced	T
15	90	Spark plugs leads	+		0	×		1 22	7.0	1.1660		4	4	1
;	5	0114	l a a a	 c	0	×		1.1	9.0	6518.0		X	Replaced, L5-26	
9	3							1 man						-T
17	i	1 0		ပ	၁	×		1.0	1.0	7000.0	×			1
1		lubrication						1 man	- 1			;		T
18	12	Adjusted hand parking		0	0	×		0.2	0.2	7382.7		×		Т
2								1 man	1	1 0001		Þ	Tananatad	Т
10	16	Front springs and		0	0	×		0.3	0.3	1387.1		4	Tushecrea	Τ
		1			,			1 man	9	7 2907 7		×	Inspected	T
20	16	Rear springs and		0	0	×			7.0	•				Τ
						>		1 man	0.0	7382.7		×	Inspected	
27	10	differential	onc-)		4		1 man			_			7
		put shaft seal		c	c	×			0.8	7806.4		×	Replaced	7
22	13	Inner tube, tire	-			4		1 man						
3		n	_	C	U	×		1.0	1.0	8001.6	X			7
73		1t.inction	+	,	,			1 man						T
6	5	Deslace tube		0	0	×		1.0	1.0	8074		×	L5-2/	Т
25	15	Replace tube	-	0	0	X		1.0	1.0	8163		×	L5-2/	Т
26	13	Replace flat tire with	th	0	0	×		0.5	0.5	8298.9		4		Т
		spare	1		,	ļ		-	1	8896	1	×	L5-27	Γ
27	13	Repair left rear tire,	e,	0	0	×		7:1	2	2520				
		be instal		0	c	×		0.3	0.3	8975	<u> </u>	×	L5-29	
28	3	Replace fuel cap gas	gasket	2	٥	4 >		. 1		0.0006	×	_		
52	-	Perform 1000-mile	-	اد	اد	4						_		7
		ion	1		C	×		0.8	0.8	9212	_	×		
<u>ස</u>	13	انه	rupe	٥	تاد	×			1.0		×			T
$\overline{1}$		Perrorm 1000-mile		,	,				_					٦
		lubrication	+											٦
	•	11 22 60			١,	20 74 7 60	٤	phanlete						
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32 33 33 34 40 40 40 40 40 40 40 40 40 40 40 40 40	AINTEL AINTEL	MAINTENANCE ANALYSIS CHART CHART CHART CHART 1-VG-1 COMPONENT AND RELATED OPERATIONS 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 1 2 3 1 3 1 2 1 1 1 2 1 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 3 1 2 1 1 2 1 1 3 1 2 1 1 3 1 2 1 1 4 06 Directional control 2 2 2 3 3 16 2 2 3 3 16 1 3 10 Rear shocks, lower mount 2 2 3 3 3 16 2 2 3 3 3 3 16 2 3 10 1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	[5 7] OOKT []	C C C C C C C C C C C C C C C C C C C	Chart Nomen Nom	CLAT 182 CLAT 182 CLAT 183 CLAT 184 CLA	11 NA TIN		11505 12276 12276 12276 12276 12431 13059 13059 13950 13950 13950	REASON PERFORMED SCD UNSCE 11		NOTE:: MCF - MISSION CRITICAL FAILURE 13 15-36, L5-37 L5-36, L5-37 L5-38, during 12,000- mile lubrication Tightened Replaced valve core Replaced valve core Replaced tube Replaced tube L5-33, replaced L5-47 L5-49
43	- -	leaks, repaired Perform 1000-mile	U	U	×		0.5	0.5	14029	×		
7	_	Tooks ronsired						ł				
420		Windshield washer pump	0	0	Х		1.5	•	13950		×	
		seals leak, repaired										
42B			0	0	×		4.5	2.3	13950		×	
		aired										
42A		front brake	0	0	×		• 1	•	13950		×	,
42	16			0	X		• [1.0	13950		×	L5-49
41	90			0	×		• [2.1	13452		×	L5-47
40A		out,	0	0	×		0.8	0.8	13059	×	,	33,
												ĺ
07		bolt		0	X		0.2	0.2	13059		×	Retightened
		lubrication										
99	!	1000-mi	ပ	ວ	X		•	0.7	13000	×		
38	13	left	0	0	×		•	0.8	12708		×	- 1
37	13			0	X		0.5	•	12431		X	valve
36	13			0	X		1.3	1.3	12276		×	4
35	01	ı.	0	0	×		0.3	0.3	12250		X	-
	_											mile lubrication
34A	\vdash	Į.	0	0	×		0.4	0.2	12084		×	during
_		lubrication										
34	!	Performed 12,000-mile	0	0	×		14.4	7.2	12084	×		- 1
												- 1
33	16	lower		0	×		0.1	0.1	11505		×	- 1
	_											- 1
32			О	ပ	×		1.0	1.0	11000	×		
-	2	3	4	5	9		8	6	10	11	12	13
o Z			PRESB		ADGT			CLOCK	R-ROUNDS		INSCD	No.
ς Ο Ε			1 1 0 1 8	•	TECH NINSTRU	CTIONS	¥ ;	Ш	H-HOURS	PERFO	RMED	
			1	:			MAINTE		ı	REA	NOS	FAILURE
			1	/EL			ACT	175	LIFE			1
		1	MAINT	ENANCE					SYSTEM			NOT C
Σ	AINIE	ANALISIS	3-120-15	11-034	Σ.	151A2						02DU8670
Ŀ		ANIAI VOIC	ı		NON	ENCLAT	URE				_	
					Cha	3B	(Conti	(pant				

STEYP-TE Form 120, 11 Dec 69 (Rev).

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Replaced turn signal

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Previous edition is obsolete.

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Flat tire, replaced

			ON 1000	Chart	35	(Concluded)	(pa					
¥Ψ	INTER				2	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	d C				2	ON NOT WELL THE WAY
		кт	1-VG-120-151-0	51-034		M151A2						02DU8670
			MAINTENA	INTENANCE LEVEL					SYSTEM			NOTE:.
			0 0 1 0	OP CREW) (2	ACTIVE MAINTENANCE		M - MILES	REASON	NOS	MCF - MISSION CRITICAL FAILURE
SEG	GROUP	COMPONENT AND	1 1	DIRECT	INSTRUCTIONS	CTIONS	2	E	H-HOURS-	PERFORMED	RMED	
°o z	o v	RELATED OPERATIONS	2	RECM	ADQT	NADQT	MAN- HOURS	CLOCK HOURS	R ROUNDS	Scb	UNSCD	EPR No REMARKS
-	2	3	4	5	9	7		6	10	11	12	13
45A	15	Checked front end	Ŧ	F	×		3.0	3.0	14840		×	
		ment										
95		Perform 1000-mile	ပ	U	×		0.5	0.5	14994	×		
		lubrication										
47	16	Left front shock,	0	0	×		2.4	2.4	14999		×	L5-50
		replaced										
85	13	Flat tire, install spare	C e	ပ	×		0.3	0.3	15060		×	
49	13	Left rear tube, replace		0	×		1.0	1.0	15240		×	
20	12	Replace brake linings	0	0	×		2.5	1.5	15263		×	
13	1	Perform 1000-mile	ပ	ပ	×		1.2	9.0	16008	×		
		lubrication						- 1				
52	i	Perform 1000-mile	O	ပ	×		0.8	0.8	17047	×		
		Iubrication										
53	1	Perform 1000-mile	ပ	၁	×		0.8	0.8	18020	×		
		Iubrication										
54	1	Perform 18,000-mile	0	0	×		27.8	11.2	18639	×		
		maintenance									•	
54A	90	Replace spark plug lead	0	0	×		9.0	9.0	18639		×	
54B	12	Replace parking brake	0	0	×		2.8	1.7	18639		×	
		band										
55	i	Perform 1000-mile	O	ပ	×		0.8	8.0	19022	×		
		lubrication	-					i				
-56	!	Perform 1000-mile	O	S	×		0.7	0.7	20097	×		
1	,		_1_	C	Þ		u c	7	20002		λ	(15-51) nuive
76.	9 %				4 >				20021		4 >	10
χ ς γ	13	Replace panel bulb	2 0	ی د	< ×		0.5	2.0	20573	×	4	1
1	<u></u>	with spare	-									
09	1	Perform 1000-mile	ပ	၁	×		0.4	0.4	21002	×		
		lubrication										4
19	01	Performed A maintenance	0	0	×				21123	×		
		and final in part										
		TOTALS					116.4	78.0				
STEYP-TE		Form 120, 11 Dec 69 (Rev).		Previous ed	edition	18	obsolete.	_				

IV-32

			PROJECT	°O _N	NOMENCLATURE	RE				IDENTIFICATION
2	DADTCA	ANAI VSIS CHART	,	. (of your oo
\			1-VC	1-VG-120-151-034 Truck,		Utility, 1	1/4-Ton, 4x4	, MI51A2	1A2	02DU8 67 0
					MAINTENA	MAINTENANCE	PART LIFE			
					1	OP CREW				
				٠.,	F - DIRE	ORG DIRECT	M - MILES			
i i	(1	GENERAL	H HOURS	REASC	REASON USED	
SEO.	NO.	PEDERAL STOCK NO.	ΩTY	NOMENCLATURE	PRESB	RECM	ROUNDS	scp.	UNSCD	EPR No REMARKS
-	2		4	S	9	7	8	6	10	-
-	90	GE-1829		Lamp, incandescent	0	0	13.6		X	1.5-3
1	0,0	6220-669-5623	1	1 2	0	0	91.8		X	L5-4
10	13	2610-678-1363	-	l a	0	0	3840.0		×	LS-14
12	13	2610-269-7332	-	Inner tube, pneumatic	0	0	3840.0		X	15-14
				tire						
15	90	2920-843-1717	2	Leads, spark plug	0	0	5997.7		×	15-24
16	10	2520-887-1347	1	rear o	0	0	6518.0		×	L5-26
22	13	2610-269-7332	-	Inner tube, pneumatic	0	0	7806.4		×	L5-27
				tire						
24	13	2610-269-7332	1	Tube, pneumatic	0	0	8074		×	L5-27
25	13	2610-269-7332	٦	Tube, pneumatic	0	0	8163		×	L5-27
27	13	2610-269-7332	1	Tube, pneumatic	0	0	9688		×	L5-27
28	03	2910-930-2060	7		0	0	8975	_	×	L5-29
30	13	2610-269-7332	-	Tube, pneumatic	0	0	9212		×	
34	0.1	2940-832-6054	П	Filter, oil	0	0	12084	×		15-36, 15-37
34A	90 ▶	2540-953-2180	П	Control, directional	0	0	12084		×	L5-38
36	13	2610-678-1363	1	Tire, pneumatic	0	0	12276		×	L5-33
	13	2610-269-7332	н	Tube, pneumatic	0	0	12276		×	L5-33
37	13	Unknown	7	Valve core	0	0	12431		×	
38	13	2610-269-7332	1	pneuma	0	0	12708		×	
40A	13	2610-678-1363	7	Tire, pneumatic	0	0	13059	×		L5-33
41	01	AR 75	4	Spark plug	0	0	13452		×	L5-47
41	01	P1-ZZ TGW3028DS	-	Contact, point set	9	9	13452	_	×	L5-47
42	16	2510-678-2963	7	Spring	0	0	13950		×	1.5–49
4.5	90	2540-953-2180	П	Control, turn signal	0	0	14840		×	L5-48
47	16	2540-176-9466		Shock absorber	0	0	14999		×	15-50
		2530-700-1423	2	Dust covers, brake						
49	13	2610-269-7332	1	Tube, pneumatic	0	0	15240		×	
50	12	2530-678-3111	8	Brake, lining shoe	0	0	15263		×	
54	03	2940-678-4253	-1	ы	0	0	18639	×	 	18,000-mile maintenance
	5	11630417	-	Filter oil	9	d	18639	×		L3-3/
544	90	2920-843-1718	4	Lead spark plug	0	0	18639	\downarrow	×	
			_		_					

	IDENTIFICATION OF THE OPENING THE OPENING TO THE OPENING THE OPENI	0200010					D EPR No REMARKS			\dashv	+	Worn out																		
						REASON USED	SCD UNSCD	9 10	X	X	×	×																		
	-		PART LIFE		M - MILES	# -HOURD	- BOUNDE - B	8	18639	20097	20173	20573																		
	RE			- OP CREW	DIRECT	- GENERAL	RECM	7	0	0	0	0																		
(Concluded)	NOMENCLATURE	N151A2	MAINT	11	1	1 I	PRESB	9	0	0	0				-		-													
Chart 3C (Con	0 Z	1-VG-120-151-034 N					NOMENCLATURE		Parking brake band	Shock absorber	Lamp, instrument panel																			
	<u>a</u>						αTΥ	4	1	1	1	1			-	-		_		-	-				_			-		-
	ANAI VSIS CHART	- 1					FEDERAL STOCK NO.	3	2530-678-1284	2540-678-2978	GE 1829	2610-678-1363																		
		PAKIS A					GROUP No.	2	∥⁻	l_		13																		
		PA					SEO.	-	54B	57	58	59																		

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MAINTENANCE LITERATURE	TUR	FACRAGE E CHART	1-VG-120-151-034	M151A2,	Truck, Ut	Utility, 1/	1/4-Ton, 4x4	02b U8670
		MANUSCRIPT		DATE RE	RECEIVED	EVALUATION	FORM 1598	
NUMBER	QTY	I	TITLE	LIT.	MATERIAL	ADOT NADOT	QT DATE FORWARD	REMARKS
1	2		3	4	5	2 9	8	6
1M-9-2320- 218-10	-	Truck, Utility, N151	y, 1/4-Ton, 4x4,	Mar 68	Apr 70	X	None	Not evaluated
TM-9-2320- 218-10 C/1	П	Truck, Utility, M151A2	.y, 1/4-Ton, 4x4,	Dec 69	Apr 70	×	None	Not evaluated
TM-9-2320- 218-20	-	Truck, Utility, M151	y, 1/4-Ton, 4x4,	Aug 68	Apr 70	×	None	Not evaluated
TM-9-2320- 218-20 C/1		Truck, Utility, M151A2	y, 1/4-Ton, 4x4,	Jan 70	Apr 70	×	None	Not evaluated
TM-9-2320- 218-20P	1	Truck, Utility, M151	y, 1/4-Ton, 4x4,	Apr 68	Apr 70	×	None	Not evaluated
TM-9-2320- 218-20P C/2	1	Truck, Utility, M151A2	y, 1/4-Ton, 4x4,	Jan 70	Apr 70	×	None	Not evaluated
TM-9-2320- 218-34	1	Truck, Utility, M151	y, 1/4-Ton, 4x4,	Jul 68	Apr 70	×	None	Not evaluated
TM-9-2320- 218-34 C/2	1	Truck, Utility, M151A2	y, 1/4-Ton, 4x4,	Jan 70	Apr 70	×	None	Not evaluated
TM-9-2320- 218-34P		Truck, Utility, M151	y, 1/4-Ton, 4x4	Apr 68	Apr 70	×	None	Not evaluated
TM-9-2320- 218-34P C/1	П	Truck, Utility, M151A2	y, 1/4-Ton, 4x4,	Jan 70	Apr 70	X	None	Not evaluated
	_							

		1							
SPECIAL TOOLS A	AND PROJECT	°°		NOMENCLATURE	TURE				TDENTIFICATION
TEST EQUIPMENT CH	CHART 1-VG-	1-VG-120-151-034	-034	Truck, Ut	Utility,	1/4-Ton,	on, 4:	4x4, M151A2	02DU8 670
		MAINTENANCE	NANCE						
			- OP CREW				REG		
			ORG				YES	TECHNICAL	
NOMENCLATURE OR	FEDERAL STOCK	1 1	DIRECT	DATE	EVALUATION	NO F	o g	MANUAL	
Ž	L	PRE	RECM	RECEIVED	ADGT 1	I NA DOT	O Z	REFERENCE	REMARKS
,	2	3	4	5	9	7	8	6	01
Bag, cotton duck	5140-772-4142	၁	၁	Apr 70	X			9-2320-218-	Ж ЭОЕ Ж
								10	
Jack	2120-729-5779	ပ	S	Apr 70	×			•	
Pliers, slip joint	5120-223-7397	O	U		×				
river	5120-222-8852	ပ	ပ	Apr 70	×				
Wrench, adjustable	5120-240-5328	ပ	၁	Apr 70	Х				
Wrench, socket handle	5120-811-4114	၁	င	Apr 70	X				
jack	5120-708-3364	၁	၁	Apr 70	×			9-2320-218-	Ж Д
								10	
Tool kit, Set A	4910-627-7048	0	0	Apr 70	×			9-2320-218-	Organizational tools
						-		20P	available and utilized
Tool kit, Set B	4910-627-7049	0	0	Apr 70	X			9-2320-218-	
								20P	
Tool kit, Set B	4910-627-7049	0	0	Apr 70	×			9-2320-218-	
								34P	
Sling, engine and	4910-627-7044	0	0	Apr 70	×			9-2320-218-	Organizational tools
								34P	available and utilized
								,	
	-								
								,	
·									
STEYP-TE Form 123, 11 Dec	69 (Rev).	Previous		edition is obsolete.	olete.				

APPENDIX V. REFERENCES

- 1. Directive for Initial Production Test of Trucks, Utility: 1/4-Ton, 4x4, M151A2, USATECOM Project No. 1-VG-120-151-034, 15 January 1970.
- 2. Letter, U.S. Army Aberdeen Research and Development Center, AMXCC-FL, subject "Temperature Limits for Lubricating Oils and Hydraulic Fluids," 24 October 1967.
- 3. MIL-A-13488A(Ord), Military Specification for Air Cleaner, Engine: Heavy-Duty, Oil Bath Type (for Internal Combustion Engines), 22 December 1955.
- 4. MIL-STD-130C, Military Standard for Identification Marking of U.S. Military Property, 29 September 1967.
- 5. MIL-STD-642H, Identification Marking of Combat and Tactical Transport Vehicles, 1 November 1968.
- 6. MIL-T-45331C(MO), Military Specification for Truck, Utility: 1/4-Ton, 4x4, M151A1, 4 February 1966.
- 7. MTP 2-2-614, Aberdeen Proving Ground, subject "Toxic Hazard Test for Vehicles," 18 June 1968.
- 8. MTP 2-2-503, Aberdeen Proving Ground, subject 'Maintenance, Vehicle," 15 January 1966.
- 9. MTP 2-4-001, Yuma Proving Ground, subject 'Desert Environmental Testing of Wheeled and Tracked Vehicles," 1 March 1968
- 10 Test Plan for Initial Production Test of Truck, Utility, 1/4-Ton, 4x4, M151A2, Yuma Proving Ground, January 1970.
- USATECOM Regulation 750-15, subject "Maintenance of Supplies and Equipment," 1 December 1969.
- 12. Slater, F. G., Inspection Comparison Test of Truck, Utility, 1/4-Ton, M151A1, USATECOM Project No. 1-7-4030-87, YPG Report 9012, January 1969.
- 13. Holman, John C., Inspection Comparison Test of Truck, Utility, 1/4-Ton, Mi51A1, USATECOM Project No. 1-VG-120-151-016, YPG Report 9089, December 1969.
- 14. Foster, J. W., Product Improvement Test of Components for Truck, Utility, 1/4-Ton, 4x4, M151A1, YPG Report 9024, March 1969.

APPENDIX VI. ABBREVIATIONS

gm - Gram(s)

GVW - Gross vehicle weight

MTP - Materiel Test Procedure

Para. - Paragraph

PN - Part number

USATECOM - U.S. Army Test and Evaluation Command

MMBM - Mean miles between maintenance

MMH - Maintenance man-hours

MTBM - Mean time between maintenance

MTBF - Mean time between failures

APPENDIX VII. DESCRIPTION OF YPG TEST COURSES

Dynamometer Course (Also Paved Durability Test Course)

A 2-mile smooth near-level (0.8 percent upgrade from south to north) 30-foot wide roadway with 500-foot radius turn-arounds at each end, surfaced with a high strength asphalt. The course is located at an elevation of approximately 470 feet above sea level and is staked at 0.1-mile intervals.

Truck Gravel Course (Straight Secondary)

An elongated loop, 3.1 miles in length and 40 feet wide with a graded gravel surface; this course is used to simulate vehicle operation at convoy speeds on secondary roads.

Tank Gravel Course (Winding Secondary)

A 3.6-mile compacted and graded gravel course with short, straight sections and curves of varying radii. This course provides a test of steering mechanisms at medium vehicle speeds.

Truck Level Cross-Country

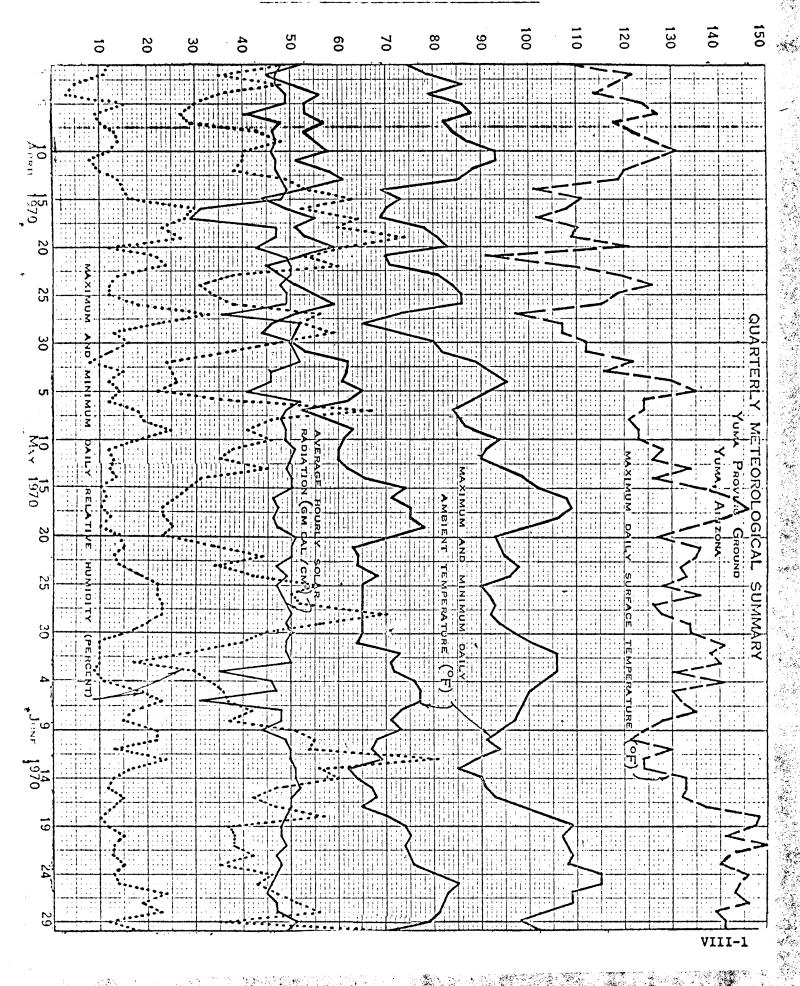
A 6.4-mile cross-country course over typical terrain consisting of desert pavement, sand and gravel washes, and loose sandy areas. This test course is used for durability tests of wheeled vehicles. The course is relatively level except for sharp embankments encountered where washes are crossed.

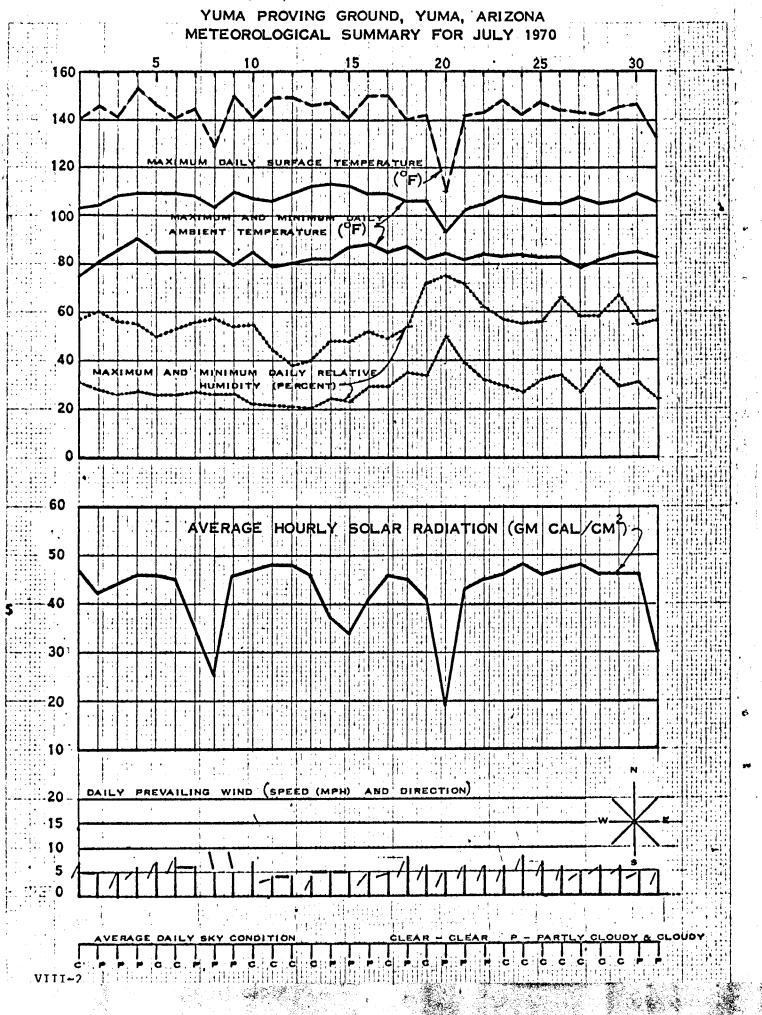
Truck Hilly Cross-Country Course

The course is a 2.7-mile test course with grades to 20 percent, several hundred feet in length. The surface varies from a rough, stony surface to loose rock, gravel and sand. Operation on this course requires frequent braking and shifting of transmission gears under load.

Belgian Block Equivalent Course

The course has a rough, stony surface with short straight sections and curves of varying radii. The course subjects the vehicle to severe, high frequency vibration.





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An initial production test of three True	cke Utility	1/4-Ton	4x4. M151A2 was con-		
An initial production test of three fide	oriod 6 April	±0 3 Augu	1970		
ducted by Yuma Proving Ground during the po	SITOU O APITI	LO J Augo			
The purpose of the test was to determine	e contractor c	onformano	ce to contractual re-		
quirements, investigate adequacy of quality	y assurance pr	ocedures	and provide verili-		
cation of safety of the vehicles with part	icular emphasi	s on veh:	icle stability.		
After 1000 miles of break-in, each truc	k completed ap	proximate	ely 20,000 miles of		
durability operation. Cooling, dust, toxic	c hazard and v	arious p	erformance tests were		
durability operation. Cooring, dust, toxi	e ware made	Tests we	re also undertaken to		
run, and safety and maintenance evaluation					
determine the effect of the new semi-trail	ing arm rear s	uspensio	n on senicie pranitirà		

and handling.

It was concluded that:

- Vehicle was not adequately suppressed for radio interference radiation.
- The design and/or quality of the A-frame control arms and propeller shaft yokes are inadequate.
- c. Uneven application and brake pulling observed throughout test constitutes a safety hazard.
- d. The rear suspension redesign has substantially improved vehicle stability and handling.

It was recommended that the brake and A-frame problems be corrected and that all deficiencies and as many shortcomings as possible be corrected.

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