RECONDITION TEST OF TRUCK, UTILITY, 1/4-TON, 4x4, M151, USA REG NO. 2F4501 AND 2D3782

FIRST AND FINAL LETTER REPORT

BY

MICHAEL J. BONKOSKI, 2LT, ORDC
DECEMBER 1970

YUMA PROVING GROUND
YUMA, ARIZONA

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STEYP-MTN

SUBJECT: First and Final Letter Report on Recondition Test (RT) of Truck, Utility, 1/4-Ton, 4x4, M151, USA Reg No. 2D3782 and 2F4501, Serial No. 3782 and 4501, PRON No. EH-0-7Q299-01-EH-L5, USATACOM Project No. QKP-ICT-70-P01, USATECOM Project No. 1-VG-120-151-047, FY70 Depot Overhaul Program

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

Dates of Test: 7 July to 6 November 1970

1. REFERENCE


2. BACKGROUND

The two Trucks, Utility, 1/4-Ton, 4x4, M151, USA Reg No. 2F4501 and 2D3782, covered in this report were submitted for recondition testing as part of the FY70 Depot Overhaul Program. The two trucks were rebuilt at Pueblo Army Depot, Pueblo, Colorado. The vehicles arrived on 29 June 1970 with odometer readings of 45.9 and 87.9 miles. Testing began on 7 July 1970 with the Initial Technical Inspection.

3. OBJECTIVE

To provide evidence of conformance to overhaul standards, production capability and the adequacy of the quality assurance system.

4. SUMMARY OF RESULTS

a. Receiving Inspection

No evidence of shipping damage was noted on receipt of vehicles.
b. Initial Technical Inspection

This inspection was performed to assure that the vehicles were in proper operating condition prior to test operations. Results of this inspection are contained in Inclosures 1 and 2.

Shortcomings discovered, corrected (except cracked distributor cap), and reported during this inspection were as follows:

USA REG NO. 2F4501

(1) Defective fan (EPR L5-1, Incl 4 and Fig. 1, Incl 5)
(2) Glazed hand brake band (EPR L5-2, Incl 4)
(3) Insufficient distributor point gap and cracked distributor cap (EPR L5-3, Incl 4)
(4) Improper brake pedal adjustment (EPR L5-4, Incl 4)
(5) Transfer case leak and poor fit of spacer (EPR L5-5, Incl 4)
(6) Incorrect headlight adjustment (EPR L5-7, Incl 4)

USA REG NO. 2D3782

(1) Defective fan (EPR L5-1, Incl 4)
(2) Glazed hand brake band (EPR L5-2, Incl 4)
(3) Incorrect headlight adjustment (EPR L5-7, Incl 4)
(4) Insufficient torque values on engine mount bolts (EPR L5-8, Incl 4)
(5) Missing coil hold-down screw (EPR L5-9, Incl 4)
(6) Broken alternator adjusting arm bolt (EPR L5-10, Incl 4)

c. Endurance Test

Vehicles USA Reg No. 2F4501 and 2D3782 were subjected to 5005 and 5128 miles of endurance testing, respectively. A breakdown of test mileage and fuel and oil consumption data is contained in Inclosure 3.

Deficiencies reported during this phase were as follows:
STEYP-MTN
SUBJECT: First and Final Letter Report on Recondition Test (RT) of Truck, Utility, 1/4-Ton, 4x4, M151, USA Reg No. 2D3782 and 2F4501, Serial No. 3782 and 4501, PRON No. EH-0-7Q299-01-EH-L5, USATACOM Project No. QKP-ICT-70-P01, USATECOM Project No. 1-VG-120-151-047, FY70 Depot Overhaul Program

USA Reg No. 2D3782

Failed universal joint fasteners, rear axle shaft (EPR's L5-11, 12, 16). EPR's L5-11 and 12 were reclassified as deficiencies due to loss of vehicle control that could result in the event failure occurs at highway speed (EPR's L5-11, 12, 16, Incl 4).

USA Reg No. 2F4501

Failed transmission input shaft (EPR L5-14, Incl 4 and Fig. 2, Incl 5).

Shortcomings reported during this phase were as follows:

USA Reg No. 2D3782

(1) Damaged and worn rubber suspension bumpers (EPR L5-17, Incl 4)
(2) Improper front end alignment (EPR L5-18, Incl 4)
(3) Oil leak through O-ring in speedometer cable fitting on transfer case (EPR L5-19, Incl 4)
(4) Cracked parking brake drum (EPR L5-20, Incl 4)
(5) Broken steering wheel spoke (EPR L5-21, Incl 4)
(6) Missing tail pipe clamp (EPR L5-22, Incl 4)

USA Reg No. 2F4501

(1) Leaking fuel line (EPR L5-6, Incl 4)
(2) Loose universal joint fasteners (EPR L5-13, Incl 4)
(3) Oil in distributor (EPR L5-23, Incl 4)
(4) Improper front end alignment (EPR L5-24 (18-2), Incl 4)
(5) Broken exhaust clamp bolt (EPR L5-25, Incl 4)
d. Final Technical Inspection

This inspection was performed to determine the existence of any damage, defects, or abnormal wear resulting from test operations. A repeat of checks and services made during the initial technical inspection was conducted. Shortcomings noted during this inspection were as follows:

**USA Reg No. 2D3782**

1. Cracked frame center members (EPR L5-26, Incl 4 and Fig. 3, Incl 5).
2. Undertorqued universal joint bolts (EPR L5-29, Incl 4).
3. Excessive play in ball joints (EPR L5-30, Incl 4).
5. Worn shock absorber (EPR L5-32, Incl 4).
6. Cracked A-frame (EPR L5-34, Fig. 7, Incl 4).

**USA Reg No. 2F4501**

1. Missing and worn thrust washers (EPR L5-27, Incl 4 and Fig. 4 and 5, Incl 5).
2. Undertorqued rear suspension arm bushing bolts (EPR L5-28, Incl 4).
3. Shock absorber wet with fluid (EPR L5-32, Incl 4).
4. Cracked A-frame (EPR L5-34, Fig. 7, Incl 4).

The following EPR was submitted for information only on vehicle 2D3782: Weld on lower A-frame (EPR L5-33, Incl 4 and Fig. 6, Incl 5).

Results of the final technical inspection are contained in Inclosures 6 and 7. An engine teardown, as requested by USATACOM, was performed. The teardown was for crankshaft removal and inspection. Upon removal USATACOM requested that the two crankshafts be sent to Ford Motor Company and new crankshafts were received as replacements.
5. CONCLUSIONS
   a. Quality control and workmanship by the depot were unsatisfactory.
   b. Durability of universal joint fasteners on rear axle shafts was unsatisfactory.

5. RECOMMENDATIONS
   a. Quality control and workmanship be improved.
   b. Durability of universal joint fasteners on rear axle shafts be improved.

FOR THE COMMANDER:

GEORGE A. CUSTER
COL, Inf
Director of Materiel Test
INITIAL TECHNICAL INSPECTION (Vehicle USA Reg No. 2D3782)

DATES OF INSPECTION: 7 July to 21 July 1970

ENGINE: Group 1:

Engine mount bolts were undertorqued - 3 at 0 lb-ft and 1 at 20 lb-ft. They were retorqued to 35 lb-ft.

CLUTCH: Group 02:

Free play was 2 inches; adjusted to 1-1/4 inches.

FUEL SYSTEM: Group 03:

Satisfactory

EXHAUST SYSTEM: Group 04:

Satisfactory

COOLING SYSTEM: Group 05:

No leakage was observed under pressure. Radiator cap relief pressure was 7.0 psi and recovery was at 6.5 psi. The fan was defective (EPR L5-1, Incl 4).

ELECTRICAL: Group 06:

Generator: 2F013646

Operation was satisfactory. Output voltage was 26.6 volts dc. The generator adjusting bolt was broken.

Starter: Serial No. 2A000618

Operation was satisfactory.

Distributor: Serial No. 20280

Operation was satisfactory.

Coil hold-down screw was missing.
Switches, Gages, and Lights:

Headlights were incorrectly adjusted as follows:

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1/2 Inches left</td>
<td>10 Inches right</td>
</tr>
<tr>
<td>10 Inches down</td>
<td>10 Inches down</td>
</tr>
</tbody>
</table>

They were readjusted to:

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Inch</td>
<td>0 Inch</td>
</tr>
<tr>
<td>9 Inches down*</td>
<td>3 Inches down</td>
</tr>
</tbody>
</table>

*Could not adjust to specification because adjusting screw was at maximum adjustment

TRANSMISSION: Group 07
Satisfactory

TRANSFER CASE: Group 08
Satisfactory

PROPELLER SHAFTS: Group 09
Satisfactory

FRONT AND REAR AXLES: Groups 10 and 11
Satisfactory

BRAKES AND WHEELS: Groups 12 and 13
The hand brake band was found to be glazed and out of adjustment.

CONTROLS: Group 14
Satisfactory

FRAME AND BRACKETS: Group 15
Satisfactory

Incl 1
Page 2 of 3
SPRINGS AND SHOCK ABSORBERS:  Group 16
Satisfactory

HOOD AND FENDERS:  Group 17
Satisfactory

BODY:  Group 18
Satisfactory
INITIAL TECHNICAL INSPECTION (Vehicle USA Reg No. 2F4501)

DATES OF INSPECTION:  7 July to 21 July 1970

ENGINE: Group 01
Satisfactory

CLUTCH: Group 02
Pedal free play was 2 inches.

FUEL SYSTEM: Group 03
Components were satisfactory. Fuel pressure was 6 pounds.

EXHAUST SYSTEM: Group 04
Satisfactory

COOLING SYSTEM: Group 05
No leakage was observed under pressure. Radiator can relief pressure was 7.0 psi and recovery was at 6.0 psi.

The fan was defective (EPR L5-1, Incl 4).

ELECTRICAL: Group 06

Generator: Serial No. 1Z008549
Operation was satisfactory.
Output voltage was 27.7 volts dc

Starter: Serial No. 2Y000142
Operation was satisfactory.

Distributor: Serial No. 3X980317. Cracked distributor cap.
Point gap was .013 inch; reset to .020 inch.
Dwell angle 43 degrees; reset to 39 degrees.

Switches, Gages, and Lights:

Headlights were incorrectly adjusted as follows:

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-1/2 Inches left</td>
<td>2 Inches right</td>
</tr>
<tr>
<td>4 Inches down</td>
<td>7 Inches down</td>
</tr>
</tbody>
</table>

Incl 2
Page 1 of 2
They were adjusted to:

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 Inch</td>
<td>0 Inch</td>
</tr>
<tr>
<td></td>
<td>3 Inch down</td>
<td>6-1/2 Inch down*</td>
</tr>
</tbody>
</table>

*Could not adjust to specification because adjusting screws were at maximum adjustment

TRANSMISSION: Group 07
Operation was satisfactory.

TRANSFER CASE: Group 08
Transfer was leaking through thrust washer retaining rivet. Rear spacer in the transfer was also defective (EPR L5-5, Incl 4).

PROPELLER SHAFTS: Group 09
Satisfactory

FRONT AND REAR AXLES: Groups 10 and 11
Satisfactory

BRAKES AND WHEELS: Groups 12 and 13
The service brake pedal free play was 1-3/4 inches. Adjusted to specified The hand brake band was glazed and out of adjustment. (EPR L5-2, Incl 4).

CONTROLS: Group 14
Satisfactory

FRAME AND BRACKETS: Group 15
Satisfactory

SPRINGS AND SHOCK ABSORBERS: Group 16
Satisfactory

HOOD AND FENDERS: Group 17
Satisfactory

BODY: Group 18
Satisfactory

Incl 2
OPERATIONS SUMMARY

VEHICLE: Truck, Utility, 1/4-Ton, 4x4, M151, Serial No. 2D3782

Endurance Mileage

<table>
<thead>
<tr>
<th></th>
<th>Paved</th>
<th>Hilly Cross-Country</th>
<th>Level Cross-Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>With trailer</td>
<td>552.5</td>
<td>1035.0</td>
<td>1044.0</td>
</tr>
<tr>
<td>Without trailer</td>
<td>450.1</td>
<td>1000.0</td>
<td>1000.0</td>
</tr>
<tr>
<td>Break-in</td>
<td>101.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial odometer: 45.9 miles
Final odometer: 5228.6 miles
Total test miles: 5182.7

Fuel and Lubricant Consumption

Gasoline consumption: 421.3 gallons
Economy: 12.3 miles per gallon

Engine oil consumption: 7.0 quarts

Transmission oil consumption: 1.0 quarts

VEHICLE: Truck, Utility, 1/4-Ton, 4x4, M151, Serial No. 2F4501

Endurance Mileage

<table>
<thead>
<tr>
<th></th>
<th>Paveda</th>
<th>Hilly Cross-Countryb</th>
<th>Level Cross-Countryb</th>
</tr>
</thead>
<tbody>
<tr>
<td>With trailer</td>
<td>453.1 m</td>
<td>1000.1</td>
<td>1000.2</td>
</tr>
<tr>
<td>Without trailer</td>
<td>451.4</td>
<td>1000.2</td>
<td>1000.1</td>
</tr>
<tr>
<td>Break-in</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial odometer: 87.9 miles
Final odometer: 5093.0 miles
Total test miles: 5005.1

Fuel and Lubricant Consumption

Gasoline consumption: 327.8 gallons
Economy: 15.3 miles per gallon

Engine oil consumption: 3.5 quarts

Transmission oil consumption: 1 pint

aTrailer payload, 1300 pounds.
bTrailer payload, 1000 pounds.

Incl 3
### SUMMARY OF DEFECTS

<table>
<thead>
<tr>
<th>No.</th>
<th>VCH</th>
<th>TH (Cal.)</th>
<th>Type</th>
<th>Item</th>
<th>Part No.</th>
<th>Test Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>4501</td>
<td>1</td>
<td>B</td>
<td>Fan</td>
<td>11599014</td>
<td>0</td>
<td>The fan was slightly bent. Upon removal, it was found to be cracked around the rivets on both fan blades. The fan was replaced. (Fig. 1, Incl 5).</td>
</tr>
<tr>
<td>12</td>
<td>4501</td>
<td>2</td>
<td>B</td>
<td>Hand brake band</td>
<td>2530-678-1284</td>
<td>0</td>
<td>Brake application was ineffective until maximum force was applied. Both vehicles under test had the same problem and in both cases the bands were replaced. The old bands were hard and glazed making them ineffective.</td>
</tr>
<tr>
<td>06</td>
<td>4501</td>
<td>3</td>
<td>B</td>
<td>Distributor</td>
<td>2920-353-7206</td>
<td>0</td>
<td>The distributor point gap was .013 inch and was reset to .020 inch. Also, the distributor cap was found to be cracked around a mounting screw. Since the cap was considered to be serviceable, it was not replaced.</td>
</tr>
<tr>
<td>12</td>
<td>4501</td>
<td>4</td>
<td>B</td>
<td>Brake adjustment</td>
<td>NA</td>
<td>0</td>
<td>The service brake pedal free play was 1-3/4 inches rather than the specified 1/2 inch. Adjusted to 1/2 inch.</td>
</tr>
<tr>
<td>08</td>
<td>4501</td>
<td>5</td>
<td>B</td>
<td>Transfer case and spacer</td>
<td>8754379-85</td>
<td>0</td>
<td>The transfer case was leaking lubricant. Upon investigation a rivet on the transfer case was found loose. Since oil was dripping out, the transfer case was disassembled for repair. During the repair, spacer (8754379-85) was found poorly seated over the snap ring on the output shaft. Spline had been cut into one side of the spacer as it worked around the shaft. Apparently the spacer</td>
</tr>
<tr>
<td>NO.</td>
<td>VNR</td>
<td>ENG.</td>
<td>NO. 1</td>
<td>TYPE</td>
<td>NO. 1</td>
<td>ITEM</td>
<td>PART NO.</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>03</td>
<td>4501</td>
<td>6</td>
<td>B</td>
<td>Fuel line</td>
<td>4730-013-7393</td>
<td>678</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>4501</td>
<td>7</td>
<td>B</td>
<td>Headlight adjustment</td>
<td>NA</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

had not been the right size. The rivet and spacer were replaced.

A complaint of excessive gas fumes disclosed a leak in the fitting at the top of the gas tank. The coupling was repaired with sealing tape and operation was continued. No further fumes were noticed.

The headlight beams were received incorrectly adjusted as follows (in.):

**Vehicle 2P4501**

- Left
  - 3 1/2 left
  - 4 down

- Adjusted to:
  - 0 left and right
  - 3 down

**Vehicle 2D3782**

- Left
  - 4 1/2 left
  - 10 down

- Adjusted to:
  - 0 left and right
  - 9 down

*Specification, using mechanical aimers, is 0 inch right or left and 3 inches down. No further adjustment could be made because adjusting screws were at maximum adjustment.
<table>
<thead>
<tr>
<th>ORDER NO.</th>
<th>SLNO.</th>
<th>VNR. NO.</th>
<th>TYPE</th>
<th>V/H</th>
<th>LM</th>
<th>PART NO.</th>
<th>TEST MILEAGE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>3782</td>
<td>8</td>
<td>B</td>
<td></td>
<td></td>
<td>5305-710-4193</td>
<td>0</td>
<td>The torque was at 0 lb-ft on three engine mount bolts and 20 lb-ft on the fourth. Retorqued to 35 lb-ft.</td>
</tr>
<tr>
<td>06</td>
<td>3782</td>
<td>9</td>
<td>B</td>
<td></td>
<td></td>
<td>424561</td>
<td>0</td>
<td>The engine stopped shortly after it was started. Since it would not restart, the distributor was disassembled. One coil hold-down screw had come loose and dropped between the points shorting the circuit. The screw was reinstalled and the engine started.</td>
</tr>
<tr>
<td>06</td>
<td>3782</td>
<td>10</td>
<td>B</td>
<td></td>
<td></td>
<td>5306-908-2500</td>
<td>0</td>
<td>The generator adjusting bolt was found broken. The bolt was replaced.</td>
</tr>
<tr>
<td>11</td>
<td>3782</td>
<td>11</td>
<td>A</td>
<td></td>
<td></td>
<td>8352296</td>
<td>425</td>
<td>The right rear outside U-joint failed on the propeller shaft. One U-joint needle bearing retainer was found broken and the other damaged. The two races opposite the retainer were unseated, allowing possible movement. The U-joint assembly was replaced. Reclassified a deficiency due to recurring failures.</td>
</tr>
<tr>
<td>12</td>
<td>3782</td>
<td>12</td>
<td>A</td>
<td></td>
<td></td>
<td>Not in TM</td>
<td>989</td>
<td>The right rear propeller shaft failed when the capscrews attaching the U-joint to the wheel spindle fell out. It should be noted here that this type of fastening device (capscrews) cannot be found in the technical manual pertaining to the M351 truck. According to the current TM for an M351 all U-joints should be fastened by use of a U-bolt. The propeller shaft, U-joint, and wheel...</td>
</tr>
</tbody>
</table>

STYP-TM Form 13, 18 Nov 64, Replaces STXT-61 Form 18, 14 May 63 which is obsolete.
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>4501</td>
<td>13</td>
<td>E</td>
<td>U-joint fasteners (right, rear propeller shaft)</td>
<td>Unknown</td>
<td>2840</td>
<td>spindle from an M151A1 were installed in the vehicle so that the testing operation could continue. Reclassified a deficiency due to recurring failures. There was severe vibration in the rear end of the vehicle while being driven to one of the test courses. Upon inspection of the right rear propeller shaft, the driver noticed that the U-bolt holding the U-joint in place was loose. Further inspection revealed that all U-bolts on the two rear propeller shafts were loose. The other vehicle being tested (USA No. 283782) had problems with cap screw fasteners (see EPR L5-12 dated 4 Sep 70). Although this vehicle also uses cap screw fasteners on the two rear propeller shafts, the difficulty was with the two U-bolts. The U-bolts were tightened and testing operations continued.</td>
</tr>
<tr>
<td>07</td>
<td>4501</td>
<td>14</td>
<td>A</td>
<td>Gear shaft, helical spur</td>
<td>2520-887-1350</td>
<td>3243</td>
<td>During operation on the truck hilly cross country course with towed load, the operator noted a loud noise coming from the transmission. On disassembly and subsequent inspection it was disclosed that two adjacent teeth were broken off the helical input gear shaft. No subsequent damage to other gears was noted. The failed part was replaced. (Fig. 2, Incl 5)</td>
</tr>
<tr>
<td>Item No</td>
<td>Date</td>
<td>Description</td>
<td>Notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
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<td>-------------</td>
<td>-------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3782</td>
<td>15</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3782</td>
<td>U-join fasteners</td>
<td>Replaced in 74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3782</td>
<td>17</td>
<td>Bumper, rubber, rear suspension</td>
<td>2516-573-3126, 1732</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3782</td>
<td>Bolt, machine: lever arm to cross member</td>
<td>5366-578-1416, 3749</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The U-joint fasteners on the left rear axle shaft failed. The cement that secure the fastener assembly were brittle and broken off. The assembly was replaced. This fastener assembly is totally unsatisfactory resulting in these failures (Item's 11-1, 17, 16). This incident is classified a deficiency due to loss of vehicle control that could result in the event failure occurs at highway speeds and the recurring nature of the failures.

The rubber bumper strap for the rear suspension were damaged and worn. Both right and left were replaced.

The front end of the vehicle sheltered and steering was difficult. Upon inspection it was noted that the rear lower suspension arm bolt on left front was loose and the shaft were broken. The front end alignment was as follows:

<table>
<thead>
<tr>
<th>Side</th>
<th>Camber</th>
<th>Castor</th>
<th>Toe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>Right</td>
<td>1/8&quot;</td>
<td>0&quot;</td>
<td>7/16&quot; out</td>
</tr>
</tbody>
</table>

The alignment was adjusted for:

<table>
<thead>
<tr>
<th>Side</th>
<th>Camber</th>
<th>Castor</th>
<th>Toe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>Right</td>
<td>1/8&quot;</td>
<td>0&quot;</td>
<td>7/16&quot; out</td>
</tr>
</tbody>
</table>
### SUMMARY OF DEFECTS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>PART</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 3782 19</td>
<td>O-ring (gear, speedometer drive)</td>
<td>2520-887-1346 3740</td>
</tr>
<tr>
<td>07 3782 20</td>
<td>Drum, parking brake</td>
<td>NA 3740</td>
</tr>
<tr>
<td>14 3782 21</td>
<td>Steering wheel</td>
<td>2530-678-3978 3749</td>
</tr>
<tr>
<td>04 3782 22</td>
<td>Clamp, tail pipe</td>
<td>NA 3749</td>
</tr>
<tr>
<td>06 4501 23</td>
<td>Distributor, ignition system</td>
<td>2920-066-7536 4720</td>
</tr>
<tr>
<td>13 4501 24</td>
<td>Bolt, machine; lower arm to cross member</td>
<td>5306-678-1416 4720</td>
</tr>
</tbody>
</table>

*Left 1/4"+ 1/2"+ 1/16" Toe-In*

A slight oil leak was noted in the transfer case. The leak was from the speedometer cable fitting. The leak was corrected by replacing the O-ring in the fitting.

*Right 1/4"+ 1/2"+ 1/16" Toe-In*

The shims were replaced.

A parking brake drum was cracked. The crack was transverse across the outer surface of the drum and approximately 1/4 inch long. The drum was replaced.

A steering wheel spoke was broken at the wheel hub and was repaired by welding.

The rear tail pipe clamp was missing and was replaced.

The engine misfired occasionally, because hard to start and would backfire. The inside of the distributor was coated with oil. The distributor was replaced. Origin of the oil could not be determined.

The rear lower front suspension arm bolts on both sides were loose and all shims missing. The front end alignment was noted to be:

---

*ST5Y-TRM Form 13, 12 Mar 62, replaces ST5Y-GIA Form 18, 14 May 63 which is obsolete.*
<table>
<thead>
<tr>
<th>PART NO.</th>
<th>TEST MILLAGE</th>
<th>Camber</th>
<th>Camber</th>
</tr>
</thead>
<tbody>
<tr>
<td>5305-260-374</td>
<td>4720</td>
<td>Left 1 1/2°</td>
<td>1 1/2°</td>
</tr>
<tr>
<td>5730-269-339</td>
<td>5230</td>
<td>Right 1 3/4°</td>
<td>1 3/4°</td>
</tr>
<tr>
<td>2520-678-1339 (parts kit)</td>
<td>5000</td>
<td>The alignment was adjusted to:</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- One of the bolts on the rear clamp of the exhaust manifold was broken off. The bolt was drilled out, the hole was retapped, and the bolt replaced.
- The center frame side members were cracked where they met the third cross member. The right side member crack was approximately 1 inch long and the left side member crack was approximately 1-1/2 inches long (Fig. 3, Incl 5).
- Three of the four thrust washers on the spider pinion gears in the rear differential were missing and the fourth was badly worn. Foreign material was found in the differential housing, possibly the remains of the washers (Fig. 4 and 5, Incl 5).
- During the final technical inspection it was noted that the rear suspension arm...
<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2.0, 2.0, 2.0, 2.0, 2.0, 2.0</td>
<td>5230</td>
</tr>
<tr>
<td>09</td>
<td>3728</td>
<td>28, B, 28, B, 28, B, 28, B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rear joint bolts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2520-67, 0-752</td>
<td>5230</td>
</tr>
<tr>
<td>13</td>
<td>3728</td>
<td>30, B, 30, B, 30, B, 30, B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Socket assembly: Main joint,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>located at x</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2520-676-752</td>
<td>5230</td>
</tr>
<tr>
<td>12</td>
<td>3728</td>
<td>31, B, 31, B, 31, B, 31, B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spring, anchor, located at x</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>unknown</td>
<td></td>
</tr>
</tbody>
</table>

The universal joint bolts were torqued as follows:

| Right side rear differential | 0-0-0-0-0 |
| Right side front differential| 10-10-10-10-10 |
| Left side rear differential | 0-0-0-0 |
| Left side front differential | 0-0-0-0 |

Specification 10-20 ft-lbs to turn. The bolts were torqued to specification.

The left and right lower ball joints were found to have excessive free play. Specifications in the technical manual state that less than 1/8 inch is acceptable. Measurements taken during the final technical inspection were as follows: Left, 5/64 inch; Right, 5/64 inch.

The front spring is checked for the 1/8 inch max. tolerance allowed. The bolts shown to be. As checked for. The lower ball joint is at tolerance of the outermost. The anchor clip was removed.
<table>
<thead>
<tr>
<th>Part</th>
<th>Test Miles</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2530-678-2906</td>
<td>5000</td>
<td>Three shock absorbers were wet with fluid. The shock absorbers were left and right rear, vehicle 3782 and right rear vehicle 4501. These shock absorbers had sufficient resistance. The right front shock absorber, vehicle 3782 had no resistance.</td>
</tr>
<tr>
<td>2530-979-8097</td>
<td>NA</td>
<td>The right lower suspension arm assembly (A-frame) had prior to testing at Yuma Proving Ground, been repaired by welding. The T-weld (approximately 1-1/4 by 1-1/4 inch) was on the top flange area of the A-frame channel between the backing plate and shock absorber mounting bracket. No cracks were observed. (Fig. 6, Inc 5).</td>
</tr>
<tr>
<td>2530-678-3070</td>
<td>5000</td>
<td>The right front lower suspension arm assembly (A-frame) was cracked on each vehicle. The crack (approximately 1/2 inch in length) was in the rear part of the reinforcing flange for the spring seat opposite the rear fastener for the shock absorber lower mounting bracket (Fig. 7, Inc 5).</td>
</tr>
<tr>
<td>2530-678-5230</td>
<td>5230</td>
<td></td>
</tr>
</tbody>
</table>

STPS-TCK Form 13, 18 Nov 61. Replaces STPS-51 Form 18, 14 May 63 which is obsolete.
FIGURE 1. Cracked fan, vehicle 4051.
FIGURE 2. Broken teeth on input shaft.
FIGURE 3. Frame cracks, vehicle 3782.
FIGURE 4. Worn and missing thrust bushings, vehicle 4501.
FIGURE 5. Foreign material in differential, vehicle 4501.
FIGURE 6. Weld on rear A-frame, vehicle 3782.
FIGURE 7. Cracked front A-frame.
DATES OF INSPECTION: 19 October to 24 October 1970

ENGINE: Group 01
Satisfactory

Crankshaft was removed and inspected. Connecting rod and main bearing journals showed evidence of superficial checks in the spray-on metal build-up. After inspection the crankshaft was forwarded to Ford Motor Company perfonecon with USATACOM.

CLUTCH: Group 02
Satisfactory

FUEL SYSTEM: Group 03
Satisfactory

Fuel pressure 5.5 psi.

EXHAUST SYSTEM: Group 04
Satisfactory

COOLING SYSTEM: Group 05
No leakage observed under pressure.

Radiator relief pressure 8 psi; recovery 6-1/2 psi.

ELECTRICAL: Group 06
Generator: Output, 27.3 vdc.

Starter: Operation satisfactory.

Distributor: Operation satisfactory.

Switches, lights, gages: Satisfactory.

TRANSMISSION: Group 07
Satisfactory

Incl 6
Page 1 of 3
TRANSFER CASE:  Group 08
Satisfactory

PROPELLER SHAFTS:  Group 09
Satisfactory

FRONT AND REAR AXLES:  Groups 10 and 11
Universal joints were undertorqued as follows:

<table>
<thead>
<tr>
<th>U-Joint</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right side rear differential to drive</td>
<td>0-0-0-0</td>
</tr>
<tr>
<td>Right side front differential to drive</td>
<td>10-10-0-0</td>
</tr>
<tr>
<td>Left side rear differential to drive</td>
<td>0-0-0-0</td>
</tr>
<tr>
<td>Left side front differential to flange</td>
<td>0-0-0-0</td>
</tr>
</tbody>
</table>

Specification, 15-20 lb-ft

BRAKES AND WHEELS:  Groups 12 and 13
The front spring anchor clip on the left rear brake was missing. There was evidence of resulting uneven wear.
The left and right lower ball joints had excessive free play:

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/64 Inch</td>
<td>5/32 Inch</td>
</tr>
</tbody>
</table>

Specification:  No more than 1/8 inch

CONTROLS:  Group 14
Satisfactory

FRAME AND BRACKETS:  Group 15
The center frame side members were cracked where they meet the third cross member. Right side crack was approximately 1 inch long; left side, approximately 1-1/2 inches long.
SPRINGS AND SHOCK ABSORBERS: Group 5

Rear shock absorbers were wet with fluid, but still had sufficient resistance. The right front shock absorber had no resistance.

HOOD AND FENDERS: Group 17
Satisfactory

BODY: Group 18
Satisfactory
FINAL TECHNICAL INSPECTION (Vehicle USA Reg No. 2F4501)

DATES OF INSPECTION: 19 October to 22 October 1970

ENGINE: Group 01
Satisfactory
Crankshaft was removed and inspected. Connecting rod and main bearing journals showed evidence of superficial checks in the spray-on metal build-up. After inspection the crankshaft was forwarded to Ford Motor Company per phone con with USATACCC

CLUTCH: Group 02
Satisfactory

FUEL SYSTEM: Group 03
Satisfactory
Fuel pressure, 5.0 psi.

EXHAUST SYSTEM: Group 04
Satisfactory

COOLING SYSTEM: Group 05
No leakage was observed under pressure.
Radiator cap relief pressure, 8 psi; recovery pressure, 6-1/2 psi.

ELECTRICAL: Group 06
Generator: Output 27.3 vdc.
Distributor: Satisfactory
Starter: Satisfactory
Switches, lights, gauges: Satisfactory

TRANSMISSION: Group 07
Satisfactory

TRANSFER CASE: Group 08
Satisfactory

Incl 7
Page 1 of 2
FINAL TECHNICAL INSPECTION (Vehicle USA Reg No. 2F4501) (Concluded)

PROPELLER SHAFTS: Group 09
Satisfactory

FRONT AND REAR AXLES: Groups 10 and 11

Three of the four thrust washers on the splined pinion gears in the rear differential were missing and the fourth was badly worn. Foreign material was found in the differential housing.

BRAKES AND WHEELS: Groups 12 and 13

The rear suspension arm bushing bolts were found to be at 0 lb-ft torque.

CONTROLS: Group 14
Satisfactory

FRAME AND BRACKETS: Group 15
Satisfactory

SPRING AND SHOCK ABSORBERS: Group 16

The right rear shock absorber was wet with fluid; however, had sufficient resistance.

HOOD AND FENDERS: Group 17
Satisfactory

BODY: Group 18
Satisfactory
A Proving Ground Test of two Trucks, Utility, 1/4-ton, 4x4, M151, was conducted at Yuma Proving Ground from 7 July 1970 to 6 November 1970. The test consisted of an initial technical inspection, a total of 10,187 endurance miles, and a final inspection.

The purpose of the test was to provide evidence of depot conformance to overhaul standards, production capability, and the adequacy of the quality assurance system.

A total of 14 deficiencies and 30 shortcomings were reported during the test. It was concluded that the quality control and workmanship by the depot were unsatisfactory and that the durability of the rear axle shaft universal joints was unsatisfactory.
### Key Words

<table>
<thead>
<tr>
<th>KEY WORDS</th>
<th>LINK A</th>
<th>LINK B</th>
<th>LINK C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROLE</td>
<td>WT</td>
<td>ROLE</td>
</tr>
</tbody>
</table>

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

- Quality control
- Durability
- Endurance