

★ **RESTRICTED**

**W A R   D E P A R T M E N T**

**TECHNICAL MANUAL**



**ORDNANCE MAINTENANCE**

**ENGINE, ENGINE ACCESSORIES,  
AND ELECTRICAL SYSTEMS FOR  
BASIC HALF-TRACK VEHICLE (IHC)**

**(PERSONNEL CARRIERS M5 AND  
M5A1, CAR M9A1, MULTIPLE GUN  
MOTOR CARRIAGES M14 AND  
M17, AND SIMILAR IHC VEHICLES)**

**10 DECEMBER 1943**

★ *Dissemination of restricted matter.—The information contained in restricted documents and the essential characteristics of restricted materiel may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also paragraph 18b, AR 380-5, 28 September 1942.)*



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**TECHNICAL MANUAL }  
No. 9-1707A }**

**WAR DEPARTMENT  
Washington, 10 December 1943**

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**CONTENTS**

|  | <b>Paragraphs</b> | <b>Pages</b>  |
|--|-------------------|---------------|
| <b>CHAPTER 1. INTRODUCTION . . . . .</b>                       | <b>1- 3</b>       | <b>4- 14</b>  |
| <b>CHAPTER 2. ENGINE . . . . .</b>                             | <b>4- 35</b>      | <b>15-130</b> |
| <b>SECTION I. Description, construction and data . . . . .</b> | <b>4- 6</b>       | <b>15- 20</b> |
| <b>II. Trouble shooting—engine . . . . .</b>                   | <b>7</b>          | <b>21- 26</b> |
| <b>III. Engine removal. . . . .</b>                            | <b>8</b>          | <b>27- 30</b> |
| <b>IV. Engine cleaning and inspection . . . . .</b>            | <b>9</b>          | <b>31- 32</b> |
| <b>V. Removal of engine accessories . . . . .</b>              | <b>10- 19</b>     | <b>33- 44</b> |

# **ORDNANCE MAINTENANCE—ENGINE, ENGINE ACCESSORIES, AND ELECTRICAL SYSTEMS FOR BASIC HALF-TRACK VEHICLE (IHC)**

## **CHAPTER 2. ENGINE—Cont'd**

|   |   | <b>Paragraph</b> | <b>Pages</b>   |
|---|---|------------------|----------------|
| <b>SECTION</b>                                | <b>VI. Disassembly of stripped engine .</b>               | <b>20</b>        | <b>45- 82</b>  |
|   | <b>VII. Cleaning of engine parts . . . . .</b>            | <b>21</b>        | <b>83</b>      |
|   | <b>VIII. Inspection of engine parts . . . .</b>           | <b>22</b>        | <b>84- 98</b>  |
|   | <b>IX. Assembly of stripped engine . . .</b>              | <b>23</b>        | <b>99-113</b>  |
|   | <b>X. Installation of accessories on engine . . . . .</b> | <b>24- 33</b>    | <b>114-121</b> |
|   | <b>XI. Engine installation . . . . .</b>                  | <b>34</b>        | <b>122-124</b> |
|   | <b>XII. Engine fits and tolerances . . . .</b>            | <b>35</b>        | <b>125-130</b> |
| <b>CHAPTER 3. CLUTCH . . . . .</b>            |   | <b>36- 44</b>    | <b>131-142</b> |
| <b>SECTION</b>                                | <b>I. Description and data . . . . .</b>                  | <b>36</b>        | <b>131-132</b> |
|   | <b>II. Clutch trouble shooting . . . . .</b>              | <b>37</b>        | <b>133-134</b> |
|   | <b>III. Clutch maintenance . . . . .</b>                  | <b>38- 43</b>    | <b>135-141</b> |
|   | <b>IV. Clutch fits and tolerances . . . .</b>             | <b>44</b>        | <b>142</b>     |
| <b>CHAPTER 4. COOLING SYSTEM . . . . .</b>    |   | <b>45- 76</b>    | <b>143-168</b> |
| <b>SECTION</b>                                | <b>I. Description and data . . . . .</b>                  | <b>45</b>        | <b>143-145</b> |
|   | <b>II. Cooling system trouble shooting</b>                | <b>46- 47</b>    | <b>146-147</b> |
|   | <b>III. Fan . . . . .</b>                                 | <b>48- 51</b>    | <b>148</b>     |
|   | <b>IV. Fan belts . . . . .</b>                            | <b>52- 55</b>    | <b>149</b>     |
|   | <b>V. Water pump . . . . .</b>                            | <b>56- 63</b>    | <b>150-157</b> |
|   | <b>VI. Thermostat . . . . .</b>                           | <b>64- 67</b>    | <b>158-159</b> |
|   | <b>VII. Radiator . . . . .</b>                            | <b>68- 71</b>    | <b>160-163</b> |
|   | <b>VIII. Surge tank . . . . .</b>                         | <b>72- 75</b>    | <b>164-166</b> |
|   | <b>IX. Fits and tolerances . . . . .</b>                  | <b>76</b>        | <b>167-168</b> |
| <b>CHAPTER 5. ELECTRICAL SYSTEM . . . . .</b> |   | <b>77-138</b>    | <b>169-227</b> |
| <b>SECTION</b>                                | <b>I. Description and data . . . . .</b>                  | <b>77</b>        | <b>169-170</b> |
|   | <b>II. Electrical system trouble shooting . . . . .</b>   | <b>78- 79</b>    | <b>171-179</b> |
|   | <b>III. Generator . . . . .</b>                           | <b>80 -84</b>    | <b>180-184</b> |
|   | <b>IV. Generator regulator . . . . .</b>                  | <b>85- 89</b>    | <b>185-189</b> |
|   | <b>V. Starter . . . . .</b>                               | <b>90 -94</b>    | <b>190-194</b> |

## CONTENTS

### CHAPTER 5. ELECTRICAL SYSTEM—Cont'd

|   | Paragraph | Pages   |
|---|-----------|---------|
| SECTION VI. Distributor . . . . .         | 95- 99    | 195-198 |
| VII. Ignition coil . . . . .              | 100-104   | 199-200 |
| VIII. Spark plugs . . . . .               | 105-109   | 201-204 |
| IX. Radio noise suppression . . . . .     | 110-112   | 205-207 |
| X. Battery . . . . .                      | 113-116   | 208-210 |
| XI. Horn . . . . .                        | 117-123   | 211-214 |
| XII. Headlights . . . . .                 | 124-130   | 215-221 |
| XIII. Taillights . . . . .                | 131-137   | 222-225 |
| XIV. Fits and tolerances . . . . .        | 138       | 226-227 |
| CHAPTER 6. FUEL SYSTEM . . . . .          | 139-168   | 228-249 |
| SECTION I. Description and data . . . . . | 139       | 228-230 |
| II. Trouble shooting . . . . .            | 140-141   | 231-233 |
| III. Carburetor and governor . . . . .    | 142-146   | 234-236 |
| IV. Fuel pump . . . . .                   | 147-153   | 237-240 |
| V. Air cleaner . . . . .                  | 154-160   | 241-244 |
| VI. Fuel filter . . . . .                 | 161-167   | 245-247 |
| VII. Fits and tolerances . . . . .        | 168       | 248-249 |
| CHAPTER 7. LUBRICATION SYSTEM . . . . .   | 169-187   | 250-261 |
| SECTION I. Description and data . . . . . | 169       | 250     |
| II. Trouble shooting . . . . .            | 170       | 251     |
| III. Oil cooler . . . . .                 | 171-178   | 252-254 |
| IV. Oil filter . . . . .                  | 179-186   | 255-260 |
| V. Specifications . . . . .               | 187       | 261     |
| CHAPTER 8. SPECIAL TOOLS . . . . .        | 188       | 262     |
| REFERENCES . . . . .                      |           | 263-264 |
| INDEX . . . . .                           |           | 265-275 |

# ORDNANCE MAINTENANCE—ENGINE, ENGINE ACCESSORIES, AND ELECTRICAL SYSTEMS FOR BASIC HALF-TRACK VEHICLE (IHC)

## CHAPTER 1

### INTRODUCTION

|                                  | Paragraph |
|----------------------------------|-----------|
| Scope . . . . .                  | 1         |
| Arrangement of manual . . . . .  | 2         |
| Maintenance allocation . . . . . | 3         |

#### 1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of engine and engine accessories for half-track personnel carriers M5 and M5A1, car M9A1, multiple gun motor carriages M14 and M17 and other similar half-track vehicles manufactured by International Harvester Company. Information on the detailed construction of the vehicles, disassembly and assembly procedure, inspection, maintenance and repair is contained in two Technical Manuals of the 1000-series, of which this is the first. These instructions are supplementary to those in the Field and Technical Manuals prepared for the using arms. This manual does not contain information which is intended primarily for the using arms, since such information is available to ordnance maintenance personnel in 100-series Technical Manuals or Field Manuals.

b. This manual contains a description of, and procedure for, removal, disassembly, repair, reassembly, and installation of the Model RED-450-B engine with its attached electrical system, cooling system, fuel system, and clutch accessories.

c. TM 9-1707B contains information pertaining to the power train, body and chassis.

d. TM 9-707 contains a description of the vehicles and technical information required for the identification, use, and care of the materiel.

#### 2. ARRANGEMENT OF MANUAL.

a. Separate chapters are provided for: engine, clutch system, cooling system, electrical system, fuel system, lubrication system, and special tools. The major units in each of the above chapters are covered in individual sections where required.

#### 3. MAINTENANCE ALLOCATION.

a. **Scope.** The scope of maintenance and repair by the crew and other units of the using arms is determined by the availability of

## INTRODUCTION

suitable tools, availability of necessary parts, capabilities of the mechanics, time available, and the tactical situation. All of these are variable and no exact system of procedure can be prescribed.

**b. Allocation of Maintenance.** Indicated below are the maintenance duties for which tools and parts have been provided for the using arm and ordnance maintenance personnel. Replacements and repairs which are the responsibility of ordnance maintenance personnel may be performed by using arm personnel when circumstances permit, within the discretion of the commander concerned. Echelons and words used in this list of maintenance allocations are defined as follows:

|  |  |
|--|--|
| <b>FIRST AND<br/>SECOND ECHELON:</b><br>Table III<br>AR 850-15   | Operating organization driver, operator or crew, companies and detachments, battalions, squadrons, regiments, and separate companies and detachments (first and second echelons, respectively).  |
| <b>THIRD ECHELON:</b><br>Table III<br>AR 850-15  | Technical light and medium maintenance units, including post and port shops.   |
| <b>FOURTH ECHELON:</b><br>Table III<br>AR 850-15   | Technical heavy maintenance and field depot units including designated post and service command shops.   |
| <b>FIFTH ECHELON:</b><br>Table III<br>AR 850-15  | Technical base units.  |
| <b>SERVICE:</b><br>(Including preventive maintenance)<br>par. 24 a (2) and<br>(3) in part<br>AR 850-15 | Checking and replenishing fuel, oil, grease, water and anti-freeze, air, and battery liquid; checking and tightening nuts and bolts; cleaning.   |
| <b>REPLACE:</b><br>Par. 24 a (5)<br>AR 850-15  | To remove an unserviceable part, assembly, or subassembly from a vehicle and replace it with a serviceable one.  |
| <b>REPAIR:</b><br>Par. 24 a (6)<br>in part<br>AR 850-15  | To restore to a serviceable condition, such parts, assemblies or subassemblies as can be accomplished without completely disassembling the assembly or subassembly, and where heavy riveting, or precision machining, fitting, balancing or alining is not required. |

# **ORDNANCE MAINTENANCE — ENGINE, ENGINE ACCESSORIES, AND ELECTRICAL SYSTEMS FOR BASIC HALF-TRACK VEHICLE (IHC)**

**REBUILD:** Consists of stripping and completely reconditioning and replacing in serviceable condition any vehicle or unserviceable part, subassembly, or assembly of the vehicle, including welding, riveting, machining, fitting, alining, balancing, assembling, and testing.

Par. 24 a (6)  
AR 850-15

**RECLAMATION:** Salvage of serviceable or economically repairable units and parts removed from vehicles, and their return to stock. This includes the process which recovers and or reclaims unusable articles or component parts thereof and places them in a serviceable condition.

AR 850-15  
Par. 4 (c) in part  
CIR. 75, dated 16  
March 43

- NOTES:**
- (1) Operations allocated will normally be performed in the echelon indicated by x.
  - (2) Operations allocated to the third echelon as indicated by E may be performed by these units in emergencies only.
  - (3) Operations allocated to the fourth echelon by E are normally fifth echelon operations. They will not be performed by the fourth echelon, unless the unit is expressly authorized to do so by the chief of the service concerned.
  - (4) Consult reclamation bulletins for detailed information relative to reclamation procedure.

|   | ECHELONS |     |     |     |
|---|----------|-----|-----|-----|
|   | 2nd      | 3rd | 4th | 5th |
| <b>ABSORBERS, SHOCK</b>   |          |     |     |     |
| Absorber assemblies, shock (w/linkage)—service and/or replace . . . . .                 | X        |     |     |     |
| Absorber assemblies, shock (w/linkage)—repair . . .                                     |          | X   |     |     |
| Absorber assemblies, shock (w/linkage)—rebuild . .                                      |          |     | E   | X   |
| <b>AXLE, FRONT</b>  |          |     |     |     |
| Arms, steering knuckle—replace . . . . .  |          | X   |     |     |
| *Axle assembly—replace . . . . .  | *        | X   |     |     |
| Axle assembly—repair . . . . .  |          | X   |     |     |
| Axle assembly—rebuild . . . . .   |          |     | E   | X   |
| Bearings, wheel—service and/or replace . . . . .  | X        |     |     |     |
| Carrier assembly, differential (w/ring gear and pinion)—replace and/or repair . . . . . |          | X   |     |     |

**NOTE:** \*The second echelon is authorized to remove and reinstall items marked by an asterisk. However, when it is necessary to replace an item marked by an asterisk with a new or rebuilt part, subassembly or unit assembly, the assembly marked by an asterisk may be removed from the vehicle by the second echelon only after authority has been obtained from a higher echelon of maintenance.



## INTRODUCTION

| AXLE, FRONT (Cont'd)  | ECHELONS |     |     |     |
|---|----------|-----|-----|-----|
|   | 2nd      | 3rd | 4th | 5th |
| Carrier assembly, differential (w ring gear and pinion)—rebuild . . . . . |          |     | E   | X   |
| Drums, brake—replace . . . . .  | X        |     |     |     |
| Hub assemblies—replace . . . . .  | X        |     |     |     |
| Hub assemblies—repair . . . . .   |          | X   |     |     |
| Hub assemblies—rebuild . . . . .  |          |     | X   |     |
| Hub and drum assemblies—replace . . . . .                                 | X        |     |     |     |
| Retainers, wheel grease—replace . . . . .                                 | X        |     |     |     |
| Rod assembly, tie—replace . . . . .                                       | X        |     |     |     |
| Rod assembly, tie—repair . . . . .  |          | X   |     |     |
| Seals, trunnion housing oil—replace . . . . .                             |          | X   |     |     |
| Shafts, axle—replace . . . . .  |          | X   |     |     |
| Wheel alinement, toe-in—adjust . . . . .                                  | X        |     |     |     |
| Wheel alinement, camber and caster—check . . . . .                        |          | X   |     |     |
| Wheel alinement, camber and caster—aline . . . . .                        |          |     | E   | X   |

## AXLE, REAR (JACKSHAFT)

|  |   |   |   |   |
|--|---|---|---|---|
| *Axle assembly—replace . . . . .   | * | X |   |   |
| Axle assembly—repair . . . . .   |   | X |   |   |
| Axle assembly—rebuild . . . . .  |   |   | E | X |
| Bearings, drive sprocket—service and/or replace . .                                      | X |   |   |   |
| Carrier assembly, differential (w/ring gear and pinion)—replace and /or repair . . . . . |   | X |   |   |
| Carrier assembly, differential (w/ring gear and pinion)—rebuild . . . . .                |   |   | E | X |
| Drums, brake—replace . . . . .   | X |   |   |   |
| Hub assemblies—replace . . . . .   | X |   |   |   |
| Hub assemblies—repair . . . . .  |   | X |   |   |
| Hub assemblies—rebuild . . . . .   |   |   | X |   |
| Retainers, drive sprocket grease—replace . . . . .                                       | X |   |   |   |
| Shafts, axle—replace . . . . .   | X |   |   |   |
| Sprocket assemblies—replace . . . . .  | X |   |   |   |
| Sprocket assemblies—repair . . . . .   |   | X |   |   |
| Sprocket assemblies—rebuild . . . . .  |   |   | E | X |

## BODY

|                                  |   |   |   |   |
|----------------------------------|---|---|---|---|
| Body assembly—replace . . . . .  |   |   | X |   |
| Body assembly—repair . . . . .   |   | X |   |   |
| Body assembly—rebuild . . . . .  |   |   | E | X |
| Cushions, seat—replace . . . . . | X |   |   |   |

NOTE: \*The second echelon is authorized to remove and reinstall items marked by an asterisk. However, when it is necessary to replace an item marked by an asterisk with a new or rebuilt part, subassembly or unit assembly, the assembly marked by an asterisk may be removed from the vehicle by the second echelon *only after authority has been obtained from a higher echelon of maintenance.*

# **ORDNANCE MAINTENANCE—ENGINE, ENGINE ACCESSORIES, AND ELECTRICAL SYSTEMS FOR BASIC HALF-TRACK VEHICLE (IHC)**

| BODY (Cont'd)   | ECHELONS |     |     |     |
|---|----------|-----|-----|-----|
|   | 2nd      | 3rd | 4th | 5th |
| Door assemblies—replace . . . . .                                       | X        |     |     |     |
| Door assemblies—repair . . . . .  |          | X   |     |     |
| Seat assemblies—replace . . . . .                                       | X        |     |     |     |
| Seat assemblies—repair . . . . .  |          | X   |     |     |
| Seat assemblies—rebuild . . . . .                                       |          |     | X   |     |
| Shield assemblies, doors and windshield (armor plate)—replace . . . . . | X        |     |     |     |
| Shield assemblies, doors and windshield (armor plate)—repair . . . . .  |          | X   |     |     |
| Tarpaulin—replace . . . . .   | X        |     |     |     |
| Tarpaulin—repair . . . . .  |          | E   | X   |     |
| Ventilator—replace . . . . .  | X        |     |     |     |
| Ventilator—repair . . . . .   |          | X   |     |     |
| Windshield—replace . . . . .  | X        |     |     |     |
| Windshield—repair . . . . .   |          | X   |     |     |
| Wiper assemblies, windshield — service and/or replace . . . . .         | X        |     |     |     |
| Wiper assemblies, windshield—repair . . . . .                           |          | X   |     |     |
| Wiper assemblies, windshield—rebuild . . . . .                          |          |     | X   |     |

## **BRAKE, DRIVE SHAFT (PARKING)**

|   |   |   |  |  |
|---|---|---|--|--|
| Controls and linkage—service and/or replace . . . | X |   |  |  |
| Controls and linkage—repair . . . . .             |   | X |  |  |
| Shoe assemblies—service and/or replace . . . . .  | X |   |  |  |
| Shoe assemblies—repair (reline) . . . . .         |   | X |  |  |

## **BRAKES, SERVICE (HYDROVAC)**

|   |   |   |   |  |
|---|---|---|---|--|
| Cleaner assembly, air—service and/or replace . . .                    | X |   |   |  |
| Cleaner assembly, air—repair . . . . .                                |   | X |   |  |
| Controls and linkage—service and/or replace . . .                     | X |   |   |  |
| Controls and linkage—repair . . . . .                                 |   | X |   |  |
| Cylinder assembly, master—replace . . . . .                           | X |   |   |  |
| Cylinder assembly, master—repair . . . . .                            |   | X |   |  |
| Cylinder assembly, master—rebuild . . . . .                           |   |   | X |  |
| Cylinder assembly, power (hydrovac)—replace . . .                     | X |   |   |  |
| Cylinder assembly, power (hydrovac)—repair . . .                      |   | X |   |  |
| Cylinder assembly, power (hydrovac)—rebuild . . .                     |   |   | X |  |
| Cylinder assemblies, wheel—replace . . . . .                          | X |   |   |  |
| Cylinder assemblies, wheel—repair . . . . .                           |   | X |   |  |
| Cylinder assemblies, wheel—rebuild . . . . .                          |   |   | X |  |
| Hose, flexible, lines and connections—replace and/or repair . . . . . | X |   |   |  |
| Shoe assemblies—service and/or replace . . . . .                      | X |   |   |  |
| Shoe assemblies—repair (reline) . . . . .                             |   | X |   |  |