

TM 9-1795B
T.O. 19-75AAD-6

WAR DEPARTMENT

ORDNANCE MAINTENANCE



**ENGINE FOR
HEAVY WRECKING
TRUCK M1**

JANUARY 23, 1943

FOR ORDNANCE PERSONNEL ONLY

TECHNICAL MANUAL }
No. 9-1795B }

TM 9-1795B
WAR DEPARTMENT
Washington, January 23, 1943

ORDNANCE MAINTENANCE

ENGINE FOR HEAVY WRECKING TRUCK M1

Prepared under the direction of the
Chief of Ordnance

(with the cooperation of the Ward La France Truck Corporation)

CONTENTS

		Paragraphs	Pages
CHAPTER 1	INTRODUCTION	1- 3	3- 13
	2 ENGINE		
SECTION	I. Gasoline engine	4- 7	14- 21
	II. Engine trouble shooting	8	22- 25
	III. Inspection of engine	9- 10	26- 28
	IV. Removal of engine from vehicle	11- 16	29- 37
	V. Disassembly of engine	17- 50	38- 87
	VI. Valves and valve mechanism ..	51- 63	88-109
	VII. Pistons and connecting rods ..	64- 78	110-132
	VIII. Cylinder head and cylinder head cover	79- 83	133-135
	IX. Crankcase	84- 86	136-138
	X. Chain case assembly	87- 93	139-144
	XI. Accessory drive shaft support assembly	94- 98	145-152
	XII. Flywheel housing and flywheel ..	99-103	153-155
	XIII. Crankshaft and crankshaft bearings	104-106	156-158
	XIV. Camshaft and camshaft bushings	107-109	159-162
	XV. Assembly of engine	110-148	163-199
	XVI. Installation of engine in vehicle and engine tune-up	149-153	200-204
CHAPTER 3	COOLING SYSTEM		
SECTION	I. Introduction	154-157	205-206
	II. Trouble shooting	158	207
	III. Cooling system maintenance ..	159-164	208-212
	IV. Radiator assembly	165-170	213-221
	V. Water pump assembly	171-176	222-229
	VI. Fan assembly	177-182	230-234
	VII. Thermostat	183-186	235

TM 9-1795B**ORDNANCE MAINTENANCE—ENGINE for HEAVY WRECKING TRUCK M1****CHAPTER 4 FUEL AND EXHAUST SYSTEM**

		Paragraphs	Pages
SECTION	I. Introduction	187-190	236-238
	II. Fuel pump	191-199	239-251
	III. Carburetor	200-209	252-270
	IV. Air cleaner	210-215	271-276
	V. Governor	216-219	277-279
	VI. Fuel tanks	220-226	280-285
	VII. Gasoline piping system	227-231	286-289
	VIII. Muffler, exhaust pipe and tail pipe	232-240	290-293
CHAPTER 5 LUBRICATION SYSTEM			
SECTION	I. Introduction	241-244	294-295
	II. Engine lubrication system	245-267	296-315
CHAPTER 6 ELECTRICAL SYSTEM			
SECTION	I. Introduction	268-271	316-323
	II. Inspection of installed electrical components	272-273	324-329
	III. Trouble shooting	274	330-331
	IV. Starting motor	275-287	332-346
	V. Generator	288-304	347-365
	VI. Voltage regulator	305-313	366-380
	VII. Battery	314-317	381-383
	VIII. Distributor, ignition coil and spark plugs	318-332	384-394
	IX. Magneto	333-340	395-414
	X. Siren, heater, horn and horn button	341-358	415-427
	XI. Lighting units	359-387	428-445
	XII. Switches and wiring	388-394	446-452
CHAPTER 7 CLUTCH			
SECTION	I. Introduction	395-398	453-454
	II. Trouble shooting	399	455-456
	III. Clutch pressure plate assembly	400-405	457-473
	IV. Adjustment of clutch	406-407	474-478
	V. Clutch air cylinder assembly	408-413	479-485
	VI. Clutch pedal and linkage	414-418	486-492
CHAPTER 8 CLEARANCES AND TOLERANCES			
		419-423	493-497
CHAPTER 9 SPECIAL TOOLS			
		424	498-502
CHAPTER 10 REFERENCES			
		425-426	503-504
INDEX			
			505-519

CHAPTER I

INTRODUCTION

	Paragraph
Scope	1
Characteristics	2
Organization maintenance	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 the Heavy Wrecking Truck M1, series 2. Information on the detailed construction of the unit, disassembly and assembly procedure, inspection, maintenance and repair is contained in four technical manuals, of which this is the second.

(1) This manual contains a description of, and procedure for, the removal, disassembly, inspection, repair, assembly and installation of the engine, engine components, cooling system, fuel and exhaust system, electrical system, clutch, and complete vehicle lubrication.

(2) TM 9-1795A contains a description of the Heavy Wrecking Truck M1, series 2, including differences between series 1 and series 2; U.S.A. registration numbers of the vehicle; a description of, and procedure for, the removal, disassembly, inspection, repair, assembly and installation of the front axle, rear axle, universal joints and propeller shafts, transmission, transfer case, and wheels and tires.

(3) TM 9-1795C contains a description of, and procedure for, the removal, disassembly, inspection, repair, assembly and installation of the crane, power take-off, drive lines, winches and cables.

(4) TM 9-1795D contains a description of, and procedure for, the disassembly, inspection, repair and assembly of the brakes, frame, springs and shock absorbers, steering, and body and sheet metal. It also contains instructions for packing, shipping and storage; and information on the preparation of the unit for use at both extremes of temperature and under other unusual operating conditions. Instructions for general decontamination of the unit are contained in TM 9-795.

2. CHARACTERISTICS.

a. The Heavy Wrecking Truck M1 is used for towing, salvaging and recovering heavy equipment, as well as for numerous repair operations away from base repair shops, where heavy hoist and winch equipment is needed. Power is delivered from a gasoline engine through the transmission and transfer case to one front and two rear axles, thereby providing drive and traction on 10 wheels and tires. There are 2 single, pneumatic tires in front, and 8 pneumatic tires in the rear. Dual wheels and tires may be mounted on the front, thereby providing drive through 12 wheels and tires.

TM 9-1795B

2-3

ORDNANCE MAINTENANCE—ENGINE for HEAVY WRECKING TRUCK M1

b. Refer to TM 9-1795A for general data on the vehicle and for its U.S.A. registration numbers.

3. ORGANIZATION MAINTENANCE.

a. **Scope.** The scope of maintenance and repair by the crew and other units of the using arms is determined by the availability of 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 personnel. Other replacements and repairs are the responsibility of ordnance maintenance personnel but may be performed by using arm personnel when circumstances permit, within the discretion of the commander concerned. Echelons and words as used in this list of maintenance allocations are defined as follows:

SECOND ECHELON: Line organization regiments, battalions, companies, detachments, and separate companies (first and second echelons).

THIRD ECHELON: Ordnance light maintenance companies, ordnance medium maintenance companies, ordnance divisional maintenance battalions, and post ordnance shops.

FOURTH ECHELON: Ordnance heavy maintenance companies, and service command shops.

FIFTH ECHELON: Ordnance base regiments, ordnance bases, arsenals, and manufacturers' plants.

SERVICE: (Including preventive maintenance.) Refer to AR 850-15, paragraph 23 a (1) and (2). Consists of servicing, cleaning, lubricating, tightening bolts and nuts, and making external adjustments of subassemblies or assemblies and controls.

REPLACE: Refer to AR 850-15, paragraph 23 a (4). Consists of removing the part, subassembly or assembly from the vehicles and replacing it with a new or reconditioned or rebuilt part, subassembly or assembly, whichever the case may be.

REPAIR: Refer to AR 850-15, paragraph 23 a (3) and (5), in part. Consists of making repairs to, or replacement of the part, subassembly or assembly that can be accomplished without completely disassembling the subassembly or assemblies; and does not require heavy welding, or riveting, machining, fitting and/or alining or balancing.

REBUILD: Refer to AR 850-15, paragraph 23 a (5) in part, and (6). Consists of completely reconditioning and replacing in serviceable condition any unserviceable part, subassembly or assembly of the vehicle, including welding, riveting, machining, fitting, alining, balancing, assembling and testing.

INTRODUCTION

ABSORBERS, SHOCK AND LINKAGE

	ECHELONS			
	2nd	3rd	4th	5th
Absorber assembly, shock and linkage—replace	X			
Absorber assembly, shock and linkage—repair		X		
Absorber assembly, shock and linkage—rebuild			E	X
AXLE, FRONT				
Alinement, wheel, camber and caster			E	X
Alinement, wheel, toe-in—adjust	X			
Arm, steering—replace	X			
*Axle, front assembly—service and replace		X		
Axle, front assembly—repair		X		
Axle, front assembly—rebuild			E	X
Bearings, wheel—adjust and replace	X			
Carrier, differential, with cross shaft and pinion cage assembly—replace and repair		X		
Carrier, differential, with cross shaft and pinion cage assembly—rebuild			E	X
Retainers, grease—replace	X			
Rod, tie—replace	X			
Rod, tie—repair		X		
Seals, oil—replace	X			
Shaft, axle—replace	E	X		
Stop, steering knuckle—adjust and replace		X		
AXLE, REAR (TANDEM UNIT)				
*Axle assembly, rear or intermediate—replace		X		
Axle assembly, rear or intermediate—repair		X		
Axle assembly, rear or intermediate—rebuild			E	X
*Axles, rear assembly (tandem unit)—replace		X		
Axles, rear assembly (tandem unit)—repair		X		
Axles, rear assembly (tandem unit)—rebuild			E	X
Bearings, wheel or connecting tube—replace	X			
Carrier, differential with cross shaft assembly (rear or intermediate)—replace and repair		X		
Carrier, differential with cross shaft assembly (rear or intermediate)—rebuild			E	X
Retainers, grease—replace	X			
Rods, torque—replace	X			
Rods, torque—rebuild			X	
Seals, oil—replace	X			
Shaft, axle—replace	X			
Shaft, propeller, intermediate with universal joints —replace	X			
Shaft, propeller, intermediate with universal joints —repair		X		

*The second echelon is authorized to remove and reinstall engine and transmission assemblies, transfer unit controlled differential assembly and other items marked by 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 asterisk will not be removed from the vehicle by the second echelon until authorization is received from a higher echelon.

TM 9-1795B

3

ORDNANCE MAINTENANCE—ENGINE for HEAVY WRECKING TRUCK M1

	ECHELONS			
	2nd	3rd	4th	5th
Shaft, propeller, intermediate with universal joints —rebuild			E	X
Tube, connecting, bogie—replace	E	X		
BRAKE GROUP				
Adjuster, slack—adjust and replace	X			
Adjuster, slack—repair		X		
Adjuster, slack—rebuild			X	
Brakes—adjust	X			
Chamber, air brake assembly—replace	X			
Chamber, air brake assembly—repair		X		
Chamber, air brake assembly—rebuild			X	
Connections, trailer, front and rear, air brake— replace	X			
Connections, trailer, front and rear, air brake— repair		X		
Diaphragm, air brake chamber—replace	X			
Drum, brake—replace	X			
Governor, air pressure assembly—adjust and replace	X			
Governor, air pressure assembly—repair		X		
Governor, air pressure assembly—rebuild			X	
Lines and connections, air—replace	E	X		
Reservoir, air—service and replace	X			
Reservoir, air—repair		X		
Shoe assemblies, brake—adjust and replace	X			
Shoe assemblies, brake—repair (reline)		X		
Shoe assemblies, brake—rebuild			X	
Valves, air brake assembly—replace	X			
Valves, air brake assembly—repair		X		
Valves, air brake assembly—rebuild			X	
BRAKE GROUP (HAND OR EMERGENCY)				
Controls and linkage, hand brake—adjust and re- place	X			
Controls and linkage, hand brake—repair		X		
Shoe, hand brake assembly—replace	X			
Shoe, hand brake assembly—repair (reline)		X		
BODY				
Bumper—replace	X			
Bumper—repair		X		
Cab assembly—replace and repair		E	X	
Cab assembly—rebuild			E	X
Glass, doors—replace		X		
Grill, protective—replace	X			
Grill, protective—repair		X		
Hoods and doors—replace	X			

TM 9-1795B

3

INTRODUCTION

	ECHELONS			
	2nd	3rd	4th	5th
Seat assembly—replace	X			
Seat assembly—repair		X		
Seat assembly—rebuild			X	
Windshield assembly—replace glass		X		
Windshield assembly—rebuild			X	
Wipers, windshield assembly—replace	X			
Wipers, windshield assembly—rebuild		X		
CASE, POWER TAKE-OFF				
Case, power take-off assembly—replace	X			
Case, power take-off assembly—repair		X		
Case, power take-off assembly—rebuild			E	X
CASE, TRANSFER				
*Case, transfer assembly—replace		X		
Case, transfer assembly—repair		X		
Case, transfer assembly—rebuild			E	X
Controls and linkage—replace	X			
Controls and linkage—repair		X		
Disk, hand brake—replace	X			
CLUTCH				
Clutch assembly—replace	E	X		
Clutch assembly—repair		X		
Clutch assembly—rebuild			E	X
Cylinder, air (winch operation)—adjust and replace	X			
Cylinder, air (winch operation)—repair		X		
Cylinder, air (winch operation)—rebuild			X	
Housing, clutch—replace	E	X		
Housing, clutch—rebuild (recondition)			E	X
CRANE AND BOOM ASSEMBLY				
Boom and jack leg assembly—replace	X			
Boom and jack leg assembly—repair		X		
Boom and jack leg assembly—rebuild			E	X
*Boom pivot assembly—replace		X		
Boom pivot assembly—repair		X		
Boom pivot assembly—rebuild			E	X
Cables—replace	X			
Cables—repair		X		
Chains, drive—service, replace and repair	X			
*Crane and boom assembly—replace		X		
Crane and boom assembly—repair		X		

*The second echelon is authorized to remove and reinstall engine and transmission assemblies, transfer unit controlled differential assembly and other items marked by 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 asterisk will not be removed from the vehicle by the second echelon until authorization is received from a higher echelon.

TM 9-1795B

3

ORDNANCE MAINTENANCE—ENGINE for HEAVY WRECKING TRUCK M1

	ECHELONS			
	2nd	3rd	4th	5th
Crane and boom assembly—rebuild			E	X
Jack assembly—replace	X			
Jack assembly—repair		X		
Pulleys and lifting hook—replace	X			
Pulleys and lifting hook—repair		X		
Sprockets, chain drive—replace	X			
Sprockets, chain drive—repair		X		
Topping pivot assembly—replace	X			
Topping pivot assembly—repair		X		
Topping pivot assembly—rebuild			X	
Winches, hand assembly—replace	X			
Winches, hand assembly—repair		X		
Winches, hand assembly—rebuild			E	X

CRANE AND WINCH DRIVE

Bearings and oil seals—replace	X			
Chains, drive—service, replace and repair	X			
Chain tightener assembly—replace and adjust	X			
Chain tightener assembly—repair		X		
Chain tightener assembly—rebuild			X	
Clutch assembly (front winch)—service and replace	X			
Clutch assembly (front winch)—repair		X		
Clutch assembly (front winch)—rebuild			X	
Sprockets, chain drive—replace	X			
Sprockets, chain drive—repair		X		
Transmission, auxiliary (rear and crane winch)— service and replace	X			
Transmission, auxiliary (rear and crane winch)— repair		X		
Transmission, auxiliary (rear and crane winch)— rebuild			E	X

ELECTRICAL SYSTEM

Battery—charge and service	X			
Battery—replace	X			
Battery—repair		X		
Battery—rebuild			E	X
Box, apparatus assembly (generator control)— replace	X			
Box, apparatus assembly (generator control)— repair and adjust		X		
Box, apparatus assembly (generator control)— rebuild			X	
Cables, battery—replace	X			
Horn assembly—service and replace	X			
Horn assembly—repair		X		
Lamps assembly—replace	X			