

TM 9-1750J

RESTRICTED

WAR DEPARTMENT

TECHNICAL MANUAL



ORDNANCE MAINTENANCE

POWER UNIT ACCESSORIES

FOR MEDIUM TANKS

M3A4 AND M4A4

MAY 12, 1943

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ORDNANCE MAINTENANCE

POWER UNIT ACCESSORIES FOR MEDIUM TANKS

M3A4 AND M4A4

Prepared under the direction of the
 Chief of Ordnance

(with the cooperation of the Chrysler Corporation)

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CHAPTER 1

INTRODUCTION

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1. SCOPE.

a. This manual is published for the information and guidance of ordnance maintenance personnel. It contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the power unit accessories for Medium Tanks M3A4 and M4A4 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 or field manuals.

2. ARRANGEMENT.

a. This manual contains a description of and procedures for removal, trouble shooting, inspection and testing, disassembly, repair, and installation of the fuel system, cooling system, lubricating system, clutch and electrical system.

3. DIFFERENCES AMONG MODELS.

a. **Fuel System.** All of the medium tank engine power units used in the Tank M3A4, as well as power units M4A4-1001 to, and including, M4A4-2304 were equipped with fuel pump mounted on the distributor end of the crankcase (fig. 17). Power units M4A4-2305, and above, incorporate a fuel pump mounted on the distributor end of No. 4 engine (fig. 18).

b. **Cooling System.** Choke type thermostats, mounted in the cylinder head adapter of each individual engine, were incorporated in the M4A4 power unit, from serial number M4A4-1001 to, and including, M4A4-3211. Power units M4A4-3212, and above, incorporate a bypass type of thermostat.

c. **Lubricating System.** All M4A4 power units are equipped with two absorption type oil filters, mounted on No. 1 engine. On vehicles with serial number M4A4-18171, and above, a full flow strainer type of oil filter, located in the rear of the fighting compartment (fig. 95), was added. The two absorption type filters are still retained.

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d. Clutch. The clutch, of the fully enclosed type, was used on power unit serial number M4A4-1001 to, and including, M4A4-4412. Power units M4A4-4413, and above, use a clutch of the ventilated type.

e. Electrical System. On all M3A4 power units and on M4A4 power units from serial number M4A4-1001 to, and including, M4A4-2304, the generator was mounted on No. 2 engine and driven by No. 2 engine water pump drive belt. The generator of power units M4A4-2305, and above, is mounted in the fighting compartment and belt-driven from the propeller shaft.

4. 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 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) (par. 23 a (1) and (2), AR 850-15) (10-6-42) Consists of servicing, cleaning, lubricating, tightening bolts and nuts, and making external adjustment of subassemblies or assemblies and controls.

REPLACE: (par. 23 a (4), AR 850-15) (10-6-42) 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.

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REPAIR: (par. 23 a (3) and (5), in part, AR 850-15) (10-6-42) 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: (par. 23 a (5), in part, and (6) AR 850-15) (10-6-42) 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.

NOTE: Operations allocated will normally be performed in the echelon indicated by "X." Operations allocated to the echelons as indicated by "E" may be accomplished by the respective echelons in emergencies only.

	ECHELONS			
	2nd	3rd	4th	5th
BOXES AND RACKS, AMMUNITION				
Boxes, ammunition—replace	X			
Boxes, ammunition—repair		X		
Racks, ammunition—replace	X			
Racks, ammunition—repair		X		
CONTROLS, BRACKETS AND LEVERS				
Brackets and levers—replace	X			
Brackets and levers—repair		X		
Controls and linkage—replace	X			
Controls and linkage—repair		X		
DRIVE, FINAL (GEAR TRAIN ASSEMBLY) (ONE-PIECE)				
*Drive, final, gear train assembly—replace		X		
Drive, final, gear train assembly—repair		X		
Drive, final, gear train assembly—rebuild			E	X
DIFFERENTIAL, CONTROLLED, CARRIER ASSEMBLY AND SUBASSEMBLY				
Differential, controlled, assembly—replace		X		
Differential, controlled, assembly—repair		E	X	
Differential, controlled, assembly—rebuild			E	X
Drum, steering brake—replace		X		
Drum, steering brake—repair			X	
Shoe, steering brake—replace	X			
Shoe, steering brake—repair (reline)		X		

*The second echelon is authorized to remove and reinstall engine and transmission assemblies, transfer units, controlled differential assembly and other 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.

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	REDUCTION, FINAL	ECHELONS			
		2nd	3rd	4th	5th
Hub, sprocket—replace		X			
Hub, sprocket—repair			X		
Hub, sprocket—rebuild				E	X
Reduction assembly, final drive—replace		X			
Reduction assembly, final drive—repair			X		
Reduction assembly, final drive—rebuild				E	X
Sprocket—replace		X			
Sprocket—rebuild				E	X
TRANSMISSION ASSEMBLY					
Brakes, parking—replace		X			
Brakes, parking—repair (reline)			X		
*Transmission assembly—replace			X		
Transmission assembly—repair			X		
Transmission assembly—rebuild				E	X
DRIVE, FINAL (GEAR TRAIN ASSEMBLY) (THREE-PIECE)					
*Drive, final, gear train assembly—replace			X		
Drive, final, gear train assembly—repair			X		
Drive, final, gear train assembly—rebuild				E	X
DIFFERENTIAL, CONTROLLED, CARRIER ASSEMBLY					
Differential, controlled, assembly—replace			X		
Differential, controlled, assembly—repair			E	X	
Differential, controlled, assembly—rebuild				E	X
DIFFERENTIAL, CONTROLLED, SUBASSEMBLY					
Differential, controlled, subassembly—replace			X		
Differential, controlled, subassembly—repair			E	X	
Differential, controlled, subassembly—rebuild				E	X
Drum, steering brake—replace			X		
Drum, steering brake—repair				X	
Shoe, steering brake—replace		X			
Shoe, steering brake—repair (reline)			X		
REDUCTION, FINAL					
Hub, sprocket—replace		X			
Hub, sprocket—repair			X		
Hub, sprocket—rebuild				E	X
Reduction, final drive—replace		X			
Reduction, final drive—repair			X		
Reduction, final drive—rebuild				E	X
Sprocket—replace		X			
Sprocket—rebuild				E	X

*The second echelon is authorized to remove and reinstall engine and transmission assemblies, transfer units, controlled differential assembly and other 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.*

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	ECHELONS			
	2nd	3rd	4th	5th
TRANSMISSION ASSEMBLY				
Brake, parking—replace	X			
Brake, parking—repair (reline)		X		
*Transmission assembly—replace		X		
Transmission assembly—repair		X		
Transmission assembly—rebuild			E	X
ELECTRICAL SYSTEM				
Battery—service, replace and recharge	X			
Battery—repair		X		
Battery—rebuild			E	X
Box, apparatus (generator control)—replace	X			
Box, apparatus (generator control)—repair		X		
Box, apparatus (generator control)—rebuild			X	
Box, battery—replace	X			
Box, battery—repair		X		
Box, terminal—replace	X			
Box, terminal—repair		X		
Box, turret collector ring—replace	X			
Box, turret collector ring—repair		X		
Box, turret collector ring—rebuild			X	
Brackets, mounting and supports—replace	X			
Brackets, mounting and supports—repair		X		
Breakers, circuit—replace	X			
Breakers, circuit—repair		X		
Breakers, circuit—rebuild			X	
Cables, battery—replace	X			
Cables, battery—repair		X		
Conduits—replace	X			
Filters, generator—replace	X			
Filters, generator—repair		X		
Generator, auxiliary assembly—replace	X			
Generator, auxiliary assembly—repair		X		
Generator, auxiliary assembly—rebuild			E	X
Lamps, all—service or replace	X			
Lamps, all—repair		X		
Siren—replace	X			
Siren—repair		X		
Siren—rebuild			X	

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	ECHELONS			
	2nd	3rd	4th	5th
ELECTRICAL SYSTEM (Cont'd)				
Solenoids—replace	X			
Solenoids—repair		X		
Switches—replace	X			
Switches—repair		X		
Switches—rebuild			X	
Wires—replace	X			
ENGINE				
Bearings, connecting rod—replace		E	E	X
Bearings, crankshaft—replace		E	E	X
Breather, crankcase—service and replace	X			
Breather, crankcase—repair		X		
Carburetor and governor assemblies—replace (Governor must be set after installation)	E	X		
Carburetor and governor assemblies—repair		X		
Carburetor and governor assemblies—rebuild			X	
Clutch assembly—replace	X			
Clutch assembly—repair		X		
Clutch assembly—rebuild			E	X
Coils, ignition—replace	X			
Controls and linkage, carburetor, and choke—service and replace	X			
Controls and linkage, carburetor, and choke—repair		X		
Cooling system—service	X			
Damper, vibration—replace	X			
Distributor assemblies—service and replace	X			
Distributor assemblies—repair		X		
Distributor assemblies—rebuild			X	
*Engine, multibank assembly—replace		X		
Engine, multibank assembly—repair		X		
Engine, multibank assembly—rebuild			E	X
Fan assembly—replace	X			
Fan assembly—repair		X		
Fan assembly—rebuild			E	X
Filters, fuel—service and replace	X			
Filters, fuel—repair		X		
Filters, ignition circuit—replace	X			
Filters, ignition circuit—repair		X		

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