

TECHNICAL MANUAL

**ORGANIZATIONAL
MAINTENANCE MANUAL**

VOLUME III - PART 1

MAINTENANCE

TURRET

FOR

COMBAT ENGINEER VEHICLE,

M728

(2350-00-795-1797)

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This copy is a reprint which includes current
pages from Changes 1 through 3.

**Technical Manual
No. 9-2530-222-20-2-3-1**

**HEADQUARTERS,
DEPARTMENT OF THE ARMY
Washington, D. C., 15 September 1980**

**Technical Manual
Organizational Maintenance Manual**

**Volume III - Part 1
Maintenance**

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS
You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedres, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander U. S. Army Armament, Munitions and Chemical Command ATTN: AMSMC-MAS Rock Island, IL 61299-6000 A reply will be furnished to you.

*This manual in conjunction with TM 9-2350-222-20-2-1, TM 9-2350-222-20-2-2-1, TM 9-2350-222-20-2-2-2, TM 9-2350-222-20-2-3-2, TM 9-2350-222-20-2-3-3 supersedes the turret portion of TM 9-2350-222-20, September 1965, including all changes.

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INTRODUCTION

SCOPE

This manual is one of a series of manuals for your use in performing organizational maintenance of the turret and turret components of the M728 oombat engineer vehicle.

Descriptions of components and maintenance procedures for these components as allocated by the Maintenance Allocation Chart (MAC) are included.

MANUAL ORGANIZATION

This manual is arranged in 3 parts with each part divided into chapters as follows:

- Chapter 1 - contains system and component functional descriptions
- Chapter 2 and subsequent chapters - contains maintenance procedures for equipment items in the turret. Each equipment item is covered in a separate chapter.

HOW TO USE THIS MANUAL

- 1 Go to Table of Contents in front of manual or Index in back of manual to find equipment item that you are looking for.
- 2 Go to chapter or section listed in Table of Contents or Index.
- 3 Use maintenance procedures index to find maintenance task paragraph reference.
- 4 Go to paragraph references in maintenance procedures index.
- 5 Each maintenance procedure has a listing of resources (tools, personnel, etc) required to do the task. The resource listing items are explained as follows:
 - Tools: Hand tools or special tools required to do task
 - Supplies: Expendable material or parts required to do task
 - Personnel: Minimum number of soldiers required to do task
 - References: Lists other technical manuals where related procedures can be found
 - Equipment Location Information: Refers to foldout illustrations at end of each part that show where equipment item is located in turret
 - Equipment Condition: Condition of tank or equipment item necessary to start task
 - Preliminary Procedures Lists procedures that must be done before starting task
 - General Instructions Provides instructions that you should be made aware of when performing entire procedure

NOTE

If any resource is not applicable to the procedure, the resource will not be listed.

HOW TO USE THIS MANUAL (CONT)

6 Obtain resources

7 Continue with procedure:

- Procedures are arranged in frames beginning with Frame 1.
- Each frame provides instructions in a series of steps.
- Parts named in each step are followed by a number in parentheses ().
- Illustrations support each frame and are either on same page or on facing page.
- Number callouts on each illustration match number in procedure step.
- Following last step on each frame are instructions to either go to next frame or end task.
- Some tasks will require other procedures be done before task is completed. This will be denoted as: Follow-on Maintenance Action Required.

NOTE

In parts of this manual component/assembly nomenclature may differ. Refer to TM 9-2350-222-20-2-1, Appendix C for component/ assembly name used in Maintenance Allocation Chart and associated common name used in maintenance procedures.

CHAPTER 1

GENERAL MAINTENANCE INFORMATION

Section 1. SCOPE

1-1. This technical manual contains instructions for organizational maintenance of turret and turret components of the full-tracked combat engineer vehicle M728. The vehicle is designed to provide maximum ballistic protection for the crew and is heavily armed, being a basic M60A1 tank modified to provide a mobile and maneuverable weapon for combat support of ground troops and vehicles. It is equipped with a hydraulically operated bulldozer mounted to the front of the hull. A winch and boom are mounted to the turret for lifting, carrying, and winching. Erecting and stowing the boom are accomplished hydraulically. The M728 vehicle is used for breaching, obstacle removal, transportation of demolition teams, and pioneering operations. The crew consists of a commander, gunner, loader and driver.

1-2. The turret, which fits into the hull opening, is a one-piece homogeneous armor steel casting. A platform (turret basket) attached to the turret permits the commander, gunner, and loader to traverse with the turret. Openings provided in the turret accommodate the 165-mm combination gun mount, commander's cupola, ventilating blower, antennas, boom and winch hydraulic lines, sighting and fire control components and loader's hatch. The turret contains electrical and hydraulic controls, communications equipment, sighting and firing controls. Externally the turret has racks for stowing miscellaneous items such as a 5-gallon water can, cargo and combat packs, towing cables, water fording equipment and the Xenon searchlight. Internal racks are provided for stowage of items such as periscopes, binoculars, flashlights, canteens, rations, a portable carbon dioxide (CO₂) fire extinguisher, ammunition, and various hand tools. A winch-boom assembly is mounted to the turret for lifting, carrying, and winching operations.

1-3. TABULATED DATA**a. Vehicle**

Armor (hull and turret)	cast homogeneous armor steel
Capacities (fuel and oil):	
Fuel tanks (total)	375 gal
Engine crankcase (fill, approximate)	18 gal
Engine crankcase, (refill, approximate)	13 gal
Transmission (fill, approximate)	23 gal
Transmission (refill, approximate)	17 gal
Hydraulic reservoir (boom, winch, and bulldozer) (fill, approximate)	50 gal
Hydraulic reservoir (boom, winch, and bulldozer) (refill, approximate)	48 gal
Crew	4 (commander, driver, gunner and loader)
Controls:	
Brakes:	
Operation	hydraulically-linked foot pedal
Type	multiple disc wet plate
Steering	
Type	mechanical, steering control
Turning radius	pivot to infinity
Transmission shift lever positions:	
"N" (Neutral)	pivot steer
"P" (Park)	lock vehicle brakes to park, start position
"L" (Low)	ascending and descending steep grades and soft or very rough terrain-forward at 10 mph maximum descending steep grades for maximum engine braking power - rearward at 5 mph maximum
"H" (High)	normal driving conditions - forward at 30 mph maximum
"R" (Reverse)	normal driving conditions and ascending steep grades for maximum engine power - rearward at 5 mph maximum descending steep grades for maximum braking power - forward at 5 mph maximum
Dimensions:	
Length (with boom and bulldozer in travel position)	350.80 in.
Length (with boom in erected position)	366.30 in.

Para 1-3**1-2**

Height (lowest operable)	128.23 in.
Length of hull with bulldozer installed	314.80 in.
Width with bulldozer installed	146 in.
Ground clearance	15 in.
Traverse radius (with boom in travel position)	197.50 in.
Traverse radius (with boom in erected position)	205.50 in.
Electrical:	
Electrical system	24-volt DC
Generated	28-volt DC, 300 amp
Number of batteries	6 (12-volt)
Power plant and final drive:	
Make and type	Continental 12-cylinder, air cooled, 90 degree "V" -type, compression-ignition
Model	AVDS-1790-2A
Displacement	1,790 cu in.
Weight, dry (with accessories)	4,527 lb
Speed:	
Governed, full load	2,400 rpm
Governed, no load	2,550 rpm
Idle	750 rpm
Horsepower, gross	750 bhp at 2,400 rpm
Horsepower, net	642 bhp at 2,400 rpm
Fuel oil, diesel	40 cetane, regular grade DF-2, VV-F-800, 20° to 115°F
Fuel oil, diesel	40 cetane, regular grade DF-1, VV-F-800, -25° to 20°F
Fuel oil, diesel	40 cetane, regular grade DF-A, VV-F-800, -65° to -25°F
Oil pressure:	
At 750 rpm (idle)	20 psi with OE 30 at 180°F
At 2,400 rpm (full load)	40 to 70 psi with OE 30 at 180°F
Oil temperature:	
Normal	180°F at 60°F ambient
Maximum	245°F

Cooling system	thermostatically-controlled engine-driven fan for cylinders, transmission and engine oil coolers
Induction system	supercharged by two Schwitzer exhaust-driven turbosuperchargers
Transmission:	
Type	Allison CD-850-6A, cross-drive
Performance:	
Vehicle speed (maximum)	30 mph
Allowable speed (maximum):	
Low	10 mph
High	30 mph
Reverse	5 mph
Cruising range (approximate)	280 miles at 20 mph on hard surface roads
Vertical obstacle vehicle will climb forward	30 in.
Width of ditch vehicle will cross (maximum)	99 in.
Fording depth (without vehicle fording kit)	48 in.
Grade ascending ability (maximum)	60 percent
Grade descending ability (maximum)	60 percent
Fuel consumption (approximate)	1.13 gpm
Traverse of turret	360 deg
Weight	
Gross (combat-loaded)	115,000 lb
Net (less crew, stowage and fuel)	109,000 lb
Ground pressure	12.2 psi
Bridge load classification:	
Empty	54
Cross country (combat loaded)	57

1-4. GUN ELEVATING AND TURRET TRAVERSING SYSTEM

a. General. The gun elevating and turret traversing system consists of mechanical, electrical, and hydraulic components so arranged as to permit either the gunner or commander to traverse the turret 360 degrees in either direction or to depress and elevate the 165-mm gun. The 165-mm gun can be elevated or depressed while the turret is being traversed. The gun elevating and traversing system consists of the following an electrical-hydraulic controlled elevating and traversing system, and in case of power or other failure, a manually operated hydraulic elevating system and a manually operated mechanical traversing system.

b. Tabulated Data

Gun elevating system:

Depression of gun

Power control	10 deg minimum each side of vehicle front centerline to 90 deg of vehicle rear centerline 0 deg minimum each side from 90 deg of vehicle rear centerline to rear centerline
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Manual control	(with power "ON") 10 deg minimum each side of vehicle front center line to 90 deg of vehicle rear centerline and 0 deg minimum each side from 90 deg of rear centerline
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	(with power "OFF") 10 deg minimum each side of front centerline to 90 deg of vehicle rear centerline and 5 deg from 90 deg to 20 deg from rear centerline and 0 deg from 20 deg to rear centerline
Elevation of gun (power and manual control)	20 deg maximum for 360 deg of turret traverse

Type of elevation mechanism	20 deg maximum for 360 deg of turret traverse
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Type of elevation mechanism	hydraulic
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Rate of power elevation of gun	4 deg per see
(maximum)	

Turret traversing system:

Time required to power traverse	37.5 see minimum
turret 360 deg	