

TECHNICAL MANUAL UNIT MAINTENANCE MANUAL

HULL AND RELATED COMPONENTS RECOVERY VEHICLE, FULL-TRACKED: LIGHT, ARMORED, M578 (2350-00-439-6242) (EIC:3LA)

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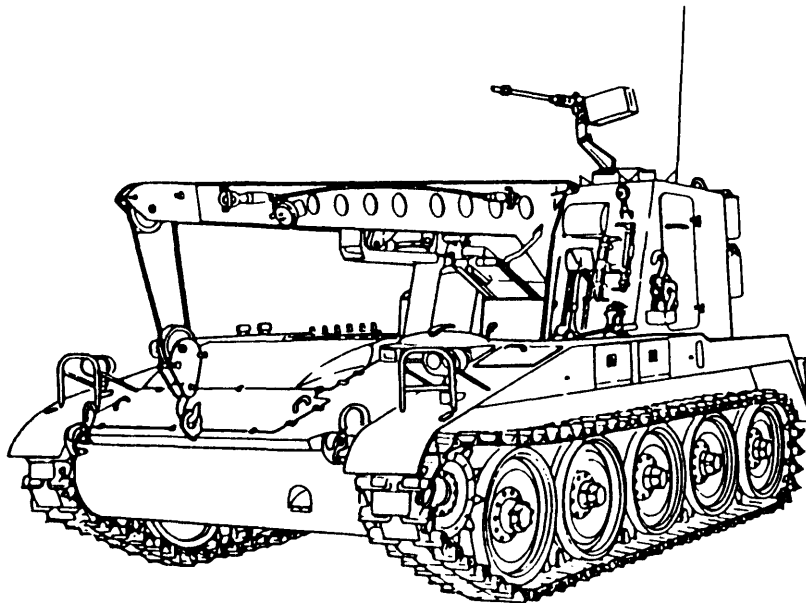
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Distribution: Statement A: Approved for public release; distribution is unlimited

This Manual supersedes hull and related components portions of
TM 9-2350-238-20, dated 4 October 82, including all changes

HEADQUARTERS, DEPARTMENT OF THE ARMY
15 MAY 1994

TECHNICAL MANUAL

No. 9-2350 -238-20-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 15 May 1994

**UNIT MAINTENANCE MANUAL
HULL AND RELATED COMPONENTS
RECOVERY VEHICLE,
FULL TRACKED: LIGHT, ARMORED, M578
(2350-00-439-6242) (EIC:3LA)**

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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 procedures, 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 direct to Commander, US Army Tank-Automotive Command, Attn: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

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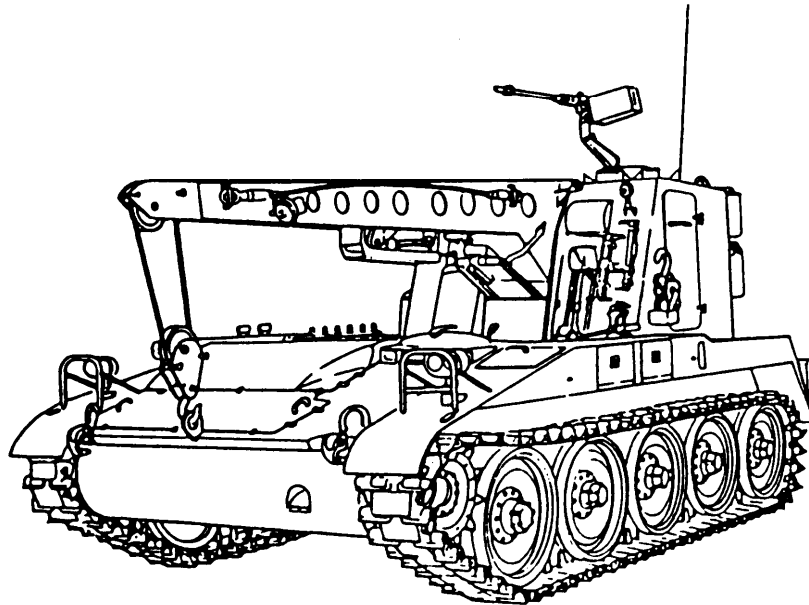
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HOW TO USE THIS MANUAL

This manual (TM 9-2350-238-20-1) contains unit level maintenance procedures for the hull and related components of the M578 Recovery Vehicle. This manual is to be used in conjunction with TM 9-2350-238-10 and TM 9-2350-238-24P-1. Chapter 1 contains general information; equipment description and data; and principles of operation. Chapter 2 contains information concerning repair parts, special tools, TMDE, and support equipment; and unit level troubleshooting and maintenance procedures.

Be sure to read and understand maintenance instructions before beginning any maintenance task. Also, read and understand information in Chapter 1 and general maintenance procedures on page 2-379 before beginning any maintenance task.

M578 RECOVERY VEHICLE



CHAPTER 1

INTRODUCTION

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Section 1. GENERAL INFORMATION

1-1. SCOPE.

- a. *Type of Manual.* Unit level maintenance.
- b. *Model Number and Equipment Name.* M578, light armored, full-tracked, recovery vehicle.
- c. *Purpose of Equipment.* Travels at convoy speed and provides a number of necessary vehicular support functions.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

a. *Tactical Situations.* Situations may arise in which it is necessary to abandon equipment in the combat zone. All abandoned equipment must be destroyed to prevent its use by the enemy. The destruction of equipment subject to capture or abandonment in the combat zone will be undertaken only upon authority delegated by a division or higher commander.

b. *Plans.*

(1) Plans for destruction of equipment must be adequate, uniform, and easily carried out in the field.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE (CONT).

(2) Destruction must be as complete as the available time, equipment, and personnel will permit. Since complete destruction requires considerable time, priorities must be established so the more essential parts are destroyed first.

(3) The same essential parts must be destroyed on all like units to prevent the enemy from constructing a complete unit from undamaged parts.

(4) Spare parts and accessories must be given the same priority as parts installed on the equipment.

c. Methods. To destroy equipment adequately and uniformly, all personnel of the unit must know the plan and priority of destruction and be trained in the methods of destruction.

d. References. Read TM 750-244-6 for information on destruction of mechanical equipment. Read TM 750-244-5-1 for information on destruction of ammunition.

1-4. PREPARATION FOR STORAGE OR SHIPMENT. Administrative storage is restricted to 90 days and must not be extended. Refer to page 2- for detailed instructions on administrative storage.

1-5. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS.

Nomenclature Cross-Reference List.

<i>Common Name</i>	<i>Official Nomenclature</i>
Arctic traction kit	Track parts kit
Base link	Heater bracket
Base straps	Window assembly to driver's cupola holddown vehicular safety belt
Brake adjustment splined wrench	Remote control lever
Crane operator's window assembly rear seal	Crane operator's window assembly cover assembly
Engine oil dipstick	Liquid level gage (oil) tube and rod
Fuel sending unit liquid transmitter	Fuel sending unit liquid quantity transmitter
Ground strap	Electrical lead
Hinge to base pin assembly	Hinge to base single chain assembly
Hull transmission compartment deck assembly	Hull transmission compartment assembly access cover

Insulation sleeving	Sleeve insulation or sleeving insulation
Lockwire	Nonelectrical wire
Low engine coolant level warning light	Low engine coolant warning indicator light
Magnetic clutch	Vehicular drive
Primary fuel filter	Fluid filter
Roadwheel	Solid rubber wheel
Secondary fuel filter	Fluid filter
Starter control relay	Electromagnetic relay
Starter ground lead	Engine ignition lead
Starter relay	Electromagnetic relay
Track shoe link pin	Threaded-end rod
Water by-pass tube	Metallic bent tube
Water crossover tube	Metallic bent tube
Window assembly chain	Window assembly to driver's cupola chain

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your M578 Recovery Vehicle needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at Commander, US Army Tank-Automotive Command, ATTN: AMSTA-Q, Warren, MI 48397-5000. We will send you a reply.

1-7. CORROSION PREVENTION AND CONTROL (CPC).

a. Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in the future.

b. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

c. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will assure that the information is identified as a CPC problem.

d. The form should be submitted to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-Q/Customer Feedback Center, Warren, MI 48397-5000.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. *Purpose.* The M578 Recovery Vehicle is a weapon which provides support to other vehicles in the field.

b. *Capabilities and Features.*

CAUTION

Do not ford water which exceeds 42.0 in. (106.7 cm) in depth. Check for soft mud or sandy bottoms.

(1) The M578 Recovery Vehicle is a light, armored, full-tracked recovery vehicle. It tows other vehicles and lifts and pulls heavy loads. This diesel-powered vehicle is highly mobile, maneuverable, and may be air transported. The vehicle is capable of long-range, high-speed operation on improved roads. It can traverse rough terrain, muddy or marshy ground, sand, and snow or ice. The M578 Recovery Vehicle can ford streams up to 42.0 in. (106.7 cm) deep.

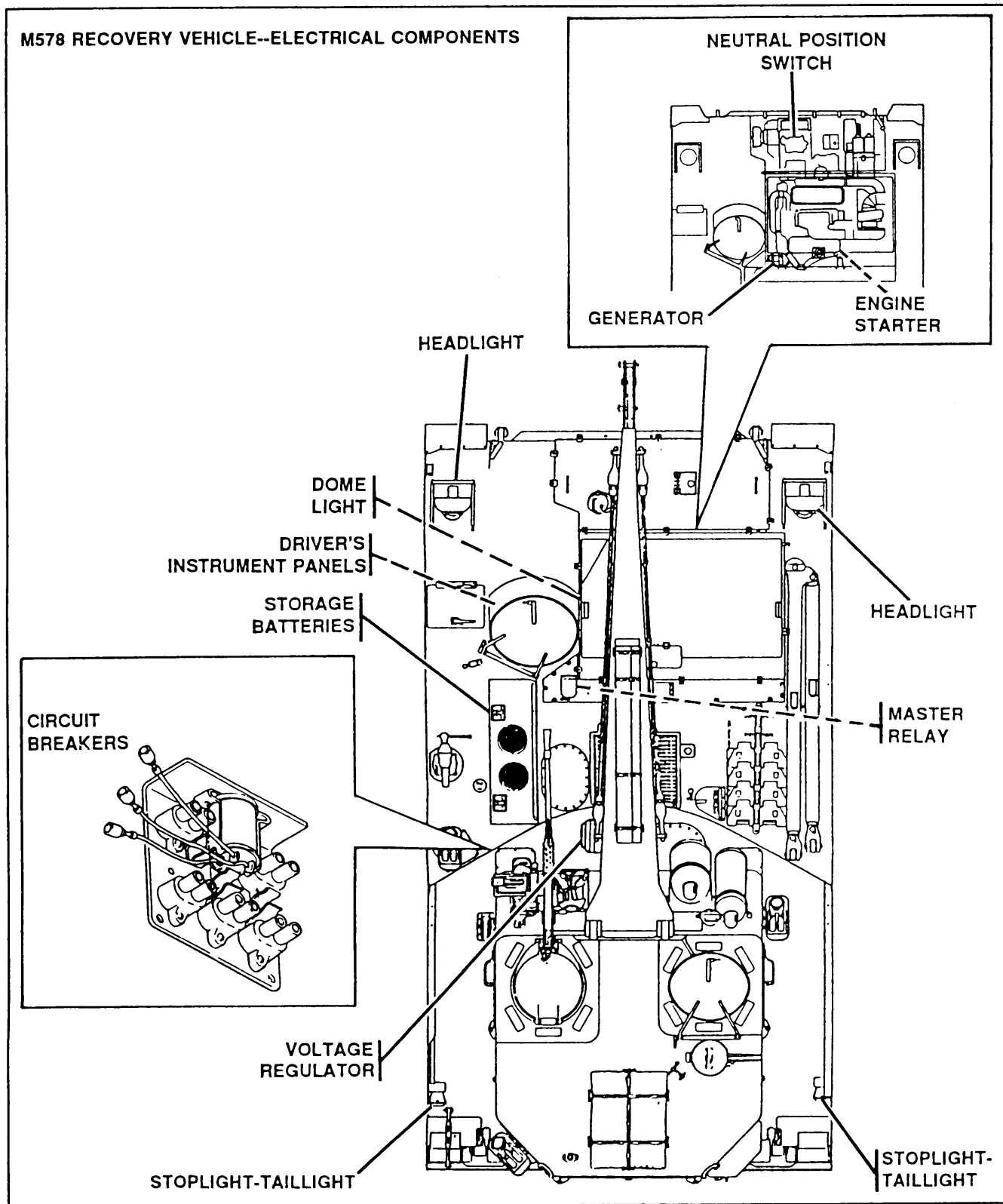
(2) A hydraulic suspension lockout system and spade assembly instantly transform the vehicle into a stable platform.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. Refer to TM 9-2350-238-20-2.

ELECTRICAL COMPONENTS

Electrical power is provided by a 24-volt, 300-ampere generator and four storage batteries. Output of the generator is controlled by a solid state voltage regulator. A master relay regulates battery power. An electric pump powers the hydraulic system. Electrical components are controlled by switches located in the driver's compartment. Leads and wiring harnesses distribute current to all electrical components. A slave receptacle allows connection of the vehicle electrical system to another power source. Electrical components are connected by wiring harnesses, electrical leads, and circuit breakers.

M578 RECOVERY VEHICLE--ELECTRICAL COMPONENTS



1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

- a. *Generator.* The 300-ampere, 24-volt dc generator operates whenever the engine is running. It provides electrical power to recharge the batteries and operate the vehicle.
- b. *Batteries.* Four 12-volt batteries are connected in series-parallel to produce 24 volts, and to provide electrical power to start and operate the vehicle.
- c. *Master relay.* The batteries transmit power through contacts in the master relay. When the master switch is on, the master relay is energized and power is available to all circuits in the vehicle.
- d. *Voltage regulator.* The voltage regulator controls the output voltage and current of the generator. It is a solid state unit and is not adjustable. Circuit breakers protect the generator from electrical overload.
- e. *Starter and solenoid.* The starter is a direct cranking, nonreversible, 24-volt unit. It is actuated by a two-coil starter motor solenoid mounted on the starter.
- f. *Neutral position switch and starter control relay.* The neutral position switch closes when the transmission shift lever is in neutral position. This completes the circuit for the starter control relay to supply battery power to the two starter windings when the start switch is pressed.
- g. *Driver's instrument and switch panel.* The instrument and switch panels contain the switches, indicator lights, and gages required for operation of the vehicle. Refer to TM 9-2350-238-10 for description of the separate items on each panel.
- h. *Vehicle lighting.* The service and infrared headlights are set for high or low beam by the dimmer switch. The two headlights are combination units. Each headlight consists of an incandescent driving lamp, infrared driving lamp, blackout driving lamp, and blackout marker lamp. The taillights are combination units. The right taillight consists of a blackout stoplight and marker light. The left taillight consists of a service taillight, service stoplight, and blackout marker light. The dome light is a standard combination blackout and service light.
- i. *Warning switches and transmitters.* When the brake foot pedal is depressed, the brake warning sensitive switch roller guide is released, causing the switch contacts to close. Closing the switch contacts causes the service stoplight or blackout stoplight to light.
 - (1) The engine low oil pressure warning switch opens at 9 to 13 psi (62 to 90 kPa) on increasing pressure. When the switch is closed, a circuit is completed to light the warning light and cause the warning horn to sound.
 - (2) The engine oil pressure transmitter is a variable resistance unit. It gives a reading on the engine oil pressure indicator.
 - (3) The engine oil temperature warning switch closes at 300 °F to 310 °F (149 °C to 155 °C) on increasing temperature. When the switch is closed, a circuit is completed that causes the warning light to light and the warning horn to sound.
 - (4) The transmission oil temperature transmitter is a variable resistance unit. It gives a reading on the transmission oil temperature indicator.

(5) The transmission oil pressure transmitter is a variable resistance unit. It gives a reading on the transmission oil pressure indicator.

(6) The fuel sending unit liquid transmitter is a sparkproof, float-operated variable resistance unit. It gives a reading on the fuel level indicator.

NOTE

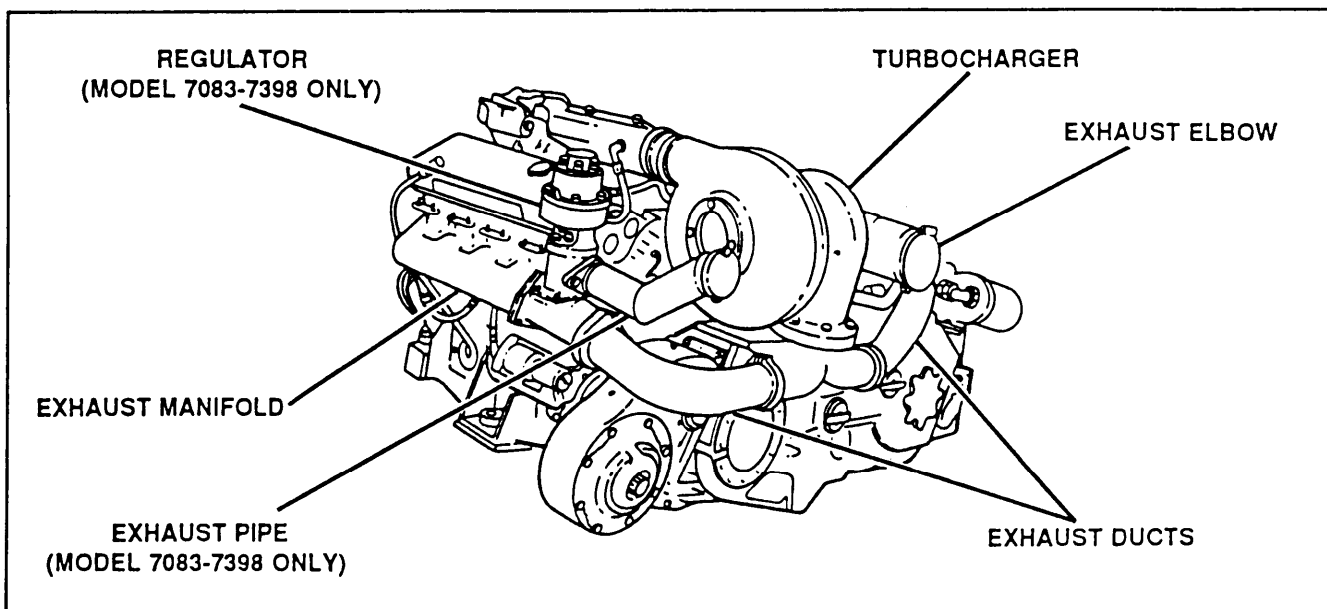
This illustration cannot show all wiring, electrical leads, and circuit breakers on the M578 recovery vehicle. For complete vehicle schematic diagrams, refer to FO-1 and FO-2.

j. *Wiring.* Vehicle components are connected with single wire leads or multiple lead wiring harnesses. All wiring is standard ordnance waterproof cable. Connections are made by waterproof, rubber, single wire quick-disconnect connectors, plug-receptacle connectors, or solderless waterproof terminals.

k. *Leads.* All leads are identified by a marker band attached to the wire and stamped with a circuit number. The socket and pin contacts of the connectors are identified by upper case letters of the alphabet, stamped on the connector insert.

l. *Circuit breakers.* Thermal break, automatic reset, 15A and 20A circuit breakers protect the vehicle components and circuits.

EXHAUST SYSTEM



1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

ENGINE MODEL 7083-7395. Engine exhaust gas is routed through two exhaust manifolds and two exhaust ducts to the turbocharger. The exhaust gas passes through the turbocharger (driving it) and out through the exhaust elbow.

ENGINE MODEL 7083-7398. Exhaust gases are discharged through two exhaust manifolds and ducts to the turbocharger. Gases from the right manifold discharge into the turbocharger turbine. Gases from the left manifold discharge through the turbocharger regulator in the turbocharger.

a. *Turbocharger regulator.* The regulator is controlled by the pressure difference between intake and outlet air of the turbocharger blower section. When the outlet pressure is greater than the inlet pressure, the regulator vents part of the exhaust gases through its exhaust pipe to bypass the turbocharger. This reduces the turbocharger speed and output of air, thus preventing turbocharger overspeed.

b. *Exhaust elbow.* Exhaust gases are expelled from the turbocharger through an exhaust elbow.

FIRE EXTINGUISHER SYSTEM

The fixed fire extinguisher system is a carbon dioxide gas system with two release handles. When either release handle is pulled, two cylinders discharge carbon dioxide gas through nozzles over the engine and into the powerplant compartment.

FUEL SYSTEM

The engine takes fuel from the cell to the low-pressure fuel filter on the engine. Fuel flows from the low-pressure fuel filter to the engine fuel pump. The fuel pump delivers fuel through a high-pressure fuel filter to the injectors at high pressure. Excess fuel is used to cool the injectors and is returned to the fuel cell through a return line. Fuel that leaks past moving parts in the engine is collected in the powerplant reservoir.

a. *Fuel cells.* A steel fuel cell is part of the hull. It is lined with a two-piece fabric fuel cell filled with foam filler blocks. The fabric fuel cell prevents fuel leakage. The foam filler blocks prevent sloshing of fuel in the cell.

b. *Air box pump and fuel prime solenoid.* The air box pump and fuel prime solenoid valve, when energized, allow the pump to draw fuel from the low-pressure filter and force it through the high-pressure filter to the injectors. This prime and purge system forces out any air trapped in the high-pressure fuel filter and lines.

HYDRAULIC SYSTEM

The M578 Recovery Vehicle has an open-center type hydraulic system. This means that the hydraulic fluid continuously circulates through the main hydraulic supply lines. When no hydraulic subsystem is being used, the hydraulic fluid pressure in the main supply lines is near zero. When a subsystem is used, hydraulic fluid from the main supply lines is diverted through the subsystem. Hydraulic fluid pressure builds up within the subsystem to a level high enough for the subsystem to function. Preset pressure relief or pressure reducing valves protect the subsystem from too much pressure.