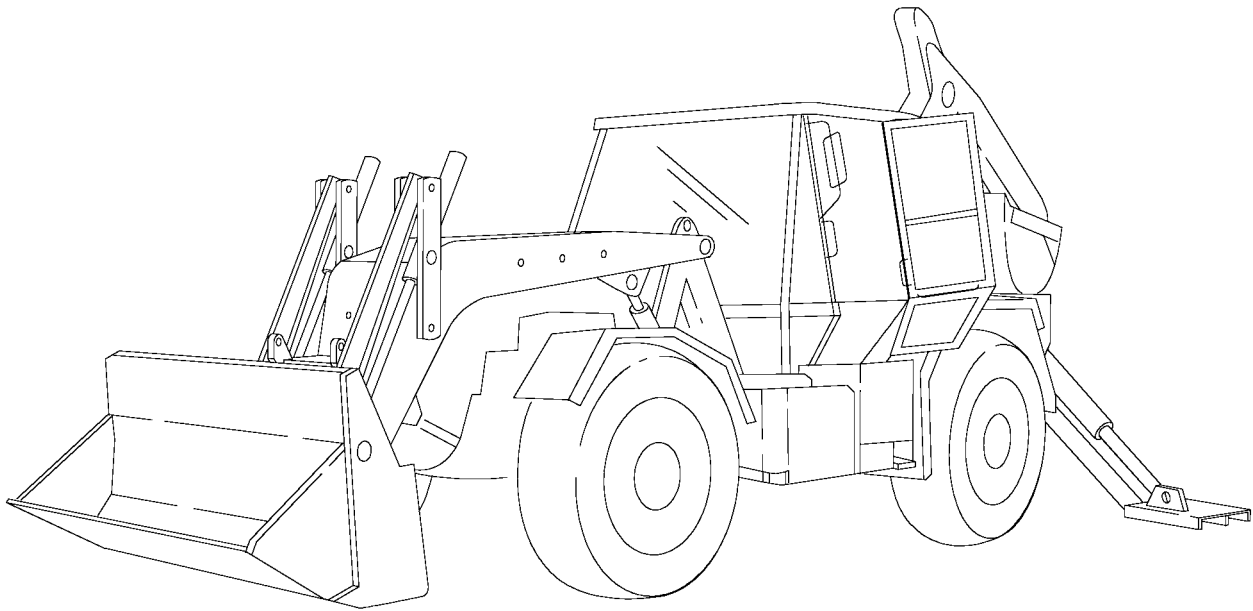

TECHNICAL MANUAL

**UNIT, DIRECT SUPPORT, AND GENERAL
SUPPORT MAINTENANCE MANUAL FOR
INTERIM HIGH-MOBILITY ENGINEER
EXCAVATOR (IHMEE)**

NSN 2420-66-148-7692



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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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PURPOSE OF MANUAL.

The information in this manual is designed to help maintain the Interim High-Mobility Engineer Excavator (IHMEE) vehicle. It is intended to serve as a guide to assist qualified mechanics in the maintenance of the vehicle. In addition to this manual, refer to TM 5-2420-230-24P for any required parts information.

HOW TO USE THIS MANUAL.

Listed below are some of the features included in this manual to help locate and use the needed information:

- Each chapter begins with a Table of Contents listing all paragraph headings in the chapter.
- Warning, caution, note, and subject headings and other essential information are printed in bold type, making them easier to see.
- The maintenance tasks describe what must be done to the vehicle before starting the task, and what must be done to return the vehicle to operating condition after the task is finished.
- The appendixes are located at the end of the manual. They contain a reference guide to other manuals, guidelines to reading the Maintenance Allocation Chart (MAC), a list of expendable supplies and materials, towing procedures, and torque values.
- Several vendor manuals have also been included as appendixes. Appendixes in this volume include those for the backhoe, axles, steering pump, and vane pump/motor. Each vendor manual has a supplement showing task boxes relating to each maintenance task.
- Refer to TM 5-2420-230-24-2 for engine vendor manuals and foldout schematics.

The manual is divided into chapters containing Unit, Direct Support, and General Support maintenance procedures. These procedures describe a number of things, such as:

- What will be needed to do the job.
- If any assistance will be needed.
- How long the job will take.
- Important safety precautions.

In addition to the text, there will be illustrations for most procedures. These illustrations are keyed to the text and shows you how to take the part off and put it on. Cleaning and inspection procedures are also included when required.

Follow these guidelines when using this manual:

- Read all WARNINGS and CAUTIONS before performing any procedure.
- Become familiar with the entire maintenance procedure before beginning a maintenance task.

CHAPTER 1

INTRODUCTION

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Section I. General Information.

1-1. SCOPE.

This manual provides the technical information required to maintain the Interim High-Mobility Engineer Excavator (IHMEE). The manual covers the vehicle and all the accessories that may be fitted. This chapter contains a general description of the IHMEE.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 738-750, Functional User’s Manual for The Army Maintenance Management System (TAMMS) or AR 700-138, Army Logistics Readiness and Sustainability.

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

Command decision, according to the tactical situation, will determine when the destruction of the IHMEE vehicles will be accomplished. A destruction plan will be prepared by the using organization unless one has been prepared by a higher authority. For general destruction procedures for this equipment, refer to TM 750-244-6, Procedures for Destruction of Tank-automotive Equipment to Prevent Enemy Use (U.S. Army Tank-automotive and Armaments Command).

1-4. PREPARATION FOR STORAGE OR SHIPMENT.

Refer to Para 3-9 and Para 3-10 for instructions on preparing the IHMEE for storage or shipment.

1-5. NOMENCLATURE CROSS-REFERENCE.

<u>Common Name</u>	<u>Official Nomenclature</u>
Engine coolant	- Antifreeze, ethylene glycol mixture
Glad hand	- Quick disconnect air coupling
Light bulb	- Incandescent lamp
O-ring	- Preformed packing
Service brake pedal	- Brake pedal
Snap ring	- Retaining ring
Throttle pedal	- Throttle control
U-joint	- Universal joint
Washer fluid	- Windshield cleaning compound

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS).

If any vehicle needs improvement, let us know. Send us an EIR. The user is the only one who can tell us how the equipment might be improved. Let us know what isn't liked about the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive Command, ATTN: AMSTA-QRT, Warren, MI 48397-5000. We'll send a reply.

1-7. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) AND EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE SUMMARY (EIR MS).

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43 0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43 0001-39 series is compiled from some of the Quality Deficiency Reports that have been prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that were submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of the DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual.

In addition, the more maintenance-significant articles, including minor alterations, field-fixes, etc., that have a more permanent and continuing need in the field are republished in the Equipment Improvement Report and Maintenance Summary (EIR MS) for TACOM Equipment (TM 43-1043). Refer to both of these publications (TB 43 0001-39 series and TM 43-1043) periodically, especially the TB 43 0001-39 series, for the most current and authoritative information on the equipment. The information will help the user do a better job and will advise of the latest changes to this manual. Also refer to DA PAM 310-1, Consolidated Index of Army Publications and Blank Forms, and Appendix A (References) of this manual.

1-8. WARRANTY INFORMATION.

The IHMEE vehicles are warranted by ADI Limited and various component equipment manufacturers. The warranty starts on the date found in block 23 of DA Form 2408-9 in the logbook. Report all defects in material or workmanship to the supervisor, who will take appropriate action. Refer to TB 5-2420-230-14 for more information on the warranty procedures for the IHMEE vehicles.

1-9. METRIC SYSTEM.

The equipment described herein contains metric components and requires metric, common, and special tools. Therefore, metric units and English units will be used throughout this publication. English values are listed first, with the metric equivalent shown afterward in parentheses. An English-to-metric conversion table is included as the last page of this manual inside the back cover.

Section II. Equipment Description and Data.

1-10. VEHICLE DESCRIPTION.

The IHMEE is a high-speed, all-terrain engineering vehicle. The IHMEE has two-wheel and four-wheel drive, and is limited to traveling at an average highway speed of 30 mph (48 km/h) due to safety-related issues. The vehicle has a Front-End Loader (FEL) and a backhoe. In addition, the FEL can be replaced with a forklift.

1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

Refer to TM 5-2420-230-10 for equipment characteristics, capabilities, and features.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Refer to TM 5-2420-230-10 for location and description of major components.

1-13. SAFETY, CARE, AND HANDLING.

Significant hazards and safety recommendations are listed in Table 1-1. Refer to Chapter 2 for more safety information.

Table 1-1. Significant Hazards and Safety Recommendations.

Hazard	Safety Recommendation or Precaution	Operating Condition*
Low air pressure for brakes.	Do not drive vehicle while low air pressure warning buzzer is sounding or warning indicator is on.	Abnormal
Vehicle instability with backhoe use.	Ensure stabilizers are down on firm ground, side slope does not exceed 5 degrees, and backhoe is not overloaded.	Abnormal
Connecting towing devices.	Do not go between vehicles unless they are both stopped and brakes are applied.	Normal
Refueling vehicle.	Shut OFF engine and no smoking when filling tank.	Normal

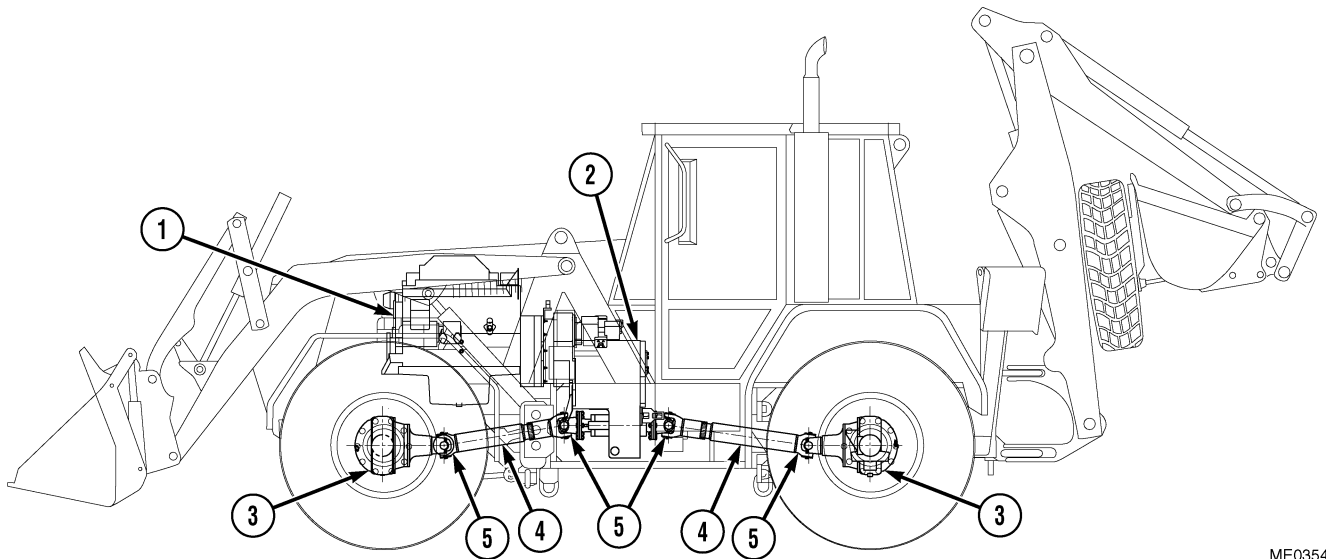
** Category of hazards as to whether they may be expected under normal or abnormal operating conditions.*

Section III. Technical Principles of Operation.

1-14. SYSTEMS INTRODUCTION.

The IHMEE contains seven functional systems: the power train; engine system; electrical system; pneumatic system; hydraulic system; steering system; and the Heating, Ventilation, and Air-Conditioning (HVAC) system. This section explains the overall operation of the functional systems.

1-15. POWER TRAIN.



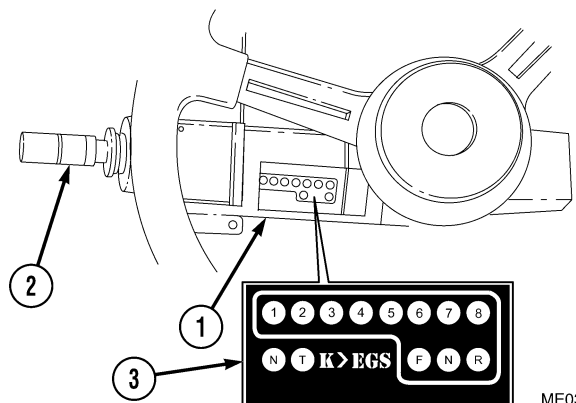
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Power for the vehicle is provided by a diesel engine (1) which is coupled directly to an automatic transmission (2). Power from the transmission is transferred to the front and rear axles (3) through the front and rear drive shafts (4) and U-joints (5).

a. Engine. The engine is a 185-hp, 6-cylinder, 5.88-L diesel engine.

b. Automatic Transmission. The transmission provides 12 gears and 8 speeds controlled by the Electronic Gear Selector (EGS): four high-range and four low-range forward gears, and two high-range and two low-range reverse gears.

The EGS (1) is comprised of a mechanical shift lever (2), a microcomputer, and an indicator display (3) integrated into the shift lever housing. The EGS computer system receives information internally from the shift lever (2) and externally from a speed sensor. This information, together with acquired vehicle speed information, is used to shift to the requested gear, or to prevent this while indicating this on the indicator display (3).

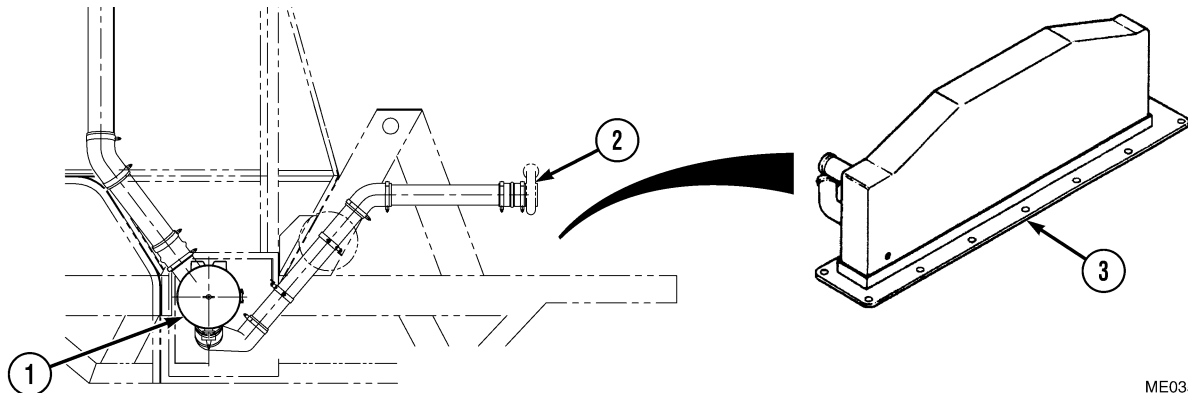


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c. Axles and Suspension. The front and rear axles are hub-reduction, full-floating, axle-shaft type. The front axle provides steering. The rear axle is nonsteering. Both the front and rear axles are equipped with wheel differentials. The front and rear suspensions consist of shock absorbers, air bags, and check straps. Check straps are used to limit the separation of the suspension and avoid damage to the air bags.

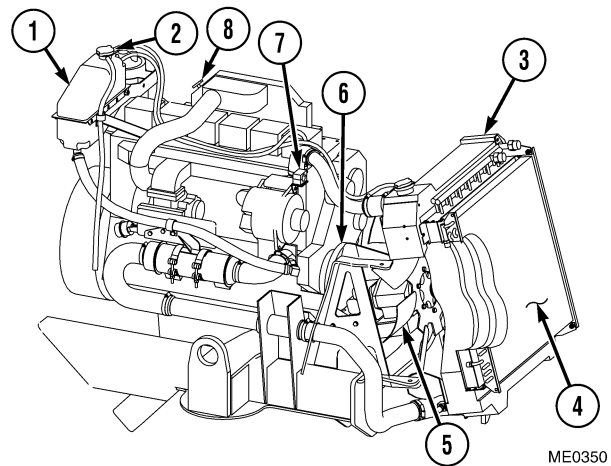
d. Drive Shafts and U-Joints. The drive shafts and U-joints transmit engine power to the axles.

1-16. ENGINE SYSTEM.



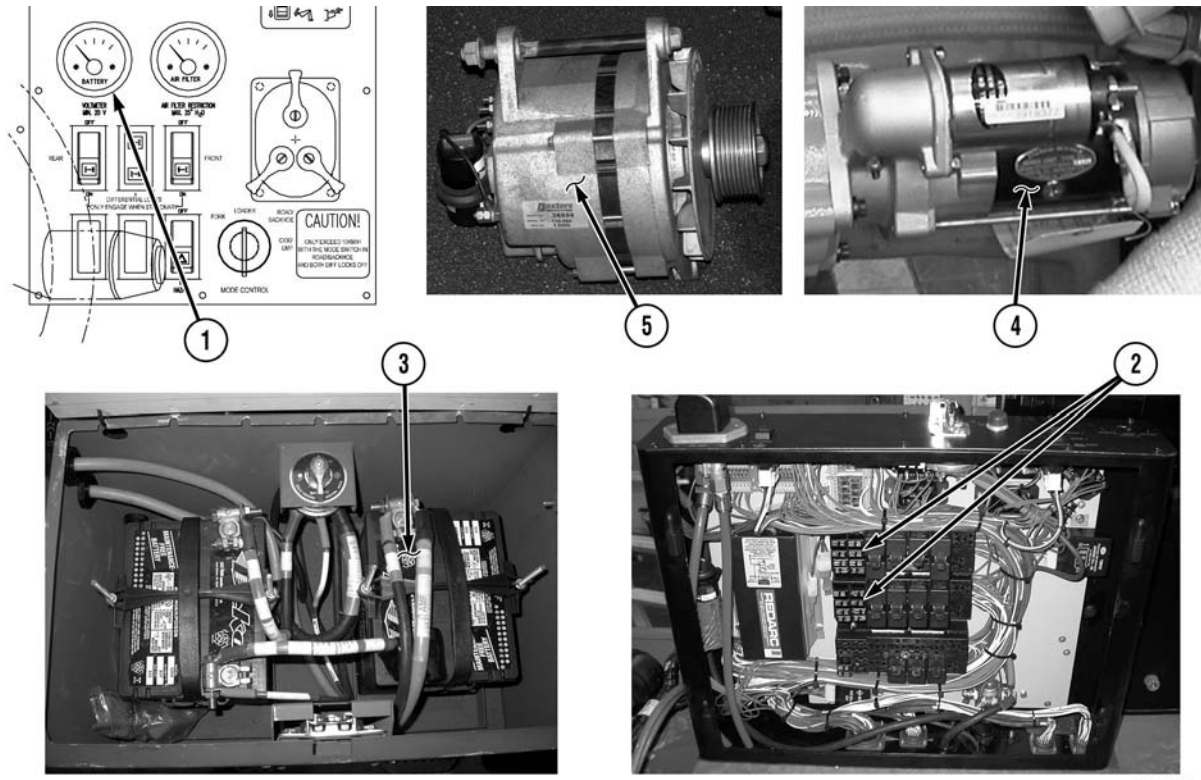
a. Air Intake. The air intake system consists of a dry-type air cleaner (1), a turbocharger (2), and an aftercooler (3). Engine exhaust gases flow through the turbocharger (2) driving a turbine wheel. A compressor wheel on the opposite end of the turbine wheel shaft rotates and draws in fresh air through the air cleaner (1). Air from the air cleaner (1) flows through the aftercooler (3) which cools the air before it is delivered to the engine cylinders.

b. Cooling System. The pressure-type cooling system protects the engine by removing heat generated during the combustion process. Coolant is added to the coolant overflow tank (1) through the filler cap (2). Pressure within the cooling system is regulated by pressure releases in the filler cap (2) and a relief cap on the radiator. Hot coolant flows from the engine to the top radiator tank (3) and through the radiator core (4) where a stream of air removes heat. This air is drawn through the cores by a hydraulically activated fan (5). A water pump (6) draws the coolant from the bottom of the radiator and pushes it through the engine, repeating the cooling process. Thermostats (7), mounted in each coolant outlet elbow, remain closed until the coolant approaches a predetermined temperature at which time they open. When the coolant temperature drops below the thermostat rating, they close. An air vent line (8), between the radiator (3) and the water pump inlet, removes air trapped in the engine when the cooling system is being filled.



c. Fuel System. Fuel is drawn from the fuel tank by the fuel pump. It passes through the supply line to a fuel/water separator (Primary Fuel Filter) and a secondary fuel filter to the engine fuel injector pump. There, fuel is metered and sent to the six fuel injectors via the fuel injector lines. Surplus fuel from injectors is returned to the fuel tank through the return line. The fuel/water separator removes water and large solid particles from the fuel. The finer particles are removed by the secondary filter before they can enter the fuel injector pump.

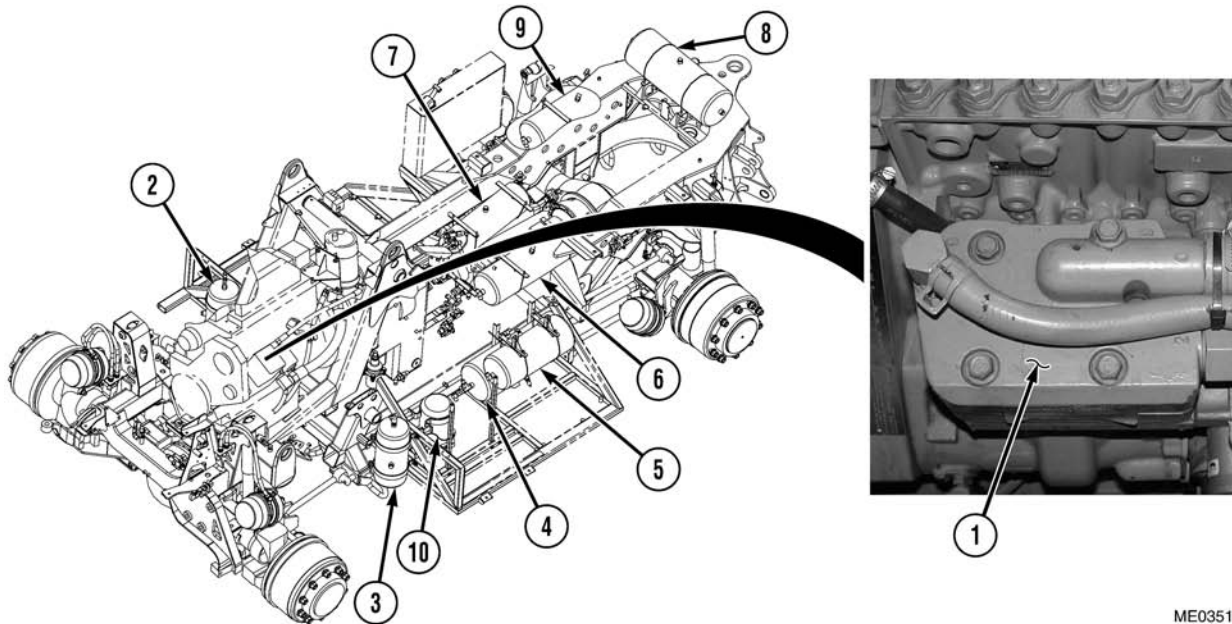
1-17. ELECTRICAL SYSTEM.



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The voltage and current for the electrical system are indicated by a voltmeter (1) located on the dash panel, inside the cab. Circuit breakers (2) located in the cab protect the main circuits. Electrical power is provided by two 12-Vdc series-connected batteries (3). Power is distributed throughout the vehicle by wiring harnesses. The harnesses are interconnected by pin connectors. A heavy-duty starting motor (4) is mounted on the engine flywheel housing and provides the cranking power necessary for starting the engine. The belt-driven alternator (5) maintains a 24-Vdc level for battery charging.

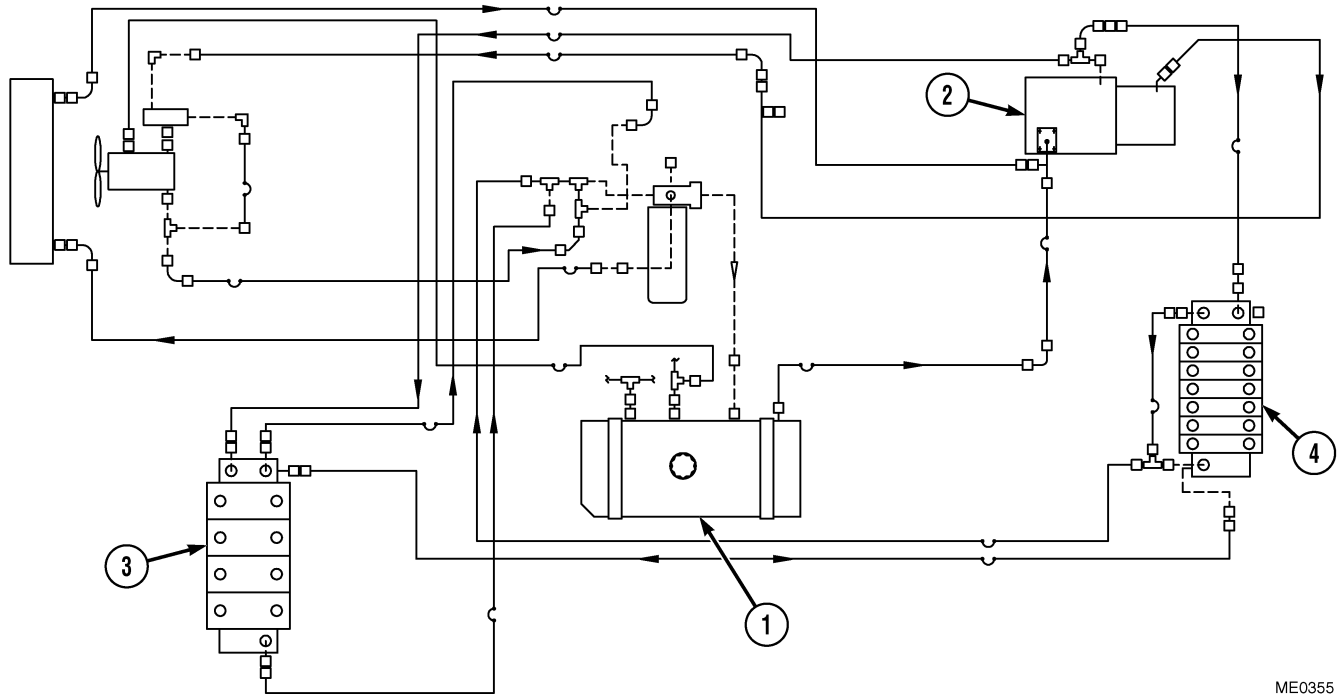
1-18. PNEUMATIC SYSTEM.



ME0351

The air system consists of an engine-driven air compressor (1) and eight air reservoirs (2) through (9). Air is drawn from the engine air intake and routed to the air compressor (1). Pressurized air flows from the air compressor through an aftercooler, a coalescing filter, and through an air dryer (10) where the air is cooled and the moisture/oil is removed. Moisture not removed by the air dryer will condense in the air reservoir. System air pressure is 119 psi (820 kPa). The air system includes the necessary valves and air lines to control the vehicles' air-operated devices. The air compressor supplies 15 cfm at 119 psi (3.25 m³/min. at 820 kPa). Air pressure in this system is shown by the red needle on the DUAL BRAKE PRESSURE gauge inside the cab.

1-19. HYDRAULIC SYSTEM.

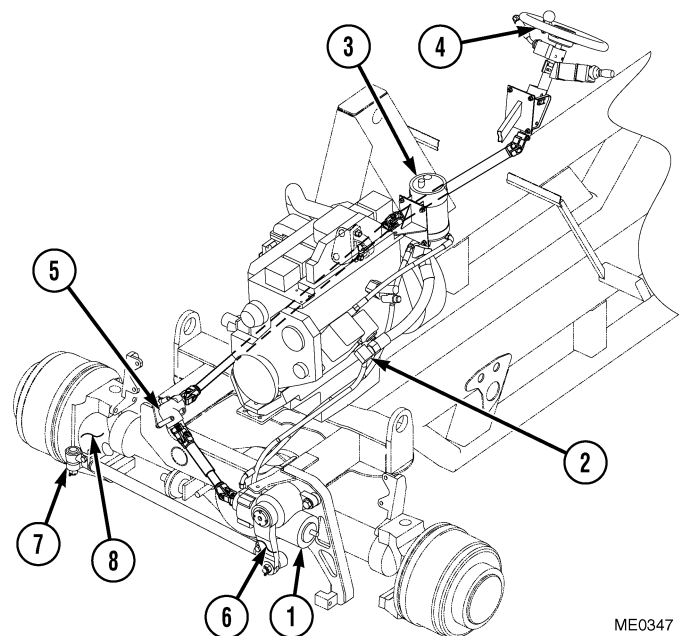


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Hydraulic reservoir (1) supplies the hydraulic pump (2), which is mounted on the back of the transmission on the left-hand side. Hydraulic pump (2) provides fluid power to the FEL and the backhoe through hydraulic lines to the FEL valve block (3) and backhoe valve block (4).

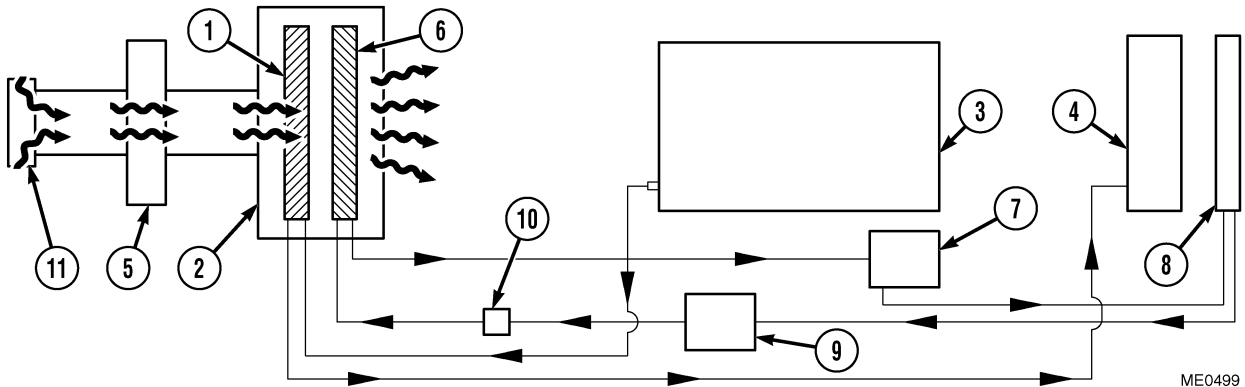
1-20. STEERING SYSTEM.

Power is supplied to the main steering gear box (1) by an engine-driven pump (2). The fluid reservoir (3) is separate from the main hydraulic system. The steering wheel (4) is mechanically linked to the steering gear box (1) by steering linkages and a miter box (5). When the steering wheel is rotated, the actuating valve in the steering gear box opens. Pressured oil is applied to one end of the steering gear piston, causing it to move the sector shaft and pitman arm. The pitman arm (6) is mechanically connected to the drag link (7). The drag link moves the steering mechanism on the front axles (8) to the left or right, causing the vehicle to steer in the same direction.



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1-21. HEATING, VENTILATION, AND AIR-CONDITIONING (HVAC).



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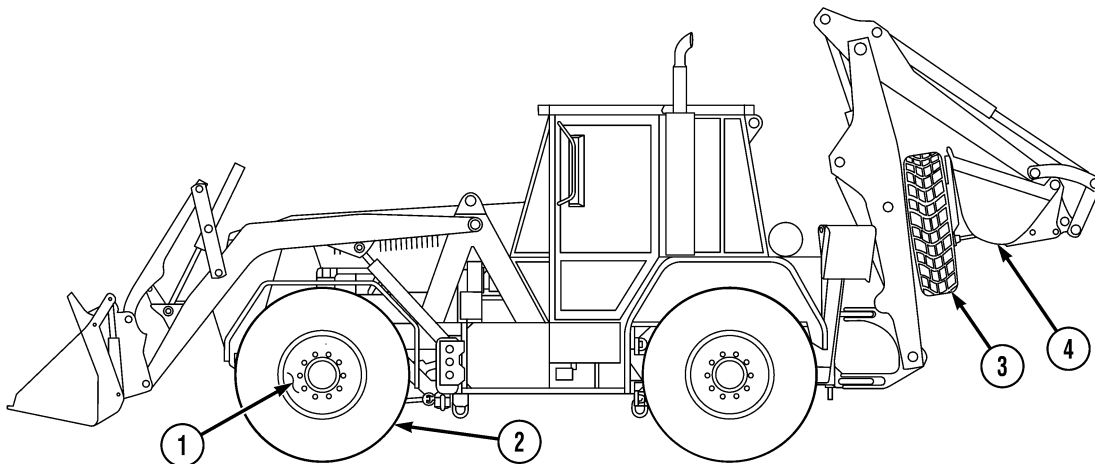
The IHMEE is equipped with an HVAC system that is capable of heating, cooling, and pressurizing the cab.

The cab heating system consists of a heater core (1) inside the cab A/C control unit (2), the engine (3), and the radiator (4). Hot coolant from the engine (3) flows to the cab A/C control unit (2) before returning to the radiator (4). The cab air pressurizer (5) blows air through the heater core (1), extracting heat from the coolant to warm the cab.

The cab cooling system consists of an evaporator (6) inside the cab A/C control unit (2), the A/C compressor (7) mounted on the engine (3), the A/C condenser (8), and the dryer (9). R-134a refrigerant is pressurized by the A/C compressor (7) and then converted to a high-pressure liquid state by the A/C condenser (8). Liquid from the A/C condenser (8) passes through the dryer (9), then to a thermal expansion valve (10), which meters the refrigerant to the evaporator (6). As expansion takes place within the evaporator (6), heat is absorbed, cooling and dehumidifying the air that the cab air pressurizer (5) blows through the evaporator (6).

In both heating and cooling, the air feeding into the cab A/C control unit (2) enters the cab through the A/C precleaner (11) and the cab air pressurizer (5), which also contains an air filter.

1-22. WHEELS AND TIRES.



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There are two front and two rear steel, three-piece, 24 x 10.00 wheels (1) with 14.00 R24 tubeless, steel radial tires (2). One spare tire (3) can be mounted to the backhoe bucket (4).