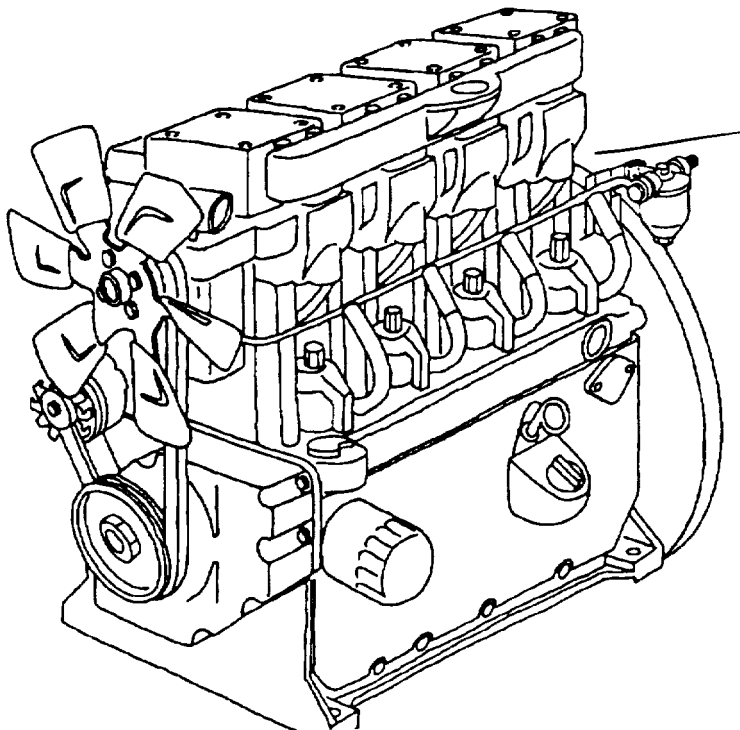


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AIR FORCE TO 38G1-93-2  
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**TECHNICAL MANUAL**  
**UNIT, DIRECT SUPPORT AND**  
**GENERAL SUPPORT MAINTENANCE INSTRUCTIONS**  
**DIESEL ENGINE**  
**MODEL DN4M**  
**4 CYLINDER 1.2 LITER**  
**NSN: 2815-01-350-2206**



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**HEADQUARTERS, DEPARTMENTS OF THE ARMY,**  
**AND THE AIR FORCE, AND**  
**HEADQUARTERS, U.S. MARINE CORPS**  
**15 SEPTEMBER 1993**

TECHNICAL MANUAL

NO. 9-2815-253-24

HEADQUARTERS, DEPARTMENTS OF  
THE ARMY AND THE AIR FORCE AND  
HEADQUARTERS, U.S. MARINE CORPS  
WASHINGTON, D.C., 15 September 1993

Unit, Direct Support and General Support  
Maintenance Instructions

**DIESEL ENGINE  
MODEL DN4M  
4 CYLINDER 1.2 LITER  
NSN: 2815-01350-2206**

**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 these procedures, please let us know.

(A) Mail your letter or 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, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil>. Instructions for sending an electronic 2028 may be found at the back of this publication immediately preceding the hard copy 2028.

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**CHAPTER 1**  
**INTRODUCTION**  
**SECTION I. GENERAL INFORMATION**

1-1. SCOPE.

1-1.1. Type of Manual. This manual contains unit, direct support and general support maintenance instructions for the Model DN4M Diesel Engine, hereafter referred to as engine. Also included are descriptions of major systems/components and their functions in relation to other systems/components.

1-1.2. Purpose of Equipment. The engine provides a driving force for generators or other equipment requiring this size (24 HP) and compatibility.

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

1-2.1. Reports of Maintenance and Unsatisfactory Equipment. 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). Air Force personnel will use AFR 66-1, Maintenance Management Policy, for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting.

1-2.2. Reporting of Item and Packaging Discrepancies. Fill out and forward SE 364, Report of Discrepancy (ROD), as prescribed in AR 735-11-2/DLAR 414-55/SECNAVINST 4355.18/AER 400-54/MCO 4430.3J.

1-2.3. Transportation Discrepancy Report (TDR) (SE 361). Fill out and forward Transportation Discrepancy Report (TDR) (SE 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AER-75-18/MCO P4610.19D/DLAR 4500.15.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

1-3.1. Army. If your Military Standard Engine 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 or performance. Put it on an SE 368 (Product Quality Deficiency Report) . Mail it to us at: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MDO, 4300 Goodfellow Boulevard, St, Louis, Missouri 63120-1798. We will send you a reply.

1-3.2. Air Force. Air Force personnel are encouraged to submit EIR's in accordance with AFR 900-4.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Refer to TM 750-244-3 for procedures to destroy equipment to prevent enemy use.

1-5. PREPARATION FOR STORAGE OR SHIPMENT.

Refer to TB 740-97-2 for procedures to place the equipment into storage.

1-6. WARRANTY.

The engine is warranted for a specific period of time. Refer to the end item warranty technical bulletin. The warranty starts on the date found in block 23, DA Form 2408-9, in the equipment log book. Report all defects in material or workmanship to your supervisor, who will take appropriate action.

## SECTION II. EQUIPMENT DESCRIPTION AND DATA

### 1-7. GENERAL.

The diesel engine (FIGURE 1-1) is four cylinder, four cycle, fuel injected, naturally-aspirated and liquid-cooled. The firing order is 1-3-4-2. The number one cylinder is toward the fan end of the engine. The serial number is found on right side of the cylinder body at number one cylinder location. Rotation of engine is counterclockwise as viewed from flywheel.

#### NOTE

**All locations referenced herein are given facing the flywheel end (rear) of the engine.**

### 1-8. DETAILED DESCRIPTION.

1-8.1. Cooling System. The cooling system consists of a radiator, water pump, cooling fan, thermostat and connecting hoses. The fan is mounted on shaft of water pump and both are belt driven from the crankshaft pulley. The thermostat controls engine temperature and is installed in the top of engine. The function of the cooling system is to maintain a specific operating temperature of 1700 to 2200F (770 to 1040C) for the engine.

1-8.2. Lubrication System. The lubrication system consists of the oil sump, a gear type oil pump, pressure relief valve, spin-on type oil filter and internal passages within the engine.

1-8.3. Fuel System. The function of the fuel system is to inject a metered quantity of clean atomized fuel into the engine cylinders at a precise time near the end of the compression stroke of each piston. The fuel system consists of the fuel tank, electrically driven transfer pump, fuel filter/water separator, fuel filter, and a fuel injection pump and fuel injector for each cylinder. The fuel tank, transfer pump and fuel filter/water separator are not mounted on engine.

1-8.4. Electrical System. The electrical system is 24 VDC operation and consists of a battery charging alternator, starter, externally mounted battery and other items as required. The battery charging alternator is mounted on front of engine and is belt driven. When the engine is operating, the battery charging alternator supplies 24 VDC to recharge the battery and maintain it at a full state of charge. The starter is mounted on the flywheel housing and when energized engages the ring gear of the flywheel to rotate the engine.

### 1-9. EQUIPMENT DATA.

**TABLE 1-1. Equipment Data**

Model .....	DN4M
Type .....	Four cylinder, four cycle, liquid cooled diesel
Bore/Stroke .....	3.38/3.12 in. (86/80 mm)
Displacement .....	113.5 cu. in. (1.8 liters)
Horsepower Rating .....	24.1 BHP 1800 rpm
Compression Ratio .....	18.5:1
Length .....	24.56 in. (623.82 mm)
Width .....	17.77 in. (451.4 mm)
Height .....	20.57 in. (522.5 mm)
Weight .....	.305 lbs. (138.4 kg)
Rotation - looking at flywheel .....	Counterclockwise
Mean Piston Speed (1800 RPM) .....	954 ft/min (288 m/min)
Number of Flywheel Ring Gear Teeth .....	96
Idle Speed .....	1745 RPM
Firing Order .....	1-3-4-2
Lubrication System Capacity .....	.5.9 qts (5.6 liters)
Coolant System Capacity (engine only) .....	0.79 gal (2.99 liters)
Oil Pressure ( 1800 RPM) .....	36 psi (248 kPa)
Oil Pressure Relief Valve Setting .....	45-59 psi (310-407 kPa)
Capacity Between Dipstick Marks .....	38.4 oz (1.2 liters)
Oil Filter Capacity .....	8.5 oz (0.25 liters)
Alternator .....	24 VDC - 18 amp
Starter.....	24 VDC - 3.2 kw