

TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL
MAINTENANCE MANUAL WITH PARTS LIST

DIVING EQUIPMENT SET
(SCUBA, TYPE B)

NSN 4220-01-023-1701

COMPRESSOR, RECIPROCATING, POWER DRIVEN,
AIR, DIESEL ENGINE, 20 CFM, 3200 PSI
TYPE DMC-AA, MODEL 1C41-RDOW
PART NUMBER 83207

NSN 4310-01-044-2301

MANIFOLD SERVICING UNIT, CASCADE
COMPRESSED GAS, AIR
TRAILER MOUNTED, TYPE 1
PART NUMBER 83208

NSN 4220-01-005-0704

MANIFOLD SERVICING UNIT, DUAL
AIR/OXYGEN
TRAILER MOUNTED, TYPE II
PART NUMBER 83209

NSN 4220-01-005-3276

COMMERCIAL TRAILER
MODEL CT-1
PART NUMBER 86169

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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CHAPTER I

SECTION I.

INTRODUCTION AND GENERAL INFORMATION

1-1. INTRODUCTION. This manual contains operation and maintenance instructions with illustrated parts breakdown for the Type DMC-AA Air Compressor, Model 1C41-RDOW, Part Number 83207. Leading features of the unit are listed in Table 1-1. Model IC41-RDOW air compressor is shown in Figure 1-1, and hereafter referred to as the air compressor unit.

temperature range of the air compressor unit is -250 to 1200F (-320 to 430C) at altitudes up to 5,000 feet (1.5 Km). The air compressor unit is used to produce air suitable for breathing purposes. Air volume of 20 cfm at 3200 psi (22,048 kPa) is available for air breathing requirements. The air compressor unit is air transportable and is designed to operate under extreme climactic conditions.

1-2. GENERAL INFORMATION. The air compressor unit is a portable, skid mounted, diesel engine driven, reciprocating, air compressor. It is designed for continuous operation at a rated capacity of 20 scfm (0.43 m3/s) at pressures up to 3,200 psig(22,058 kPa). The compressed air is filtered to a solid particle size of 10 microns. Operating

NOTE

The front of the air compressor unit contains the control panel. When the operator is facing the control panel, the right-hand side is to the operator's right, the left-hand side is to the operator's left. The rear is the engine end of the air compressor unit.

Table 1-1. Table of Lending Particulars

ITEM	PARTICULARS
AIR COMPRESSOR UNIT	Military Specification MILC-52973 (ME)
Specification	Reciprocating
Type	20 scfm (0.57 m3/min)
Air volume	3200 psig (22,048 kPa)
Air pressure (max.)	Diesel engine
Power source	-250F to 1200F (-320 to 430C)
Operating temperature range	Frame shock mounted on skid.
Mounting	12 vdc, neg. gnd.
Electrical system	60 in. (2,124 mm)
Length (OA)	48 in. (1,219 mm)
Width (OA)	50 in. (1,270 mm)
Height (OA)	144 cu. ft. (4.07m3)
Volume	1,542 lbs. (680.4 Kg)
Weight (dry)	
AIR COMPRESSOR ASSEMBLY	
Type	4 stage, radial. reciprocating
Number of cylinders	4
Cooling	Forced air
DIESEL ENGINE ASSEMBLY	
Specification	Military Standard MIL-STD-1410
Type	4 stroke-cycle, reciprocating
Number of cylinders	2
Bore and stroke	4.20 in. (108 mm) x 4.33 in. (110 mm)
Displacement	77.5 cu in. (1.27 ltr)
Operation speed	2,150 rpm (2,150 r/min)
horsepower	25 HP
Combustion Method	Direct injection
Cooling	Forced air
Compression ratio	18:1

Table 1-1. Table of leading Particulars - Continued

ITEM	PARTICULARS
ENGINE ACCESSORIES Starting motor Alternator Fuel	12 vdc 20 amp, 14 vdc, negative ground ASTM D975-Nr. 2 diesel
CLUTCH ASSEMBLY Type	Dry, single plate, manually operated
CAPACITIES Fuel tank Engine lubricating oil - With filter change - Without filter change Compressor lubricating oil - With filter change - Without filter change	16-3/4 gallons (62 ltr) 6.2 quarts (6 ltr) 5.2 quarts (5 ltr) 5 quarts (4.7 ltr) 4 quarts (3.8 ltr)

1-3. DESCRIPTION. The air compressor is a self contained unit consisting of nine major groups; the control panel; dehydrator and air purification group; trap/accumulator mounting group; air cooler assembly; air compressor group; clutch, unloader control and drain valve; engine group; frame and skid group. (See Figure 1-1).

1-4. CONTROL PANEL GROUP (1, Figure 1-1). The control panel group consists of dehydrator/air purification assembly, control panel and the instrument panel assembly. Shock mounts on the instrument panel protects the gauges and meters from excessive vibration during unit operation. All operating controls and indicators are located on either the control panel or instrument panel. The air cooler subassembly is attached to the inside of the control panel. Two removable sliding cooler doors attached to the control panel allow the area of the air cooler exhaust to be varied for best operation of the air cooler. Clamps on the cooler doors allow for stationary positioning of the doors. The control panel is also attached to the frame and skid group.

1-5. DEHYDRATOR AND AIR PURIFICATION GROUP (13, Figure 1-1). This group consists of a mechanical filter subassembly (13), two dehydrators and priority valve (11), and (12), three air purification cylinders (6, 7 and 8) and a ten micron filter (3). The mechanical filter removes oil, moisture, and air-borne foreign particles from the pressurized air prior to the air entering the dehydrators. Each dehydrator contains an oxygen purifier cartridge (MA-2). The dehydrator removes oil and moisture from the pressurized air. The air purification cylinders use the ('I-13X oil vapor removal cartridge, CO 6 carbon monoxide removal cartridge and C-I-AC activated charcoal air freshner cartridge. The cartridges perform these functions

through absorption and catalytic action. Records should be maintained for each dehydrator and air purification cylinder, so that elapsed time of use for each purifier cartridge in each cylinder can be maintained. The ten micron filter subassembly contains a replaceable filter element. This element traps any remaining foreign particles larger than ten microns and traps any condensate remaining in the pressurized air.

1-6. TRAP AND ACCUMULATOR MOUNTING GROUP (21, Figure 1-1). This group is mounted on the left side of the air compressor unit on the frame and skid group behind the control panel. Attached to the trap mount are the first through third stage trap subassemblies and the accumulator cylinder. This group helps to separate excessive water and oil residue from the pressurized air.

1-7. AIR COOLER SUBASSEMBLY (10, Figure 1-1). The air cooler subassembly removes the heat of compression from the air between stages. Air compressed in the first stage cylinder passes through the first stage air cooler and moisture separator into the second stage cylinder. Similarly, air compressed in the second stage cylinder passes through the second stage air cooler and moisture separator into the third stage cylinder. Air compressed in the third stage cylinder passes through the third stage air cooler and moisture separator into the fourth stage cylinder. Air compressed in the fourth stage cylinder passes through the fourth stage air cooler, mechanical filter, dehydrators, and into the air purification system. Air passing through the air coolers lowers the air temperature. This increases compressor efficiency. Also, condensed water and oil is removed between 1-2

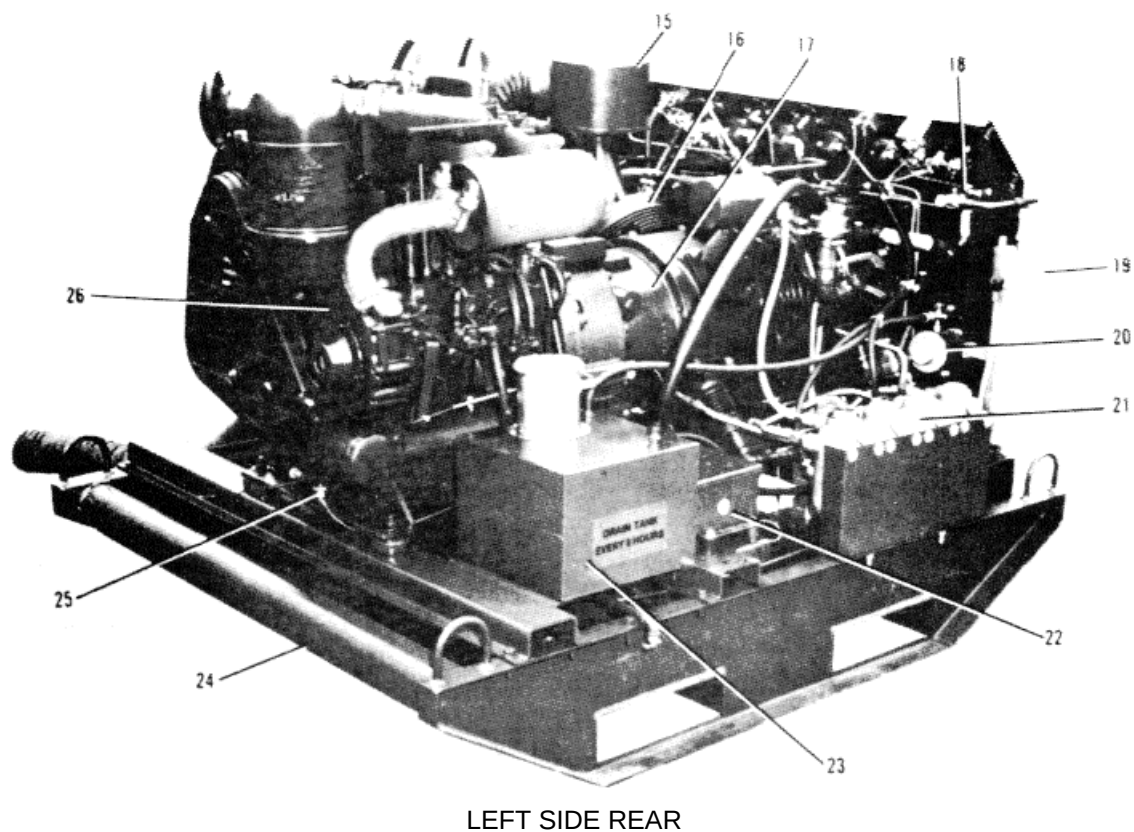
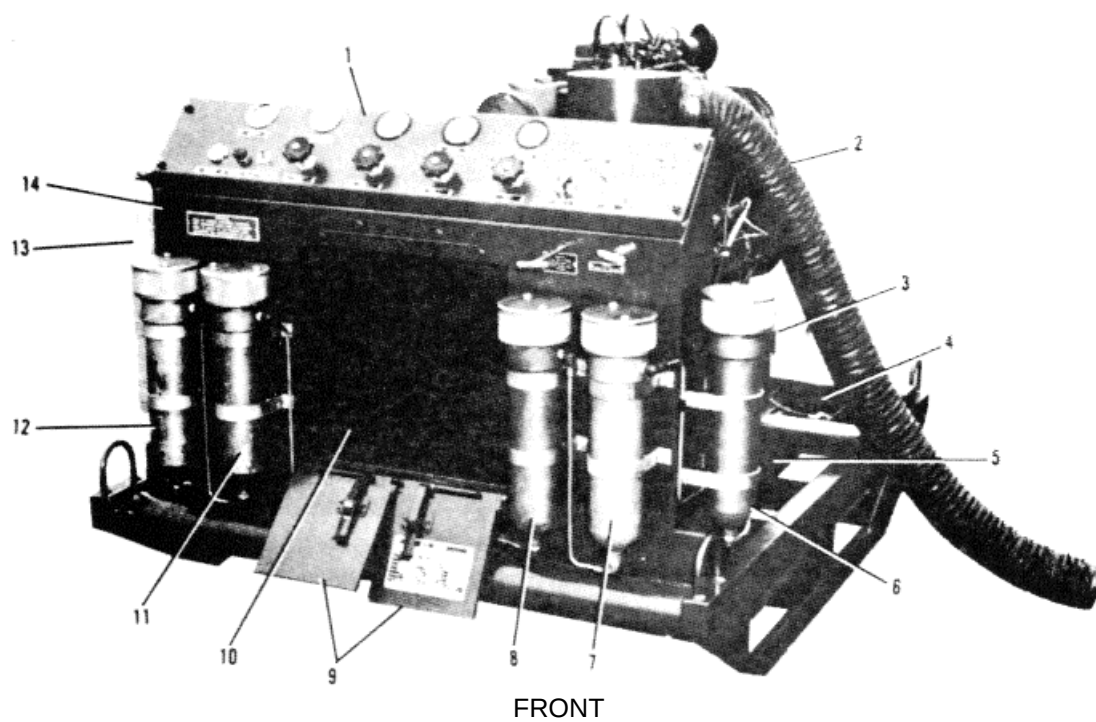


Figure 1-1. Air Compressor Unit

- | | |
|---|-------------------------------------|
| 1. INSTRUMENT PANEL | 14. CONTROL PANEL |
| 2. HOSE, AIR BREATHER | 15. COVER, AIR BREATHER, COMPRESSOR |
| 3. TEN-MICRON FILTER | 16. COMPRESSOR, AIR |
| 4. BATTERY MOUNT | 17. CLUTCH |
| 5. FUEL TANK | 18. RUPTURE DISC |
| 6. AIR PURIFICATION CYL NO. 5, C-1-AC CARTRIDGE | 19. MECHANICAL FILTER |
| 7. AIR PURIFICATION, CYL NO. 4, CO-6 CARTRIDGE | 20. BLEED VALVES |
| 8. AIR PURIFICATION, CYL NO. 3, C-1-13X CARTRIDGE | 21. TRAP GROUP |
| 9. AIR COOLER DOORS | 22. UNLOADER CONTROL BOX |
| 10. AIR COOLER | 23. CONDENSATE RECEIVER |
| 11. DEHYDRATOR CYL NO.2, MA-2 CARTRIDGE | 24. FRAME |
| 12. DEHYDRATOR CYL NO. 1, MA-2 CARTRIDGE | 25. OIL PRESSURE SWITCH |
| 13. MECHANICAL FILTER | 26. DIESEL ENGINE |

stages prior to entering the dehydrators. Cooling is accomplished by air being drawn through the cooler subassembly by the fan mounted on the compressor crankshaft. Hinged doors are provided on the control panel. These doors control the amount of air drawn through the cooler assembly and blown over the compressor assembly. Each air cooler stage is equipped with a pressure relief safety valve.

1-8. AIR COMPRESSOR GROUP (16, Figure 1-1). The air compressor assembly is a four cylinder, air-cooled, radial compressor. Compression of air from initial intake to final discharge is accomplished in four distinct stages. Discharge pressure is indicated on the instrument panel pressure gauges. Lubrication of the moving parts is provided by an oil pump located in the non-drive end cover. A air circulating fan mounted on the non-drive end of the crankshaft is used to circulate air over the compressor assembly.

1-9. CLUTCH AND HOUSING GROUP (17, Figure 1-1). The clutch group is a single plate, manually operated, dry type clutch. A clutch rod and hand lever are used to operate the clutch. The clutch rod extends to the rear and through the control panel. This allows the operator to engage and disengage the clutch. The clutch housing aligns the engine with the air compressor. A cover on the housing allows access to the clutch.

1-10. ENGINE AND ACCESSORIES GROUP (26, Figure 1-1). The diesel engine assembly is a four stroke cycle, direct injection, air cooled, diesel engine. The engine is used to drive the air compressor through the manually operated clutch.

at a rated speed of 2,150 rpm (2,150 r/min). Engine accessories include a 12V alternator, intake air filter, fuel filter, lubricating oil filter, and electrical starting motor. Operating controls for the engine are located on the control panel assembly. The AMMETER, & ENGINE OIL PRESSURE gauge are located on the instrument panel.

1-11. DRAIN VALVE ASSY. AND UNLOADER CONTROL BOX GROUP (22, Figure 1-1). When air pressure in the system reaches a pre-determined value, a pressure switch in the unloader control box will open. This ceases loading of the compressor. The drain valve assembly will then open, allowing moisture and air to be exhausted to the condensate receiver assembly.

1-12. FRAME AND SKID GROUP (24, Figure 1-1). The frame on which all the major components are mounted is welded, single unit frame work. The air compressor, clutch assembly and engine are shock mounted to the skid by steel cross members. A fuel tank with capacity for not less than eight hours of operation is mounted inside the frame work. There are lifting and tie-down eyes at each corner of the frame. These allow the complete unit to be hoisted without damage. The eyes may also be used for tying down the air compressor unit. Provisions have been incorporated in the frame/skid to allow movement of the air compressor unit by using the proper size fork lift truck.

1-13. CONSUMABLE MATERIALS. Refer to Table 1-2 for a listing of consumable materials.