

**DESALINATION UNIT, REVERSE OSMOSIS, TRAILER MOUNTED, 10 000 LPH,
NSN 4620-66-128-2333**

SERVICING INSTRUCTION

This instruction is authorised for use by command of the Chief of Army. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with EMEI General A 001.

Introduction

1. This EMEI lists the requirements for each level of servicing for the Desalination Unit, Reverse Osmosis, Trailer Mounted, 10 000 LPH Capacity (MRO 10) as follows:
 - a. Table 1 – Servicing Schedule – details the frequency of each level of servicing;
 - b. Table 2 – Servicing Requirements – in Use – details the actions to be performed at each of the levels of servicing when the equipment is in use;
 - c. Table 3 – Preparation for Storage Servicing Requirements – details the actions to be performed prior to placing the equipment into storage; and
 - d. Table 4 – Servicing Requirements When in Storage – details the actions to be performed at the level of servicing when the equipment is not in use and is in storage.
2. Servicing is based on hours run or calendar months that have expired. Unit commanders may reduce the period between servicing or add servicing operations to meet extraordinary requirements.
3. A scheduled service may be anticipated or delayed by 10% of the interval between services, to meet operational needs and permit workload planning.

Lubricants

4. All lubricants to be used are to be as specified in DEF(AUST) 206E – Handbook of Liquid Fuels, Lubricant and Allied Products.

Associated Documents

5. For maintenance, repair and inspection procedures reference may be required to the following documents:
 - a. [EMEI Engr Equip W 650](#) – Desalination Equipment, Reverse Osmosis – Data Summary;
 - b. [EMEI Engr Equip W 656](#) – Desalination Equipment, Reverse Osmosis – Authority for Use;
 - c. [EMEI Engr Equip W 656-1](#) – Desalination Equipment, Reverse Osmosis – Maintenance Manual; and
 - d. EMEI ENGR Equip W 656-2 – Desalination Equipment, Reverse Osmosis – Operator’s Manual.
6. Refer to the following publications for safety of personnel and the prevention of damage to equipment:
 - a. EMEI Workshop E Series – Occupational Health and Safety Instructions;
 - b. Defence Safety Manual ([SAFETYMAN](#)); and
 - c. Product Material Safety Data Sheets ([MSDS](#)) – product information sheets.

Servicing

7. Servicing of the MRO 10 is to be carried out by Vehicle Mechanic (ECN 229), Technician Electrical (ECN 418) and Fitter Armament (ECN 146) or civilian equivalent (CE). A qualified operator may be required to assist the tradesman or technical maintenance staff during servicing of the equipment.
8. Where varying limits are expressed (eg hours or months) the service is to be carried out at the expiration of the first occurring service interval.
9. If a Technician Electrical (ECN 418) is unavailable, a Vehicle Mechanic (ECN 229) may complete the generator related tasks.

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Table 1 Servicing Schedule

Serial	Type of Service	Period	Responsibility
1	Minor service (in use)	150 hours or 6 months	First line
2	Major service (in use)	300 hours or 12 months	First line
3	Preparation for storage	Prior to placing into storage	Third line logistics unit
4	Minor service (in storage)	3 months	Third line logistics unit

NOTE

When any equipment exceeds the servicing interval plus 10% maximum limit, it is to be classified as **Do Not Use-XX** until the required service has been completed.

When equipment is to be removed from storage, a major service (in use) is to be completed by the third line logistics unit prior to issue.

10. Daily operator servicing is to be carried out as detailed in EMEI ENGR Equip W 656-2 – Operator’s Manual.

WARNING

Chemical substances are to be stored, used and handled in accordance with SAFETYMAN, MSDS and EMEI Workshop E Series.

CAUTION

All industrial safety, work practices equipment operating and maintenance instructions pertaining to this EMEI are to be adhered to.

NOTE

During servicing procedures, nuts and bolts that require re-tensioning or adjusting and have been assembled using thread sealant are to have the thread sealant renewed.

Table 2 Servicing Requirements – in Use

Serial Refer Note	Item or Assembly	Tradesman	Minor Service 150 hrs or 6 Months	Major Service 300 hrs or 12 Months	Remarks
1	Generator - engine oil	Technician Electrical ECN 418 or CE	D	D	Lubricant – OMD 115 (O-238) (Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 83
2	Generator - engine oil filter	Technician Electrical ECN 418 or CE		R	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 89
3	Generator - diesel fuel filter	Technician Electrical ECN 418 or CE		R	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 92
4	Generator - diesel fuel strainer	Technician Electrical ECN 418 or CE	C	C	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 92
5	Generator - engine air cooling fins	Technician Electrical ECN 418 or CE	C	C	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 84
6	Generator - air cleaner	Technician Electrical ECN 418 or CE	C	C	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 79 to 81 and EMEI Vehicle A 591-1
7	Generator - Valve Tappet Clearance	Technician Electrical ECN 418 or CE		A	Inspect/Adjust clearance at 2000 hrs or 24 months. Tappet Clearance when cold Inlet valves - 0.2 mm Exhaust valves – 0.3 mm (Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 90
8	Generator - air intake and exhaust manifold	Technician Electrical ECN 418 or CE	IY	IY	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 94
9	Vee Belts	Technician Electrical ECN 418 or CE	I	I	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 87
10	Generator - fuel tank	Technician Electrical ECN 418 or CE	I	I	Check fuel tank for contamination.
11	Generator - engine temperature warning device	Technician Electrical ECN 418 or CE		I	Test (Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 94
12	Generator - nuts and bolts	Technician Electrical ECN 418 or CE	IY	IY	Check all nuts and bolts for tightness. Cylinder head bolts are not to be re-tightened
13	Trailer towing eye	Fitter Armament ECN 146 or CE	I	I	Inspect towing eye for functionality
14	Battery electrolyte	Vehicle Mechanic ECN 229 or CE	T	T	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 86
15	Battery cables and connectors	Vehicle Mechanic ECN 229 or CE		IC	
16	Interconnecting electrical cables	Technician Electrical ECN 418 or CE	I	I	Check cables for fraying, deterioration or corrosion at terminals
17	Interconnecting brake hoses	Vehicle Mechanic ECN 229 or CE	I	I	

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Table 2 Servicing Requirements – in Use (Continued)

Serial	Item or Assembly	Tradesman	Minor Service 150 hrs or 6 Months	Major Service 300 hrs or 12 Months	Remarks
18	Brake linings and drums	Vehicle Mechanic ECN 229 or CE		I	Replace shoes if necessary
19	Brake assemblies	Vehicle Mechanic ECN 229 or CE		A	
20	Axle wheel bearings	Vehicle Mechanic ECN 229 or CE		ILA	Lubricant – XG 291
			A		Adjust without disassembly
21	Suspension springs, shackles and axles	Vehicle Mechanic ECN 229 or CE	I	I	
22	Brake camshaft bearings	Vehicle Mechanic ECN 229 or CE		T	Lubricant – XG 291
23	Wheel nuts	Vehicle Mechanic ECN 229 or CE	IY	IY	Tighten to 270 N.m.
24	Lights	Technician Electrical ECN 418 or CE	I	I	
25	Hydraulic lines and Connections	Fitter Armament ECN 146 or CE	I	I	
26	Hydraulic jack oil reservoir	Fitter Armament ECN 146 or CE	T	T	Lubricant – OM 65, Capacity 65 litres.
27	Hydraulic jack oil filter element	Fitter Armament ECN 146 or CE		R	
28	High pressure pump – sump oil	Fitter Armament ECN 146 or CE	D	D	(Ref EMEI Engr Equip W 656-1), Section 4, Page 3. Lubricant – Ampol Tegoma 150, capacity 9 litres.
29	High pressure pump – condensation water trap	Fitter Armament ECN 146 or CE	C	C	
30	High pressure pump – head nuts	Fitter Armament ECN 146 or CE	I	I	Do not use spanners for this inspection
31	High pressure pump – pulsation damper	Fitter Armament ECN 146 or CE	I	I	Check nitrogen pressure
32	Anti-scalant (dosing) pump – diaphragm	Fitter Armament ECN 146 or CE		R	
33	Anti-scalant (dosing) pump – solenoid	Fitter Armament ECN 146 or CE		I	
34	Anti-scalant (dosing) pump – compressor	Fitter Armament ECN 146 or CE		I	
35	Anti-scalant (dosing) pump – compressor filters	Fitter Armament ECN 146 or CE		R	
36	Cleaning pump – mechanical seal	Fitter Armament ECN 146 or CE		L	Lubricant – XG 291
37	MRO 10	Operator or CE	P	P	(Ref EMEI Engr Equip W 656-2), Section 4, Operating. Operate the MRO 10 and check the pressure differential to confirm the integrity of the membranes.

Notes:

Serial numbers shown indicate the order which servicing tasks are to be performed.

Legend: CE – Civilian equivalent, C – Clean, A – Adjust, I – Inspect, L – Lubricate, T – Check and top up, D – Drain and refill,
O – Overhaul, R – Replace, Y – Tighten, P – Operate

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Table 3 Servicing Requirements – Preparation for Storage

Serial	Item or Assembly	Tradesman	Service Requirement	Remarks and Specifications
1	Generator - engine air cooling fins	CE to Technician Electrical ECN 418 or Vehicle Mechanic ECN 229	C	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 84
2	Generator - air cleaner	CE to Technician Electrical ECN 418 or Vehicle Mechanic ECN 229	C	(Ref EMEI Engr Equip W 656-1), Section 3, Maintenance, Page 79 to 81 and EMEI Vehicle A 591-1
3	Generator	CE to Technician Electrical ECN 418 or Vehicle Mechanic ECN 229	I	Check cables for fraying, deterioration or corrosion at terminals
4	Hydraulic jack oil reservoir	CE to Fitter Armament ECN 146	T	Lubricant – OM 65, Capacity 65 litres.
5	Jacking system	CE to Operator	P	Fully cycle jacking system
6	MRO 10	CE to Operator	P	(Ref EMEI Engr Equip W 656-2), Section 4, Operating. Operate the MRO 10 and check the pressure differential to confirm the integrity of the membranes. Perform long term shutdown process (Ref EMEI Engr Equip W 656-2), Section 6.2

Notes

Serial numbers shown indicate the order which servicing tasks are to be performed.

Legend: CE – Civilian equivalent C – Clean, A – Adjust, I – Inspect, L – Lubricate, T – Check and top up, D – Drain and refill, O – Overhaul, R – Replace; P – Operate

Table 4 Servicing Requirements – Minor Service (in Storage)

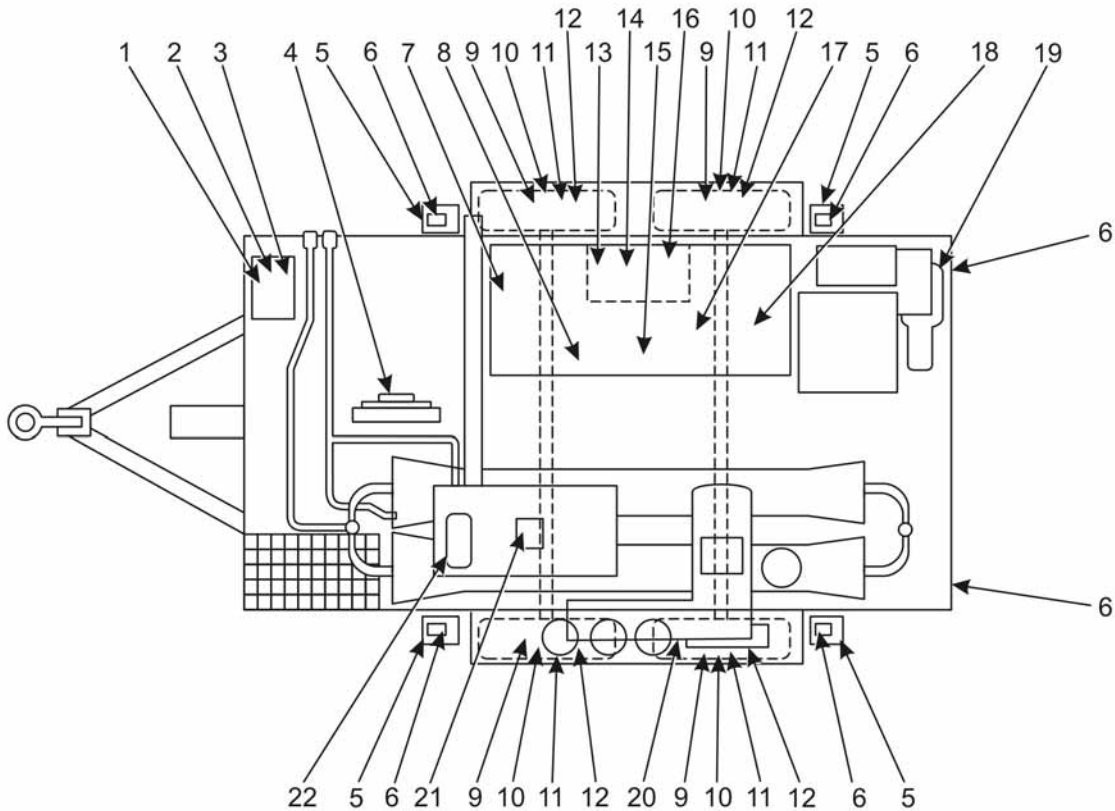
Serial	Item or Assembly	Tradesman	Service Requirement	Remarks and Specifications
1	Generator	CE to Technician Electrical ECN 418 or Vehicle Mechanic ECN 229	I	Check cables for fraying, deterioration or corrosion at terminals
2	Hydraulic jack oil reservoir	CE to Fitter Armament ECN 146	T	Lubricant - OM 65. Capacity 65 litres.
3	Jacking system	CE to Operator	P	Fully cycle jacking system
4	Battery, cables and connectors	CE to Vehicle Mechanic ECN 229	IC	
5	MRO 10	CE to Operator	P	(Ref EMEI Engr Equip W 656-2), Section 4, Operating. Operate the MRO 10 and check the pressure differential to confirm the integrity of the membranes. Perform long term shutdown process (Ref EMEI Engr Equip W 656-2), Section 6.2

Notes:

Serial numbers shown indicate the order which servicing tasks are to be performed.

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Figure 1 Servicing Points for MRO 10

Table 5 Servicing Point Locations For MRO 10

Item	Item or Assembly	Item	Item or Assembly
1	Filter element, hydraulic jack oil	12	Brake adjustment
2	Hydraulic reservoir	13	Generator set
3	Dipstick, hydraulic oil	14	Generator oil temperature sender unit
4	Dosing pump	15	Generator fuel filters (qty 2)
5	Hydraulic lines and connections	16	Batteries (qty 2)
6	Lights	17	Generator temperature sender unit
7	Generator fuel strainer	18	Generator air cleaner
8	Generator oil filters (qty 2)	19	Cleaning pump
9	Brake linings and drums	20	V belts and cover
10	Wheel bearings	21	High pressure pump
11	Wheel nuts	22	High pressure pump pulsation damper

END

Distribution List: **ENGR W 04.0 – Code 2** (Maint Level)
(Sponsor: ENG SPO, Bulk Liquid Distribution)

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