

## C AND D VEHICLES

### PREPARATION OF VEHICLES FOR PERIODS OF NON-USE (ONE TO TWELVE MONTHS)

## GENERAL 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.

### GENERAL

#### Introduction

1. Units deployed overseas on operations for periods of up to twelve months (including pre and post deployment administration) utilise equipment pre positioned in country. Whilst units are deployed, equipment remaining in Australia may not be used for extended periods. This instruction provides procedures to prevent deterioration of earth-moving and deployable material handling equipment (MHE) that is not deployed, and subject to extended periods of non-use.
2. This instruction can also be utilised by any unit where man power is reduced to levels that do not enable it to effectively operate and maintain its earth moving and deployable MHE fleets.
3. Units may also use this EMEI prior to periods of reduced activity or stand down where equipment may not be used for periods exceeding four weeks.
4. The instruction details the procedure for the preparation of earth moving and deployable MHE for periods of non-use from one to twelve months.

#### Associated Publications

5. References may be required to the following publications to assist in the management of equipment maintenance:
  - a. [Technical Regulation of Army Materiel Manual](#) (TRAMM);
  - b. [Electronic Supply Chain Manual \(ESCM\)](#);
  - c. [Standing Orders for Vehicle Operations Vol 3](#) (SOVOs); and
  - d. [Australian Standard \(AS\) 2550.1](#) – Cranes hoists and winches – safe use general requirements.
6. Reference may be made to the current issue of the following publications to ensure safety of personnel and prevent damage to equipment:
  - a. EMEI Workshop E Series – Occupational Health and Safety Instructions;
  - b. [Defence Safety Manual](#) (SAFETYMAN) – Occupational;
  - c. [Material Safety Data Sheets](#) (MSDS) – Product Information Sheets;
  - d. Relevant Equipment ILSI;
  - e. Relevant Equipment EMEI; and
  - f. Equipment User/Operator and Servicing Handbooks.
7. Reference may be required to the current issue of the following publications to ensure servicing procedures and Technical Inspections are carried out to the equipment components and assemblies:
  - a. [EMEI Engr Equip A 019-1](#) – Service of C Vehicles and Material Handling Equipment – Oil Sampling;
  - b. [EMEI Engr Equip A 020](#) – Inspection of C and D Vehicles – Inspection for Useability;
  - c. [EMEI Engr Equip A 029-1](#) – C and D Vehicles – Preparation for Shipment by Sea;
  - d. [EMEI Engr Equip D 008-1](#) – Cranes Mobile and Tractor Mounted – General – Structural Integrity Inspection of Wheeled Mobile and Tractor Mounted Cranes with a Lifting Capacity of 10 Tonne and over – Inspection for Useability;

- e. [EMEI Electrical M 013](#) – Batteries, Lead Acid – Storage, Charging, Testing and Maintenance for Vented or Flooded Cell Batteries – General Instruction;
- f. [EMEI Electrical M 029](#) – Sealed Lead Acid Batteries – Battery Charging Procedures – General Instruction;
- g. [EMEI Electrical M 029-1](#) – Sealed Lead Acid Batteries – Maintenance and Test Procedures – Miscellaneous Instruction;
- h. [EMEI Vehicle A 139-1](#) – B Vehicles and Trailers – General – Preparation of Vehicles for Periods of Non-use (One to Twelve Months);
- i. [EMEI Vehicle A 201-3](#) – Preservation – Corrosion Prevention in Vehicles Bodywork;
- j. [EMEI Vehicle A 203-2](#) – Preservation – Removal of Rust Preventative from Vehicle Components;
- k. [EMEI Vehicle A 203-3](#) – Preservation – Preservation of Vehicles and MUA;
- l. [EMEI Vehicle A 459-2](#) – Hydraulic Brake Systems – Hydraulic Brake Fluid Deterioration – Miscellaneous Instruction;
- m. [EMEI Vehicle D 108](#) – Recovery Equipment – Inspection of Recovery Equipment; and
- n. [EMEI Workshop E 410](#) – Occupational Health and Safety Instruction – Asbestos.

### Non-deployable Equipment

8. Non-deployable D vehicles and Agricultural equipment are not covered by this instruction.

### DETAIL

#### Application

9. The preparation and actions detailed in this instruction apply to all earthmoving and MHE that would normally be deployed by owner units on field exercises or operations. The preservation methods described may require variation to meet local environmental conditions such as unit location subject to salt spray or high humidity. Maintenance checks may need to be conducted more frequently than three months in harsh conditions. In harsher environments and longer storage terms, e.g. 10 to 12 months, consideration of the following instructions may assist in minimising equipment degradation:

- a. EMEI Engr Equip A 029-1 – C and D Vehicles – Preparation for Shipment by Sea;
- b. EMEI Vehicle A 203-3 – Preservation – Preservation of Vehicles and MUA;
- c. relevant equipment ILSI; and
- d. local directives for the preparation of vehicles and equipment.

#### Ancillaries and Equipment Attachments

10. Ancillary equipment that is carried to assist in the equipment's operation should be removed and is not covered by this instruction. An example of a piece of ancillary equipment is the Kyodo radio as fitted to the John Deere 850J Medium Bulldozer.

11. Equipment attachments that are for the primary use with the stored equipment are covered by this instruction. Examples of equipment attachments are as follows:

- a. the front blade assembly for the John Deere 672D Grader,
- b. the cement mixer for the John Deere 270 SSL, and
- c. the alternate fork carriage for the Merlo 3T Telehandler.

#### Storage Conditions During Periods of Non-use

12. Where possible all equipment is to be stored under cover on level ground, ensuring that the steps in Table 1 are adhered to.

### Short Term Storage Process

13. All units when considering placing equipment into short term storage are to develop a repair and maintenance program for their equipment. The preparation of equipment for short term storage is conducted over a four stage process. These stages are:
- a. stage 1 – initial planning considerations and reviews;
  - b. stage 2 – pre storage inspection, accounting;
  - c. stage 3 – storage procedures and ongoing maintenance; and
  - d. stage 4 – post deployment.
14. **Stage 1 – Initial Planning.** Initial planning should include the following:
- a. review current fleet restrictions on equipment;
  - b. review current unit's equipment health;
  - c. develop/review, Unit Standing Orders for short term storage;
  - d. review of higher directives on special storage requirements;
  - e. review unit equipment holdings to identify any surplus equipment that could be returned to depot stock; and
  - f. review of repair parts holdings and specialist tooling.
15. **Stage 2 – Pre Storage Preparation.** Pre storage preparation is to be carried out as follows:
- a. carry out a complete Technical Inspection (DDQ541) for all engineering equipment and MHE including CES being placed in to storage;
  - b. carry out repairs (so equipment is capable of being moved);
  - c. carry out any outstanding modifications;
  - d. liaise with JLU and supporting workshops for the development of a repair schedule;
  - e. raise EMEFIX on all equipment requiring repair (forward DDQ541 TI to supporting workshops), date equipment required is to be the last day of deployment (including leave period);
  - f. backload surplus equipment, repair parts and all rotatable parts;
  - g. carry out CES checks; and
  - h. order CES shortages.
16. **Stage 3 – Storage.** Whilst the vehicle is in storage a three-monthly Non-technical Inspection is to be carried out in accordance with Table 2 and Para 35 and 36 including:
- a. carrying out any minor repairs; and
  - b. updating the CES's.
17. **Stage 4 – Return to Full Use.** Preparation of the vehicle for return to full use is to be carried out in accordance with Table 3, including the following:
- a. recommission of the equipment;
  - b. restocking of repair parts specialist tooling; and
  - c. receipting of the principle equipment.

### Technical Inspections and Repairs

18. A complete Technical Inspection is to be carried out by suitably qualified personnel, prior to any period of non-use. The Technical Inspection Report is to accurately reflect the state of repair of the vehicle at the time of inspection. Prior to storage, and at the conclusion of the Technical Inspection, the equipment is to be classified at a minimum of RU/X with the restriction, 'This equipment is to be Operated in accordance with EMEI Engr Equip A 029-2'.
19. A copy of the Technical Inspection is to be retained in the GM120 at all times during periods of non-use of the equipment.

20. Immediate repairs to ensure vehicles can be operated onto and off trailers are to be completed prior to equipment being placed into storage. Repairs required to bring the equipment to a Fully Functional condition are to be rectified prior to returning the equipment for use during periods of non-use. Unit commanders, on advice from the senior technical staff, are responsible for management of this process.

### Servicing

21. This instruction does not negate the requirement to carry out periodic servicing in accordance with the relevant equipment EMEI and/or the equipment user/operator and servicing handbooks, however, should a service interval lapse whilst the equipment is in storage, the equipment supervisor is to ensure that all outstanding services are carried out prior to the equipment being operated.

### Non-technical Inspections

22. A periodic Non-technical Inspection (NTI) is not required when equipment is subject to the requirements of the preservation servicing regime detailed in this EMEI. A three-monthly check is to be carried out as detailed in Table 2.

### Air-conditioning Systems

23. Prior to any period of non-use, the air-conditioning system is to be technically inspected by a Technician Electrical (ECN 418) or suitably qualified person. The Technical Inspection is to include operating the system for 10 minutes and carrying out a leak test to ensure system integrity.

24. There is no mandatory requirement to evacuate the air-conditioning system using R134a for periods of storage up to 12 months. The system is to be operated for ten minutes every three months and then leak tested to confirm system integrity.

### NOTE

The air-conditioning system is to remain filled with R134a to prevent moisture ingress into the system.

### General Information

25. Servicing requirements to change oils and lubricants at recommended intervals ensure safe operation of equipment. Any lubricants that are contaminated (milky, black or discoloured) are to be replaced regardless of servicing intervals. Operators are to inform their supporting maintenance element of equipment with contaminated lubricants for diagnosis or fault rectification.

26. The brake and clutch hydraulic systems are to be drained, refilled and bled every twelve months. When the equipment is used north of the Tropic of Capricorn, the brake and clutch systems are to be drained and bled at six monthly intervals in accordance with EMEI Vehicle A 459-2.

27. Oil sampling and analysis can be carried out as an alternative to draining and replacing oils at specified intervals described in the relevant equipment EMEI. Although not mandatory, oil sampling and analysis can predict component failure or alleviate the equipment servicing maintenance liability.

28. Oil sampling and analysis is the preferred option, and is to be carried out in accordance with EMEI Engr Equip A 019-1.

29. Tyre pressures are to be inflated to the stated pressure in the operator's manuals plus 10 kPa.

30. Add diesel fuel stabiliser (Afloc 1000 or Fireprep 1000) to the vehicle fuel tank in accordance with the mixing instructions on the container.

31. Cranes are to be inspected, regardless of servicing intervals, to meet Australian Standards in accordance with EMEI Engr Equip D 008-1.

**32.** Winch rope is to be cleaned using mains pressure fresh water (e.g. garden hose). The winch rope is not to be cleaned using high pressure cleaners. Once cleaned, the winch rope is to be inspected in accordance with EMEI Vehicle D 108 prior to lubricating.

**33.** All CES items for a stored equipment are to be cleaned and inspected prior to storage. CES items should be stored on the supplied pallets and/or secured on the vehicle. If CES items are to be stored away from the vehicle they are to be stored in a secure area by equipment lots (with all CES for a particular vehicle stored on a pallet or storage crate).

**Table 1 Preparation of Earthmoving and MHE for Periods of Non-use**

Serial	Operation	Performed by	
		Operator	Tradesman
1	<b>Clean the Vehicle</b>		
	Clean the vehicle ensuring that personnel using steam cleaning equipment are trained in the operation of the equipment and appropriate PPE is used	X	
2	<b>Technical Inspection</b>		
	Complete a Technical Inspection		X
3	<b>Reclassification</b>		
	Classify the vehicle no higher than RU/X with the restriction 'The vehicle is to be operated in accordance with EMEI A 029-2'		X
4	<b>Carry Out Repairs</b>		
	If possible, repairs identified and servicing are to be carried out to bring the vehicle to a Fully Functional (FF) condition during the length of storage as directed by the unit commander		X
5	<b>Carry Out Modifications</b>		
	Any outstanding Group 1 or Group 2 modifications are to be carried out before the vehicle is placed in storage		X
6	<b>Servicing</b>		
	a. Check the air-conditioning charge system for leaks		X
	b. Check the brake fluid		X
	c. Check the clutch fluid		X
	d. Check the engine coolant	X	
	e. Check the windscreen washer water	X	
	f. Check the battery electrolyte	X	
	g. Check the engine oil	X	
	h. Check the steering box oil	X	
	i. Check the power steering fluid	X	
	j. Check the gearbox oil	X	
	k. Check the transfer case oil	X	
	l. Check the rear differential oil	X	
	m. Check the front differential oil	X	
	n. Check the air-conditioning system including operating the system for 10 mins		X
	o. Check the winch oil	X	
	p. Check the crane hydraulic fluid	X	
	q. Grease all lubrication points	X	
7	<b>Other Actions</b>		
	a. Inflate the tyres to the correct pressure plus 10 kPa	X	

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**Table 1 Preparation of Earthmoving and MHE for Periods of Non-use (Continued)**

Serial	Operation	Performed by	
		Operator	Tradesman
	b. Remove the battery and clean the battery compartment, repaint or patch paint as necessary	X	
	c. Clean the terminals of the battery and cables	X	
	d. Check the batteries and recharge them if the specific gravity indicates they are below full charge		X
	e. Replace the battery pack into the compartment and isolate the battery by actuating the battery isolator if fitted or leaving the terminals disconnected	X	
	f. Drain the fuel water sediment trap		X
	g. Open the fuel tank drain to ensure any water present is drained off		X
	h. Top up the fuel tanks	X	
	i. Add diesel fuel stabiliser (6850-66-136-4038) to the fuel		X
	j. De-rust and patch paint the vehicle as required	X	X
	k. Re-tension the wheel nuts		X
	l. Ensure the vehicle cabin is protected from the weather ingress	X	
	m. Operate all hydraulic actuators and rams to full extension/lift to lubricate the seals and to identify any faults	X	
	n. Operate the winch recovery equipment	X	
	o. Thoroughly clean and coat the winch ropes with Rocol wire rope lube	X	
	p. Clean, paint, lubricate, and secure all CES items	X	
	q. Clean, de rust and paint all storage bins	X	
	r. Ensure that all tool bins and storage compartments seals are fitted correctly and all drain holes are clear	X	
	s. Apply a light coat of grease on all exposed bare metal surfaces	X	
8	<b>Final Actions</b>		
	a. Place the vehicle under cover on level ground	X	
	b. Leave the vehicle in neutral	X	
	c. Chock the wheels	X	
	d. Release the handbrake	X	
	e. Disconnect or isolate all batteries	X	X
	f. Close all windows, vents, cupola hatches, doors etc	X	
	g. Drain all air reservoirs	X	
	h. Place a 'VEHICLE IN STORAGE' sign on the vehicle	X	
9	<b>Recording</b>		
	Record the preparation for non-use, in the vehicle GM120 Part 2(b)		X

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**Modified Three-monthly Non-technical Inspections**

**34.** After the actions in Table 1 have been completed, a modified check is to be conducted in accordance with Table 2 every three months from the date of initial storage.

**Table 2 Three-monthly Modified Check**

<b>Serial</b>	<b>Operation</b>	<b>Performed by Operator</b>
1	Reconnect the vehicle battery	X
2	Carry out the daily operator checks in accordance with the Operator's manual	X
3	Check the vehicle for any possible vermin infestation. Clear infestation if required	X
4	Check the vehicle and beneath the vehicle for signs of possible oil, brake/clutch fluid, hydraulic fluid or coolant leaks	X
5	Apply the vehicle handbrake	X
6	Start the vehicle and allow the engine and hydraulics to reach operating temperature (if in a building, ensure an exhaust hose is fitted to direct exhaust outside)	X
7	Check and reset the tyre pressures	X
8	Remove the wheel chocks	X
9	Move the vehicle to a clear area and operate the vehicle, ensuring all hydraulic actuators are extended and retracted over their entire free travel range	X
10	Operate all ancillary items on the equipment through their full range	X
11	Operate the air-conditioning unit for a period of 10 minutes	X
12	Top up the fuel tanks and oils as required	X
13	Check the condition of the preservation materials (grease oils etc) and reapply if required	X
14	Return the vehicle into storage mode as per Table 1, Serial 8	X

**Removal of Engineer Equipment from Storage for Repair and Return to Full Use**

**35.** Removal of equipment from storage is to be strictly controlled and limited to the following:

- a.** removal for repair action as per the Technical Inspection of the equipment;
- b.** removal for repair action detected during the three-monthly Non-technical Inspection; and
- c.** returning equipment to full use.

**36.** When equipment is removed from storage for repair action and is to be returned to storage after the repairs have been completed, the following actions are to be carried out:

- a.** reconnect the battery,
- b.** carry out the daily operator checks; and
- c.** after the repairs have been completed reclassify the equipment and return it to storage as per Table 1, Serial 8.

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37. When equipment is to be returned to full use the Plant Supervisor is to ensure the actions detailed in Table 3 are carried out prior to the equipment being released for use.

**Table 3 Equipment Return to Full Use**

Serial	Operation	Performed by	
		Operator	Tradesman
1	<b>Repair Actions</b>		
	a. Clean any preventative compounds from the equipment	X	
	b. Complete a Non-technical Inspection	X	
	c. Carry out the weekly operator tasks	X	
	d. Complete any outstanding repair action to bring the vehicle to a Fully Functional condition	X	X
	e. Complete any servicing requirements	X	X
	f. Complete any outstanding modifications		X
2	<b>Technical Inspection</b>		
	a. Update the GM 120 for all outstanding modifications		X
	b. Carry out a special Technical Inspection covering the following areas:		X
	(1) Corrosion		X
	(2) Hoses		X
	(3) Seals		X
	(4) Windscreen rubbers		X
	(5) Crazing of lights		X
	(6) Brake components		X
	(7) Warning and operator labels		X
	(8) Paint condition		X
	c. Modifications		X
3	<b>Other Actions</b>		
	a. Reclassify the equipment		X
	b. Update the vehicle GM120 to release the vehicle from storage		X

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**END**

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