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Issue 2

Jul 10



Australian Government

Department of Defence

Defence Materiel

Organisation

TECHNICAL MANUAL

USER HANDBOOK

**TRUCK CARGO MEDIUM WITH CRANE MC2
MERCEDES-BENZ UNIMOG**

NSN 2320-66-112-8976

SIG 2320 - 0046

**Publication Sponsor: COMMERCIAL AND GENERAL SERVICE
VEHICLE SPO**

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**Authorised for use in the
Australian Defence Force by
Director, COMMERCIAL
AND GENERAL SERVICE
VEHICLE**

**Brendon Jones
DAAR
CGSVSPO**

WARNING PAGE

WARNING

Before operating the stabilisers and crane controls ensure to read operating instructions.

WARNING

When operating on sloping ground position the truck to face up or down the slope. Ensure to chock the wheels to prevent movement.

WARNING

Do not operate the crane unless both stabiliser legs have been lowered and the feet are in firm contact with the ground.

WARNING

Do not use the crane if there are any signs of damage or hydraulic leaks.

WARNING

Ensure no-one is within the working area when operating the crane.

WARNING

Do not have anyone within the cabin of the operating truck except the operator.

WARNING

Ensure that only the stabiliser handle is used to push the stabiliser in.

WARNING

Before operating the stabiliser and crane controls read the DANGER notice on the instrument panel.

WARNING

When operating at night the secondary member on the ground is to use a torch and control all safety requirements for the working area.

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COMPLIANCE CERTIFICATE

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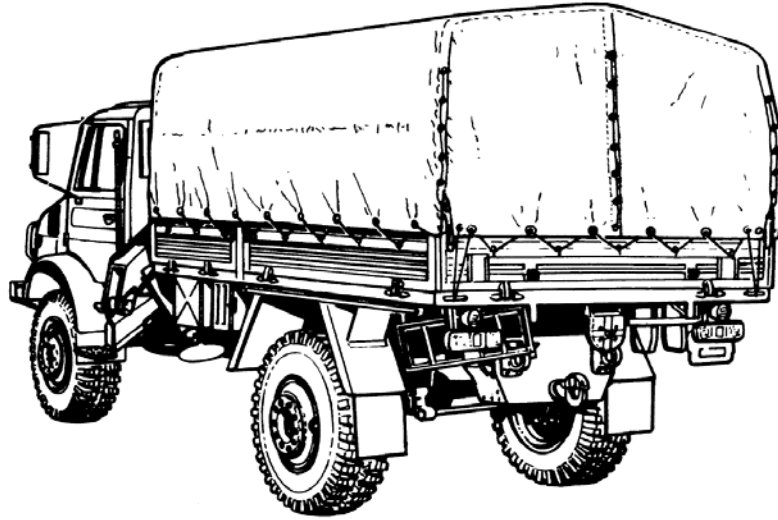
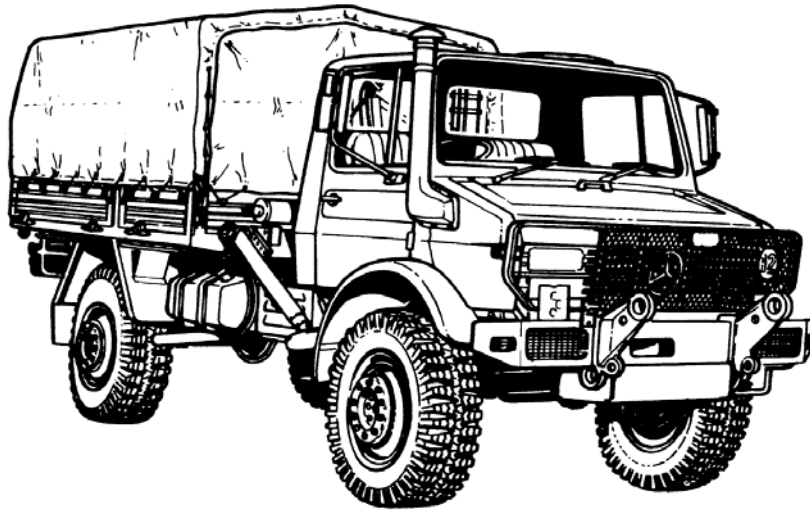
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Date Section or Unit

FRONTISPIECE



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NOTES TO READERS

1. Warnings, Cautions and Notes are used throughout this manual to ensure that actions undertaken by the reader are carried out correctly and with due consideration of occupational health and safety risks. An overview of the content of Warnings, Cautions and Notes is provided below.

WARNING

A warning precedes an operating procedure or maintenance practice, which if not correctly followed, could result in personal injury or loss of life.

CAUTION

A caution precedes an operating procedure or maintenance practice, which if not strictly observed, could result in damage to or destruction of the equipment, or corruption of data.

NOTE

A note precedes or follows an operating procedure or maintenance practice or condition, which requires highlighting.

2. It is mandatory that readers observe all warnings, cautions and notes when completing actions associated with this manual.

AMENDMENT ACTION

3. All required amendments are to be forwarded to Med B Technical Advisor Med/Hvy B vehicles, CGSVSPO, DMO DPM7.

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FOREWORD

AUTHORITY

1. This manual is for all users of the Truck Cargo with Crane MC2 Mercedes-Benz Unimog. It contains the equipment related information required to:

- a. operate;
- b. store;
- c. transport;
- d. service;
- e. conduct basic fault-finding; and
- f. manage warranty issues.

APPLICABILITY

2. This manual in conjunction with the TECHNICAL MANUAL USER HANDBOOK Truck Medium MC2 Unimog – All Types is to be used for the following vehicles:

- a. Truck, Cargo with crane – NSN 2320-66-112-8976; and
- b. Truck, Cargo with crane and twist locks – NSN 2320-66-131-4558.

OPERATING INSTRUCTIONS

3. This manual provides the best possible operating instructions for the Truck Cargo With Crane MC2 Mercedes-Benz Unimog.

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LIST OF ASSOCIATED PUBLICATIONS

EMEI Vehicle G 620	Electrical and Mechanical Engineering Instructions (EMEI) – Data Summary
EMEI Vehicle G 622	EMEI - Technical Description
EMEI Vehicle G 603	EMEI – Light Repair
EMEI Vehicle G 604	EMEI – Medium Repair
EMEI Vehicle A 028-1	EMEI – Miscellaneous Instruction (Technical Inspection)
EMEI Vehicle A 029-1	EMEI – General Instruction (Recertification)
RPS 02157	Repair Parts Scales (RPS)
CES 11756	Complete Equipment Schedules (CES) Truck, Cargo with Crane
ALI MM 10-11	Truck Medium 4 Tonne MC2 GS (Unimog) Fleet of Trucks

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SECTION 1- GENERAL DESCRIPTION

CHAPTER 1 - DATA SUMMARY

CHAPTER 2 - EQUIPMENT DESCRIPTION

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SECTION 1
CHAPTER 1
DATA SUMMARY

NOTE

Specifications common to all variants are contained in the
TECHNICAL MANUAL USER HANDBOOK Truck Medium
MC2 Unimog – all Types NSN: 7610-66-156-2407.

CARGO WITH CRANE

1. Vehicle Dimensions.

- a. Length..... 6580 mm
- b. Width..... 2465 mm
- c. Weight.....7390 kg
- d. Height:
 - (1) Laden..... 3040 mm
 - (2) Unladen 3140 mm
- e. Height Reduced (canopy, canopy frame and cupola hatch cover removed):
 - (1) Laden..... 2600 mm
 - (2) Unladen 2700 mm
- f. Ground Clearance..... 500 mm
- g. Pintle Hook Height:
 - (1) Laden..... 740 mm
 - (2) Unladen 840 mm
- h. Internal Tray dimensions:
 - (1) Length 3350 mm
 - (2) Width..... 2350 mm

(3) Height 570 mm

2. Crane.

a. MakePalfinger

b. Model..... PK4600A/24

c. Maximum Lifting Capacity (10° main boom angle)

(1) 3.3 m..... 1350 kg

(2) 4.2 m..... 1050 kg

(3) 5.1 m..... 860 kg

d. Power Sourcebelt-driven hydraulic pump

e. Width – stowed 2.3 m

f. Height – stowed 1.8 m

g. Operational height 2.05 m

h. Hook approach 2.5 m

i. Weight..... 715 kg

j. Weight booms extended..... 740 kg

k. Control positions

(1) Crane.....through cupola hatch

(2) Stabilisersat each stabiliser

l. Operating pressure 215 bar

3. Hydraulic Oil Pump.

a. MakeMercedes Benz

b. Type Inner gear

c. Operating pressure200 bar + 15 Bar (maximum)

d. Delivery at 1400 rpm 53 litres/minute

4. Hydraulic Oil Reservoir.

a. MakeMercedes Benz

b. Model..... YA425 550 01 80

- c. Capacity 35 lts
- d. OilHydraulic oil OM-33

5. Manufacturer's Details:

Daimler Chrysler Australia
Lexia Place
MULGRAVE VICTORIA 3170
Telephone: 03-95656318

6. Point of Contact:

National Fleet Manager
Medium/Heavy B Vehicles Section
CGSVSPO, DMO, Level 7
Defence Plaza Melbourne
VICTORIA 3000
Telephone: 03 96222930

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SECTION 1

CHAPTER 2

EQUIPMENT DESCRIPTION

GENERAL

- 1. Palfinger Crane.** The crane is secured to the chassis between the cabin and the truck body. The crane consists of an inner and outer boom and two extension boom assemblies connected in-line and mounted on a vertical support column. The booms may be operated individually or simultaneously by double-acting hydraulic cylinders mounted between each assembly.
- 2.** The crane may be operated to lift or lower the inner boom and the outer boom; to extend and retract the extension booms, and to slew, clock-wise or anti-clockwise through an arc of 210°.
- 3.** The crane is stabilised by two hydraulically operated legs which manually extend horizontally, one from each side of the crane mounting. The legs are controlled independently of the crane by a common rod-type lever.
- 4.** The hydraulic pressure required to operate the crane cylinders and stabilisers is supplied by an internally-gear type pump which is bracket-mounted to the front engine support. The pump is driven by a belt from the engine crankshaft pulley. Hydraulic oil is gravity fed from a reservoir to the pump and is pumped under pressure to a solenoid-controlled diverter valve and direction control valves to the crane and stabiliser cylinders. The electrical solenoid is actuated by a micro-switch attached to the engine clutch pedal and engaged when a single-pole toggled-switch is operated. The switch is mounted on the right-hand side of the passengers' seat with a label detailing the pump engage operation.
- 5.** The crane will not be able to be operated when the emergency stop is engaged. If the crane is in an overloaded condition, the operator will be able to lower the crane at a reduced operational speed.

TOOLS

- 6.** The vehicle's tools are stored within two lockers which are located central of the vehicle on the left-hand side mounted to the chassis. The tools provided are detailed in Unimog Cargo User Handbook.

7. A spotlight, complete with lead and plug is stowed beneath the passengers' seat within the cabin. When required for use with the crane, it is mounted on an extendable post which is secured externally on the left-hand side of the cabin. The spotlight is controlled locally by a push pull type switch on the rear of the fitting and remotely by a switch adjacent to the spotlight power socket on the right-hand side of the passengers' seat.

CRANE LIFTING CAPACITY

8. The crane lifting capacity at various radii (safe working load limits) is shown on a label fixed to the main support (Figure 2-1). There is also label between the operator and the control levers on top of the cabin at the control point (Figure 2-2). A warning sign for safe crane operation is located on the cabin instrument panel.



Figure 2-1 Lifting Capacity Label – Crane Mast



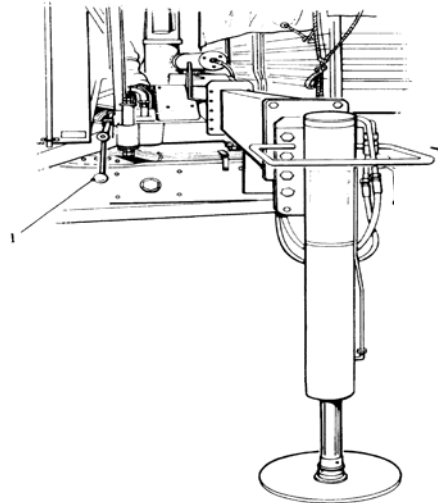
Figure 2-2 Lifting Capacity Label – Cabin

CRANE CONTROLS

9. Crane Control Levers. The crane control levers are accessible through the cabin cupola hatch. The controls consist of four levers; slew (red in colour), inner and outer boom and boom extension (black in colour, from left to right) Figure 2-2. A label fixed on the cabin roof between the operator and the control levers indicates each lever's operation.

10. Pump Indicator Light. The red indicator light labelled 'RED LIGHT ON PUMP ENGAGED' is situated on the right-hand side of the instrument panel above the ignition switch. When the hydraulic pump is engaged the light is illuminated.

11. Stabiliser Control Levers. The left-hand and right-hand stabilisers may be raised or lowered simultaneously, from either side of the truck, using a common rod-type lever labelled JACK-RAISE-LOWER (Figure 2-3). The stabilisers operate individually when the associated shut-off valve lever is set to OPEN. Both shut-off valve levers must always be in the CLOSE position when the stabilisers are stowed or after they have been deployed. Each stabiliser is secured into its extension housing by a locking bolt lever and locking bolt retaining clip, and retained in the vertical operational position or the 45 ° stowed position by the locking bolt and locking bolt retaining clip.



NOTE: LHS shown
RHS identical

1. Stabilisers common control lever
2. Shut-off valve lever
3. Stabiliser ram locking bolt lever
4. Extension housing locking bolt lever

Figure 2-3 Stabiliser Control Levers

12. Pressure Gauge. A pressure gauge (Manometer) is situated to the left of the crane controls. This gauge enables the operator to keep a visual on the crane's working pressure.

13. Emergency Stop. There is an emergency stop situated to the immediate right of the crane controls (Figure 2-4). The emergency stop is activated by pressing the red button and is set to run by pushing and twisting the red button clockwise to release it.

14. Overload Reset Valve. The overload reset valve is designated by the far right data plate on the cabin roof seen in Figure 2-4. The overload reset valve is situated under the emergency stop.



Figure 2-4 Emergency Stop

DATA PLATES

15. Data plates are fitted to the crane as follows:

- a.** Roof of the cabin at the control point, Figure 2-2;
- b.** On the crane's mast, Figure 2-1; and
- c.** On the inner boom visible by the operator when stowing or un-stowing the crane, Figure 2-5.

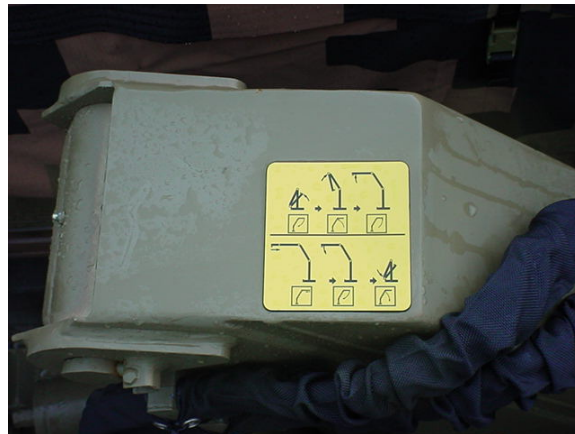
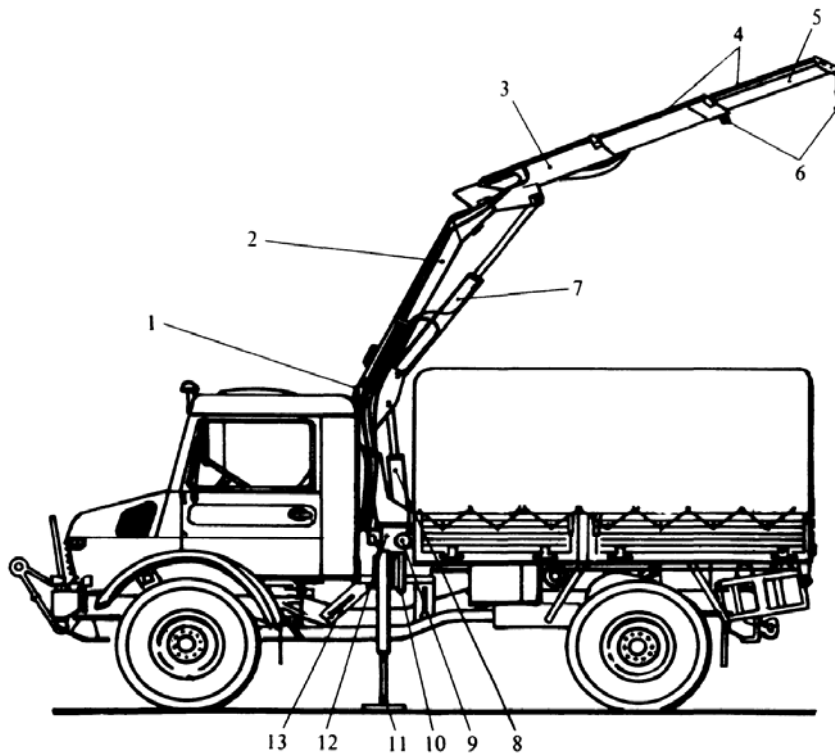


Figure 2-5 Stowing and Un-stowing Data Plate

GENERAL ARRANGEMENT

16. The crane's general arrangement is shown by Figure 2-6.



- | | |
|-----------------------------|--|
| 1. Crane control levers | 8. Inner boom cylinder |
| 2. Inner boom | 9. Slew cylinder |
| 3. Outer boom | 10. LH stabiliser shut-off valve lever |
| 4. Boom extension cylinders | 11. LH stabiliser (RH identical) |
| 5. Boom extension | 12. Crane support column |
| 6. Crane hooks | 13. Stabilisers common control lever |
| 7. Outer boom cylinder | |

Figure 2-6 Crane General Arrangement

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CHAPTER 1 - PRECAUTIONS BEFORE USE

CHAPTER 2 - PREPARATION

CHAPTER 3 - SAFETY PRECAUTIONS

CHAPTER 4 - OPERATOR INSTRUCTIONS

**CHAPTER 5 - PACKAGING, HANDLING, STORAGE AND
TRANSPORTATION**

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SECTION 2

CHAPTER 1

PRECAUTIONS BEFORE USE

BEFORE USE

1. Observe all warning lights.
2. Ensure the vehicle is on a flat level surface.
3. Ensure the operator is competent and trained.
4. Ensure ALL SAFETY requirements are adhered to.

WARNING

Do not drive the truck if the crane is not packed and stowed correctly.

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SECTION 2

CHAPTER 2

PREPARATION

FIRST PARADE SERVICE

1. Ensure that all steps of the first parade service have been performed before the first engine start of the day.

BEFORE STARTING

2. Ensure that any loose fittings or objects in the work area are removed and stowed prior to operation.

PREPARATION FOR USE OF THE CRANE

3. Prepare the Unimog and Palfinger crane for use as follows:

WARNING

When operating the crane ensure to chock all wheels to prevent the truck moving.

- a. Position the truck so that the crane is within reach of the stores,
- b. Check that the ground below the stabiliser position is firm,
- c. Apply the parking brake,
- d. Place the transmission in neutral,
- e. Check that both stabiliser shut-off valve levers are in the CLOSE position,
- f. Lower the passenger seat backrest allowing it to be used as the crane operator platform,
- g. Open the cupola cover,
- h. Start the engine, and
- i. Set the engine speed to 1400 rpm using the hand throttle.

- j. Engage the crane pump and wait for the red indicator light to illuminate on the instrument panel.
- k. Ensure the emergency stop is set to the run position.

SECTION 2

CHAPTER 3

SAFETY PRECAUTIONS

WARNING

Do not operate the crane unless both stabiliser legs have been extended and lowered, with the stabiliser feet firmly in contact with the ground.

WARNING

Ensure to place the vehicle on firm solid flat ground prior to using the crane.

WARNING

When operating the crane a guide shall be utilised to control all movement and safety requirements for the working area.

CAUTION

Do not exceed the safe working load limit for the various radii.

CAUTION

Do not drag the load along the ground by the crane hook.



Do not jerk the control levers; use a smooth movement to prevent load swing.



Ensure the load is stable, correctly packed and on firm solid flat ground prior to picking up or placing down.

SECTION 2
CHAPTER 4
OPERATOR INSTRUCTIONS

LOWERING THE STABILISERS

1. Lower the stabilisers as follows:

WARNING

Before operating the stabiliser and crane controls read the DANGER notice on the instrument panel.

WARNING

Ensure to fully extend the left hand outrigger before extending the larger and heavier right hand outrigger.

NOTE

If the ground under the stabilisers is of doubtful firmness or stability, lower the stabiliser on the side of the softer ground first. This saves time should it become necessary to resite the truck to gain sufficient stability. It may be necessary to reinforce the ground by laying steel mesh or sand bags under the stabiliser foot plates.

- a. Select the right-hand or left-hand stabiliser as appropriate for lowering,
- b. Remove the stabiliser ram locking bolt and the extension housing secondary locking clip and locking bolt from the extension housing,
- c. Rotate the stabiliser cylinder, ram and footplate until the footplate is pointing down,
- d. Insert the locking bolt,

- e. Using the handle pull the stabiliser from the extension housing to its fullest extent,
- f. Insert the locking bolt to lock the stabiliser in position,
- g. Set the shutoff valve lever to the OPEN position,

NOTE

The first stabiliser operated raises the truck chassis approximately 75 mm. The second stabiliser is raised to level the truck. Ensure to use the level indicators (Figure 4-1) on the extensions to level the vehicle correctly.

- h. Lower the stabiliser to the ground by setting the common control lever to the LOWER position,
- i. Set the shut-off valve lever to the CLOSE position,
- j. Ensure that the hydraulic lines are clear and free from obstruction,
- k. Repeat paragraphs a. to j. for the other stabiliser, and
- l. Carry out the secondary adjustments from left to right until the crane level indicators shows the bubble in the centre of the indicator glass.

NOTE

Secondary adjustments will vary dependant on environment.



Figure 4-1 Stabiliser Leg - Level Indicator

UNSTOWING THE CRANE

2. Un-stow the crane and prepare it for use as follows:

WARNING

Do not operate the crane unless both outrigger extensions have been fully extended, stabiliser legs have been lowered, the feet are in firm contact with the ground and the vehicle is level.

- a. Assume the crane operator's position by standing on the lowered passenger seat backrest,

CAUTION

Do not drag the load along the ground by the crane hook and do not jerk the control levers; use a smooth movement.

- b. Move the outer boom control lever towards the vehicle cabin and hold it in that position until the outer boom is raised clear of the stowage lug on the crane support column,

- c. Return the lever to neutral,
- d. Move the inner boom control lever towards the vehicle cabin and hold it in that position until the boom is raised to an angle of approximately 45°,
- e. Return the lever to neutral,
- f. Move the outer boom extension control lever towards the crane (away from the vehicle cabin) until the outer boom is approximately at a 45° angle downwards, and
- g. The inner boom, outer boom, extension and slew can now be operated to meet the task requirements.

OVERLOAD PROTECTION

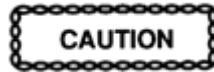
3. The crane hydraulic system is protected against overload by a hydraulic pressure sensing valve and blocking cylinders, located in the control lever circuits. If an overload condition is reached, the sensing valve bypasses oil to the blocking cylinders which neutralise any further operation, by forcing the control lever to the centre position against the operator's hand pressure. The operator must then reduce the load/radius by lifting the inner boom, lowering the outer boom or retracting the boom extensions. Under extreme emergency conditions only, the operator can bypass the overload by hand operation of the overload reset valve located under the emergency stop button.

LOAD HOLDING VALVE

4. A load holding valve is incorporated within the hydraulic system. The load holding valve ensures that if the emergency stop is activated the crane will continue to support the suspended load. The load will be supported in the position it was in when the emergency stop was activated.

LOADING THE CRANE

5. Load the crane as follows:
- a. Adjust the height of the booms so that the crane may be slewed in the desired direction without contacting any obstructions,
 - b. Slew the crane so that the booms are aligned directly above the load to be moved,
 - c. Set the inner boom angle to 10° above the horizontal for maximum lift,



Ensure that the maximum safe working load for the various radii is not exceeded. Refer to the SAFE WORKING LOAD placards.

- d. Select the appropriate hook position on the boom for the load,
- e. Use the control levers to position the hook over the sling around the load,
- f. Attach the hook to the load,
- g. Ensure that the safety catch on the hook is fully closed and secure, and
- h. Take the load up gently by raising the appropriate boom until the load is clear of any obstructions before slewing the crane.



Slew the crane smoothly, gently and gradually to prevent the load jerking or swinging.

UNLOADING THE CRANE

6. Unload the crane as follows:

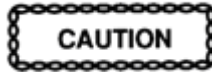


Ensure that the load is completely stable and is on firm standing before releasing the hook.

- a. Use the appropriate boom and slewing controls to lower the load gently and accurately into place,
- b. Open the safety catch on the hook and release the hook from the load, and
- c. Raise the appropriate boom until the crane is clear of the load and any obstruction before slewing the crane.

STOWING THE CRANE

7. Stow the crane as follows:
- a. Slew the crane until the booms are on the passenger side of the truck and aligned above the space between the cabin and the truck bed,
 - b. Retract the boom extension to the limit of its travel,
 - c. Raise the inner boom to an approximate angle of 45°,
 - d. Fold the outer boom most of the way towards the end of its travel,

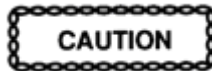


If the hook and shackle is not positioned between the inner and outer booms before fully lowering the outer boom, component damage will occur.

- e. Ensure that the shackle and hook is placed between the inner and outer boom,
- f. Lower the main boom until the stowing boss engages the stowing lug on the crane support column,
- g. Close the cupola cover, and
- h. Return the passengers seat to the normal position.

RETRACTING THE STABILISER

8. Retract the stabilisers as follows:



If the ground under the road wheels is of doubtful firmness, retract the stabiliser on the side of the firmer ground first.

Do not move the truck until both stabilisers are fully retracted and stowed correctly.

- a. Set the selected shut-off valve lever to the OPEN position,
- b. Set the JACK common control lever to RAISE,

- c. Ensure that the leg retracts fully,
- d. Set the shut-off valve lever to the CLOSE position,

WARNING

Ensure that only the stabiliser handle is used to push the stabiliser in.

- e. Remove the secondary locking clip and pull out the locking bolt of the left hand stabiliser,
- f. Push the left hand stabiliser fully home,
- g. Insert the locking bolt and engage the secondary locking clip of the left hand stabiliser,
- h. Repeat this process for the right hand stabiliser.

NOTE

The normal stowage position is for the left-hand stabiliser leg and footplate to face towards the rear of the truck and the right-hand stabiliser and footplate to face towards the front of the truck.

- i. Pull out the locking bolt,
- j. Rotate the stabiliser to approximately 45°,
- k. Insert the locking bolt to lock the stabiliser in position,
- l. Repeat paragraphs a. to j. for the other stabiliser,
- m. Select the crane pump switch to OFF, and
- n. Shut down the engine.

OPERATING IN DARKNESS

WARNING

When operating at night the secondary member on the ground is to use a torch and control all safety requirements for the working area.

NOTE

If the operational situation prevents the use of lights, use an assistant to call the boom extension and slewing instructions as required.

- 9.** If there are no lighting restrictions, proceed as follows:
 - a.** Mount the floodlight on the post secured to the left-hand side of the cabin, and
 - b.** Switch on the floodlight and aim the flood light so that it illuminates the working area.

SECTION 2**CHAPTER 5****PACKAGING, HANDLING, STORAGE AND
TRANSPORTATION****STORAGE**

1. Trucks are to be stored in accordance with the following EMEI:
 - a. EMEI Veh A 139-1 – Preparation of Vehicles for Periods of Non-use (One to Twelve Months); and
 - b. EMEI Veh A 203-3 – Preservation of Vehicles and Major Unit Assemblies.

PREPARATION FOR SEA TRANSPORTATION

2. Trucks are to be prepared for sea transportation in accordance with EMEI Vehicle A 201-2 – A and GS B Vehicles - Preparation for Shipment by Sea.

BODY CONFIGURATIONS

3. The cargo body configuration is able to be changed as follows:
 - a. Conversion to an open cargo configuration
 - b. Conversion to a drop-side configuration; and
 - c. Conversion to a flat-bed configuration.

CONVERSION TO AN OPEN CARGO CONFIGURATION

4. Convert the body to an open cargo configuration by removing the canopy and frame as follows:
 - a. Release all the canopy securing ropes,
 - b. Remove, fold and store the canopy,
 - c. Remove the canopy rails from the canopy bows,
 - d. Remove the retaining pin from the rail storage space under the body Figure 5-1,

- e. Stow the canopy rails, and
- f. Refit and secure the rail storage space retaining pin.

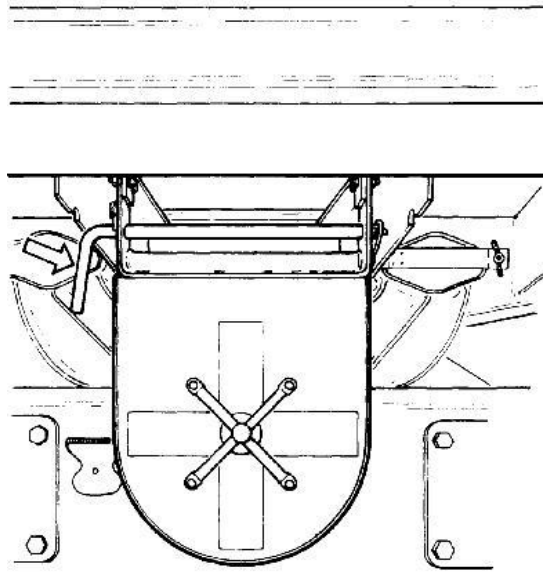


Figure 5-1 Canopy Rail Stowage

CONVERSION TO A DROP-SIDE CONFIGURATION

- 5. Convert the body to the drop-side configuration as follows
 - a. Remove the canopy and frame,
 - b. Release the leather retaining straps and lower the seats, and
 - c. Remove the nuts and bolts which secure the seat hooks to the sides of the body.

CONVERSION TO A FLAT-BED CONFIGURATION

- 6. Convert the truck body to a flat-bed configuration as follows:
 - a. Remove the canopy and frame,
 - b. Remove the seats,

- c. Release the tailboard latches,
- d. Lower the tailboard to the horizontal position,
- e. Slide the tailboard to the right,
- f. Remove the tailboard from the tray,
- g. Repeat paragraph c. to f. for each drop side assembly,
- h. Remove the panel support uprights from the tray, and
- i. Store the tailboard support uprights and drop sides appropriately.

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SECTION 3- OPERATOR SERVICING

CHAPTER 1 - SERVICING

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SECTION 3

CHAPTER 1

SERVICING

Introduction

1. The operator is to service the Unimog crane truck as follows:
 - a. first parade servicing;
 - b. halt parade;
 - c. last parade servicing; and
 - d. as detailed in EMEI Vehicle G 629 – Servicing Instruction.
2. This User Handbook only details the first and last parade servicing.

FIRST PARADE SERVICING

3. Check that the crane is correctly stowed. Check the oil level in the reservoir and top up if necessary. Check all hoses for leaks and security (tighten any connections if necessary).
4. Inspect for any visual cracks or deformation of the crane and mount. Ensure all safety placards are in place and legible.

LAST PARADE SERVICING

5. **Crane.** Ensure the crane controls are situated at neutral and that the crane and stabilisers are correctly stowed.
6. **General.** Ensure the crane and vehicle is left in a clean working condition. Report any service due to the crane and/or vehicle. Report any malfunctions or damage found or that has occurred. Ensure the crane is stowed safely and correctly.

LUBRICANTS

7. The approved hydraulic oil for use in the crane as fitted is OM-33 and for all grease points XG 291 is to be used.

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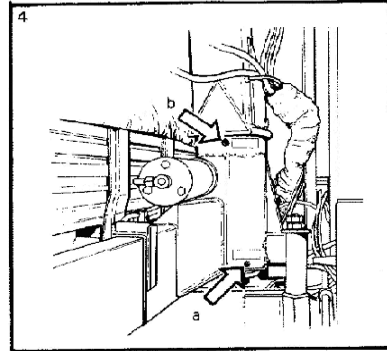
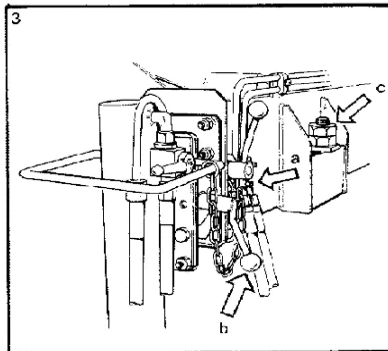
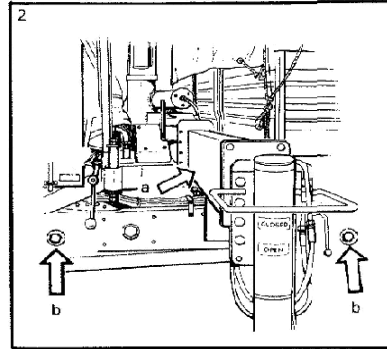
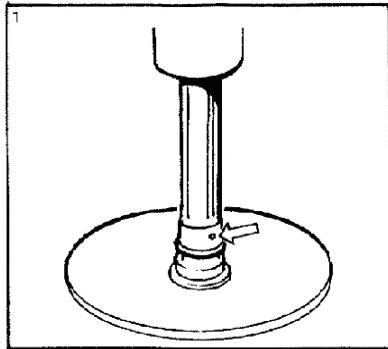
SECTION 3

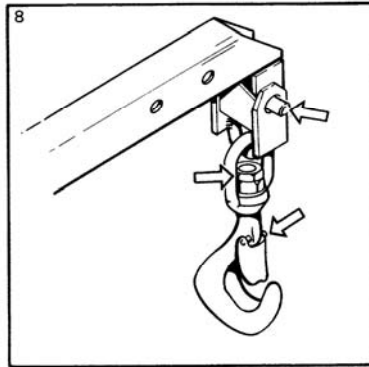
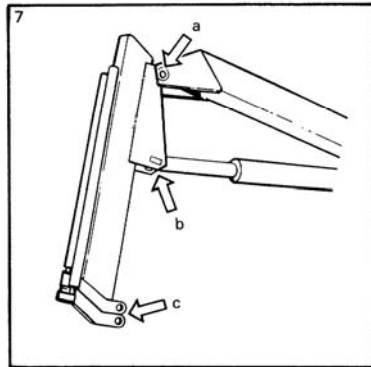
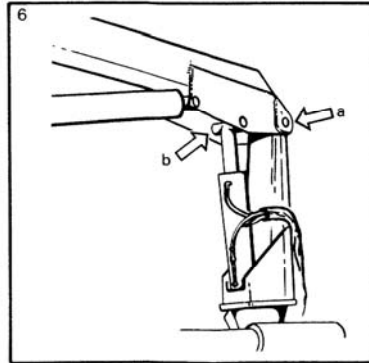
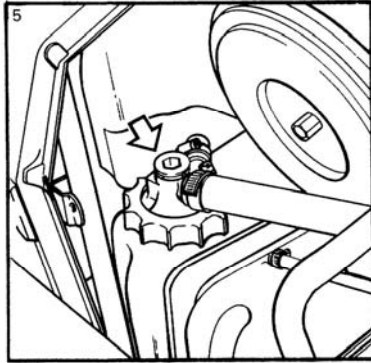
CHAPTER 2

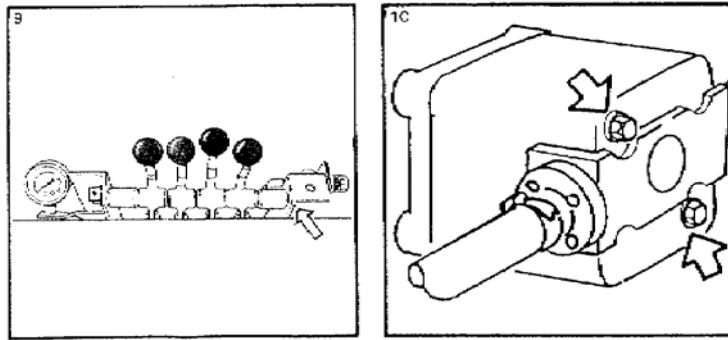
LUBRICATION

GREASING POINTS

1. The following are the grease points for the Palfinger cranes.







1	STABILISER FOOT PLATE	6a	INNER BOOM PIVOT
2a	STABILISER EXTENSION BOLTS	6b	CYLINDER PIVOT
3a	EXTENSION BOX LOCKING BOLTS	7a	OUTER BOOM PIVOT
3b	STABILISER RAM LOCKING BOLT	7b	EXTENSION BOOM PIVOT
3c	CRANE TO FRAME MOUNTING BOLT	7c	EXTENSION BOOM GUIDE BLOCKS
4a	SUPPORT COLUMN	8	CARGO HOOK
4b	SLEWING SYSTEM GUIDE BLOCK	9	CONTROL LEVERS ROLL PIN ASSEMBLY
5	HYDRAULIC OIL RESERVOIR	10	HYDRAULIC OIL PUMP MOUNTING BOLTS

Figure 2-1 Grease Points

2. XG-291 is to be used on all Palfinger grease nipples and grease points depicted in Figure 2-1. Ensure all mounting bolts and guide blocks depicted in Figure 2-1 are firmly in place and are in a serviceable condition.

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SECTION 3

CHAPTER 3

FAULT FINDING

POSSIBLE CRANE FAULTS

1. Prior to submitting the vehicle and Palfinger crane for repairs, ensure the following items have been checked:

- a. all hydraulic drive belts are tensioned, clean and secure;
- b. the starter motor is in good condition;
- c. hydraulic oil is at the correct level;
- d. all hydraulic line connections are tight and not leaking; and
- e. all the gauges, indicating lights, warning lights and alarms are operative.

2. Table 3-1 Possible Crane System Faults – details possible faults that could occur with the Unimog Palfinger crane.

Table 3-1 Possible Crane System Faults

SYMPTOMS	POSSIBLE CAUSE
Crane doesn't work	Hydraulic pump drive belts loose or broken, PTO not engaged, emergency stop activated
Erratic crane movement	Air in hydraulic system, lack of lubrication
Hydraulic pump noisy	Air in hydraulic system, incorrect hydraulic fluid, worn or damaged pump
Erratic pressure	Air in hydraulic system, contaminated fluid
Excessive oil pressure	Incorrect hydraulic fluid
No crane movement with controls operated	Excessive load, lack of lubrication, emergency stop has been activated, hydraulic leak
Hydraulic fluid system overheating	Pump worn or damaged, contaminated hydraulic fluid, incorrect hydraulic fluid

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