AP 5061 VOL 1 & 6

TRUCK, AIRFIELD CRASH, RESCUE Mk.2 AND Mk.2A

GENERAL AND TECHNICAL INFORMATION REPAIR AND RECONDITIONING INSTRUCTIONS

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence
Sponsored for use in the
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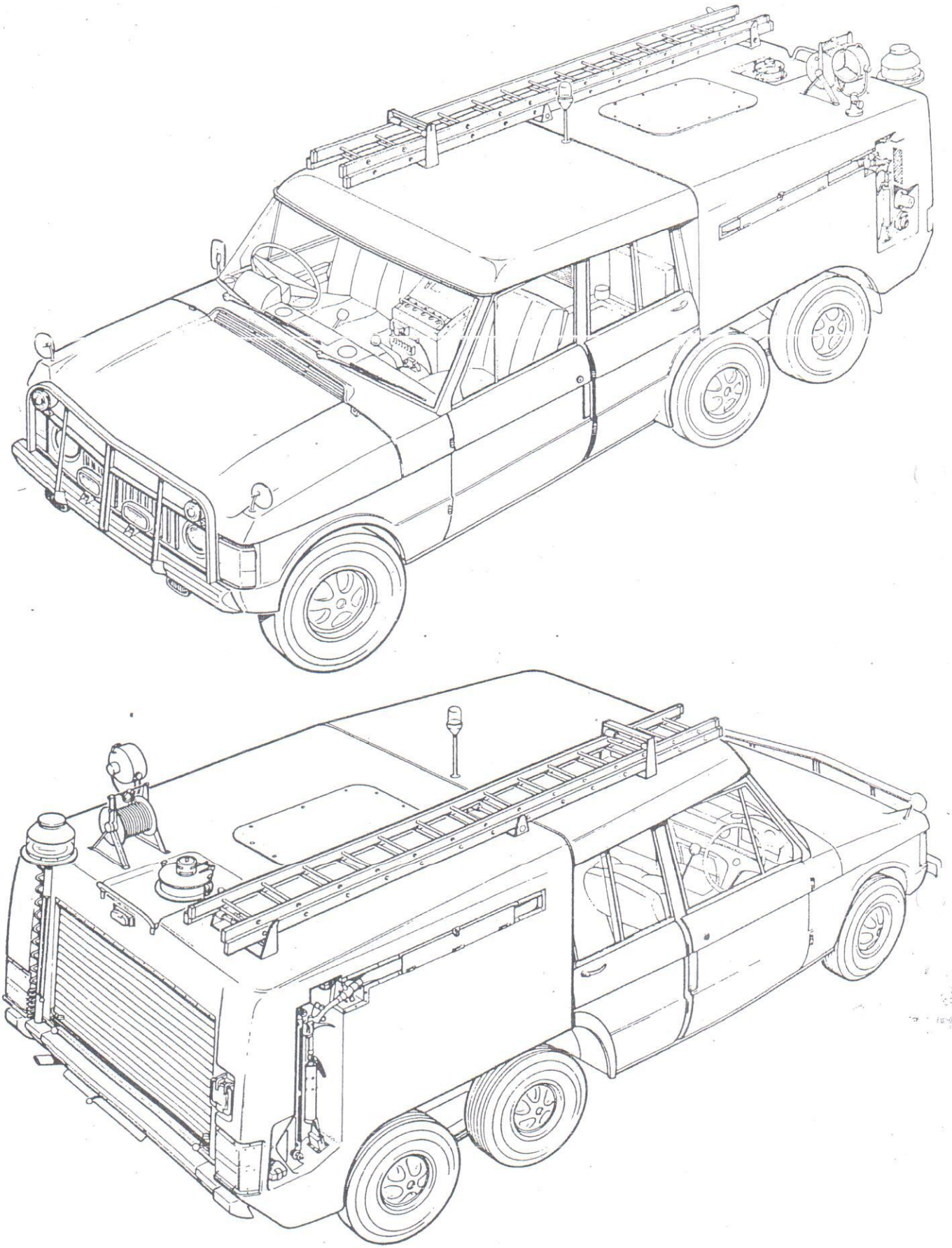


> This illustration shows the original Mk. 2A vehicle. Other variants are illustrated and described in Chap 1. <

Frontispiece

LEADING PARTICULARS

General

This publication covers the following:

AVC	Mk	
1963-0782	2	
1964-0782	2 Winterised	
1963-4100	2A	
1964-4100	2A Winterised	
1963-4101	2A	) Contract
1964-4101	2A Winterised	) FVE 22B/925

LEADING PARTICULARS Mk. 2

Reference No. ... ... AVC 1963-0782

> Chassis type ... ... Range Rover (modified) <

Weight

Empty plus 3 galls ... ... 1700 kg (3730 lb)

Laden ... ... 4090 kg (9000 lb)

Extinguishant tank capacity ... ... 909 litres (200 UK galls)

Fire pump ... ... Type UFP Mk.6

Rating ... ... 2273 litres min (500 UK gpm)

Oil bath capacity ... ... 1.14 litres (2 UK pints)

Hand operated foam making branch nozzles ... ... Type C50 HB

Valves:	Pt.No.	Manufacturers
Delivery valve 2 in ball valve	GM-C79902	Worcester Valve Co.
Water flush 3 in ball valve	GN-B79906B	Worcester Valve Co.
Tank to pump valve > 3 in ball valve <	GM-C80146	Saunders Valves Ltd.
Drain line valve > 3/4 in type M ball valve <	GM-B80313	Saunders Valves Ltd.
Pump drain valve 1 in BSP S/S Globe valve	GM-B79923	Trent Valve Co. Ltd.

LEADING PARTICULARS Mk. 2A

Except where stated in this list, the leading particulars are identical to those for the Mk. 2.

Reference No. ... ... AVC 1963-4100 and AVC 1963-4101 (later version)

> Fire pump ... ... Type GVA 2700 (formerly UFPX 656/8) <

Oil bath capacity ... ... 0.75 litres (1.3 UK pints)

Fuel system (petrol)	
Eberspacher tank	..6 UK pints (3.4 litres)
Electrical system	
Battery (1)	..60 amp hour
Pump Blanket Front	240 V 175 Watts
Rear	240 V 175 Watts
Valve Jacket	240 V 67 Watts
Pipe Heater Tape	240 V 25 Watts <

WARNINGS ...

(1) THE VOLTAGES USED IN THIS EQUIPMENT CAN ENDANGER HUMAN LIFE

(2) WHEN FILLING WITH FLUORINATED FOAM LIQUID ENSURE THAT ALL PERSONNEL ARE STANDING UPWIND

(3) IF FLUORINATED LIQUID CONTACTS UNPROTECTED PARTS OF THE BODY IT SHOULD BE WASHED OFF IMMEDIATELY WITH CLEAN WATER

(4) TO AVOID POLLUTION IN ENCLOSED AREAS SPACE HEATERS MUST BE SWITCHED OFF AT ALL TIMES WHEN THE VEHICLE IS PARKED IN BAYS OR GARAGES

(5) NEVER USE AN AIRLINE TO CLEAR BRAKE DUST. BRAKE LININGS CONTAIN ASBESTOS.

(6) DO NOT USE COMPRESSED AIR TO CLEAN FLAME TRAPS OR FUEL FILTERS

(7) DO NOT SHOCK LOAD STEERING COLUMN

> (8) THE RELAY PUMPING CONNECTION (SITUATED ON THE LEFT-HAND SIDE REAR) IS NOT TO BE USED FOR FILLING THE TANK. DAMAGE TO THE TANK WILL OCCUR IF EXCESS PRESSURE IS APPLIED DUE TO MISUSE OF THIS CONNECTION. <

CAUTIONS ...

(1) The handbrake acts on the transmission, not the rear wheels. When jacking the vehicle, apply handbrake, engage first gear and ensure wheels are chocked.

(2) Do not bottom-load the extinguishant tank.

(3) Full frost precautions must be observed when the vehicle is not connected to the mains.

FOREWORD

1 The later Mk 2A versions of the Truck Airfield Crash Rescue (TACR) Mk 2 and Mk 2A involve minor constructional changes which do not affect the operation. The changes are listed below.

1.1 Braking system. A different master cylinder has been fitted. The hand brake is now positioned further to the rear making its operation awkward.

1.2 Rear springs. These have a different spring rate.

1.3 Exhaust system. This is now a single system.

1.4 Fuel system. The fuel tank has been lowered and the fuel pump is now positioned inside the tank.

1.5 Engine speed governor. A different type has been fitted.

1.6 External mirrors. These are now mounted on the door pillars.

1.7 Bumpers. They are a different style.

1.8 Door locking. The fuse for the central locking system has been removed. A blanking plate has been fitted to prevent the child proof locks on the rear doors from being operated.

1.9 Heating system. Heating ducts are fitted along the transmission tunnel and are taken to the rear pump compartment.

1.10 Roof. The outer and inner skins are made of glass reinforced plastic (grp) and not aluminium.

1.11 Minor differences. There are a number of minor changes to the trim, gear lever and instrumentation.

Chapter 1

DESCRIPTION AND OPERATING INSTRUCTIONS

(completely revised)

CONTENTS

Introduction

1 The Mk. 2/2A crash vehicle is designed as a rapid means of positioning fire and rescue services close to airfield emergencies. The vehicle can seat a crew of four including the driver. It is based on a standard Range Rover chassis with a 775 mm (30.5 in) extension and an additional pair of rear wheels and axle.

2 Three versions of the Mk. 2A vehicle are in service. The original Mk. 2A is similar to the Mk. 2 but is constructed on a four-door chassis, rather than on a two-door chassis, with additional doors fitted and is fitted with a five-speed gearbox and different types of fire pump (see Leading Particulars).

3 A later version of the Mk. 2A (AVC 1963-4101) includes the following changes which do not affect the operation.

3.1 Braking system. A different master cylinder is fitted. The handbrake is positioned further to the rear making its operation awkward.

3.2 Rear springs. These have a different spring rate.

3.3 Exhaust system. This is a single system.

3.4 Fuel system. The fuel tank is lowered and the fuel pump is positioned inside at the top of the tank.

3.5 Engine speed governor. A different type is fitted.

3.6 External mirrors. These are mounted on the door pillars.

3.7 Bumpers. They are a different style.

3.8 Repeater lamps. A new type of blue repeater lamps are fitted in the front grill.

3.9 Door locking. The fuse for the central locking system has been removed. A blanking plate has been fitted to prevent the child proof locks on the rear doors from being operated.

3.10 Heating system. Heating ducts are fitted along the transmission tunnel and are taken to the rear pump compartment.

3.11 Roof. The outer and inner skins are made of glass reinforced plastic (grp) and not aluminium.

3.12 Minor differences. There are a number of minor changes to the trim, gear lever and instrumentation.

4 Final version includes the above modifications plus changes to the 240 V power circuit and changes to the winterisation equipment.

5 Differences are described in detail in the appropriate sections of this chapter and Chapter 1-2. General arrangements of the Mk. 2 and Mk. 2A vehicles are shown in Fig 1 and Fig 2 respectively.

FOAM MAKING SYSTEM

Extinguishant tank

6 A fibreglass tank is mounted between the crew compartment bulkhead and the ancillary equipment stowage at the rear of the vehicle. Due to the corrosive nature of the chemical extinguishant, all components attached to the tank are of stainless steel.

Tank filler and strainer

7 The tank is filled via an inlet mounted on the top rear surface of the tank. The inlet is fitted with a strainer basket and the filler cap contains a pressure vacuum valve, set at 17 mb to 34.5 mb (½ in Hg to ½ lbf/in^2).

Water tank contents indicator

8 The water tank contents indicator consists of a vertically mounted sightglass, adjacent to the right-hand foam making branch stowage. It is graduated to read FULL, 0.75, 0.5, 0.25 and EMPTY conditions of the tank.

Tank to pump valve

9 This is a 3 inch hand operated ball valve used to open and close the coupling between the tank and the pump. The control is in the form of a cranked lever situated below the helmet stowage.

Mk. 6 universal fire pump (Godiva)

10 This unit is fitted to Mk. 2 vehicles. The pump is an aluminium constructed single stage centrifugal pump driven clockwise. The drive shaft runs on ball bearings which are immersed in a bath containing 1.14 litres (2 UK pints) of oil. Shaft sealing is by a special mechanical face seal, ensuring efficiency and long life without adjustment.

11 The pump is driven from the vehicle power take-off (PTO) point through a pulley belt tensioning arrangement mounted beneath the pump. This arrangement consists of a shaft supported at one end in bearings and the other end bolted to a companion flange which forms part of a universal joint.

12 The universal joint is one end of the PTO propeller shaft. A belt links the companion flange to the pulley on the end of the pump drive shaft. Belt adjustment is carred out by altering the position of the four lock and thin nuts supporting the bearing mounting plate.

13 The pump inlet is coupled to the tank via a cone shaped Tee piece, reducing the four inch suction inlet to three inches. A flushing point is mounted at the rear of the vehicle and connected to the cone.

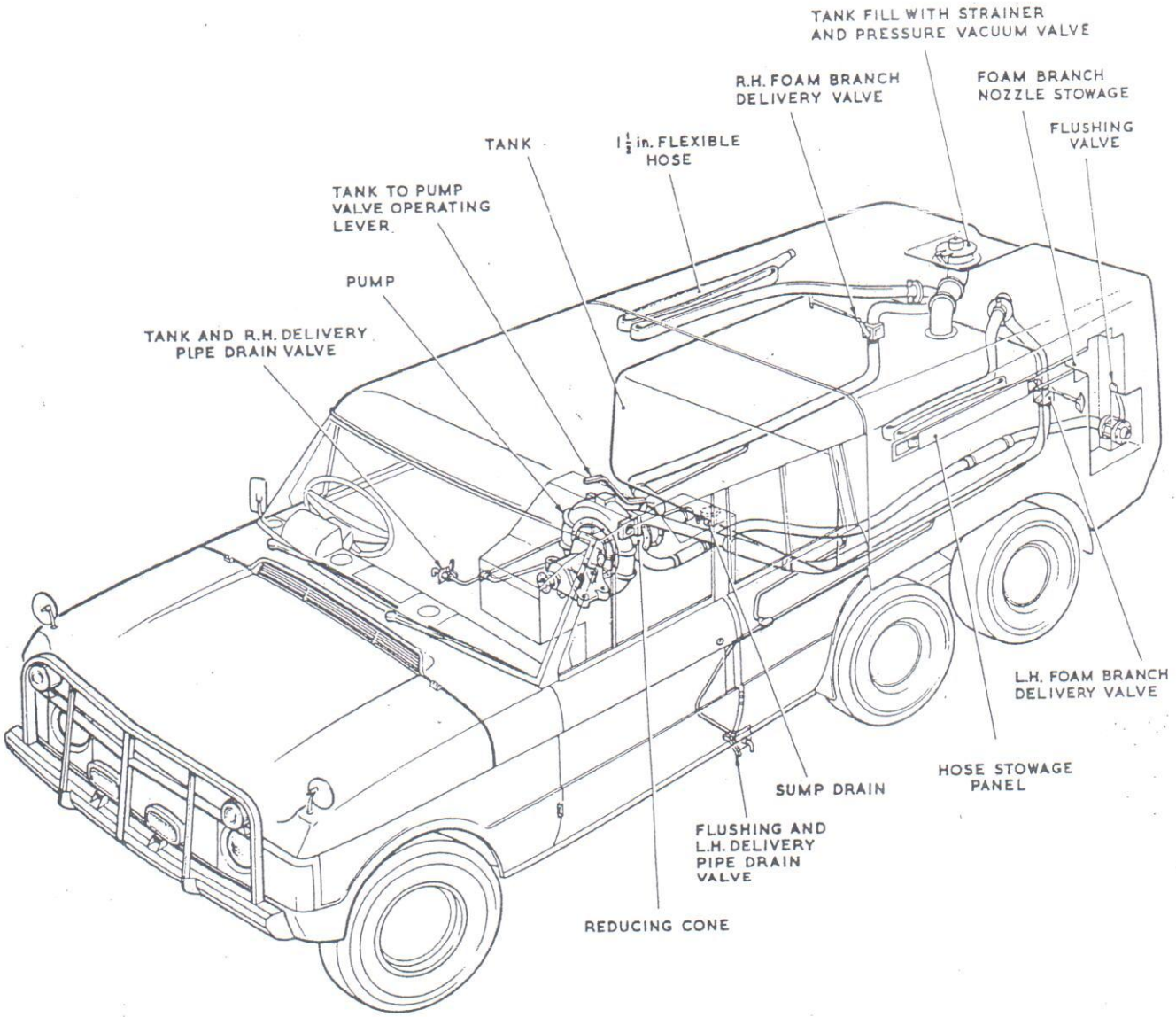


Fig 3 Foam delivery circuit

TABLE 1 ANCILLARY EQUIPMENT - Mk. 2 AND EARLY Mk. 2A VEHICLES (continued)

Description	Ref.No.	Qty
Chest, small tools	-	1
comprising.		
Crowbar, small	1A 468-3103	1
Saws, hack	1C 910-5746	2
Blade, saws hack	1C 549-0181	2
Blade, saws hack	1C 549-0182	2
Saw, double edge	1C 466-0038	1
Cutters, wire 12 in.	1A 783-9037	1
Pliers, insulated 8 in.	1B 910-5526	1 pr.
Rippagun, CP Model 5xB, complete with back pack	3AP 4148	1

TABLE 2 ANCILLARY EQUIPMENT - LATER Mk. 2A VEHICLES (1963-4101)

Description	Ref.No.	Qty
First aid kit GP	6545-99-211-0674	1
Torches, flame proof	5A 106-7377	2
BCF extinguishers, 2.5 Kg		1
1.5 Kg		1
Tripod, for searchlight	6230-99-412-7100	1
Leather gloves	-	2 pr.
Rubber gloves	8415-99-945-7240	2 pr.
Blankets, coloured	7210-99-942-4896	2
Blanket, smothering (non-asbestos)	4210-99-120-6022	1
c/w case	4210-99-120-6262	1
Crash axe, large	1A 466-0095	1
Shovel	3750-99-910-5950	1
Light alloy ladder (2-section)	4210-99-737-9684	1
Hose assys, 1½ in. ID x 100 ft	4210-99-139-0948	3
Branch pipe, jet/spray foam	4210-99-762-8436	2
Adaptor, hose unit 1½ in - 2½ in	-	1
Searchlight, c/w cable	-	1
Floodlight, c/w elevating gear	6220-99-400-8500	1
Extinguisher, dry powder 25 lb	4210-99-120-5134	1
Grease gun, hand	4930-99-942-6974	1
Tool kit, box	GMD 80322	1
comprising		
Saw, double-edged	1C 466-0038	1
Hacksaw (complete)	1C 910-5746	1
Blade, hacksaw	1C 549-0181	2
Blade, hacksaw	1C 549-0182	2
Crowbar, small	1A 468-3103	2
Cutters, wire	1A 783-9037	1 pr.
DZUS keys	5240 Proto (USA)	1
	T637 Bonney (USA)	1
	5244 Proto (USA)	1

(continued)

Tank and system flushing (tank empty)

30 To flush the tank and system, proceed as follows.

30.1 Remove tank filler cap.

30.2 Fill tank with clean water through lid, with small bore hose.

30.3 Layout hoses and branches with all delivery and system drain valves open.

30.4 Engage pump, open tank valve and adjust throttle to maintain good water flow.

30.5 When water flows clean, close tank valve and disengage pump.

30.6 Close all valves, make up equipment and carry out normal refill procedure through lid.

System flushing (tank partially full)

31 To flush the system, proceed as follows.

31.1 Check tank valve is closed.

31.2 Connect hydrant water supply to flushing valve.

31.3 Layout hoses and branches with all delivery and system drain valves open.

31.4 Engage pump, open flushing valve, and adjust throttle to maintain good water flow.

31.5 When clean water flows, disengage pump.

31.6 Close all valves, make up equipment, and carry out normal top up procedure through tank lid.

Pump test/training handline operators on water discharge

32 To train handline operators on water discharge, proceed as follows.

32.1 Couple a water supply to the flush/test valve.

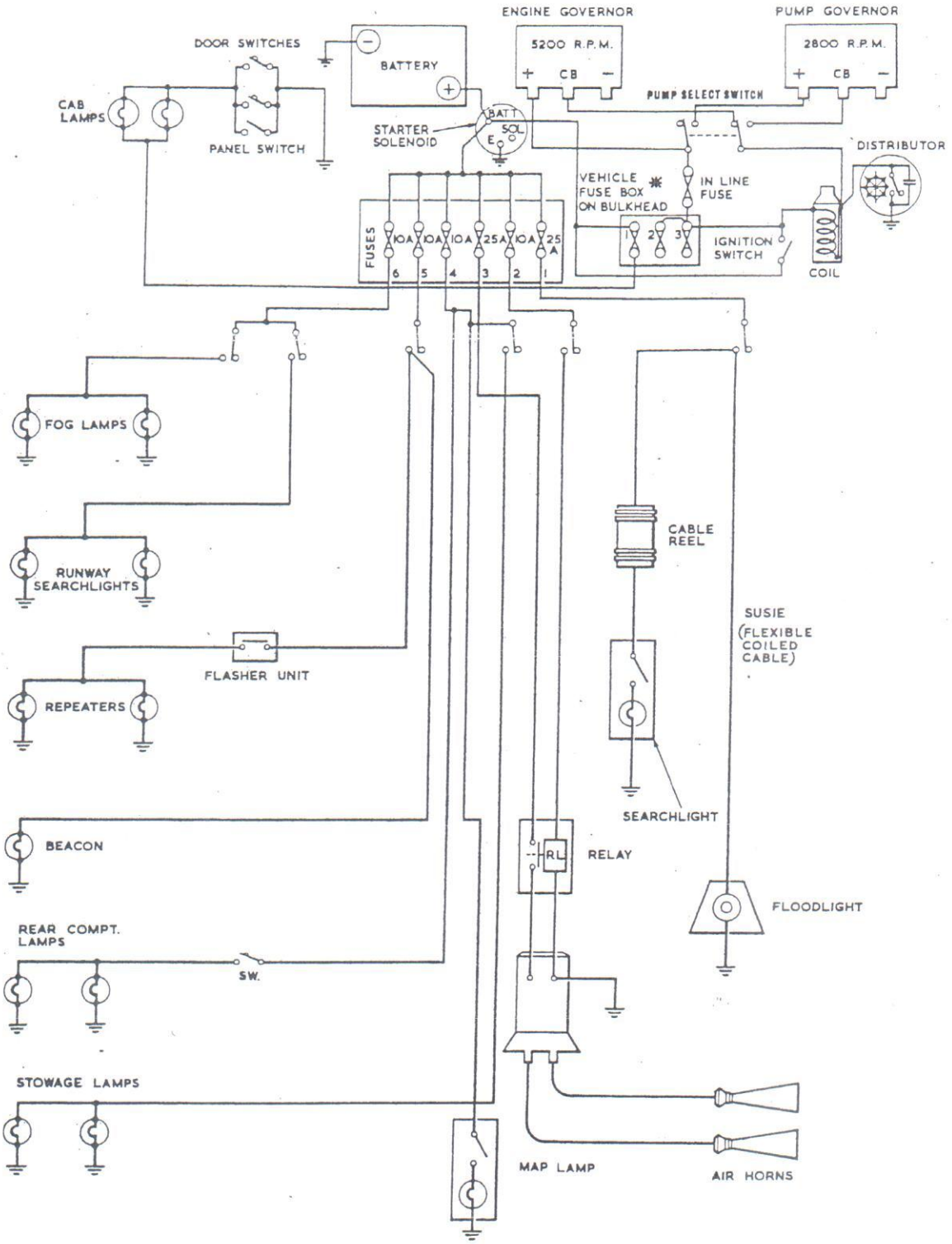
32.2 Pull out the foam making branch hoses and open delivery valves, handline men controlling branches.

32.4 Start engine, select PTO as for normal procedure.

32.5 Open flush/test valve, raise pump speed to required flow rates and continue pumping.

Note ...

Tank valve remains closed to ensure contents are not used.



* VEHICLE FUSE BOX FITTED IN THE DASHBOARD ON LATER MK.2A VEHICLES

Fig 4 12 volt power circuit

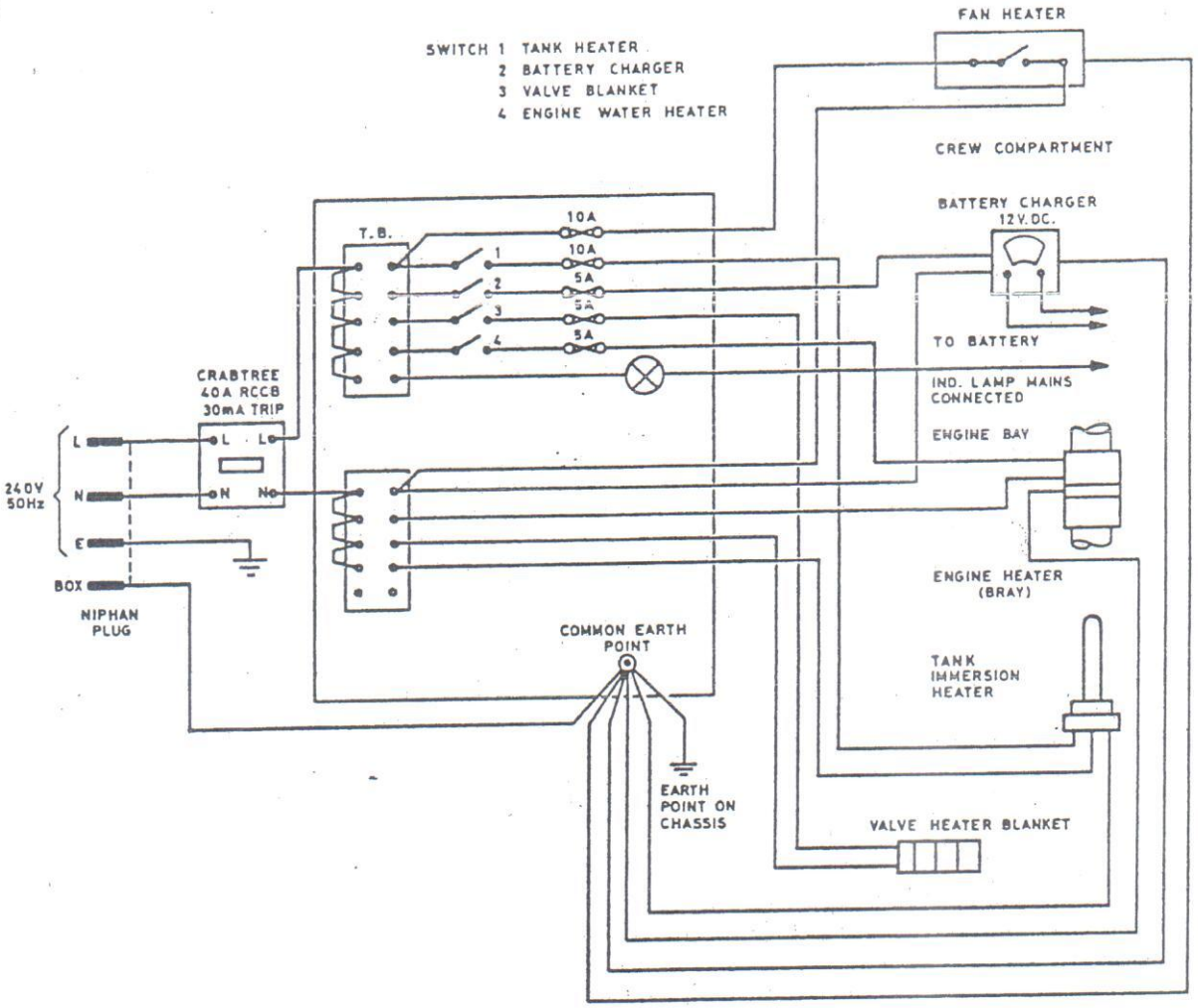


Fig 6 240 volt power circuit - later Mk. 2A vehicles(1963-4101)

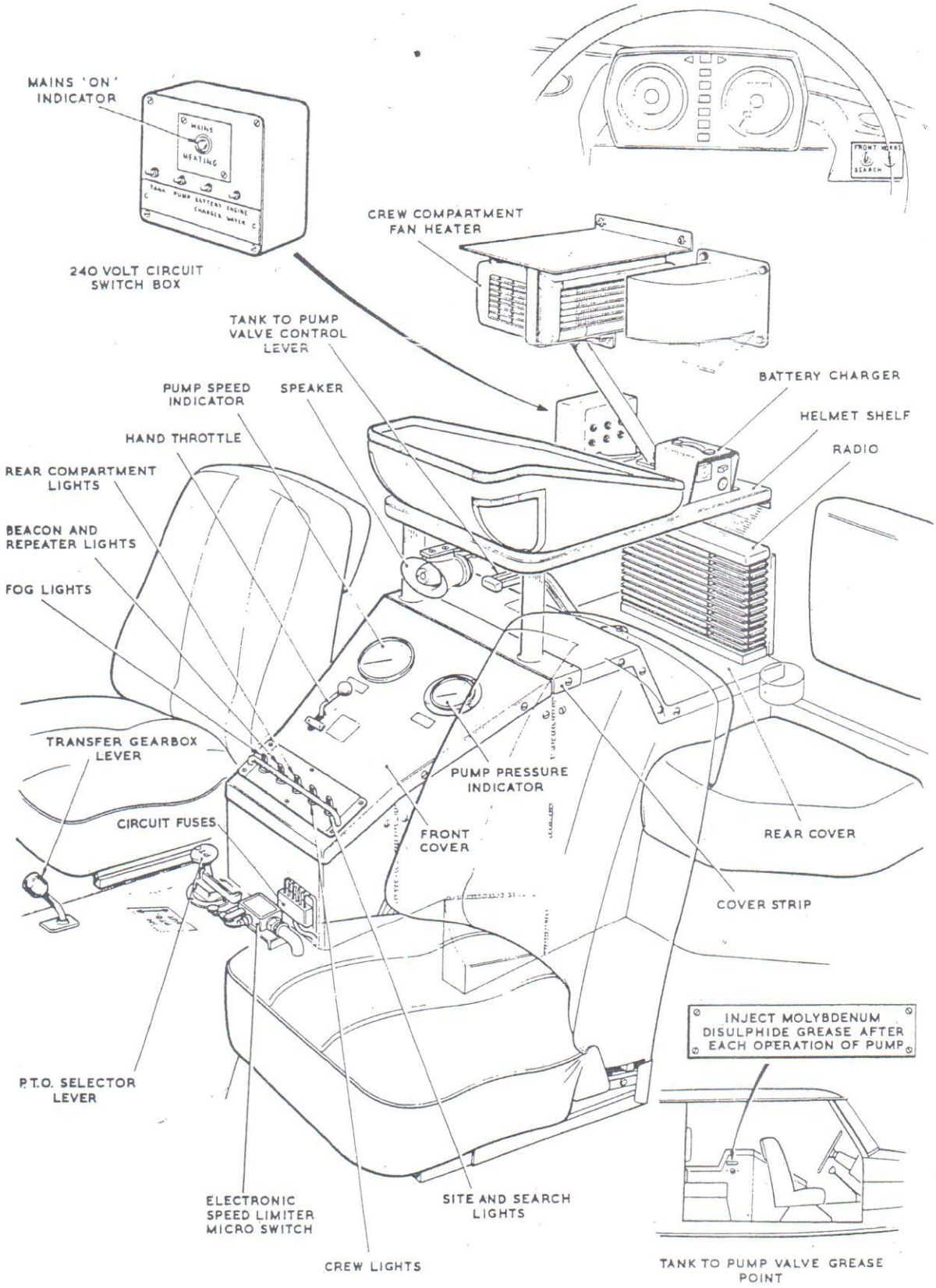


Fig 8 Operating controls - Mk. 2A vehicles

Chapter 1-1

DESCRIPTION AND OPERATING INSTRUCTIONS - WINTERISATION

(completely revised)

CONTENTS

Introduction

1 The Winterisation of the standard Mk. 2 and 2A Airfield Crash Rescue Truck includes the introduction of a number of modifications which enables the vehicle to operate efficiently at ambient temperatures of -30°C (-22°F).

2 These modifications include the fitment of the following.

2.1 A Thermocyclic heater, or, on later versions an Eberspacher heater.

2.2 Improved heating in the crew compartment.

2.3 Ducted warm air into hose stowage side panels and rear equipment stowage.

2.4 Ducted warm air to the delivery valves.

2.5 Electrically heated blanket for the pump.

2.6 Electrically heated tape surrounding the foam tank outlet pipe.

2.7 Windscreen and side blinds.

17 The heater continues to run at full-heat load capacity (7 kW) until the water temperature is approximately 80°C, the sensor then switches the heater to a low heat setting of 1.75 kW. When the water temperature drops to 70°C, the sensor switches back to full-heat load, and the system cycles between these two temperatures.

18 Should the water temperature rise to 85°C, the heater shuts down, rather than reduce heat, until the water temperature falls to 70°C. On shut-down, the fuel pump is cut off but the combustion-air blower and the water pump run for a further three minutes, controlled by a delay circuit. This sequence could occur if the vehicle engine is running as well as the heater.

Note...

The heater re-starts when the coolant temperature raches 70°C if the rocker switch is left 'ON' even though the engine is switched off.

19 When the heater is switched off by the rocker switch, the fuel supply is stopped, but the combustion-air blower and the water pump run for a further three minutes until they are cut off automatically.

Crew compartment heating

20 Heating for the crew compartment is normally provided by the fan heater mounted above the pump cover.

21 To supplement this, warm air from the heat exchanger assisted by a booster fan is ducted via flexible pipes and air nozzles across the inside of the windscreen.

Stowage and delivery valve heating

22 Two additional flexible pipes from the heat exchanger are routed into the heater duct situated on the compartment rear bulkhead. From the duct the warm air is piped across the top of the tank to a four-way connector mounted on the rear equipment stowage bulkhead.

23 The connector is used to disperse the warm air to the hose stowage compartments and to the left-hand and right-hand delivery valves which are enclosed within heater boxes.

Pump heating

24 Modification of the Mk. 6 or the GVA 2700 (formerly UFPX 656) Godiva pumps to Winterisation standard involves the fitting of a two-part insulated blanket to maintain an above freezing temperature while the vehicle is stationary and connected to a 240 volt mains supply. Each part of the blanket contains a 175 watt heating element connected to the supply via a switch on the circuit switch box.

Foam tank outlet pipe

25 An insulated jacket consisting of an electrically-heated tape enclosed within a layer of Kaowool is wrapped around the outlet pipe and secured at each end with plastic cable ties.

26 The 25 watt tape is supplied from the 240 volt input when the suction valve switch is selected ON.

32.9 When the unit has started, release the glowplug switch and adjust the choke control to give smooth running.

32.10 Replace the unit cover.

32.11 The heater fan can now be switched ON.

Note ...

There is sufficient fuel to enable the thermocyclic unit to operate for 4 hours.

Stopping procedure

32.12 Remove the cover of the unit.

32.13 Rotate the choke control fully clockwise.

32.14 Replace the cover.

32.15 Set the control box isolating switch to OFF.

Eberspacher heater unit

33 Before starting this unit, ensure that the fuel tank mounted on the offside front wing, under the bonnet, is filled with petrol and that the adjacent fuel cock is ON.

Note...

When the Eberspacher heater is operating, power is drawn from the vehicle single battery. Therefore, care must be taken to avoid discharging the battery to a level where the vehicle cannot be started.

Starting procedure

33.1 Open the isolating cock to the heat exchanger, mounted on the left of the tank to pump valve operating lever.

33.2 Press rocker ON/OFF switch, located on the dashboard, to the ON position. The heater will start up automatically.

33.3 The heat exchanger fan may be switched on in the cab after starting the engine or when the coolant temperature reaches about 55°C.

33.4 Should the heater fail to ignite within 90 seconds of fuel being pumped to the heater, press the switch to OFF. Repeat the starting procedure. If the heater again fails to operate correctly after a further 90 seconds of the fuel pump starting, a malfunction shutdown procedure occurs.

33.5 If the flame goes out spontaneously during operation, the heater is first re-started. If the heater fails to ignite within 90 seconds of the fuel being switched on, or if it ignites but goes out again within three minutes, automatic shutdown follows. This shutdown can be lifted by briefly switching the heater off and back on again.

33.6 If the battery voltage drops below 10.5 volts, OR rises above 15 volts, automatic shutdown follows.

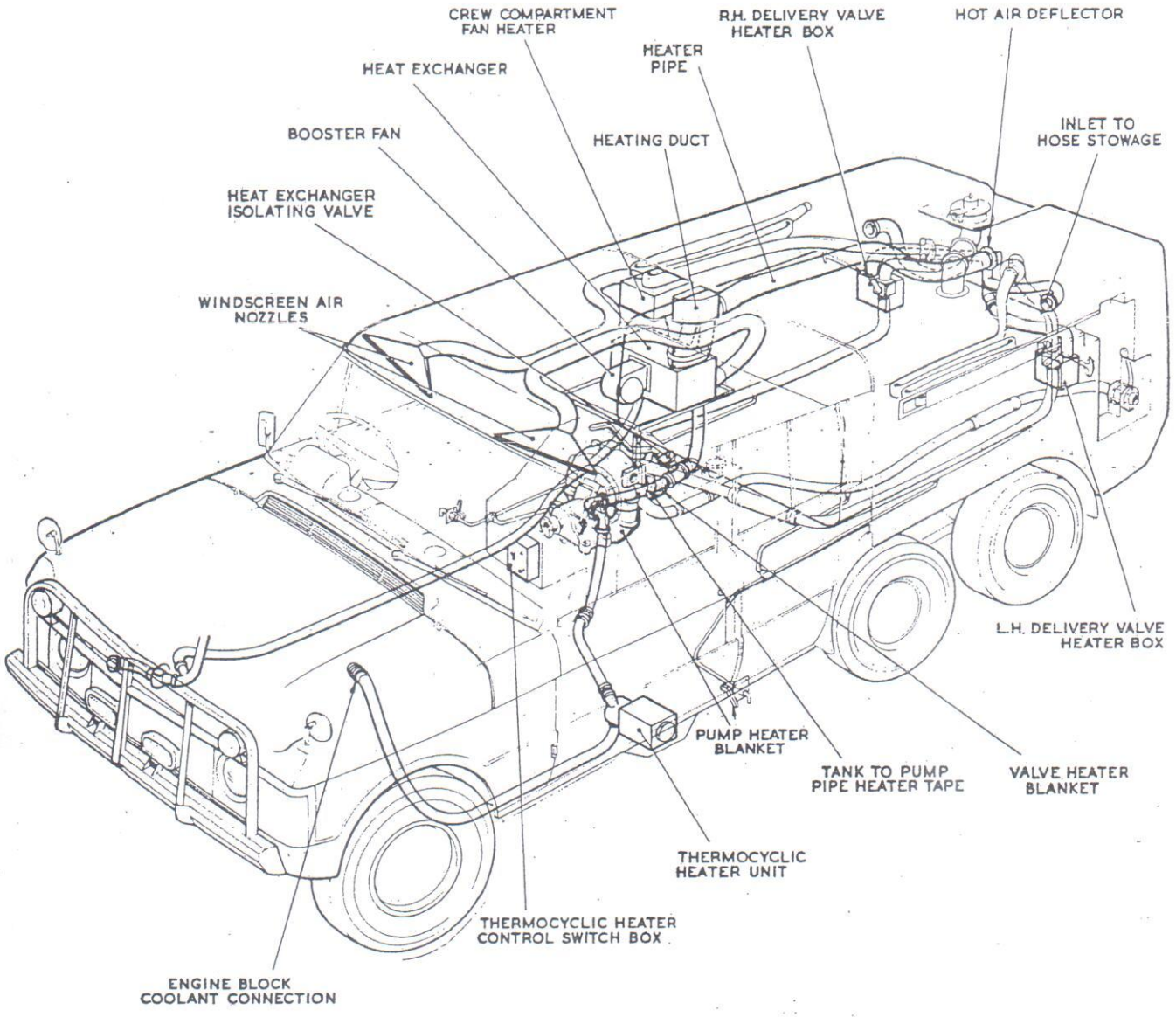


Fig 1 Winterisation heating equipment - Mk. 2 and early Mk. 2A vehicles

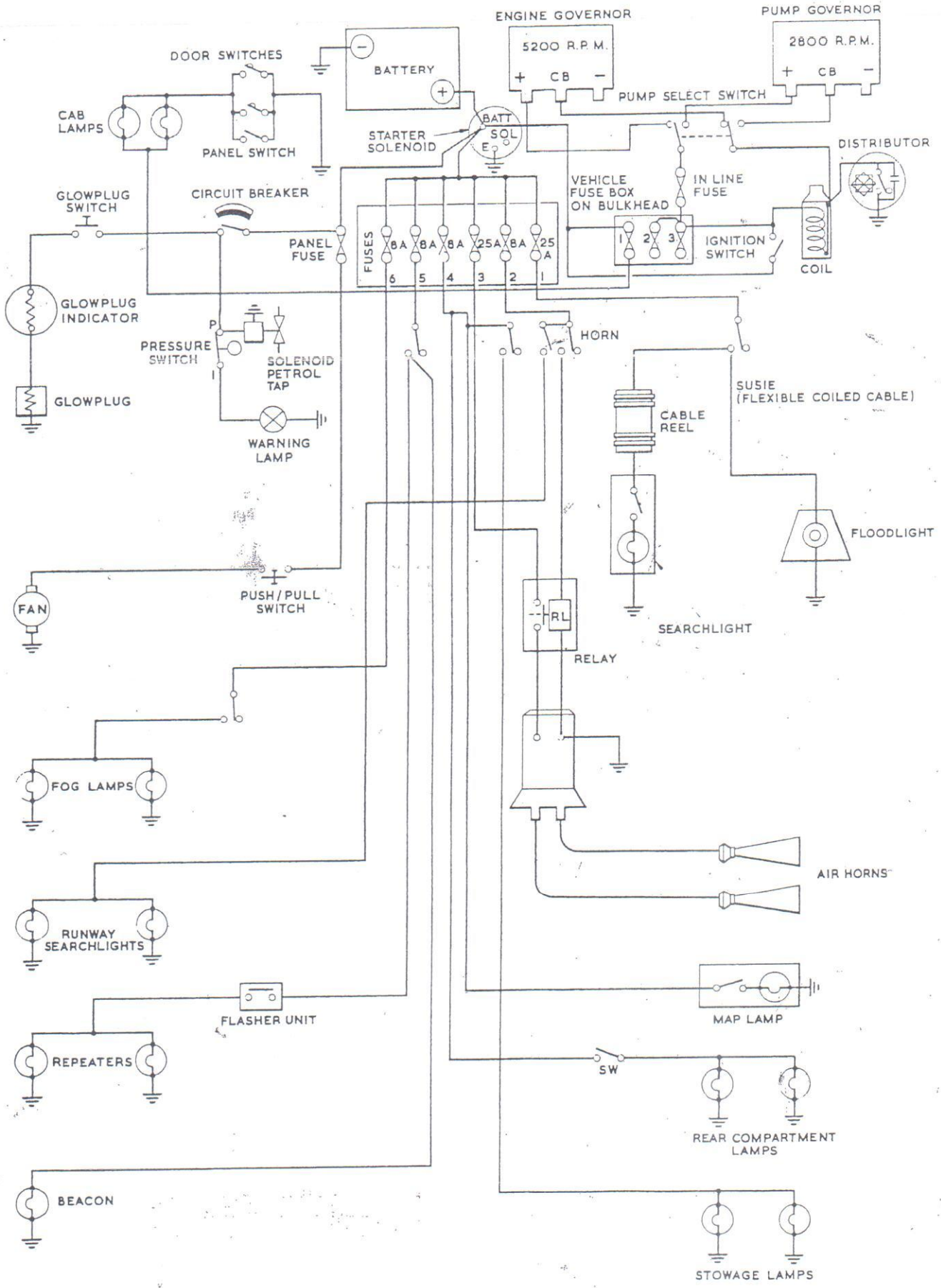


Fig 3 12 volt power circuit - Winterisation Mk 2 and early Mk 2A vehicles

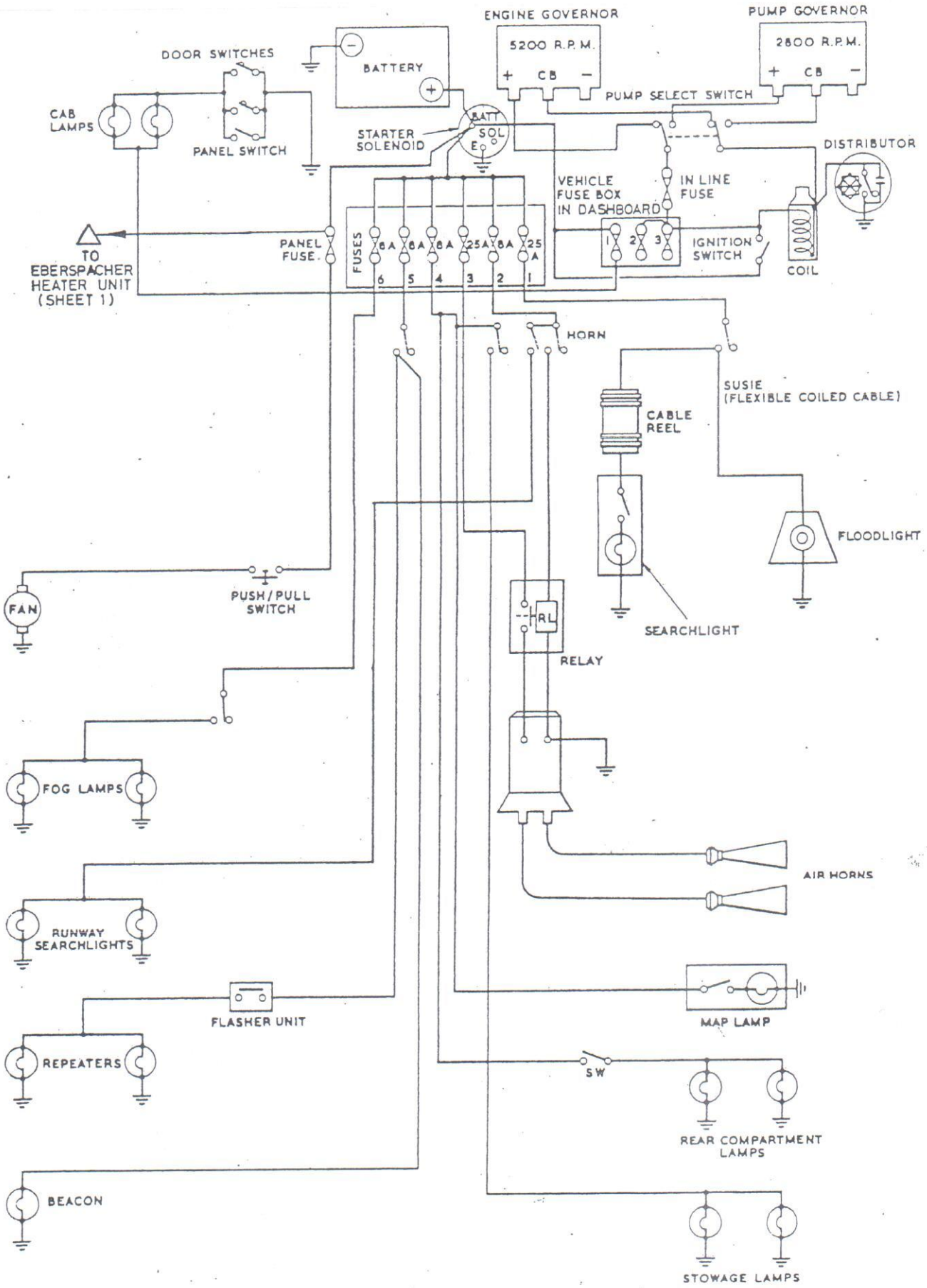


Fig 4 Sheet 2 12 volt power circuit -
Winterisation later Mk. 2A vehicles (1964-4101)

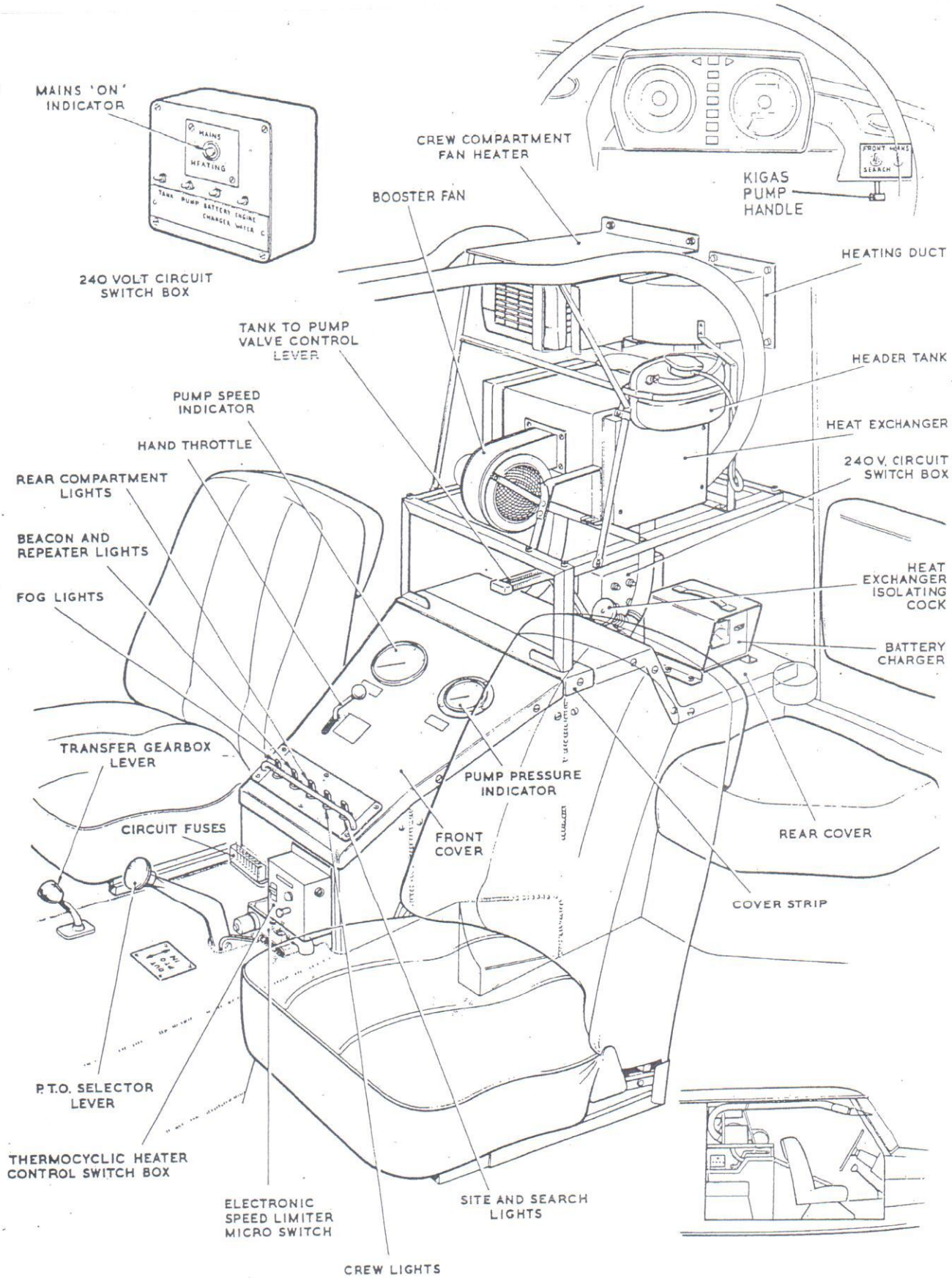


Fig 6 Operating controls - Winterisation Mk. 2 vehicles (1964-0782)

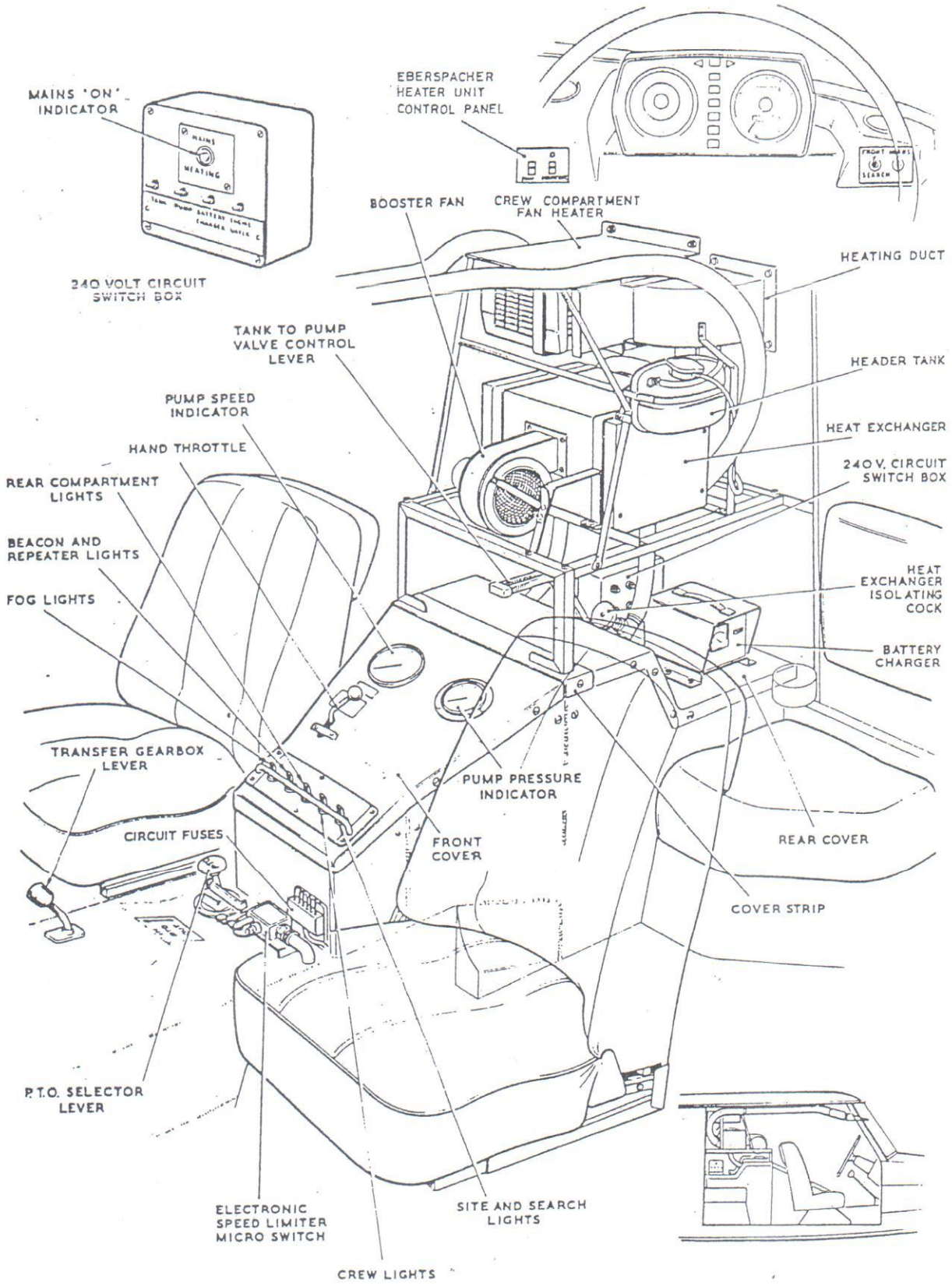


Fig 8 Operating controls - Winterisation later Mk. 2A vehicles (1964-4101)

Chapter 1-2

DESCRIPTION AND OPERATING INSTRUCTIONS - MARK 2A

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ILLUSTRATIONS

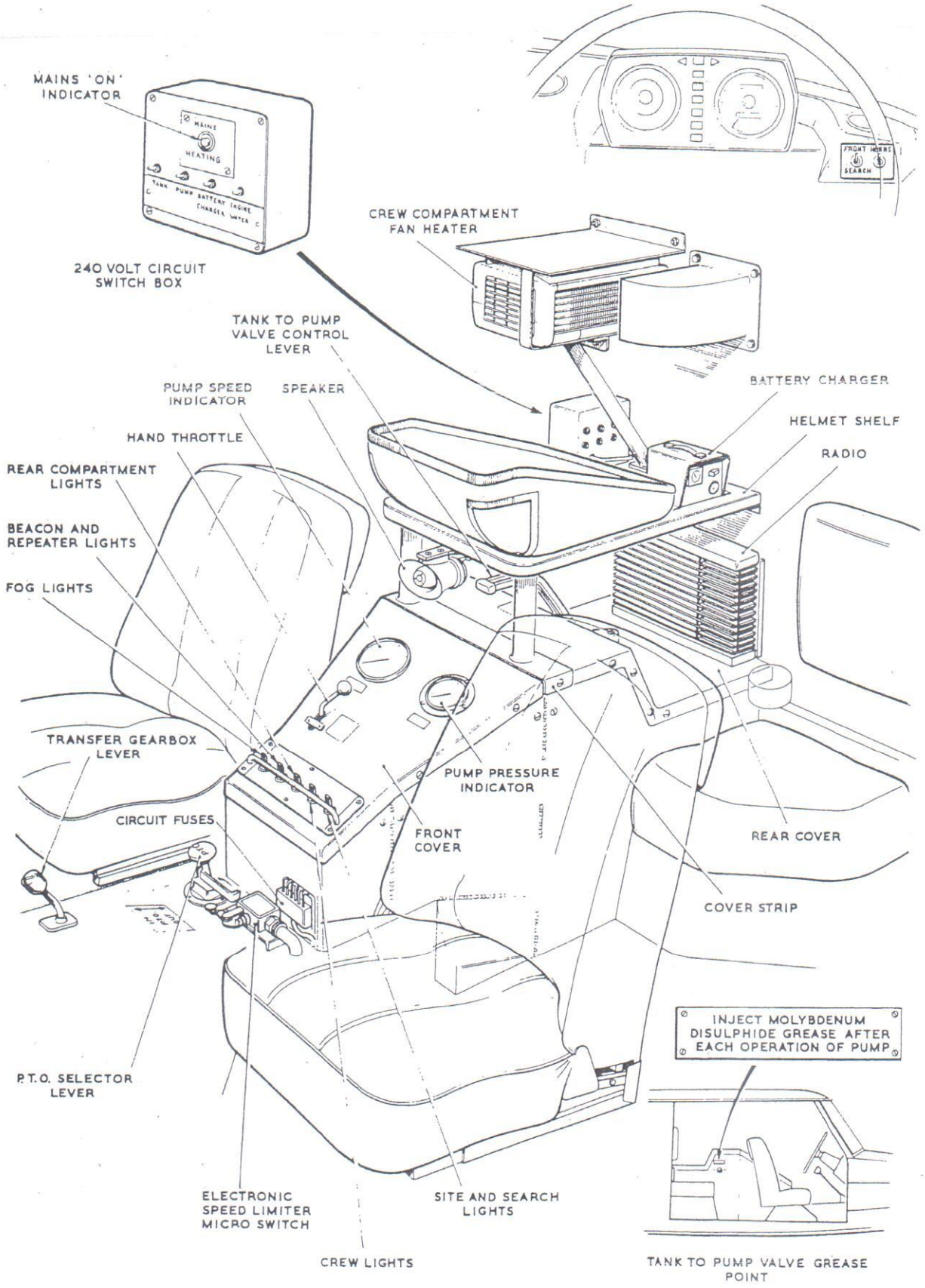

Fig.1 Operating controls

Chapter 2

MAINTENANCE INSTRUCTIONS - MARK 2

CONTENTS

MAINTENANCE

Note ...

Refer to AESP 4210-L-104-601 maintenance schedule for periodicity of preventive maintenance and types of oils and lubricants.

Lubrication

1 Lubrication information mentioned in this chapter is applicable only to the pump and pumping equipment.

2 A grease nipple located forward of the right-hand rear crew seat enables the shaft of the tank to pump ball valve to be lubricated.

3 Two grease nipples are provided on the pump drive bearing housing and should be lubricated in accordance with AESP 4210-L-104-601. Do not over lubricate. The nipple sealing balls and springs have been removed to prevent over lubrication, when using high pressure grease guns, from damaging shaft seals. It is normal for surplus grease to ooze from the nipples.

4 The drive shaft on the pump is immersed in a bath of oil.

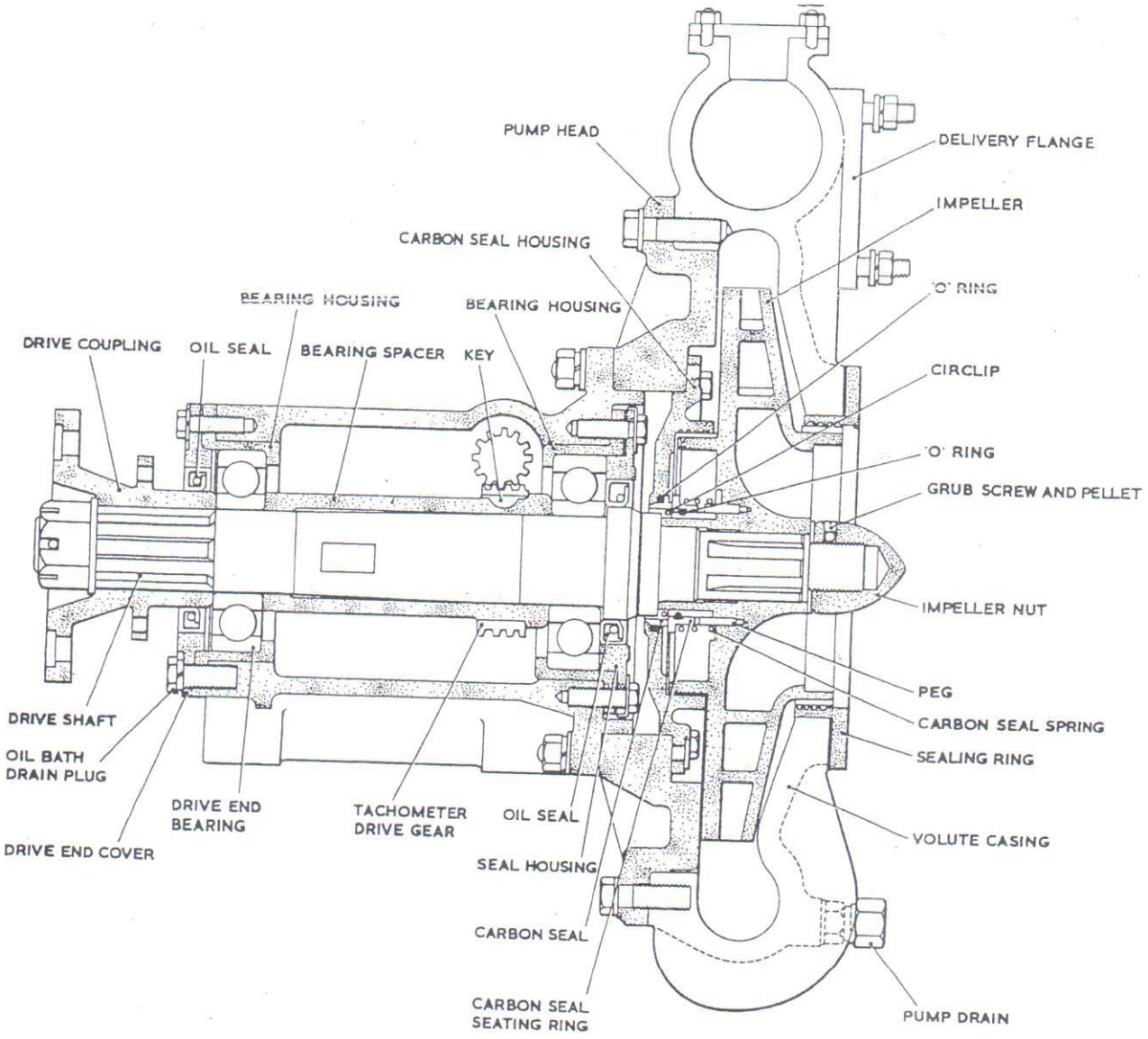

Fig.1 Water pump type UFP Mk.6

WATER PUMP

Impeller removal and refitting

8. If maintenance is necessary to the impeller or the carbon seal requires changing, proceed as follows:

(1) Remove the six nuts and washers securing the reducing cone flange to the suction inlet of the pump. Withdraw the flange clear of the studs.

(2) Remove the eight nuts and washers securing the two delivery pipes to the manifold. Withdraw each pipe flange clear of the studs.

(3) Disconnect the pump drain.

WARNING ...

THIS PUMP WEIGHS 61 kg (134 lb)

(7) Carefully lift the pump clear of the vehicle.

(8) Discard all joint washers.

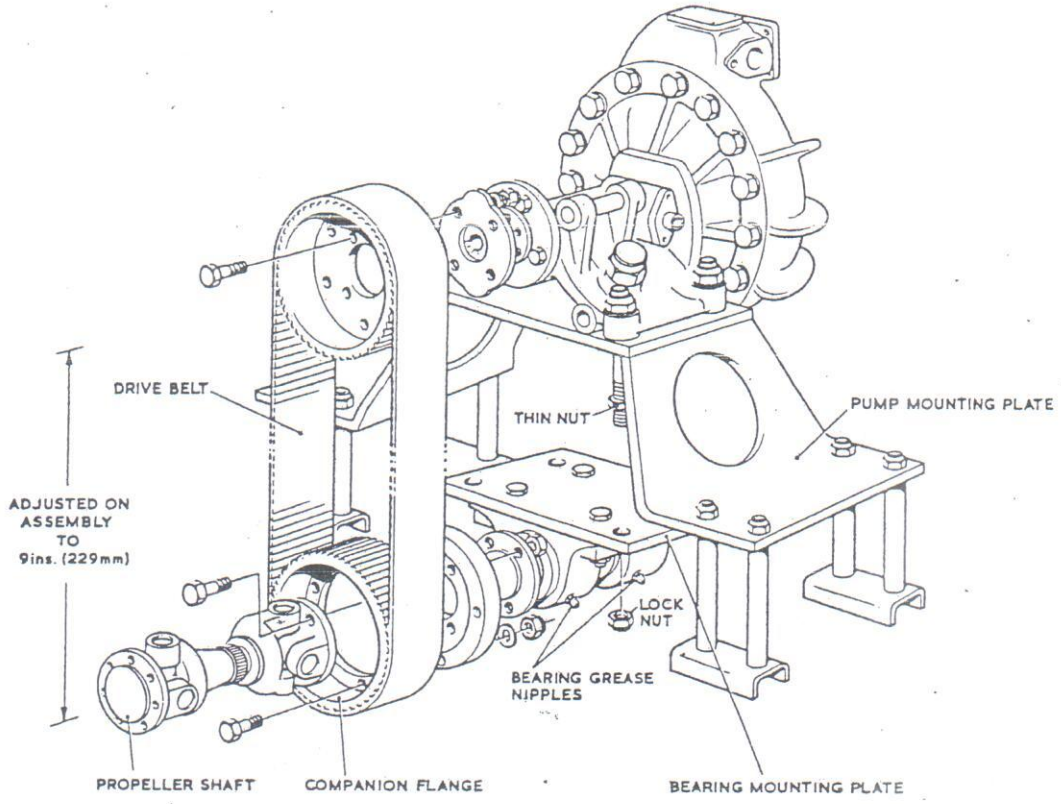

Fig 2 Drive belt tensioning

Dismantling the pump (Oil seal renewal)

10 (1) Refer to Para 7 and remove the panels.

(2) Refer to Para 9 and remove the pump from the vehicle.

(3) Remove the plug (Fig 1) and drain the lubricating oil into a suitable receptacle.

(4) Refer to Para 8 and dismantle the pump.

(5) To change the oil seal at the volute end of the drive shaft, remove the four bolts and tab washers to release the oil seal housing.

(6) To change the oil seal at the drive end, remove the split pin and castellated nut together with washer and withdraw the companion flange.

(7) Remove the four bolts and shakeproof washers and carefully withdraw the drive end oil seal housing and bearing retainer.

(8) Re-assembly is a reversal of the dismantling procedures, but new joints lightly coated with grease, should be fitted between the oil seal housings and pump head.

(8) Locate the pump to tank valve operating handle on the shaft and secure with the locating screw and bolt.

(9) Position the helmet shelf over the rear panel and secure at the bulkhead and the pump cover strip with five nuts and bolts and five screws.

(10) Reconnect the speaker.

(11) Fit the radio and reconnect the electrical connections.

(12) Reclip the cable looms adjacent to the radio.

(13) Reconnect the battery charger and the main switch box.

(14) Position the fan heater mounting bracket and support strut and secure.

(15) Reconnect the fan heater.

(16) Replace the two front seats.

(17) Reconnect the vehicle battery.

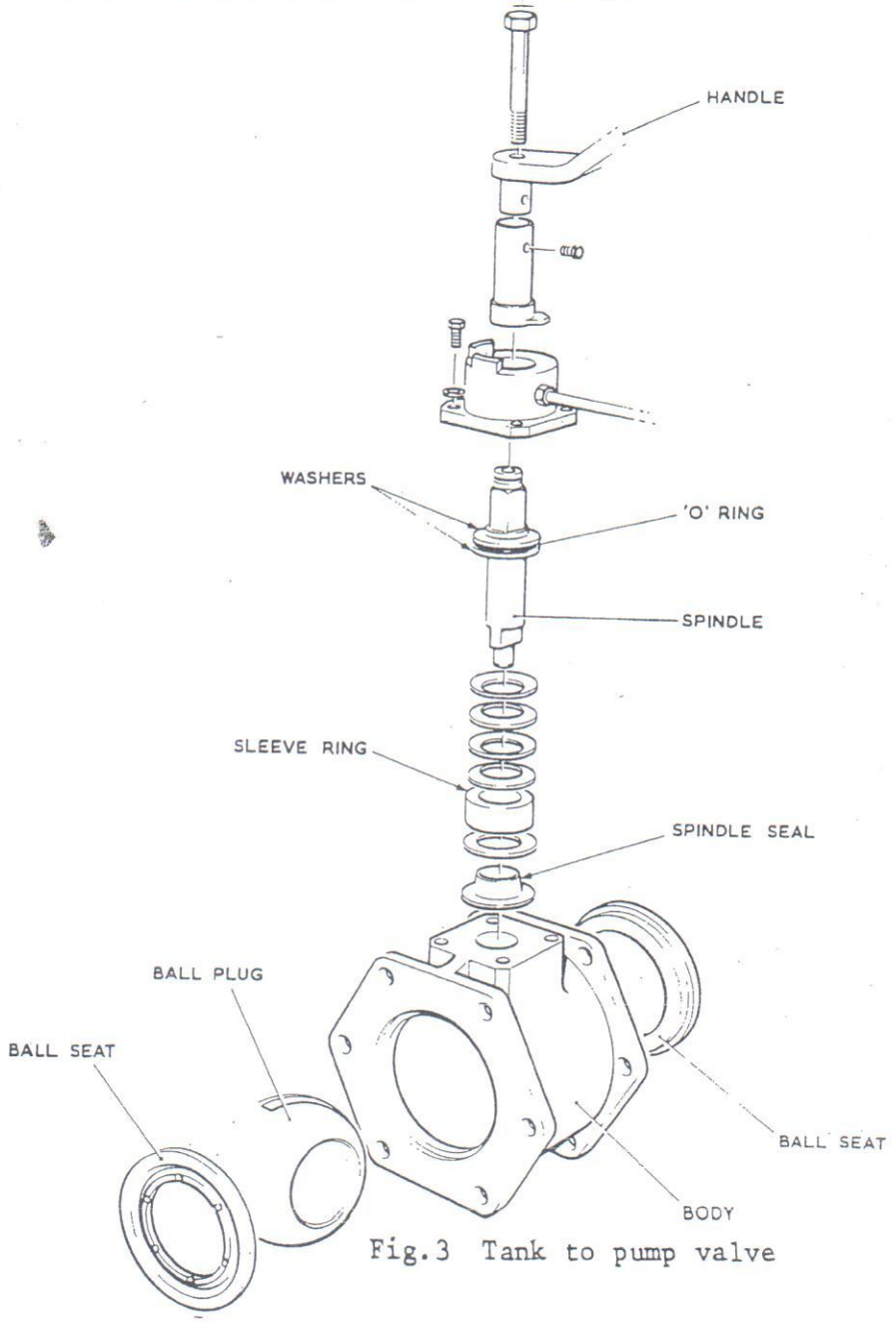

Fig.3 Tank to pump valve

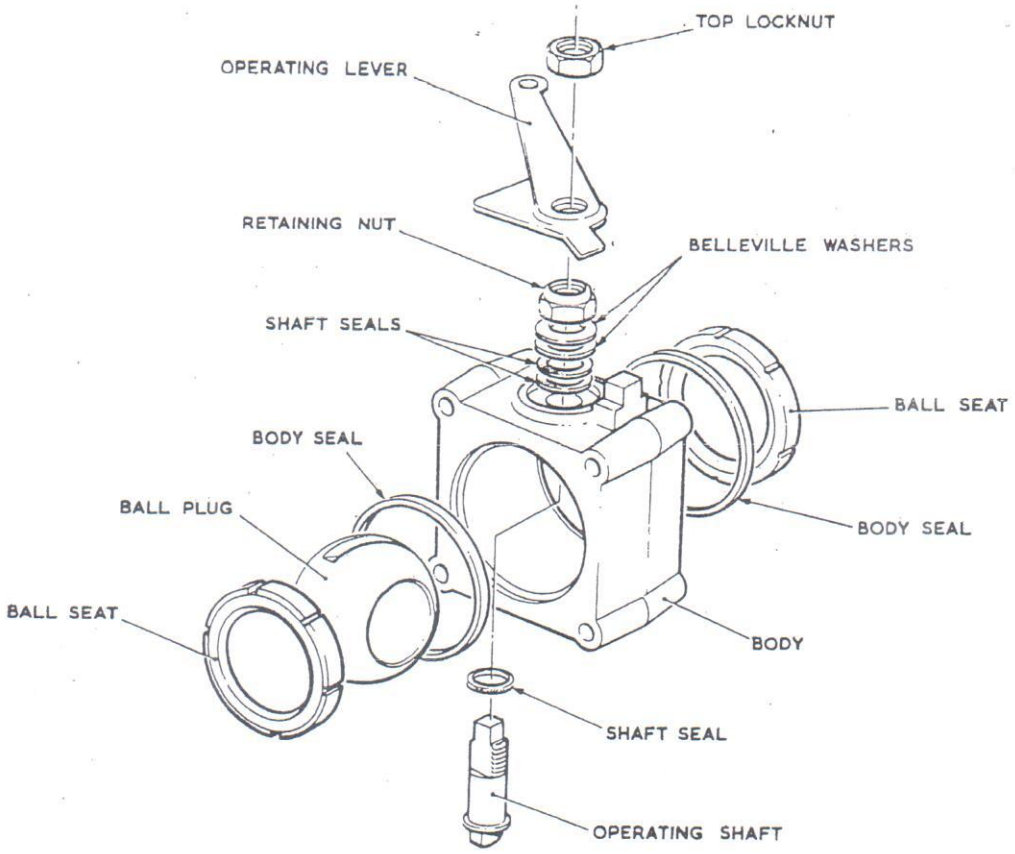

Fig.4 Delivery valve

DELIVERY VALVES

18. These square flange, 2 inch ball valves are mounted in the steel pipework and are accessible from the rear compartment stowage.

19. Removal of the valve is accomplished by disconnecting the operating lever extension Tee piece and removing the four flange nuts and bolts.

20. To dismantle the valve:

(1) Remove the top locknut and withdraw the operating lever, retaining nut, two Belleville washers and shaft seals.

(2) Remove the two body seats and the ball plug seals.

(3) Turn the ball plug to the closed position and then slide the plug clear of the operating shaft.

(4) Remove the shaft from the valve body.

21. All components should be checked for wear or damage and when re-assembling it is recommended that new seals are used.

MINISTRY OF DEFENCE

Amendment No.1
to AP 5061, Vol 1 & 6

Remove and destroy Chap.2, pages 11 and 12 (one leaf) and substitute new Chap.2, pages 11 and 12 (one leaf)
Record the incorporation of this amendment in the Amendment Record Sheet.

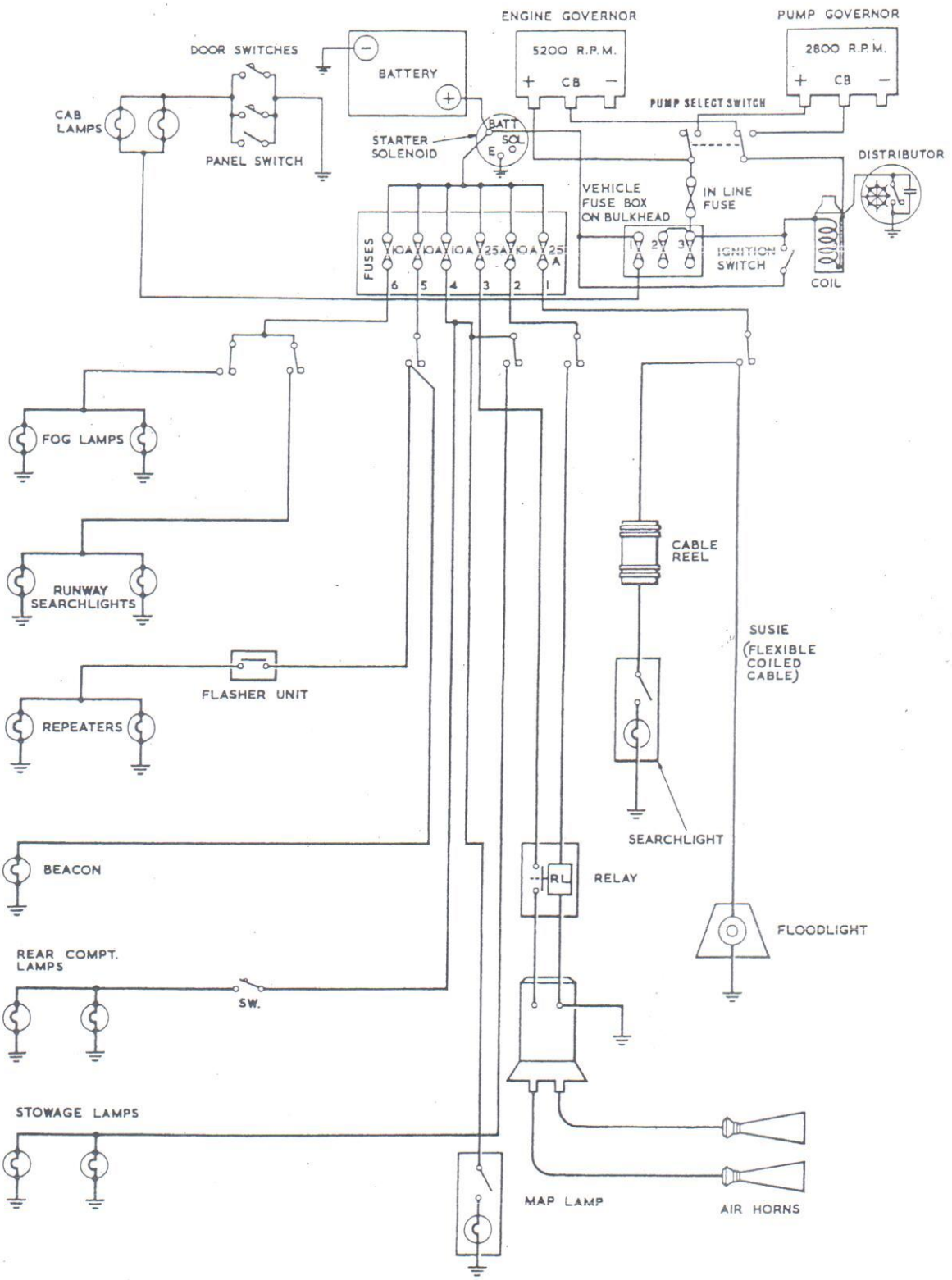

Fig.6 12 volt power circuit

Issued Dec.76

Chapter 2-1

MAINTENANCE INSTRUCTIONS - WINTERISATION - MARK 2

CONTENTS

5.10 Remove the bolt and locating screw from the tank to pump valve operating handle and remove the handle.

5.11 Remove the eighteen screws securing the rear and top sections of the cover.

5.12 Disconnect the valve grease nipple pipe at the valve operating shaft.

5.13 Disconnect the r.p.m. indicator flexible drive from the pump bearing housing.

5.14 Disconnect the pressure gauge connection at the side of the pump delivery manifold.

5.15 Remove the knob from the hand throttle control lever.

5.16 Remove the seven screws securing the front cover to the structure.

5.17 Carefully lift the cover clear of the structure taking care not to put undue strain on the electrical cables.

Impeller Removal and Refitting

6. If maintenance is necessary to the impeller or the carbon seal requires changing, proceed as follows:-

6.1 Slacken the ties joining the two halves of the pump heater blanket and carefully lift the blanket clear of the volute body.

6.2 Remove the six nuts and washers securing the reducing cone flange to the suction inlet of the pump. Withdraw the flange clear of the studs.

6.3 Remove the eight nuts and washers securing the two delivery pipes to the manifold. Withdraw each pipe flange clear of the studs.

6.4 Disconnect the pump drain.

6.5 Remove the sixteen bolts and sealing washers securing the volute body to the pump head. Withdraw the volute body and discard the joint washer.

6.6 Straighten the tab of the locking washer and then remove the impeller nut.

NOTE ... On later models of the Mk.6 pump the tab washer and impeller nut are replaced by a grubscrew, lead pellet and a modified impeller nut.

6.7 Withdraw the impeller from the splined shaft taking care to retain the two driving pegs.

6.11 Insert the driving pegs into the holes in the impeller and fit the seal spring and seating ring with a new '0' ring over the impeller centre boss.

6.12 Offer up the impeller assembly to the splined drive shaft and secure with a new tabwasher and the impeller nut.

6.13 Offer up the volute body with new joint washer to the pump head and secure with the sixteen bolts and sealing washers.

6.14 Reconnect the pump drain.

6.15 Position the delivery pipe flanges over the studs and secure to the manifold with eight nuts and washers.

6.16 Position the reducing cone flange over the studs and secure to the suction inlet using the six nuts and washers.

6.17 Position the two halves of the heater blanket around the volute body and secure with the ties.

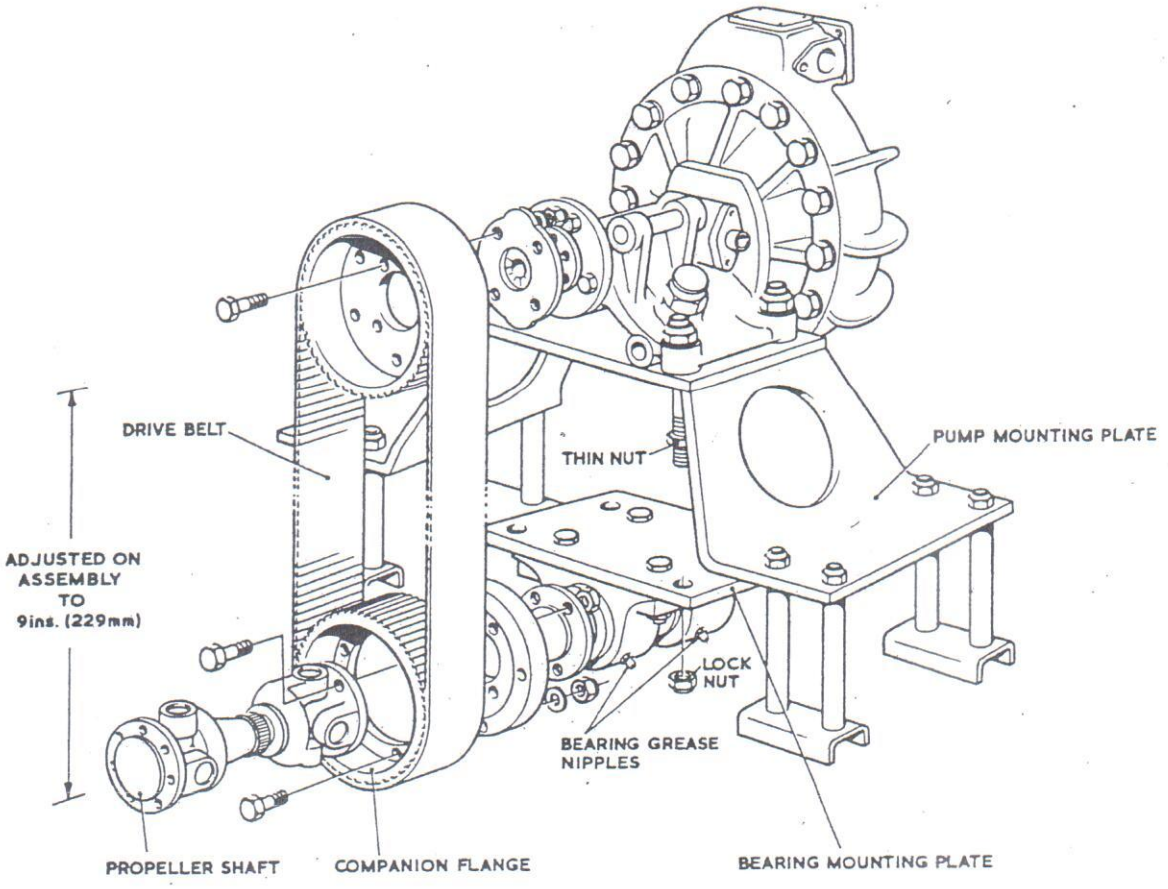

Fig 2 Drive belt tensioning

8.8 Re-assembly is a reversal of the dismantling procedures, but new joints lightly coated with grease should be fitted between the oil seal housings and pump head.

8.9 On completion of assembly operations fill the oil bath to the correct level using oil specified for sub-zero temperatures.

Replacing the Pump

9. Care must be taken when lifting the pump into position.

9.1 Position the pump on the mounting bracket.

9.2 Tilt the pump forward to allow the belt drive to be fed over the pump pulley. Ensure that the belt is positioned correctly between the flanges of the pulley.

9.3 Secure the pump to its mounting using the four nuts and washers.

9.4 Position the power-take-off drive and secure the companion flange using the four bolts and nuts.

NOTE ... The belt tensioning dimension is adjustable by altering the lower pulley mounting bracket. The distance between the pulley centres should be 229mm (9 in.).

9.5 Place new joint washers over the delivery manifold studs.

9.6 Offer up the delivery pipe flanges to the manifold studs and secure each pipe with four nuts and washers.

9.7 Reconnect the pump drain connection.

9.8 Offer up the reducing cone flange with new joint washer to the studs at the suction inlet and secure with the six nuts and washers.

9.9 Position the heater blanket around the volute body and secure with the ties. Reconnect the electrical connections.

Replacement of Panels

10. If the front panel is fitted first, the rear panel opening will allow easy access to the r.p.m. and pressure gauge connections. Replacement is therefore as follows:-

10.1 Position the front panel carefully over the structure and ensure that the electrical and instrument connections are free from possible damage.

10.2 Secure panel with the seven screws.

10.3 Replace the throttle control lever knob.

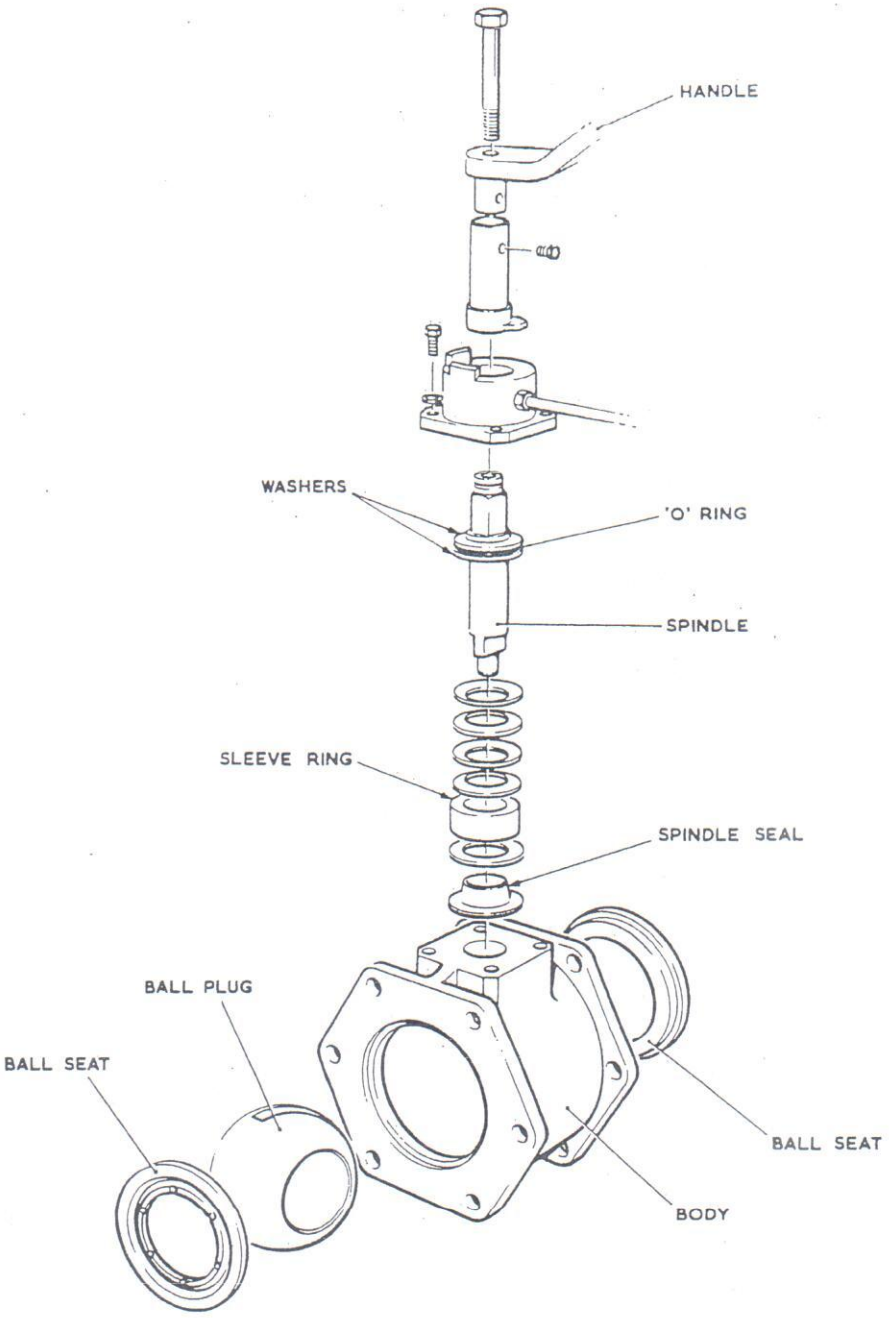

Fig.3 Tank to pump valve

Tank to Pump Valve

12. This 3 in. stainless steel ball valve is accessible after the removal of the pump rear panel and the disconnection and removal of the heater jacket.

12.1 Remove the six nuts and bolts securing the valve flange to the flexible tank couplings.

12.2 Support the valve then remove the six nuts and bolts securing the valve flange to the reducing cone.

16. Removal of the valve is accomplished by:-

16.1 Disconnecting the heater pipe connection located on top of the jacket.

16.2 Removing the screws securing the top and bottom panels of the jacket.

16.3 Removing the jacket from the rear bulkhead to expose the valve.

16.4 Disconnecting the operating lever extension Tee piece and removing the four flange nuts and bolts.

17. To dismantle the valve:-

17.1 Remove the top locknut and withdraw the operating lever, retaining nut, two plain washers and shaft seals.

17.2 Remove the two body seals and the ball plug seals.

17.3 Turn the ball plug to the closed position and then slide the plug clear of the operating shaft.

17.4 Remove the shaft from the valve body.

18. All components should be checked for wear or damage and when re-assembling it is recommended that new seals are used.

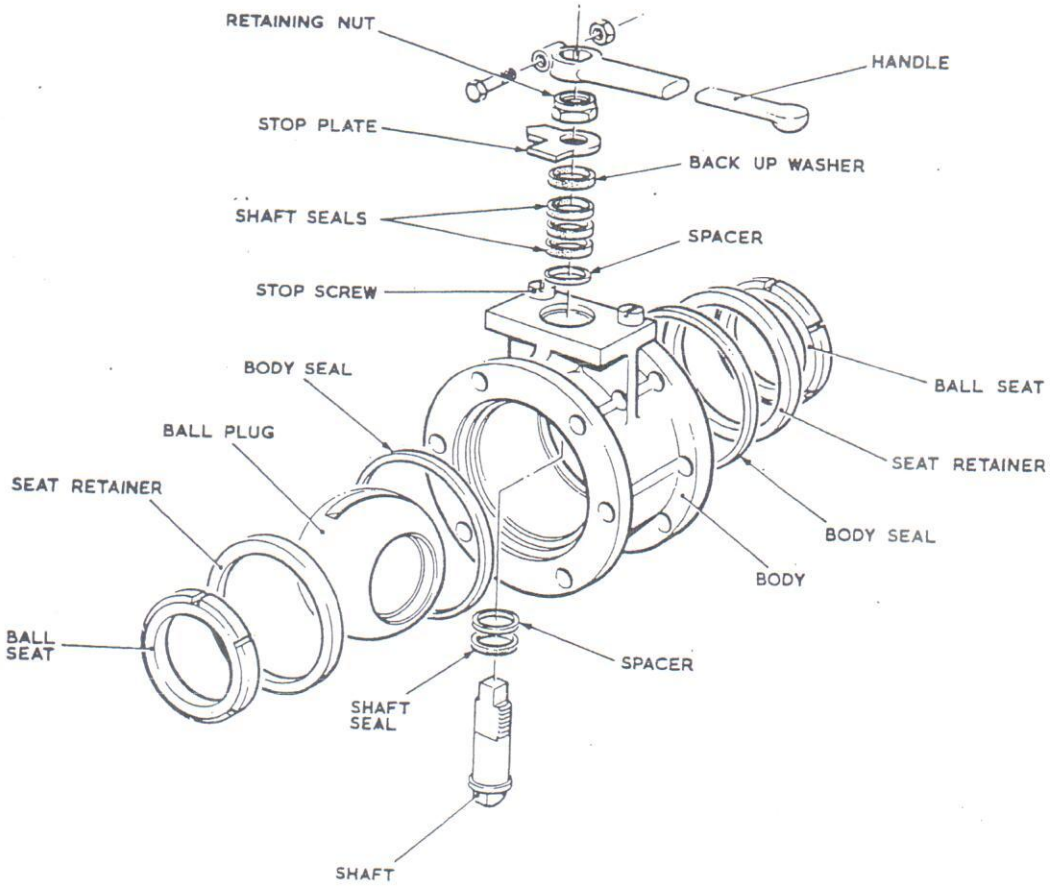

Fig. 5 Flushing valve

Chapter 2-2

MAINTENANCE INSTRUCTIONS - MARK 2A

(completely revised)

CONTENTS

MAINTENANCE

Introduction

1 The Mark 2A version of the Airfield Crash Rescue Truck has the latest standard of Godiva pump, namely a GVA 2700 (formerly UFPX 656).

2 Except for the pump lubrication, the Maintenance section of Chapter 2, relating to the Mark 2, will apply.

Lubrication

3 The drive shaft on the pump is immersed in a bath of oil.

DISMANTLING AND REPAIR

Introduction

4 The latest standard of the water pump from Godiva incorporates taper roller bearings instead of ball bearings. This affects the internal construction of the pump but does not alter the size, installation or performance of the pump.

5 Except for the water pump dismantling, the Dismantling and Repair section of Chapter 2, relating to the Mark 2, will apply.

WATER PUMP

Impeller removal and refitting

6 If maintenance is necessary to the impeller or if the carbon seal requires changing, proceed as follows:

the nut and fit a new split pin with both its legs bent over the nut towards the impeller.

6.15 Offer up the volute body with a new joint washer to the pump head and secure with the sixteen bolts and sealing washers.

6.16 Reconnect the pump drain and the plastic hose from the priming valve.

6.17 Position the delivery pipe flanges over the studs and secure to the manifold with eight nuts and washers.

6.18 Position the reducing cone flange over the studs and secure to the suction inlet using the six nuts and washers.

Dismantling the pump (Oil seal renewal)

7 To dismantle the pump, proceed as follows:

7.1 Refer to Chapter 2 Para 7, and remove the panels.

7.2 Refer to Chapter 2 Para 9, and remove the pump from the vehicle.

7.3 Remove the plug (Fig 1) and drain the lubricating oil into a suitable receptacle.

7.4 Refer to Para 6 above and dismantle the pump.

7.5 To change the oil seal at the volute end of the drive shaft, remove the four bolts and tab washers to release the oil seal housing.

7.6 To change the oil seal at the drive end, remove the split pin and castellated nut together with its washer and withdraw the companion flange. Remove the drive key.

7.7 Remove the four bolts and shakeproof washers and carefully withdraw the oil seal housing.

7.8 Reassembly is a reversal of the dismantling procedures, but new joints lightly coated with grease, should be fitted between the oil seal housings and the pump head.

7.9 On completion of the assembly operations, fill the oil bath to the correct level.

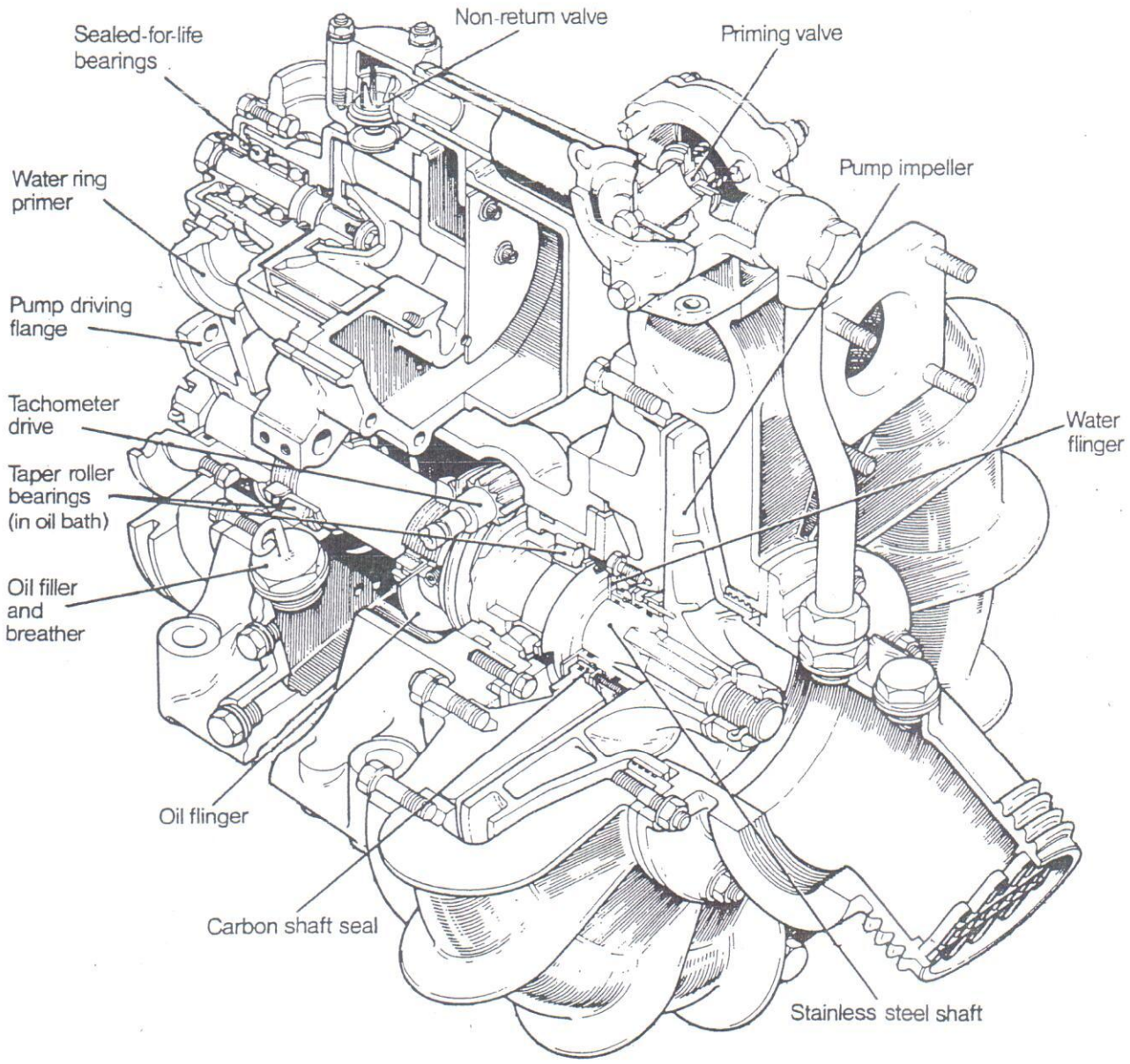

Fig. 1 Water pump type UFPX 656

Chapter 2-3

MAINTENANCE INSTRUCTIONS - MARK 2A WINTERISATION

(completely revised)

CONTENTS

MAINTENANCE

Introduction

1 The Mark 2A version of the Airfield Crash Rescue Truck has the latest standard of Godiva pump, namely a GVA 2700 (formerly UFPX 656).

2 Except for the pump lubrication, the Maintenance section of Chapter 2-1, relating to the Mark 2, will apply.

Lubrication

3 The drive shaft on the pump is immersed in a bath of oil.

DISMANTLING AND REPAIR

Introduction

4 The latest standard of the water pump from Godiva incorporates taper roller bearings instead of ball bearings. This affects the internal construction of the pump but does not alter the size, installation or performance of the pump.

5 Except for the water pump dismantling, the Dismantling and Repair section of Chapter 2-1, relating to the Mark 2, will apply.

WATER PUMP

Impeller removal and refitting

6 If maintenance is necessary to the impeller or if the carbon seal requires changing, proceed as follows:

6.15 Fit the impeller on to the splined shaft, locating the drive dowel into the dowel hole in the seating ring. Fit the stainless steel washer and slotted nut. Holding the drive flange on the shaft firmly, tighten the nut and fit a new split pin with both its legs bent over the nut towards the impeller.

6.16 Offer up the volute body with a new joint washer to the pump head and secure with the sixteen bolts and sealing washers.

6.17 Reconnect the pump drain and the plastic hose from the priming valve.

6.18 Position the delivery pipe flanges over the studs and secure to the manifold with eight nuts and washers.

6.19 Position the reducing cone flange over the studs and secure to the suction inlet using the six nuts and washers.

6.20 Position the two halves of the heater blanket around the volute body and secure with the ties.

Dismantling the pump (Oil seal renewal)

7 To dismantle the pump, proceed as follows:

7.1 Refer to Chapter 2-1 Para 5, and remove the panels.

7.2 Refer to Chapter 2-1 Para 7, and remove the pump from the vehicle.

7.3 Remove the plug (Fig 1) and drain the lubricating oil into a suitable receptacle.

7.4 Refer to Para 6 above and dismantle the pump.

7.5 To change the oil seal at the volute end of the drive shaft, remove the four bolts and tab washers to release the oil seal housing.

7.6 To change the oil seal at the drive end, remove the split pin and castellated nut together with its washer and withdraw the companion flange. Remove the drive key.

7.7 Remove the four bolts and shakeproof washers and carefully withdraw the oil seal housing.

7.8 Reassembly is a reversal of the dismantling procedures, but new joints lightly coated with grease, should be fitted between the oil seal housings and the pump head.

7.9 On completion of the assembly operations, fill the oil bath to the correct level.

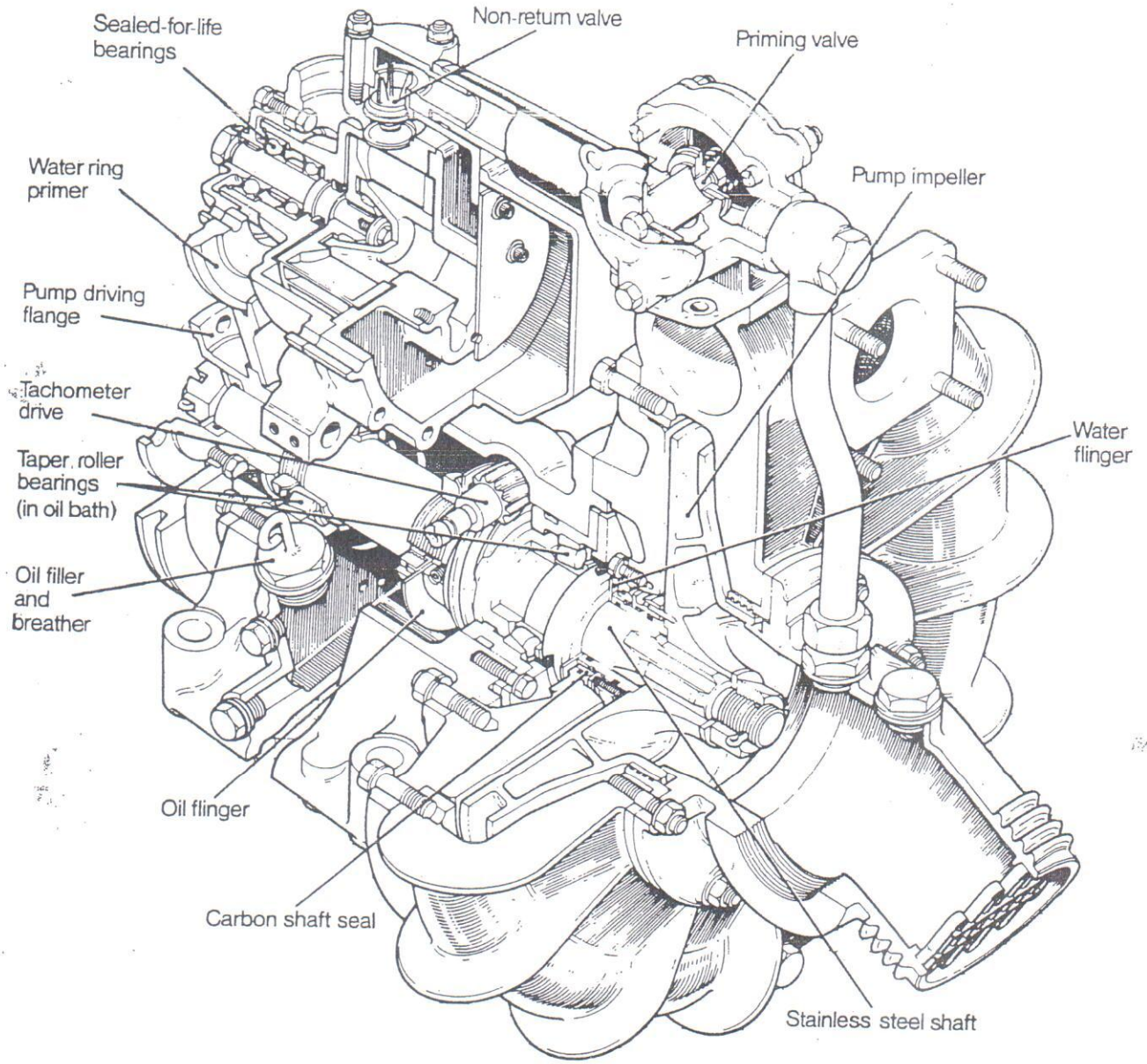

Fig. 1 Water pump type UFPX 656