Registry of Ex Military Land Rovers

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AUSTRALIAN ARMY

TECHNICAL MANUAL

USER HANDBOOK

TRUCK, AMBULANCE, LIGHT, 4 LITTER, FFR, WINCH, MC2

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(D.M.M. Francis)
Major General
Assistant Chief of the
General Staff
Materiel — Army

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of the Chief of the
General Staff

AMENDMENT RECORD

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SYNOPSIS

The Truck, Ambulance, Light, 4 Litter, FFR, Winch, MC2 is a six wheeled Army vehicle designed specifically for military use. The vehicle is based on the Land Rover 110 Series commercial vehicle, but with an extended chassis and an additional axle. The ambulance is a constant four wheel drive, with selective six wheel drive for negotiating difficult terrain. Vehicle slinging, tie-down and recovery points are incorporated on the chassis.

The ambulance module is mounted on the vehicle chassis in the same manner as the cargo tray body. The module is equipped with a 24 volt electrical system which provides power for the radio system, lighting and the medical equipment, while the vehicle operates on a 12 volt system.

The ambulance module can accommodate up to four litter casualties or up to eight seated casualties, as well as the medical assistant, with seat belts provided for each seating position. Medical equipment and supplies are stowed within the module in positions readily accessed by the medical assistant. Apart from the heater hoses, environmental control unit hoses and wiring connections, the ambulance module is self contained and can be readily detached from or installed on the truck, light MC2 chassis.

The vehicle has a range of approximately 600 km on first class roads, and 480 km on second class roads. Cross country ranges vary depending on terrain. The rated gross vehicle mass (GVM) and gross combined mass (GCM) for both highway and cross country conditions is 5.6 tonne and 7.1 tonne respectively.

WARNING

WARNING

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ASSOCIATED PUBLICATIONS

1. Standing Orders for Vehicle Operation and Servicing
2. Australian Army Books:
   TGM 120 Record Book for Service Equipment — Army
3. Complete Equipment Schedules (CES):
   (a) SCES 12100
   (b) Equipment Kit SCES 12068/2
   } Truck, Ambulance, Light, 4 Litter, FFR, Winch, MC2
4. Block Scale 2406/31 Issue 1 — Special Tools for RAEME – B Vehicles – Truck Utility and Truck Light MC2 (Land Rover Model 110)
5. EMEI VEH A 029 — Servicing of B Vehicles
6. EMEI VEH A 119-22 — Repair of Vehicles Under Warranty Agreement — Policy Instruction
7. EMEI VEH G 220 — Data Summary (Truck, Ambulance, Light, FFR, Winch, MC2)
8. EMEI VEH G 202 — Technical Description (Truck, Cargo, Light, MC2)
9. EMEI VEH G 222 — Technical Description (Truck, Ambulance, Light, FFR, Winch, MC2)
10. EMEI VEH G 203 — Unit Repair (Truck, Cargo, Light, MC2)
11. EMEI VEH G 223 — Unit Repair (Truck, Ambulance, Light, FFR, Winch, MC2)
12. EMEI VEH G 204 — Field Repair (Truck, Cargo, Light, MC2)
13. EMEI VEH G 204-1 — Base Repair (Truck, Cargo, Light, MC2)
14. EMEI VEH G 224-1 — Field and Base Repair (Truck, Ambulance, Light, FFR, Winch, MC2)
15. EMEI VEH G 209 — Servicing Instruction
16. Australian Change in War Materiel 31422
17. Repair Parts Scale 02208

FRONTISPIECE

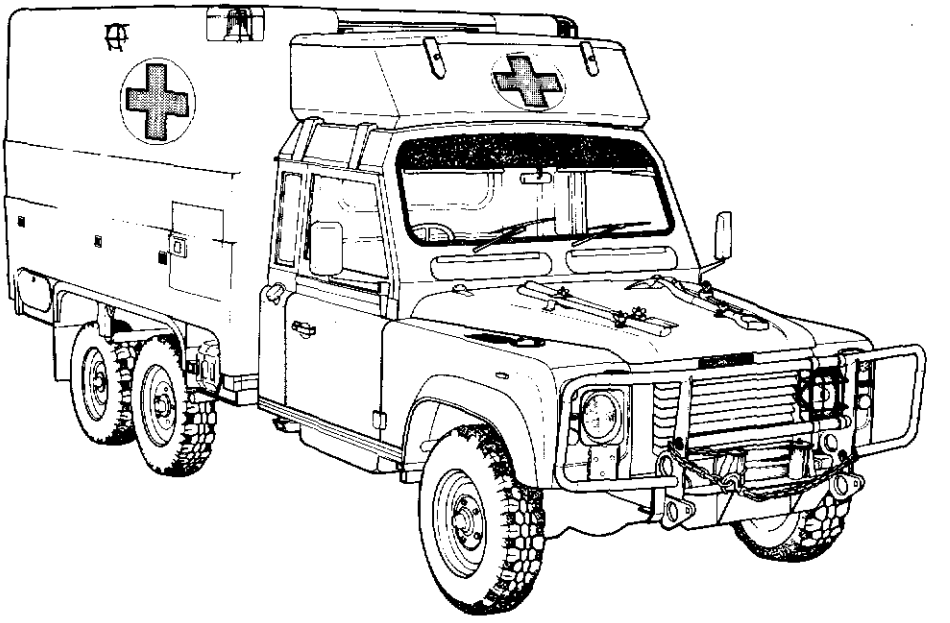


Figure 1-1 Truck, Ambulance, Light, 4 Litter, FFR, Winch, MC2 — front view

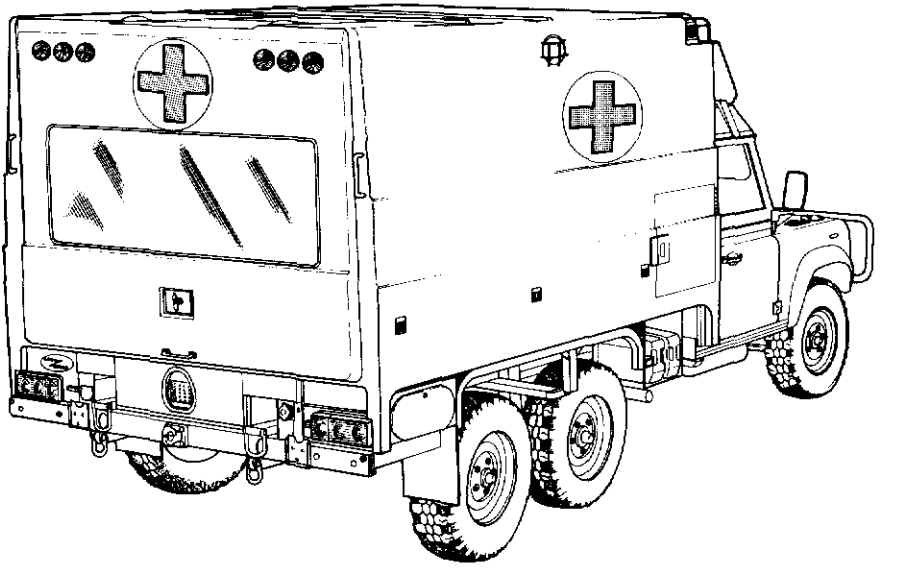


Figure 1-2 Truck, Ambulance, Light, 4 Litter, FFR, Winch, MC2 — rear view

MAINTENANCE SUPPLY ITEM (MSI)

IDENTIFICATION

Table 1-1 Location of identification numbers on MSI's

Chassis — Right hand side of the chassis, forward of the spring mounting turret

Chassis nameplate — Left hand seat box, in the cab

Engine — Left hand side of the engine block

Injection pump identification — Side of the pump

Transmission and transfer case — Rear of the transfer case

Air conditioner compressor — Front outer mounting point

Ambulance module — Right hand rear, opposite the heater

CHAPTER 1

GENERAL DESCRIPTION

SECTION 1 — DATA SUMMARY

SECTION 2 — SHIPPING AND TRANSPORTATION DATA

SECTION 3 — EQUIPMENT DESCRIPTION

SECTION 1
DATA SUMMARY

NOTE

Throughout this manual all references to left hand (LH) and right hand (RH) are as viewed from the rear of the vehicle looking forward.

Truck Model No.	Truck Light 6 x 6 MC2
1. Engine	
Manufacturer	Isuzu
Type	4BD1 TRB-G series, turbocharged, four cylinder in line, overhead valve four cycle direct injection diesel engine
Displacement	3.856 litres
Bore	102 mm
Stroke	118 mm
Compression ratio	17:1
Firing order	1 - 3 - 4 - 2
Power	90 kW @ 3000 rpm
Maximum torque	314 Nm @ 2200 rpm
No load maximum	3600 ± 100 rpm
Engine idle speed	650 ± 20 rpm
Oil capacity	8.5 litre including filters
Oil filters	External, full flow, spin on
Oil pressure	390-581 kPa @ 2400 rpm
Oil cooler	Water cooled, plate and tube type

Engine dry weight	
— With 24 volt alternator	350 kg
— Without 24 volt system	322.5 kg
Turbocharger	Water cooled, Garret, model ATD-T25

2. Cooling system

Type	Pressurised spill return system with thermostat control, pump and fan assisted
Capacity	12.8 litres
Thermostat	Downward opening wax element type incorporating a by-pass shut off valve. Opening temperature 82°C
Coolant	Water with 5% Alfloc 2001 inhibitor

3. Engine accessory drive

12 volt system	
Type	Single Vee-belt
Tension	Approximately 10-15 mm deflection, midway along the longest span using moderate thumb force
24 volt system	
Type	Dual Vee-belts
Tension	Approximately 5-10 mm deflection midway along the longest span using moderate thumb force

4. Fuel system

Fuel pump	Diesel Kiki (Bosch) in-line Type A model 550k with automatic timer
Governor	RLD-K mechanical
Transfer pump	KE mechanical with gauze intake filter
Injectors	Four-hole spray type

Main filter	Inlet manifold mounted, spin-on type
Sedimenter	Two chassis mounted CAV SS type sedimenters are connected in parallel
Fuel tanks	Two, 62 litre tanks connected in parallel and independent of each other, tank selection by dash mounted switch

5. Engine starter

Manufacturer	Mitsubishi
Type	Waterproof, gear reduction (electric powered)

6. Clutch

Manufacturer	Repco/Isuzu
Type	Hydraulically operated single dry plate and diaphragm spring
Free travel (pedal)	6 mm minimum

7. Transmission

Manufacturer	Land Rover
Type	Model LT95A, four forward, one reverse, synchromesh on all forward gears. Incorporates an integral transfer case

Ratios

First gear	4.069:1
Second gear	2.448:1
Third gear	1.505:1
Fourth gear	1.000:1
Reverse gear	3.664:1

8. Transfer case

Manufacturer	Land Rover
Type	High and low gear ratios operating on the main transmission output. The front and intermediate axles are per-

	manently engaged via a differential in the transfer case. The rear axle is automatically engaged when the transfer case differential is locked — for traversing difficult terrain
Ratios	High range 0.996:1 Low-range 3.321:1

9. Power take-off (PTO)

Manufacturer	Land Rover
Type	Variable speed, chain drive, integral with the transfer case, and incorporates a torque limiter

10. Winch

Manufacturer	Winch Industries
Type	Thomas T9000M
Ratio	45:1
Maximum cable pull	
First layer on drum	4077 kg
Second layer on drum	3488 kg
Third layer on drum	3048 kg
Fourth layer on drum	2707 kg
Fifth layer on drum (partial)	2434 kg
Winch rope	
Type	Right hand ordinary lay with an independent wire rope core
Diameter	11 mm
Length	45 metres
Minimum breaking force	76.3 kN
Oil capacity	2.1 litres

11. Front axle

Manufacturer	Land Rover

Type	Fully floating spiral bevel steerable drive axle with enclosed outboard constant velocity joints and four pinion differential
Ratio	4.7:1
Track	1698 mm
Load rating	1650 kg

12. Rear axles

Manufacturer	GKN
Type	Salisbury fully floating hypoid bevel drive, four pinion differential
Ratio	4.7:1
Track	1698 mm
Load rating	2050 kg

13. Propeller shafts

Type — Front	An open shaft, incorporating a Hookes type universal joint at either end. Variations in the length of the shaft is achieved by employing a splined sliding joint between the two universal joints
—Intermediate	An open shaft, incorporating a Hookes type universal joint at either end. Variations in the length of the shaft is achieved by employing a splined sliding joint between the two universal joints
—Rear	A two piece open shaft incorporating a Hookes type universal joint at either end. The centre section of the shaft is mounted via a bearing to the chassis frame and the articulation of the rear section of the shaft is achieved through the use of a double Hookes joint, and a splined sliding joint

14. Front suspension

Type	Radius arms with Panhard rod located live axle with vertically mounted double acting telescopic shock absorbers mounted inside single rate coil springs
Load rating	1650 kg

15. Rear suspension

Type	Consists of two live axles located by four semi-elliptic springs. These springs are so mounted that the ends, between the axles overlap each other and are articulated by a load sharing rocker beam connected to the chassis. Axle bump and rebound travel is controlled by chassis mounted pads and cables. Suspension dampening is by four hydraulic shock absorbers
Load rating	4100 kg

16. Steering

Manufacturer	Adwest
Type	Power assisted variable ratio worm and roller type utilizing a gear driven pump, mounted on the engine and a remote hydraulic reservoir
Turning circle	
Between kerbs	16.8 metres (nominal)
Between walls	17.2 metres (nominal)

17. Brakes

Type	Hydraulic split system with front disc and rear drum brakes, foot pedal actuated
Parking brake	Cable operated, transmission mounted drum brake

Warning devices	Dash mounted globes indicating brake lining depth (actuated at 3 mm thickness) a failed hydraulic circuit, and parking brake applied

18. Chassis

Type	Hot dipped galvanized welded box section steel with welded box section crossmembers
Wheelbase	
Front to intermediate axle	3040 mm
Front to rear axle	3940 mm

19. Wheels and tyres

Rim type and size	Ventilated disc, 6F x 16
Tyre size	7.50-R-16LT 10 ply Olympic Steeltrek with 105 pattern
Tyre pressure (cold)	Highway: front 250 kPa (36 psi) intermediate 350 kPa (50 psi) rear 350 kPa (50 psi) Cross-country: front 200 kPa (29 psi) intermediate 275 kPa (40 psi) rear 275 kPa (40 psi) Sand: front 150 kPa (22 psi) intermediate 225 kPa (33 psi) rear 225 kPa (33 psi)

20. Electrical system

Type	The vehicle is fitted with both 12 volt and 24 volt electrical systems
12 volt system	12 volt negative earth
Battery	12 volt cold cranking performance of approximately 410 amps, located in the engine compartment

Alternator	Hitachi, 12 volt — 70 amp
24 volt system	24 volt negative earth
Batteries	Two 12 volt, 93 ah deep cycle batteries located in a box on the left hand side of the chassis
Alternator	EDE designed 24 volt 100 amp

21. Lighting, external 12 volt	**Location, quantity and wattage**
Headlights, high/low	Front of vehicle, 2 off, 60/55 watt Halogen
Park lights	Front of vehicle, 2 off, 5 watt
Stop and tail lights	Rear of vehicle, 2 off, 21/6 watt
High level stop and tail lights	Top of rear door, 2 off, 10/5 watt
Turn indicator lights	Each corner of vehicle, 4 off, 21 watt
High level turn indicator lights	Top of rear door, 2 off, 10 watt
Side indicator lights	Front mudguards, 2 off, 4 watt
Reverse lights	Rear of vehicle, 2 off, 10 watt
High level reverse lights	Top of rear door, 2 off, 18 watt

22. Lighting, external 24 volt	**Location, quantity and wattage**
Rotating beacon lights	Top leading edge of module, 2 off, 55 watt
High level flashing lights	Top of rear door utilizing a separate socket in the high level stop and tail lights 2 off, 18 watt
Scan lights	Centre top on side of the module 2 off, 55 watt

23. Lighting, internal 12 volt	**Location, quantity and wattage**
Dome light	Roof of cab, 1 off, 21 watt

Map light	Left hand side of instrument panel 1 off, 5 watt Halogen
Instrument lights— except speedo	Instrument panel, 3 off, 2 watt
Speedometer light	Instrument panel, 2 off, 3 watt
Warning lights — except low fuel	Instrument panel, 10 off, 1.2 watt
Low fuel light	Instrument panel, 1 off, 3 watt
Hazard switch warning light	Dashboard, 1 off, 0.6 watt
Ammeter	Dashboard, 1 off, 2 watt
Hourmeter	Dashboard, 1 off, 2 watt

24. Lighting, internal 24 volt	**Location, quantity and wattage**
Rear loading lights	Inside rear door, 2 off, 18 watt
Module interior lights	On ceiling, 4 off, 18 watt
Litter lights	Wall mounted forward of the head of each litter, 4 off, 5 watt
Casualty observation stalk lights	Centrally mounted above each litter 4 off, 5 watt
Blackout lamps	Centrally mounted on ceiling, 2 off, 18 watt
Low power lights	Incorporated in the forward mounted ceiling lights, 2 off, 5 watt

25. Lighting, military	**Location, quantity and wattage**
Blackout lights	Front and rear of vehicle 4 off, re-placeable module
Convoy light	Rear of vehicle,1 off, 2 watt
Reduced headlights	Front of vehicle, 2 off, 18 watt

Ancillary circuits	Couplings are provided at the rear of the vehicle to accept NATO trailer connectors and to power the module's 12 volt electrical circuit

26. Fuses 12 volt system	**Rating (continuous)**
Located inside the cab, centre console, behind protective panel	
Headlights	4 off, 8 amp
Park lights	2.5 amp
Horn, dome light	10 amp
Hazard lights	10 amp
Reverse lights	10 amp
Windscreen wiper, washer	12 amp
Fan	10 amp
Spare	8 amp
Stop lights, instruments, turn indicators	10 amp
Blackout lights	8 amp
Reduced head lights	8 amp
Located under bonnet, near brake master cylinder/ booster	
Stop/start control motor	10 amp

27. Fuses and circuit breakers 24 volt system	**Rating (continuous)**
Located adjacent to the medical assistants seat in the module	
Beacon lights and high level flashing lights	20 amp
Scan lights and rear door lights	20 amp
Module interior lights	10 amp

Buzzer and suction pump	10 amp
Heater fan	10 amp
Master interior	10 amp
Litter lights	10 amp
Casualty observation stalk lights	10 amp
Blackout lights	10 amp
Located in the distribution box	
Outlet circuit breaker	100 amp
Auxiliary	2 amp
External generator in	150 amp
External battery in	150 amp
Vehicle batteries (FFR)	150 amp

28. Performance

Gradeability (cross-country laden) Both directions	60 per cent gradient (31 degree slope)
Range of operation	600 km (first class roads) approx. 480 km (second class roads) approx.
Fuel consumption	22 litres per 100 km (highway laden) 27 litres per 100 km (second class laden) Fuel tank capacity 62 litres each
29. Carrying capacity	11 including driver (4 litter patients or 8 seated patients and 2 medical assistants)

30. Module internal dimensions

Height	1815 mm
Width	2085 mm
Rear door width	1900 mm

Rear door height	1310 mm
Length	3100 mm
Height of floor from road	
— Laden	725 mm
— Unladen	740 mm

SECTION 2
SHIPPING AND TRANSPORTATION DATA

31. Dimensions

Overall length	6000 mm
Wheelbase	3040 mm
Overall width — Over mirrors	2550 mm
— Reduced	2160 mm
Overall height — Laden	2560 mm
— Unladen	2590 mm
Track — Front	1698 mm
— Rear	1698 mm
Height of ambulance module from ground	
— Laden	725 mm
— Unladen	740 mm
Rear axle to rear of vehicle overhang	1183 mm
Towing pintle height — Laden	650 mm
— Unladen	730 mm
Mass (Unladen)	
— Front	1700 kg
— Intermediate	1475 kg
— Rear	1475 kg
— Total	4650 kg

32. Capacities

Equipment	DEF (AUST) 206	METRIC (litres)
Engine system (including filters)	OMD-115	8.5
Cooling system (including inhibitor)		12.8
Transmission	OMD-115	2.7
Transfer case (without PTO)	OMD-115	3.2
Transfer case (with PTO)	OMD-115	5.8
Front axle	OEP-220	1.7
Intermediate axle	OEP-220	2.3

Rear axle	OEP-220	2.6
Winch	OEP-220	2.1
Swivel pin housing (each)	OEP-220	0.35
Steering box (including reservoir)	OX 46	1.25
Fuel tank — Right hand		62
— Left hand		62
Air-conditioner	Freon R12	As required

NOTE

See EMEI VEH G 209 for list of approved lubricants.

33. Fording depth

Unprepared vehicle	500 mm
Limiting features (over 500 mm)	Cooling fan
Prepared vehicle	No facility available, as for unprepared vehicle

34. Bridge classification

Solo unladen	6

35. Ground clearance

Unladen	215 mm
Limiting feature	Rear differential housings

36. Transportability

Railway loading gauges (Local authorities must be consulted)

Rail authority	Gauge	Maximum rolling stock height
Commonwealth	1435 mm	2532 mm
Commonwealth	1067 mm	2532 mm
New South Wales	1435 mm	2182 mm
Queensland	1067 mm	1806 mm
South Australia	1600 mm	2075 mm

South Australia	1435 mm	2075 mm
South Australia	1067 mm	1761 mm
Tasmania	1067 mm	1992 mm
Victoria	1600 mm	2182 mm
Victoria	1435 mm	2182 mm
Western Australia	1435 mm	2532 mm
Western Australia	1067 mm	1973 mm

37. Slinging and tie-down points are illustrated in Fig. 1-3.

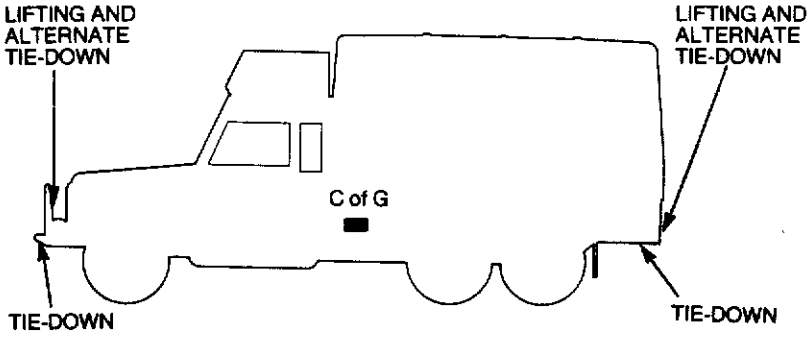


Figure 1-3 Slinging and tie-down points

38. Approach and departure angles

Approach angle	— Unladen	45 degrees
	— Laden	41 degrees
	— Limiting feature	Tie down points
Departure angle	— Unladen	33 degrees
	— Laden	30 degrees
	— Limiting feature	Tie down points
Ramp breakover angle	— Unladen	148 degrees
	— Laden	152 degrees
	— Limiting feature	Chassis rail

SECTION 3
EQUIPMENT DESCRIPTION

Introduction

39. The truck, ambulance, light, 4 litter, FFR, winch, MC2 has been designed specifically for military use and is capable of transporting up to eight medical casualties under field conditions. To meet this requirement, the vehicle has been fitted with permanent four wheel drive, and, selective six wheel drive for negotiating difficult terrain. The transmission has eight forward gear ratios and two reverses which is coupled through a disc clutch to a 3.9 litre, turbo-charged, diesel engine.

Operational and logistic concept

40. This vehicle provides general support for first and second line medical evacuation. The vehicle is fitted with an ambulance module and can be utilized to transport up to four litter casualties or eight seated casualties (plus a medical assistant) in the ambulance module. The cab has seating for a driver and a medical assistant.

Engine

41. The vehicle is fitted with an Isuzu 3.9 litre 4BD1TRB-G turbo-charged, four cylinder diesel engine which produces 90 kW of power at 3000 rpm and 314 Nm of torque at 2200 rpm.

Transmission

42. The transmission is a heavy duty four-speed all-synchromesh transmission with an integral two-speed transfer case. Clutch and gear operations are manual and are without power assistance.

Transfer case and power take-off (PTO)

43. The transfer case, which is cast as part of the main transmission, provides high and low gear ratios, and four or six wheel drive capabilities. It has an integral differential fitted to prevent wind up in the drive lines during normal on road conditions and which can be locked to provide a positive drive between the front and rear axles. During off road use, the locking of this differential, by operating a dash mounted switch, automatically engages the vehicle in six wheel drive. It is imperative that this differential is locked, when crossing dif-

ficult terrain, or when conditions may lead to a loss of traction. A high speed range and a low speed range in the transfer case can be selected by operating a floor mounted lever. The selection of a speed range will not influence the four or six wheel drive mode.

44. The parking brake operates a single drum brake which is mounted on the rear output shaft of the transfer case.

45. The transfer case also incorporates a chain-driven PTO with torque limiter, which provides the drive for the front mounted winch.

Winch

46. A Thomas T9000M winch is fitted to the front of the vehicle between the chassis rails and below the grille. Drive for the winch comes from the PTO via the torque limiter and a two-piece propeller shaft. The winch has a reduction ratio of 45:1 and is fitted with 45 metres of 11 mm diameter wire rope.

47. There are two dog-clutches in the winch drive line, one in the PTO and the other at the winch. The PTO dog-clutch is cable actuated from within the cab while the winch dog-clutch, which allows free-spooling of the cable, is lever-operated at the winch.

Steerable front drive axle

48. The vehicle is fitted with a steerable front drive axle, comprising of a differential carrier assembly and axles, driving through constant velocity joints to steerable drive ends fitted with hydraulically operated disc brakes.

Front suspension

49. The front suspension utilizes radius arms, a Panhard rod, vertically mounted double acting telescopic shock absorbers and single rate coil springs. Bump stops are provided to limit the upward travel of the suspension, while the shock absorbers limit the downward travel of the axle.

Rear axles

50. The rear axles are Salisbury type, fully floating hypoid bevel drive axles with offset four pinion differentials.

Rear suspension

51. Dual rate semi-elliptic leaf springs linked via shackles to a rubber bushed load sharing rocker beam. Axle movement is controlled by four long travel telescopic shock absorbers and steel cable rebound straps.

Service brakes

52. The vehicle is fitted with a dual circuit hydraulic brake system consisting of two completely separate circuits. The primary circuit supplies the rear drum brakes and the secondary circuit supplies the front disc brakes.

53. Brake pad wear indicators are fitted to the front left hand caliper and will actuate a brake circuit warning light on the dashboard when brake pad thickness is reduced to approximately 3 mm. In addition, the warning light will illuminate if fluid loss occurs from either the primary or secondary brake circuit.

Parking brake

54. A single drum brake is mounted on the intermediate axle output shaft of the transfer case. This brake, which is mechanically operated by the parking brake lever in the cab, and is completely independent of the foot operated hydraulic brake system.

Instruments, electrical accessories and controls (see Fig. 1-30)

55. Ventilator control (Fig. 1-30 items 1 and 15)

Two ventilators are provided in the windscreen frame, which may be opened independently by pushing the appropriate control lever downward.

56. Normal, blackout and reduced lighting switch (Fig. 1-30 item 2).

This three position switch, located on the fascia panel, controls the vehicle lighting as follows:

a. In the NORMAL or left position, all vehicle lighting operates via the usual controls.

b. In the BLACKOUT or mid position, all of the NORMAL lighting, with the exception of dash instruments, warning and map reading lights, are switched off. In this mode, the blackout stop lights will function when the brakes are applied, and the blackout marker lights at the front and rear of the vehicle are illuminated. The convoy light also operates in this mode.

c. In the REDUCED or right position, the reduced head lights are utilized in addition to the blackout lighting. The dash instrument lights and map reading light can also be used.

57. Auxiliary power socket (Fig. 1-30 Item 3)

A two pin socket is fitted in the dash as a power supply for the vehicle trouble light lead.

58. Panel light dimmer control (Fig. 1-30 Item 4)

The instrument panel light intensity can be adjusted by the dimmer control, which functions irrespective of which of the three modes of lighting is selected. The switch also has an ON-OFF control.

59. Heater fan control switch (Fig. 1-30 Item 5)

A three position rocker switch controls the heater fan as follows:

a. With the switch in the off position the heating and ventilation system is inoperative.

b. Low speed or high speed fan operation is provided when the switch is moved down to the first or second stop respectively. Air will be forced into the vehicle then ducted and heated as determined by the air distribution and heat control levers. The fan motor will only operate with the engine running or with the ignition on.

60. Air temperature control (Fig. 1-30 Item 6)

The temperature control lever controls the temperature of the air from the heater unit. Moving the lever up in the direction of the blue arrow will cut off the heat, while moving the lever down toward the red arrow will increase the heat (see Fig. 1-4). Action is progressive between the two settings.

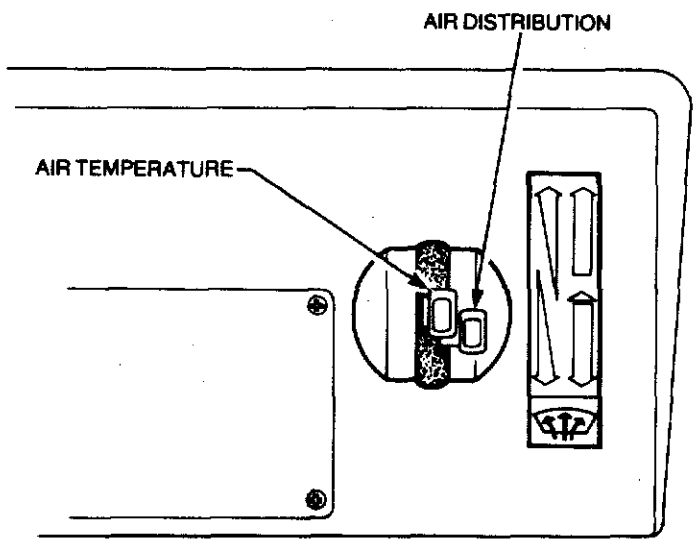


Figure 1-4 Air temperature and distribution controls

61. Air distribution control (Fig. 1-30 item 7)

The air distribution control lever controls the direction of air flow as follows (see Fig. 1-4).

a. With the lever in the lower position, all air is directed to the windscreen via the demister vents.

b. With the lever in the mid position, air is directed to the foot level vents as well as the windscreen.

c. With the lever in the upper position, the air is directed to the foot level vents although a certain amount of air will continue to pass through the demister vents to the windscreen.

62. Fuel switch (Fig. 1-30 item 8)

A two position toggle switch is located on the dash, which when operated determines from which tank fuel will be drawn.

63. Transfer case control switch (Fig. 1-30 item 9)

The transfer case is fitted with a differential which allows the vehicle to be operated on road without transmission wind-up. The differential is lockable, to provide positive drive to the axles when necessary, and is controlled by a dash mounted two position switch. The switch should be pushed in for on road use and pulled out when traction is difficult, thereby providing positive six wheel drive. (refer to the warning on page 63).

64. Hourmeter (Fig. 1-30 item 10)

An hourmeter is fitted to the dashboard console to record the engine running hours, which provides an indication of the charging time for the communications system batteries.

65. Ammeter (Fig. 1-30 item 11)

An ammeter is fitted to the dashboard console to monitor the charge rate of the communications system batteries.

66. PTO warning light (Fig. 1-30 item 12)

With the PTO control in the engaged position the PTO warning light is illuminated.

67. Combination switch (Fig. 1-30 item 13)

The combination switch has six positions and provides control over the headlights, turn indicators and the horn. The switch operates as follows (see Fig. 1-5):

a. With the switch in the central position (A), the headlights will be dipped.

b. With the switch pushed away from the driver (B), the

headlights will be on high beam.

c. Pulling the switch toward the driver (C), will flash the headlights. This operation can be achieved at any time, irrespective of other switch positions.

d. Pushing the switch knob inward (D), will operate the horn.

e. With the switch in the upper position (E), the right hand turn indicators will flash.

f. With the switch in the lower position (F), the left hand indicators will flash.

The combination switch functions are not available during blackout conditions.

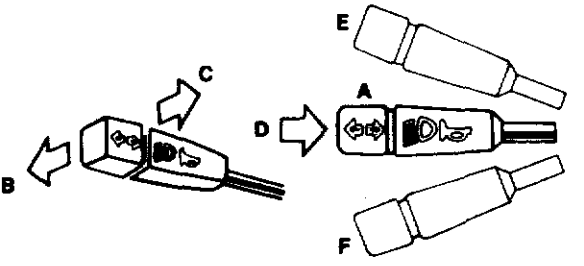


Figure 1-5 Combination switch operation

68. Speedometer and odometer (Fig. 1-30 item 14)

The speedometer indicates the road speed in kilometres per hour and the total distance travelled. A trip meter is incorporated in the speedometer together with its associated reset button.

69. Fuel gauge (Fig. 1-30 item 16)

One fuel gauge services both the left and right hand mounted fuel tanks. The approximate contents of each tank can be assessed by operating a dual purpose dash mounted switch — fuel will only be drawn from the tank indicated.

70. Warning light cluster (Fig. 1-30 item 17)

The warning lights provide a visual indication that a fault has occurred in one or more of the systems represented by the warning lights.

a. The oil pressure warning light (Fig. 1-6 item 2) indicates when the oil pressure is insufficient for safe engine operation. The light should illuminate when the ignition is turned on and extinguish once normal engine oil pressure is established. If this light illuminates during normal running, the vehicle should be stopped immediately and the cause determined.

b. The ignition warning light (Fig. 1-6 item 3) indicates a malfunction in the battery charging circuit. The light should illuminate when the ignition is turned on and extinguish once the engine is running.

c. The brake circuit warning light (Fig. 1-6 item 4) indicates that leakage has occurred from either the front or rear brake circuit. In this case, the light will illuminate when the foot brake is applied. In addition, a brake pad wear indicator is fitted to the front left hand caliper and will actuate the light when the pad thickness is reduced to approximately 3 mm. Normally, the light will illuminate momentarily when the ignition is turned on, then extinguish. If the light illuminates during normal running, the vehicle should be stopped immediately and the cause determined.

d. The turn indicator warning light (Fig. 1-6 item 5) flashes when the turn indicator lights are functioning. Both arrows will flash as the turn indicator is operated by the switch on the steering column. If the light does not flash, there may be a blown globe in the warning light or one of the turn indicators.

e. The high beam warning light (Fig. 1-6 item 6) illuminates when the headlight high beam has been selected. The light also illuminates when the head light flasher is used.

f. The low fuel warning light (Fig. 1-6 item 7) illuminates when there is approximately nine litres of fuel left in either fuel tank and will remain illuminated until the fuel supply is replenished. When cornering, the light may flash intermittently before the fuel reaches the nine litre level.

g. Both the differential lock warning light (Fig. 1-6 item 8) and the six wheel drive light (Fig. 1-6 item 1) will illuminate when the transfer case differential lock is engaged. Operation of the differential lock is necessary when traction to one or more wheels is likely to be lost.

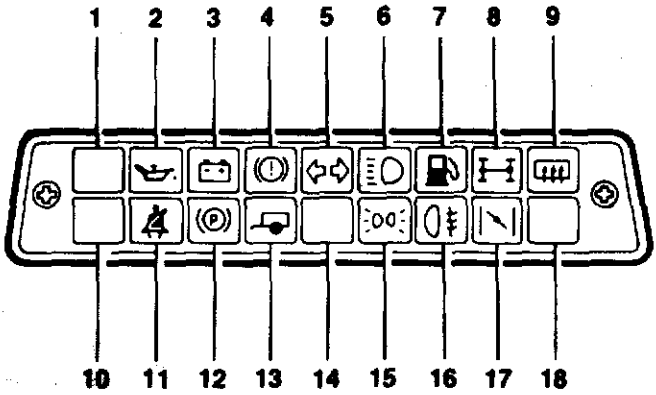
h. The parking brake warning light (Fig. 1-6 item 12) will illuminate if the parking brake is applied while the ignition is on.

i. The trailer warning light (Fig. 1-6 item 13) provides an indication that the turn indicators on a towed trailer are functioning correctly. The light will flash simultaneously with the vehicle turn indicator warning light when a trailer is connected to the vehicle's NATO socket. When no trailer is used, the light will flash momentarily each time the

combination switch is moved up or down. In addition, the trailer warning light will flash when the hazard warning switch is activated.

j. The park light warning light (Fig. 1-6 item 15) indicates when the park lights have been switched on.

k. The cold start warning light (Fig. 1-6 item 17) illuminates when the starter switch is in the glow plugs on position.



1.	Six wheel drive	Red
2.	Oil pressure	Red
3.	Ignition	Red
4.	Brake circuit	Red
5.	Turn indicators	Green
6.	High beam	Blue
7.	Low fuel	Amber
8.	Differential lock	Amber
9.	Not used	Amber
10.	Not used	Red
11.	Not used	Red
12.	Parking brake	Red
13.	Trailer	Green
14.	Not used	Green
15.	Park lights on	Green
16.	Not used	Amber
17.	Cold start (glow plugs)	Amber
18.	Not used	Amber

Figure 1-6 Warning lights

71. Coolant temperature gauge (Fig. 1-30 item 18)

Under normal running conditions, the temperature gauge needle should be within the green band. When operating in high ambient tem-

peratures, with heavy loads or on steep grades at high altitudes, the operating temperature could rise. However, if the needle rises into the red band, the vehicle should be stopped and the cause determined.

72. Voltmeter (Fig. 1-30 item 19)

The voltmeter measures the vehicle system voltage. With the engine running above idle speed, the needle should be within the green band (12-14 volts). A reading above this in the high red band, which continues after approximately ten minutes, is too high and should be investigated. Similarly, a reading in the low red band which continues after approximately ten minutes, with no electrical load switched on, is too low and should also be investigated.

73. Windscreen washer and wiper switch (Fig. 1-30 item 20)

The windscreen washer and wiper switch is a five position switch, which only operates when the ignition is on. Switch operation is as follows (Fig. 1-7).

a. With the switch in the upper position (A), fast wiper action is achieved.

b. With the switch in the second position (B), slow wiper action is achieved.

c. With the switch in the third position (C), the wipers are off.

d. With the switch in the lower position (D), the wipers will operate at the slow speed until the switch is released.

e. Pushing the switch knob inward (E) will activate the windscreen washer, which will spray water on the windscreen until the knob is released. This can be achieved with the switch on or off.

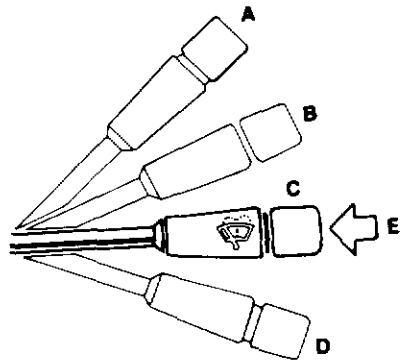


Figure 1-7 Windscreen washer and wiper control

74. Cab dome light switch (Fig. 1-30 item 21)

The cab dome light switch is a two position rocker action switch. Pressing the lower section of the switch turns the dome light on and pressing the upper section of the switch turns the dome light off (see Fig. 1-8). The dome light will not function during blackout conditions.

75. Hazard warning switch (Fig. 1-30 Item 22)

The hazard warning switch is a two position rocker action switch. By pressing the lower section of the switch, both the left and right hand turn indicators, together with the side repeaters, flash simultaneously. A globe in the switch also illuminates to indicate that the switch is on. In addition, the trailer warning light will flash when the hazard warning switch is activated. Pressing the upper section of the switch turns the hazard warning lights off (see Fig. 1-8). Hazard warning lights will not function during blackout conditions.

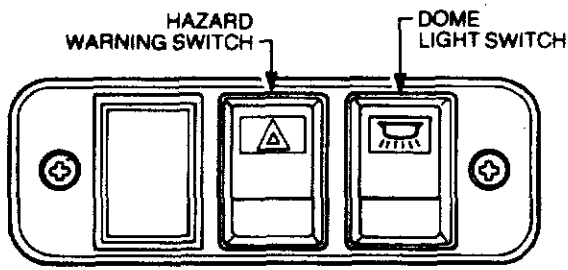


Figure 1-8 Hazard warning and cab dome light switches

76. Hand throttle (Fig. 1-30 item 23)

The hand throttle control can be used to over-ride the accelerator pedal to set engine speed. To utilize the hand throttle, first set the engine speed with the accelerator then pull out the hand throttle and turn the control to lock it in position. The accelerator will over-ride the hand throttle setting when increasing the engine speed. However, when the accelerator is released, the engine will return to the speed set by the hand throttle. To release the hand throttle, turn the knob and push the control fully down to the closed position.

77. Bonnet release (Fig. 1-30 Item 24)

The bonnet release handle is located to the right of the steering column, and by pulling the handle, the bonnet catch will release. From the front of the vehicle, lift the safety catch lever and raise the bon-

net. Pull the support stay forward to secure the bonnet in the open position. The bonnet safety catch is illustrated in Fig. 1-9.

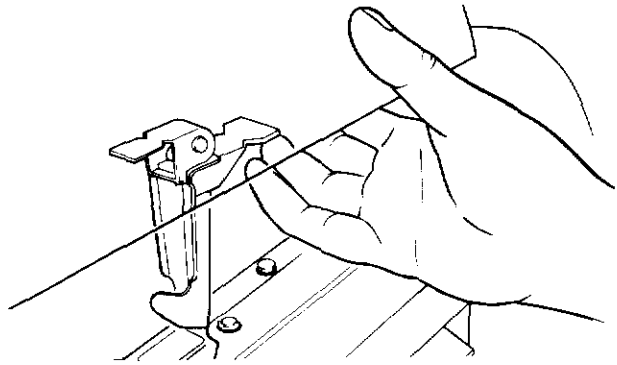


Figure 1-9 Bonnet safety catch

78. Accelerator pedal (Fig. 1-30 item 25)

The accelerator pedal controls the engine speed via the accelerator cable. Depress the pedal to increase engine speed.

79. Foot brake pedal (Fig. 1-30 item 26)

The foot brake pedal controls the application of the service brakes to all six wheels. Depress the pedal progressively to apply increased braking pressure.

80. Starter switch (Fig. 1-30 item 27)

The starter switch is a four position switch, providing control over the ignition, glow plugs and starter motor. The switch is turned clockwise to activate the vehicle electrical system.

81. Main lighting switch (Fig. 1-30 item 28)

The main lighting switch is a three position switch, providing control over the lighting as follows (see Fig. 1-10).

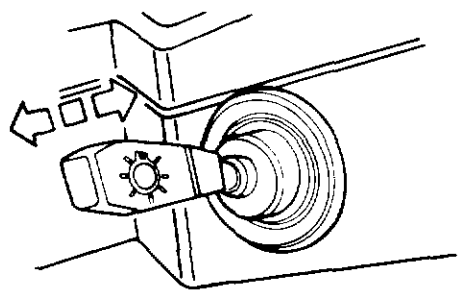


Figure 1-10 Main lighting switch

a. With the switch pulled toward the driver, all lights will be off.

b. With the switch in the centre position, the park lights will be illuminated.

c. With the switch pushed away from the driver, both the main and park lights will be illuminated.

82. The main lighting switch will not function during blackout conditions.

83. Clutch pedal (Fig. 1-30 Item 29)

Depress the clutch pedal to disengage the clutch.

84. Cigar lighter (Fig. 1-30 Item 30)

Push the lighter in to operate. The lighter will automatically return to the normal position when ready for use.

85. Parking brake lever (Fig. 1-30 Item 31)

The parking brake is applied by pulling the lever up. To release the brake, pull the lever slightly up, depress the release button and push the lever down. Application of the parking brake will illuminate a warning light on the instrument panel.

86. Winch/PTO control (Fig. 1-30 Item 32)

The winch/PTO control is a push-pull cable which provides control over the PTO dog-clutch for winch drive. Lift the control lever to engage the dog-clutch or depress the lever to disengage the dog clutch. With the PTO control in the engaged position the PTO warning light (see Fig. 1-30 item 12) is illuminated.

87. Gear lever (Fig. 1-30 Item 33)

The gear lever is used to manually change the gear ratios in the transmission. The gear change pattern is illustrated in Fig. 1-11.

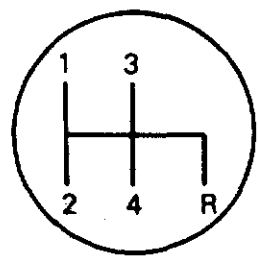


Figure 1-11 Gear change pattern

88. Transfer case shift lever (Fig. 1-30 item 34)

The transfer case shift lever provides the manual selection of high or low gear ratios as required. The ratio shift pattern is illustrated in Fig. 1-12.

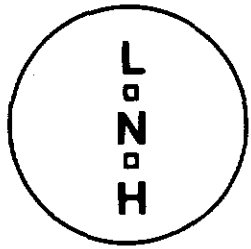


Figure 1-12 Transfer case shift pattern

89. Fuse Box (Fig. 1-30 item 35)

Removing the fuse box cover allows access to the fuses. The location of each fuse is provided by the decals as shown in Fig. 1-13.

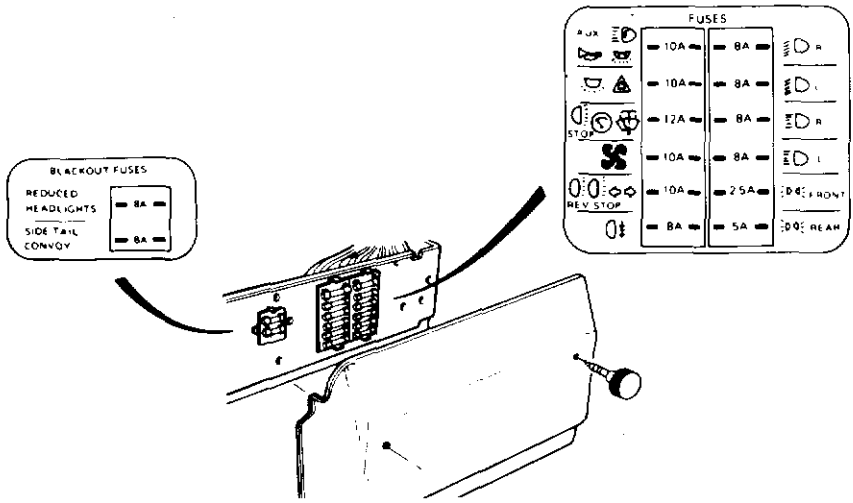


Figure 1-13 Fuses

90. The stop/start control motor is protected by a 10 amp fuse located under the bonnet to the side of the brake master cylinder.

91. Radio speaker bracket (Fig. 1-30 item 36)

Mounted on the dash panel is a bracket to allow for the fitting of a remote radio speaker.

92. Map reading light (Fig. 1-30 item 37)

The map reading light switch is located on the end of the light unit. The light can only be utilized when the ignition is on.

93. Rotating beacon

Flush mounted on the top leading edge of the module, are two red rotating beacons which are controlled by a three position switch located on the ambulance switch panel (see Fig. 1-14) in the cabin overhead console. The two rear red high level lights operate in sequence with the rotating beacon.

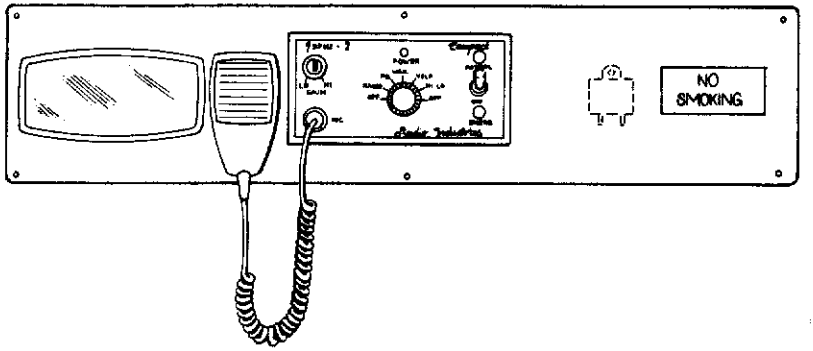


Figure 1-14 Ambulance switch panel

94. Audible warning device/speaker

The speaker and bell assembly of the warning device is mounted on the vehicle brush guard (see Fig. 1-15) and is controlled from the ambulance switch panel. The warning device has three distinctive siren tones (wail, yelp and hee haw).

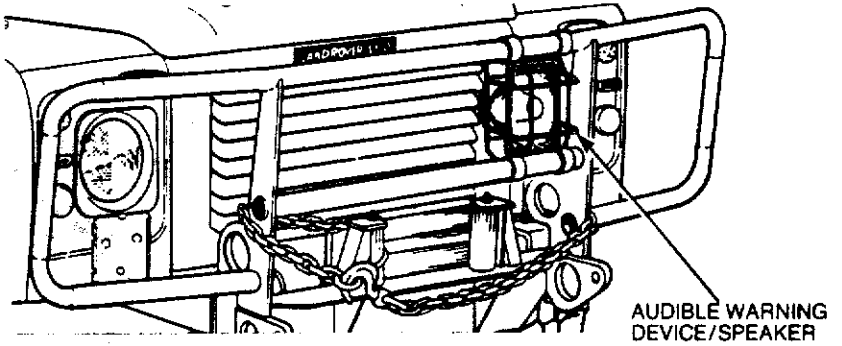


Figure 1-15 Audible warning device/speaker

95. Warning buzzer

A warning buzzer is mounted in the auxillary ambulance switch panel as a means of communication from the medical assistant in the ambulance module to the driver, and is activated by pressing the continuous strip switch along the centre of the roof in the module.

96. Cabin seating (Fig. 1-16)

The cabin seating is adjustable as illustrated in Fig. 1-16.

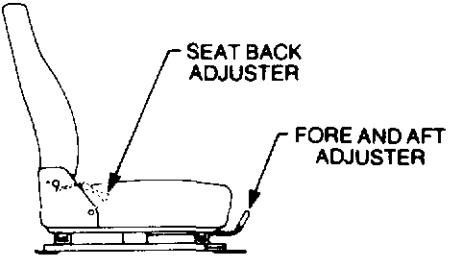


Figure 1-16 Seat adjustment

Body and Chassis Fittings

97. Vehicle chassis/cab construction

The chassis frame is an all welded construction type, consisting of box section steel runners and crossmembers. The frame is hot dipped galvanized to prevent the formation of rust. One crossmember is detachable to simplify servicing. The cab consists of pressed aluminium and fibreglass panels that form the engine compartment bolted to a galvanized steel cabin.

NOTE

The body, chassis and engine have certain common features with other variants to allow for variant transfer throughout the life of the fleet. It is not intended that this occur regularly but allow flexibility in fleet management should circumstances dictate.

98. Ambulance module construction

The module is a welded galvabond steel frame with a fibreglass outer skin bonded to the tubular frame. The interior walls and ceiling are fibreglass and the floor is constructed from waterproof ply.

99. Stowage

A stowage bin is provided in each side of the rear body section, behind the rear wheels. These bins are lockable and the key is located in a canvas pocket secured to the right hand side of the seat box.

100. Mounted on top of the cabin supported by a roof rack is a fibreglass stowage bin which can be utilized for the carriage of personal equipment or stores. A hinged cover is used to prevent ingress of water into the stowage bin.

101. Rear window (Fig. 1-17)

A sliding window is fitted to the rear of the cab to allow communication with the front and rear passengers.

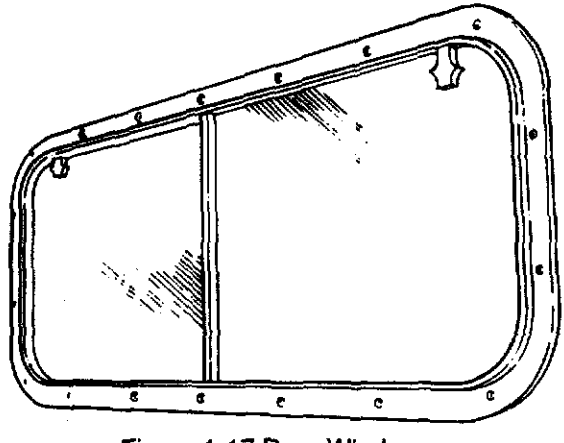


Figure 1-17 Rear Window

102. Roof hatch (Fig. 1-18)

A roof hatch is fitted to the roof panel to provide an observation hatch, and is standard fitment to all 2 tonne vehicles, but cannot be opened due to the position of the roof mounted stowage bin.

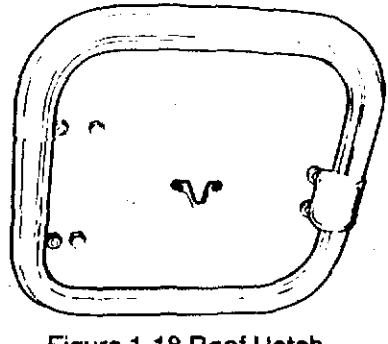


Figure 1-18 Roof Hatch

103. Rear side windows (Fig. 1-19)

Rear side windows are fitted to the cabin to provide ventilation. They may be locked in either the open or closed position by an over-centre catch.

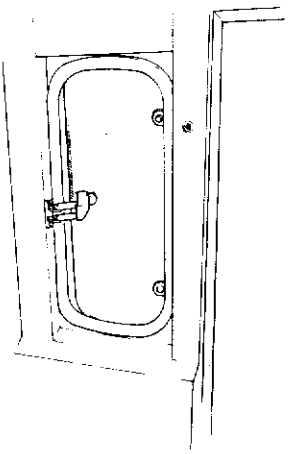


Figure 1-19 Rear Side Window

104. Jerrican stowage

Two jerricans can be stowed, in carriers, on the right hand side of the vehicle below the ambulance module.

105. Rifle clips and butt boxes

There are facilities to mount two rifles between the seats in the cabin.

106. Fire extinguisher

A 1.5 kg BCF Fire Extinguisher is fitted on the rear bulkhead behind the cabin seats.

107. De-ditching tools

The de-ditching tools are mounted in brackets fitted to the bonnet. The tools comprise one axe, one shovel and one pick with handle.

108. Spare wheel stowage

The spare wheel is stowed under the vehicle behind the rear axle and is secured by a chain. The wheel is lowered from the stowed position by using the wheel brace to operate a winch drive (see Fig. 1-20) situated behind the left hand rear mudguard. The spare wheel is positively locked in the travelling position by a brake in the winch mechanism. When raising the spare wheel an additional resistance to movement of the wheelbrace, indicates the spare is correctly stowed. The spare wheel can be lowered by rotating the wheel brace in a counter clockwise direction.

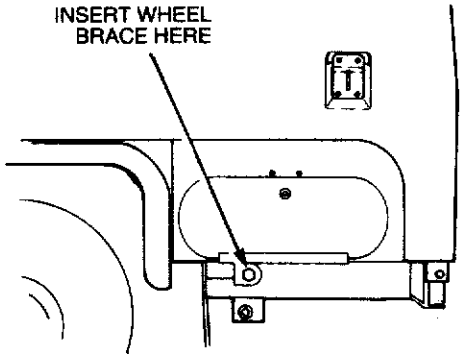


Figure 1-20 Spare wheel lowering

109. Electrical trailer connection sockets

A 12 pin NATO trailer connection socket is fitted to the rear of the left hand chassis rail. A supplementary, seven pin, utilux connection is fitted to the rear of the right hand chassis rail. Although this is wired in a conventional manner, it is not intended for use with trailers, as it supplies the 12 volt power for the module.

110. Towing pintle

A removable towing pintle is secured to the rear crossmember of the vehicle by four bolts, washers and nuts to allow for removal if necessary.

111. Seat belts

Inertia reel lap/sash seat belts are fitted to the outer cabin seats. The centre seat has a lap belt only fitted. Seat belts are fitted for each seating position in the ambulance module.

112. Rear vision mirrors

The external rear vision mirrors are hinged to fold back (inward) when knocked or bumped, thus reducing damage during cross country operations.

113. Distribution box (Fig. 1-21)

A power distribution box is fitted behind the passenger seat in the cabin of the vehicle. Connections and controls are as follows:

a. a 100 amp ON/OFF circuit breaker,
b. two 24 volt outlets,
c. an external battery inlet,
d. an external generator inlet,
e. an auxiliary 24 volt outlet, together with a 2 amp fuse,
f. a voltmeter to monitor battery condition, and
g. three internal 150 amp fuses.

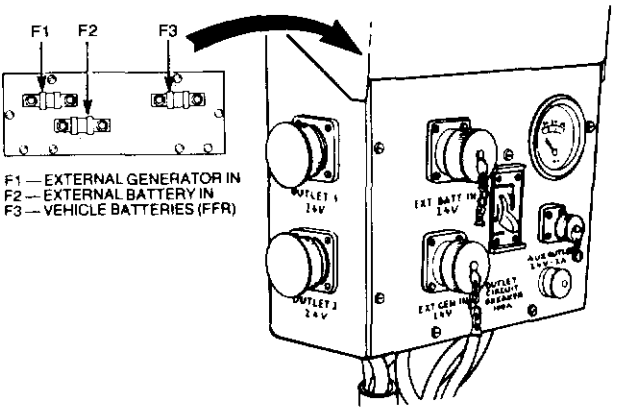


Figure 1-21 Distribution box

114. Battery box

Two batteries are housed in a box forward of the left hand rear mudguard and are accessed through a lift up lid. A label detailing battery replacement procedures (see Fig. 1-22) is affixed to the inside of the lid.

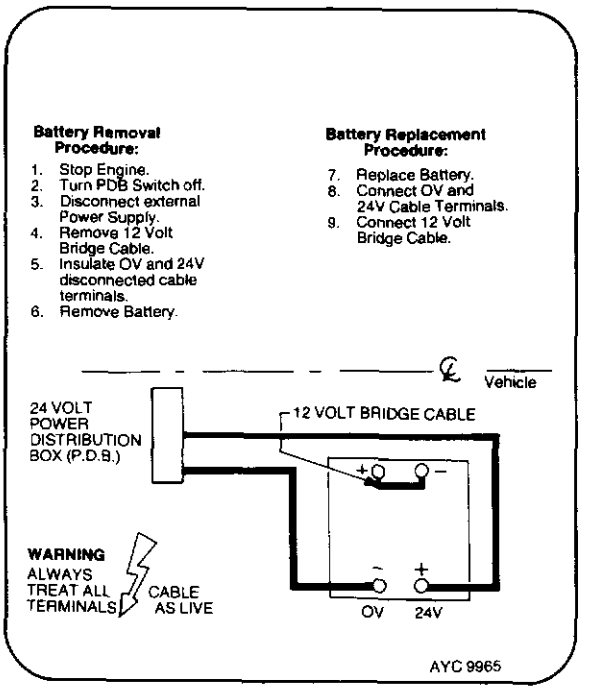


Figure 1-22 Battery replacement label

115. Antenna mount

Fitted to the vehicle right hand front mudguard is an antenna base to accept a VHF vehicle antenna.

116. Radio installation

The cabin is equipped with a radio distribution box located in a vertical position behind the passenger seat. Also incorporated in the cabin is a Project Raven radio mounting plate positioned behind the centre passenger seat. Also alternative brackets will be supplied to allow for the installation of an in-service 160 type radio set (see Fig. 1-23).

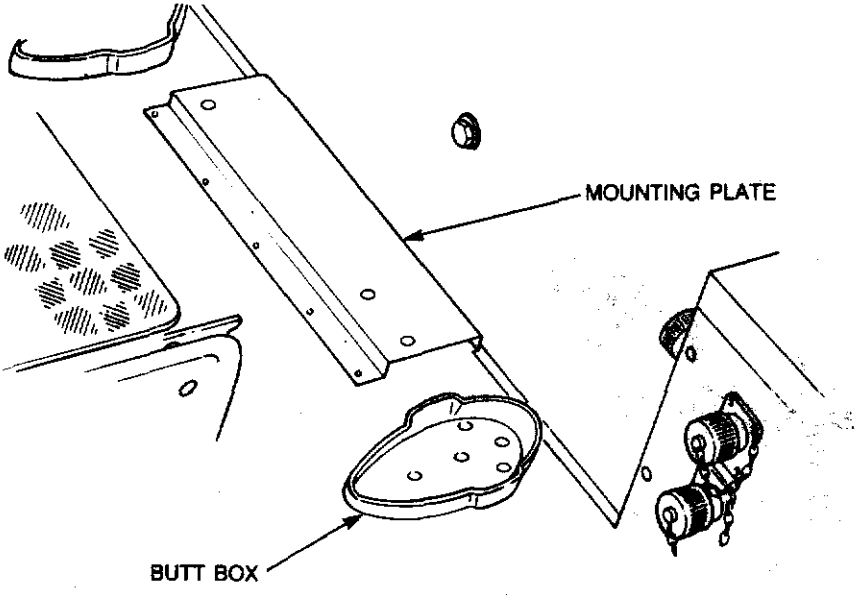


Figure 1-23 Radio installation

117. Vehicle nomenclature plate (Fig. 1-24)

The vehicle manufacturer's identification number is stamped on a plate that is riveted to the passenger's seat box. The identification number is also stamped on the right hand side of the chassis, forward of the spring mounting turret.

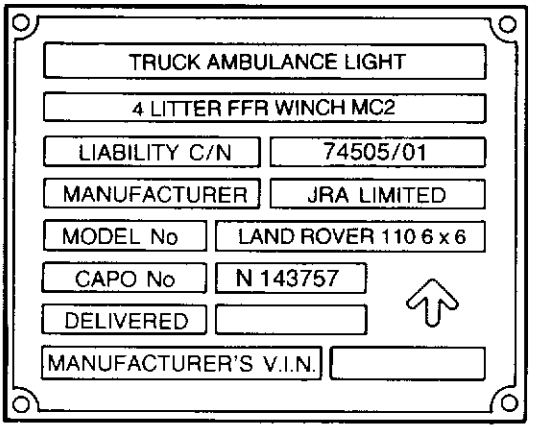


Figure 1-24 Vehicle nomenclature plate

118. Servicing data plate (Fig. 1-25)

The vehicle servicing data plate is riveted to the passenger's seat box, adjacent to the vehicle nomenclature plate.

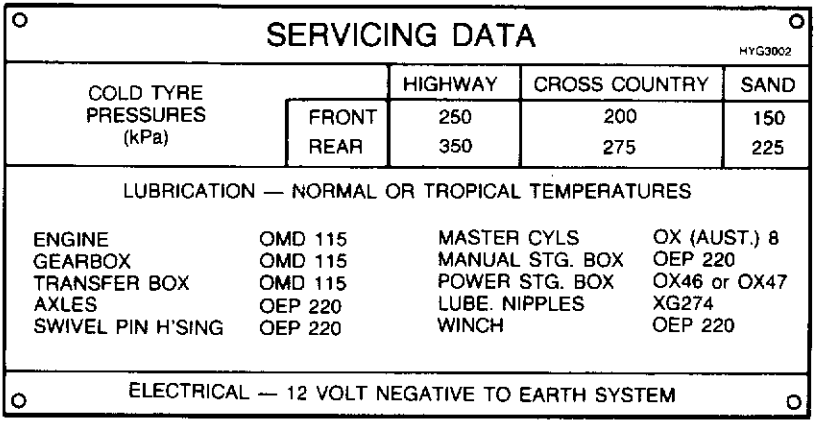


Figure 1-25 Servicing data and tyre pressure plate

119. Shipping data plate (Fig. 1-26)

A shipping data plate is riveted to the passenger's seat base just below the servicing date plate.

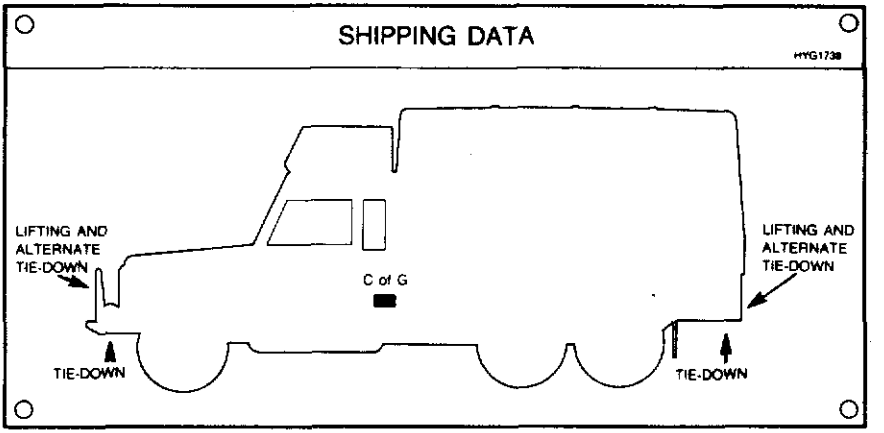


Figure 1-26 Shipping data plate

120. Towing and dyno test data plate (Fig. 1-27)

The towing and dyno test plate is riveted to the driver's seat box. See para. 233 for propeller shaft removal precautions.

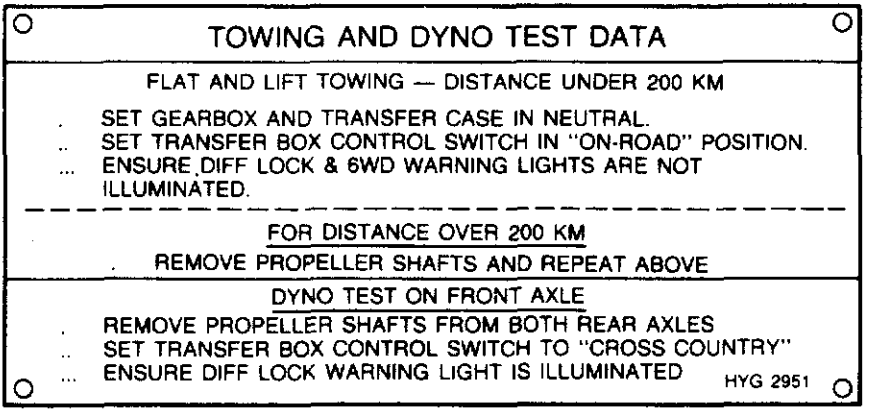


Figure 1-27 Towing and dyno test data plate

121. Jacking plate (Fig. 1-28)

A jacking plate is fitted to the stowage area lid as well as to the jack itself.

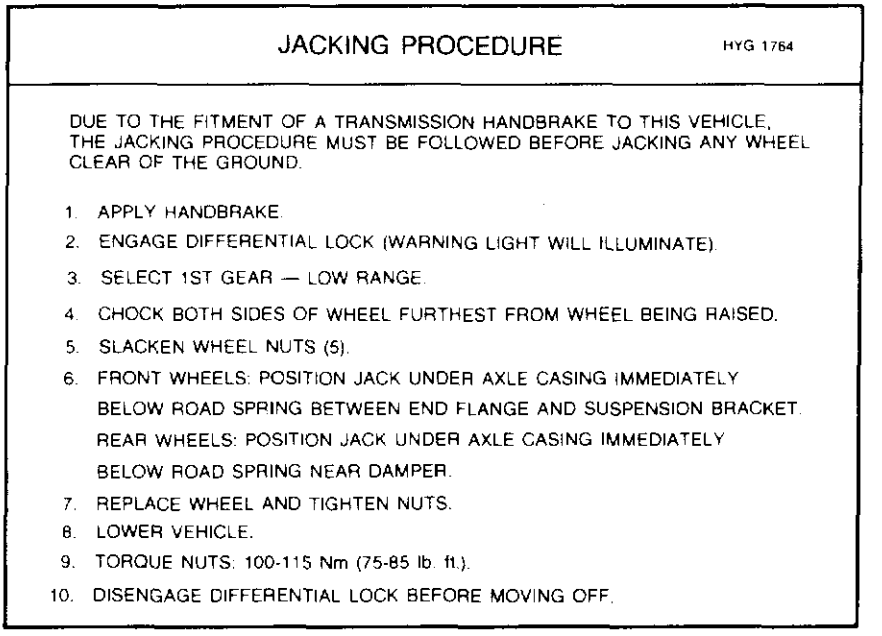


Figure 1-28 Jacking procedure plate

122. Winch operation decal (Fig. 1-29)

A winch operation decal is affixed to the fuse box lid.

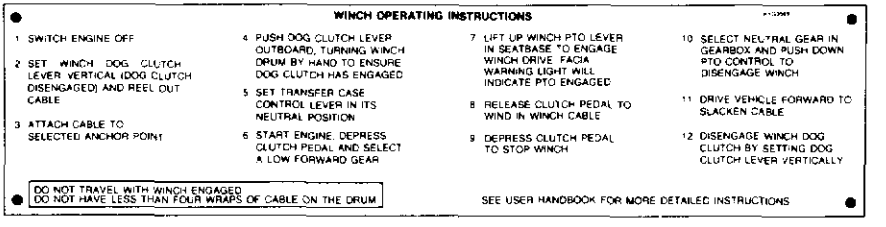


Figure 1-29 Winch operation decal

123. Centre of gravity (C of G) designation plate

A "C of G" plate designating the longitudinal point of balance of the unladen vehicle is fitted to the left hand sill panel. See Fig. 1-3.

124. Unit/formation signs

Four unit/formation sign holders are fitted to the vehicle. Two are riveted just below the head lights and the other two are riveted to brackets on the rear crossmember.

125. Bridge classification sign

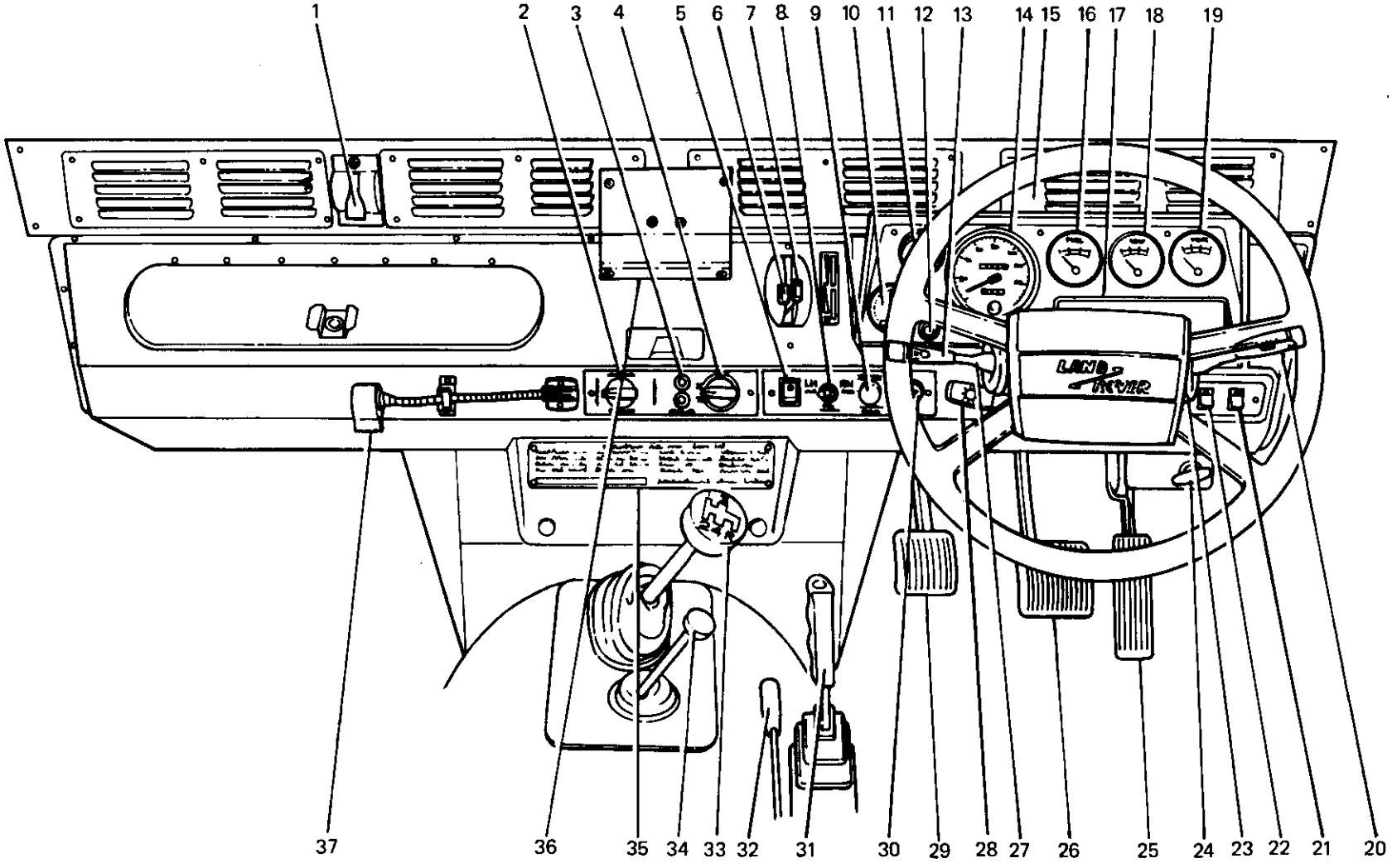
Due to the size and weight of this vehicle, no bridge classification sign is fitted.

126. Camouflage lashing points

Three lashing points are provided on each side of the ambulance module for securing camouflage equipment. Lashing points are also incorporated on the module roof.

NOTE

These lashing points are not to be subjected to high tension loadings.



1. Ventilator control
2. Lighting control
3. Auxillary power
4. Panel light dimmer control
5. Heater fan control
6. Air temperature control
7. Air distribution control
8. Fuel switch
9. Transfer case control
10. Hourmeter
11. Ammeter
12. PTO warning light
13. Combination switch
14. Speedometer
15. Ventilator control
16. Fuel gauge
17. Warning light cluster
18. Temperature gauge
19. Voltmeter
20. Windscreen washer and wiper switch
21. Cab dome light switch
22. Hazard warning switch
23. Hand throttle
24. Bonnet release
25. Accelerator pedal
26. Brake pedal
27. Starter switch
28. Main lighting switch
29. Clutch pedal
30. Cigar lighter
31. Parking brake lever
32. Winch/PTO control
33. Gear lever
34. Transfer case shift lever
35. Fuse box
36. Radio speaker bracket
37. Map reading light

Figure 1-30 Instruments, electrical accessories and controls

CHAPTER 2

OPERATING INSTRUCTIONS

SECTION 1 — WARRANTY AND REPAIR

SECTION 2 — VEHICLE OPERATION

SECTION 1
WARRANTY AND REPAIR

Warranty provisions

201. The Contractor (JRA Limited) accepts responsibility for warranty in respect to the whole vehicle (except GFE items other than the mounting of such items) for a period of 12 months or 20 000 km, whichever occurs first from the time of issue of vehicle to user unit. Where vehicles are delivered to supply depots for extended storage, the depot becomes the user unit.

202. Where a vehicle is delivered into storage, provision is made for the warranty to be suspended for up to two years. Should the vehicle enter service during the two year period, then a pro-rata warranty applies in accordance with Table 2-1.

Table 2-1 Pro-rate warranty

Time of Withdrawal from Storage (measured from day of delivery into storage)	Period of Warranty after Withdrawal from Storage (whichever expires first)	
	Distance (km)	Time (mths)
First day of 1st month — last day of 3rd month	20 000	11
First day of 4th month — last day of 6th month	18 000	10
First day of 7th month — last day of 9th month	16 000	9
First day of 10th month — last day of 12th month	14 000	8
First day of 13th month — last day of 15th month	12 000	7
First day of 16th month — last day of 18th month	10 000	6
First day of 19th month — last day of 21st month	8 000	5
First day of 22nd month — last day of 24th month	6 000	4*
First day of 25th month — last day of 27th month	3 000	3*

***NOTE**: The warranty finally expires after twenty-seven (27) months irrespective of any outstanding distance or time pro-rate warranty.

Special provisions

203. The warranty shall not apply where failure arises from:

a. Vehicle not being maintained in accordance with User Handbook or EMEI manuals.

b. EMEI storage procedures not being effectively applied.

c. Misuse or neglect.

d. The fitting of non-genuine parts and where it is mutually agreed as a contributing factor.

e. The use of equipment not normally or reasonably associated with the operation of the supplies.

f. Supplies that have been altered in form or function without consultation with and approval of the Contractor.

g. Any part or parts of which the specification has been altered by the Commonwealth without the Contractor's approval.

h. Any part or parts from which the identification marks or numbers have been altered or removed by the Commonwealth.

i. Repairs which involved or resulted from either directly or indirectly the use of non-genuine parts.

j. Incorrect tuning, adjustments or maintenance operations which are associated with periodic servicing requirements.

k. Parts or equipment which have not been supplied by the Contractor or by a supplier approved by the Contractor and any problems which may arise, either directly or indirectly from the fitment of such equipment.

l. The consequences of the supplies having been repaired by a non-approved repairer. For the purpose of this clause, approved repairer shall include Army vehicle maintenance personnel.

Application of warranty

204. The application of the warranty will be by repair or replacement of the defective component at no cost to the Commonwealth.

205. Provision is made for warranty repairs to be carried out by JRA Limited authorised Land Rover dealers and a list of such dealers is included in this publication.

206. However, if for reasons of distance, location etc., it is not practical to have the necessary repairs carried out by a JRA Limited authorised Land Rover dealer, then an Army tradesman is approved to carry out the repair. This procedure should be adopted in the case of emergency or essential repairs only (e.g. for safety, prevention of further damage or an operational requirement).

207. In such circumstances, JRA Limited will reimburse the Army for parts used at cost and labour at standard repair times and the prevailing Land Rover dealer warranty hourly labour rate.

208. The information required to be documented by the Army unit in such circumstances is:

a. Identify the vehicle by chassis and or Army registration number.

b. Date vehicle entered service (if known).
c. Current odometer reading.
d. Nature of failure (brief explanation).
e. Nature of repair necessary.
f. Parts replaced by designation and part number.
g. Time taken or Standard Repair Time (SRT) and operation number (refer to EMEI VEH A119-22).
h. If parts were procured through a Land Rover dealer, then documentation identifying purchase and price paid.
i. JRA Authority Number (if applicable).

209. The procedure for submitting a claim to JRA Limited to obtain reimbursement is defined in EMEI VEH A119-22.

Prior consultation

210. Where a vehicle is presented to an authorised JRA Limited Land Rover dealer for warranty repairs, the Army need not be concerned as the dealer has adequate authority to deal with most situations and the necessary procedure to obtain authority in the case of major repairs.

211. In circumstances where the Army are themselves undertaking a warranty repair, this may proceed without authority provided the estimated total material and labour cost is less than $500. If the cost is estimated to be in excess of $500, then the appropriate JRA Limited State Office listed in Table 2-2 should be contacted for authority and guidance.

212. The person making the contact should have the following information available:

a. Vehicle chassis and Army registration number.
b. Date in service (if known).
c. Current odometer reading.
d. Knowledge of the problem encountered.

Continuance of warranty following a warranty repair

213. Any supplies corrected or furnished by way of replacement under warranty claim, whether it be an initial equipment supply or replacement part, will enjoy the balance of any existing warranty.

Warranty on replacement parts and MSI's

214. Except when fitted in the execution of a warranty repair,

replacement parts and MSI's enjoy the same warranty as the vehicle and in general terms as applicable the same special provisions apply (see para. 203).

Table 2-2 JRA State Offices

JRA State Offices	Telephone	Telex	Facsimile
N.S.W Cnr. Heathcote Rd. and Church St., LIVERPOOL NSW 2170	(02) 600 1333	25375	(02) 602 1759
VIC. (TAS.) Level 1, Southgate 10 Jamieson St., CHELTENHAM VIC 3192	(03) 581 5600	—	(03) 581 5660
QLD. Cnr St Pauls Terr. and Brunswick St., FORTITUDE VALLEY QLD 4006	(07) 854 1599	42311	(07) 52 3776
S.A. 164 Fullerton Rd., DULWICH S.A. 5065	(08) 332 7799	—	(08) 364 0456
W.A. 6 Glassford Rd., KEWDALE W.A. 6105	(09) 353 1499	—	(09) 353 1498

List of agents

215. Table 2-3 details the Land Rover dealers throughout Australia and their repair level capability. This list was correct at the time of printing. A list of current Land Rover dealers is available from JRA State Offices.

Table 2-3 Land Rover dealers

Agent	Repair Level
Queensland (1 MD)	
Atherton Aldridge Motors Pty Ltd (070- 91 1468) 18 Mabel Street Atherton QLD 4883	Unit

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Brisbane Westco Rover (07- 844 0221) 79 Melbourne Street South Brisbane QLD 4104	Base
Bundaberg Alan Powell Jaguar Rover (071- 72 9666) 26 Bourbong Street Bundaberg QLD 4670	Field
Burketown Nowland Engineering (011- 077- 45 5107 via exchange) Gregory Street Burketown QLD 4830	Field
Caloundra Pacific Jaguar Rover (071- 91 1344) 32 Bowman road Caloundra QLD 4551	Base
Cairns John Broadley Jaguar Rover (070- 51 1188) 94 McLeod Street Cairns QLD 4870	Base
Cooktown Peninsula Auto Services (070- 69 5327) 10 Boundary Street Cooktown QLD 4871 Phil Witheridge (Prop.)	Field
Gympie Gympie Carworld (071- 82 2822) 69 Monkland Street Gympie QLD 4570	Field

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Mackay Carlisle Motors Pty Ltd (079- 57 2971) 36 Gregory Street Mackay QLD 4740	Base
Maryborough Jack Casey Motorworld (071- 21 2545) 103 Lennox Street Maryborough QLD 4650	Base
Mount Isa Ian Brien Ford (077- 43 4622) 59 West Street Mount Isa QLD 4825	Base
Normanton Top Service Station (077- 45 1261 STD) (077- 40 7777 via exchange) Landsborough Street Normanton QLD 4890	Field
Rockhampton Farmers Centre Pty Ltd (079- 27 6277) Cnr Fitzroy and George Streets Rockhampton QLD 4700	Base
Southport Southport Motors (075- 32 0399) Cnr Minnie and Anne Streets Southport QLD 4215	Base
Toowoomba Alan Flohr Jaguar Rover (076- 34 3233) Cnr James and Anzac Avenues Toowoomba QLD 4350	Base
Townsville Tony Ireland Jaguar Rover (077- 71 6855) 87 Charters Towers Road Townsville QLD 4810	Base

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Virginia Grand Prix Nominees Pty Ltd (07- 265 1000) Cnr Robinson Road and Hadley Street Virginia QLD 4014	Base
Weipa Weipa Servicentre (070- 69 7277) Boundary Road Weipa QLD 4874	Field
New South Wales (2 MD)	
Albury Albury Motors (060- 21 2188) 475 Olive Street Albury NSW 2640	Base
Arncliffe Purnell Motors (02- 59 0241) 139 Princes Highway Arncliffe NSW 2205	Base
Artarmon New Rowley Motors (02- 436 0857-0987) 393 Pacific Highway Artarmon NSW 2064	Base
Bega Tarra Rover (0649- 2 1666) 151 Auckland Street Bega NSW 2550	Field
Bombala Lomas' Garage (0645- 8 3311) 80-86 Maybe Street Bombala NSW 2553	Field

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Carlton Lindsay Johnstone (02- 546 3211) 57 Planthurst Road Carlton NSW 2218	Base
Casino Capitol Car Sales (066- 62 1477) Centre Street Casino NSW 2470	Unit
Coffs Harbour Autocare (066- 52 1422) 115 High Street Coffs Harbour NSW 2450	Field
Dubbo Sainsbury Toyota (068- 82 1511) Bourke Street Dubbo NSW 2830	Unit
Dungog Modern Motors (049- 92 1486) 282 Dowling Street Dungog NSW 2420	Field
Gosford/Wyoming Regal Motors (043- 28 2888) Frances Parke Drive Wyoming NSW 2250	Base
Hamilton Regal Motors (049- 62 1011) 67 Tudor Street Hamilton NSW 2303	Base
Homebush Asquith and Johnstone Pty Ltd (02- 764 1777) 145 Parramatta Road Homebush NSW 2140	Base

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Hurstville Arthur Garthon Motors (02-588 5000) 71 Forest Road Hurstville NSW 2220	Base
Lismore John Chant Motors Pty Ltd (066- 21 2601) Cnr Ballina and Brewster Streets Lismore NSW 2480	Unit
Moorebank Wrendco Automotive Repairs (02- 600 6537) 8 Seton Road Moorebank NSW 2170	Base
Murwillumbah Youngblutt Car Sales Pty Ltd (066- 72 1963) 389 Pacific Highway Murwillumbah NSW 2480	Field
Nowra Tory Classic Cars (044- 21 0922) Kinghorn Street Nowra NSW 2540	Field
Singleton R. and E. Teasdale Pty Ltd (065- 72 1655) 64 George Street Singleton NSW 2330	Field
Sydney (City) City Automobiles (02- 33 0678) 123 William Street Sydney NSW 2000	Base
Tamworth Clifton's Pty Ltd (067- 65 3000) Cnr In and Hercules Streets Tamworth NSW 2340	Base

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Toronto Triggs Motors (049- 59 2122) 36 Victory Parade Toronto NSW 2283	Base
Wagga Wagga Jupiter Motors Pty Ltd (069- 21 6555) 20 Edward Street Wagga Wagga NSW 2650	Field
Wauchope Wauchope Motors (065- 85 3766) High Street Wauchope NSW 2446	Field
Victoria (3 MD)	
Ballarat Gordon Motors Pty Ltd (053- 39 5022) 1041-1043 Howitt Street Wendouree VIC 3355	Base
Bendigo Provincial Motors Div. of Ansett Transport — Operations (054- 48 4433) Midland Highway, Epsom Bendigo VIC 3551	Field
Brighton Lane Jaguar Rover Pty Ltd (03- 557 2875) 771 Nepean Highway Brighton VIC 3187	Base
Corryong Mildren and Coysh Pty Ltd (060- 76 1151) Cnr Anzac and Towong Roads Corryong VIC 3707	Field

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Frankston Stewart Webster (03- 781 2022) 130 Dandenong Road Frankston VIC 3199	Base
Geelong Peck and Stokes Motors (052- 21 2111) 31-37 Gordon Avenue Geelong VIC 3218	Unit
Malvern ULR Sales and Service (03- 822 0211) 1339 High Street Malvern VIC 3144	Base
Mansfield Berry and O'Halloran (057- 75 2375) 121-123 High Street Mansfield VIC 3722	Field
Melbourne Manton Motors (03-266 2501) 666 Elizabeth Street Melbourne VIC 3051	Base
Mildura Syd Mills Motors Pty Ltd (050- 23 0261) 19-29 Orange Avenue Mildura VIC 3500	Field
Morwell Massaro Motors Pty Ltd (051- 34 1422) 497 Princes Highway Morwell VIC 3840	Field
Nunawading Whitehorse Motors (03- 878 6677) 296 Whitehorse Road Nunawading VIC 3131	Base

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
South Australia (4 MD)	
Bordertown Inglis Motors (087- 52 1577) South Terrace Bordertown SA 5268	Field
Hawthorn Solitaire Motors (08- 272 8155) 26 Belair Rd Hawthorn SA 5062	Base
Millicent Alex Bohner Motors Pty Ltd (087- 33 2022) 44 Mount Gambier Road Millicent SA 5280	Base
Walkerville Prestige Cars (08- 269 2922) 130-134 North East Road Walkerville SA 5081	Base
Western Australia (5 MD)	
Broome Shinju Motors (091-92 1250) Walcott Street Broome WA 6725	Field
Bunbury Wallace Motors Pty Ltd (097- 21 4588) 72 Spencer Street Bunbury WA 6230	Base
Carnarvon Dellbar Motors (099- 41 1397) 60 Robinson Street Carnarvon WA 6701	Field

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Derby Kimwest Motors (091- 91 1647) 44 Clarendon Street Derby WA 6728	Field
Esperance Ratten and Slater (090- 71 0133) Cnr Norseman and Sheldon Road Esperance WA 6450	Field
Katanning P. L. Bolto and Co. (098- 21 1566) 71 Clive Street Katanning WA 6317	Field
Kununurra Norwest Diesel Service (091- 68 1195) Bloodwood Drive Kununurra WA 6743	Field
Manjimup Manjimup All Wheel Drive (097- 71 1535) Franklin Street Manjimup WA 6258	Field
Perth Winterfaulls Pty Ltd (09- 328 9333) 252 Aberdeen Street Perth WA 6000	Base
South Hedland N and L Mechanical (091- 72 2623) Lot 3780 Carlindie Way Wedgefield South Hedland WA 6722	Field

Table 2-3 Land Rover dealers (cont'd)

Agent	Repair Level
Wyndham Branco BP Motors (091- 61 1305) Great Northern Highway Wyndham WA 6740	Unit
Tasmania (6 MD)	
Hobart Terry Hickey Autos Pty Ltd (002- 34 9122) 167-171 Murray Street Hobart TAS 7000	Base
Launceston Davies Car Centre (003- 31 9422) Cnr. Wellington and Frederick Streets Launceston TAS 7250	Base
Northern Territory (7 MD)	
Alice Springs Sutton Motors (089- 52 1334) 13 Smith Street Alice Springs NT 5750	Field
Darwin Port Darwin Motors Pty Ltd (089- 81 9444) 15 Stuart Highway Darwin NT 5790	Base
Katherine Agserv Industries (089- 72 1788) 441 Victoria Highway Katherine NT 5780	Unit
Australian Capital Territory	
National Capital Motors (062-51 2600) Josephson Street Belconnen ACT 2617	Base

SECTION 2
VEHICLE OPERATION

216. General

Proper operation determines the service life and operating economy of the vehicle. This includes, careful driving, normal road speeds, reasonable rates of acceleration and braking and changing gears in a manner to avoid shock loading and labouring.

217. Before starting

Carry out a first parade service as detailed in Chapter 3 Section 1.

218. Before starting the engine

Ensure that the parking brake is applied. Depress the clutch pedal fully to disengage the clutch then move the gear lever to neutral.

219. Starting the engine

CAUTION

Do not accelerate the engine immediately after starting, otherwise damage to the turbocharger will result through lack of lubrication.

NOTE

The glow plugs need only be used to start the engine when the vehicle is operating continually in low ambient temperatures (below 5°C), and then for no longer than five seconds.

Depress the accelerator pedal approximately half way and hold the pedal in this position while turning the ignition switch clockwise to start the engine. As the switch is turned to the first position (see Fig. 2-1), the oil pressure, battery charge and parking brake warning lights will illuminate. In the next switch position the glow plug light illuminates, but do not hold the switch in this position unless cold operating conditions are experienced. Turn the switch fully to engage the starter motor, then release the switch and return the accelerator pedal to the idle position once the engine has started. All warning lights except the parking brake light should now be extinguished.

NOTE

Do not operate the starter motor continuously for longer than ten seconds without a pause.

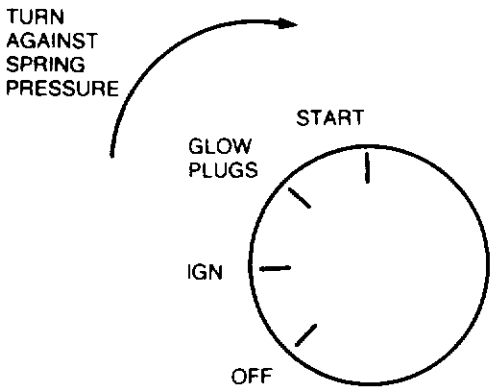


Figure 2-1 Starter switch positions

220. Moving the vehicle

a. With the engine operating, disengage the clutch by pushing the pedal to the floor. Select high ratio or low ratio on the transfer case shift lever, depending on the vehicle load and terrain.

NOTE

Changing from high to low or low to high ratio should only be attempted when the vehicle is stationary. Should difficulty be encountered when engaging high or low ratio, do no force the lever. With the engine running, engage a gear with the main gear lever and release the clutch momentarily, then return the main gear lever to neutral and try the transfer case shift lever again.

b. Select first gear on the gear lever then release the parking brake. If the parking brake warning light does not extinguish, do not attempt to move the vehicle.

c. Engage the clutch smoothly by releasing the clutch pedal and simultaneously depressing the accelerator pedal the amount necessary for the engine to move the load.

NOTE

Never allow the foot to RIDE the clutch pedal with the clutch engaged. This causes premature clutch wear.

d. As the vehicle gains speed, continue changing gear until cruising speed is achieved and the transmission is in the highest gear possible without labouring the engine.

Good driving habits

221. Engine temperature

Allow the engine to reach normal operating temperature before engaging in high speeds or hauling heavy loads.

WARNING

Should the engine become overheated, park the vehicle in a safe working area and allow the engine to cool before attempting repairs to, or refilling of, the cooling system.

222. Instruments

Glance at the instruments frequently. If a fault is indicated, assess the corrective action required and stop the vehicle as necessary.

223. Clutch

To avoid damage, engage the clutch with a smooth action. Do not RIDE the clutch.

224. Gear changing

Ensure than the correct gear is selected for the terrain, vehicle load and speed.

225. Braking

Avoid sudden stops. When stopping on slippery surfaces, smoothly apply and release the brakes alternately, to prevent skidding. When slowing to a halt, leave the clutch engaged as long as possible to utilize the engine braking effect. Before descending steep slopes, select first gear, low ratio with the differential locked to provide maximum engine braking.

226. Stopping the engine

CAUTION

Before shutting down the engine, allow the engine to run for several minutes to allow the turbocharger temperature to stabilize and the rotational speed of the turbine to slow down. Otherwise damage to the turbocharger will result through lack of lubrication.

Allow the engine to return to the normal idle speed before turning the ignition off.

227. Parking

Use the parking brake when parking the vehicle. Check frequently to ensure that the brake is adjusted to lock and hold the vehicle when parked. Do not use the parking brake when the vehicle is in motion, except in an emergency. When parking on an incline, leave the vehicle in gear.

228. Fording

The maximum advisable fording depth is 500 mm. When fording is to be undertaken, ensure that the flywheel housing drain plug is securely fitted (see Fig. 2-2). If deep water is anticipated, loosen the fanbelt to prevent damage to the fan or radiator, and saturation of the electrical system. Avoid excessive speed.

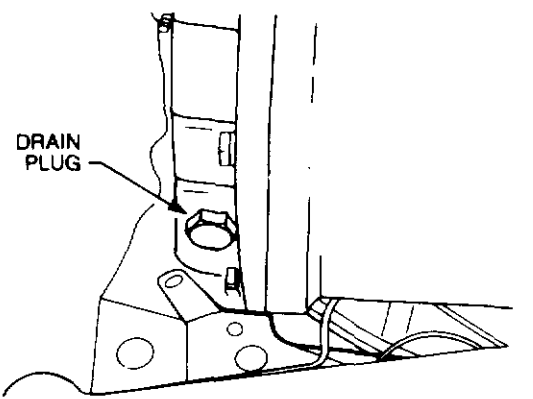


Figure 2-2 Flywheel housing drain

229. Once the crossing has been accomplished, drain the flywheel housing and tighten the fanbelt. Ensure that the brakes are dry and fully effective before proceeding.

NOTE

After fording, check the oil in the engine, transmission, transfer case and swivel pin housing for signs of water contamination. Change contaminated oils as soon as possible.

230. Cross-country driving

WARNING

Because of the excellent rough terrain characteristics of this vehicle, drivers are cautioned to maintain a safe speed for the conditions encountered, **especially when towing a trailer or utilizing tyre chains.**

NOTE

The mobility of this vehicle is greatly enhanced if correct tyre pressures are maintained, and in extreme conditions, tyre chains are used.

The transfer case differential lock should be utilized for cross-country driving, ie. off formed roads and tracks. When activated, the differential lock warning light will illuminate indicating that the dog clutch in the transfer case is fully engaged. Although the differential lock can be engaged while the vehicle is moving, no power should be applied to the transmission during this operation.

NOTE

Under some conditions, a slight delay may be experienced before the warning light illuminates. This is due to the time required for the dog clutch to align with its mating splines and become fully engaged.

231. On reaching normal road conditions, the differential lock must be disengaged.

NOTE

Under some conditions, a slight delay may be experienced before the warning light extinguishes after the switch is pushed in. If the warning light does not extinguish, this indicates that the dog clutch is not fully disengaged. This is usually due to transmission wind-up which jams the dog clutch. If the warning light does not extinguish within 100 metres of the switch being pushed in, the vehicle should be stopped and reversed a few metres to unwind the transmission. The warning light should now extinguish. **If not, do not continue as serious damage may occur.**

Changing a wheel

232. To replace a flat tyre with the spare wheel, proceed as follows:

a. Remove the hydraulic jack, handle and jack base plate, from the stowage bin.

b. Engage the differential lock and check that the differential lock warning light illuminates.

NOTE

If the vehicle has been stationary prior to changing the wheel, the differential lock may not engage when selected. In this case, it will be necessary to start the engine, engage a gear and release the clutch sufficiently to allow slight movement of the gears, until the warning light is illuminated. Switch off the engine.

c. Ensure that the parking brake is applied and that the wheels are chocked.

WARNING

The parking brake acts on the transmission, not the rear wheels. The differential lock must be engaged and the wheels chocked to enable the vehicle to be raised safely.

d. Engage first gear in the transmission and low range in the transfer case.

e. Position the jack under the vehicle as follows:

(1) Front wheel. Position the jack so that when raised, it will engage with the front axle casing immediately below the coil spring, where it will locate between the flange at the end of the axle casing and the large bracket to which the front suspension members are mounted (see Fig. 2-3).

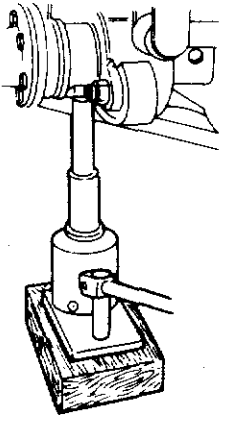


Figure 2-3 Jack position — front wheels

(2) Rear wheel. Position the jack so that when raised, it will contact the axle tube between the spring and the shock absorber bracket (see Fig. 2-4).

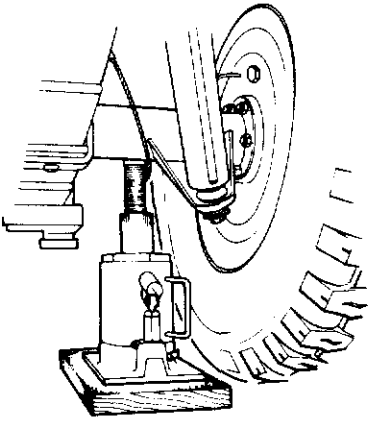


Figure 2-4 Jack position — rear wheels

f. Before raising the vehicle, lower the spare wheel to the ground and remove it from under the vehicle, then using the wheel brace, initially slacken the nuts on the wheel to be removed.

g. Jack up the appropriate corner of the vehicle. When the wheel is clear of the ground, remove the wheel nuts and lift off the wheel.

h. Ensure that the wheel nuts and studs are clean then fit the spare wheel and secure with the wheel nuts. Tighten the wheel nuts.

i. Lower the vehicle to the ground and torque the wheel nuts to 100-115 Nm (75-85 lb.ft) in the correct sequence (diagonally opposite). Use hand pressure only. Do not use foot pressure or extension tubes as this could overstress the wheel studs.

j. Remove the jack and the wheel chocks then disengage the differential lock.

Towing the vehicle

233. The following precautions must be taken before this vehicle is towed:

WARNING

When using rear lift recovery, extreme caution must be observed.

a. Set the transmission and transfer case to neutral.

b. Set the transfer case control switch to the on-road position.

c. Ensure that the differential lock warning light is extinguished. If the warning light fails to extinguish, both the front and rear propeller shafts are to be removed.

d. When the front propeller shaft is to be removed, the flange mounting bolts must be secured with nuts or wire to prevent damage to the transmission casing.

e. Welded to the bullbar and the rear crossmember are two towing eyes which are used as fixed mounting points to allow for the attachment of an A frame to facilitate vehicle recovery.

Battery replacement — FFR

234. To replace the communication batteries, proceed as follows:

a. Stop the engine and ensure that the parking brake is applied.

b. Set the master switch on the power distribution box to the OFF position and disconnect any external power source.

c. Slide the battery box out from the chassis.

d. Remove the nuts and washers securing the lid to the battery box, and remove the lid.

e. Remove the bridging cable which interconnects the batteries.

f. Disconnect the negative and positive terminals respectively. Insulate each terminal as it is disconnected to prevent possible sparking.

g. Remove the battery retaining frame, then remove the batteries.

h. Install the new batteries and secure in position with the retaining frame.

i. Connect the positive and negative terminals respectively, then connect the battery bridging cable between the remaining positive and negative terminals.

j. Position the lid on the battery box and secure in position with the washers and nuts.

k. Slide the battery box towards the chassis and lock the sliding frame in position.

l. Reset the power switch at the distribution box.

Winch operation

235. The following precautions must be observed:

WARNING

Always wear industrial gloves when handling steel wire rope. Do not use the hands to guide the rope on or off the drum when winching.

a. The winch rope must be lubricated regularly and used correctly to maintain the rope in a serviceable and easy to handle condition.

b. The winch rope should be wound tightly and evenly on the winch drum, otherwise pressure on the top layer will force the rope down between the lower layers, causing entanglements and serious damage could result.

c. Do not continue winching if a kink is noticed in the winch rope. Release the tension and remove the kink.

d. The winch rope should not be looped around a load or anchor point. Chain should be used for this purpose.

e. The winch rope should not be paid out under power except when circumstances offer no alternative.

f. Do not disengage the winch dog-clutch under load.

g. Do not leave less than four wraps of winch rope on the drum.

h. Do not travel with the winch engaged.

i. Do not use the winch rope for towing under any circumstances.

236. To release the winch rope manually:

a. Ensure that the engine is switched OFF, then set the winch dog-clutch lever to the vertical position (see Fig. 2-5) to disengage the dog-clutch. Reel out the winch rope as required.

NOTE

Do not leave less than four wraps of winch rope on the drum.

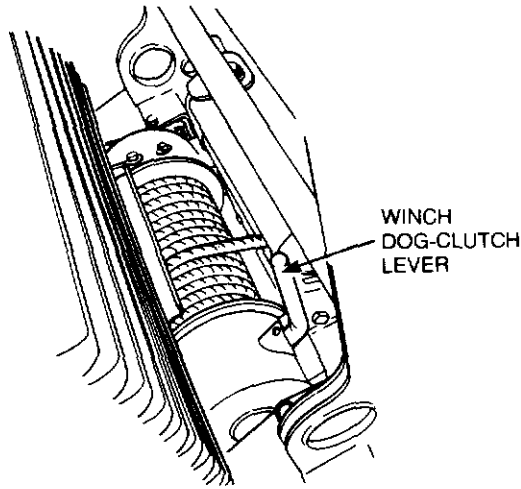


Figure 2-5 Winch dog-clutch operation

237. Attach the winch rope to the selected anchor point.

NOTE

The winch rope should not be looped around a load or anchor point. Use suitable chains for this purpose.

238. To winch out under power:

a. Push the winch dog-clutch lever outward, while turning the winch drum by hand to ensure that the winch dog-clutch has engaged.

b. Place the transfer case control lever to the neutral position, then start the engine.

NOTE

Ensure that a load is always applied to the winch rope when winching out.

c. Depress the clutch pedal and select reverse gear, then pull up the winch/PTO control in the seat base (see Fig. 2-6) to engage the winch drive. Increase engine speed to approximately 1300 rpm then slowly release the clutch pedal to begin winding out the winch rope.

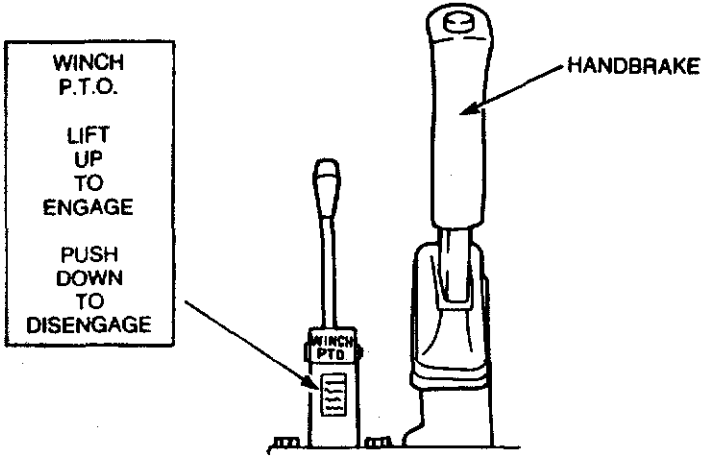


Figure 2-6 Winch/PTO control operation

d. To stop the winch during operating procedures, depress the clutch pedal. The worm gearing will ensure that the winch load is held until winching is resumed.

239. Attach the winch rope to the selected anchor point.

NOTE

The winch rope should not be looped around a load or anchor point. Use suitable chains for this purpose.

240. To winch in:

a. Push the winch dog-clutch lever outward, while turning the winch drum by hand to ensure that the winch dog-clutch has engaged.

b. Place the transfer case control lever to the neutral position, then start the engine.

NOTE

Ensure that a load is always applied to the winch rope when winching in.

c. Depress the clutch pedal and select a low forward gear, then pull up the winch/PTO control in the seat base (see Fig. 2-6) to engage the winch drive. Increase engine speed to approximately 1300 rpm then slowly release the clutch pedal to begin winding in the winch rope.

d. To stop the winch during operating procedures, depress the clutch pedal. The worm gearing will ensure that the winch load is held until winching is resumed.

NOTE

1. The winch oil will overheat and rapidly lose its lubricating properties if the winch is used continuously at its maximum capacity. Under these circumstances, time should be allowed for the winch lubricant to cool before resuming winching. The maximum allowable temperature of the winch oil is 120°C, but operation below 100°C is preferable.
2. An automatically re-setting torque limiter is incorporated in the winch power take-off. This is pre-set to release at an input

torque corresponding to the rated capacity of the winch, and will be indicated by a loud rattling sound from the transmission area. When this occurs, winching should immediately be stopped and the means found to reduce the winch rope load, for instance by relocating the rope anchor point. Extensive use of the power take-off with the torque limiter continuously released will cause excessive wear of the torque limiter, and will not assist in the winch operation.

241. On completion of the winching task:

a. Depress the clutch pedal to stop the winch and allow the engine to idle.

b. Place the transmission in neutral and push down the winch/PTO control to disengage the winch drive.

c. Drive the vehicle forward to slacken the winch rope and remove the winch rope from the anchor point. Winch the remaining rope in under light load, ensuring that the winch rope is correctly rolled, then secure the chain to the front of the vehicle.

d. Disengage the winch dog-clutch by turning the dog-clutch lever to the vertical position.

CHAPTER 3

OPERATOR SERVICING

SECTION 1 — SERVICING

SECTION 2 — LUBRICATION

SECTION 1
SERVICING

First parade servicing

301. Before moving off with a loaded or unloaded vehicle, carry out the inspections, checks and tests as laid down in this section. Inspect for damage, security and serviceability.

302. Check the wheels and tyres for the following:

a. Loose wheel nuts.

b. Correct tyre pressure (see page 86).

c. Cuts, weak spots, uneven wear, exposed cords, or clogged tyres.

303. Check the following fittings:

a. All cabin and body fittings.

b. Spare wheel.

c. Stowage space, doors and lids.

d. Windscreen, driving mirrors, door windows, hinges, catches and latches for security.

e. Check light lenses, driving mirrors and windscreens and clean.

f. Tow hook, coupling and security.

g. Winch rope security.

304. Check the stowed items as follows:

a. Completeness of equipment and correct stowage.

b. For loose items in cabin or rear section.

c. De-ditching tools.

d. Fire extinguisher, fully charged and correctly stowed.

305. Check the fuel, lubricants and coolant as follows:

a. Fuel level in tank. Replenish as necessary.

b. Check jerrican and refill if necessary.

c. Engine oil level using dipstick. Top-up as necessary.

d. Coolant level in radiator expansion tank. Top-up if necessary.

e. Water can in stowage. Top-up if necessary.

f. For fuel, lubricant and coolant leaks. Examine major assemblies and the ground below the vehicle for evidence.

Start the vehicle

306. Start the vehicle as detailed in Chapter 2 Section 2 and check the following:

a.	Voltmeter	Any irregular readings indicates battery or charging system requires checking.
b.	Horn	Check operation of the horn.
c.	Lights	Check operation of all lights.
d.	Windshield wipers/washers	Check operation. Add water, if needed.
e.	Parking brake	Check release, holding ability and application.
f.	Clutch pedal	Check for free travel.
g.	Seat adjustment	Ensure that seat is correctly adjusted.

Electrical

307. Check the following:

a.	Battery	Check electrolyte level — fill to 10 mm above plates. Check that the terminals are clean and tight.
b.	Lights	Switch off all lights not required.

Moving off and running

308. Check the following:

a. Load — make a final check of the security of load and lashings, if applicable.

b. Moving off — Release the parking brake. DO NOT move off if the parking brake warning light remains illuminated. Check correct operation of steering and brakes.

c. Keep a running check on all instruments.

d. Check the fuel level, coolant temperature, warning lights, charging rate and speedometer at intervals.

Halts on the march

309. At halts on the march check that:

a. The cargo and lashings are secure, if applicable.

b. No tyre is soft, punctured or overheated.

c. Wheel hubs or brake drums are not overheated.

d. There are no oil, fuel or coolant leaks.

310. At halts or after approximately four hours running:

a. Check tyre pressures. If low, inflate. (If high, check later when tyres are cold, before deflating).

b. Ensure that all wheel nuts are secure.

c. Test all lights (especially if there is a possibility that they will be required).

d. Check generally for loose bolts or fittings. Tighten as necessary.

e. Ensure security of stowed items.

f. Inspect for security and correct operation any parts on which recent repairs or adjustments have been carried out.

Last parade servicing

311. Carry out the following:

a. Clean the vehicle.

b. Carry out "halt on the march" servicing.

c. Draw fuel and lubricants, as required and top-up fuel tanks, engine oil and radiator expansion tank coolant. If operating under very dusty conditions, the air cleaner should be removed and cleaned.

d. If vehicle has been subjected to deep water crossings during daily exercise, the oil in the swivel pin housings, front, intermediate and rear axles, transmission and transfer case, should be checked for signs of water contamination. If any traces of water are found, the oil should be drained and replenished with correct type as soon as possible.

e. Check radiator core for insects, mud, etc., clean as required with compressed air or water.

f. Complete documentation.

g. Close the doors and windows.

Opening bonnet for servicing access

312. To open the bonnet, proceed as follows:

a. Pull the bonnet release handle.

b. Release the safety catch at the front of the bonnet.

c. Lift the bonnet up and pull the support stay forward.

WARNING

Ensure that the bonnet support stay is properly locked before releasing the bonnet.

313. To close the bonnet, proceed as follows:

a. Hold the bonnet open and push the support stay back.

b. Gently lower the bonnet then push the bonnet down firmly to lock in position. Do not allow the bonnet to drop from the open position.

Radiator coolant

314. Normal cooling system replenishment is via the expansion tank. However, in the event of excessive coolant loss or drainage, the following radiator filling procedure is to be adopted:

a. Remove the expansion tank pressure cap and move the heater controls to the highest temperature position.

b. Remove the brass filler plug from the thermostat housing (see Fig. 3-1).

c. Using coolant with a mixture concentration of 5% Alfloc 2001, top-up the system through the filler hole, then replace the plug.

d. With the pressure cap removed, run the engine for a minimum of two minutes.

e. Stop the engine and remove the plug from the thermostat housing. Top-up as required, then install and tighten the plug securely.

f. Fill the expansion tank to the correct level and install the cap.

g. Run the engine and check for leaks.

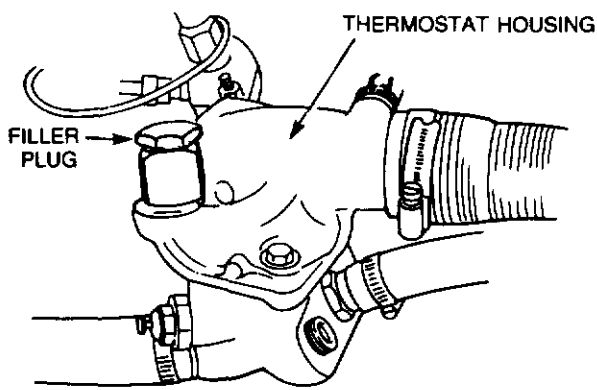


Figure 3-1 Thermostat housing

Bleeding the fuel system

315. To bleed the fuel system, proceed as follows:

a. Loosen the screw cap on the transfer pump and operate the primer.

b. Loosen the overflow valve on the fuel filter adapter (see Fig. 3-2) and continue operating the primer until a solid stream of fuel flows from the valve.

c. Tighten the overflow valve and continue operating the primer. Loosen the air bleed screw on the fuel injection pump and continue operating the primer until a solid stream of fuel flows from the air bleed screw. Tighten the air bleed screw.

d. Secure the primer screw cap and start the engine. Ensure that the engine runs smoothly.

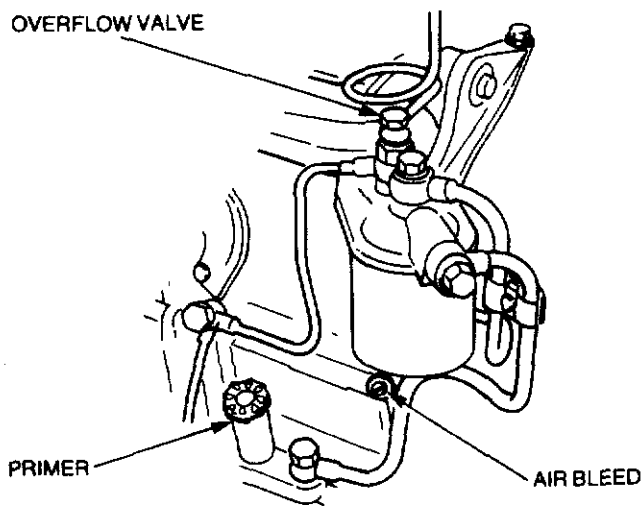


Figure 3-2 Bleeding the fuel system

316. Periodical maintenance

a. To ensure that the vehicle is correctly maintained and prepared for operational tasks, it is necessary to carry out regular maintenance.

b. Daily and Fortnightly Servicing in accordance with Tables 3-1 and 3-2 is to be carried out by operators and is the responsibility of owner units.

c. Initial service should be carried out after the vehicle has

been in service for a period of three months, or having travelled 1600 km, whichever occurs first. The service is the responsibility of JRA Limited and will be carried out by arrangement with any Land Rover franchised Dealer at no charge to the Army, except for the cost of replacement lubricants and filters. Alternatively this service can be carried out by an Army tradesman in accordance with Table 3-3, should it not be convenient for the vehicle to be returned to the authorised Land Rover Dealer at that time.

d. Minor and Major Servicing is to be carried out by RAEME with assistance from operators working under RAEME supervision in accordance with Tables 3-4 and 3-5. The unit is responsible for ensuring that the vehicle is serviced at the following intervals.

(1) **Minor Service.** This is to be carried out every six months or 10 000 km of operation, whichever occurs first.

(2) **Major Service.** This is to be carried out every twelve months or 20 000 km of operation, whichever occurs first.

Special requirements

317. During the early life of a vehicle the working parts settle down, with the result that various clearances and adjustments need to be corrected. Operators should report problems for rectification at the earliest opportunity.

318. The Initial Service includes a warranty inspection which must be reported to Land Rover Australia in accordance with EMEI VEHICLE A 119-22.

Table 3-1 Daily tasks

The following operations are to be performed by the driver:

1. Check engine oil level (top-up if necessary).
2. Check coolant level (top-up if necessary).
3. Check power steering reservoir (top-up if necessary).
4. Check tyres and wheels. Inflate tyres if necessary, inspect wheel nuts for evidence of looseness.
5. Check for fuel, oil and coolant leaks.

Table 3-1 Daily tasks (cont'd)

6. Check fuel supply and operation of fuel gauge.
7. Check voltmeter reading. With switch on and engine off, indicates battery condition. With engine running, reading indicates condition of charging system.
8. Check operation of horn.
9. Check all lights for correct operation and report any defects.
10. Check operation of footbrake, parking brake and clutch.
11. Check coolant temperature gauge reading.
12. Check operation of windscreen wipers and washers, top-up washer reservoir if required.
13. Check air cleaner restriction gauge reading. If locked in "red" position, the air cleaner elements must be changed. Under dusty conditions, remove and clean elements.
14. Check seats and seat belts for operation and security.
15. Check driving mirrors, door windows, catches and latches.
16. Check winch rope is properly secured.

Table 3-2 Fortnightly tasks

The following operations are to be performed by the driver:

1. Check condition and tension of fanbelts. Approx. 10-15 mm deflection on longest span using moderate thumb pressure for the 12 volt alternator and approx. 5-10 mm for the 24 volt alternator fanbelts.
2. Battery. Check level of electrolyte, top-up if necessary, examine terminals for cleanliness and security. Check for leaks and security, clean outside of battery if required. Also check FFR batteries, if fitted.
3. Check radiator external condition for restriction, clean if required.
4. If operating in dusty conditions, remove air cleaner elements and clean.
5. Check operation of hand throttle and stop control.
6. Check operation of differential lock control.

Table 3-2 Fortnightly tasks (cont'd)

7. Check operation of transfer case control.
8. Check condition of wheel rims, tyres and valve stems.
9. Check wheel nuts are torqued correctly.
10. Check operation and security of spare wheel carrier.
11. Check security of fuel tanks and lines.
12. Check fuel, oil and coolant systems for leaks.
13. Drain water from sedimenters.
14. Check winch rope is properly secured.
15. Check operation of air-conditioner.

Table 3-3 Initial servicing

The following operations are to be performed by the driver under supervision:

1. Start and warm up the engine.
2. Stop the engine, drain engine oil and refill.
3. Remove and replace oil filters.
4. Drain and refill transmission.
5. Drain and refill transfer case.
6. Drain and refill front axle.
7. Drain and refill intermediate axle.
8. Drain and refill rear axle.
9. Drain and refill swivel pin housings.
10. Lubricate propeller shafts.
11. Lubricate winch propeller shafts and support bearings.
12. Lubricate winch dog-clutch.
13. Lubricate winch rope.
14. Lubricate pintle hook.
15. Lubricate fanbelt jockey pulley.

Table 3-3 Initial servicing (cont'd)

16. Check oil level in winch gearbox, top-up if necessary.
17. Check battery electrolyte level (10 mm above plates) and security of terminals.
18. Check all fuel and oil lines and unions for leaks.
19. Retorque all wheel nuts to correct specifications.
20. Check tyres and wheels, inflate if necessary. Inspect rims for damage.
21. Check operation of all lights and gauges.
22. Check for loose electrical connections.
23. Check operation of foot brake, parking brake and clutch.
24. Check exhaust systems for leaks, damage and security.
25. Tighten all module to chassis mounting bolts.
26. Tighten all step and platform mounting bolts. Check the function of latches and catches.
27. Tighten and check all rear door mount latches. Lubricate and check the function of the catches.
28. Check operation of litter rails and tension the bolts. Lubricate slides and latches.
29. Check operation of module electrical components.
30. Check oxygen free flow.
31. Check suction pump operation and reservoir.
32. Check function of all doors, seals and vents.
33. Check gas charge, hoses and the function of the air conditioner.
34. Check hoses, clamps and function of the compartment heater.

The following operations are to be performed by a Qualified Vehicle Mechanic:

35. Retorque inlet and exhaust manifolds.
36. Check and adjust fanbelt tension. Retorque alternator mounting bolts.
37. Check torque of radiator mounting bolts, tighten as required.

Table 3-3 Initial servicing (cont'd)

38. Tighten all propeller shaft coupling drive bolts.
39. Replace primary fuel filter and bleed system.
40. Road Test. Carry out a road test on steering and brake system. Note all faults and rectify as necessary.

Table 3-4 Minor servicing

The following operations are to be performed by the driver under supervision:

1. Start and warm up engine.
2. Stop engine, drain engine oil and refill.
3. Remove and replace oil filters.
4. Check condition of engine mountings.
5. Check engine hand throttle and stop control for connections and operation.
6. Check all lights and gauges for correct operation, report defects.
7. Check condition of radiator shroud and fins. Clean fins as necessary.
8. Retorque radiator hose connections.
9. Check operation of footbrake, parking brake and clutch.
10. Check operation of windscreen wipers and washers.
11. Check condition of windscreen wiper blades.
12. Check battery electrolyte level (10 mm above plates) and security of terminals on all batteries. Check battery for cleanliness and security.
13. Check for oil, fuel and coolant leaks. Report any defects.
14. Check tyres and wheels, inflate if necessary. Inspect rims for damage.
15. Drain fuel sedimenters.
16. Drain flywheel housing.
17. Check air cleaner, remove, clean and install. If indicator shows "red" replace elements.

Table 3-4 Minor servicing (cont'd)

18. Check exhaust system for leaks, damage and security.
19. Check front shock absorbers for leaks, damage and security.
20. Inspect front and rear springs for damage.
21. Check oil level in front axle, top-up if necessary.
22. Check oil level in intermediate axle, top-up if necessary.
23. Check oil level in rear axle, top-up if necessary.
24. Check oil level in transmission, top-up if necessary.
25. Check oil level in transfer case, top-up if necessary.
26. Check oil level in swivel pin housings, top-up if necessary.
27. Check oil level in winch gearbox, top-up if necessary.
28. Check brake, fuel and clutch pipes for chafing, leaks or corrosion.
29. Check condition of fanbelts.
30. Check radiator coolant, top-up if necessary.
31. Check brake servo hose for security and condition.
32. Check steering damper for leaks.
33. Check brake fluid reservoir, top-up if necessary.
34. Check clutch fluid reservoir, top-up if necessary.
35. Lubricate pintle hook.
36. Lubricate parking brake mechanical linkage.
37. Lubricate accelerator control linkage and pedal pivot.
38. Lubricate water pump.
39. Lubricate all hinges.
40. Lubricate propeller shafts.
41. Lubricate winch propeller shafts and support bearings.
42. Lubricate winch dog-clutch.
43. Lubricate winch rope.
44. Lubricate fanbelt jockey pulley.
45. Check operation of spare wheel carrier.

Table 3-4 Minor servicing (cont'd)

46. Check security of additional equipment.
47. Check driving mirrors, door windows, hinges, catches and latches.

The following operations are to be performed by a Qualified Vehicle Mechanic:

48. Inspect front brake pads for wear, calipers for leaks and the condition of the discs.
49. Inspect the rear brake linings and drums for wear.
50. Inspect wheel cylinders for fluid leaks.
51. Adjust rear brakes.
52. Adjust parking brake.
53. Check condition and security of steering unit, joints and boots.
54. Clean fuel pump strainer.
55. Check and adjust fanbelt if necessary.
56. Check and adjust engine idle.
57. Check and adjust steering box.
58. Check and adjust headlights.
59. Check front wheel alignment.
*60. Drain and refill cooling system.

* Coolant to be changed at 10 000 km, then every two years.

Table 3-5 Major servicing

The following operations are to be performed by the driver under supervision:

1. Start and warm up engine.
2. Stop engine, drain engine oil and refill.
3. Remove and replace oil filters.
4. Check condition of engine mountings.
5. Check engine hand throttle and stop control for connections and operation.

Table 3-5 Major servicing (cont'd)

6. Check all lights and gauges for correct operation, report defects.
7. Check condition of radiator shroud and fins. Clean fins as necessary.
8. Retorque radiator hose connections.
9. Check operation of foot brake, hand brake and clutch.
10. Check operation of windscreen wipers and washers.
11. Check condition of windscreen wiper blades.
12. Check battery electrolyte level (10 mm above plates) and security of terminals on all batteries. Check for cleanliness and security.
13. Check for oil, fuel and coolant leaks. Report any defects.
14. Check tyres and wheels, inflate if necessary. Inspect rims for damage.
15. Drain fuel sedimenters.
16. Check air cleaners, remove, clean, and install. Fit new elements if indicators show "red".
17. Check exhaust system for leaks, damage and security.
18. Check front shock absorbers for leaks, damage and security.
19. Check front and rear springs for damage.

*20. Drain and refill front axle.

*21. Drain and refill intermediate axle.

*22. Drain and refill rear axle.

*23. Drain and refill swivel pin housings.

*24. Drain and refill transmission.

*25. Drain and refill transfer case.

*26. Drain and refill winch gearbox.

27. Check brake, fuel and clutch pipes for chafing, leaks or corrosion.
28. Check condition of fanbelts.
29. Check radiator coolant, top-up if necessary.
30. Check brake servo hose for security and condition.

Table 3-5 Major servicing (cont'd)

31. Check steering damper for leaks.
32. Check steering reservoir level, top-up if necessary.
33. Check brake fluid reservoir, top-up if necessary.
*34. Renew brake servo filter.
35. Check clutch fluid reservoir, top-up if necessary.
36. Lubricate pintle hook.
37. Lubricate parking brake mechanical linkage.
38. Lubricate accelerator control linkage and pedal pivot.
39. Lubricate all hinges.
40. Lubricate propeller shafts.
41. Lubricate winch propeller shafts and support bearings.
42. Lubricate winch dog-clutch.
43. Lubricate winch rope.
44. Lubricate fanbelt jockey pulley.
45. Check propeller shaft coupling bolts.
46. Check operation of spare wheel carrier.
47. Check security of additional equipment.
48. Check driving mirrors, door windows, hinges, catches and latches.

* Every second major service (40 000 km).

The following operations are to be performed by a Qualified Vehicle Mechanic:

49. Inspect front brake pads for wear, calipers for leaks and the condition of the discs.
50. Inspect the rear brake linings and drums for wear.
51. Inspect wheel cylinders for fluid leaks.
52. Adjust rear brakes.
53. Adjust parking brake.
54. Check condition and security of steering unit, joints and boots.

55. Clean fuel pump strainer.
56. Check and adjust fanbelts, if necessary.
57. Clean and spray test fuel injectors.
58. Clean and test glow plugs.
59. Check engine compression.
60. Clean engine breather filter.
61. Check and adjust engine idle.
62. Check and adjust steering box.
63. Check front wheel alignment.

Tyre pressure (cold)

Highway:

front	250 kPa (36 psi)
intermediate	350 kPa (50 psi)
rear	350 kPa (50 psi)

Cross-country:

front	200 kPa (29 psi)
intermediate	275 kPa (40 psi)
rear	275 kPa (40 psi)

Sand:

front	150 kPa (22 psi)
intermediate	225 kPa (33 psi)
rear	225 kPa (33 psi)

SECTION 2
LUBRICATION

319. Table 3-6 details the lubricants required for vehicle servicing. However, refer to EMEI VEH G 209 for the approved list of lubricants and servicing instructions.

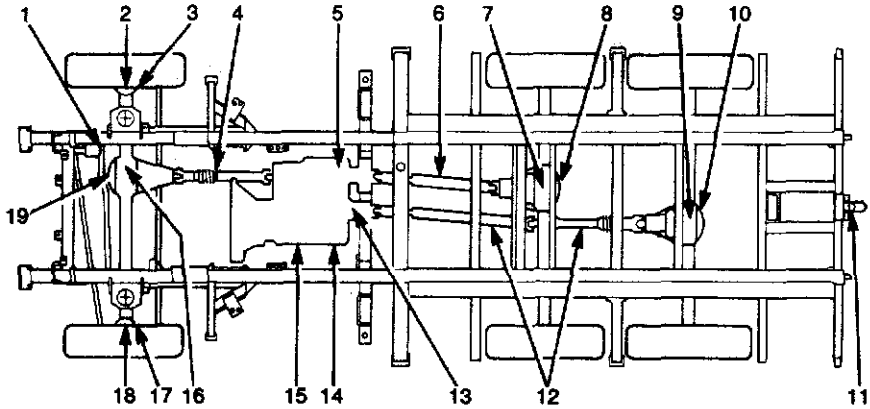
Table 3-6 List of Lubricants

Equipment	Lubricant	Capacity (litres)
Engine (including filters)	OMD-115	8.5
Transmission	OMD-115	2.7
Transfer Case (without PTO)	OMD-115	3.2
Transfer Case (with PTO)	OMD-115	5.8
Front Axle	OEP-220	1.7
Intermediate Axle	OEP-220	2.3
Rear Axle	OEP-220	2.7
Swivel Pin Housings	OEP-220	0.35 (each)
Brake Master Cylinder	OX (Aust) 8	Fill to level
Clutch Master Cylinder	OX (Aust) 8	Fill to level
Steering Box (including reservoir)	OX 46	1.25
Winch	OEP-220	2.1
Winch Rope	ZX-8	As required
Chassis Lubrication	XG-274	As required
Wheel Bearings	XG-274	As required
Fanbelt Jockey Pulley	XG-274	As required
Air-conditioner	Freon	As required

320. Fig. 3-3 illustrates the location of various lubrication and oil drainage/refill points around the vehicle.

NOTE

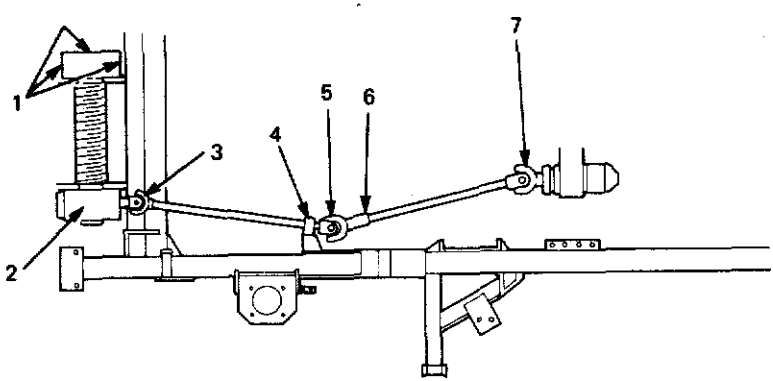
Run the engine or drive the vehicle as appropriate to warm oils before draining.



1. Power steering reservoir
2. Right hand swivel pin housing drain plug
3. Right hand swivel pin housing fill plug
4. Front propeller shaft grease nipples
5. Transfer case drain plug
6. Intermediate propeller shaft grease nipples
7. Intermediate axle drain plug
8. Intermediate axle fill plug
9. Rear axle drain plug
10. Rear axle fill plug
11. Pintle
12. Rear propeller shaft
13. Transfer case fill plug
14. Transmission fill plug
15. Transmission drain plug
16. Front axle drain plug
17. Left hand swivel pin housing fill plug
18. Left hand swivel pin housing drain plug
19. Front axle fill plug

Figure 3-3 Lubrication and oil drain/refill points

321. Fig. 3-4 illustrates the location of lubrication and oil drainage/refill points on the winch and winch drive line.



1. Winch grease points
2. Winch drain and fill plugs
3. Universal joint grease nipple
4. Pillow block bearing grease nipple
5. Universal joint grease nipple
6. Slip joint grease nipple
7. Universal joint grease nipple

Figure 3-4 Winch and winch drive line

Engine oil and oil filter change procedure

322. Run the engine until the engine coolant reaches normal operating temperature then shut down the engine. Remove the engine oil pan drain plug (see Fig. 3-5) and drain the oil into a suitable receptacle before the engine cools. Fit a new sealing washer on the drain plug and install the drain plug.

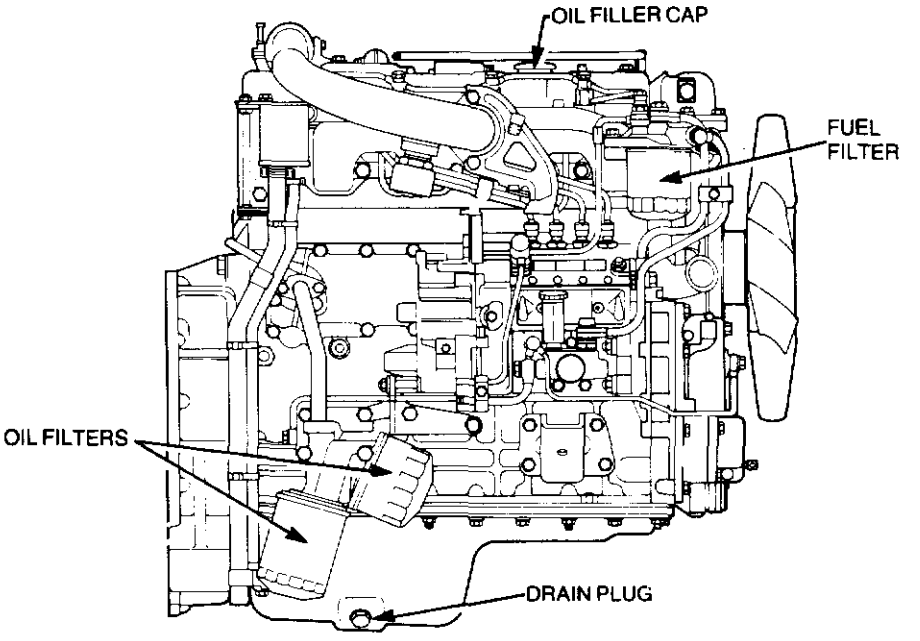


Figure 3-5 Engine — right hand side

323. Unscrew each oil filter cartridge counter-clockwise, using a suitable oil filter removing tool if necessary (see Fig. 3-6). Apply a film of clean engine oil on the rubber seal of each new filter cartridge and install each filter. After the filter seal contacts the adapter, tighten the filter a further half a turn by hand only.

324. Fill the engine with the correct quantity of the recommended lubricant. Do not overfill. Check the level on the dipstick, then run the engine for about five minutes. Stop the engine and check the oil level on the dipstick. Add additional oil as required and check for leaks at the filters.

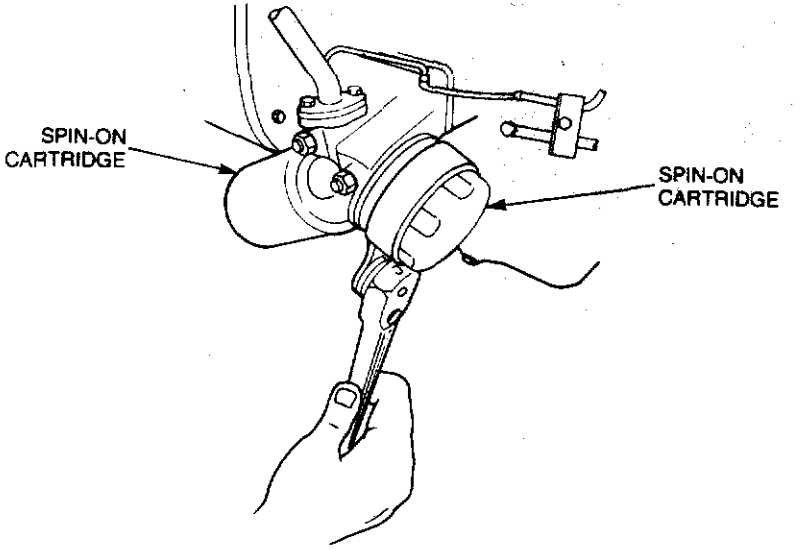


Figure 3-6 Oil filter removal

Transmission

325. The transmission drain plug is located on the left hand side of the transmission. Behind the drain plug is a filter which should be washed in clean fuel each time the transmission oil is drained. Allow the filter to dry completely before installing. Remove and wash the magnetic plug and remove all metallic particles. Install the plug.

326. The transmission fill plug is adjacent to the drain plug (see Fig. 3-7). Fill the transmission with the recommended lubricant to the bottom of the fill hole.

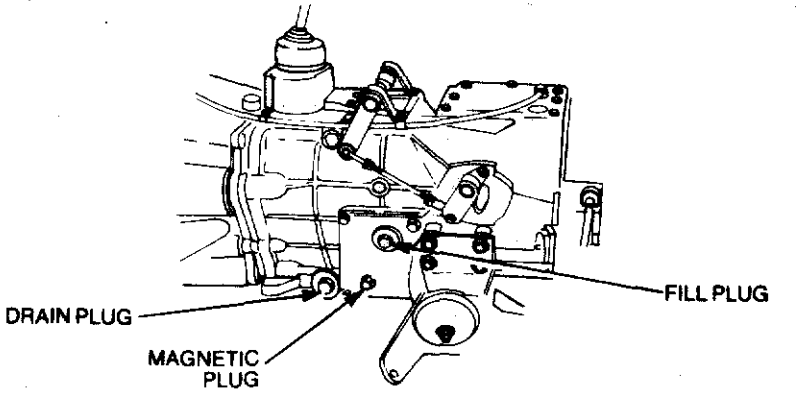


Figure 3-7 Transmission drain and fill plugs

Transfer case

327. The transfer case drain plug is located in the bottom of the PTO housing (see Fig. 3-8). The plug should be cleaned each time the transfer case oil is drained. Use a new sealing washer on installation.

328. The transfer case fill plug is located on the rear of the housing (see Fig. 3-8). Fill the transfer case with the recommended lubricant to the bottom of the fill hole.

329. Ensure that the transfer case breather is not restricted.

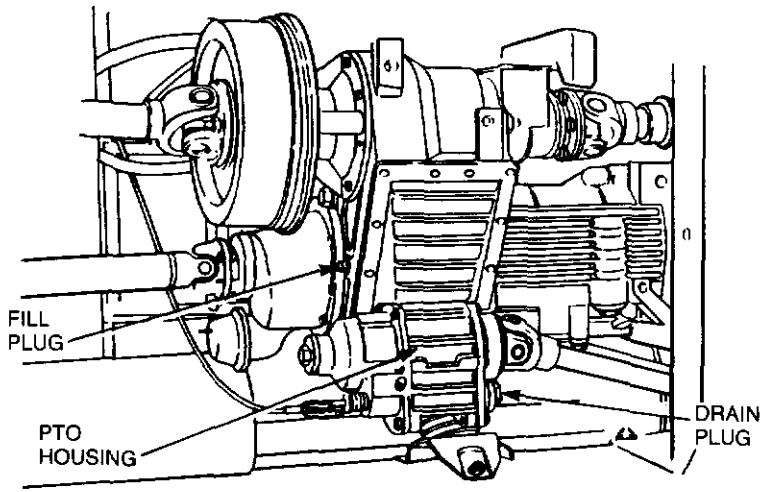


Figure 3-8 Transfer case drain and fill plugs

Intermediate axle

330. The drain plug is located on the bottom of the housing, while the fill plug is located on the rear cover (see Fig. 3-9). Fill the differential with the recommended lubricant to the bottom of the fill hole.

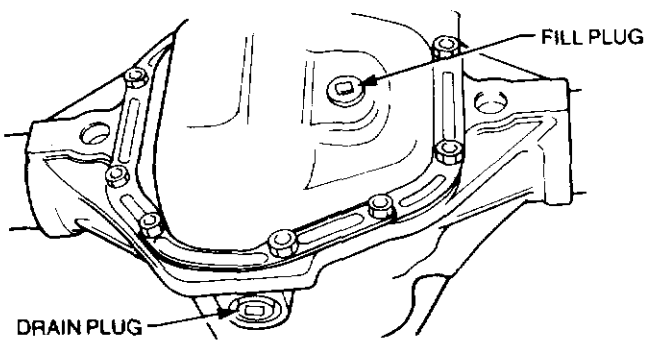


Figure 3-9 Intermediate axle drain and fill plugs

Rear axle

331. The drain plug is located on the bottom of the housing, while the fill plug is located on the rear cover (see Fig. 3-10). Fill the differential with the recommended lubricant to the bottom of the fill hole.

332. Ensure that the rear axle breather is not restricted.

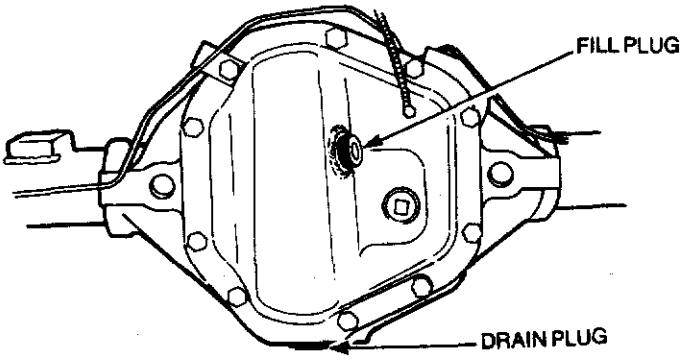


Figure 3-10 Rear axle drain and fill plugs

Front axle

333. The drain plug is located on the bottom of the housing, while the fill plug is located on the front of the housing. Fill the differential with the recommended lubricant to the bottom of the fill hole.

334. Ensure that the front axle breather is not restricted.

Steering reservoir/box

335. The steering reservoir/box are filled by removing the cap on top of the reservoir and filling the reservoir to the prescribed mark on the dipstick. No drain plug is fitted.

Swivel pin housings

336. The location of the drain plug and the fill plug is shown in Fig. 3-11. To drain the swivel pin housing, remove both the fill and drain plugs and drain the oil into a suitable receptacle. Fill the swivel pin housing with the recommended lubricant to the bottom of the fill plug.

Propeller shafts

337. The propeller shafts are each fitted with a grease nipple (see Fig. 3-3 items 4 and 6) and lubrication is required each service.

Towing pintle

338. The towing pintle is fitted with one grease nipple and lubrication is required each service.

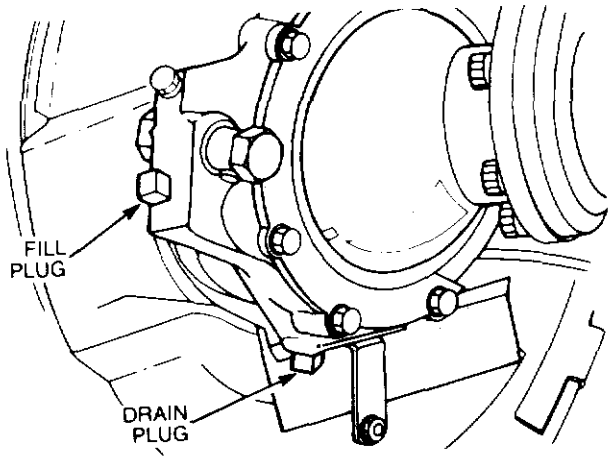


Figure 3-11 Swivel pin housing drain and fill plugs

Fuel filter

339. Place a suitable container beneath the fuel filter, then, using a suitable filter-removing tool, remove the filter (see Fig. 3-12). Remove the filter rubber seal from the cover. Smear clean fuel on the rubber seal of a new filter and install the new filter on the cover. Tighten the filter by hand until the rubber seal touches the cover face, then tighten a further half a turn. Bleed the fuel system as detailed in Chapter 3 Section 1.

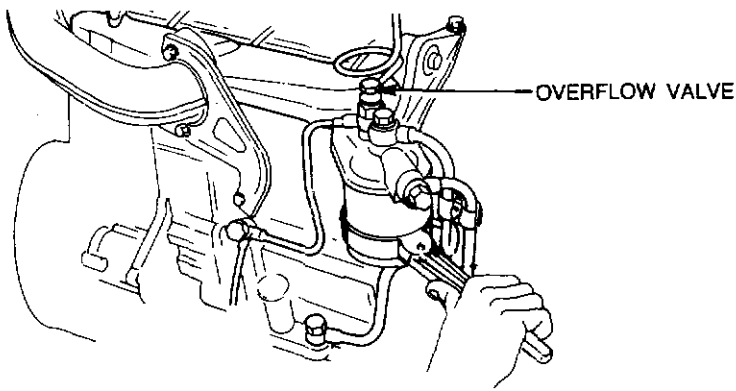


Figure 3-12 Fuel filter

Fuel sedimenters

340. Two fuel sedimenters, are located on the cabin rear crossmember forward of the rear spring mounting. A drain plug is fitted to allow the contents to be drained (see Fig. 3-13). Bleed the fuel system as detailed in Chapter 3 Section 1.

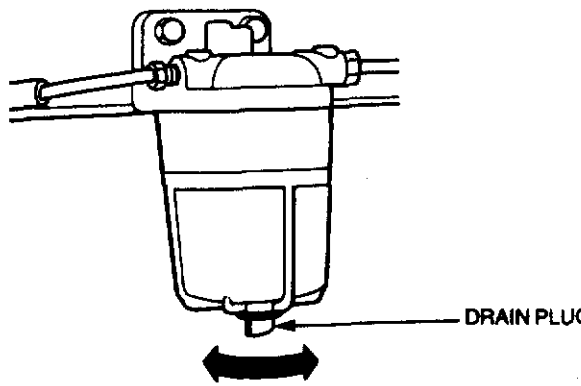


Figure 3-13 Fuel sedimenter

Air cleaner

341. The air cleaner elements will require cleaning or replacement when the signal indicator shows red. To clean or replace the air cleaner elements, proceed as follows:

a. Remove the hose clamps securing the air inlet and outlet hoses to the air cleaner housing (see Fig. 3-14) then remove the two wing nuts from the clamp bolts. Carefully lift the air cleaner out of the mounting brackets.

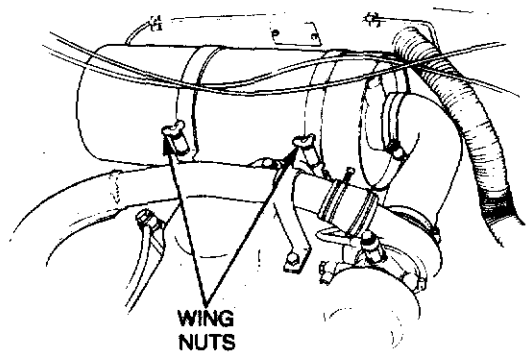


Figure 3-14 Air cleaner removal

b. Remove the wing nuts securing the end cover and elements.

c. Wipe out the air cleaner housing with a clean damp cloth. Remove and clean the dust valve (see Fig. 3-15).

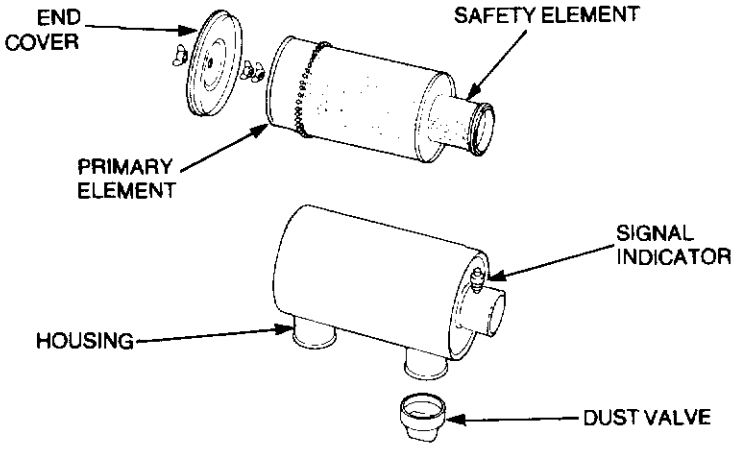


Figure 3-15 Air cleaner elements

d. Clean or discard the primary element. If the element is to be cleaned, this can be achieved with compressed air or washing with a non-sudsing general purpose detergent (see EMEI VEH A 591-1). If washing, ensure that the element is dry before installing. Do not clean the safety element.

e. Install and secure the new or cleaned element, then secure the end cover.

f. Install the air cleaner assembly and connect the air inlet and outlet hoses. Secure the hose clamps and tighten the wing nuts.

g. Depress the reset button on the signal indicator to enable the red signal to be released.

Brake reservoir

342. Check the fluid level in the brake reservoir against the level marked on the reservoir. If necessary, remove the reservoir top and top-up with clean brake fluid OX (Aust) 8. See Fig. 3-16 for reservoir location.

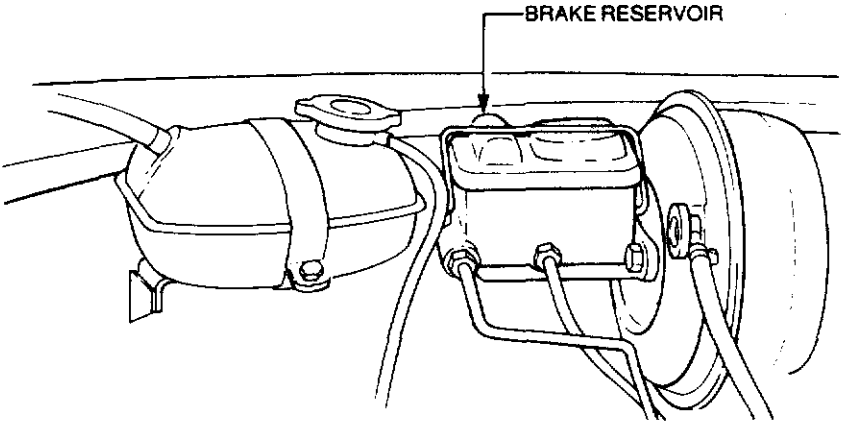


Figure 3-16 Brake reservoir

Clutch reservoir

343. Remove the reservoir cap and check that the fluid level in the clutch reservoir is up to the bottom of the filler neck. If necessary, top-up with clean brake fluid OX (Aust) 8. See Fig. 3-17 for reservoir location.

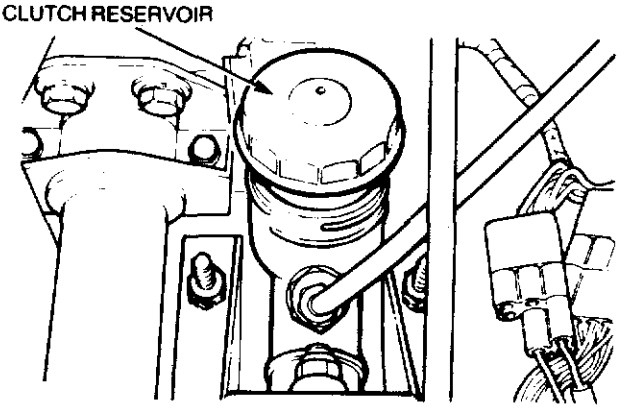


Figure 3-17 Clutch reservoir

Winch

344. Remove the winch gearbox fill plug (see Fig. 3-18) and check that the oil level is up to the bottom of the fill plug. Top-up if necessary.

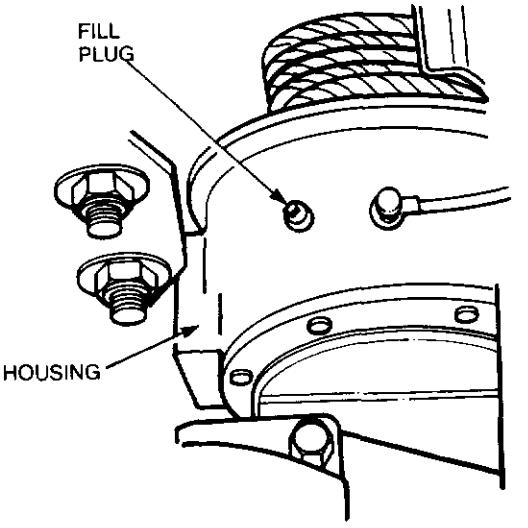


Figure 3-18 Winch fill plug

345. The winch drive line is fitted with three grease nipples which require lubrication each service.

WARNING

Always wear industrial gloves when handling steel wire rope. Do not use the hands to guide the rope on or off the drum when winching.

346. The winch rope should be pulled out, checked, cleaned and greased at every service. Ensure that a load is maintained on the winch rope when rewinding.

347. To drain the winch gearbox, remove the fill plug, then remove the drain plug which is located on the bottom of the gearbox housing. Drain the oil into a suitable container, then clean and install the drain plug. Top-up the gearbox with clean oil to the bottom of the fill plug hole, then install the fill plug.

348. Ensure that the winch breather is not restricted.

Fanbelt jockey pulley

349. The 24 volt alternator fanbelt jockey pulley is fitted with one grease nipple and requires lubrication at each service (see Fig. 3-19).

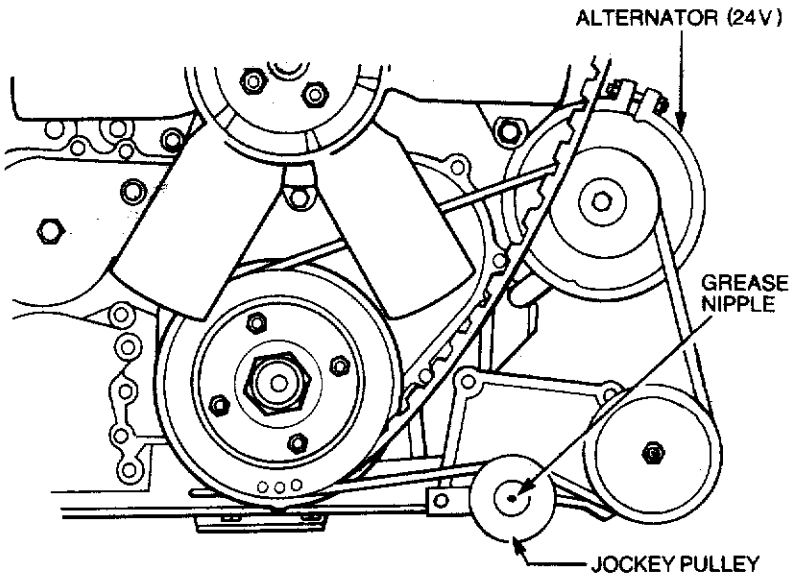


Figure 3-19 Jockey pulley lubrication

CHAPTER 4

AMBULANCE MODULE GENERAL DESCRIPTION

SECTION 1 — EQUIPMENT DESCRIPTION

SECTION 2 — EQUIPMENT OPERATING INSTRUCTIONS

SECTION 3 — EQUIPMENT MAINTENANCE

SECTION 1
EQUIPMENT DESCRIPTION

Introduction

401. The ambulance module is a self contained unit which is mounted on the chassis of the truck cargo, light, FFR, winch, MC2 in place of the cargo tray. The module is of a steel frame fibreglass sandwich construction which can be mounted on the truck, cargo, light, FFR, winch, MC2 by two tradesmen in a fully equipped workshop in three days.

Operational and logistic concepts

402. This module can accommodate (as well as the medical assistant) up to four litter casualties or up to eight seated casualties. The ambulance has the ability to evacuate casualties from the point of wounding or from field medical facilities in the evacuation chain. Medical equipment and supplies are stowed within the module in positions readily accessed by the medical assistant.

Ventilation and heating systems

403. A high capacity air conditioning system is fitted to the module as follows:

a. The air conditioning compressor is fitted in the vehicle's engine bay and is driven by the engine.

b. An AMC model RM2010 high capacity, fan assisted condenser unit is mounted on and recessed into the roof line of the module.

c. Mounted in the module in the front bulkhead is an AMC model CM2000 evaporator unit capable of offering effective cooling and high air flow for casualty comfort. Four adjustable louvres plus two round vents allow for air distribution within the module.

d. A separate AMC model UHD-2, three speed fan assisted recirculating heater is mounted in the left rear floor well of the module. Heat is supplied by the engine's cooling system and is controlled by a valve opening or closing of the hot water flow.

Lighting, electrical systems and controls

404. Air conditioning and heater controls

The controls for the air-conditioning system are mounted above the medical assistants seat on the bulkhead evaporator. Heater fan controls are on the main switch panel located on the right wall of the module adjacent to the medical assistants seat. The heater control valve is operated by a push/pull cable located on the left hand side of the vehicle near the base of the medical assistants seat in the footwell.

405. Individual litter lights and switches

Switches to control the litter lights at the head of each litter are located on the wall forward of the upper litter light (see Fig. 4-1) on each side of the module.

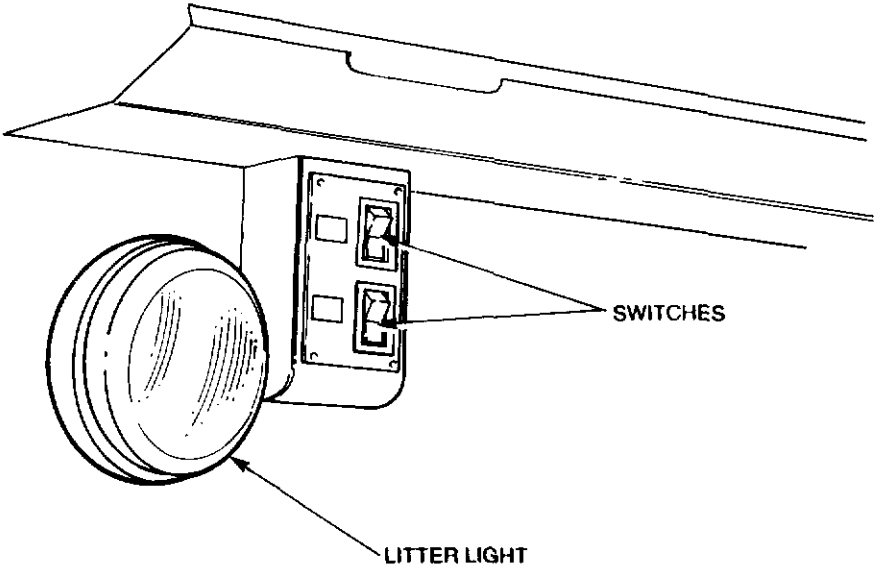


Figure 4-1 Litter light switches

406. Casualty observation stalk lights

An adjustable stalk light is mounted centrally above each litter and is switched on and off by rotating the light hood, these lights still operate in blackout mode.

407. Module interior ceiling lights (clear)

Four dome lights are mounted on the module ceiling to provide interior illumination, and are controlled by a neon piloted rocker switch

located on the main switch panel on the right wall of the module adjacent to the medical assistants seat, and a switch adjacent to the rear door.

408. Blackout function — module

A rocker switch on the main switch panel adjacent to the medical assistants seat and a rocker switch on the secondary panel located adjacent to the rear door control the blackout mode. When operated, the red ceiling lights are illuminated, while the power supply to the external scan lights, litter lights and the clear ceiling lights is isolated. However, power supply is still available for the casualty observation lights, 12 volt power outlet and the suction pump.

409. Module interior low power lights

The low power lights are incorporated in the two forward mounted ceiling lights, and are operated by a switch adjacent to each ceiling light.

410. High level reversing lights

Two clear exterior lights are mounted on the door (see Fig. 4-2) and are controlled by the vehicles 12 volt lighting circuit as reversing lights.

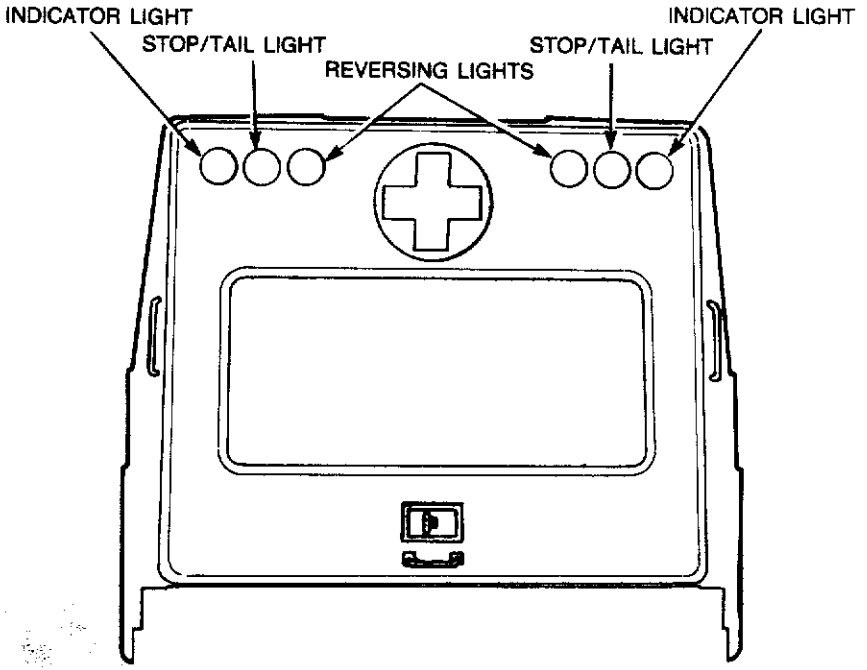


Figure 4-2 Rear door lights

411. High level indicator lights

Two amber lensed lights are mounted on the upper section of the door (see Fig. 4-2) and work in conjunction with the vehicles 12 volt lighting circuit to act as high level indicator lights.

412. High level stop, tail and warning lights

Two red lensed lights are mounted on the upper section of the door (see Fig. 4-2), and work in conjunction with the vehicles 12 volt lighting circuit to act as high level stop and tail lights. These lights also flash in unison with the beacon lamps and operate off the vehicles 24 volt system using seperate globes.

413. Main switch panel

The main switch panel is located on the right wall of the module adjacent to the medical assistants seat (see Fig. 4-3) providing control over the following:

a. ceiling lights, clear (neon piloted two way rocker switch),
b. master interior lights (neon piloted two way rocker switch),
c. blackout lights (neon piloted two way rocker switch),
d. recirculating heater (4 position rotary switch), and
e. suction equipment (neon piloted rocker switch).

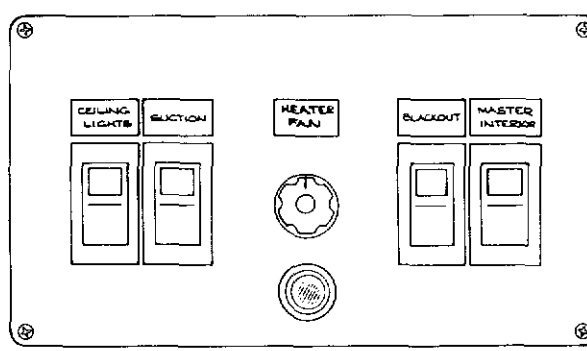


Figure 4-3 Main switch panel

414. Secondary switch panel

The secondary switch panel is located on the right hand wall adjacent to the door (see Fig. 4-4), providing control over the following:

a. right hand scan light (neon piloted rocker switch),
b. left hand scan light (neon piloted rocker switch),
c. rear loading lights (neon piloted rocker switch),

d. ceiling lights, clear (neon piloted two way rocker switch),
e. master interior (neon piloted two way rocker switch), and
f. blackout (neon piloted two way rocker switch).

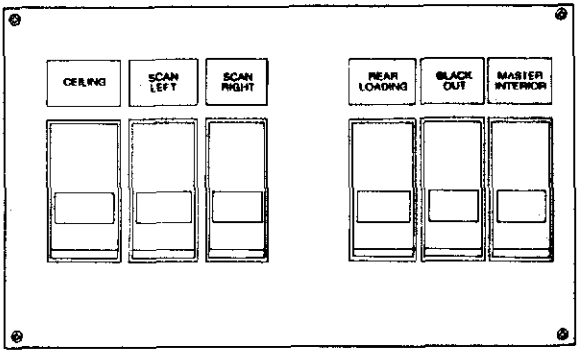


Figure 4-4 Secondary switch panel

415. Rear loading lights

Two interior rear door mounted lights which act as loading lights are controlled by a neon piloted switch (see Fig. 4-4), located on the secondary switch panel at the right hand rear of the module adjacent to the rear door.

416. Scan lights

Two exterior scan lights, one on each side of the module are individually controlled by neon piloted rocker switches (see Fig. 4-4), located on the secondary switch panel adjacent to the rear door. These lights are recessed into the sides of the module and protected by a guard.

417. Fuses

Lifting the fuse box cover allows access to the fuses. The location of each fuse is as shown in Fig. 4-5.

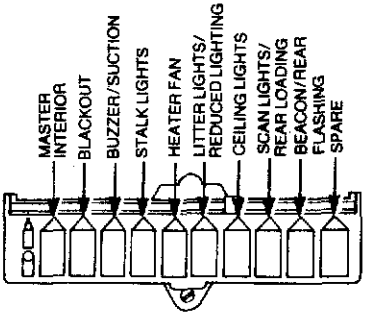


Figure 4-5 Fuses

418. Relays

Relays are mounted in the master switch box as shown in Fig. 4-6.

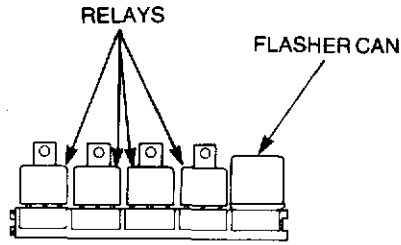


Figure 4-6 Relays

419. The exterior rear lamps are controlled from within the drivers cabin, and are extinguished in the reduced or blackout mode.

420. Master switch

A two way interior master switch is located on the secondary switch panel, while a second switch is provided on the main switch panel. Either of these switches will extinguish all interior lights and isolate the module 12 and 24 volt power supply.

421. 12 volt power supply

Adjacent to the medical assistants seat on the left hand interior is a 12 volt 2-pin power socket (on the face of the soiled linen bin).

Ambulance module fittings

422. Module construction

The module consists of welded galvabond steel tube framing which is covered by a fibreglass outer skin bonded to the frame. The inner panelling consists of two fibreglass shells that are positioned in the module and secured to the frame to form a fibreglass (urethane foam) sandwich.

423. Rear door

WARNING

The manual locking device fitted to the rear door struts, to prevent accidental closure, must be utilised to support the door when open fully and released prior to closing the door.

A full width rear door manufactured from fibreglass, bonded to a galvabond frame provides access to the module for the loading and unloading of casualties and has the following features:

a. A large push in/out emergency exit/access window manufactured from clear plastic panel which can be covered internally by a heavy duty blackout curtain.

b. A rubber sealing ring door seal to guard against the ingress of dust or water.

c. Two heavy duty gas struts, with both struts having a manual locking device to support the door in a near horizontal position and to prevent against accidental closure.

d. Dual slam-latches are provided for the rear door and non-locking, tee-latch release handles are provided internally and externally. A pivoting pull down handle is fitted internally to the rear door.

424. Communications opening

Located in the front of the module in line with the cabin rear sliding window is a flexible membrane connecting the cabin and module opening to allow for communication between the driver and medical assistant. The membrane prevents the ingress of dust and water into the cabin or module. A heavy duty roll up blackout curtain is fitted to the inside of the module opening.

425. Exhaust vents

Two exhaust vents are located on the module roof and are semi-recessed into the rear of the roof panel. Rotating shut-off controls are fitted to the ceiling, with ducting between the two, sealing the roof cavity. Two flap style air ventilators are fitted to the roof of the module adjacent to the forward mounted ceiling lights.

426. Grab handles

Grab handles are located externally on each side of the door opening to assist as a hand hold when entering the module.

427. Pull down rail

Fitted to the inside of the door is a pull down pivoting rail to assist in closing the door.

428. Lifting handle

A lifting handle is fitted on the external lower edge of the door.

429. Rear step

Located centrally at the rear of the vehicle is a hinged step (see Fig. 4-7), which when swung down gives access to the module. When closed (in the up position) provides a weather seal to the footwell area of the module. The step is held in the closed position by a slam latch which is released by a rod on the step within the footwell.

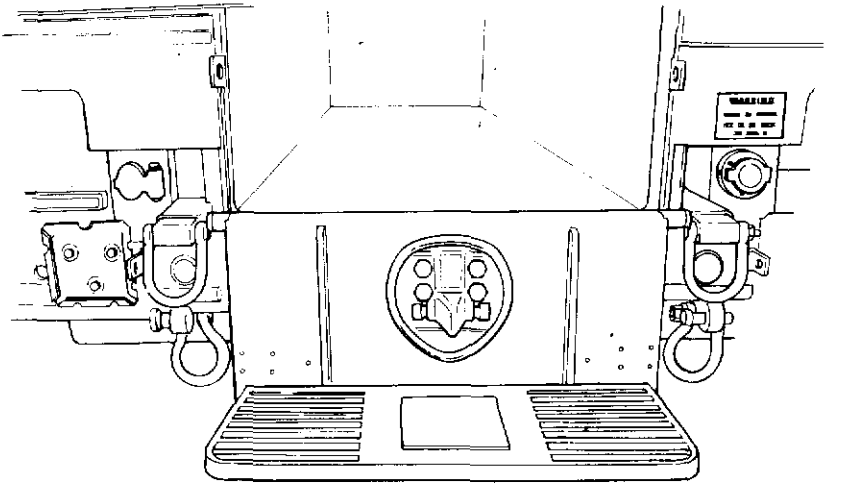


Figure 4-7 Rear step

Module interior layout

430. Seat/lower litter location (Fig. 4-10 item 1)

Bench style seating is provided on both sides of the module for four sitting casualties. Runners are positioned along the front and rear of each seat cushion to accept a standard NATO litter when required.

431. Seat belts (Fig. 4-10 item 2)

Inertia reel lap seat belts are fitted for each seated casualty, and also provided for the medical assistants seat.

432. Seat backrests (Fig. 4-10 item 3)

Back rests are provided in the module which can be lowered to allow for access to the stowage area behind each bench seat. Provision is made for all four litters to be stowed behind the seat on one side of the module while on the other side, stowage for casualties personal equipment, weapons or additional litters is provided.

433. Upper litter support (Fig. 4-10 item 4)

Mounted on each side of the module is a litter support that is normally secured in a raised travelling position when not in use. The litter support when required for use is unlatched and secured in position to accept a standard NATO litter.

434. Stowage locker (Fig. 4-10 item 5)

An open face locker is provided along each side of the module at the roof line to allow for the stowage of Thomas leg splints, medical equipment or spare blankets. Adjustable straps are fitted to secure equipment in position.

435. Water containers (Fig. 4-10 item 6)

Forward of each stowage locker, is a shelf provided to support and secure two insulated drink containers, easy wipe towels and a dispenser for paper drinking cups.

436. Main medical supplies locker (Fig. 4-10 item 7)

A stowage locker is provided at the front of the module on each side to allow for the stowage of the ambulance's main medical stores. These lockers extend from floor to ceiling, with the lower portion being accessible from the exterior of the module. Midway down each locker an open shelf is provided for the mounting of oxygen therapy and suction equipment. Each shelf has two wall mounted oxygen outlets, providing oxygen to each litter group for use with resuscitators, demand valves, masks, and catheters.

437. Resusitator and inhilator (Fig. 4-10 item 8)

Mounted under the left medical supplies locker is a resusitator and inhilator unit. The unit is secured in a clip attached to the locker with oxygen being supplied via a rubber hose.

438. Resuscitator flow and oxygen therapy controls (Fig. 4-10 item 9)

The control box for the resuscitator and therapy controls is mounted to the module wall directly above the oxygen therapy and suction shelf in the left hand medical supplies locker.

439. Soiled linen bin/suction pump (Fig. 4-10 item 10)

The soiled linen bin is located in the lower portion of the left main medical supplies locker and is fully lined to allow for easy cleaning. Mounted in this bin is a 12 volt suction pump stepped down from a 24 volt power supply. Rigid lines provide suction to two wall mounted inlets and line filters, one each fitted to the rear edge of the lower portion of the main medical supplies lockers. Flexible lines are used to connect the inlets to suction bottles with integral check valves.

440. Air conditioner evaporator (Fig. 4-10 item 11)

Mounted above the communications opening is the air-conditioner evaporator which is used to cool and circulate air through the module.

441. Oxy viva (Fig. 4-10 item 12)

An oxy viva resuscitator unit is located in the right hand lower portion of the main medical supplies locker mounted on a bracket fitted with a quick release latch. The oxy viva is accessible via the interior and exterior of the module.

442. Fire extinguisher (Fig. 4-10 item 13)

A 1.5 kg BCF fire extinguisher is fitted in the right hand lower portion of the main medical supplies locker mounted on a bracket fitted with a quick release latch. The extinguisher is accessible via the interior and exterior of the module.

443. "C" sized oxygen cylinder brackets (Fig. 4-10 item 14)

Mounted to the rear door end of each bench seat base is a bracket for the storage of a "C" sized oxygen bottle.

444. Suction bottles (Fig. 4-10 item 15)

Mounted on the rear edge of the lower portion of the main medical supply lockers is a suction bottle fitted with M346 suction bung tops and check valves. The bottles are supported in cradles and connected via flexible lines to suction inlets (see Fig. 4-8).

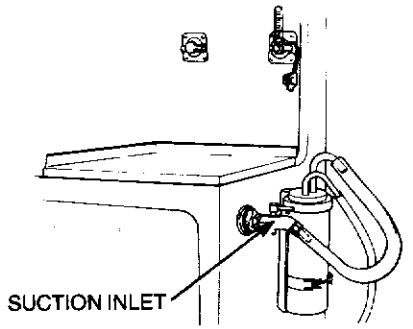


Figure 4-8 Stop cock

445. Tumble out bins (Fig. 4-10 item 16)

Four tumble out bins are located in the module (three on the right side and one on the left side) of the centre floorwell secured in a closed position by latches. When opened the bins are supported by stops to allow access to the medical stores located within.

446. Medical assistants seat (Fig. 4-10 item 17)

Centrally located in the forward section of the module, is a seat provided for the medical assistant. The seat cushion is hinged to allow for access to the locker beneath the seat for the stowage of the bedpan and foot operated suction pump. The backrest is also hinged to allow for access to the three "D" sized cylinders located behind the seat (see Fig. 4-9) A removable headrest is fitted to the seat.

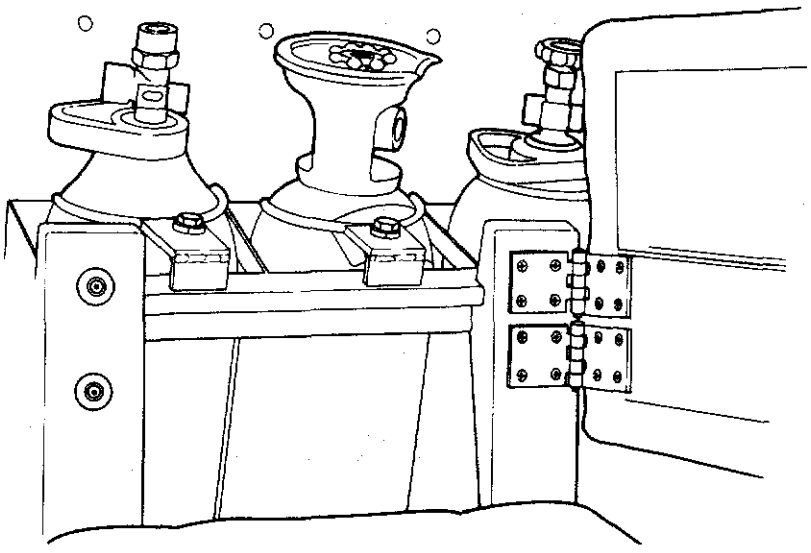


Figure 4-9 "D" sized cylinders

447. Body waste disposal hatch (Fig. 4-10 item 18)

A body waste disposal hatch is located in the floor of the module for use in extreme circumstances.

448. Physicians satchel (Fig. 4-10 item 19)

Located to the left of the medical assistants seat is the physicians satchel complete with medical equipment as detailed in the SCES.

449. Recirculating heater (Fig. 4-10 item 20)

A three speed fan assisted heater is located on the rear left hand floor well to supply heating to the casualty compartment by recirculating internal air. Heat is supplied via the engine's cooling system and is controlled by a valve opening or closing the hot water flow. The heater fan control is located on the main switch panel adjacent to the medical assistants seat. The heater air inlets and outlets are guarded against obstruction of the air flow.

450. Clock (Fig. 4-10 item 21)

Mounted on the left hand medical supplies locker is a battery powered clock.

451. Infusion sets suspension hooks

Six hooks, three for each litter group are mounted to the ceiling of the module. The carabina style hooks on brackets are capable of being folded and clipped against the ceiling. The hooks are designed to support intravenous bottles or bags.

452. Blackout curtains

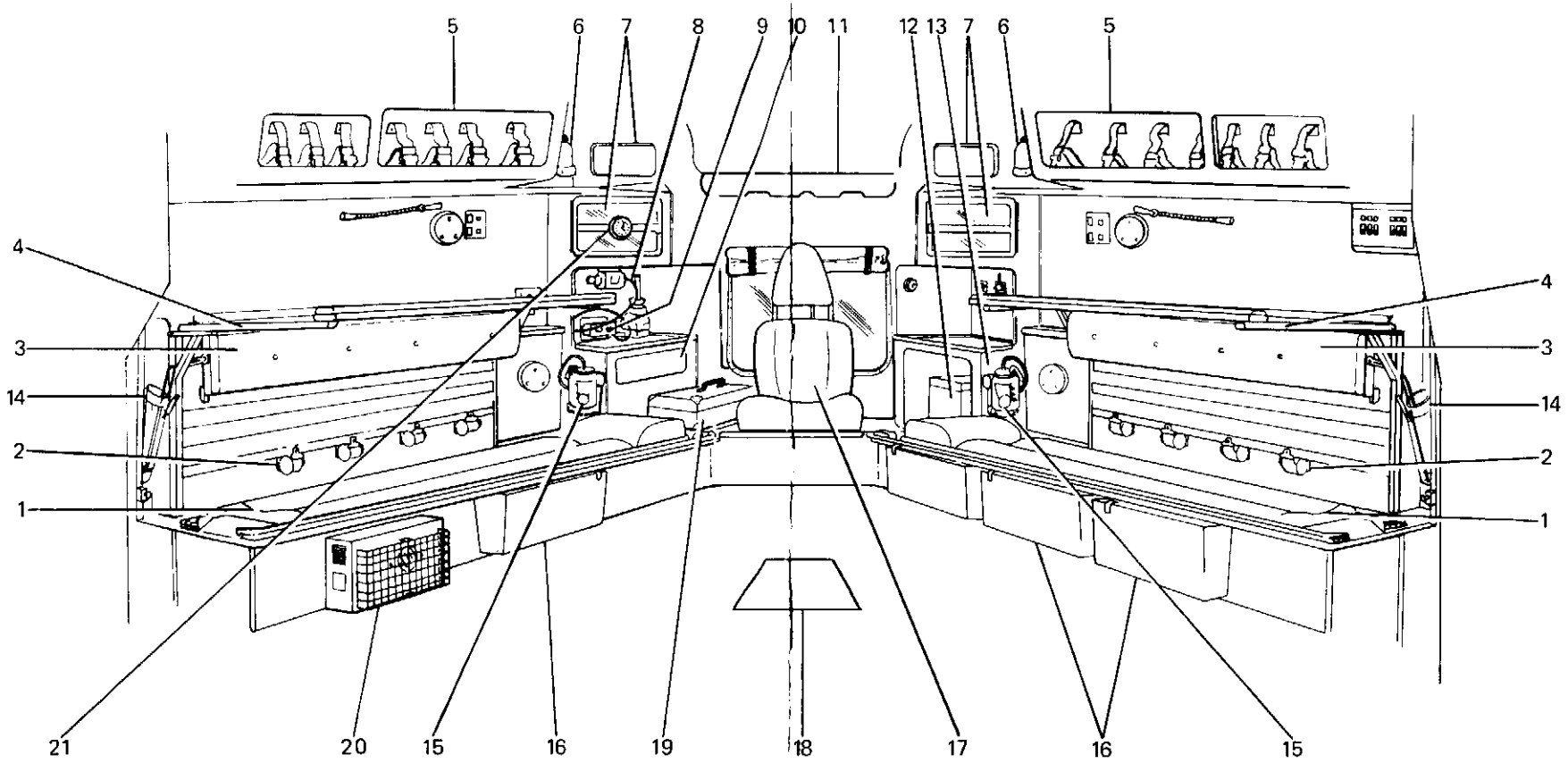
Blackout curtains are fitted to the rear window and to the communications opening to prevent the emission of light from the module.

453. Oxygen lines

A flexible hose and hand wheel assembly is connected to a pressure regulator, which is fitted to the oxygen bottle. The hose is then connected to a wall mounted inlet fitting to supply oxygen through tubing to the two outlets located above each oxygen therapy and suction shelf at the head of each litter group.

454. Communications switch

Centrally mounted on the ceiling of the module is a touch sensitive continuous strip switch, that when activated by placing pressure on the strip causes a warning buzzer to sound in the drivers cabin.



1. Seat lower litter location
2. Seat belt
3. Seat backrest
4. Upper litter support
5. Stowage locker
6. Water containers
7. Main medical supplies locker
8. Resucitator and inhilator
9. Resuscitator flow and oxygen therapy controls
10. Soiled linen bin/suction pump
11. Air conditioner evaporator
12. Oxy viva
13. Fire extinguisher
14. "C" sized oxygen cylinder brackets
15. Suction bottles
16. Tumble out bins
17. Medical assistants seat
18. Body waste disposal hatch
19. Physicians satchel
20. Recirculating heater
21. Clock

Figure 4-10 Module interior view

SECTION 2
EQUIPMENT OPERATING INSTRUCTIONS

General

455. Correct loading procedures of casualties and operation of the ambulance module's non-medical equipment is essential to ensure the most efficient and comfortable evacuation of casualties.

Casualty loading configurations

456. Accommodation is provided in the module for a medical assistant plus up to four litter or eight sitting casualties.

Casualty loading priorities

457. The loading priorities of casualties will normally depend on the number of casualties, the extent of injuries, and the discretion of the medical assistant after he has assessed the situation. Loading priorities are as follows:

a. the least priority litter casualty is loaded first, on the left side,
b. top litters are filled first,
c. the highest priority litter casualty is last on, and is loaded on the bottom left, and
d. sitting casualties occupy the bench seats provided.

NATO litters

NOTE

Ensure that the backrest is locked when in the raised position.

458. To remove and gain access to the NATO litters, release the latches at each end of the backrest then lower. Firmly return the backrest to the latched position after removal of the NATO litters.

459. Adjustable backrests are provided for the comfort of seated casualties and to provide clearance for lower litter casualties. For seated casualties the backrest is swung into position by releasing the catch at the top centre of the backrest. For transport of lower litter

casualties the backrest is swung away by lifting the latching bar (see Fig. 4-11) located behind the backrest, then pushed to a latched position.

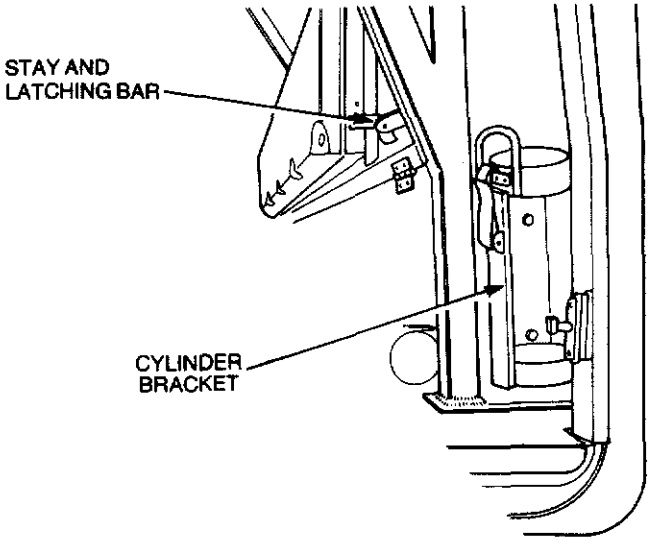


Figure 4-11 Backrest stay

Loading of lower litter casualties

460. Push the litter on the guide rail until it is safely against the stops and secured in the transport position.

NOTE

The loading of upper litter casualties requires three personnel. Two personnel are required to lift the head end of the litter onto the guide or load assist rails and then to assist the third person at the foot end to push the litter into the transport position inside the module. Ensure that it is safely locked for transport.

Loading of upper litter casualties

WARNING

Ensure that the upper litter rails are lowered under control to prevent personal injury.

461. To load a litter on the upper litter rails, support the rails and release the latches securing the rails to the overhead stowage lockers (see Fig. 4-12), then release the safety strap and lower the rails into position. Release the locks at the centre of the litter (nearest to the centre line of the module), then slide the rail assembly toward the walkway.

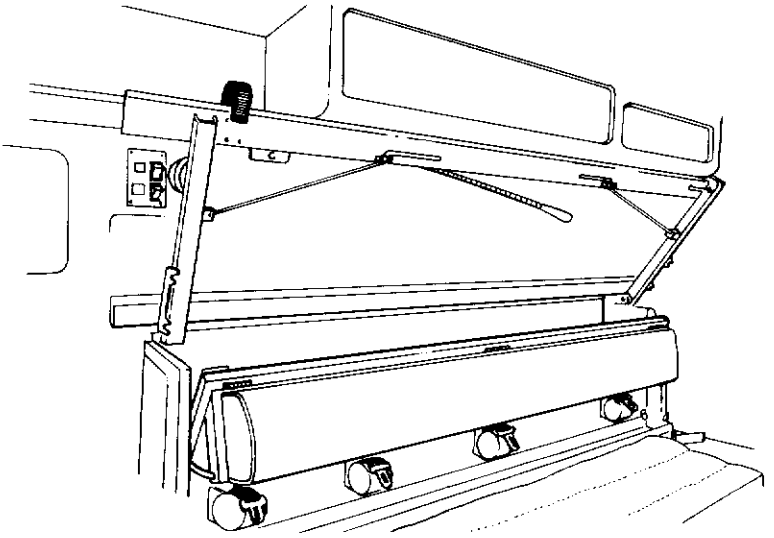


Figure 4-12 Upper litter rails — travelling position

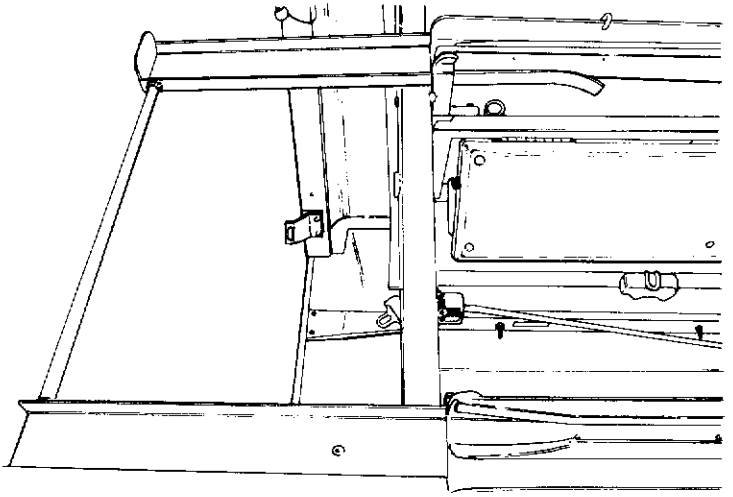


Figure 4-13 Loading assist rails

462. Extend the loading assist rails out and downward from the ends (rear) of the litter rails (see Fig. 4-13), then lift the litter until the front ferrules of the litter are positioned on the loading assist rails. Push and guide the litter onto the litter rails and ensure that the front ferrules are locked in the transport position, then lift and push the loading assist rail back under the litter rails. After the litter is loaded push the litter and rails, as a unit, toward the module sidewalls to the latching or transport position.

SECTION 3
EQUIPMENT MAINTENANCE

General maintenance

463. All door hinges, gas stay ball ends, support slides and pivots and the litter/loading assist rails are to be lubricated weekly by applying a light application of dry film spray.

Cleaning

464. Cleaning of medical equipment and shelves/cupboards used to stow medical equipment or supplies is to be carried out using a 50 per cent solution of hibitane and water. Wet dust the area to be cleaned with the solution, then using a dry clean cloth remove any cleaning residue remaining.

465. The interior of the module is to be cleaned using a mop and bucket to clean the floor and bench seats. All other surfaces should be cleaned with a damp cloth and dried.

466. After use, the suction bottles are to be cleaned in a suitable sterilizer unit.

467. Medical instruments that have been used are to be cleaned in a suitable sterilizer unit.

Changing oxygen bottles

468. To change the cylinder regulator from an empty bottle to a full one, proceed as follows:

a. Using the key provided close the shut-off valve on the empty bottle.

b. Release the pressure from the regulator diaphragms by turning the adjusting knob in a counter-clockwise direction.

c. Using a suitable wrench loosen the nut securing the regulator to the bottle and remove the regulator.

d. Secure the regulator in position on the new bottle, then using the key provided open the shut-off valve. Adjust the regulator to the required pressure by turning the adjusting knob in a clockwise direction.

Medical stores

469. All expendable medical stores are to be checked monthly by a medical assistant to ensure they are still serviceable, sterile and have at least one month life according to the expiry date.

SIMPLEX COMPLETE EQUIPMENT SCHEDULE 12100
EQUIPMENT KIT
TRUCK, AMBULANCE, LIGHT, 4 LITTER, FFR, WINCH, MC2 — LANDROVER 110
LIABILITY CODE 74505/01

ITEMS SUPPLIED/ISSUED WITH TRUCK, AMBULANCE, LIGHT

PART 1— Principal Items

NIL

PART 2A — Items Essential to Operation of Equipment

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
1	5120-66-048-8548	Baseplate, Jack, Wooden, 12 in x 12 in. x 2 in.			1	X	
2	6140-66-065-0681	Battery, Storage, 12V, 11 Plate, 80 Amp/hr, 305 mm 305 mm Lg x 175 mm x 225 mm H			1	N	
3	NIC	Battery, Storage, 15 Plate, 93 Amp/hr, 343 mm Lg x 173 mm W x 245 mm H (Exide Cycle X Plus, C X 4)			4	N	
4	8115-66-022-0114	Box, Small Parts, Plastics, 4-1/2 in. Lg x 2-1/2 in. W x 2-3/4 in. H, W/Lid			1	N	
5	7530-66-107-1001	Book, Record, TGM 120, Record Book for Service Equipment			1	X	A

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
6	4210-66-089-8751	Extinguisher, Fire, Vaporizing Liquid, Bromohchlorodifluoromethane, 1.50 kg Capacity, Stored Pressure, Regulated Discharge type			1	N	
7	4910-66-054-4679	Gauge, Tyre pressure, Self Contained, Portable Bar Type, 20 to 140 PSI Range, 2 PSI Calibrations, 165 mm O/A Lg W/Pocket Clip			1	X	
8	2610-66-010-7864	Inner Tube, Pneumatic Tyre, Light Truck, 7.50-16, TR15 Valve			1	N	B
9	5120-66-012-6101	Jack, Hydraulic, Hand, Double Lift, 7-1/2 in. Closed H, 17 in. Extended, 5 Ton W/Handle			1	N	
10	5120-66-014-0251	Pliers, Combination Side Cutting, W/Pipe Grip and Serrated Jaws, Insulated, 6 in. Nom. Lg			1	N	
11	4320-00-852-9036	Pump, Inflating, Manual, Hand Operated, Single Action, W/30 in. Lg Hose and Adaptor			1	X	
12	5140-66-067-5483	Roll, Tools and Accessories, Cloth Coated Nylon, 2 Pockets, 14 Loops, 690 MH mm x 350 mm W, W/2 Flaps			1	X	
13	5120-66-024-7832	Screwdriver, Crosstip, Cellulose Acetate Handle Phillips No. 3 x 150 mm Lg Blade 3-6			1	X	
14	5120-66-026-0206	Screwdriver, Flat Tip, Cellulose Acetate Handle, 8 mm W Tip x 150 mm Lg Blade			1	N	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
15	NIC	Tyre, Pneumatic, Light Truck, Tubed 7.50 R016 Lt, 10 ply Olympic Steeltrek			1	N	B
16	NIC	Wheel Chocks			2	N	
17	NIC	Wheel, Pneumatic Tyre 6.00 x 16			1	N	B
18	5120-66-016-1257	Wrench, Open End, Fixed, Double Ended, 15 Degree Offset, 1/2 in. and 9/16 in. A/F			1	N	
19	5120-66-013-6747	Wrench, Open End, Adjustable, 250 mm Nom. Size			1	X	
20	5120-66-016-1255	Wrench, Open End, Fixed, Double Ended, 15 Degree Offset, 5/8 in, and 11/16 in. A/F			1	N	
21	5120-66-016-0098	Wrench, Ring, Bi-Hexagon, Double Offset, Double Ended, 1/2 in. and 9/16 in. A/F			1	X	
22	5120-66-016-1851	Wrench, Ring, Bi-Hexagon, Double Offset, Double Ended, 5/8 in. and 11/16 in. A/F			1	X	
23	NIC	Wrench, Socket, Wheelnut, 4 Way Type 15/16 in. and 1-1/16 in. x 16. in. Nom. Lg O/A			1	N	

Part 2B — Optional Equipment — To Be Demanded Separately

Footnotes

A. Individual pages to be demanded as per User Catalogue for Stationary Supplies (Forms).

B. Spare.

SIMPLEX COMPLETE EQUIPMENT SCHEDULE 120xx
EQUIPMENT KIT

ITEMS REQUIRED TO MAKE UP THE EQUIPMENT KIT

PART 1— Principal Items

NIL

PART 2A — Items Essential to Operation of Equipment

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
1	5110-66-011-0377	Axe, Single Bit, 2 kg, 820 mm Lg			1	X	
2	7240-66-021-5710	Can, Dispensing, Funnel Top, Tin Plate, 1 pint Capacity, W/O Handle			1	X	
3	7240-99-802-2405	Can, Gasoline, Military, Steel, 22 Litre			1	X	
4	8110-66-016-0717	Can, Screw Cap, Oil Rect Shape, 5 Litre			1	N	
5	7240-66-054-8602	Can, Water, Military, Plastics, 22 Litre			1	X	
6	2640-00-060-3550	Cap, Pneumatic Valve, Brass			7	X	
7	4010-66-086-8464	Chain Assembly, single Leg, Alloy Steel, 4 m Lg, 0.500 in. Dia, SWL 10 080 lb Hook Other End 4 m Lg, 10 080 lb SWL			1	N	
8	5120-66-012-6821	Handle, Mattock-Pick, 5 lb. Pick			1	X	
9	5340-66-025-0498	Holder Key, Steel, 3/4 in. ID			1	X	
10	5970-66-018-8475	Insulation Tape, Electrical, Black, 18 mm W x 33 m Lg			1	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
11	6240-00-155-7900	Lamp, Incandescent, 12V, 6 to 21 CP, Double Contact Bayonet Base, 'B' Shape, Clear			2	X	
12	6240-66-026-0478	Lamp, Incandescent, 12V, 40/50 W, Double Contact Prefocus Base, 'T' Shape, Clear			2	X	
13	6240-66-010-7460	Lamp, Incandescent, 12V, 5 W, Single Contact Bayonet, Candelabra Base, 'G' Shape, Clear			3	X	A
14	6240-66-010-8161	Lamp, Incandescent, 12V, 21 W, Single Contact Bayonet, Candelabra Base, 'S' Shape, Clear			2	X	
15	6240-66-022-6561	Lamp, Incandescent, 12V, 3 W, Single Contact Bayonet (BA 15S) Base, G-6 Shape, Clear			2	X	
16	6230-99-942-7876	Light, Extension, C/W Cable and Plug, W/O Globe			1	N	
17	5340-66-020-2790	Padlock, Brass, Solid Case, Steel Shackle, 45 mm in. W, 19 mm Shackle Clearance			3	X	
18	5120-66-012-6893	Pick, Digging, W/O Handle, 5 lb.			1	X	
19	4030-66-123-1450	Shackle, Dee, Alloy Steel, Quality Grade S, 19 mm Nom Size, C/W Metric Thd Collared Eye Pin, 4.7 Tonne WLL, Zinc Coated			2	X	
20	5120-66-093-8563	Shovel, Hand, GS, Rd Point Blade, Plastic D-Handle, Black or Dark Green, 35-1/2 in. LG O/A			1	X	
21	9905-66-018-3897	Sign, Warning, Portable, Motor Vehicle			3	X	
22	9905-66-048-0206	Tag, Marker, Brass, Rd, 1-1/4 Dia.			2	X	
23	2640-00-050-1229	Valve Core, Pneumatic Tyre			7	X	

Item No.	NATO Stock No.	Designation	Unit of issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
24	6145-66-014-2971	Wire, Electrical, No. 20 SWG	RL		1	X	

Part 2B — Optional Equipment — To Be Demanded Separately

Footnotes

A. One is for the light, the remainder are spares.

SIMPLEX COMPLETE EQUIPMENT SCHEDULE 12068/2
MEDICAL EQUIPMENT KIT
FIELD EVACUATION AMBULANCE VEHICLE

ITEMS REQUIRED TO MAKE UP THE EQUIPMENT KIT

PART 1— Principal Items

NIL

PART 2A — Items Required to Make Up the Complete Equipment

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
1	6135-66-014-3454	Battery, Dry, 1.5V, Heavy Duty			2	X	B
2	6505-66-038-8324	Chlorhexidine Gluconate and Cetrimide Solution, Chlorhexidine Gluconate 0.3 Pct, Cetrimide 3 Pct, 250 ml	BT		1	X	
3	6505-66-066-5612	Sodium Chrloride, Benzalkonium Chloride, Calcium Chloride, Magnesium Chloride, Potassium Chloride, Sodium Acetate and Sodium Citrate Ophthalmic Solution, Sterile, Plastic Dispenser Bottle, 120 ml			1	X	
4	6505-66-088-7647	Oxygen, Medical, 1130 L, in Cylinder 8120-66-086-8994	CY		1	X	C,D
5	6510-66-019-9919	Bandage, Triangular, Calico, Unbleached, 91.4 cm x 91.4 cm x 1.295 M			12	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
6	6510-66-019-9973	Gauze, Paraffin Impregnated, "Tulle Gras", PK of 50, 10 cm x 10 cm (4 in. x 4 in)	CN		1	X	
7	6510-66-027-2615	Dressing, Burn, Sterile, Polyurethane Foam Arm 45 cm x 60 cm			2	X	
8	6510-66-027-2616	Dressing, Burn, Sterile, Polyurethane Foam Body, 60 cm x 1.350 m			2	X	
9	6510-66-027-2617	Dressing, Burn, Sterile, Polyurethane Foam, 60 cm x 78 cm			2	X	
10	6519-66-027-2638	Adhesive Tape, Surgical, Non-Elastic, Rayon Fibre, Microporous, 2.5 cm x 9.15 m			1	X	
11	6510-66-027-2640	Adhesive Tape, Surgical, Non-Elastic, Rayon Fibre, Microporous, 7.5 cm x 9.15 m			1	X	
12	6510-66-032-9513	Bandage, Elastic, Cotton, Crepe Weave, 5 cm x 4.57 m			4	X	
13	6510-66-032-9514	Bandage, Elastic, Cotton, Crepe Weave, 7.5 cm x 4.57 m			4	X	
14	6510-66-032-9516	Bandage, Elastic, Cotton, Crepe Weave, 15 cm x 4.57 m (6 in, x 5 yd)			4	X	
15	6510-66-032-9527	Cotton Wool, Absorbent, 100 Gm	BX		1	X	
16	6510-66-061-7772	Pad, Eye, Oval, Cotton Covered W/Woven Gauze, 127 mm x 635 mm x 762 mm, 144's	BX		1	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
17	6519-66-108-4140	Dressing, Wound, Sterile, Compressed, For Field Use, 100 m,m LG x 65mm W			4	X	
18	6515-00-371-3100	Sphygmomanometer, Aneroid, W/Case			1	N	
19	6515-66-020-5723	Scissors, Bandage, Cres, Ward, Heavy, Straight, Sharp Points, 6.25 cm LG Cut, 21.25 cm LG			1	X	
20	6515-66-020-5952	Stethoscope, Bowles, Binaural, Complete			1	X	
21	6515-66-020-9416	Airway, Pharyngeal, Plastics, Reviva Tube, Double Ended, Mouth to Mouth, Resuscitation, Adult-Child Size			2	X	
22	6515-66-021-8208	Oxygen, Therapy Apparatus, for use W/Central Oxygen System or Cylinder			1	X	
23	6515-66-047-2789	Catheter, Nasal, Plastics, Disposable, Open Tips, C/W Elastic Headband			1	X	
24	6515-66-054-8658	Laryngoscope, Macintosh, Plastics, Combined Blade and Handle, Lamp, Child-Adult Size			1	N	
25	6515-66-068-0932	Resuscitator-Inhalator-Aspirator, Portable, Oxy-Viva, Manually Operated, W/Demand Valve, POS Pressure, Mini Regulator, Control and Accessories, In Cres Case — Mk 3			1	N	
26	6515-66-099-2300	Light, Diagnostic, General Purpose, Clip-on Type, Lightweight, Disposable, 6's	PK		1	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
27	6515-66-104-6965	Resuscitator and Inhalator, Portable, Flowrate Control Unit and Demand Valve, Flowrate 30 L/Min to 150 L/Min, Graduations 30, 60 and 150 L/Min Rear Handwheel for fitting to Wall Unit, Auxillary Outlet on Front of Unit, Safety Valve Relieves Pressure in Excess 70 cm H20				1	ND
28	6515-66-107-1598	Mask, Oxygen, Clear Plastic, Disposable, Air Entrainment, Set Consists of Mask, Aerosol Attachment, 2 m Oxygen Tubing and Five Different Plugs in 28 PCT, 31 PCT, 35 PCT, and 40 PCT Oxygen concentration Delivery, Adult Size	SE			2X	D
29	6515-66-107-6559	Airway, Pharyngeal, Rubber, Guedel, W/Metal Insert, Size 1			2	X	
30	6515-66-112-9136	Resuscitator, hand Operated, Air Viva Type, Portable, Mark 2, in Case			1	N	
31	6515-66-123-1547	Suction Apparatur, Surgical, Piston Type, hand Operated, Portable			1	N	
32	6515-99-210-3019	Airway, Pharyngeal, Rubber, Guedel, W/Metal Insert, Size 3			2	X	
33	6515-99-210-3020	Airway, Pharyngeal, Rubber, Guedel, W/Metal Insert, Size 2			2	X	
34	6515-99-210-3835	Depressor, Tongue, Wood, 100's	PK		1	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
35	6515-99-716-5916	Cannula, Laryngeal, Steel, Chromium Plated, Yankauer, Suction, Curved, Perforated-Tip, W/Handle, 33 cm LG			2	X	
36	6530-00-784-4205	Strap, Webbing, Patient Securing, Buckle W/Locking Device and Spring, Olive Drab			6	X	
37	6530-66-020-3524	Pin, Safety, Brass, Nickel Plates, Card of Ten, 3.75 cm LG	PK		1	N	
38	6530-66-023-8665	Urinal, Male Ptient, Plastics	BX		1	X	
39	6530-66-036-4764	Cover, Bedpan, Paper, Bag Type, Disposable, 1000	BX		1	N	
40	6530-66-130-1565	Frame, Jordam, Lifting, Folding Model Steel Frame Nylon Dipped, W/-Strong Hinge in Centre, Arched Locking Bar, Special Lugs for Lifting, W/-Gliders and Restraint Strap in Small Satchel, Dimensions 970 mm x 595 mm x 170 mm Folden, Unfolded, 1915 mm x 595 mm			1	N	
41	6545-66-025-9141	Splint Set, Plastics, Inflatable (SCES 11023)	SE		1	X	C
42	6545-66-097-7860	Adapter Set, Gas to Resuscitator, Oxy-Viva (SCES 11053)	SE		1	N	D
43	7210-66-130-0825	Towel, Hand, Cotton and Rayon Fibre Disposable, 32 cm x 34 cm, Pack of 100	PK		1	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
44	8105-66-060-0960	Bag, plastics, Polyethylene, 12 1/2 in. LG x 10 1/2 in. W, by 0.006 in. Thick			2	X	
45	8120-66-086-8994	Cylinder, compressed Gas, Empty, Medical, Oxygen, 40 cu. ft. Capacity			1	N	C,D
46	8540-66-034-6956	Tissue, Facial, White, 25 cm x 21.5 cm, Interleaved in Box of 150, 2 Ply			1	X	
		Part 2B — Optional Equipment					
		NIL					
47	6515-66-125-2778	Inhaler, Analgesic, Methoxyglurane, Disposable	BX		1	X	
48	6505-66-125-2778	Methocyflurane, BP 3 ml	VI		10	C	E
49	6505-66-096-5244	Oxygen, Medical, 440 litre, Size C in Pure Indexed Aluminium Cylinder 8120-66-096-5245	CY		2	X	
50	6515-66-093-2263	Suction Apparatus, Surgical Electric, 12V, DC, Portable, Battery op or 220V AC, in case	EA		1	NX	
51	6575-66-112-9136	Resuscitator, Hand Operated, Air Viva Type, Portable, Mk 2, in Case, SCES 11143	EA		1	NX	
52	6515-66-130-1340	Splint, Pneumatic, Leg, Dorway, W/Parts, SCES 11287	EA		1	NY	
53	6530-66-126-9502	Basin, Wash, Plastic, Green Heavy Duty	EA		2	X	

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
54	6530-66-126-9547	Basin, Emesis, Kidney Shape, Plastic, Green	EA		4	X	
55	6530-66-023-8664	Bedpan, Plastic	EA		1	X	
56	8120-66-096-5245	Cylinder, Compressed Gas, Empty, Medical Oxygen, 440 Litre Capacity, Size C, for Oxy Viva	CY		2	NX	
57	6545-66-019-9831	Surgical Instrument and Supply Set, Individual	SE		1	NX	
58	6545-66-082-6962	Medical Equipment Set, Intraveneous, Emergency Resuscitation Fluid Replacement Set SCES 11162/2	SE		1	NX	
59	6545-66-130-3703	Medical Equipment Set, Emergency Resusciation and Intubation, SCES 11428	SE		1	NX	

NOTE

All Expendibility classifications are correct at time of compilation. Users should check Master Army Supply Catalogue (MASC) for current classification.

Footnotes:

A. To be used as the container for the small items of this CES. To remain with the vehicle at all times.
B. Batteries listed are used with the equipment, but for Supply and Accounting purposes, are not to be considered part of the equipment. Dry Batteries will not necessarily be issued with this equipment by ordnance depots. Units should indent separately for quantities to operate and maintain equipment held.
C. The detail at item 4 is to enable unit indent action for replacement.
D. Items are only to be demanded and held when TRUCK, AMBULANCE, FIELD TYPE MC2 is held.
E. Schedule 4 Drug.

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