Registry of Ex Military Land Rovers

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AUSTRALIAN ARMY

TECHNICAL MANUAL

USER HANDBOOK

TRUCK, GENERAL MAINTENANCE, LIGHT, WINCH, MC2

2320-66-128-5309
(LIABILITY CODE No. 73230/01)
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Specification Army (Aust) 6434
Headquarters Logistic Command
1990

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

Issued by Command
of the Chief of the
General Staff

AMENDMENT RECORD

Amendment No.	Actioned by: Signature and Date

SYNOPSIS

The Truck, General Maintenance, Light, Winch, 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 truck, general maintenance is a constant four wheel drive, with selective six wheel drive for negotiating difficult terrain. Vehicle slinging, tie-down and recovery points are incorporated in the chassis.

The maintenance module is mounted on the vehicle chassis in the same manner as the cargo tray body. The module utilizes 24 volt lighting, and 240 volt power provided by an external power source, while the vehicle operates on a 12 volt system.

The module is designed to allow two tradesmen to carry out general maintenance repairs to military equipment either inside or outside of the module. The maintenance 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

Page No.

WARNING 58

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.

WARNING 60

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.**

WARNING 61

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.

WARNING 63

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

WARNING 64/95

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.

WARNING 72

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

WARNING 102

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

WARNING 103

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

WARNING 104/111

The vehicle is to be earthed using the external earth spike prior to external 415/240 volt power sources being connected to the vehicle.

WARNING 112/113

The bench with vice fitted weighs approximately 30 kg at its outer extremity when lowered to 45 degrees.

WARNING —

This vehicle is painted in polyurethane paint. Precautions should be taken prior to carrying out repairs which include painting, sanding, scraping or welding. For safety precautions refer to Introduction Into Service Instruction, Materiel Management Policy Statement, Painting Policy for Vehicles and Equipment or relevant EMEI.

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ASSOCIATED PUBLICATIONS

1. Standing Orders for Vehicle Operation and Servicing (Vol. 2 — B Vehicles)
2. Australian Army Books:

   TGM 120 Record Book for Service Equipment — Army
3. Complete Equipment Schedules (CES):
   (a) SCES 12107/1
   (b) Equipment Kit SCES 12123/1
   } Truck, General Maintenance, Light, Winch, MC2
4. Block Scale 2406/31 Issue 1 — Special Tools for RAEME – B Vehicles – Truck, Cargo, 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 240 — Data Summary (Truck, General Maintenance, Light, Winch, MC2)
8. EMEI VEH G 202 — Technical Description (Truck, Cargo, Light, MC2)
9. EMEI VEH G 242 — Technical Description (Truck, General Maintenance, Light, Winch, MC2)
10. EMEI VEH G 203 — Unit Repair (Truck, Cargo, Light, MC2)
11. EMEI VEH G 243 — Unit Repair (Truck, General Maintenance, Light, 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 244-1 — Field and Base Repair (Truck, General Maintenance, Light, Winch, MC2)
15. EMEI WKSP E 652 — Occupational Health and Safety (Polyurethane paint)
16. EMEI VEH G 209 — Servicing Instruction (Truck, Cargo, Light, MC2)
17. Repair Parts Scale 02209

FRONTISPIECE

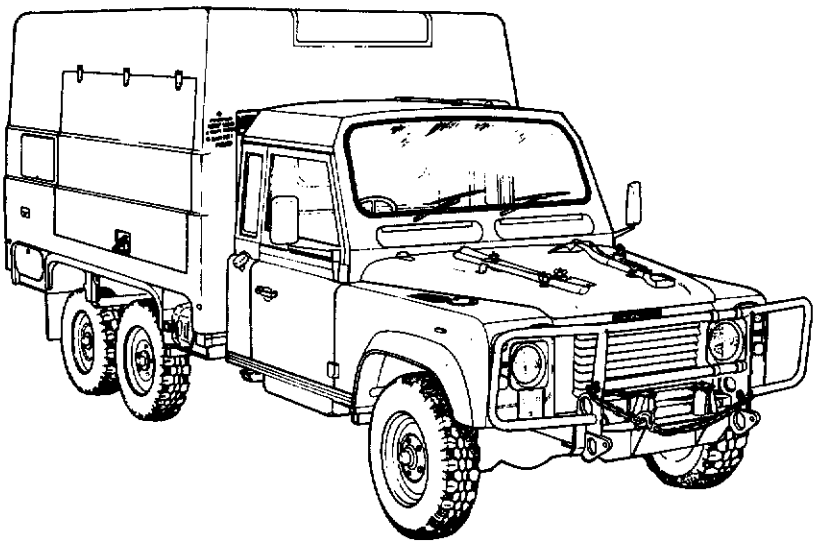


Figure 1-1 Truck, General Maintenance, Light, Winch, MC2 — front view

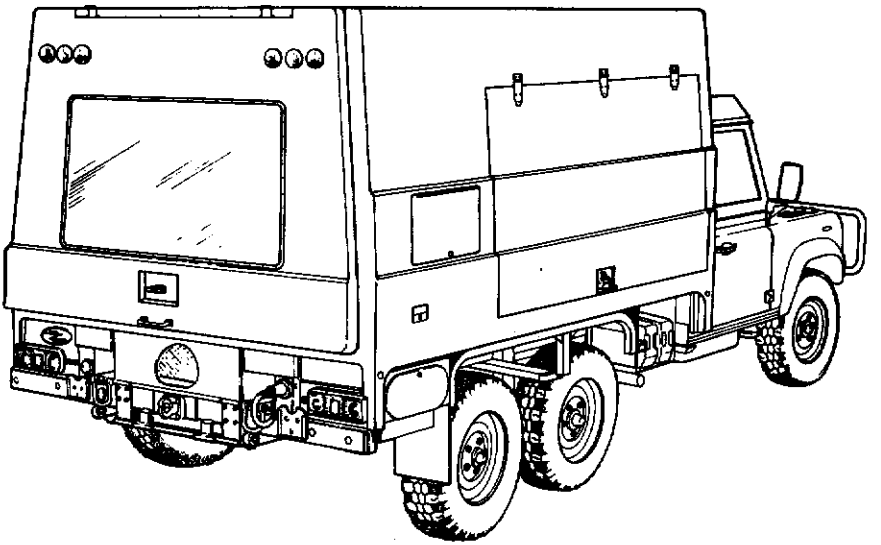


Figure 1-2 Truck, General Maintenance, Light, Winch, MC2 — rear view

MAINTENANCE SUPPLY ITEM (MSI)

IDENTIFICATION

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

Chassis No. — Right hand side of the chassis, forward of the spring mounting turret

Chassis nameplate — Left hand seat box, in the cab

Engine No. — Left hand side of the engine block

Injection pump identification — Side of the pump

Transmission and transfer case — Rear of the transfer case

Maintenance module — Right hand rear

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.	Land Rover 110 6 x 6

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	Single Vee-belt
Tension	Approximately 10-15 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 permanently 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
Design load rating	1900 kg

12. Rear axles

Manufacturer	GKN
Type	Salisbury fully floating hypoid bevel drive, four pinion differential
Ratio	4.7:1
Track	1698 mm
Design 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
Design load rating	1900 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
Design 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 front

	brake pad 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 350 kPa (36 psi) intermediate 350 kPa (50 psi) rear 350 kPa (50 psi) Cross-country: front 275 kPa (29 psi) intermediate 275 kPa (40 psi) rear 275 kPa (40 psi) Sand: front 225 kPa (22 psi) intermediate 225 kPa (33 psi) rear 225 kPa (33 psi)

20. Electrical system

Type	The vehicle is fitted with 12 volt, 24 volt, 240 volt and 415V 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	Bosch 24 volt, 55 amp
240 volt/415 volt system	240 volt single phase/415 volt three phase
Mains input or field generator	Six switched 240 volt, AC, single phase, 10 amp Two switched 240 volt, AC, single phase, 15 amp
Battery charger	Arlec 240 volt input, three voltage (6/12/24) volt) output with high and low charging rate

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, 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

23. Lighting, internal 24 volt	**Location, quantity and wattage**
Emergency light	Roof of module, 1 off, 18 watt
Rear and side door lights	Doors, 5 off, 16 watt
Blackout	Ceiling, 2 off, 18 watt
Ceiling light	Roof of module, fluorescent tube, 4 off, 18 watt

24. Lighting, military	**Location, quantity and wattage**
Blackout lights	Front and rear of vehicle 4 off, replaceable 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 and civilian trailer connectors

25. Fuses	**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 headlights	8 amp
Located under bonnet, near brake master cylinder/ booster	
Stop/start control motor	10 amp

26. 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
27. Carrying capacity	3 (including driver)

28. Module internal dimensions

Height	1800 mm
Width	2085 mm
Rear door width	1900 mm
Rear door height	1310 mm
Length	3100 mm
Height of floor from road	
— Laden	710 mm
— Unladen	740 mm

SECTION 2
SHIPPING AND TRANSPORTATION DATA

29. Dimensions

Overall length	6001 mm
Wheelbase — Front axle to intermediate axle	3040 mm
— Front axle to rear axle	3940 mm
Overall width — Over mirrors	2430 mm
— Reduced	2072 mm
Overall height — Laden	2480 mm
Track — Front	1698 mm
— Rear	1698 mm
Height of module from ground	
— Laden	710 mm
— Unladen	740 mm
Rear axle to rear of vehicle overhang	1183 mm
Towing pintle height — Laden	700 mm
— Unladen	730 mm
Mass (Unladen)	
— Front	1700 kg
— Intermediate	1475 kg
— Rear	1475 kg
— Total	4650 kg
Design limit loading	
— Front	1900 kg
— Intermediate	2050 kg
— Rear	2050 kg
— Total	5600 kg

30. 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 (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	Diesel	62
— Left hand	Diesel	62

NOTE

See EMEI VEH G 209 for list of approved lubricants.

31. Fording depth

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

32. Bridge classification

Solo unladen	6

33. Ground clearance

Unladen	215 mm
Limiting feature	Rear differential housings

34. 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

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

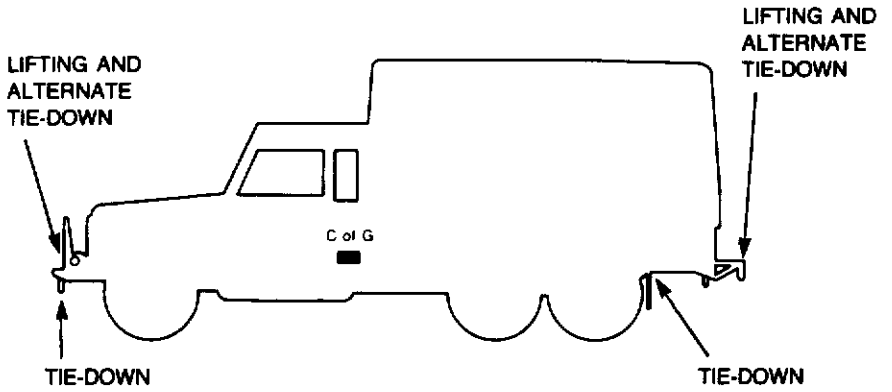


Figure 1-3 Slinging and tie-down points

36. 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

37. The truck, general maintenance, light, winch, MC2 has been designed specifically for military use and is capable of allowing two tradesmen to carry out general maintenance repairs. The module is self contained and is equipped with tools and machinery to perform the tasks as required 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 reverse gear ratios which are coupled through a disc clutch to a 3.9 litre, turbo-charged diesel engine.

Operational and logistic concept

38. The role of the maintenance vehicle is to provide mobile work stations for Unit and Field repair, internal stowage for tools, test equipment, documentation, repair parts and personal equipment in an operational environment.

Engine

39. 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

40. 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)

41. 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.

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

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

Winch

44. 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.

45. 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

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

Front suspension

47. 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

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

Rear suspension

49. 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

50. 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.

51. 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 lining 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

52. 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, is completely independent of the foot operated hydraulic brake system.

Instruments, electrical accessories and controls (see Fig. 1-25)

53. Ventilator control (Fig. 1-25 items 1 and 14)

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

54. Normal, blackout and reduced lighting switch (Fig. 1-25 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.

55. Auxiliary power socket (Fig. 1-25 item 3)

A 2-pin socket is fitted in the dash as a power supply for the vehicle trouble light lead.

56. Panel light dimmer control (Fig. 1-25 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.

57. Heater fan control switch (Fig. 1-25 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.

58. Air temperature control (Fig. 1-25 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.

59. Air distribution control (Fig. 1-25 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.

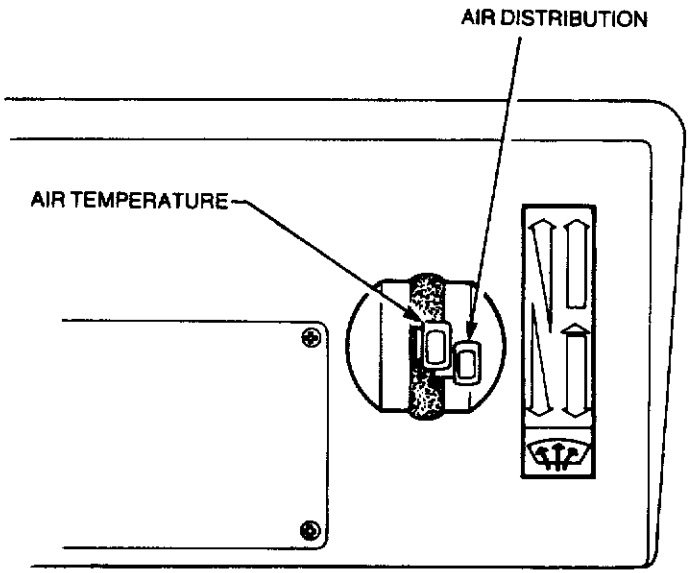


Figure 1-4 Air temperature and distribution controls

60. Fuel switch (Fig. 1-25 item 8)

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

61. Transfer case control switch (Fig. 1-25 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. When changing vehicle wheels the switch must be pulled out (refer to the warning on page 61).

62. Voltmeter — 24 volt (Fig. 1-25 item 10)

This meter measures the voltage of the module's 24 volt system. With the engine operating above idle speed, the voltmeter needle should be within the 24-28 volt (green band) range. If the voltage indicated is outside this range, and continues after approximately ten minutes, investigation of the 24 volt system is required.

63. PTO warning light (Fig. 1-25 item 11)

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

64. Combination switch (Fig. 1-25 item 12)

The combination switch has six positions and provides control over the headlights, turn indicators and the horn. The combination switch functions are not available during blackout conditions. 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.

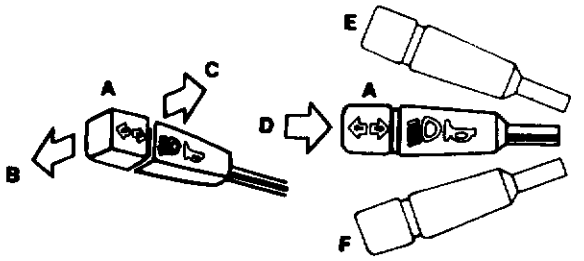


Figure 1-5 Combination switch operation

65. Speedometer and odometer (Fig. 1-25 item 13)

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.

66. Fuel gauge (Fig. 1-25 item 15)

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.

67. Warning light cluster (Fig. 1-25 item 16)

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 brake pad lining 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 headlight 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.

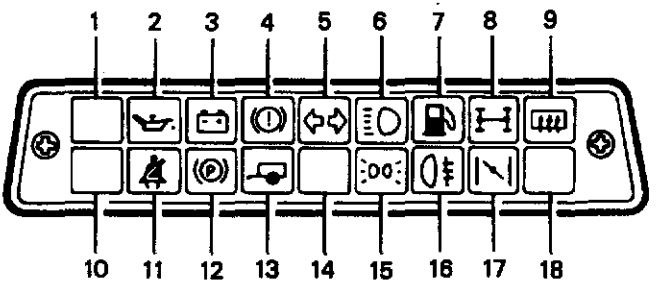
g. Both the differential lock warning light (Fig. 1-6 item 8) and the six wheel drive light (Fig. 1-6 item 1) will illuminate when the transfer case differential lock is engaged. Operation of the differential lock is necessary when traction to one or more wheels is likely to be lost.

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

68. Coolant temperature gauge (Fig. 1-25 item 17)

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

69. Voltmeter — 12 volt (Fig. 1-25 item 18)

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.

70. Windscreen washer and wiper switch (Fig. 1-25 item 19)

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

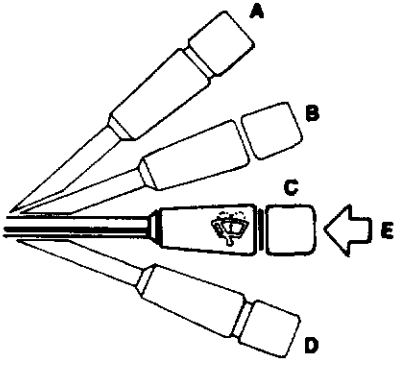


Figure 1-7 Windscreen washer and wiper control

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.

71. Cab dome light switch (Fig. 1-25 item 20)

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.

72. Hazard warning switch (Fig. 1-25 item 21)

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.

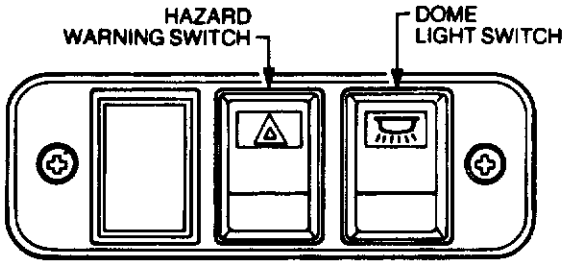


Figure 1-8 Hazard warning and cab dome light switches

73. Hand throttle (Fig. 1-25 item 22)

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.

74. Bonnet release (Fig. 1-25 item 23)

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

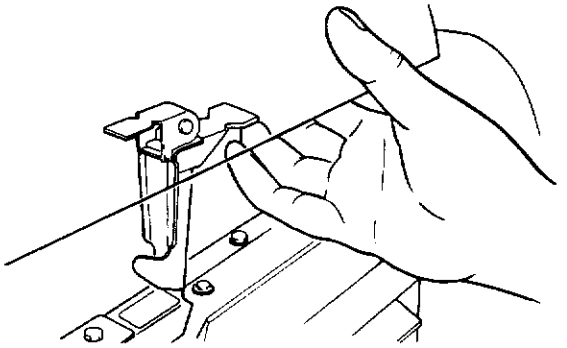


Figure 1-9 Bonnet safety catch

75. Accelerator pedal (Fig. 1-25 item 24)

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

76. Foot brake pedal (Fig. 1-25 item 25)

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

77. Starter switch (Fig. 1-25 item 26)

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.

78. Main lighting switch (Fig. 1-25 item 27)

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

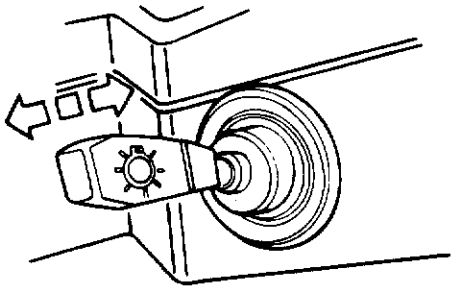


Figure 1-10 Main lighting switch

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.

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

80. Clutch pedal (Fig. 1-25 item 28)

Depress the clutch pedal to disengage the clutch.

81. Cigar lighter (Fig. 1-25 item 29)

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

82. Parking brake lever (Fig. 1-25 item 30)

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.

83. Winch/PTO control (Fig. 1-25 item 31)

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. 1-25 item 11) is illuminated.

84. Gear lever (Fig. 1-25 item 32)

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

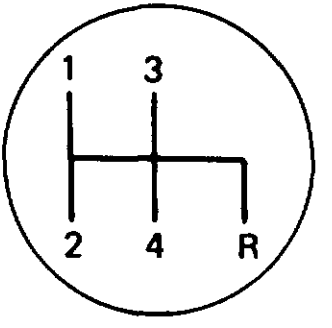


Figure 1-11 Gear change pattern

85. Transfer case shift lever (Fig. 1-25 item 33)

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.

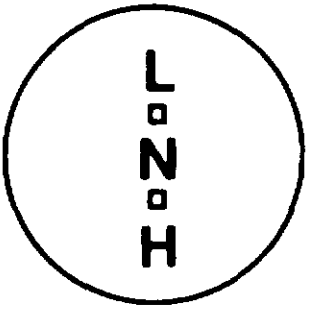


Figure 1-12 Transfer case shift pattern

86. Fuse box (Fig. 1-25 Item 34)

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.

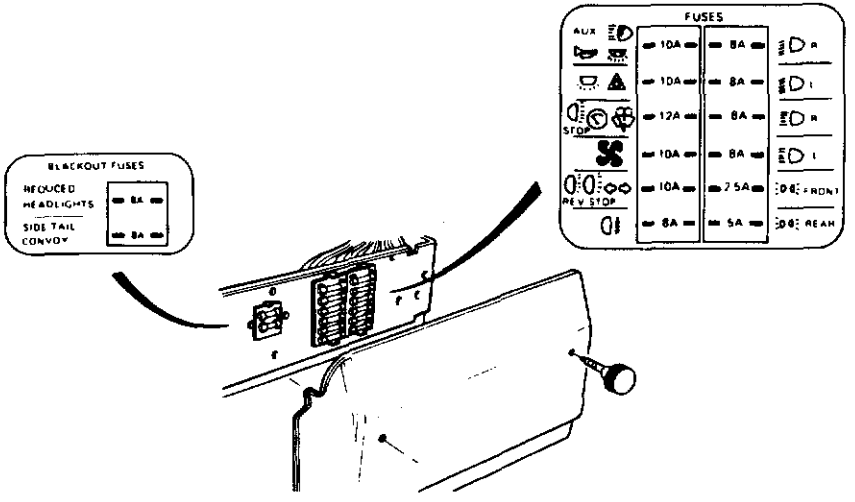


Figure 1-13 Fuses

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

88. Map reading light (Fig. 1-25 item 35)

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.

89. Cabin seating (Fig. 1-14)

The central cabin seat back can be tilted forward and utilized as a platform by the observer using the roof hatch, and fore and aft movement can be adjusted as illustrated in Fig. 1-14.

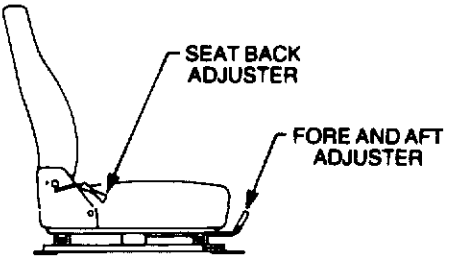


Figure 1-14 Seat adjustment

Body and Chassis Fittings

90. Vehicle body 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 frame.

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.

91. General maintenance module construction

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

92. 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.

93. Rear window (Fig. 1-15)

A sliding window is fitted to the rear of the cab.

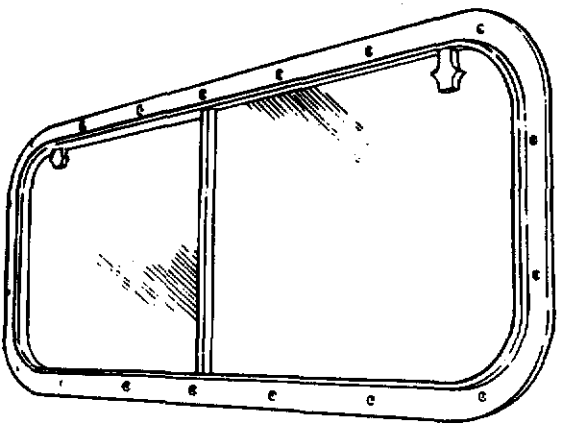


Figure 1-15 Rear Window

94. Roof hatch (Fig. 1-16)

A roof hatch is fitted to the roof panel to provide an observation hatch.

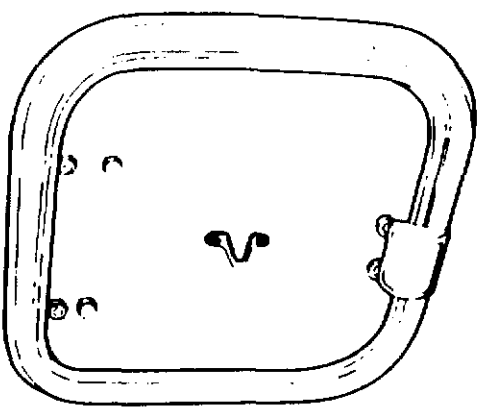


Figure 1-16 Roof Hatch

95. Rear side windows (Fig. 1-17)

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.

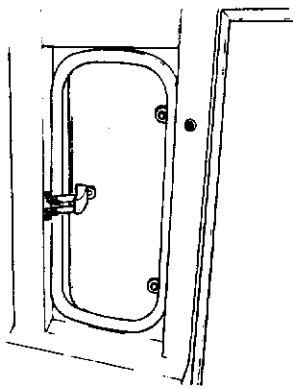


Figure 1-17 Rear Side Window

96. Jerrican stowage

Two jerricans can be stowed, in carriers, on the right hand side of the vehicle behind the cab.

97. Rifle clips and butt boxes

There are facilities to mount two rifles between the seats in the cabin and on either side of the module rear door opening.

98. Fire extinguishers

Two fire extinguishers are fitted to the vehicle. A 1.5 kg BCF is located on the rear bulkhead behind the cabin seats and a 3.0 kg BCF is located inside the rear door jamb on the right hand side of the module.

99. 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.

100. 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. 1-18) 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.

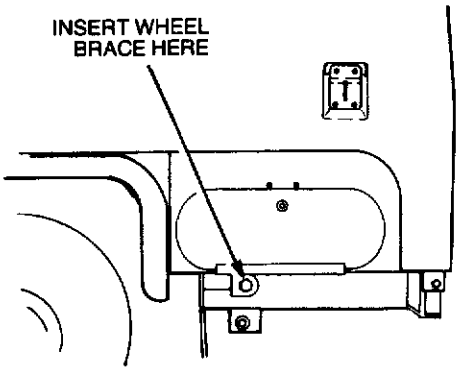


Figure 1-18 Spare wheel lowering

101. Electrical trailer connection sockets

A 12-pin NATO trailer connection socket is fitted to the rear of the left hand chassis rail. A supplementary, 7-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.

102. 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.

103. Seat belts

Inertia reel lap/sash seat belts are fitted to the outer cabin seats. The centre seat has a lap belt only fitted.

104. 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.

105. 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 is affixed to the inside of the lid.

106. Vehicle nomenclature plate (Fig. 1-19)

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.

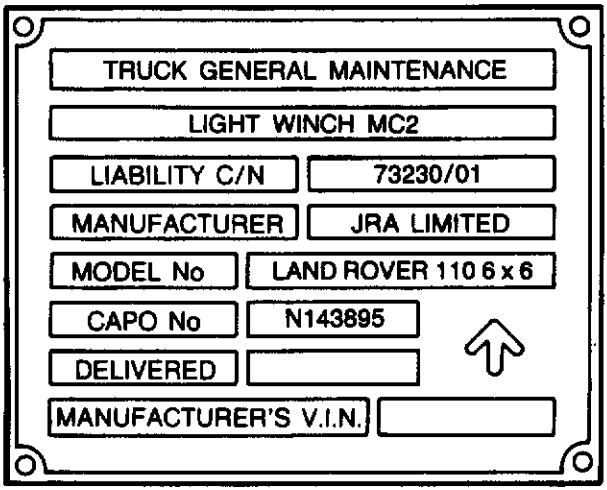


Figure 1-19 Vehicle nomenclature plate

107. Servicing data plate (Fig. 1-20)

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

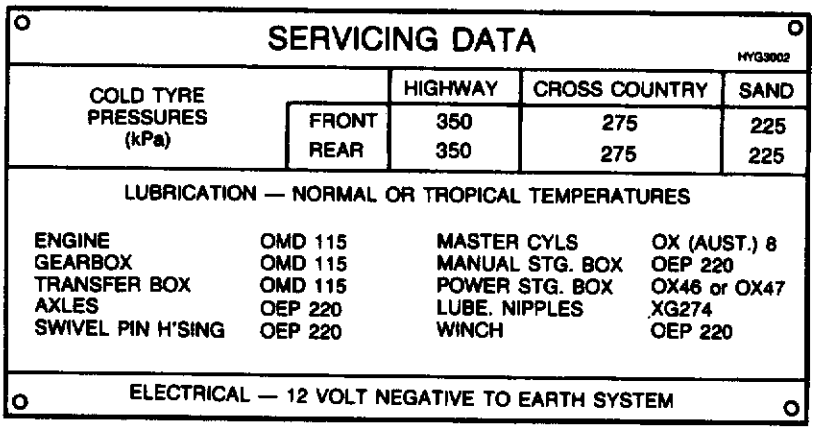


Figure 1-20 Servicing data and tyre pressure plate

108. Shipping data plate (Fig. 1-21)

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

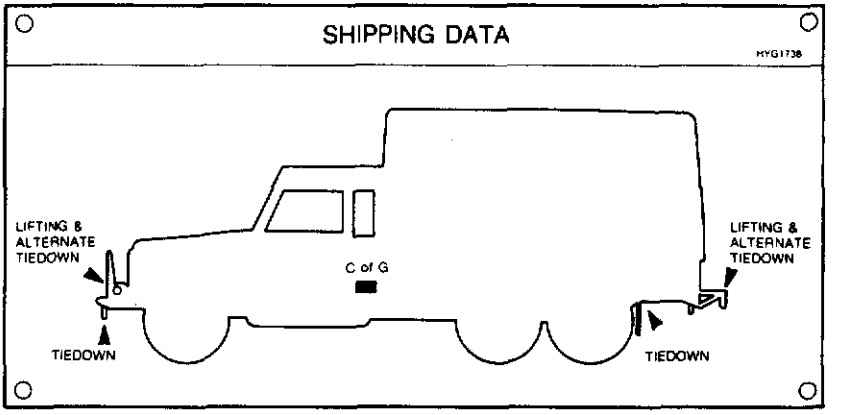


Figure 1-21 Shipping data plate

109. Towing and dyno test data plate (Fig. 1-22)

The towing and dyno test plate is riveted to the driver's seat box. See para. 234 for propeller shaft removal precautions.

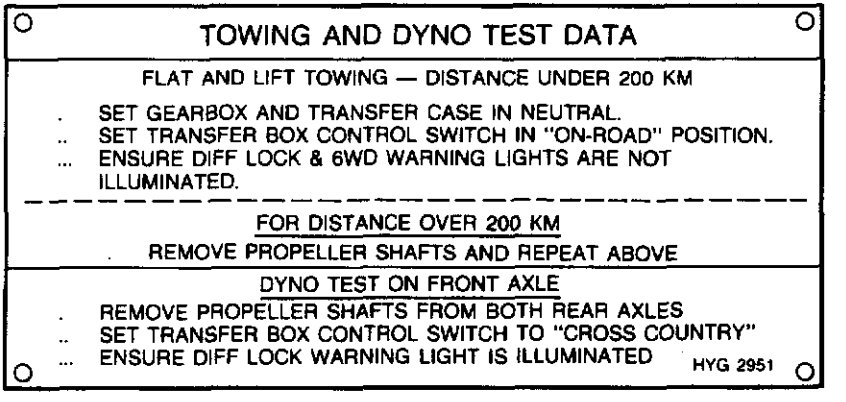
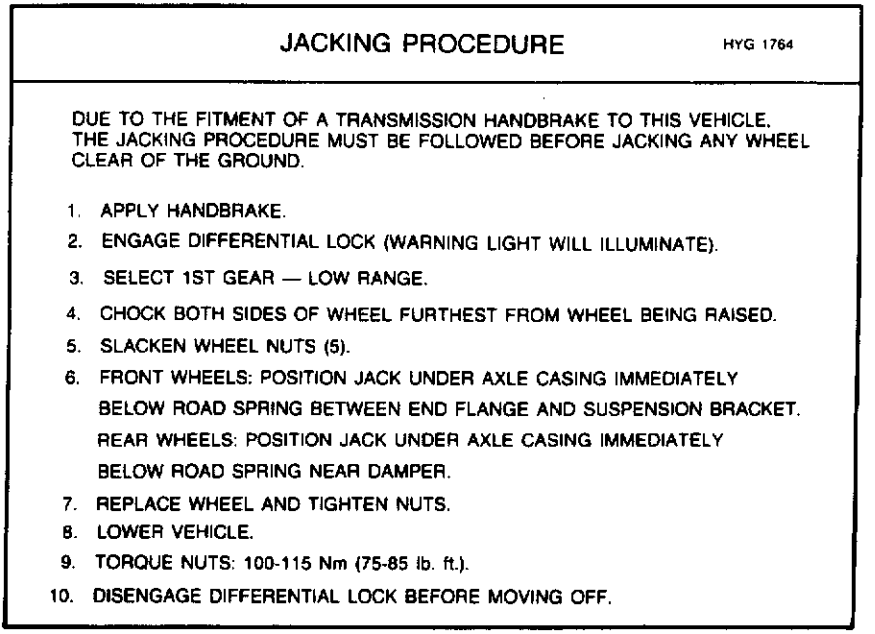


Figure 1-22 Towing and dyno test data plate

110. Jacking plate (Fig. 1-23)

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



JACKING PROCEDURE HYG 1764

DUE TO THE FITMENT OF A TRANSMISSION HANDBRAKE TO THIS VEHICLE, THE JACKING PROCEDURE MUST BE FOLLOWED BEFORE JACKING ANY WHEEL CLEAR OF THE GROUND.

1. APPLY HANDBRAKE.
2. ENGAGE DIFFERENTIAL LOCK (WARNING LIGHT WILL ILLUMINATE).
3. SELECT 1ST GEAR — LOW RANGE.
4. CHOCK BOTH SIDES OF WHEEL FURTHEST FROM WHEEL BEING RAISED.
5. SLACKEN WHEEL NUTS (5).
6. FRONT WHEELS: POSITION JACK UNDER AXLE CASING IMMEDIATELY BELOW ROAD SPRING BETWEEN END FLANGE AND SUSPENSION BRACKET.
   REAR WHEELS: POSITION JACK UNDER AXLE CASING IMMEDIATELY BELOW ROAD SPRING NEAR DAMPER.
7. REPLACE WHEEL AND TIGHTEN NUTS.
8. LOWER VEHICLE.
9. TORQUE NUTS: 100-115 Nm (75-85 lb. ft.).
10. DISENGAGE DIFFERENTIAL LOCK BEFORE MOVING OFF.

Figure 1-23 Jacking procedure plate

111. Winch operation decal (Fig. 1-24)

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

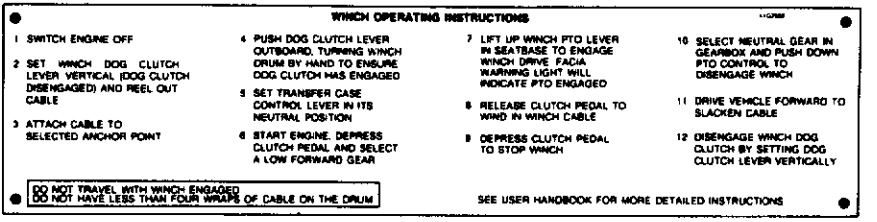


Figure 1-24 Winch operation decal

112. 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.

113. Unit/formation signs

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

114. Bridge classification sign

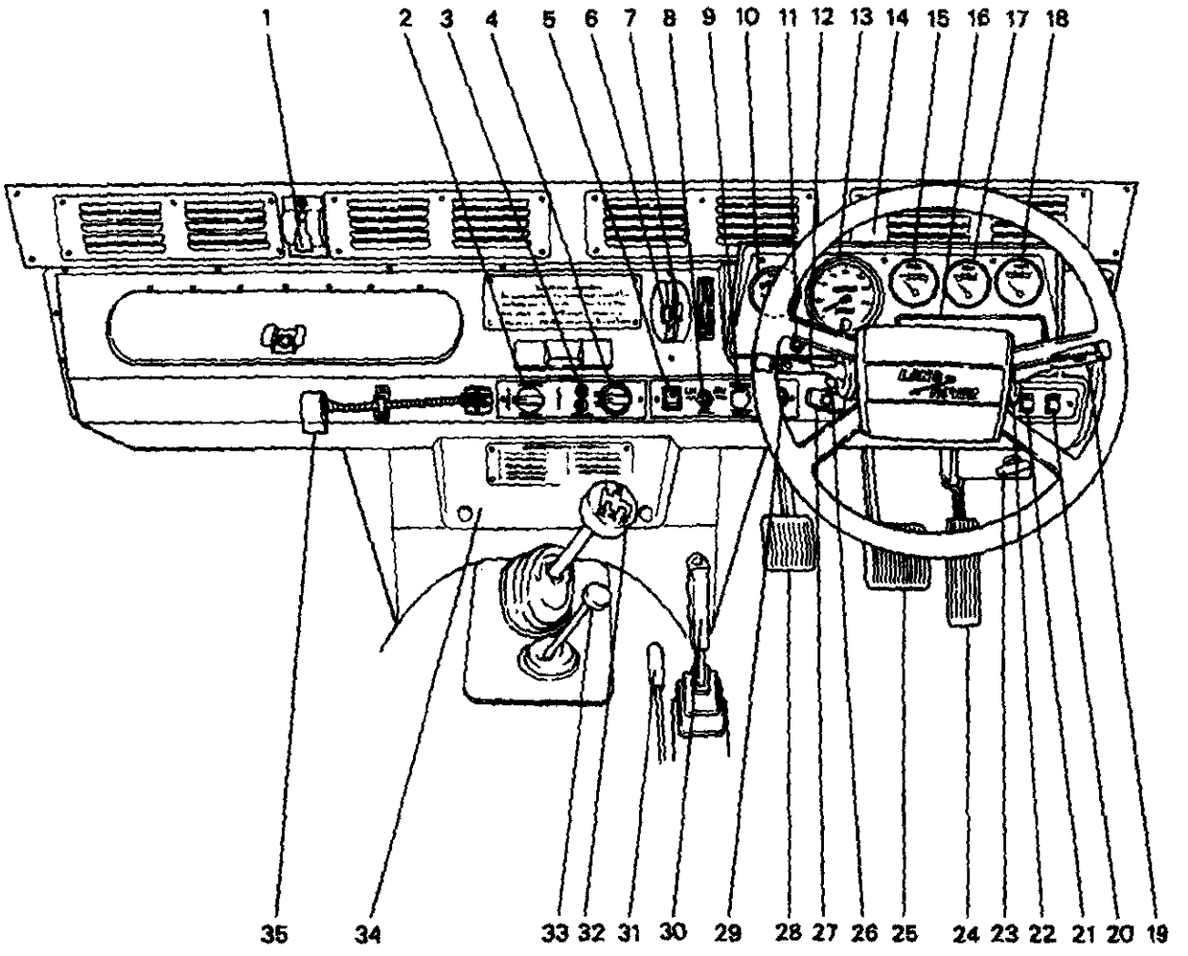
Due to the size and weight of this vehicle, no bridge classification sign is fitted.

115. Camouflage net lashing points

Lashing points are provided on each side of the 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. Auxiliary 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. Voltmeter (24V)
11. PTO warning light
12. Combination switch
13. Speedometer
14. Ventilator control
15. Fuel gauge
16. Warning light cluster
17. Temperature gauge
18. Voltmeter (12V)
19. Windscreen washer and wiper switch
20. Cab dome light switch
21. Hazard warning switch
22. Hand throttle
23. Bonnet release
24. Accelerator pedal
25. Brake pedal
26. Starter switch
27. Main lighting switch
28. Clutch pedal
29. Cigar lighter
30. Parking brake lever
31. Winch/PTO control
32. Gear lever
33. Transfer case shift lever
34. Fuse box
35. Map reading light

Figure 1-25 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-rata 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-rata 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 A 119-22).
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 A 119-22.

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).

Pre expiration warranty checks

215. Vehicles are to be inspected by RAEME Technical Support personnel prior to expiry date of the warranty. Refer EMEI VEH A 119-22.

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. (N.T.) 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

216. 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)	
Ayr General Engineering Co (077- 83 2393) 28 Queen Street Ayr QLD 4807	Unit
Brisbane (Newstead) Austral Motors (07-253 9427) 145 Breakfast Creek Road PO Box 199 Fortitude Valley Newstead QLD 4006	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- 31 3000) 94 McLeod Street Cairns QLD 4870	Base
Cooktown Peninsula Auto Services (070-69 5327) 10 Boundary Street Cooktown QLD 4871 Phil Witheridge (Prop.)	Field

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

Agent	Repair Level
Cunnamaulla Casey-Gemac (074-55 1688) 25 John St Cunnamulla QLD 4490	Unit
Goondiwindi Jack Rose's Garage (076-71 1194) 4 Moffit Street Goondiwindi QLD 4390	Unit
Gympie Gympie Carworld (071- 82 2822) 109-113 River Road Gympie QLD 4570	Field
Ipswich Don Faulkner Motors Pty Ltd (07-281 2744) Cnr Warwick and Churchill roads Ipswich QLD 4305	Base
Mackay Roberts Motors (079- 57 2144) 85 Gordon Street Mackay QLD 4740	Base
Maryborough Jack Casey Motor Centre (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

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

Agent	Repair Level
Normanton Top Service Station (077- 45 1261 STD) (077- 40 7777 via exchange) Landsborough Street Normanton QLD 4890	Field
Southport Southport Motors (075- 32 1833) 187 Nerang Road Southport QLD 4215	Base
Stanthorpe McCosker Motors (076- 81 1202) 127 High Street Stanthorpe QLD 4380	Unit
Toowoomba Alan Flohr Jaguar Rover (076- 34 3233) Cnr James and Anzac Avenues Toowoomba QLD 4350	Base
Townsville Tony Ireland Townsville (077- 71 6855) 87 Charters Towers Road Townsville QLD 4810	Base
Weipa Weipa Mobil Service Centre (070- 69 7277) Boundary Road Weipa QLD 4874	Field
Winton Winton Motors (074- 57 1477) 21 Oondooroo Street Winton QLD 4735	Unit

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

Agent	Repair Level
New South Wales (2 MD)	
Albury Albury Motors Pty Ltd (060- 21 2188) 478 Olive Street Albury NSW 2640	Base
Annangrove John E Davis Motor Works (02-679 1179) 225 Annangrove Road Annangrove NSW 2156	Field
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
Bathurst Bathurst Prestige Cars (063- 31 3422) 124-132 Russell Street Bathurst NSW 2795	Unit
Bombala Lomas' Garage (064- 58 3311) 80-86 Maybe Street Bombala NSW 2553	Field
Bowral Reynolds Motors Bowral Pty Ltd (048- 61 2444) 252 Bong Bong Street Bowral NSW 2576	Unit

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

Agent	Repair Level
Broken Hill Williams Motors (080- 88 7868) 80-82 Oxide Street Broken Hill NSW 2880	Field
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
Dorrigo Doust and Fitzgerald (066-57 2116) 14-16 Cudgery Street Dorrigo NSW 2453	Field
Dubbo Dubbo City Jaguar (068- 82 1511) 3-5 Bourke Street Dubbo North NSW 2830	Unit
Dungog Modern Motors (049- 92 1486) 282 Dowling Street Dungog NSW 2420	Field
Gloucester Gloucester Machinery Co P/L (065-58 1510) 19 Denison Street Gloucester NSW 2422	Field

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

Agent	Repair Level
Homebush Asquith and Johnstone Pty Ltd (02- 764 1777) 145 Parramatta Road Homebush NSW 2140	Base
Hurstville Arthur Garthon Motors (02-588 5000) 71A Forest Road Hurstville NSW 2220	Base
Inverell T & T Machinery Pty Ltd (067-22 2936) 79-85 Ring Street Inverell NSW 2360	Field
Lismore John Chant Car Sales (066-21 2601) Cnr Balina and Brewster Streets Lismore NSW 2480	Field
Maitland George White Motors (049-33 5233) 317-323 High Street Maitland NSW 2320	Base
Moorebank Wrendco Automotive Repairs (02- 600 6537) 8 Seton Road Moorebank NSW 2170	Base
Nowra Tory Classic Cars (044- 21 0922) Kinghorn Street Nowra NSW 2541	Field
Singleton R. and E. Teasdale Pty Ltd (065- 72 1655) 64 George Street Singleton NSW 2330	Field

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

Agent	Repair Level
Sydney (City) City Automobiles (02- 33 0678) 123-129 William Street Sydney NSW 2000	Base
Taree Manning Valley Motors (065- 52 1088) 8-16 Victoria Street Taree NSW 2430	Base
Tamworth Tamworth Prestige (067- 65 3000) Cnr In and Hercules Streets Tamworth NSW 2340	Base
Toronto Triggs Motors (049- 59 2122) 36-44 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) 85 High Street Wauchope NSW 2446	Field
Wollongong Compass Car Centre (042- 29 8433) Princes Highway North Wollongong NSW 2500	Base

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

Agent	Repair Level
Victoria (3 MD)	
Bairnsdale J J Dwyer Garage (051- 52 3094) 46-56 Nicholson Street Bairnsdale VIC 3141	Base
Ballarat Gordon Motors Pty Ltd (053- 39 5022) 1041-1043 Howitt Street Wendouree VIC 3355	Base
Brighton Lane Jaguar Rover (03- 557 2875) 771 Nepean Highway Brighton VIC 3187	Base
Corryong Mildren and Coysh Pty Ltd (060- 76 1151) White Street Corryong VIC 3707	Field
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 3220	Unit
Malvern ULR Sales and Service P/L (03- 822 0211) 1339 High Street Malvern VIC 3144	Base

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

Agent	Repair Level
Mansfield Berry and O'Halloran (057- 75 2375) 125 High Street Mansfield VIC 3722	Field
Mildura Syd Mills Motors (050- 23 0261) 19-29 Orange Avenue Mildura VIC 3500	Field
Morwell Massaro Motors (051- 34 1422) 497 Princes Highway Morwell VIC 3840	Field
Nunawading Whitehorse Motors Pty Ltd (03- 878 6677) 296 Whitehorse Road Nunawading VIC 3131	Base
Shepparton McPherson Motors (058-21 9400) 69 Benalla Road Shepparton VIC 3630	Field
South Yarra Kellow-Falkiner Motors (03- 266 2501) 93 Commercial Road South Yarra VIC 3141	Base
Wendouree Gordon Motors (Ballarat) P/L (053-38 1335) 1041-1043 Howitt Street Wendouree VIC 3355	Field

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

Agent	Repair Level
South Australia (4 MD)	
Bordertown Inglis Motors (087- 52 1577) 90 South Terrace Road Bordertown SA 5268	Field
Kingscote Nepean Motors Ltd (084- 82 2162) Kingscote Terrace Kingscote SA 5223	Unit
Millicent Mac Ford (087- 33 2022) 44 Mount Gambier Road Millicent SA 5280	Base
Port Lincoln H V Motors (086- 82 1600) 80 Mortlock Terrace Port Lincoln SA 5606	Unit
Walkerville Prestige Car Sales (08- 269 2922) 130-134 North East Road Walkerville SA 5081	Base
Western Australia (5 MD)	
Broome BP 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

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

Agent	Repair Level
Carnarvon Delibar Motors (099- 41 1397) 60 Robinson Street Carnarvon WA 6701	Field
Derby Kimwest Motors (091- 91 1647) 44 Clarendon Street Derby WA 6728	Field
Esperance Ratten and Slater (090- 71 0100) 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) Lot 219 Bloodwood Drive Kununurra WA 6743	Field
Manjimup Manjimup All Wheel Drive (097- 71 1535) Franklin Street Manjimup WA 6258	Field
Osborne park Alf Barbagallo (09-444 5999) 354 Scarborough Beach Road Osborne Park WA 6017	Field
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 Argyle Street Hobart TAS 7000	Base
Launceston Launceston Rover/Peugeot (003- 31 6633) 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 0870	Field
Darwin Port Darwin Motors Pty Ltd (089- 81 9444) 15 Stuart Highway Darwin NT 0800	Base
Katherine Katherine Toyota (089- 72 1788) 1 Katherine Terrace Katherine NT 0850	Unit
Australian Capital Territory	
National Capital Motors (062-51 2600) Josephson Street Belconnen ACT 2617	Base

SECTION 2
VEHICLE OPERATION

217. 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.

218. Before starting

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

219. 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.

220. Starting the engine

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.

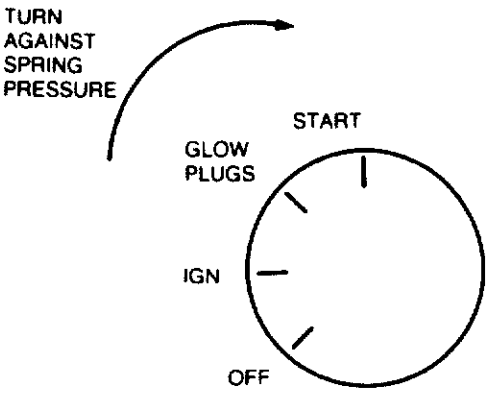


Figure 2-1 Starter switch positions

221. 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 not 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

222. 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.

223. Instruments

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

224. Clutch

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

225. Gear changing

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

226. 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.

227. Stopping the engine

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

228. 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.

229. 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.

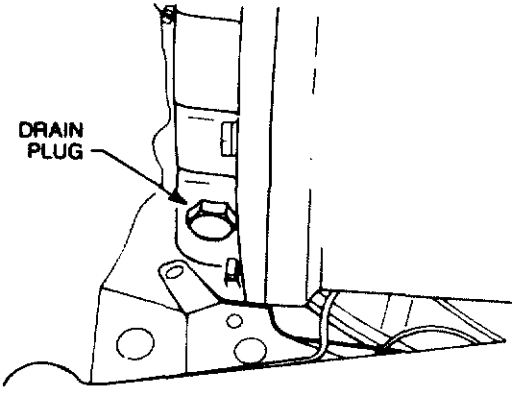


Figure 2-2 Flywheel housing drain

230. 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.

231. 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.

232. 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

233. 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).

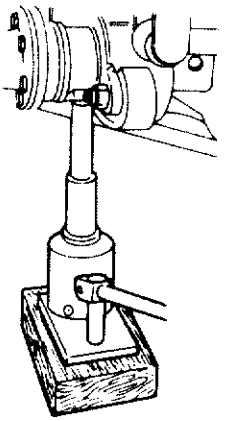


Figure 2-3 Jack position — front wheels

(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).

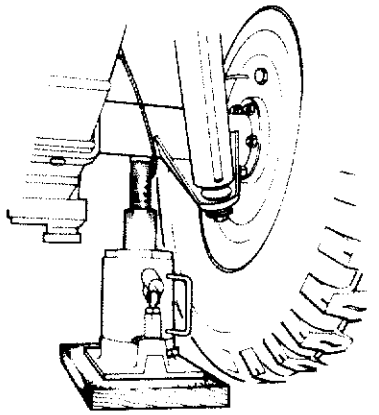


Figure 2-4 Jack position — rear wheels

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

234. 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 — 24 volt

235. To replace the batteries, proceed as follows:

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

b. Slide the battery box out from the chassis.

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

d. Remove the bridging cable which interconnects the batteries.

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

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

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

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

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

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

Winch operation

236. 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.

237. 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.

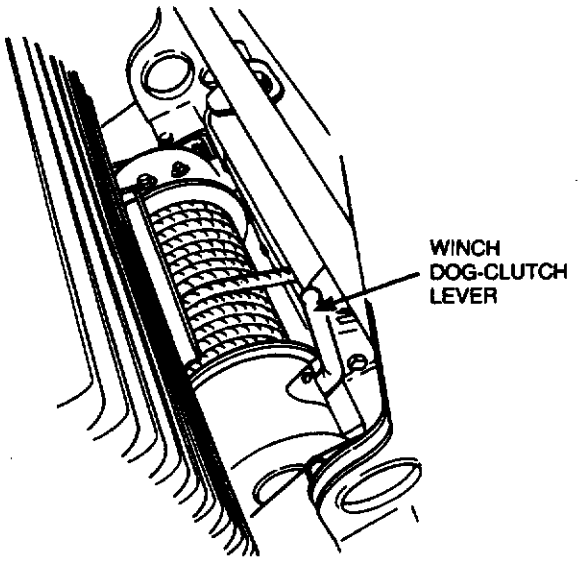


Figure 2-5 Winch dog-clutch operation

238. 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.

239. 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.

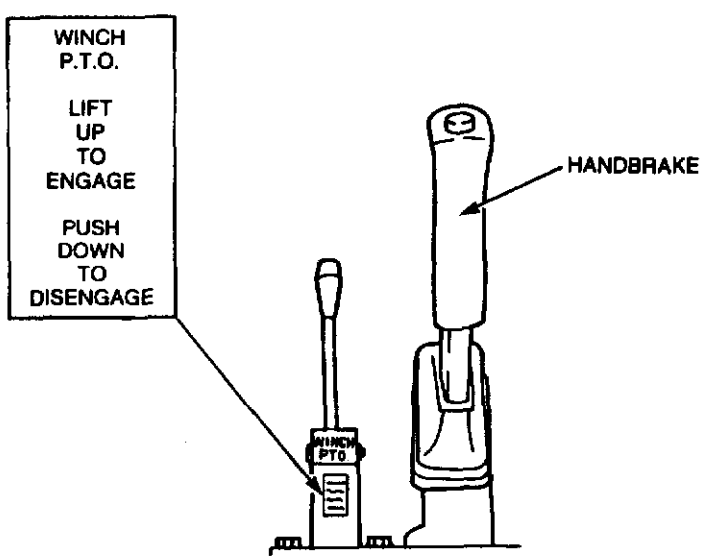


Figure 2-6 Winch/PTO control operation

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.

240. 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.

241. 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.

242. 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 84).

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.

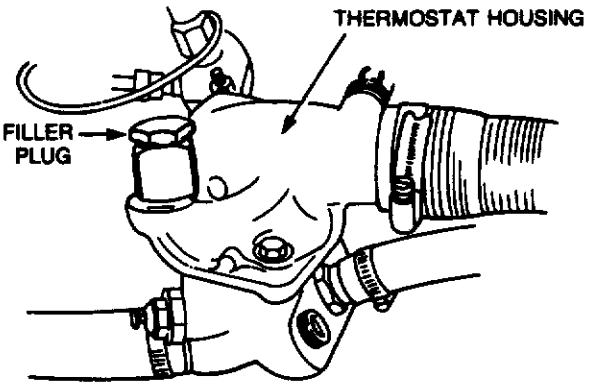


Figure 3-1 Thermostat housing

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.

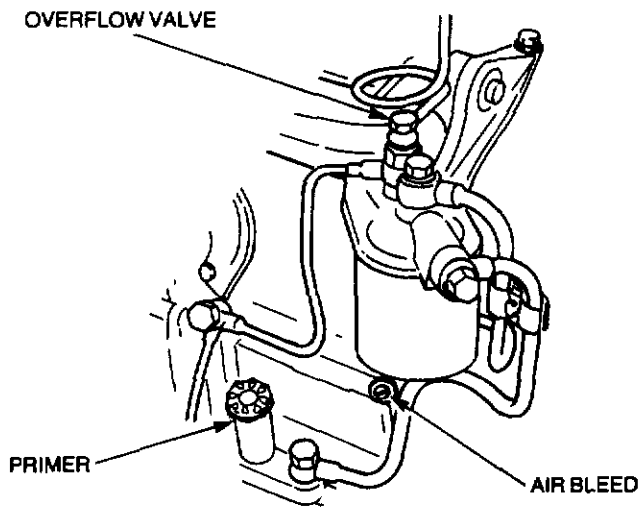


Figure 3-2 Bleeding the fuel system

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.

319. Vehicles are to be inspected by RAEME Technical Support personnel prior to expiry date of the warranty. Refer EMEI VEH 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.

Table 3-1 Daily tasks (cont'd)

4. Check tyres and wheels. Inflate tyres if necessary, inspect wheel nuts for evidence of looseness.
5. Check for fuel, oil and coolant leaks.
6. Check fuel supply and operation of fuel gauge.
7. Check voltmeter readings. With ignition switch on and engine off, reading 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 both alternator belts.
2. Check level of electrolyte, top-up if necessary, examine terminals for cleanliness and security. Check for leaks and security, clean outside of batteries if required.
3. Check radiator external condition for restriction, clean if required.
4. If operating in dusty conditions, remove air cleaner elements and clean.

Table 3-2 Fortnightly tasks (cont'd)

5. Check operation of hand throttle and stop control.
6. Check operation of differential lock control.
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.

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 and universal joints.
11. Lubricate winch propeller shafts and support bearings.
12. Lubricate winch dog-clutch.
13. Lubricate winch rope.
14. Lubricate pintle hook.

Table 3-3 Initial servicing (cont'd)

15. Check oil level in winch gearbox, top-up if necessary.
16. Check battery electrolyte levels (10 mm above plates) and security of terminals.
17. Check all fuel and oil lines and unions for leaks.
18. Retorque all wheel nuts to correct specifications.
19. Check tyres and wheels, inflate if necessary. Inspect rims for damage.
20. Check operation of all lights and gauges.
21. Check for loose electrical connections.
22. Check operation of foot brake, parking brake and clutch.
23. Check exhaust systems for leaks, damage and security.
24. Tighten all module-to-chassis mounting bolts.
25. Tighten all step and platform mounting bolts. Check the function of latches and catches.
26. Tighten and check all rear door mount latches. Lubricate and check the function of the catches.
27. Check operation of module electrical components.
28. Check function of all doors, seals and vents.

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

29. Retorque inlet and exhaust manifolds.
30. Check and adjust fanbelt tension. Retorque alternator mounting bolts.
31. Check torque of radiator mounting bolts, tighten as required.
32. Tighten all propeller shaft coupling drive bolts.
33. Replace primary fuel filter and bleed system.
34. 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 levels (10 mm above plates) and security of terminals. Check batteries 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.
18. Check exhaust system for leaks, damage and security.
19. Check front and rear 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.

Table 3-4 Minor servicing (cont'd)

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 all hinges.
39. Lubricate propeller shafts and universal joints.
40. Lubricate winch propeller shafts and support bearing.
41. Lubricate winch dog-clutch.
42. Lubricate winch rope.
43. Check operation and security of spare wheel carrier.
44. Check security of additional equipment.
45. Check driving mirrors, door windows, hinges, catches and latches.

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

46. Inspect front brake pads for wear, calipers for leaks and the condition of the discs.

Table 3-4 Minor servicing (cont'd)

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

Table 3-5 Major servicing (cont'd)

11. Check condition of windscreen wiper blades.
12. Check battery electrolyte levels (10 mm above plates) and security of terminals. 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. Drain flywheel housing.
17. Check air cleaners, remove, clean, and install. Fit new elements if indicators show "red".
18. Check exhaust system for leaks, damage and security.
19. Check front and rear shock absorbers for leaks, damage and security.
20. Check front and rear springs for damage.

*21. Drain and refill front axle.

*22. Drain and refill intermediate axle.

*23. Drain and refill rear axle.

*24. Drain and refill swivel pin housings.

*25. Drain and refill transmission.

*26. Drain and refill transfer case.

*27. Drain and refill winch gearbox.

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 steering reservoir level, top-up if necessary.
34. Check brake fluid reservoir, top-up if necessary.

*35. Renew brake servo filter.

Table 3-5 Major servicing (cont'd)

36. Check clutch fluid reservoir, top-up if necessary.
37. Lubricate pintle hook.
38. Lubricate parking brake mechanical linkage.
39. Lubricate accelerator control linkage and pedal pivot.
40. Lubricate all hinges.
41. Lubricate propeller shafts and universal joints.
42. Lubricate winch propeller shafts and support bearings.
43. Lubricate winch dog-clutch.
44. Lubricate winch rope.
45. Check propeller shaft coupling bolts.
46. Check operation and security 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.

Table 3-5 Major servicing (cont'd)

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	350 kPa (50 psi)
intermediate	350 kPa (50 psi)
rear	350 kPa (50 psi)

Cross-country:

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

Sand:

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

SECTION 2
LUBRICATION

320. 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.

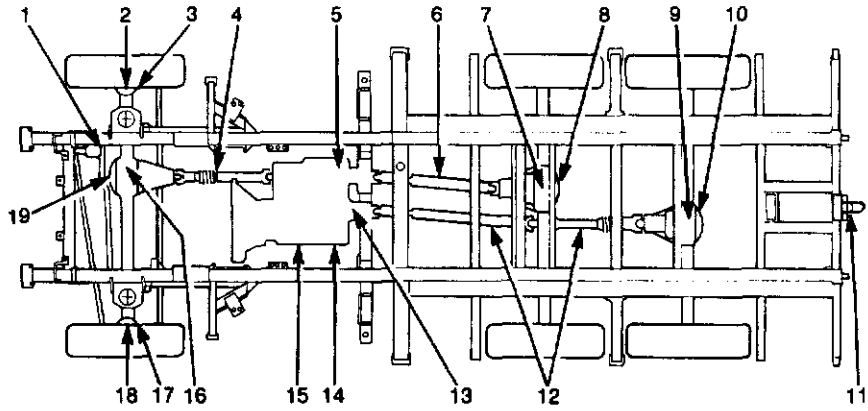
Table 3-6 List of Lubricants

Equipment	Lubricant	Capacity (litres)
Engine (including filters)	OMD-115	8.5
Transmission	OMD-115	2.7
Transfer Case (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

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

NOTE

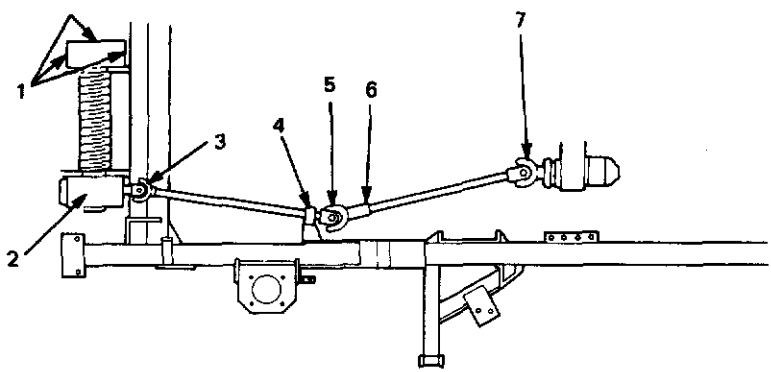
Run the engine or drive the vehicle as appropriate to warm oils before draining.



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

322. 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

323. 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.

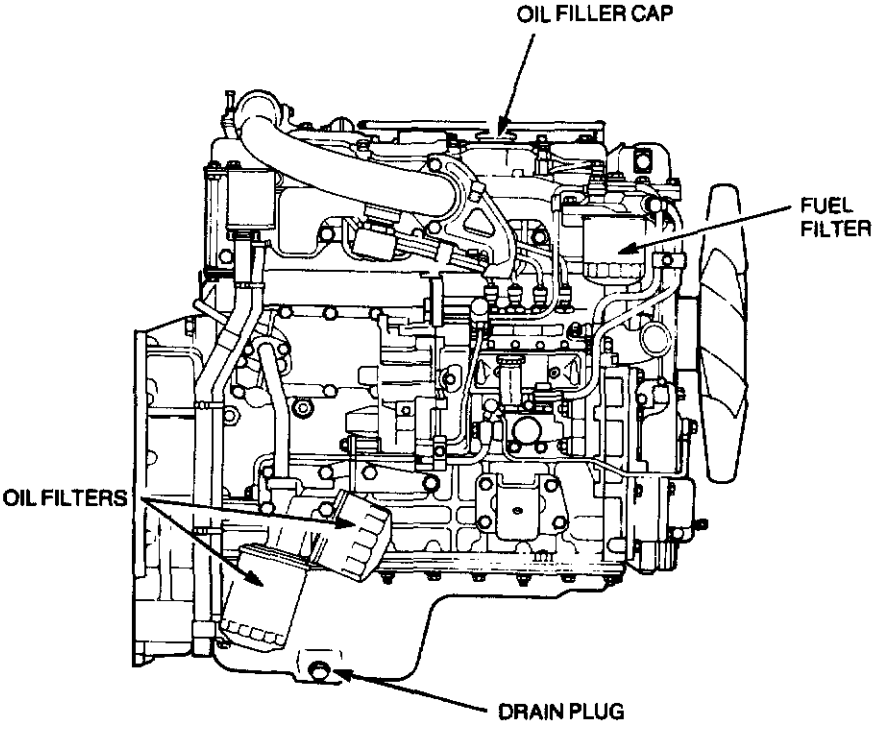


Figure 3-5 Engine — right hand side

324. 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.

325. 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.

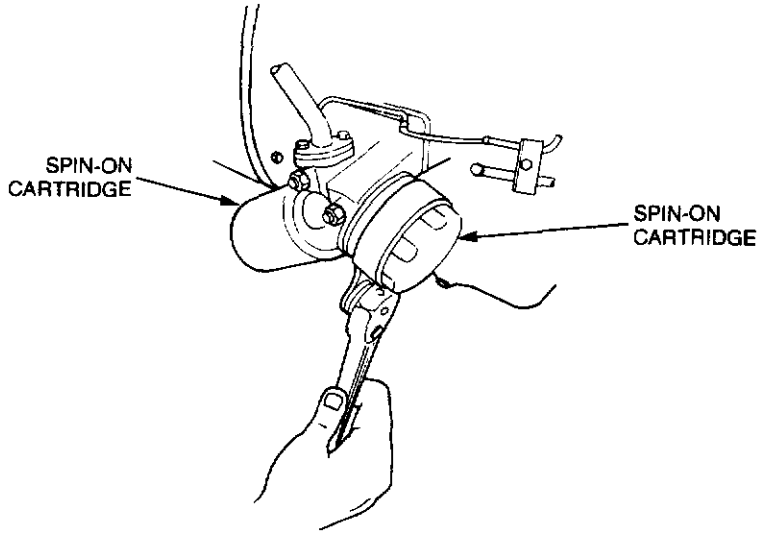


Figure 3-6 Oil filter removal

Transmission

326. 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.

327. 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.

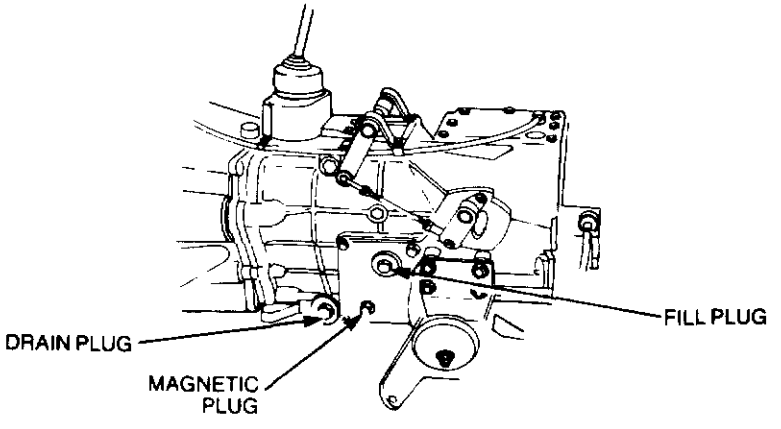


Figure 3-7 Transmission drain and fill plugs

Transfer case

328. 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.

329. 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.

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

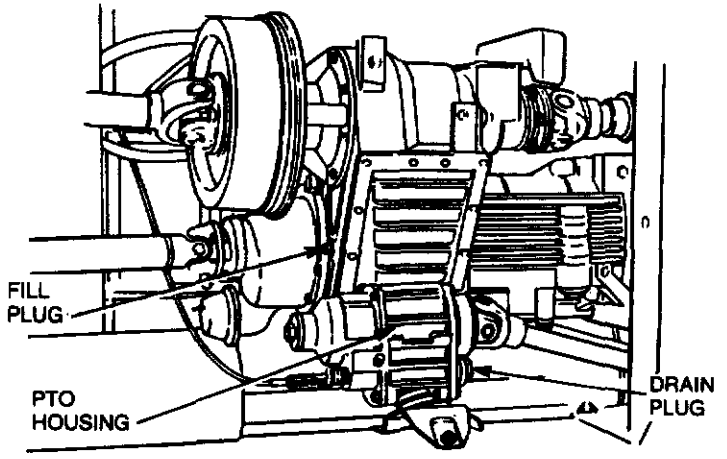


Figure 3-8 Transfer case drain and fill plugs

Intermediate 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. 3-9). Fill the differential with the recommended lubricant to the bottom of the fill hole.

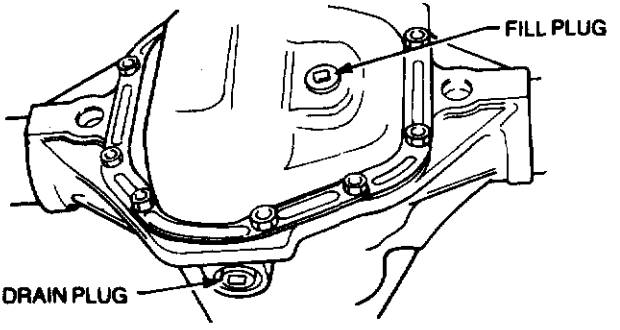


Figure 3-9 Intermediate axle drain and fill plugs

Rear axle

332. 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.

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

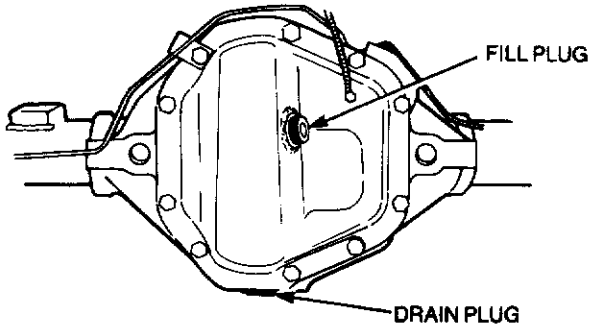


Figure 3-10 Rear axle drain and fill plugs

Front axle

334. 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.

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

Steering reservoir/box

336. 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

337. 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 hole.

Propeller shafts

338. The propeller shafts and universal joints are each fitted with a grease nipple (see Fig. 3-3 items 4, 6 and 12) and lubrication is required each service.

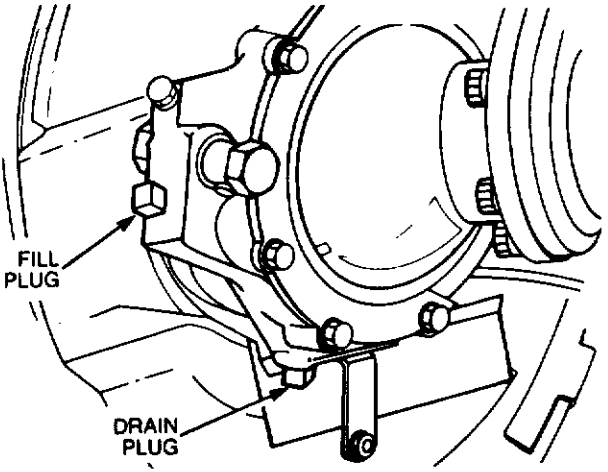


Figure 3-11 Swivel pin housing drain and fill plugs

Towing pintle

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

Fuel filter

340. 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.

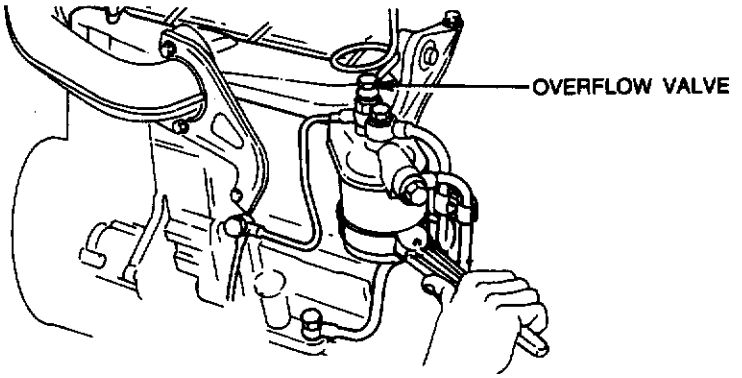


Figure 3-12 Fuel filter

Fuel sedimenters

341. 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.

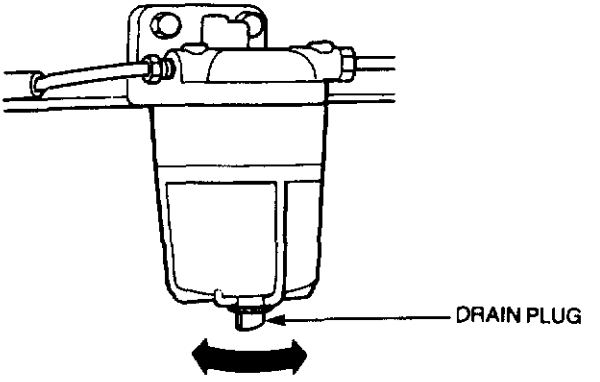


Figure 3-13 Fuel sedimenters

Air cleaner

342. 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.

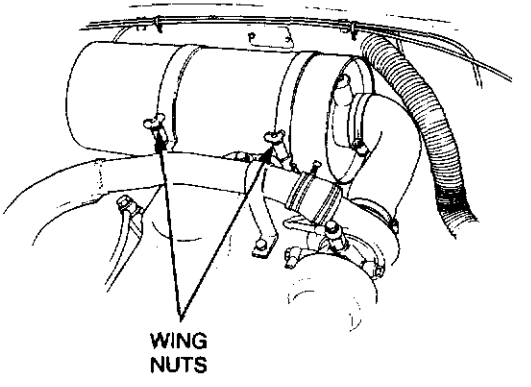


Figure 3-14 Air cleaner removal

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).

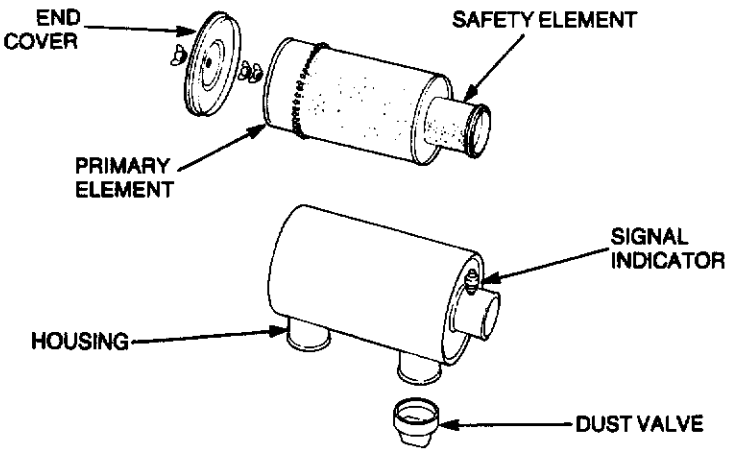


Figure 3-15 Air cleaner elements

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

343. 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.

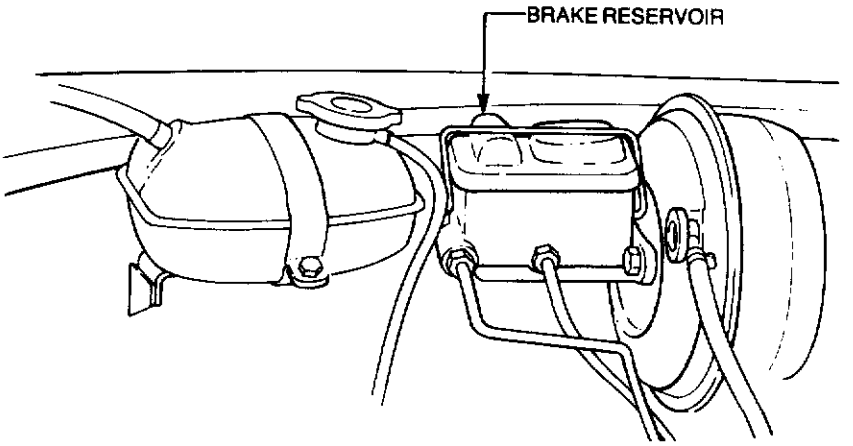


Figure 3-16 Brake reservoir

Clutch reservoir

344. 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.

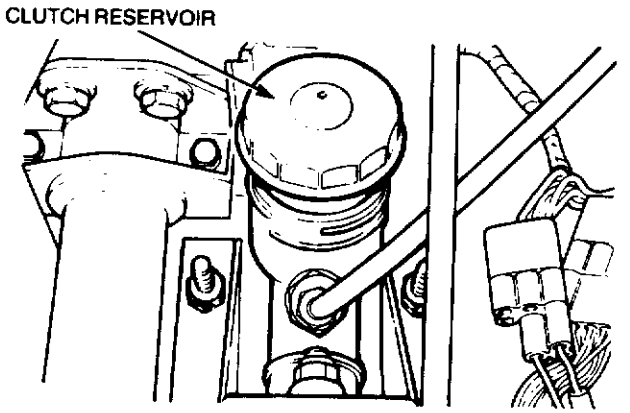


Figure 3-17 Clutch reservoir

Winch

345. 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.

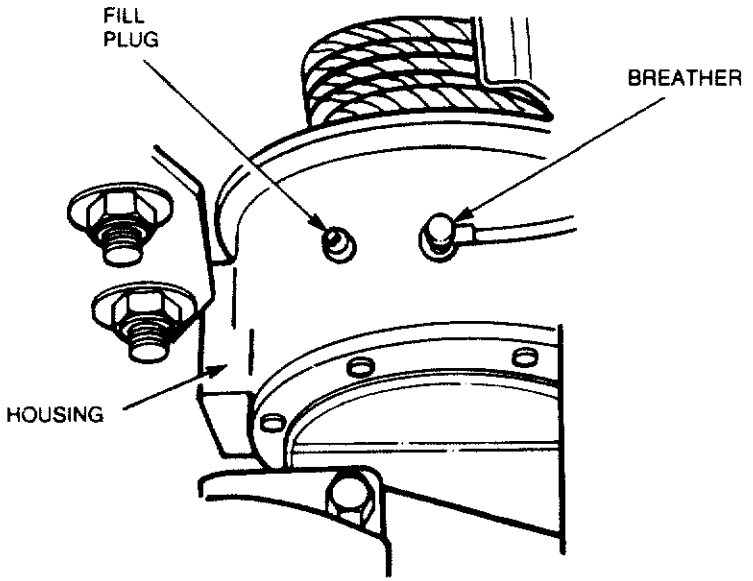


Figure 3-18 Winch fill plug

346. 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.

347. 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.

348. 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.

349. Ensure that the winch breather is not restricted.

Fanbelt jockey pulley

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

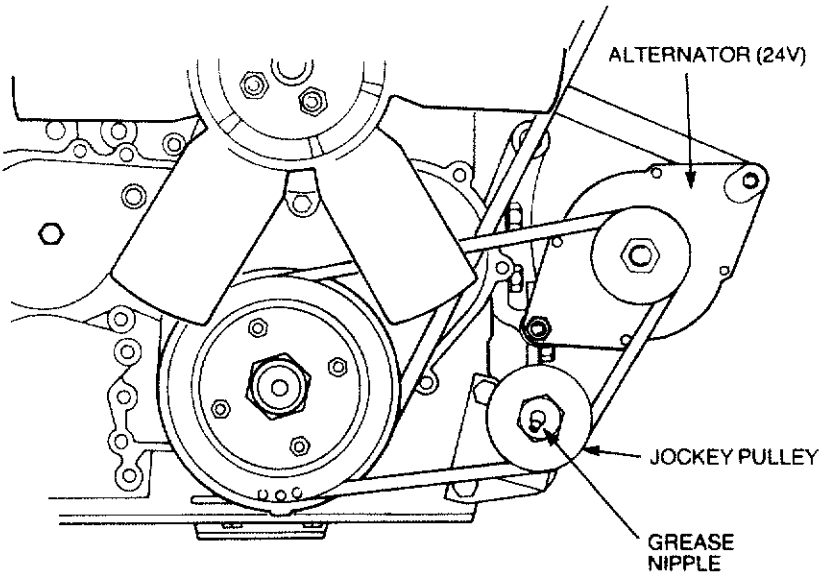


Figure 3-19 Jockey pulley lubrication

CHAPTER 4

GENERAL MAINTENANCE MODULE

SECTION 1 — EQUIPMENT DESCRIPTION

SECTION 2 — EQUIPMENT OPERATING INSTRUCTIONS

SECTION 1
EQUIPMENT DESCRIPTION

Introduction

401. The general maintenance module is a self-contained unit which is mounted on the chassis of the truck, cargo, light, winch, MC2 in place of the cargo tray (see Fig. 4-1). The module is of a steel frame fibreglass sandwich construction which can be mounted on the chassis of the truck, cargo, light, winch, MC2 by two tradesmen in a fully equipped workshop in three days.

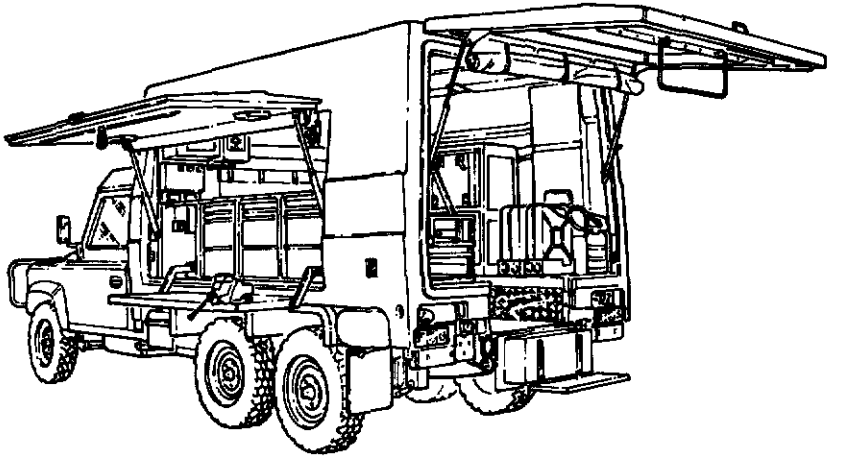


Figure 4-1 Truck, General Maintenance, Light, Winch, MC2 — module configuration

Operational and logistic concepts

402. This module provides a facility for two tradesmen to carry out Unit repairs in an operational environment. The module is supplied with basic fittings such as benches, storage space, electrical connections and lighting. The module can be configured to accomodate the specialist requirements to meet the owner unit's role.

Ventilation and heating systems

403. A 240 volt variable speed fan assisted heater is mounted in the footwell at the front of the module. Four roof mounted vents are fitted to allow for air distribution within the module.

404. Ceiling lights

The main lighting utilizes eight 240 volt fluorescent tubes and is controlled by a switch secured to the roof adjacent to the rear door (see Fig. 4-2).

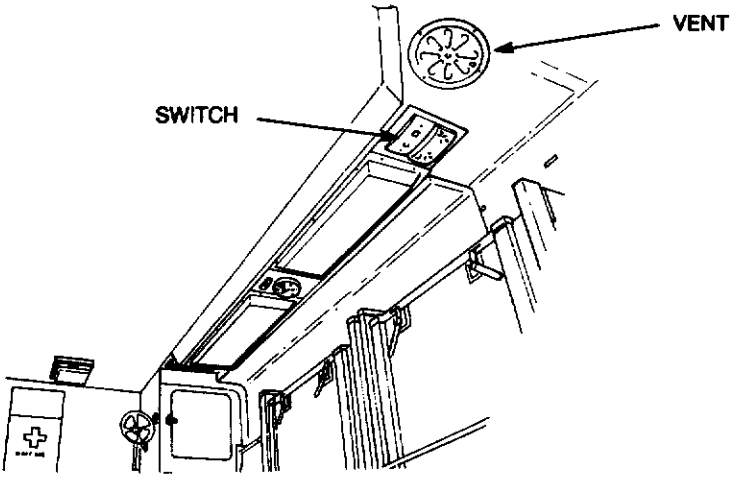


Figure 4-2 Ceiling light switches

405. Additional lights — 24 volt

Additional lighting is available utilizing the vehicles 24 volt electrical system. The lights, which are fitted with an on/off switch, are positioned on the side and rear doors, and above the front work bench (see Fig. 4-3).

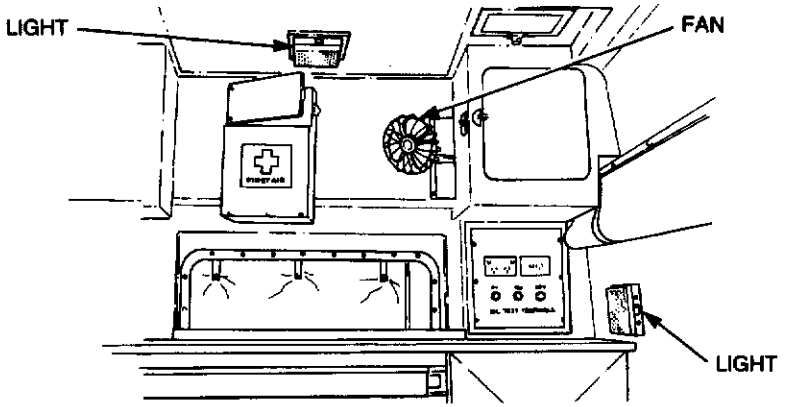


Figure 4-3 Module 24 volt lighting

406. Blackout function — module

A red rocker switch is located on the roof mounted switch panel (see Fig. 4-2) to control the blackout mode. When operated, the red ceiling lights are illuminated only.

407. High level reversing lights

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

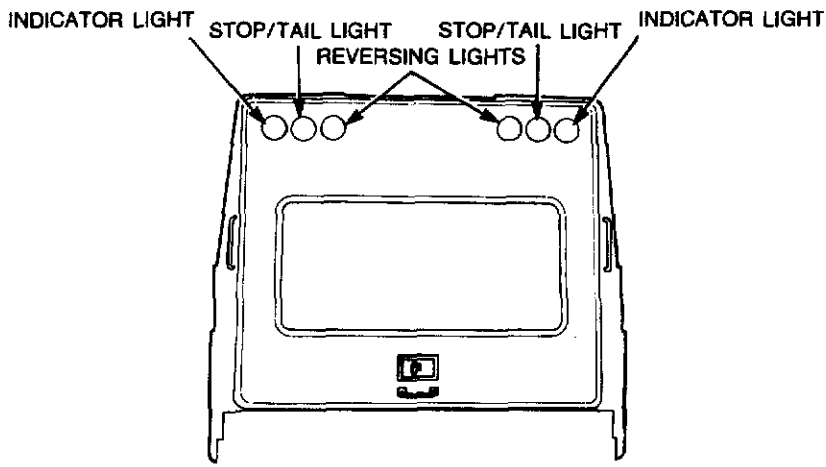


Figure 4-4 Rear door lights

408. High level indicator lights

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

409. High level stop and tail lights

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

410. Fan assisted heater

The heater is located in the front left hand corner of the module footwell (see Fig. 4-5), and incorporates a 3 position rotary switch for fan speed control, and a variable rotary switch for temperature control.

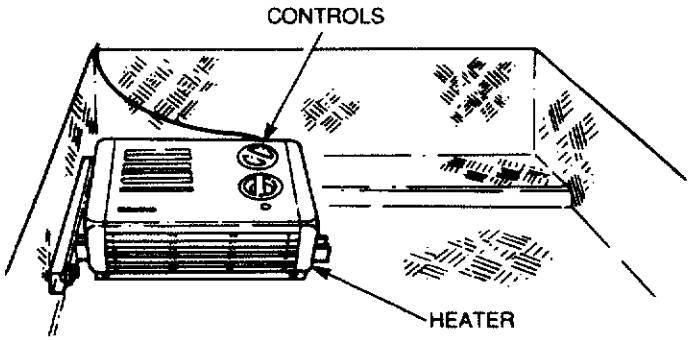


Figure 4-5 Fan heater controls

411. Cooling fan

The 24 volt cooling fan is located on the front wall above the work bench (see Fig. 4-6) and the on/off switch is secured to the roof panel adjacent to the fan.

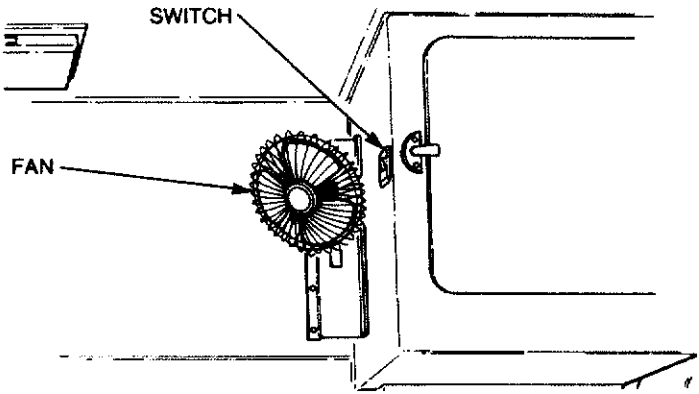


Figure 4-6 Cooling fan

412. Power supply — 240 volt

Single and double switched power sockets are located in various positions on the module walls and ceiling. These 10 amp and 15 amp sockets supply mains voltage (240 volt) via an external source (generator or mains) to the power equipment being used.

413. Circuit breaker and power selection panel

The circuit breaker and power selection panel is located in the front left hand corner of the module (see Fig. 4-7) and controls the mains input and output voltage.

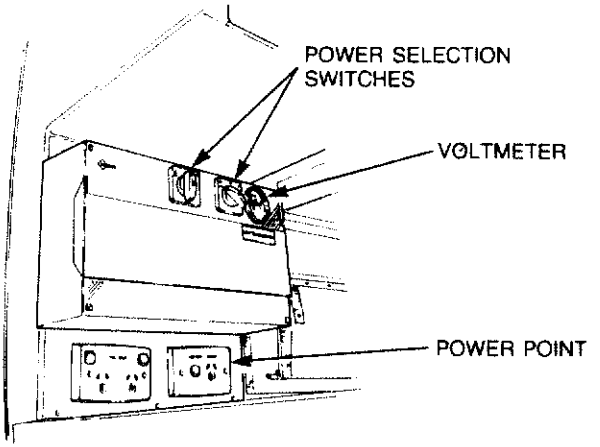


Figure 4-7 Circuit breaker and power selection panel

General maintenance module fittings

414. 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.

415. Rear door

WARNING

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

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

a. A large push out emergency exit 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 accidental closure.

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

416. Side doors

WARNING

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

Two side doors manufactured from fibreglass, bonded to a galvabond frame, provide access to the drop down bench, battery charger, transformer and two-way drawers on the left side of the module, and storage bins on the right side of the module. The side doors also have the following features:

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

b. 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 accidental closure.

c. Dual slam-latches are provided for the side doors and are opened by a release handle.

d. A 'D' type handle is provided to assist in closing the door when the vehicle is parked on uneven ground.

417. 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 lockers located above the front bench.

418. Pull down rail

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

419. Lifting handle

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

420. Rear step

Located centrally at the rear of the vehicle is a hinged step (see Fig. 4-8), 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.

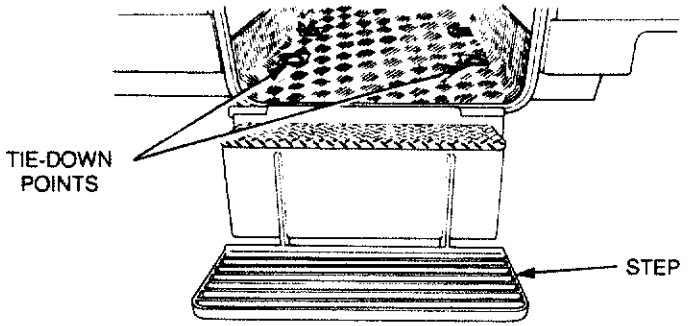


Figure 4-8 Rear step

421. Power inlet sockets

WARNING

The vehicle is to be earthed using the external earth spike prior to external 415/240 volt power sources being connected to the vehicle.

NOTE

The 415 volt power inlet socket is fitted with a Panclimatic, Ruggedised, FEMALE, 5 PIN, 45 A three phase power connector.

Located in the rear right hand corner of the module is a lockable flap which provides weather protection to the three inlet sockets (see Fig. 4-9). These sockets accept 240 volt single phase and 415 volt three phase power from mains or 2.5 kVA, 10 kVA or 15 kVA field generators.

Module interior layout

422. Oxygen and acetylene hoses (Fig. 4-10 item 1)

Oxygen and acetylene hoses are stowed on a reel in the wire mesh stowage bin.

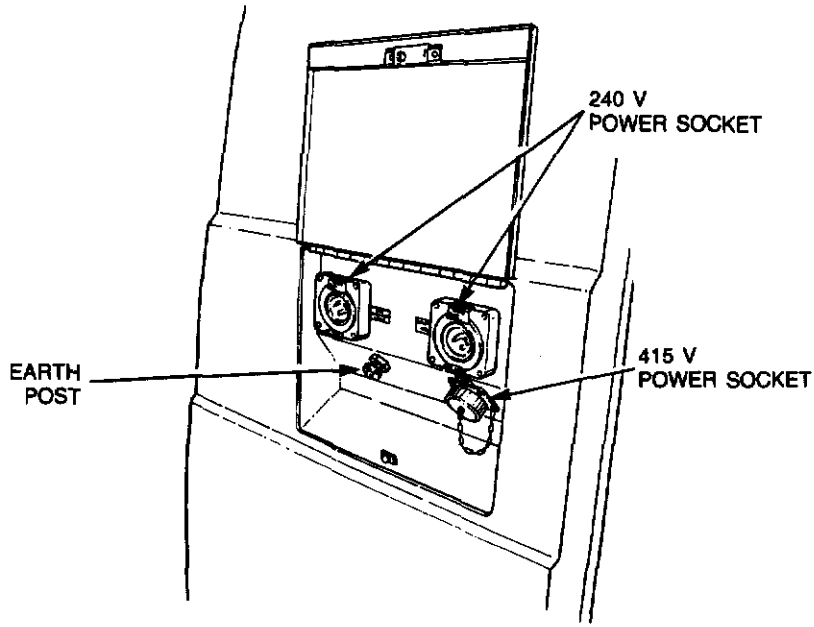


Figure 4-9 Power inlet sockets

423. Oxygen and acetylene cylinders (Fig. 4-10 Item 2)

Oxygen and acetylene cylinders are stowed in the wire mesh stowage bin.

424. Vice (Fig. 4-10 Item 3)

The offset 100 mm relocatable vice can be secured to the bench top, the drop down work bench and a stowage bracket.

425. Pull down handles (Fig. 4-10 Item 4)

A pull down handle is fitted to each side door to assist in closing whilst on uneven ground.

426. Side doors (Fig. 4-10 Item 5)

Two lift up doors are fitted to the module sides and are fitted with two 24 volt work lamps, two gas struts and a release handle with a facility to secure in a locked position with padlocks.

427. Work bench (Fig. 4-10 Item 6)

A work bench with a galvanised surface that may be installed on the right or left hand side of the module is fitted. Benches are also installed at the front of the module.

428. Work lamp (Fig. 4-10 Item 7)

Two 24 volt work lamps with switches are mounted on each side door and illuminate the drop down work bench area.

429. Gas struts (Fig. 4-10 item 8)

Gas struts are fitted to each door and utilize a manual locking device to support the door in a near horizontal position and to prevent against accidental closure.

430. Publication cabinets (Fig. 4-10 item 9)

Two lockers are provided in the upper front corners of the module to store maintenance manuals as necessary.

431. Circuit breaker and power selection panel (Fig. 4-10 item 10)

The circuit breaker and power selection panel located in the front left hand corner of the module provides protection for the 24 volt and 240 volt power circuits.

432. First aid locker (Fig. 4-10 item 11)

A first aid locker is located on the front wall of the module and contains a basic first aid kit.

433. Work lamp (Fig. 4-10 item 12)

A 24 volt work lamp is fitted above the front work bench to provide illumination over the working area.

434. Cooling fan (Fig. 4-10 item 13)

A 24 volt cooling fan is mounted on the front wall of the module to recirculate internal air. The on/off switch is mounted on the side of the publication locker adjacent to the fan.

435. Power outlet sockets (Fig. 4-10 item 14)

Power outlet sockets, one single and one double, with outputs of 240 volt 15 amp and 10 amp respectively, are fitted to the front wall of the module below the right hand publication locker and below the circuit breaker and power selection panel.

436. Stowage frames (Fig. 4-10 item 15)

Two stowage frames are secured to the channel sections on the right hand side platform area of the module. The frames are used for the stowage of four bin packs.

437. Fire extinguisher (Fig. 4-10 item 16)

A 3.0 kg BCF fire extinguisher is located inside the rear door jamb on the right hand side of the module. A quick release bracket secures the extinguisher in place when not in use.

438. Jerrican holders (Fig. 4-10 item 17)

Two jerrican holders are secured to the channel sections on the right hand side platform area of the module for jerrican stowage.

439. D.C. test points (Fig. 4-10 item 18)

A 0 to 24 volt test point is installed above the front right hand work bench.

440. Gasket drawer (Fig. 4-10 Item 19)

A gasket drawer is located underneath the centre section of the front bench. Wing latches secure it in the closed position.

441. Fan assisted heater (Fig. 4-10 Item 20)

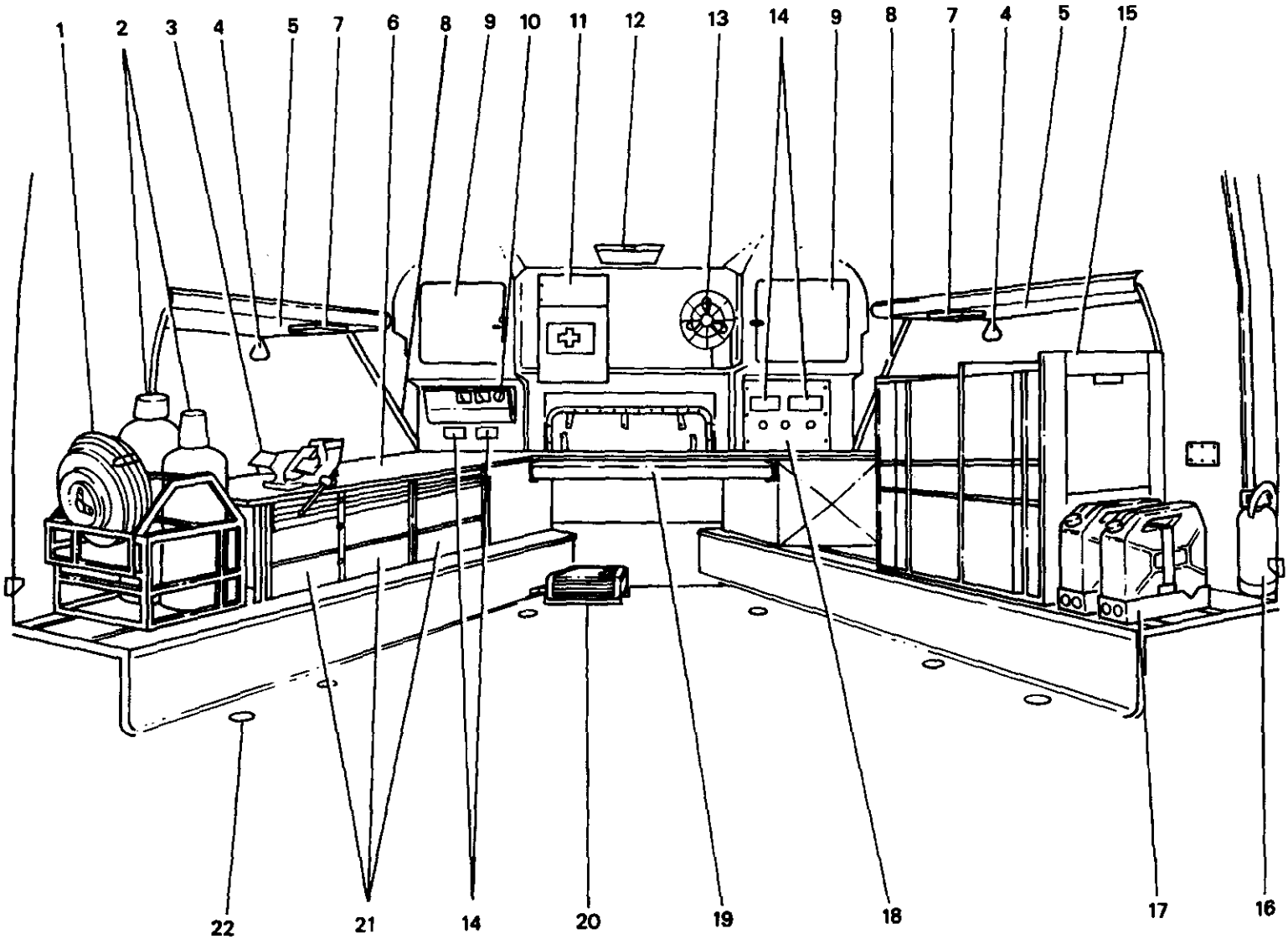
The fan assisted heater is located in the footwell of the module. A 240 volt supply is required to operate the fan heater.

442. Drawers (Fig. 4-10 Item 21)

Three groups of drawers are provided beneath the side bench. Each group consists of two shallow and two deep drawers. Wing latches secure in the closed position when not in use.

443. Tie-down rings (Fig. 4-10 Item 22)

Six recessed tie-down rings are provided in the floor of the module for the purpose of securing tool boxes and loose equipment.



1. Oxyacetylene hoses
2. Oxyacetylene cylinders
3. Vice
4. Pull down handles
5. Side doors
6. Work bench
7. Work lamp
8. Gas strut
9. Publication cabinet
10. Circuit breaker and power selection panel
11. First aid locker
12. Work lamp
13. Cooling fan
14. Power outlet sockets
15. Stowage frames
16. Fire extinguisher
17. Jerrican holders
18. D.C. test points
19. Gasket drawer
20. Fan assisted heater
21. Drawers
22. Tie-down rings

Figure 4-10 Module interior view

SECTION 2
EQUIPMENT OPERATING INSTRUCTIONS

General

WARNING

The vehicle is to be earthed using the external earth spike prior to external 415/240 volt power sources being connected to the vehicle.

444. The general maintenance module is a mobile self-contained repair facility providing stowage for repair equipment and spare parts. The correct operation and stowage of the equipment and parts is essential to enable repairs to be carried out efficiently, either inside or outside the module.

Module access

445. Access to the module is gained through the rear upward opening door. Ensure that the locking device on the door struts is activated to prevent accidental closure of the door (see Fig. 4-11), then lower the rear step. As necessary, raise the side doors and lock the struts in the same manner.

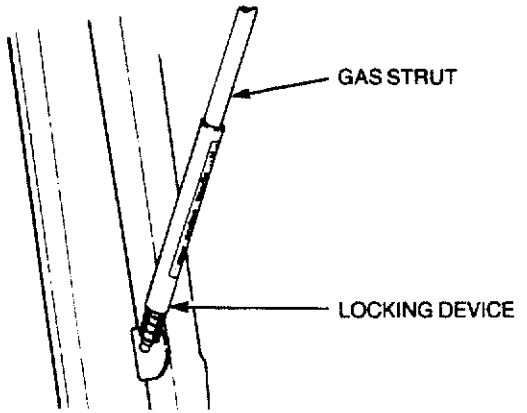


Figure 4-11 Strut locking device

Lowering the external work bench

446. To lower the external work bench proceed as follows:

WARNING

The bench with vice fitted weighs approximately 30 kg at its outer extremity when lowered to 45 degrees.

a. Ensure that the release catch (see Fig. 4-12) at the left hand bench support is in the detent position by pushing the bench towards the vehicle and the safety chain is connected to the bench.

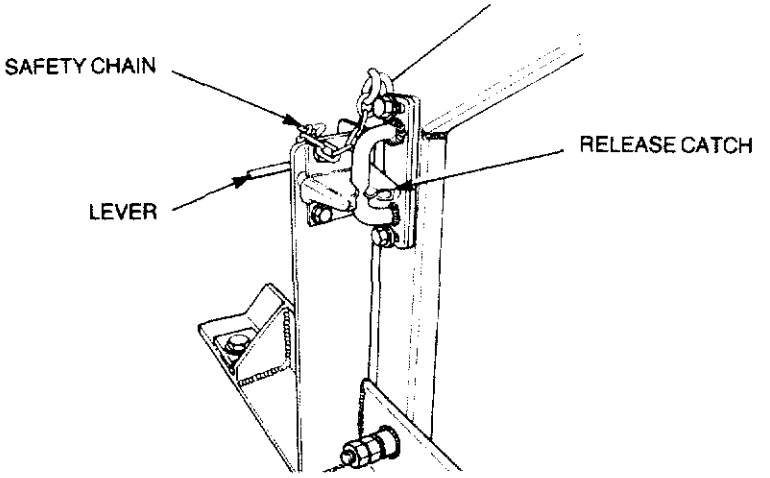


Figure 4-12 Bench release catch

b. Support the bench with one hand and release the locking lever at the right hand bench support (see Fig. 4-13).

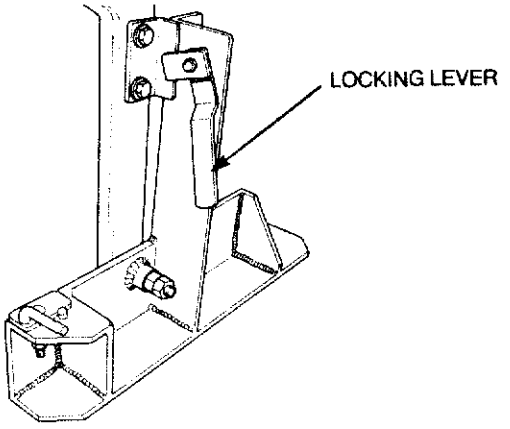


Figure 4-13 Bench locking lever — right hand

c. Steady the bench with one hand, undo the safety chain from the bench, then operate the release catch on the left hand bench support.

d. Lower the bench with care.

c. Apply the left hand and right hand bench lock down clamps (see Fig. 4-14).

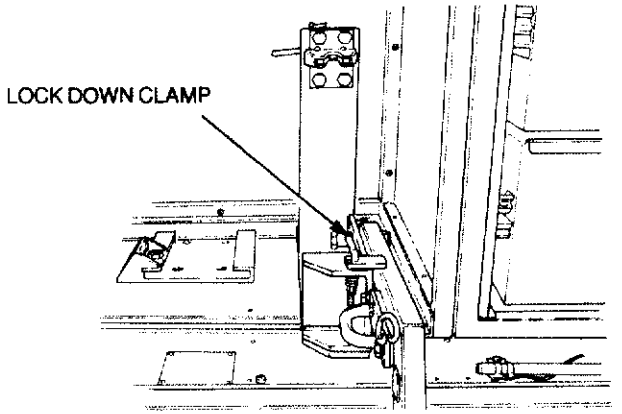


Figure 4-14 Bench lock down clamp

Stowing the external work bench

447. To stow the external work bench proceed as follows:

WARNING

The bench with vice fitted weighs approximately 30 kg at its outer extremity when lowered to 45 degrees.

a. Disengage the left hand and right hand lock down levers.

b. Raise the bench and engage the locking bar (see Fig. 4-14) in the release catch and hook up the safety chain to the bench. Ensure the locking mechanism is in the detent position and the safety chain is applied before releasing the bench.

c. Apply the right hand locking lever.

Adjusting the level of the external work bench

448. To adjust the level of the external work bench proceed as follows:

a. Raise and lock the bench in the stowed position.

b. Slacken the bench level adjusting bolts lock nuts (see Fig. 4-15) and turn the bolts clockwise to lower and counter-clockwise to raise the level of the bench.

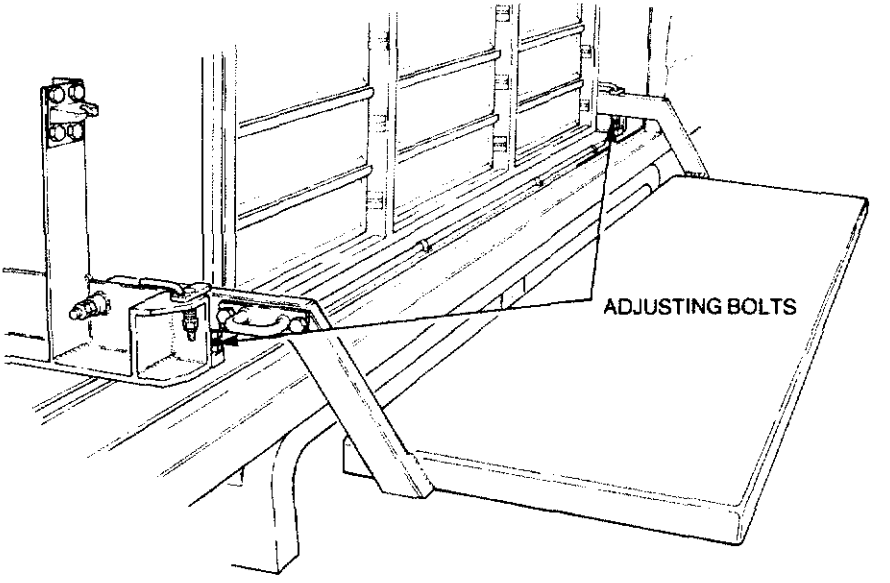


Figure 4-15 Bench level adjusting bolts

c. Lower the bench and check the level. Repeat steps a. and b. until the desired level is reached.

d. Tighten the lock nuts.

Opening or removing bench drawers

449. To open or remove the bench drawers proceed as follows:

a. Press down on the release lever on the drawer to be removed and pull the drawer out until it contacts the stop.

b. To remove the drawer from the bench, press down on the release lever after the drawer has contacted the stop, then carefully pull and remove the drawer from the runners.

Replacing or closing the drawers

450. To replace or close the drawers proceed as follows:

a. Locate the drawer slides between the runners and push the drawer in until the automatic retaining mechanism has operated. Pull on the drawer to ensure that the drawer is secure.

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	
15	NIC	Tyre, Pneumatic, Light Truck, Tubed 7.50 R016 Lt, 10 ply Olympic Steeltrek			1	N	B
16	NIC	Wheel Chocks			2	N	

SIMPLEX COMPLETE EQUIPMENT SCHEDULE 12107/1
TRUCK, GENERAL MAINTENANCE, LIGHT, FFR, WINCH, MC2 — LANDROVER 110
LIABILITY CODE 73230/01

ITEMS SUPPLIED/ISSUED WITH TRUCK

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)			2	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

Part 2B — Optional Equipment — To Be Demanded Separately

NIC	Equipment Kit, Vehicular Light, MC2, 6x6, 4 Cylinder Diesel Engine, Manual Transmission, Shelter Installation, Small 12V Electrical System, Land Rover Model 110 Series (PSCES) 004/86)	1	N

Footnotes

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

Item No.	NATO Stock No.	Designation	Unit of Issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note
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	5120-66-016-0098	Wrench, Ring, Bi-Hexagon, Double Offset, Double Ended, 1/2 in. and 9/16 in. A/F			1	X	
21	NIC	Wrench, Socket, Wheelnut, 4 Way Type 15/16 in. and 1-1/16 in. x 16. in. Nom. Lg O/A			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
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	
24	6145-66-014-2971	Wire, Electrical, No. 20 SWG	RL		1	X	

SIMPLEX COMPLETE EQUIPMENT SCHEDULE 12123/1
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	

INDEX

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Item No.	NATO Stock No.	Designation	Unit of issue	Quantity per sub-assembly	Quantity per equip-ment	Expend-ability classi-fication	Foot-note

Part 2B — Optional Equipment — To Be Demanded Separately

Footnotes

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

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