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**TRUCK, 4 TONNE, 4x4,
BEDFORD MJ, ALL VARIANTS
REPRINTED INCORPORATING AMDTS 1-3
OPERATING INFORMATION**

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PREFACE

SPONSORS

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Except where stated otherwise, all references to left hand side, right hand side, front or rear in this publication are as viewed from the driver's seat, facing forward.

The subject matter of this publication may be affected by Defence Council Instructions. If possible, amendments are issued to correct this publication accordingly. When an instruction contradicts any portion of this publication the Instruction is to be taken as the over-riding authority.

ASSOCIATED PUBLICATIONS

Refer to CAT 1 (AESP No 2320-H-100-101)

EQUIPMENT DESIGNATION

RECOVERY VEHICLE, Wh Lt, 4t, 4x4, w/turbo charged engine, Bedford
MJP2BMO

Vehicle Asset Code B27 1310-3100

NSN 2320-99-893-6140

TRUCK, CARGO, 4t, 4x4, w/hyd tail lift, w/turbo charged engine, Bedford
MJP2BMO

Vehicle Asset Code B36 2022-3101

NSN 2320-99-893-6144

TRUCK, CARGO, 4t, 4x4, w/turbo charged engine, Bedford MJP2BMO

Vehicle Asset Code B36 2025-3100

NSN 2320-99-893-5954

TRUCK, CARGO, 4t, 4x4, LHD, w/turbo charged engine, Bedford MJP2BMO

Vehicle Asset Code B36 2025-8100

NSN 2320-99-893-6142

TRUCK, CARGO, w/3t crane, 4t, 4x4, Armament Support, w/turbo charged
engine, Bedford MJP2

Vehicle Asset Code B36 2038-3100

NSN 2320-99-893-6146

TRUCK, CARGO, w/3t crane, 4t, 4x4, Armament Support, LHD, w/turbo
charged engine, Bedford MJP2BMO

Vehicle Asset Code B36 2038-8100

NSN 2320-99-893-6147

TRUCK, CARGO, w/3t crane, 4t, 4x4, APFC, w/turbo charged engine,
Bedford MJP2BMO

Vehicle Asset Code B36 2039-3100

NSN 2320-99-893-6148

TRUCK, CARGO, w/winch, 4t, 4x4, w/turbo charged engine, Bedford
MJP2WMO

Vehicle Asset Code B36 2050-3100

NSN 2320-99-893-6141

TRUCK, CARGO, w/winch, 4t, 4x4, LHD, w/turbo charged engine, Bedford
MJP2WMO
Vehicle Asset Code B36 2050-8100
NSN 2320-99-893-6143

TRUCK, FLAT PLATFORM, 4t, 4x4, w/turbo charged engine. Bedford
MJP2BMO
Vehicle Asset Code B36 2091-3100
NSN 2320-99-893-6137

TRUCK, FLAT PLATFORM, 4t, 4x4, LHD, w/turbo charged engine, Bedford
MJP2BMO
Vehicle Asset Code B36 2091-8100
NSN 2320-99-893-6138

TRUCK, FUEL SERVICING AIRCRAFT, 4t, 4x4, 4500 litres, w/turbo charged
engine, Bedford MJP2BMO
Vehicle Asset Code B36 2165-3100
NSN 2320-99-893-6139

TRUCK, FUEL SERVICING, AIRCRAFT, 4t, 4x4, 1000 gal, D/P, Tactical
Airportable, Mk 5. LHD, w/turbo charged engine, Bedford MJP2BMO
Vehicle Asset Code M36 2165-8100
NSN 2320-99-893-6145

Chapter 1-1

GENERAL DESCRIPTION

TRUCK, CARGO 4 TONNE 4 x 4 AND W/WINCH

1. The 4 tonne cargo vehicle is an all wheel drive logistic vehicle with a 4 tonne payload and is designed to carry 6 Unit Load Containers or pallets. The vehicle is based on proved commercial components with special military features incorporated. It can be supplied with or without a 6.5 tonne capacity winch. It is to provide the Army's main logistic lift at 1st, 2nd and 3rd Line.
2. The six-cylinder engine is of the in-line, turbocharged, four-stroke, direct injection type, with combustion chambers formed in the piston crowns. The overhead valves are push rod operated. The turbocharger, mounted in the centre of the exhaust manifold, is driven by the engine exhaust gas. Lubrication of the engine is by a high pressure gear-type pump, oil being filtered by an AC full-flow filter.
3. Drive to the front wheels is transmitted through hypoid gears, the differential and pinion assembly being similar to that used in the rear axle, apart from changes necessary to bring the pinion above the centre of the axle. The drive from the differential assembly to the road wheel hubs is by 'Tracta' universal joints.
4. The rear axle drive is also by hypoid gears, the drive being transmitted to the road wheel by fully-floating axle shafts.
5. Steering of the vehicle is effected through steering gear of the semi-irreversible worm and sector type.
6. Suspension consists of semi-elliptic springs and double-acting telescopic shock absorbers.
7. A single, dry-plate clutch, with a spring-loaded centre, transmits the power to the gearbox.
8. The gearbox has four forward speeds and one reverse, with synchromesh operation on Top, 3rd and 2nd gears.

9. All four wheels of vehicle can be driven. The drive to the front wheels is engaged or disengaged by means of the transfer box lever situated centrally in the driver's cab.

10. A transfer box, mounted beneath the third intermediate chassis frame crossmember, transmits the drive to either the rear axle (high ratio only), or to both front and rear axles, in either high or low ratio as required. It also provides a power take-off.

11. The footbrake operates through an air-hydraulic system and acts on all four wheels. The horizontal pull-up type handbrake operates a drum type independent transmission brake. The system incorporates 3-line connections for trailer brake operation. Air supply is by an engine driven compressor.

12. Vehicles with a Date Into Service (DIS) on or after 1st April 1989, are fitted with Self Sealing Trailer Air Brake Connections (Palm Couplings). Vehicles with a DIS before 1st April 1989 have manual trailer brake couplings. Vehicles with Manual Couplings will need the air supply to the trailer selected on before driving off. On vehicles with self seal couplings, connecting the brake couplings automatically turns on the air supply.

13. On standard vehicles the electrical system is 24 volt negative chassis ground. On vehicles without a standard electrical system a 24 volt insulated negative return is fitted, providing an insulated ground return for all vehicle electrical components. Both systems are suppressed. The batteries are secured in a carrier attached to the frame sidemember on standard vehicles whereas on vehicles equipped with an insulated negative return system the batteries are located behind the driver in the rear parcel shelf.

14. The winch (where fitted) is power operated and its maximum pull is governed by the engine torque. The drive to the winch is controlled by the transfer box and power take-off levers, when the first speed of the main gearbox is engaged.

15. All vehicles have a Vehicle Weight Specification plate which carries the vehicle identification details. The plate is riveted to the cab right-hand door pillar.

16. All models also have a Service Parts Identification plate which carries the chassis number and all the code numbers for the particular vehicle. When ordering replacement parts, all details on this plate, together with the engine number where applicable, should be quoted to ensure correct replacement parts being obtained. The plate is attached to the cab left-hand door pillar.

17. The engine number is stamped on a machined pad on the lower right-hand side of the crankcase.

End of Chapter

Chapter 1-2

GENERAL DESCRIPTION

TRUCK, CARGO 4 TONNE 4x4 W/CRANE

Note

This Chapter to be read in conjunction with Chapter 1-1

1. The 4 tonne cargo with crane is an all wheel drive logistic vehicle with 4 tonne payload, designed to carry 6 Unit Load Containers or pallets. The vehicle is based on proven commercial components with special military features incorporated, including a 3 tonne capacity crane. It is to provide the Army's main logistic lift at 1st, 2nd and 3rd Line.
2. The crane is hydraulically driven by a pump taking its drive from the transfer box. Operating controls are behind the cab and are accessible through the cab roof observation hatch.

END OF CHAPTER

Chapter 2-1

CONTROLS AND INSTRUMENTS

TRUCK CARGO 4-TONNE 4 x 4 AND W/WINCH

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4	Engine idle control
7	Lighting switch
8	Infra-red light switch
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12	Turn and lane change signal light control switch
15	Hazard warning device
16	Rear fog guard light switch
18	Cab roof light switch
19	Instrument panel lighting
20	Circuit check leak switches
23	Battery condition indicator and alternator warning light
26	Cold start aid
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28	Fuel gauge
29	Accelerator pedal
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31	Brake controls
32	Vehicle and trailer emergency brake hold (Hill holder)
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BATTERY CUT-OUT SWITCH

CAUTION

Always stop the engine before switching off the cut-out switch.

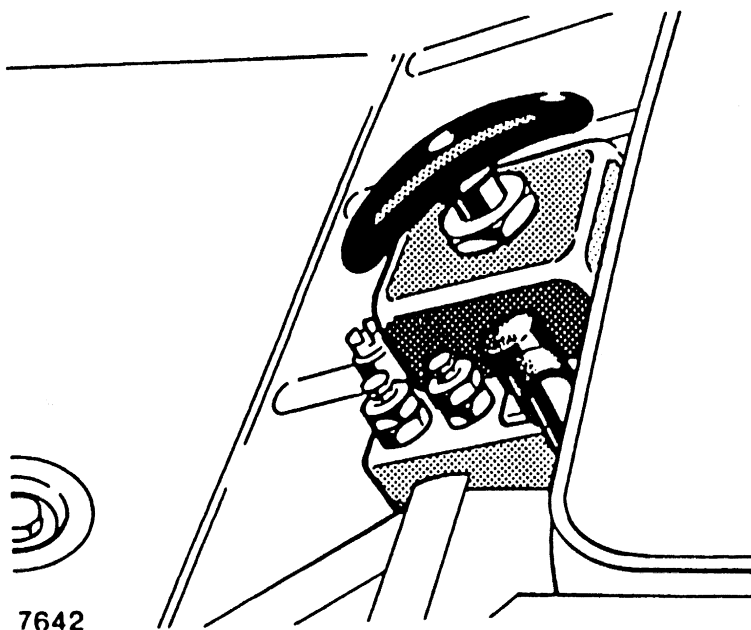


Fig 1 Battery master switch

1. This switch (Fig 1) is positioned beneath the right-hand seat in the cab. When the switch is in the 'OFF' position, the battery is completely isolated from the rest of the vehicle. The switch positions are marked on the switch top cover.

COMBINED MAIN KEY-START SWITCH

2. This switch (Fig 2(39)) is located on the engine compartment top panel, adjacent to the driver's seat. It is operated by a key and the first movement of the switch turns on the main circuits. Further rotation of the switch against the pressure of a spring operates the starter. When the switch is released it returns automatically to the running position.

Note

Turning the key-start switch to the 'OFF' position does not stop the engine. See paragraph 3 for use of engine 'stop' control.

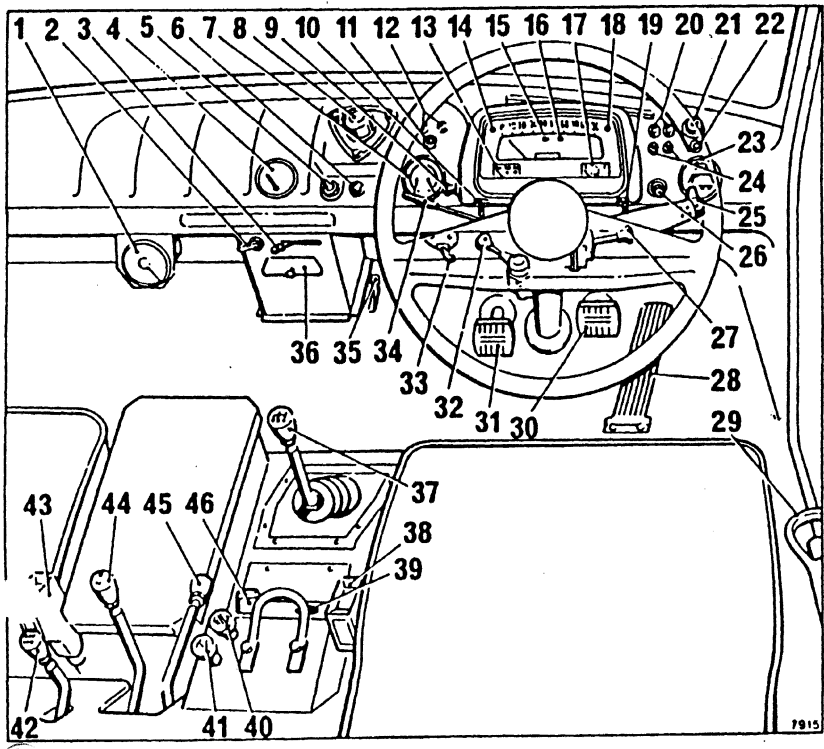


Fig 2 Instruments and controls

Key to Fig 2

- | | |
|---|--|
| 1 Tachometer | 23 Battery condition indicator |
| 2 Heater fan switch | 24 Circuit leak check switches* |
| 3 Heater temperature control lever | 25 Combined headlight dipper control and horn push |
| 4 Temperature gauge* | 26 Windscreen wash control button |
| 5 Infra-red lighting switch | 27 Hill holder |
| 6 Warning lamp - trailer turn light or interior light switch* | 28 Accelerator pedal |
| 7 Dual air pressure gauge | 29 Parking brake lever |
| 8 Main driving light switch | 30 Brake pedal |
| 9 Rear fog guard light switch | 31 Clutch pedal |
| 10 Panel light switch | 32 Winch brake |
| 11 Low air pressure warning | 33 Trailer brake emergency hand control valve |
| 12 Inspection light sockets | 34 Turn signal switch lever |
| 13 Temperature gauge (Chassis ground return only) | 35 Air control lever |
| 14 Alternator warning light | 36 Air flap |
| 15 Turn signal warning light | 37 Gear lever |
| 16 Main beam warning light | 38 Driver's seat belt lock |
| 17 Fuel gauge (Chassis ground return only) | 39 Key-start switch |
| 18 Oil pressure warning light | 40 Engine stop control |
| 19 Windscreen wiper switch | 41 Engine idle control |
| 20 Circuit leak check warning lights* | 42 Power take-off lever |
| 21 Hazard warning light switch | 43 Passenger seat belt lock |
| 22 Warning light-trailer turn light* | 44 Transfer box ratio control lever |
| | 45 Transfer box two/four wheel drive lever |
| | 46 Cold start control knob |

**Insulated earth return vehicles only*

ENGINE STOP CONTROL

3. The knob (40) is positioned on the engine compartment top panel adjacent to the main switch. To operate the control, pull the knob outward and hold it there until the engine stops.

ENGINE IDLE CONTROL

4. The idling control knob (41) is mounted on the engine compartment top panel and is appropriately marked.

5. To increase idling speed, screw the knob anti-clockwise. To decrease idling speed, screw the knob clockwise.

6. The control can be used to best advantage to prevent the engine stalling whilst it is warming up.

LIGHTING SWITCH

7. The driving light switch (8) is adjacent to the centre of the instrument panel and the switch has six positions including the 'OFF'. Turning the switch knob anti-clockwise from the 'OFF' to the 'T' position operates the tail and number plate lights. Rotation to the 'ST' position operates the sidelights in addition to the tail and number plate lights. Further rotation to the 'HST' position operates the headlights also. The stoplight and turn signal circuits are energised with the switch at 'OFF' or any of the anti-clockwise positions. Turning the switch knob clockwise from the 'OFF' to the 'C' position operates the convoy light and breaks the stoplight and turn signal circuits. Further rotation to the 'CS' position brings the sidelights also into circuit.

INFRA-RED LIGHT SWITCH

8. The infra-red lights are controlled by a switch (5) located at the centre of the instrument panel. In the 'Normal' position all the exterior driving lights operate in the normal manner.

9. In the 'IR' position all the driving lights (including the brake stop lights and the turn signal lights) but with the exception of the headlights, are extinguished. This position should only be used when infra-red shields are in position on the headlights.

COMBINED HEADLIGHT BEAM CONTROL AND HORN PUSH SWITCH

10. The headlights beam control (25) is located on the right-hand side of the steering column. The switch is a two-position switch, the clockwise position being dipped beam and the anti-clockwise position being main beam. A blue warning light (16) in the speedometer is illuminated when the headlights are on main beam.

11. The headlight beam switch also operates the horn by depressing the switch knob.

TURN AND LANE CHANGE SIGNAL LIGHT CONTROL SWITCH

12. The switch (34) is on the left-hand side of the steering column. Anti-clockwise movement of the lever switches on the left-hand turn signal, signalling a left-hand turn. Clockwise movement of the lever correspondingly indicates a right-hand turn.

13. Whenever the turn signals are in use, a small green light (15) in the instrument cluster panel is illuminated.

14. When a trailer is in use, the flasher circuit provides for the turn signal switch to operate the trailer turn signals simultaneously with those of the prime mover, through the 12-point trailer socket. There is a separate green warning light (6 or 22) on the instrument panel for the trailer turn signals.

HAZARD WARNING DEVICE

15. The switch (21) for the device is located on the right-hand side of the instrument panel, just above the battery condition indicator (23). To bring the hazard warning system into operation, depress the switch button. The flashing turn-signals on both sides of the vehicle, and on the trailer if in use, will then come into operation. The switch incorporates a red light which flashes on and off in conjunction with the turn signals on the vehicle. To switch the hazard warning system off, depress the switch button.

REAR FOG GUARD LIGHT SWITCH

16. The switch (9) is mounted on the left-hand side of the instrument surround panel. When lights are switched on, indication is given by lamp illumination in the switch itself.

17. The lights can only be illuminated with headlights in the dipped beam position. If fog guard lights are switched on and the headlights are changed to main beam or side lights only, the rear fog lights are automatically extinguished.

CAB ROOF LIGHT SWITCH

18. The switch for the roof light is incorporated in the light itself on vehicles with a negative chassis ground electrical system. On vehicles equipped with an insulated negative return electrical system, the switch (6) is mounted in the dash panel.

INSTRUMENT PANEL LIGHTING

19. Illumination of the instrument panel is provided by concealed lights, mounted behind the instruments. They are controlled by a small switch (10) located on the left-hand side of the instrument panel. The panel lights cannot be switched on until the side and tail lights are also switched on.

CIRCUIT LEAK CHECK SWITCHES

20. On vehicles equipped with an insulated negative return electrical system a circuit leak check is incorporated which indicates if there is an electrical leak to the chassis.

21. The switches (24) are mounted directly below the warning lights (20) to the right of the instrument panel. If when depressing the switches independently, the warning lights illuminate, it indicates that there is an electrical leak to the chassis, and should be reported.

22. In the event of lamp failure in the warning lights, no indication of a leak would be given, therefore to overcome this situation, a lamp illumination, check should be carried out first. To check lamp illumination, depress both switches simultaneously. If lamps do not illuminate, this indicates a lamp or line fuse failure and should be reported.

BATTERY CONDITION INDICATOR AND ALTERNATOR WARNING LIGHT

23. The condition of the vehicle's batteries can be checked by turning key-start switch to the 'ON' position and noting the reading on the battery condition indicator (23) which is located to the right of the instrument cluster. With a well

charged battery the needle should rest between 24 and 26. A reading below 24 shows that the battery requires attention. It is necessary to wait a few seconds for the battery voltage to stabilize before taking a reading.

24. A red warning light (14) in the instrument cluster panel is illuminated when the key-start switch is turned to the 'ON' position. With the engine running it should go out as soon as the alternator commences to charge the battery. The light acts as a warning if, for any reason, the alternator ceases to charge the battery.

25. When the engine is running at above idling speed the needle should indicate between 26 and 30 on the indicator (23). If the needle rests near the 30 mark the charging voltage is satisfactory. Should the needle stay near the 26 mark the charging voltage is low. This position may also be indicated when the headlights and other electrical equipment are in use. When the needle rests consistently on or above the 30 mark, it indicates a charging problem. Disregard readings shown when the engine is idling.

COLD START AID

26. The cold start aid knob (46) is located on the engine compartment top cover and is basically a push-type switch which controls two electrically-operated igniters in the inlet manifold to assist the starting of the engine from cold. See Chap 3-1, para 2 for engine starting procedure.

TEMPERATURE GAUGE

27. The temperature gauge (13) or (4) shows whether the engine is operating at the correct temperature. Under normal conditions the needle should lie around the 80 mark. If the needle rises significantly higher than normal, the cause should be investigated. Due allowance however, should be made for travelling in extremely hilly country, or in hot weather with a following wind. Should the temperature gauge show that the cooling system is consistently operating at too low a temperature, the efficiency of the thermostat should be checked.

WARNING

WHEN THE ENGINE IS AT NORMAL OPERATING TEMPERATURE OR ABOVE, THE INTERNAL PRESSURE BUILT UP IN THE COOLING SYSTEM WILL BLOW OUT SCALDING FLUID AND VAPOUR IF THE RADIATOR CAP

IS SUDDENLY REMOVED. TO PREVENT LOSS OF COOLANT AND TO AVOID THE DANGER OF BEING SCALDED, THE COOLANT LEVEL SHOULD BE CHECKED OR COOLANT ADDED ONLY WHEN THE ENGINE IS COOL. IF THE CAP MUST BE REMOVED WHEN THE ENGINE IS HOT, PLACE A CLOTH OVER THE CAP AND ROTATE THE CAP SLOWLY ANTI-CLOCKWISE TO THE FIRST STOP AND ALLOW PRESSURE TO ESCAPE COMPLETELY. THEN TURN THE CAP SLOWLY ANTI-CLOCKWISE TO REMOVE IT. MAKE SURE THAT THE CAP IS TURNED FULLY CLOCKWISE WHEN IT IS INSTALLED.

FUEL GAUGE

28. On vehicles with a negative chassis ground electrical system the fuel gauge (17) is electrically operated and functions only when the main starter switch is turned to the 'ON' position. Vehicles which have insulated negative return electrical systems have a mechanical fuel gauge positioned in the side of the fuel tank.

ACCELERATOR PEDAL

29. The accelerator pedal (28) is on the extreme right-hand side of the driver's footwell.

CLUTCH PEDAL

30. The clutch pedal (31) is on the extreme left-hand side of the driver's footwell.

BRAKE CONTROLS

31. The footbrake pedal (30) is between the clutch and accelerator pedals. It operates the brake shoes on all four wheels on the prime mover and also on the trailer when towing through an air pressure/hydraulic system. The parking brake lever (29) positioned at the outer side of the driver's seat, is of the horizontal pull-up type and it operates an independent drum-type transmission brake, which is mounted on the rear axle pinion shaft.

VEHICLE AND TRAILER EMERGENCY BRAKE HOLD (HILL HOLDER)

32. The hand control lever (27) is mounted on the right of the steering column and when applied in an anti-clockwise direction and held against spring

pressure, enables the vehicle and trailer brakes to be applied. This can be used to assist the driver, when holding vehicle and trailer on, or pulling away on, a steep incline. For operating instructions refer to Chap 3-1, paras 41-43 inclusive.

TRAILER BRAKE EMERGENCY HAND CONTROL VALVE

33. The trailer brake emergency hand control valve (33) mounted to the instrument panel allows the driver to leave the vehicle and trailer safely parked to enable him to leave the vehicle and apply the manual parking brake. For operating instructions refer to Chap 3-1, paras 44 and 45.

BRAKE WARNING DEVICES

34. On all models there is a dual air pressure gauge (7) located in the instrument panel to register the air pressure in the reservoirs. The brake system also incorporates a tow air pressure alarm buzzer and an amber warning light (11).

35. The vehicle must not be driven until the amber warning light goes out and the buzzer ceases to operate. If the buzzer sounds and the amber light comes on during vehicle operation, an immediate stop should be made and the cause of the air loss determined.

OIL PRESSURE WARNING LIGHT AND BUZZER

36. An amber warning light (18) in the instrument cluster panel will illuminate and an audible buzzer will sound when the ignition is switched on. The light should go out and providing there is sufficient air in the braking system, the buzzer will cease to sound when the engine is started. The light and buzzer are operated through a switch in the engine lubrication system and will, therefore, operate as soon as the oil pressure falls below the safety limit.

ALTERNATOR WARNING LIGHT

37. An alternator warning light (14) in the instrument cluster glows when the main switch is turned to the 'ON' position. It should go out as soon as the alternator commences to charge the battery. The light also serves as a warning not to leave the combined main and key-start switch on when the engine is not running. The light acts as warning if for any reason the alternator ceases to charge the battery.

MAIN GEARBOX CHANGE-SPEED LEVER

38. The main gearbox change-speed lever (37) is positioned centrally in the cab. There are four forward speeds and one reverse, with synchromesh operation on top, third and second speeds.

TRANSFER BOX RATIO CONTROL LEVER

39. The transfer box ratio lever (44) is centrally positioned in the cab, on the engine top compartment panel. The knob is marked 'H-N-L'.

TRANSFER BOX TWO/FOUR WHEEL DRIVE CONTROL LEVER

40. The transfer box two/four-wheel drive control lever (45) is located on the engine compartment top panel, to the left of the transfer box ratio control lever, and it is marked '4WD, 2WD'.

POWER TAKE-OFF LEVER (WHERE FITTED)

41. The power take-off lever (42) is centrally positioned on the engine compartment top panel, to the left of the transfer box levers. Move back to engage the power take-off.

WINCH CONTROLS (WHERE FITTED)

42. An air-operated winch brake lever (32), painted white, is attached to the steering column.

43. The winch cable drum clutch and cable tensioning device is controlled by a hand lever on the frame sidemember.

44. On all vehicles equipped with a winch, a modified engine idling control is fitted. This provides adequate control of the engine during winching operations. To increase the engine speed, unscrew the knob.

TACHOMETER (WHERE FITTED)

45. The engine-driven tachometer (1) is attached to a bracket on the lower edge of the instrument panel, just to the left of the heater and the figures on the dial indicate hundreds of revolutions - ie when the needle points to 15, the engine is running at 1500 rev/min.

WINDSCREEN WIPERS

46. Dual, parallel action, two-speed windscreen wipers are operated by a heavy-duty electric motor. The switch (19) is on the right-hand lower edge of the instrument cluster panel.

WINDSCREEN WASH

47. The knob for operating the screen-wash (26) is at the right of the instrument panel. To clean the screen, push the knob in and two jets of water will be directed on to the area of the screen swept by the wiper blades. The reservoir for the screen-wash is located under the instrument panel.

SEAT ADJUSTMENT

CAUTION

Do not adjust driver's seat while the vehicle is moving - the seat could move unexpectedly, causing loss of control.

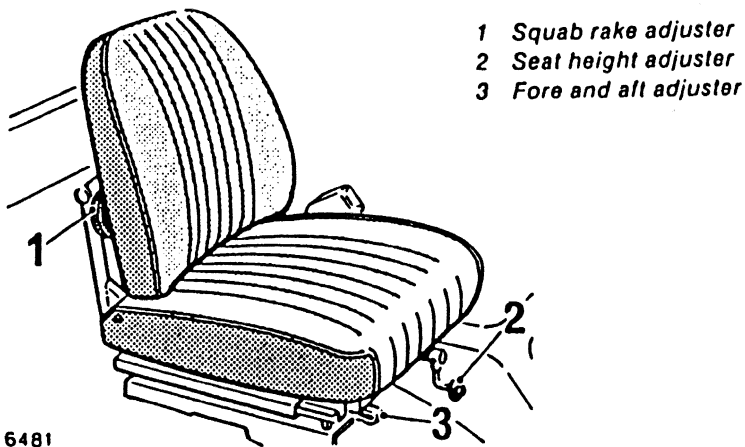


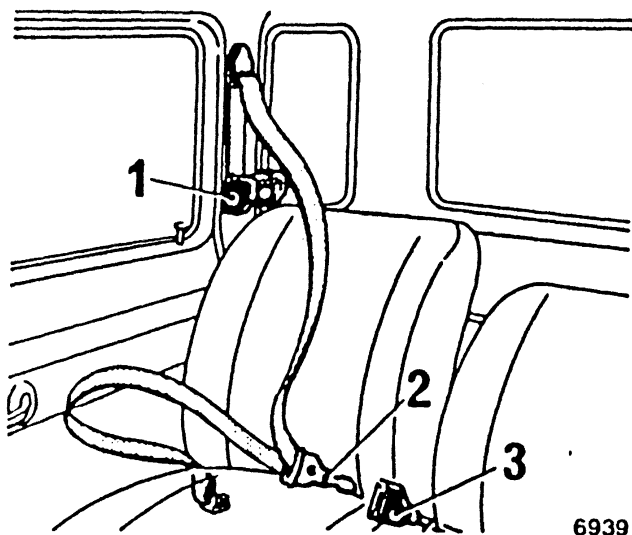
Fig 3 Seat adjustment controls

48. The driver's seat has provision for 50 mm (2 inch) height adjustment, forward and rearward adjustment of 127 mm (5 inch) and squab rake of 17 degrees.

49. To raise the seat assembly when in the sitting position, turn the handle (Fig 3 (2)) at the front of the seat to the left. To lower the seat assembly turn the handle to the right. This operation is easier if the body weight is not resting on the seat cushion.

50. Fore and aft adjustment is carried out by releasing the lever (3) at the front of the seat. When the seat is in the required position, release lever and rock seat to ensure catch has engaged.

51. To adjust the squab rake turn the large knurled knob (1) situated on the right-hand side of seat squab, either clockwise or anti-clockwise for the desired angle.



1 Inertia reel

2 Tongue

3 Coupling buckle

Fig 4 Seat belt layout

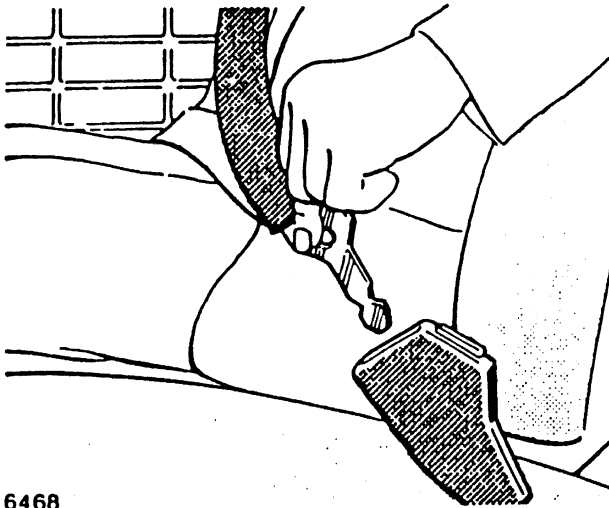
SEAT BELTS

52. The seat belts (Fig 4) are of the lap diagonal type with single-handed operation.

53. This type of seat belt stores the belt neatly away when not in use, provides automatic adjustment and gives the wearer complete freedom of movement under normal driving conditions.

To fasten the belt

54. To fasten the belt, grasp the tongue and slowly pull the webbing through the top attachment point. The belt should pass over the right shoulder on the right-hand seat and over the left shoulder on the left-hand seat. With the lap portion of the belt positioned as low on the hips as possible, push the tongue into the coupling buckle (Fig 5). A positive click will signal that the tongue is securely locked in the buckle.



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Fig 5 Seat belt fasten

To release the belt

55. Simply depress the release button (Fig 6) on the coupling buckle which is marked 'PRESS', and return the tongue to its stowed position near the top attachment point.

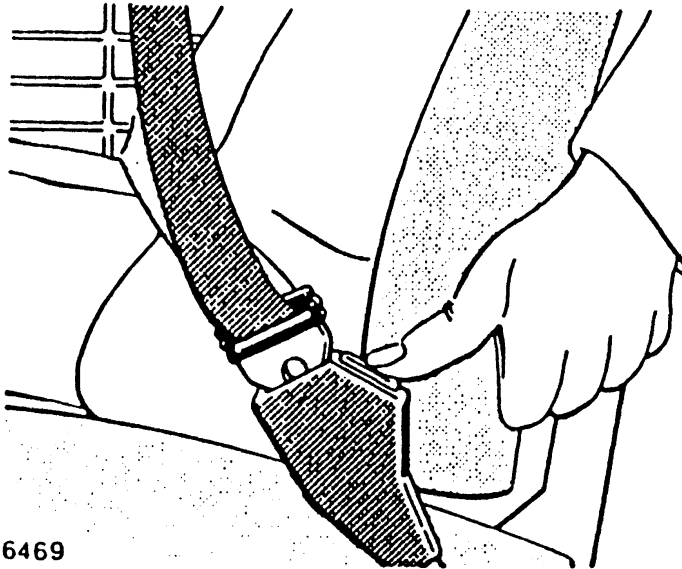
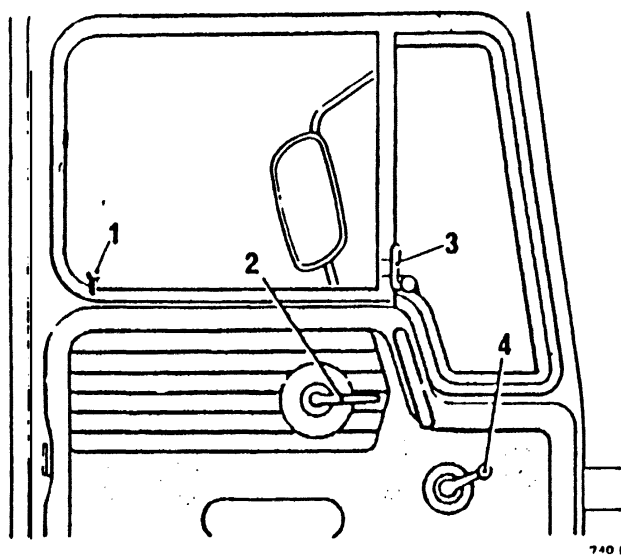


Fig 6 Seat belt release

CAB DOOR LOCKS

56. The passenger's door can be locked by depressing plunger knob (Fig 7 (1)). Similarly, the driver's door can be locked from the inside in this manner. The driver's door can be locked from the outside using the main switch key.



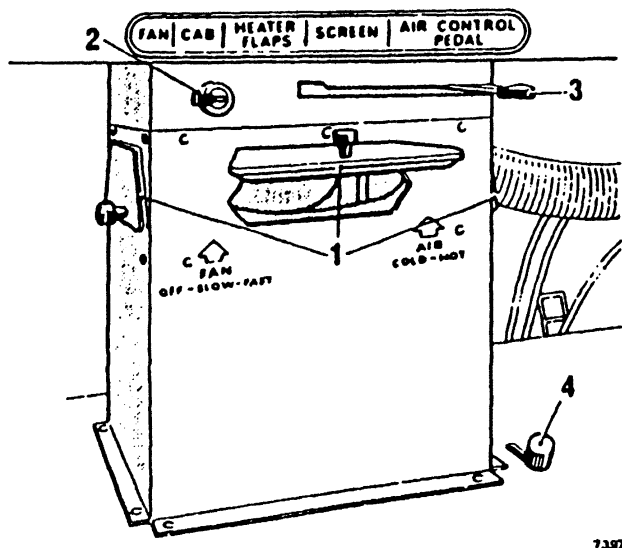
1 Internal locking knob
2 Door release lever

3 No-draught ventilation catch
4 Window winder control

Fig 7 Door controls

WINDOW CONTROLS

57. No-draught ventilator windows are incorporated in the front portion of each door. They are retained in the closed position by a small catch (3) on the bottom of the window frame. To open a window, turn the catch forward and push the rear of the window outward. This allows air to circulate without draughts. The rear portion of each front door has a window which can be raised or lowered by turning the handle (4) on the door inside panel.



1 Air flaps

2 Air booster switch

3 Heat control lever

4 Ventilation control lever

Fig 8 Heating and ventilation controls**VENTILATION AND HEATING**

58. The heater is designed to operate in conjunction, with the cab fresh air ventilation system. In addition to heating the cab interior, the heater is also used for demisting and de-icing the windscreen, air being diverted for this purpose through a duct at each side. Air flaps (Fig 8 (1)), and a ventilation flap controlled by lever (4), direct air through the system. The temperature of the air is controlled by lever (3) and to boost air flow an electrically-operated fan, controlled by switch (2), is provided. Whenever the vehicle is parked, the air intake control lever (4), must be moved to the rearward (closed) position, to prevent the ingress of insects etc. The system is operated as follows:

No ventilation or heating

59. Move the floor mounted air control lever to its rearward position. Heat control lever to the left. Close the three air flaps on the sides and front of the heater.

Cab cooling

60. Heat control lever to the left. Move the floor mounted air control lever to its forward position. Open air flaps on both sides and front of heater. Air flow can be increased by operating the heater fan, fast or slow as required.

Cold air demisting

61. Heat control lever to the left. Open floor ventilation flap by moving the control lever to its forward position. Close air flaps on both sides and front of heater. Air flow can be increased by operating the heater fan.

Cab heating

62. Heat control lever to the right. Open floor ventilation flap by moving the control lever to its forward position. Open air flaps on both sides and front of heater. Air flow can be increased by operating the heater fan.

Hot air demisting and de-icing

63. Heat control lever to the right. Open floor ventilation by moving the control lever to its forward position. Close all air flaps on both sides and front of the heater. Air flow can be increased by operating the heater fan.

ENGINE ACCESS PANELS

64. Hinged panels, beneath the quarter lights on each side of the cab, are fitted with slam-type locks, with outside handles. Self-locking stays retain them in the open position.

OBSERVATION HATCH

65. The observation hatch is situated in the centre of the roof panel and the fire resistant cover is secured by three stretch rings located over pegs in between hip ring padding.

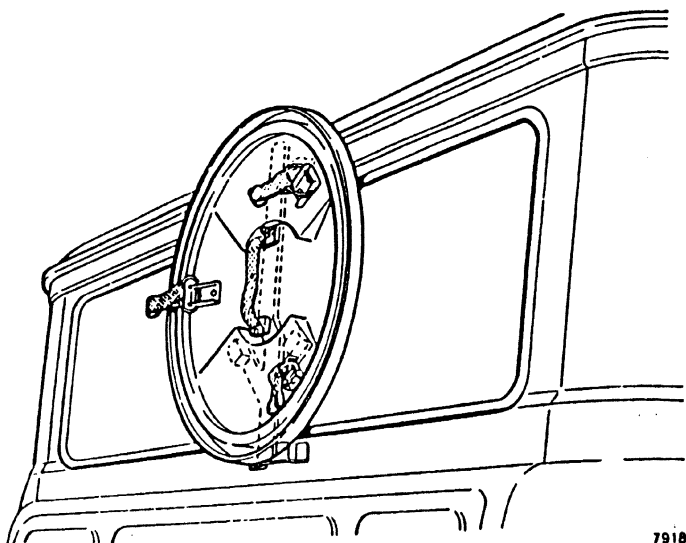


Fig 9 Observation hatch stowage

66. A bracket positioned on the centre of the cab back panel (Fig 9) is provided for hatch cover stowage when removed.

REAR VISION EXTERIOR MIRRORS

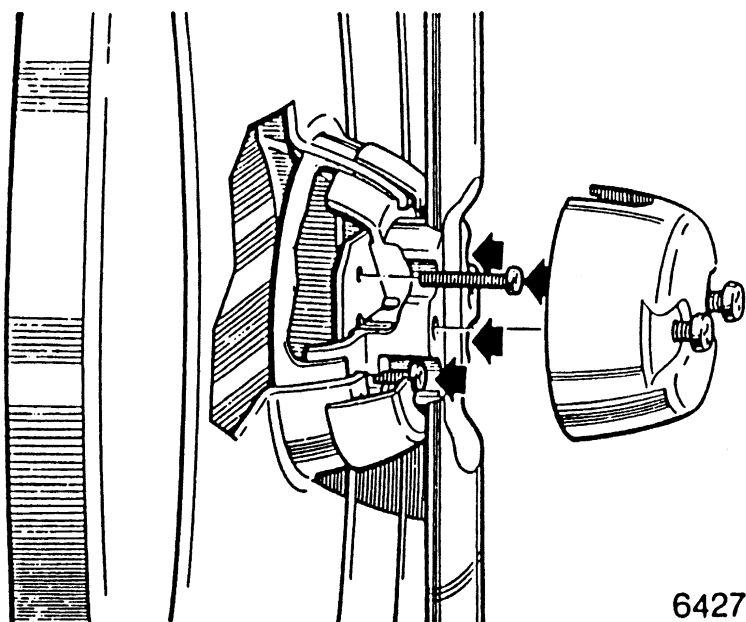
67. Two rear view exterior convex mirrors incorporating a ball joint tensioning device are installed.

68. The tensioning screws may need some adjustment from time to time.

69. Access to the ball joint tensioning screws is gained after temporarily removing the mirror attachment bracket, which is secured to the mirror housing by two screws.

70. When setting the ball joint clamping load, tighten four screws (Fig 10 arrowed) carefully and evenly until the required mirror head tension is attained.

71. Adjust the convex mirror until the side of the vehicle is visible in the portion of the mirror closest to the vehicle. This type of mirror is designed to give a much wider view in the rear, especially of the lane next to your vehicle. This may be helpful when changing lanes, or when reversing the vehicle. However, cars and other objects seen in a convex mirror will LOOK smaller and further away than when seen in a flat mirror. Therefore, use care when judging the size or distance of a car or object seen in this convex mirror. Use the interior mirror or glance rearward to determine the size and distance of objects seen in the convex mirror.



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Fig 10 Rear vision mirror

End of Chapter

CHAPTER 2-2
CONTROLS AND INSTRUMENTS
TRUCK CARGO 4 TONNE 4 x 4 W/CRANE
CONTENTS

Para

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| 1 | Gearbox power take-off lever |
| 2 | Cab roof floodlight switch and warning light |
| 3 | Crane lever controls |

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| 1 | Instrument gauges and controls | 2 |
| 2 | Crane lever controls | 4 |

Note

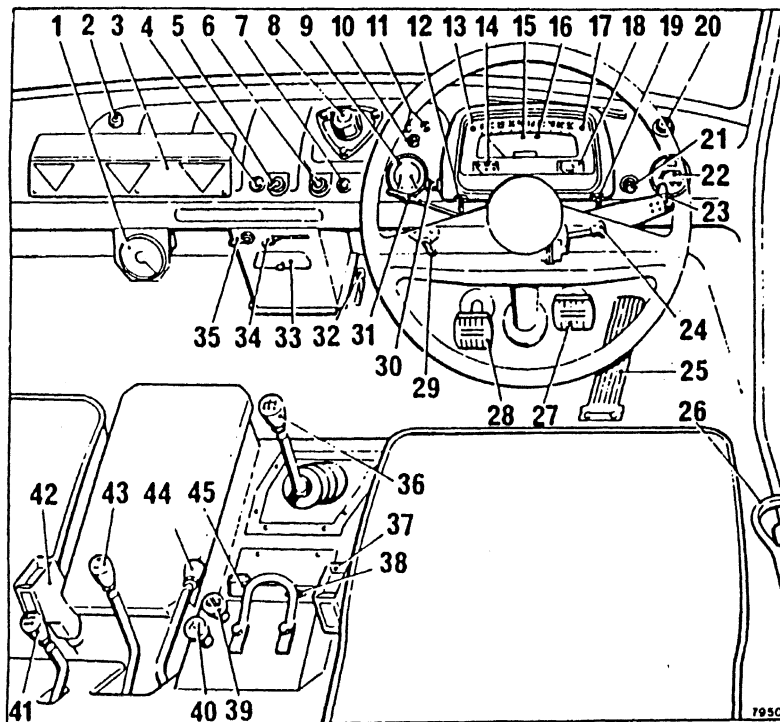
This Chapter to be read in conjunction with Chap 2-1

GEARBOX POWER TAKE-OFF LEVER

1. The gearbox power take-off lever (Fig 1(40)) is positioned on the cab back panel adjacent to the transfer box two/four-wheel drive and ratio control levers. When this is engaged a warning lamp (2) in the dash panel will illuminate.

CAB ROOF FLOODLIGHT SWITCH AND WARNING LIGHT

2. The lights can be illuminated by switches on the lights or by a switch (5) in the dash panel. Adjacent to switch is a warning light (4), which indicates when illuminated, the floodlights are on. The switch mounted in the dash panel can also extinguish the floodlights even though they have been illuminated by the independent switch on the light.



Key to Fig 1

- | | |
|---|-----------------------------------|
| 1 Tachometer | 8 Main driving light switch |
| 2 Power take-off engagement warning light | 9 Dual air pressure gauge |
| 3 Crane warning labels | 10 Low air pressure warning light |
| 4 Roof floodlights illumination warning light | 11 Inspection light sockets |
| 5 Roof floodlight switch | 12 Panel light switch |
| 6 Infra-red lighting switch | 13 Alternator warning light |
| 7 Warning light-trailer turn light | 14 Temperature gauge |
| | 15 Turn signal warning light |
| | 16 Main beam warning light |

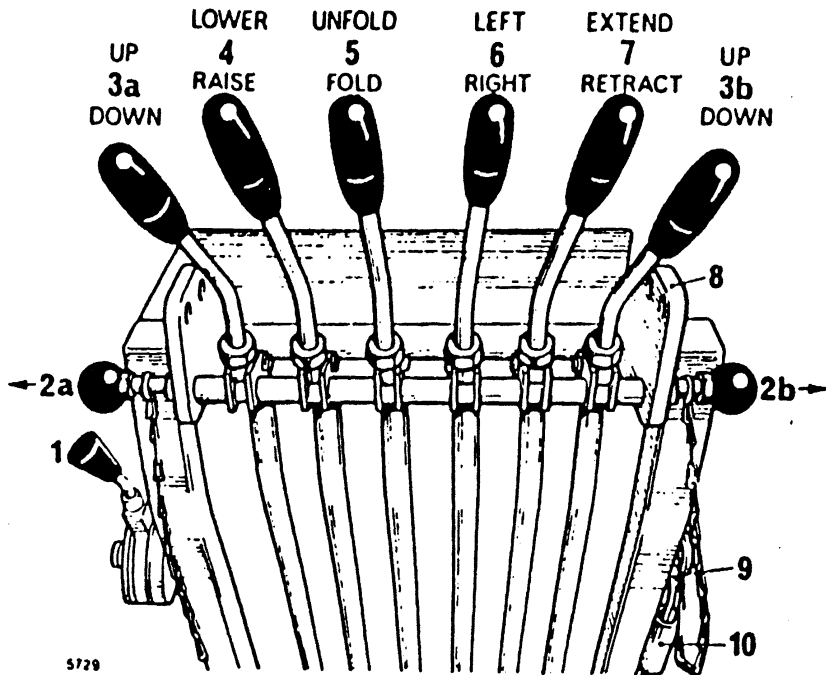
Key to Fig 1 (contd)

- | | |
|---|--|
| 17 Oil pressure warning light | 31 Turn signal switch lever |
| 18 Fuel gauge | 32 Air control lever |
| 19 Windscreen wiper switch | 33 Air flap |
| 20 Hazard warning light switch | 34 Heater temperature control lever |
| 21 Windscreen wash control button | 35 Heater fan switch |
| 22 Battery condition indicator | 36 Gear lever |
| 23 Combined headlamp dipper control and horn push | 37 Driver's seat belt lock |
| 24 Hill holder | 38 Key-start switch |
| 25 Accelerator pedal | 39 Engine stop control |
| 26 Parking brake lever | 40 Engine idle control |
| 27 Brake pedal | 41 Power take-off lever |
| 28 Accelerator pedal | 42 Passenger seat belt lock |
| 29 Trailer brake hand control valve | 43 Transfer box ratio control lever |
| 30 Rear fog guard light switch | 44 Transfer box two/four wheel drive lever |
| | 45 Cold start |

Fig 1 Instrument gauges and controls

CRANE LEVER CONTROLS

3. The crane lever controls (Fig 2) are positioned behind the cab at roof level and are accessible after removing observation hatch cover. Lever control directions are marked on frame directly in front of levers.



- | | |
|--|-------------------------------|
| 1 Throttle control | 6 Stew control |
| 2a & 2b Stabilizer control
safety mechanism | 7 Jib extension control |
| 3a & 3b L/H & R/H Stabilizer
control | 8 Control bracket |
| 4 Boom control | 9 Safety stirrup |
| 5 Jib control | 10 Stirrup stowage
bracket |

Fig 2 Crane lever controls

End of Chapter

Chapter 3-1

OPERATING INSTRUCTIONS

TRUCK CARGO 4 TONNE 4 x 4 CARGO AND W/WINCH

CONTENTS

Para

1	Before starting the engine
3	Starting the engine (Caution)
21	Starting a warm engine
22	To stop the engine (Caution)
23	Sensible driving
25	Gear changing (Caution)
36	Engaging the power take-off
39	Use of clutch
40	Use of brakes
42	Vehicle and trailer emergency brake hold (Hill holder)
	WARNING
45	Trailer brake emergency hand control valve
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BEFORE STARTING THE ENGINE

1. Check the fuel, oil and coolant levels and top-up as necessary. Use the correct anti-freeze for the cooling system when authorised. See that the battery master switch is turned on (see current instructions). Where applicable turn the fuel tank tap to the 'ON' position and operate the circuit leak check switches as detailed in Chap 2-1, para 19a.
2. If the engine has not been run for one month or more, it will be necessary to oil prime the turbocharger. To prime turbocharger 50 cm (2 fl oz) of clean engine oil should be added via the turbocharger oil adaptor plug (Fig 1).

Arrow indicates priming plug

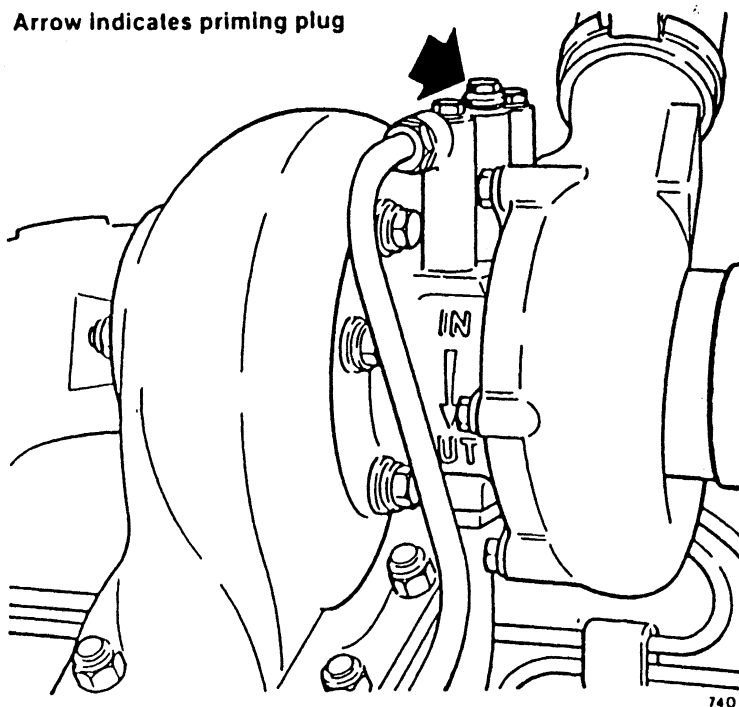


Fig 1 Turbocharger

STARTING THE ENGINE

CAUTION

When starting a turbocharged engine from cold it is important that the engine idling speed does not exceed 1000 rev/min for one minute in ambient temperatures above +10 degrees C and for three minutes in ambient temperatures below 10 degrees C. This period should be strictly adhered to as this allows the turbocharger shaft, seals and bearings to be well lubricated before high engine speeds are required, thus prolonging the service life of the turbocharger.

Note

An engine idling control is used to vary the engine idling speed. It can be used to advantage to prevent stalling of the engine during the warming-up period. The idling speed should be returned to normal when the engine is warm.

3. The method of starting the engine is dependent on the prevailing temperature and the driver should make sure that he is thoroughly familiar with the appropriate procedure.

With temperature above +10 degrees C

4. See that main gearbox gear shift lever is in neutral and the parking brake control is applied.
5. Turn key-start switch to 'ON' position.
6. Check that manual stop control is in 'run' position.
7. Fully depress accelerator pedal and hold down.
8. Fully depress clutch pedal and hold down.
9. Turn key-start switch to engage starter.
10. When engine fires evenly release key-start switch and release clutch pedal.

11. When engine fires evenly, gradually release accelerator pedal to maintain 1000 rev/min for 1 minute.
12. Return to idle.

CAUTION

If engine does not start after 10 seconds cranking, turn key-start to OFF position, operate stop control and use procedures as for below +10 degrees C.

With temperature below +10 degrees C to -32 degrees C

13. See that main gearbox gear shift lever is in neutral and the parking brake control is applied.
14. Turn key-start switch to 'ON' position.
15. Check that manual stop control is in 'run' position.
16. Depress cold start device control knob and hold down.
17. After 15 seconds fully depress clutch and accelerator pedals and turn key-start switch to engage starter.
18. When engine fires evenly release key-start switch and release clutch pedal.
19. When engine is running evenly, release cold start control knob and gradually release accelerator pedal to maintain 1000 rev/min for 3 mins.
20. Return to idle.

CAUTION

If engine does not start after 10 seconds cranking, turn key-start to OFF position, operate stop control and repeat procedure as from para 13.

Note

The cold start device holds 3 minutes of fuel. If the device is operated for more than 3 minutes, refill by hand priming for 200 strokes and repeat starting procedure as from para 13.

STARTING A WARM ENGINE

21. When engine is warm it can be started by turning key-start switch to engage the starter. When engine fires evenly, release key-start switch.

TO STOP THE ENGINE

CAUTION

The method of stopping a turbocharged engine is dependent upon the conditions under which the engine has been operating. For normal running and moderate engine speeds it is only necessary to pull the engine stop control and turn the key-start switch to the OFF position. If the engine has had a long run sustaining high engine speeds, it is important, before engine shutdown, to idle engine for three minutes including any low speed manoeuvring time, to allow lubricating oils to carry heat away from the turbocharger shaft, bearing and seals.

22. Pull the engine stop control knob and hold out until the engine stops. See that the control goes fully home when released after the engine has stopped. Turn off the key-start switch.

SENSIBLE DRIVING

23. Extensive testing has shown that the formal running-in schedule with specified speed restrictions for a given mileage is now unnecessary. However, during the early life of the vehicle a certain amount of restraint and the observance of a few simple precautions will ensure, smoother engine life, better performance, lower oil consumption and a greater all-round mechanical silence.

24. The following driving techniques are to be observed:

24.1 Drive with restraint for the first 1500 km (1000 miles). Thereafter, progressively take advantage of the capabilities of the vehicle.

24.2 Avoid full-throttle operation and high engine speeds, particularly in the low range of gears.

24.3 Use the gearbox freely to avoid letting the engine labour or 'over-rev'.

24.4 Unnecessary heavy braking should be avoided during this initial period as it may reduce future brake efficiency and life.

24.5 Drive at moderate speeds until the engine has completely warmed up.

GEAR CHANGING

CAUTION

To avoid damage to the transfer box, the P.T.O. lever must only be operated when the vehicle is stationary.

25. The main gearbox has four forward speeds and one reverse, with synchromesh operation on top. 3rd and 2nd gears. The gear shift lever positions shown in Fig 2 are also marked upon the knob on the top of the gear shift lever.

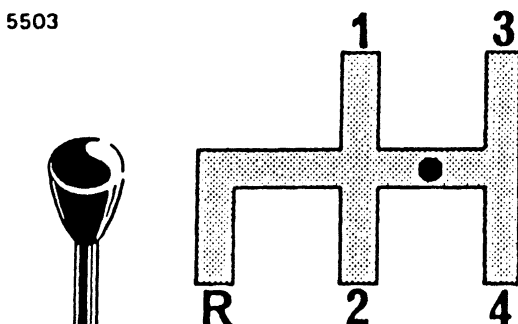


Fig 2 Gear change diagram - main gearbox

26. To prevent any risk of reverse gear being accidentally engaged while the vehicle is moving forward, the resistance of a stiff spring must be overcome before the gear can be engaged.

27. Except when changing into 1st gear, gear changes can be made either up or down, by merely depressing the clutch pedal and moving the gear shift lever firmly into the required position. It is necessary to double-declutch when changing down to 1st gear.

28. The transfer box provides three alternative drives: a straight through drive to the rear axle, a straight through drive to all four wheels and a 2:1 reduction for four-wheel drive. The control levers are mounted in the cab adjacent to the driver and high or low ratio must be engaged before the vehicle can be driven.

29. The transfer box operation is controlled by two levers and the operating positions are marked on the appropriate lever knobs (Fig 3).

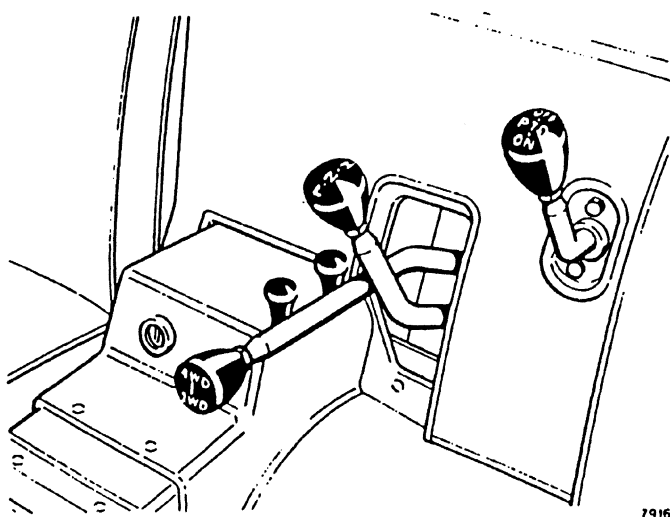


Fig 3 Transfer box controls

30. The right-hand lever controls the drive. In the fully down position normal two-wheel drive is engaged, in the fully-up position four-wheel drive is engaged.

31. The left-hand lever controls the selection of either high or low ratio. The fully-up position engages the high ratio, the central position neutral, and the fully downward position engages low ratio.

31.1 High ratio can be used when the drive lever is in either two or four-wheel drive.

31.2 Low ratio can be used only in four-wheel drive.

32. The arrangement of the inter-lock linkage between the two levers is such that should the driver inadvertently attempt to change from four-wheel drive to two-wheel drive while the ratio lever is in low, the ratio lever will automatically be moved to the neutral position.

33. Changes from two-wheel drive to four-wheel drive are made by depressing the clutch and simultaneously moving the drive lever upwards. These changes should only be made in anticipation of heavy going and at low vehicle speeds. Four-wheel drive should not be used on normal prepared road surfaces.

34. Changes from four-wheel drive high to four-wheel drive low - or vice versa - are made by depressing the clutch pedal and simultaneously moving the ratio lever to the appropriate position.

35. Changes from low four-wheel drive to two-wheel drive necessitates a combination change in the following sequence. Depress the clutch pedal and simultaneously move the ratio lever from low to high and then move the drive lever to the two-wheel drive position. This change sequence should be carried out as quickly as possible to reduce the loss of road speed to a minimum.

Note

Two-wheel drive cannot be operated with the transfer box in low ratio (See Para 31).

36. The change from four-wheel drive high to two-wheel drive is made by

moving the drive lever downwards, not depressing the clutch but getting the drive line in a no-torque position by use of the throttle.

37. If difficulty is experienced in accomplishing the operation given in the previous paragraph this will be due to the presence of transmission wind-up. It will then be necessary to use one of the following methods to release the wind-up and allow the drive lever to be moved.

37.1 Reverse the vehicle while keeping firm hand pressure on the drive lever.

37.2 Position one or more wheels on a soft or loose surface.

37.3 Raise one wheel clear of the ground, after applying the usual safety precautions.

Note

Do not use four-wheel drive on roads or firm surfaces. For normal road work the 'high' two-wheel drive must be used. The four-wheel drive should only be engaged when conditions render its use essential ie for temporary use over rough ground. The two-wheel drive must be re-engaged at the earliest opportunity. The four-wheel drive low-ratio is not to be regarded as providing a specially low series of gear ratios for hill climbing on hard road surfaces.

ENGAGING THE POWER TAKE-OFF (WHERE FITTED)

38. Start the engine as detailed at the beginning of this section. Depress the engine clutch pedal. Engage first gear in the main gearbox and, with the transfer box gear lever in the neutral position, engage the power take-off by moving the control lever downwards. Take up the drive by allowing the clutch pedal to return slowly to its normal position.

Note

It is not possible to engage power take-off unless the transfer box is in the neutral position.

USE OF CLUTCH

39. Avoid 'riding the clutch' - ie resting the left foot on the pedal while driving as it may result in wear of the clutch linings and withdrawal bearing. The pedal should have 25 mm (1 inch) of 'free travel' ie the amount of travel before pressure of the clutch springs is felt.

USE OF BRAKES

40. On all models there is a dual air pressure gauge located in the instrument panel to register the air pressure in the reservoirs. The brake system also incorporates a low air pressure alarm buzzer and an amber warning light.

41. The vehicle must not be driven until the amber warning light goes out and the buzzer ceases to operate. If the buzzer sounds and the amber light comes on during vehicle operation an immediate stop should be made and the cause of the air loss determined.

VEHICLE AND TRAILER EMERGENCY BRAKE HOLD (HILL HOLDER)

WARNING

THE VEHICLE AND TRAILER EMERGENCY BRAKE HAND CONTROL LEVER OPERATES AGAINST SPRING PRESSURE AND MUST BE HELD IN THE APPLIED POSITION DURING THE TIME VEHICLE AND TRAILER IS HELD ON AN INCLINE.

42. A brake hand control lever mounted on the right of the steering column enables the vehicle and trailer brakes to be applied to assist the driver, when holding vehicle and trailer on, or pulling away on, a steep incline.

43. When stopping vehicle and trailer on a steep incline use foot brake in normal manner and apply hand control lever against spring pressure in an anti-clockwise direction and hold. When moving vehicle and trailer on an incline slowly release hand control lever whilst driving away using normal driving techniques.

44. In the unlikely event of failure of the footbrake the brake hand control valve can be used to apply the vehicle and trailer brakes. The lever should be moved slowly so that a gradual application of the brakes is obtained.

TRAILER BRAKE EMERGENCY HAND CONTROL VALVE

WARNING

ON NO ACCOUNT SHOULD THE TRAILER BE LEFT PARKED ON AIR PRESSURE BRAKING ONLY. ALWAYS USE THE TRAILER MANUAL PARKING BRAKE.

Note

The following procedure must be used when parking a trailer.

45. The trailer brake emergency hand control valve fitted to the instrument panel operates the trailer brakes. This allows the driver, after applying vehicle hand brake and trailer brake emergency control valve, to leave the vehicle and apply the trailer manual parking brake. It is also recommended that the wheels should be chocked as a safety measure.

46. When control valve is in the ON position, trailer brakes applied, an audible buzzer will sound.

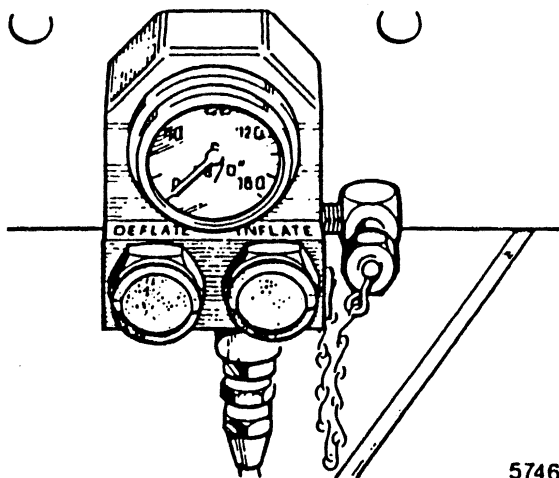


Fig 4 Tyre Inflator

TYRE INFLATOR

47. A tyre inflator assembly (Fig 4) is attached to the outside of the left-hand frame sidemember and it includes a manually operated valve for inflation and deflation of the tyres, a pressure gauge and a connection for the hose. To use the tyre inflator proceed as follows:

47.1 Start the engine and see that full pressure is indicated on the air pressure gauges in the cab. Keep the engine running at a fast idling speed whilst the tyres are being inflated.

47.2 Remove the dust cap from the inflator outlet.

47.3 Connect the hose and before connecting the other end of the hose to the tyre valve, press the 'INFLATE' button for a few seconds to clear any foreign matter from the hose.

47.4 To check the pressure in the tyre, connect the hose to the tyre to be checked, and read off the pressure from the gauge.

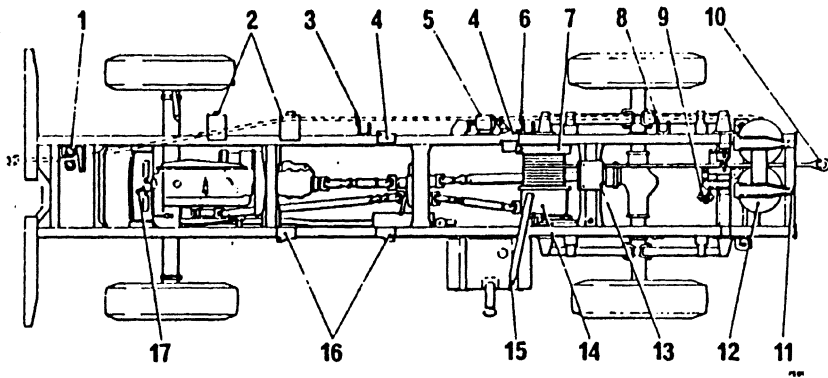
47.5 To inflate or deflate a tyre just press the respective button marked 'INFLATE' or 'DEFLATE'.

47.6 When the operations are completed, disconnect the hose and replace the dust cap to the inflator outlet. Stow the hose carefully and ensure that it is not kinked or in contact with oil or battery acid.

PREPARING FOR WINCHING

48. A tachometer is provided which should be used in conjunction with the hand throttle to set the engine to run at 1600 rev/min prior to a winching operation. A warning buzzer will operate if the load on the winching cable approaches the maximum. If the load is not reduced the engine will stop automatically.

49. The normal procedure when preparing to use the winch is to scotch the vehicle, thread cable through the fairleads, pay out the cable (unwind the cable from the drum) and attach the cable to the load. The method of doing each of these operations is as follows:



- 1 Front fairlead rollers
- 2 Side fairlead rollers
- 3 Cable guide
- 4 Anchor brackets
- 5 Winch brake air cylinder
- 6 Cable guide
- 7 Cable drum brake band
- 8 Cable guide
- 9 Cable tensioner air cylinder

- 10 Cable eye
- 11 Rear fairlead rollers
- 12 Rear fairlead sheaves
- 13 Cable pay-on guide
- 14 Winch worm reduction gear
- 15 Winch clutch and cable tensioner lever
- 16 Anchor brackets
- 17 Winch brake lever

Fig 5 Winch cable threading diagram

49.1 To scotch the vehicle. Two wheel scotches and two hawsers are provided for anchoring the vehicle. When hauling from the rear, place one under each front wheel. When hauling from the front, place one under each rear wheel. When hawsers are in use, they must be attached to the anchor brackets (Fig 5(4 and 16)).

49.2 To thread the cable. According to whether it is intended to haul from the front or rear of the vehicle, thread the cable as shown in Fig 5. It should be noted however, that when hauling from the front of the vehicle, the cable is threaded through guides attached to the right-hand sidemember

49.3 **To pay out the cable.** Disengage the winch clutch by moving the clutch and cable tensioner lever (15) towards the front of the vehicle and then release the cable drum brake. The cable may then be unwound from the drum by pulling on the end. When the red mark on the cable shows at the rear fairleads do not pay out any more cable.

49.4 **Attaching the load.** Attach the cable to the load so that a direct strain only is put on the cable when winding in. Never wrap or tie the winch cable round any object for securing purposes. Use the tow rope provided.

BEFORE DRIVING THE WINCH

50. Make sure that the main gearbox gear shift lever, the left-hand transfer box lever and the power take-off are in neutral. Release the cable drum brake and engage the dog-clutch by moving the winch clutch lever toward the front of the vehicle. Start the engine in the usual manner.

DRIVING THE WINCH

51. Depress the engine clutch pedal. Move the gear shift lever into first on the main transmission and, with the left-hand transfer box gear lever in the neutral position, engage the power take-off moving the control lever downwards. Take up the drive by allowing the clutch pedal to return slowly to its normal position.

52. The air-operated winch brake control, painted white, is located on the steering column under the wheel. As the brake is applied, the driver should declutch. If it is intended to hold the load for any length of time, disengage the power take-off.

WINDING IN THE CABLE

CAUTION

When winching operations are completed it is important to ensure that the winch clutch is disengaged and the winch brake is applied.

53. Never haul in slack cable. Keep the cable taut when winding in so that coiling will be firm and even.

END OF CHAPTER.

CHAPTER 3-2

OPERATING INSTRUCTIONS

TRUCK CARGO 4 TONNE 4 x 4 W/CRANE

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3	Crane loading chart	6

NOTE

This Chapter to be read in conjunction with Chap 3-1.

PREPARATION FOR USING CRANE

WARNINGS

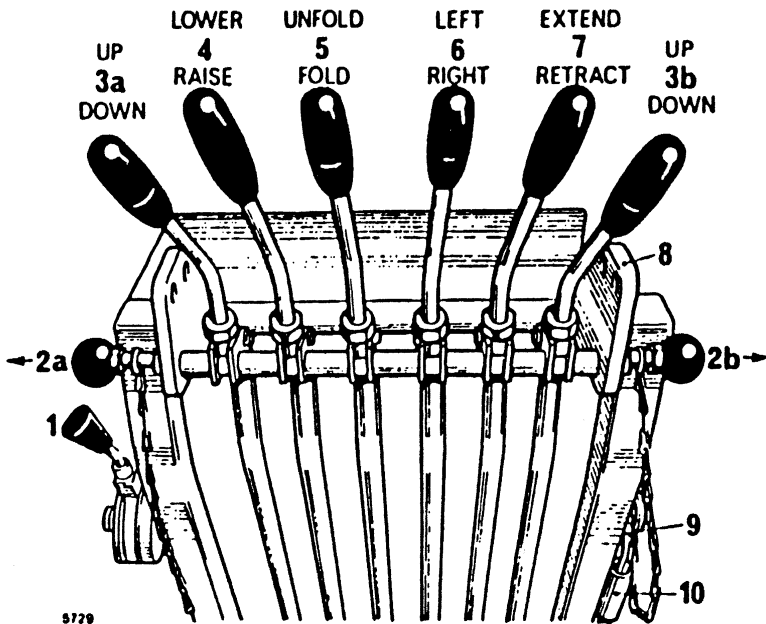
- (1) THE CRANE OPERATOR MUST BE CONVERSANT WITH ALL ACCIDENT PREVENTION REGULATIONS AND OPERATING INSTRUCTIONS.
- (2) IT IS PROHIBITED TO OPERATE THE CRANE ON BOARD SHIPS.
- (3) THE USE OF THE CALM FOR LIFTING TASKS ASSOCIATED WITH AIRCRAFT REQUIRES THE AIRFRAME TO BE EARTH BONDED IMMEDIATELY BEFORE AND DURING THE USE OF THE CALM.
- (4) THE USE OF JIB EXTENSIONS IS PROHIBITED.

- (5) THE CRANE HYDRAULIC OPERATING PRESSURE MUST NOT BE INCREASED OR MODIFIED IN ANY WAY.**
- (6) ENSURE THAT THE HYDRAULIC STABILISERS (OUTRIGGERS) ARE CORRECTLY DEPLOYED AND LOCKED IN POSITION BEFORE ATTEMPTING TO OPERATE THE CRANE.**
- (7) ENSURE THAT THE HANDBRAKE IS APPLIED AND THAT CHOCKS ARE POSITIONED BENEATH THE ROAD WHEELS BEFORE ATTEMPTING TO DEPLOY/OPERATE THE CRANE.**
- (8) WHERE POSSIBLE, PARK THE VEHICLE ON FIRM LEVEL GROUND BEFORE DEPLOYING/OPERATING THE CRANE.**
- (9) WHEN THE GROUND SURFACE IS SOFT AND THERE IS A POSSIBILITY OF THE HYDRAULIC STABILISER FEET PENETRATING THE GROUND SURFACE, PLACE RIGID PANELS OF SUFFICIENT STRENGTH BENEATH EACH STABILISER FOOT.**
- (10) PERSONNEL ARE NOT PERMITTED TO BE WITHIN THE CRANE'S SLEWING RANGE OR UNDER SUSPENDED LOADS.**
- (11) DO NOT SHUT DOWN THE CRANE WITH A SUSPENDED LOAD.**
- (12) DO NOT ATTEMPT TO MOVE THE VEHICLE WITH A SUSPENDED LOAD.**
- (13) DO NOT COMMENCE SLEWING UNLESS THE CENTRAL COLUMN IS UPRIGHT.**
- (14) DO NOT COMMENCE SLEWING UNTIL THE LOAD IS SUSPENDED AND IT IS SAFE TO DO SO.**
- (15) DO NOT EXCEED THE LOAD CAPACITY STATED IN THE LOAD CAPACITY CHART. THE LOAD CAPACITY STATED REFERS TO THE CRANE IN A HORIZONTAL POSITION; THIS CAPACITY WILL BE REDUCED WHEN THE CRANE IS OPERATED AT AN ANGLE.**
- (16) ENSURE THAT A MINIMUM SAFE WORKING DISTANCE OF 5 METRES IS OBSERVED WHEN WORKING IN THE VICINITY OF OVERHEAD CABLES.**

- (17) WHILST OPERATING THE CRANE, OPERATORS NEED TO BE AWARE OF ANY OVERHEAD OBSTRUCTIONS, AND THAT A FULLY EXTENDED CRANE IN THE EXTENDED VERTICAL POSITION CAN REACH A HEIGHT OF 10.5 METRES FROM GROUND LEVEL.**
- (18) ENSURE THAT THE POWER TAKE-OFF UNIT IS DISENGAGED BEFORE ATTEMPTING TO DRIVE THE VEHICLE.**
- (19) ENSURE THAT THE HAND THROTTLE LEVER IS RETURNED TO THE ENGINE IDLING POSITION BEFORE ATTEMPTING THE DRIVE THE VEHICLE.**
- (20) ENSURE THAT BOTH HYDRAULIC ISOLATION VALVES ARE IN THE FULLY CLOSED POSITION WHILST THE OUTRIGGERS ARE EITHER IN THE DEPLOYED OR FULLY RETRACTED POSITIONS.**

CAUTIONS

- (1) WHEN THE COLUMN FOLDING RAM ATTAINS IT'S FULLY STOWED OR ERECTED POSITION, ENSURE THAT THE CONTROL LEVER IS CONTINUED TO BE OPERATED FOR AN ADDITIONAL 5 SECONDS TO ENSURE THAT THE COLUMN FOLDING HYDRAULIC SYSTEM IS FULLY PRESSURISED.**
- (2) TO PREVENT ACCIDENTAL DAMAGE TO THE VEHICLE OR CRANE, ENSURE THAT PARTICULAR CARE IS TAKEN WHILST THE CRANE BOOM IS BEING MANOUEVERED INTO IT'S DEPLOYED OR TRANSIT POSITIONS AND WHENEVER THE CRANE IS OPERATED WITHIN CLOSE PROXIMITY OF THE VEHICLE HEADBOARD OR BODY.**
- (3) THE DESIGN OF THIS CRANE PROHIBITS A STRAIGHT VERTICAL LIFT. CRANE OPERATORS WILL NEED TO OPERATE THE INNER AND OUTER BOOMS ALTERNATELY TO OBTAIN A STAGED VERTICAL LIFT (ALL).**



- 1 Throttle control
- 2a & 2b Stabilizer control
safety mechanism
- 3a and 3b L/H & R/H stabilizer
control
- 4 Boom control

- 5 Jib control
- 6 Slew control
- 7 Jib extension control
- 8 Control bracket
- 9 Safety stirrup
- 10 Stirrup stowage bracket

Fig 1 Crane lever controls

1. A sequence of operations must be followed when crane is being used. These are summarized as follows:

1.1 Where possible ensure vehicle is on firm level ground, stationary with parking brake control applied.

1.2 Check hydraulic oil level. An indication sight glass is situated in the side of the oil reservoir.

1.3 Start engine. Depress clutch pedal and engage appropriate gear, and with transfer box gearshift lever in neutral, engage P.T.O. Take up the drive by allowing the clutch pedal to return slowly to its normal position.

Note

Appropriate gears are Vehicles prior to chassis number KT 210342, engage second gear. Vehicles after this chassis number, engage third gear, (an instruction plate stating this is attached to the underside of the crane controls cover).

1.4 Open hand throttle (Fig 1(1)) to achieve fast idle (approx 1000 rev/min).

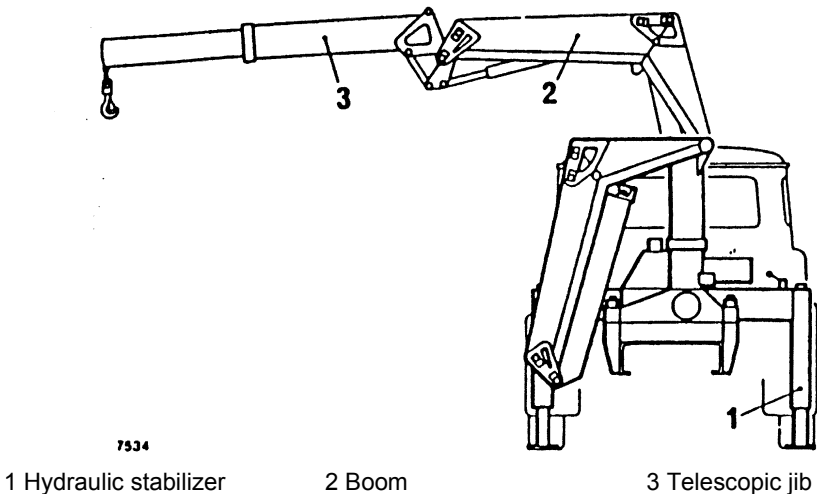


Fig 2 Hydraulic Crane

1.5 Remove safety stirrup (9) from control bracket (8) and locate in stowage bracket (10).

1.6 Pull out stabilizer safety pin (2a) extend stabilizer (3a) and release safety pin. Repeat same for (2b and 3b).

1.7 To move the loading crane into working position, lift the boom (Fig 2(2)) until the safety hook disconnects the jib (3). Working instructions for the crane are self explanatory by referring to the appropriate illustrations.

1.8 If fast craning is required open hand throttle further.

1.9 When craning operations are completed, ensure crane assembly has been stowed correctly and the safety stirrup (Fig 1(9)) has been replaced in control bracket (8). Close hand throttle, depress clutch pedal and disengage hydraulic pump drive.

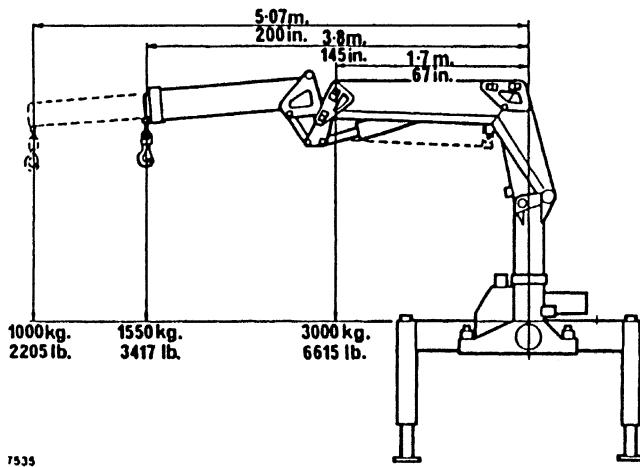


Fig 3 Crane loading chart

CRANE LIFTING CAPABILITIES

2. The crane lifting capacities relating to reach are as shown (Fig 3).

END OF CHAPTER

CHAPTER 4

SPECIAL INSTRUCTIONS

CONTENTS

Para

1	Brake air compressor anti-freezer
5	Fire precautions
6	Towed equipment
7	General towing information
10	Towing hook
12	Shallow fording

BRAKE AIR COMPRESSOR ANTI-FREEZER

1. The brake air compressor anti-freezer prevents freezing of any moisture in the air which is being drawn into the compressor when the vehicle is operating under low ambient temperature conditions.
2. The anti-freezer consists of a reservoir and a cover fitted with an air filter, filler plug and check valve. The reservoir is positioned behind the cab and is accessible after raising the left-hand maintenance inspection cover.
3. When topping up use only a methyl-alcohol solution.
4. The level of fluid can be checked visually through the translucent reservoir and should, during periods of low ambient temperature, be kept topped-up.

FIRE PRECAUTIONS

5. Two BCF type (bromochlorodifluoromethane) fire extinguishers are provided one being located in the cab, the other being attached to the exterior of the cab. Fire precautions should be strictly observed in accordance with current standing orders.

TOWED EQUIPMENT

6. Before commencing to tow, the driver of the towing vehicle and the officer in charge must refer to the User Handbook/Maintenance Schedule for the towed equipment or plant in order to familiarise themselves with:

6.1 Special checks that may be required before starting and during the journey.

6.2 Speed restriction and bridge classification imposed by the nature of the towed equipment or plant.

Note

When a vehicle tows any equipment or plant, except in the case of a standard train where the dual classification is usually given, the classification of the train should normally be taken as the SUM of the separate classifications of the prime mover and the towed equipment or plant.

GENERAL TOWING INFORMATION

7. The rear couplings for the Service and Emergency air lines are of the 'palm' type, colour coded yellow and red for Service and Emergency lines respectively.

Note

Drivers will need to be aware that two different types of trailer brake couplings may be encountered on Bedford vehicles, Manual Couplings and self sealing Couplings.

Vehicles with Self Seal Couplings only require the trailer brake hoses to be connected; these vehicles will have an information label located in the cab and also next to the towing hook to show that self sealing couplings are fitted

Vehicles with Manual Couplings will need the air supply to the trailer turned on before driving off, as per normal routine.

7.1 To connect the hose to a coupling head, the two parts of the coupling are placed together at right angles so that the spigot engages correctly, then the hose part is turned until they are in line and locked together.

7.2 When both couplings are connected, open the shut-off cocks at each coupling head (turn the cock handles until they are in line with pipe).

7.3 Before disconnecting the hoses, close the shut-off cocks (handles at right angles to the pipeline) and after disconnection refit the dummy couplings to exclude dirt.

8. Provision is made to enable trailers with three-line braking to be coupled to towing vehicle. A secondary park connecting hose is attached to the secondary line coupling which can be disconnected and coupled to the towed vehicle.

9. Interconnection of the electrical system between the towing and towed vehicle is provided by a 12-point socket situated on rear crossmember.

9.1 An air warning 2-pin plug is installed adjacent to the 12-point plug. This must be connected up when towing and indicates, by the air gauge on the instrument panel in the cab, when air pressure falls below minimum requirement on the towed vehicle.

TOWING HOOK

10. The vehicle is installed with a towing hook at the front and rear. The hook may be used either as a rigid or swivelling coupling according to the type of tow bar installed to the trailer. It should be locked rigid when coupled to a swivelling-type tow bar and unlocked when coupled to a solid tow bar. As a swivelling coupling the hook is free to rotate about a horizontal axis which allows the trailer front axle to tilt on uneven ground. To change to a rigid coupling, swing the swivel lock up to engage the bottom of the hook.

11. The eye of the trailer tow bar is prevented from jumping out of the hook by the hook jaw. To open this, pull out the release pin and lift the jaw. The jaw can be retained in this position by the catch and can be released in a similar manner.

SHALLOW FORDING

12. The vehicle is capable of shallow fording to a depth of 762 mm (2.5 ft) without special protection. The breather on each axle vents through a tube which has its outlet raised well clear of the axle case.

END OF CHAPTER

Chapter 5-1

USER MAINTENANCE

TRUCK CARGO 4 TONNE 4 x 4 AND W/WINCH

CONTENTS

Para

1	Top-up engine oil
2	Change engine oil
3	Change oil filter element
5	Top-up cooling system level (WARNING)
8	Check tightness of injector pipe clips
9	Change main fuel filter element (WARNING)
10	Air venting fuel system
12	Drain sediment bowl
14	Drain main fuel filter trap
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21	Gearbox
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31	Change air cleaner element
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33	Drain air reservoirs
34	Winch oil level
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38	Side lights
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40	Rear guard fog light
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42	Rear number plate light
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46	Air pressure gauge illumination
47	Hazard warning switch lamp
48	Low air pressure warning light/Trailer turn warning light
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53	Fuses
54	Combined turn signal and hazard warning flasher unit
55	Spare wheel
58	Jacking Instructions (WARNING)
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63	Tightening wheel nuts without a torque wrench
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TOP-UP ENGINE OIL

1. When checking the oil level of the engine., ensure the vehicle is standing on level ground. The dip-stick is accessible after raising the right-hand engine access panel and the filler is located on the valve rocker cover. Wipe the dip-stick then check the level. Replenish, if necessary with the correct grade of oil up to the 'FULL' mark on the dip-stick, The amount of oil required to bring the level on the dip-stick from the 'ADD OIL' to 'FULL' mark is 3.1 litres (5.5 UK pt). When adding oil to the engine, time must be allowed for the oil to flow down inside the engine to the oil pan before a further check is made on the oil level. It is important to ensure the oil has reached the oil pan before making this check otherwise overfilling of the oil pan may result.

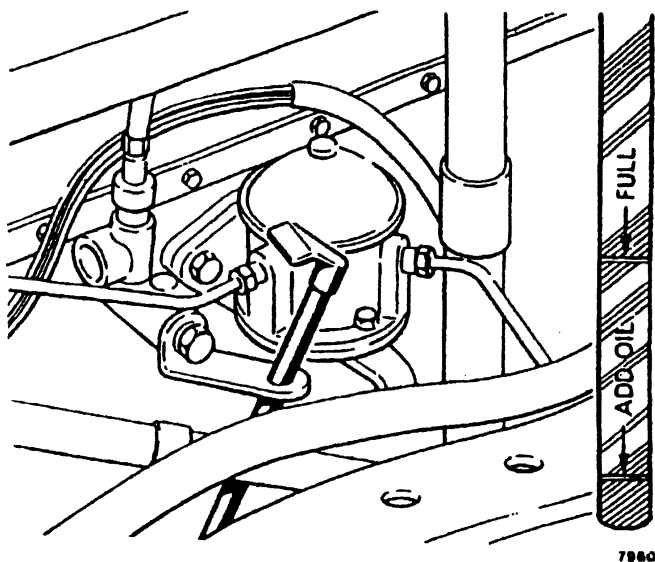


Fig 1 Engine dipstick

CHANGE ENGINE OIL

2. The drain plug is in the bottom of the engine oil pan. It possible, drain after the vehicle has been running when the oil is warm and will flow freely. When warm, the impurities will be in suspension and will be drained out with the oil. After replacing the drain plug, refill with fresh oil through the filler hole.

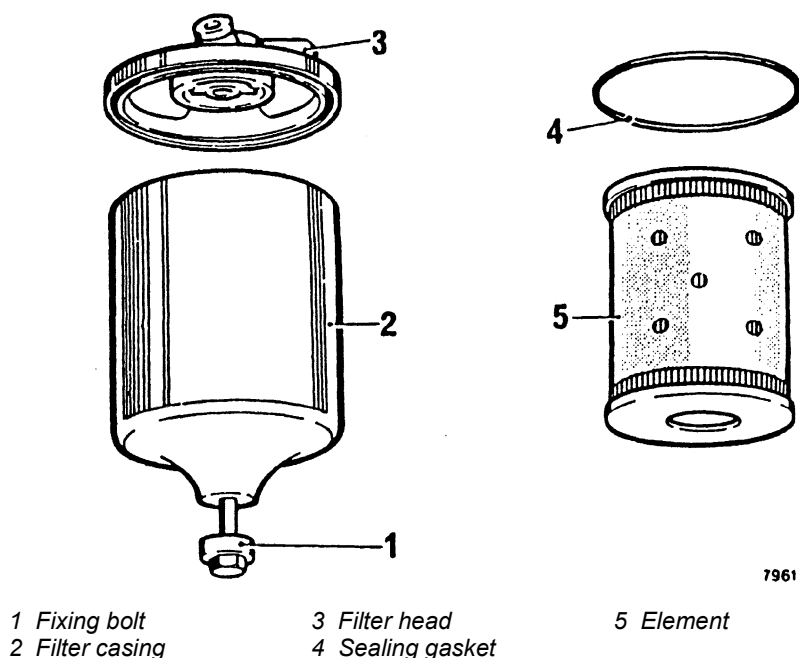


Fig 2 Oil filter - exploded view

CHANGE OIL FILTER ELEMENT

3. Unscrew filter casing centre bolt (Fig 2(1)) and withdraw the casing (2) and element assembly (5) from the filter housing (3), taking care when removing the filter casing as some oil will run out as soon as the casing

separates from the filter housing. Lift out the element and discard it. Remove sealing washer (4) from the groove in filter housing. Thoroughly clean the inside of filter head and casing to remove any sludge deposits.

4. Install new sealing washer ensuring that it locates correctly and is free from kinks. Position new element in casing and carefully locate casing into the groove in filter head and tighten centre bolt. It is important not to overtighten the bolt as this can distort the casing, causing it to leak. Replenish the oil pan with new oil and run the engine for two to three minutes to allow the oil to circulate. Stop the engine, allow time for the oil to drain back into the oil pan and then recheck the level. Check for leaks and top-up as necessary.

TOP-UP COOLING SYSTEM LEVEL

WARNING

WHEN THE ENGINE IS AT NORMAL TEMPERATURE OR ABOVE, THE INTERNAL PRESSURE BUILT UP IN THE COOLING SYSTEM WILL BLOW OUT SCALDING FLUID AND VAPOUR IF THE RADIATOR CAP IS SUDDENLY REMOVED. TO PREVENT LOSS OF COOLANT AND TO AVOID THE DANGER OF BEING SCALDED, THE COOLANT LEVEL SHOULD BE CHECKED OR COOLANT ADDED, ONLY WHEN THE ENGINE IS COOL. IF THE CAP MUST BE REMOVED WHEN THE ENGINE IS HOT, PLACE A CLOTH OVER THE CAP AND ROTATE THE CAP SLOWLY ANTI-CLOCKWISE TO THE FIRST STOP AND ALLOW PRESSURE TO ESCAPE COMPLETELY. THEN TURN THE CAP AGAIN SLOWLY ANTI-CLOCKWISE TO REMOVE IT. MAKE SURE THAT THE CAP IS TURNED FULLY CLOCKWISE WHEN IT IS INSTALLED.

5. Check the level in the system after removing the bayonet-type filler cap (Fig 3 (arrowed)) from the header tank which is accessible after raising the engine left-hand side access panel. If necessary, add coolant until the level is up to the bottom of the filler neck.

6. If the engine is allowed to run short of coolant and overheats, use hot coolant for replenishing or wait until the engine is cool.

7. If the cooling system contains anti-freeze, the coolant level should only be topped-up with anti-freeze solution of the correct strength if dilution of the solution already in the cooling system is to be avoided. Since the use of plain water will dilute the anti-freeze solution in the cooling system and reduce the

degree of frost protection provided a check on the strength of the anti-freeze solution is incorporated in the maintenance services.

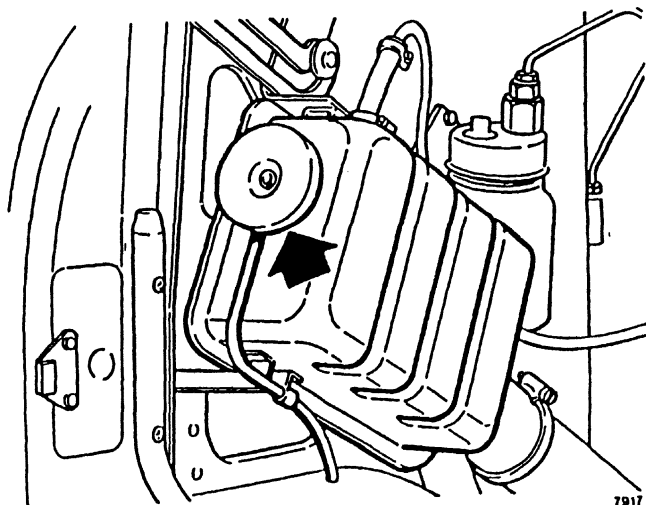


Fig 3 Cooling system header tank

CHECK TIGHTNESS OF INJECTOR PIPE CLIPS

8. The injector pipe clips must be secure on the pipes and prevent vibration of the pipes which could lead to eventual fracture or chafing of the pipe

CHANGE MAIN FUEL FILTER ELEMENT

WARNING

COMPRESSED AIR. DO NOT DIRECT COMPRESSED AIR AGAINST THE SKIN

9. Clean all dirt from and around the filter. To remove the filter element, unscrew the centre bolt at the filter head and detach the sediment trap and element, gaskets and sealing rings. Clean the filter head and the sediment trap to remove any foreign matter and then blow dry with compressed air. Do not use cloth for this purpose. Install new sealing rings and gaskets (Fig 4) to the filter head and sediment trap, ensuring that they are correctly located and not kinked or twisted. Position new filter element so that it locates over the sealing ring, reassemble bottom and refit and tighten centre bolt to bottom cover.

Note

As air will have entered the fuel system it will be necessary to air vent the system.

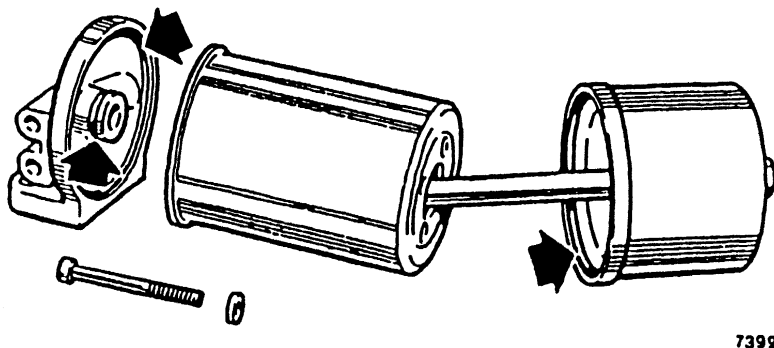


Fig 4 Renewing fuel filter element. Arrows indicate sealing rings and gaskets

AIR VENTING FUEL SYSTEM

10. Slacken plug in unused outlet of fuel filter and vent screws on pump body (Fig 5 (2)) and governor housing (1). Operate priming lever of fuel lift pump until air-free fuel flows from outlet on filter and tighten plug while operating lever. Continue priming until air-free fuel flows from vent screw on pump body then tighten screw.

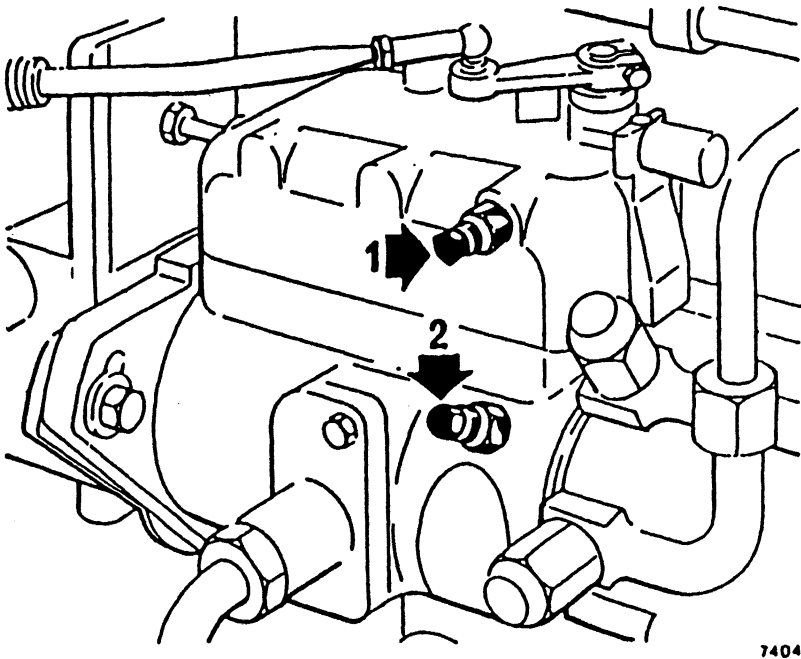
11. Slacken two injection pipe unions, operate starter and as soon as engine runs, tighten injection pipe unions and vent screw on governor housing.

Note

Do not pump fuel by cranking engine with starter as this may lead to overheating of the starter.

DRAIN SEDIMENTOR BOWL

12. The fuel sedimentor (Fig 6) is located towards the rear on the lower right-hand side of the engine crankcase.



7404

1 Governor housing vent screw

2 Pump body vent screw

Fig 5 Fuel injection pump

13. Before draining, clean dirt from and around plug in base of sedimentor bowl. Remove the plug to expel trapped water and sediment. Check drain plug sealing ring for condition and renew if necessary. Re-install seal and plug after draining.

DRAIN MAIN FUEL FILTER TRAP

14. Wipe the base of the sediment trap (Fig 7) to remove any dirt and then unscrew the drain plug. After allowing any moisture to drain away, replace the plug.

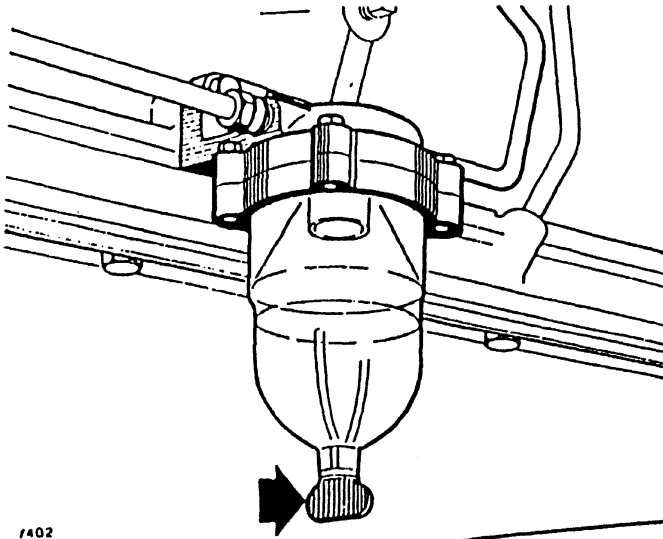


Fig 6 Fuel sedimentor

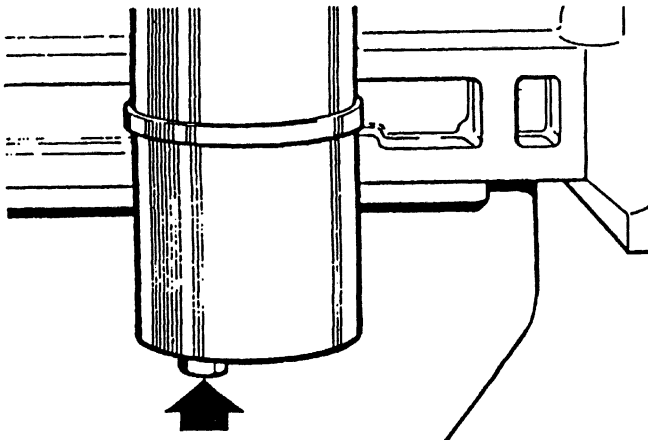


Fig 7 Main fuel filter sediment trap

BATTERY ELECTROLYTE LEVEL

WARNING

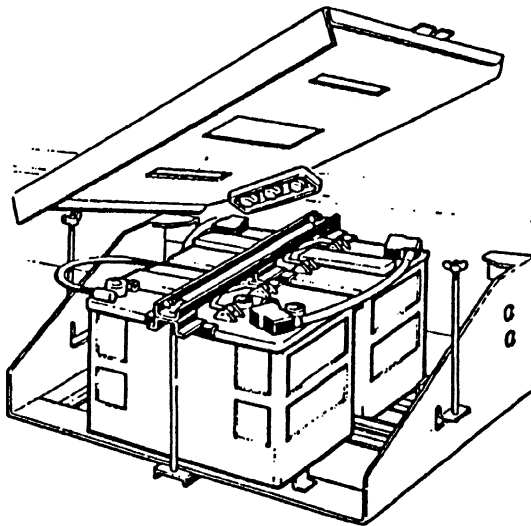
NEVER EXPOSE THE BATTERY TO AN OPEN FLAME OR ELECTRIC SPARK - CHEMICAL ACTION IN THE BATTERY GENERATES HYDROGEN GAS WHICH IS FLAMMABLE AND EXPLOSIVE. DO NOT ALLOW BATTERY ELECTROLYTE (FLUID) TO CONTACT EYES, SKIN, FABRICS, OR PAINTED SURFACES. FLUID IS A SULPHURIC ACID SOLUTION WHICH COULD CAUSE SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE. FLUSH ANY CONTACTED AREA WITH WATER IMMEDIATELY AND THOROUGHLY. IF CONTACT HAS BEEN MADE WITH EYES OR SKIN, AFTER FIRST AID TREATMENT SEEK MEDICAL ATTENTION. WEAR EYE PROTECTION WHEN WORKING ON OR NEAR BATTERY. REMOVE RINGS, METAL WATCHBANDS AND OTHER METAL JEWELLERY BEFORE WORKING ON OR AROUND A BATTERY. BE CAREFUL IN USING METAL TOOLS AND EQUIPMENT. IF SUCH METAL SHOULD CONTACT THE POSITIVE BATTERY TERMINAL (OR METAL IN CONTACT WITH IT) AND ANY OTHER METAL ON THE VEHICLE, A SHORT CIRCUIT MAY OCCUR WHICH COULD CAUSE PERSONAL INJURY. BATTERIES AND BATTERY ACID SHOULD ALWAYS BE KEPT OUT OF THE REACH OF CHILDREN.

15. To check the level of the electrolyte in the cells, remove the battery cover (Fig 8) which is retained by two wing nuts and carefully remove the plastic covers from the top of each battery. Top-up, if necessary, each cell with colourless, odourless, drinking water until the level of electrolyte is just over the separator guard. Replace the plastic covers.

16. See that the batteries are dry on top and secure in their mountings. Also see that the terminals are tight, free from corrosion and coated with petroleum jelly.

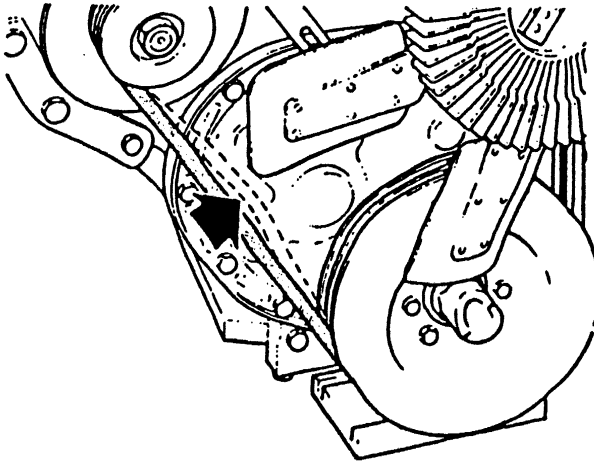
FAN DRIVE BELT ADJUSTMENT

17. With the engine switched off, it should be possible to depress the slackest drive belt 8 mm (0.3 in) when firm thumb pressure is applied. The correct position to check the amount of belt deflection is midway between alternator and water pump pulleys (Fig 9). The fan drive belts should be neither too tight nor too loose. Too tight a belt imposes an undue load on the fan assembly and shortens the life of the belts. Too loose a belt allows slippage and lowers the fan speed, causing excessive belt wear and overheating of the cooling system.



7405

Fig 8 Checking battery electrolyte level



7962

Fig 9 Fan belt slack

The dotted outline shows where the fan belt must be depressed to determine if the belt requires adjustment.

Adjustment

18. To adjust the belts, slacken the nuts on the two mounting bolts and then slacken the two bolts securing the slotted brace (Fig 10).

19. Pivot the alternator away from the engine to tighten the belts. If a lever is used to move the alternator, it is essential that leverage is applied to the drive end shield and never against the stator or rear end shield.

20. When the tension is correct it is important that the bolts and nuts are tightened in the following order; the front mounting bolt nut, the slotted brace to alternator bolt; the rear mounting bolt nut; the bolt securing the brace to the engine.

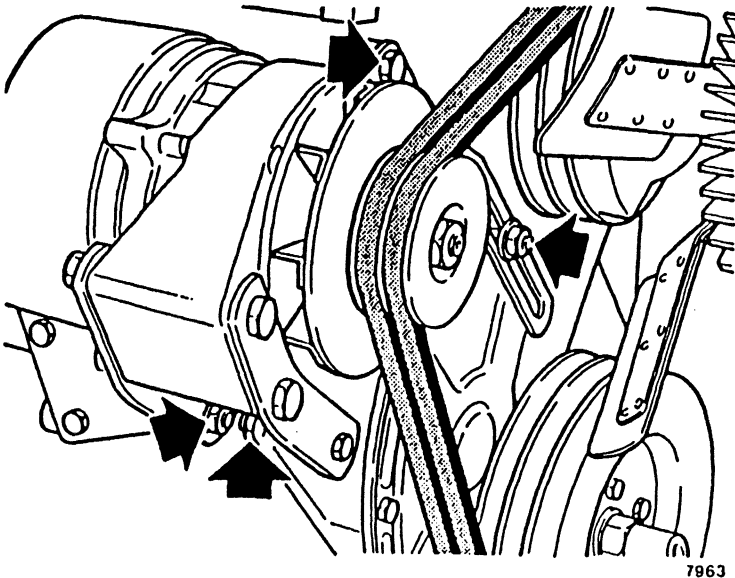
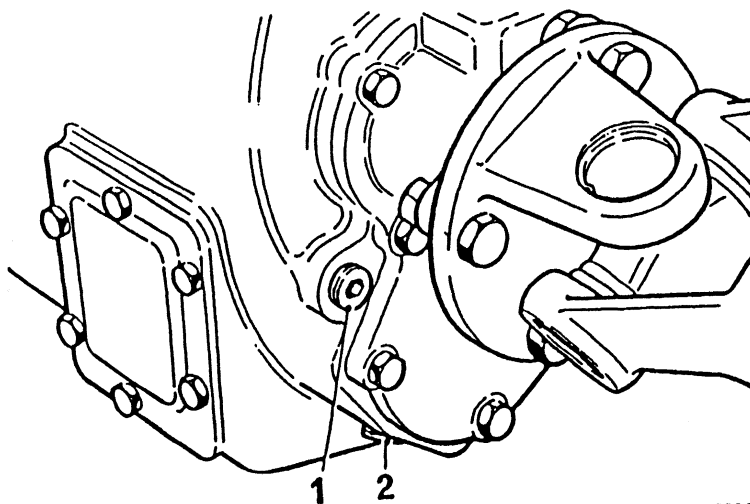


Fig 10 Fan belt adjustment details

GEARBOX

21. When checking the oil level of the gearbox ensure that the vehicle is standing on level ground. The oil filler/level plug (Fig 11(1)), located in the rear vertical face and the drain plug (2), located at the lowest point of the casing are both accessible from beneath the vehicle. The oil level should be up to the bottom of the filler/level plug hole.

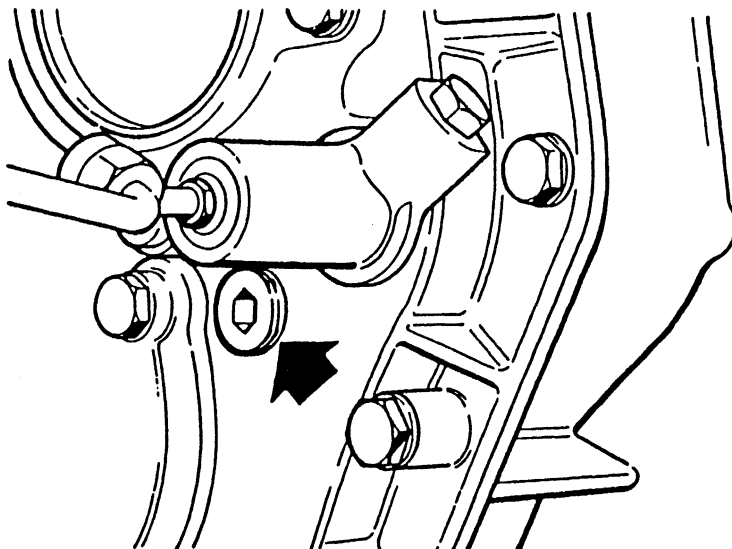


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Fig 11 Main gearbox oil filler and drain plugs

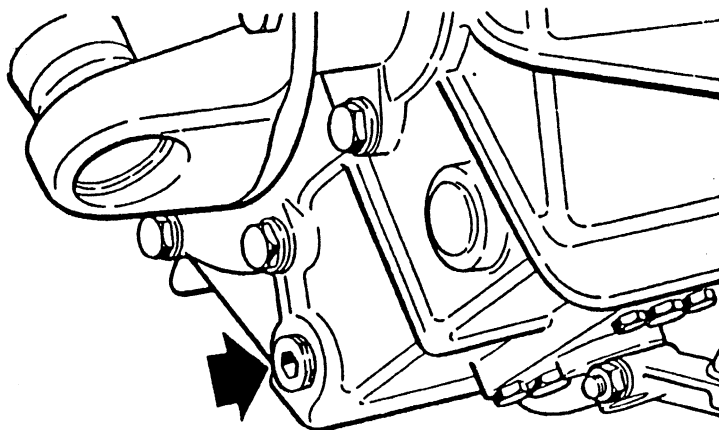
TRANSFER BOX

22. The oil filler/level plug (Fig 12) is situated in the front face of the transfer box. The level of oil should be up to the bottom of the filler/level plug hole with the vehicle standing on level ground. The oil drain plug (Fig 13) is located at the lowest point of the casing and faces the rear of the vehicle.



7895

Fig 12 Transfer box oil filler/level plug

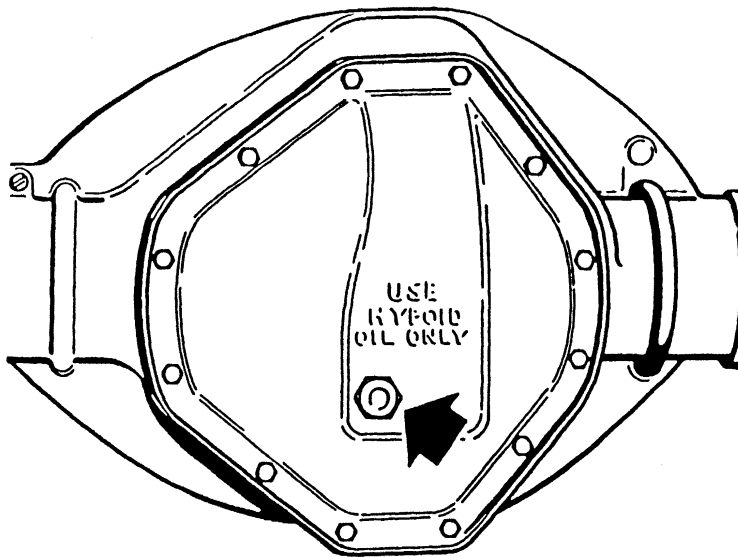


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Fig 13 Transfer box oil drain plug

FRONT AND REAR AXLES

23. The oil filler/level plug (Fig 14) is situated in the axle housing cover and the oil level should be up to the bottom of the filler plug hole with the vehicle, standing on level ground. To drain oil remove the axle housing cover.

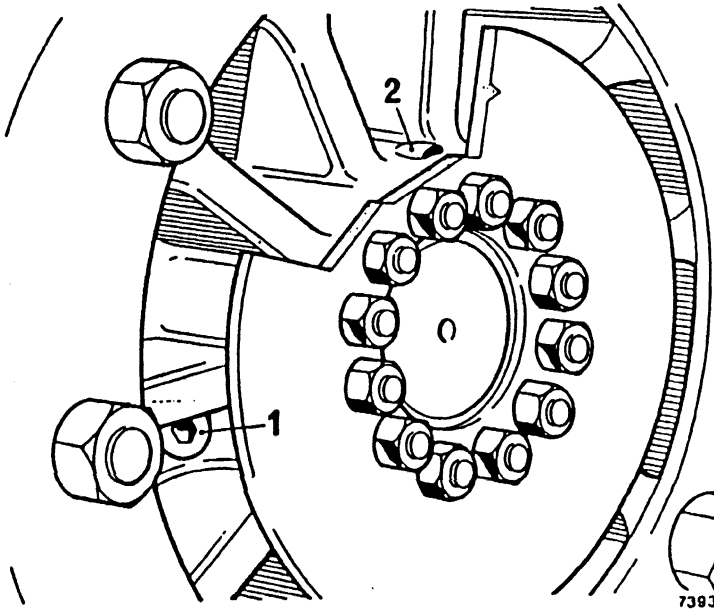


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Fig 14 Front and rear axle oil filler/level plug

REAR AXLE HUBS

24. Check oil level in rear axle hubs by rotating hub until boss (Fig 15(2)) is in uppermost position. Remove filler/level plug (1) and check level, topping-up if necessary, to the bottom of filler/level plug hole.



1 Filler/level plug

2 Boss on hub

Fig 15 Checking rear hub oil level

STEERING BOX

25. To top-up steering box apply oil gun to nipple (Fig 16(2)) on the box until oil begins to ooze from the hole in the casing at the top of the box.

26. To drain and refill steering box, remove nipple (2) and plug (1) from base of the box and allow all the oil to drain away. Replace plug and refill with correct oil to the level of the lubrication nipple hole. Finally replace the nipple and apply oil gun to the nipple until oil begins to ooze from hole in casing at the top of box.

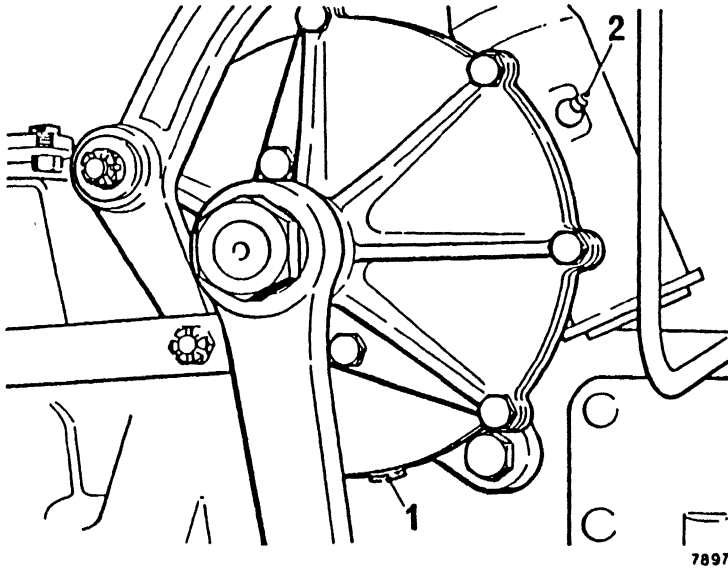


Fig 16 Steering box lubrication points

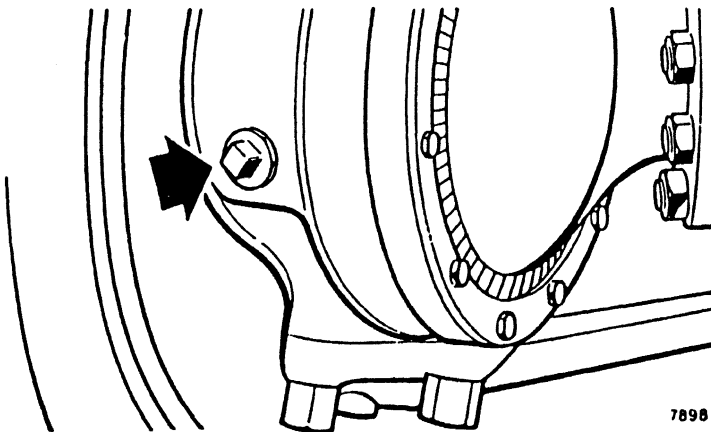


Fig 17 Steering knuckle oil filler/level plug

TRACTA JOINT HOUSINGS

27. A combined oil filler/level plug (Fig 17) is fitted to each steering knuckle. The level of the oil should be to the bottom of the filler/level plug hole.

INSPECT AIR CLEANER RESTRICTION INDICATOR

28. An air cleaner restriction indicator (Fig 18), attached to the air inlet pipe from air cleaner to turbocharger, indicates the need for filter servicing.

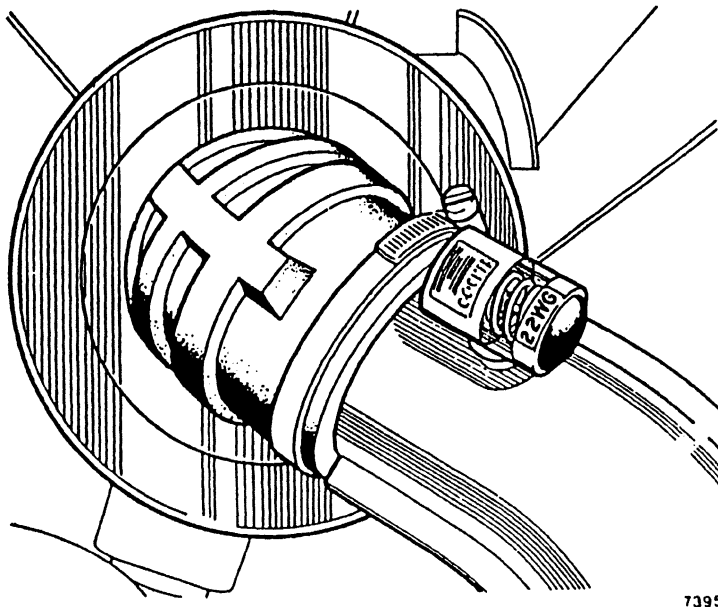


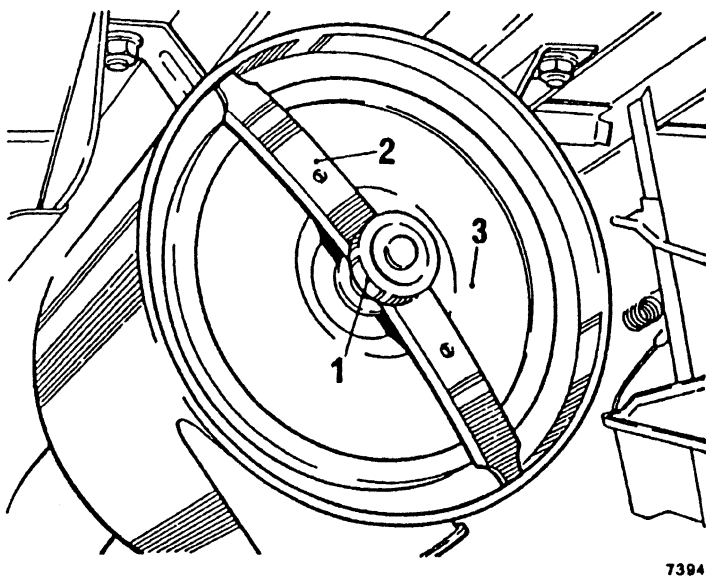
Fig 18 Air cleaner restriction indicator

29. If a red signal is visible, it is a warning that the air cleaner element is blocked with dirt, etc and needs replacing.

30. The cleaner restriction indicator can be reset by depressing rubber button.

CHANGE AIR CLEANER ELEMENT

31. To remove air cleaner element, slacken knurled knob (Fig 19(1)) and withdraw retaining clamp (2) and filter element (3). Clean inside of filter casing, including rubber water drain valve in base of casing, install new element and retain with clamp.



1 Knurled knob

2 Retaining clamp

3 Filter element

Fig 19 Air cleaner

BRAKE HYDRAULIC FLUID LEVEL

32. There are two separate transparent reservoirs (Fig 20) with screw-on caps. Both reservoirs have to be inspected and topped-up to the maximum fluid level indicator line marked on the reservoirs.

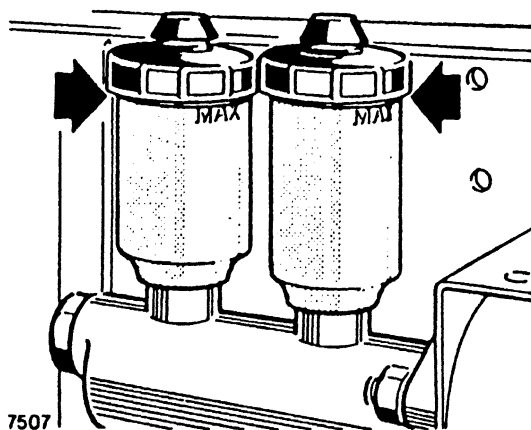


Fig 20 Brake hydraulic fluid levels

DRAIN AIR RESERVOIRS

33. Slacken the plug at the bottom of each reservoir (Fig 21) so that moisture can be drained away. Securely tighten plug when air only is being emitted. Finally run engine to fully charge air supply.

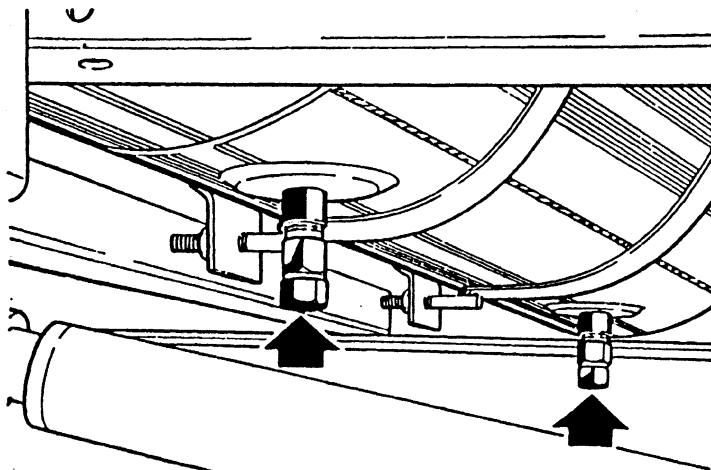
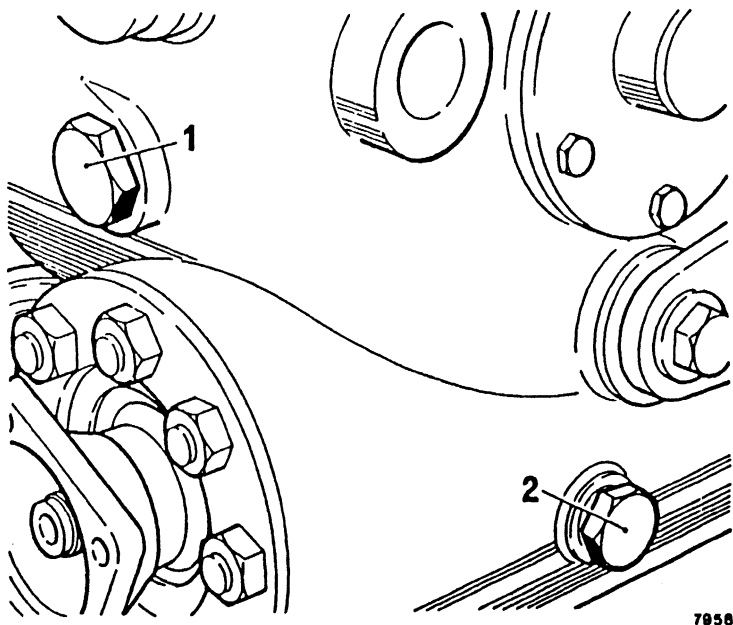


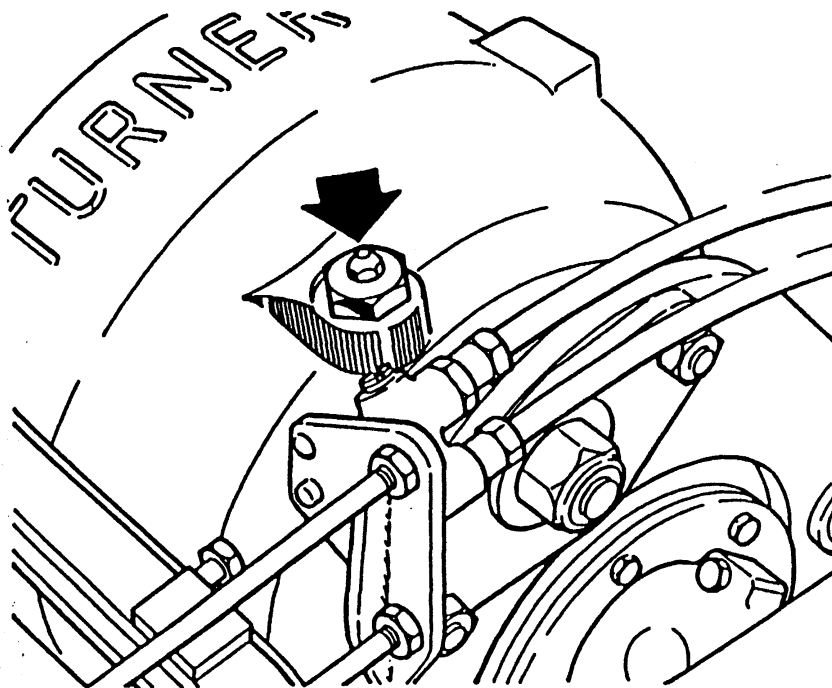
Fig 21 Brake air reservoir drain plugs

*1 Level/filler plug**2 Drain plug***Fig 22 Winch oil filler/level and drain plugs****WINCH OIL LEVEL**

34. Ensure vehicle is on level ground and remove filler/level plug (Fig 22(1)) and check that oil is level with bottom of hole.

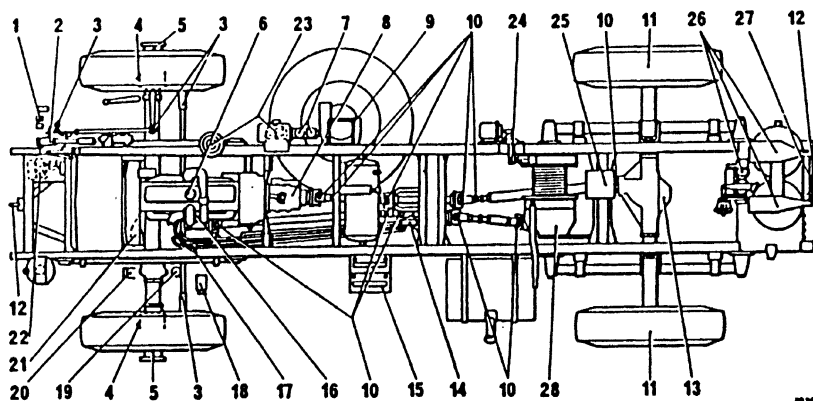
35. To renew oil, drain from plug (2) and refill using correct grade of oil.

36. When necessary, clean winch breather (Fig 23) by removing breather (arrowed) from large hexagon, clean thoroughly and refit.



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Fig 23 Winch breather



- | | |
|---|---|
| 1 Lubricate accelerator brake and clutch control linkage | 16 Oil prime turbocharger (when applicable) |
| 2 Top-up steering gear oil level | 17 Lubricate transfer box control linkages |
| 3 Lubricate steering connecting rod and tie rod ball joints | 18 Top-up cooling system level |
| 4 Top-up tracta joint oil levels | 19 Top-up air compressor anti-freeze level |
| 5 Lubricate hub bearings | 20 Top-up windshield wash |
| 6 Top-up engine oil level | 21 Top-up front axle oil level |
| 7 Top-up brake fluid level | 22 Lubricate front fairlead rollers |
| 8 Top-up gearbox oil level | 23 Lubricate side fairlead rollers |
| 9 Lubricate spare wheel carrier mechanism | 24 Lubricate winch brake linkage |
| 10 Lubricate propeller shaft sliding couplings and universal joints | 25 Lubricate winch cable pay-on gear |
| 11 Top-up hub bearing oil level | 26 Lubricate cable tensioner assembly |
| 12 Lubricate towing hook | 27 Lubricate rear fairlead rollers |
| 13 Top-up rear axle oil level | 28 Top-up winch oil level |
| 14 Top-up transfer box oil level | |
| 15 Top-up battery electrolyte level | |

Fig 24 Lubrication and levels chart

HEADLIGHTS

37. To renew a headlight lamp press the complete light unit inwards and turn anti-clockwise. With the light unit held in the palm of the hand, press in and turn the lamp holder anti-clockwise to release and withdraw lamp from light unit.

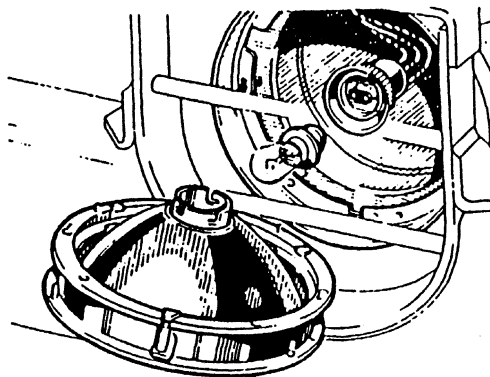


Fig 25 Headlight lamp renewal.

SIDE LIGHT

38. Unscrew threaded lens for lamp access (Fig 26). The lamp can then be removed by pushing in and turning anti-clockwise.

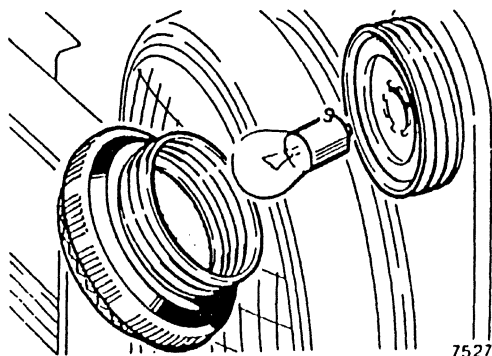
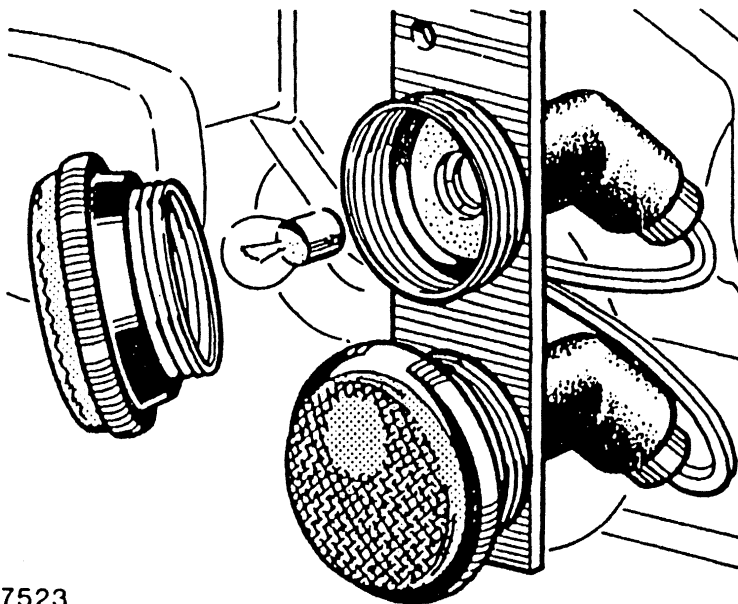


Fig 26 Side light lamp renewal

STOP/TAIL AND REAR TURN SIGNAL LIGHTS

39. Access to either lamp is achieved after unscrewing lens anti-clockwise (Fig 27).



7523

Fig 27 Stop, tail and rear turn signal lamp renewal

REAR GUARD FOG LIGHT

40. Unscrew threaded lens for lamp access as shown in Fig 27. The lamp can be removed by pushing in and turning anti-clockwise.

HAZARD WARNING LIGHT

41. The lamps utilize the front and rear turn signal lamps.

REAR NUMBER PLATE LIGHT

42. Access to the lamp is gained after removing lens and cover (Fig 29) secured by three screws.

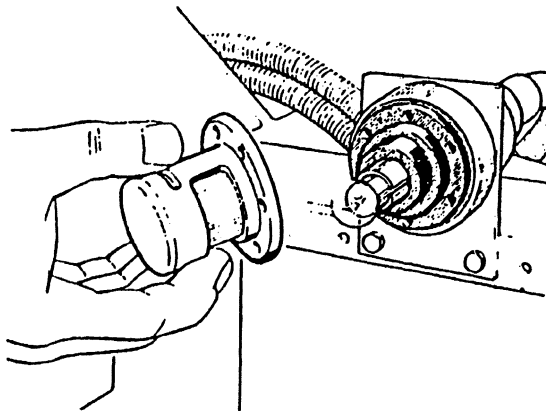
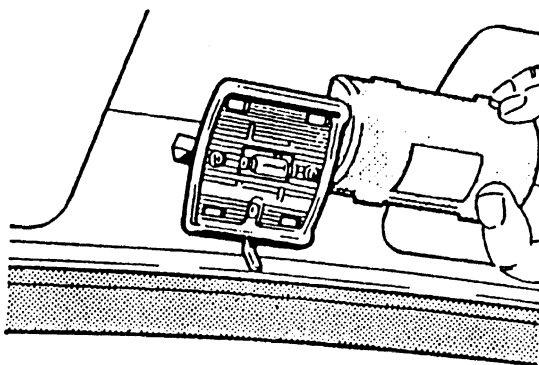


Fig 28 Rear number plate light

CAB INTERIOR LIGHT

43. To gain access to the roof light lamp (Fig 30), remove the lens by carefully squeezing top and bottom sides together and pulling downwards.



7528

Fig 29 Cab interior light

FRONT TURN SIGNAL LIGHT

44. Lamp access is gained after removing the rim securing screw and easing the rim away from lens (Fig 31). Remove lens by easing it away from the light body and sideways out of rim.

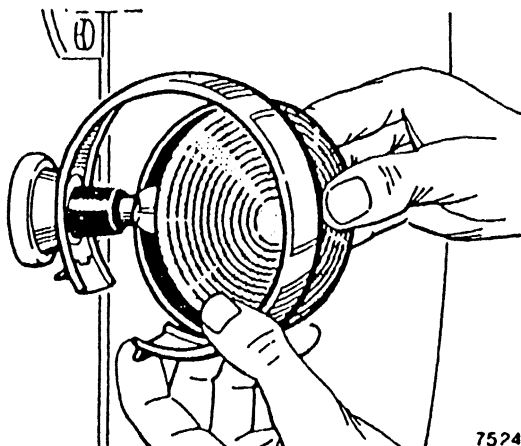


Fig 30 Front turn signal light

CONVOY LIGHT

45. Access to lamp is gained after removing lens and cover secured by three screws, as number plate light (Fig 29).

AIR PRESSURE GAUGE ILLUMINATION

46. To gain access to lamp, remove instrument panel, disconnect speedometer cable and place instrument assembly to one side. Using instrument aperture in dash panel, the lamp holder can be pulled from rear of air pressure gauge.

HAZARD WARNING SWITCH LAMP

47. The lamp is incorporated in the hazard warning switch, to renew lamp, unscrew the top cover of switch.

LOW AIR PRESSURE WARNING LIGHT/TRAILER TURN SIGNAL WARNING LIGHT

48. Access to lamp is gained after prising warning light from dash panel and separating lens from lamp holder. Turn lamp anti-clockwise for removal.

TACHOMETER ILLUMINATION LAMP

49. Access to lamp is gained after prising lamp holder from rear of instrument. Turn bulb anti-clockwise for removal.

MAIN INSTRUMENT LAMPS

50. All lamps contained within the main instrument are accessible when the instrument is withdrawn from dash panel. These lamps are as follows:

- Alternator Warning Lamps
- Oil Pressure Warning Lamp
- Turn Signal Warning Lamp
- Main Beam Warning Lamp
- Panel Lamps

BATTERY CONDITION INDICATOR LAMP

51. The battery condition indicator lamp is mounted in rear of instrument. Access is gained to lamp after removing indicator from dash panel. To facilitate removal of indicator, remove fuse box mounting panel from beneath right-hand side of dash panel, release knurled nut and clamping bracket retaining indicator and withdraw indicator.

REAR GUARD FOG LAMP SWITCH LAMP

52. Lamp access is gained after unscrewing switch knob and shaft from holder and unscrewing knob from shaft.

FUSES

53. A 4-way fuse box is mounted beneath the instrument panel adjacent to the steering column. Access to fuses is gained after removing knurled nut and cover.

COMBINED TURN SIGNAL AND HAZARD WARNING FLASHING UNIT

54. The unit is positioned beneath the dash panel, to the right of steering column and screwed to the fuse box mounting panel. To gain access to unit, remove two bolts supporting the fuse box panel and pull clear of dash.

SPARE WHEEL

55. The spare wheel is carried in a winch-type carrier (Fig 32) located on the right-hand chassis sidemember.

56. Before attempting to remove spare wheel from its carrier ensure that the cable of carrier is fully wound up. Hook the short length of chain into one of the wheel fixing holes. This will ensure that when the wheel reaches the ground it will be in a vertical position and easier to handle.

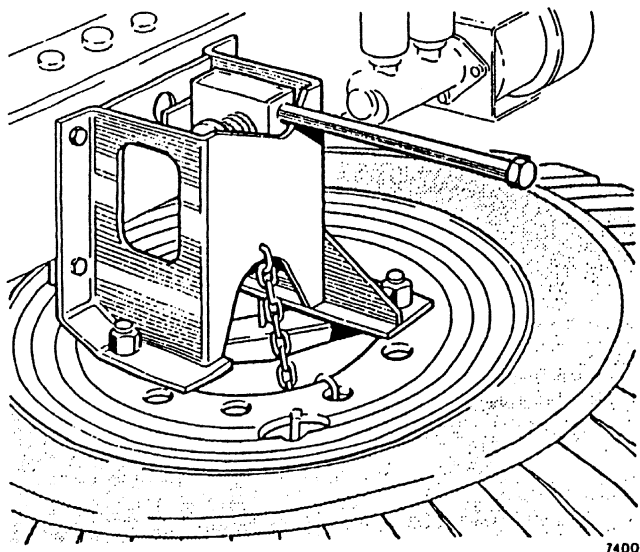


Fig 31 Spare wheel carrier

57. Using the wheel nut wrench remove the two nuts holding the wheel to the carrier. Again using the wheel nut wrench, turn the winch bar screw anti-clockwise to lower the spare wheel to the ground. When installing a wheel to the carrier turn the winch bar clockwise until the wheel support bar studs engage the carrier and the nuts can be started on the studs. Securely tighten nuts.

JACKING INSTRUCTIONS

58. To raise a wheel clear of the ground place the jack under the axle tube adjacent to the wheel which is to be raised.

PREPARATIONS

WARNING

FOLLOW JACKING PREPARATION AND INSTRUCTIONS IN ORDER TO REDUCE THE POSSIBILITY OF SERIOUS PERSONAL INJURY. THE JACK IS DESIGNED FOR USE ONLY WHEN CHANGING WHEELS. STAND CLEAR OF AND NEVER GET BENEATH THE VEHICLE WHEN IT IS SUPPORTED ONLY BY A JACK. DO NOT START OR RUN THE ENGINE WHILE THE VEHICLE IS ON THE JACK.

59. Park on a firm level surface and apply the parking brake. Activate the hazard warning system. Block both the front and back of the wheel diagonally opposite the jack position.

TO REMOVE WHEELS

60. Slacken the wheel nuts about a half turn (left-hand thread on left-hand side of the vehicle, right-hand thread on the right-hand side). Then jack up the vehicle, remove the wheel nuts and lift the wheel clear of the studs.

61. Before the wheel nuts are replaced, wheel stud threads should be cleaned and oiled. Take care when replacing the wheel to locate the conical seats of the nuts against the wheel. The torque 544 Nm (400 lbft) of the wheel nuts should be checked after the jack has been lowered.

62. Whenever a wheel has been removed and replaced it is advisable to re-check the torque of the wheel nuts after a further 1500 km (1000 miles) have been covered. Also it is sound 'safety practice' to occasionally check the torque of all the wheel nuts.

TIGHTENING WHEEL NUTS WITHOUT A TORQUE WRENCH

63. Tighten the wheel nuts as tight as possible using the issued wheel brace without the use of extension tubes etc. Drive the vehicle for 2 - 3 miles, stop and re-check wheel nut tightness. Recheck tightness of the wheel nuts using a torque wrench set to 544Nm (400lb ft) as soon as possible.

FITTING AND REMOVAL OF PASSENGER SEATING

64. The flat bed of Bedford MJ vehicles is designed to accept two standard passenger seats. Figure 32 is a general view of one seat fitted to the vehicle.

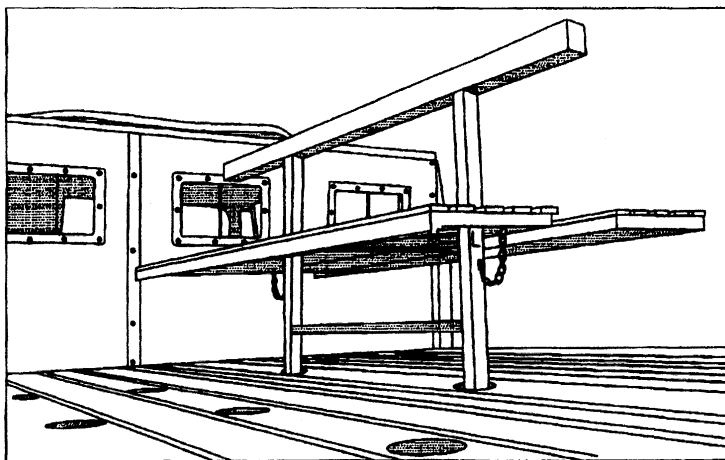


Fig 32 Passenger seats in position

65. The seats consist of a central square section steel frame with slatted sitting platforms fitted either side. The seats are supplied in the stowed position, i.e. with the sitting platforms folded up onto the central frame and secured with webbing straps. The sitting platform base of square section steel is mounted on the central frame on steel bearing pins with securing pins to prevent the seats from sliding off the bearing pins.

66. The procedure for fitting the seats is as follows:

66.1 Position the seats so that the square section supports (legs) align with the square holes in the flat bed, see Figure 33.

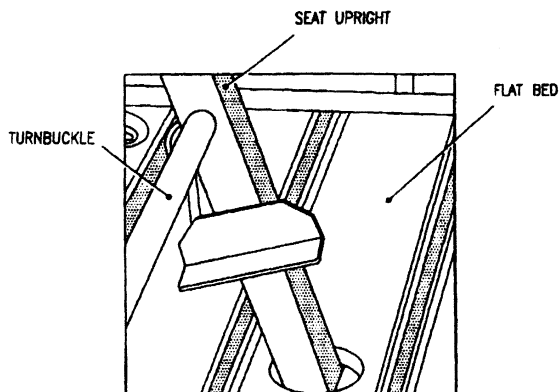


Fig 33 Positioning seat upright

66.2 Adjust the turnbuckle between the legs so that the legs will slide easily into the holes.

66.3 Adjust the turnbuckle to clamp the legs securely in the holes (Fig 34).

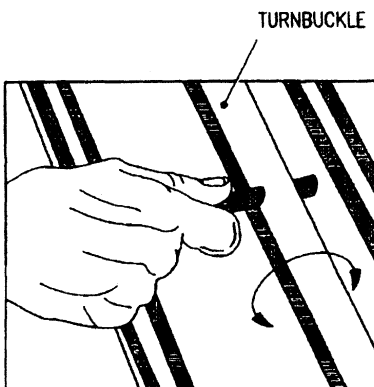


Fig 34 Adjusting turnbuckle

66.4 Release the webbing securing straps and lower the seats into position (Fig 35).

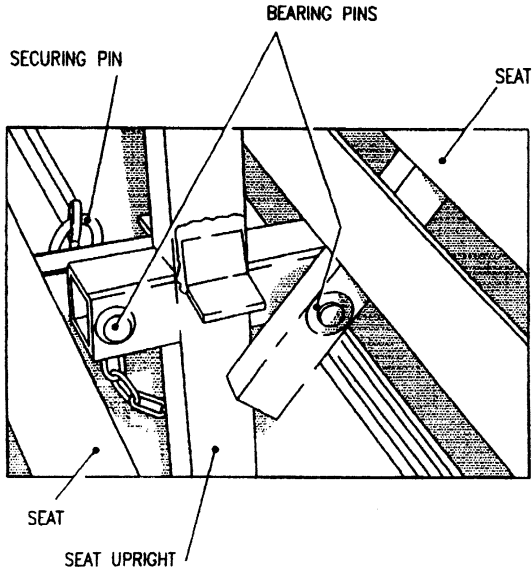


Fig 35 Seat locking arrangements

66.5 Insert the securing pin.

67. The seat is now ready for use

68. Removing the seats is the reverse of the fitting procedure.

CHAPTER 5-2
USER MAINTENANCE
TRUCK 8 TONNE 4 x 4 W/CRANE

CONTENTS

Para

- | | |
|---|---|
| 1 | Top-up crane hydraulic oil reservoir (Caution) |
| 3 | Clean/change crane hydraulic oil filter (Caution) |
| 5 | Change crane hydraulic oil (Caution) |

Fig

Page

1	Crane hydraulic reservoir	2
2	Crane hydraulic oil filter	3
3	Lubrication and levels chart.....	5
4	Crane lubrication chart	6

Note

This Chapter to be read in conjunction with Chap 5-1.

TOP-UP CRANE HYDRAULIC OIL RESERVOIR

CAUTION

Cleanliness is of extreme importance where hydraulic circuits and components are concerned. It is, therefore, most important to exercise care as the ingress of dirt or foreign matter in the oil will result in rapid wear of the pump and valves.

1. When checking the oil level of the reservoir ensure the vehicle is standing on level ground and all rams are retracted. The oil level is visible through an inspection glass in the side of the reservoir.

2. When it becomes necessary to top-up oil level the following procedure should be carried out:

- 2.1 Remove cover (Fig 1) from top of filter.
- 2.2 With all rams retracted top-up oil level to the middle of the sight glass.
- 2.3 Re-install filter top cover.

CLEAN/CHANGE CRANE HYDRAULIC OIL FILTER

CAUTION

Cleanliness is of extreme importance where hydraulic circuits and components are concerned. It is, therefore, most important to exercise care as the ingress of dirt or foreign matter in the oil will result in rapid wear of the pump and valves.

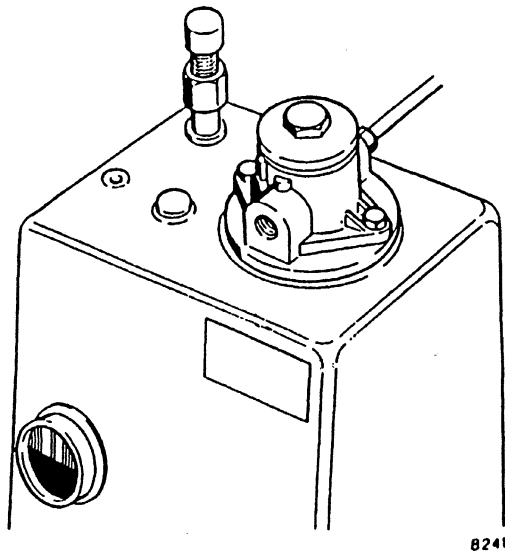
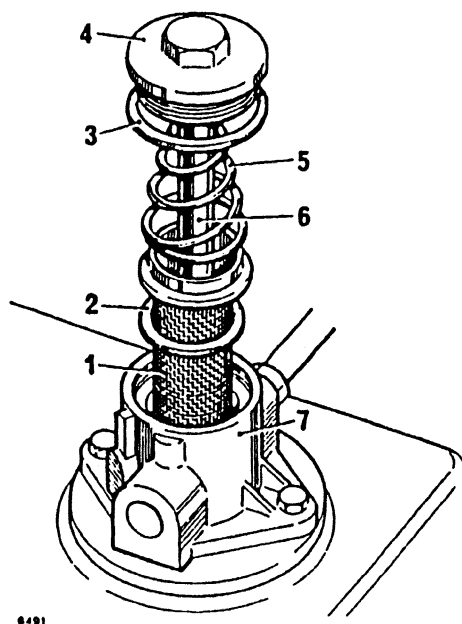


Fig 1 Crane hydraulic reservoir

Removal

3. Unscrew and remove filter cover (Fig 2(4)) together with gasket (3) and compression spring (5). Clean magnetic rod (6) with a clean fluff-free cloth.

3.1 Withdraw filter element (1) and gasket (2) from filter housing 7. Clean filter element in diesel fuel. If element is too heavily contaminated it must be renewed.



- 1 Element
- 2 Gasket
- 3 Cover gasket
- 4 Cover

- 5 Compression spring
- 6 Magnetic rod
- 7 Filter housing

Fig 2 Crane hydraulic oil filter

Installation

4. Install filter element and gasket to filter housing. With rams in the fully retracted position, check level of hydraulic oil in sight glass on reservoir and if necessary top-up.

4.1 Replace compression spring, gasket and filter cover.

CHANGE CRANE HYDRAULIC OIL

CAUTION

Cleanliness is of extreme importance where hydraulic circuits and components are concerned. It is, therefore, most important to exercise care as the ingress of dirt or foreign matter in the oil will result in rapid wear of the pump and valves.

5. Drain oil from reservoir using drain plug or the outlet pipe connection.

5.1 Refill reservoir up to the middle of the oil inspection sight glass.

5.2 Extend stabilizer rams.

5.3 Fully extend lifting ram at slow pump speed.

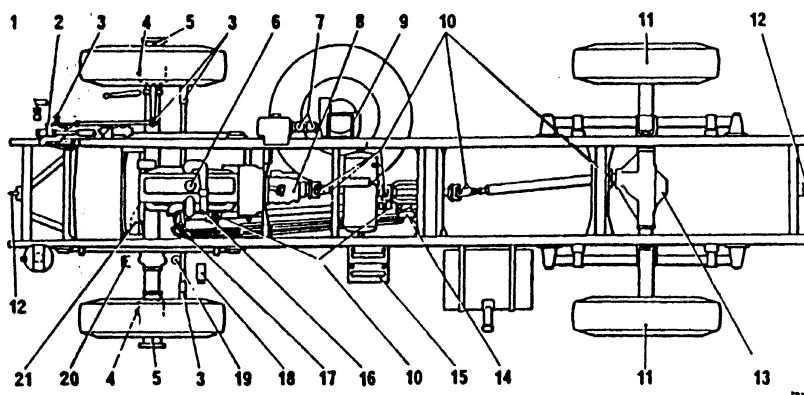
5.4 Fully extend jib ram and jib extension ram.

5.5 Retract all rams in reverse order.

5.6 Replenish oil up to the middle of sight glass and replace filter cover.

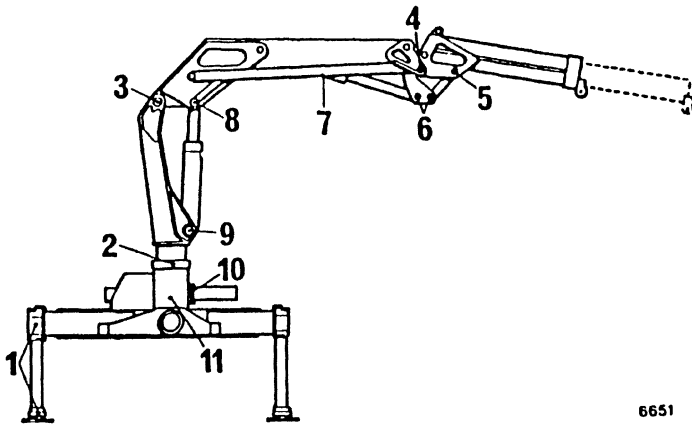
Note

It is recommended that all oil pipes be pressure tested after filling by actuating the control valve to bring each ram to its final position, where it should be held for several seconds under pressure, whilst a visual check is made of all joints for leakage.



- | | |
|---|---|
| 1 Lubricate accelerator brake and clutch control linkage | 12 Lubricate towing hook |
| 2 Top-up steering gear oil level | 13 Top-up rear axle oil level |
| 3 Lubricate steering connecting rod and tie rod ball joints | 14 Top-up transfer box oil level |
| 4 Top-up tractor joint oil levels | 15 Top-up battery electrolyte level |
| 5 Lubricate hub bearings | 16 Oil prime turbocharger (when applicable) |
| 6 Top-up engine oil level | 17 Lubricate transfer box control linkages |
| 7 Top-up brake fluid level | 18 Top-up cooling system level |
| 8 Top-up gearbox oil level | 19 Top-up air compressor anti-freeze level |
| 9 Lubricate spare wheel carrier mechanism | 20 Top-up windshield wash |
| 10 Lubricate propeller shaft sliding couplings and universal joints | 21 Top-up front axle oil level |
| 11 Top-up hub bearing oil level | |

Fig 3 Lubrication and levels chart



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- | | |
|--|--|
| 1 Lubricate stabilizer rams and supports | 7 Lubricate jib lifting ram |
| 2 Lubricate upper trestle | 8 Lubricate boom lifting ram top pivot |
| 3 Lubricate centre column to boom pivot | 9 Lubricate boom lifting ram bottom pivot |
| 4 Lubricate boom to jib pivot | 10 Lubricate slewing ram |
| 5 Lubricate jib lifting ram upper pivot | 11 Lubricate centre column to pendulum frame |
| 6 Lubricate boom and jib linkage pivots | 12 Top-up crane reservoir |

Fig 4 Crane lubrication chart**End of Chapter**

CHAPTER 6

USER SPARES DATA

CONTENTS

<i>Table</i>		<i>Page</i>
1	Lamp data.....	1
2	Fuse data.....	2
3	Other Items.....	2

TABLE 1 LAMP DATA

Light	Volts	Watts	Type
Head	26	50/50	Pre-focus, vertical dip
Side and Number			
Plate	26	6	Small centre contact
Convoy	26	21	Small centre contact
Tail/Stop	24	7/30	Small bayonet cap (offset pins)
Turn Signal/			
Hazard Warning	24	24	Small centre contact
Interior Roof	6	24	Festoon
Instrument illumination & warning	24	3	Wedge base capless
Hazard Warning Switch	24	3	Peanut
Trailer Turn			
Signal and Winch			
Warning	24	2	Peanut
Speedometer	24	2.8	Miniature centre contact
Illumination			
Tachometer	24	4	Miniature Edison screw
Illumination			
Brake Air Pressure			Miniature Edison screw
Gauge illumination	24	2.8	
Rear Fog	24	21	Small centre contact

TABLE 2 FUSE DATA

Fuse No	Circuits Protected
1	Windscreen wipers, alternator and oil pressure warning lights, heater fan motor, temperature gauge, fuel gauge, winch torque limiter (where applicable). Air pressure warning buzzer and light and two-pin trailer socket.
2	Instrument illumination light, rear tail light and number plate.
3	Hazard warning circuit, convoy light and turn signals.
4	Horn, interior light, inspection light sockets and battery feed for trailer sockets.

TABLE 3 MISCELLANEOUS DATA

Part No	Description
	Engine oil filter element Fan drive belts Fuel filter element Air cleaner element Engine oil Gearbox oil Transfer box oil Axle oil Hub oil

End of Chapter

Chapter 7

DESTRUCTION OF VEHICLE TO PREVENT ENEMY USE

CONTENTS

Para

1	General
3	Degree of damage
4	Priorities for destruction
5	Spare parts
6	Methods of destruction
7	Mechanical
8	Burning (WARNING)
9	Gunfire (WARNING)

GENERAL

1. Destruction of the equipment, when subject to capture by the enemy, will be undertaken by the user arm, ONLY WHEN, in the judgment of the unit commander concerned, such action is necessary in accordance with orders of, or policy established, by the Army or Divisional Commanders.
2. The reporting of the destruction of the equipment is to be done through command channels.

Degree of damage

3. The degree of damage inflicted, to prevent the equipment being used by an enemy, shall be as follows:

3.1 Methods of destruction should achieve such damage to, equipment and essential spare parts, that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or by cannibalization.

3.2 Classified equipment must be destroyed in such degree as to prevent, whenever possible duplication by or revealing means of operation or function to the enemy.

3.3 Any classified documents, notes, instructions or other written material pertaining to function, operation, maintenance or employment, including drawings or parts lists, must be destroyed in a manner to render them useless to the enemy.

Priorities for destruction

4. The priorities for destruction should be considered as follows:

Priority	Parts
1	Fuel pump and injectors
2	Engine block and cooling system
3	Tyres and suspensions
4	Air and Hydraulic systems
5	Differentials
6	Frame

4.1 Priority must be given to the destruction of classified equipment and associated documents.

4.2 When lack of time and/or means prevents complete destruction of equipment, priority is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment.

4.3 A guide to priorities for destruction of the equipment is shown in the Table.

Spare Parts

5. The same priority, for destruction of component parts of a major item necessary to render the item inoperable, must be given to the destruction of similar components in spare parts storage areas.

METHODS OF DESTRUCTION

6. The following information is for guidance only. Of the several means of destruction, those most generally applicable are as under.

Mechanical

7. This requires an axe, pick, crowbar or similar implement. The equipment should be destroyed in accordance with the priorities given in the Table.

Burning

8. This requires gasoline, oil or other flammables.

8.1 Remove and empty the portable fire extinguishers.

8.2 If quantities of combustibles are limited, smash all vital elements, such as switches, instruments and control levers.

8.3 Place ammunition and charges in and about the equipment so that the greatest damage will result from the explosion.

8.4 Pour gasoline and oil over the equipment. Ignite by means of an incendiary grenade fired from a safe distance, by a burst from a flame thrower, by a combustible train of suitable length or other appropriate means. Take cover immediately.

WARNING

DUE CONSIDERATION SHOULD BE GIVEN TO THE HIGHLY FLAMMABLE NATURE OF GASOLINE AND ITS VAPOUR. CARELESSNESS IN ITS USE MAY RESULT IN PAINFUL BURNS.

Gunfire

9. When destroying the equipment by gunfire proceed as follows:

9.1 Remove and empty the portable fire extinguishers.

9.2 Smash all vital elements as outlined in sub-para 8.2.

WARNING

FIRING ARTILLERY AT RANGES OF 500 YARDS OR LESS, AND FIRING RIFLE GRENADES OR ANTI-TANK ROCKETS SHOULD BE FROM COVER.

9.3 Destroy the equipment by gunfire, using tank guns, self-propelled guns, artillery, rifles using rifle grenades or launchers using anti-tank rockets.

10. In general, destruction of essential parts, followed by burning, will usually be sufficient to render the equipment useless. However, selection of the particular method of destruction requires imagination and resourcefulness in utilization of the facilities at hand under the existing conditions. Time is usually critical.

11. If destruction is ordered, due consideration should be given to:

11.1 Selection of a point of destruction that will cause greatest obstruction to enemy movement and also prevent hazard to friendly troops from fragments or ricocheting projectiles which may occur incidental to the destruction by gunfire.

11.2 Observance of appropriate safety precautions.

End of Chapter

