



# Ministry of Defence

Army Equipment Support Publication

## Truck Utility Light (TUL) HS, Truck Utility Medium (TUM) HS and (TUM) Battlefield Ambulance HS, All Variants

2320-D-128-101

4<sup>th</sup> Edition May 2017

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**PREFACE**

Sponsor: Operational Support Vehicles Programme (OSVP)  
Project Number: -  
File Ref: -  
Publication Authority: DES-LE-OSP-OSVP

**INTRODUCTION**

1 Users should forward any comments on this publication in accordance with Army Equipment Support Publication (AESP) 0100-P-011-013. All comments are only to be submitted using the electronic and interactive Form 10 which can be accessed and downloaded from the Joint Asset Management and Engineering Solutions (JAMES) Portal (via Hot Topic — Forms) or from DR TDOL (F10).

2 All electronic Form 10s are to be completed and forwarded to the Form 10 cell using the instructions accompanying the form in its template location. Security procedures are to be observed in accordance with Joint Services Publication (JSP) 440.

3 The Form 10 procedure is only to be used for the purpose of commenting on the content of an individual AESP and must not be used:

3.1 In place of the Equipment Failure Reporting (EFR) procedure outlined in The Land Equipment Unit Maintenance Standards (LEUMS).

3.2 For subjects which are the concern of the Technical Staff Suggestions outlined in Army General and Administrative Instructions (AGAI).

4 AESPs are issued under United Kingdom (UK) Ministry Of Defence (MOD) authority and where AESPs specify action is to be taken, the AESP will of itself be sufficient authority for such action and also for the demanding of the necessary stores, subject to the provisions of Para 3 below.

5 The subject matter of this publication may be affected by Defence Instructions and Notices (DIN), Standard Operating Procedures (SOP) or by local regulations. When any such instruction, Order or Regulation contracts any portion of this publication it is to be taken as the overriding authority.

**RELATED AND ASSOCIATED PUBLICATIONS**

**Related publications**

6 The AESP Octad for the subject equipment consists of the publications shown below. All references are prefixed with the first eight digits of this publication.

Category/Subcategory			Information Level			
			1 User/ Operator	2 Unit Maintenance	3 Field Maintenance	4 Base Maintenance
1	0	Purpose and Planning Information	101	101	101	101
	1	Equipment Support Policy Directive	111	111	111	111
	2	Cancellation Instruction	*	*	*	*
2	0	Operating Information	201	201	201	201
	1	Aide-Memoir	211	211	*	*
	2	Training Aids	*	*	*	*
3	0	Technical Description	302	*	*	*
4	1	Installation Instructions	411	411	411	411
	2	Preparation for Special Environments	421	421	421	421
5	1	Failure Diagnosis	*	512	512	512
	2	Maintenance Instructions	*	522	523	524
	3	Inspection Standards	*	532	533	534
	4	Calibration Procedures	*	*	524	524
6	0	Maintenance Schedule	601	601	601	601
7	1	Illustrated Parts Catalogue	*	711	711	711
	2	Commercial Parts List	*	721	721	721
	3	Complete Equipment Schedule, Production	*	*	*	*
	4	Complete Equipment Schedule, Service Edition (Simple Equipment)	741	741	741	741
	5	Complete Equipment Schedule, Service Edition (Complex Equipment)	*	*	*	*
8	1	Modification Instructions	811	811	811	811
	2	General Instructions, Special Technical Instructions and Servicing Instructions	821	821	821	821
	3	Service Engineered Modification Instructions (RAF only)	*	*	*	*

\*Category / Subcategory not published.

**Associated publications**

7 The following associated publications should be read in conjunction with this category:

<b>Reference</b>	<b>Title</b>
AP 3260 Book 1	Mechanical Transport Maintenance Regulations for the Royal Air Force - Maintenance Repair Policy
AP 4545 Volume 2	Mechanical Transport
AESP 2320-D-128-Octad	Truck Utility Light (TUL), HS, Truck Utility Medium (TUM) HS and (TUM) Ambulance HS, All Variants
JSP 375 Vol 2	MOD Health and Safety
JSP 800	Defence Movement and Transport Regulations
LEUMS	Land Equipment User Maintenance Standards

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### WARNINGS AND CAUTIONS

8 The following WARNINGS are used in this document:

#### WARNINGS

(1) **HAZARDOUS SUBSTANCES. BEFORE USING ANY HAZARDOUS SUBSTANCE OR MATERIAL, THE USER MUST BE CONVERSANT WITH THE SAFETY PRECAUTIONS AND FIRST AID INSTRUCTIONS DETAILED ON ITS CONTAINER, THE RELEVANT SAFETY DATA SHEET AND IN LOCAL SAFETY ORDERS AND REGULATIONS.**

(2) **PERSONAL INJURY. EXHAUST FUMES ARE HIGHLY TOXIC. WHEN UNDERTAKING REPAIR OPERATIONS THAT REQUIRE THE ENGINE TO BE RUN, ALWAYS ENSURE THAT EXHAUST EXTRACTION EQUIPMENT IS USED, OR THAT THE WORK AREA HAS ADEQUATE VENTILATION.**

(3) **PERSONAL INJURY. WHEN WORKING ON A VEHICLE THAT IS JACKED UP, ALWAYS ENSURE THAT AXLE STANDS OR BLOCKS ADEQUATELY SUPPORT IT. NEVER VENTURE UNDER A VEHICLE THAT IS SOLELY SUPPORTED BY JACKS.**

#### CAUTIONS

9 There are no **CAUTIONS** identified in this document.

## ABBREVIATIONS AND SYMBOLS

## ABBREVIATIONS

10 The following abbreviations are used in this category:

Abbreviation	Definition
A	Ampere
AC	Alternating Current
AESP	Army Equipment Support Publication
Amdt	Amendment
C	Celcius/Centigrade
cm <sup>3</sup>	Centimetre cubed
DE&S	Defence Equipment and Support
DIN	Defence Instructions and Notice
EC	European Community
ES	Equipment Support
FFR	Fitted For Radio
Fig	Figure
GEMS	MOD Staff Suggestion Scheme
GS	General Service
HQ	Headquarters
IK	Installation Kit
IPT	Integrated Project Team
JAMES	Joint Asset Management and Engineering Solutions
JSP	Joint Service Publication
kg	kilogramme(s)
km	kilometre(s)
LAG	Local Awards Group
LHD	Left Hand Drive
m	metre
mm	millimetre
MOD	Ministry of Defence
MT	Mechanical Transport
NATO	North Atlantic Treaty Organisation
No.	Number
NSN	NATO Stock Number
OEM	Original Equipment Manufacturer
OSVP	Operational Support and Vehicles Programme
Para	Paragraph
PM	Project Manager
POC(s)	Point(s) of Contact
RAF	Royal Air Force
REME	Royal Electrical and Mechanical Engineers

(continued)

<b>Abbreviation</b>	<b>Definition</b>
RHD	Right Hand Drive
rpm	revolutions per minute
SOP	Standard Operating Procedure
ST&TE	Special Tools and Test Equipment
TDOL	Technical Documents On-Line
TUL	Truck Utility Light
TUM	Truck Utility Medium
UK	United Kingdom
V	Volt

**SYMBOLS**

11 The following symbols are used in this Publication:

<b>Symbol</b>	<b>Meaning</b>
+ve	positive
-ve	Negative
°	Degree (Angle/Temperature)

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CHAPTER 1

PURPOSE AND PLANNING INFORMATION

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**EQUIPMENT IDENTITY**

1 The vehicle asset details are listed in Table 1.

**TABLE 1 VEHICLE ASSET CODES**

<b>Serial (1)</b>	<b>Nomenclature (2)</b>	<b>NSN (3)</b>	<b>Asset Code (4)</b>
1	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (Non EEGR)	2310-99-893-9746	NB 1047 3100
2	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2310-99-893-9971	NB 1047 3101
3	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (Non EEGR) with Bowman NH	2310-99-908-6890	NB 1047 3160
4	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2310-99-908-6891	NB 1047 3161
5	Ambulance Battlefield (HS) 4 Stretcher LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2310-99-893-9970	NB 1047 8100
6	Ambulance Battlefield (HS) 4 Stretcher LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2310-99-908-6892	NB 1047 8160
7	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Semi Water (Proofed for 600mm Depth)	2310-99-908-5445	NB 1048 3100
8	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Semi Water (Proofed for 600mm Depth) with Bowman NH	2310-99-908-6893	NB 1048 3160
9	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Tropical	2310-99-908-5446	NB 1049 3100
10	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Tropical with Medical Monitoring IK	2310-99-908-6497	NB 1049 3101
11	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (Non EEGR ) Tropical with Medical Monitoring IK	2310-99-908-6550	NB 1049 3102
12	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Desert with Medical Monitoring IK	2310-99-908-6705	NB 1049 3103
13	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (Non EEGR) Desert with Medical Monitoring IK	2310-99-908-6706	NB 1049 3104
14	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Tropical with Bowman NH	2310-99-908-6894	NB 1049 3160
15	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (EEGR) Tropical with Bowman NH & Medical Monitoring IK	2310-99-908-6895	NB 1049 3161
16	Ambulance Battlefield (HS) 4 Stretcher RHD 4x4 Land Rover 2.5 Tdi (Non EEGR )Tropical With Bowman NH & Medical Monitoring IK	2310-99-908-6896	NB 1049 3162
17	Truck Utility Light (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water	2320-99-893-9933	NB 4219 3100

(continued)

**TABLE 1 VEHICLE ASSET CODES (continued)**

Serial (1)	Nomenclature (2)	NSN (3)	Asset Code (4)
18	Truck Utility Light (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9741	NB 4220 3100
19	Etc.		

**NOTE**

Chassis Manufacturer: Land Rover, Solihull, England  
Contract No: LV2a/088 LV2b/179

**ROLE**

2 The different models cover such roles as cargo carrying or personnel ferrying. Hard tops are used for installed equipment requiring better protection and 24/24 Volt (V) models are used for radio or other installed electronic equipment.

**DESCRIPTION**

3 All vehicles are of the 4 wheeled type, in Right Hand Drive (RHD) and Left Hand Drive (LHD) configuration driving through all wheels. The various vehicle types are based on the Land Rover Defender 90, 110 and 130 inch wheelbase basic cargo vehicle.

4 All vehicles are powered by a 2.5 litre, direct injected, turbo charged, 4 stroke, liquid cooled engine. The drive is through a single plate clutch and a 5 forward and 1 reverse speed main gearbox, with a HIGH and LOW ratio transfer box in permanent 4 wheel drive via a lockable differential.

5 Vehicles are fitted with a 24 V electrical system. The lighting system conforms to United Kingdom (UK) or European Community (EC) traffic regulations.

**PHYSICAL DATA**

**Dimensions**

6 The dimensions of the vehicle variants are as follows:

6.1 Table 2 and Fig 1 identify the dimensions for the Truck Utility Light (TUL).

**TABLE 2 TRUCK UTILITY LIGHT (TUL) DIMENSIONS**

Serial (1)	Dimension Title (2)	Measurement (3)
1	Overall Length	3835 mm
2	Overall Width	1910 mm
3	Overall Height (unladen)	2150 mm
4	Track (front and rear)	1521 mm
5	Ground Clearance (min)	240 mm
6	Approach Angle (laden)	47°
7	Departure Angle (laden)	43°
8	Turning Circle (between kerbs)	SSSS

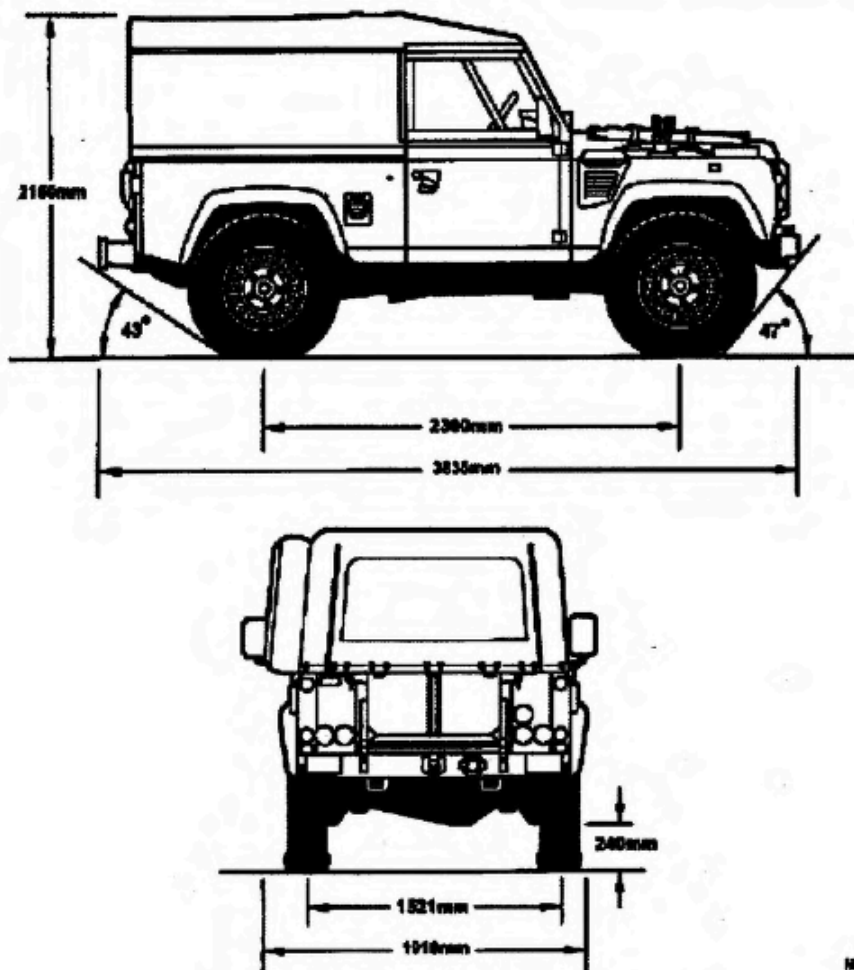


Fig 1 Truck Utility Light (TUL) dimensions



6.2 Table 3 and Fig 2 identify the dimensions for the Truck Utility Medium (TUM).

**TABLE 3 TRUCK UTILITY MEDIUM (TUM) DIMENSIONS**

Serial (1)	Dimension Title (2)	Measurement (3)
1	Overall Length	4550 mm
2	Overall Width	1910 mm
3	Overall Height (unladen)	2200 mm
4	Track (front and rear)	1521 mm
5	Ground Clearance (min)	240 mm
6	Approach Angle (laden)	49°
7	Departure Angle (laden)	30°
8	Turning Circle (between kerbs)	SSSS

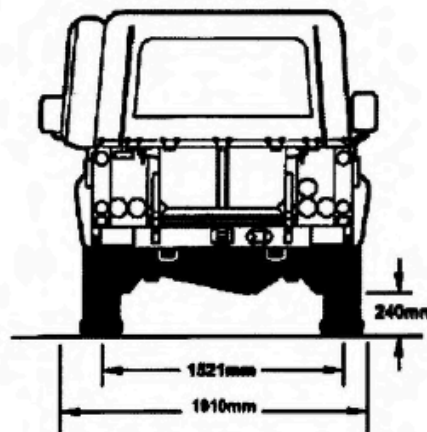
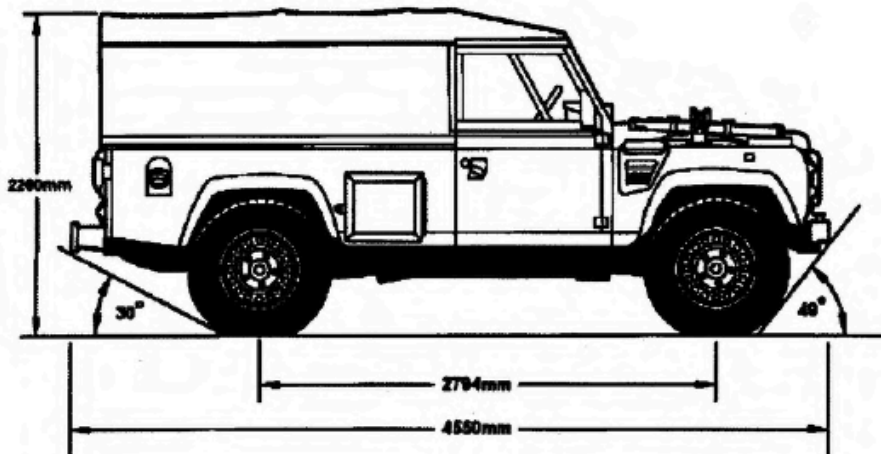
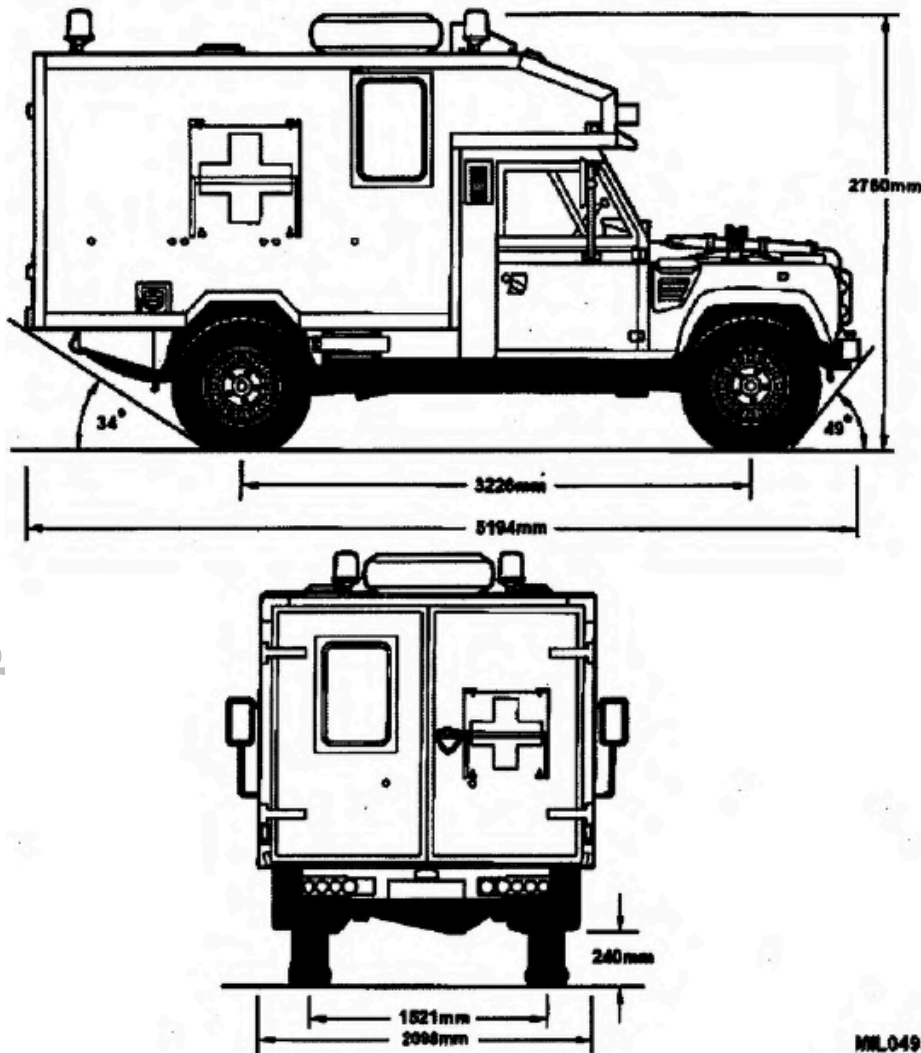


Fig 2 Truck Utility Medium (TUM) dimensions

6.3 Table 4 and Fig 3 identify the dimensions for the Ambulance.

**TABLE 4      AMBULANCE DIMENSIONS**

Serial (1)	Dimension Title (2)	Measurement (3)
1	Overall Length	5194 mm
2	Overall Width (over body)	2098 mm
3	Overall Width (over body protrusions)	2160 mm
4	Overall Height (unladen)	2200 mm
5	Track (front and rear)	1521 mm
6	Ground Clearance (min)	240 mm
7	Approach Angle (laden)	49°
8	Departure Angle (laden)	34°
9	Turning Circle (between kerbs)	SSSS



MIL0495

Fig 3 Ambulance dimensions

6.4 Table 5 and Fig 4 identify the dimensions for the Winterised/Waterproofed.

**TABLE 5 WINTERISED/WATERPROOFED DIMENSIONS**

Serial (1)	Dimension Title (2)	Measurement (3)
1	Overall Length	4550 mm
2	Overall Width	1910 mm
3	Overall Height (unladen)	2760 mm
4	Track (front and rear)	1521 mm
5	Ground Clearance (min)	240 mm
6	Approach Angle (laden)	49°
7	Departure Angle (laden)	30°
8	Turning Circle (between kerbs)	SSSS

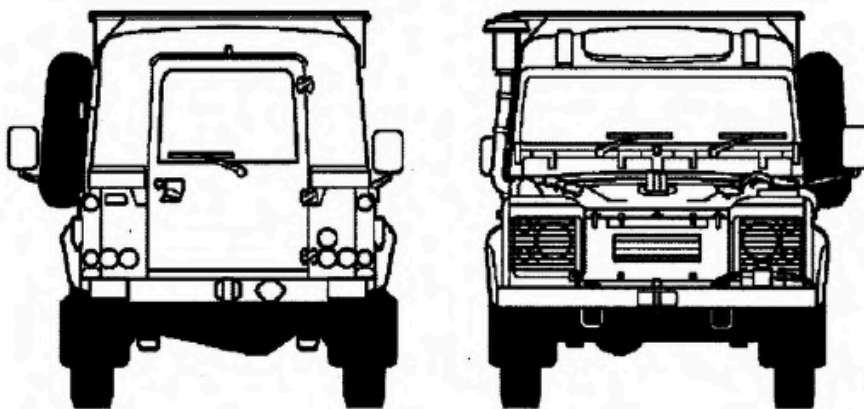
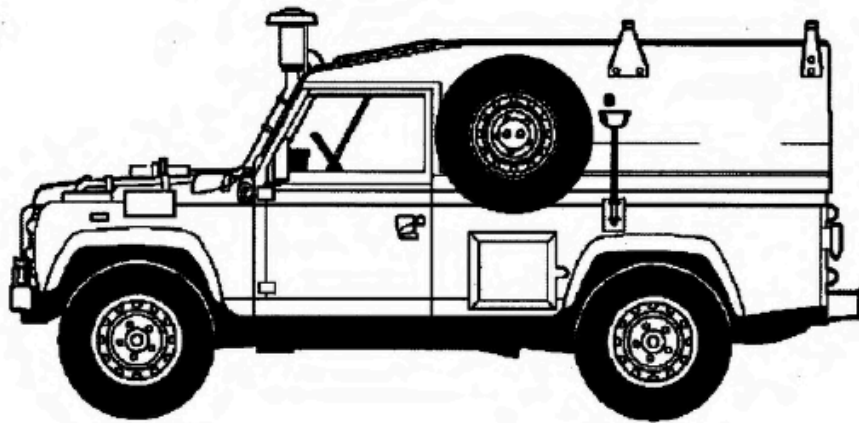


Fig 4 Winterised/Waterproofed dimensions

**Capacities**

7 The fluid capacities of the vehicle sub-systems are as stated in Table 6.

**TABLE 6 WINTERISED/WATERPROOFED DIMENSIONS**

Serial (1)	Vehicle System (2)	Capacity (Litres) (3)
1	Engine Oil (with filter)	6.85
2	Cooling System	11.5
	Gearbox:	
3	Main	2.4
4	Transfer	2.3
	Differential:	
5	Front	1.7
6	Rear	1.7
	Steering:	
7	Steering Box	0.43
8	Steering Reservoir	1.24
9	Swivel Pin housing	0.33
10	Fuel:	
	TUL	55
	TUM and Ambulance	82

**Engine**

8 The engine is a Land Rover 300Tdi (2495 cm<sup>3</sup>) 4 cylinder, 4 stroke, direct injected, turbo charged diesel engine with the following capabilities:

- 8.1 Maximum power is 83 kW at 4000 rpm.
- 8.2 Maximum torque 265 Nm at 1800 rpm.
- 8.3 Compression ratio 19.5:1.
- 8.4 Positive crank ventilation to the intake system via a depression control valve.

**Transmission**

9 The transmission has numerous sub-systems with the following specification:

- 9.1 **Clutch:** Single dry plate with heavy duty cover assembly. Hydraulically operated with a diameter of 242 mm.
- 9.2 **Gearbox (main):** Type R380 Manual 5 forward speed and one reverse, helical constant mesh with synchromesh on all gears.
- 9.3 **Transfer Gearbox:** Type LT 230T, permanent 4 wheel drive with lockable transfer differential and high or low reduction on main gearbox output.

- 9.4.1 Fully floating, spiral bevel drive incorporating single constant velocity joints, ratio 3.54:1.
- 9.4.2 Fully floating, hypoid drive type, ratio 3.54:1.

### Suspension

10 The suspension consists of helical coil springs at each wheel station with double acting hydraulic telescopic dampers and rubber buffers. Anti-roll bars are fitted to TUM front suspension and Ambulance rear.

### Steering

11 The steering system is an Adwest variomatic type, consisting of a power assisted worm and roller steering box. Lock to lock of the steering takes 3.3 turns of the steering wheel.

### Brakes

12 The braking system consists of two types as follows:

12.1 **Foot brake:** The foot brake is a vacuum servo assisted, hydraulic type, divided through front and rear circuits (split) activating disc brakes located at each of the road wheels. The brake system also incorporates a hydraulic failure warning light. The TUL brake system is equipped with a pressure reducing valve.

12.2 **Parking brake:** Mechanically operated drum type on the transfer box output shaft drum.

### Wheels and tyres

13 The wheels are styled steel of a 6.50J x 16 size, having five stud fixings. The tyres are a light truck, radial tubeless type in a size of 7.50 x 16.

**Weights, fuel consumption and speed data**

14 Table 7 details the weights, fuel consumption and speed data of the Winterised/ Waterproofed TUL, TUM, the TUL, TUM and Ambulance variants.

**TABLE 7 WEIGHTS, FUEL CONSUMPTION AND SPEED DATA 1**

Serial (1)	Details (2)	Winterised/ Waterproofed		TUL (5)	TUM (6)	Ambulance (7)
		TUL (3)	TUM (4)			
1	Gross vehicle weight	-	-	SSSS	SSSS	SSSS
2	Maximum permitted axle loads:					
3	Front axle GS HT	-	-	SSSS	SSSS	SSSS
3	Rear axle GS HT	-	-	SSSS	SSSS	SSSS
4	Front axle weight (unladen):					
4	GS ST	SSSS	SSSS	SSSS	SSSS	-
5	GS HT	-	SSSS	SSSS	SSSS	SSSS
6	FFR ST	-	-	SSSS	SSSS	-
7	FFR HT	-	-	SSSS	SSSS	-
8	Rear axle weight (unladen):					
8	GS ST	SSSS	SSSS	SSSS	SSSS	-
9	GS HT	-	SSSS	SSSS	SSSS	SSSS
10	FFR ST	-	-	SSSS	SSSS	-
11	FFR HT	-	-	SSSS	SSSS	-
12	Maximum trailer weight	Sssssssss ssss sssssss sssssssss ss ssss.				
	<b>Performance Data</b>					
13	Range:					
14	Fuel consumption rate:					
	Roads — Steady 90 km/hr					
15	Vehicle speed:					
	Average maximum on level roads	-	-	100 km/hr	100 km/hr	100 km/hr
16	Average cruising on roads (laden)	-	-	80 km/hr	80 km/hr	60 km/hr
17	Average speed across country (laden)	-	-	20 km/hr	20 km/hr	20 km/hr
18	Maximum Gradient:					
	Dry concrete	-	-	SSS	SSS	SSS
19	Air portability code (C130 Hercules)	-	-	TDS 631	TDS 630	-
20	Bridging classification	-	-	MLC 2	MLC 3	-
21	Shipping tonnage	-	-	17.2 m <sup>3</sup>	20.3 m <sup>3</sup>	30.6 m <sup>3</sup>
22	Fording depth (unprepared)	-	-	600 mm (24 in.)	600 mm (24 in.)	600 mm (24 in.)

15 Table 8 details the weights, fuel consumption and speed data of the TUM FFR, RWMIK and TUM 130 variants.

**TABLE 8 WEIGHTS, FUEL CONSUMPTION AND SPEED DATA 2**

Serial (1)	Details (2)	TUM FFR (3)	RWMIK (4)	TUM 130 (5)
1	Gross vehicle weight	SSSS	SSSS	SSSS
2	Maximum permitted axle loads:			
3	Front axle	SSSS	SSSS	SSSS
4	Rear axle	SSSS	SSSS	SSSS
5	Train	SSSS	SSSS	SSSS
5	Maximum trailer weight	Sssss ssss sssssss ss sss		
	<b>Performance data</b>			
6	Range:			
	Roads — Steady 90 km/hr	-	-	-
7	Fuel consumption rate:			
	Roads — Steady 90 km/hr	-	-	-
8	Vehicle speed:			
	Average maximum on level roads	-	-	-
9	Average cruising on roads (laden)	-	-	-
10	Average speed across country (laden)	20 km/hr	20 km/hr	20 km/hr
11	Maximum Gradient:			
	Dry concrete	-	-	-
12	Air portability code (C130 Hercules)	-	-	-
13	Bridging classification	-	-	-
14	Shipping tonnage	-	-	-
15	Fording depth (unprepared)	600 mm (24 in.)	600 mm (24 in.)	600 mm (24 in.)

**Environmental data**

16 The different vehicle variants can operate in environments detailed as follows:

16.1 **Temperature:** European and tropical climate with a temperature between -18 °C to +52 °C.

16.2 **Terrain:** Good class roads and cross country.

**Transportation data**

17 For transportation data applicable to the relevant variants, refer to Table 9 and Table 10.

**Electrical data**

18 The details of the vehicle electrical system are as follows:

- 18.1 **Charging system:** 24 V rectified Alternating Current (AC), negative earth with a voltage compensation alternator and ducted breathing to control water ingress into the alternator. A Separate 24 V charging system is fitted to FFR variants with an electronically controlled link to the vehicle circuit when one circuit requires additional charge capacity.
- 18.2 **Alternator:** Magneti Marelli A127i 24V 50 Ampere (A) suppressed to class A requirements. Two alternators are fitted to FFR variants.
- 18.3 **Starter motor:** A Bosch, pre-engaged type.
- 18.4 **Starter aid:** All variants are fitted with four heater plugs.
- 18.5 **Batteries:** Two Absorbent Glass Mat (AGM) maintenance free batteries. Each battery being a 12 V, PC1200MJT type.

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