



Ministry of Defence

Army Equipment Support Publication

TRUCK UTILITY LIGHT (TUL) HS, TRUCK UTILITY MEDIUM (TUM) HS AND (TUM) BATTLEFIELD AMBULANCE HS, ALL VARIANTS

This publication contains information covering the
requirement of Category 533 at levels 3 - 4.


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AMENDMENT RECORD

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56		
57		
58		
59		
60		
61		
62		

CONTENTS

PRELIMINARY MATERIAL	Page
Front cover (title page)	(i)
AMENDMENT RECORD	(iii)/(iv)
CONTENTS (this list)	(v)
PREFACE	(vi)
Introduction	(vi)
Equipment identity	(vii)
Related and Associated Publications	(xi)
Related Publications	(xi)
Associated Publications	(xii)
WARNINGS AND CAUTIONS	(xii)
Warnings	(xii)
Cautions	(xii)
ABBREVIATIONS AND SYMBOLS	(xiii)
Abbreviations	(xiii)
Symbols	(xiv)

Table	Page
1 Equipment identity	(vii)

Chapters

- 1 2.5 Litre 300Tdi direct injected diesel engine
- 2 Not taken up
- 3 Five speed manual gearbox
- 4 LT230T Transfer box and propeller shafts
- 5 Not taken up
- 6 Not taken up
- 7 Power assisted steering system

PREFACE

Sponsor: Operational Support Vehicles Programme (OSVP)
Project Number: -
File Ref: -
Publication Authority: [REDACTED]

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.

EQUIPMENT IDENTITY

6 The details are listed in Table 1.

TABLE 1 EQUIPMENT IDENTITY

Serial (1)	Nomenclature (2)	NSN (3)	Asset Code (4)
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 EQUIPMENT IDENTITY (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	Truck Utility Light (HS) GS (Soft Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9964	NB 4220 8100
20	Truck Utility Light (HS) GS (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter	2320-99-908-5441	RB 4224 3100
21	Truck Utility Light (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9742	NB 4225 3100
22	Truck Utility Light (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9965	NB 4225 8100
23	Truck Utility Light (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water	2320-99-893-9935	NB 4226 3100
24	Truck Utility Light (HS) FFR (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9936	NB 4228 3100
25	Truck Utility Light (HS) FFR (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Air Dropable	2320-99-908-5442	NB 4232 3100
26	Truck Utility Medium (HS) GS (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Heli Support	2320-99-908-5449	RB 5006 3100
27	Truck Utility Medium (HS) GS (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water	2320-99-893-9938	NB 5008 3100
28	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water	2320-99-893-9939	NB 5009 3100
29	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter / Water with Bowman NH	2320-99-908-6924	NB 5009 3160
30	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (Non EEGR)	2320-99-893-9743	NB 5010 3100
31	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9963	NB 5010 3101
32	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (Non EEGR) with Bowman NH	2320-99-908-6904	NB 5010 3161
33	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (Non EEGR) with BOWMAN SH	2320-99-908-6905	NB 5010 3171
34	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (Non EEGR) Trial Vehicle	2320-99-908-5511	NB 5010 3199
35	Truck Utility Medium (HS) GS (Soft Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9966	NB 5010 8100
36	Truck Utility Medium (HS) GS (Soft Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2320-99-908-6906	NB 5010 8160
37	Truck Utility Medium (HS) GS (Soft Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman SH	2320-99-908-6907	NB 5010 8170
38	Truck Utility Medium (HS) GS (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9940	NB 5017 3100
39	Truck Utility Medium (HS) GS (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9967	NB 5017 8100

(continued)

TABLE 1 EQUIPMENT IDENTITY (continued)

Serial (1)	Nomenclature (2)	NSN (3)	Asset Code (4)
40	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9744	NB 5020 3100
41	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-5944	NB 5020 3101
42	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-5945	NB 5020 3102
43	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-5946	NB 5020 3103
44	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-6066	NB 5020 3104
45	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-6417	NB 5020 3107
46	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2320-99-908-6913	NB 5020 3160
47	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman SH	2320-99-908-6914	NB 5020 3170
48	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with BOWMAN BF LAS	2320-99-908-6911	NB 5020 3180
49	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with BOWMAN FF LAS	2320-99-908-6912	NB 5020 3190
50	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9968	NB 5020 8100
51	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-6492	NB 5020 8104
52	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2320-99-908-6918	NB 5020 8160
53	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman SH	2320-99-908-6919	NB 5020 8170
54	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman BF LAS	2320-99-908-6916	NB 5020 8180
55	Truck Utility Medium (HS) FFR (Hard Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman FF LAS	2320-99-908-6917	NB 5020 8190
56	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water	2320-99-893-9941	NB 5021 3100
57	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water with Bowman NH	2320-99-908-6926	NB 5021 3160
58	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water with Bowman SH	2320-99-908-6927	NB 5021 3170
59	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water with Bowman BF LAS	2320-99-908-6928	NB 5021 3180

(continued)

TABLE 1 EQUIPMENT IDENTITY (continued)

Serial (1)	Nomenclature (2)	NSN (3)	Asset Code (4)
60	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter/Water with Bowman FF LAS	2320-99-908-6920	NB 5021 3190
61	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Commander's IK	2320-99-908-5720	NB 5022 3100
62	Truck Utility Medium (HS) FFR (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9745	NB 5031 3100
63	Truck Utility Medium (HS) FFR (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman NH	2320-99-908-6922	NB 5031 3160
64	Truck Utility Medium (HS) FFR (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) with Bowman SH	2320-99-908-6923	NB 5031 3170
65	Truck Utility Medium (HS) FFR (Soft Top) LHD 4x4 Land Rover 2.5 Tdi (EEGR)	2320-99-893-9969	NB 5031 8100
66	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-908-5272	NB 5035 3100
67	Truck Utility Medium (HS) GS (S/Wagon) RHD 4x4 Land Rover 2.5 Tdi (EEGR) 110 Media Operations Support Vehicle	2320-99-908-6976	NB 5040 3100
68	Truck Utility Medium (HS) FFR (Hard Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) Winter Heli Support vehicle	2320-99-908-5450	RB 5042 3100
69	Truck Utility Medium (HS) FFR 4x4 Land Rover 2.5 TDi (w/EEGR) Scout	2320-99-908-7633	NB 5033 3100
70	Truck Utility Medium (HS) GS (Soft Top) RHD 4x4 Land Rover 2.5 Tdi (EEGR) [REDACTED]	2320-99-490-5237	NB 5037 3100
71	Truck Utility Medium (HS) 4x4 GS (Hard Top) Land Rover 130 2.5 Tdi Double Cab Pickup (DCPU)	2320-99-908-7750	NB 5045 3100
72	Truck Utility Medium (HS) 4x4 GS (Soft Top) Land Rover 130 2.5 Tdi Double Cab Pickup (DCPU)	2320-99-908-7876	NB 5046 3100

6.1 Chassis Manufacturer Land Rover
Solihull, England.

6.2 Contract No LV2a/088
LV2b/179.

RELATED AND ASSOCIATED PUBLICATIONS

Related Publications

7 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/Sub-category			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 Directives	111	111	111	111
	2	Cancellation Instructions	*	*	*	*
2	0	Operating Information	201	201	201	201
	1	Aide-Memoire	211	211	*	*
	2	Training Aids	*	*	*	*
3		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	533
	4	Calibration Procedures	*	*	524	524
6		Maintenance Schedules	601	601	601	601
7	1	Illustrated Parts Catalogues	*	711	711	711
	2	Commercial Parts Lists	*	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/sub-category not published

Associated Publications

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

<u>Reference</u>	<u>Title</u>
AESP 2610-B-100-013	Pneumatic, Solid And Cushioned Tyres, Tubes And Associated Road Wheels
AP 3260 Book 1	Mechanical Transport Maintenance Regulations for the Royal Air Force
JSP 800 Vol 5	Road Transport Regulations

WARNINGS AND CAUTIONS**WARNINGS**

9 The following WARNINGS are used in this document:

(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 IT IS ADEQUATELY SUPPORTED BY AXLE STANDS OR BLOCKS. NEVER VENTURE UNDER A VEHICLE THAT IS SOLEY SUPPORTED BY JACKS.**

CAUTIONS

10 There are no CAUTIONS associated with this document.

ABBREVIATIONS AND SYMBOLS

ABBREVIATIONS

11 The following abbreviations are used in this category:

Abbreviation	Definition
AESP	Army Equipment Support Publication
Amdt	Amendment
C	Celsius/Centigrade
CES	Complete Equipment Schedule
DA	Design Authority
DE&S	Defence Equipment and Support
DIN	Defence Instructions and Notice
DMC	Domestic Management Code
EEGR	Electric Exhaust Gas Recirculation
ESPD	Equipment Support Policy Directive
FFR	Fitted For Radio
GS	General Service
HS	High Specification
IK	Installation Kit
IPT	Integrated Project Team
JSP	Joint Service Publication
kg	kilogramme(s)
km	kilometre(s)
kW	kilowatt(s)
LAD	Light Aid Detachment
m	metre(s)
min	minute
mm	millimetre(s)
MOD	Ministry of Defence
NATO	North Atlantic Treaty Organisation
No.	Number
NSN	NATO Stock Number

(continued)

ABBREVIATIONS (continued)

Abbreviation	Definition
Para	Paragraph
RAF	Royal Air Force
REME	Royal Electrical and Mechanical Engineers
TDOL	Technical Documents On-Line
TUL	Truck Utility Light
TUM	Truck Utility Medium
UK	United Kingdom

SYMBOLS

12 There are no symbols used in this category.

CHAPTER 1

2.5 LITRE TURBO CHARGED DIESEL ENGINE

INSPECTION STANDARD PART 2

CONTENTS

Para

- 1 General
- 2 Index to schedules
- 3 Examination of components
- Running in and testing of equipment
- 4 General
- 5 Engine testing
- 7 Fuel injection pump testing
- 8 Pump specification

Table

Page

1	Examination of components	3
2	Running-in schedule	13
3	Torque tightness figures	14

GENERAL

- 1 This section details the examination of the engine components.

INDEX TO SCHEDULES

- 2 The examination of components is broken down as follows:

Serial	Details
1-5	Cylinder block
6-10	Pistons
11-13	Piston rings
14	Gudgeon pin
15	Connecting rod
16	Small end bush
17-29	Crankshaft
30-32	Cylinder head
33	Valve guides
34	Inlet valves
35	Exhaust valves
36	Valve springs
37	Rocker shaft and rocker arms
38-41	Camshaft
42-43	Camshaft bushes
44-46	Tappet guide
47-48	Tappet slide
49	Roller follower
50	Camshaft and fuel injection pump drive belt
51	Flywheel

EXAMINATION OF COMPONENTS

3 Table 1 details the acceptable quality levels for the examination of components.

TABLE 1 EXAMINATION OF COMPONENTS

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
	CYLINDER BLOCK			
1	Height, centre line of crankshaft to top face of block	H = 278.613 mm (10.969 in.) L = 278.511 mm (10.965 in.)		Cylinder block to be examined for cracks, machined surfaces to be free from burrs or other damage, coolant passages to be clear, oilways to be free from metal swarf deposits.
2	ID bore for tappet guides	H = 34.95 mm (1.376 in.) L = 34.925 mm (1.375 in.)		
3	ID bore for camshaft bushes	H = 50.013 mm (1.9690 in.) L = 49.987 mm (1.9680 in.)		
4	ID bore for main bearing shells	H = 67.721 mm (2.6662 in.) L = 67.704 mm (2.6655 in.)		
5	ID cylinder bore			
	5.1 Standard	H = 90.4875 mm (3.5625 in.) L = 90.475 mm (3.5620 in.)		Surface finish cross hatch 38° to 42° (1) All bores to exhibit a uniform cross hatch pattern. (2) All bores to exhibit a uniform cut in both directions down the bore. (3) No metallurgical defects to be present, i.e blow hole, and surface porosity. (4) No evidence of plucking out of carbon flakes.

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
	PISTONS (KS)			
6	OD piston Standard		H = 89.0 mm (3.503 in.) L = 88.4 mm. (3.48 in.)	Pistons may only be reused if free from crown erosion. Single pistons may be replaced in an engine but only KS pistons may be used.
7	Fit, piston to cylinder bore			Piston height in any one engine may vary between high and low limits.
	7.1 Standard pistons and bores		H = 2.0875 mm (0.0821 in.) L = 1.475 mm (0.580 in.)	
8	Piston height		91.9 mm (3.62 in.)	
9	Width of piston ring grooves			
	9.1 Top compression ring		3.00 mm (0.11 in.)	(0.04 mm Taper groove)
	9.2 Second compression ring groove		H = 2.56 mm (0.10in.) L = 2.54 mm (0.10 in.)	
	9.3 Oil scraper ring groove		H = 3.06 mm (0.12 in.) L = 3.04 (0.119 in.)	
10	ID piston bore for gudgeon pin		H = 30.170 mm (1.1878 in.) L = 30.159 mm (1.1873 in.)	

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
11	PISTON RINGS			Measured 1.5 mm from outside edge of ring.
	Thickness			
	11.1 Top compression ring	H = 2.833 mm (0.111 in.) L = 2.818 mm (0.110 in)		
	11.2 Second compression ring	H = 2.49 mm (0.098 in.) L = 2.475 (0.0974 in.)		
	11.3 Oil control ring	H = 2.99 mm (0.117 in.) L = 2.975 mm (0.117 in.)		
12	GUDGEON PIN			
	OD of pin	H = 30.162 mm (1.1875 in.) L = 30.156 mm (1.1872 in.)		
	Fit, pin to small end bush	H = 0.0157 mm (0.0006 in.) L = 0.003 mm (0.0001 in.)		
14	Fit, pin to piston	H = -0.012 mm (-0.0005 in.) L = -0.002 mm (-0.0001 in.)		Hand push fit in piston (selective fit).
15	CONNECTING ROD			
	Length between centres, big end to small end	H = 175.438 mm (6.907 in.) L = 175.387 mm (6.905 in.)		
16	Rod end float on crankpin	H = 0.3556 mm (0.014 in.) L = 0.1524 mm (0.006 in.)		

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
17	Maximum misalignment, big end to small end	0.127 mm (0.005 in.) per 25.4 mm (1.0 in.) length		Measured over mandrels fitted in big end and small end bores.
	SMALL END BUSH			Bush to be a press fit in connecting rod small end.
18	OD of bush	H = 34.252 mm (1.348 in.) L = 34.201 mm (1.346 in.)		
19	ID of fitted bush	H = 30.177 mm (1.188 in.) L = 30.166 mm (1.187 in.)		New bushes to be bored to finished size after fitting to connecting rod. Bored size: H = 30.177 mm (1.188 in.) L = 30.166 mm (1.187 in.)
	CRANKSHAFT			Main journals may be re-ground 0.254 mm (0.010 in.) undersize from design of:
20	OD Main bearing journals	H = 63.487 mm (2.5 in.)		H = 63.500 mm (2.5 in.) L = 63.487 mm (2.4995 in.)
21	Fit main journals to bearings	H = 0.0665 mm (0.00262 in.) L = 0.018 mm (0.0007)		Check 'nip' of bearing shells as detailed in Category 524.
22	Width, main journals			Surface finish main bearing journals 10 micro inches max.
	22.1 Front (No 1)	H = 31.85 mm (1.254 in.) L = 31.09 mm (1.224 in.)		

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
	22.2 Centre (No 3)	H = 33.325 mm (1.312 in.) L = 33.274 mm (1.310 in.)		Centre journal thrust face may be re-ground a maximum of 0.025 mm (0.010 in.) on both faces to accept oversize thrust washers.
	22.3 Rear (No 5)	H = 44.957 mm (1.177 in.) L = 44.704 mm (1.760 in.)		Crankshaft to be crack detected and demagnetised before and after grinding. Fillet radii need not be re-rolled for 0.254 mm (0.010 in.).
	22.4 Intermediate (No 2 and 4)	H = 34.645 mm (1.364 in.) L = 34.392 mm (1.354 in.)		
23	Main journal fillet radii	H = 2.500 mm (0.098 in.) L = 2.100 mm (0.086 in.)		Fillet radii are rolled and penetrate 0.25 mm (0.10 in.) to 0.50 mm (0.11 in.) below surface of finished pin diameter on new crankshafts.
24	OD crankpin journals	H = 58.744 mm (2.31275 in.) L = (see serial 24)		Crankpins may be ground. 0.254 mm (0.010 in.) undersize from design size of H = 58.744 mm (2.31275 in.) L = 58.725 mm (2.3120 in.).
25	Fit crankpin to big end bearing	H = 0.075 mm (0.00295 in.) L = 0.0254 mm (0.00098 in.)		Check 'nip' of bearing shells as detailed in Cat 524.
26	Width crankpins	H = 33.401 mm (1.315 in.) L = 33.249 mm (1.309 in.)		Surface finish of crankpins 10 micro inches max.

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
27	Crankpin fillet radii	H = 2.500 mm (0.098 in.) L = 2.100 in. (0.010 in.)		Fillet radii are rolled and penetrate 0.25 mm to 0.50 mm (0.086 in.) (0.020 in.) below surface of finished pin diameter on new shaft.
28	Maximum ovality main journals and crankpins	0.039 mm (0.0015 in.)		Profile of re-ground journals to be within 0.007 mm (0.0003 in.) of a true circle.
29	Maximum taper main journals and crankpins	0.025 mm (0.001 in.)		
30	Maximum crankshaft bow	0.076 mm (0.003 in.)		Measured at centre journal with end journals supported in vee blocks.
31	Crankshaft end float	H = 0.152 mm (0.006 in.) L = 0.05 mm (0.002 in.)		Centre main bearing thrust faces may be re-ground to a maximum of 0.25 mm (0.010 in.) each side to accept oversize thrust washers. Variation in thrust washer thickness each side not to exceed 0.08 mm (0.003 in.).
32	OD of flange for flywheel	H = 99.517 mm location (3.917 in.) L = 99.390 mm (3.912 in.)		
CYLINDER HEAD				
33	Minimum thickness rocker face to flame face (new head)	H = 128.13 mm (5.044 in.) L = 127.87 mm (25.034 in.)		Cylinder head may be refaced, see Cat 522. Surface finish on flame face 75 micro-inches maximum.
34	Maximum flame face distortion over total length	0.127 mm (0.005 in.)	0.05 mm (0.002 in.)	Maximum face distortion over any 25 mm (1.0 in.) length 0.10 mm (0.0004 in.)

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
35	Valve seat angles 35.1 Inlet 35.2 Exhaust	H = 120 deg 30 min L = 120 deg 00 min H = 90 deg 00 min L = 89 deg 30 min		Valve seat inserts may be replaced, see Category 522 for details.
	VALVE GUIDES			
36	OD of inlet and exhaust	H = 14.06 mm (0.5535 in.) L = 14.05 mm (0.5531 in.)		Cylinder head to be heated to 120 deg C for the fitting of valve seats and guides.
37	ID of valve guide bores	H = 7.68 mm (0.3023 in.) L = 7.58 mm (0.2984 in.)		
	INLET VALVE			
38	OD valve stem	H = 7.975 mm (0.3139 in.) L = 7.960 mm (0.3133 in.)		Dimensions allow for chrome finish.
39	Valve seat angle	H = 60° 30' L = 60°00'		For reaming of valve guides refer to Category 522 for details.
40	Valve head diameter	H = 39.05 mm (1.537 in.) L = 38.75 mm (1.525 in.)		
	EXHAUST VALVE			
41	OD valve stem	H = 7.96 mm (0.3133 in.) L = 7.94 mm (0.3125 in.)		
42	Valve seat angle	H = 45 deg 00 min L = 44 deg 30 min		

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
43	Valve head diameter	H = 36.65 mm (1.442 in.) L = 36.35 mm (1.431 in.)		
	VALVE SPRINGS			
44	Free length	47.1 mm (1.854 in.)		
45	Length spring compressed and force required 39.8 mm (1.56 in.) 32.0 mm (1.26 in.)	320 ±16N 680 ±27.5N		
	ROCKER SHAFT AND ARMS			
46	OD Rocker shaft	H = 17.984 mm (0.708 in.) L = 17.973 mm (0.707 in.)		
47	Bore of bush in rocker arm	H = 18.049 mm (0.710 in.) L = 18.034 mm (0.71 in.)		
	CAMSHAFT			
48	OD all camshaft journals	H = 46.787 mm (1.8420 in.) L = 46.768 mm (1.8412 in.)		Surface finish on journals 15 micro inches max (lapped finish).
49	Maximum depth of roller follower wear in cam profile	0.050 mm (0.002 in.)		Surface finish on cams 25 micro-inches max.
50	Fit journals to bushes	H = 0.06985 mm (0.002275 in.) L = 0.025 mm (0.001 in.)		
51	Maximum camshaft bow	0.050 mm (0.002 in.)		Measured at centre journal with end journals mounted on vee blocks.

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
	CAMSHAFT BUSHES			
52	OD bush	H = 50.1269 mm (1.9735 in.) L = 50.0888 mm (1.9720 in.)		
53	ID of fitted bush	H = 50.1269 mm (1.9735 in.) L = 46.812 mm (1.8430 in.)		
54	Camshaft end float	H = 0.203 mm (0.008 in.) L = 0.063 mm (0.0025 in.)		
	TAPPET GUIDE			
55	OD tappet guide	H = 34.92 mm (1.3748 in.) L = 34.907 mm (1.3743 in.)		
56	ID of slot for tappet	H = 28.626 mm (1.127 in.) L = 28.575 mm (1.125 in.)		Surface finish of slot to be smooth and free from deep scores.
57	Width of slot for tappet	H = 12.75 mm (0.502 in.) L = 12.70 mm (0.500 in.)		Surface finish of tappet to be smooth and free from deep scores.
	TAPPET SLIDE			
58	Tappet slide width	H = 28.562 mm (1.1245 in.) L = 28.537 mm (1.1235 in.)		
59	Diameter of tappet roller location	H = 25.55 mm (1.006 in.) L = 25.50 mm (1.004 in.)		Roller slot in tappet has a Teflon coating 0.127 mm (0.005 in.) to 0.025 mm (0.001 in.) thick when new.

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
60	ROLLER FOLLOWER OD of roller	H = 25.397 mm (0.9995 in.) L = 25.3746 mm (0.9990 in.)		Tappet wear mark on roller should be even round diameter. Flats on roller indicate roller is not turning. Surface finish on roller 10 micro-inches.
61	Roller width	H = 12.662 mm (0.4985 in.) L = 12.637 mm (0.4975 in.)		
62	CAMSHAFT AND FUEL INJECTION PUMP DRIVE BELT Torque setting of belt tensioner	H = 13 Nm L = 11 Nm	H = 16 Nm L = 14 Nm	Belts to be renewed on engine overhaul and at 60,000 mile intervals.
63	FLYWHEEL Minimum flywheel thickness	36.96 mm (1.453 in.)		
64	Maximum flywheel run out when bolted to crankshaft	0.7 mm (0.003 in.)		Scored flywheels may be refaced down to minimum dimension.

RUNNING IN AND TESTING OF EQUIPMENT**General**

4 This section details the running in and testing procedures for overhauled components and assemblies.

Engine testing

5 Overhauled engines are to be run in according to Table 2 and EMER T and M A 028 Chap 100.

6 Overhauled engines are to be power tested according to EMER T & M A 028 Chap 100. Rover instruction sheet No. 12.930.

TABLE 2 RUNNING-IN SCHEDULE

Procedure (1)	Oil type (2)	Engine Speed RPM (3)	Load Nm (4)	Power Kw (5)	Oil Temp deg C (Max) (6)	Water Temp deg C (Min) (7)	Duration Min (8)
Warm up	OMD160	1600	No load	No Load	110	75	10
Run-in	OMD160	1500	25	3.93	110	75	10
Run-in	OMD 80	2500	85	22.3	110	75	10
Run-in	OMD 80	3500	75	27.5	110	75	10
Run-in	OMD 80	3500	125	45.8	110	75	10
Check/adjust tappets Governor setting	OMD 80	4480	Min	Min	110	75	10

Fuel injection pump testing

7 Fuel injection pump testing is detailed in Category 522 Chap 11-1.

Pump specification

8 Pump type - Bosch VE pump R509-2-24V non-EEGR
R509-4-24V EEGR

- 8.1 Rotation (Looking on drive end): Clockwise.
- 8.2 Governor type: Two speed mechanical.
- 8.3 Advance type: Automatic speed.
- 8.4 Solenoid shut-off device: 24Volts.
- 8.5 Delivery valves in HP outlet connections.
- 8.6 Automatic high pressure venting system.

TABLE 3 TORQUE TIGHTNESS FIGURES

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
	ENGINE (CYLINDER BLOCK)		
1	Bearing Cap	130-136	96-100
2	Blanking Plug-Oil Gallery-Rear	32-42	24-31
3	Oil Squirt Jet Assembly	14-20	10-15
4	Drain Plug -Cylinder Block	22-28	16-21
5	Oil Squirt Jet Vacuum Pump Cam)	6-8	4.5-6
6	Con-Rod To Cap	56-62	41-46
7	Oil Pick Up Assy To Bearing Cap	8-10	6-7
8	Oil Pick Up Assy To Front Cover	22-28	16-21
9	Camshaft Thrust Plate	7-10	5-7
10	Oil Drain Pipe To Block (Int)	22-28	16-21
11	Oil Drain Pipe To Block (Ext)	22-28	16-21
12	Sump To Cyl Block/Front Cover	22-28	16-21
13	Drain Plug - Oil Sump	35	26
14	Tappet Guide	13-15	10-11
15	Breather Side Cover Assy	22-28	16-21
16	Baffle Plate To Breather Side Cover	3-4	2.2-3
17	Vacuum Pump	22-28	16-21
18	Fuel Lift Pump	22-28	16-21
19	Flywheel Housing	40-50	30-37
20	Flywheel Housing/Clutch Cover (Stud)	9-11	6.5-8
21	Plug (Flywheel Housing)	10-14	7-10
22	Rear Oil Seal Assy	22-28	16-21
23	Oil Filter Adaptor Assy	40-50	30-37
24	Waxstat Adaptor To Oil filter Adaptor	7-10	5-7
25	Oil Pressure Switch	15-19	11-14
26	Oil Filter 'Spin On'	11-14	8-10
27	Oil Cooler Unions To Filter Adaptor Assy	40-50	30-37
28	Oil Level Tube Assy	22-28	16-21
29	Engine Mounting Foot To Cylinder Block	80-90	59-66
30	Engine Mounting Foot To Flywheel Housing	40-50	30-37
31	Engine Mounting Rubber Mounting Foot (Bolt And Nut)	80-90	59-66
	CYLINDER HEAD		
32	Cylinder Head To Cylinder Block (refer to Cat 522 Chap 1)	40+60°+60° angle	29+60°+60° angle
33	Stub Pipe -Heater Feed	15-30	11-22
34	Water Temperature Sensor	12-15	9-11
35	Blanking Plug - Cylinder Head	12-15	9-11
36	Engine Lifting Bracket (Front And Rear)	22-28	16-21

(continued)

TABLE 3 TORQUE TIGHTNESS FIGURES (continued)

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
37	Electrical Harness Clip Bracket	22-28	16-21
38	Exhaust Manifold (Stud)	9-11	7-8
39	Exhaust Manifold (Nut)	40-50	30-37
40	Inlet Manifold (Nut)	6-10 5-7	
41	Inlet Manifold (Nut And Bolt)	22-28	16-21
42	Air Temperature Sensor - Inlet Manifold	12-15	9-11
43	Blanking Plug - Inlet Manifold	12-15	9-11
44	Heatshield To Inlet Manifold	5-7	4-5
45	Glow Plug	15-25	11-18
46	Glow Plug Terminal Nut	1.5-2	1.1-1.5
47	Injector Clamp (Stud)	6-10	4-7
48	Injector Clamp (Nut)	22-28	16-21
49	Thermostat Housing	22-28	16-21
50	Water Outlet Elbow To Thermostat Housing	22-28	16-21
51	Water Temp Switch	9-12	7-9
52	Plug - Thermostat Housing	5-6	4-4.5
53	Rocker Shaft Pedestal Bolt	5+50° angle	4+50° angle
54	Rocker Cover (Stud)	6-10	4-7
55	Rocker Cover (Fixing Nut)	8-11	6-8
56	Breather Cyclone To Rocker Cover	7-10	5-7
57	Tappet Adjusting Nut	14-18	10-13
	FRONT COVER		
58	58 Front Cover To Cylinder Block	22-28	16-21
59	Front Cover To Cylinder Block /Front Cover	22-28	16-21
60	Static Idler - Timing Belt (Stud)	9-11	7-8
61	Static Idler - Timing Belt (Nut)	40-50	30-37
62	Tensioner (Timing Belt)	40-50	30-37
63	Camshaft Hub Bolt	75-85	55-63
64	Timing Pulley To Camshaft Hub	22-28	16-21
65	FIE Pump Stud	6-10	5-7
66	FIE Pump Nut	22-28	16-21
67	Abutment Bracket To FIE Pump	22-28	16-21
68	Support Bracket - FIE Pump/Cylinder Block	22-28	16-21
69	FIE Pump Access Plate To Front Cover Plate	22-28	16-21
70	Timing Pulley To FIE Pump Hub	22-28	16-21
71	TV Damper Pulley Bolt To Crankshaft	80+90°angle	60 90°angle
72	Fan Pulley To Hub	22-28	16-19
73	Fan And Viscous Unit To Hub	40-50	30-37

(continued)

TABLE 3 TORQUE TIGHTNESS FIGURES (continued)

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
74	Auto Tensioner - Aux Drive (Stud)	12-15	9-11
75	Auto Tensioner - Aux Drive (Nut)	40-50	30-37
AUXILIARY MOUNTED BRACKET RELATED			
76	Aux Mounting Bracket - Cylinder Block (Stud)	6-10	5-7
77	Aux Mounting Bracket - Cylinder Block (Bolt And Nut)	22-28	16-21
78	Water Pump To Cylinder Block	22-28	16-21
79	Water Pump To- Aux Mounting Bracket	22-28	16-21
80	Water Pump Pulley To Water Pump Hub	22-28	16-21
TURBOCHARGER			
81	Oil Drain Pipe Adaptor To Cylinder Block	36-48	27-35
82	Oil Drain Pipe To Turbocharger	22-28	16-21
83	Oil Drain Pipe Adaptor	36-40	27-30
84	Oil Feed Pipe Adaptor To Cylinder Block	22-28	16-21
85	Oil Feed Pipe To Adaptor	22-28	16-21
86	Oil Feed Pipe To Turbo (Banjo Bolt)	15-22	11-16
87	Turbocharger To Cylinder Head (Stud)	9-11	7-8
88	Turbocharger To Cylinder Head (Nut)	40-50	30-37
EEGR			
89	EEGR Delivery Tube To EGR Valve	22-28	16-21
90	EEGR Valve To Turbocharger	22-28	16-21
91	EEGR Delivery Tube To EGR Mixing Tube	22-28	16-21
92	Blanking Plate To Turbocharger	22-28	16-21
FUEL SYSTEM			
93	Fuel Lift Pump To Fuel Filter (Union)	12-17	9-12
94	Fuel Filter From Lift Pump (Banjo Bolt)	30-35	22-26
95	Fuel Filter To FIE Pump (Banjo Bolt)	30-35	22-26
96	FIE Pump From Fuel Filter (Banjo Bolt)	22-28	16-21
97	Injector Pipes To Injectors And FIE Pump	26-31	19-23
98	Spill Rails To Injectors (Banjo Bolt)	8-12	6-9
99	Boost pump to FIE pump (Banjo Bolt)	22-28	16-21
100	Spill Rail To FIE Pump (Banjo Bolt)	8-12	6-9
101	Plug In Rear Of FIE Pump (Service Only)	28-30	21-22
PAS PUMP			
102	PAS Pump To Mounting Plate	22-28	16-21
103	Mounting Plate To Auxiliary Mounting Bracket	22-28	16-21
104	PAS Pump To Pulley To Hub	22-28	16-21

(continued)

TABLE 3 TORQUE TIGHTNESS FIGURES (continued)

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
ELECTRICAL			
105	Alternator To Auxiliary Mounting Bracket	22-28	16-21
106	Starter Motor (Bolt And Nut)	40-50	30-37
107	Tachometer Electrical Connection	3.2-4.4	2.4-3.2
108	Alternator Heatshield	2.5-3.5	1.8-2.5
109	Alternator Phase Tap (Electronic EGR)	3.2-4.4	2.4-3.2
COMPRESSOR AND 24V ALTERNATOR			
110	Compressor Mounting Bracket To Front Cover	40-50	30-37
111	Compressor To Mounting Bracket (Stud)	6-10	5-7
112	Compressor To Mounting Bracket (Nut)	22-28	16-21
113	Alternator Mounting Bracket To Front Cover	40-50	30-37
114	Alternator To Mounting Bracket	80-90	59-66
115	Alternator Pulley To Hub	90-100	66-73
116	Belt Tensioner Pulley To Tensioner Arm	40-50	30-37
117	Belt Tensioner Assy To Front Cover Plate	22-28	16-21
118	Idler Pulley To Front Cover Plate	40-50	30-37
119	Compressor Belt Guard (Nut)	22-28	16-21
120	Alternator Belt Guard	22-28	16-21
GENERAL			
121	Flexible Mountings To Air Cleaner Mounting Bracket	7-10	5-7
122	Clips To Breathers And Water Hoses	2.5-3.5	1.8-2.5

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CHAPTER 3

FIVE SPEED MANUAL GEARBOX

INSPECTION STANDARD PART 2

CONTENTS

Para

- 1 General
- 2 Index to schedules
- 3 Examination of components

Table

Page

1	Examination of components	2
2	Torque tightness figures.....	3

GENERAL

- 1 This section details the examination of the gearbox components.

INDEX TO SCHEDULES

- 2 Main breakdown of the examination of the components.

Serial	Details
1	Baulk rings and gears clearance
2	Minimum permissible gap between baulk rings and gears
3	End floats
4	Reverse idler gear clearance
5	Mainshaft and layshaft end float
6	5th /Reverse hub adjustment

EXAMINATION OF COMPONENTS

3 Table 1 details the acceptable quality levels for the examination of components.

TABLE 1 EXAMINATION OF COMPONENTS

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
1	Baulk rings and gears clearance	0.38 mm (0.015 in.)		
2	Minimum permissible gap between baulk rings and gears	0.5 mm (0.02 in.)		
3	End floats			Check between 1st gear and mainshaft bearing.
	3.1 1 st gear end float	H = 0.2 mm (0.001 in.) L = 0.05 mm (0.0002 in.)		
	3.2 2 nd gear end float	H = 0.21 mm (0.008 in.) L = 0.04 mm (0.0016 in.)		
	3.3 3 rd gear end float	H = 0.21 mm (0.4 in.) L = 0.11 mm (0.8 in.)		
4	Reverse idler gear	H = 0.38 mm clearance (0.16 in.) L = 0.04 mm (0.015 in.)		
5	Mainshaft and layshaft end float	H = 0.06 mm (0.0024 in.) L = 0.01 mm (0.0004 in.)		Measure the movement on each shaft with a dial test indicator.
6	5th /Reverse hub adjustment	H = 0.055 mm (0.022 in.) L = 0.005 mm (0.002 in.)		Selectable shims.

TABLE 2 TORQUE TIGHTNESS FIGURES

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
1	Transfer gearbox selector housing to main gearbox extension casing	40-50	29-37
2	Transfer gearbox selector housing to main gearbox remote housing	22-28	16-21
3	Engine to bell housing	45-50	33-37
4	Mounting brackets to transfer gearbox	80-90	59-66
5	Rear propeller shaft	43-51	32-38
6	Front propeller shaft	43-51	32-38
7	Drain plugs	25-35	18-26
8	Filler level plugs	25-35	18-26
9	Extension housing to centre plate and main casing	22-28	16-21
10	Selector quadrant fork setscrew	22-28	16-21
11	Transfer gearbox selector housing retaining bolts	15	11
12	Gear lever shaft retaining screw	10	7
13	Remote housing, transfer gearbox selector housing and gear lever housing	25	18
14	Layshaft 5th gear nut	375	276

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CHAPTER 4

LT230T TRANSFER GEARBOX

INSPECTION STANDARD PART 2

CONTENTS

Para

- 1 General
- 2 Index to schedules
- 3 Examination of components

Table

Page

1	Examination of components	2
2	Torque tightness figures	3

GENERAL

- 1 This section details the examination of the transfer gearbox components.

INDEX TO SCHEDULES

- 2 Main breakdown of the examination of the components.

Serial	Details
1	High and low range gears end float.
2	Adjusting front differential bearing preload with the correct shim fitted.
3	Checking input gear bearing preload.
4	Centre differential gears torque to turn.

EXAMINATION OF COMPONENTS

3 Table 1 details the acceptable quality levels for the examination of components.

TABLE 1 EXAMINATION OF COMPONENTS

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
1	High and low range gears end float	H = 0.15mm (0.005 in.) L = 0.05 (0.002 in.)		
2	Adjusting front differential bearing preload with the correct shim fitted.			
	2.1 Using a torque meter.	H = 1.69 Nm (15 lbf in.) L = 0.56 Nm (5 lbf in.)		
	2.2 Load to turn	H = 4.53 kg (10 lb) L = 1.36 kg 3 lb		
3	Checking input gear bearing preload.			
	3.1 Using a torque meter.	H = 2.25 Nm (20 lbf in.) L = 0.56 Nm (5 lbf in.)		
	3.2 Load to turn	H = 9 kg (20 lbf in.) L = 2.26 kg (5 lbf in.)		
4	Centre differential gears torque to turn.			With handbrake drum fitted.
	4.1 Using a torque meter			
	4.1.1 Run in gears	Maximum 0.6 Nm (5 lbf in.)		Applied to flange nut.
	4.1.2 New gears	Maximum 2 Nm (20 lbf in.)		

(continued)

TABLE 1 EXAMINATION OF COMPONENTS (continued)

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
	4.2 Using the spring balance			
	4.2.1 Run in gears	Maximum 0.5 kg (1 lb)		
	4.2.2 New gears	Maximum 2 kg (4 lb)		

TABLE 2 TORQUE TIGHTNESS FIGURES

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
1	Transfer gearbox to main gearbox extension case	40-50	29-37
2	Transfer gearbox bottom cover	22-28	16-21
3	Front differential case half securing bolts	55-64	40-47
4	Centre differential torque to turn (old gears)	0.6	5 lbf in.
5	Centre differential torque to turn (new gears)	2	20 lbf in.
6	Front and rear differential case; halves	55-64	40-47
7	Stake nut	66-80	50-59
8	Selector fork assembly grub screw	22-28	16-21
9	Drain plug	25-35	19-26
10	Output housing to transfer box casing	40-50	29-37
11	Transfer gearbox selector housing retaining bolts	22-28	16-21
12	Differential rolling resistance	0.56-1.69	5-15 lbf in.
13	Front output housing to transfer box	22-28	16-21
14	Flange nut	146-179	108-132
15	Differential lock finger housing	22-28	16-21
16	Differential lock finger housing to transfer box	22-28	16-21
17	Input gear bearing preload	0.56-2.25	5-20 lbf in.
18	Anti-rotation plate	22-28	16-21
19	Bearing housing to transfer box casing	22-28	16-21
20	Power take-off cover	40-50	29-37
21	Side cover to front output housing	22-28	16-21
22	Transmission brake back plate	65-80	48-59
23	Transmission brake drum	22-28	16-21

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CHAPTER 7

POWER ASSISTED STEERING SYSTEM

INSPECTION STANDARD PART 2

CONTENTS

Para

- 1 General
- 2 Index to schedules
- 3 Examination of components

Table

Page

1	Examination of components.....	2
2	Torque tightness figures.....	2

GENERAL

- 1 This section details the examination of the power assisted steering components.

INDEX TO SCHEDULES

- 2 Main breakdown of the examination of the components.

Serial	Details
1	Valve and worm assembly rolling torque
2	Sector shaft adjustment
3	Rack adjuster

EXAMINATION OF COMPONENTS

3 Table 1 details the acceptable quality levels for the examination of components.

TABLE 1 EXAMINATION OF COMPONENTS

Serial (1)	Detail (2)	Acceptable Quality Level		Remarks (5)
		Level 3 (3)	Level 4 (4)	
1	Valve and worm assembly	H = 0.34 Nm rolling torque (0.32 lbf ft) L = 0.21 Nm (0.15 lbf ft)		At one and a quarter turns. To increase the figure recorded in Cat 524 Para 12.4.
2	Sector shaft adjustment	0.34 Nm (0.24 lbf ft)		
3	Rack adjuster	H = 0.34 Nm (0.24 lbf ft) L = 0.23 Nm (0.16 lbf ft)		

TABLE 2 TORQUE TIGHTNESS FIGURES

Serial (1)	Item (2)	Nm (3)	lb/ft (4)
1	Worm adjuster locknut	100	74
2	Sector shaft cover screws	75	54
3	Sector shaft adjuster locknut	60	43
4	Drop arm to steering box	176	129