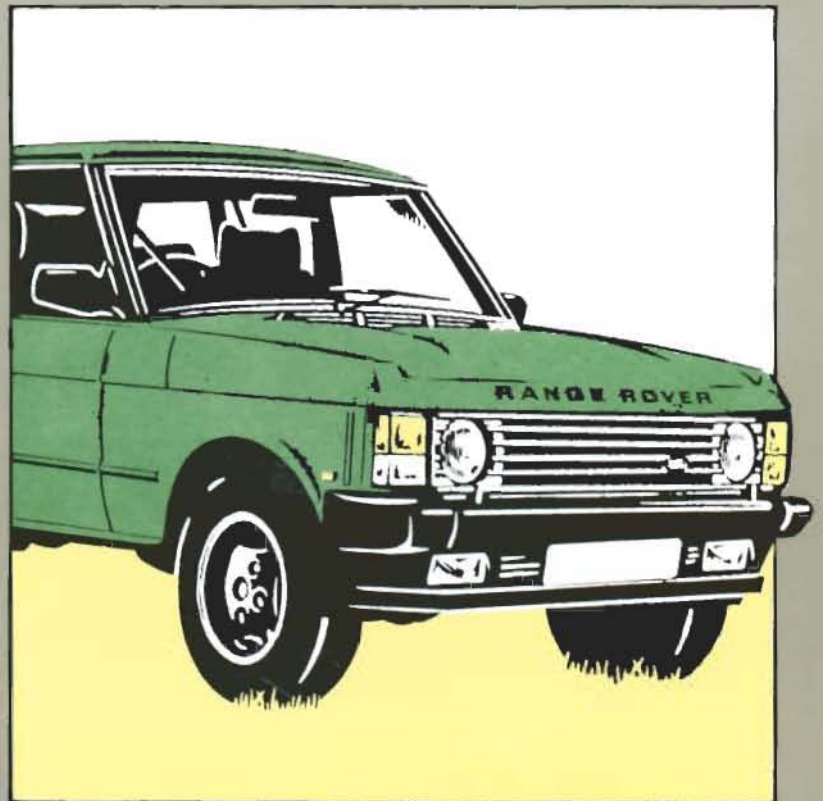


Workshop Manual

Range Rover

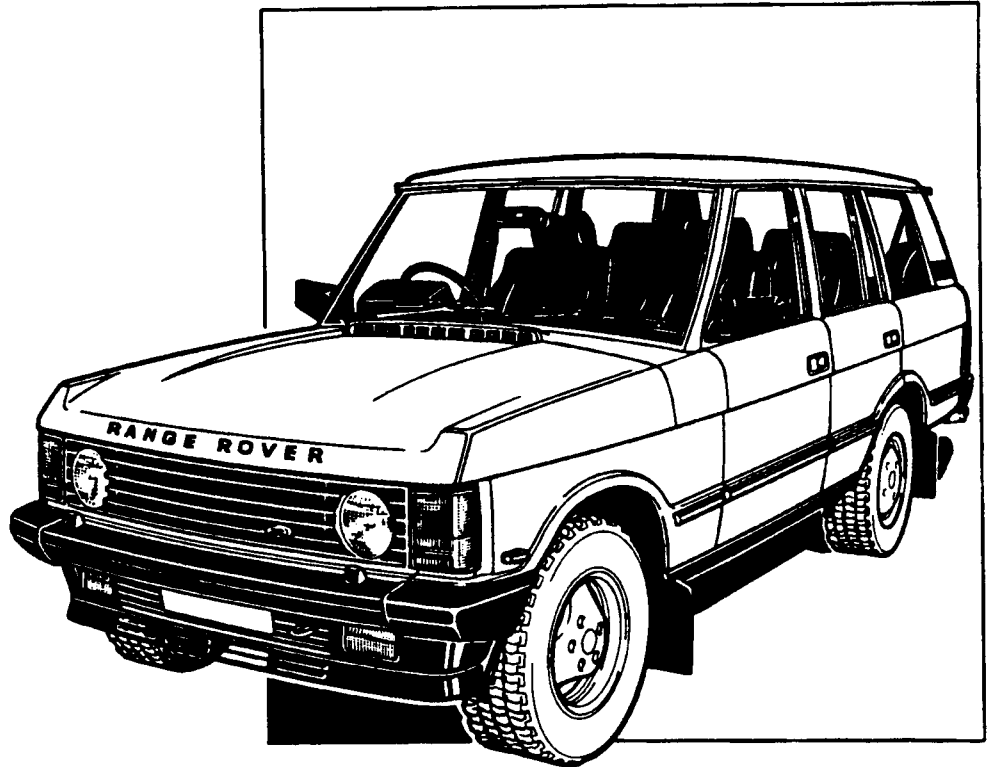


All petrol and diesel models
from 1986 to 1989





RANGE ROVER



RANGE ROVER

WORKSHOP MANUAL

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Land Rover
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Solihull
West Midlands, B92 8NW
England

INTRODUCTION

This workshop manual covers all petrol and diesel Range Rover models manufactured between 1986 and the end of the 1989 model year. It contains the basic manual LSM180WM and all supplements and bulletins issued up to the beginning of the 1990 model year. Owners of 1990 to 1994 Range Rovers should refer to our later manual LHA WM EN A02.

Supplements and bulletins appear in chronological order and each contain their own contents listing. The start of each section can be easily located by the high-lighted border. When dealing with vehicles from 1987 model year onwards, readers should refer to not only the main manual but also the relevant supplements and bulletins.

Whilst every effort is made to ensure the accuracy of the particulars in this manual, neither the Manufacturer, nor Brooklands Books Limited, or the Distributor or Dealer, by whom this manual is supplied, shall under any circumstances be held liable for any inaccuracy or the consequences thereof.

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1986 Basic Workshop Manual.

Plus the following supplements and bulletins

1987 Model Year Supplement

1988 Model Year Supplement

Alternator Bulletin

Brake Bulletin

Sunshine Roof Bulletin

Vogue SE Bulletin

1989 Model Year Supplement

Concealed Door Hinges Bulletin

2.4 & 2.5 Turbo Diesel Engine Supplement

This manual covers all 1986 to 1989
model year Range Rovers, powered
by 3.5 V8 petrol engines and
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INTRODUCTION

This Workshop Manual covers the Range Rover range of vehicles. It is primarily designed to assist skilled technicians in the efficient repair and maintenance of Range Rover vehicles.

WARNINGS and **CAUTIONS** are given throughout this manual in the following form:

WARNING: Procedures which must be followed precisely to avoid the possibility of personal injury.

CAUTION: This calls attention to procedures which must be followed to avoid damage to components.

NOTE: This calls attention to methods which make a job easier to perform.

REFERENCES

References to the left- or right-hand side in the manual are made when viewing the vehicle from the rear. With the engine and gearbox assembly removed, the water pump end of the engine is referred to as the front.

To reduce repetition, operations covered in this manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the vehicle is carried out particularly where safety related items are concerned.

DIMENSIONS

The dimensions quoted are to design engineering specification. Alternative unit equivalents, shown in brackets following the dimensions, have been converted from the original specification.

During the period of running-in from new, certain adjustments may vary from the specification figures given in this Manual. These adjustments will be re-set by the Distributor or Dealer at the After Sales Service, and thereafter should be maintained at the figures specified in the Manual.

REPAIRS AND REPLACEMENTS

When replacement parts are required it is essential that only Land Rover parts are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories:

Safety features embodied in the vehicle may be impaired if other than Land Rover parts are fitted. In certain territories, legislation prohibits the fitting of parts not to the vehicle manufacturer's specification. Torque wrench setting figures given in the Repair Operation Manual must be strictly adhered to. Locking devices, where specified, must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed. Owners purchasing accessories while travelling abroad should ensure that the accessory and its fitted location on the vehicle conform to mandatory requirements existing in their country of origin. The terms of the Owners Service Statement may be invalidated by the fitting of other than Land Rover parts.

All Land Rover parts have the full backing of the Owners Service Statement.

Land Rover Distributors and Dealers are obliged to supply only Land Rover service parts.

POISONOUS SUBSTANCES

Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should as far as possible be kept away from open wounds. These substances among others include antifreeze, brake fluid, fuel, windscreen washer additives, lubricants and various adhesives.

FUEL HANDLING PRECAUTIONS

The following information provides basic precautions which must be observed if petrol (gasoline) is to be handled safely. It also outlines the other areas of risk which must not be ignored.

This information is issued for basic guidance only, and in any case of doubt appropriate enquiries should be made of your local Fire Officer.

GENERAL

Petrol/gasoline vapour is highly flammable and in confined spaces is also very explosive and toxic.

When petrol/gasoline evaporates it produces 150 times its own volume in vapour, which when diluted with air becomes a readily ignitable mixture. The vapour is heavier than air and will always fall to the lowest level. It can readily be distributed throughout a workshop by air current, consequently, even a small spillage of petrol/gasoline is potentially very dangerous.

Continued

Always have a fire extinguisher containing FOAM CO₂ GAS, or POWDER close at hand when handling or draining fuel, or when dismantling fuel systems and in areas where fuel containers are stored.

Always disconnect the vehicle battery BEFORE carrying out dismantling or draining work on a fuel system.

Whenever petrol/gasoline is being handled, drained or stored, or when fuel systems are being dismantled all forms of ignition must be extinguished or removed, any head-lamps used must be flameproof and kept clear of spillage.

NO ONE SHOULD BE PERMITTED TO REPAIR COMPONENTS ASSOCIATED WITH PETROL/GASOLINE WITHOUT FIRST HAVING HAD SPECIALIST TRAINING.

FUEL TANK DRAINING

WARNING: PETROL/GASOLINE MUST NOT BE EXTRACTED OR DRAINED FROM ANY VEHICLE WHILST IT IS STANDING OVER A PIT.

Draining or extracting petrol/gasoline from vehicle fuel tank must be carried out in a well ventilated area.

The receptacle used to contain the petrol/gasoline must be more than adequate for the full amount of fuel to be extracted or drained. The receptacle should be clearly marked with its contents, and placed in a safe storage area which meets the requirements of local authority regulations.

WHEN PETROL/GASOLINE HAS BEEN EXTRACTED OR DRAINED FROM A FUEL TANK THE PRECAUTIONS GOVERNING NAKED LIGHTS AND IGNITION SOURCES SHOULD BE MAINTAINED.

FUEL TANK REMOVAL

On vehicles where the fuel line is secured to the fuel tank outlet by a spring steel clip, it is recommended that such clips are released before the fuel line is disconnected or the fuel tank unit is removed. This procedure will avoid the possibility of residual petrol fumes in the fuel tank being ignited when the clips are released.

As an added precaution fuel tanks should have a PETROL/GASOLINE VAPOUR warning label attached to them as soon as they are removed from the vehicle.

FUEL TANK REPAIR

Under no circumstances should a repair to any tank involving heat treatment be carried out without first rendering the tank SAFE, by using one of the following methods:

STEAMING: With the filler cap and tank unit removed, empty the tank. Steam the tank for at least two hours with low pressure steam. Position the tank so that condensation can drain away freely, ensuring that any sediment and sludge not volatilised by the steam, is washed out during the steaming process.

BOILING: With the filler cap and tank unit removed, empty the tank. Immerse the tank completely in boiling water containing an effective alkaline degreasing agent or a detergent, with the water filling and also surrounding the tank for at least two hours.

After steaming or boiling a signed and dated label to this effect should be attached to the tank.

SPECIFICATION

Purchasers are advised that the specification details set out in this Manual apply to a range of vehicles and not to any one. For the specification of a particular vehicle, purchasers should consult their Distributor or Dealer.

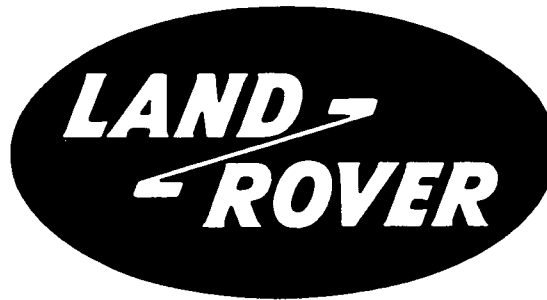
The Manufacturers reserve the right to vary their specifications with or without notice, and at such times and in such manner as they think fit. Major as well as minor changes may be involved in accordance with the Manufacturer's policy of constant product improvement.

Whilst every effort is made to ensure the accuracy of the particulars contained in this Manual, neither the Manufacturer nor the Distributor or Dealer, by whom this Manual is supplied, shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

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Special Service Tools

The use of approved special service tools is important. They are essential if service operations are to be carried out efficiently, and safely. The amount of time which they save can be considerable.

Every special tool is designed with the close co-operation of Land Rover Ltd., and no tool is put into production which has not been tested and approved by us. New tools are only introduced where an operation cannot be satisfactorily carried out using existing tools or standard equipment. The user is therefore assured that the tool is necessary and that it will perform accurately, efficiently and safely.

Special tools bulletins will be issued periodically giving details of new tools as they are introduced.

All orders and enquiries from the United Kingdom should be sent direct to V. L. Churchill. Overseas orders should be placed with the local V. L. Churchill distributor, where one exists. Countries where there is no distributor may order direct from V. L. Churchill Limited.

The tools recommended in this Repair Operation Manual are listed in a multi-language, illustrated catalogue obtainable from Messrs. V. L. Churchill at the above address under publication number 2217/2/84 or from Land Rover Ltd., under part number LSM0052TC from the following address: Land Rover Limited, Service Department, Lode Lane, Solihull, West Midlands, England B92 8NW.

ABBREVIATIONS AND SYMBOLS USED IN THIS MANUAL

Across flats (bolt size)	AF	Midget edison screw	MES
After bottom dead centre.....	ABDC	Millimetre	mm
After top dead centre	ATDC	Miles per gallon	mpg
Alternating current	a.c.	Miles per hour	mph
Ampere	amp	Minimum.....	min
Ampere-hour	amp hr	minute (angle)	'
Atmospheres.....	Atm	Minus (of tolerance)	-
Before bottom dead centre.....	BBDC	Negative (electrical).....	-
Before top dead centre	BTDC	Number	No.
Bottom dead centre.....	BDC	Ohms	ohm
Brake mean effective pressure	BMEP	Ounces (force)	ozf
Brake horse power	bhp	Ounces (mass)	oz
British Standards	BS	Ounce inch (torque).....	ozf.in.
Carbon monoxide	CO	Outside diameter	o.dia.
Centimetre.....	cm	Paragraphs	para.
Centigrade (Celsius)	C	Part number.....	Part No.
Cubic centimetre	cm ³	Percentage.....	%
Cubic inch.....	in ³	Pints.....	pt
Degree (angle)	deg or °	Pints (US).....	US pt
Degree (temperature).....	deg or °	Plus (tolerance)	+
Diameter.....	dia.	Positive (electrical).....	+
Direct current	d.c.	Pound (force).....	lbf
Fahrenheit	F	Pounds feet (torque)	lbf.ft.
Feet.....	ft	Pounds inches (torque)	lbf.in.
Feet per minute.....	ft/min	Pound (mass).....	lb
Fifth.....	5th	Pounds per square inch	lb/in ²
Figure (illustration).....	Fig.	Radius	r
First	1st	Rate (frequency)	c/min
Fourth.....	4th	Ratio	:
Gramme (force).....	gf	Reference.....	ref.
Gramme (mass).....	g	Revolution per minute	rev/min
Gallons.....	gal	Right-hand	RH
Gallons (US)	US gal	Right-hand steering.....	RHStg
High compression	h.c.	Second (angle).....	"
High tension (electrical).....	H.T.	Second (numerical order)	2nd
Hundredweight	cwt	Single carburetter	SC
Independent front suspension	i.f.s.	Specific gravity	sp.gr.
Internal diameter	i.dia.	Square centimetres	cm ²
Inches of mercury	in.Hg	Square inches.....	in ²
Inches	in	Standard.....	std.
Kilogramme (force).....	kgf	Standard wire gauge	s.w.g.
Kilogramme (mass).....	kg	Synchroniser/synchromesh.....	synchro.
Kilogramme centimetre (torque)	kgf.cm	Third.....	3rd
Kilogramme per square centimetre	kg/cm ²	Top dead centre	TDC
Kilogramme metres (torque).....	kgf.m	Twin carburetters	TC
Kilometres	km	United Kingdom	UK
Kilometres per hour	km/h	Vehicle Identification Number	VIN
Kilovolts	kV	Volts	V
King pin inclination	k.p.i.	Watts.....	W
Left-hand steering	LHStg	SCREW THREADS	
Left-hand thread	LHThd	American Standard Taper Pipe.....	NPTF
Litres	litre	British Association	BA
Low compression	l.c.	British Standard Fine	BSF
Low tension.....	l.t.	British Standard Pipe	BSP
Maximum	max.	British Standard Whitworth.....	Whit.
Metre.....	m	Unified Coarse.....	UNC
Microfarad	mfd	Unified Fine.....	UNF

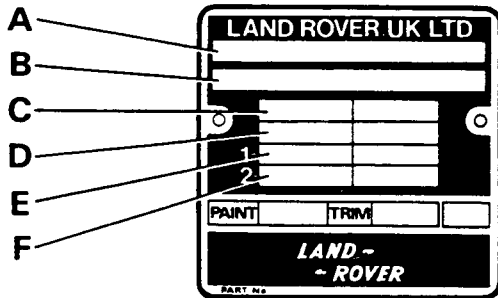
VEHICLE IDENTIFICATION NUMBER (VIN)

The Vehicle Identification Number and the recommended maximum vehicle weights are stamped on a plate located under the bonnet riveted to the top of the front grille at the front of the engine compartment.

The number is also stamped on the right side of the chassis forward of the spring mounting turret.

Key to Vehicle Identification Number Plate (UK, Australia, R.O.W., Europe)

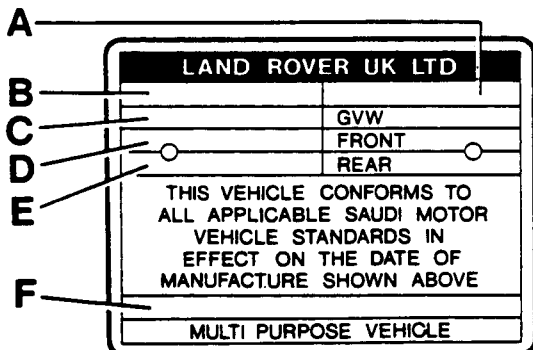
- A. Type approval (UK only)
- B. VIN (minimum of 17 digits)
- C. Maximum permitted laden weight for vehicle
- D. Maximum vehicle and trailer weight
- E. Maximum road weight—front axle
- F. Maximum road weight—rear axle



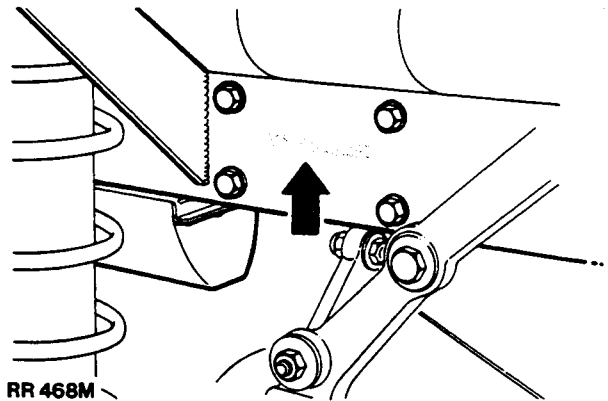
RR 381

Key to Vehicle Identification Number (Saudi Arabia)

- A. Year of manufacture
- B. Month of manufacture
- C. Maximum vehicle weight
- D. Maximum road weight—front axle
- E. Maximum road weight—rear axle
- F. VIN (minimum of 17 digits)



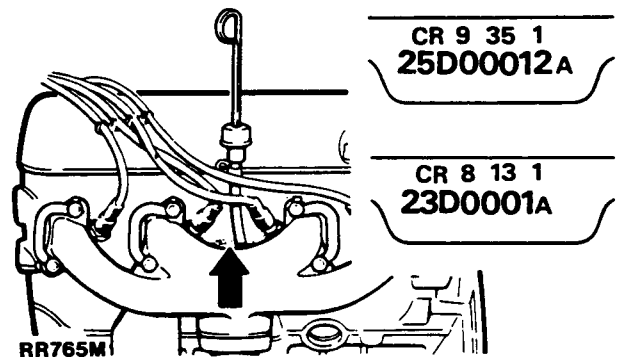
RR 466M



ENGINE SERIAL NUMBER—V8 ENGINE

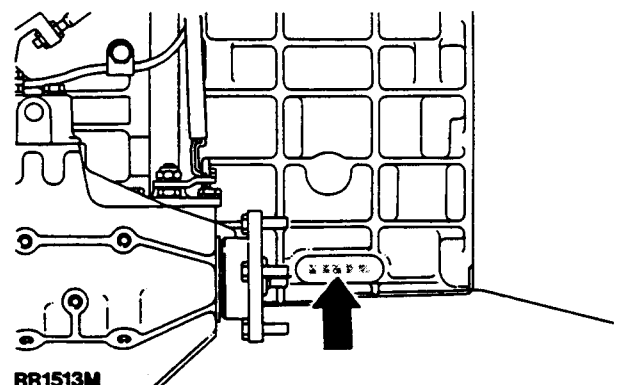
The V8 engine serial number is stamped on a cast pad on the cylinder block between numbers 3 and 5 cylinders.

NOTE: The appropriate engine compression ratio is stamped above the serial number.



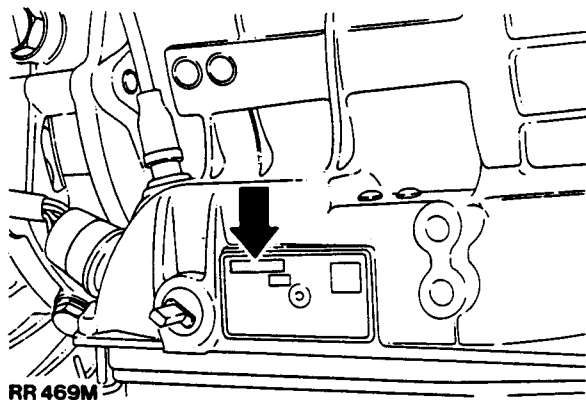
MAIN GEARBOX LT77—5 SPEED

The serial number is stamped on a cast pad on the bottom right-hand side of the gearbox.

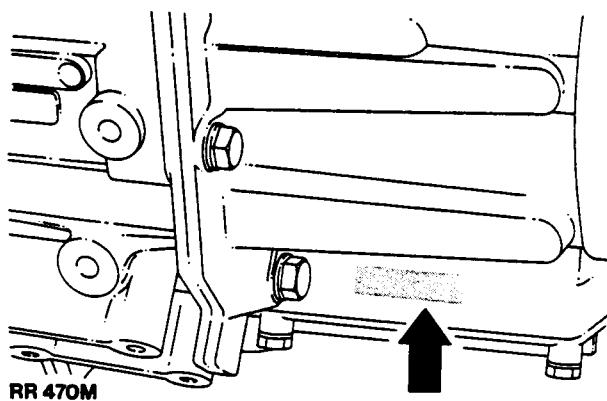


AUTOMATIC GEARBOX ZF4HP22

The serial number is stamped on a plate riveted to the bottom left-hand side of the gearbox casing.

**TRANSFER GEARBOX LT230T**

The serial number is stamped on the left-hand side of the gearbox casing below the mainshaft rear bearing housing adjacent to the bottom cover.

**FRONT AXLE**

The serial number is stamped on top of the left-hand axle tube.

REAR AXLE

The serial number is stamped on the left-hand rear axle tube.