



DISCOVERY



J5243M

WORKSHOP MANUAL

SJR900ENWM



DISCOVERY



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INTRODUCTION

This Workshop Manual is designed to assist skilled technicians in the efficient repair and maintenance of Land Rover Discovery vehicles.

Individuals who undertake their own repairs should have some skill and training, and limit repairs to components which could not affect the safety of the vehicle or its passengers. Any repairs required to safety critical items such as steering, brakes, or suspension should be carried out by a Land Rover Dealer. Repairs to such items should NEVER be attempted by untrained individuals.

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, some 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.

REPAIRS AND REPLACEMENTS

When replacement parts are required it is essential that genuine 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 values given in the Workshop 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 replaced with a new one. Certain fasteners must not be re-used. These fasteners are specified in the Workshop Manual.

POISONOUS SUBSTANCES

Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should be kept away from open wounds. These substances among others include anti-freeze, brake fluid, fuel, windscreen washer additives, air conditioning refrigerant, lubricants and various adhesives.

SYNTHETIC RUBBER

Many 'O' ring seals, flexible pipes and other similar items which appear to be natural rubber, are in fact made from synthetic materials called Fluoroelastomers. Under normal operating conditions this material is safe and does not present a health hazard. However, if the material is damaged by fire or excessive heating, it can breakdown and produce highly corrosive Hydrofluric acid which can cause serious burns on contact with the skin. Should the material be in a burnt or over heated condition, handle only with seamless industrial gloves. Decontaminate and dispose of the gloves immediately after use. If skin contact does occur, remove any contaminated clothing immediately and obtain medical assistance without delay. In the meantime, wash the affected area with copious amounts of cold water or lime water for fifteen to sixty minutes.

ASBESTOS

WARNING: Some components on the vehicle, such as gaskets and friction surfaces (brake linings, clutch discs) may contain asbestos. Inhaling asbestos dust is dangerous to your health and the following essential precautions must be observed:

1. Work out of doors or in a well ventilated area and wear a protective mask.
2. Dust found on the vehicle or produced during work on the vehicle should be removed by vacuuming and not by blowing.
3. Dust waste should be dampened, placed in a sealed container and marked to ensure safe disposal.
4. If any cutting, drilling etc., is attempted on materials containing asbestos the item should be dampened and only hand tools or low speed power tools used.

FUEL HANDLING PRECAUTIONS

The following information provides basic precautions which must be observed if fuel 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 station.

Fuel vapour is highly flammable and in confined spaces is also very explosive and toxic. When fuel 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 fuel is very dangerous.

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

WARNING: It is imperative that the battery is not disconnected during fuel system repairs as arcing at the battery terminal could ignite fuel vapour in the atmosphere. Always disconnect the vehicle battery BEFORE carrying out work on a fuel system. Whenever fuel is being handled, transferred 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 FUEL WITHOUT FIRST HAVING HAD SPECIALIST TRAINING.

HOT FUEL HANDLING

WARNING: Before commencing any operation requiring fuel to be drained from the fuel tank, the system must be vented by removing the filler cap and the engine allowed to cool.

FUEL TRANSFER

WARNING: Fuel must not be extracted or drained from any vehicle while it is standing over a pit.

The transfer of fuel from the vehicle fuel tank must be carried out in a well ventilated area. An approved transfer tank must be used according to the transfer tank manufacturer's instructions and local regulations, including attention to grounding of tanks.

FUEL TANK REMOVAL

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 a spark igniting residual fumes present in the fuel tank while the clips are being released. As an added precaution fuel tanks should have a **FUEL 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 be attempted.

RECOMMENDED SEALANTS

A number of branded products are recommended in this manual for use during maintenance and repair work. These items include: **HYLOMAR GASKET AND JOINTING COMPOUND** and **HYLOSIL RTV SILICON COMPOUND**. They should be available locally from garage equipment suppliers. If there is any problem obtaining supplies, contact one of the following companies for advice and the address of the nearest stockist.

Marston Lubricants Limited

Hylo House
Cale Lane, New Springs
Wigan, WN2 1JR

Tel: 0942 824242
Fax: 0942 826653
Telex: 67230

Northern Adhesives Limited

Prudhoe
Northumberland
NE42 6NP

Tel: 0661 32014
Fax: 0661 35839

USED ENGINE OIL HANDLING PRECAUTIONS

Prolonged and repeated contact with engine or motor oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities should be provided.

Health Protection Precautions

1. Avoid prolonged and repeated contact with oils, particularly used engine oils.
2. Wear protective clothing, including impervious gloves where applicable.
3. Do not put oily rags in pockets.
4. Avoid contaminating clothes, particularly underwear, with oil.
5. Overalls must be cleaned regularly. Discard unwashable clothing and oil impregnated footwear.
6. First aid treatment must be obtained immediately for open cuts and wounds.
7. Use barrier creams, before each work period, to help the removal of oil from the skin.
8. Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
9. Do not use petrol, kerosene, diesel fuel, gas oil, thinners or solvents for washing the skin.
10. If skin disorders develop, obtain medical advice.
11. Where practicable, degrease components prior to handling.
12. Where there is a risk of eye contact, eye protection should be worn, for example, goggles or face shields; in addition an eye wash facility should be provided.

DISPOSING OF USED OILS AND FLUIDS

Environmental protection precaution

It is illegal to pour used oil and other fluids onto the ground, down sewers or drains, or into waterways.

Dispose of used oil through authorised waste disposal contractors.

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 contact their 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.

While every effort is made to ensure the accuracy of the particulars contained in this Manual, neither the Manufacturer 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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ACCESSORIES AND CONVERSIONS

Land Rover vehicles are designed and constructed for a variety of uses but no alterations or conversions should be carried out to any vehicle produced by Land Rover which could affect the safety of the vehicle or its passengers.

Land Rover has tested and approved a large number of accessories and conversions, suitable for the Discovery. Before fitting any accessory or commencing any conversion work to any Land Rover vehicle, CHECK that the accessory or conversion is approved by Land Rover.

WARNING: DO NOT FIT unapproved accessories or conversions, as they could affect the safety of the vehicle. Land Rover will not accept any liability for death, personal injury or damage to property which may occur as a direct result of fitment of non-approved accessories or the carrying out of non-approved conversions to Land Rover vehicles.

ABBREVIATIONS AND SYMBOLS

Across flats (bolt size)	AF	Low tension	l.t.
After bottom dead centre	ABDC	Maximum	max.
After top dead centre	ATDC	Metre	m
Alternating current	a.c.	Millilitre	ml
Ampere	amp	Millimetre	mm
Ampere hour	amp hr	Miles per gallon	mpg
Before bottom dead centre	BBDC	Miles per hour	mph
Before top dead centre	BTDC	Minute (angle)	'
Bottom dead centre	BDC	Minus (of tolerance)	-
Brake horse power	bhp	Negative (electrical)	-
British Standards	BS	Newton meters (torque)	Nm
Carbon monoxide	CO	Number	No.
Centimetre	cm	Ohms	ohm
Centigrade (Celsius)	C	Ounces (force)	ozf
Cubic centimetre	cm ³	Ounces (mass)	oz
Cubic inch	in ³	Ounce inch (torque)	ozf.in.
Degree (angle)	deg or °	Outside diameter	O.D.
Degree (temperature)	deg or °	Part number	Part No.
Diameter	dia.	Percentage	%
Direct current	d.c.	Pints	pt
Electronic Control Unit	E.C.U.	Pints (US)	US pt
Electronic Fuel Injection	E.F.I.	Plus (tolerance)	+
Fahrenheit	F	Positive (electrical)	+
Feet	ft	Pound (force)	lbf
Feet per minute	ft/min	Pounds inch (torque)	in.lbf.
Fifth	5th	Pound (mass)	lb
First	1st	Pounds per square inch	P.S.I.
Fluid ounce	fl oz	Ratio	:
Foot pounds (torque)	ft lb	Reference	ref.
Fourth	4th	Revolution per minute	rev/min
Gramme (force)	gf	Right-hand	RH
Gramme (mass)	g	Second (angle)	"
Gallons	gal	Second (numerical order)	2nd
Gallons (US)	US gal	Specific gravity	sp.gr.
High tension (electrical)	H.T.	Square centimetres	cm ²
Internal diameter	I.D.	Square inches	in ²
Inches of mercury	in. Hg	Standard wire gauge	s.w.g.
Inches	in	Synchroniser/Synchromesh	synchro.
Kilogramme (force)	kgf	Third	3rd
Kilogramme (mass.)	kg	Top dead centre	TDC
Kilogramme centimetre (torque)	kgf.cm	United Kingdom	UK
Kilogramme per square millimetre	kgf/mm ²	Vehicle Identification Number	VIN
Kilogramme per square centimetre	kgf/cm ²	Volts	V
Kilogramme metres (torque)	kgf.m	Watts	W
Kilometres	km		
Kilometres per hour	km/h	SCREW THREADS	
Kilovolts	kV	American Standard Taper Pipe	NPTF
Left-hand steering	LHStg	British Standard Pipe	BSP
Left-hand thread	LHThd	Unified Coarse	UNC
Litres	litre	Unified Fine	UNF



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. Where special tools are specified, **only these tools should be used to avoid the possibility of personal injury or damage to the components.** Also the amount of time which they save can be considerable.

Every special tool is designed with the close co-operation of Land Rover, and no tools 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.

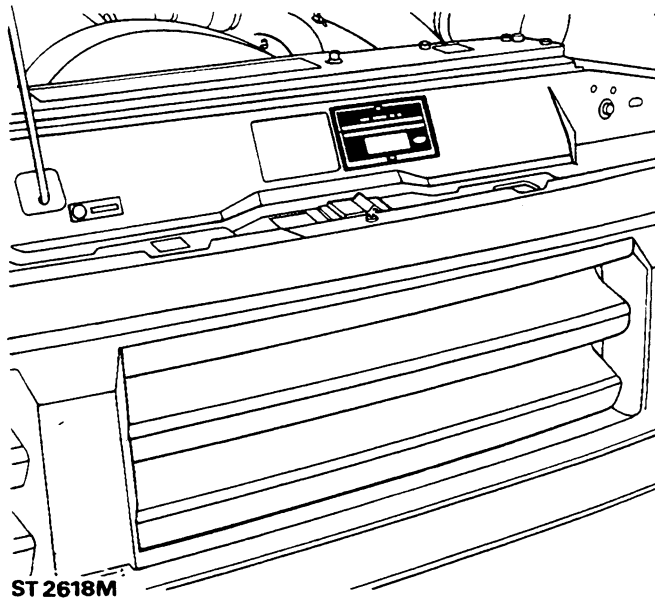
All orders and enquiries from the United Kingdom should be sent direct to V. L. Churchill. Overseas orders should be placed with the local V. L. Churchill distributor, where one exists. Countries where there is no distributor may order direct from V. L. Churchill Limited, PO Box 3, Daventry, Northants, England, NN11 4NF.

The tools recommended in this Workshop Manual are listed in a multi-language illustrated catalogue obtainable from Messrs. V. L. Churchill at the above address under publication number VLC 2372/1/87 or from Land Rover Merchandising Service, quoting publication number SMR 681 MI, PO Box 534, Erdington, Birmingham, B24 0Q5.

LOCATION OF VEHICLE IDENTIFICATION & UNIT NUMBERS

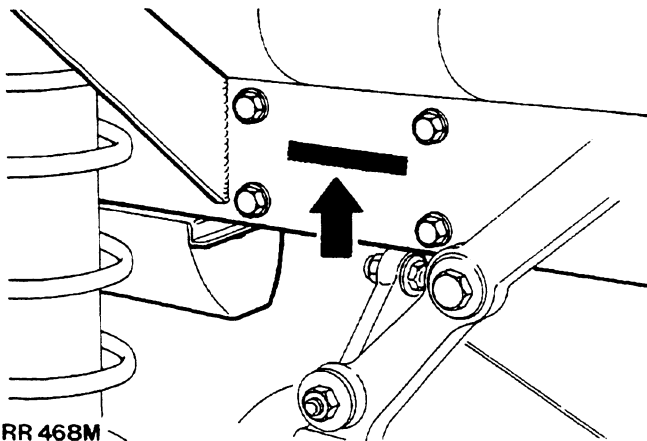
VEHICLE IDENTIFICATION NUMBER (VIN)

The Vehicle Identification Number and the recommended maximum vehicle weights are stamped on a plate riveted to the bonnet lid closing panel adjacent to the bonnet lock



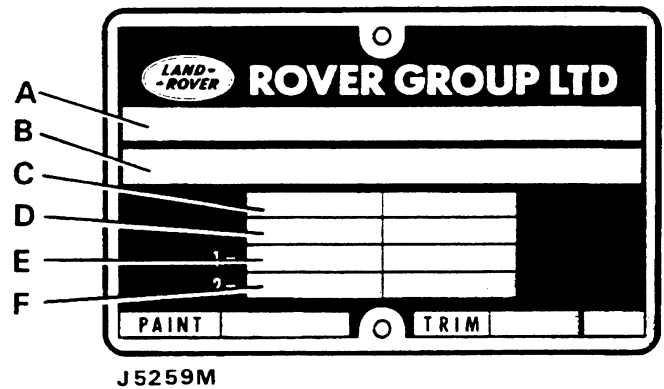
ST 2618M

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



RR 468M

Always quote this number when writing to Land Rover.



J5259M

Key to Vehicle Identification Number Plate

- A. Type approval
- 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

The Vehicle Identification Number identifies the manufacturer, model range, wheel base, body type, engine, steering, transmission, model name and place of manufacture. The following example shows the coding process.

SAL World manufacturer identifier

- LJ Discovery
- G Class 100 inch
- B 2 door
- F 200Tdi or V V8 Petrol
- 8 5 speed LHD or 7 5 speed RHD
- G 1990 MY
- A Solihull site

ENGINE SERIAL NUMBER - 200Tdi ENGINE

The 200Tdi engine number is stamped on the cylinder block on the right hand side of the engine above the camshaft front cover plate.

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.

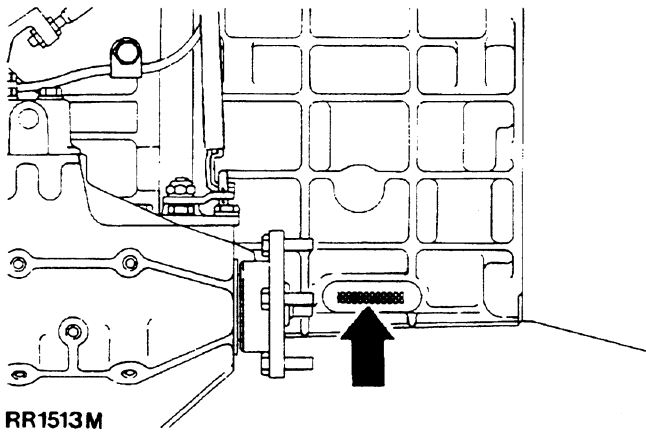
NOTE: The appropriate engine compression ratio is stamped above the serial number.

ENGINE SERIAL NUMBER Mpi ENGINE

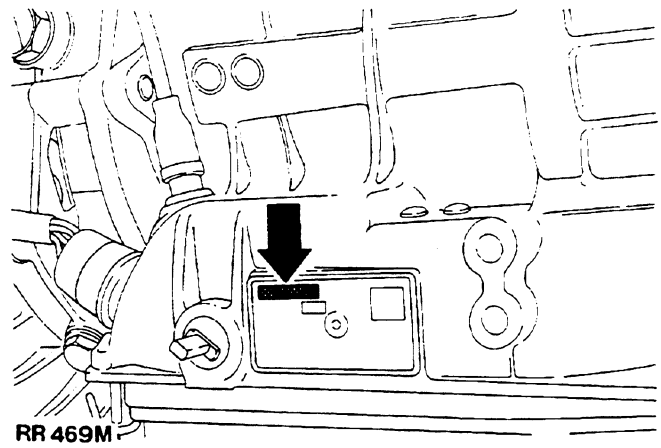
Stamped on the R.H. face of the cylinder block adjacent to the gearbox.

MAIN GEARBOX LT77 - 5 SPEED

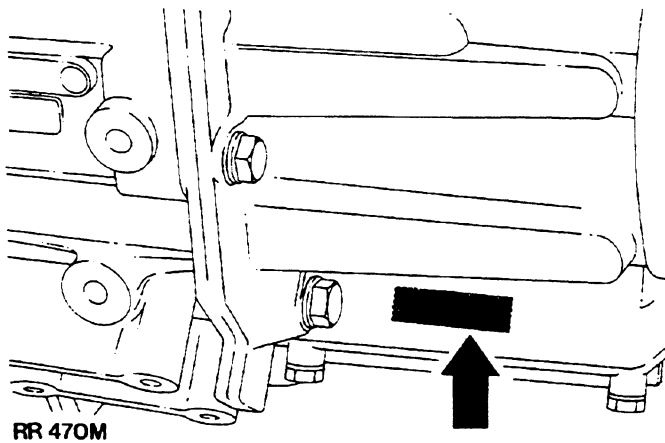
The serial number is stamped on a cast pad on the bottom right hand side of the gearbox.

**AUTOMATIC GEARBOX**

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

**TRANSFER GEARBOX LT230**

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 AND REAR AXLES**

Serial number is stamped on top of the left hand axle tube.