

OWNER'S REPAIR GUIDE

MITSUBISHI

SPACE RUNNER AND SPACE WAGON

1.8 and 2.0 LITRE PETROL ENGINES

2.0 LITRE TURBO DIESEL ENGINE

FROM 1991

COVERING:

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**Published by
Peter Russek Publications Ltd.
Little Stone House, High Street,
Marlow, Bucks.
Tel.: High Wycombe (01494) 440829**

ISBN NO. 1 - 898780 - 36-6

**WITH FAULT FINDING SECTION
AT END OF MANUAL**

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No liability can be accepted for any inaccuracies or omissions in this workshop manual, or for personal injuries, arising from the use of this manual, although every possible care has been taken to make it as complete and accurate as possible. Every care has also been taken to prevent personal injury or damage to equipment when working on the vehicle. We have tried to cover all models produced to the day of publication, but are unable to refer to all modifications and changes for certain markets or up-dating of models.

PREFACE

Small though this Workshop Manual is in size, it lacks no detail in covering the whole of the servicing and repair of the Mitsubishi Space Wagon and Space Runner, introduced for model year 1991. Only the Space Wagon is available with petrol or diesel engine. 16 valve petrol engines are used throughout the vehicle range, an 1834 c.c. engine in the Space Runner and a 1997 c.c. in the Space Wagon. Both engines belong to the "G" series of engines. A turbo diesel engine can be fitted to the Space Wagon (2.0 litres), replacing the 1.8 litre engine used on earlier models. Brief, easy-to-follow instructions are given, free from all necessary complication and repetition, yet containing all the required technical detail and information, and many diagrams and illustrations.

Compiled and illustrated by experts, this manual provides a concise source of helpful information, all of which has been cross-checked for accuracy to the manufacturer's official service and repair procedures, but many instructions have derived from actual practice to facilitate your work. Where special tools are required, these are identified in the text if absolutely necessary and we do not hesitate to advise you if we feel that the operation cannot be properly undertaken without the use of such tools.

The readers own judgement must ultimately decide just what work he will feel able to undertake, but there is no doubt, that with this manual to assist him, there will be many more occasions where the delay, inconvenience and the cost of having the car off the road can be avoided or minimised.

The manual is called "Owner's Repair Guide" with the aim that it should be kept in the vehicle whilst you are travelling. Many garage mechanics themselves use these publications in their work and if you have the manual with you in the car you will have an invaluable source of reference which will quickly repay its modest initial cost.

A fault finding (trouble shooting) section is included at the end of the manual and all items listed are taken from actual experience, together with the necessary remedies to correct faults and malfunctioning of certain parts.

0. GENERAL INFORMATION

0.0. Introduction

The models covered in this publication is the Mitsubishi Space Wagon and the Space Runner, fitted with the engines specified on the previous page. A diesel engine with turbo charger is used in the other version.

The Space Runner/Wagon is a conventional front-wheel drive vehicle, with a transversely fitted engine.

All engine types are fitted with an overhead camshaft, driven by a toothed belt from the crankshaft. 16 valves are used in the petrol engines. The oil pump is fitted to the front housing and is driven from the engine timing belt. The cylinder head is made of aluminium alloy and has semi-spherical combustion chambers. Solid-skirt pistons of alloy material and a five-bearing crankshaft are fitted.

The transmission is fitted below the engine. Either a five-speed transmission or a three-speed automatic transmission can be fitted to both variants.

The front suspension consists of McPherson struts with integral hydraulic shock absorbers, coil springs, wishbone-type lower suspension arms and a stabiliser bar, also known as anti-roll bar. Coil springs and hydraulic shock absorbers are also used for the rear suspension. The semi-trailing rear suspension arms are attached at their inner ends to crossmember.

A power-assisted rack and pinion steering is fitted as standard fitment. Disc brakes at the front and self-adjusting drum brakes at the rear, together with a dual-line braking system and a brake servo make up the brake system. Disc brakes are also used on the rear wheels, if ABS is fitted.

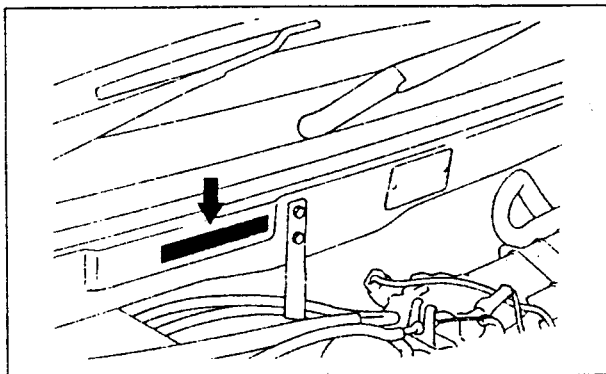


Fig. 0.1. — The location of the chassis number.

0.1 Vehicle Identification

A vehicle can be identified by the following type identification plates:

Chassis Number: The chassis number is stamped into the centre of the engine com-

partment bulk head, as shown in Fig. 0.1. Vehicle model, engine type, transmission type and model year are contained in this type identification plate. The letter "N" in the centre of the number refers to a space Runner or Space Wagon. "N11" is the identification for a Spacer runner with the 1.8 litre engine. "N33" (petrol) or "N38" (diesel) is used for the Space Wagon. The letter "W" (wagon) is next, followed by the code letter for the model year (for example "N" for 1992). The type of transmission fitted is shown after the letter "A" (Europe, R.H.D.). Either the letter "N" (five-speed transmission) or "R" (automatic transmission) can be found at this position. The following numbers are the actual chassis number.

Vehicle Information Code Plate: This plate can be found at the position shown in Fig. 0.2. The plate shows the model code, engine type, transmission type and the body colour code.

Engine Number: The engine number of a 1.8 litre petrol engine can be found near the water hose connection, as shown in Fig. 0.3 on the L.H. side. A similar location is used on the diesel engine, i.e. on the narrow side of the cylinder block, just below the cylinder head rocker cover. The number of the 2.0 litre petrol engine is located in the cylinder block face, facing the front of the vehicle, shown on the R.H. side of Fig. 0.3.

The serial number always commenced with the engine type.

Further identification numbers

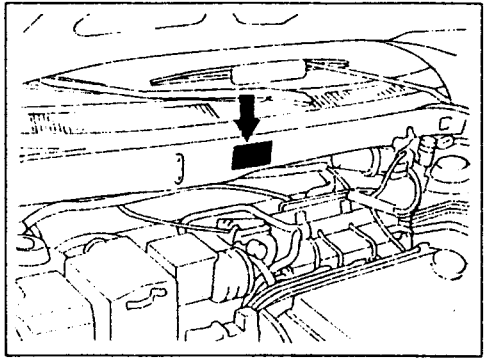


Fig. 0.2. The location of the vehicle information code plate.

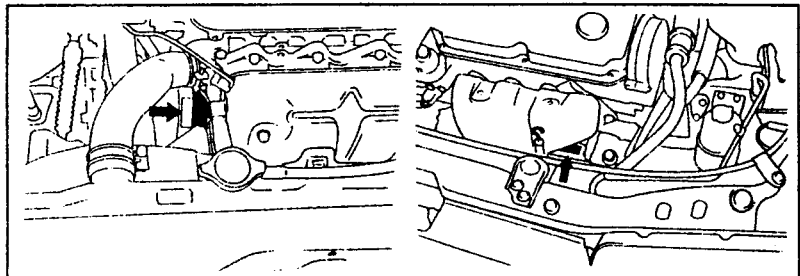


Fig. 0.3 — The location of the engine number on petrol engines. On the L.H. side in the case of the 1.8 litre engine, on the right in the case of a 2.0 litre engine.

are stamped into the upper part of the transmission. The transmission serial number returns from 99999 to 00101 and the letter changes in their alphabetical order.

These numbers and codes are important when ordering replacement parts and should always be quoted. Your Dealer will only be in a position to supply you with the correct part if he is able to identify your particular model.

NOTE: If parts are required, always supply the model code of the engine, the model year and the engine type and number. This will speed-up the processing of your parts order.

0.2. Dimensions and Weights

Overall Length:	
Space Runner:	4290 mm (170.75 in.)
Space Wagon:	4515 mm (179.3 in.)
Overall Width — All Models:	1695 mm (66.7 in.)

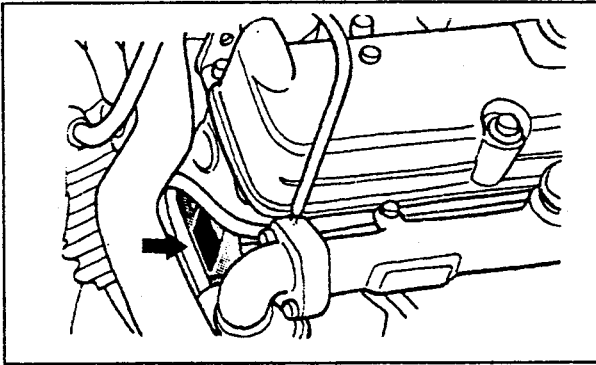


Fig. 0.4. — The location of the engine number of the diesel engine.

Overall Height — Space Runner:	
Without roof rail:	1625 mm (64.0 in.)
With roof rail:	1640 mm (64.6 in.)

Overall Height — Space Wagon:	
Without roof rail:	1580 mm (62.2 in.)
With roof rail:	1615 mm (63.6 in.)

Wheelbase:	
Space Runner:	2520 mm (99.2 in.)
Space Wagon:	2720 mm (107.1 in.)

Front Track:	1460 mm (57.5 in.)
Rear Track:	1460 mm (57.5 in.)
Ground clearance:	120 mm (4.7 in.) — 160 mm (6.3 in.) from May 1993

Weights (typical)

Kerb weight (weights have been changed during May 1993):

Space Runner, depending on version:	1279 to 1379 kg (2820 to 3040 lbs.) max.
Space Wagon — Petrol model, depending on version:	1353 to 1393 kg (2983 to 3071 lbs.)
Space Wagon — Diesel model:	1330 - 1431 kg (2932 - 3155 lbs.)

Max. gross vehicle weight:

Space Runner:	1720 kg (3792 lbs.)
Space Wagon — Petrol model:	1980 kg (4365 lbs.)
Space Wagon — Diesel model:	1960 kg (4321 lbs.)

0.3. Capacities

Fuel Tank:

Space Runner:	55 litres (12.1 Imp. galls.)
Space Wagon:	60 litres (13.2 Imp. galls.)

Cooling system:

Petrol engines:	6.0 litre (10.7 Imp. pts.)
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Diesel engine:	7.5 litres (13.2 Imp. pts.)
Oil cooler for automatic transmission:	0.5 litre (approx. 1 pint)
Engine oil, incl. oil filter and oil cooler:	
1.8 litre petrol engine:	3.8 litres (6.6 Imp. pts.)
2.0 litre petrol engine:	4.3 litres (7.6 Imp. pts.)
Diesel engine:	5.1 litres (9.0 Imp. pts.)
Manual transmission:	
Petrol engine:	1.8 litres (3.2 Imp. pts.)
Diesel model:	2.3 litres (4.1 Imp. pts.)
Automatic transmission:	6.1 litres (10.8 Imp. pts.)
Power assisted steering:	950 c.c. (1.6 Imp. pts.)

0.4. General Servicing Notes

The servicing and overhaul instructions in this Workshop Manual are laid out in an easy-to-follow step-by-step fashion and no difficulty should be encountered if the text and diagrams are followed carefully and methodically. The "Technical Data" sections form an important part of the repair procedures and should always be referred to during work on the vehicle.

In order that we can include as much data as possible, you will find that we do not generally repeat in the text the values already given under the technical data headings. Again, to make the best use of the space available, we do not repeat at each operation the more obvious steps necessary — we feel it to be far more helpful to concentrate on the difficult or awkward procedures in greater detail. However, we summarise below a few of the more important procedures and draw your attention to various points of general interest that apply to all operations.

Always use the torque settings given in the end of most of the sections.

Bolts and nuts should be assembled in a clean and very lightly oiled condition and faces and threads should always be inspected to make sure that they are free from damage, burrs or scoring. DO NOT degrease bolts or nuts.

All joint washers, gaskets, tabs and lock washers, split pins and "O" rings must be replaced on assembly. Oil seals will, in all cases, also need to be replaced, if the shaft and seal have been separated. Always lubricate the lip of the seal before assembly and take care that the seal lip is facing the correct direction.

References to the left-hand and right-hand sides are always to be taken as if the observer is at the rear of the car, facing forwards, unless otherwise stated.

Always make sure that the vehicle is adequately supported, and on firm ground, before commencing any work on the underside of the car. A small jack or a make shift prop can be highly dangerous and proper axle stands are an essential requirement for your own safety.

Dirt, grease and mineral oil will rapidly destroy the seals of the hydraulic system and even the smallest amounts must be prevented from entering the system or coming into contact with the components. Use clean brake fluid or one of the proprietary cleaners to wash the hydraulic system parts. An acceptable alternative cleaner is methylated spirit, but if this is used, it should not be allowed to remain in contact with the rubber parts for longer than necessary. It is also important that all traces of the fluid should be removed from the system before final assembly.

Always use genuine manufacturer's spares and replacements for the best results.

Since the manufacturer uses metric units when building the cars it is recommended that these are used for all precise units. Inch conversions are given in most cases but these are not necessarily precise conversions, being rounded off for the unimportant values.

Removal and installation instructions, in this Workshop Manual, cover the steps to take away or put back the unit or part in question. Other instructions, usually headed "Ser-

ving", will cover the dismantling and repair of the unit once it has been stripped from the vehicle. It is pointed out that the major instructions cover a complete overhaul of all parts but, obviously, this will not always be either necessary and should not be carried out needlessly.

There are a number of variations in unit parts on the range of vehicles covered in this Workshop Manual. We strongly recommend that you take care to identify the precise model, and the year of manufacture, before obtaining any spares or replacement parts. The following abbreviations are sometimes used in the text and should be noted:

- Std.: To indicate sizes and limits of components as supplied by the manufacturer. Also to indicate the production tolerances of new unused parts.
- O/S: Parts supplied as Oversize or Undersize, or recommended limits for such parts to enable them to be used with worn or re-machined mating parts. O/S indicates a part that is larger than Std. size. U/S may indicate a bore of a bushing or female part that is smaller than Std.
- U/S: Parts supplied as Oversize or Undersize, or recommended limits for such parts to enable them to be used with worn or re-machined mating parts. O/S indicates a part that is larger than Std. size. U/S may indicate a bore of a bushing or female part that is smaller than Std.
- Max.: Where given against a clearance or dimension indicates the maximum allowable. If in excess of the value given it is recommended that the appropriate part is fitted.
- TIR: Indicates the Total Indicator Reading as shown by a dial indicator (dial gauge).
- HT: High Tension (ignition) wiring or terminals.
- TDC: Top Dead Centre (No. 1 piston on firing stroke).
- MP: Multi-Purpose grease.

0.5. Jacking up the Vehicle

Due to the construction of the vehicle, a jack and/or chassis stands should only be placed under the vehicle at certain position. These are shown in Fig. 0.5.

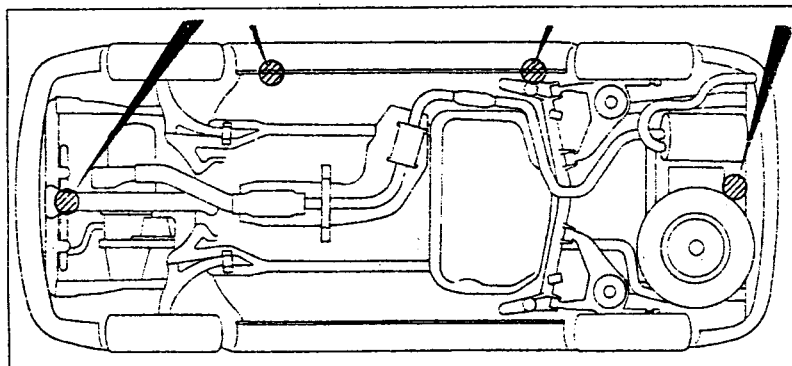


Fig. 0.5. — The jacking positions and locations where chassis stands can be placed. The large pointers show where a trolley jack can be applied. The small arrows show where chassis stands must be placed underneath the vehicle.

To jack up the front of the vehicle, place a mobile jack underneath the front suspension crossmember, as shown in the illustration. A piece of rubber or other soft material should be inserted between crossmember and jack head to prevent damage. Apply the handbrake or chock the rear wheels to add safety to the operation.

To jack up the rear end of the vehicle, place the jack underneath the position shown on the R.H. side in the illustration. Again use a piece of soft material between jack head and the jack location. The front wheels should be chocked (for example a brick) or a gear engaged to prevent the vehicle from rolling off the jack.

Always use secure chassis stands when working underneath the vehicle. Fig. 05 shows with the smaller pointers where chassis stands can be located. Any other location may lead to damage.

Before any jacking operation, check the condition of the ground to make sure the jack or the chassis stands cannot "sink" into the ground.

I. PETROL ENGINES

1.0. Main Features

NOTE: The Diesel Engine is covered separately at the end of the manual (Section 15).

Engine Identification:

Space Runner	4G93
Space Wagon:	4G63
Number and arrangement of cylinders:	4, in-line
Arrangement of camshaft/valves:	In cylinder head (OHC), 16 valves
Camshaft drive:	Toothed timing belt

Engine Capacity:

Space Runner:	1834 ccm
Space Wagon:	1997 ccm

Cylinder Bore:

Space Runner:	81.0 mm (3.19 in.)
Space Wagon:	85.0 mm (3.35 in.)

Piston stroke:

Space Runner:	89.0 mm (3.50 in.)
Space Wagon:	88.0 mm (3.46 in.)

Compression ratio:

Space Runner:	10.0 : 1 (9.5 : 1 without catalytic converter)
Space Wagon:	10.0 : 1

Max. Performance:

Space Runner:	120.6 B.H.P. at 6000 rpm
Space Wagon:	132 B.H.P. at 6000 rpm

Max. Torque:

Space Runner:	161 Nm (116 ft.lb.) at 4500 rpm
Space Wagon:	176 Nm (127 ft.lb.) at 4750 rpm

Compression Pressures at 250 rpm:

Space Runner:	14.5 kg/sq. cm. (206 psi.), 14.0/199 with catalytic converter
Space Wagon:	14.0 kg/sq.cm. (199 psi.)

Min. compression pressure at 250 rpm:

Space Runner:	10.4 kg/sq.cm. (148 psi.), 10.0/142 without catalytic converter
Space Wagon:	10.6 kg/sq.cm (151 psi.)

Firing order: 1 — 3 — 4 — 2

Valve Clearances (engine warm) — Only 1.8 litre Engine:

Inlet valves:	0.20 mm (0.08 in.)
Exhaust valves:	0.30 mm (0.012 in.)

Ignition timing, all engines: $5^{\circ} \pm 2^{\circ}$ before T.D.C. at idling speed

Oil pump type: Gear-type pump

Oil sump capacity: See Section 0.3

Fuel system: Multi-point fuel injection system

Ignition system: Combined with fuel injection system

1.1 Engine — Removal and Installation

The engine is removed without the transmission, but the transmission must be removed from the vehicle before the actual removal of the engine can take place. The relevant information are contained in Section 7, dealing with the manual transmission or Section 8, dealing with the automatic transmission. The instructions are based on the removal of the 1.8 litre engine. Any major differences for the 2.0 litre engine are given when applicable. Note that most hose connections use special hose clamps. A pair of special pliers may be needed to refit the clamps. Otherwise screw-clamps may be used.

Read Section 0.5 before jacking up the vehicle for operations to be carried out from underneath:

- Release the pressure in the fuel system before opening any of the fuel connections. Further information on this subject are given in Section 4.
- Open the bonnet. Mark the outline of the bonnet panel (using a pencil) and unscrew the bonnet from the hinges. This will give greater freedom of movement and will prevent damage to the bonnet paint work. Lift off the bonnet and store it in a safe place.
- Drain the cooling system. A drain plug is fitted to the bottom of the radiator. A further plug is fitted near the flywheel end of the cylinder block on a 1.8 litre engine. This engine also has a bleed screw at the top of the thermostat housing, which should be opened..
- Disconnect the battery and completely remove the battery, to have it out of the way.
- Remove the transmission as described in the relevant section.
- Remove the radiator as described in Section "Cooling System".
- Refer to Fig. 1.1 for the following removal operations:
- Disconnect the vacuum hoses (1). In the case of a 2.0 litre engine there is one hose at the front of the engine and three more near the hose location (1) in Fig. 1.1.
- Disconnect the heater hose (2) between thermostat housing and heater unit and the vacuum hose from the brake servo unit. On the 2.0 litre engine three hoses are connected in this area. All three can be disconnected; one of the hoses is the heater hose between heater unit and water inlet pipe, the other one is the brake servo unit hose.
- Disconnect the heater hose between heater unit and water inlet pipe (3).
- Unscrew the fuel pressure hose (4) and take off the "O" sealing ring (5). The arrangement is similar on the 2.0 litre engine. Remember that the system must be free of pressure.
- Disconnect the fuel return hose (6) after slackening the hose clip.
- Disconnect the throttle cable.
- The next operation concerns the removal of the various plugs and connectors. These are the connectors for the engine coolant temperature switch (9), the oxygen sensor (Lambda probe) (10), the oil pressure switch (11), the coolant thermometer (12), the engine coolant temperature sensor (13), if fitted, the engine coolant temperature switch for the condenser fan (14), if an automatic transmission is fitted, the two plugs from the distributor (15), the condenser (16), the idle speed regulator (17), the

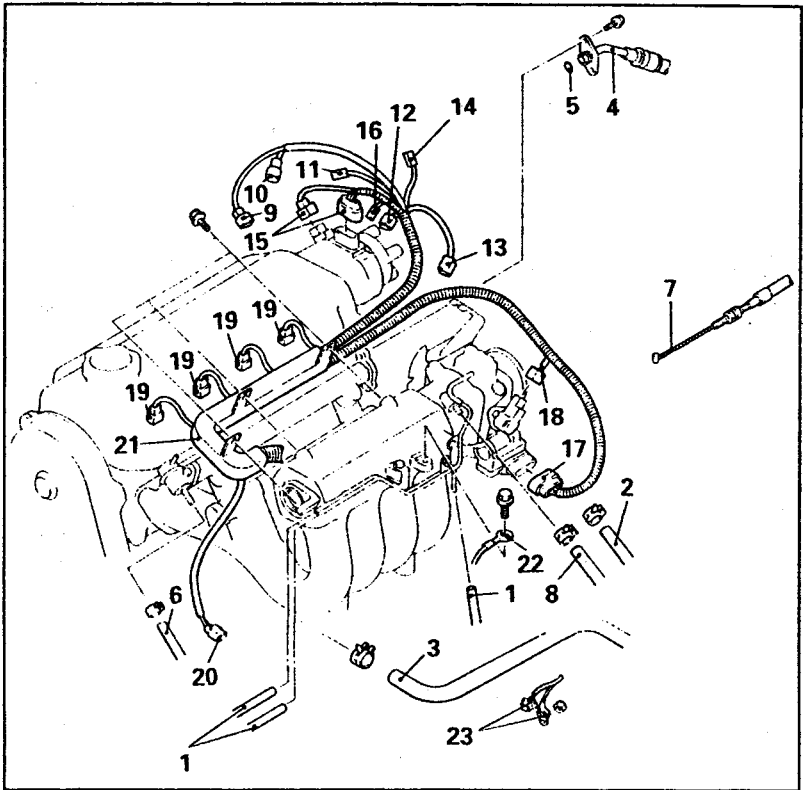


Fig. 1.1. — Order of removal of parts (engine removal, 1.8 litre, Space Runner).

throttle positioner (18), the fuel injectors (19) and the knock sensor (20). The connectors are located at similar locations on the 2.0 litre engine, but some are not used.

- Remove the engine main harness (21) and unscrew the earth cable (22).
- Disconnect the two plugs (23) from the rear of the alternator. On the 2.0 litre engine there is a third lead which leads to the oil pressure switch. Remove the single screw and withdraw the cable harness.
- Slacken the drive belt tension for the power steering drive, remove the belt and unscrew the steering pump without disconnecting the hose. On the 1.8 litre engine a connector plug for the steering pump oil pressure switch must be withdrawn. Place the pump assembly to one side where it will not be in the way when the engine is lifted out.
- Separate the front exhaust pipe from the bottom of the exhaust manifold and free the pipe from its bracket. Lower the exhaust pipe. If possible place a support underneath the pipe to prevent it from hanging down. Remove the gasket.
- If an air conditioning system is fitted, unscrew the compressor from the mounting bracket and tie it up with wire or string where it cannot interfere with the removal and installation of the engine.