SECTION 1

INTRODUCTION

The Lotus Seven was originally launched to the public at the Earls Court Motor Show in 1957 as a successor to the highly successful, though relatively low volume, Lotus 6 which ceased production in 1955.

The original Series 1 Seven was produced with a Ford sidevalve engine and a 3-speed gearbox although later models were available with the Coventry Climax 1097cc engine or the BMC 948cc engine from the Austin A35, with the 4-speed BMC gearbox.

In 1960 after around 240 Series 1s were completed, the Series 2 was introduced. This had a lighter spaceframe, clamshell front wings were fitted for the first time, and a revised fibreglass nosecone, which remains outwardly unchanged to this day.

Engine options followed on from the Series 1 although the 100E engine was soon phased out in favour of better BMC engines from the Austin Healey Sprite and the Ford 997cc 105E engine as fitted to the newly introduced Anglia.

Further options included the Ford Classic 109E 1340cc engine from 1961, and later the 1498cc 116E engine from the Cortina followed in 1962. These later models were known as Super Sevens and in Cosworth tuned form made shatteringly fast road/club race cars for their day.

The Series 2 introduced the 'A' frame rear suspension which is still in production today and were made in considerably greater numbers than other Lotus Seven models, a total of some 1310 being built.

It was not until 1968 that the Series 3 Seven was launched and in appearance looked similar to the Series 2 except for wider wings to accommodate wider wheels and tyres. The chassis frame, however, was considerably stiffer and the 1600cc Ford 2265E crossflow engine and Ford Escort rear axle became the basic specification. This axle, incidentally, replaced that from the Standard 10 dating back to the early fifties which somehow Lotus had continued to use in the Series 2 right until the end. Axle failures were not uncommon!

The Super Seven was now available with the Lotus Twin-Cam for the first time and this, especially in 125 BHP Holbay form, became the fastest production Seven yet. Around 265 Series 3s were made.

By 1970 it was felt that the Seven, after 12 years, had become very dated and a successor, intended to reach the fast growing Beach Buggy market as well as that currently accommodated, was launched. This, of course, was the Seven Series 4.

Although intended to retain the character of the Seven, it was very different in appearance, having a simpler steel ladder frame chassis with stressed steel side panels enclosed by a fibreglass body. Engine options were carried over from the Series 3, and around 600 cars were built by 1973.

Colin Chapman had for many years wanted to phase out the Seven from an increasingly upmarket range and indeed, without the efforts of Graham Nearn, it would probably have been dropped as early as 1966.

Seven production had continued erratically for some years, firstly at Lotus Components and then at Lotus Racing, which closed in 1971.

Series 4s were manufactured in a corner of the main factory for a while, alongside Elans and Europas, before the impending launch of the new Elite, and increasing financial difficulties at Hethel finally spelt the end of the car.

In May 1973 Graham Nearn's Caterham Cars took over all the remaining Seven parts, jigs, moulds and, most importantly, the manufacturing rights from Lotus. Subsequently about 40 series 4 Caterham Sevens were sold until it was phased out largely due to problems with component suppliers in 1974.

Much interest continued to be expressed in the classic Series 3 Seven, however, which enthusiasts had always preferred over the heavier and less agile Series 4. As a result, Caterham introduced an improved version of the Series 3 with a considerably strengthened chassis and numerous detailed modifications to upgrade the car in every way whilst preserving its appearance and character.

The Caterham Seven has therefore continued outwardly unchanged. Its specification has changed notably in respect of its engines and transmissions, as suppliers and motor manufacturers have updated their products.

Initially Caterham Sevens were fitted with Ford Escort axles, but supplies of this axle dried up in 1981 with the introduction of the FWD Mk III Escort. The replacement Morris Marina/Ital axle was fitted to approximately 500 Caterham Seven Series 3's between 1981 and 1986 when it too ceased to be available. Seeing that the writing was on the wall for small beam axles, Caterham then designed their own De Dion rear suspension, based on Ford Sierra parts, which was introduced in 1986. This in turn has seen further improvement with the fitment of rear disc brakes in 1989 along with a sealed pedal box and adjustable pedals.

For 1991 the De Dion chassis was revised incorporating a double wishbone front suspension and revised rear suspension derived from the Vauxhall engined race series cars to further improve handling. Provision was also made to accommodate inertia reel safety belts and, in redesigning the rear of the car, more boot space was achieved.

The De Dion chassis was again revised for 1994 to further improve chassis performance, ease of build, and serviceability. Removable upper engine bay diagonals improve access to the engine bay, and at the same time the length and width of the pedalbox was increased, improving comfort.

By the mid eighties, supplies of Ford Escort Sport semi-close ratio gearboxes also dried up so the chassis was re-engineered to accept the 5-speed gearbox from the V6 Sierra. Caterham have designed and manufactured their own special bellhousings to mate this gearbox, in close ratio form, to both the Rover and Vauxhall 16 valve engines.

Caterham have now engineered a close ratio six speed gearbox for the Seven, with ratios chosen specifically to suit the character of the Seven and the engines used in it. The gearbox is a direct replacement for the Ford five speed gearbox and can be retro-fitted in cars fitted with the five speed box.

When Lotus Twin-Cam engines ceased to be manufactured, Caterham first turned to Vegantune who were making their own version of this unit. Around 40 Sevens were fitted with this VTA engine of which 30 were exported.

Demand for an engine developing more power than the standard Ford 1600GT led Caterham to introduce their 'Sprint' specification, basically the 1600GT with twin Weber 40 DCOE carburettors and a mild performance camshaft. In 1984, the 'Supersprint' version of the same Ford engine was launched, this time bored out to 1690cc with larger valves and a high lift camshaft to produce some 135 BHP with minimal loss of tractability.

However the public continued to demand even more power and in addition sophistication, so the Ford Cosworth BDR with double overhead camshafts and 16 valves became available in 1985 followed by the even faster 'HPC' specification in late 1986. This engine has now been replaced by the 2 litre 16 valve Vauxhall engine which provides even more power and, along with the Rover K Series unit, enables the Seven to meet emissions legislation.

In turn, the Rover engine has been improved in conjunction with Rover to produce the "Supersport" specification which means that performance from the 16 valve 1400cc unit is now very similar to the Ford powered "Supersprint" cars which continue to be available.

In 1993 the 'Classic' live axle car was introduced as a low cost entry level Seven. Using a single carburettor Ford crossflow engine and a reconditioned 4 speed gearbox and Ital axle, this represents excellent value for money.

In its earliest days, the Seven was sold in kit form to avoid purchase tax which in the late 1950's was about 40%! This practise continued throughout the car's long production history, although the imposition of Value Added Tax meant that the savings

were no longer so great, and the level to which a car had to be disassembled to become a kit rather than a car were the subject of constant negotiation with Customs and Exise.

Completed cars were and are offered for overseas markets, but Caterham have traditionally sold cars in Component form, and latterly in Kit form also, for those customers wishing to save money or enjoy building the whole car themselves and by using new or used parts of their choice.

With current EEC legislation it is now possible to sell certain Caterham models fully built in the United Kingdom and in Europe, though the majority of engine specifications available do not satisfy noise and emission regulations and therefore remain available in kit or virtually built Component form.

This assembly guide has therefore been produced to give the non-expert near comprehensive instruction as to how a car can be built to the same standards as those produced by Caterham Cars. For more experienced builders, this guide may be somewhat elementary in its detail. However, no doubt some sections will be helpful and we wish all our customers many hours of pleasure building a car that both they, and we at Caterham cars, can be proud of.

SECTION 2

ORDERING SPECIFICATIONS

Contents

The Super Seven is sold to customers all over the world so individual specifications are likely to vary according to the legislation of the country where the car is to be registered. This guide is aimed primarily at UK customers although differences, other than left hand drive, are likely to be minor. If there is any doubt, Caterham Cars should be consulted.

2.1 Chassis

Apart from left or right hand drive, the basic chassis is available in two forms to cater for the live axle and De Dion specifications. It is not possible to fit the De Dion assembly to a live axle chassis.

2.2 Engines

2.1 Caterham currently supply three ranges of engines as standard equipment; the Ford 2265E 16OOcc overhead valve crossflow unit, in Classic (1599cc 84BHP), Sprint (1599cc 100BHP) and Supersprint (1690cc 135BHP) tune, Rover 16 valve "K" Series with multipoint fuel injection (1400cc 110BHP) and Supersport (1400cc 130BHP) tune and the Vauxhall DOHC 16 valve fuel injected unit (1998cc 165BHP) all of which run on unleaded 95 Octane fuel. Alternatively, if a pre '93 Vauxhall 16 valve engine is sourced it can be fitted with twin Weber carb's, in which form it will give 175BHP. Full specifications appear at the rear of this Section.

2.2 When sourcing you own Ford engine, we strongly recommend the use of the Ford 2265E engine and in particular the later 7llM block which is considerably stiffer than earlier units. These engines are used in Formula Ford 16OO racing and are not only cheap and readily obtainable new and second hand, but also very robust and easily tuneable.

2.3 The majority of Caterham Super Sevens sold in the past have been fitted with this engine and when tuned to our 'Supersprint' 17OOcc specification, around 135 bhp

at the flywheel can be obtained reliably. A tuning kit to this specification is available and further tuning is of course possible. We will be happy to supply advice, parts, or engines complete with all ancillaries as necessary.

2.4 It should be noted that the inlet manifolds used by Caterham in order to fit Weber DCOE carburettors are specially manufactured to position the air filters correctly in the bonnet aperture without offsetting them so far as to cause clearance problems to the inside face of the front wing. Customers should note that the use of an alternative manifold may cause problems.

2.5 Similarly, Caterham can supply electronic ignition systems and standard distributors compatible with the vehicle wiring loom and the inlet manifold. Whether their performance is suitable for your specification engine is a question which can only be answered by your engine builder.

2.6 One problem applying to all Sevens is ground clearance. All Ford engines should be fitted with a 'rear pan' sump as fitted to an Escort MkII 1600 or early Capri (1969 - 1972), along with appropriate pick-up pipe and dipstick. Since these items are becoming hard to obtain Caterham now manufacture a special sump for these engines designed to provide an optimum balance between ground clearance and oil capacity with adequate baffling for hard road or "road tyre" competition use. New engines from Caterham Cars are supplied with a special dipstick tube assembly to ensure accuracy with the modified sump.

2.7 The De Dion chassis is able to accept any of the standard engine ranges, however once a kit has been prepared for a customer there are a number of factors making it a bespoke kit for a specific engine type. It is essential therefore that you specify which engine type you intend to use when ordering your kit. The live axle chassis can only accept the Ford crossflow engine.

2.3 Gearboxes/Back Axles

Chassis		Classic Live axle	De Dion
Engine	Ford OHV	X	X
	Vauxhall		X
	Rover 16v		X
Gearbox	Ford Escort Sport 4 speed	X	
	Ford Sierra XR4i 5 speed		X
	Caterham 6 speed		X
Axle	Morris Ital/Marina	X	
	Caterham De Dion		X

Table 2.3.1 Engine Gearbox and Axle Options

3.1 It is strongly recommended that the home builder chooses a specification of car that represents an original Caterham build. This will ensure the availability of spare parts and will help the car retain its residual value.

3.2 The combinations in table 2.3.1 are therefore recommended and as each chassis is built to order, it is important that this table is studied first.

3.3 Classic live axle cars

The optimum gearbox for a live axled car is that fitted to the Ford Escort MkII 16OO Sport and 16OO Ghia (Ford exchange part number 5004364), which combines close ratios with a cable clutch, integral bell housing and one piece rear gearlever extension casting. Classics are supplied with a reconditioned wider ratiod version of this gearbox.

The axle from the 1.7/2.O Marina or Ital is best since this incorporates the ideal 3.64 final drive ratio. This combination is the correct Caterham Classic standard specification and gives the best spares availability. The rear stud centres are the same on this axle as the Triumph based front hubs.

Reconditioned gearboxes and axles are all available from Caterham Cars who also stock new standard specification engines as an ideal basis for a tuned engine to a customer's individual specification, though Caterham only supply engines to their own states of tune, Sprint and Supersprint.

3.4 De Dion cars

The De Dion chassis has been designed to take either the five speed gearbox from the Ford Sierra, or the Caterham 6 speed gearbox. Special bellhousings or adaptors are available to match these to the standard range of engines. The De Dion assembly uses largely Ford parts notably the Final Drive housing and the rear hub and brake assemblies which are sourced from the Ford Sierra range, but unfortunately not from one model. Please note that neither the 2WD or 4WD Sierra Cosworth diffs are suitable.

Such items as driveshafts and the De Dion tube itself, however, are only available from Caterham Cars.

It should be noted that special front hubs with Ford stud centres will be needed, and these will be supplied automatically with the front upright kit if a De Dion chassis is specified.

2.4 Wheels and Tyres

4.1 The following combinations are recommended to give the correct rolling radius and wheel/tyre ratio.

i) 5[1]/2" x 13 wheels with 165 HR 13 Tyres (Live axle only)
ii) 5[1]/2" or 6" x 13 wheels with 185/70 HR 13 Tyres
iii) 6" x 14 wheels with 185/60 HR 14 Tyres (De Dion only)
iv) 6[1]/2" x 15 Caterham Prisoner wheels with 195/50 VR 15 Tyres (De Dion only)
v) 7" x 16" Caterham 5 spoke wheels with 205/45 VR 16 Tyres (De Dion only)

4.2 Caterham wheels have been specially designed and manufactured for the car and the 15" and 16" wheels are therefore of equivalent weight to split-rim racing wheels and much lighter than most aftermarket products. All wheels with the exception of alternative iv) should have 19mm inset or negative offset. These wider wheels have 13mm negative offset. Wheel stud centres are as follows:-

De Dion	4 stud 4.25 inch PCD (108 mm) 12mm x 1.5 thread
Classic Live Axle	4 stud 3.75 inch PCD (95 mm) 3/8 UNF thread

4.3 It must be stressed that the car has been designed around these wheel/tyre combinations and that under or oversize combinations will almost certainly cause problems with steering, handling, ride, gearing and speedometer calibration, body and ground clearance.

4.4 The 15" and 16" options now available from Caterham are the result of extensive testing and feature the latest in tyre technology from Michelin giving both a superior ride and adhesion, in both wet and dry conditions, compared with our normal 14" specification.

4.5 For competition purposes, 185/60 x 13 tyres will aid roadholding and lower overall gearing, but will cause ground clearance problems and cannot therefore be recommended for road use.

2.5 Speedometer Calibration

5.1 When ordering your kit, it is important to specify which gearbox/axle combination you are using along with the final drive ratio and wheel tyre size. If you do not, your speedometer may well be inaccurate which, apart from the consequences of being stopped for speeding, is illegal in the UK and EC countries.

5.2 All Classic kits are supplied with the same speedometer labelled on the case W=1.00 (W=0.625 for k.p.h). Correct calibration is achieved by changing the plastic driven gear in the gearbox. Speedometer recommendations for the Escort Sport/ Marina or Ital cars are shown below:-

Diff Ratio	No of Teeth on Driven Gear	Ford Finis Code for Driven Gear
3.64	22	1546878
3.89	24	6011062
4.11	25	1546789

5.3 All five speed De Dion kits leave the factory with 3.92 calibration speedometers, marked W=1.00 (w=0.625 for kph). Your gearbox should always be fitted with a 24 tooth gear Finis Code 6011058

5.4 If your car is fitted with a six speed box in conjunction with a 3.92 or 3.62 differential, the above speedo marked w=1.00 is used. If however a 3.38 or 3.14 differential is used, a different speedo, marked w 0.865 should be fitted. Please check the correct part is fitted **before** driving the car, so we can provide you with the correct speedo if necessary. The 24 tooth gear is fitted to all six speed gearboxes.

2.6 Ordering of supplementary kits and accessories

6.1 There have been a number of minor changes to the specification of the Seven recently and more are anticipated as we continually seek to keep up with changing legislation and make engineering improvements. It is important therefore that you always quote the chassis number of your car to us when ordering, especially when it is being built over an extended period, or we may unintentionally provide you with components incompatible with your basic kit.

6.2 CKD kits

It is possible to order a Caterham Seven kit in 5-Speed De Dion form complete with all components needed to complete your car including Engine, Gearbox, Wheels and Tyres. Components which should be specified at the time of ordering are as follows:-

ENGINES (All running on unleaded fuel):-

1600 OHV	84 BHP
1600 Sprint	100 BHP
1700 Supersprint	135 BHP
1400 K Series	110 BHP
1400 Supersport	130 BHP
2000 Vauxhall Injection	165 BHP
2000 Vauxhall Carburettor	175 BHP

WHEELS and TYRES:-

6" x 14 wheels	185/60 HR 14 Tyres
6 1/2" x 15 wheels	195/50 VR 15 Tyres
7" x 16 wheels	205/45 VR 16 Tyres

6.3 C.K.D. kits are supplied with front uprights assembled and weather kit fitted so Sections 4 and 13 of this manual will not apply. Since a completed car will have been assembled from all new parts Caterham Cars will issue a "Certificate of Newness" enabling the owner to obtain a current registration prefix. This is covered under section 15.

2.7 Caterham Cars' Location

In October 1987, Caterham Cars opened their new factory at Dartford in Kent. This means that the company is split into two locations with sales remaining at the Company's traditional site at Caterham and production expanded into this additional 35,000 sq ft facility. Please note therefore that although you should place your order at Caterham, your car and any subsequent parts will be delivered from Dartford. Subsequent spare parts should be ordered from Dartford. However any queries relating to specification or availability must be addressed to our Caterham office, whilst technical queries during the build of your kit should be directed to Dartford.

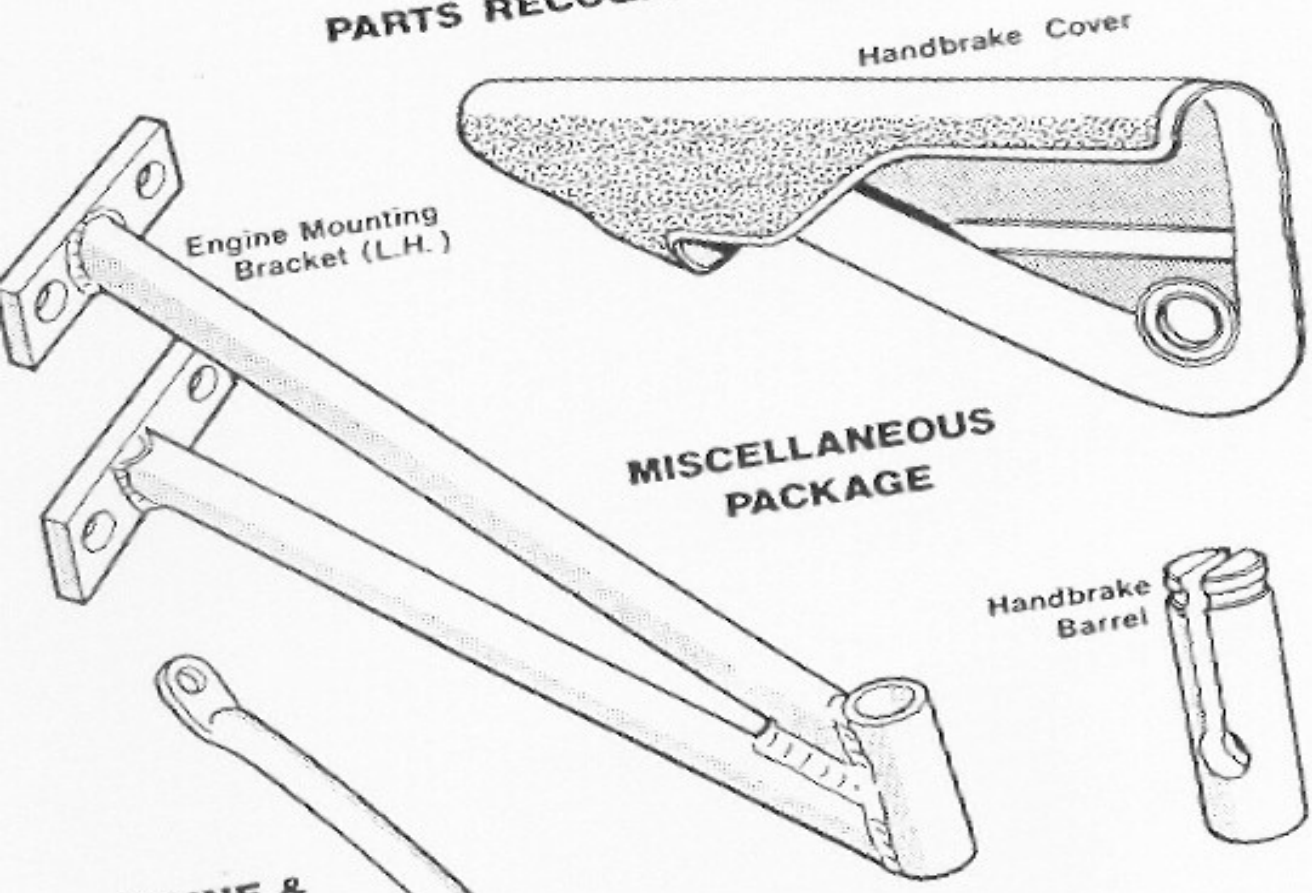
Please call technical support on: (01322) 559124

2.8 Safety

Should you choose to incorporate parts not sourced from Caterham Cars we strongly advise that second hand components are not included in the braking system.

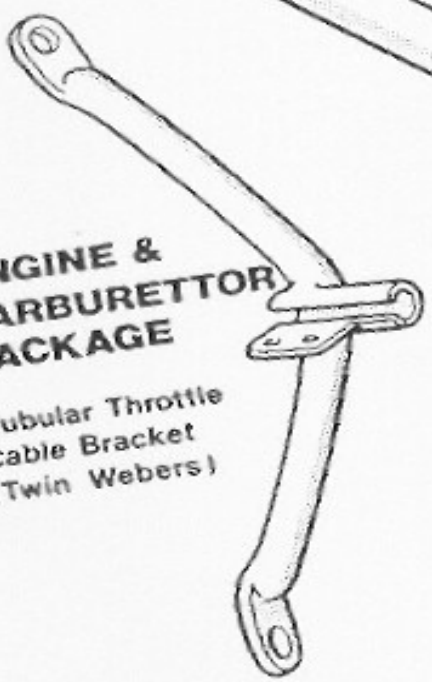
IN PARTICULAR NEVER RE-USE METAL BRAKE PIPES OR FLEXIBLE HOSES AS YOU MAY SEVERELY COMPROMISE THE SAFETY OF YOUR CAR

PARTS RECOGNITION SHEET

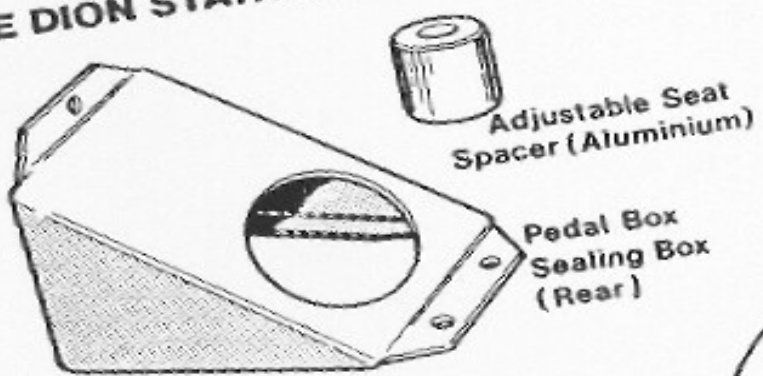


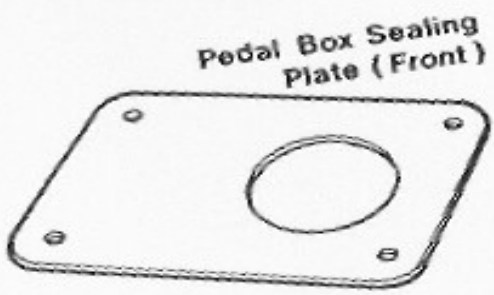
MISCELLANEOUS PACKAGE

ENGINE & CARBURETTOR PACKAGE



DE DION STARTER KIT





LIVE AXLE STARTER KIT

SECTION 2A

PACKAGE CONTENTS

The following listings detail the main contents of each of the packages that make up a complete kit. Due to the large range of packages and options available it is impossible to list every permutation.

Chassis / Body Unit :- Chassis, body panels, pedals, master cylinder(s), instruments, switches, wiring loom, windscreen, windscreen wipers, fuel tank, fuel pump (not Ford), fuel lines, ignition module / ECU, battery.

Front Suspension :- Springs and dampers, upper and lower wishbones, anti-roll bar and fixings, front upright assemblies including brakes, cycle wing stays (where applicable).

Steering :- Steering rack, rack clamps, upper and lower columns, column bush, column clamp, track rod ends.

Rear Suspension :- Springs and dampers, radius arms, A frame, anti-roll bar and fixings (De Dion only).

Axle Package (De Dion) :- Differential, driveshafts and nuts, discs pads and calipers, drive flanges, De Dion tube, De Dion tube ears, brake pipes, brake bleed kit.

Axle Package (Live Axle) :- Live axle complete with all brackets and brake parts.

Miscellaneous Pack :- Handbrake lever, pulley and cables, interior mirror, battery cables, throttle cable, clutch cable, wheelbrace, speedo cable, propshaft and bolts, gearlever, extension and knob, toolbag, nosecone badge, engine mounting brackets and rubbers, scissor jack, windscreen washer kit, stainless steel brake hoses, horns, steering wheel, roll over bar, rear wing protectors, spare wheel wishbone, fuel filler neck and cap (not injection).

Engine Kit :- Complete engine and clutch, engine loom (injection cars).

Exhaust Kit :- Manifold, collector (competition system), silencer, exhaust guard, mounting brackets and bobbins, manifold support bracket (Vauxhall Injection).

Cooling Package :- Radiator, coolant hoses, water rail (not Ford), cooling fan, heater (if specified), bobbins.

Gearbox Kit :- Gearbox, bellhousing (not 4 speed), spacer (Ford, not 4 speed), clutch release fork, release bearing, reverse light switch, speedo drive, mounting rubber.

Lighting Kit :- Headlamp shells, headlamp units, indicator mounts, indicators, number plate lamp, reversing lights, fog lights, side repeaters (flared wing only).

Interior Trim :- Aluminium tunnel top and saddle (Ford), vinyl covered tunnel top (Vauxhall and Rover), tunnel carpets, footwell carpets, underseat carpets (not bench seats), seats, seat runners (not bench seats), padded scuttle vertical carpet.

Weather Equipment :- Hood, sidescreens, hoodsticks, hoodstraps, exterior mirrors (x2), boot cover.

Wheels and Tyres :- 5 alloy wheel and tyre assemblies, wheel bolts, centre caps.

1400 ROVER "K" SERIES ENGINE SPECIFICATION

BASE UNIT
Rover 16 valve double overhead camshaft "K" series

BORE	73.00mm	STROKE	79.00mm
CAPACITY	1397cc	COMPRESSION RATIO	9.5:1

CYLINDER HEAD
Standard Rover

CAMSHAFTS
Standard Rover (Supersport - Caterham special high lift)

FLYWHEEL
Standard Rover

CLUTCH
Standard Rover

IGNITION
Rover contactless electronic (reprogrammed for Supersport)

LUBRICATION
Caterham cast alloy wet sump

INLET MANIFOLD
Rover standard plastic (Supersport - Caterham cast alloy large bore with integral plenum)

FUEL INJECTION
Rover multipoint electronic (reprogrammed for Supersport)

PERFORMANCE DATA	Standard	Supersport
max. Power	103 BHP @ 6000rpm	130 BHP @ 7400rpm
max. Torque	96 lbft @ 5000rpm	99 lbft @ 5000rpm

SERVICE DATA

Ignition Timing	No adjustment required
Valve Clearances	Hydraulic Tappets
Spark plug type	NGK BCP7ES
Spark plug gap	0.025"
Firing order	1-3-4-2
Fuel	95 octane unleaded
Fuel (Supersport)	98 octane super unleaded
Fuel - non-catalyst cars	97 octane 4 star
Maximum engine speed	6800rpm (Supersport - 7600rpm)

1600 CLASSIC AND SPRINT ENGINE SPECIFICATIONS

BASE UNIT
Ford ohv 2265E "Kent" crossflow

BORE	80.98mm	STROKE	77.62mm
CAPACITY	1599cc	COMPRESSION RATIO	9.0:1
CYLINDER HEAD	Standard	CAMSHAFT	Ford GT profile

FLYWHEEL
Lightened and balanced

CLUTCH
Uprated competition cover assembly and drive plate

IGNITION
Caterham distributor with Lucas electronic ignition

ROCKER COVER
GT - Standard pressed steel
Sprint - Caterham cast alloy with "SUPER 7 SPRINT" script

LUBRICATION
Standard oil pump with Caterham wet sump

INLET MANIFOLD
GT - standard cast alloy Sprint - Caterham cast alloy

CARBURATION
GT - Weber twin choke downdraft 32 DGAV 5E
Sprint - Two Weber twin choke sidedraft 40 DCOE 151

AIR FILTRATION
GT - One foam filter Sprint - Two K&N performance filters

PERFORMANCE DATA	GT	Sprint
max. Power	84 BHP @ 5500rpm	100 BHP @ 6000rpm
max. Torque	92 lbft @ 3500rpm	95 lbft @ 4800rpm

SERVICE DATA

Ignition Timing	14^0 BTDC
Valve Clearances	Inlet 0.010" Exhaust 0.022"
Spark plug type	GT - Motorcraft AGR 12 Sprint - NGK BP7ES
Spark plug gap	0.025"
Firing order	1-2-4-3
Fuel	97 octane 4 star
Oil Pressure	3>4 BAR (normal temp.)

1700 SUPERSPRINT ENGINE SPECIFICATION

BASE UNIT Ford ohv 2265E "Kent" crossflow

BORE	83.27mm	STROKE	77.62mm
CAPACITY	1690cc	COMPRESSION RATIO	9.5:1

CYLINDER HEAD
Gas flowed with enlarged ports and oversized 21-4N steel valves and duplex valve springs

CAMSHAFT
Caterham BCD, with high lift short duration profile

FLYWHEEL
Lightened and balanced

CLUTCH
Uprated competition cover assembly and drive plate

IGNITION
Caterham distributor with Lucas electronic ignition

ROCKER COVER
Caterham cast alloy with "1700 SUPERSPRINT" script

LUBRICATION
High pressure oil pump with Caterham wet sump

INLET MANIFOLD
Caterham cast alloy

CARBURATION
Sprint - Two Weber twin choke sidedraft 40 DCOE 151

AIR FILTRATION
Two K&N performance filters

PERFORMANCE DATA
Max Power 135 BHP @ 6000rpm, Max Torque 122 lbft @ 4500rpm

SERVICE DATA

Ignition Timing	14^0 BTDC
Valve Clearances	Inlet 0.022" Exhaust 0.024"
Spark plug type	NGK B8ECS
Spark plug gap	0.025"
Firing order	1-2-4-3
Fuel	97 octane 4 star
Oil Pressure	3>4 BAR (normal temp.)

2000 VAUXHALL 16v ENGINE SPECIFICATION

BASE UNIT
Injection - New post '93 Vauxhall 16v (not Ecotec)
Carburettored - Remanufactured pre '93 Vauxhall 16v

BORE	86.00mm	STROKE	86.00mm
CAPACITY	1998cc	COMPRESSION RATIO	10.5:1

CYLINDER HEAD
Cosworth designed DOHC 4 valve per cylinder

CAMSHAFTS
Standard Vauxhall

CLUTCH and FLYWHEEL
Standard Vauxhall

IGNITION
Injection - Standard Vauxhall
Carburettored - Caterham mapped ignition module

LUBRICATION
Caterham cast alloy wet sump (optional dry sump & bell tank housing)

INLET MANIFOLD
Rover standard plastic (Supersport - Caterham alloy large bore)

FUEL SYSTEM
Injection - standard Vauxhall
Carburettored - Two weber twin choke 45 DCOE 152

PERFORMANCE DATA	Injection		Carburettored	
max. Power	165 BHP @ 6000rpm	146 lbft	175 BHP @ 6750rpm	136 lbft
max. Torque	162 lbft @ 5000rpm	154 bhp	160 lbft @ 5000rpm	132 bhp

SERVICE DATA

Ignition Timing	No adjustment required
Valve Clearances	Hydraulic Tappets
Spark plug type	Vauxhall 90297152
Spark plug gap	0.025"
Firing order	1-3-4-2
Fuel (catalysed engine)	95 octane unleaded
Fuel (non-catalyst)	97 octane 4 star
Maximum engine speed	Injection 6800rpm, Carburettors 7500rpm

SECTION 3

BASIC ASSEMBLY

Kits supplied by Caterham Cars are specifically designed for the amateur car builder with basic facilities. No special tools or jigs are required.

We suggest that when you get the kit home, the chassis is supported on 4 axle stands which will give stability for both safe working and ready access. Ideally these should be positioned at the outer ends of the second chassis crosstube adjacent to the rear wishbone mounting, at the front (see Fig.3), and at each end of the chassis crosstube supporting the front of the fuel tank at the rear.

A work bench for sub assembly jobs would be helpful along with a good vice for both holding items stable and lightly pressing parts into position. Although brute force will never be necessary if assembly is carried out in the right sequence, a soft copper/hide or plastic/rubber hammer will be useful to aid striking items into place without causing damage.

Please make a note of your order number as this is the reference by which we know you and your kit, and will ensure that, no matter how long you take to assemble your car, subsequent packages will be compatible.

The following points are helpful tips to bear in mind when assembling your kit

1. Always test fit items to ensure that you understand their correct location and that they do fit. It may occasionally be necessary to ease mounting holes for certain bolts. **IF YOU HAVE ANY DOUBTS - RING US.**

2. Always assume that bolts and fasteners are not properly tightened until they have been specifically checked.

3. Check all fluid levels before operation, rear axles and 5 Speed gearboxes are particularly easy to overlook.

4. Apply the correct tightening torque's. Where not specified, please use table 3.1 as a guide. Over-tightening can often cause more problems than under-tightening, such as sheared bolts and studs, and incorrect stresses.

All safety critical fastenings supplied by Caterham Cars are high tensile conforming to British Standards 1768 (Imperial) and 3692 (Metric). Customers supplying their own should only use high tensile fasteners marked with "8.8", 10.9 or "12.9" on the head, particularly when attaching suspension, steering, upright and axle kits. Any unmarked bolts should not be used. Please note that when tightening a bolt into an aluminium part, much lower torque's should be used.

Spanner Size	A/F	Metric	Torque(lb/ft)
l/4 UNF/UNC or M6	7/l6	10mm	3-5
5/l6 UNF/UNC or M8	l/2	13mm	l2-l5
3/8 UNF/UNC or M10	9/l6	17mm	2O-25
7/l6 UNF	5/8 or 11/16		3O-35
l/2 UNF or M12	3/4	19mm	4O-45

Table 3.1 General Bolt Fastening Torque's

The car is assembled with predominantly Imperial nuts and bolts but in some areas Metric items are used.
The following should provide a helpful guide :-

Suspension & Steering	UNF
Engine - Ford	UNC
Engine - Vauxhall and Rover	Metric
Gearbox	Metric
Live Axle	UNF
De-Dion Axle	Metric

5. The majority of fastenings are secured with the help of washers inserted between the nut or bolt head and the item to be secured. As a general rule particular washers are used in the following circumstances, otherwise washers should not be used:-

a) To protect the surface and spread a load when attaching to a soft material such as glass fibre or aluminium, use a plain washer.
b) To lock a thread where there is a possibility of the nut working loose use a spring washer, but not under a nyloc nut which serves a similar purpose.
c) To adjust the spacing of one component to another use plain washers of appropriate external diameter.
d) To spread a load onto very thin material use a large diameter thin plain washer.
e) To prevent the migration (sideways movement) of rubber bushes and to ensure that they fail safe, washers which arelarger than the outside diameter of the bush should be used, for example at the bottom of the rear dampers where they attach to the De Dion tube.
f) To present a uniform surface on which to tighten a fastening onto a rough or irregular surface use a plain washer.
g) To enable the use of a bolt smaller than the hole through which it passes use a plain washer sufficiently large.

6. In order to ensure ease of assembly and subsequent maintenance, we suggest the use of the following:

a) Castrol LM grease (or equivalent) for general use wherever movement occurs.
b) 'Rubber Lube' or a spray equivalent to ease assembly and operation of rubber bushes and grommets.
c) 'Copper Slip' anti-seize compound where lubrication is not needed to ensure easy future disassembly.
d) 'Loctite' thread locking fluid where the application prevents the use of nylon locking (Nyloc) nuts or spring washers.

Please note that all sealants should be applied very sparingly and the thinnest possible layer achieved. Any excess should be wiped away immediately once the components are assembled.

7. The kits provided by Caterham (from the factory at Dartford) include all the items needed to build the car but, due to the sheer number of different components, it is sometimes possible that parts are omitted or duplicated. We therefore strongly recommend that you check that all items as listed at the rear of the ordering specification section are correctly provided on receipt of your kit. If there are any shortages please telephone the factory at Dartford on 0322 559124.

8. Due to the nature of the motor industry, it is frequently necessary for us to change suppliers and/or make minor changes to the car's specification. This will generally be explained to you on collection, but if you come across something which differs from these instructions, *please do not hesitate to contact us.*

9. The golden rule must be **'WHEN IN DOUBT, ASK'**. Caterham Cars happily provide technical back up when required.

10. Basic starter kits as supplied by Caterham are unpainted, the bodywork being bare aluminium and the wings and nosecone pre-impregnated fibreglass.

If you wish your car to be painted, we advise that this is done by Caterham Cars. If you wish to have this done elsewhere however, the following should be either removed or fitment delayed until painting is complete.

i) front and rear wings, nosecone
ii) front wing stays
iii) bonnet catches from both bonnet and chassis
iv) windscreen
v) windscreen wiper spindle rubbers

Considerable masking is necessary before a Seven can be sprayed so, if you are proposing to get a local bodyshop to do the job, significant cost savings can be made if you do this yourself.

You will notice that the rear of the car is marked in order that the holes for the popper bases which secure the hood are correctly located. These should be drilled with a 5/32" drill before painting.

You should note that cars are normally supplied with wings unfitted so a small amount of additional work is necessary to attach them. (refer section 9.5.6)

11. **Due to the composition of the subsidiary kits and their necessity to link together, it is important to study the whole manual before commencing assembly.**

It is structured in a manner that presents a logical build sequence but the car does not have to be assembled in this precise order.

In particular the propshaft is supplied in the miscellaneous kit. With De Dion cars it is not possible to install the propshaft once the differential unit has been fitted and therefore we recommend that the rear axle, rear suspension and miscellaneous kits are purchased together.

The miscellaneous kit for all varieties of car contains items relating to the rear axle, engine, gearbox, braking and interior which are covered in sections of the assembly guide prior to that dealing specifically with this kit.

In addition, particular care should be taken to measure the bolts and fastenings before using them since it is quite possible to use an overlong bolt only to find that it is apparently "missing" later on when the only remaining bolts are too short. The instructions in each section detail the precise bolt sizes needed in each operation.

You should be aware that Caterham Cars have a policy of continuous development and this means that the manual is revised regularly each year to reflect the latest information. If you have taken your Assembly Guide at time of order it is possible that parts of it will be out of date by the time you receive your kit. Therefore should you find any discrepancies between the parts supplied and the description in this manual please consult the factory. We regret that it will not be possible to exchange old manuals for new ones.

12. Seven builders should take care to observe basic safety precautions whilst assembling their kits since tools, parts, and materials incorrectly handled can cause injury.

In particular your attention should be brought to the following:-

a) **Never** work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.

b) The electric radiator cooling fan is controlled by a thermostat which operates when the ignition switch is in the on position. If you are working in the vicinity of the fan with a hot engine we recommend that the engine is switched off before starting work.

a) Castrol LM grease (or equivalent) for general use wherever movement occurs.
b) 'Rubber Lube' or a spray equivalent to ease assembly and operation of rubber bushes and grommets.
c) 'Copper Slip' anti-seize compound where lubrication is not needed to ensure easy future disassembly.
d) 'Loctite' thread locking fluid where the application prevents the use of nylon locking (Nyloc) nuts or spring washers.

Please note that all sealants should be applied very sparingly and the thinnest possible layer achieved. Any excess should be wiped away immediately once the components are assembled.

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ii) front wing stays
iii) bonnet catches from both bonnet and chassis
iv) windscreen
v) windscreen wiper spindle rubbers

Considerable masking is necessary before a Seven can be sprayed so, if you are proposing to get a local bodyshop to do the job, significant cost savings can be made if you do this yourself.

c) Cars fitted with electronic ignition systems have much increased voltages compared with conventional systems and there is a real danger of electric shocks if you work on the system with the ignition on, particularly in damp conditions. The ignition should be switched off before touching any part of the ignition system.

d) Engine Oils - Health Warning:-

i) Prolonged and repeated contact may cause serious skin disorders including dermatitis and skin cancer.

ii) Avoid contact with the skin as far as possible and wash thoroughly after any contact.

iii) Keep out of the reach of children.

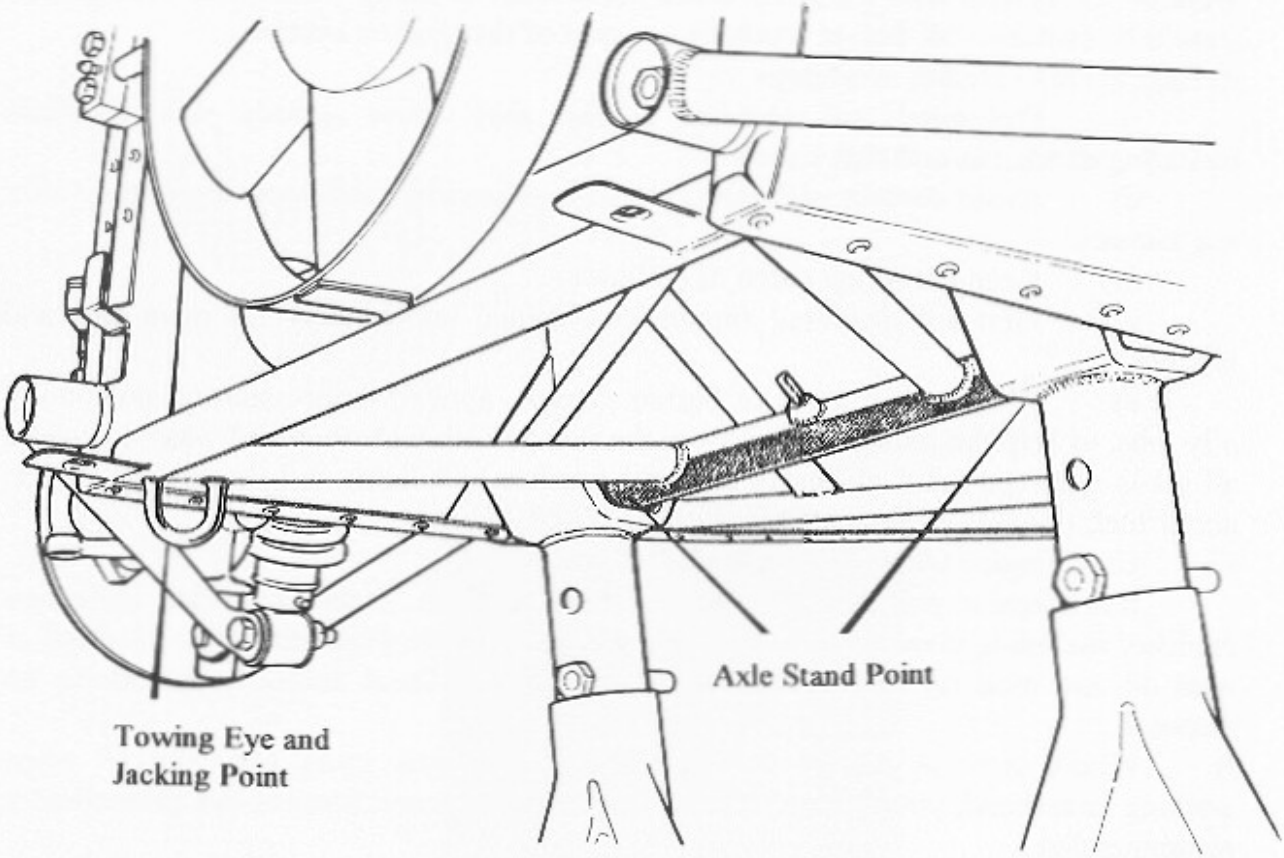
iv) First aid treatment should be obtained immediately for open cuts and wounds.

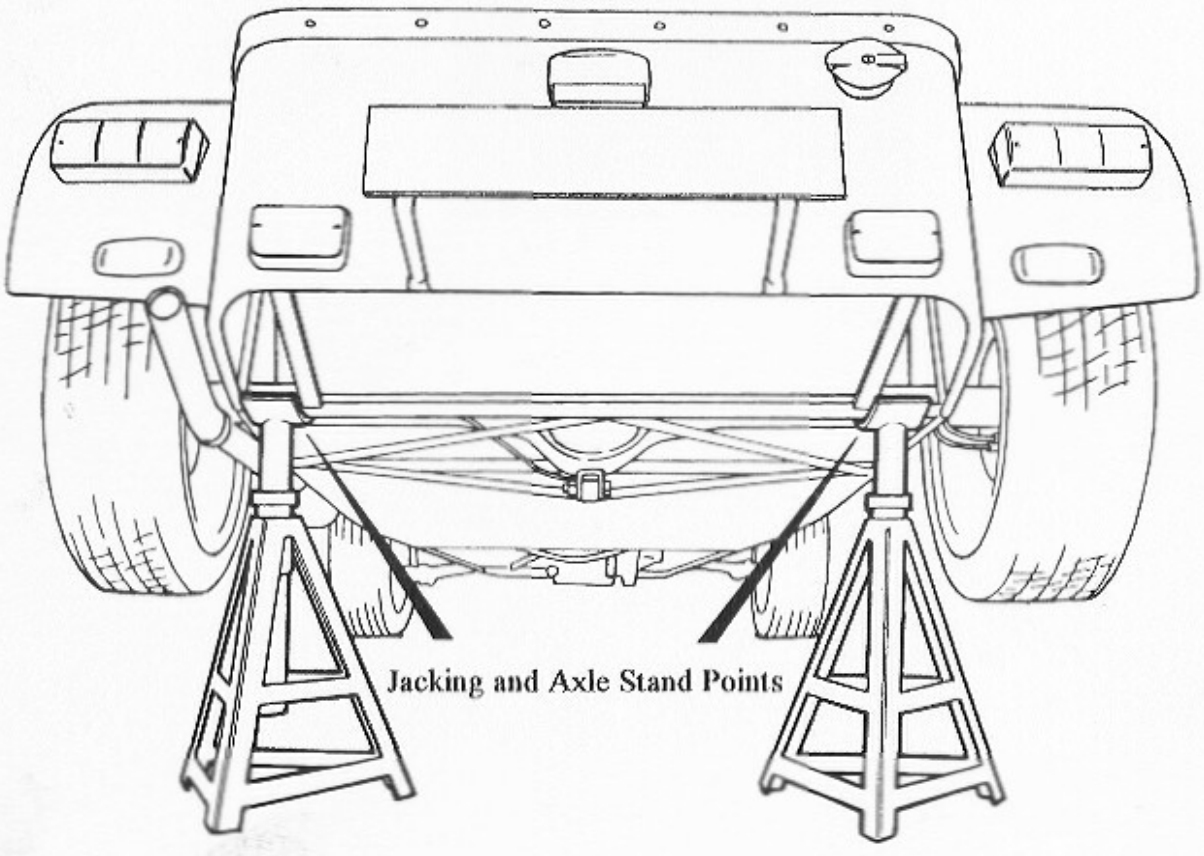
v) We advise the use of barrier creams, applied before starting potentially oily jobs, to help the removal of oil from the skin. Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help) and do not use petrol, diesel fuel, thinners or solvents for washing skin.

E) Used Engine Oils - Protect the Environment:-

It is illegal to pollute drains, water courses and soil. Authorised waste collection facilities including civic amenity sites and garages provide facilities for the disposal of used oil and used oil filters. If in doubt contact your local authority for advice on disposal.

f) Where there is risk of particles getting into your eyes, for example when working underneath your car or while drilling or filing some form of eye protection is recommended.


Towing Eye and
Jacking Point
Axle Stand Point


Jacking and Axle Stand Points

SECTION 4

ASSEMBLY OF FRONT UPRIGHTS

Contents

4.1 Introduction

1.1 All new kits, both Classic and De Dion, are supplied with the front uprights assembled and ready to fit to the car. This section is still included in the assembly guide for maintenance and service purposes however.

1.2 The front upright fitted on Classic live axle cars is common to the MK IV Triumph Spitfire with the exception of the brake pads. We strongly advise however, that new items are used as both the braking and suspension systems are safety critical. De Dion uprights are unique to Caterham and sections 4.2 and 4.3 below referring to the trunnions do not apply.

4.2 Trunnion Assembly

2.1 The first step applicable to live axle cars only is the assembly of the two front trunnions which are handed left and right. Refer to diagram 4.1 for clarity. Assembly is identical for each side as follows:-

2.2 Lightly grease one of the smaller steel washers and place over the top hat bush, lip facing outwards and press into the trunnion using a vice. Repeat with the second top hat bush into the other side.

2.3 Push the stainless steel bush duly greased through the hole in the top hat bushes, again using a vice.

2.4 Slip a rubber sealing washer over the outside of the top hat bush and clip the larger steel washer, again well greased, around the outside of this so as to leave the bush and rubber seal enclosed and hence dirt proof.

2.5 Hold this assembly together temporarily either with the 7/16" bolt provided or a tywrap until later assembly onto the front wishbone.

2.6 Repeat this exercise for the other side. Note that the trunnion kits include a rubber bush with a steel insert. These are not needed.

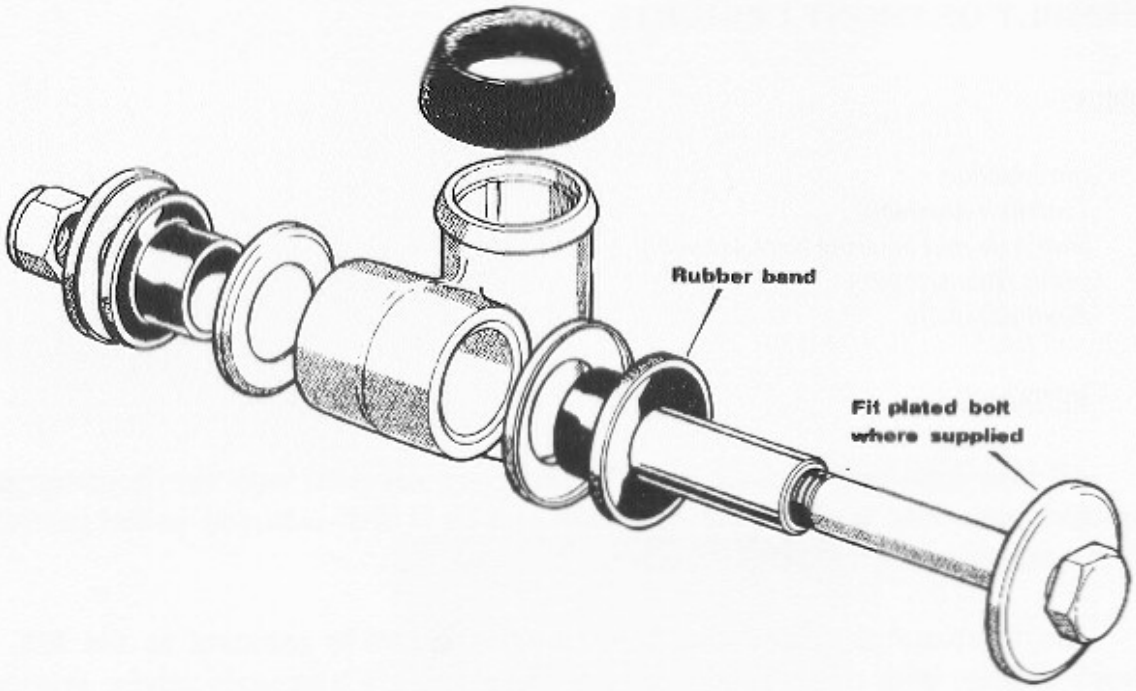


Figure 4.1 Front Trunnion Assembly

2.7 The appropriate trunnion should be half filled with Hypoid 90 oil and then screwed onto the bottom of the upright with the rubber dust cover sandwiched above the trunnion. Please note that the left hand trunnion has a left hand thread. The front uprights are clearly marked L.H. and R.H..

2.8 The trunnion should be wound up by hand to the limit of its travel and then unwound until it can rotate freely. This should only be by about one turn and if at first it seems too stiff, repeated screwing and unscrewing will loosen it.

2.9 The rubber seal at this point should be in firm contact with both trunnion and upright. If there is a gap then the trunnion will need to be wound up further. While this is happening, oil will ooze out around the seal and also the hole for the "grease" nipple.

2.10 When assembled, insert the "grease" nipple and tighten lightly using a 3/32" AF spanner. Fill the trunnion with more oil until it oozes around the seal once again. A good quality grease gun can be filled with oil for this purpose but do not use grease as this will go hard in service leading to premature wear of the trunnion.

4.3 Stub Axle and Steering Arm Assembly

3.1 Degrease one of the stub axles, which are not handed, using petrol or thinners and insert into upright as shown in figure 4.4.

3.2 Select the appropriate steering arm and assemble onto the upright according to the diagram using a 1/2" nyloc nut (3/4 AF spanner) on the end of the stub axle and a 7/16" x 1 7/8" bolt and lock washer to attach the steering arm noting that to obtain the correct spacing one of the red washers supplied should be inserted between the upright and steering arm. The steering arm should face forward in a horizontal position.

Torque settings:	Stub axle	60-65 lbft
	Steering arm to upright	22-27 lbft

3.3 Should cycle wings have been opted for, the stays which locate onto the front upright should be fitted at this stage using a thin 1/2" UNF nyloc fitted to the stub axle in place of the standard thickness nyloc.

4.4 Front Hub Assembly

4.1 Fit both the inner and outer taper roller bearing housings into the hub casting. Referring to figure 4.2., note that the larger bearing fits into the inner housing and both need to be pushed fully home into the hub. This can be done either using a vice or by tapping into place with a hammer and a suitable drift, taking very great care not to damage either the hub or the bearing face.

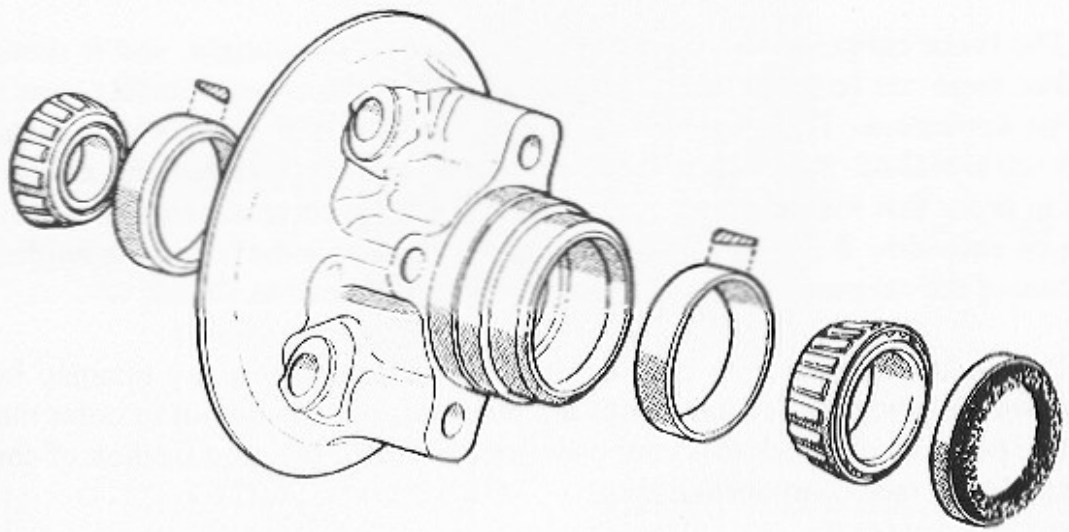


Figure 4.2 Front Hub Assembly

4.2 Pack the inner bearing race liberally with grease, along with its housing, and place in position.

4.3 The dust cover should now be pressed into place retaining this bearing. Note that the metal side should face the bearing and the felt outer acts as a dust seal against the upright when fitted. This is a tight fit and may prove very difficult to achieve with a bench vice and hammer alone. Ideally it should be fitted using a press and if your

local garage cannot help you, Caterham Cars will happily fit this for you on appointment.

4.4 The brake discs should now be relieved of their protective coating, methylated spirit is ideal for this job, and fitted to the hubs using four 3/8" x 1 1/2" bolts with shakeproof washers under the bolt heads. These bolts should be torqued to 22-27 lbft.

4.5. Final Assembly

5.1 The hub/disc assembly can now be fitted onto the stub axle. Push the assembly firmly home and ensure that the outer bearing race is pushed into place in its housing. The large washer with the half-moon centre should be fitted over the hub spindle to locate and protect the bearing and the 1/2" castellated nut screwed into place.

5.2 Because this is a taper roller assembly, the nut should be done up until all trace of free play in the bearings is eliminated, but not so tightly that the free spinning of the hub is restricted.

5.3 The split pin should be fitted through the hole in the hub spindle which should line up with one of the slots in the castellated nut. If it does not, slacken the nut slightly. Check for free running or play, and finally clip the dust cap into place.

5.4 The brake caliper assembly can now be fitted to the upright, and it should be noted that these are handed. In either case the bleed nipple and flexible pipe input should be uppermost. These are secured using 7/16" x 1 1/4" bolts which should be torqued up to 40-45 lbft, with the pink spacing washers between the caliper and upright in order that the caliper is positioned correctly relative to the disc with equal spacing on each side. It is very important that you check that the four bolts holding the two halves of the caliper itself together are correctly tightened to 30 lbft.

5.5 The brake pads can now be fitted into the calipers. These are retained by the two pins which, when the retaining clips are removed, can be slid out in order that the pad can be positioned. Check that your pads are correct for the specification of car that you are building. (see component listing)

5.6 Use a little copperslip on the edges and back of the pads to prevent seizure and assemble into the caliper. Note that the anti-squeal shims fit between the pad and the caliper piston and ensure that the little arrows stamped on them reflect the normal (forward) direction of travel.

5.7 The retaining pins should be slid into place (it does not particularly matter whether from the inside or outside of the caliper) capturing both shims and pads, and are locked using the spring clips.

5.8 Repeat for the other side and leave in an upright position to prevent leakage of oil from the trunnions.

Bolt Size	Usage	Torque
7/16"UNF x 1 7/8"	Steering arm to upright	22-27 lbft
1/2" nyloc	Stub axle	60-65 lbft
3/8"UNF x 1 1/2"	Brake disc to hub	22-27 lbft
1/2" castellated	Front hub nut	see text
7/16"UNF x 1 1/4"	Brake caliper bolts	40-45 lbft

Table 5.7 Front Uprights - Torques

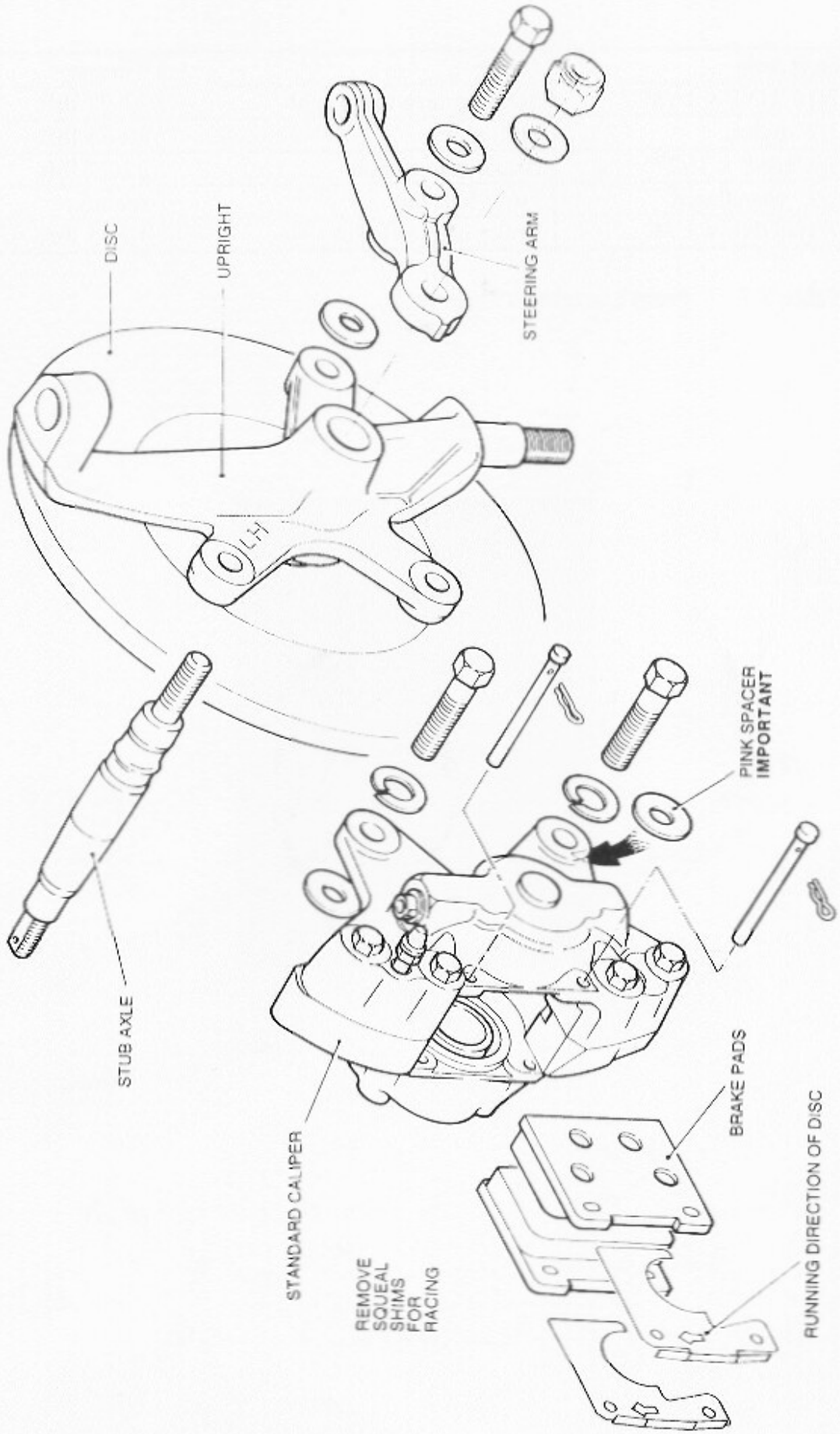


Figure 4.3.1 Front Upright Assembly

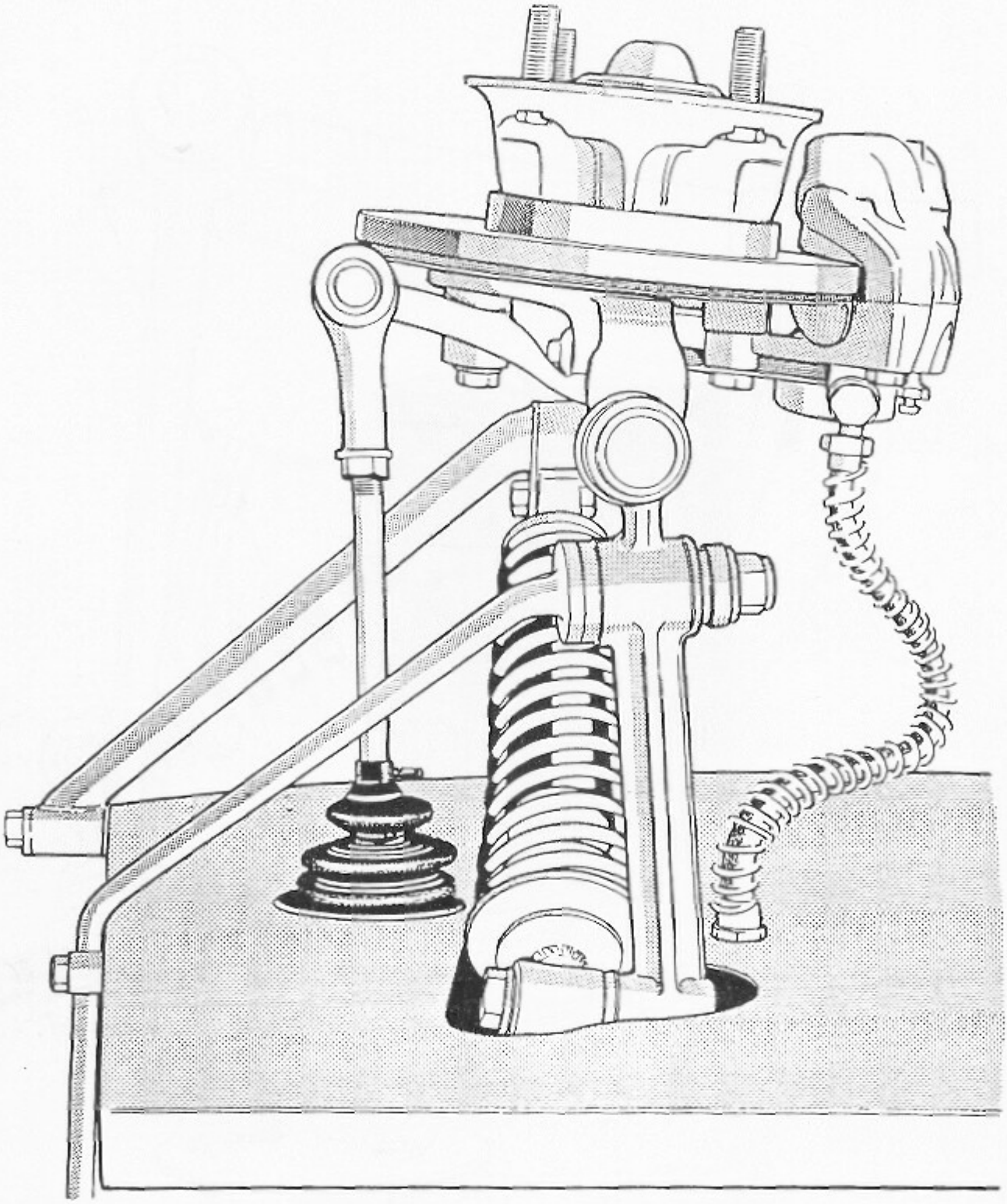


Figure 5B.1 Front Suspension (Classic) - Top View

Bolt Size	Usage	Torque
1/2"UNF x 4"	Damper & upper link to chassis	40-45 lbft
5/16"UNF x 2 3/4"	Anti roll bar blocks	12-15 lbft
1/2" nyloc	Anti roll bat to upper link	20 lbft
1/2"UNF x 3 1/2"	Lower wishbone rear mount	40-45 lbft
5/16"UNF x 1"	Lower wishbone front mount	12-15 lbft
1/2"UNF x 2 1/2"	damper to lower wishbone	40-45 lbft
7/16"UNF x 2 3/4"	wishbone to trunnion	30-35 lbft
7/16" nyloc	Toplink to upright	20-25 lbft

Table 5.1 Front Suspension - Classic - Torques

faces forwards so as any exposed thread is to the rear of the wishbone and thus relatively safe from dirt. Do not fully tighten at this stage.

4.2 Locate the front upright assemblies onto the lower wishbones securing through the trunnions with the 7/16" x 2 3/4" bolts with plain washers each end and 7/16" AF nyloc nuts. You should note that the steering arms must face horizontally forwards. Cycle wingstays should be fitted to the upright before the uprights are fitted to the car. (see section 4.3.3)

4.3 Again, these should not be fully tightened at this stage. Note that when assembling both the uprights and damper units onto the wishbones the fit will be a little tight. Do not be tempted to use an ordinary hammer to help line up the mountings since this can cause damage, but use a soft copper/hide or plastic/rubber hammer instead. Final lining up can be carried out using a screwdriver. Avoid hammering the mounting bolts into place since this can damage the threads.

4.4 Finally attach the top of the uprights to the top links securing with the 7/16" AF nyloc nuts provided with the top link/knuckle joints, fully tighten to 20-25 lbft.

4.5 This completes assembly of the front suspension except for final tightening which should be done with the engine in the car and the wheels on the ground.

4.6 It is important to do it this way as the rubber bushes in the suspension should not be incorrectly preloaded by being stressed when not in the normal running position. Thus premature wear and slight handling irregularities will be avoided. This point is especially important if the car is to be used for competition purposes.

4.7 When carrying out final tightening please refer to the table of torques in Table 5.1. However the 1/2" nyloc nuts securing the anti-roll bar to the top suspension links should be tightened to no more than 20 lbft in order to obtain the correct preload in the bushes.

4.8 We recommend that Loctite is used when finally tightening the 5/16" x 1" bolts which hold the front of the lower wishbones to the chassis spindles, to prevent these loosening in service.

2.2 Note that unlike the spring damper assemblies, the top links are handed and when fitted should be angled forwards with the knuckle joint facing downwards. Do NOT tighten at this stage.

2.3 The anti-roll bar should be fitted next. Push two half bushes onto the threaded ends of the roll bar smearing well with rubberlube. The ends of the anti-roll bar locate through the holes provided in the top links and are held in place using the other halves of the bushes, 1/2" plain washers and 1/2" UNF nyloc nuts which should not be tightened yet.

2.4 Assemble the aluminium blocks onto the front of the chassis (noting that these are machined as two pairs) capturing the anti-roll bar and bolt into place using the four 5/16" x 2 3/4" bolts with the blocks drilled to take a grease nipple outwards. Insert the grease nipples, lightly tightening with a 9/32" AF spanner, and once the main locating bolts are tightened, fill with grease using a grease gun.

5.3 Front Suspension Assembly - Lower

3.1 Fit a lightly rubber-lubed half bush over each of the lower wishbone mounting spindles at the front of the chassis, stripped of powder coating (as in 1.3).

3.2 The front lower wishbones are handed and you should note that the damper location should end up lower than the front upright as shown in the diagram.

3.3 Select the appropriate wishbone and position its open end over the spindle and bush and using gentle pressure backwards, ease its other end, with the bush already fitted, through the corresponding slot in the body skin and line up with the lower rear mounting point.

3.4 Great care must be taken to avoid damage to the bodywork at this point and protection with masking tape is advised.

3.5 Secure the rear lower wishbone mounting with 1/2" x 3 1/2" bolt, washer, and nyloc, inserting the bolt from the rear with the washer against its head. Do NOT fully tighten at this stage.

3.6 Insert the other rubberlubed half bush into the forward end of the wishbone over the spindle and secure using a 5/16" x 1" bolt, springwasher and 5/16" x $1^{1}/4$" diameter plain washer. The spindles are threaded for this purpose, although care should be taken to avoid cross threading, and we suggest that the bolts are tested in these holes prior to actual assembly. Do NOT fully tighten at this stage.

5.4 Final Assembly

4.1 The coil spring damper units should now be attached to the lower wishbones securing with the 1/2" x 2 1/2" bolts and 1/2" AF nyloc nuts, noting that the bolt head

SECTION 5

FRONT SUSPENSION CLASSIC

Contents

5.1 Preparation

1.1 Please note that figures 5.1A and 5.1B are provided at the end of this section which show the general layout of the completed assembly. However before starting a small amount of preparation will be necessary.

1.2 If the front clamshell wings are removed, a simple task, access to the front suspension is considerably improved and indeed we suggest these are left off until after the engine is installed, both to ease access and to prevent any damage.

1.3 At the lower front of the chassis are found the spindles for locating the front wishbones. The powder coating should be removed from these and a light coating of grease will help with later maintenance.

1.4 The anti-roll bar is held onto the chassis with aluminium mounting blocks. The paint should be removed from the bar at the points where it passes through these so as to ensure free movement. In addition it is wise to trial fit the bar in its mounting blocks prior to fitment of any other suspension components to check that there is no binding when the fixing bolts are tight.

1.5 When assembling the front suspension, there is a risk that the aluminium body skin can be damaged, especially when fitting the top mounting bolt. It is therefore advisable, particularly with painted cars, to protect the bodywork with masking tape in key areas.

5.2 Front Suspension Assembly - Upper

2.1 Using a 1/2" x 4" bolt, washer and nyloc, assemble the coil spring damper unit and the top suspension link onto the upper mounting bracket on the chassis, noting that the damper rate adjusting screw is at the bottom and facing inward towards the centre line of the car. The bolt head should face forwards with the plain washer between it and the damper and great care should be taken not to damage the body skin.

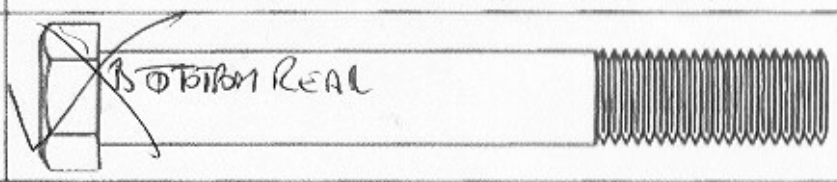
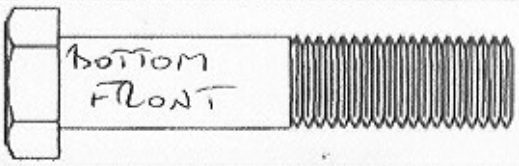
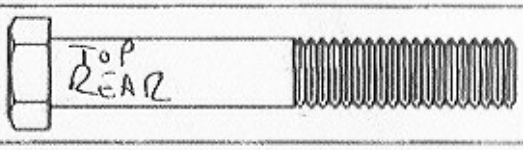
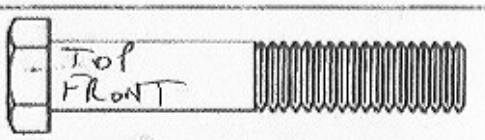
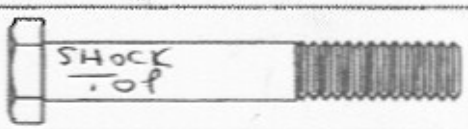
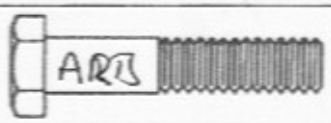
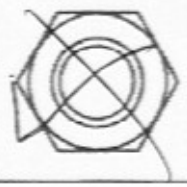
Plated

SERIAL NUMBER: 300325 PACK NUMBER:

08A V-Grade CATERHAM ZFS14

FASTENER PACK - FRONT SUSPENSION (All DeDion Cars)

Please note: This pack may include extra fasteners to cover different options.

DESCRIPTION	PART NO.	QTY	ILLUSTRATION (Actual Size)
Bolt 1/2" x 4" with plain section & Imperial (fine) threaded section	BF 1/2 x 4 V-Grade 10.9 **1**	2	
Bolt 1/2" x 2 1/2" with plain section & Imperial (fine) threaded section	BF 1/2 x 2 1/2 V-Grade 10.9 **2**	2	
Bolt 3/8" x 2 1/2" with plain section & Imperial (fine) threaded section	BF 3/8 x 2 1/2 V-Grade 10.9 **3**	2	
Bolt 3/8" x 2 1/4" with plain section & Imperial (fine) threaded section	BF 3/8 x 2 1/4 V-Grade 10.9 **4**	2	
Bolt 5/16" x 2 1/4" with plain section & Imperial (fine) threaded section	BF 5/16 x 2 1/4 V-Grade 10.9 **5**	2	
Bolt 5/16" x 1 1/2" with plain section & Imperial (fine) threaded section	BF 5/16 x 1 1/2 V-Grade 10.9 **6**	4	
Nut 1/2" Half Nut with Imperial thread & nyloc locking mechanism	NFYH 1/2 for 1 & 2 **7**	4	
Nut 3/8" Nut with Imperial thread & nyloc locking mechanism	NFYF 3/8 Top 3/8 For **9**	4	
Washer 5/16" Plain Washer Heavy Duty	WPH 5/16 Top SHOCK **11**	2	
Washer 1/2" x 1.1/8" Plain Washer Chamfered	WPH 1/2 **8**	18	
Washer 1/2" Spring Washer Heavy Duty	WSH 1/2 Bottom Front **10**	2	
Washer 5/16" Spring Washer Heavy Duty	WSH 5/16 ARB **12** Top SHOCK	6	

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FINAL TIGHTENING

20 Tighten the fixings detailed in Table 1 now.

TABLE 1 TORQUE FIGURES

Location	Washer	Torque
Stub axle		60 lbft (82 Nm)
Damper to lower wishbone (lower fixing)		15 lbft (20 Nm)
Damper to chassis (top fixing)		15 lbft (20 Nm)
Front anti-roll bar fixing		15 lbft (20 Nm)
Upright top ball joint	None	45 lbft (48 Nm)
Upright - bottom	Spacer - wide track only	45 lbft (61 Nm)

21 The remaining front suspension fixings should not be tightened until the suspension is loaded. This is achieved when the engine is in place and the car wheels are on the ground. This ensures that the rubber bushes are correctly preloaded. All bolts should then be tightened according to Table 2.

TABLE 2 TORQUE FIGURES

Location	Washer	Torque
Lower wishbone front	Spring under head then plain as shown in Fig 3 and Fig 4	60 lbft (82 Nm)
Lower wishbone rear	Plain spacers as shown in Fig 3 and Fig 4	60 lbft (82 Nm)
Upper wishbone front	None	25 lbft (34 Nm)
Upper wishbone rear	None	25 lbft (34 Nm)

CARS FITTED WITH ADJUSTABLE DAMPER PLATFORM

22 Cars fitted with adjustable damper platforms should be set to have a ride height of a minimum 75 mm under the sump with driver and passenger aboard. The rear of the car should then be adjusted to be approximately 15 mm higher than the front. This is achieved by lowering or raising the height of the platforms on the collar. Lower the collar to decrease ride height, raise the collars to increase ride height. At the end of adjustments ensure that the collars are locked together to avoid movement.

WARNING

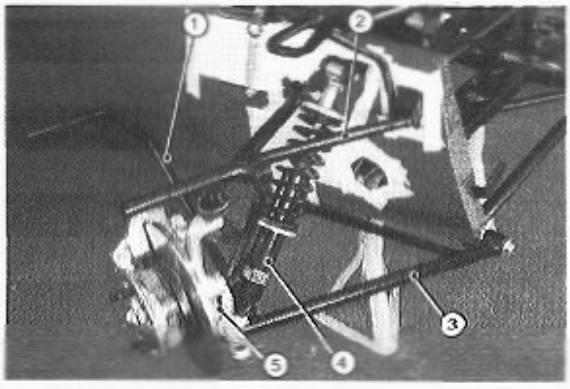
Correct use of fixings is required in order to ensure full engagement of the nyloc nut.

- **Wide track**. The upright is located into the spherical joint on the lower wishbone. Prior to locating the upright, a spacer (5/8" mm id x 3/4" od x 8mm) located in the polythene bag marked 'front suspension') must be inserted onto the bottom of the upright. The upright is secured using the special turned down nyloc nut supplied. Tighten the special nyloc nut to 40 lbft (54 Nm).

13 Pass the top wishbone ball joint down through the top of the upright and through the wingstay. Secure using the M14 nyloc nut. Tighten the nyloc nut to 45 lbft (61 Nm). To help the taper to grip in the vertical link smear a small amount of grease onto the tapered part of the ball joint and apply pressure to the top forcing it into the tapered part of the vertical link as tightly as possible. (Under no circumstances should this part be hit with a hammer).

14 Ensure the upright turns freely on the wishbones.

15 Your front suspension should now resemble that shown in Fig 4.



1 Cycle wing stay
2 Upper wishbone
3 Lower wishbone
4 Spring damper unit
5 Upright assembly

Fig 4 Front suspension (anti-roll bar not fitted)

FRONT ANTI-ROLL BAR

16 The anti-roll bar is attached to the front of the chassis using the special mounting brackets and cotton reel shaped bushes (supplied in the polythene bag marked 'front suspension'). Liberally coat the bushes with rubber lubricant and fit the bushes into the brackets. Slide the brackets over the ends of the anti-roll bar and around so they will align with the holes drilled in the front face of the chassis tube.

NOTE

Check that the colour of the bushes corresponds to the colour marked on the front anti-roll bar.

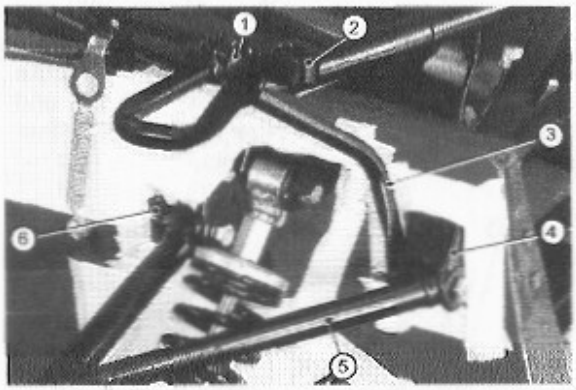
17 The rubber boots should be slid over the anti-roll bar, ensuring that the larger diameter of the rubber boot is outboard. Apply loctite to one end of the two threaded studs and screw into the threaded holes at each end of the anti-roll bar so that 15-18 mm of thread is left protruding. The plastic balls are fitted onto the threaded ends and tightened using protected grips. Ensure loctite is applied.

NOTE

With the smaller diameter front anti-roll bars the threaded stud is an integral part of the bar so only the rubber boots and the balls need to be fitted as described above.

18 Liberally coat the balls with bearing grease. Assemble the anti-roll bar onto the chassis by pushing the plastic balls, one at a time, into the mounting cups in the upper wishbones. Fit the spring washers (12) to the bolts (6) and pass forward through the vertical chassis tubes and into the captive nuts on the mounting brackets. Tighten to 15 lbft.

19 The rubber boots are slid over the plastic balls and secured to the top wishbone using cable ties which fit into the grooves provided. A further cable tie is used to hold the boot onto the anti-roll bar itself with the tails of the cable tie being cut off underneath for neatness.



1 Chassis mounting headlight bracket
2 Headlight bracket
3 Headlight bracket front arm
4 Upper wishbone front mount
5 Upper wishbone
6 Upper wishbone rear mount

Fig 3 Upper wishbone securing

8 The front leg of the upper wishbone is secured to the front mount using bolt (4). Prior to inserting the bolt the headlight bracket rear arm must be inserted into the chassis mount. The front arm is secured at the rear of the upper wishbone front mounting by nut (9). Do not tighten fixings.

SPRING DAMPER UNITS

9 An aluminium spacer bush 5/16" id x 1/2" od x 32 mm (polythene bag marked 'front suspension') must be coated in copper slip and inserted into the top mounting bush of the front spring damper unit. The spring damper is secured to the top mounting by bolt (5) with a plain washer (11) and a spring washer (12) under the bolt head.

NOTES

(1) It is necessary to gently press the body panel inwards to allow sufficient clearance for the bolt to be located.

(2) To prevent damage to the paintwork it is recommended that the plain washer and spring washer are placed closest to the spring damper mounting during bolt location.

10 An aluminium spacer 5/16" id x 1/2" od x 32 mm must be coated in copper slip and inserted into the lower mounting bush of the spring damper unit. The spring damper unit is secured using a 5/16" caphead bolt (supplied in wishbone) which passes through the rear leg of the lower wishbone through the aluminium spacer bush and into a captive thread on the front leg. This bolt should be torqued to 15 lbft (20 Nm).

NOTE

Do not tighten any other fixings at this stage.

UPRIGHT ATTACHMENT

WARNING

Correct use of fixtures is required to ensure full engagement of nyloc nut.

11 The cycle wing stay locates on the upright. Remove the 1/2" UNF nyloc nut and plain washer fitted to the stub axle and discard. Place cycle wing stay over the stub axle and secured using the thin 1/2" UNF nyloc provided.

12 Remove and retain the upper wishbone ball joint nyloc nut and the nyloc nut from the bottom of the upright assembly. The upright assembly must be mounted with the steering arm facing forward. Mount the upright assembly as follows:

NOTE

The upright assemblies are marked RHS or LHS on the inside of the assembly.

- **Standard.** The upright is located into the spherical joint on the lower wishbone and secured using the retained 1/2" nyloc nut. Tighten the nyloc nut to 40 lbft (54 Nm).

SECTION 3 - FRONT SUSPENSION

PREPARATION

1 It is recommended that the front wings are left unfitted until the front suspension is assembled and the engine installed. This will ensure that easy access to the engine bay etc is maintained.

2 When assembling the front suspension, there is a risk that the aluminium body skin can be damaged, especially when fitting the top mounting bolts and the spring damper units. It is therefore advisable, particularly with painted cars, to protect the bodywork with 2 or 3 layers of masking tape in key areas. It is recommended that the bodywork under the front bonnet catches is protected using card and masking tape. Fig 1 refers.

3 Apply a thin coat of copper slip to all fixings prior to fitment.

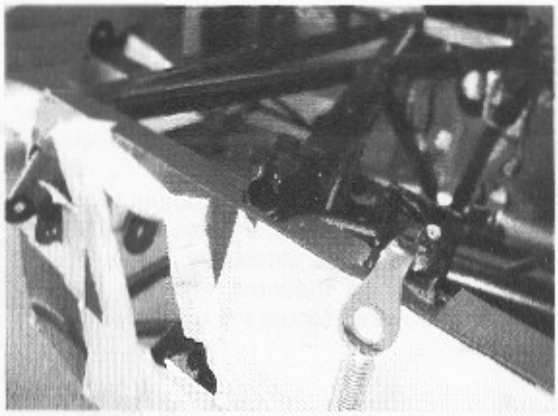


Fig 1 Bodywork protection

LOWER WISHBONES

WARNING

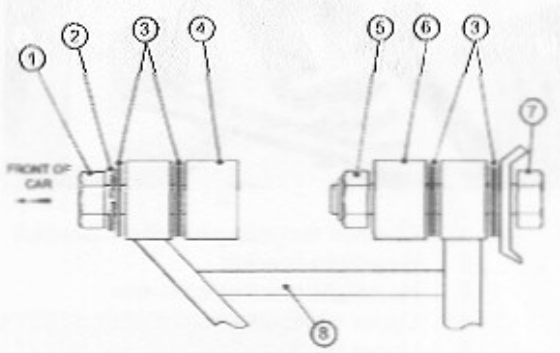
Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.

4 The lower wishbones are assembled with the longer leg forward and the circlip facing downward.

NOTE

Ensure the circlip is correctly located in the retaining groove prior to assembling the lower wishbone.

5 Fit the rear leg of the lower wishbone through the slot in the bottom skin immediately behind the vertical chassis member. Secure using bolt (Fastener pack ZFS14, Item (1)) and nut (7) and inserting two plain washers (8) either side of the wishbone. Fig 2 refers.



1 Bolt
2 Spring washer
3 Plain washer
4 Front chassis mount
5 Nyloc nut
6 Rear chassis mount
7 Bolt
8 Lower wishbone

Fig 2 Washer usage - lower wishbone

6 The front leg of the lower wishbone is secured to the front of the chassis using bolt (2), with washer (8) and spring washer (10) next to the bolt head. Two washers (8) are inserted between the wishbone and the chassis, Fig 2 refers.

UPPER WISHBONES

7 The upper wishbones are handed and are assembled with the longer leg facing the front of the car. Prior to locating the upper wishbone a spacer bush 3/8" id x 1/2" od x 35 mm (polythene bag marked 'front suspension'), must be inserted into the rear bush. The rear leg of the upper wishbone (Fig 3 refers) is secured to the rear mount using bolts (3) inserted from the front of the mounting. The spacer bush must be coated with copper slip. The bolt is secured with a nut (9). Do not tighten fixings.

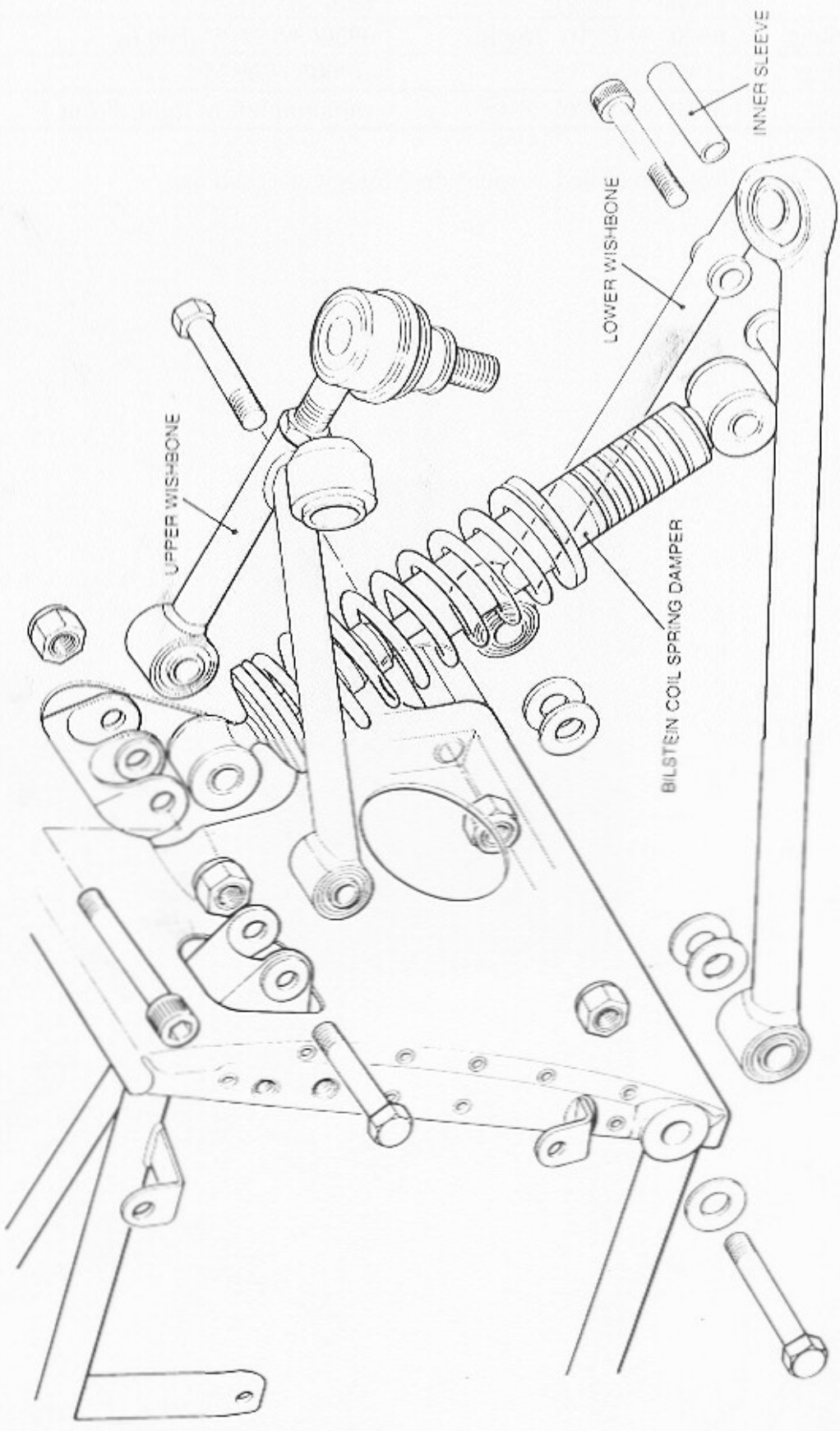


Figure 5A.1 Front Suspension Assembly - De Dion

	Front	Rear
Tracking	**0°20'** +/-0°10' Toe In	**0°30'** +/-0°15" Toe In
Camber	**-1°00'** +/-0°15'	**-1°00'** +/-0°15'
Castor	**3°30'** +/-1°00' (0°45'	variation left to right, Front)

Table 5A.7 Recommended Suspension Alignment - road use

5A.6 Final Tightening

6.1 The front suspension fixings should not be tightened until the engine is in place and the car's wheels are on the ground. This ensures that the rubber bushes are correctly preloaded and optimises handling. All bolts should be torqued according to table 5A.6

Bolt Size	Usage	Torque
1/2"UNF x 3 1/2"	Damper / upper wishbone mount	60 lbft
3/8"UNF x 2"	Upper wishbone - forward mount	20-25 lbft
1/2"UNF x 4"	Lower wishbone mounts	60 lbft
5/16"UNF x 2 3/4"	Lower wishbone to damper	12-15 lbft
M14 nyloc	upper balljoint	20-25 lbft
1/2" nyloc	lower wishbone to upright	40 lbft
5/16"UNF x 1 1/2"	Anti-roll bar brackets	12-15 lbft

Table 5A.6 Front Suspension Torques - De Dion

5A.7 Suspension Alignment

7.1 The front suspension is adjustable for both camber and castor angles and though the top wishbones normally come from the factory pre-adjusted you may wish to reset or change the basic settings. Factory recommended settings are therefore shown in the following table .

7.2 For your information, increased negative camber will tend to improve the car's turn in characteristics in fast corners but at the expense of possible tramlining on uneven surfaces and uneven tyre wear under normal conditions. The factory settings should therefore be adhered to except where the car is being prepared for motor sport.

7.3 The adjustment of castor is achieved by moving the lower front wishbone backwards or forwards in the chassis using spacing washers, therefore altering the effective kingpin angle in side elevation. Increasing the angle away from vertical will produce more pronounced self centring of the steering and hence a greater feeling of stability, but at the expense of heavier steering.

The Caterham factory has considerable experience with this suspension and would recommend distinctly different settings for race, hillclimb or sprint applications. For instance there is a range of different anti-roll bars available Contact Reg Price or Jez Coates at Dartford on 01322 559124 if you need advice.

5A.4 Front Upright Attachment

4.1 The ends of the top wishbones are threaded and the adjustable ball joints will have been fitted at the factory and set to the correct roadgoing camber settings. Do not therefore slacken the M16 fine thread lock nuts which prevent the joints from screwing in and out of the wishbones or the factory settings will be lost, leading to possible unbalanced handling and excessive tyre wear. However, for competition purposes, it does facilitate the re-setting of camber angles to fine tune the car's handling. Please check the locknuts for tightness.

4.2 The completed front upright assembly slots into the spherical joint in the lower wishbone, steering arm facing forward, and hangs from the ball joint secured with a M14 nyloc nut which must be tightened to 20-25 lbft. The bottom of the upright is secured using a 1/2" nyloc nut which is tightened to 40 lbft. Check that the upright swivels freely when tightened. Cycle wingstays should be fitted to the upright before the upright is assembled onto the car. (see section 4.3.3)

4.3 If the upper balljoint nyloc nut cannot be fully tightened because the balljoint is rotating, the taper of the balljoint has not fully engaged in the upright. To get around this, gently tap the balljoint into the upright with a soft faced hammer.

5A.5 Front Anti-roll Bar Attachment

5.1 The anti-roll bar is attached to the front of the chassis using special mounting brackets and cotton reel shaped rubber bushes. Fit the bushes into the brackets using plenty of rubber-lube and, again using lube, slide both brackets over the ends of the anti-roll bar and round until they align with the holes drilled in the front face of the chassis tubes.

5.2 When these mountings have been fitted onto the bar, the rubber boots and their securing bands should be slid over the anti-roll bar, ensuring that the larger diameter of the boot is outboard. Apply Loctite to the 10mm stud, then screw the plastic ball fully home. Now screw the plastic ball and stud into the threaded end of the anti-roll bar. Liberally coat the balls with grease. Do not fit the stud to the bar first, as this will leave insufficient thread to support the ball.

5.3 Assemble the anti-roll bar onto the chassis by pushing the plastic balls, one end at a time, into the mounting cups in the top wishbones and hold it in place using 5/16" x 1 1/2" bolts passed forward through the vertical chassis tubes and into the captive nuts on the mounting brackets, again using "Loctite". These bolts can be tightened immediately.

5.4 The rubber boots are slid over the plastic balls and secured to the top wishbone using the plastic bands which slip over the boot and hold it into the machined grooves provided. A smaller band is used to hold the boot onto the anti-roll bar itself.

2.3 DO NOT TIGHTEN any fixings at this stage and in particular be aware that cars fitted with clamshell wings, the wingstays are fitted using the same 1/2" caphead bolts as the dampers. Refer to Miscellaneous Section 9.16.1.

5A.3 Front Suspension - Lower

3.1 The front lower wishbones are handed, and are assembled with the longer arm forward and the circlip downward, as per Fig 5A.1. Each wishbone is fitted with a 1 3/16" OD, 5/8" ID spherical joint which is held in place with a circlip. Take care to ensure that this circlip is correctly located.

3.2 Fit the rear leg of the wishbone in place through the slot in the lower bodywork immediately behind the vertical chassis member and attach using a 1/2" x 4" bolt, plain 1 1/8" washers and nyloc, the bolt facing backward with two 3mm thick washers on either side of the wishbone as in figure 5A.3.2.

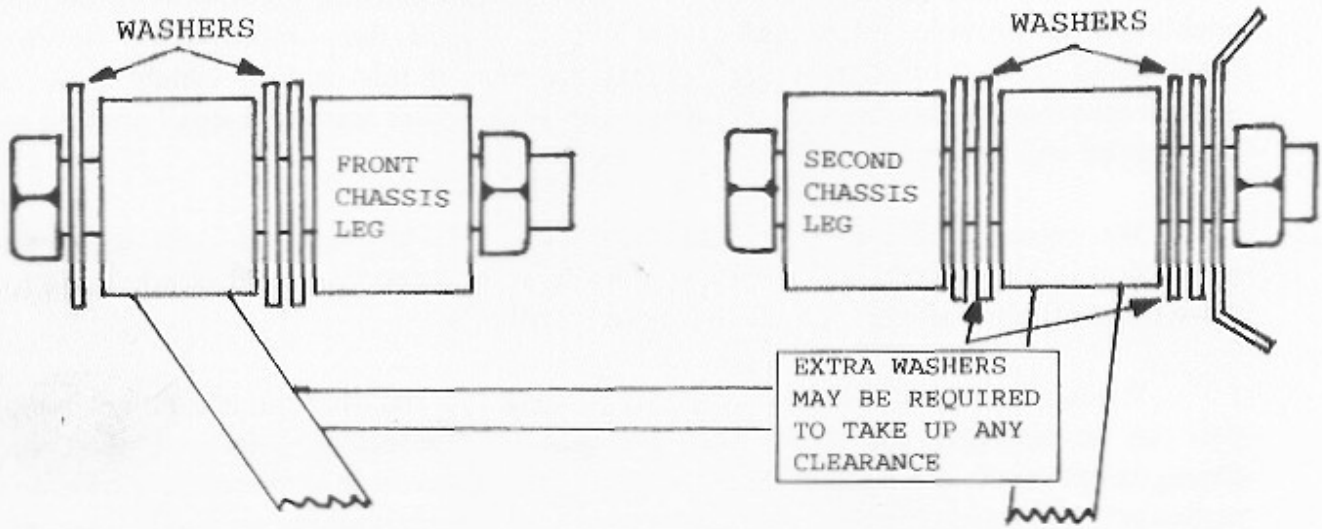


Figure 5A.3.2 Washer Usage - Left Hand Lower Wishbone

3.3 The front leg attaches similarly to the front of the chassis using a 1/2" x 4" bolt, plain 1 1/8" washers and nyloc facing rearwards with both a washer under its head and two 3mm washers between the wishbone and the front of the chassis.

3.4 You will note that the distribution of these washers may need to be altered to allow for any tolerances in the wishbone. Redistribution will also enable subsequent adjustment of castor angles.

3.5 The spring damper unit is attached to the lower wishbone using a 5/16" x 2 3/4" caphead bolt which passes through the rear leg of the wishbone, through a 1/2" OD aluminium bush which fits into the lower damper eye, and into a captive thread in the front leg. This bolt requires no washer, but should be "Loctited" in place.

DO NOT TIGHTEN any fixings at this stage.

SECTION 5A

FRONT SUSPENSION DE DION

Contents

5A.1 Preparation

1.1 De Dion cars are fitted with a revised front suspension incorporating double wishbones to provide better Castor angle control and thus improve the Seven's roadholding. Please refer to figure 5A.1 at the rear of this section which shows a general overview of this suspension layout. However before starting a small amount of preparation will be necessary.

1.2 We recommend that front clamshell wings are left unfitted until the front suspension is assembled since access is considerably easier. Indeed it is advisable to leave these off until after the engine has been installed.

1.3 When assembling the front suspension, there is a risk that the aluminium body skin can be damaged, especially when fitting the top mounting bolts and when the spring damper units are hanging down against the bodywork. It is therefore advisable, particularly with painted cars, to protect the bodywork with masking tape in key areas.

5A.2 Front Suspension - Upper

2.1 Using a 1/2" x 3 1/2" caphead bolt, washer and half nyloc, assemble the Bilstein coil spring damper unit and the rear leg of the upper wishbone onto the upper mounting bracket on the chassis, the wishbone slotting into the mounting located behind the damper. Feed the bolt in from the front, taking great care not to damage the body skin. At the same time, the forward end of the upper wishbone should be slotted into place in the mounting bracket on the chassis and attached using a 3/8" x 2" bolt and nyloc.

2.2 If racing specification Bilstein dampers have been chosen these should be fitted with their threaded ends downwards so that coil springs can be changed without removing the dampers from the chassis.

SECTION 6

STEERING

Contents

6.1 Standard Rack Fitment

1.1 The steering rack (steel bodied) is held in position by two aluminium mounting blocks which are drilled as pairs. These blocks clamp the rack in position as they are bolted in place on the front rack platform. Initially, therefore, clamp the rack into place loosely using the 1/4" x $2\frac{3}{4}$" bolts, nylocs and washers ensuring that a washer is placed between the steel bolt heads and the aluminium blocks and the aluminium spacers (provided with Classic live axle cars only) are fitted between the blocks and the rack platform, 1/4"x 3" bolts should be used. The rack will be tightened later when the column is correctly positioned.

1.2 Note that both of the blocks are drilled to take a grub screw and locking nut. This prevents the rack from moving in its mountings and should be left loose for the time being. The steering rack is unique to the Seven and cannot be substituted.

6.2 Aluminium Quick Rack

2.1 When a quick rack is fitted, which can be recognised by the Caterham script cast into the aluminium casing, grub screws are not required to locate the rack. The rack clamps supplied will not have any provision for grub screws. See figure 6.2

2.2 When fitted on live axle cars, two 1/8" rack clamp spacers will be required under each rack clamp to raise the rack.

6.3 Steering Column

3.1 The upper steering column slides over the lower column enabling a small amount of adjustment to suit the individual driver, and also prevent it moving backwards in an accident.

3.2 In view of the width of Rover and Vauxhall engines and for ease of assembly with Ford engines, the steering column should not be fitted until after the

engine has been installed as otherwise it is difficult to install the right hand side engine mounting.

3.3 All chassis are now fitted with an enclosed pedal box assembly through which the steering column passes and since this box is sealed to prevent water ingress, the steering column passes through two rubber grommets. It will be necessary to remove the lid covering this before the lower column can be fitted. (see Fig 6.3)

3.4 Supplied with your basic kit is a flat aluminium plate with a large rubber grommet in the middle. This is used to seal the hole in the front of the footbox through which the steering column passes. Before fitting the lower column therefore the plate should be slid over it, but not secured to the front of the footbox at this stage. The inside of the grommet should be smeared with rubber lube to both prevent wear and ensure water tightness.

3.5 Similarly, a folded aluminium box fits over the steering column at the back of the pedal box containing a second identical grommet which should also be smeared with rubber lube. Again do not secure at this stage (see Fig 6.3).

3.6 Align the rack and column to clear the engine oil filter assembly before securing these plates in place. Both plate and box are pre-drilled therefore the only drilling needed is into the front and top of the footbox/pedalbox. Use the rubber grommets to ensure the column passes through the plates centrally and mark and drill 5/32" holes in order to pop-rivet them into place, using silicone sealant to ensure waterproofing. In order to drill the holes for fixing the rear box a right angled drive drill will be necessary, although as a temporary measure the sealant on its own will hold the box in place.

3.7 The lower half of the column should be positioned first. Slide the column into position through the dashboard, under the brake master cylinder, through the pedal box and down towards the rack, splined end downwards.

3.8 Attach the universal joint to the splined end of the column noting how the clamping 5/16" x 1 3/8" bolt and nyloc fit into the cutaway provided. Fit the lower end of the universal joint onto the rack, again clamping with the bolt and nyloc and tighten both bolts.

3.9 The upper half of the column can now be fitted, but a small amount of preparation is advised first. The column is located into a tube within the dashboard by two rubber/metal/nylon bushes. In order to ensure free movement, it will be helpful if you polish the column where it locates into the bushes with some fine wet and dry paper. The lower bush will already be located in the chassis but the upper

one has to be fitted and this should be a close, but not overtight, fit onto the column, which is where the polishing helps.

3.10 Slide the upper half of the column down through the dashboard and telescope it over the lower half. The two halves are held together by the locking clamp. Tighten the two outer 1/4" x 1 1/2" bolts first with the grub screw loose and then tighten the grub screw with an allen key to eliminate any free play in the steering. Lock the assembly with a 7/16" locknut.

3.11 Fit the upper bush into the locating tube under the dashboard, noting how the rubber bumps on the bush locate it. If the rubber is lightly greased, it should push into place easily, but if trouble is encountered, it will help to chamfer off the inner edge of the rubber bumps with a sharp knife.

6.4 Tightening and Alignment

4.1 Fit the steering wheel onto its centre boss using the nuts and bolts provided. Temporarily fit the wheel onto the splined end of the upper column and check that the boss does not foul the dashboard. Clearance can be adjusted by slackening the clamp and sliding the two halves of the column relative to each other.

4.2 The track rod ends can now be fitted to the rack along with their locking nuts. These will need to be painted with Hammerite or similar first and as an approximate guide should be screwed on by 22 turns each in order to get the tracking roughly correct. The outer ball joints should now be attached to the steering arms and the 9/16" AF nuts tightened to 20-25 lbft, noting that the threaded ends face downward onto the arms.

4.3 Turn the steering from lock to lock and check that the universal joint does not foul any part of the chassis and that the tyres do not foul the body panels. If it does, adjust the position of the rack accordingly. At the same time you should centralise the standard type rack in the chassis as closely as possible by measuring the gap between the tyre and the bodywork on full lock either side. This process is not necessary with a quick rack.

4.4 When you are happy that the rack is correctly positioned, tighten the bolts holding the mounting blocks. Please note that when the engine is installed there is not much clearance between the lower column and the oil pump housing on Ford engines. We advise that final tightening be left until it can be easily checked.

N.B. When cycle wings are specified a different rack has to be fitted to prevent the wings from fouling the bodywork. This rack gives 2 1/4 turns lock to lock as against 2 3/4 turns of the normal version and necessarily a poorer turning circle. Quick racks are suitable for both flared and cycle wing cars

4.5 In addition, to finally secure the standard rack, remove the grub screws and locking nuts from the mounting blocks and drill slight depressions in the rack so as to give the grub screws, when fitted, a good key to prevent the rack either moving from side to side or twisting. Refit the grub screws, tighten with a 2.5 mm allen key and the lock nut with an 8mm spanner, taking care not to overtighten.

4.6 With the engine installed and the wheels on the ground, the tracking can be set by slackening the lock nuts, rotating the track rods and retightening the lock nuts again. Make certain that the adjustment is made at both ends so that the same amount of thread is visible on each track rod.

4.7 Correct wheel alignment should be 20 minutes toe in, see rear of front suspension section.

6.5 Final Assembly

5.1 Before fitting the steering wheel, it will be necessary to fit the horn contact ring into the top of the steering column bush in the chassis. This is an interference fit and will need to be gently tapped into place. The electrical lead from this ring must be connected to the black/purple lead in the wiring loom adjacent to the steering column. This is not used with Momo or Racetech wheels, which have a pushbutton on the dash (see section 9.7)

5.2 Attach the steering wheel to its boss using the small screws and nuts provided taking care not to damage the front faces of the screw heads or to scratch the black anodised finish on Motalita wheels. Slide the horn contact pencil into the hole in the boss.

5.3 If a Momo or Racetech wheel has been specified the boss needs to be fitted to the column before the wheel is fitted. Momo wheels use 6mm x 16mm panhead allen bolts and Racetech wheels use 6mm x 10mm countersunk allen bolts.

5.4 Establish the straight ahead position and fit the steering wheel onto the column over its splines. Lock this in position with the 1/2" half nyloc nut and washer and tighten firmly. Connect the wire from the horn contact pencil to the underside of the spring loaded steering wheel centre cap and finally clip the centre cap into position.

5.5 Before driving the car on the road, recheck the tightness of all nuts and bolts in the steering system.

Bolt Size	Usage	Torque
1/4"UNF x 2 3/4"	Steering rack clamps	5-8 lbft
5/16"UNF x 1 3/8"	Column U.J. bolts	12-15 lbft
1/4"UNF x 1 1/2"	Column clamp bolts	8-10 lbft
9/16" nyloc	track rod end to upright	20-25 lbft

Table 6.1 Steering Component Torques

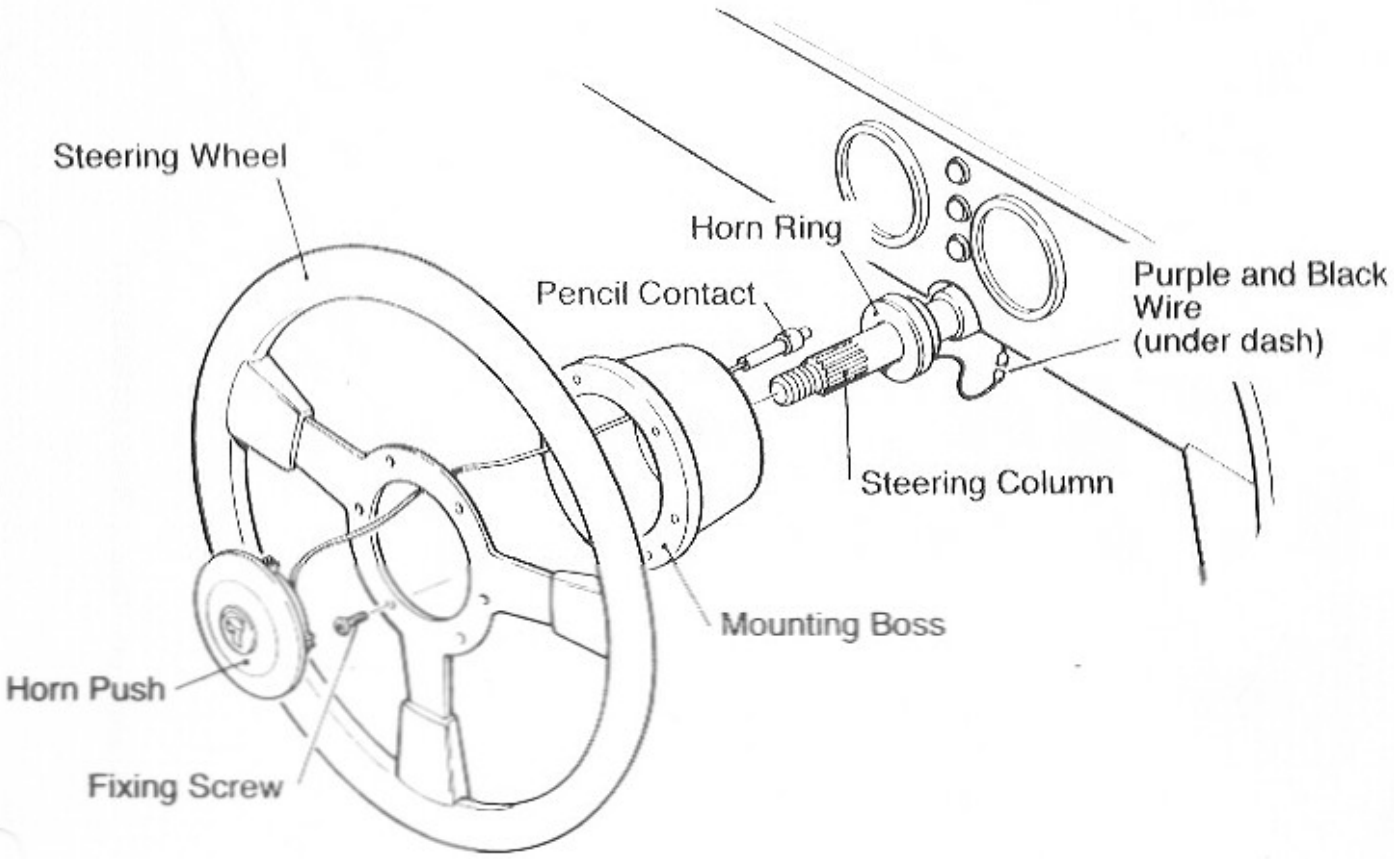


Figure 6.5 Horn Push - Mountney and Motalita Wheels

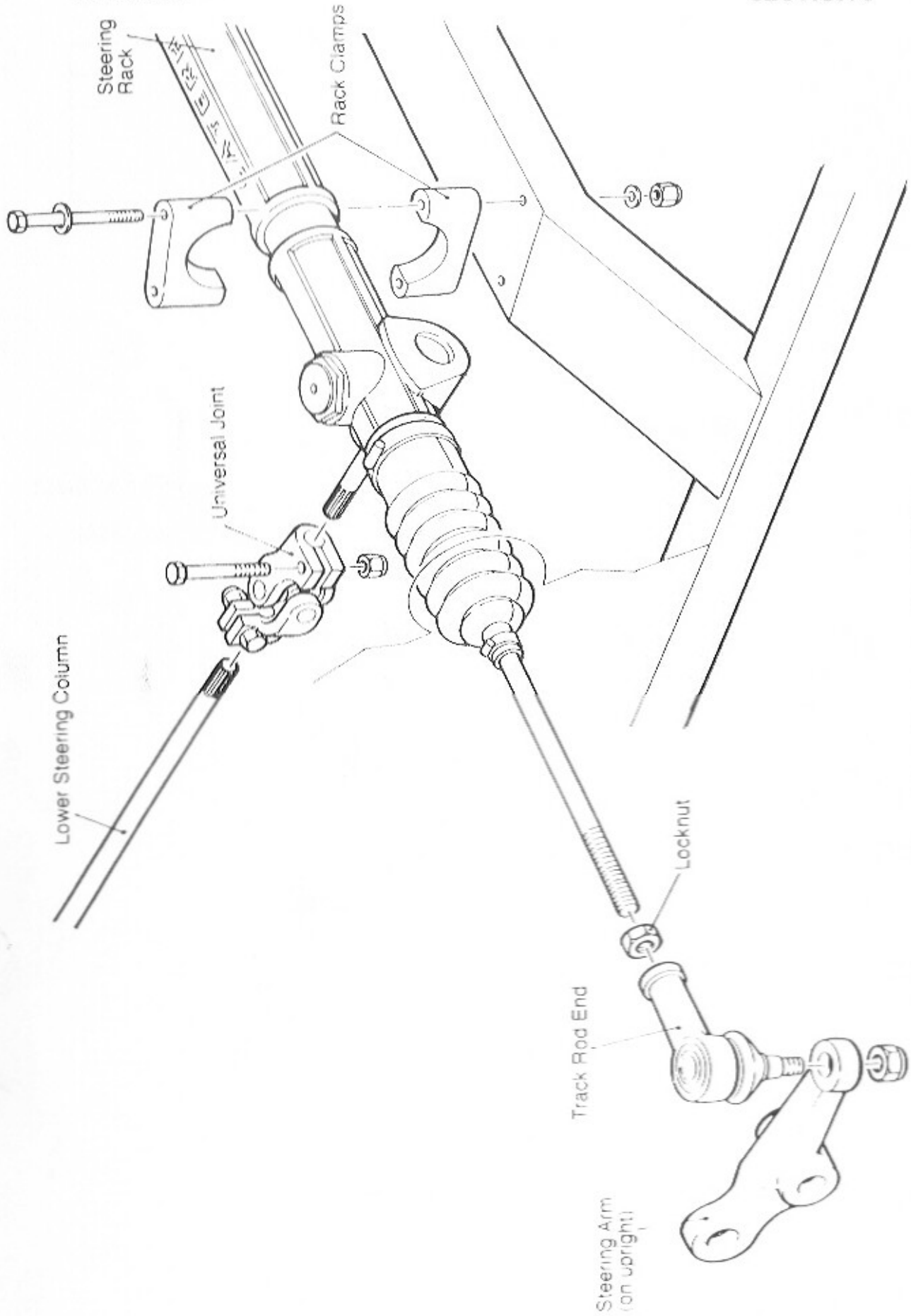


Figure 6.2 Quick Rack Assembly (De Dion)

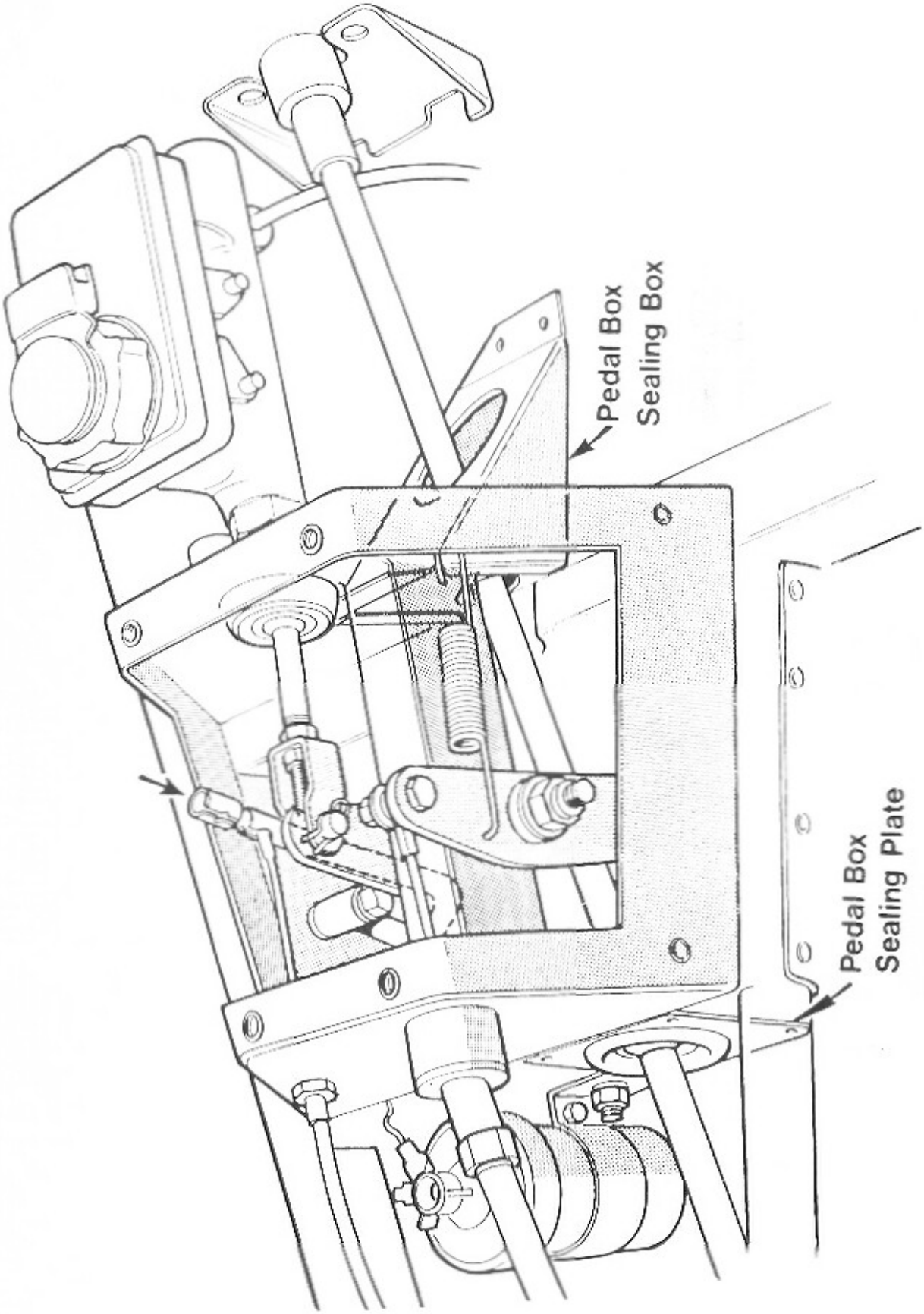


Figure 6.5 Steering Column Through Pedal Box

SECTION 7

REAR SUSPENSION - DE DION

Contents

7.1 The De Dion kit as supplied by Caterham Cars includes all the parts necessary to assemble the De Dion axle including differential, hubs and disc brakes.

It is possible to source the differential second hand as it is a Ford Sierra item, and the kit is available without this item if a used item is preferred. The driveshafts and hub assemblies, however, although using Sierra constant velocity joints, are specially manufactured for the Seven. Please note that the Sierra Cosworth differentials will not fit a Seven as they are physically too large.

7.2 Installation of Differential

2.1 Before fitting the differential unit, the locating lug on the top rear of its casing must be removed since this can foul the De Dion tube at the full extent of its travel. Exactly 3/4" should be removed from the lug. If too much metal is cut away there is a danger that the differential casing will be holed.

2.2 Fit the plastic breather pipe to the top of the diff unit ensuring the 'pips' are aligned. This part is a tight fit

2.3 Attach the propshaft to the nose of the differential using four special blue bolts, without washers, which are torqued to 42 lbft using 'loctite' to make absolutely certain they do not come loose in service. Before fitting this however, check that you have been supplied with the correct item, the Vauxhall/Rover propshaft being 26 1/2" long, the Ford 28" long, and that the other end is a smooth sliding fit into the back of your gearbox. If not call Caterham at once.

2.4 Insert the completed assembly into the transmission tunnel and hang the differential from its upper mounting using the 1/2" x 11" bolt, not securing at this stage.

2.5 The lower, forward mounting is attached to the chassis using two special 12mm x 65mm, 1/2" shank bolts through the metalastic bushes with plain 3/4" diameter washers either side of each bush. The differential has to be located centrally in the

chassis and this can be achieved using further 3/4" diameter washers in equal numbers each side, taking up any clearances. Take care not to force too many washers between the chassis and differential since the small amount of free movement allowed by the rubber bushes will be eliminated, causing excessive noise and vibration to be transmitted into the car. However, all the play should be taken up by the washers. Thinner shim washers are supplied to allow this.

2.6 The 3/4" washers are important because they prevent noise and vibration shorting out between the differential and chassis, bypassing the sound absorbing qualities of the metalastic bushes.

2.7 It is advised that as a double check on the central location of the differential, you measure the distance between the outer edge of the differential and the inner edge of the outer chassis tubes, which should be identical within 2mm. (See figure 7.2)

2.8 Remove the ll" bolt from the upper mounting and centralise with the 3/4" washers in the same way. Tighten this to 4O lb ft.

2.9 · Tighten the two lower mounting bolts to 4O lbft.

2.10 The rear lower mounting points on the differential are redundant on the Seven.

7.3 Assembly of De Dion Tube

3.1 The video shows the De Dion tube being partially assembled before installation in the chassis, although these instructions assume that the builder will fit the De Dion tube and driveshafts first,attaching both rear De Dion ears and hub assemblies with the tube in the chassis. Either way, the rear wings should not have been fitted or access becomes difficult.

3.2 Place the De Dion tube into the chassis noting that the outer 'ears' face forward and the diagonal link mounting downward. This is a tight squeeze between the differential and petrol tank.

3.3 Fit both driveshaft assemblies into place inserting their inner (unthreaded) ends into the differential taking care not to damage the seals. These are handed left (nearside for a RHD car) and right (offside).

3.4 Fit the rear taper roller bearings into the hub carriers. These bearings are identical and supplied as matched pairs. The outer housings should be pressed into the hub carriers using either a vice or gently tapped into place using a hammer and suitable drift taking care not to damage the bearing face. If possible this job is better done using a press at your local garage. Note that each bearing outer housing should be fitted with its smaller inner diameter innermost into the hub carrier.

3.5 The inner races and the hub itself should be liberally packed with grease and the races then pushed into place. The seals can now be pressed carefully into position. (see diagram 7.3)

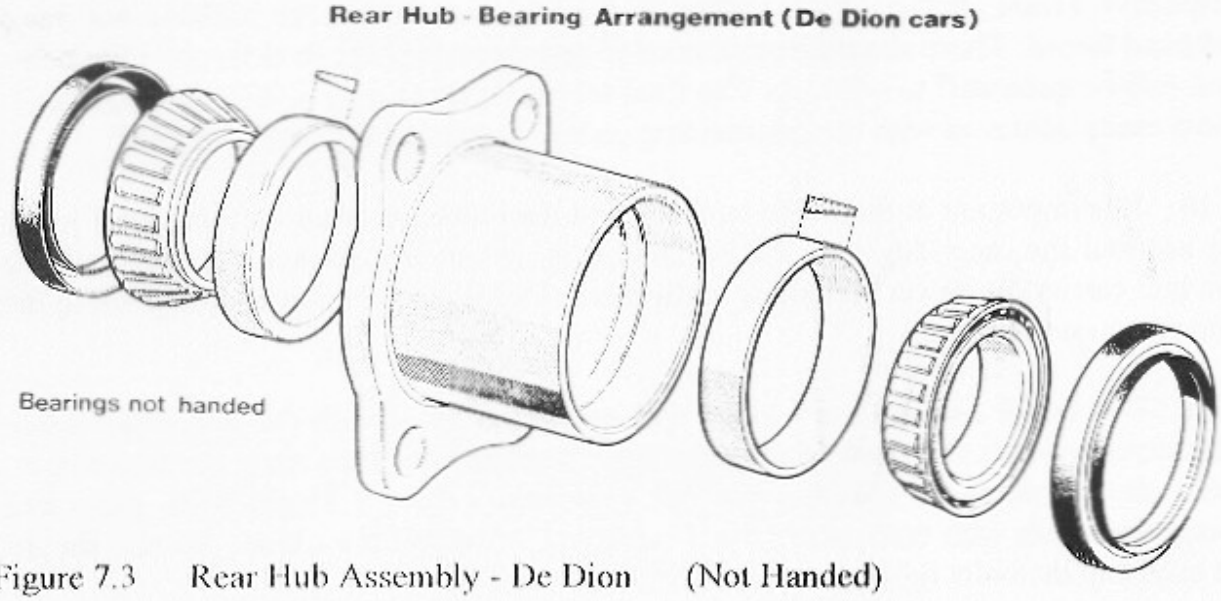


Figure 7.3 Rear Hub Assembly - De Dion (Not Handed)

3.6 Position one of the cast aluminium De Dion cars (these are not handed but the flange to which the brake calipers fit must be at the top) over one of the driveshafts and attach to the De Dion tube, noting that thin aluminium plates are fitted over the hollow ends of the tube. The holes in these plates are not symmetrical so ensure they align correctly. Bolt the ear into place using the 10mm x 40mm bolts with plain and spring washers into the tapped holes which are rearmost on the De Dion tube ear. It is possible that these bolts will not go fully home due to the depth of thread available. Should this be the case, add an additional plain washer in order to space out the bolt. Do not fully tighten at this stage, but when you DO, use Loctite to ensure these bolts do not work loose in service. (see Figures 7.3.8A & B).

Note that the countersunk small diameter holes in the ears are redundant and are for manufacturing purposes only.

3.7 Position the rear hub carrier the correct way up and slide this over the end of the driveshaft taking care not to damage the bearing seals. Bolt the hub onto the De Dion ear using 10mm x 55mm bolts, plain washers and nylocs at the front and 10mm x 65mm bolts and nylocs to the centre. The plain washers should be positioned against the alloy ear, but are not needed on the steel De Dion tube. All these bolts, including those fitted in 3.6 above, are tightened to 35 lb ft.

3.8 The rear hubs are specially manufactured items with their drive flanges machined to fit brake discs identical to those fitted at the front. The discs are bolted to the flanges using 4 3/8" x 7/8" UNF thin head bolts each side using Loctite and torqued to 30 lb ft. Ensure that mating surfaces are thoroughly cleaned as any dirt present can cause disc run-out.

3.9 Slide each of the rear hubs complete with brake discs onto the splined end of the driveshaft and ease into position through the seals into the hub carrier. Place a thick 22mm x 45mm diameter washer over the remaining thread and secure with the respective 41mm nyloc nut (LH plain, RH green), noting that the lefthand nut has a lefthand thread. These should be tightened to approximately 30 lb ft for the time being and will be quite stiff to wind up. The final torque on these nuts is 200 lbft and this is most easily achieved with the car standing on its wheels and the brakes applied.

3.10 It is important at this stage to check that the outboard driveshaft universal joints do not foul the inner edges of the De Dion ears. If they do, slacken the bolts holding the hub carrier to the ear and adjust until there is sufficient clearance. Retighten to the correct torque settings.

3.11 The brake calipers are handed and should be fitted with the handbrake cable abutments towards the front of the car. Slide over the disc, separating the brake pads, and bolt into place on the De Dion ears using the 10mm x 55mm bolts, plain and locking washers with the spacers fitted between the ear and the caliper. Loctite should be used and the bolts tightened to 35 lbft.

7.4 Assembly of Rear Suspension

4.1 Fit the radius or "Z" arms to the chassis with the offset inwards to provide maximum clearance to the brake calipers when fitted, noting that they are not exactly parallel to the chassis tubes. These are fitted using a 3/8" x 2" bolt into a threaded bush in the chassis with a large diameter plain washer under the head of the bolt.

4.2 There are two alternative positions for these arms, a higher location which will provide a slightly better ride and a lower location biased in favour of handling. In the lower position it may be necessary to trim the wing flange to gain adequate clearance around the radius arm front mounting. The lower mounting position is not threaded.

4.3 Attach the rear end of the radius arms to the brackets on top of the De Dion tube using the special 1/2" x 2 1/2" bolts and nylocs passed inward to the centre of the car, do not fully tighten yet. These bolts have threaded heads to which the lower ball joint of the anti-roll bar drop link will be attached.

4.4 It is imperative to check the clearance between the De Dion tube and the rear of the differential casing throughout its full arc of travel, particularly if the rear radius arms are fitted in the upper position. Relieve with a coarse file if necessary.

4.5 If it is intended that an FIA approved competition roll-over bar is to be fitted considerable time will be saved if it is installed now since once the spring/damper units are fitted it will not be possible to reach the roll bar fixings.

4.6 The rear spring/damper units are suspended from their mountings under the top of the spaceframe using 1/2" x 2 1/2" caphead bolts inserted through the access holes provided in the seat back panel. A light application of Loctite should be made and the bolts tightened to 40 lbft once the damper has been attached to the De Dion tube.

4.7 Slide a copa-slipped 1/2" x 5" bolt through the De Dion tube from the rear and secure the damper to the tube using a plain washer either side of the bush with a thin nyloc nut, checking that there is clearance between the protruding thread on the bolt and the rubber boot on the driveshaft.

4.8 The De Dion tube is located laterally using an "A" frame, which has bushes fitted to its forward ends and must be fitted the correct way up, which is with the frame itself below the centreline of the outer bushes. The De Dion tube has an "everymans" bush fitted where it attaches to the A frame.

4.9 Attach the "A" frame using a 1/2"x 2 1/2" bolt and a half nyloc nut with a 3/4" diameter plain washer on either side of the everymans bush. Secure the forward outer ends of the "A" frame to the mountings provided on the chassis using 1/2" x 4 1/2" bolts, large diameter plain washers and nylocs passing the bolts inward. A large diameter washer should be placed on either side of the A frame bush. Do not fully tighten these mountings yet. If competition use is envisaged, nylon race washers should be fitted as per figure 7.4-3.

4.10 To check that the De Dion tube is centralised in the chassis measure the gaps between the De Dion ears and the outer edge of the chassis tubes which should be identical to within 2mm. If not insert spacing washers between the chassis and forward ends of the "A" frame until an acceptable tolerance is achieved.

7.5 Rear Anti-roll Bar Attachment

5.1 The rear anti-roll bar is suspended above the differential from "U" bolt mountings immediately below the inertia reel seatbelt boxes with its blades facing rearward to pick up onto the De Dion tube through a vertical link.

5.2 The anti-roll bar is attached to the 5/16" "U" bolts pointing downwards under the inertia reel housings using split aluminium blocks similar to those holding the steering rack, with the thicker half of the block above the anti-roll bar. The bar is mounted using rubber cotton reel bushes sandwiched by these blocks and secured using plain washers and nyloc nuts. The Cotton reel bushes can be slid over the anti-roll bar with the help of a little rubberlube. Do NOT force these with a screwdriver, or they will stretch, hand pressure should be adequate.

5.3 The anti-roll bar is positioned horizontally in the car and its blades are connected to the radius arm brackets on the De Dion tube using two drop links. Attach the lower ends of each drop link to the De Dion tube by screwing them into the

threaded ends of the special bolts attaching the rear radius arms. The upper ends attach to the outer edge of the anti-roll bar blade and are secured with an 8mm nyloc nut.

5.4 The droplinks are installed at an angle - this is normal. The links should be adjusted to be as short as possible, whilst being equal in length, side to side.

5.5 The handling charactaristics of the car can be altered by re-positioning the drop links into alternative holes in the anti-roll bar blades. The rearmost hole is recommended for road use maximizing safe understeer, while the foremost hole increases the effect of the bar to bring in more oversteer.

7.6 Final Assembly

6.1 Fit the brass brake pipe union to the threaded stud protruding from the De Dion tube, input uppermost, and attach using a 1/4" UNF nyloc nut.

6.2 Bend the steel brake pipes to fit as tightly as possible to the De Dion tube and attach to both the union and respective brake caliper, tightening to 5-7 lb ft. This tubing is readily bent by hand, but take care to avoid any sharp kinks or bends of less than 1" radius since this can lead to weakening and possible brake failure. Due to the design of the calipers a small amount of movement needs to be taken up as the pads wear and therefore the brake pipes where they enter the caliper should not be bent tighter than a 3 to 4 inch radius. The use of flexible brake hoses here is not considered necessary.

6.3 Secure the brake pipes to the De Dion tube using the long ty-wraps provided and check carefully that the pipes do not foul any part of the suspension or chassis. **The pipe must run along the top of the tube, not the front**.

6.4 The handbrake cable can now be fitted. This is double ended and is designed to be attached to both rear calipers and to be pulled from the centre by the separate forward cable attached to the handbrake lever itself. (see Miscellaneous section). Feed the centre of the cable (inner only) up through the transmission tunnel and note that location points are provided for the cable outers at the differential end of the tunnel.

6.5 Unscrew the knurled nylon adjusters on the cable to ensure plenty of slack. Fit each end of the cable into the respective brake caliper, noting that the cables are above both 'A' frame and the lower chassis rail. The inner ends of the cable are fed through the abutments in the caliper and hooked over the brake levers. The cable outer is secured by the caliper body.

6.6 The rubber grommets which have been fed over both ends of the cable should be attached to the chassis diagonal tubes using Ty-wraps. This prevents the cables from contacting the driveshafts or the chassis tubes as the suspension moves.

6.7 Finally attach each half of the cable to the unused lower mont of the differential with the rubber lined 'P' clips supplied. Undersized bolts should be passed through the large threads to secure the 'P' clips.

6.8 In order to avoid any incorrect preloading of the rubber bushes in the suspension, the securing bolts should be tightened with either the wheels on the ground or the car's weight taken by the De Dion tube. Axle stands are ideal for this purpose.

6.9 Tighten all the bolts through rubber bushes securing the rear suspension as follows. The 1/2" bolts should be torqued to 60 lb ft and the radius arm bolts to 35 lbft. The radius arm bolts should have an application of loctite immediately before being torqued up and the weight of the car should be on the suspension also.

6.10 Finally, with the wheels on the ground and the brakes on, torque the rear hub nuts to 200 lb ft. Since most domestic torque wrenches do not reach this figure, it may be necessary to visit your local garage for assistance. Alternatively these nuts can be attended to at Caterham Cars if your car is brought in to us for its post build check. On no account must the car be driven until these nuts are correctly tightened.

6.11 41mm sockets are available from Caterham under Part No. 79067 and since this is a 3/4" drive socket, appropriate adaptors to 1/2" are also available.

Bolt Size	Usage	Torque
1/2"UNF x 11"	Upper diff bolt	40 lbft
M12 x 65mm	Lower diff bolts	40 lbft
M10 x 40mm	De Dion ears	35 lbft
M10 x 55mm	Hub carrier - front	35 lbft
M10 x 65mm	Hub carrier - rear	35 lbft
3/8"UNF x 7/8"	Disc to drive flange	30 lbft
41mm A/F	rear hub nut	200 lbft
M10 x 55	Calipers to ears	35 lbft
3/8"UNF x 2"	Radius arm front	35 lbft
1/2"UNF x 2 1/2"	Upper damper mount	60 lbft
1/2"UNF x 2 1/2"	Radius arm to De Dion tube	60 lbft
1/2"UNF x 5"	Lower damper mount	60 lbft
1/2"UNF x 2 1/2"	A frame to De Dion tube	60 lbft
1/2"UNF x 4 1/2"	A frame to chassis	60 lbft
5/16" nyloc	Anti-roll bar clamps	7-10 lbft

Table 7.1 De Dion Rear Suspension - Torque Settings

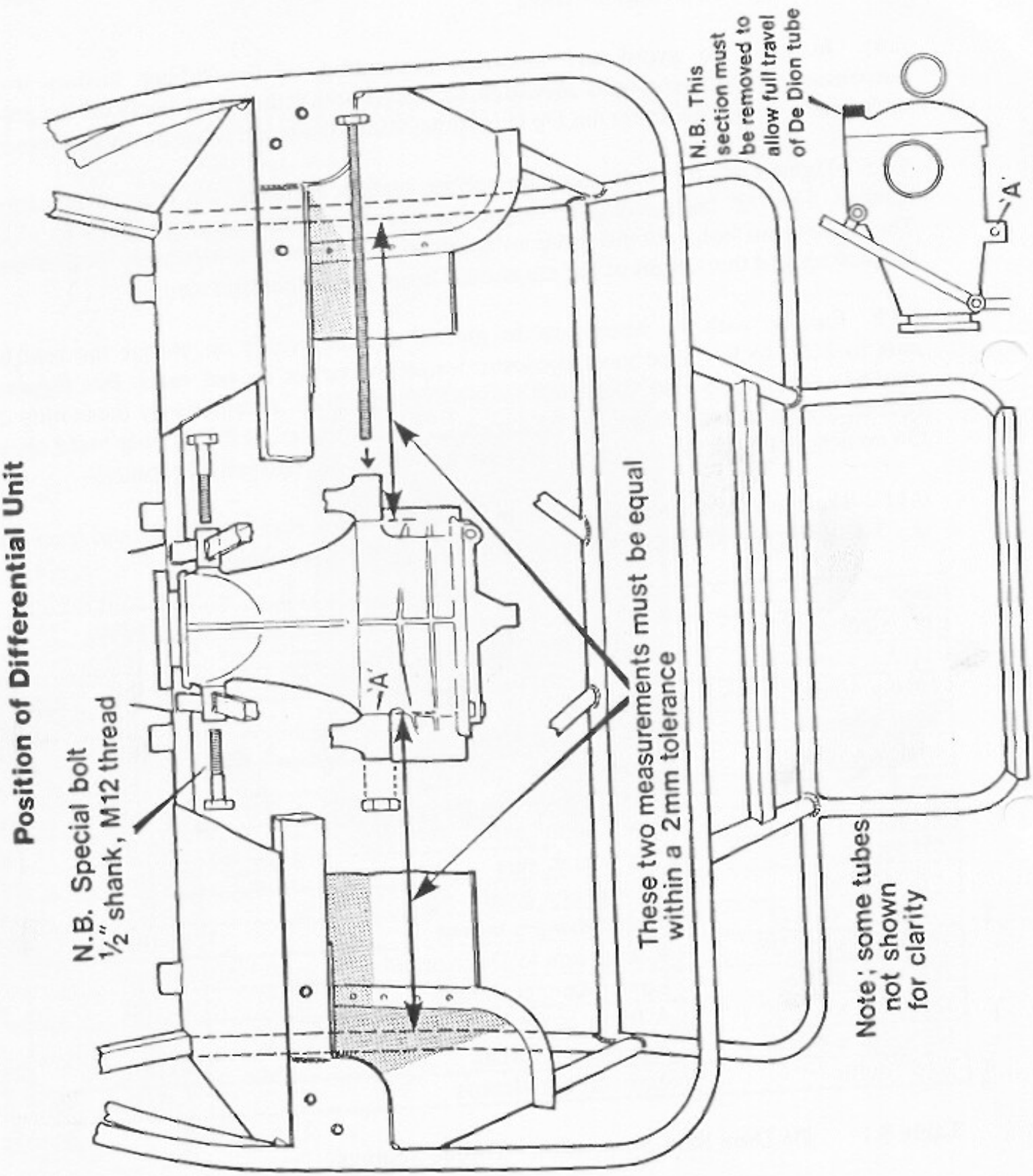


Figure 7.2.1 Position Of Differential Unit

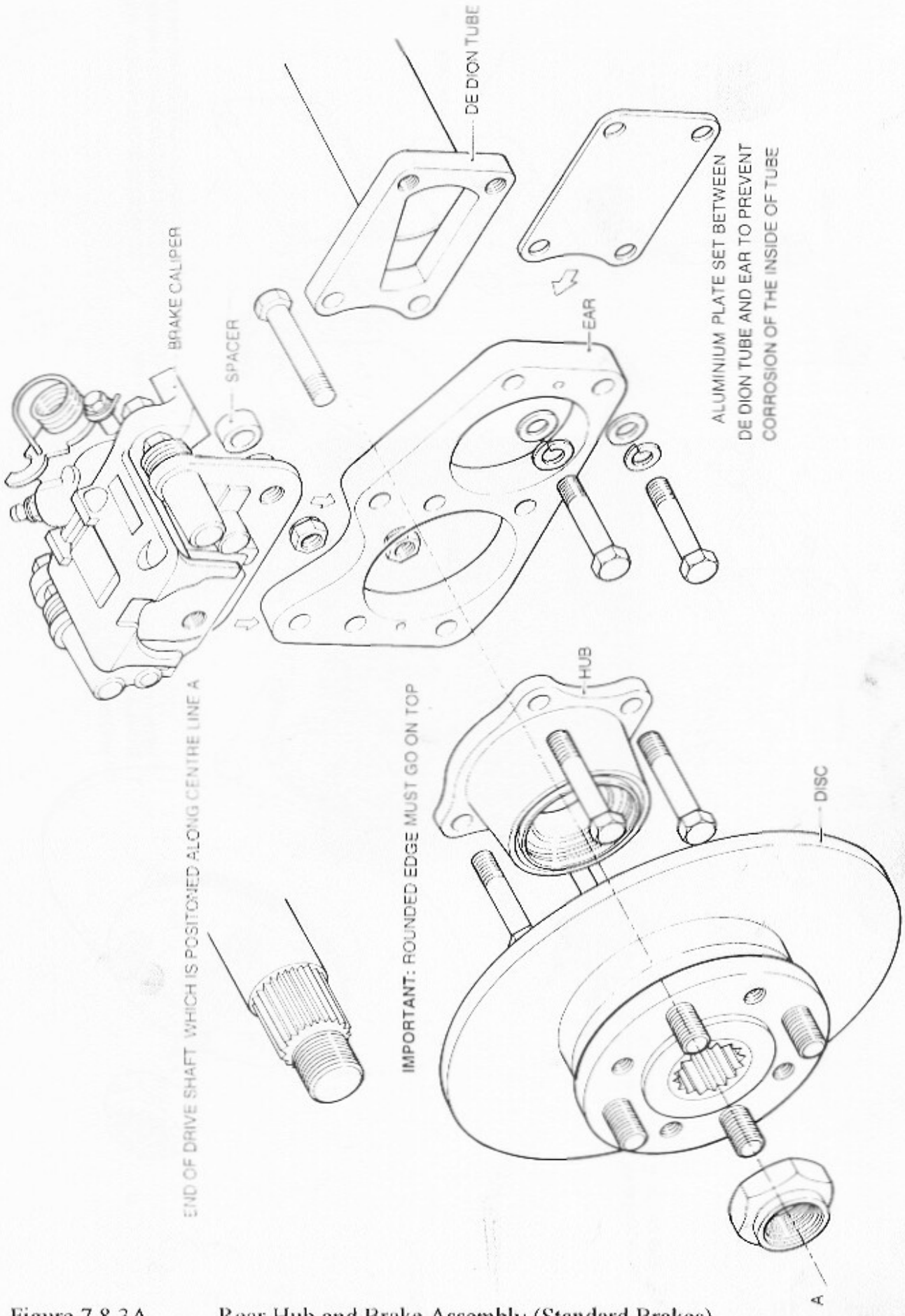


Figure 7.8.3A Rear Hub and Brake Assembly (Standard Brakes)

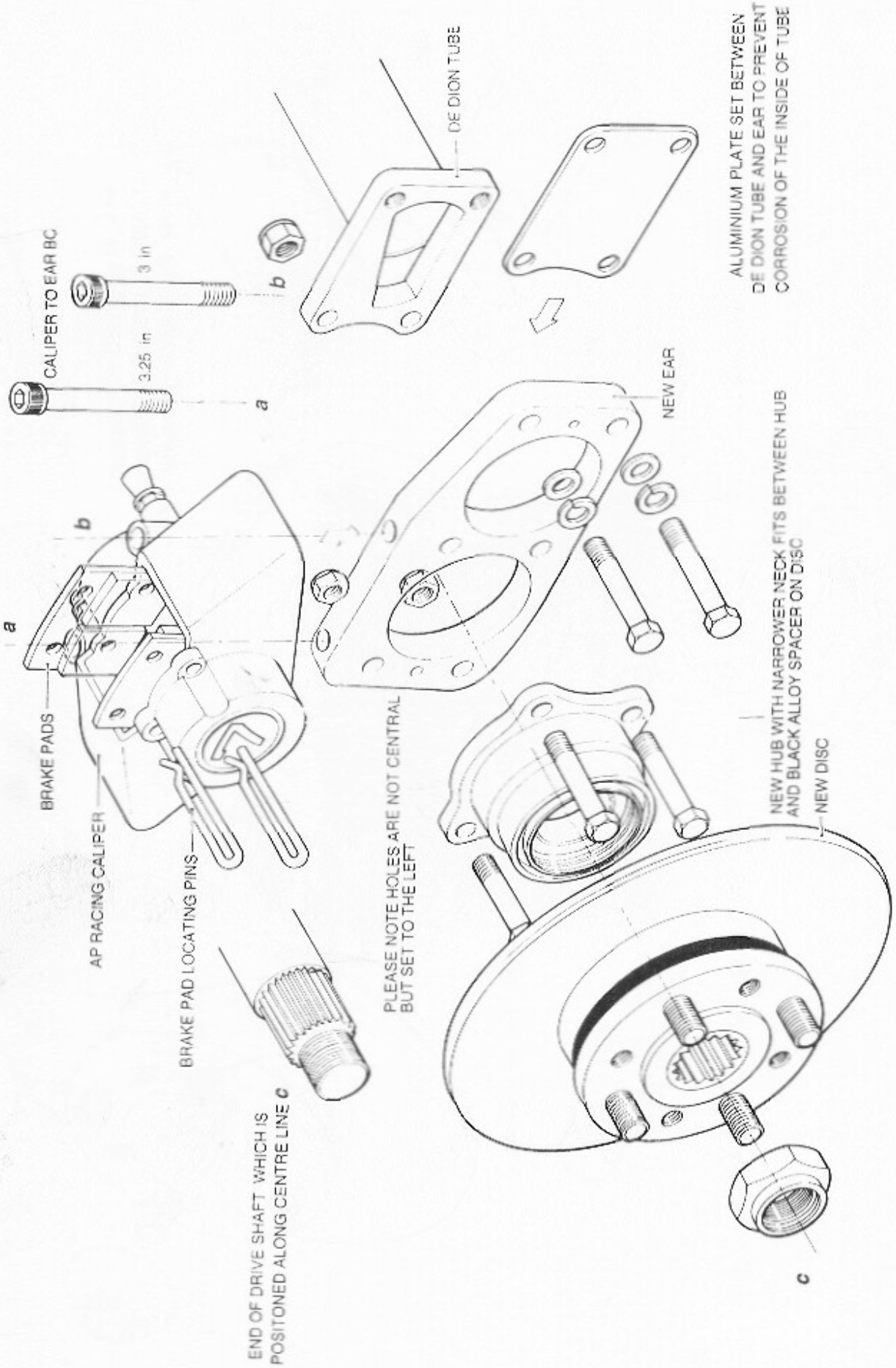


Figure 7.3.8B Rear Hub and Brake Assembly (Uprated Brakes)

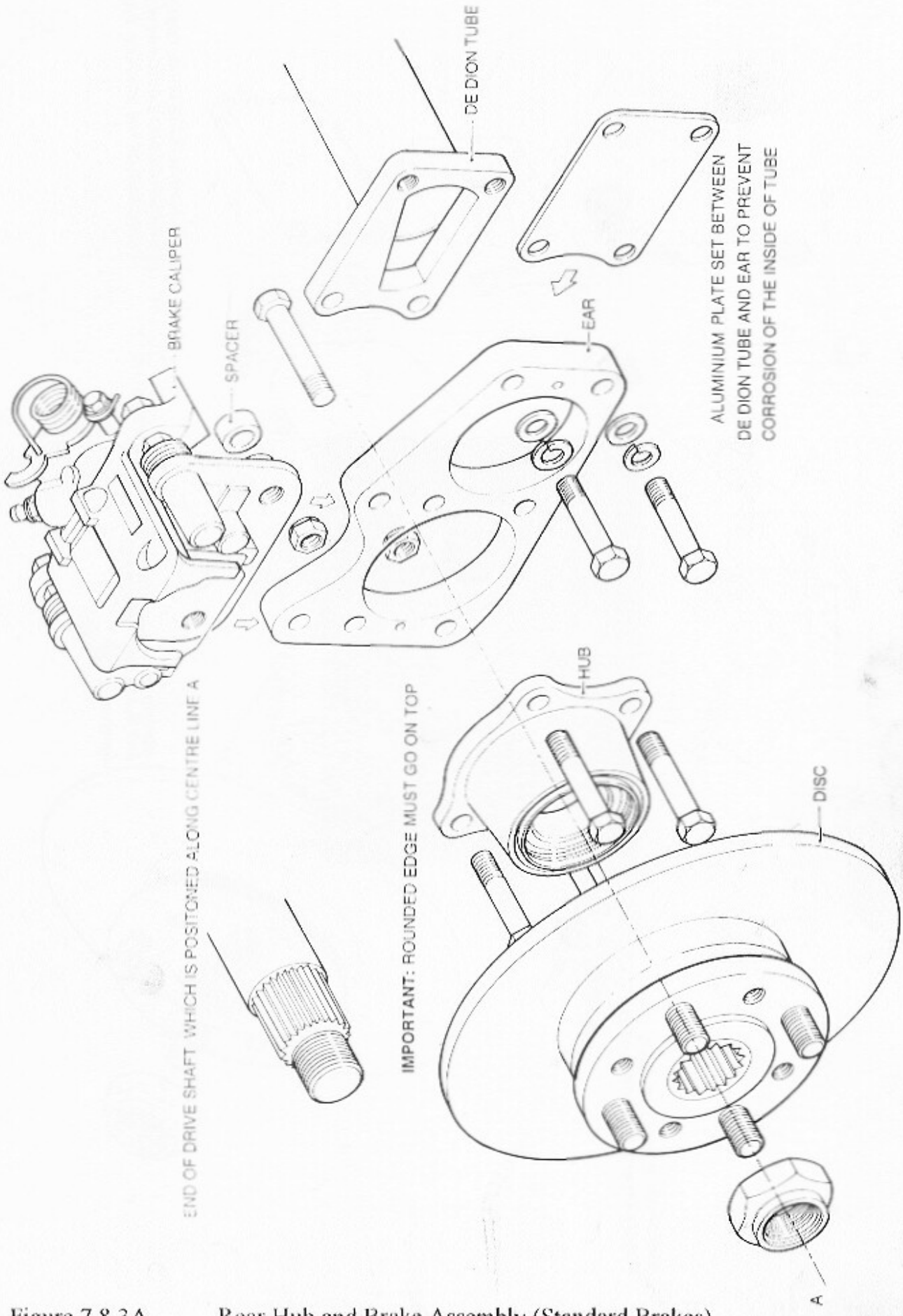


Figure 7.8.3A Rear Hub and Brake Assembly (Standard Brakes)

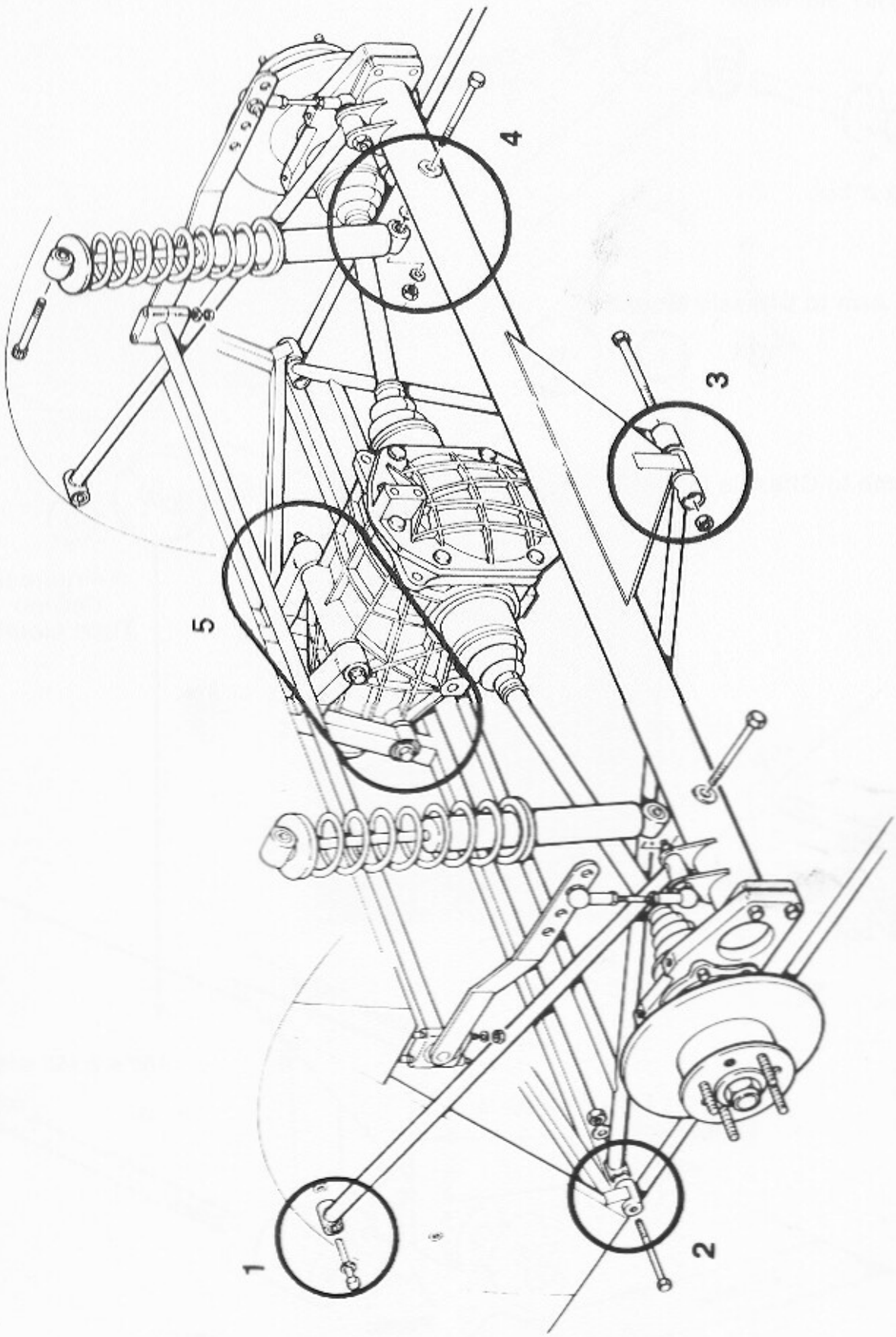
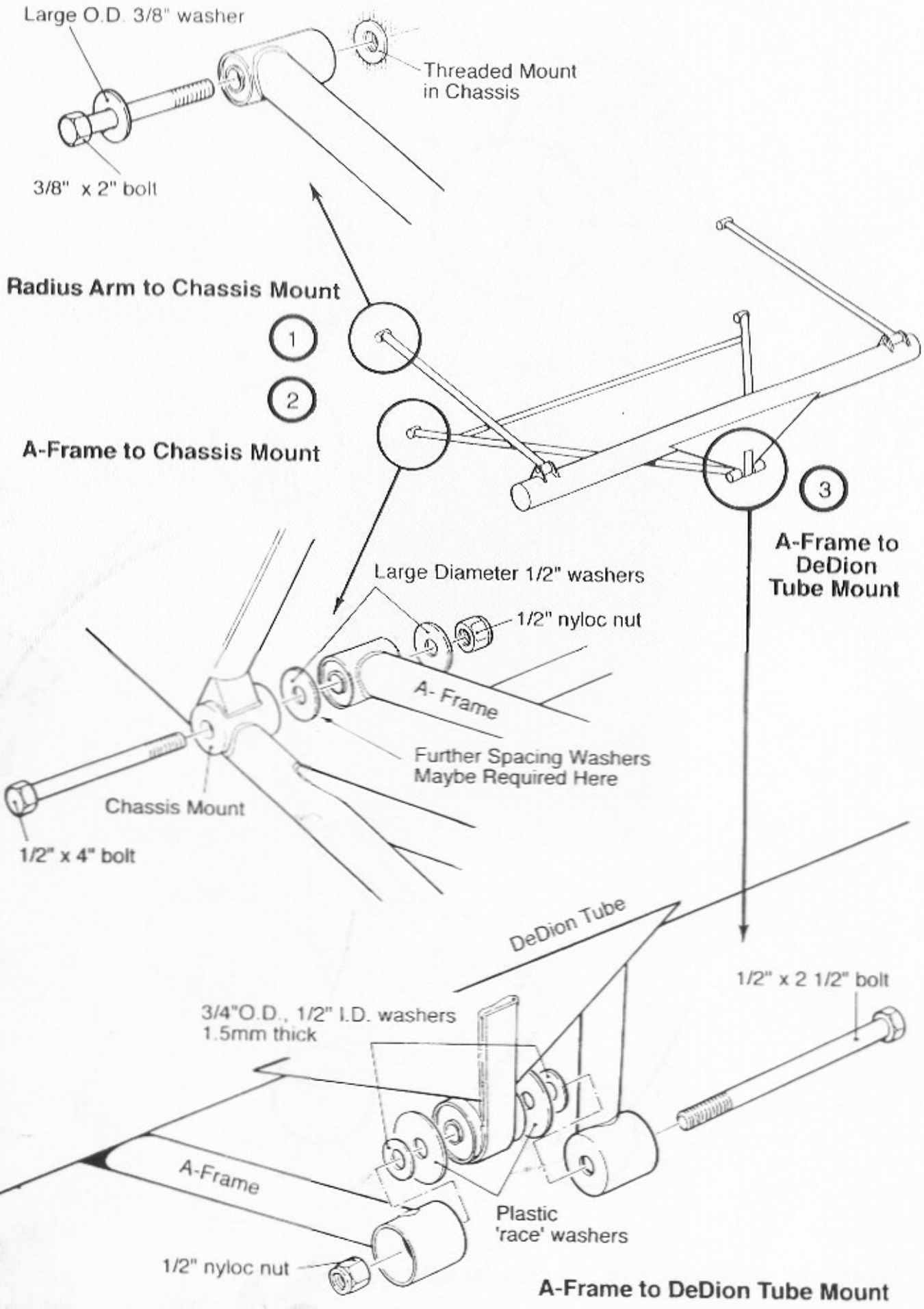
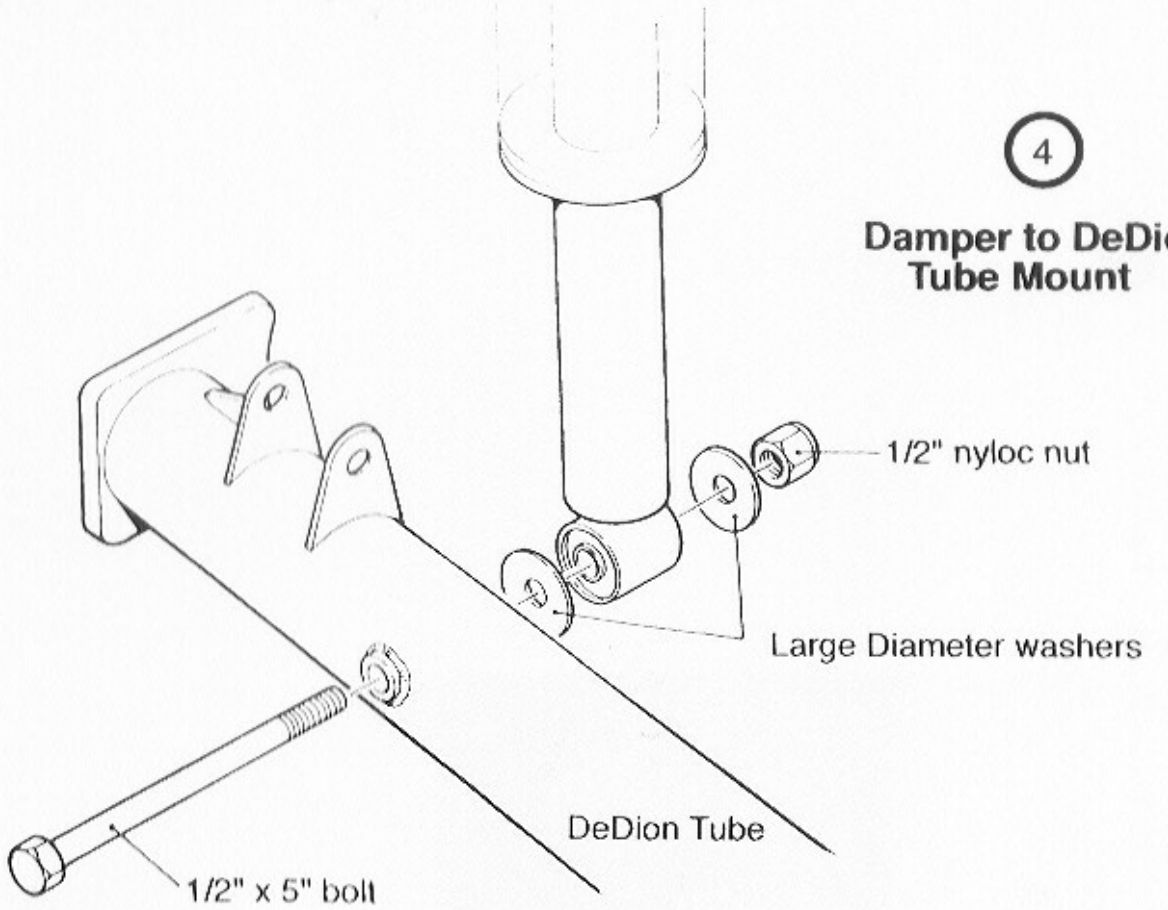
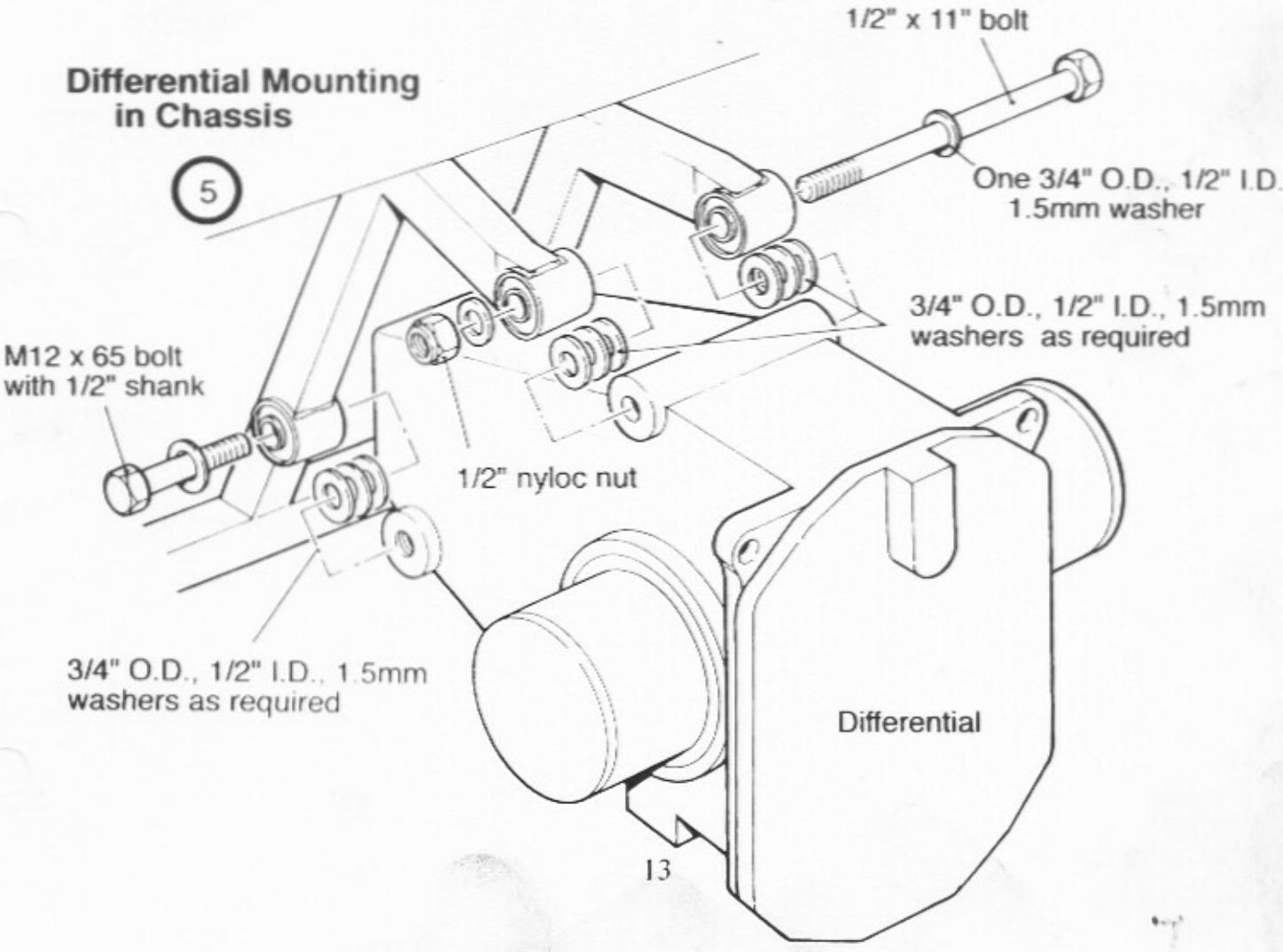


Figure 7.4 Rear Suspension - De Dion - General Assembly


Large O.D. 3/8" washer
Threaded Mount in Chassis
3/8" x 2" bolt
Radius Arm to Chassis Mount
1
2
A-Frame to Chassis Mount
3
A-Frame to DeDion Tube Mount
Large Diameter 1/2" washers
1/2" nyloc nut
A- Frame
Further Spacing Washers Maybe Required Here
Chassis Mount
1/2" x 4" bolt
DeDion Tube
1/2" x 2 1/2" bolt
3/4"O.D., 1/2" I.D. washers 1.5mm thick
A-Frame
Plastic 'race' washers
1/2" nyloc nut
A-Frame to DeDion Tube Mount


4
Damper to DeDion Tube Mount
1/2" nyloc nut
Large Diameter washers
DeDion Tube
1/2" x 5" bolt


Differential Mounting in Chassis
5
1/2" x 11" bolt
One 3/4" O.D., 1/2" I.D. 1.5mm washer
3/4" O.D., 1/2" I.D., 1.5mm washers as required
M12 x 65 bolt with 1/2" shank
1/2" nyloc nut
3/4" O.D., 1/2" I.D., 1.5mm washers as required
Differential

SECTION 8

REAR SUSPENSION - CLASSIC LIVE AXLE

Contents

The axle suitable for the Caterham Seven is sourced from either a Morris Marina or Ital, neither of which is available new any longer. Reconditioned items are available from Caterham cars along with all spare parts, the best Marina/Ital axle is that from the 1.7, 1.8 or 2.OL versions which have a 3.64 final drive ratio.

8.1 Preparation of Axle

1.1 Customers axles should be drained, thoroughly cleaned and your name painted on the casing before being brought down to Caterham to have the suspension mountings and strengthening plate welded on.

1.2 It takes about three weeks to modify your axle and when collected from Caterham, it will need to be painted prior to assembly into the car. Hammerite is ideal for this purpose since it needs no primer and provides a surface well able to sustain life under the car.

1.3 We strongly recommend that you use new wheel cylinders and brake shoes and that the handbrake mechanism and brake adjusters are thoroughly overhauled.

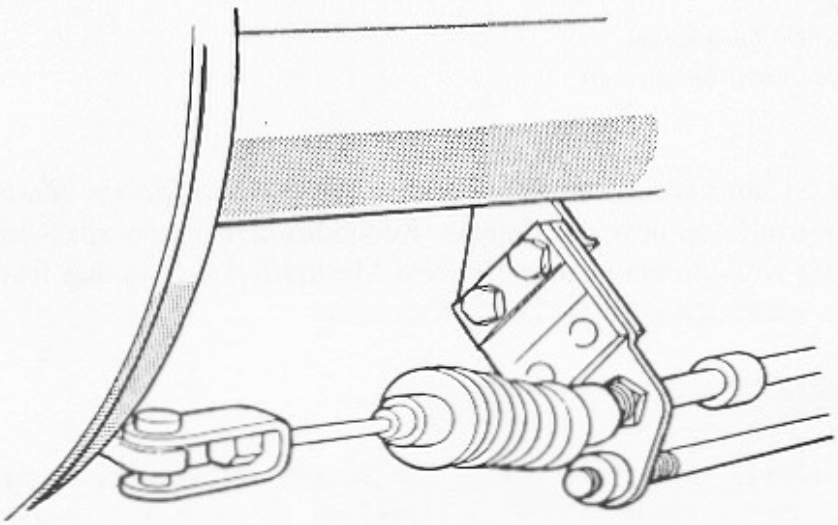
8.2 Assembly of Axle Before Installation

2.1 The miscellaneous kit contains all the parts necessary to install the axle into the Seven, and although it is possible to fit the axle into the car first, the following tasks are considerably easier if the axle is out of the car.

2.2 Fit the hydraulic brake pipes to the axle, bending to the correct shape as you do so. The long pipe provided in the kit fits between the wheel cylinders and follows the contours of the axle.

2.3 The short pipe fits to the offside (driver's side on RHD cars) wheel cylinder and should be bent so that its input end finishes adjacent to the mounting provided for the flexible hose. Drill the axle brace to accept the black plastic clips which secure the pipes in place.

2.4 Each wheel cylinder is provided with an input and a bleed hole. The offside cylinder dispenses with the bleed nipple and the pipe running across the axle should be connected into the lower hole in the cylinder from which the nipple has been removed. The nearside cylinder retains its bleed nipple in the upper hole of the cylinder and is used to bleed the entire rear half of the brake system.



Section 8.2.5 Handbrake Strap

2.5 Attach the handbrake strap and its backplate to the bracket provided on the nearside of the axle using two 1/4" bolts, washers and nylocs. Fit the long handbrake rod to this strap with a nut and shakeproof washer each side of the mounting hole, after passing it through the mounting provided on the axle brace, and attach the other end to the handbrake lever with a clevis pin and lock in place using a small split pin. (see diagram 8.2.5.)

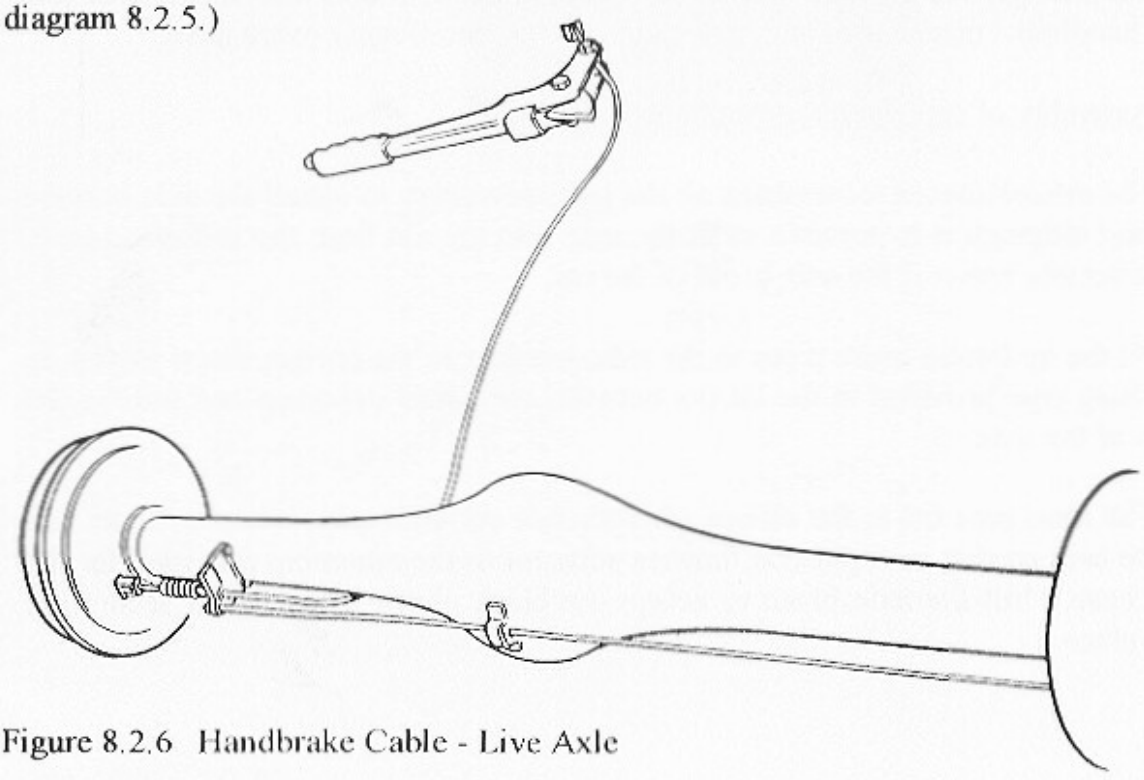


Figure 8.2.6 Handbrake Cable - Live Axle

2.6 The handbrake cable can now be fitted with its outer casing located into the handbrake strap and the inner cable attached to the nearside brake lever with a clevis and split pin. Leave the adjustment slack for the time being. (See diagram 8.2.6. for clarity).

2.7 From the rear of the tunnel, the handbrake cable should be routed under the transverse bracing tube of the A frame and over the diagonal tube of the A frame before being attached to the axle.

2.8 Fit the plastic axle breather to the axle casing in the threaded hole provided.

8.3 Installation of Axle and Rear Suspension

3.1 Hang the coil spring/damper units from the upper mountings provided on the chassis noting that there should be a washer/rubber bush/washer combination both above and below and that there are two 3/8" UNF nuts on each damper. Do NOT fully tighten these at this stage.

3.2 Using the 1/2" x 4 1/2" bolts, plain washers and nylocs, fit the bottom of the dampers to the axle noting that the adjusting screws should face to the rear of the car. The axle should now be suspended by the damper units.

3.3 Attach the radius arms to the outboard end of the same bolt ensuring that there is a plain washer either side of the bush. Secure with the nyloc nut but do not fully tighten at this stage.

3.4 Attach the forward ends of the radius arm to the chassis using the 3/8" x 3 1/4" plated hex head bolts, washers and nylocs, passing these bolts outward from the cockpit. Again, do NOT fully tighten yet.

3.5 Fit the 'A' frame to the chassis locating its forward end inside the main lower chassis tubes at the front of the rear axle bay, noting that the central mounting at the rear should face upward.

3.6 This 'A' frame locates the axle laterally and it is important that it is fitted centrally so as to ensure that the axle is also centred. Attach to the chassis using the 1/2" x 4" bolts, washers and nylocs, passing these in from the outside, but centre using the thin 7/8" external diameter washers provided.This should also be used to eliminate any side to side movement of the 'A' frame.

3.7 The 'A' frame is attached to the bracket welded onto the differential casing using a 1/2" x 2 1/2" bolt and nyloc and the split metal/rubber bush. The two halves of the bush are pressed into the socket provided in the 'A' frame and then captured within the axle bracket.

3.8 This job can be a little difficult since the two halves of the bush need to be compressed together in order to make it fit. We suggest you coat the outside of the bushes with rubber lube to make compression easier and if it still proves difficult, use a couple of strips of thin aluminium or steel in order to shoehorn the bush into place with either a jack or a soft hammer. Secure with the bolt and nyloc, but do not fully tighten yet.

8.4 Final Tightening

4.1 Before finally tightening the axle and rear suspension mountings, it is advisable to have the car's weight supported by the axle as it would be when on the road in order that no unwanted preloadings are present in the bushes. Axle stands under the axle are ideal for this purpose.

4.2 Tighten firstly the damper mountings to the chassis using the lower 3/8" UNF nut until the rubber bush assumes the same diameter as that of the washers holding it. Lock this nut with the second identical nut and lastly place a black rubber cap over the protruding thread.

4.3 Tighten all the bolts securing the axle to the following torque settings. The 1/2" bolts should be tightened to 40 lbft and the 3/8" bolts to between 25 and 35 lbft.

4.4 Finally, check the distance between the brake back plates and the lower chassis tubes on both sides. These dimensions should be equal within a tolerance of 3mm.

If they are not, and your back plates are not distorted, the 'A' frame centering can be adjusted by moving spacing washers from one side to the other.

Bolt Size	Usage	Torque
3/8" half nut	upper damper mount	See text
1/2"UNF x 4 1/2"	Damper & radius arm to axle	40 lbft
3/8"UNF x 3 1/4"	Radius arm to chassis	25-35 lbft
1/2"UNF x 4"	A frame to chassis	40 lbft
1/2"UNF x 2 1/2"	A frame to axle	40 lbft

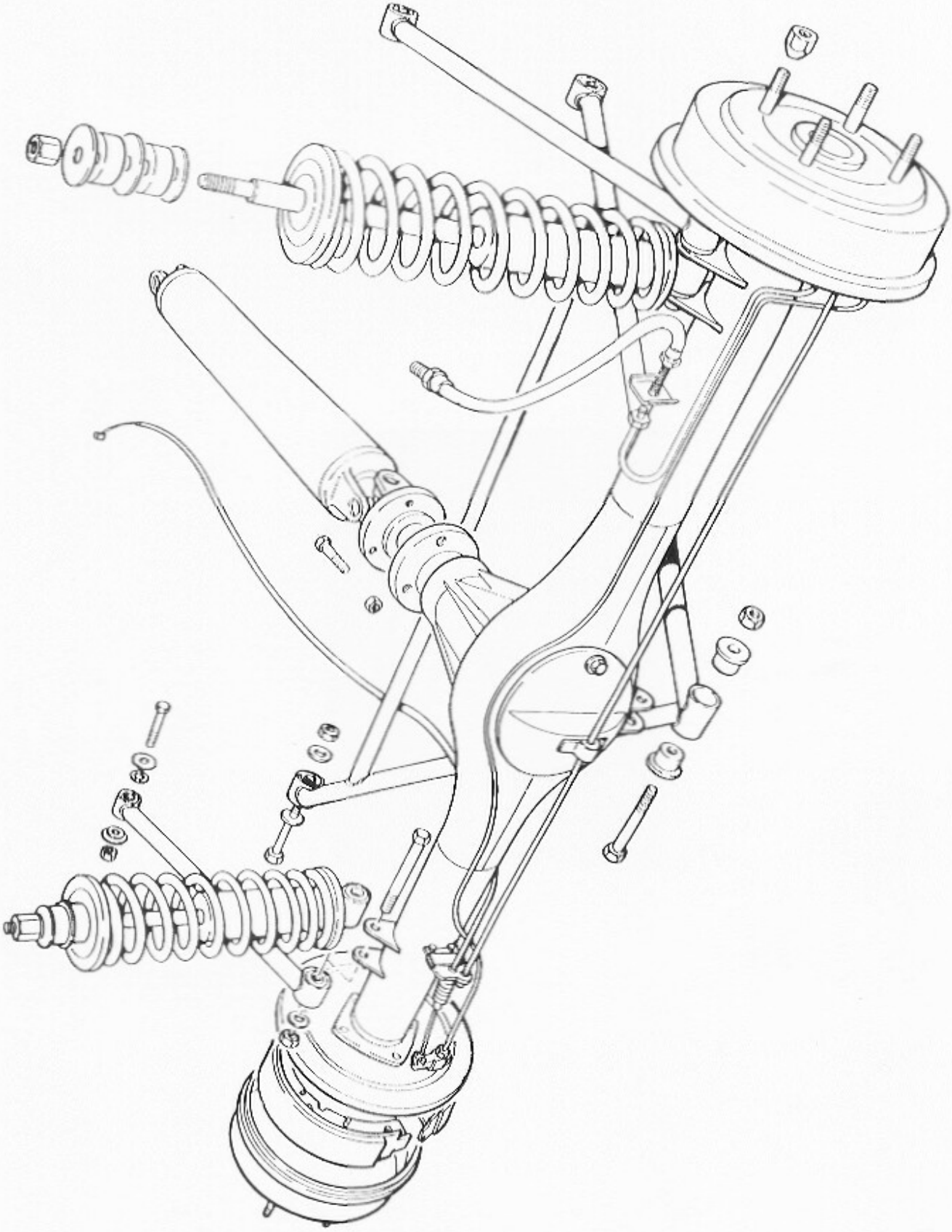


Figure 8.3 Classic Rear Suspension Assembly

SECTION 9

INSTALLATION OF ITEMS COMPRISED IN THE MISCELLANEOUS KIT

Contents

The miscellaneous kit consists of all the items necessary to finish off your car which are not included in the other kits. As such, it is not assembled as a unit and needs to be fitted in conjunction with other areas of the car. Not having acquired this kit, however, will not prevent you from fitting the other kits first, although it will not be possible to install the engine, gearbox or differential without it.

9.1 Front Brake Hoses

1.1 Attach the inner end of each brake hose through the hole provided in the aluminium body side. Secure this in place with the 3/8 UNF nut provided with the shakeproof washer between the nut and the inner body side. Do NOT tighten yet.

1.2 Immediately inside the body are located the steel brake pipes from the Master Cylinder and thse are fitted with appropriate female unions. Tighten these connections fully before securing the lock nut attaching the hose to the body side.

1.3 The outer end should be attached to the brake caliper using the special banjo bolt provided with a copper washer on either side of the banjo union. Be careful not to over tighten this.

1.4 Turn the steering from lock to lock and watch carefully that the hoses do not foul on the suspension. If they do, a small amount of twist can be put into the hoses by adjusting the inner fixing onto the body side. It may help to undo the connection into the caliper and twist the hose through 180°.

9.2 Rear Brake Hose

2.1 The rear hose can now be fitted. On De Dion cars the hose should first be screwed into the 'T' union on the De Dion tube and tightened before attaching to the vertical aluminium panel adjacent to the metal brake pipe with the nut and lock washer. On live axle cars the hose is attached to the bracket on the axle with nut and lock washer, then connected to the union on the metal pipe to the wheel cylinder.

2.2 It should be noted that on live axle cars this hose may be in contact with the turned down aluminium edge of the front part of the boot floor. To avoid chaffing a piece of plastic edging is provided with the chassis and this should be slid along to protect the flexible hose.

2.3 Lastly, the hose should be connected to the steel pipe under the rear bulkhead which may need a little careful realignment in order to do up properly. Note that if steel hoses have to be bent, sharp kinks must not be created since if pipes are overstretched in this way, failure in service is possible.

2.4 Note also that all brake connections should be kept spotlessly clean and contamination with oil, water or petrol must be avoided. Connections should also be finger tight initially. If a spanner is needed to start the thread, there is a real chance of damaging threads which will prevent a safe joint being made.

2.5 Finally, before filling with fluid, recheck all brake connections, including ours, from master cylinder through to each caliper or wheel cylinder and ensure they are properly tightened.

9.3 Brake System - Filling and Bleeding

3.1 Brake fluid used should comply with SA3J 17O3f DOT 4 specification and must be fresh. Once a container has been opened it is rapidly contaminated by moisture in the air.

3.2 The master cylinder should be filled first, with all bleed nipples closed. Carefully bleed the system using slow strokes of the brake pedal starting at the nearside rear, then the nearside front and, lastly, the offside front until a firm high pedal is achieved. It will probably be necessary to repeat this exercise a couple of times before all the air is bled away.

3.3 De Dion Cars are supplied with an Easibleed brake bleeding device, including instructions. Great care must be taken to ensure that the Easibleed cap attached to the top of the master cylinder is firmly and correctly seated. Brake fluid under pressure can be dangerous to eyes and can damage paintwork if it escapes. We recommend that the area around the master cylinder is protected during the bleeding process. The rear

calipers can be difficult to bleed, therefore it can help if you tap the caliper body during bleeding to release air pockets. It may also help to tip the car downwards on the side being bled to enable air to escape from inside the caliper piston.

3.4 As a check on the system's integrity, get someone to hold the brake pedal down for about a minute whilst you check all connections and bleed nipples for any sign of leakage. The pedal should remain solid. If it slowly sinks, there is a leak somewhere in the system.

3.5 On De Dion cars fitted with new pads, pedal travel may still seem excessive despite being fully and properly bled. In use however the system will improve dramatically with normal use (500-1000 miles).

9.4 Handbrake Mechanism - De Dion

4.1 Before assembly, please check that the handbrake lever has been bent through an angle of 20° to clear the transmission tunnel using a bench vice.

4.2 Fit a rubber grommet into the hole in the top front of the transmission tunnel and feed the handbrake cable through this into the passenger compartment, locating the end of the inner cable into the lug under the front bulkhead.

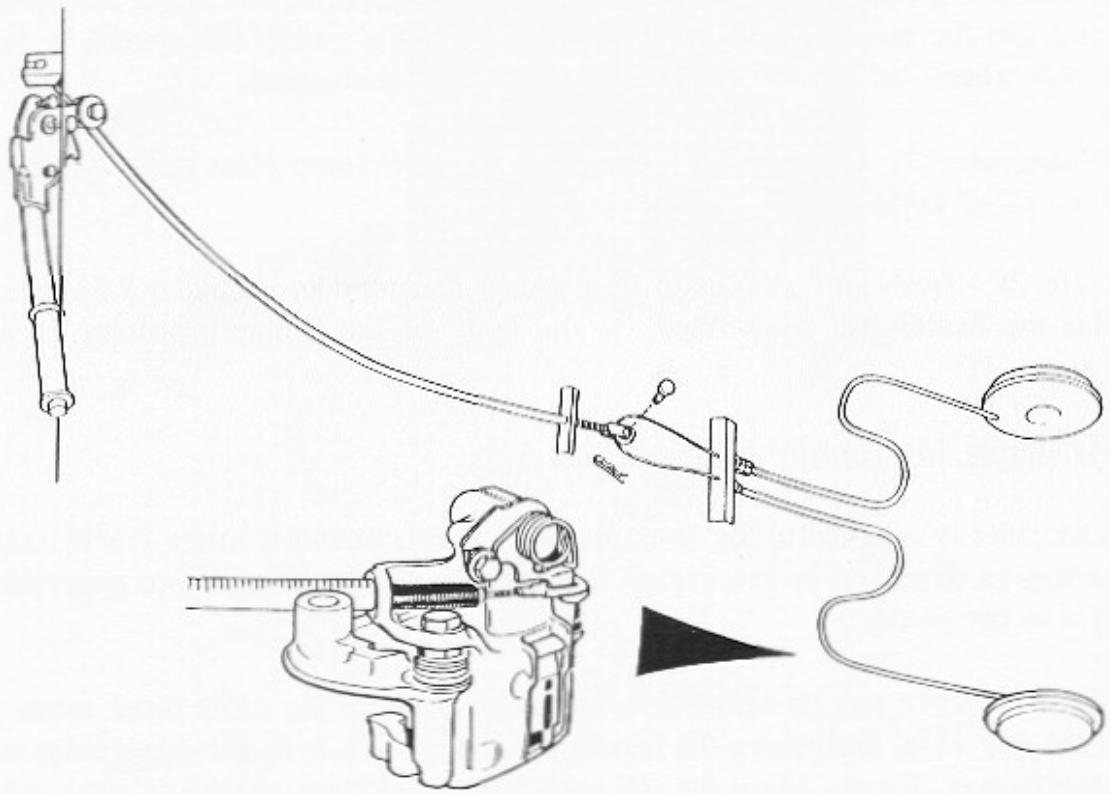


Figure 9.4 De Dion Handbrake Cable

4.3 Assemble the handbrake lever onto the cable, locating the cable outer with the handbrake barrel and bolt in place under the bulkhead. The 7/16" x 2 3/4" bolt and nyloc act as the handbrake pivot and the ratchet is located with a 1/4" x 2 1/4" bolt and nyloc. (see diagram 9.4)

4.4 You will be working against the spring at the other end of the cable as this is installed under tension.

4.5 Please note that when assembling the handbrake barrel, the longer end with a groove in it must face downwards. This is to enable the handbrake cover to be fitted. The cover is slid over the handbrake lever, after it has been fitted but before tightening the cable, and locates so that the handbrake barrel protrudes through the hole in the cover. Secure in place using the circlip provided.

4.6 The longer handbrake cable will have been attached to the rear brake calipers as part of the rear suspension assembly and this should now be connected to the front cable. The clevis pin is slid downward through the twin eyes of the front cable, capturing the nylon pulley around which the longer rear cable should be fitted. This clevis is secured by a small 'R' pin.

4.7 The handbrake can now be adjusted using the nylon knurled nuts threaded onto the rear where it locates in the tunnel. Take care to ensure that it is not adjusted too tightly and that the rear pads are not binding. Ideally the handbrake should be sat to lock the rear wheels on about four clicks of the ratchet mechanism.

4.8 When correctly adjusted the forward nut is locked into place with the second knurled nut fitted to the cable.

4.9 Note, if a fresh air heater is to be fitted, the handbrake should not be adjusted until after the heater has been fitted, as the body of the heater protrudes into the cockpit area.

9.5 Handbrake Mechanism - Classic Live Axle

5.1 The cable is attached to the lever and the lever is mounted in the car in exactly the same way as described in 9.4, except that instead of there being a two part cable, it is supplied in one piece.

5.2 The handbrake can be adjusted in two places; where the cable outer meets the strap on the rear axle, and where the handbrake rod crosses from the same strap to the offside brake lever. Firstly adjust the rod until there is an even amount of slack at both brake levers and then adjust the cable itself until the handbrake locks both back wheels after about four clicks of its ratchet.

General Items

9.6 Screen Washer Kit

6.1 On Ford and Vauxhall wet sump cars, the bottle/motor assembly is fitted to the forward face of the chassis frame in the centre immediately above the gearbox top cover. Offer up the washer bottle clipped into its mounting bracket and mark a suitable location for the bracket ensuring that the bottle is well clear of the gearbox, which means that the bracket will be protruding above the top of the chassis cross tube. This mounting bracket is riveted or screwed in place with self-tapping screws. See figure 9.6.1 for all variants.

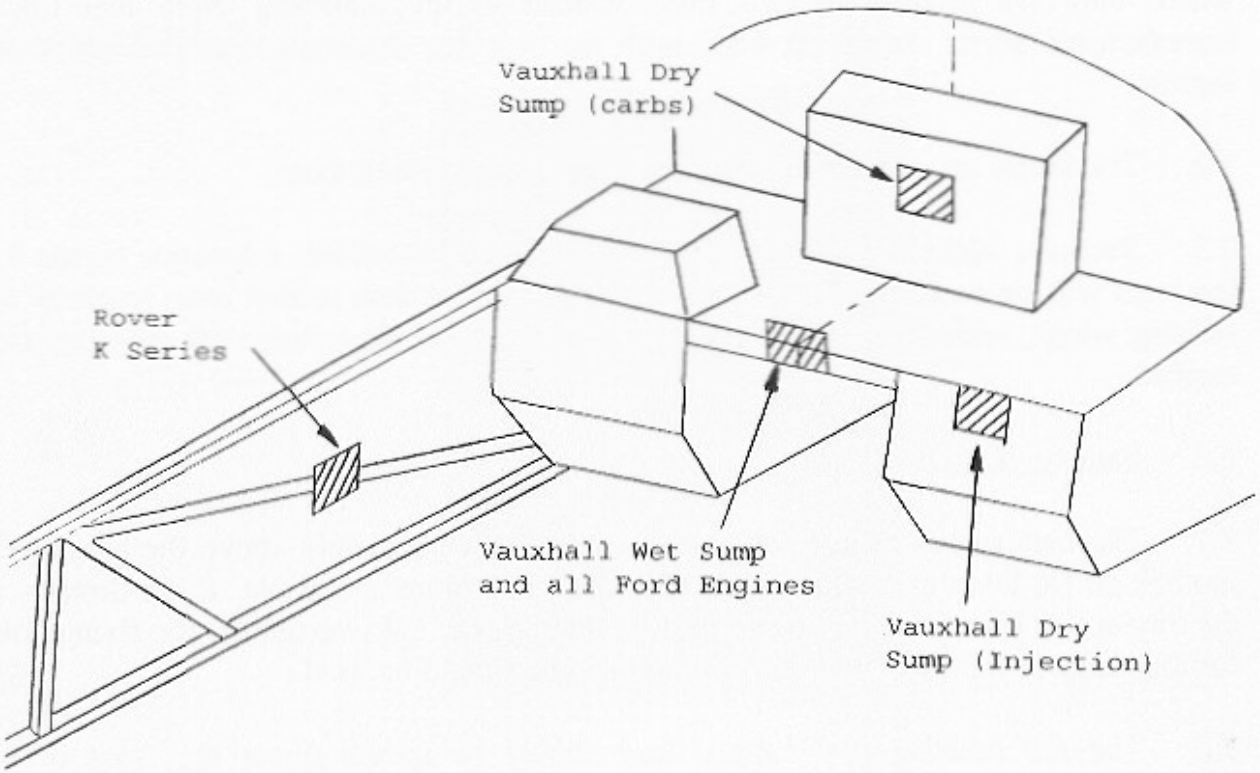


Figure 9.6.1 Screenwasher Bottle Position - All Models

6.2 On Rover powered cars the bracket is pre-fitted on the lower right hand side of the engine bay. On Vauxhall dry sump cars the bottle can be fitted on the front of the heater on carburettor cars or on the front of the passenger footbox.

6.3 Attach the clear plastic tubing to the plastic washer jet after first removing the securing nut. Slide the tubing down through the hole in the centre of the scuttle and secure with the nut which is fed back over the tubing. Note that there should be a rubber washer between the jet and the top of the bodywork.

8.6 The top of the battery incorporates a breather, into which a length of washer hose should be inserted. This should be secured so that it exits *below* the bottom level of the chassis.

IMPORTANT: The battery must be disconnected until the engine is installed and all electrical equipment properly connected.When reconnected, ALWAYS attach the live lead before the earth to prevent a short circuit should a spanner contact part of the car while the connection is being tightened.

9.9 Battery - Live Axle Cars

9.1 On live axle cars the battery is located at the bottom offside rear of the engine compartment and should be positioned with its live (+) connection forward. The red lead is bolted to the (+) connection and runs forwards along the upper face of the lower chassis diagonal tubes, between the vertical tubes adjacent to the engine mountings and the body skin and round to the starter solenoid connection. Attach the cable with plenty of tyraps and take care to prevent it from hanging down below the car.

9.2 The earth (-) lead is routed over the battery, around the fixing clamp and connects to the nearest bolt holding the engine block onto the bellhousing.

IMPORTANT: The battery must be disconnected until the engine is installed and all electrical equipment properly connected.When reconnected, ALWAYS attach the live lead before the earth to prevent a short circuit should a spanner contact part of the car while the connection is being tightened.

9.10 Fuel Filler - Carburettor Cars Only

This should be fitted in conjunction with the boot floor contained in the interior kit. With the boot floor in place, attach the rubber filler pipe to the tank filler and check that its upper end aligns with the hole in the rear panel, trimming as necessary. Secure with one of the large jubilee clips. Insert the large rubber grommet into the filler hole and attach the filler neck with its locking cap through into the pipe, securing with the second large jubilee. The boot floor and tank filler will already have been fitted along with the fuel pump on the fuel injected Rover and vauxhall powered cars.

9.11 Coil

11.1 This attaches to the top front face of the driver's footwell (RHD cars) by two 1/4" x 3/4" bolts. Attach the white/black wires to the negative connection and the white wire(s) to the positive terminal(s).

11.2 Current Vauxhall engines use double ended coils which are supplied as part of the engine assembly and are located on the rear of the inlet camshaft. Previous specification Vauxhall engines have a separate coil which is connected using a special 4 way plug.

11.3 Rover coils are fitted with a male terminal on one side and female on the other. The female should be unbolted from the coil and replaced with a male double terminal as required

Trim Items

9.12 Scuttle Edge Trim

This strip is designed both to finish off the edge of the scuttle around the dashboard tidily and to protect occupants from the hard aluminium edge. It will need to be trimmed to length.

9.13 Nose Badge

The circular nose badge is fitted by inserting the two prongs through the two holes drilled in the nosecone. Trial fit first to ensure correct alignment, then clean off the nosecone, remove the adhesive backing and stick in place.

9.14 Interior Mirror

This is stuck by its self adhesive pad to the windscreen as high up as possible on the centreline of the car, noting that the mirror can be inverted on its stalk to minimise the windscreen area obstructed.

9.15 Seat Belts

15.1 Mountings are fitted which comply with all EEC regulations (including German TUV) and specially made Static lap and diagonal belts for live axled cars or Inertia Reel belts suitable De Dion cars are supplied pre-fitted on all starter kits unless harnesses have been specified. The law in the UK states that an occupant must be able to do up or undo a seat belt with one hand, hence full harness belts, despite their obvious safety benefits, are not strictly legal for road use. In practice, however, a large number of Seven owners use harnesses and their mountings are standardised in the chassis.

15.2 Due to the size and design of the Seven, Saloon car type harnesses are not suitable and specially made belts produced by LUKE are available from Caterham Cars.

9.16 Front and Rear Wings

16.1 Front Clamshell:- Remove the 1/2" half nyloc nuts loosely fitted to secure the shock absorbers/top front suspension and ease the bolt forward. Attach the the front wing stays, which also incorporate the headlamp mountings, by sliding the upper tube into the sleeves fitted to the chassis. Locate the slotted lower mountings into the suspension aperture securing with the mounting bolt and refit the half nyloc nut. Please note that the wingstays are handed and once in place the headlamp brackets face forward. Cut an approximately six inch length of self adhesive foam strip and attach it to the outer top edge of each wingstay to act as a vibration damper.

16.2 The wings are pre-drilled to line up with the riv-nuts fitted to the side panels and each is attached with a combination of 2 5/16" bolts, one being at the rear, and six 5mm x 20mm bolts, all with 3/4" plain washers. At the same time rubber piping is fitted between the wing and the body. The rubber piping will need to be cut to length and cut in a series of "V"s in order to allow for the wing bolts, and should end up with the flat strip clamped between wing and body while the beading itself should be positioned on top of the joint to provide a neat finish.

16.3 Do not overtighten the wing fixings since this can cause the riv nuts to rotate in the side panels. With the wings in place adjust the front stays so that the centre of the stay matches that of the inside of the wing and ensuring they are vertical tighten the pinch bolts holding the stays to the chassis.

16.4 The wings are attached to the wingstays using the bolts which also attach the front indicator repeaters, please refer to Section 11 of this Guide.

16.5 Rear: The rear wings are secured using 5mm x 20mm bolts into riv-nuts at the front and nyloc nuts into the rear six mounting holes again using 3/4" plain washers and are pre-drilled accordingly.

16.6 As with the fronts rubber beading is provided and this should be trimmed as appropriate.

16.7 Cycle Wings:

The front cycle wings bolt to the tubular wingstays which are rigidly mounted to the front suspension uprights as supplied. 5mm x 35mm pozidrive bolts are used for the wings, passed downwards through the wing and the round tube of the wingstay.

The wing will have been marked with the positions for the front two mounting bolts for each wing. These should be drilled through with a 5mm drill , taking extreme care to avoid damaging the gel-coat finish - slow drill speeds should be used.

With the front wheels fitted, place the wing in position on the stay, so the bolt holes are over the centreline of the forward round wingstay tube, ensuring the wing is centralised over the tyre. Mark the positions for the bolts onto the wingstay.

With the wing removed and the wheel & tyre protected or removed, the holes can be drilled through the stay. To prevent the drill from wandering, centrepunch the wingstay then drill the two holes to 6mm. TAKE CARE TO AVOID DAMAGING THE TYRES.

Loosely refit the cycle wing and wheel/tyre to check the wingstays' alignment relative to the wheel, then remove the wings. Place a strip of masking tape across the tyre underneath the drilled tube of the wingstay, then mark onto this the lateral positions of the two holes. Rotate the wheel so that the masking tape is under the rear tube of the wingstay and transfer the bolt hole positions to the tube. Centrepunch and drill to 6mm as at the front.

Refit the cycle wing, loosely bolting it at the front and aligning it over the tyre, then carefully remove the wheel without disturbing the wing. Mark the underneath of the wing with the bolt hole positions, then remove the wing. Drill a small pilot hole from underneath, taking extreme care to avoid damaging the gel-coat, then once you have checked that these are correctly positioned, drill through from above to 5mm.

Bolt the wings to the stays with 5mm x 35mm pozidrive screws with nylocs, with a strip of self adhesive foam on the top of the wingstay and rubber washers under the heads of the bolts.

SECTION 10

INSTALLATION OF ENGINE AND GEARBOX - FORD

Contents

The Ford crossflow engine is supplied in three states of tune, ranging from standard Ford GT up to 1700 Supersprint. Please refer to Section 2 of this guide for full details. Engines supplied by us are wholly new, and are supplied complete with all ancillaries including starter, alternator and fuel pump.

Should you intend to fit an engine obtained elsewhere, we are in a position to supply spare parts, ancillaries, brackets, nuts and bolts etc., including for example Weber DCOE carburettors, correctly jetted and modified for engines fitted to Sevens. We cannot undertake specialist machining work on non Caterham supplied engines.

We supply the correct Sierra XR4i (V6) five speed gearbox with a full kit of items necessary to complete the installation. We are able to provide these items on better terms than a Ford dealer. Ford Escort Mark II 4 speed gearboxes are no longer available new, but Caterham supply reconditioned units and all the other minor items needed to complete the installation are held by us.

Alternatively, for De Dion chassis cars we are able to supply our own six speed gearbox as a direct replacement for the Ford five speed

10.1 Assembly of Gearbox Kit - 5 Speed XR4i & Caterham 6 Speed

1.1 The five and six speed gearbox kits includes all the items necessary to prepare the gearbox for installation in the Seven when fitted with any of the recommended engines. It should be noted that several items relating to the gearbox are included in the miscellaneous kit such as the speedo cable, gearlever and clutch cable.

1.2 The bellhousing and adaptor should be bolted to the front of the gearbox using the four special 12mm x 60 mm bolts (metric fine thread) and spring washers,

noting that the gasket should be fitted between the gearbox and the adaptor. These bolts should be torqued to 45 lbft.

1.3 Fit the speedometer drive gear into the rear, nearside of the tailshaft housing and secure in place gently tapping its locating plate into place with a soft hammer. The small oil seal fits over the output spindle and should be gently pressed or tapped into place using a suitably sized socket as a drift. It is advisable to lightly lubricate or grease the moving parts before assembly.

1.4 Insert the square section drive pin into the spindle and slot the right angle drive gear into the socket provided for it. Secure using the circlip and check to make sure this is fully home since re-doing this job with the gearbox in the car is very awkward. Attach the speedometer cable.

1.5 Screw the reversing light switch into place on the rear offside of the tailshaft housing.

1.6 Gently tap the clutch arm pivot into the hole provided inside the nearside of the bellhousing capturing the nylon bush. Insert the clutch arm over the first motion shaft with its inner end clipped over the pin and the outer end protruding through the end of the bellhousing to accept the cable. Clip the clutch release bearing into place. Push the yellow plastic cable bush into the hole provided in the bellhousing for the clutch cable from the front. See figure 10.1

1.7 The clutch cable is threaded through the cable bush in the bellhousing and then through the hole in the gaitor which is held in place with its metal clip. The hydraulic slave cylinder used on left hand drive cars locates in the same way, its adjusting rod substituting for the cable.

1.8 Bolt the metal/rubber/metal gearbox mounting, chamfered edge rearward, to the underside of the tailshaft housing using the 12mm x 25mm bolt and lockwasher.

1.9 Preparation of the six speed gearbox is exactly the same as the five speed described above.

10.2 Preparation of Gearbox - Four-Speed Escort

2.1 A Caterham supplied reconditioned gearbox will need the following items to be attached before it can be installed in a Seven.

a) Reversing lamp switch
b) Speedometer drive gear
c) Speedometer drive oil seal

d) Clutch cable bush
e) Clutch actuating arm
f) Clutch release bearing
g) Clutch cable/arm rubber gaitor and clip
h) Speedometer drive locating plate

All the above items are included with a Caterham gearbox but are in any case stocked by Caterham Cars. It may be necessary to partially grind away the lug underneath this gearbox to avoid contact with the chassis crossmember. (see figure 10.2.1)

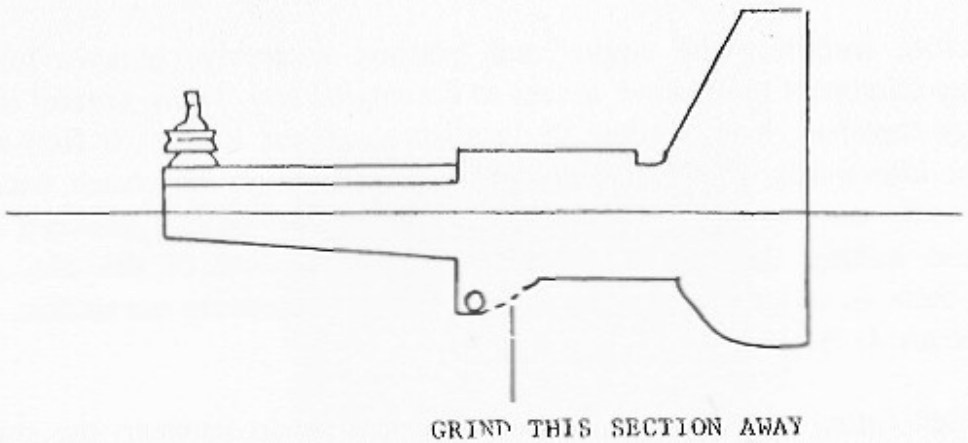


Figure 10.2.1 Ford Escort 4 Speed Gearbox - Grinding

2.2 The Miscellaneous kit provides the following:
- Speedometer cable and circlip
- Clutch cable
- Gear lever, knob, gaitor etc.
- Gearbox mounted shortened gear lever and remote linkage

2.3 Fit the gearbox mounting, speedometer drive and reverse gear switch as per the five-speed, with the exception of the right angle drive gear for the speedometer cable, which is not required.

2.4 Similarly, fit the clutch arm and release bearing, though this gearbox does not need a seperate clutch arm pivot pin.

2.5 Remove the blanking plate at the rear of the gearbox above the output shaft and carefully lever out the reverse gear stop, taking care not to damage the threads into which the gearlever is screwed. Refit the blanking plate.

2.6 Screw the dummy (shortened) gearlever into place, assemble the remote shift links onto this (as below) leaving connection to the second gear lever until the gearbox is installed in the car. (See diagram 10.2.6)

2.7 Slip the drilled metal bush over the shortened gearlever and attach the two gearchange links, with the black plastic inserts clipped into their holes. Bolt together with steel washers on each side using the 3/16" x 1 3/4" caphead bolts and nylocs provided. Assemble the rear complete gearlever with spacing washers between the lever and the steel links in order to make the strips parallel.

10.3 Preparing Engine For Fitment Into Car - 5/6 Speed De Dion

3.1 Before installing the engine and gearbox assembly, remove both upper engine bay diagonals to improve access to the engine bay, being careful to keep all the fixings together. It is possible to install the gearbox in the car first and attach the engine afterwards, however it can be difficult to align the clutch with the first motion shaft, due to tight tolerances in the engine bay. Caterham therefore recommend bolting the engine and gearbox together out of the car, and then inserting them as an assembly. N.B. bolts into the bellhousing are metric, bolts into the engine are U.N.C.

3.2 When fitting a non Caterham supplied dust shield between the engine and gearbox, we advise that you take the precaution of welding up the existing split and cutting it into two seperate upper and lower halves along a line roughly corresponding with the bottom of the cylinder block, but retaining the starter motor location in the upper half (see diagram 10.3.2). Due to low ground clearance it is likely that at some stage in the cars life the sump pan will be damaged, and this simple modification allows the pan to be removed without separating the engine and gearbox in the car.

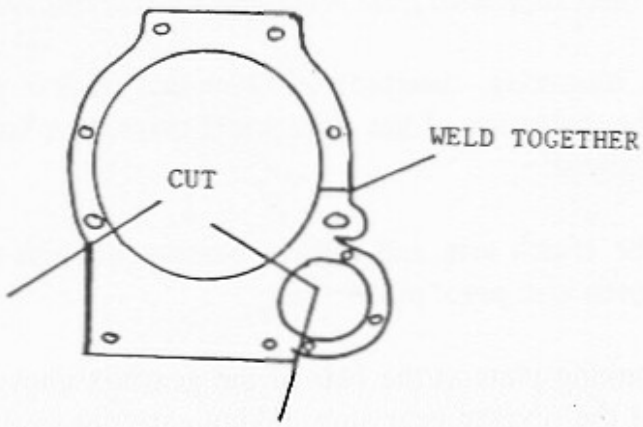


Figure 10.3.2 Dust Shield - Modification

3.3 Bolt the engine and gearbox together, after sliding the first motion shaft into engagement on the clutch and flywheel. Using two 3/8UNC x 1 1/4 into the block, and two M10 x 30mm and two M10 x 40mm bolts into the bellhousing with spring washers and loctite. The lower half of the dustshield should be bolted to the bellhousing with M10 x 30mm bolts with plain nuts and spring washers.

3.4 The engine can be fully kitted with ancillaries e.g. carburettor(s), fuel pump, oil pump and filter, starter etc., but the engine mounting brackets are best left unfitted until the engine/gearbox assembly is in position. This is because the right hand bracket will foul the steering column if fitted, and the width of the engine with the brackets fitted is such that the fragile aluminium body panels can easily be damaged.

3.5 The engine mounting rubbers are attached to the chassis using four 5/16" x 1 3/4" U.N.F. bolts, washers and nylocs and for convenience these should be bolted in place before the engine is inserted. The gearbox mounting is held using two 5/16" x 3/4" U.N.F. bolts, washers and nylocs.

3.6 Before fitting the gearbox into the car, remove the transmission tunnel top by removing the 4 screws holding it in place.

3.7 Caterham supplied gearboxes will not be completely full of oil as supplied. It is possible to fill the gearbox before it is fitted in the car, however some of this oil may leak out of the rear of the gearbox casing where the propshaft is inserted until the propshaft has been fitted. The gearbox will therefore need to be topped up with oil after fitment. Alternatively the gearbox can be filled with oil after it has een fitted in the car. Access to the filler hole is extremely tight in the tunnel. The gearbox will require approximately an extra litre of Ford gearbox oil (part no. 5015547), and is full when the oil level reaches the filler plug.

10.4 Fitting Engine/Gearbox Into car - 5/6 Speed DeDion

4.1 An engine crane or block and tackle will be needed to lift the engine/gearbox assembly and position it accurately in the chassis. As the gearbox is inserted into the tunnel, it will be necessary to slide the propshaft into the rearhousing of the gearbox. A 9/16" thick gearbox mount spacer is required between the chassis and the gearbox mount to raise the rear of the gearbox. A trolley jack under the gearbox will be very helpful.

4.2 It will probably be necessary to rotate the propshaft in order to get the splines to align. Please note that the forward end of the propshaft is not supposed to go fully home into the gearbox. Note also that the speedometer right angle drive is very vulnerable and a tight fit into the tunnel.

4.3 Fit the engine mounting brackets to the engine block using the 5/16" UNC x 3/4" bolts supplied holding the engine stands on, raising or lowering the engine to allign the holes. The brackets should be bolted to the rubbers with 1/2" x 2 1/2" bolts. With the engine securely mounted to the chassis, release the engine hoist. Do not tighten at this stage.

4.4 If the engine hasn't already been fitted with all its ancillaries including carburettors, fuel pump, starter motor etc, then do so now along with the steering column as per Section 6. (Please see 10.8 for electrical connections and 10.7 for the cooling system)

4.5 It is possible that some adjustment of the engine positioning will be necessary to give sufficient clearance for the carburettors and exhaust system. (see Section 10.9) Twin DCOE carburettors are a close fit through the bonnet aperture as is the exhaust system through its hole in the side panel, and furthermore clearance between the exhaust manifold and the upper engine bay diagonals is tight.

4.6 Adjustment can be performed as follows:-

a) By fitting 1/2" washers between the engine mounting brackets and the engine mounting rubbers on both sides to lift the engine or on only one side to raise and twist the engine.

b) By cutting off a portion from the bottom of the engine mounting brackets, on both sides to lower the engine or on one side only to lower and twist the engine.

4.7 Please note that the amount of adjustment likely to be required is small and it should not be necessary to remove more than 1/8" from a mounting or add more than two 1/16" washers. On most cars no adjustment will be needed, if more than the above small adjustments appear necessary please contact Caterham Cars. However the use of a non-standard inlet or exhaust manifold will cause problems hence we supply an exhaust with the kit, and our recomendation in section 2 regarding the inlet when using DCOE's.

4.8 The clutch cable should be fitted by feeding its inner through the bush provided in the bellhousing and hooking the nipple into the outer hole in the clutch arm. the inner hole should then be plugged with a plain grommet. The other end fits into the pedal box, the inner cable being connected to the top of the clutch pedal using a 6x25mm clevis pin and 'P' clip.

4.9 Adjust the position of the clutch pedal to suit your individual preference (normally level with the brake pedal) by turning the adjusting screw on the cable

end of the clutch pedal, locking in position with the nut when a satisfactory position is achieved.

4.10 The clutch cable is adjusted where it feeds into the bellhousing. The 'bite' point should again be set according to personal preference but take care that it is not so adjusted as to prevent the clutch from fully engaging or disengaging.

4.11 The speedometer cable should be passed through the large grommet above the steering column in the front bulkhead and connected to the back of the speedometer, where it is hand tightened.

4.12 The throttle cable should be connected at the carburettor end first. With twin Weber DCOE's it feeds upward from underneath, its outer cable being located by the bracket connecting the two carburettors, and the nipple is attached to the throttle lever.

4.13 Push the barrel halfway through the end of the lever and slot the the inner cable into it, allowing enough slack to keep the nipple clear then push the barrel fully home. The inner cable is pulled down until the nipple locates in the recess in the barrel. Attach the 'hairpin' throttle spring between the outer cable locating bracket and the throttle lever, bending the end of the spring over to prevent it coming out or fouling the body of the carburettor. See figure 10.4 (N.B. The cable should not pass around the steering column or lay across the battery)

4.14 The other end of the outer cable is threaded to allow adjustment and has two nuts threaded onto it for this purpose. The nipple on the inner cable is held onto the accelerator pedal using a special clip. The pedal position is adjustable, as there are three mounting points to which the pedal can be attached. As supplied from the factory the pedal will be fitted in the central position. There is an adjustable throttle stop under the lip above the pedal. Having chosen a pedal position to suit your ideal driving position, the throttle cable can be adjusted. It is important when adjusting the cable to make certain that the carburettor butterflies are fully open when the pedal just reaches the full extent of its travel and that with the pedal released the butterflies are closed.

4.15 Cars fitted with a single carburettor are similarly connected, though the throttle mechanism is much more accessible.

4.16 On left hand drive cars fitted with DCOE carburettors the cable fits the other way up, the inner cable attaching to the fixed bracket and the outer to the lever.

4.17 The fuel pipe should be attached to the fuel pump input union on the right hand side of the engine, securing by crimping the clip with pliers. Alternatively a

jubilee clip can be used. The fuel pipe is deliberately supplied too long so will need to be shortened.

4.18 A rubber engine breather pipe needs to be fitted to the plastic breather box on the right hand side of the engine. This should be routed vertically upwards for about 9" and then tucked down between the gearbox and the transmission tunnel and trimmed to length as appropriate.

4.19 The gearlever is attached to the top of the gearbox tailshaft housing using three screws. Refit the transmission tunnel top and with the gearlever in neutral, fit the aluminium plate to which the gearlever gaitor is attached. Check that gear selection is not obstructed and rivet in position. Screw the gearlever knob into place.

4.20 Refit the upper engine bay diagonals as shown in figure 10.4.20, torqueing the 5/16" x 1 3/4" caphead bolts to 25 lbft.

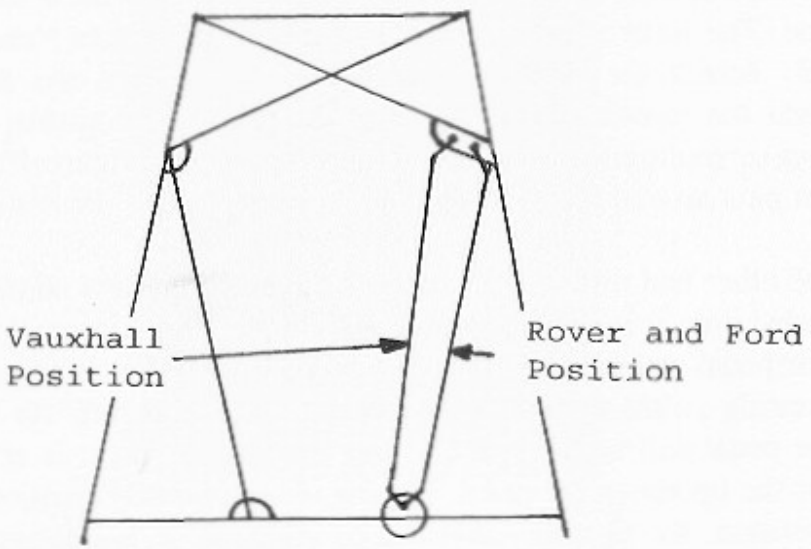


Figure 10.4.20 Upper Engine Bay Diagonals

10.5 Hydraulic Clutch Installation (Some L.H.D. Markets only)

5.1 The pedal box is fitted with a second master cylinder to which a steel brake pipe is attached. Attach the flexible hose provided between the union on this pipe and the slave cylinder fitted to the bellhousing in place of the clutch cable. Tighten both unions ensuring the pipe is not stretched or twisted.

5.2 Fill the master cylinder with brake fluid and, having loosened the bleed nipple, bleed the system using slow strokes of the pedal. To bleed the system fully it will be necessary to twist the slave cylinder so the bleed nipple is level with the input pipe.

5.3 To adjust the clutch, pull the rubber cover back over the adjusting rod and screw the rod in or out accordingly so the 'bite' point is correct. (see figure 10.5)

10.6 Fitting Engine/Gearbox to Car - Four Speed Classic

6.1 Attach the engine to the gearbox before fitting into the car. The propshaft must also be slid into the taishaft housing at this point. You should remove the transmission tunnel cover from inside the car, by releasing the 4 screws.

6.2 Note our comments in 10.3.2 relating to the dust shield and do not fit the engine mounting brackets to the cylinder block yet.

6.3 Lower the engine/gearbox/propshaft assembly into the car carefully feeding the propshaft through the transmission tunnel to the rear axle. Watch also that the dummy gearlever complete with links does not foul the underside of the bulkhead. When correctly positioned, attach the engine mountings and bolt the engine and gearbox to the chassis as in section 10.4. A trolley jack under the gearbox will be helpful at this stage.

The propshaft is attached to the axle by four 3/8" x 1" UNF bolts and nylocs which should be tightened to 25 lbft.

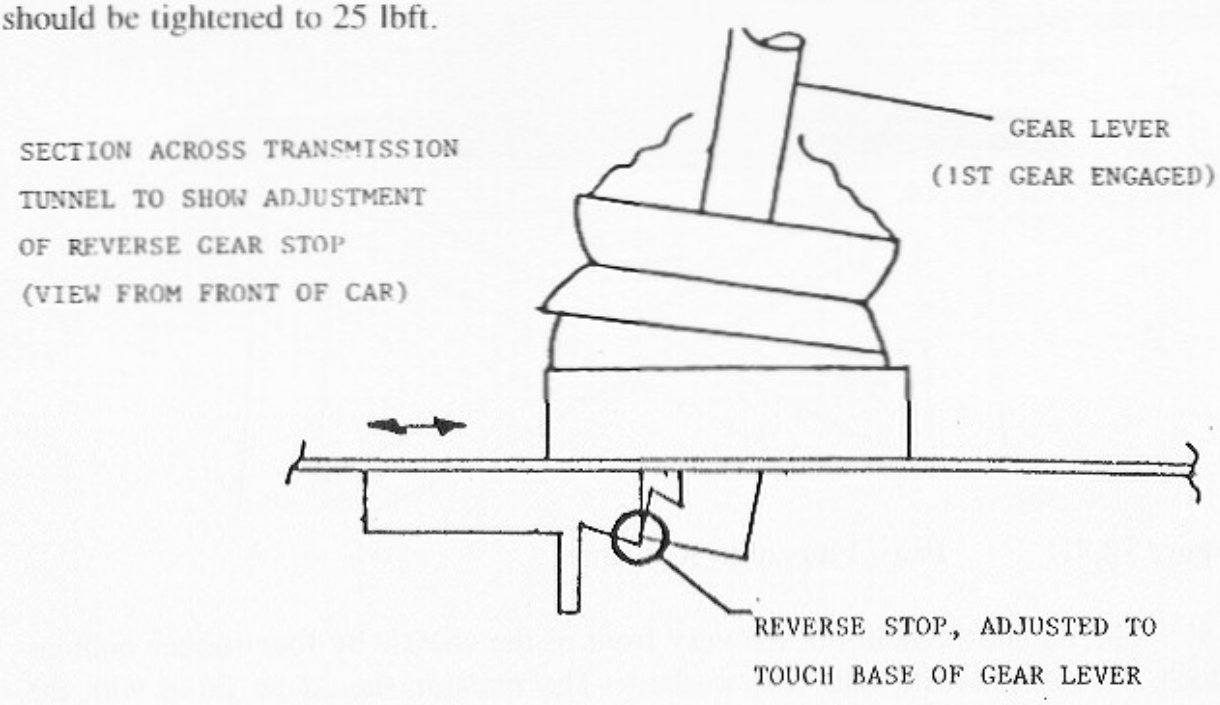


Figure 10.6.4 Reverse Gear Stop Adjustment

6.4 Attach the reverse gear stop to the chassis as shown in diagram 10.6.4 and screw the remote lever into place. Check that all gears can be selected. It is necessary to push downwards to select reverse gear.

6.5 Engine mountings and ancillaries are fitted in the same way as for De Dion cars (section 10.3).

10.7 Cooling System Kit

7.1 Before the radiator can be fitted, the cooling fan needs to be fitted to the rear of the radiator. Four 6mm serated hank nuts should be pushed into the tapered holes in the fan legs (These may have already been fitted). These can be pushed until flush using a vice, or pulled through using an M6 bolt. The fan should be fitted between the body of the radiator and the brackets on the rear of the radiator and fastened using M6x16mm bolts. It may be necessary to space these bolts out using 6mm plain washers to prevent the possibility of the bolt touching the radiator. (See figure 10.7.1)

7.2 The wiring connections match those provided in the wiring loom but check that the fan pulls air through the radiator rather than pushing it towards the radiator. Reverse the connections if necessary.

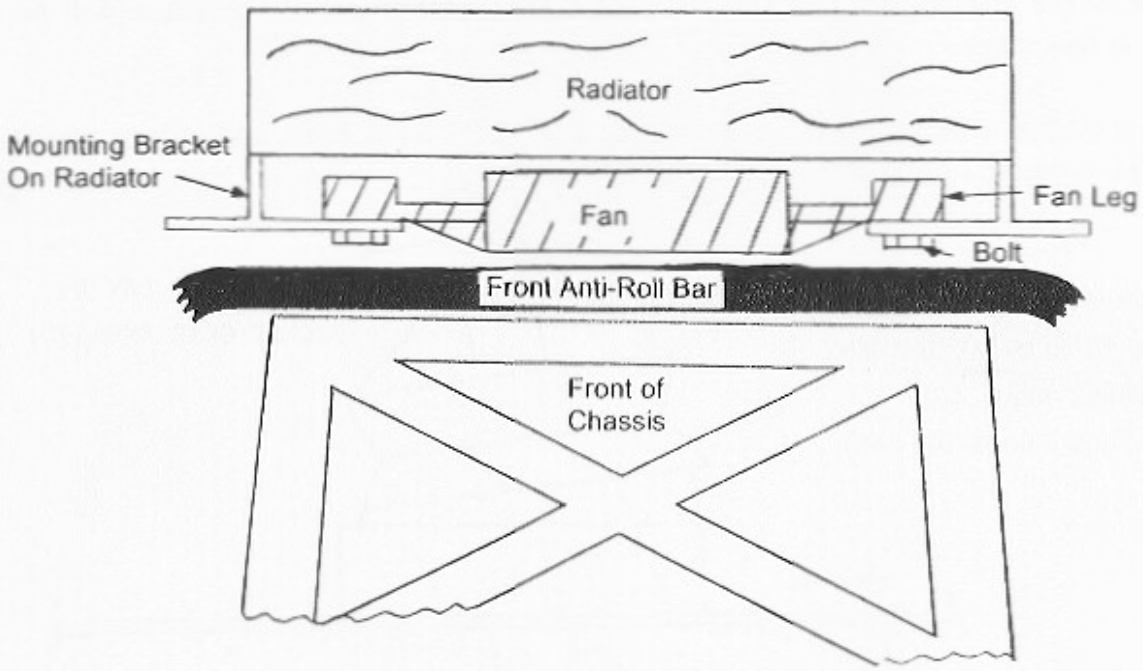


Figure 10.7.1 Fan - Fitment to Radiator

7.3 The radiator attaches to the very front of the chassis by four rubber bobbins which are secured with nuts and washers. The radiator should be fitted with the blanked off threaded boss uppermost. This boss is not used on Ford powered cars.

7.4 The Caterham cooling system uses a special thermostat housing/header tank arrangement, so the normal thermostat housing, if fitted, should be discarded. If a non Caterham supplied engine is being used these items are available from Caterham spares department. Drop the Caterham thermostat into place and position a greased or hermetited gasket before bolting the housing into place using the two 5/16" x 1" UNC bolts and lockwashers. This will have been completed on a Caterham supplied engine.

7.5 The neck to which the top hose is attached should point forward and to the nearside. Do not overtighten the cooling fan switch in this housing.

7.6 The kit provides two rubber hoses for connecting the radiator to the engine as follows:-

Top hose :- Radiator to thermostat housing Part no.594-1

Bottom hose :-Radiator to water pump Part no.594-3

Both hoses should be a tight fit over the relevant inlet/outlet and the jubilee clips used to secure the connections will probably need to be slackened before sliding into place.

7.7 The heater, when specified, is connected using 5/8" diameter hose between the outlet on the water pump and that on the water pump. The fresh air heater, as fitted on De Dion chassis, fits in the large rectangular aperture in the scuttle. It is secured using four M5x16mm panhead screws. Two rectangular gaskets are provided which should be stuck on the base of the heater, around the the air outlets in the heaters base. Alternatively, if a heater hasn't been specified, a blanking plate will be supplied.

7.8 The control cable needs to be released from the heater before it can be fitted. Drill a 10mm hole in the lower right hand side of the vertical face of the scuttle, ensuring that you drill well clear of anything attached to the inside of the scuttle, and that the ultimate location of the heater control is readily accessible by the driver. Remove one of the locknuts from the cable, feed the cable through from the inside, and replace the locknut securing the cable to the scuttle. Re-attach the other end of the cable to the heater. Connect the 5/8" ID pipes to the heater and route tidily to the engine noting that it is very important to connect the water outlet on the inlet manifold to the upper connection on the water valve.

7.9 The heater is wired with three connections, black to earth, red to green/purple, and orange to green/yellow. All connections should be fully tightened and care will be required to ensure the hoses are clear of the chassis, cooling fan

and steering gear. Remember to retighten the jubilee clips once the engine has been warmed to prevent leakage of coolant.

7.10 Instructions for fitting the recirculating type heater on live axle cars can be found in section 14.1, optional extras.

7.11 Finally the overflow bottle is attached to the left hand side of the chassis within the cruciform bracing immediately above the steering rack. (see diagram 10.6)

7.12 The top chassis square tube is drilled and the bracket attached using the large pop rivets provided or self tapping screws. The overflow bottle is a tight fit in this space so accurate positioning of the bracket is important. The bottle cap should be drilled to take the overflow hose, (1/2") the other end of which attaches to the thermostat housing. Secure the overflow hose to the top hose using ty-wraps.

10.8 Engine Compartment Wiring

8.1 The wiring loom provided is designed to be used with a Ford 2265E OHV engine with a pre-engaged starter and Lucas distributor with or without electronic ignition. Caterham supplied ignition components comply with all statutory requirements as stipulated in EEC Regulation 10 and EEC Directive 72/245.

8.2 If your engine differs from this specification, the notes provided under this section will help but failing this, contact Caterham Cars or an automotive electrician. Before going any further, the battery MUST be disconnected. (Refer to diagram 10.8 and the wiring diagram at the end of section 17)

8.3 Alternator - The alternator is connected using the thick brown wires attached to two large spade terminals and a single brown/yellow wire. It does not matter which way round the large spades are connected. The brown/black wire should be connected to the B+ terminal on the alternator. If you are using a non-Caterham alternator (e.g. Lucas) there will be no B+ terminal, in which case this wire should be taped back into the loom.

8.4 Note that these wires are close to the exhaust manifold and we therefore recommend that the loom is routed down the diagonal and under the the engine mounting bracket to the starter and held in place with ty-wraps.

8.5 Pre-engaged Starter - The red battery lead is connected to the main bolt on (15mm) terminal. The small white/red wire is connected to the spade terminal immediately underneath this. Do not disturb the solenoid to starter connecting wire.

8.6 Temperature Sensor - This is fitted to the cylinder head on the left hand side, immediately below the thermostat housing. The sensor provided with the engine must be used since this is compatible with the cars VDO temperature gauge. Connect using the green/blue wire which fits sideways onto the button of the sensor, trimming its insulator sleeve as necessary.

8.7 Electric Fan Switch - This is connected using the black/green and purple wires. It does not matter which way round these are fitted.

8.8 Oil Pressure Sender - The Seven is wired to use a VDO electric oil pressure gauge and the correct sensor is provided with a Caterham supplied engine. Fit this to the engine block on the offside above the oil filter housing. Connect this with the white/brown wire in the black sleeve, which is secured to the sender with the nut provided.

8.9 Distributor - The loom includes connectors for both Lucas and Aldon electronic ignition systems, One of the two plugs (2 pin - Aldon, 3 pin - Lucas) will match up with the plug on the distributor. The unused plug should be taped back into the loom. If points are to be used, the white/black wire should be removed from the 2 pin plug and connected to the distributor.

8.10 Engine Earth - The engine is earthed to the chassis from the rear upper bolt holding the right hand engine mount to the block, to the rear engine mounting rubber bolt on the chassis. It is important to ensure there is good electrical contact at both these points.

8.11 The battery earth lead should be fitted between the battery negative terminal band the top left bellhousing to engine bolt on De Dion chassis, and the top right on live axle cars.

8.12 Live Battery Connection - The wiring loom is connected to the battery through a thick brown wire and a thin brown/black wire terminating in an 8mm eyelet which emerges from the loom adjacent to the pedal box. This should be connected to the clamping bolt holding the red battery lead to the live (+) battery terminal. It will be necessary to snip the red terminal cover to incorporate these wires.

8.13 This red cable is routed from the positive terminal on the battery, (which should be innermost) down the front of the footbox, and along the lower tubes to the starter motor. Secure in place with tyraps. On live axle cars, the battery is located on the lower chassis tubes in front of the pedal box. The red positive cable is routed from the battery down to the bottom chassis tube, forward round the lower engine bay diagonals in front of the engine and back again along the bottom lower chassis tube to the starter. secure in place with tyraps.

Do not connect the earth at this point.

8.14 Final Connection - Only when all other connections have been made should the battery be connected, remembering to connect the live (+) terminal first.

10.9 Exhaust System

9.1 The exhaust kit includes a full stainless steel exhaust system for the car which you have specified. The standard exhaust exits the engine bay at the left hand side, runs along the side of the car under the axle and exits at the rear. (If a competition exhaust has been specified see options)

9.2 We recommend the use of Holts firegum or similar to seal the joints and this should be used fairly liberally to prevent 'blowing'.

9.3 attach the exhaust manifold, which is in two pieces, to the engine using suittable gaskets and 5/16" UNC bolts. Slide two small exhaust clamps over the bottom of the pipes and slide on the 'Y' piece which turns the exhaust through the hole in the body side.

9.4 Bolt the small metal bracket to the lower nearside of the car immediately in front of the rear wheel arch using the 5/16" x 1" bolt, taking care that the threaded bush is clear. It may be necessary to drill a hole in the aluminium panel to reveal the bush, which is located 180mm forward from the centre of the 'A' frame mount on the chassis and 13mm up from the base of the chassis . Drill an initial 1/8" pilot hole to find the bush then expand the hole as required, taking care not to damage the threads. The bracket when fitted, should point downwards with the longer side (with two holes) outwards. Attach the rubber bobbin on the top of this and tighten using An M8 nut and washer.

9.5 The main silencer is supported on this bracket and slides onto the 'Y' piece where it is secured with one of the larger clamps. The rear bracket attaches to the bobbin using a 5/16" nut and washer. N.B. The silencer bracket sits on top of the rubber bobbin mounted on the exhaust bracket.

9.6 Fit a further exhaust clamp over the pipe emerging from the back of the silencer and slide on the tailpipe. This should be adjusted by twisting to ensure it does not foul the underside of the chassis or the inside face of the rear tyre.

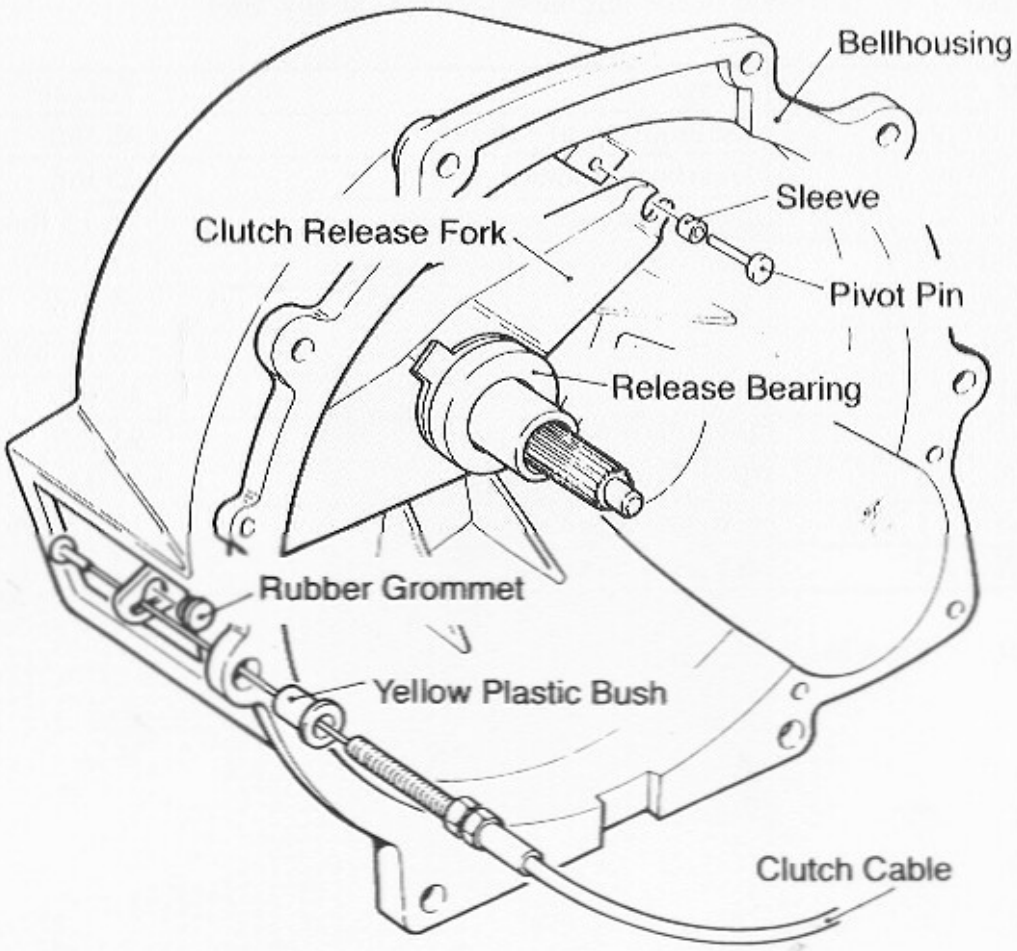
9.7 The rear exhaust strap hangs from the bracket protruding from the chassis immediately behind the axle, which should be drilled to suit a 5/16" bolt and nyloc. The top of the strap is secured to this bracket and the bottom should be hooked with a jubilee clip around the tailpipe.

9.8 Finally the aluminium exhaust guard can be fitted after sliding the long jubilee clips through the channels provided in its underside. This is positioned to protect the passenger from inadvertently touching the hot silencer, although care should be taken to ensure the guard doesn't touch the bodywork. The jubilee clip adjuster should be positioned in the gap between the body and the silencer, such that it is above the level of the base of the silencer

9.9 Before the exhaust clamps are fully tightened, we suggest you carefully check the alignment of the system to ensure that it neither lays too low nor contacts the bodywork or the inside of the left hand rear tyre at any point.

Bolt Size	Usage	Torque
M12 x 60mm	Bellhousing to gearbox	45 lbft
M12 x 25mm	Gearbox Mount	45 lbft
5/16"UNF x 1 3/4"	Engine Mounting rubbers	12-15 lbft
5/16"UNF x 3/4"	Gearbox mount to chassis	12-15 lbft
5/16"UNF x 1 3/4"	Upper engine bay diagonals	25 lbft
5/16"UNC x 3/4"	Engine mounts to block	12-15 lbft
1/2"UNF x 2 1/2"	Engine mounts to rubbers	40 ftlb
3/8"UNF x 1"	Propshaft to axle (Ital)	25 lbft
5/16"UNC x 1"	Thermostat Housing	12-15 ftlb
5/16"UNF x 1"	Exhaust Mounting Bracket	12-15 ftlb
5/16"UNC x 1"	Exhaust Manifold	12-15 ftlb

Table 10.1 Ford Engine Torques



Ford Bellhousing and Clutch Arm Assembly

Figure 10.1 5/6 Speed bellhousing and Clutch Arm Assembly

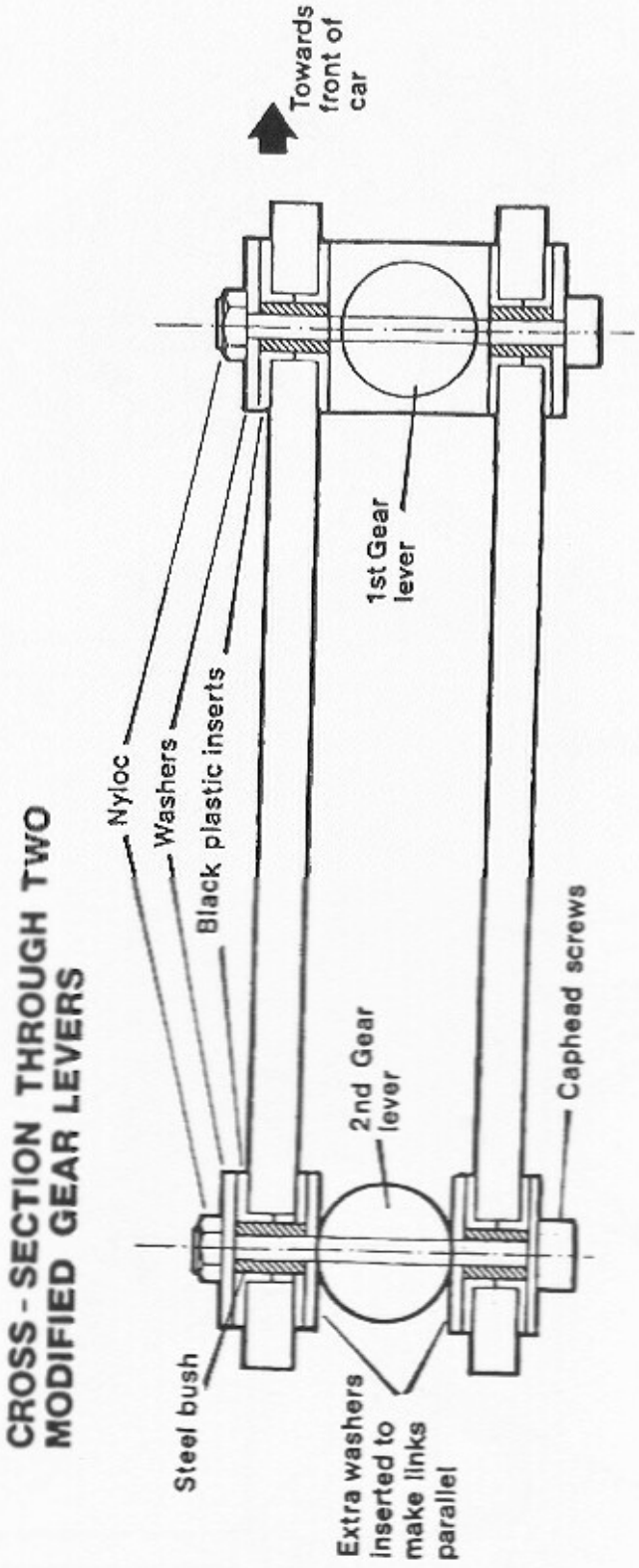
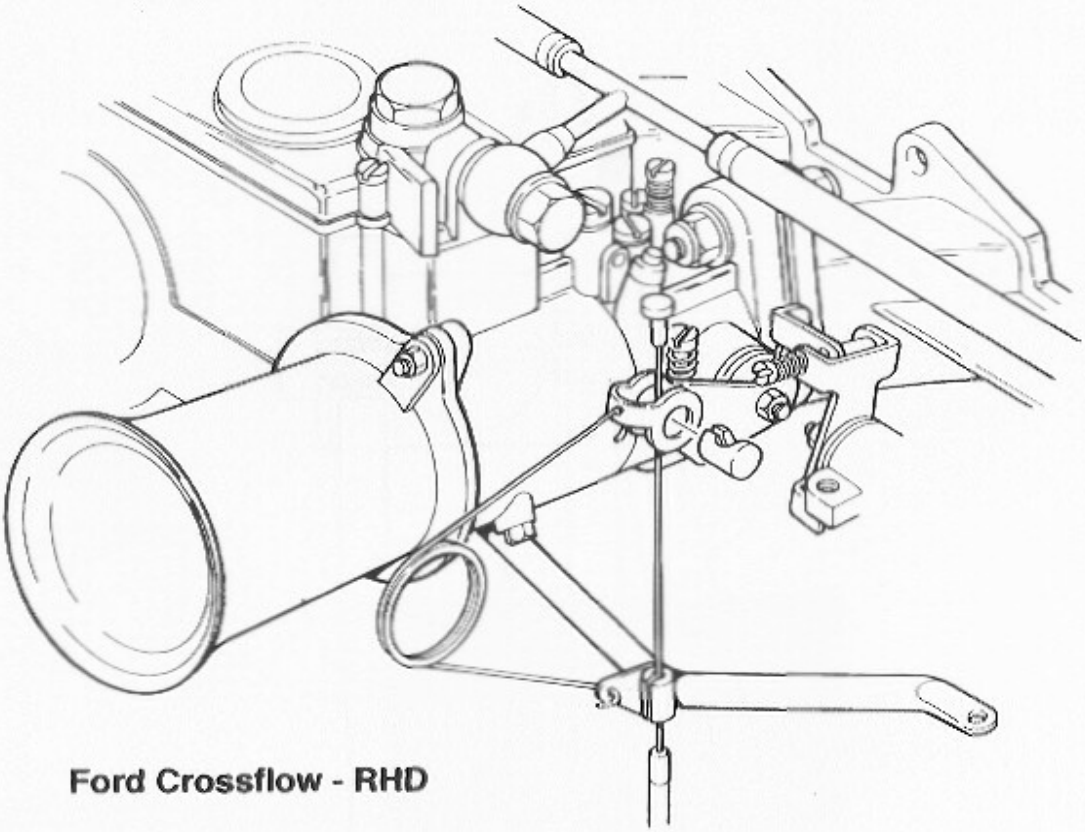
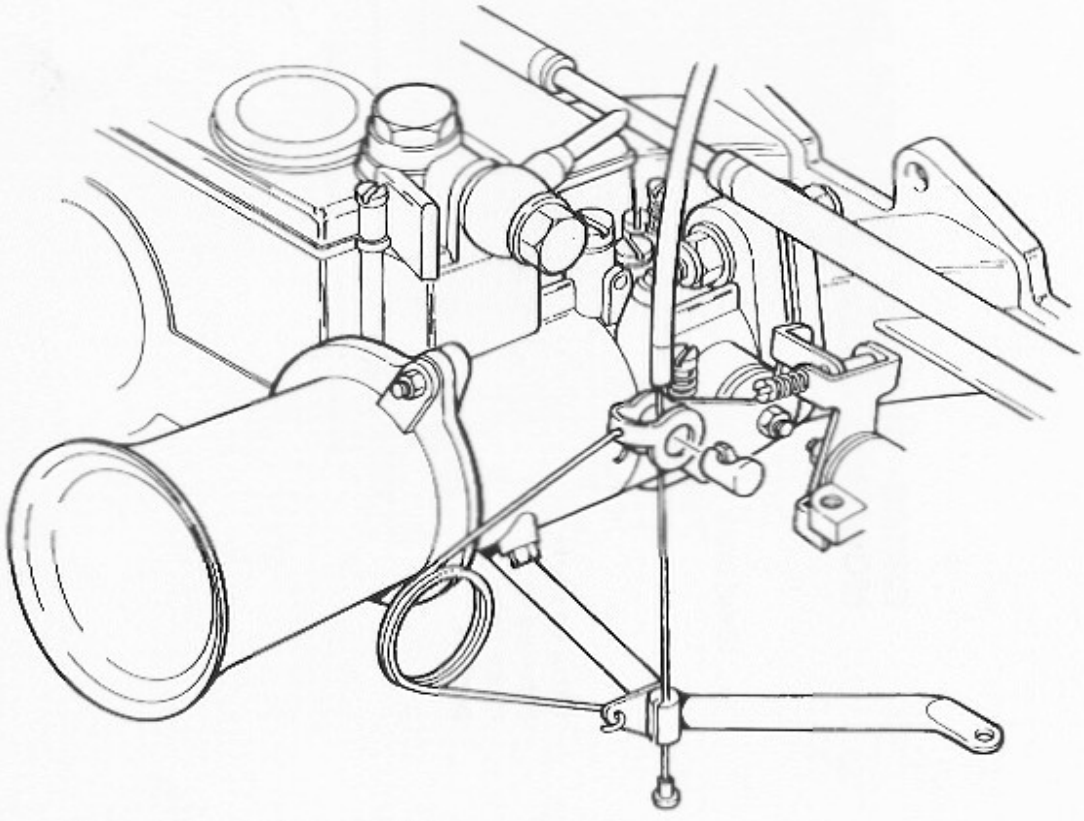


Figure 10.2.6 4 Speed Gearlever Mechanism



Ford Crossflow - RHD



Ford Crossflow - LHD

Figure 10.4 Weber Carburettors - Ford Crossflow

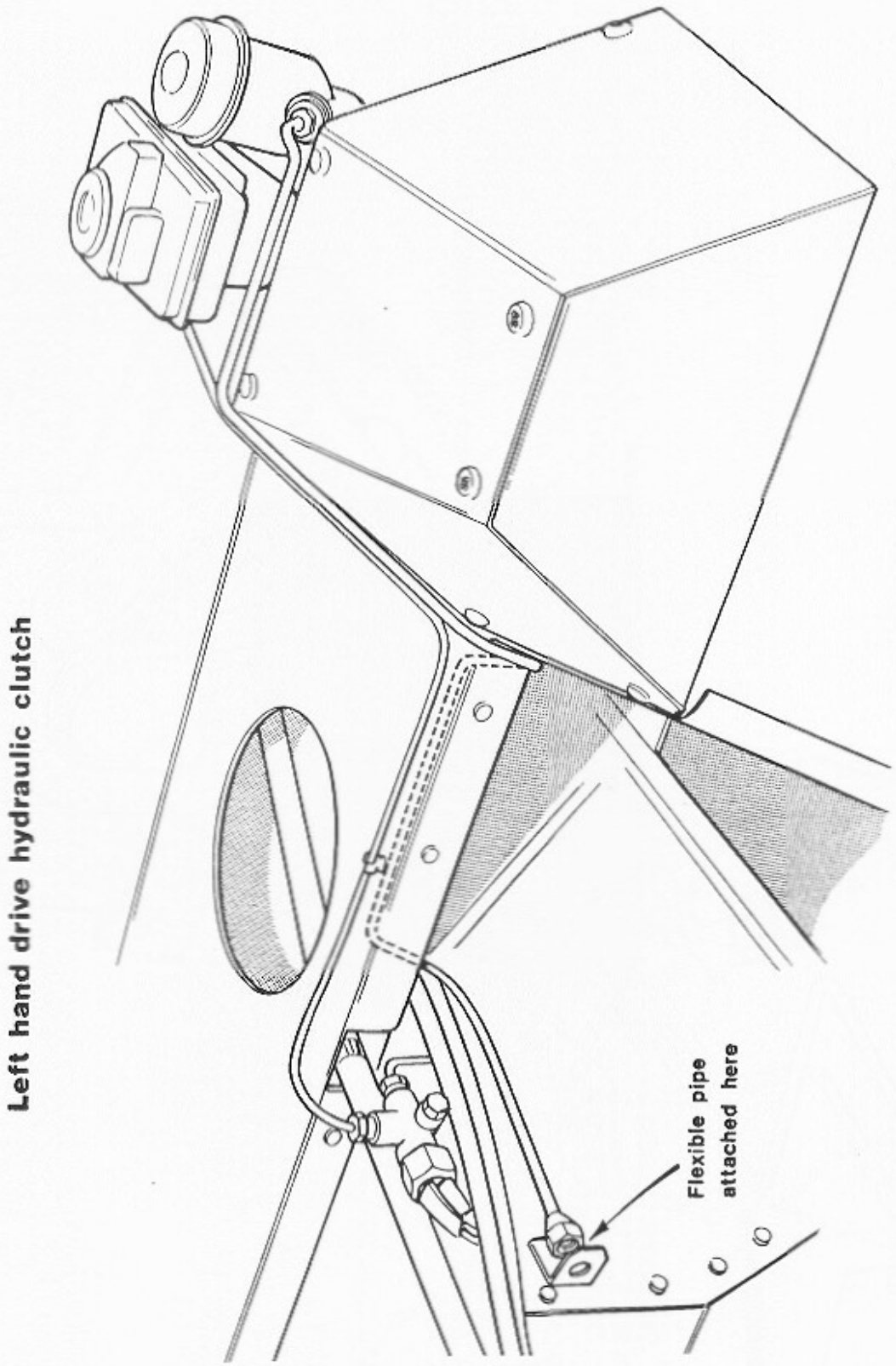


Figure 10.5 LHD Hydraulic Clutch

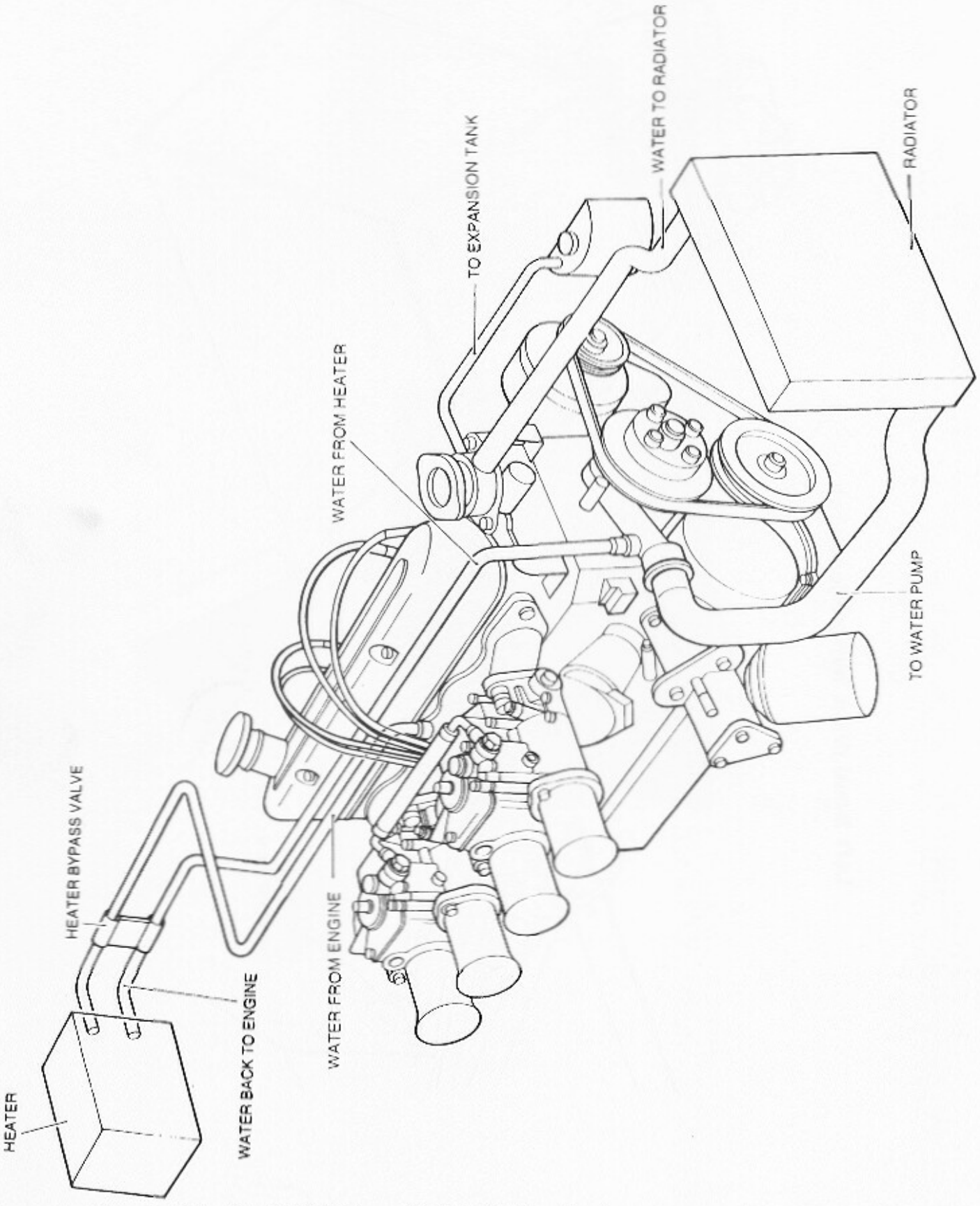


Figure 10.7 Ford 1700 Super Sprint Cooling System

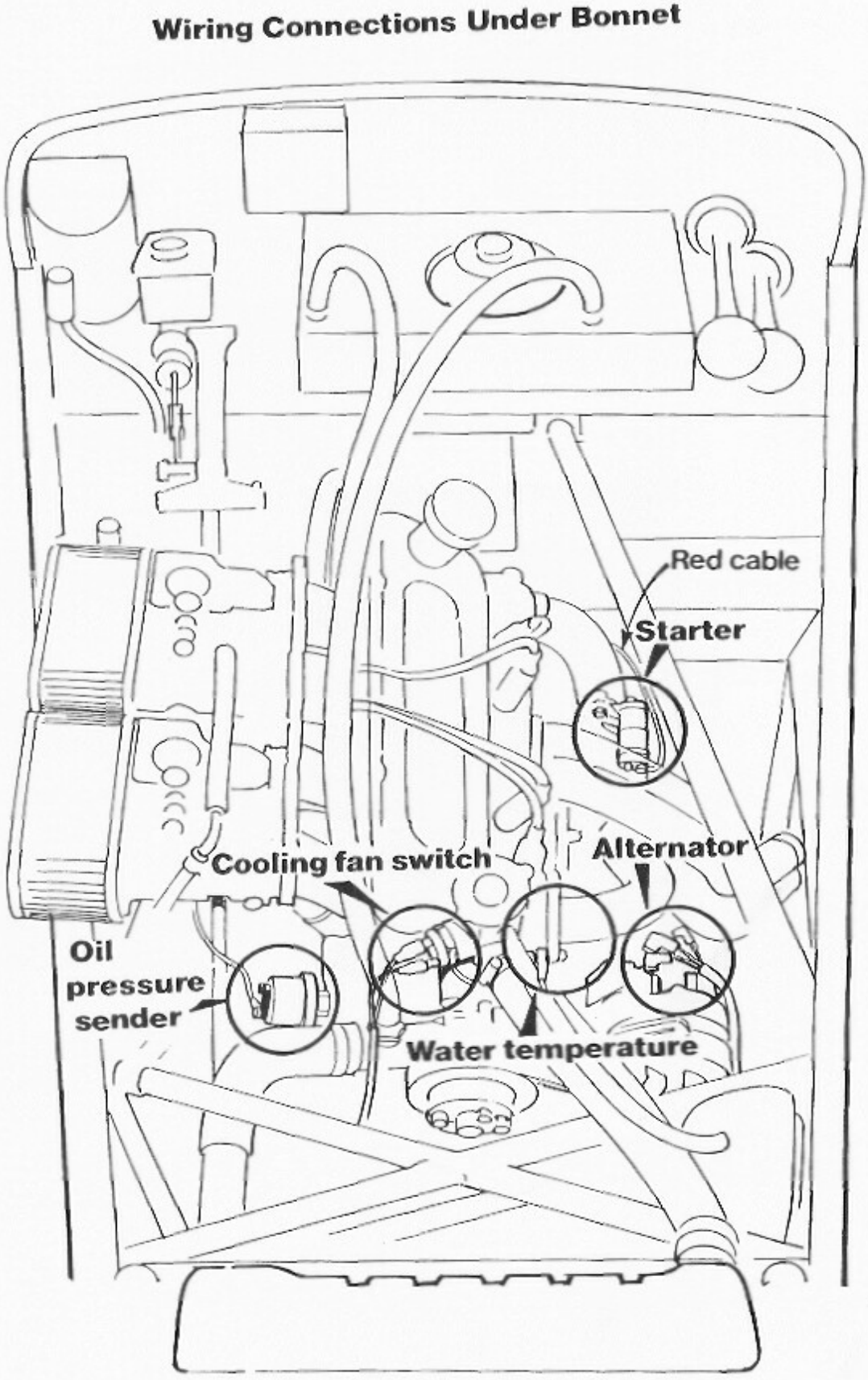


Figure 10.8 Wiring Connections Under Bonnet

SECTION 10A

INSTALLATION OF ENGINE AND GEARBOX - FUEL INJECTED VAUXHALL

Contents

Although this section is broadly similarly to section 10 of the assembly guide, there are some key differences between installation of the injected Vauxhall engine and Ford crossflow engines. To avoid duplication please refer to section 10 in conjunction with this section.

10A.1 Installation of Gearbox Kit - 5/6 Speed

1.1 The Vauxhall powered car uses the same Caterham or Ford gearboxes, though with a different bellhousing which eliminates the need for an adapter between the gearbox and bellhousing. The optional dry sump system uses an integral bellhousing/oil tank and employs a hydraulic clutch mechanism, so after assembling the gearbox itself please refer to 10A.4.2.

1.2 Follow the gearbox build up instructions in 10.1 with the exception of 10.1.2, as no spacer is required. The bellhousing bolts directly to the front of the gearbox, noting that the gasket still needs to be used. Tighten the M12x40mm fine thread bolts (with springwashers) to 45 lbft.

10A.2 Bellhousing / Dry Sump Tank Assembly

2.1 This is a complicated aluminium casting, and although it will have been pressure washed by both the manufacturers and Caterham Cars, it is possible that some sand may remain in the oil tank. It is vitally important therefore to check inside very carefully and to scrub out any remaining sand residues. The bellhousing assembly is shown in figure 10A.2.

2.2 Fit the clutch bleed screw to the left hand upper face of the casting.

2.3 To the lower left hand side of the casting, fit a 1/2" by 5/8" male/male adapter, screwing the 1/2" end into the casting using a crush washer (Dowty seal) to prevent leakage. To the right hand side of the casting, fit the small blanking screw.

2.4 Apply a smear of silicon sealant and attach the square cast base plate to the underside of the casting using M6x16mm caphead screws. We recommend the use of loctite on these screws.

2.5 Attach the rectangular plate with the oil filler neck to the top of the casting again using M6x16mm caphead screws with loctite and silicon sealant.

2.6 This top contains two horizontal and one vertical holes. The right hand horizontal hole is blanked off with the plug provided and the left hand hole is fitted with an aluminium elbow, which will eventually be connected to the engine oil catch tank.

2.7 The vertical left hand hole is fitted with a 1/2" by 1/2" male/male adapter screwed in with a Dowty seal.

2.8 The hole on the upper right hand side of the belltank assembly is fitted with a 1/2" by 5/8" male/male adapter, the 1/2" end being screwed into the casing with a Dowty seal.

2.9 The bellhousing assembly is attached to the front of the gearbox with 4 M12x110mm fine thread bolts using loctite and tightened to 45 lbft. It is very important that the gasket is fitted between the two, and some additional sealer applied where the selector shaft extends into the belltank will prevent any oil leaks from the gearbox.

2.10 The clutch slave cylinder and integral release bearing assembly is pre-fitted into the belltank at the factory. This should not be removed as the rear seal is inevitably damaged in the process.

10A.3 Preparing Engine For Fitment In Car

3.1 The two removable upper engine bay diagonals allow the engine and gearbox assembly to be fitted as a unit, once the diagonals have been removed. This greatly simplifies assembly as fitting the engine to the gearbox is very much easier out of the car. Take care to ensure the fixings for the diagonals are retained, so the correct bolts can be re-used. Please note that the diagonals are fitted in a different position on Vauxhall powered cars (see figure 10A.3.1

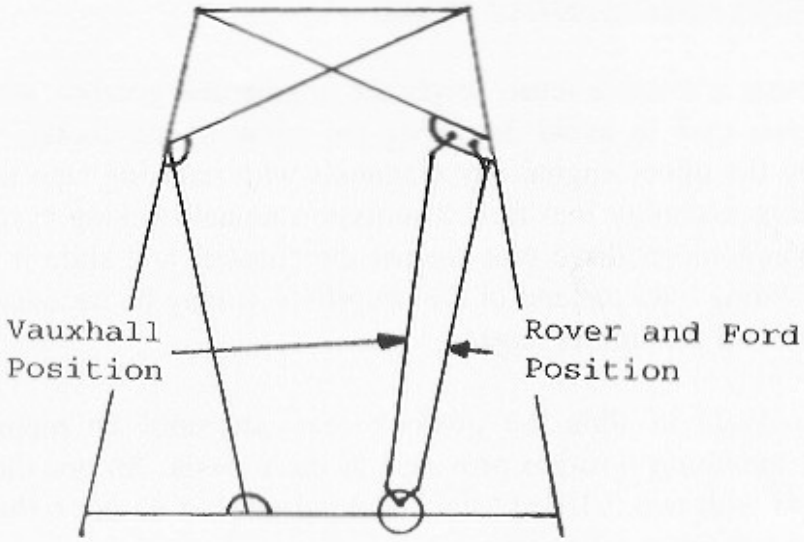


Figure 10A.3.1 Upper Engine bay Diagonals

3.2 The engine can be fully kitted before installation with the exception of the exhaust manifold. It is recommended that the engine mounting brackets are left off at this stage to avoid the risk of damaging the fragile body side panels. This will mean that the alternator has to be left off also. The 'J' shaped water rail (see cooling kit installation 10A.10.2) should be attached to the water pump and inlet manifold and the 5/8" hose to the heater connected to the rearmost outlet on the water rail and tightened.

3.3 Before being fitted to the chassis, the gearbox needs to be fitted to the engine. Slide the gearbox into place on the rear of the engine. It may be necessary to turn the crankshaft using the bolt on the front pulley in order to line up the gearbox first motion shaft splines with the clutch. Once the gearbox is in place on the engine, connect the two together using 6 M12x40mm bolts with spring washers where possible and loctite where not. An M12x60mm bolt passes through the starter and engine flanges to secure the top of the starter. Please note that the thread in the top of the starter motor is drilled out to permit this, earlier cars had this bolt fitted the other way round.

3.4 Before fitting the engine/gearbox assembly, two operations must be carried out.
i) The transmission tunnel top must be removed by releasing the four screws that hold it in place.
ii) Fit the metal/rubber engine mountings to the chassis using 4 5/16"x1 3/4" bolts, plain washers and nylocs, but do not tighten at this stage. Do not fit the mounting brackets themselves to the block at this stage, as they will foul the chassis and steering column while the engine is being fitted.

10A.4 Fitting Engine/Gearbox In Car

4.1 Using a suitable hoist, lower the engine and gearbox assembly into the chassis taking great care to avoid damaging the paint on the chassis tubes. We recommend protecting the upper engine bay diagonals with masking tape to avoid damage. Insert the gearbox assembly into the transmission tunnel, (taking care to avoid touching the fragile speedometer drive unit against the chassis) and slide it back with the tailshaft housing sliding over the end of the propshaft. It may be necessary to turn the propshaft slightly before the splines engage.

4.2 Continue to slide the gearbox rearward until its mounting locates onto the rearmost mounting position provided in the chassis. Secure the gearbox mounting to the chassis with two 5/16"x1" bolts and nylocs, but do not tighten at this stage as final tightening has yet to take place.

4.3 With the engine still suspended, attach the exhaust manifold and engine mounting brackets to the cylinder block. The left-hand mounting bracket is then attached using 2 M10 x 25mm and 1 M10 x 45mm bolt into the rearmost position. The right-hand bracket fitment varies according to whether a dry or wet sump system is installed.

i) Wet sump: Attach the mounting to the block using 2 M10x45mm bolts and position the two cylindrical aluminium spacers provided between the mounting and the cylinder block.

ii) Dry sump: The mounting is secured through the oil scavenge pump, so the two bolts holding this to the block must first be removed. When doing this take care to ensure that the two spacing washers between this casing and the block do not drop out, or if they do, are put back as otherwise tightening the engine mounting will put unnecessary stress on this aluminium casting and change the adjustment of the toothed belt driving the oil pump. Fit the mounting to the block using 2 M10x45mm bolts.

4.4 The engine can now be lowered onto its mountings and secured with two 1/2"UNF x $2\frac{1}{2}$" bolts and lockwashers. If the engine mountings do not align it may be necessary to loosen the bolts holding the rubber mounts to the chassis rails temporarily to get a little more movement. It also helps to keep a trolley jack under the engine to facilitate alignment.

4.5 Finally the gearbox can be adjusted in the tunnel using its slotted mountings, to achieve equal clearance on both sides within the transmission tunnel, and its mounting bolts tightened.

4.6 Refit the upper engine bay diagonals as in figure 10A.3.1, noting that the right hand diagonal passes under the inlet manifold and is attached in a different position to the Ford. Refit the 5/16" x 1 3/4" caphead bolts and torque to 25 lbft.

10A.5 Connection Of Dry Sump Oil System

5.1 There are two braided oil pipes provided which are the main feeds to and from the oil tank. The pipe marked 70105 has one 45 degree and one 90 degree union and is connected between the scavenge pump on the right-hand side of the engine block and the union on the right-hand side of the oil tank. The 90 degree union fits to the oil tank. The second pipe marked 70106 has two 90 degree connections and fits between the sump itself and the bottom left-hand side of the oil tank, providing the main oil feed to the engine.

5.2 The oil tank should be filled with oil, we recommend a synthetic oil such as BP Visco 2000. Ensure that the tank is filled to within approximately 5" from the top which amounts to about 4 litres of oil. Do not allow the level to fall below 2/3 full (about 2.8 litres) or some surge could be encountered under hard cornering. On the other hand over filling will lead to excess oil being blown messily out of the breather. The oil level in a dry sump system can only be checked with the engine running. The left-hand union on top of the oil tank should be connected to the breather outlet on the front right-hand side of the cam cover using the rubber hose provided secured with Jubilee clips.

5.3 The final operation is to fit another rubber hose to the aluminium union emerging from the side of the top cover of the tank and trim to length so that it breathes to atmosphere adjacent to the bottom of the gearbox.

10A.6 Clutch Connection

6.1 The normal wet sump installation uses a cable clutch mechanism similar to that used in Ford powered Sevens, except that it is capable of being adjusted from both ends. Please refer to section 10.4.6 but note that it should be adjusted so that the minimum amount of the outer cable enters the pedal box. If the dry sump has been specified the nylon hose must be fitted between the master cylinder on the pedal box and the threaded hole on the right-hand side of the bellhousing.

6.2 The clutch master cylinder should be filled with brake fluid, and having loosened the bleed screw, bleed using long steady strokes of the clutch pedal until the fluid emerging is free from bubbles. Tighten the bleed screw and check that the pedal operates the clutch correctly. The clutch itself is self-adjusting although the pedal location can be adjusted along with that of the brake pedal (see section 17). The use of silicon clutch fluid is not recommended.

10A.7 Air Intake System

7.1 Vauxhall Fuel Injection engines are supplied with the inlet manifold and throttle body fitted, in which state the engine should be installed in the chassis. The throttle body will have a plastic bung in it to prevent ingress of foreign matter, which should be left in place until the rest of the air intake system is fitted.

7.2 After removing this plastic bung, the fibreglass elbow should be fitted to the throttle body using a smear of silicon sealant and four panhead bolts (2 M6x55, 1x M6x35 and 1 M6x25). The idle air bypass valve can then be fitted between the inlet manifold and the intake elbow. The valve is an aluminium barrel shaped device, 45mm in diameter and 100mm in length. The horizontal takeoff (marked with an arrow) is connected to a port on the side of the inlet manifold using a short 50mm length of pipe and the vertical take off is connected to the intake elbow with a curved rubber tube around 200mm long. Both these lengths of pipe should be cut from the complex pipe labelled 90323561223.

7.3 The large bore straight, flexible pipe should then be fitted between the elbow and the throttle body, and fixed in place using jubilee clips. The curved 'bellows' pipe is then fitted between the air flow meter and the air filter assembly, which is fitted on the scuttle, over the hole in the aluminium panel above the gearbox. This round hole may have a blanking plate fitted over it, if so this should be removed, and a tubular aluminium spinning should be riveted in place.

7.4 Having loosely assembled the air intake trunking, and with the heater fitted in the scuttle, the location for the air filter can be fixed. To fit the air filter assembly, the top half of the box and the filter element should be removed, along with the rear upper to lower box clip. The bottom half of the filter box should be positioned on the scuttle in front of the heater.

7.5 The mounting holes for the air filter can then be marked out and drilled, and the air box riveted in place. Before refitting the upper half of the air filter box, drill a 15mm hole in the front face to accept the air temperature sensor. The sensor should be pushed in and sealed with silicon sealant. Take care to ensure the intake pipes take as smooth a run as possible before bolting down the air filter, and use jubilee clips on all joints.

7.6 The 24" long trunking should then be fitted facing rearwards within the tunnel, with the 90 degree elboe attached to the aluminium spinning fitted in section 7.2. The elbow should be attached with a jubilee clip, and the long end should be secured to the chassis tubes above the gearbox with ty-wraps.

10A.8 Electrical Connections

8.1 The alternator is fitted to the left engine mounting bracket on the horizontal tube running parallel to the engine. Attach the alternator using a 5/16" x 5" bolt and nyloc.

8.2 The adjusting strap is attached to the hexagonal block already bolted to the engine using a 3/8"bolt and spring washer and to the alternator by an M8 x 25 bolt using both spring and plain washers. fit the alternator drive belt and tighten by swinging the alternator away from the engine until there is no more than 1/2" movement in the belt.

8.3 The live battery connection is made using the short red lead between the positive terminal on the battery and the bolt on the starter solenoid. The earth strap connects between the negative terminal on the battery and the lower fixing bolt (13mm across flats) for the distributor or phase sensor on the back of the cam.

N.B. Do not actually connect this earth lead to the battery until all electrical equipment is installed and connected and the car is ready to run.

8.4 The engine in turn is earthed to the chassis on the rear engine mounting rubber fixing bolt on the right hand lower chassis tube. The other end of the strap is bolted to an unused threaded hole in the engine block adjacent to the engine mounting bracket.

8.5 Vauxhall injection cars have two separate wiring harnesses, which are joined together with a multi pin plug. The main wiring harness is fitted to the chassis by Caterham Cars, and the engine harness, which covers all the connections to equipment on the engine, is supplied fitted to the engine. This leaves a number of connections to be made once the engine is fitted in the car. Most of the connectors in the engine harness are labelled with their destinations and the following connections need to be made:- (See figure 10A.8) The numbers in brackets refer to the labelling of figure 10A.8.

Inlet air temperature sensor (1)	2 pin plug, labelled 'I.A. Temp' connects to plug on air filter box
Air flow meter (2)	4 pin plug, labelled 'flow', on air flow meter (see Air Intake section)
Purge Valve (8)	2 pin plug, labelled purge, goes to top of charcoal canister
Air bypass valve (12)	2 pin plug, labelled 'bypass', on bottom of air bypass valve (see Air Intake section)

Fuel Quality Plug (16)	3 pin plug, labelled 'F/Qual' connects to small brown part in area of inertia switch.
Diagnostic plug (17)	Labelled 'Diag', and fitted to bracket on scuttle, does not connect to anything on car.
Relays (18)	The relays are fitted to the loom, but need to be bolted to the scuttle
Inertia switch (19)	3 pin plug, labelled 'Inertia' on a black plastic part with a rubber button on top of the scuttle.
Warning Light (20)	Plug in red light in scuttle area
Engine E.C.U. (21)	Multipin connector for the E.C.U. on footbox
Ignition module (22)	7 pin connector to small black plastic part in footbox/scuttle area.
Main Harness Connector (23)	Multipin Connector in main harness in engine bay
Lambda Probe (24)	4 pin plug (see exhaust section)
Alternator (25)	brown, brown, and brown/yellow wires in a plastic connector, Brown/yellow to B+
Earth	ring terminal, labelled earth, bolts to 3 way brake union by front suspension

8.6 There are 3 wires in the main harness that are not used with the Vauxhall engine, and should be insulated and taped back into the loom. These are the white and white/black wires by the pedal box and the purple wire from a similar area.

8.7 Once all the connections have been made, and the upper engine bay diagonals have been refitted, the engine harness should be routed along the right hand upper engine bay diagonal. Do not bolt the intake manifold support bracket into place until the wiring harness is in place.

10A.9 Exhaust System

9.1 The Vauxhall exhaust system consists of a one piece fabricated exhaust manifold/collector assembly, and a one piece silencer and tail pipe which also incorporates the catalytic converter. The exhaust manifold, using the gasket supplied,

is fitted to the studs on the engine using M8 plain nuts and lockwashers. It can then be secured to the engine block using the "cats cradle" bracket provided. This attaches to the vertical face of the bellhousing substituting 60mm rather than 40mm long bolts holding the engine to the bellhousing and to the cylinder block using an M10 x 45mm bolt. The cradle is then attached to the rear face of the integral collector using 2 x 5/16" bolts springwashers and plain nuts.

9.2 Bolt the small angle bracket to the lower nearside of the car in front of the rear wheel as per 10.8.4. The silencer assembly can be slid in through the aperture in the body skin and over the manifold using a single band clamp, and hung onto the rubber bobbins using M8 nuts and lockwashers.

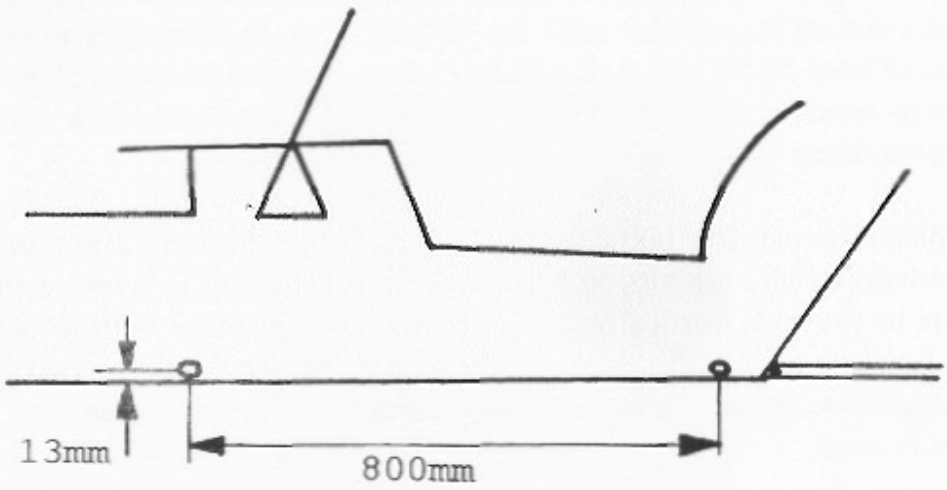


Figure 10A.9 Front Exhaust Bush Location

9.3 The side exit catalyst exhaust has an extra mount at the front of the silencer to support the catalyst. This mount uses the same type bracket and bobbin as the rear mount and is fitted as follows. There is a threaded bush in the chassis to which the front angle bracket bolts, which can be found 800mm forward from the rear exhaust bush, and 13mm up from the base of the chassis. This should be revealed with a pilot hole which can be expanded to suit the bolt, taking care not to damage the threads. See figure 10A.9

9.4 Assembly is completed in exactly the same way as with the Ford installation except that the exhaust guard is fitted with three jubilee clips not two, and that if catalyst equipped no clamp should be fitted to the catalyst itself as this gets extremely hot in service. The jubilee clip adjuster should be positioned in the gap between the body and the silencer, such that it is above the level of the base of the silencer

9.5 Finally screw the Lambda sensor into the top face of the manifold collector and attach to the engine wiring loom with the special 4 pin plug. Ensure that the wires are tied out of contact with the exhaust manifold.

10A.10 Cooling System

10.1 Refer to section 10.7.1 for the fitment of the cooling fan and 10.7.2 for the radiator. The radiator itself is fitted with a blanking plug which must be positioned face upward. The plug is removed and a thermostatic fan switch fitted in its place, to which the black/green and green wires are connected.

10.2 The J shaped stainless steel water rail will have already been fitted to the water pump (section 10A.3.2) using a 3" length of hose. This length of hose should be cut from the short end of hose 594/3 after the 90° bend. This is connected to the radiator using the rest of hose 594/3 which should be routed over the steering column and rack. This hose may need to be trimmed at the radiator end to achieve a good fit. The remaining connections should be evident from diagram 10A.10

10.3 The plastic expansion bottle is located on top of the cruciform immediately behind the radiator where a it sits on 5/16" x 3" bolt. The bolt is screwed into the boss in the chassis to protrude vertically, where it is locked in place with a lock nut. It is held by two brackets on the chassis secured to the expansion bottle by two 1/4" x 3/4" bolts and nylocs (see figure 10A.10.3). The position of the expansion tank should be adjusted so it is level.

10.4 The underside of this bottle is connected to the water rail with a rubber hose cut to length, and a second thinner hose runs backwards from the top of the bottle to the water connection on the inlet manifold.

10.5 The heater is connected to the outlet on the rear of the block using an 'L' shaped hose, with the short end having a larger bore than the long end. The larger bore end fits on the rear of the block.

10.6 The cooling system should be filled with a 33% antifreeze solution to the level marked on the expansion tank. Carefully bleed with the engine running and the bleed valve on the radiator loosened until normal operating temperature is reached and the air is bled out of the radiator. After the car has been road tested the radiator should be bled once again to ensure that all the air is removed from the system.

10A.11 Fuel System

11.1 The fuel system is complete for injection cars except for the attachment of the fuel feed and return pipes to the injection system, and the connections to the charcoal

canister from the inlet manifold and the fuel filler neck. These can be seen in figure 10A.11

11.2 There are three pipes that travel through the transmission tunnel, a metal pipe and two black plastic pipes. The metal pipe is the fuel feed from the fuel tank to the inlet manifold, and is connected to a rubber fuel hose leading to the fuel rail on the inlet manifold. The black plastic fuel return pipe connects to the fuel return valve on the fuel rail (mushroom shaped, brass coloured object) using a short length of 1/4" rubber hose and jubilee clips. This plastic pipe will have been connected to the top of the fuel tank at the factory. The second plastic pipe connects to the 'tank' connection on the charcoal canister using a short length of rubber hose and jubilee clips. This pipe will already have been connected to the fuel filler neck at the rear. A further length of 3/16" rubber fuel hose is connected between the throttle body and the purge connection on the charcoal canister. The air connection on the charcoal canister is left free to allow the canister to vent to atmosphere.

10A.12 Throttle and Speedometer Cable

12.1 At the throttle body, the barrel on the inner cable fits into a slot in the quadrant in which the cable lies. The rubber bush at the end of the outer cable clips into the aluminium bracket above the inlet manifold. At the pedal end, the outer cable sits directly in the front of the pedal box, and the nipple clips into the pedal. See figure 10A.11.

12.2 The speedometer cable should be fed through the large grommet above the steering column in the front bulkhead and connected to the back of the speedo where it is hand tightened.

Bolt Size	Usage	Torque
M12 x 40mm	Gearbox to bellhousing	45 lbft
M6 x 16mm	Belltank top plate	5 lbft
M12 x 110mm	Dry sump belltank to gearbox	45 lbft
M12 x 40mm	Engine to bellhousing	45 lbft
M12 x 60mm	Engine to bellhousing	45 lbft
5/16"UNF x 1 3/4"	Engine mount rubber to chassis	12-15 lbft
5/16"UNF x 1"	Gearbox mount to chassis	12-15 lbft
M12 x 25mm	Gearbox mount to gearbox	45 lbft
M10 x 25mm	Left engine mount	25 lbft
M10 x 45	Left and Right engine mount	25 lbft
1/2"UNF x 2 1/2"	Mounting brackets to rubbers	12-15 lbft
5/16"UNF x 5"	Alternator	12-15 lbft
5/16"UNF x 1 3/4"	Upper engine bay diagonals	25 lbft
M8 x 25mm	Alternator to strap	12-15 lbft
M10 x 60mm	Cats cradle to bellhousing	25 lbft
M10 x 45mm	Cats cradle to block	25 lbft
5/16"UNF x 1 3/4"	Cats cradle to manifold	12-15 lbft
5/16"UNF x 3/4"	Exhaust bracket	12-15 lbft
M8 nuts	Exhaust manifold	12-15 lbft
5/16"UNF x 3 1/2"	Expansion tank support	12-15 lbft
1/4"UNF x 3/4"	Expansion tank brackets	8 lbft

Table 10A.1 Vauxhall engine installation - Torques

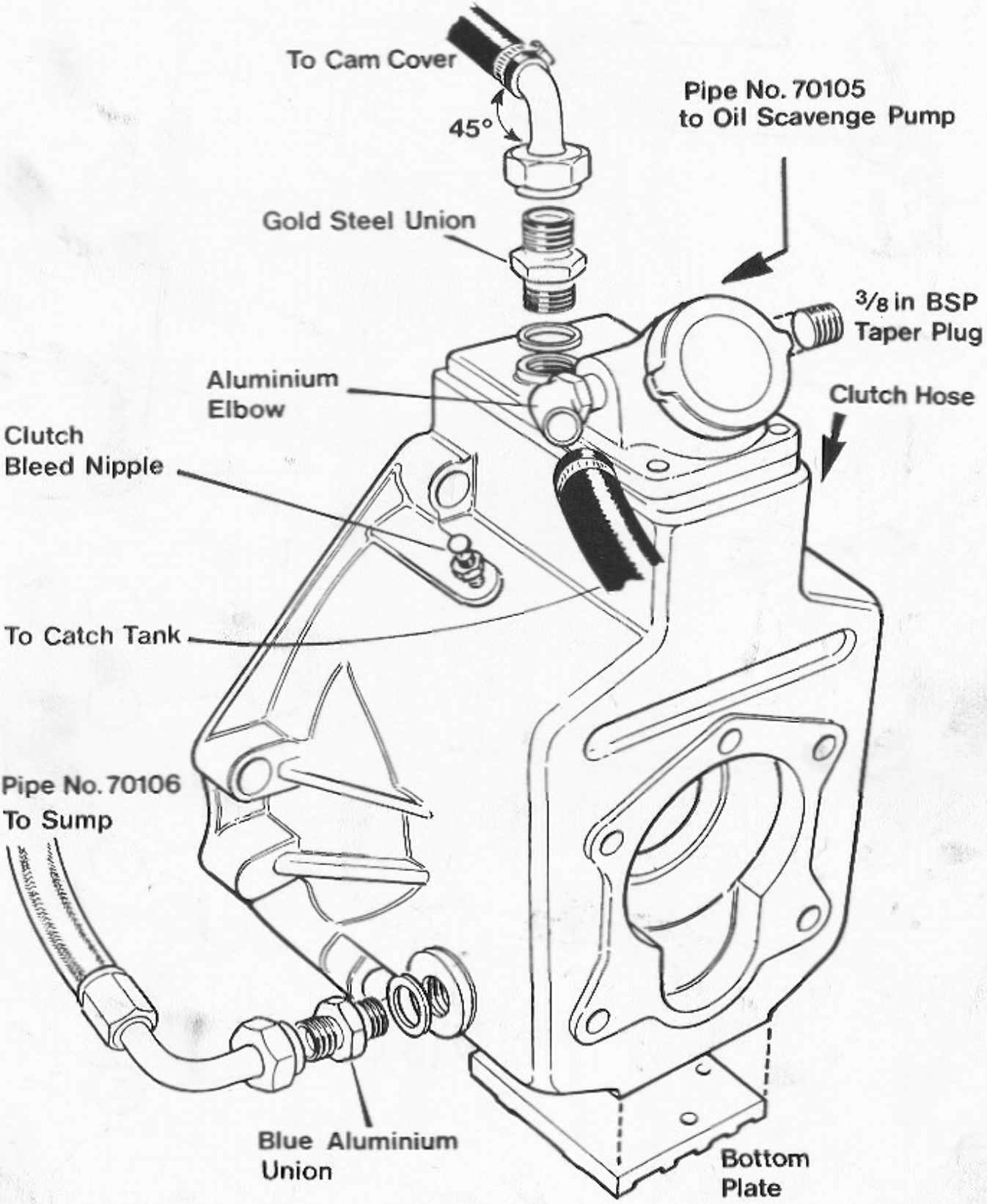
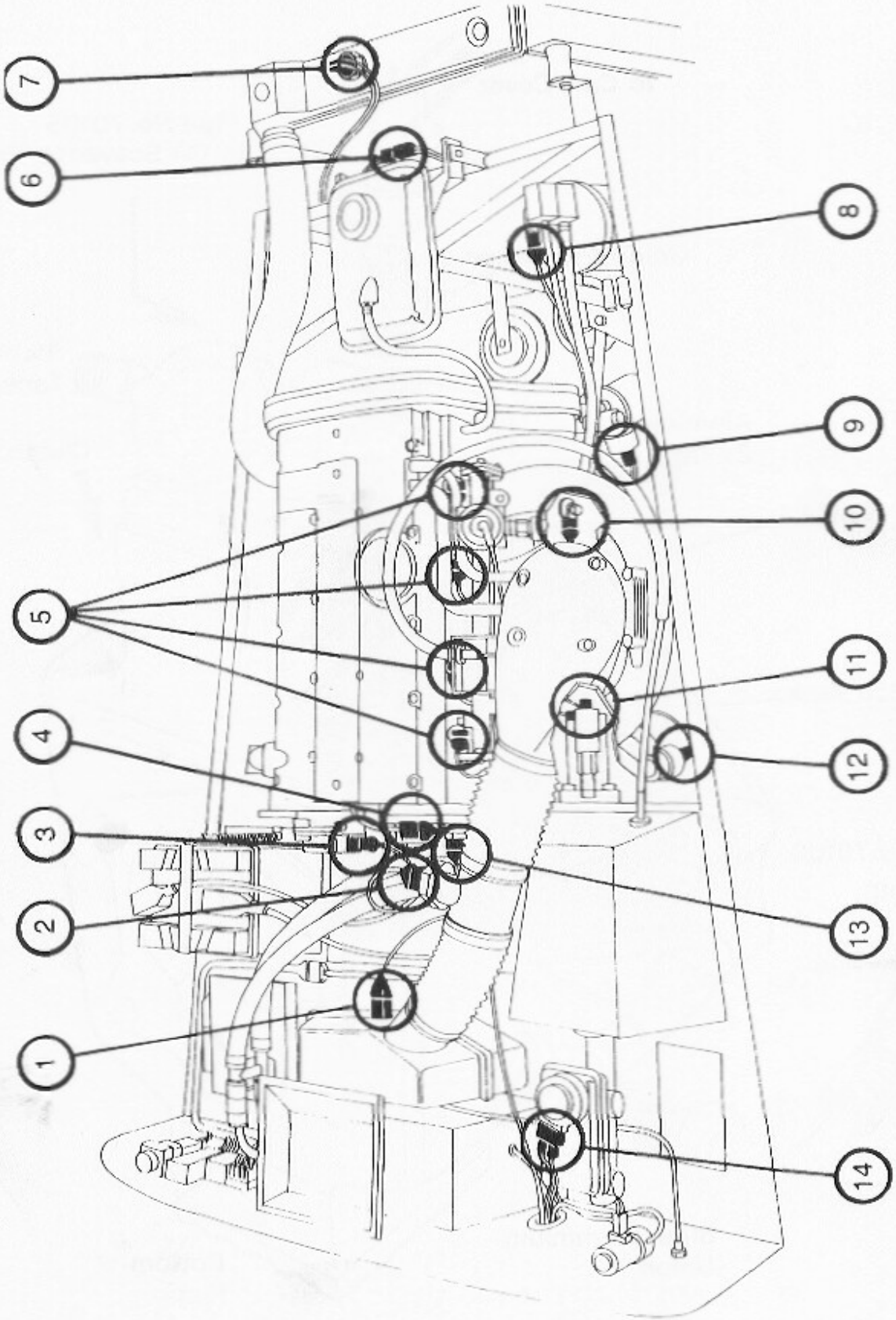
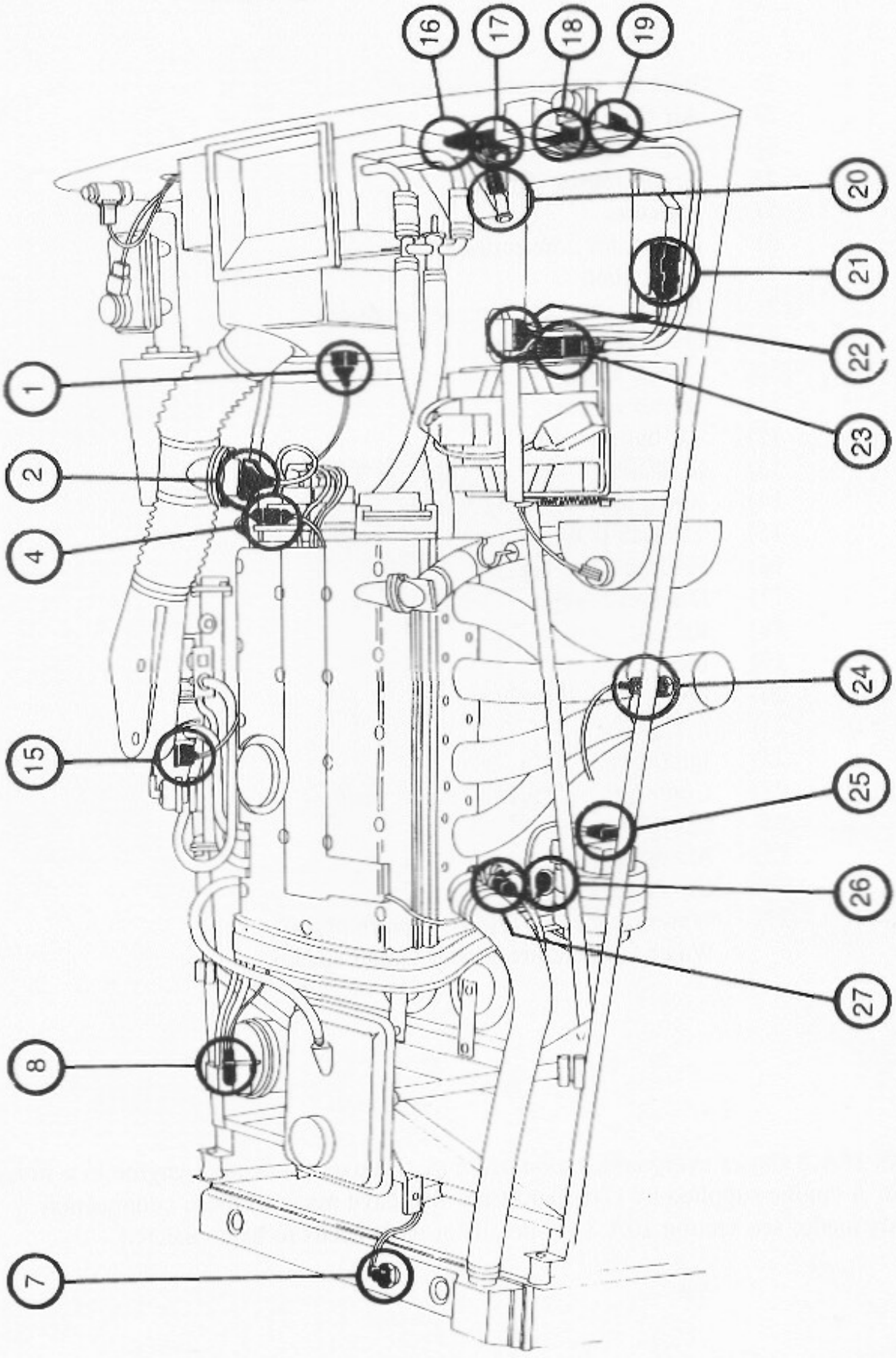


Figure 10A.2 Dry Sump Bell Tank Housing



10A.8 (1) Vauxhall Injection Electrical Connections



10A.8 (2) Vauxhall Injection Electrical Connections

Vauxhall Injection - Electical Connections

1) Inlet air temperature sensor
2) Air flow meter
3) Phase Sensor
4) Crank sensor (flylead)
5) Injectors
6) Fan motor connection
7) Fan switch
8) Purge valve on charcoal cannister
9) Oil pressure sender
10) Knock sensor
11) Starter motor
12) Air bypass valve
13) Coil pack
14) Brake level warning switch
15) Throttle potentiometer
16) Fuel quality plug
17) Diagnostic plug
18) Relays
19) Inertia switch
20) Ignition warning light
21) E.C.U.
22) Ignition module
23) Connector, engine to vehicle harness
24) Lambde probe
25) Alternator
26) Crank sensor (on engine)
27) Water temperature sensor (large plug)
Water temperature sender (small spade)

Figure 10A.8 shows every connection made to a Vauxhall injection engine in a super seven. A engine supplied by Caterham Cars will have many of these connnection already made, see section 10A.8 for details of what needs to be connected

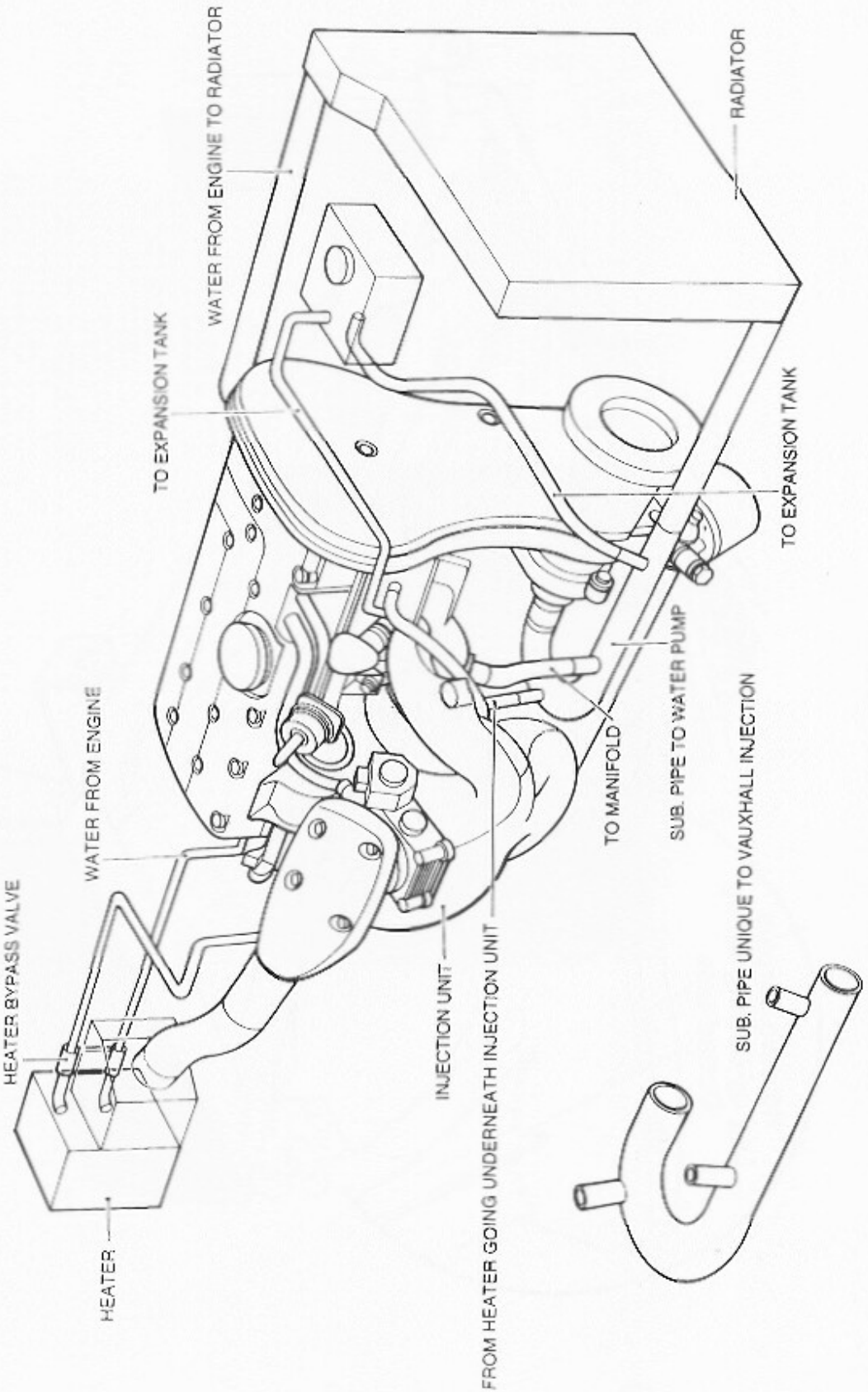


Figure 10A.10 Vauxhall Injection Cooling System

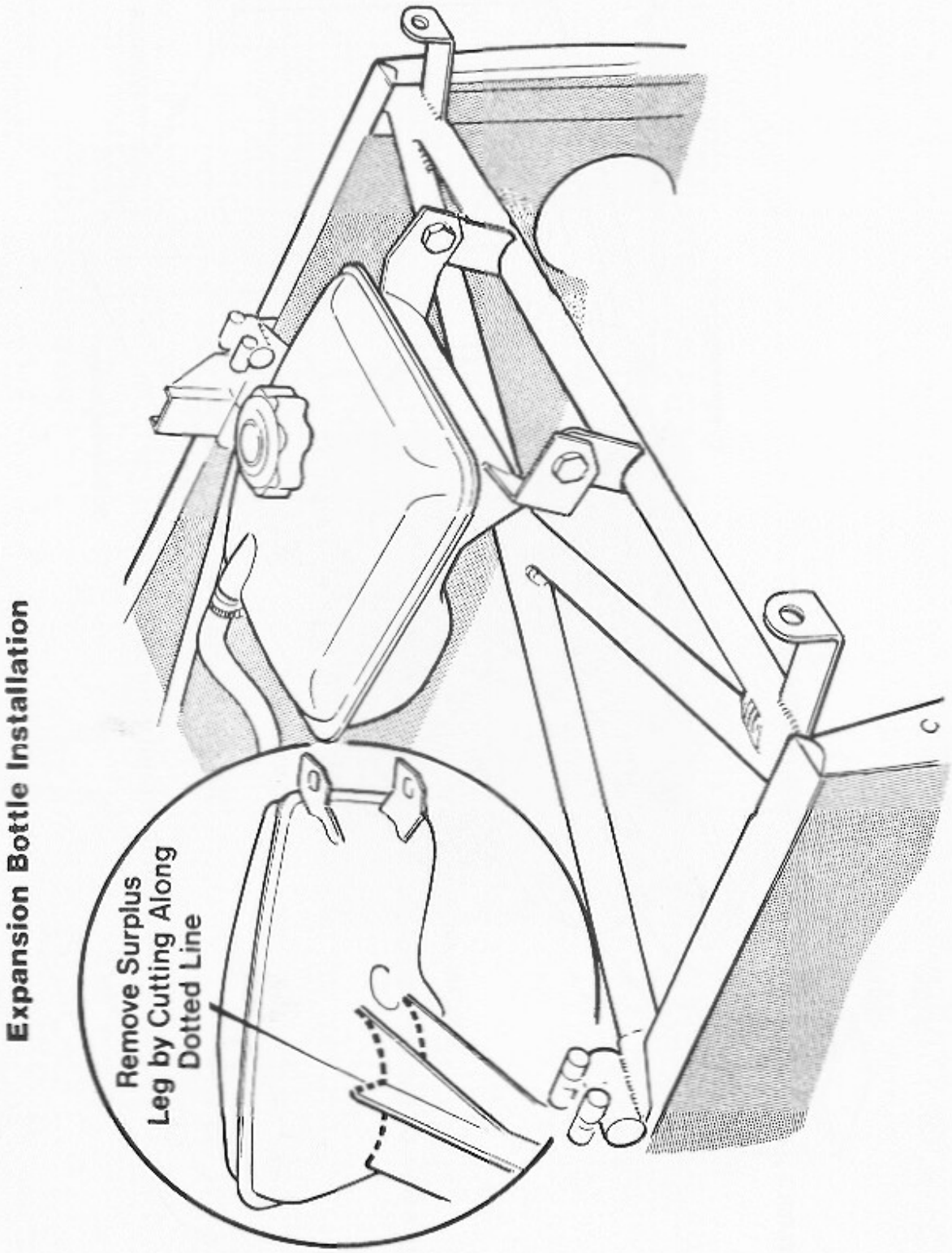


Figure 10A.10.3 Expansion Bottle Installation

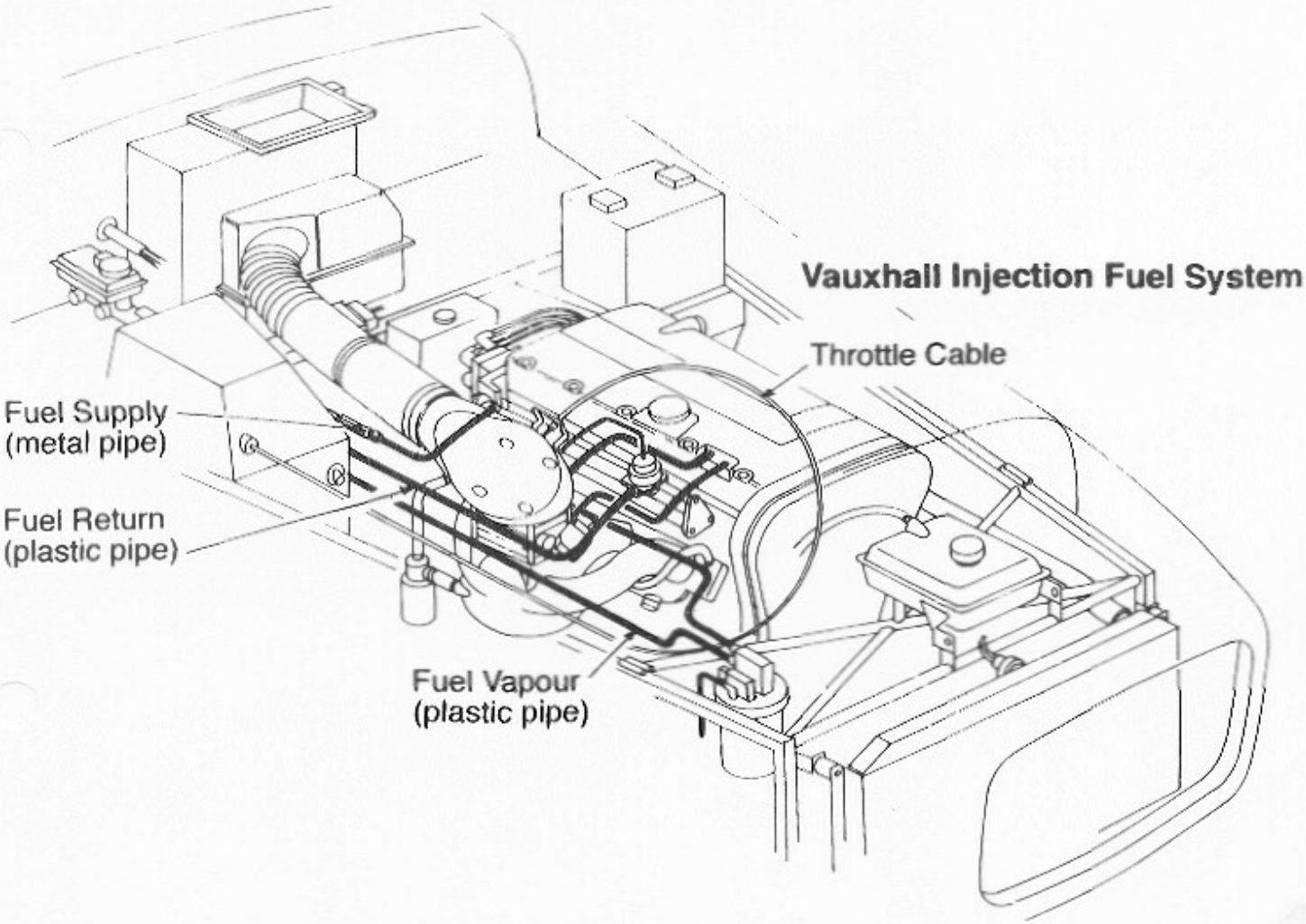


Figure 10A.11 Vauxhall Injection Fuel System

SECTION 10B

INSTALLATION OF ENGINE AND GEARBOX - CARBURETTOR VAUXHALL

Contents

The installation of the Vauxhall engine when equipped with Weber carburettors is fundamentally the same as the Vauxhall injection engines with some changes amongst the engine ancillaries.

10B.1 Assembly of Gearbox Kit

This is the same as for the injection engine in section 10A.1.

10B.2 Bellhousing / Dry Sump Tank Assembly

This again is identical to the injection installation. (see section 10A.2)

10B.3 Preparing Engine for Fitment in Car

3.1 The same steps need to be taken to prepare a carburettor engine for fitment in the car as with the injection installation. The only change is that the water pump does not need to be connected up before installation as access in this area is greatly improved.

3.2 The engine and gearbox assembly should be installed with both engine bay diagonals removed, and with the carburettors in place.

10B.4 Fitting Engine/Gearbox Into car

The engine and gearbox assembly should be installed into the car following the same steps as with the Vauxhall injection engine. The upper engine bay diagonals should be fitted in the same position as for a Vauxhall injection engine, ensuring there is adequate clearance for the throttle cable and bracket.

10B.5 Electrical Connections

5.1 The alternator is fitted to the left hand engine mounting bracket where it is located by the horizontal tube running parallel to the engine. Attach the alternator using a 5/16" x 5" bolt and nyloc.

5.2 The adjusting strap is attached to the hexagonal block already bolted to the engine using a 3/8" bolt and lockwasher, and to the alternator by an M8x25mm bolt with both a plain and a lockwasher. Fit the alternator drive belt and tighten by swinging the alternator away from the engine until there is no more than 1/2" movement in the belt.

5.3 The live battery connection is effected using the red lead between the positive terminal on the battery and the bolt on the starter solenoid. The battery earth lead connects between the negative terminal on the battery and the lower fixing bolt (13mm across flats) for the distributor or phase sensor on the back of the cam.

N.B. Do not actually connect this earth lead to the battery until all electrical equipment is installed and connected and the car is ready to run.

5.4 The engine in turn is earthed to the chassis on the rear engine mounting rubber fixing bolt on the right hand lower chassis tube. The other end of the strap is bolted to an unused threaded hole in the engine block adjacent to the engine mounting bracket.

5.5 Other electrical connections are as follows:-

Alternator	brown, brown and brown / yellow wires in a plastic connector, brown/black to B+
Water temperature sender	green / blue
Oil pressure sender	white / orange
Coil	This connects directly to the coil, factory fitted to the bulkhead
Crankshaft Sensor	Connects to socket adjacent to 3 way union on main loom

10B.6 Exhaust System

6.1 The standard Vauxhall exhaust system runs under the car, unlike the Ford and Vauxhall injection systems, and does not incorporate a catalyst. Therefore no hole is

required in the side panel of the car for the exhaust to exit through. If the competition side exit system has been specified, please see section 14.5, Optional Extras.

6.2 With the upper engine bay diagonal removed, attach the exhaust manifold using the gasket supplied, M8 plain nuts, lockwashers and plain washers. Attach the four into one collector onto the manifold using four 5/16" x 1 1/4" bolts and ensure the correct gasket is used. Do not fully tighten at this stage

6.3 Fit the rubber bobbins to the forward hole in the left hand silencer mounting bracket, located underneath the boot area at each side of the fuel tank. These bobbins are secured *ABOVE* each bracket and the silencer/tailpipe assembly is fitted on top of the bobbins and secured with 5/16" nuts and lockwashers.

6.4 Slide the two exhaust clamps over the forward end of the silencer, and slot the twin pipes and collector onto it, locating the front end onto the 1 into 2 flange. Bolt the flanges together with the appropriate gaskets and two 3/8"x1 1/2" UNF bolts. Ensure that the system is correctly aligned, and that no parts of the system are in contact with the chassis or under strain, before tightening the flanges and clamps. We recommend the use of "Firegum" or equivalent in the joints to ensure there is no leakage of exhaust gaskets.

10B.7 Cooling System

7.1 Refer to section 10.7.1 for the fitment of the cooling fan and 10.7.2 for the radiator. The radiator itself is fitted with both a bleed screw and a blanking plug, which must be positioned at the top. The plug is removed and a thermostatic fan switch fitted in its place, to which the black/green and green wires are connected.

7.2 The bottom radiator hose is in two sections with a metal 'submarine' section tube with three 'conning' towers in between. The 'J' shaped hose is connected to the water pump on the right-hand side of the engine block, and the smaller bleed outlet from the submarine piece should face inwards. The correct location of the other two hoses is evident from their shape, but note that the bottom hose has a front and a back, and offers significantly better clearance to the steering rack when correctly fitted. It is important to ensure that no chaffing is possible between the lower forward hose and the steering rack or between the rear lower hose and the water pump casing.

7.3 The other connections to the 'submarine' pipe are shown in figure 10B.7.

7.4 The plastic expansion bottle is located on top of the cruciform immediately behind the radiator where it sits on a 5/16"x3" bolt. It is held by two brackets at the front of the chassis to which it is bolted with two 1/4"x3/4" bolts and nylocs. A locknut should be used on the 5/16" bolt to fix it in position when it has been adjusted to set the expansion bottle level.

7.5 The underside of this bottle should be connected to the submarine pipe, and the upper outlet on the bottle is connected to the bleed connection at the front of the inlet manifold.

7.6 The cooling system should be filled with a 33% antifreeze solution to the level marked on the expansion tank. Carefully bleed with the engine running and the bleed valve on the radiator loosened until normal operating temperature is reached and the air is bled out of the radiator. After the car has been road tested the radiator should be bled again to ensure that all the air is bled from the system.

10B.8 Fuel System

The fuel system is complete except for the attachment of the fuel pipe to the connection on the front carburettor using the short piece of rubber tubing supplied and the two clips. See figure 10B.8.

10B.9 Throttle and Speedometer cables

9.1 Please refer to section 10.4.10 for instructions on fitting the throttle cable noting that the attachment to the carburettors uses a ball joint which clips together and is secured using a cylindrical clip in the same way as the other end is secured to the throttle pedal.

9.2 The speedometer cable should be fed through the large grommet above the steering column in the front bulkhead, and connected to the back of the speedometer where it is hand tightened. See figure 10B.9

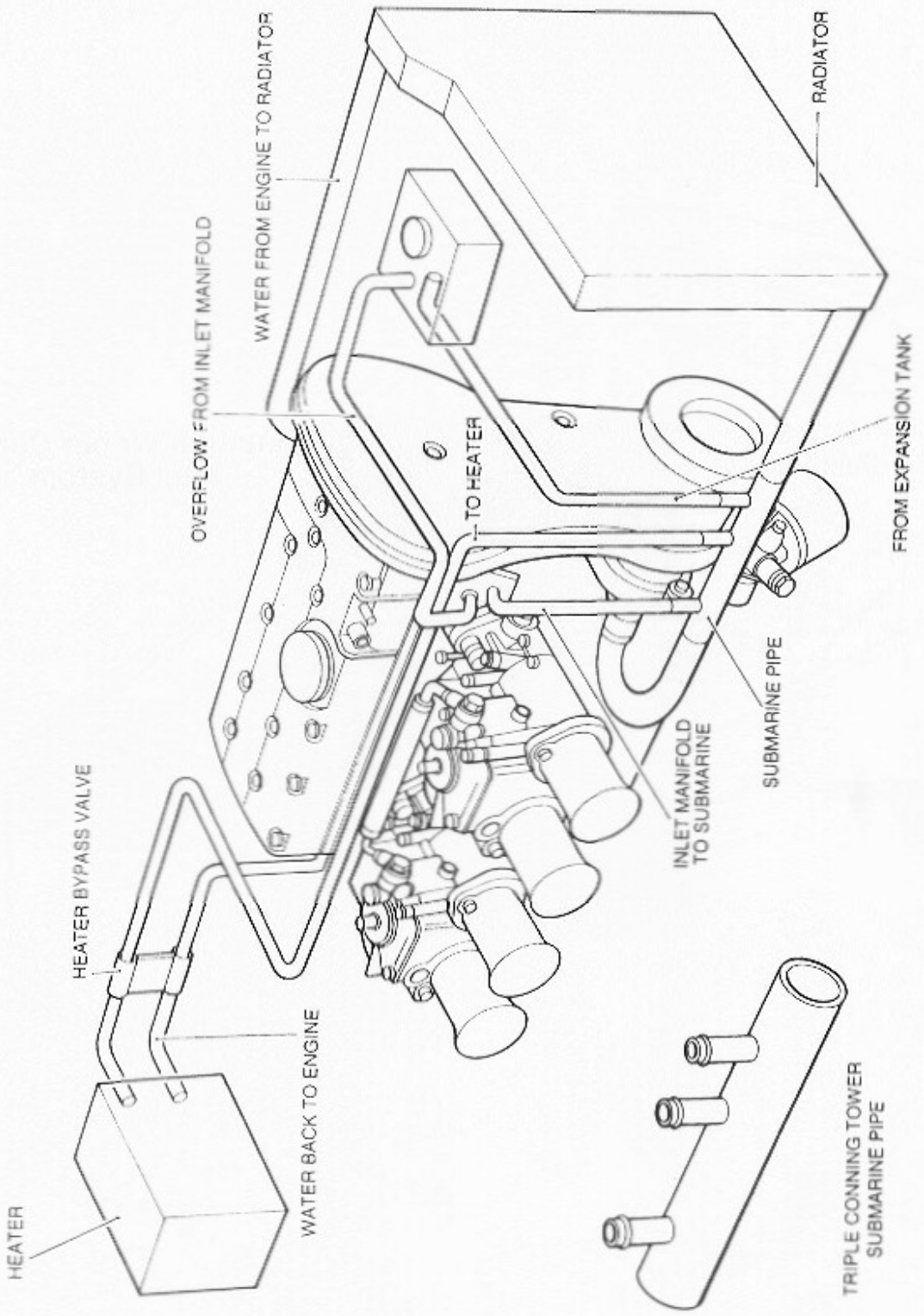


Figure 10B.7 Vauxhall Carb' Cooling System

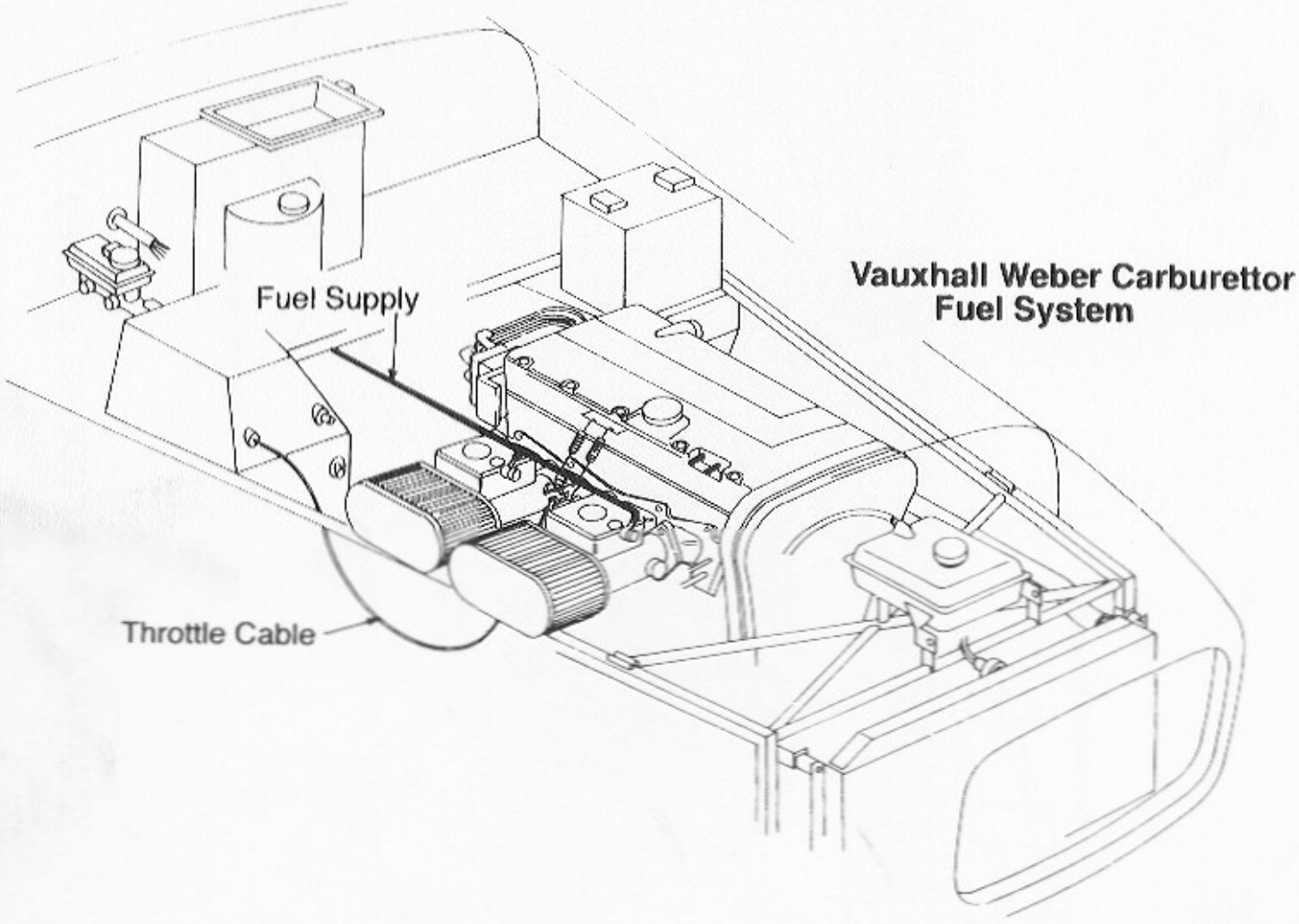
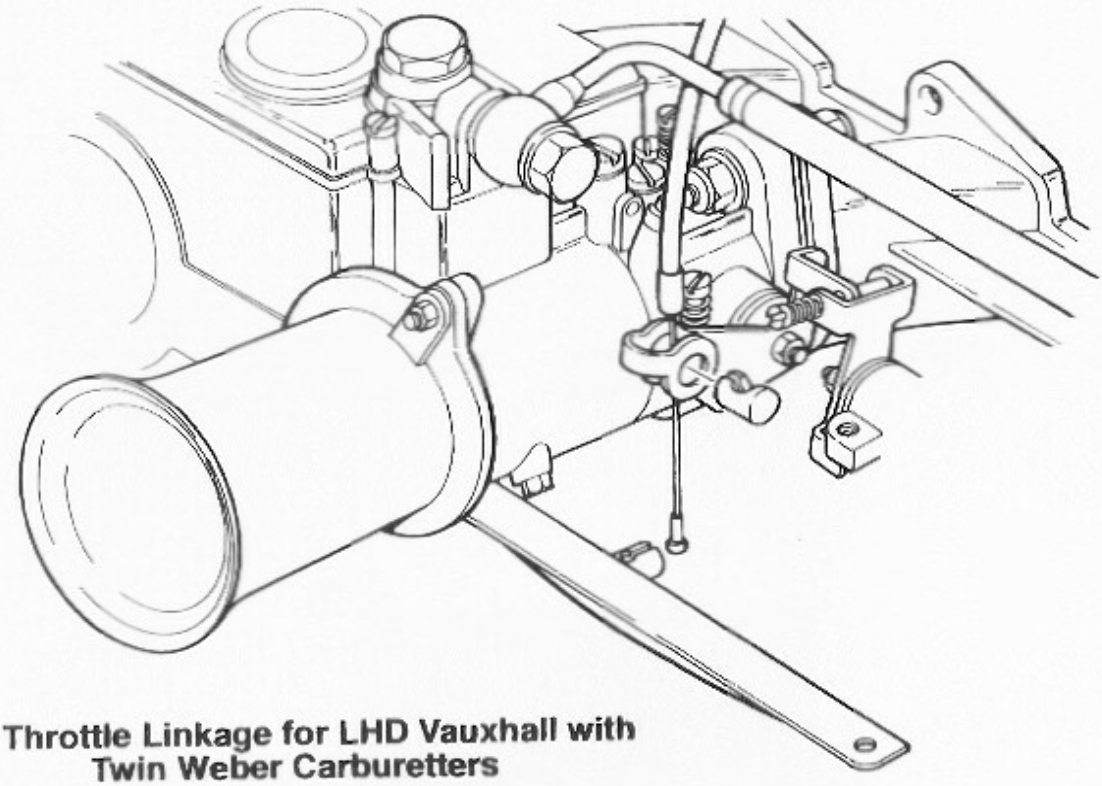
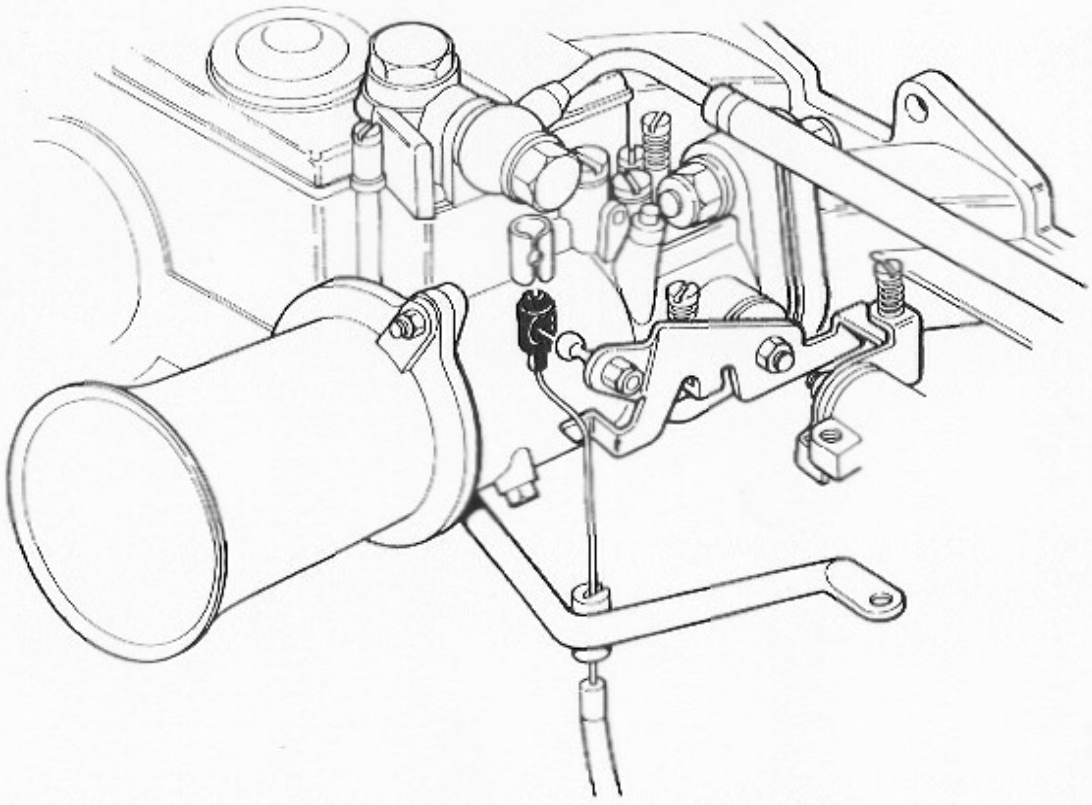


Figure 10B.8 Vauxhall Weber Carburettor Fuel System



Throttle Linkage for LHD Vauxhall with Twin Weber Carburetters



Throttle Linkage for RHD Vauxhall with Twin Weber Carburetters

Figure 10B.9 Throttle Cable Connection - Vauxhall Carbs

SECTION 10C

INSTALLATION OF ROVER ENGINE

Contents

Although this section is broadly similar to Section 10 and 10A of the Assembly Guide, there are some key differences between the Rover DOHC 16 Valve "K" Series engine installation and that for the Vauxhall and Ford derived engines. In order to avoid duplication, please refer to section 10 in conjunction with this section.

10C.1 Assembly of Gearbox Kit - 5/6 Speed

1.1 The Rover powered car uses the same Caterham or Ford gearboxes though with a different bellhousing which eliminates the need for an adapter between the bellhousing and gearbox.

1.2 Follow the gearbox build up instructions in 10.1. with the exception 10.1.2. as no spacer is required. The bellhousing bolts directly to the front of the gearbox, noting that the gasket still needs to be used. Tighten the M12 x 40mm fine thread bolts (with spring washers) to 45 lbft.

1.3 Note also that though the clutch mechanism uses the same components as the Ford installation, the rubber gaiter which prevents dirt from entering the bellhousing is not provided with a metal clip to hold it in place. This is not considered necessary in view of the dimensions of the bellhousing.

10C.2 Preparing Engine For Fitment in Car

2.1 The two removable upper engine bay diagonals allow the engine and gearbox assembly to be fitted as a unit, once the diagonals have been removed. This greatly simplifies assembly as fitting the engine to the gearbox is very much easier out of the car.

2.2 The engine can be fully kitted before installation with the exception of the exhaust manifold. It is recommended that the engine mounting brackets are left off at this stage also to avoid the risk of damaging the fragile body side panels.

2.3 Before being fitted to the chassis, the gearbox needs to be fitted to the engine. Slide the gearbox into place on the rear of the engine. It may be necessary to turn the crankshaft using the bolt on the front pulley in order to line up the gearbox first motion shaft splines with the clutch. Once the gearbox is in place on the engine, connect the two together using 4 M12 bolts with spring washers. Two 40mm bolts pass forward from the top of the bellhousing into the back of the cylinder block and two 60mm bolts with plain as well as spring washers pass backwards through the "ears" on the bearing ladder of the engine into the bellhousing.

2.4 The starter motor can now be attached to the bellhousing on the left hand side of the engine using M10 x 55mm bolts through the special aluminium spacer designed by Caterham to adapt the starter motor to the Caterham bellhousing.

2.5 Before fitting the engine/gearbox assembly, two operations must be carried out.
i) The transmission tunnel top must be removed by releasing the four screws that hold it in place.
ii) Fit the metal/rubber engine mountings to the chassis using 4 5/16"x1 3/4" bolts, plain washers and nylocs, but do not tighten at this stage. The engine earth strap fits *on the right hand front bolt, check for good earth contact at this point. Do not fit the* mounting brackets themselves to the block at this stage, as they will foul the chassis and steering column while the engine is being fitted.

10C.3 Fitting Engine/Gearbox Into Car

3.1 Using a suitable hoist, lower the engine/gerabox assembly into the chassis at an angle of approx 30-40^{0} taking great care to avoid damaging the paint on the chassis tubes. We recommend protecting the upper engine bay diagonals with masking tape to avoid damage. Insert the gearbox assembly into the transmission tunnel, (taking care to avoid touching the fragile speedometer drive unit against the chassis) and slide it back with the tailshaft housing sliding over the end of the propshaft. It may be necessary to turn the propshaft slightly before the splines engage.

3.2 Continue to slide the gearbox rearward until its mounting locates onto the rearmost mounting position provided in the chassis. Secure the gearbox mounting to the chassis with two 5/16"x1" bolts and nylocs, but do not tighten at this stage as final tightening has yet to take place.

3.3 With the engine still suspended, loosely attach the exhaust manifold and engine mountings to the cylinder block. The standard exhaust manifold must be fitted before the left-hand engine mounting since it is impossible to fit with the mounting in place,

but fitment of the competition variety (see Section 14.5) can be done later. Attach the manifold using the gasket to the 4 M10 studs on the engine securing with nuts and lockwashers and use one M10 x 30mm caphead setscrew on the rearmost fixing. Both engine mountings are then attached using the correct fixings removed earlier, the right hand mounting using M10 x 55mm bolts and Loctite, while the left hand mounting uses M10 x 30mm bolts with lockwashers.

3.4 The engine can now be lowered onto its mounting rubbers and secured with two large 1/2" UNF x 2 1/2" bolts and lockwashers. The brackets can now be fully tightened to a torque of 25 lb ft, and the engine released from its hoist. It also helps to keep a trolley jack under the engine to facilitate alignment.

3.5 Finally the gearbox can be adjusted in the tunnel using its slotted mountings, to achieve equal clearance on both sides within the transmission tunnel, and its mounting bolts tightened. Check this carefully, as clearances are tight and poor alignment can cause the gearbox to contact the chassis under cornering leading to a heavy vibration. The gearlever can now be fitted along with the transmission tunnel top and its gaiter, see 10.4.7 and 12.5 for the necessary instructions.

3.6 Refit the upper engine bay diagonals as in figure 10C.3.6 and torque to 25 lbft using the fixings removed earlier.

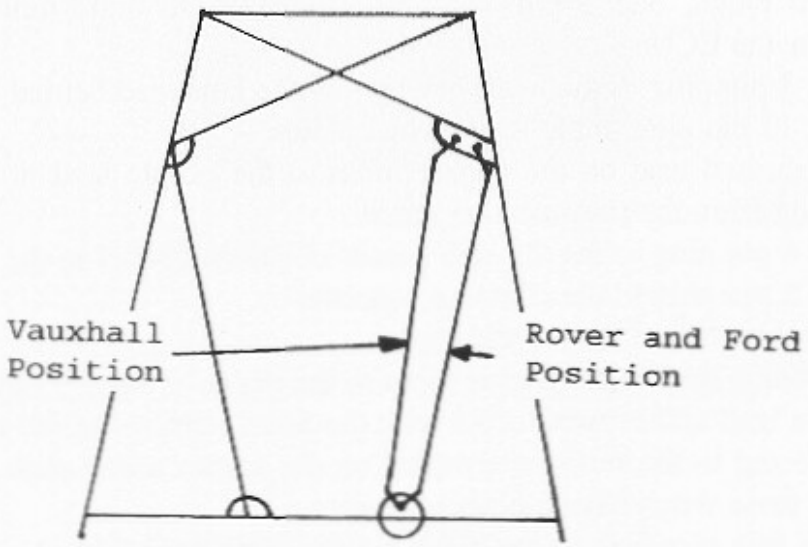


Figure 10C.3.6 Upper Engine Bay Diagonal Positions

10C.4 Clutch Connection

4.1 The clutch cable should be fitted by feeding its inner through the yellow plastic bush provided in the bellhousing, through the gaitor, and hooking the nipple onto the clutch arm in the outermost position. The other end fits into the pedal box, the inner cable being connected to the top of the clutch pedal by a clevis pin. This pin must be fitted with its head on the inboard (transmission tunnel) side, and secured with the split pin provided. See figure 10.1

4.2 The cable is fitted with adjusting screws at both ends so that it can be adjusted at both the bellhousing and the pedal box. Set the pedal box end so that a minimum length of outer cable protrudes past the location bush into the box itself and adjust the bellhousing end until a satisfactory clutch pedal position is achieved. The "bite" point should be set according to personal preference but take care to ensure that it is not so adjusted as to prevent the clutch from fully engaging or disengaging.

10C.5 Electrical Connections

5.1 The engine is supplied with its own wiring harness which needs to be connected to that provided on the car as below. All connecting plugs are in matched pairs which are not interchangeable with each other so it should not be possible to connect the loom incorrectly.

1) Attach one 36 pin plug to the electronic control unit (ECU) at the rear of the engine bay
2) Attach two plugs, one 8 pin and one 6 pin, to the multi-function unit (MFU) mounted under the ECU
3) Attach one 3 pin plug to the inertia switch on the bulkhead behind the ECU.
4) Attach one 13 pin plug to the main vehicle loom
5) Attach the brown lead on the engine loom to the purple lead in the main vehicle loom, emerging from the transmission tunnel.
6) Attach one 4 pin plug to the Oxygen sensor (Lambda probe) in the exhaust system
7) Attach one 2 pin plug to the charcoal cannister
8) Connect the brown/red lead to the starter
9) Attach the black lead in the engine loom to the negative battery terminal
10) The brown lead and brown/purple with the 8mm terminal at the rear of the engine must be connected to the positive terminal on the starter along with the main battery lead. (beware these wires have a black sleeve)
11) Attach the ring terminal on the black battery earth lead to the upper left bolt from the bellhousing into the engine block.

5.2 The live battery connection is effected using the red lead between the positive terminal on the battery to the starter solenoid, routing the cable forward down the

front of the footbox to the starter solenoid. The cable should be secured to the footbox with tyraps. Keep well clear of the exhaust manifold.

NB: Do not actually connect the earth lead to the battery until all electrical equipment is installed and connected and the car is ready to run.

5.3 The engine in turn is earthed to the chassis at the foremost bolt attaching the right hand engine mounting rubber to the chassis rail.

10C.6 Exhaust System

6.1 The Rover exhaust system fits in the same way as the Vauxhall system (see 10A.9), though the Rover exhaust manifold does not need the support of the cat's cradle bracket fitted to the Vauxhall application.

10C.7 Cooling System

7.1 Refer to section 10.7.1 for the fitment of the cooling fan and 10.7.3 for the radiator. The radiator itself is fitted with a bleed screw which must be positioned at the top, and also with a blanking plug which must be positioned to face rearwards. This plug is removed and a thermostatic fan switch fitted in its place, to which the black/green and purple wires are connected. N.B. There is also a radiator drain plug.

7.2 The bottom radiator hose is in two sections with a metal 'submarine' section tube in between. The 'J' shaped rubber hose is connected to the water pump on the right-hand side of the engine block, and the small bleed outlet from the conning tower of the 'submarine ' piece should face inwards. The correct location of the other two hoses is evident from their shape (see figure 10C.7.2) but note that the bottom hose has a front and a back and offers significantly better clearance to the steering rack when correctly fitted. It is important to ensure that no chaffing is possible between the lower forward hose and the steering rack and the rear lower hose and the water pump casing.

7.3 When attaching the top and bottom hoses to the radiator note that the inlet and outlet tubes are longer than might be expected and swaged at their ends. When securing with Jubilee clips ensure that these clips are fitted immediately behind the swages and not hard up against the radiator itself.

7.4 The plastic expansion bottle is located on top of the cruciform immediately behind the radiator in exactly the same way as described in the Vauxhall section 10A.10.3. The underside of this bottle is connected to the single conning tower of the 'submarine piece' with a rubber hose cut to length, and a second thinner hose runs backwards from the top of the bottle to the bleed connection at the front of the inlet manifold.

7.5 The heater is connected between the inlet to the water pump on the right hand side of the engine and the water rail which runs parallel to the cylinder head on the left hand side of the engine. It is very important that the hose from the water rail connects to the inflow side of the heater control valve. If a heater is not fitted, a hose must be run between these two points on the engine and on no account must these pipes be blocked off, or the engine will overheat.

7.6 The cooling system should be filled with a 33% antifreeze solution, and carefully bled with the engine running and the bleed valve on the radiator loosened. The system will hold approximately six pints of water/antifreeze mix.

10C.8 Fuel And Vacuum System

8.1 The fuel system is complete except for the attachment of the fuel feed and return pipes to the injection system. The high pressure fuel feed from the pump, already fitted at the rear of the vehicle, is via a metal pipe running through the transmission tunnel which is fixed to the union on the rubber fuel hose on the engine. The low pressure return flow is via the second rubber hose, without a union, which pushes onto the black nylon pipe also located in the transmission tunnel, secured with a crimped clip.

8.2 It is important that the vacuum system is connected up correctly, in particular the E.C.U. feed should be as close to the throttle body as possible. See figure 10C.8.2. The E.C.U. is connected to the green pipe on the fuel trap and the throttle body to the longer black pipe.

10C.9 Air Filter Fitment

9.1 The standard K series engine is fitted with a box type air filter which fits in front of the heater. Under the air cleaner will be a round aluminium blanking plate, this should be removed and replaced with a spun aluminium 'trumpet'. The air filter should be connected to the throttle body with the flexible hose supplied, and secured with the special clip supplied. Normal pliers are adequate to fit this clip.

9.2 Having positioned the air filter, remove the top half of the box, the element, and the base to upper clip at the rear. With the base in position, mark the positions of the four holes in the base, drill through the aluminium panel and rivet in place. Reassemble the air filter assembly and connect to the flexible hose with a jubilee clip.

9.3 The 24" long trunking should then be fitted facing rearwards within the tunnel, with the 90 degree elboe attached to the aluminium spun trumpet. The elbow should be attached with a jubilee clip, and the long end should be secured to the chassis tubes above the gearbox with ty-wraps.

9.4 The Supersport engine uses a K&N air filter that clamps straight onto the throttle body. It is secured with the jubilee clip supplied. N.B. This clamp on filter can also be fitted to the standard K series engine.

10C.10 Throttle and Speedometer cables

10.1 The throttle cable should be attached to the engine end first, and connects to the throttle body by engaging the nipple in the throttle operating lever and then clipping the square shaped black plastic adjuster onto the adjacent bracket. Please note that this adjuster can be threaded up and down the cable outer to adjust the throttle pedal position

10.2 Pass the cable through the 22mm hole in the front of the pedal box and secure the outer cable to it using the circlip. The inner cable is clipped into the slot on top of the pedal, which is gently squeezed with a pair of pliers to capture it and is secured in place by the clip which fits over the top, (see diagram in section 6.5).

10.3 The speedometer cable should be fed through the large grommet above the steering column in the front bulkhead and connected to the back of the speedometer where it is hand tightened.

10C.11 Supersport Gear Change-up Light

11.1 Included in the Rover Supersport engine upgrade is a gear change up warning light. This operates at 7400 RPM, 200 RPM before the rev-limiter cuts in at 7600 RPM. This should be connected as follows.

11.2 The L.E.D. requires a +12V supply from the coil and the trigger from the E.C.U.. This requires a new pin in the plug to the E.C.U. in the 6th hole from the left side, middle row, looking into the plug with the plastic catch to the bottom of the plug. This is plug 19 in figure 10C.11.

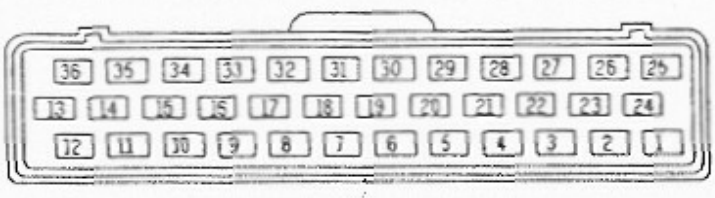


Figure 10C.11 E.C.U. Connector Plug

Bolt Size	Usage	Torque
M12 x 40mm	Gearbox to bellhousing	45 lbft
M12 x 25mm	Gearbox mount	45 lbft
M12 x 40mm	Engine to bellhousing	45 lbft
M12 x 60mm	Engine to bellhousing	45 lbft
M10 x 55mm	Starter motor	25 lbft
5/16"UNF x 1"	Gearbox mount to chassis	12-15 lbft
M10 nuts	Exhaust manifold	25 lbft
5/16"UNF x 1 3/4"	Engine mounting rubbers	12-15 lbft
M10 x 55mm	Right Hand Engine Mount	25 lbft
M10 x 30mm	Left hand engine mount	25 lbft
1/2"UNF x 2 1/2"	Mounting bracket to rubbers	45 lbft
5/16"UNF x 3/4"	Exhaust bracket	12-15 lbft
5/16"UNF x 3 1/2"	Expansion tank support	12-15 lbft
1/4"UNF x 3/4"	Expansion tank brackets	8 lbft
5/16"UNF x 1 3/4"	Upper engine bay diagonals	12-15 lbft

Table 10C.1 Rover Engine - Torques

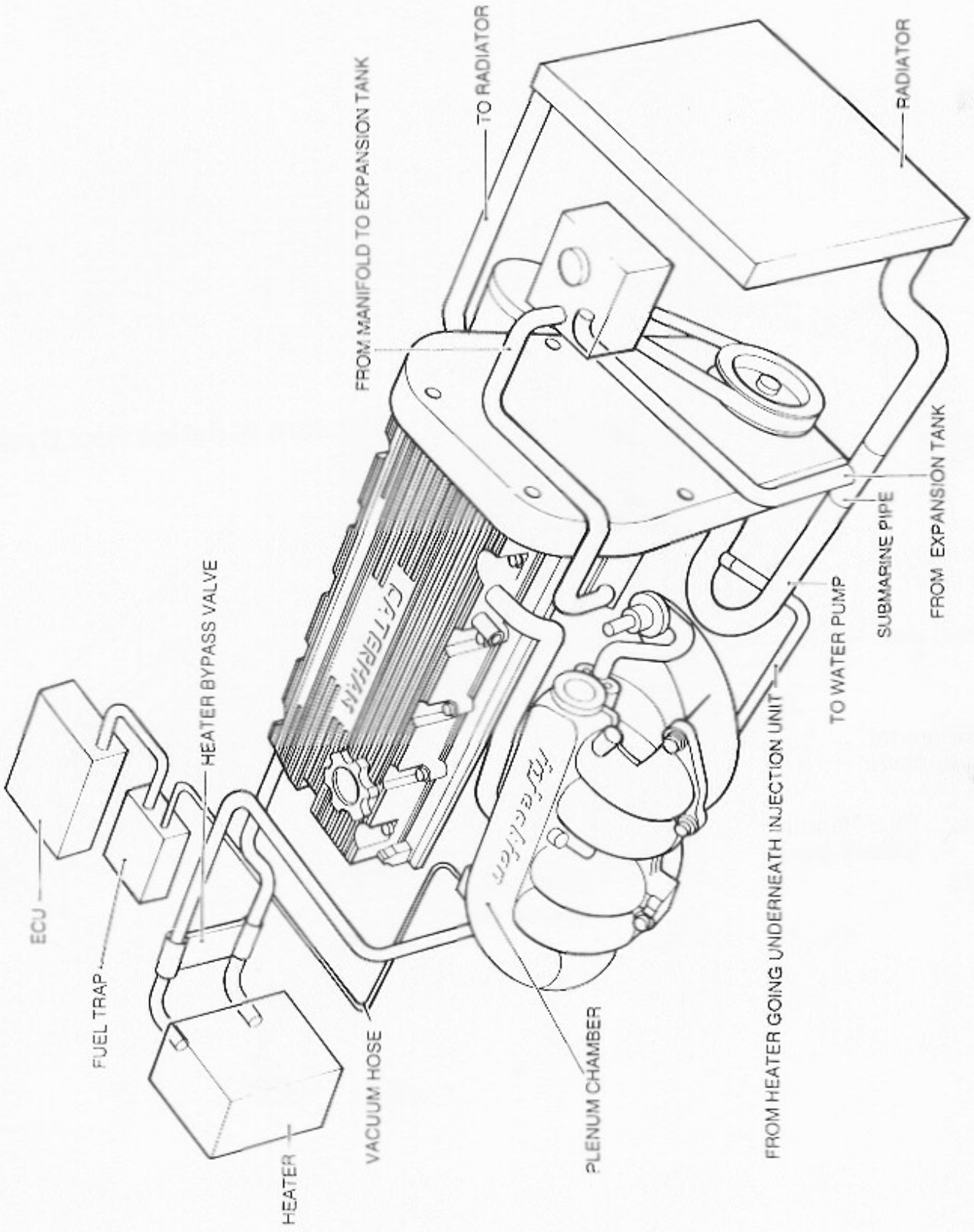


Figure 10C.1 Rover K Series Cooling System

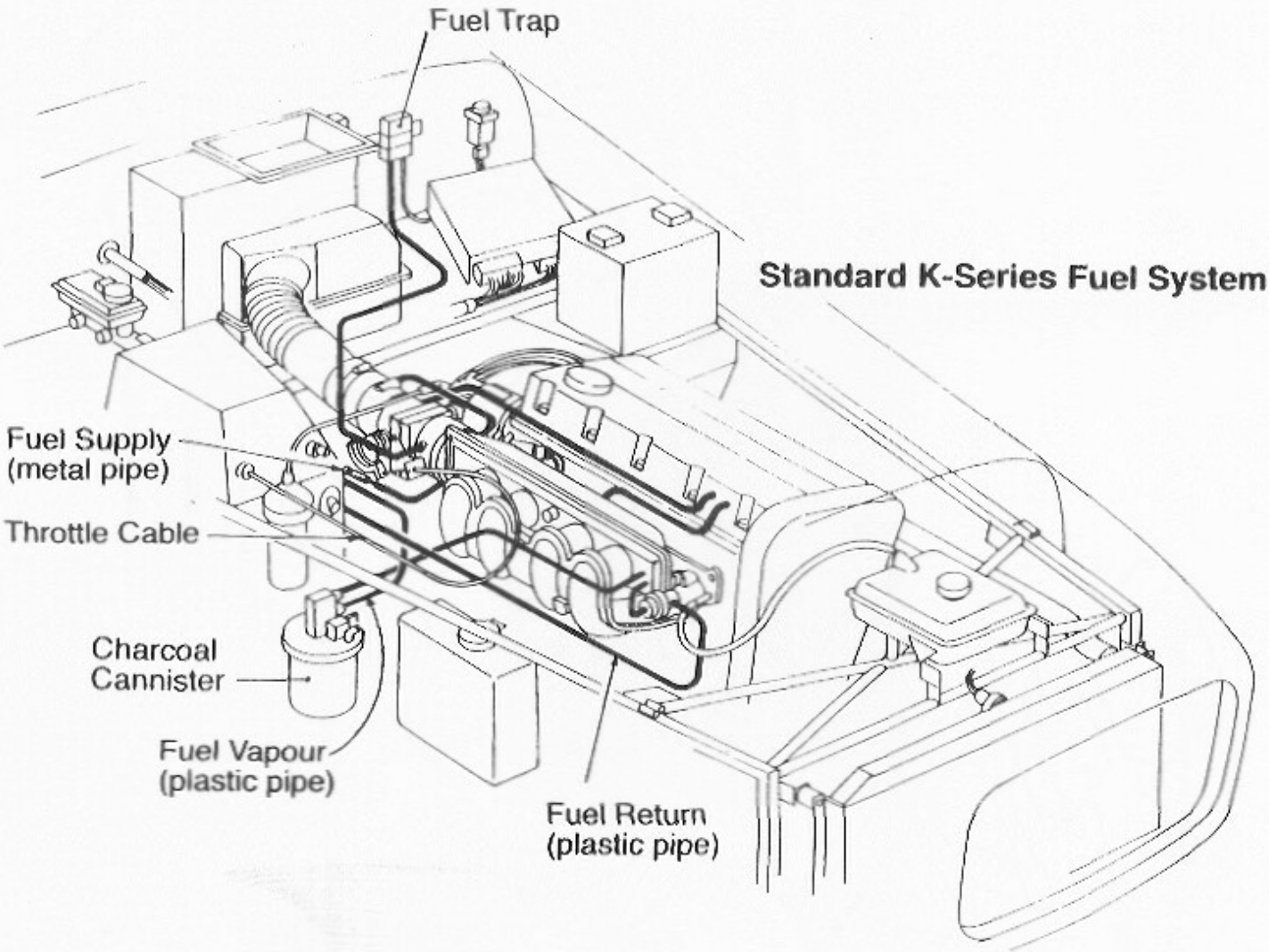


Figure 10C.8A Rover K Series Fuel System (Standard)

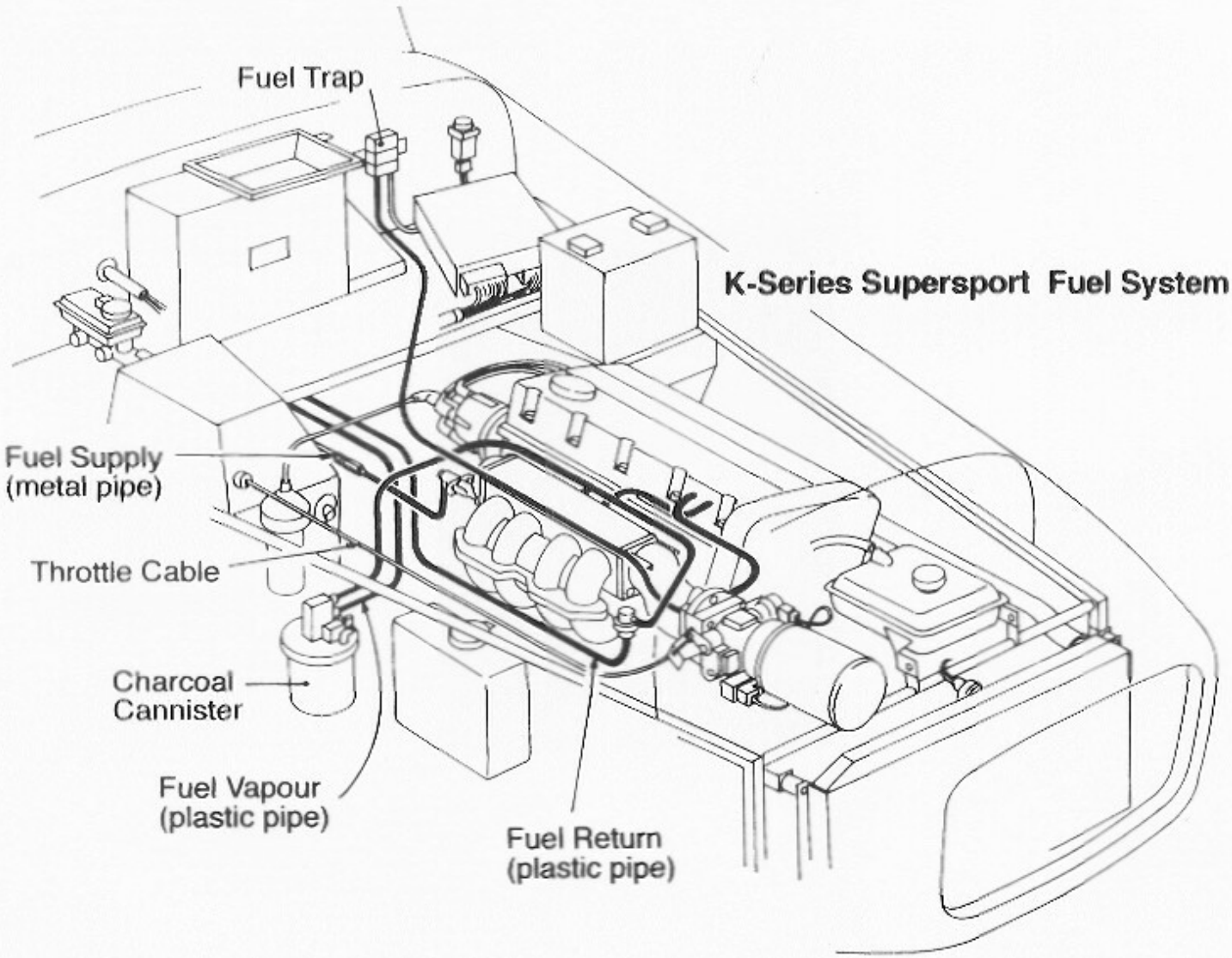


Figure 10C.8B Rover K Series Fuel System (Supersport)

SECTION 11

ATTACHMENT OF LIGHTING KIT

The lighting kit includes all the parts needed to make the Seven comply with lighting requirements under United Kingdom Construction and Use regulations. If the instructions in this section are followed, all legal requirements will be fulfilled.

If alternative parts are used they must be 'E' marked and fitted in accordance with diagram 11.1 or your vehicle will not comply with Construction and Use regulations. (See also wiring diagram at rear)

11.1 Rear Lights

1.1 The kit includes two identical rear light assemblies which comprise rear, brake and indicator lights. They are mounted on rubber blocks which ensure that the lights are vertical when fitted. These units can be turned around on the blocks to enable the amber indicator lights to be on the outside.

1.2 The rear wings are marked with two dots which give the position for the rear lights. Drill the lower innermost hole to 4mm and the outer mark 8mm to take the wiring.

1.3 Remove the lenses from the rear lamps along with the bulbs noting that the indicators use a single filament and the rear/brake lights a double filament bulb. You will see that there are four square holes in the metal base plate which tie in with dimples in the rubber block. Drill these through the rubber with a 4mm drill ensuring this is at 90° to the base plate.

1.4 Each rear light unit is attached using four long self tapping screws, the upper ones being longer. Feed the wiring through the 8mm hole you have drilled and attach the rear light with one of the shorter screws at its bottom inside corner. Adjust for levelness and drill through into the wing using the 4mm drill for the remaining three holes. We suggest that you remove the unit and clear away the swarf before finally fixing in place. Replace the bulbs and lenses.

1.5 The wiring is connected to the main loom using 'bullet' connectors into insulated sleeves provided with the kit. Fit the sleeves onto the exposed bullets on the loom checking that they have been pushed fully home. A fine nosed pair of pliers may be useful here. Feed the wires from the light unit through the grommet under the wheel arch and connect to the loom as follows:-

Function	Loom Wires	Light Unit Wires
Rear light	red/white	red
Brake	green/mauve	green/mauve
Left Indicator	green/red	green
Right Indicator	green/white	green
Earth	black	black

1.6 For neatness, bind the wires from the light unit together with insulation tape and clip them out of harm's way with a tywrap to a block screwed onto one of the protruding ends of the light mounting self tappers.

11.2 Reversing Lights

2.1 The reversing lights are fixed to the rear wings below and slightly inboard of the rear light units. The builder has flexibility with their exact location, but we suggest that the bottoms of the reversing lights are 1" above the bottom of the wings, and the inner edge 2" outboard from the beading at the inner edge of the wing.

2.2 Dismantle the reversing light unit, removing the lens and bulb and reveal two holes in its metal base. Having established the correct positioning on the wing, mark and drill two 5mm holes for the fixing bolts and a further hole large enough to take the live wire connection.

2.3 The reversing lights are bolted to the rear wings using two 5mm x 16mm screws and nylocs noting that the green/brown earth lead fitted with an eyelet connector should be fed through the grommet from the car and secured to the reversing light by one of these.

2.4 The live green/brown wire from the light unit is connected to the green wire on the main wiring loom using the bullet connectors provided.

2.5 Replace the bulb and lens, taking care not to overtighten the lens retaining clips which may crack.

11.3 Rear Fog Lights

3.1 The twin rear fog lights are attached to the back panel of the car and again the exact positioning is down to the builder. We suggest they are fitted with their bottom

edges 1" up from the bottom of the back panel and with their inner edges 2 1/2" outboard of the outer edge of the spare wheel carrier. It is wise to check their position relative to your spare wheel prior to fitment, especially if oversize wheels are being used.

3.2 Having established your chosen positioning, drill two 5mm clearance holes for the locating bolts and a central 9/16" hole for the main body of the light. Bolt in place using M5 x 16mm screws with the bolt passing through from the boot area into the body of the light. A large plain washer should be used between the head of the bolt and the aluminium body. It will be necessary to dismantle the light, removing the lens, bulb and reflector in order to fit the unit.

3.3 Due to the proximity of the fuel tank, take great care to avoid damaging the tamk whilst drilling. To get access to the foglight retaining bolts, loosen off the fuel tank retaining bolts and slide the tank forwards. Ensure that the fuel tank is securely fitted after bolting up and connecting the fog lights.

3.4 The live red/yellow leads are connected using 'bullet' connectors to the red/orange wires from the main loom on each side. The plastic loom protection should be stripped back to allow the black earth wire to be shortened and doubled back onto one of the fixing screws.

11.4 Rear Number Plate Light

4.1 Dismantle the light unit and note that there are two round and two square holes provided in its metal base. The upper square holes are used to secure the unit to the spare wheel carrier and one of the round holes will align with a similar one on the carrier to take the feed wire. It will be necessary to pierce the rubber backing before fixing, using two 5mm x 16mm posidrive screws, nuts and spring washers.

4.2 Feed the red wire through from the loom into the back of the unit and stripping back just sufficient insulation, attach to the screw connection provided in the centre of the light unit. The number plate light is earthed through its base so no other connection is needed.

11.5 Front Indicator Repeaters (Flared wings only)

5.1 These are attached to the outer edges of the front wings and are so located that the forward 5mm mounting bolt passes through the wing and holds the wing onto the wingstay. These should be aligned to suit the wingstay and ensure symmetry between both sides.

5.2 Dismantle the repeater assemblies removing bulb and lens. Drill through the front wings at the appropriate points with a 5mm drill for the outer holes and a 9/16"

drill for the centre hole where the bulbholder locates. The forward hole should be drilled down through the wingstay so that the repeater, wing and wingstay are all in alignment.

5.3 Remove the studs from the unit and bolt the repeaters into place using 5mm x 16mm Posidrive screws and nylocs. Attach the black earth wire to one of the mounting screws, enlarging the tag hole to suit, in the process and replace the bulb and lens.

5.4 The repeaters are wired in with the main front indicators - see section 11.7.

11.6 Headlights

6.1 The headlamp bowls are mounted upon brackets which are part of the upper front wing stays. The front indicator mountings (flasher brackets) also attach at the same point and are secured in place by the nut holding the bowl assemblies.(Cycle wing cars have separate headlamp/indicator brackets)

6.2 Mount the headlamp bowl on top of the front wing support with its cast base above the bracket. Fit the indicator mounting bracket or cone over the protruding thread of the headlamp bowl and secure into place underneath the wing support with the large nut and lockwasher.

6.3 Tighten until the headlamp bowl can move but does not flop about. Note that the flasher brackets for live axle cars are handed and that the indicator itself mounts in front of the bracket. The cones used on De Dion cars are not handed.

6.4 The wiring for both headlight and indicator is part of the main wiring loom which should be fed through rubber grommets provided in the outer skin of the chassis.

6.5 The head and sidelight wiring which consists of 4 wires terminating in bullet connectors, should be fed upward through the centre of the mounting stem into the headlamp itself where it can be connected to the short sub-loom provided. Take care to match the main loom colours with those of the sub-loom. The metal clamp and screw are not necessary.

6.6 The light unit is held into place by the rim which uses a clamping screw to hold it and the light onto the front of the headlamp bowl. This rim will need to be rotated in order to position the light the correct way up. You should be aware that with these bowls the wiring is a very tight fit up through the mounting stems, a little grease will help.

6.7 Connect the main headlamp wiring plugs and clip the sidelights into the back of the headlights. Hook the bottom of the rim into the lip on the headlamp bowl and

swing the rim/light assembly up into position, securing with the top screws. Check that the headlights are the correct way up in their mountings. Final alignment should be carried out using a headlight beam aligning device which all garages should have, but a close approximation can be achieved by positioning the car in front of a suitable wall or garage door and, having loosened the bowl securing nuts, aligning the beams to face slightly downwards and to the left.

6.8 If you find the headlights are a loose fit within the bowls after the rim has been tightened, the headlamp shell may need to be adjusted as follows. With the headlight unit removed, bend out the three locating tabs in the headlamp bowls slightly. This will force the headlamps forward slightly so they are tightly clamped by the ring.

11.7 Front Indicators

7.1 The indicator units are fitted with rubber insulator/protectors which must first be removed. At the back of these protectors are the holes through which the wiring is fed and these will need to be opened up.

7.2 Fit the rubber protectors onto the mounting brackets or cones and feed the wiring through from behind. There will be four wires to be connected: green/red LH (or green/white RH) and black from the loom and green and black from the repeater. Connect the black earth wires and the remaining pair of wires together.

7.3 There are several ways of connecting the relevant wires together including soldering or crimping into suitable 'bullets' but probably the easiest method is to push the bullets into a sleeved connector.

7.4 With the wiring attached, the indicator unit is slid back into its protective sleeve and secured to the bracket with 3/16" nyloc nuts.

11.8 Final Testing

When all connections are made to the engine and the battery is installed, all the electrical functions can be checked. If there are any problems, recheck your connections and check that the bulbs have not been damaged in transit. In addition check *EVERY* earth point on the chassis, both for the wiring loom and the battery earth leads. In the unlikely event that problems persist, either contact Caterham Cars or an automotive electrician.

At the rear of section 17 there is a wiring diagram provided which may be of assistance.

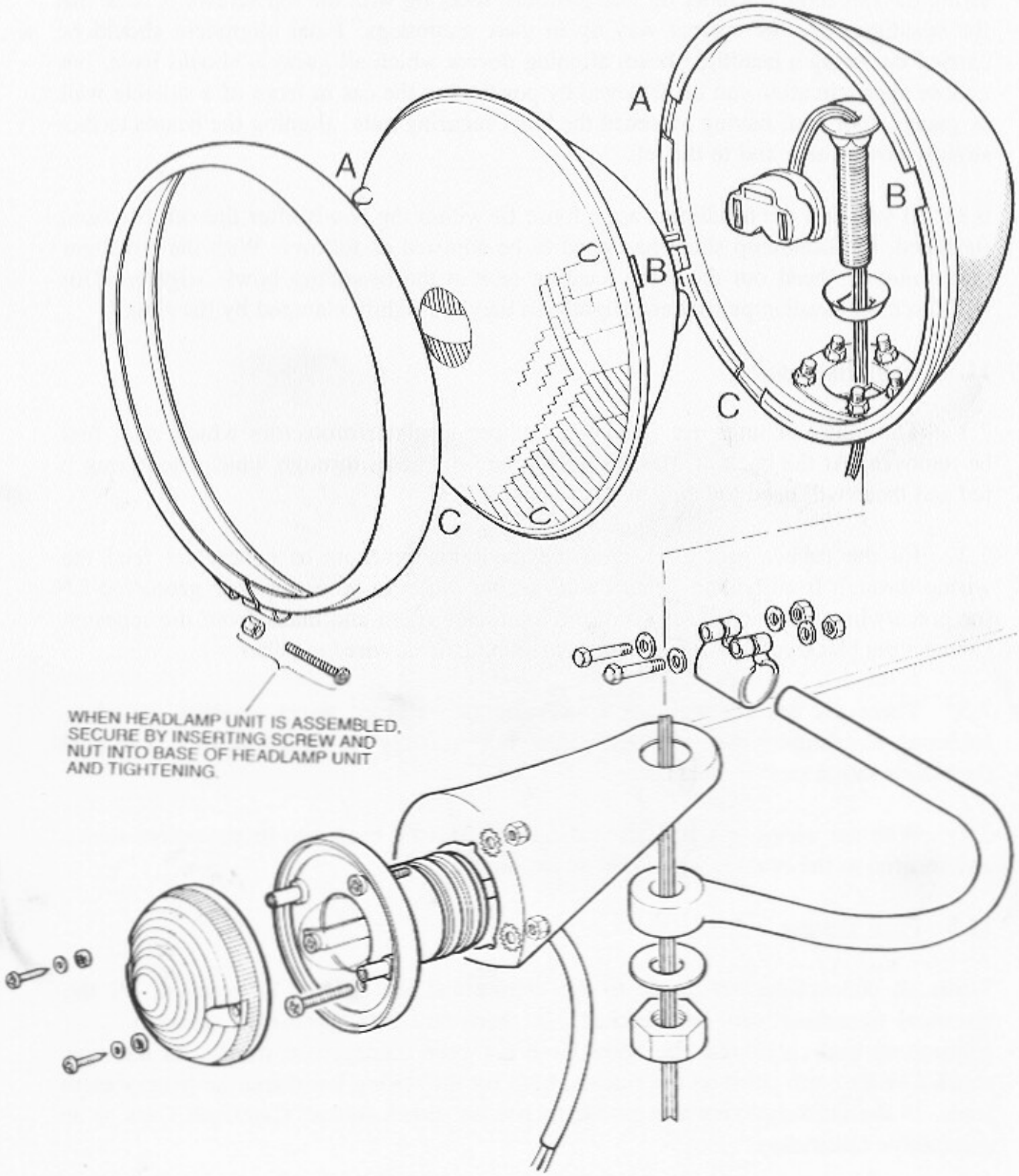
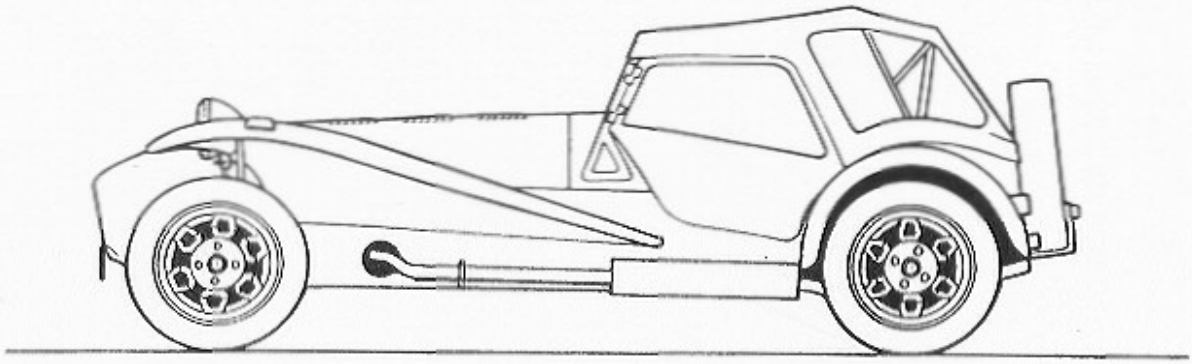
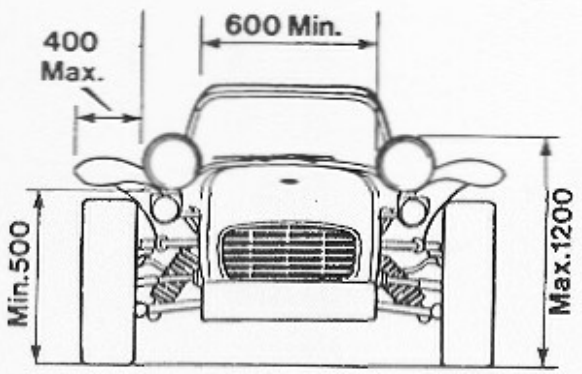


Figure 11.6 Cycle Wing Headlights (De Dion)

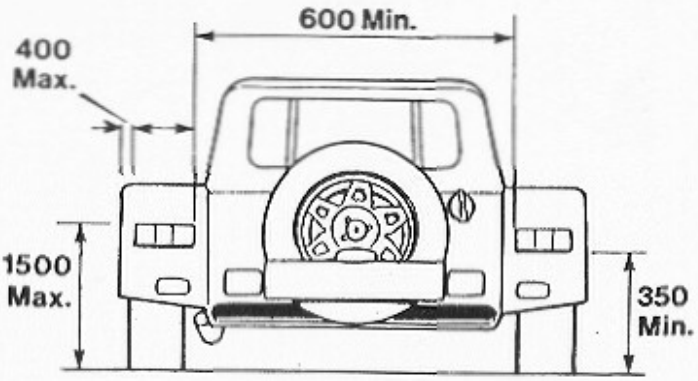
Lighting - Legal Requirements



Position of Headlamps



Position of Rear Lamps



Dimensions in millimetres unless otherwise stated

	Min. height	*Max. height*
Fog Lamps	250	1000
Direction Indicators	430	2290

SECTION 12

INSTALLATION OF INTERIOR KIT

Contents

This kit provides the seats, carpeting and boot floor which is fitted in conjunction with the petrol filler (see Miscellaneous Section 9.10). Vauxhall and Rover powered cars use a different interior kit, with an integral transmission tunnel armrest, see also 12.4.

12.1 Boot Floor Classic

1.1 This consists of a pre cut piece of plywood sheet. Although not strictly necessary, it can be protected with a suitable exterior or marine varnish before being fitted.

1.2 When in position above the fuel tank the floor is supported by the aluminium floor section at the front of the luggage compartment and the horizontal 'U' section at the back of the chassis. Drill through both the floor and its supports with a 1/8" drill and secure with self tapping screws.

1.3 The fuel filler pipe can now be fitted noting that the lower Jubilee clip is tightened from the right hand wheel arch.

1.4 The boot carpet is laid in place but will need to be cut where it fits around the fuel filler.

12.2 Boot Floor De Dion-Ford

2.1 This differs from Live Axle cars in that the boot floor consists of two plywood and one aluminium sections. We recommend a trial fit of these pieces before securing into place since the front and rear wooden sections are joined by the folded aluminium strip which needs to be secured first.

2.2 Position the front half of the boot board tightly up against the bulkhead and position the aluminium strip behind it with its lip under the board. Mark the position of this strip and remove the front board. Drill the strip at each end and rivet into place with four 1/8" pop rivets.

2.3 Refit the front board and drill through it and its supports with a 1/8" drill securing with self tapping screws.

2.4 The rear board can now be fitted in conjunction with the fuel filler pipe as described in 9.10. Secure this board as with the front board.

2.5 Fit the boot carpet as in 12.1.4, there is no need to use glue or fasteners to hold it in place.

12.3 Carpeting

3.1 The footwell carpets are secured using three poppers at the rear of the footwell. Mark and drill three holes, evenly spread each side, approximately 1" in front of the cross member and secure the popper bases with either pop rivets or self tapping screws.

3.2 Stick masking tape onto the underside of the carpet approximately where the popper bases are and lay in place, pressing firmly so that the bases make an impression on the tape. Use the riveting tool and punch provided (instructions included in the pack) to make appropriate holes in the carpet and to rivet together the popper and its retaining cap.

3.3 *If adjustable seats are to be fitted,a rear bulkhead carpet will be needed.* This has a leatherette strip along its upper edge which is glued (Evostick is suitable) to the top of the crossmember behind the seats. The bottom edge is secured by two poppers each side, the bases of which are riveted or screwed to the bulkhead. We suggest you use the masking tape technique again to locate the correct points on the carpet.

3.4 On the De Dion cars in particular, the shape of the plate covering the joint between transmission tunnel and bulkhead prevents the carpet from lying flat. Alleviate this by making short inward cuts so that tabs of carpet can hinge out against the tunnel. These will be covered by the tunnel carpet.

3.5 Before fitting the transmission tunnel carpet it will be necessary to fit the gearlever gaiter. This is secured in all models to the removable aluminium panel on the transmission tunnel, and appropriate holes should be drilled with a 1/8" drill and held with self tapping screws. To fit this in the ideal place, try the gear lever in all positions before marking, so as to prevent it fouling the aluminium gaiter retainer.

3.6 Once the gaiter is in position, the gearlever knob and extension piece can be fitted. To fit the gearlever extension (De Dion cars only), we suggest that you first protect it with tape and then use Mole Grips to tighten it properly onto the existing lever. A little loctite will prevent it subsequently coming loose.

3.7 Remember on De Dion cars to fit the rubber plug into the speedometer drive access hole.

3.8 The transmission tunnel carpet is held in place once again mainly with poppers. We suggest that you employ three each side spaced along the bottom of the tunnel, ensuring that this carpet is pulled firmly down in place and locates correctly in front of the gearlever and against the rear bulkhead.

3.9 With live axle cars in particular, great care should be taken when drilling holes into the transmission tunnel not to drill through brake pipes or wiring routed through it.

3.10 Where this carpet extends forward into the footwells, we normally glue it in position using a glue such as Dunlop L107 since Evostick is rather too powerful and may damage the carpet if it needs to be unstuck for cleaning or maintenance.

3.11 Alternatively, we suggest that you stick a VELCRO pad to the transmission tunnel and glue or sew its opposite half to the carpet.

3.12 Finally, the carpets that fit under the seats in adjustable seat versions can be laid in place. There is no need to retain these with poppers since the seat runners prevent them from moving once fitted.

12.4 Seating

4.1 Before the seats can be fitted it will be necessary to fit seat belts. Lap and diagonal belts are available for Live Axle cars and Inertia reel belts for De Dion cars instructions for the fitting of which are in 9.5.5. Both types of belts available from Caterham Cars have been made specifically for the Seven so that their mountings and webbing lengths are correct.

4.2 Optional four-point full harness belts use the top mountings provided on the crossmember and share the same lower mountings.

4.3 Non adjustable seats are simply laid in place being secured by their own weight and that of the occupants.

4.4 Adjustable seats (not available for short cockpit cars), whether of leather or cloth, are bolted in place using M8 panhead pozidrive setscrews front and rear, plain washers and nyloc nuts. Firstly, it will be necessary to drill down through both the crossmember in front of the seats and the brackets at the rear so that the seat runners can be bolted through the aluminium floor using a 5/16" drill.

4.5 Lay the seats which are already attached to their runners in place and bolt down through their mountings using a plain washer below the bolt head and above the nyloc nut. The longer (8mm x 50mm) caphead bolts are used on the crossmember.

4.6 On De Dion cars 4 aluminium spacers are supplied which should be inserted between the rear fixing lugs on the chassis and the floorpan to prevent distortion on tightening.

12.5 Vauxhall and Rover Cars Interior Trim

5.1 The transmission tunnel trimming on these vehicles is not in one piece, but divided into three. The two pieces of carpet are glued to the sides of the transmission tunnel, but the top piece includes both a padded armrest and the gearlever gaiter. This is secured by inserting the tab at the front end into the slot at the very front of the tunnel and by pozidrive screws into the riv-nuts pre-fitted into the top of the tunnel at the rear.

5.2 A small piece of padded carpet with a vinyl strip should be glued to the angle above the drivers legs, to provide protection in the event of an accident.

5.2 A padded tunnel top is also available to suit Ford De Dion cars.

SECTION 13

ATTACHMENT OF WEATHER EQUIPMENT KIT

Contents

13.1 Fitting Hoodsticks and Hoodstraps

1.1 The rear of the vehicle is marked with the locations of the fourteen popper bases necessary to secure the rear of the hood. These should be drilled with a 5/32" drill and the popper bases secured with 5/32" countersunk pop rivets.

1.2 To prevent the drill from wandering off course we suggest that the hole centres are indented using a centre punch. (Failing this, a Phillips screwdriver may suffice).

1.3 Remove the inner hoodstick from the hoodstick assembly and feed the hoodstraps over the inner and outer hoodsticks. Adjust so that they take up the positions as shown in the diagram. Since the exact positioning will depend upon the hood itself when fitted, temporarily secure the inner hoodstick to the rear of the car with string to maintain the 16" spacing as shown in figure 13.1.

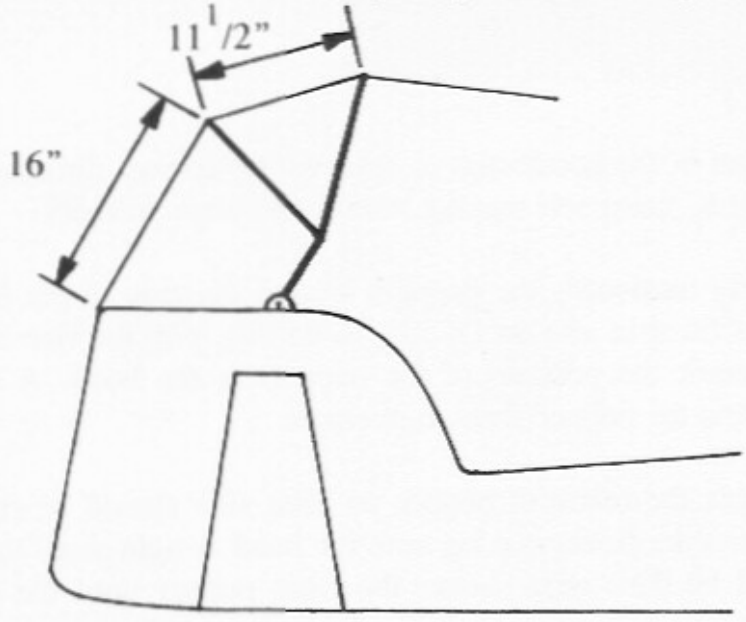


Figure 13.1 Hoodstick Spacing

1.4 Reassemble and bolt the assembly in place using the washers and nylocs supplied.

13.2 Hood Fitting

2.1 With the hoodsticks in the up position and the hoodstraps loose, drape the hood approximately in position. Attach the hood at the front and rear with the pre-fitted poppers. Please note that there will be no poppers fitted around the side of the hood.

2.2 Noting the dimensions in 13.1.3 fix the hoodsticks into position. The hoodsticks should align with the 'darts' in the hood. Drill the inner edge of the top rear tube with two 1/8" holes, 6 1/2" outboard of the vertical braces as shown in figure 13.2.

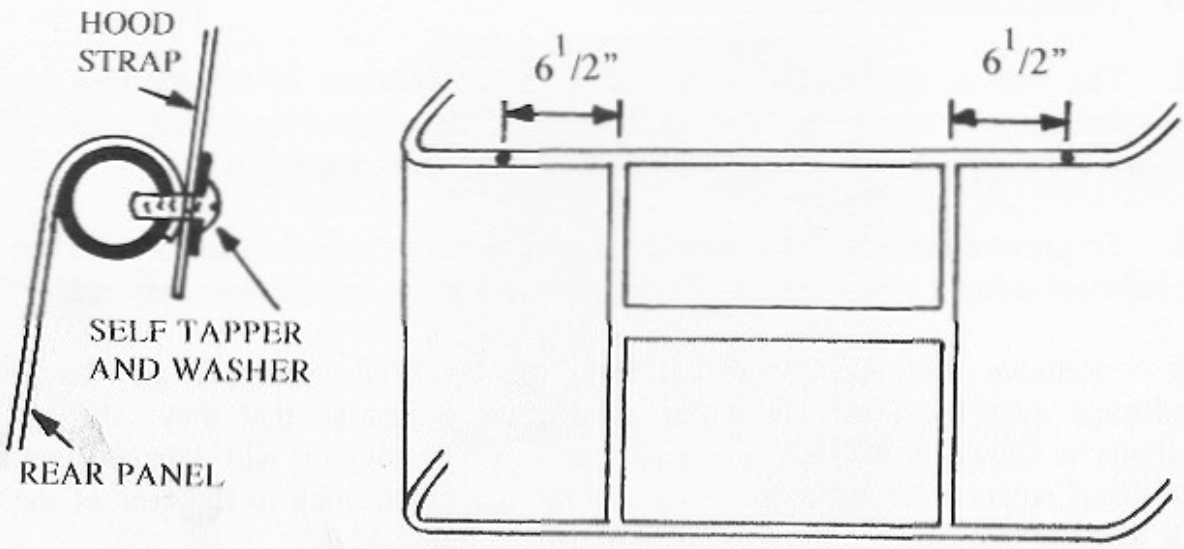


Figure 13.2 Hoodstrap Fixing

2.3 Make corresponding holes in the hoodstraps to achieve the correct dimensions and attach them to the top rear tube using self tapping screws and plain washers.

2.4 Now the hood is correctly tensioned, the poppers around the side of the hood can be fitted, to match the bases fitted in section 13.1.1. To do this, pull the side of the hood down so it is tight and mark the position of the popper on the hood. A hole should be punched in the hood and the popper fixed in position.

2.5 When fitting these poppers the rearmost popper on each side should be fitted first, followed by the second from the front, making sure the hood is tight at all times. The poppers in between should be done next. Leave the front popper until the side screens have been fitted.

13.3 Side Screens (Standard Hood)

3.1 Attach the side screen hinges to the outside of the windscreen with 5mm x 16mm bolts and nylocs.

3.2 With the hood erected and tensioned, offer up the side screens into position. The top of the side screen should align with the hood guttering and the front tucks in behind the windscreen support to provide protection from the elements.

3.3 Position the other halves of the hinges above those fitted to the screen and temporarily insert the brass hinge pins. Mark the locations of the hinge mounting holes on the outside of the side screens and drill 3/16" holes through the metal frame within the screen. For ease of marking, stick masking tape onto areas where the hinges are expected to locate and before drilling make sure that all the holes form one line. See figure 13.3

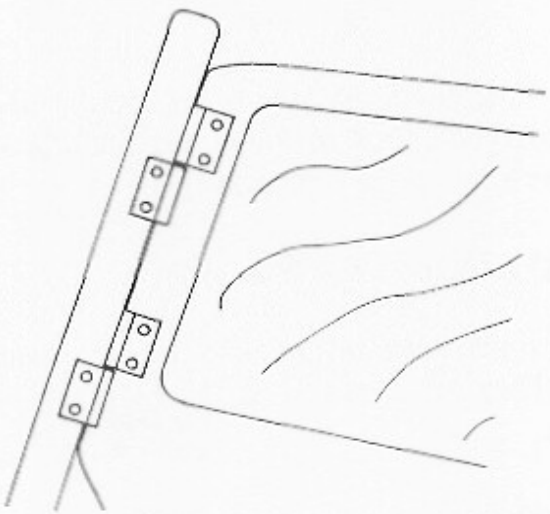


Figure 13.3 Side Screen Fixings

3.4 Bolt the hinges onto the outside of the side screens using 5mm x 16mm Posidrive screws and nylocs and mount them in place on the windscreen. In order to locate properly, the screens need to be bent around the scuttle, and where these should be bent will be clear when hung.

3.5 The side screens whether standard or increased visibility are held closed by straps located both at the rear and midway along the bottom edge in the case of increased visibility and on the hinged panel on the standard variety.

3.6 The straps to the rear on the side screens are secured using poppers, the bases for which should be fixed to the top rail of the chassis frame inside the cockpit using pop rivets.

3.7 The strap attached to the hinged panel on the side screen clips this panel shut onto a popper which needs to be fitted to the top tube just inside the car.

3.8 The position of both sets of poppers and their bases on the car will be apparent with the side screen in position, and it is important when fitting the corresponding part of each popper to the straps to ensure they are so positioned as to keep the side screens firmly shut if draughts and water ingress are to be avoided.

3.9 Fit the front popper base for the hood sides to the chassis, such that the aperture in the hood lines up with the rear of the side screen

13.4 Increased Visibility Hood and Side Screens

4.1 For taller drivers a revised hood and side screen kit is available which allows greater visibility and elbow room from a redesigned side screen and correspondingly realigned hood.

4.2 The fitment of the hood is exactly as described in 13.1 to 13.3 the only difference being an enlarged side screen aperture and the addition of a sleeve fastened with Velcro to hold the hood to the top hoodstick (see Fig 13.4).

13.5 Exterior Mirrors - Fitment to Sidescreens

5.1 Exterior mirrors are fitted to the sidescreens, towards the front just below the clear window panel. They are attached to the hidden metal frame of the sidescreen with countersunk bolts.

5.2 Drill a 5mm hole 5 inches back from the front edge of the sidescreen (not the sealing flap) and approximately 3/4" down from the clear window panel, such that the lower edge of the mirror mount is level with the seam in the sidescreen.

5.3 Loosely mount the mirror to the sidescreen and mark the position of the rear mounting hole, so that the mirror is parallel with the seam.

5.4 Bolt the mirror in place with the 5mmx16mm countersunk posidrive bolts and nyloc nuts

5.5 Take care when drilling the sidescreens to avoid the surface, underneath the vinyl covering is a sheet steel frame through which you will need to drill.

13.6 Hood Erection

If the correct procedure is not followed the hood can prove somewhat tricky to erect so we recommend that the following steps are taken:

i) Remove the spare wheel from its carrier unless the optional spacer has been supplied.

ii) Erect the hoodsticks.

iii) Slacken the Hoodstraps by easing them around the sides of the rearmost hoodstick reducing the normal hood height.

iv) Unfold the Hood and clip it onto the windscreen first.

v) Stretch the rear of the Hood over the back of the car and clip it over the poppers situated on the backpanel starting at the outside and working into the centre.

vi) Attach to the remaining poppers on the sides of the vehicle.

vii) From the inside of the car ease the Hoodstraps round tothe top of the rear Hoodstick to tension the Hood using the adjusting buckle to align the hoodsticks with the darts in the hood (13.6).

viii) Some Hoods have the facility to capture the front Hoodstick in a "pocket" secured by Velcro strips. This should be done up last and prevents the Hood from "ballooning" at speed.

ix) Finally replace the spare wheel in its carrier.

13.7 Folding

In order to preserve your hood and its windows we suggest that it is always carefully folded as in figure 13.7.

13.8 Boot Cover

6.1 The boot cover is designed to attach semi permanently to the top of the bulkhead behind the seats and to clip onto the same fasteners as those provided for the hood at the rear of the vehicle. Please note that it is designed to fit over the hoodsticks therefore it is essential that these have been fitted prior to the boot cover. When not in use, i.e. when the hood is erected, it folds away into the boot area.

6.2 The cover is designed to fit around the optional rollover bar, but since these vary according to chassis type, be sure to order the correct cover. There is also a special cover designed for De Dion cars fitted with the competition Rollover bar. Due to the positioning of this competition bar, it will be necessary to remove it before the boot cover can be fitted.

6.3 If the poppers have not already been fitted, measure carefully the centre point of the car across the rear bulkhead and mark the positions for six 1/8" holes to be drilled in the middle of the tube at 1 1/4", 7 3/4" and 14 1/4" each side of the centre line.

6.4 Carefully mark out and drill corresponding holes through the front edge of the boot cover aligning the front edge with the front edge of the bulkhead, and secure it using six popper bases with the small self-tapping screws provided.

6.5 Stretch the boot cover over the luggage area and establish locations for the poppers. We suggest that you fit the outermost poppers on the flat rear panel first since these will hold the cover evenly in position while the others are marked up. We suggest also that masking tape be used to assist with marking and that poppers are fitted in the same way as in the weather equipment section.

6.6 Fit the remaining poppers across the rear and sides of the boot area except for the forward two poppers on each side (see diagram).

6.7 If a tonneau cover is also to be fitted the normal popper outer or male part will have to be substituted by a further popper base. The kit includes special bases with small 1/8" centre hole to enable them to be riveted together with the normal popper inner. The rivet should pass from the inside outwards as shown.

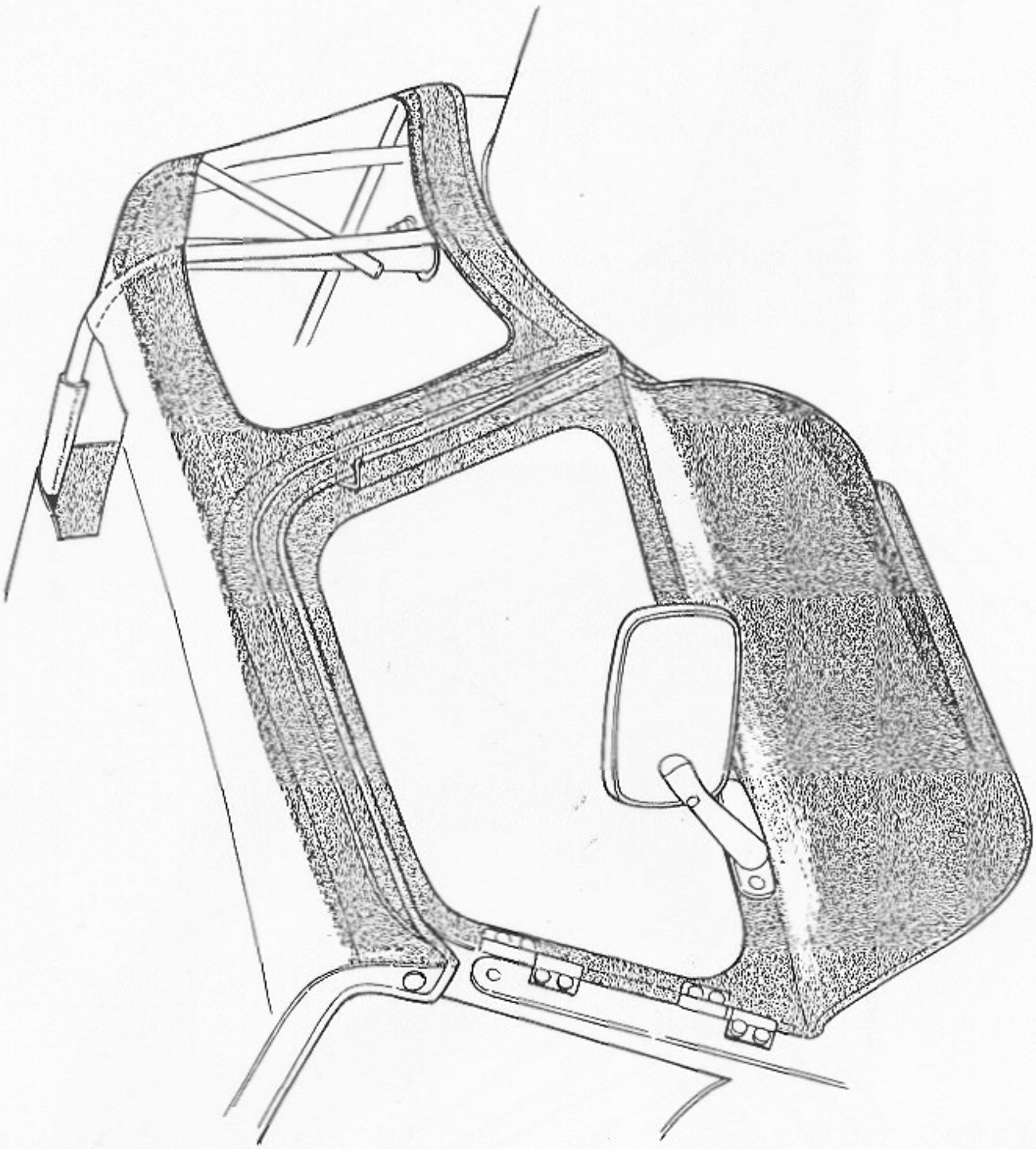


Figure 13.4 Increased Visibility Hood and Sidescreens

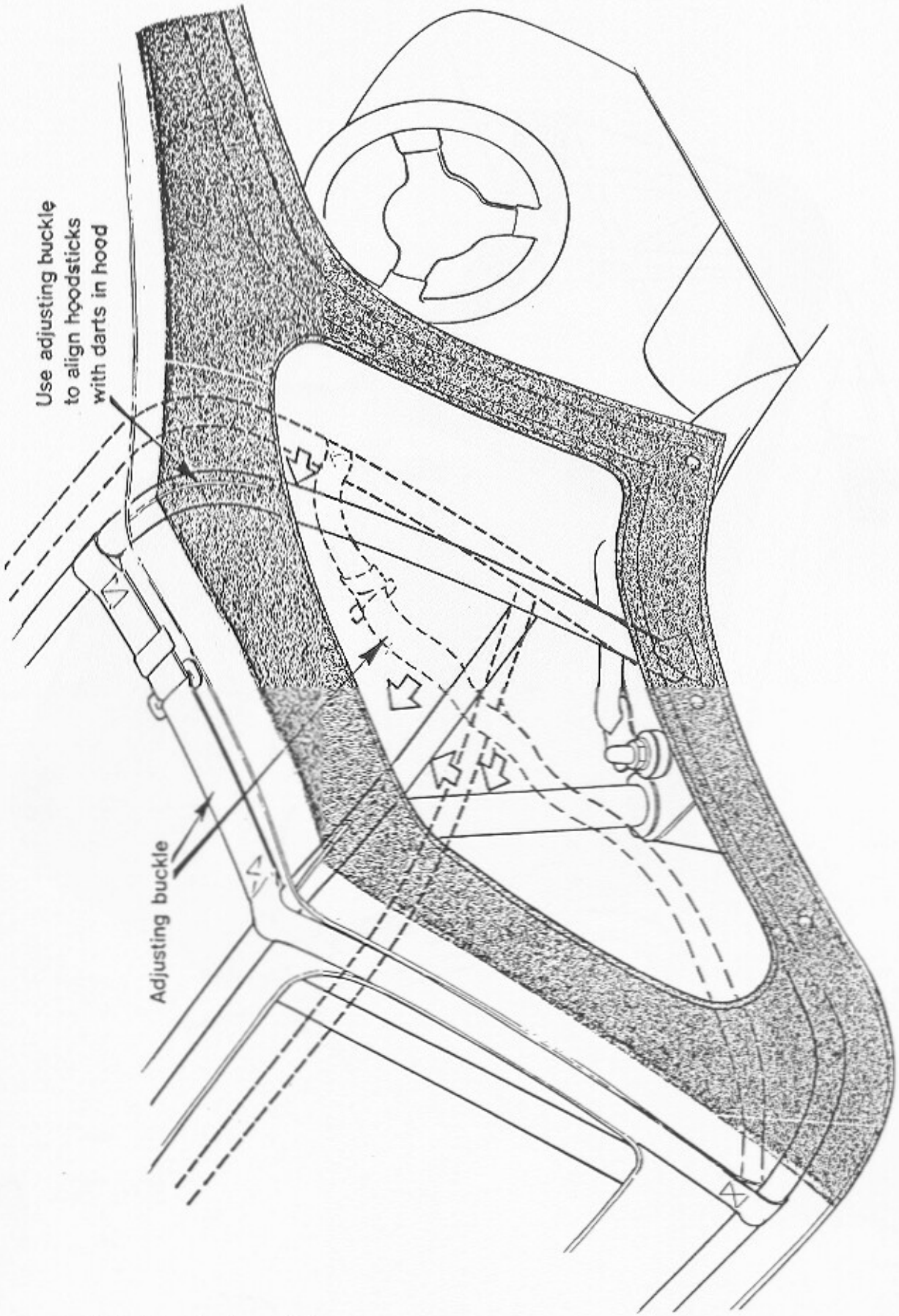
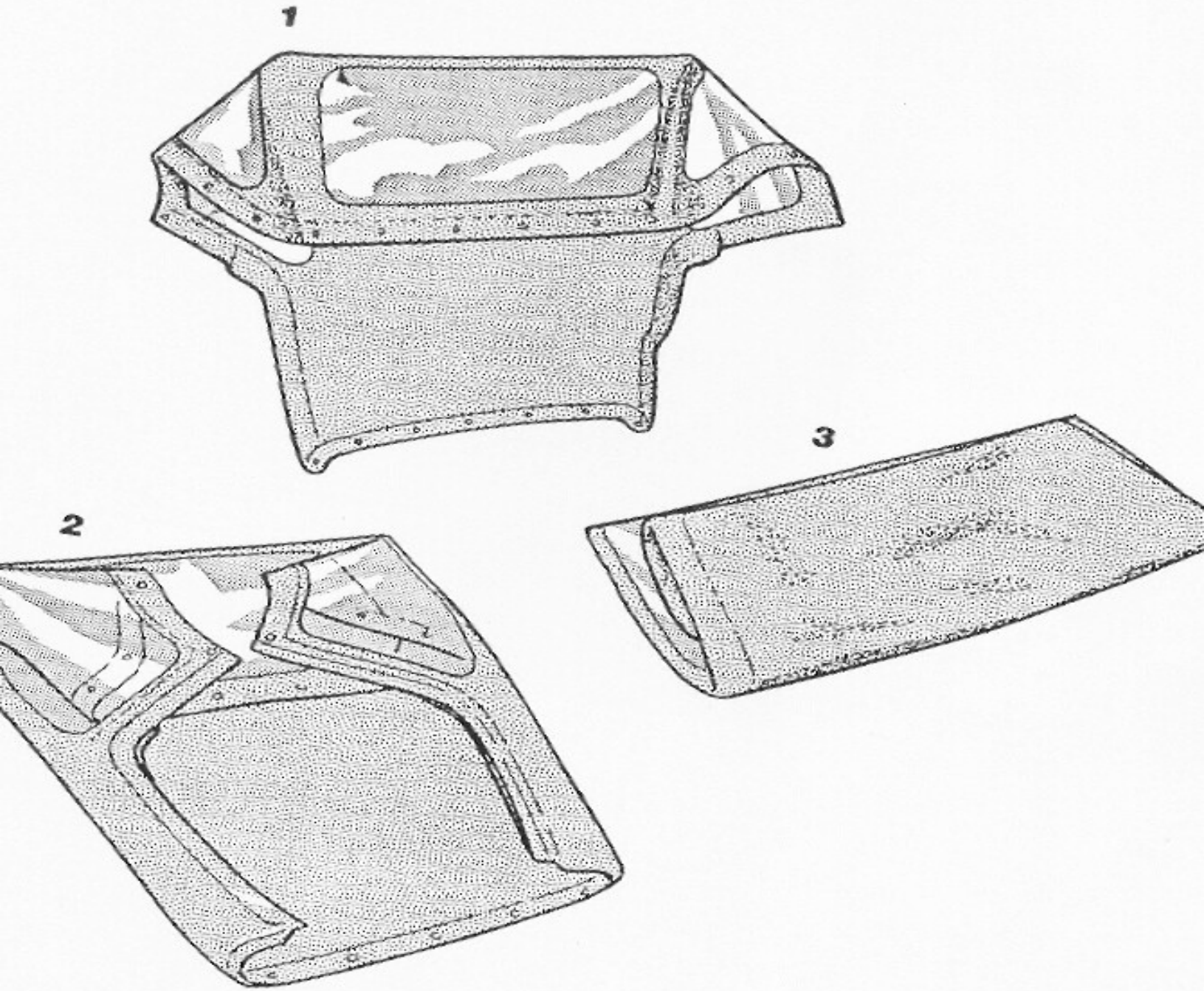


Figure 13.6 Tensioning of Hood



7 Folding of Hood

SECTION 14

OPTIONAL EXTRAS

Contents

There are a wide range of extras available for the Caterham Seven and the attachment of the most popular items are covered by this section.

14.1 Heater-Recirculating Type

1.1 The heater kit includes all the items necessary to install a heater in an existing live axle car.

1.2 The heater unit itself is fitted to the horizontal bulkhead above the occupants' feet and operates by recirculating air from above the gearbox and ducting warm air down through slots into both footwells.

1.3 It is held down by four self tapping screws and plain washers so the first step is to lay the unit in place and mark the positions for 1/8" holes to be drilled, checking that it does not foul the steering column. You will also need to mark out on the chassis where the outer ducts locate relative to the bulkhead so that the self adhesive foam seals can be correctly located and stuck on the bulkhead. With these in place, the heater can be screwed into position.

1.4 The heater is wired using 3 connections, the black wire to earth, the red wire to the green/purple on the loom and the white wire to the green/yellow on the loom. The earth is connected to one of the self tapping screws locating the unit. It will be necessary to drill a 3/8" hole in the vertical bulkhead behind the heater approximately 5" up and 15" in from the left hand side edge of the chassis in order that the wires can be passed through a grommet to connect with the loom.

1.5 Attach one end of the 5/8" diameter rubber tubing to the 5/8" connection on the water pump, using a jubilee clip and, mounting it as per diagram 10.5, attach its other end duly trimmed to length, to the left hand connection on the heater with another jubilee.

1.6 Attach the shorter length of 5/8" diameter tubing to the 5/8" connectoon the inlet manifold and connect it in turn to the connection on the heater using Jubilee clips. Clip the pipes together so that they run in parallel above the engine with the three clips provided.

1.7 In order to get the heater operational it will be necessary to bleed the air out of it first. This can be done by disconnecting the hoses above the inlet manifold and slowly filling the heater with a water/antifreeze mixture, with the radiator cap removed until the water level in the header begins to rise.

14.2 Heater Control Valve (Recirculating Heater)

2.1 For those wishing to obtain better control over their heaters a control valve is available which is used to cut off or reduce the supply of hot water to the heater. This kit is available under Caterham part No. HV01 and consists of the valve, its operating cable and the necessary fixings.

2.2 The valve locates in the heater input hose which is the right hand one as viewed from the driver's seat. It is therefore necessary to remove a section of this hose 5cm long in line with the forward edge of the pedal box. Place a jubilee clip over each end of the hose and insert the control valve, operating lever uppermost, and secure the clips.

2.3 The operating control locates under the scuttle above the driver's right knee, and a hole 1/2" (12.5mm) diameter must be drilled in the vertical face of the scuttle at the bottom right hand side, taking care that this is positioned to avoid any obstructions.

2.4 Feed the cable through from inside the car and secure the cable outer to the scuttle using the nut and shakeproof washer threaded onto it, the washer on the engine bay side and use the spring clip to attach it to the control valve body.

2.5 With the control handle pushed fully home and the lever on the valve in the shut (left viewed from the driving seat) position, the inner cable is passed through the hole in the lever and bent back on itself so that the lever can be pushed shut or pulled open.

2.6 Finally the cable is secured to the outside face of the pedal box using the 2 'P' clips provided and we suggest that these are fitted in place of the existing clips holding the brake pipe.

14.3 Rear Wing Protectors

3.1 These consist of stainless steel panels which are attached to the lower front of the rear wings with 5/32" pop rivets. These are supplied flat and will need to be gently bent to suit the contour of the wings.

3.2 Cut the rubber wing piping strip to fit around the lower outer and upper edges, cutting darts in its flange in order to take up a smooth curvature.

3.3 With the panels pressed against the wing piping strip between the rear wing and chassis, drill through the existing holes and rivet the panels into place on the wing capturing the beading. It is easiest to drill the inside holes with the wings away from the body.

14.4 Oil Cooler (Ford Engines Only)

4.1 The oil cooler plumbing connects to the engine using a special adapter fitted to the oil filter housing. First remove the filter and then fit the aluminium casting containing the oil cooler connections into its place securing with the special 1" sleeve nut provided. Ensure that the rubber seal between this and the oil filter housing is lightly greased to both help tightening and prevent leaks and that the nut is not over tightened since to do so will damage the oil pump/filter housing.

4.2 IMPORTANT: De Dion cars must have a Capri type oil pump fitted or the filter will foul the diagonal chassis tubes at the front of the engine bay. When fitted the connections taking the pipes to the cooler should ideally face to the right hand side of the car leaving sufficient clearance for the unions. The oil filter can now be replaced and should be pre-filled with oil to prevent an air lock occurring in the oil pump. Oil filters must not be re-used.

4.3 The oil cooler is located in front of the radiator. This is held by two special brackets which are attached to the radiator using the existing mountings at the bottom and the spare holes in the radiator flange at the top. Note that these brackets are not handed and the oil cooler is suspended above them. (see Fig 14.4A and 14.4B)

4.4 There are two oil pipes provided in the kit, the ends which attach to the oil pump/filter housing using 90° unions, while at the oil cooler the right hand union is straight and the left hand uses a 90° union. This allows the pipes to be fitted parallel to each other and for tidiness they can be secured together with tywraps.

4.5 The oil pipes should be routed upwards from the cooler, over the radiator and down over the front chassis cruciform to the engine. Take great care that these pipes do not foul the steering mechanism or rub on any sharp edges.

14.5 Competition 4 - 1 Exhaust System

5.1 The Competition type stainless steel exhaust system is available for all engine variants including Ford, Vauxhall and Rover power plants. It differs from the standard system by having a large bore 4 into 1 manifold leading into a larger bore silencer which exits to the side in front of the left-hand rear wheel. Please note that Vauxhall and Rover engines manufactured after 1.1.93 must have a catalyst to pass the MOT test. We do not offer a 4-1 competition catalytic exhaust system.

5.2 You should be aware that this system is considerably louder than the standard system described in 10.8 but releases more power. However, it does not meet RACMSA silencing restrictions when fitted to certain engine variants so check with the factory first if competition is envisaged.

5.3 On chassis designed for Ford engines, the aperture provided in the body skin is intended to take the standard 4 into 2 into 1 exhaust system and hence is too small for this option. To enlarge it we recommend that you use a small pair of CURVED tinsnips and enlarge the aperture sufficient to allow about 1/4" clearance around the system. This work will have been completed at the factory on Vauxhall and Rover powered cars. We also suggest that you cover the area around it with masking tape which serves the dual role of protecting the paintwork if appropriate and enabling you to mark clearly where cutting is necessary.

5.4 The aperture is enlarged as follows:

i) Fit the dual pipe serving cylinders 2 and 3 onto the engine (Rover and Ford engines - Vauxhall engines use individual primary pipes) and temporarily secure with 5/16" UNC Allen bolts and springwashers (Ford), or to studs securing with appropriate nuts. This should fit through the existing aperture although trimming at the lower edge will be needed. Mark where the aluminium skin is to be cut and having removed the manifold cut as required.

ii) Replace the dual pipe and now in addition test fit the rear pipe which serves No. cylinder. Once again mark where the body skin is to be cut away and remove both parts of the manifold before trimming.

iii) Repeat this exercise with the forward No. section.

iv) Finally finish off any sharp edges with a half round or round file and bolt the manifold loosely into place using suitably enlarged gaskets to the cylinder head.

5.5 The manifold pipes can now be fed into the fabricated 4 into 1 piece and secured using the two 1/4" x 3/4" UNF bolts, plain washers and nylocs. Tighten the manifold on the cylinder head

5.6 The silencer mounting bracket and rubber bobbin attaches in the same way as with the standard system (10.9.4). Slide the silencer unit over the end of the 4 into 1 piece, again using Firegum, and secure the rear of the silencer to the bobbin using a plain washer and 5/16" UNF nyloc nut.

5.7 Use the clamp provided to secure the silencer to the 4 into 1 piece twisting the silencer to make certain that the side pipe is not too close to the ground.

5.8 Finally attach the exhaust guard using long Jubilee clips in the same way as with the standard system (10.9.8). The adjuster clip should be positioned in the gap between side bodypanel and the silencer, such that it is above the level of the base of the silencer.

14.6 Tonneau Cover

6.1 Tonneau fitting varies slightly according to whether the chassis is fitted with a De Dion or Classic live Axle since a different form of top spring/damper mounting is employed.

De Dion cars

6.2 Before the tonneau can be fitted both the boot cover and seat belts must be installed, and the steering wheel and head restraints must be removed (if specified).

6.3 Carefully align the tonneau along the centre line of the car and stretch it across so that there should be about 1" of tonneau ahead of the popper centres. Mark and fit two poppers at the front to correspond with the bases just fitted.

6.4 Carefully measure the positioning of the rear edge of the tonneau relative to the popper bases securing the front of the boot cover ensuring that its rear edge is exactly parallel to the seat bulkhead and that it is properly centred. Mark the positions of the popper bases and fit the six poppers across the back. It is very important to locate these poppers correctly as these set the correct tension for the whole cover. It should not be so tight that it puts too much stress on the fittings, bearing in mind that it will not stretch as well in cold weather, nor so loose that water can collect on it.

6.5 Working one side at a time, starting with the passenger side, mark and drill a hole and fit a further popper base on the scuttle approximately 1 3/4" inward from the lower inner edge of the windscreen support where it joins its triangular base (see

figure 14.6). Stretch the tonneau carefully into position taking care to pull the tonneau far enough forward to achieve a little clearance in front of the rear wing and fit another fastener.

6.6 Carefully pull the rear edge of the tonneau over the side of the car and mark and fit a fastener to secure it to the boot cover side.

6.7 Mark, drill and fit a popper base 3/4" below the rear lower edge of the scuttle, 1" rearward of the centreline of the large securing rivet. Again stretch and fit the tonneau with a fastener.

6.8 Carefully pull the rear edge of the tonneau over the side of the car and mark and fit a fastener to secure it to the boot cover side.

6.9 Mark, drill and fit a popper base at a point 2" down from the top rear of the doorway and 1 3/4" forward of the rear wheelarchs. Pull down the tonneau to achieve an even fit to the wheelarch and fit the final fastener.

6.10 Un-zip the tonneau and refit the steering wheel when fitting the first fastener leaving the rear fasteners in place along the seat bulkhead. Repeat the fitting procedure taking care to stretch the tonneau away from the vehicle centreline towards the windscreen stanchion just sufficient to prevent bagginess in front of the steering wheel.

Fastening the zip will correctly tension the tonneau.

Classic Live Axle Cars

6.11 Tonneau fitting is generally similar to the above instructions except that the rear shock absorber spindles protrude above the bulkhead and eyelets are fitted to the tonneau which fit over them. This means that the location of the rear of the cover is accurately fixed and therefore saves the careful measuring required for a De Dion car. Fit the rear fasteners according to the logical location given by the spindles but otherwise follow the instructions in the same way as with De Dion cars.

14.7 Wind Deflectors

7.1 The Wind Deflectors available from Caterham Cars locate onto the mountings fitted to the sides of the windscreen used for the sidescreens.

7.2 These are manufactured from ICI cast acrylic sheet of high quality and are 10 times more impact resistant than glass.

7.3 It is extremely important however that they are not cleaned with any solvents as it is likely that the surface will be damaged. Use soap and water and rinse off, or use "Mr Sheen" or similar polish. The occasional use of "T" Cut will remove any polish build up, and any small scratches, but do not use a power tool buffer.

14.8 Side Sill Protectors

8.1 These consist of pre-formed stainless steel plates which fit over the upper edge of the cockpit sills to protect paintwork from being damaged while entering or leaving the car.

8.2 To fit these accessories, first drill out the rivets holding the inner trim panels to the upper chassis tube along the bottom edge of the cockpit so that the longer edge of the "U" shaped protectors can be slotted down between the tube and the trim.

8.3 Having aligned the protectors and ensuring that they are flush with the top of the tubes, drill through the existing holes in the trim into the protectors and rivet both trim and protectors into place.

14.9 Adjustable Platform Shock Absorbers (Classic Only)

9.1 For owners wishing to use their cars for competition purposes, the specification of this option enables the front and rear ride height to be adjusted in order to cater for springs of varying length and to be able to run their cars lower than standard.

9.2 These units are adjusted using the lower spring platforms which are threaded onto the damper body. The platform is comprised of two rings the upper of which bears on the spring and the lower is used to lock the upper one in position.

9.3 In order to adjust the platforms special 'C' spanners should be used. Although it is possible to use a pair of screwdrivers there is a risk of damaging the notches in the rings designed to accept 'C' spanners.

9.4 These dampers are supplied from Caterham Cars with springs fitted but it will be necessary to adjust them to obtain the correct ride height as follows:

i) Adjust the front until the lower wishbones are horizontal which will mean that the top links of the front suspension will slope slightly downwards and inwards. As a secondary check measure the dimensions as shown on Fig. 14.9.

ii) Adjust the rear until, without driver or passenger, the dimension 'B' on the diagram is approximately 15mm higher than 'A'.

9.5 In order to achieve an even ride height from side to side you can either measure the distances from the bottom of the dampers to the underside of the locking rings or count the number of threads exposed.

9.6 It is recommended that in order to prevent the exposed threads becoming corroded or blocked with road dirt they are firstly greased and then covered with protective tape.

9.7 We also strongly recommend that you do not lower the car relative to these settings as handling will deteriorate due to substantial use of the bump stops which prevent the car's suspension from operating properly, the available wheel travel is by the very nature of the vehicle limited.

9.8 In addition, by running the car excessively low, the car's ground clearance is reduced which is likely to lead to damage to the engine sump.

9.9 If for competition purposes you still wish to reduce the ride height we suggest that you use stiffer springs to keep the car off the bump stops and fit a Dry Sump oil system to the engine in order to increase ground clearance.

9.10 De Dion cars are supplied with adjustable platform shock absorbers as standard, these adjust by moving the sporing platforms up and down by removing the retaining circlip and placing it in an alternative groove as required. Spacer shims of 1mm and 2mm thickness are available for fine tuning the ride height.

14.10 Battery Master Switch

10.1 A master switch kit has been produced by Caterham Cars to enable the fitment of an Autolec battery master switch, primarily for competition purposes, but also for security. This contains the following components:

1 Autolec Battery Master Switch with fixing bolts
1 Main Cable (red) Starter Solenoid to Master Switch
5 Female Lucar connectors and insulating covers
1 Male Lucar connector
3 Ring terminals (2 x 1/2", 1 x 5mm)
1 Protection "Eyebrow" and fixing bolts
All necessary cables and sufficient cable ties

Please refer to the wiring diagram Fig. 14.10. with this kit.

10.2 We recommend fitting the switch in the triangular section of the right hand windscreen stanchion and a scale template is included on Fig. 14.10 Trace or cut out this template and use it to mark and drill three holes in the aluminium.

10.3 Remove the rubber cap from the switch and insert it from the inside of the scuttle securing with the bolts supplied. The rubber cap can be replaced on the switch but leave the key out for the time being.

10.4 Remove the existing battery to starter solenoid cable (red) completely though it is reused later.

10.5 Disconnect the two brown wires from the positive terminal of the battery, cut off their terminals and join the bare wires together. Solder to this joint the additional brown wire provided insulating well with insulating tape, and attach the 1/2" ring terminal to the other end.

10.6 This new wire is routed along the chassis tube above the gearbox, up through the wiring loom grommet in the transmission tunnel cover and then behind the dashboard to the switch, connecting it to either of the main terminals.

10.7 Attach the new red main battery cable to the starter solenoid and following the chassis members, run this above the gearbox, through the wiring grommet and along to the switch attaching it to the same terminal as the brown wire.

Ford Engined Variants

11.8 Unclip the black plastic cover from the rear of the steering lock, protecting the ignition switch terminals, and remove the terminal with the two white wires attached to it.

10.9 Using the male Lucar connector, connect this to one of the white wires contained in the kit and having attached a female Lucar connector and an insulator to the other end of the wire, connect it in turn to one of the 'Z' terminals on the back of the master switch.

10.10 Attach a female Lucar connector and insulator to each end of the second white wire and connect this between the remaining 'Z' terminal and the ignition switch where the twin white wires were disconnected.

Rover K Series Cars

10.11 Disconnect the purple power lead in the main loom from the brown lead in the engine loom. Extend and connect the purple lead to one side of the terminal Z on the battery master switch. Extend and connect the brown wire to the other terminal Z on the battery master switch, see Figure 14.10.

All Variants

10.12 Solder each of the black wires supplied to each end of the resistor contained in the Autolek kit and insulate with tape. Attach an insulated Lucar connector to one wire and the 5mm ring terminal to the other. Connect the Lucar end to the 'W' terminal on the master switch and earth the ring terminal to metal at a convenient point.

10.13 Fit the green wire with suitable connectors and attach it between the remaining 'W' terminal on the master switch and the main terminal to which the brown and red wires have been attached.

10.14 Finally the original red battery cable removed earlier should be routed from the remaining terminal on the master switch, through the grommet, and along the chassis tube to the positive terminal on the battery. CAUTION do not connect to the battery until the cable is routed and connected to the master switch.

10.15 Tie all cables to the existing loom using the cable ties provided and take care to ensure that all connections are well insulated and no wires are hanging loose.

10.16 To test the system, turn the master switch to the on position and check that the lights work. Start the engine and while the engine is running turn the master switch to off, the engine should immediately die. If there is a fault recheck your wiring and if this cannot be traced contact Caterham Cars.

10.17 Please note that on no account should you reconnect the battery or run the engine until the switch wiring is complete or damage can be done to the alternator.

10.18 On K Series cars it is not advisable to switch the engine off on the master switch except in emergencies as this will wipe the memory of the ECU. While no permanent damage will be done, it will result in initial rough running until the ECU has been able to re-programme itself.

10.19 On Vauxhall Injection cars, to protect the E.C.U., the E.C.U. needs a permanent power feed that is not switched by the cut out switch. To provide this, remove the white wire from the plug connecting the engine harness to the vehicle loom. (N.B. this wire should be removed from the engine harness side) Extend this wire and fit a ring terminal to its end, where it bolts to the positive terminal of the battery.

10.20 Where the cut off switch has been fitted for racing purposes it will also be necessary to fit the "eyebrow" shield around it to prevent the switch being damaged in a side on accident. This is fitted to the windscreen stanchion by substituting the existing plated caphead bolts for the longer bolts supplied with the kit.

14.11 Flush Fuel Filler Cap (Standard on injected cars)

11.1 It is mandatory for racing and advisable for other forms of motorsport to fit a flush fuel filler which will not be torn off in the event of a rear end impact. Accordingly a kit is provided which consists of a new filler neck and retaining bezel, a plastic locking cap and the necessary fastenings. If you have fitted the standard filler cap already it should be removed along with the back panel grommet and the rubber hose.

11.2 Using the two self tapping screws provided attach the retaining bezel to the filler neck, noting that one of the six rivet holes in this collar should be at the top.

11.3 Cut down the original filler hose by removing a section from either end measuring 3" on the inside by 3.5" on the outside. If in doubt test fit the hose in place removing smaller amounts until it fits correctly as in 12.4 below.

11.4 Push the shortened hose onto the back of the filler neck and loosely assemble onto the petrol tank. Insert the filler cap through the hole in the back panel and capture the filler neck assembly by turning the key in the lock.

11.5 Using the holes in the bezel as a guide, mark and drill six 1/8" holes in the back panel for the retaining rivets and secure passing the rivets through from the outside.

11.6 The jubilee clips retaining the filler hose can now be tightened, and any fire protecting cover replaced. Note that as the cap supplied is not vented, it will be necessary to drill an extra 1mm hole through the cap if symptoms of fuel starvation are suffered.

14.12 Fuel Tank Protection Kit

12.1 This kit is again needed for competition purposes and contains seven pieces (six on injected cars) of 1/2" aluminium honeycomb shaped to fit around the fuel tank. Firstly it will be necessary to remove the roll over bar, boot floor and the tank itself.

12.2 Referring to Fig. 14.12 the first panel to be fitted is the centre rear panel which is secured using a thin smear of silicon sealant to the inside face of the back panel.

12.3 Remove the self adhesive foam strips from the angle brackets which support the tank and drill five 5/32" holes evenly spaced in each. Drill corresponding holes in the tank undertray noting that the crushed edge faces backwards and rivet this into place. Fit new pieces of self adhesive foam and replace and resecure the fuel tank.

12.4 Attach the two rear side plates and both end plates directly to the fuel tank using silicon sealer, pressing firmly into place. On injected cars the fuel pump is located on

the right hand side of the tank and therefore it is not possible to fit this part of the protection kit.

12.5 Finally replace the wooden boot board with the honeycomb one provided (rear only for De Dion), securing with self tapping screws in the same way. It may be necessary to trim this slightly in order to obtain a good fit. The roll over bar and fuel tank filler can now be replaced.

14.13 Floor Impact Protection Panels

13.1 To provide additional protection for the driver (RHD cars only) 1/2" honeycomb panels are available for all chassis types which fit onto the cockpit floor. These are secured using a thin bead of silicon sealant close to the edge of the underside of each panel, and a heavy weight should be used to hold them in place until the sealant has dried. These panels may need to be trimmed using tin-snips or a file to obtain a tight fit.

13.2 Both this kit and the fuel tank kit in 14.12 are fitted using silicon sealant. This is available along with a suitable frame applicator from Caterham Cars under part numbers 76828 and 76829 respectively.

14.14 Competition Rollover Bar

14.1 Before fitting the rollover bar it will first be necessary to remove the rear spring damper units in order to gain access to the lower mounting points (De Dion only). (See Section 7.4)

14.2 The rollover bar is slotted into the recesses provided in the bulkhead behind the cockpit, and is secured from underneath by 5/16" x 1" bolts and lockwashers into the threaded holes provided in each vertical member of the bar. Leave these bolts loose for the time being so that the bar can be moved to allow alignment of its other fixings.

14.3 The rear diagonals are secured to the brackets provided at the rear of the boot compartment using 5/16" x 2" bolts and nylocs with a plain washer under both the boltheads and nylocs.

14.4 The main mounting flange is attached using 5/16" x 1" bolts, plain washers and lockwashers at the rear outside edge, and by the 7/16" x 1" bolts holding the full harness seatbelts at the inner edge. When all the bolts are located they can be fully tightened and the rear spring damper units replaced.

14.5 The diagonal brace is fitted between the top of the rollover bar and the inside edge of the cockpit on the passenger side (RHD cars). It is supplied in two halves so that it can be adjusted exactly to fit each individual chassis.

14.6 The forward and lower mounting is to a bush located within the chassis and normally hidden behind the trim panel. It can be found approximately one inch below the point at which the dashboard tube is welded to the top of the chassis rail.

14.7 Drill out six 3/16" rivets holding the top edge of the trim panel in place around this point and ease the panel away from the chassis until the exact location of the bush is identified. Drill a small pilot hole through the trim panel and enlarge so that a 7/16" bolt can be fitted through, taking care when doing so that the thread in the bush is undamaged. When this can be done replace the trim using new dome headed rivets.

14.8 The top half of the brace is secured to the top of the rollover bar with a 7/16" x $2\frac{3}{4}$" bolt and nyloc with plain washers under both the bolt head and nyloc, while the bottom section is secured to the bush in the side panel using another 7/16" x $2\frac{3}{4}$" bolt, plain washer and lock washer.

14.9 The two halves are held together by another 7/16" bolt, nyloc and washers after first drilling through both sections to suit.

14.10 We strongly recommend that all parts of the rollover bar likely to be contacted by either the driver's or passenger's heads be protected. We suggest that you obtain some foam pipe lagging of appropriate size and tape it to the bar using canvas tank tape or similar.

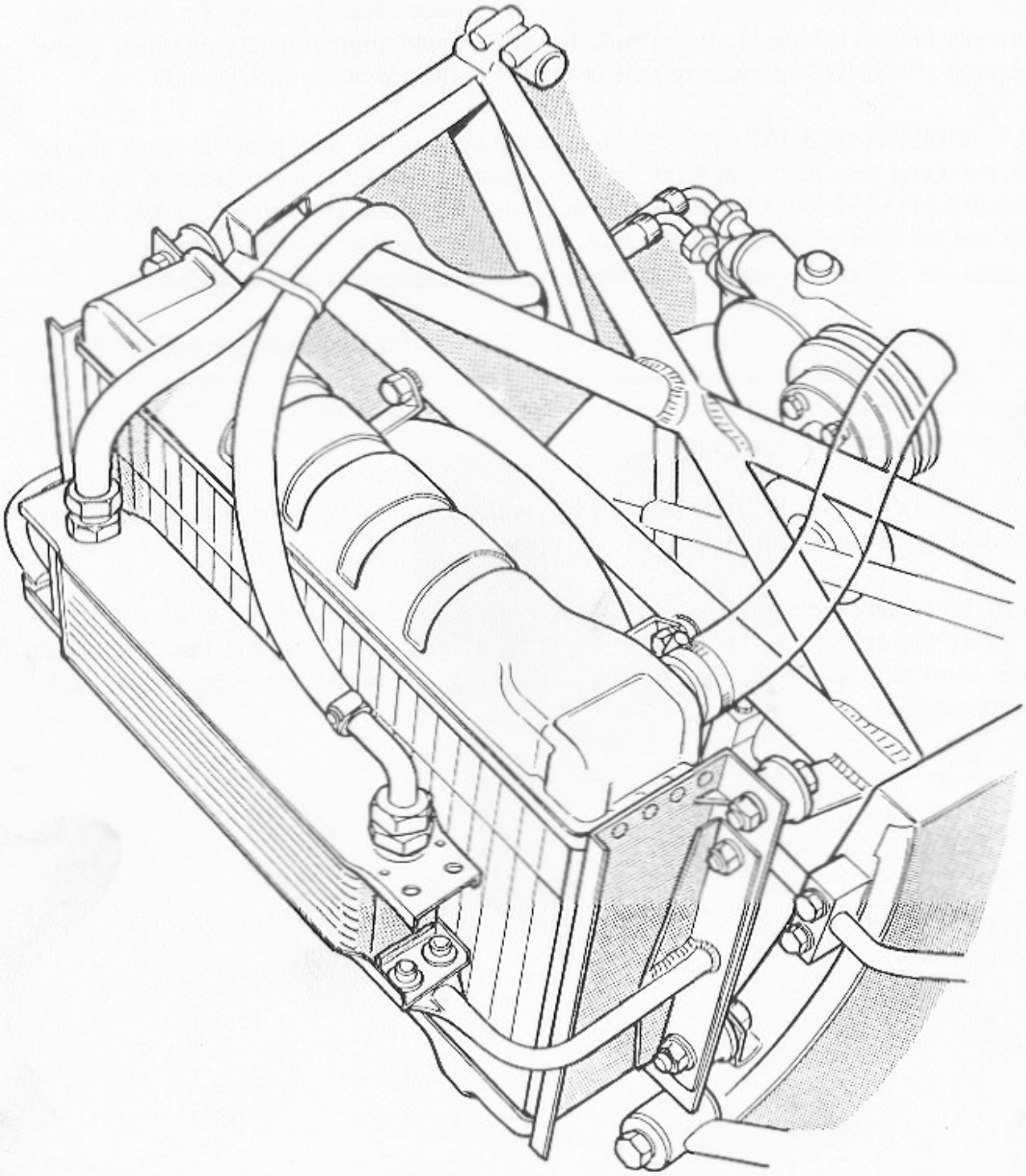
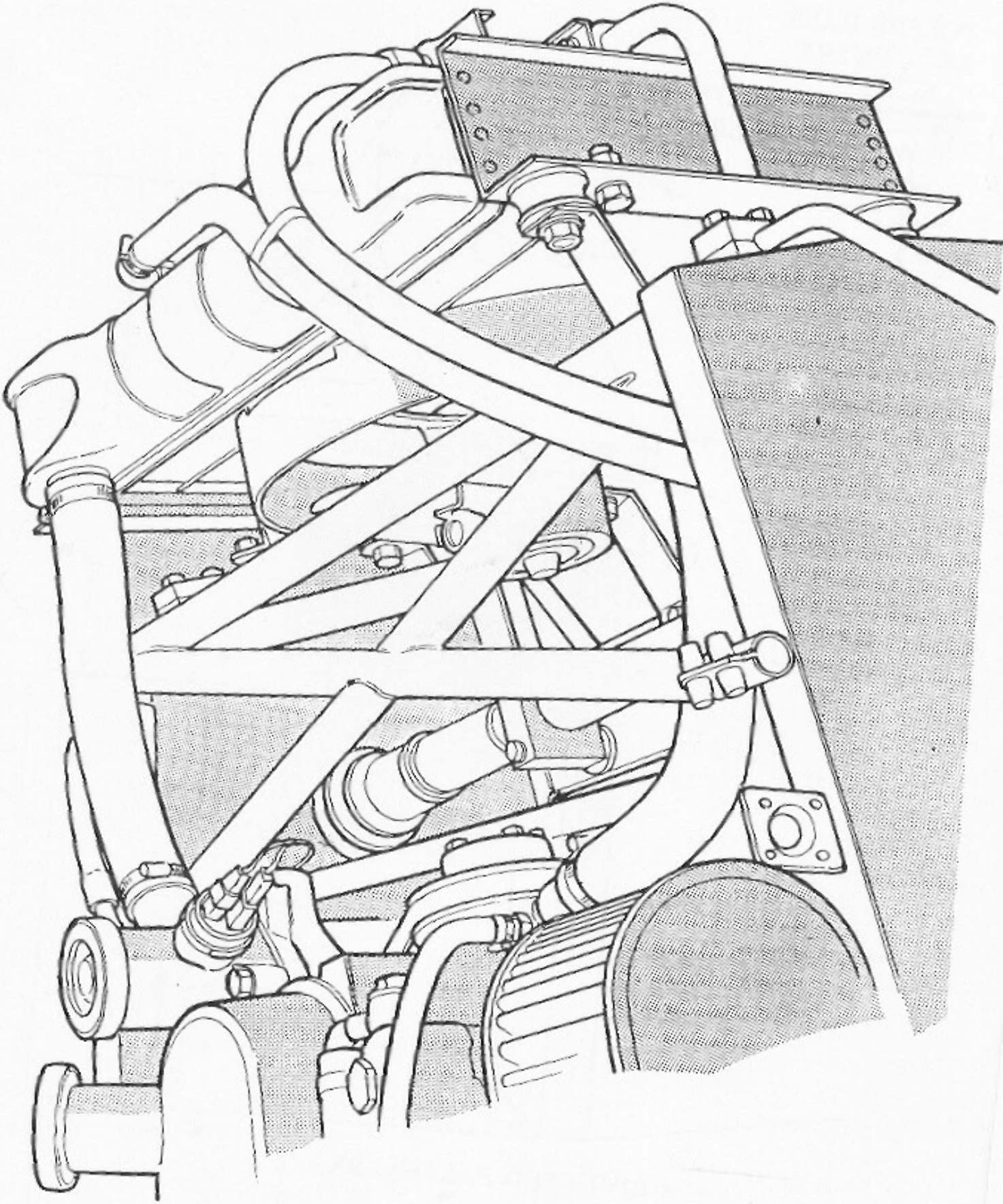


Figure 14.4A Oil Cooler Pipes Layout (Front View)



igure 14.4B Oil Cooler Pipes Layout (Rear View)

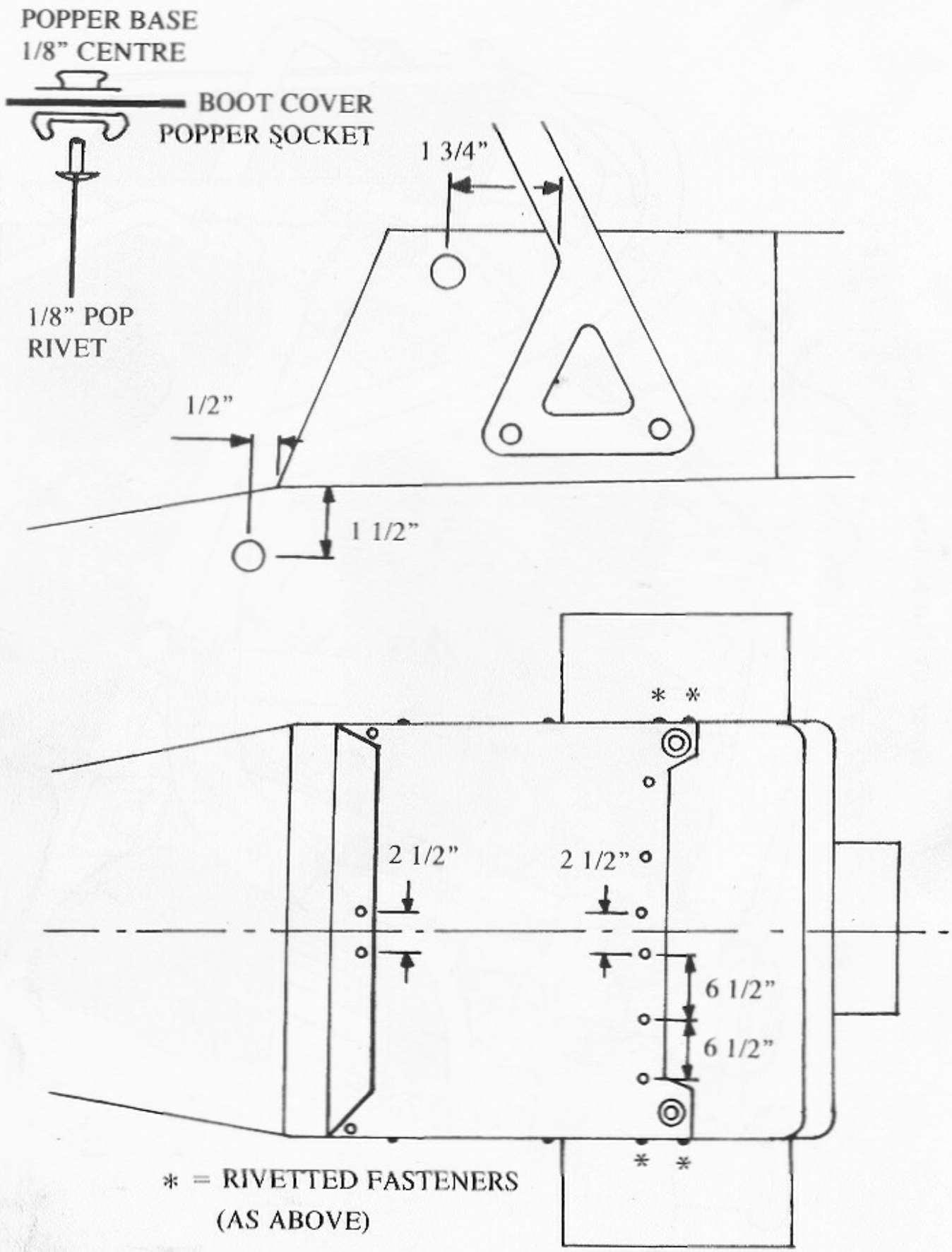
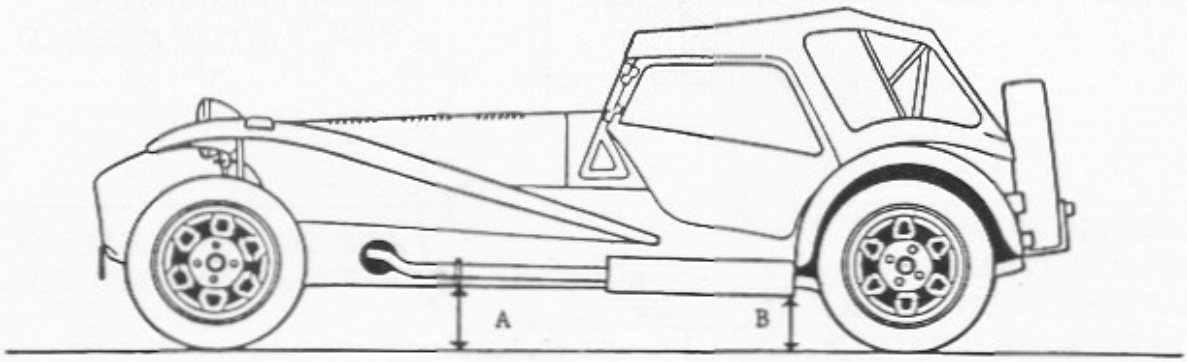


Figure 14.6 Tonneau Cover Fitment

RIDE HEIGHT AND GEOMETRY SETTINGS



A - 140mm (Measured between forward edge of floorpan and ground)

B - 155mm (Measured just in front of the rear wheel arch)

-These should be accurate to within a tolerance of +/- 10mm.
-Ensure that the rear ride height is always approximately 15mm higher than the front.

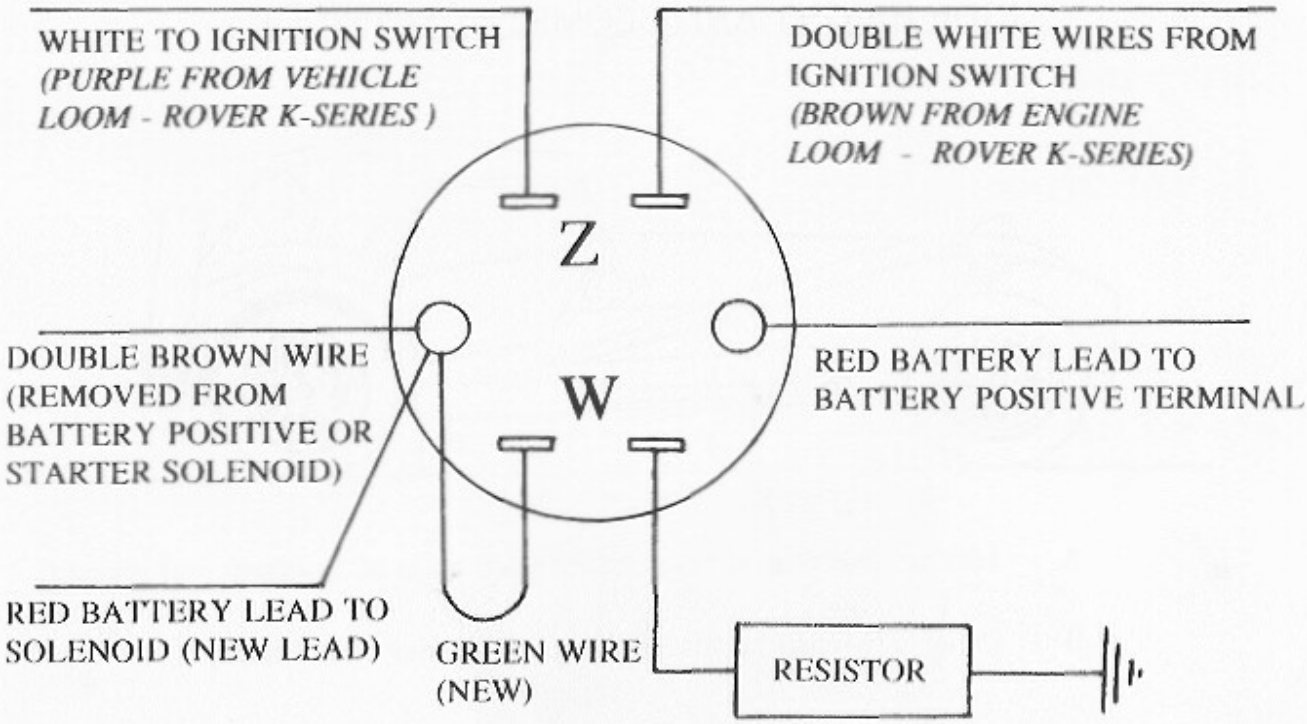
CLASSIC

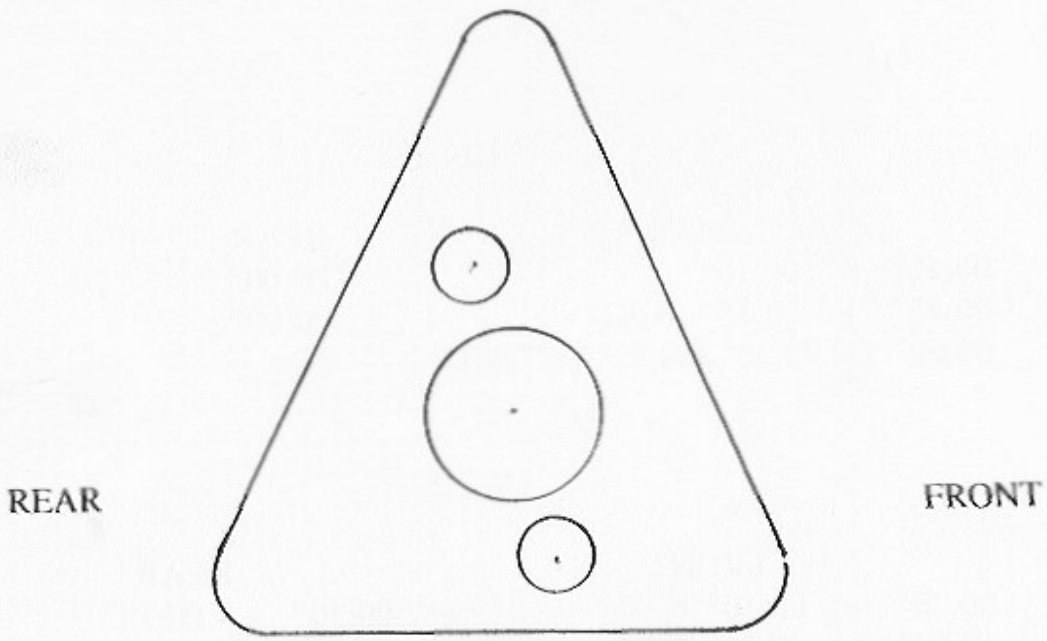
	FRONT	REAR
TOE IN	00,20" +/- 00,10"	00,00"
CAMBER	00,45" +/- 00,15" (NEG)	00,00"
CASTOR	50,00" TO 70,30" (60,30" OPTIMUM)	N.A

DE DION

	FRONT	REAR
TOE IN	00,20" +/- 00,10"	00,30" +/- 00,15"
CAMBER	10,00" +/- 00,15" (NEG)	10,00" +/- 00,15" (NEG)
CASTOR	30,30" +/- 10,00"	N.A

Figure 14.9 Ride Height and Geometry Settings





TEMPLATE FOR MASTER SWICH
(SHOWN ACTUAL SIZE)

Figure 14.10 Battery Master Switch Connections

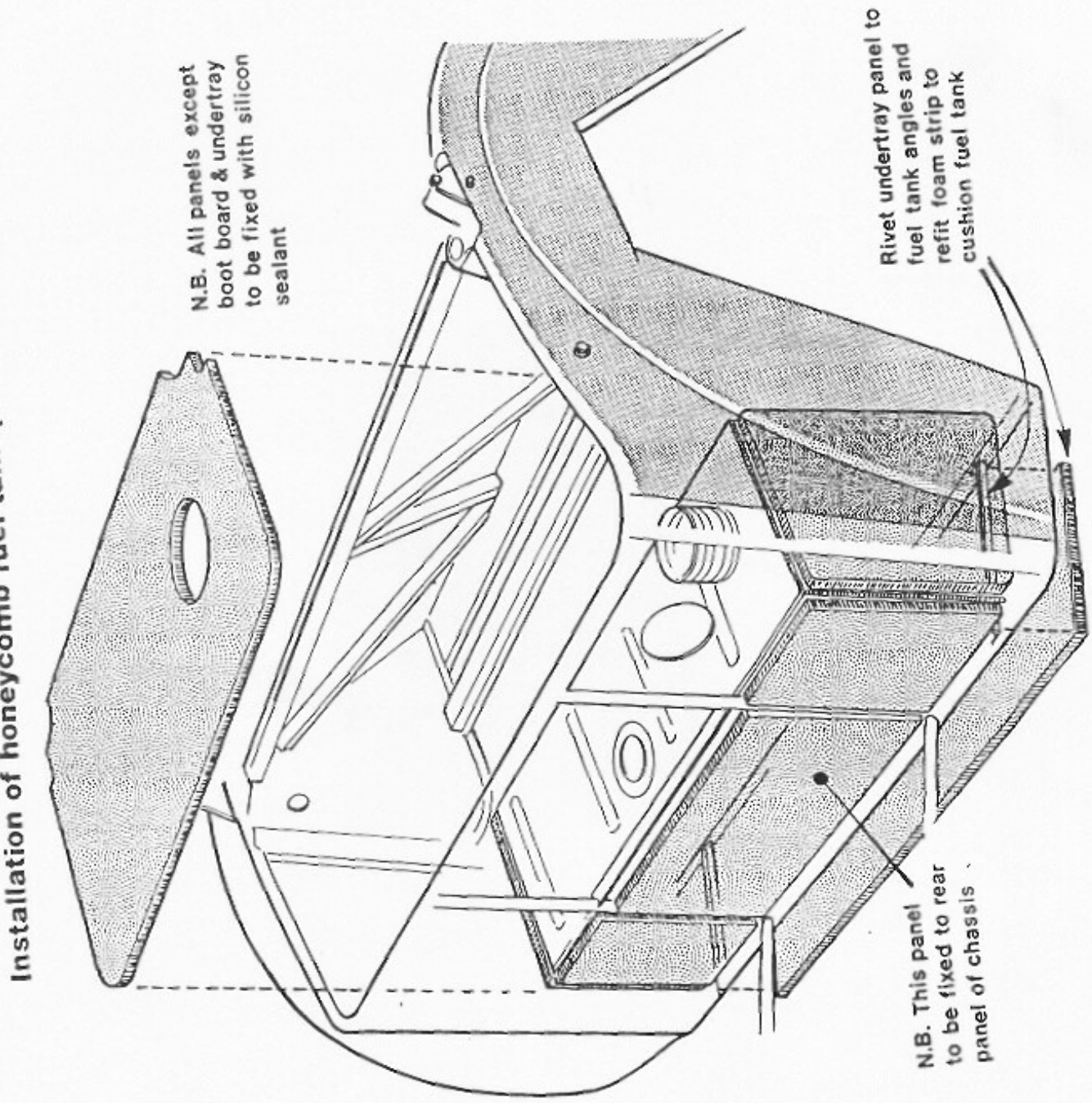


Figure 14.12 Fuel Tank Protection Kit

SECTION 15

REGISTRATION PROCEDURE

Should you build a car from a kit, and use second hand components, your car will not be registered as new but on a 'Q' registration number though this does avoid the ageing of a traditional plate.

To be eligible for a current prefix it will be necessary to have constructed the car from all new parts, i.e. no second hand or reconditioned items. A Certificate of Newness is provided with Component Cars and CKD kits which are in every way new by Caterham Cars. Please note that we cannot supply a Certificate of Newness for ANY car which we did not completely supply.

The procedure for registering a CKD kit therefore is as follows:

1. Obtain the form V55/5 from your nearest vehicle licensing office, these are not available from Post Offices.

2. Arrange for an insurance cover note specifying just the chassis number of your vehicle. Please note that Caterham Cars have a concessionary insurance scheme which should help you to get competitively priced cover.

3. Present yourself at the vehicle licensing centre - not your local Post Office - with the following information:

a) Completed form V55/5
b) Certificate of Insurance
c) Certificate of Newness
d) Your cheque (or cash) for the Road Tax.

You will then be issued with a current prefix registration number and a Tax disc. Please note that some licencing offices will insist that a CKD car is inspected before registration can take place. We recommend that you contact your local office in good time to establish what their policy is. (see para 5 of the kit registration procedure below)

4. Before taking your car onto the road for the first time order a set of number plates and notify your insurers of the registration.

The procedure for registering a car on a 'Q' plate is straightforward provided that the following steps should be followed:

1. Obtain the form V55/5 from your nearest vehicle licensing office.

2. Arrange for an insurance cover note specifying just the chassis number of your vehicle.

3. Take the vehicle to the nearest approved MOT testing station and obtain a pass certificate. The law states that, providing the vehicle is covered by Third Party Insurance, it can legally be driven to and from the **nearest** testing station for the purpose of obtaining this certificate as long as a prior appointment has been made. If you are worried by this, either deliver the car yourself on a trailer or ask for the MOT station to collect your car on trade plates.

4. Present yourself at the vehicle licensing centre - not your local post office - with the following information:

a) Completed form V55/5
b) MOT pass certificate under your chassis number
c) Certificate of Insurance
d) Bills for all the parts bought showing that VAT has been paid on all new items. Receipts for second hand parts should also be produced and in particular for the engine, gearbox and rear axle.
e) Your cheque (or cash) for the road tax.

5. *Subject to the above being satisfactory, the licensing office will probably* arrange for your vehicle to be inspected before a registration can be issued. There may be a delay before the local inspector can visit you, but to speed up the process, it may sometimes be possible to take the car to the local inspection site on a trailer.

6. Assuming the inspection proves satisfactory - and on a new Caterham it is unlikely to be otherwise - the authority is given for your registration to be issued. Your tax disc can then be collected from the licensing office.

Generally this inspection is to prove the existence and correct identity (engine and chassis numbers) of your vehicle, not a safety or Construction and Use check.

7. All that remains is to order a set of number plates and notify your insurance company of the registration.

Again, if you have any difficulties, please do not hesitate to contact Caterham Cars and we will do our best to help.

SECTION 16

PREPARATION FOR COMPETITION

Contents

Due to the difficulty and illegality of using the Caterham Seven's full power on the public roads, many owners choose to use their cars in competitions, such as autotests, sprints, hillclimbs and circuit racing.

Caterham Cars, in conjunction with the British Racing and Sports Car Club (BRSCC), run two circuit racing championships specifically for Caterham Sevens. The first is for Rover K series Supersport cars in road going form and the second is for the 'Caterham Vauxhall Challenge' racecars. Both these series have very strictly controlled regulations aimed at providing close and cost effective racing.

This section of the Assembly Guide seeks to explain how to prepare a car for competition and details the organisation and administration required before you can take part.

Caterham Cars have appointed the following official motor sports agent to assist customers with all aspects of race car preparation.

Hyperion Motorsport	Contact:	Magnus Laird
Unit 3, Sudbury Road	Tel:	01787 478800
Little Maplestead	Fax:	01787 478533
Halstead,		
Essex CO9 2SE		

16.1 Driver Requirements for Competition

1.1 In order to take part in any form of motorsport other than club autotests, it will be necessary to obtain a competition licence from the RAC, who co-ordinate all motorsport in this country.

For Sprints and Hillclimbs you will need a 'Speed licence' and unless you intend to contest a national championship, a 'Restricted licence' will suffice. No special qualification or experience is needed for a 'National licence', however.

For circuit racing, a Restricted Race licence will be needed and in order to be issued with one of these, you will need to visit your doctor with the licence application form for a medical check up. He will probably charge you a nominal sum for this. No specific level of fitness is needed but unless you have a history of heart disease, mental instability, a wooden leg, or VERY bad eyesight, you are unlikely to be disqualified. The fee for a first racing licence also includes a course at a racing driver school, which must be passed.

Licence application forms are obtainable from RAC MOTOR SPORTS ASSOCIATION LIMITED, MOTORSPORTS HOUSE, RIVERSIDE PARK, COLNBROOK, SLOUGH SL3 0GH. TEL: 01753 681736

1.2 Before taking part in motorsport, it will also be necessary to join an RAC affiliated Car Club. Because of the 'Restricted' licence, only members of invited clubs may participate in meetings. Unusually, no more than six clubs are invited, so it is important to join the correct club. For hillclimbs and sprints, we recommend that you join the BRITISH AUTOMOBILE RACING CLUB (BARC) who are invited to most hillclimbs and sprints in the UK and who also run their own championship. Their address is BARC, THRUXTON CIRCUIT, ANDOVER, HANTS SP11 8PN TEL: 01264 772696. Alternatively contact the RAC at the above address for details of your local clubs.

If you wish to participate in either of the Caterham race series', it will be necessary to register with ENTREPRIX LTD who have been appointed by Caterham Cars as co-ordinators. Contact Belinda or Jim McDougall at 20 LOUIES LANE, DISS, NORFOLK IP22 3LR TEL: 01379 640065 and they will be happy to help you with all racing matters. You will also need to become a racing member of the BRITISH RACING AND SPORTS CAR CLUB (BRSCC). Their address is BRSCC, BRANDS HATCH CIRCUIT, FAWKHAM, DARTFORD, KENT DA3 8NH TEL: 01474 874445.

There is another racing option for Seven owners, which is the Roadgoing Sportscar Championship run by the 750 MOTOR CLUB. This caters for all makes of road registered sports cars, from Porsches to Triumph Spitfires, run in appropriate classes. If you wish to join the 750 MOTOR CLUB LIMITED you need to contact Robin Knight at West View, New Street, Stradbroke, Suffolk IP21 5JG, Tel 01379 384268. For 1995 the 750MC race series may include a specific class for Ford powered Caterhams.

1.3 Once you have joined a suitable club and obtained a competition licence, the next step is to obtain entry forms for your chosen events. These can be obtained from the organising clubs and should be submitted in good time before the closing date. You should note that hillclimbs in particular tend to be oversubscribed, so get entries posted early in order to avoid disappointment.

The organisers will usually send you an acknowledgement of entry, normally by return, which will tell you whether your entry is accepted, rejected or placed on a reserve list. If you are told that you are a reserve, telephone to find out why, and what chance you have of actually racing.

1.4 When you receive your competition licence you will also receive a copy of the annual RAC Blue Book which contains all the regulations pertinent to motor sport in this country. In it you will find the specification for approved crash helmets and fireproof clothing which are mandatory for hillclimbs, sprints and circuit racing. Seven drivers will also need either goggles or a helmet visor.

1.5 At each competition meeting there is a routine which must first be observed by all competitors. Firstly, you will have to 'sign on'. You will need to present your competition licence, club membership card and (for road going classes) current MOT and insurance certificates. You should also hand in a completed commentators' information sheet. Assuming that all your documentation is in order, you will next be issued with a scrutineering ticket which should be taken, with your car, crash helmet and clothing, to the scrutineering bay. Your car helmet and clothing will be checked to ensure that you have observed all regulations. New helmets must carry an RACMSA sticker of approval so make certain that yours complies with the RAC regulations. An approval sticker can normally be applied by the scrutineer at your first event, phone him up and check beforehand however. If you are unsure about helmet approvals, buy yours from a motorsports specialist.

As general advice, always arrive in plenty of time. Although the final instructions issued a week or so before the event will give signing on, scrutineering and practice times, be prepared for queues or problems with your car. If the scrutineer fails to pass your car, you will need time to remedy the situation before practice. Under no circumstances will you be allowed to practice without a scrutineering pass and you will not be allowed to race if you miss practice. Occasionally it is possible to practice in a later session with a different class, which means that you will be able to take part in the event, BUT YOU WILL NOT BE TIMED which means that you will have to start at the BACK of the grid with a ten second penalty to boot!

16.2 Preparation for Circuit Racing

Before a car can be raced, it will be necessary for it to be scrutineered. Two factors are taken into consideration during scrutineering; safety and eligibility. This manual does not seek to cover eligibility, as this depends on the type of event entered.

2.1 Rollover Bars

The standard Caterham bar is not suitable for racing and needs to be replaced by the competition bar. This is mounted to the rear suspension towers and is braced by a removable diagonal which locates within the passenger compartment. If you do not specify this bar when ordering your kit, do not worry since the threaded mounting for this brace is provided on all chassis.

Instructions for the fitment of this bar are provided in Section 14.14.

The FIA bars are specifically designed to fit underneath the hood, but drivers over six feet tall should note that the top of a helmeted head must be at least two inches below the top of the bar. If this not possible a rollover bar specialist such as Safety Devices should be consulted and subsequently any one off bar will need to be approved by Caterham to be eligible for their race series.

A rollcage is also available for the ultimate in protection - fitting instructions are supplied with the kit. This will also fit under the standard hood.

2.2 Seat Belts

The standard lap and diagonal belts are not suitable for racing and should be replaced by a four or six point competition harness. This uses the standard lower seat belt mountings, but the shoulder straps mount to the top rear crossmember where suitable threaded holes are provided. The harnesses manufactured for Caterham by LUKE carry FIA approval.

By some quirk in the law, these belts are not technically legal on the road and although the police are extremely unlikely to pick you up on it, some MOT testing stations may be particular.

2.3 Fireproof Rear Bulkheads and Impact Protection

RAC regulations state that there should be a firewall between the cockpit and petrol tank, so the boot floor area will need to be sealed. The carpet should be removed and the wooden floor covered with aluminium sheet. A box will also need to be fitted around the petrol filler. A suitable kit is available from Caterham to achieve this but note that the wooden floor must be retained as this provides impact protection not possible with aluminium sheet. Ideally the edges where this kit meets the existing aluminium floor and sides should be sealed using glass fibre but, in practice, scrutineers appear happy if the gaps are carefully sealed with tank tape or silicon sealant.

Alternatively and preferably a replacement boot floor and fuel tank protection kit is available in aluminium honeycomb from Caterham under the following part numbers:

T102 - Classic T103 - De Dion

Please note that injection cars are supplied with a honeycomb bootboard as standard, the rest of the kit is applicable however.

See Section 14.12 for fitting instructions.

This can be supplemented by fitting floor impact protection panels which are available for all models under the following part numbers. You should note that with these in place it is no longer possible to fit an adjustable driver's seat.

FI02 - Classic FI04 - De Dion

See Section 14.13 for fitting instructions.

In addition it will also be necessary to replace the existing fuel filler with a flush fitting variety, except on fuel injected cars which have this type of filler as standard. A kit is available from Caterham Cars under Part No. FF01, see Section 14.12 for fitting instructions.

2.4 Fireproof Front Bulkheads

If a heater kit is not fitted, it will also be necessary to seal off the apertures in the front bulkead provided for air circulation using aluminium sheet riveted or screwed into place and sealed with silicon sealant. A blanking angle is available to suit De Dion cars to blank off the fresh air heater apertures.

2.5 Emergency Cut Off Switch

Should your car be involved in an accident or become stationary on the circuit, the Marshals will wish to isolate the battery and ignition circuits. An isolator switch must be fitted which enables this to be done from outside the car and we suggest that this is mounted within the triangulation of the windscreen stay on the offside. These switches, along with full wiring kits, are available from Caterham Cars. They also have the advantage of acting as very effective theft deterrents since they have a removable key. You will need to affix a warning sticker with an "OFF" arrow in the immediate vicinity of the switch and a protective "eyebrow" around the switch to prevent it being damaged in an impact. (see 14.10 for full fitting instructions)

2.6 Fire Extinguisher

It is also a requirement for all cars to carry a 0.9 litre AFFF foam or equivalent fire extinguisher which should be securely mounted within reach of the driver. We suggest that the best location for this is bolted to the cockpit floor on the passenger side.

Fully plumbed in systems are expensive and not mandatory at present though likely to become a requirement in future. A hand held extinguisher will suffice. Please note that halon production has now ceased, and the use of halon may be banned at some point in the future. Various environmentally friendly alternatives are available.

2.7 Throttle Return Spring

Cars must be fitted with an alternate means of closing the throttle in case the normal return spring on the carburettor fails. Weber DCOE carburettors contain a small spring within them but since these are very weak and frequently break anyway, scrutineers are not happy to approve them. It is therefore necessary to fit an additional throttle spring acting directly on the butterfly spindle in some way. On cars fitted with twin Weber DCOEs or equivalent Dellortos we suggest that, since the spring in the Caterham installation works on the rear carburettor, you fit an extra spring on the forward one.

To solve this problem, Caterham Cars can supply a replacement operating lever for the forward carburettor with provision for an extra throttle return spring. The additional modified hair spring is attached to a secondary hole in the tubular throttle cable bracket. (This applies to Webers using Caterham throttle linkages only)

Operating lever Part No: 77826
Return spring Part No: 77827

2.8 Oil Catch Tanks

When racing, an engine's tendency to lose oil through its breathing system is amplified. It is therefore a regulation that the breather output should be routed into a translucent catch tank of at least two litre capacity. Caterham can supply an additional screen washer bottle and bracket for this purpose.

2.9 Headrest

It is a requirement that a head restraint should be attached firmly to prevent the driver's head moving back in an accident.Caterham can supply adjustable head restraint for all FIA rollover bars that comply with RACMSA regulations.

2.10 Ignition Switch

The ignition switch should be clearly marked with an arrow indicating the "OFF" direction. A suitable sticker affixed to the dashboard above the switch will suffice.

2.11 Lights

To prevent glass getting on the track in the event of an accident, all glass lamp lenses should be taped over. The only glass lenses on a Caterham are the headlights and reversing lights, so it will not be mandatory to tape over rear lights, indicators etc. although many people do so.

2.11 75O Motor Club Road Going Sports Car Championship

Generally a car prepared for the Caterham Cars BRSCC series will also be eligible for this championship. However, the 75O Motor Club permit a car to be run in a more modified form and we suggest you study both sets of regulations carefully.

2.12 RAC Blue Book

All these requirements are contained in the Blue Book which is updated annually. Sections Q, QS, QA, QG 9 (Production Sports Car Formula) and relevant sections of QM should be referred to.

This book also gives details of event programmes, circuit addresses etc and is sent automatically to licence holders.

6.3 Preparation for Hillclimbs and Sprints

3.1 A car prepared for racing will be fully eligible for hillclimbs and sprints provided that the vertical strut specified in 16.3.3 is fitted.

3.2 Many of the items in section 16.2 are not compulsory for hillclimbs and sprints, however all are recommended. Please check the regulations for the events you are entering.

3.3 A vertical timing strut must be fitted to the nosecone of the vehicle which must be opaque and non-reflecting. Viewed from the side it must measure lO inches high and two inches wide and be fitted in a position so that its base is eight inches from the ground and its top l8 inches from the ground.

An ideal material for this is sheet aluminium, painted matt black and this can easily be attached to one of the front numberplate mountings.

16.4 Performance Options

Caterham Sevens can be specified with optional features that improve their track performance without compromising their day to day use on the road. This manual does not cover engine tuning since this is very much a matter of budget, taste and class

eligibility. Caterham do not provide non standard engine specifications nor do they modify engines for customers, but they can put customers in contact with specialists if requested.

4.1 Lowered and Uprated Springs

These are available for live axle cars only and sharpen up the handling in exchange for a stiffer ride. Definitely recommended for competition purposes, they can be specified instead of standard items when ordering kits. At present lowered and uprated springs are not available for De Dion cars, with the exception of 300lb front springs.

4.2 Adjustable Platform Shock Absorbers

On live axle cars these dampers which are manufactured by Spax are a direct swap for the standard items and have identical characteristics except that they have adjustable spring platforms which allow the ride height to be altered. Where competition springs and lower than standard profile tyres are fitted, these allow normal ride height to be regained for road use whilst deriving handling benefits from low ride height on the track. These are available from Caterham or can be incorporated within the kits at extra cost. (see 14.9 for further details)

The Bilstein dampers used on De Dion cars can have the ride height adjusted by moving the spring platform and retaining circlip. Alternatively the special units developed for the Vauxhall powered race series will fit, they are differently rated and require different springs. Refer to Caterham Cars for details.

4.3 Axle Baffling Live Axle Only

Under racing conditions Ital/Marina rear axles can suffer oil surge due to being subjected to G forces not anticipated by their designers. To overcome this problem we fit special baffling inside the axle and ideally this should be done whilst the axle is being modified initially. If you intend to use your car for competition purposes we strongly suggest that you have this done in order to avoid premature wear and possible failure.

4.4 Competition Driving Seat

The standard seats are not ideally suited to racing as they neither allow for 6 point harnesses nor for additional underfloor honeycomb protection and, with taller drivers, allow the drivers head to be insufficiently below the top of the roll-over bar.

Caterham Cars can supply a fibreglass racing seat with provision for 6 point harnesses. Once fitted, the position of this seat cannot be altered. Alternatively, Oxted Trimming can manufacture bespoke seats for you - contact Will Marinner on 01883 712112

4.5 Dry Sump Oil System

For serious competition use, particularly where it is intended to use slick racing tyres, a dry sump kit for Ford engines is available under part number DSO2 which contains all the parts needed to convert a Ford Kent O.H.V. or Cosworth BDR or BDA engines for installation in a Seven. This is a specialist job however so we recommend that you seek advice from your engine builder or Caterham Cars. A dry sump system is also available for Vauxhall engines (see section 10A.2)

4.6 Adjustable Camber/Castor De Dion Only

De Dion cars incorporate the facility to adjust both camber and castor in order to fine tune the car's handling for competition purposes. Generally increased negative camber will improve the car's high speed stability and turn in, though settings are quite critical and depend upon such factors as tyre size and type. We recommend seeking advice from Caterham or Hyperion Motorsport before changing the standard settings, and you should be aware that camber and castor changes will also affect the tracking.

4.7 Competition Petrol Tank

An FIA approved bag tank, as fitted to Caterham Vauxhall racing cars, is available from Caterham Cars. This tank is fitted with an in-boot filler and maximises safety in a rear end impact.

16.5 Additional Maintenance

Vehicles used for competition purposes are subjected to stresses far in excess of those normally encountered in normal road use. It is very important that not only should the normal maintenance schedules be strictly observed but that a further thorough check be carried out before each event. This is important both from a safety point of view and to be competitive, a car that does not finish the course will not win anything!

5.1 Suggested Pre Race Check

Chassis

a) Check tyre pressures, correct wheel tightness, and tyre condition. For racing purposes it is often advisable to increase pressures over the normal recommended road settings, though this practice is dependant on the size and type of tyre used.

B) Check brake system, including pad and shoe wear, pedal travel and fluid level. Live axled cars may need frequent adjustment.

C) Check front wheel bearings and adjust if necessary.

D) Check tightness of all suspension and steering components paying particular attention to the rear 'A' frame bushes, these do loosen under the stresses of competition.

E) Check the front wheel alignment, particularly if you have bounced hard over kerbs or suffered an off track excursion in your previous event.

F) Carry out a general check on the whole car looking for items that have worked loose or been bent or otherwise damaged. In particular check the operation of all controls.

Engine

G) Check engine oil level and top up if necessary. If the engine has blown oil into its catch tank do not re-use it, but ensure the tank is empty before presenting the car to a scrutineer. If the engine has been over filled, the chances are that the excess will be blown into the catch tank so a small amount after a race is no concern.

H) Check security of engine ancillaries and manifolds, tightening anything that may have worked loose. Do not however risk over tightening bolts 'to be on the safe side', always use a good quality torque wrench. In particular ensure that the alternator drive belt is correctly adjusted since the engine will be sustaining higher revs than normal and the water pump will need to be operating properly to avoid overheating.

I) Check the cooling system for leaks, topping up as necessary.

J) Check the adjustment of both clutch and throttle cables, remembering that a stretched throttle cable may no longer be opening the carburettor chokes fully with a detrimental effect on performance.

K) The gearbox and rear axle/differential will not normally require topping up but check underneath the car for any signs of oil leakage.

Safety

L) Check security and adjustment of your safety harness, replacing it if there are any signs of cuts or fraying. Never re-use a seat belt if it has been stretched by any kind of impact.

M) Check that the pressure indicator on your fire extinguisher (if fitted) shows it to be ready for action and ensure that the safety release pin is removed before the car is taken onto the track.

5.2 Accident Damage

In the event that your car sustains accident damage, hopefully an unlikely event, it is vitally important that it is properly repaired. Impact damage to any front corner of the car is likely to overstress safety critical components which are the stub axle, steering arm, upright, trunnion and top link. Wishbones should be replaced if there is any evidence of distortion, not straightened.

Although damage to these components may not be visually evident components may well have been overstressed leading to a later failure. When in doubt always replace with new parts.

If the chassis itself has been distorted, proper repair can only be carried out on the correct jig. Please contact Caterham Cars for assistance, if the chassis is repaired in any way twisted it will neither handle properly nor be safe

SECTION 17

FINAL CHECKS AND SERVICE INFORMATION

Contents

17.1 Final Checks before taking to the Road

1.1 Before the car is used, make doubly sure that all bolts securing suspension, steering and brakes are properly tightened and that no wires or brake hoses are positioned in such a way as to foul anything that moves or gets hot in use. Particular care should be taken with wires close to the exhaust manifold.

1.2 Wheel nuts should not be over tightened and we suggest they be torqued to 55 lbft with the car on the ground. New Caterham supplied alloy wheels are fitted with steel inserts enabling secure tightening of the wheel nuts. However, these inserts can tighten themselves into the wheels over the first few hundred miles causing the wheel nuts to lose torque. IT IS VERY IMPORTANT THEREFORE TO RETIGHTEN YOUR WHEEL NUTS AFTER THE FIRST 200 MILES.

Tyre pressures in p.s.i should be as follows:

13" & 14" Wheels	20 p.s.i.
15" Wheels	18 p.s.i.
16" Wheels	16 p.s.i.

Please note that wheel/tyre combinations supplied by Caterham, and included in CKD kits, are pre-inflated to around 40 psi to ensure that the tyre is correctly seated on the wheel. Do not forget to let them down.

1.3 Engine, gearbox and rear axle/differential oil levels should be checked and/or filled as follows :-

1.4 The spring damper units fitted to Classic live axle cars are adjustable for stiffness which enables the owner to tailor the ride/handling compromise to his own needs. There are twelve settings available which can be felt as clicks when the

adjusters are turned. As an initial setting, we suggest that they be adjusted to the fully soft position anticlockwise.

APPLICATION	VISCOSITY	VOLUME (L)
Ford engine	SAE 15W/40	3.3
Vauxhall & Rover engine	SAE 5W/50	4.0
Gearbox - 4 speed	EP80 gear oil	0.9
Gearbox - 5 speed	* see below	1.9
Gearbox - 6 speed	* see below	2.0
Differential (De Dion)	EP90 gear oil	0.9
Axle (Marina/Ital)	EP90 gear oil	0.7
Brake Fluid	SA3J 1703f DOT 4	as reqd.

* 5 and 6 speed gearboxes use Ford oil, part number 5015547, alternatively BP synthetic gear oil may be used.

Caterham Cars use and recommend BP lubricants especially BP Visco 2000 Engine Oil

17.2 Pedal Adjustment Facility

2.1 All cars are now fitted with a pedal box assembly which incorporates sufficient movement to cater for most sizes and shapes of drivers. This is not intended to give instant adjustment but provides an opportunity for the owner to tailor an optimum driving position.

2.2 The range of movement is limited and adjustment towards the extremes of travel will lead to the pedals lifting to a somewhat high position, but we believe that in combination with the adjustable seat, the majority of drivers will find a suitable setting. (see Fig. 6.5)

2.3 When a De Dion kit leaves the factory the pedals are set in the middle of three positions, unless specified otherwise, and can thus be moved backwards and forwards as required. It is important not to move the pedals too far forwards however as this will restrict pedal travel, interfering with the correct operation of the master cylinder. This may prevent the dual circuit fail safe facility from operating thus rendering your vehicle both illegal and potentially dangerous. A Classic only has two positions , of which the front is used when delivered from the factory.

2.4 In order to move the pedals the procedure set out below should be followed, starting with the removal of the pedal box lid which is held in place by 8 screws.

2.5 Install the clutch cable adjusting at the bellhousing end in order to bring it level with the brake pedal as in 10.3.4. and also the throttle cable.

2.6 Position the driving seat to suit your reach to the steering wheel and gearlever and assess whether and how far the pedals need to be moved.

2.7 Firstly adjust the brake pedal, and this can be achieved in two ways.

A) By increasing the effective length of the master cylinder pushrod which has an adjustable shackle.

B) By moving the fulcrum position from the middle hole to either the rear hole or the front hole where appropriate, which also moves the clutch pedal. Note that if the movement required is more than 2" then the adjustment available on the pushrod will not be sufficient.

2.8 The clutch pedal can now be levelled up to the brake pedal by adjustment at the bellhousing.

2.9 Finally the throttle pedal pivots around its mounting bolt. This bolt is screwed into the front mounting bush of the two provided in the chassis.

2.10 In order to level the throttle with the brake and clutch it may be necessary to move the bolt to an alternative mounting point. The threaded portion of the throttle cable can then be adjusted to take up any lost movement in the pedal. Please note that this adjustment facility is not available on Vauxhall injection cars.

2.11 The pedal box lid can now be replaced and the eight fixing screws properly tightened.

17.3 Initial Carburettor Set Up and Ignition Timing

It is very important, before the engine is run for any length of time, to ensure both the ignition timing and carburettor tuning is correct. Fine tuning can be carried out by your engine tuner or by Caterham Cars or its approved agents at the post-build check, but in order to get the engine running at least satisfactorily in the absence of professional equipment, the following instructions may prove of use. The ignition setting procedure does not apply to Vauxhall and Rover engines which have electronically mapped ignitions, but the carburettor balancing instructions apply to all engines using Weber DCOE carburettors.

3.1 Ignition Setting - Ford Engines - Electronic Ignition

Referring to diagram 17.3.1, you will see that timing marks are provided on the crankshaft front pulley and on the engine front cover. Check that the number one cylinder is at top dead centre, i.e. the forward piston is at the top of its travel with both

valves closed, and set the mark on the crankshaft pulley to 14^0 for Caterham sourced engines, the marks on the front cover representing 0^0, 4^0, 8^0, and 12^0.

The engine should always be turned in its normal clockwise direction of travel in order to take up the slack in the drive gears and timing chain, so if you overshoot the mark turn the engine back at least 45^0 before trying again.

With the crankshaft correctly set, the distributor clamping bolt can be slackened in order that it can be turned, but not too loosely. Remove the High Tension lead from the coil and stand short length of metal (e.g. an Allen Key, screwdriver etc) in the top of the coil such that it is within 10-15 mm of the surrounding metal.

Switch the ignition on and then turn the distributor about 20^0 anti clockwise, then very very slowly turn it back clockwise until the "crack" of the spark is heard or seen. Stop turning it immediately and lock the distributor at that point, the ignition should now be set with reasonable accuracy. If you overshoot the "crack" point, turn back the distributor through at least 20^0 and repeat the exercise.

3.2 Setting Twin Weber DCOE Carburettors

If you have an engine supplied by Caterham Cars the carburettors will have the correct jets installed but will not have been set up as this is not possible without the engine running. Before attempting this procedure which in effect is to set up the carburettors by ear, read through the instructions and study the diagram 17.3.2 carefully.

i) Identify the four idle mixture screws referring to the diagram and close them by turning clockwise until the first signs of resistance is felt. DO NOT OVER TIGHTEN OR PERMANENT DAMAGE WILL BE DONE. Open each screw through exactly $2^1/2$ turns.

ii) In the absence of a balancing tool, the next task is to set the throttles so that the butterflies in both carburettors open simultaneously. This can be done by eye observing the movement of the butterflies against the progression holes, which are covered by brass plugs. These plugs are positioned directly outboard of each idle mixture screw and it is necessary to remove the right-hand one from the left-hand carburettor and the left-hand one from the right-hand carburettor. When removed three progression holes are revealed.

iii) Looking through the 1mm hole nearest to the cylinder head on the left-hand carburettor, find the outer edge of the throttle butterfly. You may find it helpful to use a torch and to move the throttle lever by hand to show the movement of the butterfly. Turn the idle speed adjusting screw, located on the right-hand side of the left-hand carburettor, clockwise until the butterfly edge is positioned across the centre of this 1mm hole.

iv) Between the two carburettors there is a horizontal balancing screw which is used to set the throttles relative to each other. Turn this screw until the edge of the butterfly in the right-hand carburettor exactly corresponds with its neighbour. The balance is now set, and this horizontal screw must not be touched again or the procedure will need to be repeated. Replace the brass plugs, and turn the idle speed screw on the left-hand carburettor anti-clockwise until the throttle lever ceases to move any further shut, then screw it clockwise $1^{1}/2$ turns.

v) Assuming that the ignition is correctly set and the car has petrol oil and water, the engine can be started and warmed up, adjusting the idle speed screw until the engine will idle at about 1000 rpm. You are now ready to reset the idle mixtures on each carburettor choke in turn.

vi) With the engine running and at normal temperature close the number one cylinder (forward) idle mixture screw 2 turns. At this point the engine will slow and run on only 3 cylinders, so open one turn and then successive quarter turns always allowing at least 5 seconds for the engine to settle on the particular mixture and for you to hear the effect. Normally, with the screw between 2 and 3 turns open the engine will speed up and run more smoothly.

vii) Repeat this process with the other three idle mixture screws, after which the engine will probably be idling at around 2000 rpm. Adjust the idle speed screw until it ticks over at about 950 rpm and repeat the whole process again to get a finer tune, setting the idle to 950 rpm again when finished. The important thing is to always allow enough time for the engine to stabilise after each adjustment

17.4 Caterham Cars' Inspection Service

When your Seven is finally completed and ready for the road we strongly recommend that you make use of our Post Build Check facility carried out at Dartford. The Seven even in its lowest state of tune possesses acceleration and cornering abilities far in excess of most road going cars and it is therefore extremely important that it is assembled and set up correctly.

We are also keen to ensure that our customers do not suffer disappointment as a result of premature component failure due to incorrect assembly or sub standard performance.

The Post Build Check therefore includes:

a) Checking assembly of all suspension and steering parts

b) Checking both braking systems for leaks or faulty assembly

c) Checking all electrical installations and circuits

d) Checking installation and lubrication of engine gearbox and rear axle

e) Checking body and weather equipment

f) Road test by experienced Caterham personnel

Any defects found can be either rectified immediately, or brought to the customers attention for future correction.

Customers for all kits are sent a voucher covering a free Post Build Check which can be carried out either at our premises at Dartford (please contact Steven Peakin on 01322 559124) or one of our build check centres.

The inspection will take approximately $2^{1}/4$ hours and we suggest that you allow at least two weeks notice when booking your car in. If you need any additional work done please notify this at the time of booking so that sufficient time can be made available.

If an inspection at Caterham or any of these centres is not possible you will find a copy of the factory post build check sheet at the rear of this section.

Also at the rear of this section you will find a questionnaire on both this Assembly Guide and the accompanying video. It would be much appreciated if you let us have your comments on this as the guide is being constantly updated and improved and any areas which you may have found difficult or ambiguous can be clarified.

17.5 Running In Period

If your car has been built using a Caterham supplied engine and gearbox we advise the following running in procedure which has recently been revised. New factory supplied Ford crossflow engines are built to run on unleaded fuel and fitted with a special distributor having a unique ignition advance curve necessary to burn unleaded without harmful detonation. This distributor is available from Caterham Cars should you wish to adapt a non factory engine similarly.

We recommend that when normally running unleaded, one tankful in five is leaded to ensure adequate upper cylinder lubricant and that valve clearances are checked and adjusted at 3000 mile intervals. During the running in period use only LEADED fuel.

Please note that we do not recommend the use of Mobil 1 or equivalent synthetic oils whilst running in Ford engines as the lubrication properties are such that they will prevent the bedding in process. Thereafter their use is highly encouraged.

Vauxhall or Rover 16 valve engines run on either unleaded or super-unleaded fuel, there is no need to use 4 star at any time.

Running in should be carried out as follows:

Ford Engines:

MILEAGE	MAX REVS	NOTES
0-100	3500	No labouring
100-300	4000	No labouring
300-500	4500	No labouring
500-1000	6000 (occasional)	Build up revs steadily, avoid labouring

Vauxhall and Rover Engines:

0-600 miles 4000 Max revs No labouring

At 500 miles (800 kilometres) the initial service should be carried out.

17.6 Service and Maintenance

To ensure safety and component longevity and to maximise the enjoyment of your Seven, it is very important that the recommended servicing procedures are carried out correctly.

It is, of course, possible to return your car to Caterham Cars or to any of our approved centres for servicing, but for those who wish to carry out their own maintenance a detailed Owner's Manual including all normal service information is available.

All Caterham Sevens should have an initial service at 500 miles (800 km) followed by regular services at 3000 mile (5000 km) intervals, or every 3 months as appropriate. Major services take place at 6000 and 12000 mile intervals. Please note that although Vauxhall recommend 9000 miles between oil changes, the Caterham installation uses a small oil filter which must be changed more regularly.

17.7 Electrical Problems

At the rear of this section you will find a wiring diagram for a Ford powered car with an appropriate key and also diagrams showing the layout of the fuse boxes for all models. In our experience 90% of electrical problems are caused by poor earth

connections and therefore if you suffer a problem check the vehicle earthing points which are as follows:

a) Battery to engine block (at right hand engine mounting on Ford or at engine to bellhousing bolt Vauxhall)
b) Gearbox bellhousing to chassis at 3 way brake union (Ford)
c) Inlet manifold to chassis at 3 way brake union (Vauxhall)
d) Instrumentation to chassis (at wiper motor securing bolt under dashboard)
e) Rear lights to chassis (to rear wing securing bolts)

The wiring circuits for the lights, instruments and switches are the same for all cars, although functions relating to the engine vary according to what engine type is fitted. Should you require a wiring diagram for another engine type, please don't hesitate to contact the factory.

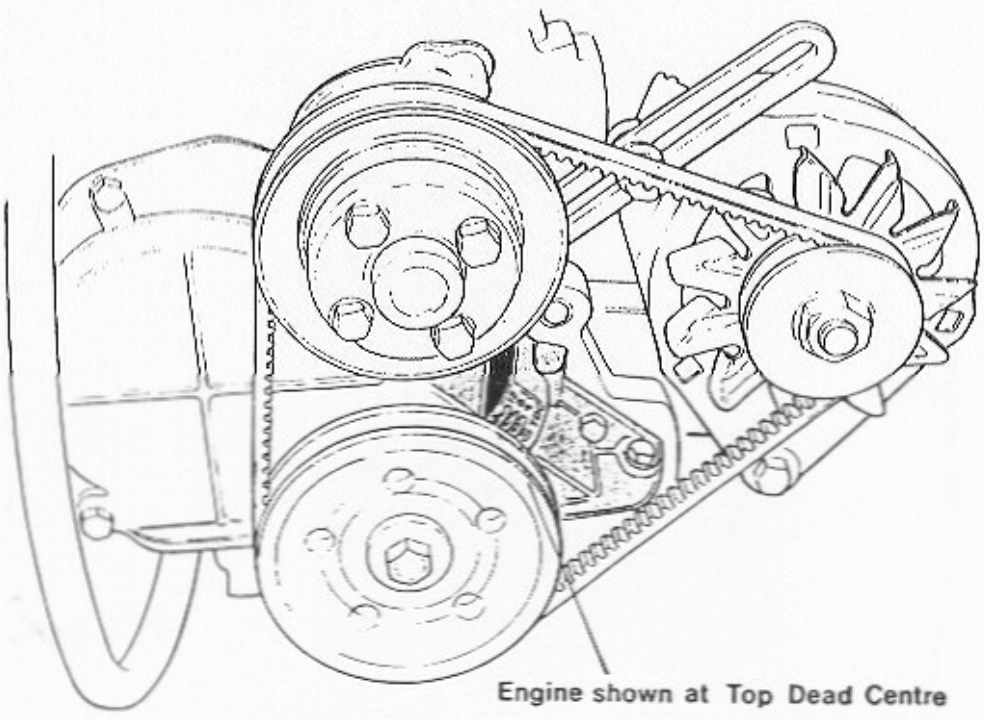


Figure 17.3.1 Ford Crossflow Engine Timing Marks

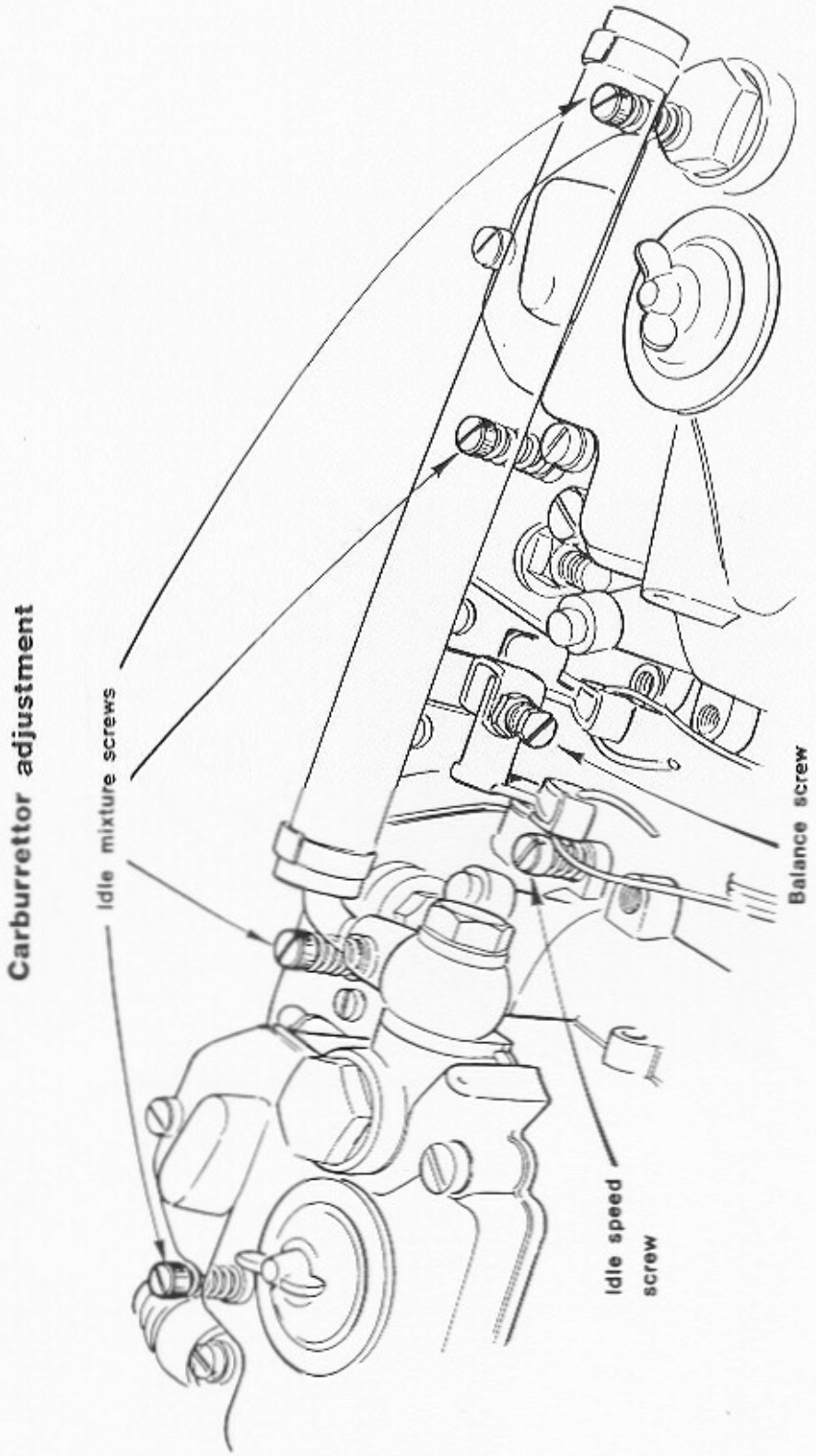


Figure 17.3.2 Weber DCOE Carburettor Adjustment

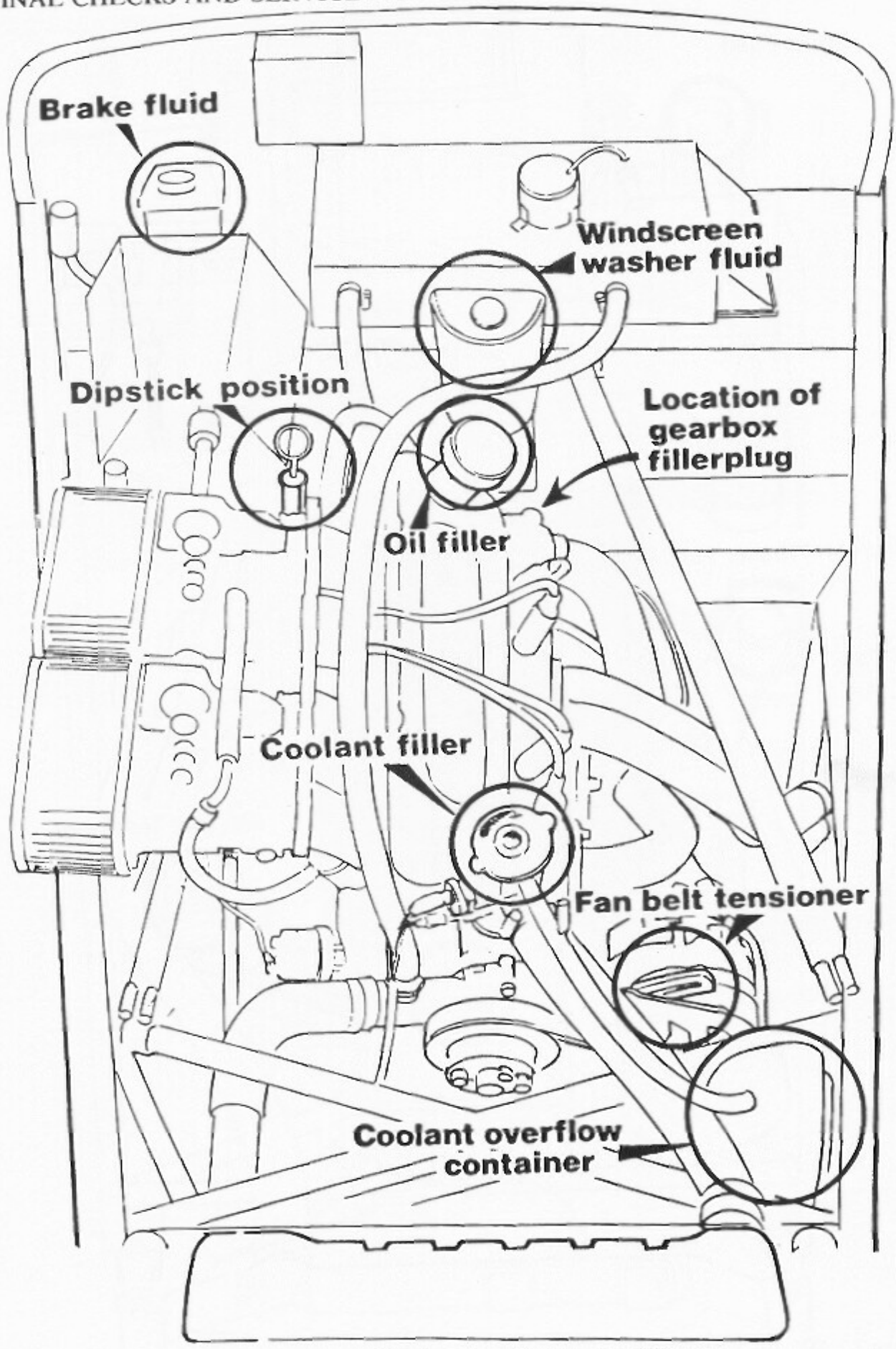


Figure 17.6A Underbonnet Service Locations - Ford Engine

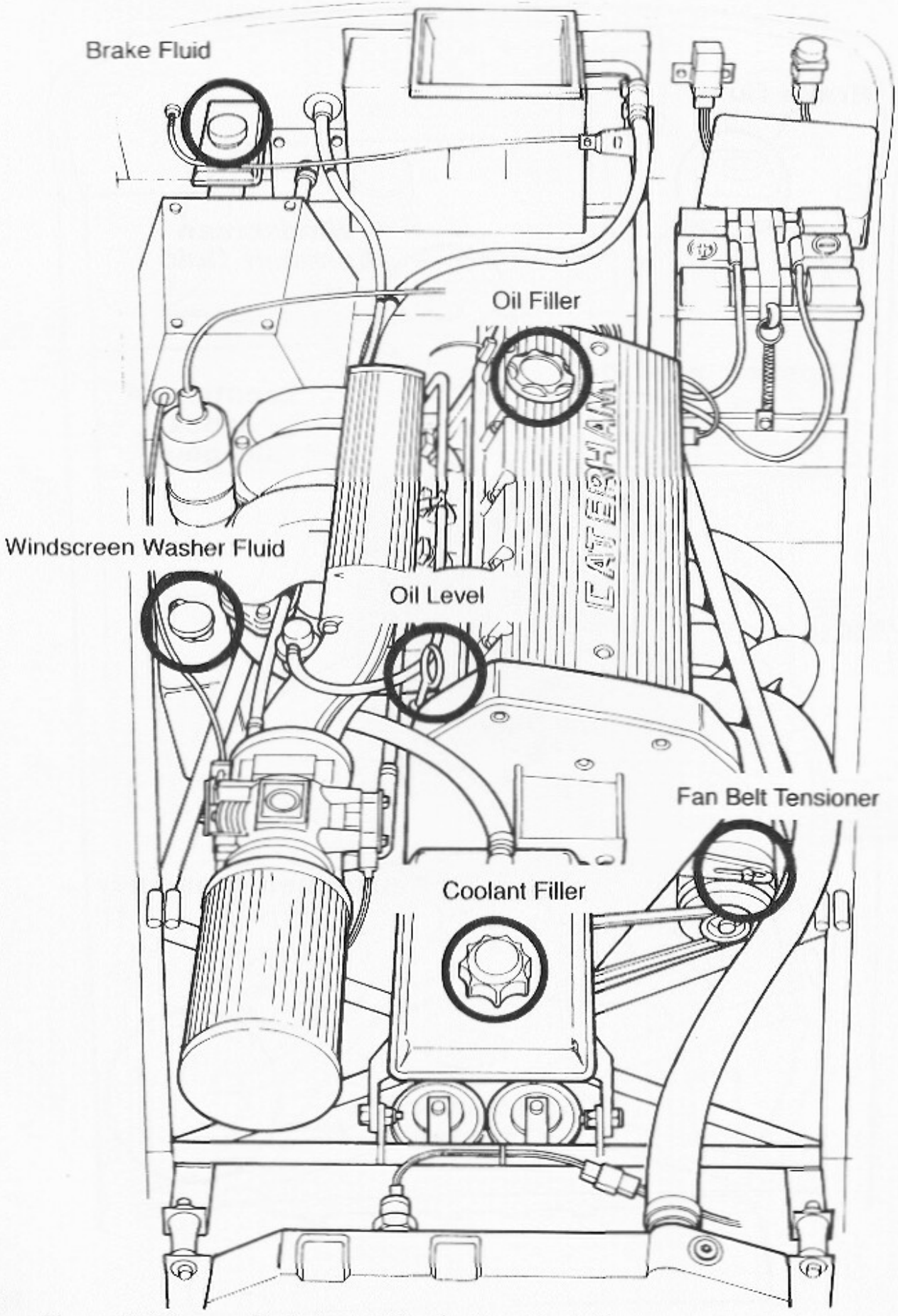


Figure 17.6B Underbonnet Service Locations - Rover

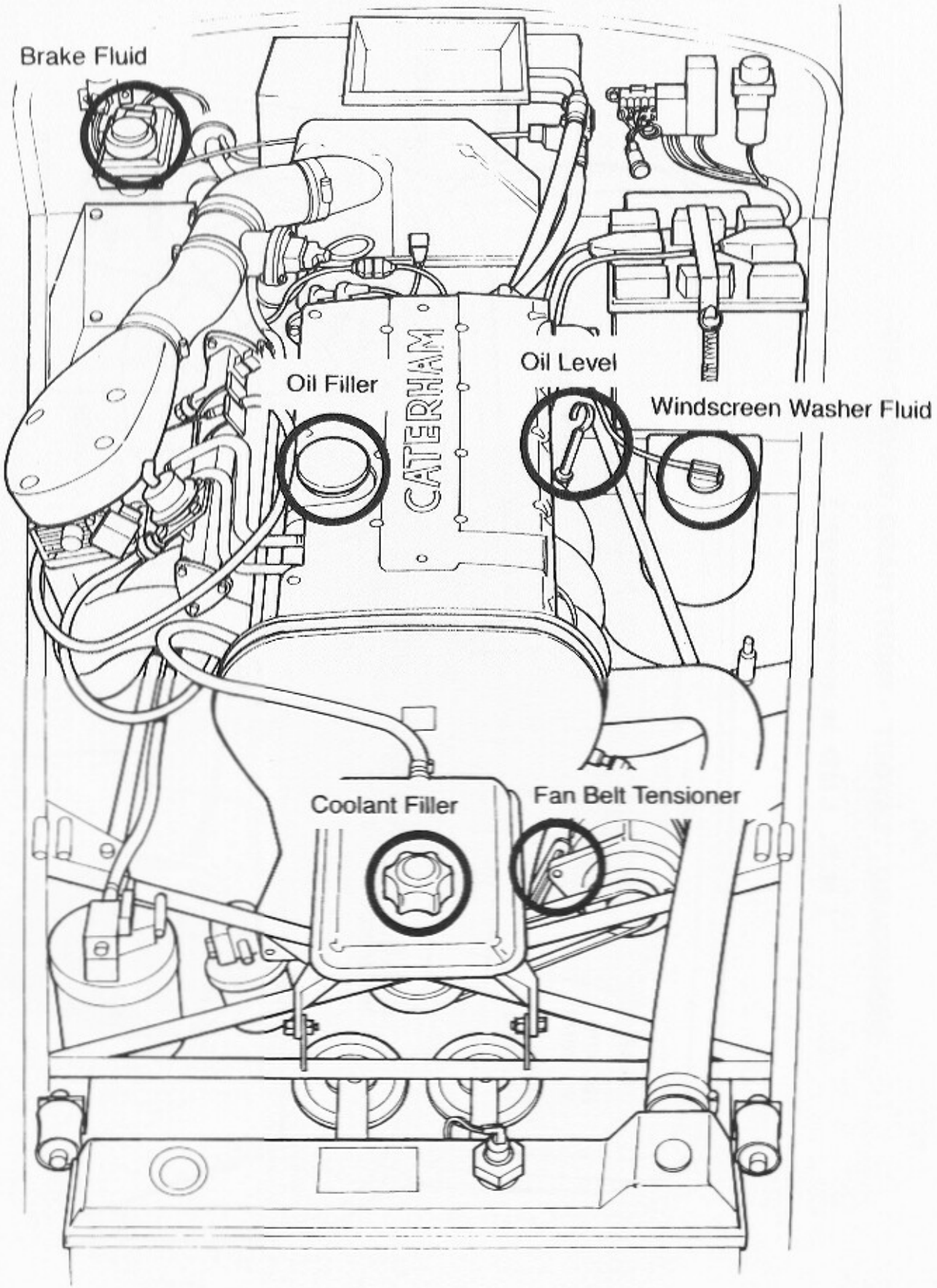


Figure 17.6C Underbonnet Service Locations - Vauxhall

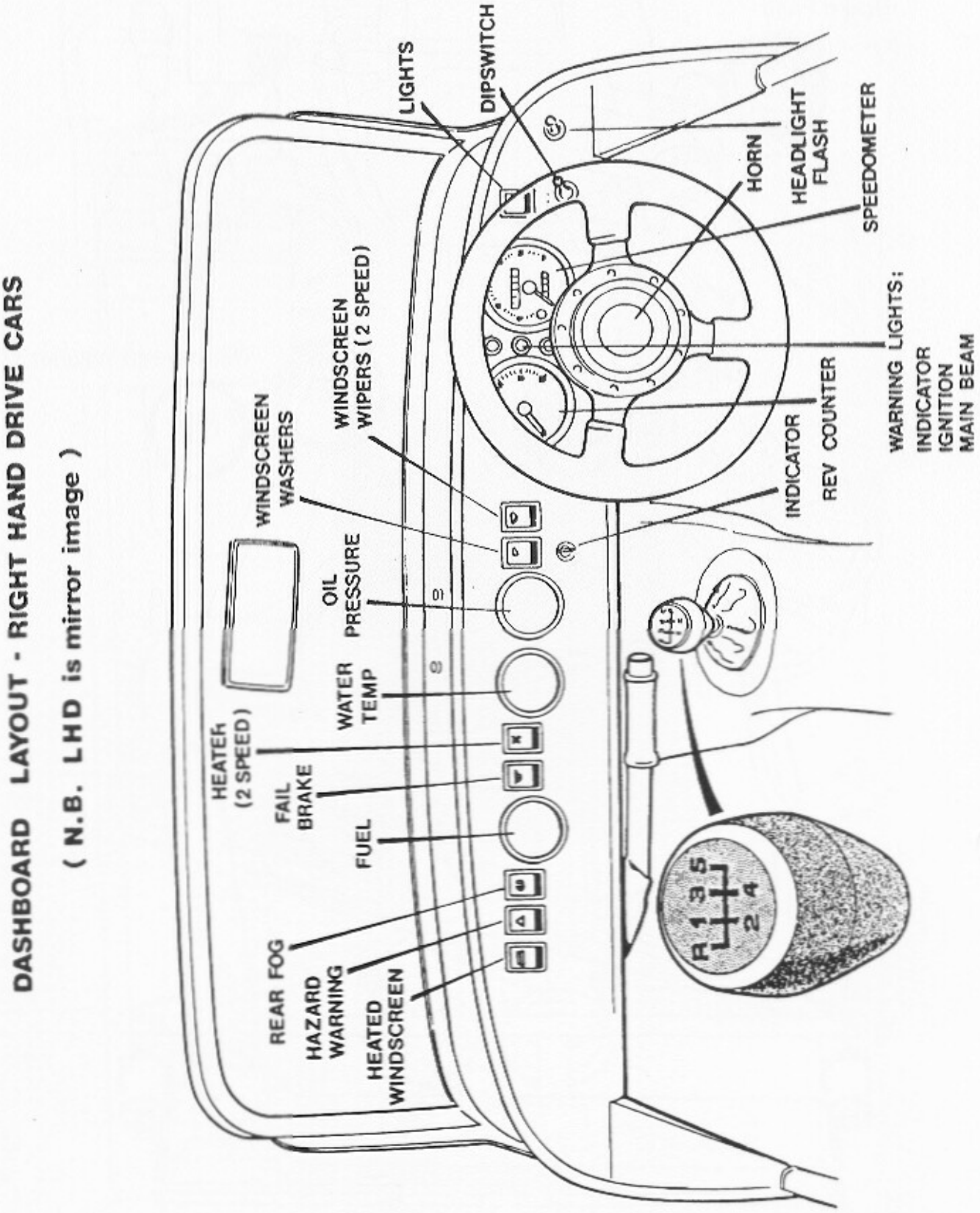


Figure 17 Dashboard Layout - RHD

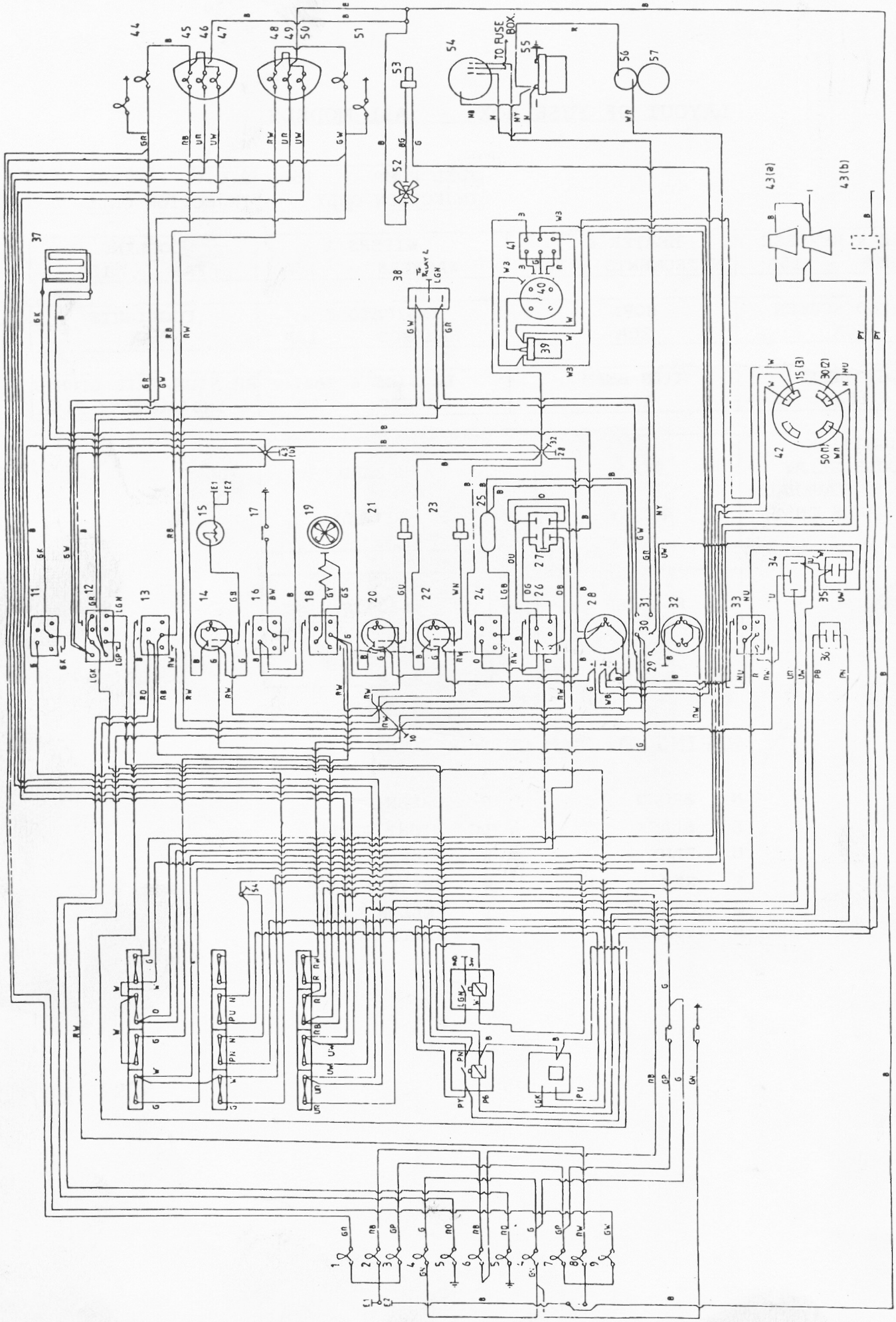
LAYOUT OF FUSE BOX - ALL MODELS

		FUEL PUMP - 15A INJECTION ONLY	E.C.U. - 20A INJECTION ONLY
BRAKE & REVERSE LIGHTS - 15A	HEATER & INSTRUMENTS - 10A	WIPERS & WASHERS - 15A	COOLING FAN - 15A
HEATED SCREEN 10A	HORN 20A	INDICATORS & HAZARDS - 10A	FOGLIGHTS 5A
DIP BEAM 15A	MAIN BEAM 15A	LH SIDE & TAIL LIGHTS - 5A	RH SIDE/TAIL LIGHTS & INSTRUMENTS 7.5A

IGNITION MODULE RELAY (POST 93 VAUXHALL WITH CARBS ONLY)	HORN RELAY	HAZARD RELAY	
	FLASHER UNIT	LIGHTS RELAY	

WIRING DIAGRAM COLOUR CODE

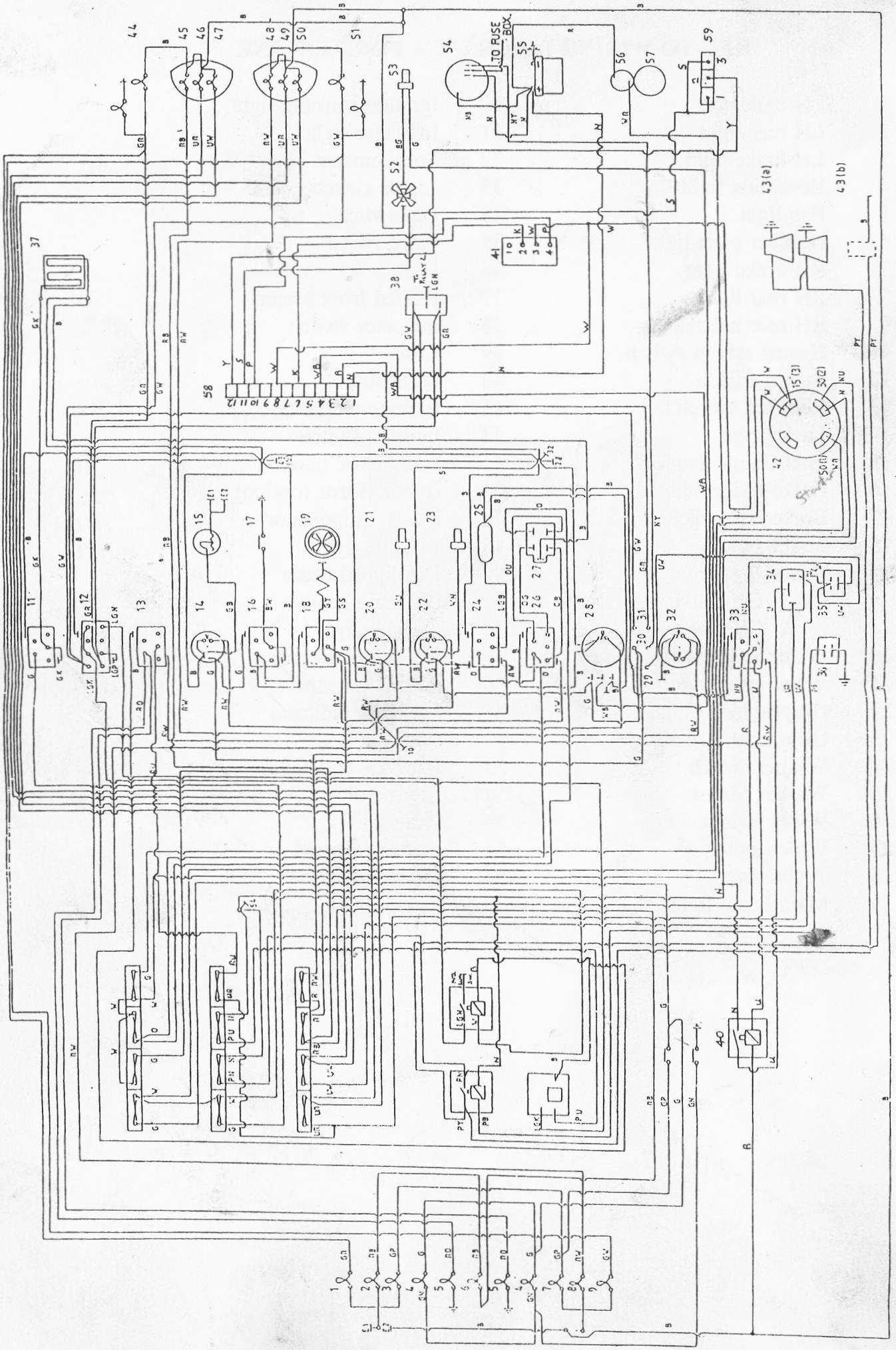
N	BROWN	G	GREEN
B	BLACK	LG	LIGHT GREEN
U	BLUE	K	PINK
R	RED	W	WHITE
O	ORANGE	Y	YELLOW
P	PURPLE	S	SLATE



CIRCUIT DIAGRAM :-
FORD POWERED CATERHAM SEVEN

KEY TO WIRING DIAGRAM - FORD ENGINE

1 LH indicator
2 LH rear light
3 LH brake light
4 Reversing light
5 Fog light
6 Number plate light
7 RH brake light
8 RH rear light
9 RH rear indicator
11 Heated screen switch
12 hazard switch
13 Rear fog switch
14 Fuel gauge
15 Fuel Gauge Sender
16 Brake test switch
17 Brake fail switch
18 heater switch
19 Heater 2 speed
GY Slow
GS Fast
20 Water temperature gauge
21 Water temperature sender
22 Oil pressure gauge
23 Oil pressure sender
24 Washer switch
25 Washer Motor
26 Wiper switch
27 Wiper motor
28 Tachometer
29 Main Beam light
30 Ignition warning light
31 Indicator light
32 Speedometer
33 Lights switch
34 Dip switch
35 Flash switch
36 Horn
37 Heated front screen
38 Indicator switch
39 Coil
40 Distributor
41 Ignition amplifier
42 Ignition switch
43 (a) Electric horns
(b)Air Horns (option)
44 LH front indicator
45 LH side light
46 LH dipped beam
47 LH main beam
48 RH side light
49 RH dipped beam
50 RH main beam
51 LH front indicator
52 Radiator fan
53 Radiator fan switch
54 Alternator
55 Battery
56 Starter solenoid
57 Starter motor



CIRCUIT DIAGRAM :-
CATERHAM SEVEN WITH VAUXHALL
ENGINE WITH CARBS (PRE 1993 ENGINE)

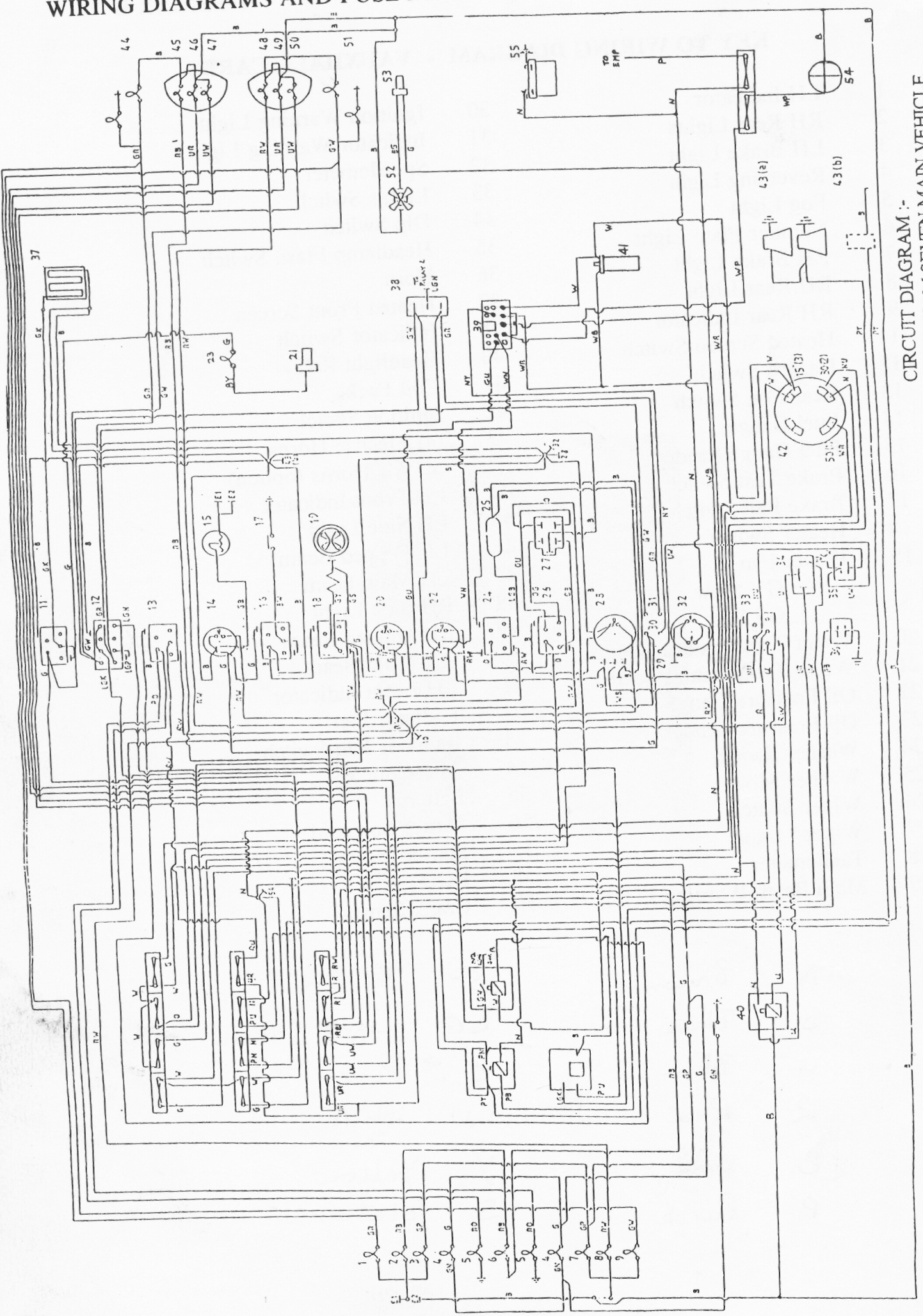
KEY TO WIRING DIAGRAM - VAUXHALL CARBS

1	LH Indicator	30	Ignition Warning Light
2	RH Rear Lights	31	Indicator Warning Light
3	LH Brake Light	32	Speedometer
4	Reversing Light	33	Lights Switch
5	Fog Light	34	Dip Switch
6	Number Plate Light	35	Headlamp Flash Switch
7	RH Brake Light	36	Horn
8	RH Rear Light	37	Heated Front Screen
9	RH Rear Indicator	38	Indicator Switch
11	Heated Screen Switch	40	Headlight Relay
12	Hazard Switch	41	Coil Pack
13	Rear Fog Switch	42	Ignition Switch
14	Fuel Gauge	43	(a) Electric Horns
15	Fuel Gauge Sender		(b) Air Horns (option)
16	Brake Test Switch	44	LH Front Indicator
17	Brake Fail Switch	45	LH Side Light
18	Heater Switch	46	LH Dipped Beam
19	Heater Fan	47	LH Main beam
	GY Slow	48	RH Side Light
	GS Fast	49	RH Dipped Beam
20	Water Temperature Gauge	50	RH Main Beam
21	Water Temperature Sender	51	LH Front Indicator
22	Oil Pressure Gauge	52	Radiator Fan
23	Oil Pressure Sender	53	Radiator Fan Switch
24	Washer Switch	54	Alternator
25	Washer Motor	55	Battery
26	Wiper Switch	56	Starter Solenoid
27	Wiper Motor	57	Starter Motor
28	Tachometer	58	ECU
29	Main Beam Warning Light	59	Crank Sensor

N	Brown	G	Green
B	Black	LG	Light Green
U	Blue	K	Pink
R	Red	W	White
O	Orange	Y	Yellow
P	Purple	S	Slate

WIRING DIAGRAMS AND FUSE BOX LAYOUT

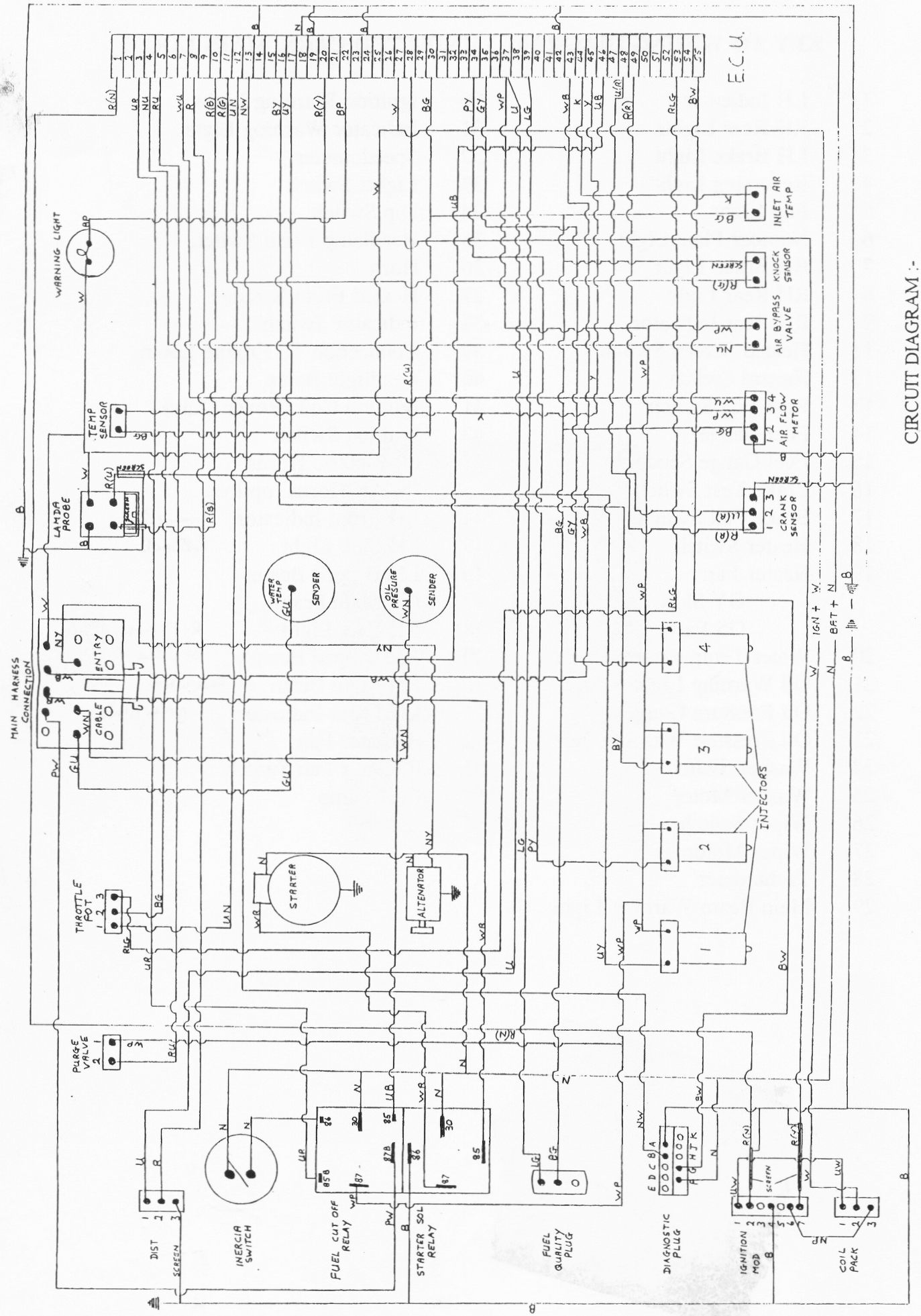
APPENDIX B



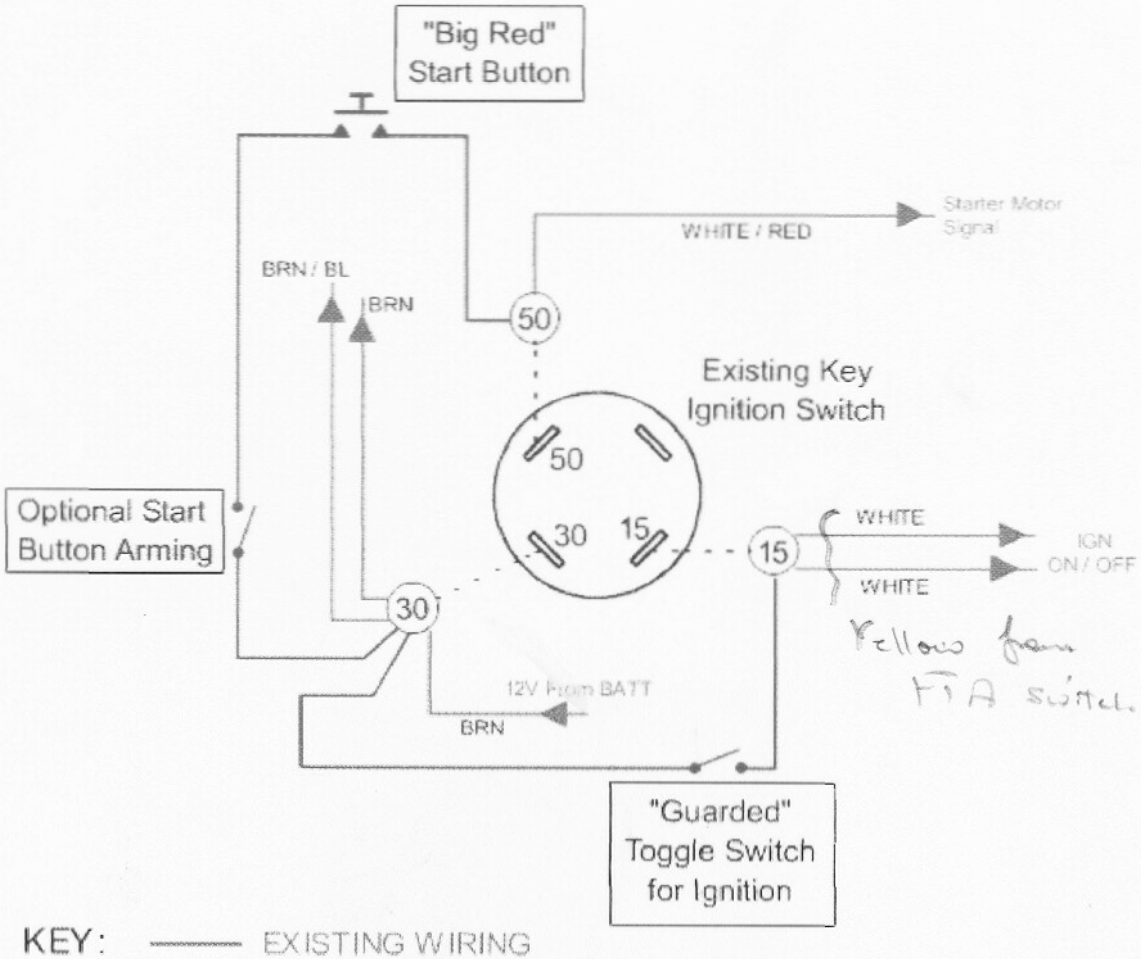
CIRCUIT DIAGRAM :-
CATERHAM SEVEN MAIN VEHICLE
HARNESS FOR INJECTED ENGINES

KEY TO WIRING DIAGRAM - INJECTED CARS, MAIN LOOM

1 LH Indicator
2 RH Rear Lights
3 LH Brake Light
4 Reversing Light
5 Fog Light
6 Number Plate Light
7 RH Brake Light
8 RH Rear Light
9 RH Rear Indicator
11 Heated Screen Switch
12 Hazard Switch
13 Rear Fog Switch
14 Fuel Gauge
15 Fuel Gauge Sender
16 Brake Test Switch
17 Brake Fail Switch
18 Heater Switch
19 Heater Fan
GY Slow
GS Fast
20 Water Temperature Gauge
21 Oil Warning Light Switch
22 Oil Pressure Gauge
23 Oil Pressure Warning light
24 Washer Switch
25 Washer Motor
26 Wiper Switch
27 Wiper Motor
28 Tachometer
29 Main Beam Warning Light
30 Ignition Warning Light
31 Indicator Warning Light
32 Speedometer
33 Lights Switch
34 Dip Switch
35 Headlamp Flash Switch
36 Horn
37 Heated Front Screen
38 Indicator Switch
39 Connection To Engine Loom
40 Headlight Relay
41 Ignition Coil (Rover Only)
42 Ignition Switch
43 (a) Electric Horns
(b) Air Horns (option)
44 LH Front Indicator Green/Red
45 LH Side Light R.Black
46 LH Dipped Beam
47 LH Main beam
48 RH Side Light Red/brown
49 RH Dipped Beam Blue/Red
50 RH Main Beam Blue, white
51 RLH Front Indicator green/white
52 Radiator Fan
53 Radiator Fan Switch
54 Fuel Pump
55 Battery



CIRCUIT DIAGRAM :-
ENGINE HARNESS FOR A POST
93 VAUXHALL INJECTION ENGINE



KEY: ——— EXISTING WIRING

——— NEW WIRING

USE MINIMUM: Thinwall cable 28/0.30mm, 2mm^2, 25amp

CATERHAM SUPER SEVEN MODELS - POST BUILD CHECK

LUBRICATION

1) Check Engine, Gearbox and Rear Axle oil levels, check for leaks and report.

ENGINE

2) Check hose connections and radiator level.
3) Check security of engine mountings and exhaust system.
4) Check security of oil cooler hoses and ensure they do not chafe on chassis, suspension or radiator.

CLUTCH

5) Check correct adjustment and operation of clutch and ensure that cable is free to pivot on end of pedal.

BRAKES

6) Check braking system for operation and correct adjustment.
7) Check brake hydraulic lines for security and leaks ensure that De Dion axle pipe does not foul the differential.
8) Check brake fluid reservoir level.
9) Ensure any faults are rectified before road test.

STEERING AND SUSPENSION

10) Check all front and rear mounting bolts for tightness.
11) Check and adjust tyre pressures and wheel nut tightness.
12) Check security of all steering connections.
13) Check that steering rack mountings are secure.
14) Check front wheel alignment.

ELECTRICAL SYSTEM

15) Check headlamp adjustment.
16) Check operation of all circuits.
17) Check that battery and terminals are secure.

BODY

18) Check weather equipment.
19) Check security of front and rear wings.

GENERAL

20) Road test and report on any defects found

Use of Bilstein Dampers on the Caterham Seven

Additional spring grooves are provided in Bilstein roadgoing dampers:

Front - Part Number 75515 RR

Rear - Part Number 75516 RR

These grooves are for motorsport purposes only.

For road use the top groove must be used in conjunction with the standard Caterham springs:

Front (Rover) -	Part Number 75511
Front (Ford / Vauxhall) -	Part Number 75517
Rear (all models) -	Part Number 75518

If competition Bilstein dampers with threaded bodies are used (part numbers 77841/2), the spring platform height must be adjusted as shown in the diagram below, and used with the standard Caterham springs.

Front - Part Number 77843

Rear - Part Number 77844