

CATERHAM

ASSEMBLY GUIDE

SEVEN 160

Version 09.2015.b

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0.0) Preliminary information

0.1) General warnings & cautions

The following warnings and cautions indicate general and environmental hazards present during the building process:

Warnings

Due consideration should be given to the highly flammable nature of petroleum or alcohol based products and their vapours. Serious burns can result from incorrect use.

Oils – prolonged and repeated contact may cause serious skin disorders.

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

Keep out of reach of children.

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

Use appropriate barrier creams.

Hydraulic fluid (brake fluid) is poisonous. Wash affected areas immediately in case of skin contact and seek medical assistance if swallowed.

Hydraulic fluid (brake fluid) is hygroscopic. Ensure only clean fresh fluid is used.

Hydraulic fluid (brake fluid) is corrosive to paintwork, powder coat and plastic components. Care should be taken to avoid spillage at any times.

Cautions

Protect the environment. It is illegal to pollute drains, water course and soil. Authorised waste collection facilities include civic amenity sites and garages which provide facilities for the disposal of oil and used oil filters. If in doubt ask the local authority for advice.

0.2) Specific warnings & cautions

The following warnings and cautions indicate specific hazards relating to the Caterham build process:

Warnings

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

Use appropriate eye protection whilst carrying out drilling operations.

Use appropriate eye protection whilst working under the car.

Cars fitted with electronic ignition systems have increased voltages compared with conventional systems. Ensure system is switched off prior to carrying out any work.

The electric radiator fan is controlled by the engine control unit, which operates when the ignition is in the 'on' position. Whilst working on a hot engine ensure that the ignition is switched off.

Do not remove coolant expansion bottle cap whilst coolant is hot. Take precautions to prevent scalds.

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

Both imperial and metric threads are used on the brake pipes. The threads on the three way union are imperial whilst those on the brake calipers are metric. To aid recognition, a small notch is machined into the hexagon of the metric unions.

Retighten wheel nuts after 200 miles.

Ensure adhesive is applied in a well-ventilated area. Follow instructions on adhesive packaging. Care must be taken whilst working in a confined area, for instance the footwell.

Use a suitable face mask to prevent inhalation of dust when drilling fibreglass or carbon fibre.

Cautions

All brake connections must be kept spotlessly clean and contamination with oil, water and petrol should be avoided.

When drilling fibreglass, use tape on the surface over the drill holes to prevent damage to the gel coat or painted finish. Slow drill speeds must be used.

1.0) Introduction

It is recommended that the entire assembly guide is read before commencing building of the car. This will allow planning ahead for the procurement of tools, consumables and equipment required during the build process.

Whilst it is possible for many of the build processes to be undertaken simultaneously, there are some areas where the correct build sequence is critical. A suggested build sequence is included at the end of this section.

1.1) Contact information

1.1.1) Customer Liaison

For all enquiries between point of order and delivery please contact your salesman.

1.1.2) Caterham Aftersales

To maximise the enjoyment of your Seven, the safety and integrity of the car must be maintained by careful adherence to the maintenance schedules. Further information on when servicing is required can be found in the Owners Handbook supplied with your car.

For all service, repairs, warranty and upgrade enquiries, contact the aftersales team located at Caterham Gatwick or your Caterham dealer:

Caterham Gatwick

T: +44 (0)1293 31230

E: Aftersales@caterham.com

1.1.3) Caterham Parts

For parts enquiries please contact Caterham Dartford +44 (0)1322 625801

1.1.4) Technical Assistance

Caterham Cars will happily provide technical assistance when required. When in doubt, ask. Our technical team can be contacted on +44 (0)1322 625800.

Do ensure that you make a note of your sales order number (top of invoice) and your customer number as these are the references 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 kit provided by Caterham Cars includes all the items required to build the car. However, due to the sheer number of different components it is possible that some parts are omitted or duplicated. Kits should be checked to ensure all components (including contents of fastener packs) are present prior to starting construction. If there are any shortages contact the Customer Liaison

Department at Caterham Dartford on +44 (0)1322 625800.

1.2) Post build check

When your Caterham Seven is finally completed and ready for the road it is strongly recommended that you make use of our Post Build Check facility. All customers are sent a free voucher covering the first three hours of the Post Build Check (this is ample time to check a completed kit, which can be carried out at Caterham Gatwick or your Caterham dealer. 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 sub-standard performance or premature component failure resulting from incorrect assembly.

The Post Build Check therefore includes:

- Inspection of all safety related items.
- Inspection of all operating systems (Clutch, Gearbox, Axle etc.).

- A written report on any matters causing concern or requiring attention.
- Completion of any agreed warranty work.
- Post Build Inspection Certificate when the car has passed inspection.
- Check to ensure compliance to IVA requirements (if required).

The inspection will take approximately three hours and we suggest that you give at least two weeks' notice when booking your car in. If additional work is required please notify the Service Manager at the time of booking to ensure that sufficient time can be made available. Any additional work will be charged on an hourly basis.

1.3) Individual Vehicle Approval

The requirements for Individual Vehicle Approval (IVA) are detailed in the IVA and registration section. For advice or assistance on IVA matters contact the Aftersales Department. IVA is a requirement for UK markets only, therefore the additional parts will not be supplied with overseas orders.

1.4) Disclaimer

The Caterham Seven is supplied in kit form and is supplied for amateur construction.

The builder must assume that all nuts, bolts and fasteners may be loose and takes the responsibility to ensure road worthiness.

Sound engineering principles must always be followed.

A free post build check is available from Caterham Gatwick or your Caterham dealer.

NOTE

In the UK, the assembled kit cannot legally be driven to the post build inspection (prior to successful completion of an IVA test).

1.5) Suggested Build Sequence

Table 1: Suggested Build Sequence

Work Area	Detail	Comment
Front		
Steering		
	Steering rack	
	IVA sleeves	
	Track rod ends	
Front suspension		
	Lower wishbones	
	Upper wishbones	
	Headlight brackets and headlight assembly	
	Damper units	
	Uprights	
	Wing stays	
	Anti-roll bar	
	Front flexible brake hoses	
	Cycle wings	
Engine & Gearbox		
Prep engine	Gearbox to engine	
	Gearbox rear mount bracket	
	Gear change extension	
	Closing Plate – bell housing	
	Clutch cable bracket to bell housing	

	Starter motor	
	Battery positive cable to starter and alternator	
	Gearbox filler and level plugs	Loosen
	Gearbox tail shaft plug	Remove
Engine Bay		
	Engine mount rubber blocks	Fit to chassis
	Horns	
	Windscreen washer reservoir mounting bracket	Fit to RH footwell bulkhead
	Install engine/gearbox	
	Gearbox rubber mounting	
	Engine/chassis loom connections	
	Windscreen washer reservoir	
	Fuel and purge pipes	
	Header tank mounting beam and plate	Fit to chassis
	Exhaust catalyst with pipe	
	Lambda probe	
	Catalyst top heat shield	
	Turbo compressor outlet	
	Heater	May be fitted before engine
	Heater hoses	
	Heater valve	
	Heater control cable	
	Battery cradle	

	Battery and clamp	
	Battery positive and earth leads	
	ECU	
	Steering columns	
	Steering wheel	
	Bottom hose	
	Top hose	
	Radiator bobbins	
	Radiator	
	Intercooler bobbins	
	Intercooler	
	Intercooler hoses	
	Air filter	
	Header tank	
	De-gas and fill hoses	
	Clutch cable	
	Roll over bar	
Rear chassis		
	Handbrake lever, compensator and connect to handbrake light	
	Prop shaft	Initial assembly
Prep rear axle	Fit differential to rear axle casing	
Rear suspension	Fit axle into chassis	In on left hand side
	Fit Panhard rod to chassis	
	Connect propshaft	
	Rear dampers	

	Radius arms	
	Panhard rod to axle	
	Install axle seals and shields	
	Install half shaft assemblies	
	Speed sensors	
	Brake pipes and flexi hose	
	Fit handbrake cables	
Cockpit & Boot		
	Gear stick	
	Transmission tunnel trim	
	Gear knob	
	Scuttle edge trim	
	Sill protectors	Optional
	Knee trim panels and interior panel piping	
	Carpets	
	Seats	
	Head restraint	
	Fuel filler shroud	
Bodywork and Hood		
	Front wings and indicator repeater lights	May be fitted immediately after fitting front anti-roll bar
	Rear wing protectors	
	Rear wings	
	Exhaust pipe brackets	
	Exhaust heat shield	Silencer

	Exhaust system	
	Hood sticks	
	Hood fasteners	
	Side screens	
	IVA	

2.0) Kit contents

The following pages include pictures and tables to assist with part recognition and location. Due to the multiple permutations that can be produced, it is impossible to show the exact locations of every part. However, the pictures have been laid out in such a way that each picture represents what you should expect to find in a particular box.

2.1 Packages

The complete kit is supplied as follows:

- Chassis/Body unit (CBU).
- Composite panels (nosecone, rear wings and front wings).
- Engine assembly.
- Gearbox assembly.
- Boxes of parts (approximately 10).
- Wheel/tyre assemblies.
- Seats.
- Exhaust silencer.
- Heater (in own box).

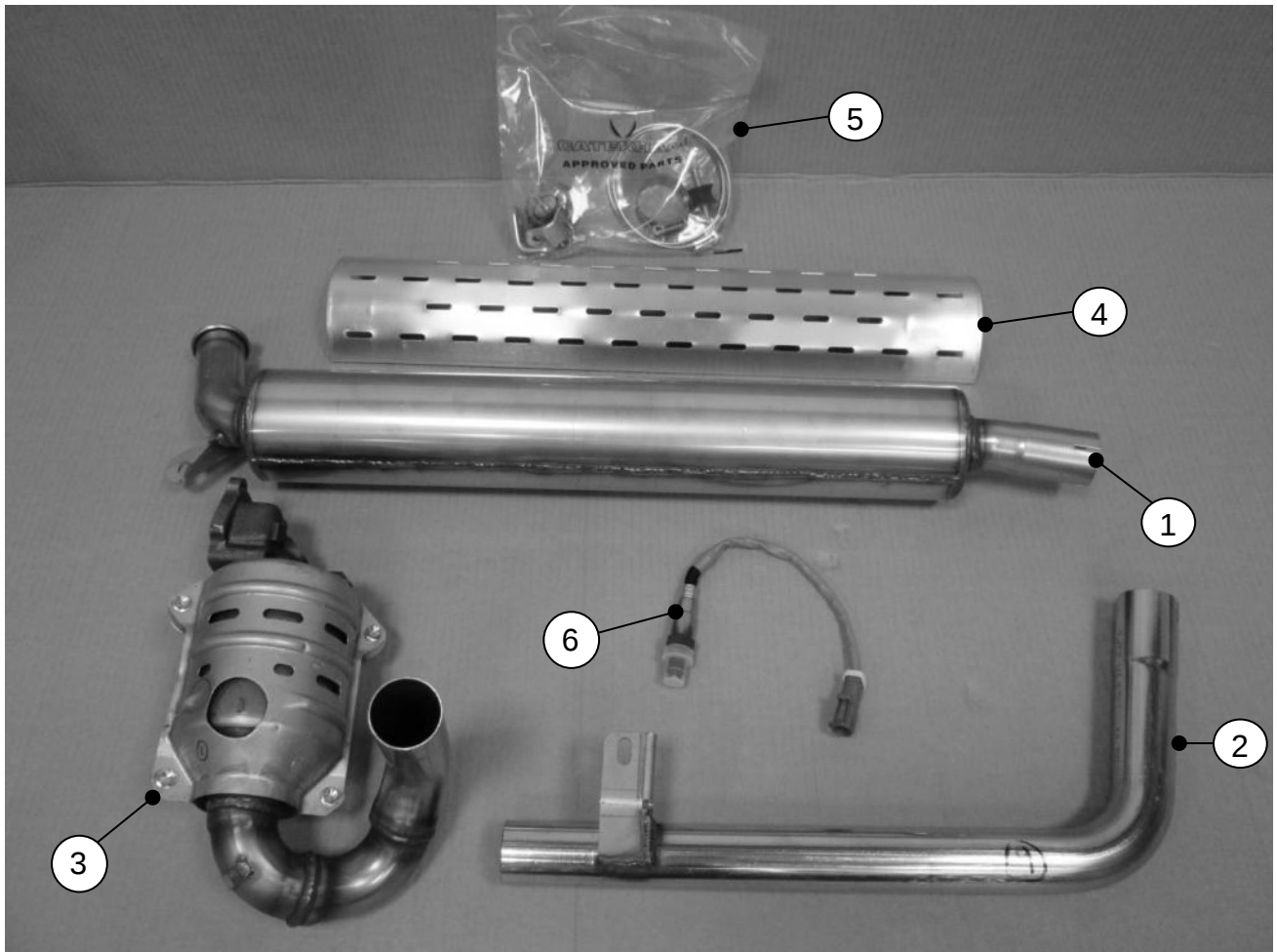
IMPORTANT NOTE

The following pages are provided as a guide to aid recognition of parts. The packages shown will not be an exact representation of what you should expect to find in the packages supplied with your kit and should therefore not be used as a parts check list.

2.1.1) Exhaust, steering, large suspension items, and front wing stays

The exhaust, steering, large suspension items, and front wing stay items are shown in Figure 1 and Figure 2. The contents of the polythene bags are shown in Table 2.

Figure 1: Exhaust



- | | |
|---------------------|-------------------------|
| 1. Exhaust silencer | 2. Exhaust primary pipe |
| 3. Catalyst | 4. Silencer guard |
| 5. Polythene bag | 6. Lambda Sensor |

NOTE

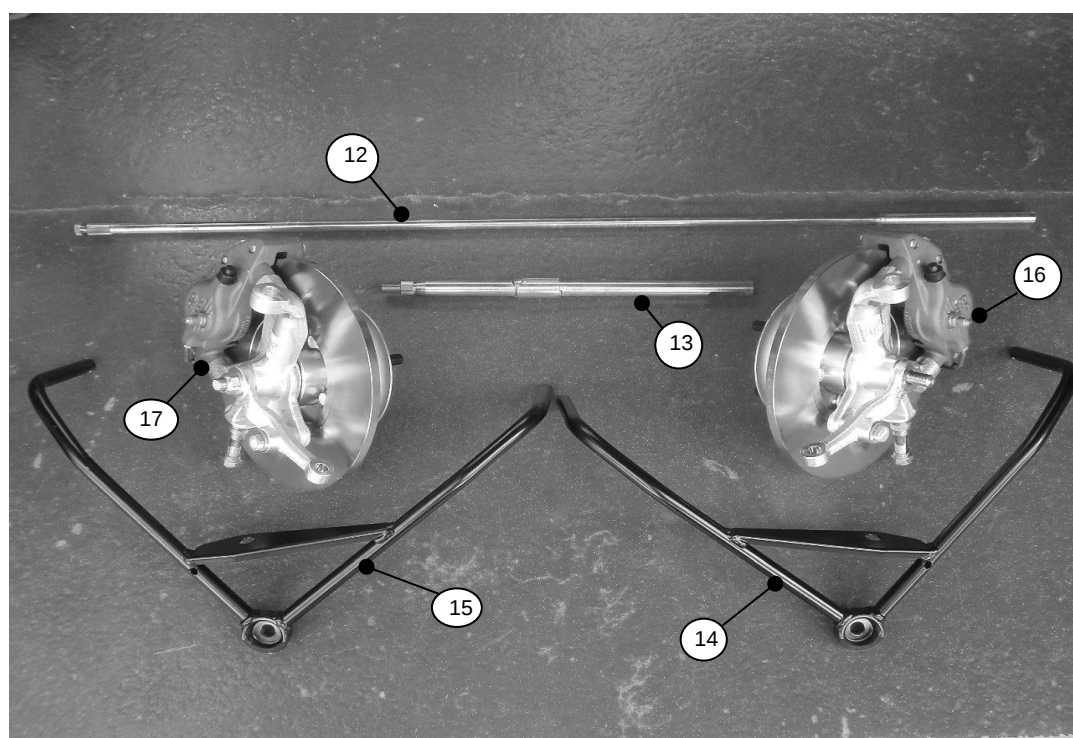
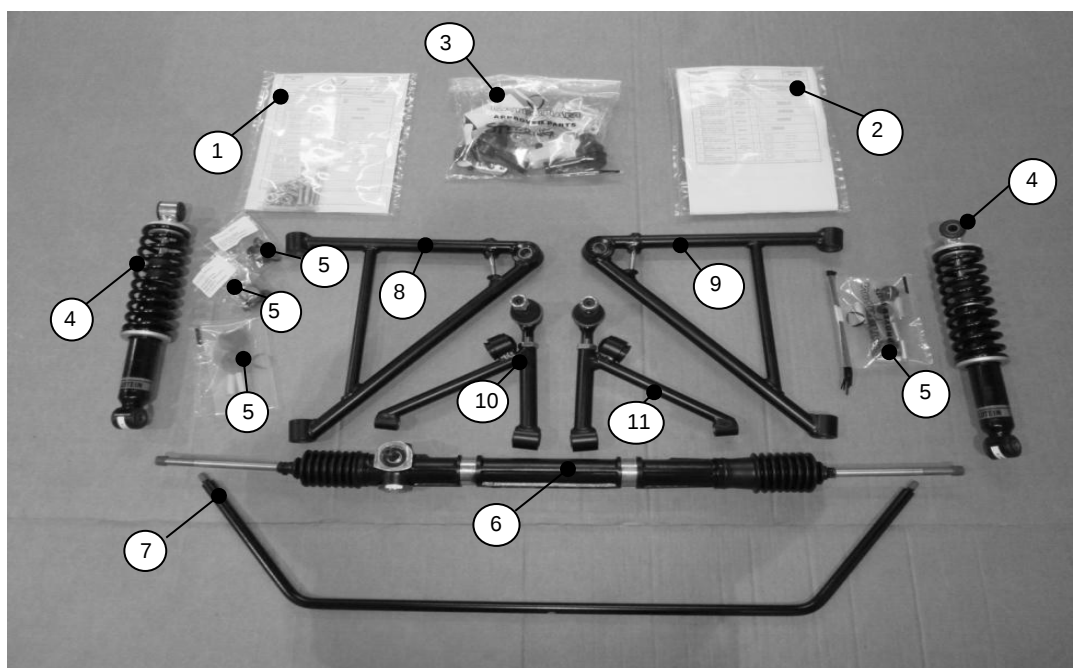
Items may differ from those illustrated

2.1.2) Steering, front suspension items, and front wing stays

Table 2: Polythene bag contents - steering, front suspension items, and front wingstays

Identifier	Description	Qty
Gearbox	Gearbox mounting rubber	1
	Gear knob	1
Steering	Track rod ends	2
	Universal joint	1
	Aluminium steering rack clamps	2 pairs
	Bump steer plates	2
	Bump steer long plate	1
	Steering column bush	1
	Grub screw	1
	Steering column clamp	1
	Steering column plate	1
Exhaust	Jubilee clips	2
	Exhaust clamps	2
	Exhaust mounting brackets	2
	Mounting bobbins	2
	Lambda sensor	1
Wheels	Wheel nuts	16
	Centre caps	4
	Centre cap badges	4

Figure 2: Steering, front suspension items, and front wing stays

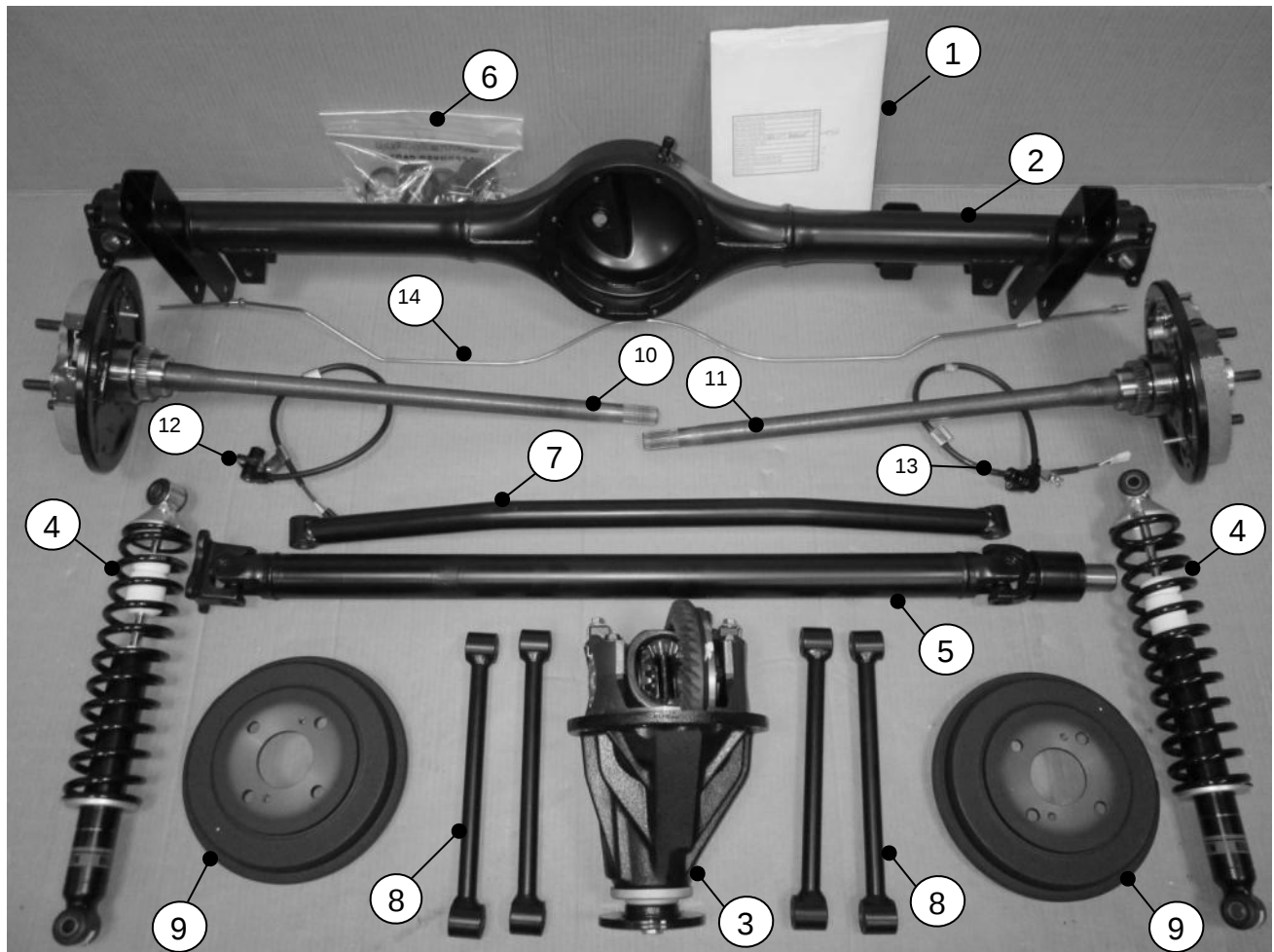


- | | | |
|---|---------------------------|---------------------------|
| 1. Fastener pack 'steering' (30S003B) | 7. Front anti-roll bar | 13. Steering column upper |
| 2. Fastener pack 'suspension' (30F015A) | 8. Lower wishbone LH | 14. Wing Stay LH |
| 3. Polythene bag 'steering' | 9. Lower wishbone RH | 15. Wing stay RH |
| 4. Spring/damper unit | 10. Upper wishbone LH | 16. Front Upright LH |
| 5. Polythene bags 'suspension' | 11. Upper wishbone RH | 17. Front Upright RH |
| 6. Steering rack | 12. Steering column lower | |

2.1.3) Rear Axle and suspension

The rear suspension and axle items are shown in Figure 3. The contents of the polythene bags are detailed in Table 3.

Figure 3: Rear suspension items



1. Fastener pack Rear Suspension and Live Axle (3GZ1141B).
2. Axle casing
3. Differential
4. Spring damper units (rear)
5. Prop-shaft
6. Polythene bag 'rear suspension'
7. Panhard rod

8. Radius arms
9. Brake drums
10. Half shaft assembly RH
11. Half shaft assembly LH
12. Wheel speed sensor RH
13. Wheel speed sensor LH
14. Brake pipe

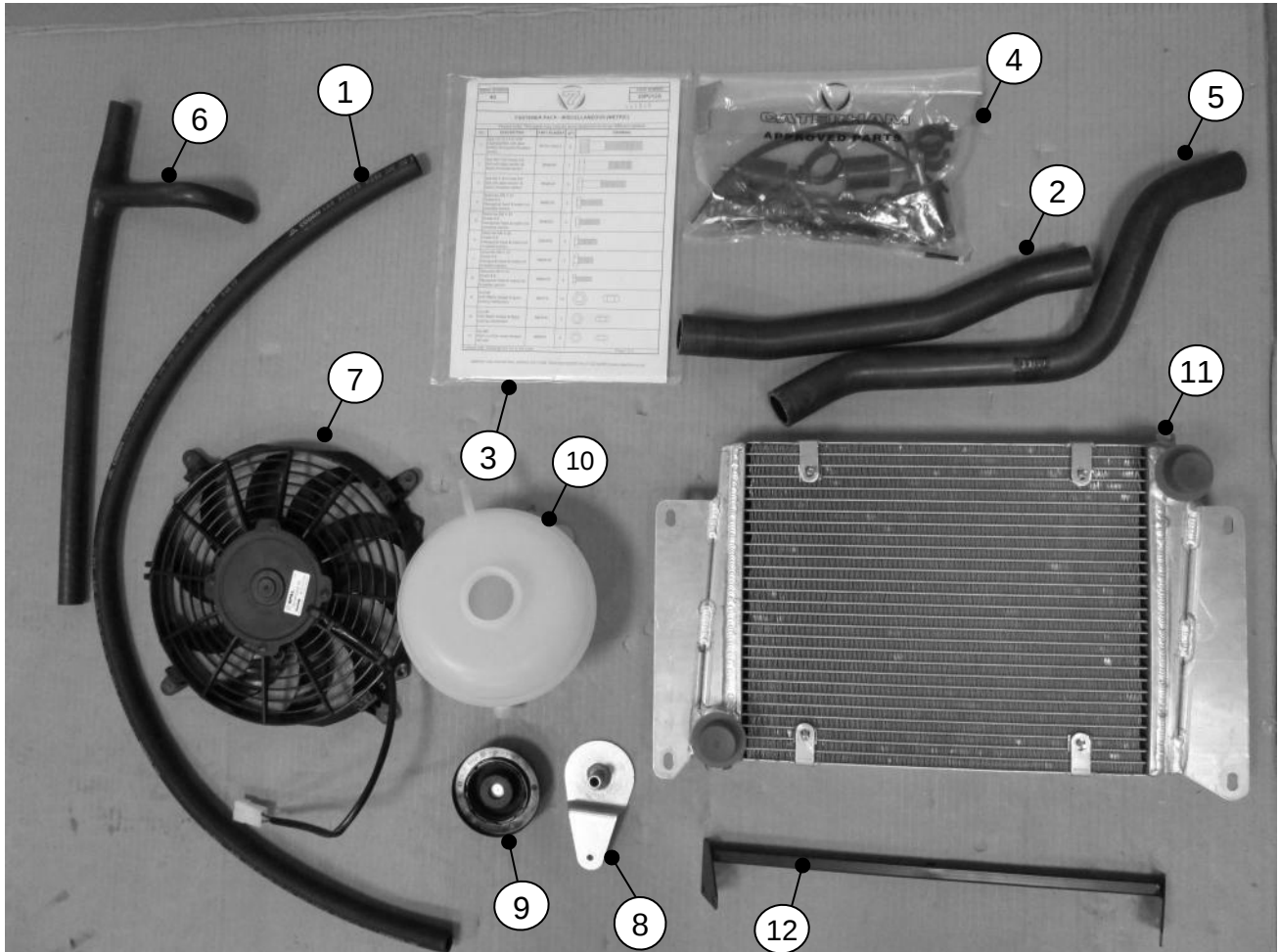
Table 3: Polythene bag contents - suspension

Identifier	Description	Qty
Front suspension	Rubber cotton reel bushes	2
	Damper sleeves ½" O.D. x 8mm I.D.	4
	Anti-roll bar rubber cover	2
	Anti-roll bar ball ends	2
	Cable ties	-
	Anti-roll bar mounting clamps	2
	Wishbone sleeves 12mm O.D. x 10mm I.D.	2
Rear suspension	Axle seal protectors	2
	Axle seals	2
	Damper sleeves ½" O.D. x 10mm I.D.	4
	Radius arm sleeves 12mm O.D. x 10mm I.D.	2
	Handbrake link rod	1
	Handbrake compensator	1
	Axle breather cap	1
	Axle breather spring	1
	Axle level plug	1
	Axle level plug seal	1
	Axle drain plug	1
	Axle drain plug seal	1
	Suzuki axle fixings	1 set

2.1.4) Cooling

The cooling items are shown in Figure 4.

Figure 4: Cooling items



- | | |
|--|-----------------------------------|
| 1. Expansion bottle hose | 7. Cooling fan |
| 2. Top radiator hose | 8. Expansion bottle bracket |
| 3. Fastener pack 'miscellaneous' (30P012A) | 9. Expansion bottle cap |
| 4. Polythene bag 'cooling' | 10. Expansion bottle |
| 5. Bottom radiator hose | 11. Radiator |
| 6. Heater hose | 12. Expansion bottle mounting bar |

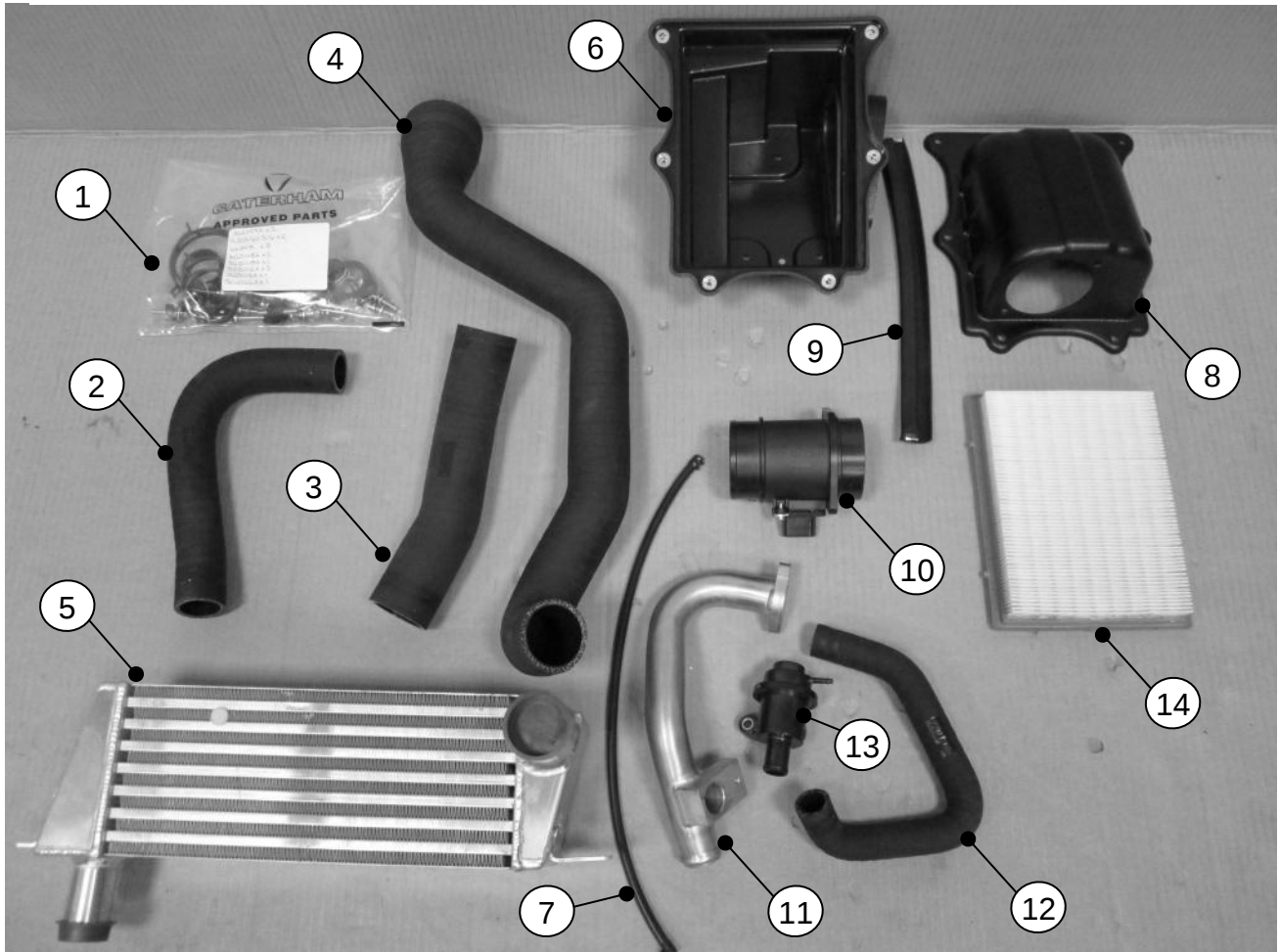
NOTES

(1) Items may differ from those illustrated, dependant on kit specification.

2.1.5) Engine inlet

The engine inlet items are shown in figure 5

Figure 5: Intake items

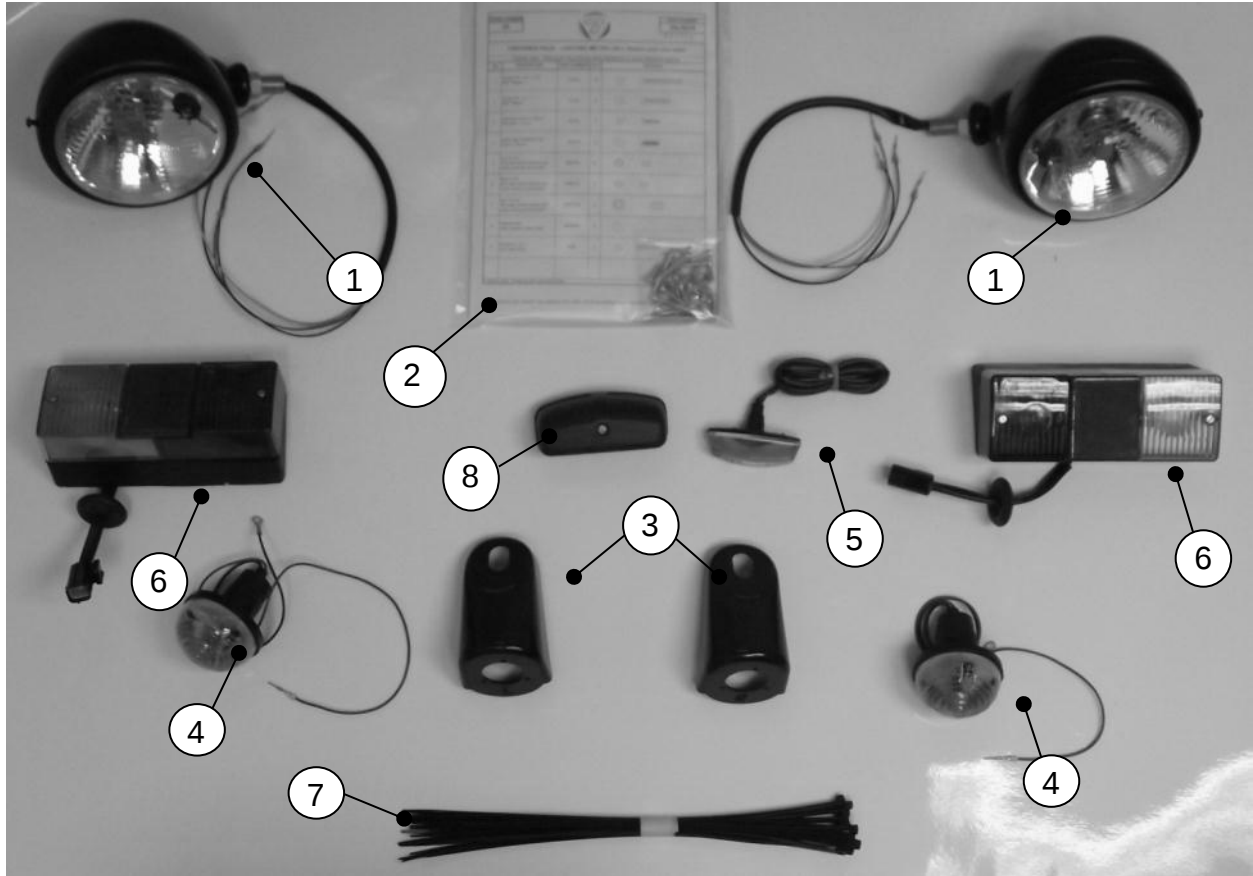


- | | |
|---------------------------------|-------------------------------|
| 1. Polythene bag 'engine inlet' | 8. Air filter housing - upper |
| 2. Intercooler inlet hose | 9. Seal – air filter housing |
| 3. Intercooler outlet hose | 10. Mass air flow sensor |
| 4. Air filter to turbo hose | 11. Compressor outlet pipe |
| 5. Intercooler | 12. By-pass valve hose |
| 6. Air filter housing – lower | 13. By-pass valve |
| 7. Vacuum hose | 14. Air filter element |

2.1.6) Lighting

The lighting items are shown in Figure 6.

Figure 6: Lighting items

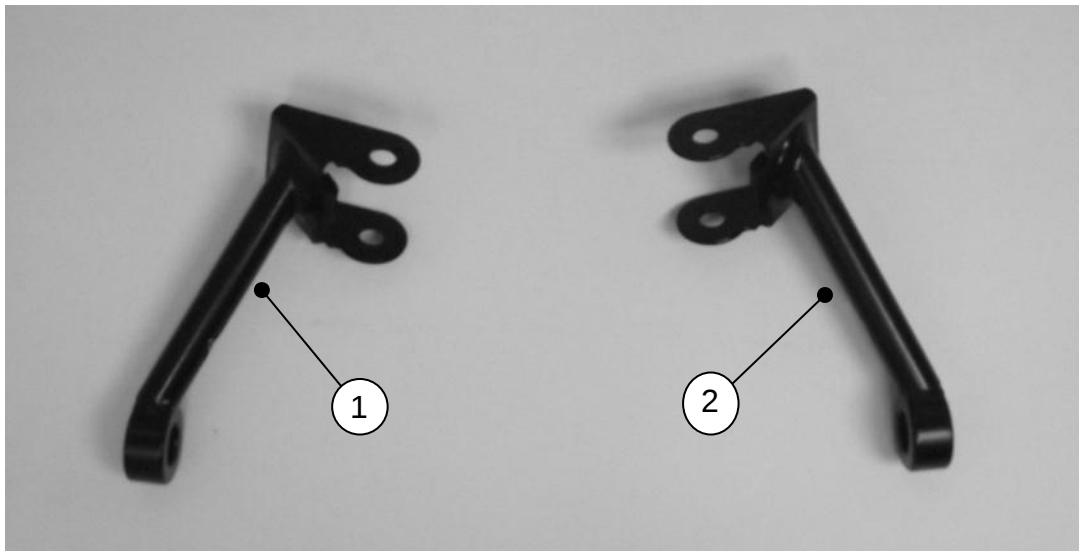


- | | |
|----------------------------------|--------------------------|
| 1. Headlight | 5. Indicator repeater x2 |
| 2. Fastener pack 30L002A | 6. Rear light cluster |
| 3. Indicator cones (l/h and r/h) | 7. Cable ties |
| 4. Indicator (front) | 8. Number plate light |

2.1.7) Head light brackets

The headlight brackets are shown in Figure 7.

Figure 7: Headlight brackets



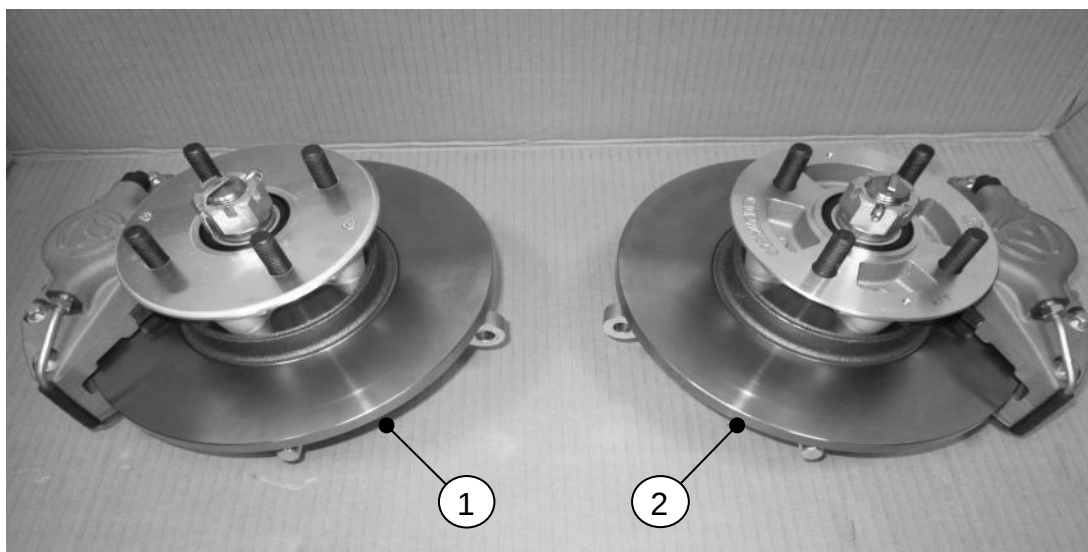
1. LH headlight bracket

2. RH headlight bracket

2.1.8) Uprights

The uprights are shown in Figure 8.

Figure 8: Uprights



1. Upright assembly (RH)
shown with spacer

2. Upright assembly (LH)
shown without spacer

2.1.9) Interior trim, cables and options

The interior trim, cables and options items are shown in Figures 9, 10, 11, and 12. The contents of the polythene bags are detailed in Table 4.

Figure 9: Boot carpet

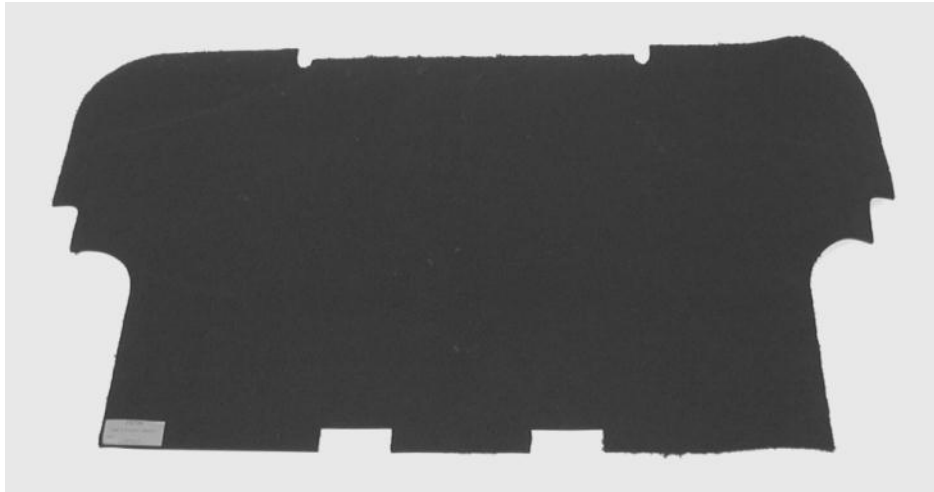


Figure 10: Bulkhead carpet

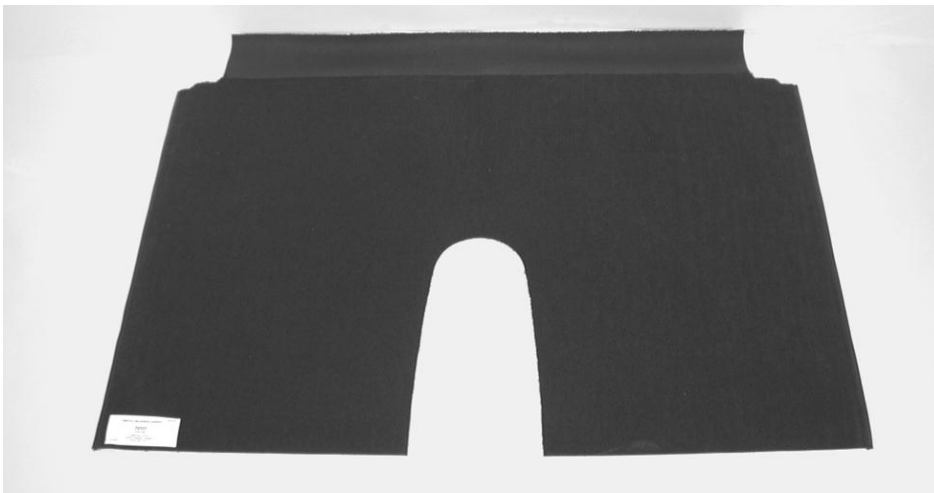


Figure 11: Rubber mats



Figure 12: Transmission tunnel top

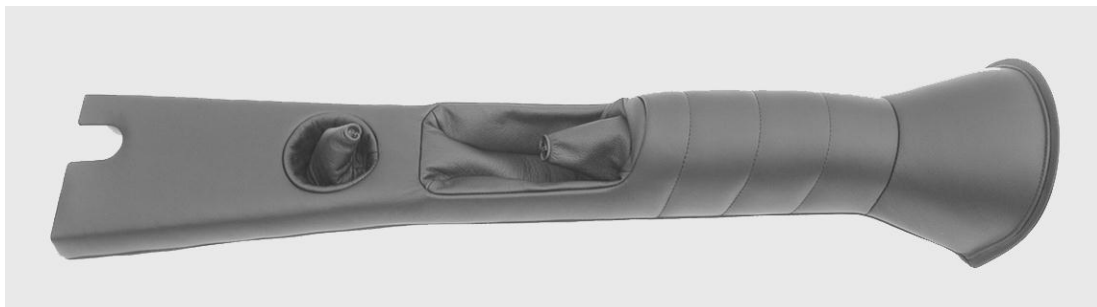


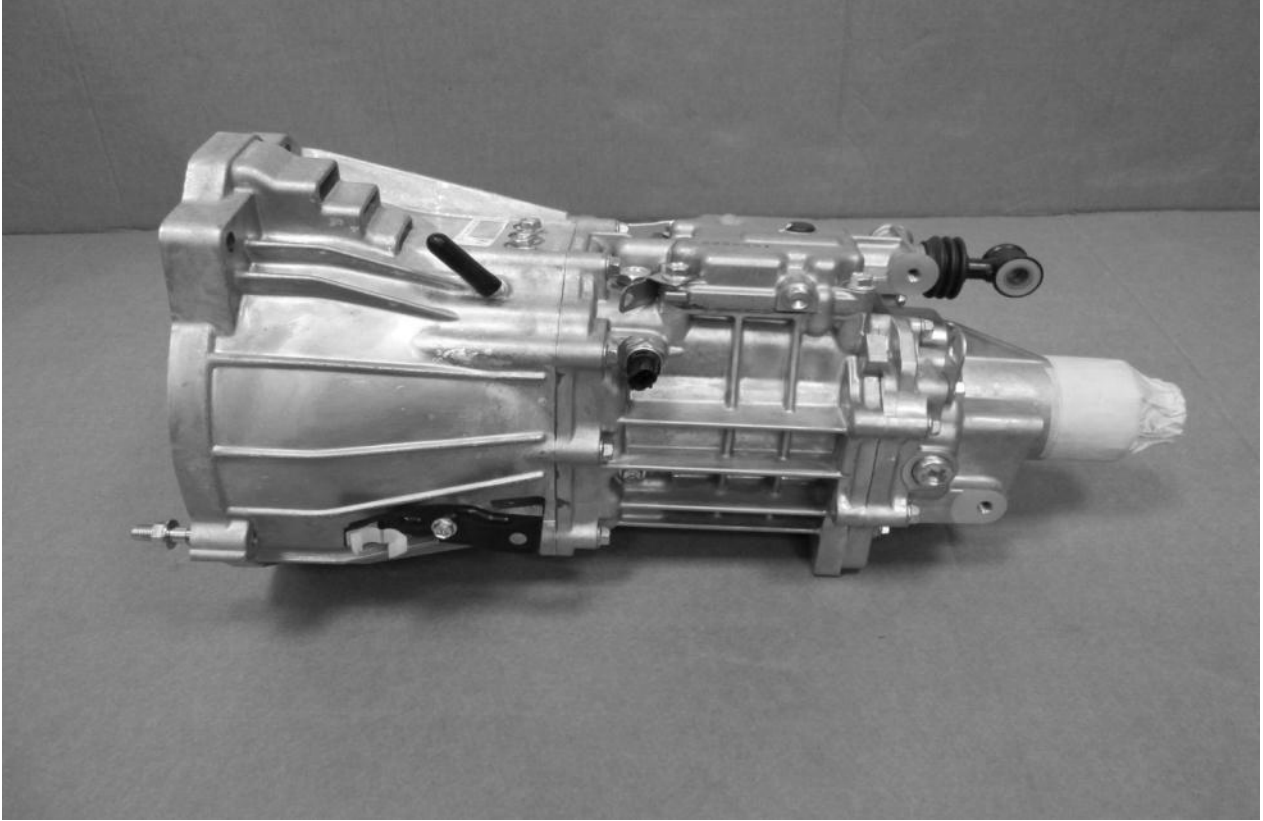
Table 4: Polythene bag contents - interior trim, cables and options

Identifier	Description	Qty
IVA	Cable ties	-
	Track rod end sleeves	2
	Track rod end bottom cap	2
	Wing mirror pack	1
	Sticky back foam (roll)	1
	Edge trim (roll)	1
	Large flat bolt head covers	6
	Small domed caps	12
	Long bonnet catch rubbers	2
	Short bonnet catch rubbers	2
	Large domed caps	2
	Medium domed caps	4
Spare Wheel	Wheel nuts	2
	Spare wheel bolt	1
	Spacer	1
	Mounting wishbone	1

2.1.10) Gearbox

The standard 5-speed gearbox is shown in Figure13.

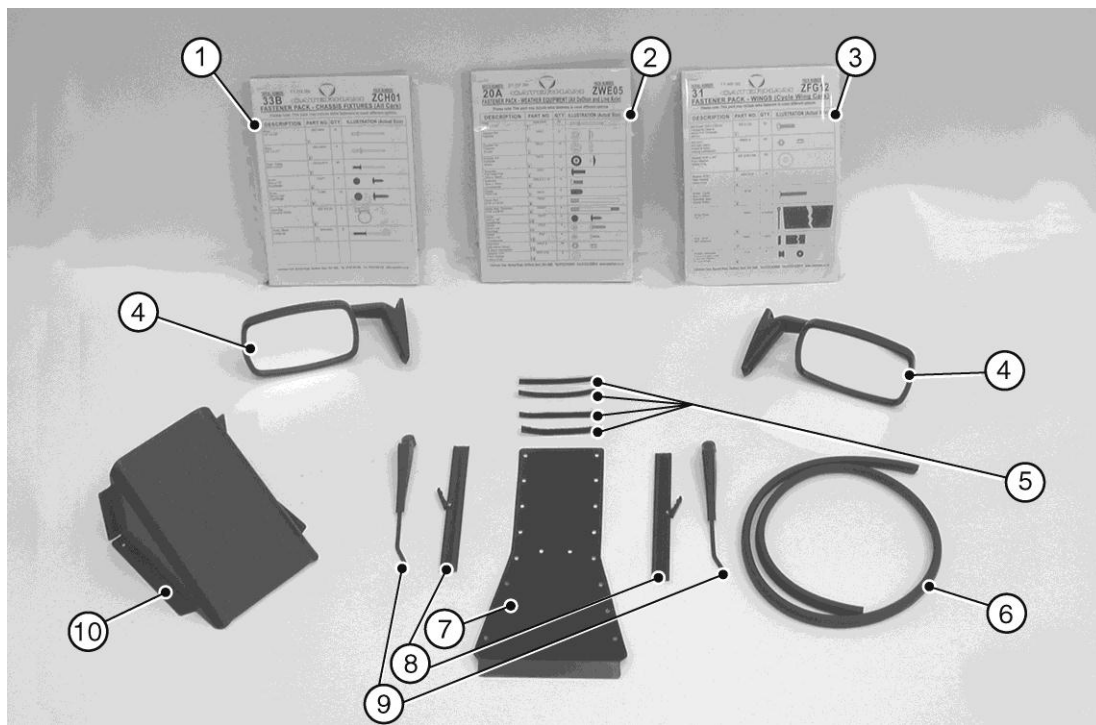
Figure 13: 5-speed gearbox



2.1.11) Chassis/body unit

The chassis/body unit comprises; chassis, body panels, pedals, master cylinder, instruments, switches, wiring loom, windscreen, fuel tank, fuel pump, fuel lines, ECU. Additional items placed loose in the chassis are shown in Figure 14.

Figure 14: Items loose in chassis



- | | |
|--------------------------|------------------------------|
| 1. Fastener pack ZCH | 6. IVA trim |
| 2. Fastener pack ZWE | 7. Transmission tunnel cover |
| 3. Fastener pack 30P016A | 8. Wiper blades |
| 4. Side screen mirrors | 9. Wiper arms |
| 5. Velcro strips | 10. Fuel filler cover |

NOTE

If the optional weather gear has been specified, the side screen mirrors will be supplied in the weather gear pack.

2.1.12) Weather gear (optional)

The optional weather gear items are shown in Figure 15.

Figure 15: Weather gear (optional)

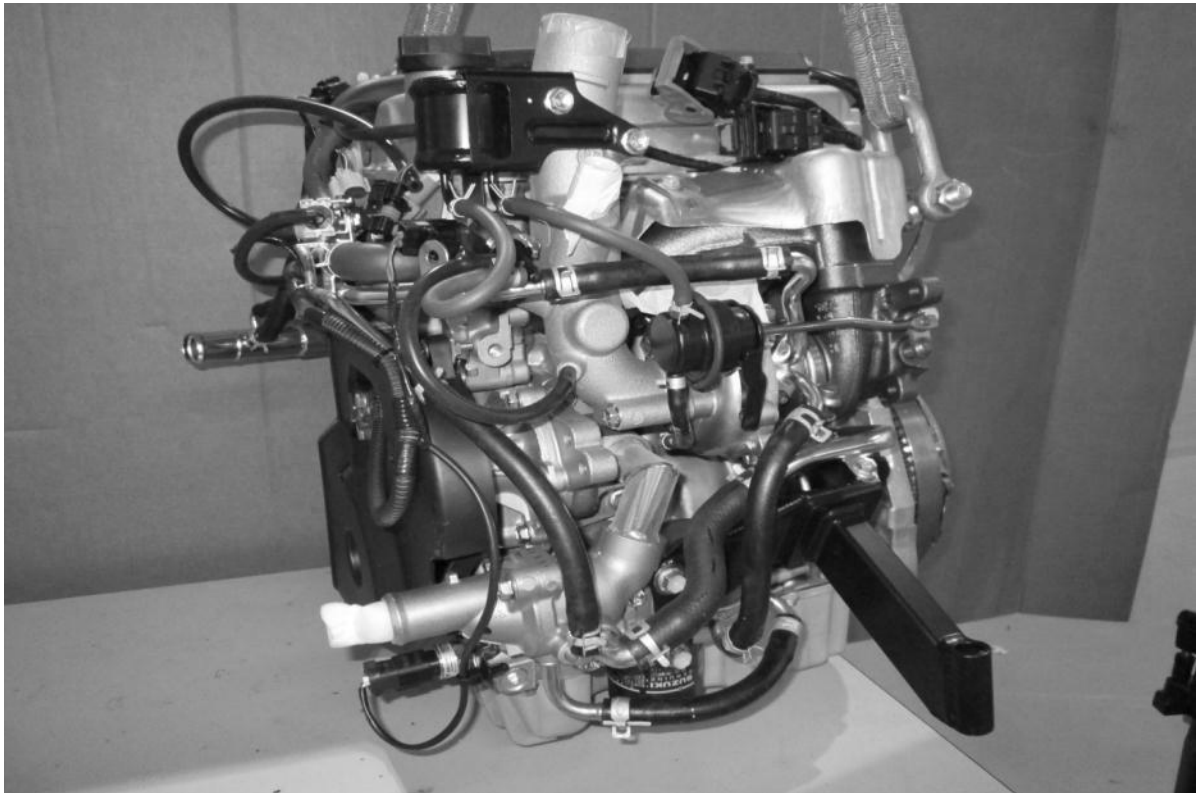


- | | |
|----------------------------|--------------------------------|
| 1. Hoodsticks | 5. Mirrors |
| 2. Hood | 6. Mirror plate (not required) |
| 3. Side screens | 7. Hood straps |
| 4. Fastener pack 'weather' | 8. Hinges |

2.1.13) Engine

The engine, Fig 16, is supplied on a frame complete with engine mountings and lifting eyes. The engine is supplied complete with wiring loom. The starter motor is not fitted as it is secured to the bell-housing.

Figure 16: Suzuki engine



2.1.14) Heater assembly

The heater assembly, Figure 17, is packed into an unmarked cardboard box.

Figure 17: Heater assembly



2.1.15) Wheels

The wheels are supplied with tyres already fitted. It should be noted that the tyres may be handed, that is, have a direction of rotation arrow showing the direction of travel. Wheels must be fitted with the directional arrow in the correct direction.

2.1.16) Seat

The seats are supplied in protective covers. It is recommended that the covers are not removed until the seats are required for fitment.

2.1.17) Wings

The front and rear wings are supplied protected with bubble wrap. The two largest wings are for fitment to the rear of the car.

2.1.18) Nosecone

The nosecone is supplied in protective bubble wrap. It is recommended that it is left protected until required for fitment.

2.1.19) Roll over bar

The roll over bar is protected by bubble wrap and is supplied in its own box.

3.0) Pre-assembly information

This section has been included to aid recognition of parts and to give a basic idea as to where they might be found. Due to the complexity of the range of options available and subsequent variations on packages it is impossible to list every permutation; however Table 5 below shows the normal location of parts in a standard CKD kit.

3.1) Package contents

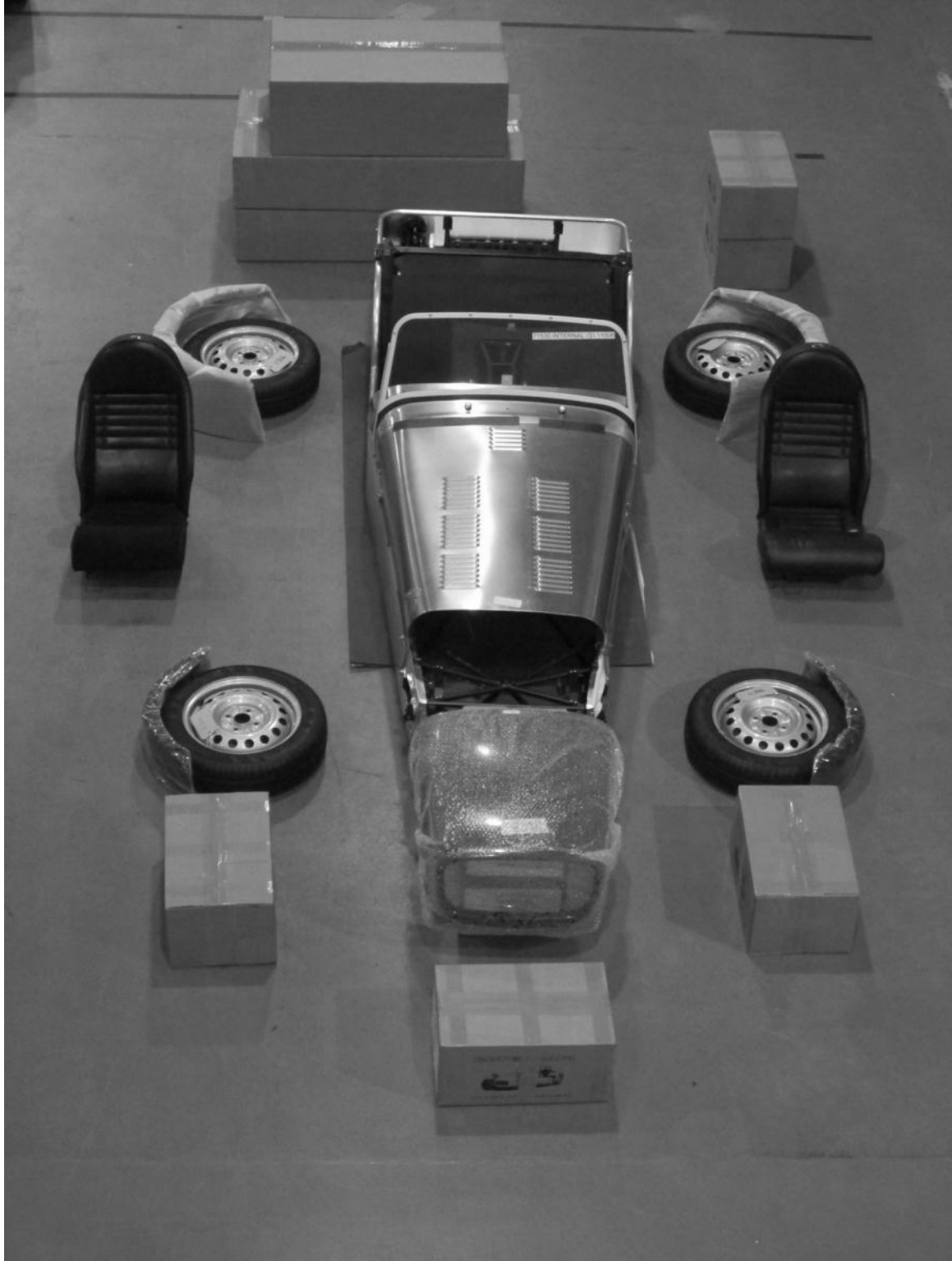
Kits supplied from Caterham Cars arrive as shown in Fig 18. Due to packaging constraints some items may be located in different packages.

Table 5: Package contents

Box	Package	Contents
Box 1	Steering, exhaust, axle casing	Steering rack, rack clamps, upper and lower steering columns, column bush, column clamp, track rod ends. Grub screws, silencer assembly. Primary pipe, catalyst collector, silencer heat guard, mounting brackets and bobbins, wheel nuts, centre caps, badges, clutch cable, speed sensors, mounting rubber, gear knob, front anti-roll bar and fixings, cycle wing stays, Axle casing, brake pipe, propshaft, Panhard rod, gearbox breather hose.
Box 2	Axle	Half shafts,
Box 3	Differential	Differential assembly
Box 4	Front suspension, rear suspension	Front Spring/damper units, upper and lower wishbones, Rear spring/damper units, radius arms,
Box 5	Cooling	Coolant hoses, water rail, cooling fan, heater (option), bobbins, expansion bottle and cap, radiator cowling, de-gas hose.
Box 6	Lighting	Headlamp units, headlamp brackets, indicator pods, indicators, number plate light, side repeaters, horns
Box 8	Interior trim	Covered tunnel top, tunnel side carpets, footwell mats, seat back carpets, hood, hood sticks, boot cover, handbrake cables, clutch cable, rear wing protectors, steering wheel, spare wheel wishbone, seat belts and fixings, tonneau cover, seat runners, seat spacers, assembly guide, arm restraint, hardware packs, IVA packs.

Box 9	Weather equipment	Hood straps, exterior mirrors, fuel filler cover, hinges (sidescreen), sill protectors, wiper arms, wiper blades, hardware pack, mirrors
Box 10	Airbox/air intake system	Airbox and fixings, MAF sensor, intercooler, air filter, intake hose, intercooler hoses, compressor outlet pipe, by-pass hose, by-pass valve
Own box	Uprights	Front uprights assemblies inc. brakes on uprights
Pallet	Engine	Complete engine and clutch, engine loom, engine mounting brackets, de-gas hose.
Loose	Sidescreens	
Own box	Gear box	
Own box	Radiator	
Loose	Wheels and tyres	Wheels and tyre assemblies
Loose	Seats	
Own box	Roll over bar	
On Chassis	Chassis/body unit	Chassis, battery, body panels, pedals, master cylinder, instruments, switches, wiring loom, fuel tank, fuel pump, fuel lines, ignition module/ECU. Rear wings, front wings, nosecone, battery, battery clamp/tray, knee trim panels, scuttle trim, steering column plate, grilles (Mesh 7), int panel trim, keys (ignition, fuel cap, battery master switch), aluminium tonneau cover, paint touch bottles, fog & reverse lights.

Figure 18: Complete kit (less engine)



3.2) Basic definitions

The text in the assembly guide refers to the Right Hand (RH) side or Left Hand (LH) side of the car. For all purposes the RH side of the car is taken to be the driver's side of a RH drive car.

Also mentioned in the assembly guide are the terms inboard (pointing towards the centre line of the car) and outboard (pointing away from the centre line of the car).

3.3) Tools and equipment

All kits supplied by Caterham Cars are specifically designed for the amateur car builder with basic facilities. Table 6 details the general purpose tools that will be required during the build process.

Table 6: Tools required

Item	Remarks
Socket set	Metric and imperial
Spanner set	Metric and imperial
Screwdriver	Flat point (various)
Screwdriver	Phillips/pozidrive (various)
Soft faced hammer	Rubber/plastic/copper/hide
Circlip pliers	
Torque wrench	0-80 Nm
Allen Keys	Metric
Measuring tape	
Hacksaw	
Rivet gun	

Goggles	Eye protection
Twist drill bits	Metric and imperial
Crimp pliers	
Drill	Preferably rechargeable
Axle stand	Qty. 4
Jug/small funnel	

The tools detailed in Table 7 are not generally to hand in the amateur workshop. These will be required during the build process.

Table 7: Additional tools and equipment

Item	Remarks
Engine hoist	SWL of 150 kg
Torque wrench	Up to 275 Nm
Flat band hose clamp pliers	To install hose clamps
Durable Dot fastening tool	76068 – supplied with chassis kit

The engine hoist should only be required for a short time and can usually be sourced from a tool hire company.

The consumables detailed in Table 8 and recommended lubricants detailed in Table 9 are required during the build process.

Table 8: Consumables

Item	Type	Remarks
Rubber lubricant	Holts RL2R	To ease assembly and operation of rubber bushes and grommets
Copper grease	Comma Copper ease	Anti-seize compound where lubrication is not required to ensure ease of future disassembly
Threadlock	Loctite threadlock 242 or 243	Used where the application prevents the use of nyloc nuts or spring washers
Silicone sealant	Clear	To achieve a watertight seal. It should be applied sparingly
Masking tape	Duct tape	Protection of body
Adhesive	Contact	Carpet/trim
Gasket sealer	30Z2009A	Diff to axle

Table 9: Recommended lubricants & fluids

Item	Lubricant		
Engine oil	Shell Helix Ultra AVL 5W-30		
Gearbox oil	Shell Spirax S4 AT 75W/90		
Differential	Shell Spirax S3 AX 80W/90		
Brake fluid	Comma DOT4		
Engine coolant	Comma Xstream red anti-freeze		

It is recommended that a sturdy workbench and a good vice are made available for holding items stable.

The application of undue force should not be necessary if assembly is carried out in the correct sequence.

3.4) Nuts, bolts and washers

As a general rule, the fasteners used are RH thread and of Metric dimensions. Some Imperial fasteners are still used, particularly within the brakes and suspension.

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

Ensure that the correct tightening torque is applied. Where torque figures are not specified, use the figures detailed in Table 10. Particular care must be taken when

using the torque wrench to tighten fastenings into aluminium.

Table 10: General torque figures

Thread	Socket size	Torque (Nm)
1/4" UNF/UNC	7/16" A/F	7
5/16" UNF/UNC	1/2" A/F	20
3/8" UNF/UNC	9/16" A/F	34
7/16" UNF	5/8" or 11/16" A/F	47
1/2" UNF	3/4" A/F	61
5mm	8mm	6
6mm	10mm	7
8mm	13mm	20
10mm	17mm	47
12mm	19mm	61

It is good practice to mark the bolt head, or nut, with a spot of paint once it has been finally tightened. This provides a good visual means of checking that all fixings have been set to the correct torque.

Over tightening can often cause more problems than under tightening, such as sheared bolts and studs and incorrect stresses.

The majority of fastenings have washers inserted between the nut and/or bolt head and the item being secured. Spring washers or lock washers are usually placed next to the bolt head or nut then

the plain washer. As a general rule, the following washers are used as detailed:

Plain washer

- To protect the surface and spread a load when attaching to a soft material such as glass fibre or aluminium.
- To adjust the spacing of one component to another - use plain washers of appropriate thickness and external diameter.
- To present a uniform surface on which to tighten a fastening onto a rough or irregular surface.

Spring washer

- To lock a thread where there is a possibility of the nut or bolt working loose. Not used with a nyloc nut.

Large diameter, thin plain washer

- To spread a load onto very thin material.

Large diameter plain washer

- To prevent migration (sideways movement) of rubber bushes.
- The large plain chamfered washers are often used in conjunction with the metalastic suspension bushes. Where this is the case, the

chamfered edge must be fitted towards the bush to prevent contact with the outer metal part of the bush.

Particular care should be taken to ensure that the correct fastening is being used, since it is possible to use an overlong bolt only to find that it is apparently missing when the only remaining bolts are too short.

The majority of fasteners supplied by Caterham are in polythene bags with an A4 sheet on a card insert, refer to Fig 19. The A4 sheet can be used to confirm that the contents are correct. Each pack has a unique number, located at the top RH corner and each item within the pack can be identified by a number at the bottom LH corner of the part number box. Where fasteners are specified in the text, the unique pack number will be stated the first time it is required along with the description and the Item Identification number in brackets. The next time an item from that pack is required it will be identified by description and the Item Identification number only, for example:

- Bolt (fastener pack 30P017A Item 1) identifies the Bolt M8 x 50 mm from the fastener pack illustrated at Fig 19.

- At a later point in the same section of text 'nut (4)' identifies the M8 nut from the same fastener pack.

NOTE

Imperial and metric fasteners are supplied together in some packs. Ensure that the correct thread form is identified before use.

Figure 19: Fastener pack

SERIAL NUMBER

51

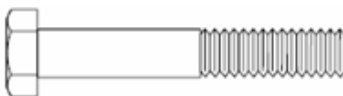
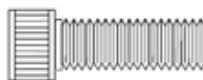


PACK NUMBER

30P017A

FASTENER PACK - ROLL CAGE (SERIES 3 METRIC)

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

NO	DESCRIPTION	PART NUMBER	QTY	DRAWING
1	Bolt M8 X 50 Grade 8.8 Bolt with plain section & Metric threaded section	BM8X50	2	
2	Set Screw M10 X 16 Grade 8.8 Hexagonal Head & Metric Full Threaded section	SM10X16	4	
3	Caphead Bolt M10 X 20 With Metric threaded section	BMCH10X20	2	
4	Nut M8 With Metric thread & Nyloc locking mechanism	NMYF 8	2	
5	Washer M10 Plain Washer Heavy-Duty	WPHM10	4	
6	Washer M8 Plain Washer Heavy-Duty	WPHM8	4	

* please note : Drawings are not to the scale

Page 1 of 1

3.5) General build information

Caterham Seven builders should take care to observe basic safety precautions whilst assembling the kit since tools, parts and materials handled incorrectly may result in injury.

Due to circumstances beyond the control of Caterham Cars, occasionally it is necessary to change suppliers and/or to make minor changes to the car or kit specification.

If it is intended to build the car over a short period (up to 4 weeks), it is recommended that an application for the IVA inspection is submitted as soon as possible. There is usually a wait of 2-3 weeks, minimum. In addition, it will take up to a week for the Vehicle Inspectorate to process the application. Full details about applying for the IVA inspection can be found in the IVA section or at www.directgov.co.uk.

Warning

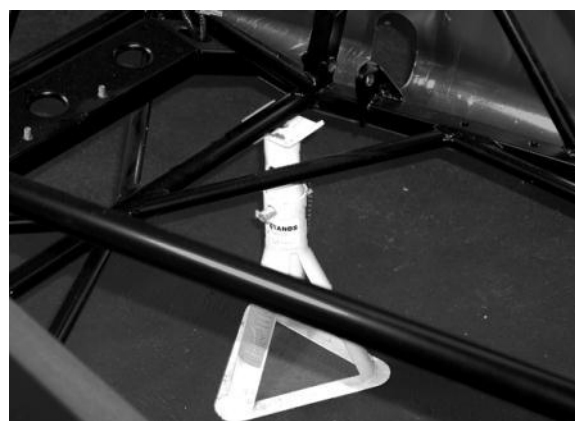
Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.

For IVA inspection you will need photographic evidence of the car build. Caterham recommends that you should take some photos of yourself

working on the car at different build levels.

It is recommended that the chassis is supported on 4 axle stands which will give stability for both safe working and ready access. Placing of the axle stands is made easier if assistance is available. Lift the front of the car and place the axle stands at the outer ends of the second chassis cross tube adjacent to the rear mounting of the lower front wishbone mounting, refer to Fig 20. If the car is raised using a jack, ensure that it is positioned under the front cruciform and that the powder coat finish is protected.

Figure 20: Front axle stands



The rear axle stands should be positioned at either end of the chassis tube that supports the front of the fuel tank, refer to Fig 21. If the car is raised using a jack, ensure that it is positioned centrally and the powder coat finish on the chassis tube is protected.

Figure 21: rear axle stands



4.0) Steering

The following section contains information on steering rack, steering wheel fitments and other associated tasks.

4.1) Steering rack

The steering rack should be fitted before the front suspension. Before fitting the steering rack, it is advisable to protect the outside of the aluminium side panels around the circular cut-outs through which the rack protrudes. Masking tape is sufficient for this purpose.

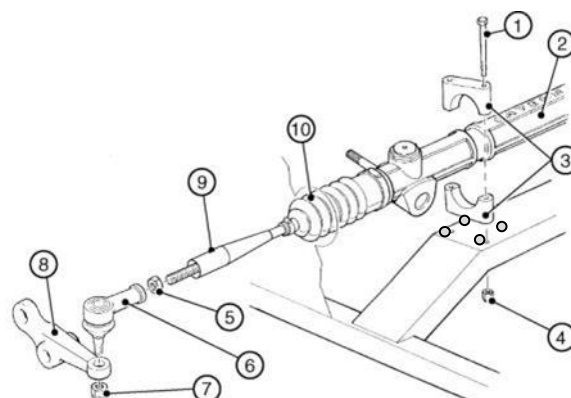
Warning

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

Carefully pass the steering rack through the circular cut-outs in the side panels until the machined areas of the rack line up with the holes in the rack platform. Ensure that the rack pinion exits the rack on the driver's side of the vehicle.

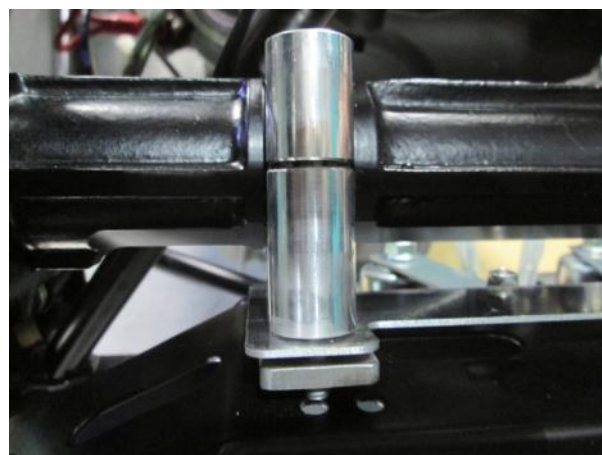
The steering rack is held in place by two piece aluminium rack clamps (polythene bag marked 'steering'). The rack clamps are matched pairs and clamp the steering rack into position as they are bolted into place, refer to Figures 22 and 23.

Figure 22: Steering rack assembly



- | | |
|------------------|--------------------------|
| 1. Securing bolt | 6. Track rod end |
| 2. Steering rack | 7. Securing nut |
| 3. Rack clamps | 8. Steering arm |
| 4. Nyloc nut | 9. IVA cover |
| 5. Locknut | 10. Steering rack gaiter |

Figure 23 Steering rack bump steer spacers



Fit one thick spacer under each steering rack mount, plus one dual thin spacer on top of the thick spacers (this ensures that the spacer clears the horn mounts) to raise the steering rack. **Using the right hand steering rack mounting holes** and with reference to Steering Z Pack 30S003B, clamp the rack loosely into place using rack clamps, M6x75 cap head

bolts, M6 nyloc nuts, and fitting an M6 flat washer between the chassis rack mount and each nyloc nut. The rack will be tightened later when the steering column is correctly positioned.

Fit the IVA cover (polythene bag marked 'IVA') to the end of the steering rack arm, ensure that the larger diameter is outboard. Screw the locknut (Figure 22 item 5) onto the steering rack arm then fit the track rod end. This should be screwed on 11 full turns to give an approximate track setting. Do not tighten the locknuts.

NOTES

(1) *The IVA covers will need to be trimmed on one end to fit over the tie rod ends*

(2) *The IVA covers are secured using cable ties. However this should not be done at this stage as final adjustment to the tracking will be required.*

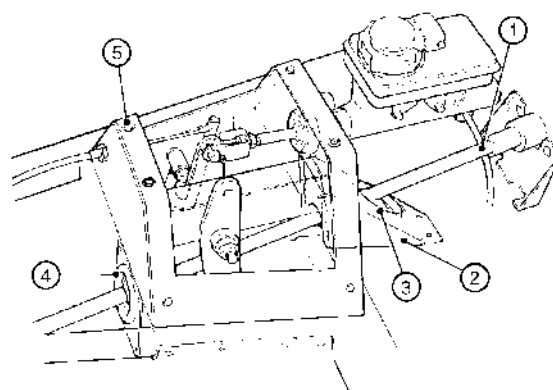
(3) *Tracking is adjusted during final checks.*

4.2) Steering column

The steering column should not be fitted until after the engine and gearbox have been installed.

Remove the lid of the pedal box, refer to figure 24

Figure 24: Pedal box



1. Lower steering column
2. Cheese wedge sealing box
3. Grommet
4. Grommet
5. Pedal box

(Brake pipes omitted for clarity)

The front of the pedal box is sealed by using a grommet inserted into the hole through which the steering column passes, refer to Fig 24. The inside of the rubber grommet should be smeared with rubber lubricant to prevent wear.

Position the 'cheese wedge' (refer to Figure 24) on the pedal box, aligned with the hole for the steering column. Mark the three hole positions using the holes in the cheese wedge as a guide. Drill the holes using 1/8" drill bit. Apply silicone sealant to the seating edges of the cheese wedge and secure the cheese wedge with rivets. Seal the edges with sealant. Fit the grommet to the large hole at the rear of the cheese wedge. Coat the grommet with rubber lubricant.

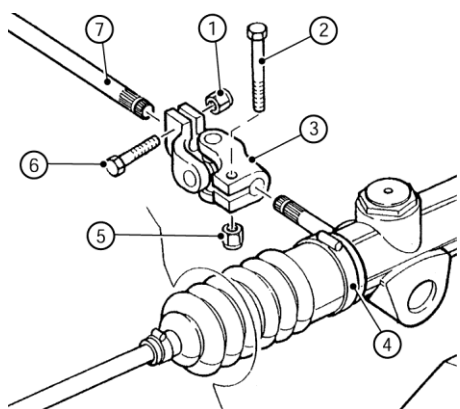
It is possible that the cheese wedge has already been fitted to the chassis.

The lower steering column is inserted, splined end first, through the dashboard under the brake master cylinder, through the rubber grommet in the 'cheese wedge', through the pedal box and finally through the rubber grommet in the pedal box sealing plate.

NOTE

Engine installation must be completed before the lower steering column is fitted.

Figure 25: Steering rack to steering column



- | | |
|--------------------|--------------------------|
| 1. Nyloc nut | 5. Nyloc nut |
| 2. Bolt | 6. Bolt |
| 3. Universal joint | 7. Lower steering column |
| 4. Steering rack | |

(Steering Z Pack 30S003B)

Position the front wheels (or uprights) in an approximate 'straight ahead' position and attach the universal joint (polythene bag marked 'steering') using bolt (6) and

nyloc nut (1) noting how the bolt locates into the machined groove in the splined end of the lower steering column.

NOTE

If insertion is difficult the universal joint can be opened up by inserting a flat blade screwdriver into the split and twisting. To ensure linearity of response it is recommended that the yoke of the universal joint is positioned with the cross vertical/horizontal when the steering wheel is in the straight ahead position.

Fit the lower end of the universal joint onto the rack, again clamping with the bolt (2) and nyloc nut (5) and tighten both bolts to 25 Nm. The universal joint should be run as straight as possible, continuing along the same angle as the column, the steering rack can be turned in its blocks to achieve this.

The upper steering column can now be fitted.

NOTE

When fitting an optional quick release column, the upper steering column bush can be fitted prior to inserting the upper steering column into the steering column lock tube.

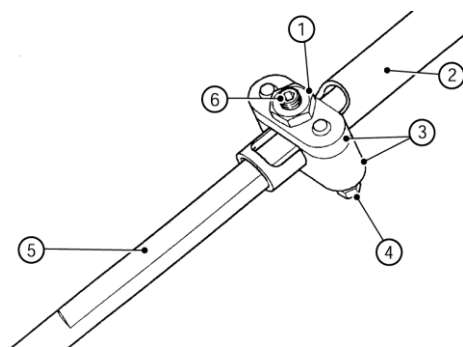
The lower column bush will have been fitted by Caterham, but care must be

taken when sliding the upper steering column down through the dashboard. Ensure that the lowest portion of upper steering column is liberally coated with grease and minimum force is exerted. Telescope the upper steering column over the lower steering column.

Slide the upper steering bush onto the column and into the dash tube. Note how the raised rubber locators on the bush fit in the holes in the dash tube.

To ease fitment, lightly coat the upper steering bush with rubber lubricant.

Figure 26: Upper steering column clamp



- | | |
|--------------------------|--------------------------|
| 1. Locknut | 4. Securing bolts |
| 2. Upper steering column | 5. Lower steering column |
| 3. Clamp | 6. Grub screw |

(Steering Z Pack 30S003B)

The two parts of the steering column are clamped together using the locking clamp. Make sure the cut out faces the column, and refer to Fig 26. Insert the grub screw

(6) loosely into the clamp. Secure the two halves of the clamp using two bolts (4), plain washers and spring washers. Torque to 14 Nm. Tighten the grub screw with an Allen key to eliminate any free play in the steering. Lock the grub screw into place using locknut (1).

NOTE

Before tightening the clamp:

Fit the steering wheel boss onto its spline to ensure that the steering wheel boss does not foul the dashboard. Slide the steering column/steering wheel boss away from the dashboard to achieve clearance.

Check that the lower steering column does not foul any parts on the engine. If necessary rotate the steering rack in its clamps to provide clearance.

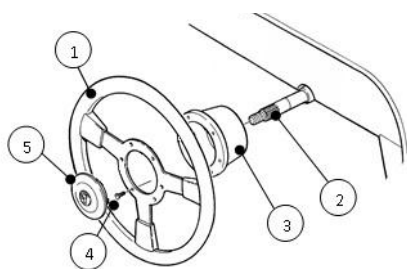
Tighten the steering rack clamps to 11 Nm. Ensure that the two bolts securing the steering column lock tube to the scuttle face are tight.

4.3) Steering wheel fitment

Two makes of steering wheel are available. Both the Motolita and the Momo wheel have a horn button mounted on the dashboard. Each steering wheel has a different type of mounting boss. It is recommended that the fitting of the steering wheel is left until the entire interior trim, including seats, has been completed.

4.3.1) Motolita

Figure 27: Steering Wheel - Motolita



- | | |
|--------------------|-----------------|
| 1. Steering wheel | 4. Fixing screw |
| 2. Steering column | 5. Wheel centre |
| 3. Mounting boss | |

(IVA pad omitted for clarity)

Release the steering lock and centre the road wheels to establish the straight ahead position. Fit the steering wheel over the steering column splines. Fit the washer and secure the steering wheel to the steering column using nyloc nut and tighten.

4.3.2) Momo

Loosely fit the mounting boss to the steering wheel using the 6 mm x 16 mm countersunk Allen bolts provided with the steering wheel. Centre the road wheels to establish the straight ahead position of the steering wheel. Place the steering wheel and boss over the splines in the straight ahead position. Remove the wheel and secure the boss to the column using nyloc nut and washer. Finally re-secure the wheel to the boss using the fixings provided.

4.3.3) Quick release column

The Quick Release (QR) column has a keyway in the QR boss and the steering wheel must be centred by removing the upper bolt on the lower steering column universal joint, withdrawing the column and then turning the steering wheel and column to the straight ahead position. Re-engage the column to the universal joint, re-insert the bolt and tighten the securing nyloc nut to 20 Nm.

Ensure that the steering wheel can be rotated smoothly with no tight spots. Tighten the steering rack clamp bolts and steering column universal joint bolts/nylocs to the torque figures specified in Table 11.

Table 11: Steering component torque figures

Location	Washers	Nut Torque
Steering rack clamps	Plain under nut	Nyloc 11 Nm
Universal joint	None	Nyloc 20 Nm
Column clamp	Spring and plain under bolt head	Bolt 14 Nm

4.4) Associated tasks

Whilst the pedal box lid is removed, fit the brake light switch harness and the clutch cable.

NOTE

Before refitting the pedal box lid, check that the pedal positions are acceptable and that the brake switch operates correctly. Adjust as necessary.

Refit the pedal box lid ensuring that the brake pipes and wiring harness are not trapped or kinked and that the 'P' clips are secured under the pedal box lid screws.

5.0) Front suspension

The following section covers the assembly and installation of all areas of the front suspension for your kit.

5.1) Preparation

It is recommended that the front wings are not fitted until the front suspension is assembled and the engine installed. This reduces the risk of damage to the wings and maintains easy access to the engine bay.

It is recommended that the steering rack is fitted before assembling the front suspension, refer to Section 4.

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, refer to Figure 28.

Apply a thin coat of copper grease to all fixings prior to fitment (avoid contaminating any threads where Loctite is to be used).

Figure 28: Bodywork protection



5.2) Lower wishbones

Warning

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

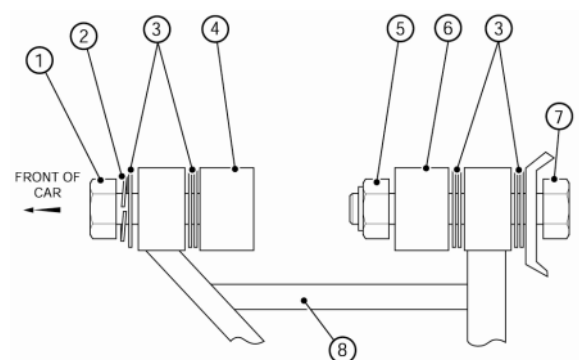
The lower wishbones are assembled with the longer leg forward and the bearing retaining circlip facing downward.

NOTE

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

Fit the rear leg of the lower wishbone through the slot in the bottom skin immediately behind the vertical chassis member. From fastener pack 30F015A, secure using bolt Item 1) and nut 7) and inserting four plain washers (9), two either side of the wishbone (refer to Figure 29).

Figure 29: Washer usage - lower wishbone (LH side)



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

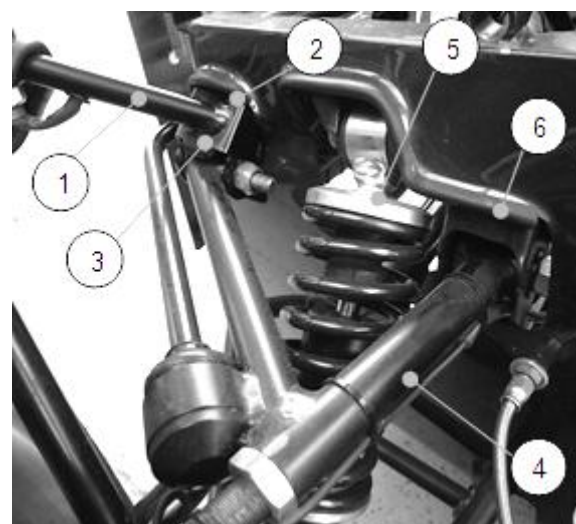
From fastener pack 30F015A, secure the front leg of the lower wishbone to the front of the chassis using bolt item (2), with washer (9) and spring washer (12) next to the bolt head. Two washers (9) are inserted between the wishbone and the chassis (refer to Figure 29).

5.3) Upper wishbones

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 10 mm ID x 1/2" OD x 35 mm (polythene bag marked 'front suspension') must be inserted into the rear bush. From fastener pack 30F015A, secure the rear leg of the upper wishbone to the rear mount using bolt item 3)

inserted from the front of the mounting. The spacer bush must be coated with copper slip. Loosely secure with a nut item 8) but do not tighten fixings (refer to fig 30).

Figure 30: Upper wishbone securing



- | | |
|-------------------------------|--------------------------------|
| 1. Headlight bracket | 4. Upper wishbone |
| 2. Headlight bracket mounting | 5. Spring damper unit mounting |
| 3. Upper wishbone front mount | 6. Upper wishbone rear mount |

Secure the front leg of the upper wishbone to the front mount using bolt item 4) and nut item 8). Prior to inserting the bolt the headlight bracket must be inserted over the chassis mount. Before fitting the headlight bracket, assemble the headlight assembly to the bracket - see page 109.

Ensure to fit a rubber grommet in the hole in the bracket before assembly.

Since access to the upper and lower wishbone mountings are restricted by other components installed later in the build process, the mounting fasteners must be fully tightened at this point. Hold the wishbones horizontal and tighten the upper wishbone mounting bolts/nuts to 34 Nm and the bottom wishbone to 81 Nm.

NOTE

Check that there is an equal amount of exposed threads between the locknut and ball joint, this should be adjusted to eight threads for normal road use

5.4) Spring/damper units

An aluminium damper sleeve 8mm id x 1/2" od x 32mm (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 the M8 cap head bolt supplied in the chassis, with a spring washer under the bolt head. This bolt should be torqued to 20 Nm.

NOTES

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

An aluminium spacer 8 mm 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 an M8 cap head 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 20 Nm.

NOTE

Do not tighten any other fixings at this stage

5.5) Upright attachment

Warning

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

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:

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 55 Nm.

Warning

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

The cycle wing stay locates on the upright. Remove and discard the 1/2" UNF nyloc nut and plain washer fitted to the inner end of the stub axle. Place cycle wing stay over the stub axle and secure using the 1/2" UNF nyloc, item 15) provided in Fastener Pack 30F015A. Do not tighten.

Pass the top wishbone ball-joint down through the top of the upright and through the wing stay. To fully engage the tapers of the wishbone and ball-joint, fit the M14 plain nut, item (6) from the fastener pack 30F015A, apply pressure to the top of the ball-joint and tighten the plain nut. Once the ball-joint is locked in place remove the plain nut and replace it with the nyloc supplied on the ball-joint. Tighten the nyloc nut to 54 Nm.

Tighten the inner stub axle/Wing Stay nut to 81 Nm and ensure that the upright turns freely on the wishbones.

Remove and retain the nyloc nut from the track rod end. Remove and discard the hard plastic boot protector from the track rod end taper and pass the tapered shaft down through the steering arm on the upright, secure with the nyloc nut. Tighten nyloc nut to 41 Nm.

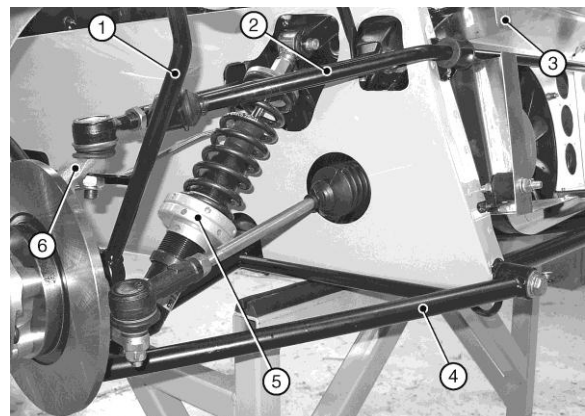
Figure 31: Front hub spacer



Fit one wheel spacer to each front hub and secure with two M4 x 6 countersunk screws

Your front suspension should now resemble that shown in Figure 32. (IVA covers not shown)

Figure 32: Front suspension



- | | |
|-------------------|--------------------------|
| 1. Cycle wingstay | 4. Lower wishbone |
| 2. Anti-roll bar | 5. Spring damper unit |
| 3. Inner radiator | 6. Upright assembly cowl |

5.6) Front anti-roll bar

Note

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

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.

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 the threads at each end of the anti-roll bar and fit the plastic balls, tighten using protected grips.

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 (13) to the bolts (5) and pass forward through the vertical chassis tubes and into the captive nuts on the mounting brackets. Tighten to 20 Nm.

The rubber boots are slid over the mounting cups 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.

NOTE

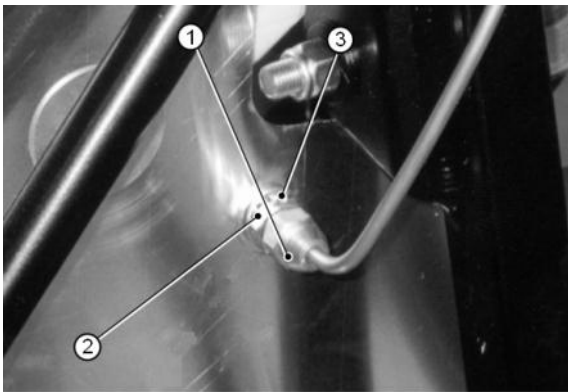
All connections should initially be made finger tight

5.7) Front brake hoses

Three stainless steel braided brake hoses are supplied, two of equal length for the front brakes and one of longer length for the rear brakes.

Refer to Figure 33 to fit the inner, threaded end of each front brake hose through the hole in the aluminium body from the outside. From fastener pack 30F015A fit plain washer item 11 on to the hose thread directly next to the outside of the aluminium body, and shake proof washer item 14 directly next to the inside of the aluminium body. Secure using the 3/8" nut supplied with the hose. Do not tighten.

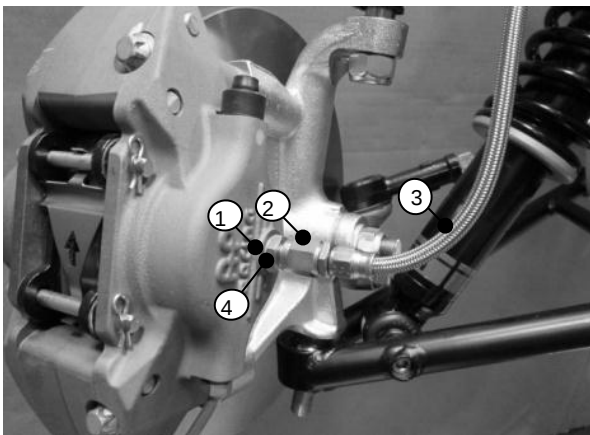
Figure 33: Brake pipe union



- 1. Female pipe union 3. Shakeproof washer
- 7. Nut

For the front brake calliper the braided brake hose has a female union at the calliper end, refer to Fig 34, and should be attached as follows:

Figure 34: Standard calliper



- 1. Copper washer 3. Braided brake hose
- 2. Female union 4. Adaptor

The braided hoses are supplied with an adaptor that screws into a threaded drilling inboard of the calliper body. The adaptor must be fitted with the tapered end outward (to provide the seal between the adaptor and the braided brake hose female union), and a copper washer between the adaptor and the brake calliper. Tighten the adaptor in the calliper to 25Nm. The female union on the braided hose screws directly to the adaptor. Torque to 9Nm. Do not over tighten.

Located on the inside of the body are the female unions, refer to Fig 33, on the end of the brake pipes from the brake master cylinder. Fix the female union to the braided brake hose connection and tighten to 19Nm. Tighten the locknut to 10Nm.

Turn the steering from lock to lock and ensure that the braided brake hoses do not foul on the suspension. If fouling is observed slacken the female union on the calliper and slightly twist the hose then retighten the female union to 9Nm. Re-check for hose foul.

5.8) Final tightening

All the remaining fixings should be tightened according to Table 12.

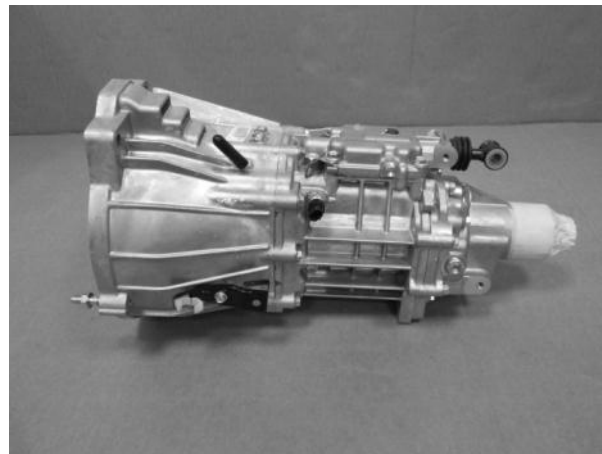
Table 12: Front suspension torque Figures

Location	Washer	Torque
Sub axle		81Nm
Damper to lower wishbone (lower fixing)	N/A	20Nm
Damper to chassis (top fixing)	Spring washer under bolt head	20Nm
Front anti-roll bar fixing	Spring under head	20Nm
Upright top ball-joint	None	54Nm
Upright – bottom	N/A	54Nm
Upper wishbone		34Nm
Lower wishbone front	Spring under head then plain as shown in Fig. 29.	81Nm
Lower wishbone rear	Plain spacers as shown in Fig. 29	81Nm

6.0) Fitment of gearbox to engine

6.1) 5 speed gearbox.

Figure 35: 5 speed gearbox



6.2) Fitting gearbox to engine

Fit 2 dowels into engine block for gearbox alignment; ensure spacer plate between engine and gearbox positioned onto dowels.

Figure 36: Gearbox spacer and dowels



Slide the gearbox into place on the rear of the engine. It may be necessary to rotate the gearbox assembly in order to line up the gearbox first motion shaft splines with the splines of the clutch plate.

Four fixings secure the bell-housing to the engine, two M10 x 50 x 1.25 pitch hex flange head bolts at the top and two M10 x 1.25 pitch hex flanged nuts either side.

Tighten to 63Nm

Fit bell-housing closing plate with two M6 x10 hex flange bolts, torque 10Nm

Fit clutch cable bracket with two M8 x 35 hex flange bolts, torque 23Nm

6.3) Starter motor

Install the starter motor into the front of the bell-housing and secure with 2 M8 x 50 hex flange bolts and M8 hex flange nuts; Fit the engine earth lead under the top starter nut, keeping the lead horizontal from the nut.

Tighten all starter motor and bell-housing the bolts to the torques specified in Table 13.

6.4) Extension housing

Figure 37: Gear change extension



Fit gearbox mount bracket to rear of gearbox with four M8 x 16 hex flange head bolts, torque to 23Nm.

Fit modified gear linkage assembly to the rear of gearbox using two M8 x 35 hex flange head bolts in the upper holes and two M8 x 35 button head bolts in the lower holes, torque to 23Nm.

Align gear change rod with link on gearbox and insert M8 x 45mm long-shank bolt. Fit spring washer and nut onto bolt. Torque to 23Nm.

Table 13: Gearbox torque figures

Fixing	Torque
Clutch cable bracket to bell-housing	23Nm
Gearbox rubber mounting to mounting bracket	50Nm
Engine to bell-housing	63Nm
Bell-housing closing plate	10Nm
Starter motor	23Nm
G/box mount bracket to G/box	23Nm

6.5) Alternator and starter harness

Figure 38: Starter Lead



Fit middle eyelet of harness to starter solenoid stud secure with M8 hex flange nut, torque to 10Nm, see fig. 38.

Fit eyelet on end of short cable to alternator stud and secure with M6 hex flange nut, torque to 10Nm

Connect the brown/red wire (covered with black convoluted insulation) from the chassis loom to the starter solenoid.

7.0) Installation of engine and gearbox

7.1) Engine

7.1.1) Preparation

The special tools detailed in Table 14 below will be required for this section.

Table 14: Special tools required for engine fitment.

Item	Description
Engine hoist and sling	SWL of 150 Kg (min)
Pop rivet pliers	
Hose clamp pliers	

7.1.1.1) Screen wash/wipe

NOTE

The bracket for the washer bottle must be fixed to the front of the RH side foot box before the engine is installed.

Remove the securing nut from the base of the washer jet and pass the washer jet through the hole in the centre of the scuttle and secure with the plastic securing nut. Fit the clear plastic tubing to the washer jet. Dip the end of the clear plastic tubing in hot water to soften in order to make fitting easier.

Route the clear washer tubing along the wiring loom behind the dashboard and attach using cable ties, to prevent it falling down into view. Pass it down through the large grommet in the top of the transmission tunnel and along the engine bay diagonal tube until in line with the washer bottle. Trim the tube to length and attach to the washer motor.

Connect the washer motor to the wiring loom via the two pin plug adjacent to the washer bottle mounting. To ease fitment of the two pin plug, the washer motor can be removed from the washer bottle, the two pin plug fitted and the washer motor reinserted into the washer bottle.

The windscreen wipers must not be fitted until the wiper motor has been run and allowed to park in order to prevent damage to the paintwork. Fit the wiper arms so that they are horizontal when parked. The wiper arms must move smoothly through their range of travel.

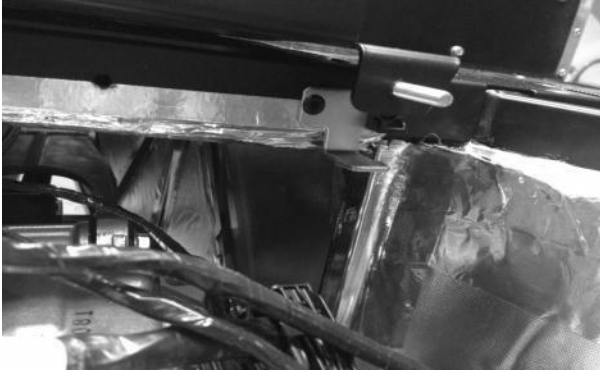
NOTE

A small amount of water splashed on the windscreen will prevent the wiper blades from juddering during test and adjustment.

7.1.1.2) Purge Valve

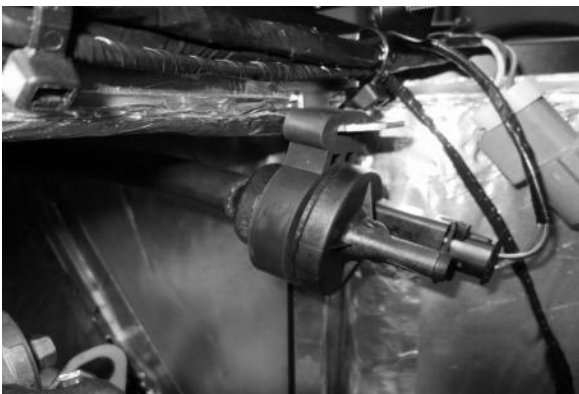
The purge valve bracket and purge valve are normally pre-fitted prior to delivery, if not then the following procedure applies.

Figure 39: Purge valve bracket



Fit purge valve bracket – aligning one hole in the bracket with pre-drilled hole in chassis and drilling one further 5/32" hole. Secure bracket using pop rivets, the left hand rivet passes through a tie wrap mounting clip for the electrical harness.

Figure 40: Purge valve mounting



Mount purge valve onto bracket (left hand side of tunnel), join purge plastic pipe to valve with a 120mm long piece of 5/16" fuel hose onto rear stub of the valve. Secure hose to valve with hose clamp.

7.1.1.3) Engine preparation

Remove the plastic plug from the gearbox tailshaft housing. Removal of this plug is not essential at this point; however, access is restricted within the confines of the transmission tunnel.

7.1.1.4) Compressor outlet pipe assembly

Figure 41: Compressor outlet pipe



Fit the air by-pass valve to the compressor outlet pipe secure with M6 x 25 hex flange head bolt, torque to 10Nm.

Figure 42: Compressor outlet assembly



Temporarily fit the compressor outlet pipe to the engine, secure with 2 x M6 x 25 cap head screws. Remove the 2 hose clamps from the 90 degree rubber hose and fit the 2 hose clamps to the new outlet hose, approximately 40mm from each end.

Discard the 90 degree hose. Fit the hose to the air by-pass valve and the air inlet pipe as shown in figure 42, move the hose clamp over the air by-pass valve stub. Remove the by-pass hose/compressor outlet assembly from the engine. Fit a length of vacuum hose (440mm long) to the air by-pass valve, secure with clamp.

It is possible that the compressor outlet has been assembled ready for fitting

(This assembly is to be refitted when engine is in the car).

7.1.2) Chassis preparation

Protect the appearance of the engine bay chassis tubes and pedal box sides and edges by covering with card and/or masking tape.

Ensure that all wires and connector plugs are secured and will not snag or catch the engine/gearbox as it is lowered.

NOTE

Before fitting engine mounting rubber blocks, ensure that the large threaded (1/2" UNF) boss in the centre is clear of rubber and that the bolt will thread in cleanly.

Fit the 2 engine mounting rubber blocks, one on each side of the engine bay. The two bolts (fastener pack 30P012A Item 3) and plain washer (12) are passed

downwards through each mounting, through the chassis and are secured with nyloc nuts (9) and plain washers (12). Do not tighten.

Locate the twin electric horns on the two studs near the rear edge of the steering rack platform. Before fitting the horns, loosen the M8 nut in the centre of each horn, this will allow rotation of the horns so that the electrical connections are closer together.

Secure the horns with the nyloc nuts (fastener pack 30P012A item 10) and ensure that it is not possible for the horns to come into contact with each other, the steering rack, or other components in the engine bay refer to Figure 43.

Figure 43: Horn location



Tighten the M8 nut in the centre of each horn and connect the horns to the electrical harness by the purple and yellow wires and connectors located above the horns on the front upper cross member.

7.1.3) Installation of engine/gearbox into chassis

Warnings

- 1. Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.**
- 2. Use appropriate eye protection whilst working under the car.**
- 3. Care should be taken while lowering the engine into the chassis to avoid any damage to engine component or wiring.**

Using the lifting hoist and sling detailed in Table 14, attach the engine/gearbox using the lifting eyes provided on the engine, lower the engine/gearbox assembly into the engine bay at an angle of between 30-40° (with the engine higher than the gearbox). Insert the gearbox assembly into the transmission tunnel.

Figure 44: Engine fit



Continue to slide the engine/gearbox rearward adjusting the angle until the engine/gearbox is level and the gearbox tailshaft is above the mounting cross member.

Lower the engine onto the rubber engine mountings and pass the bolts (fastener pack 30P012A Item 1 (LHS) and 21 (RHS)) down through the tube on the outer end of the engine mounting brackets. Screw the bolts loosely into the threaded bush in the centre of the rubber engine mounting. It is recommended that the engine is not removed from the hoist until all the bolts have been tightened.

Figure 45: Gearbox mount



The gearbox rubber mount can only be fitted once the engine and gearbox are in the car.

Raise the gearbox tailshaft housing and position the gearbox mount on the cross member, with the chamfered edge forwards, align with the gearbox mount

bracket and fit the M10 x 25 hex flange head bolt.

Bolt the gearbox mounting rubber to the chassis using bolts (fastener pack 30P012A Item 4) passed down through the outer metal part of the rubber mounting and then through the elongated holes in the chassis. Secure with a plain washer and nyloc nut on each bolt.

Finally tighten all the fixings as detailed in Table 15.

Table 15: Engine and gearbox installation torque figures

Fixing	Torque
Gearbox mounting to bracket	50Nm
Engine mounting to mounting rubbers	41Nm
Engine mounting rubbers to chassis	20Nm
Gearbox mounting rubber to chassis	20Nm

NOTE

1. It is now safe to remove the engine hoist.

7.2) Gearbox

Fit gearbox breather hose to stub on the gearbox top secure with hose clamp, include hose in tie wrap with purge hose at clip assembly with engine wiring harness.

Figure 46: Gearbox breather (1)

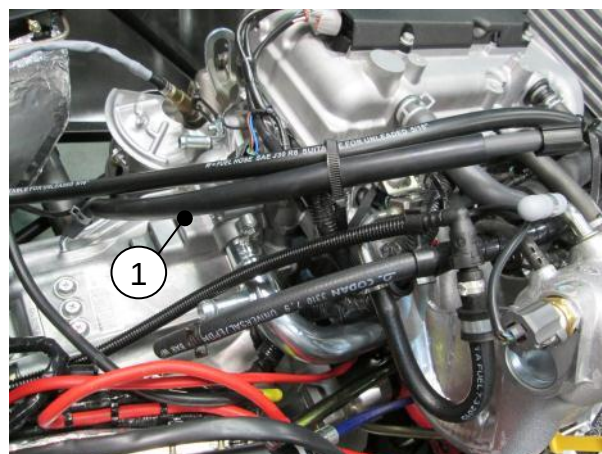


Figure 47: Gear lever



Figure 48: Gear lever installed



Fit the gear lever to the top of gearbox tailshaft housing by aligning plastic end cap with gear change rod and gear lever slots with pins in tail housing, push down gear lever gently into housing (lever

biased towards the rear). Align slots in gear lever retaining cap with the pins, then push down to stop, then twist cap clockwise to stop and release.

From the cockpit, insert the large grommet (polythene bag) to cover the access hole in the transmission tunnel.

7.3) Electrical connections

NOTES

1. *The battery bracket and battery are normally fitted to the chassis at the factory (but battery left un-connected).*

2. *Wiring – Every effort is made to clearly explain and identify all the electrical connections as you go through this section; however, the loom fitted to your car may have additional wires and connectors that are not required on your vehicle. To help clarify this, a wiring diagram can be found in the electrical section.*

The engine wiring loom is already attached to the engine and some ancillaries, however it is necessary to link the engine wiring loom to the remaining ancillaries and the vehicle wiring loom. All the plastic connecting plugs are matched pairs so it is not possible to connect them incorrectly.

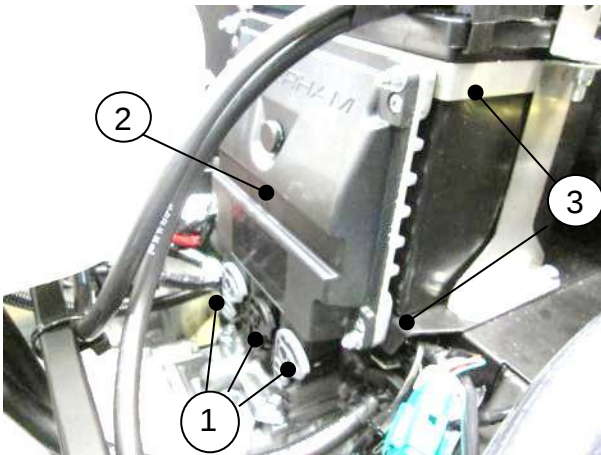
Figure 49: Wiring harness route



The three multi-pin plugs from the rear of the engine loom are for the exhaust mounted lambda probe, purge valve and the throttle mass air flow unit. Route the harness along the top of the tunnel, securing with cable ties, include the reverse switch cable and the earth lead from the main harness in the cable ties. Connect the 2 pin plug to the purge valve. The other two cannot be fitted until their relevant items are fitted.

Connect the reverse lead plug to the gearbox switch.

Figure 50: Battery and ECU



1. Multi-pin plugs
2. ECU
3. Battery bracket

Fit the ECU onto the four studs on the front of the battery bracket and tray using four M5 washers and M5 nyloc nuts, torque to 3Nm.

It is possible that the battery and the ECU have been fitted.

Attach the three multi-pin plugs to their respective sockets on the Engine Control Unit (ECU). Make the connections and ensure that the retaining clips are pushed fully home, refer to Figure 50.

Connect the black battery earth cable to the chassis earth point, including the earth lead from the main harness.

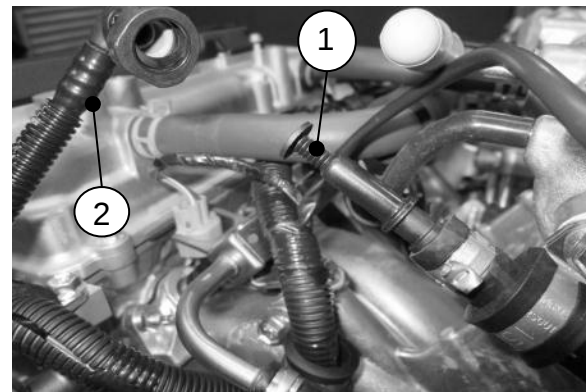
NOTE

Make sure the leads are not touching to any surrounding metal component.

7.4) Fuel system

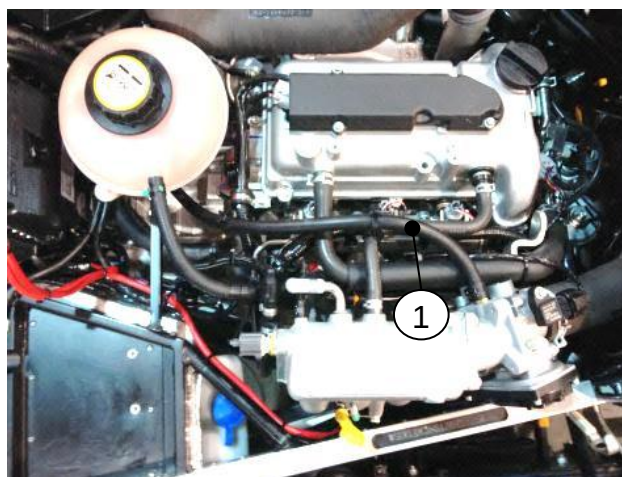
The black, corrugated, plastic, high pressure fuel pipe from the fuel pump emerges from the transmission tunnel and fits on to the rear of the fuel rail. Once connected the pipe cannot be removed without a special tool so ensure the pipe is kink free and routed away from possible snags or chafe points before assembly. Note that there is no fuel return pipe with this system. To fit the pipe, refer to Fig 51 and remove the transport plug from the end of the fuel pipe connector. Push the connection on the fuel pipe firmly onto the fuel rail connection and check it is securely attached. Secure the pipe with cable ties if necessary.

Figure 51: Fuel pipe connection



1. Fuel rail connection
2. Fuel pipe (from pump)

Figure 52: Purge hose



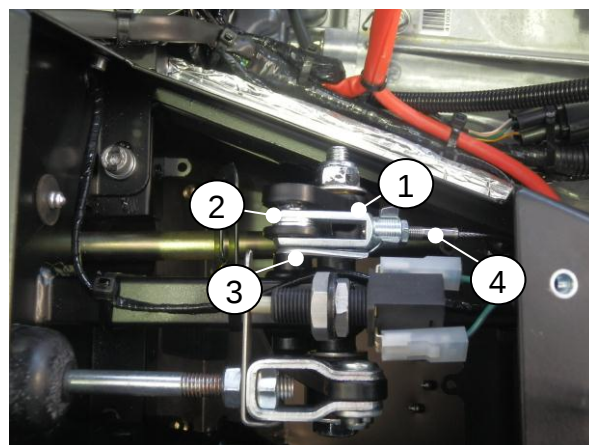
1. Purge Hose

Cut a length of 5/16" fuel hose to 680mm long, route from throttle body adaptor to the purge valve. Secure with hose clamps and tie to wiring harness and breather pipe with clips and cable ties

7.5) Clutch cable

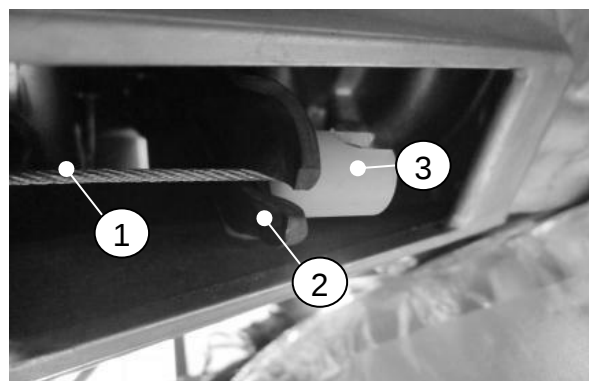
Remove the clevis from the pedal end of the clutch cable, pass the cable through the tube in the front of the pedal box, ensuring that the plastic ferrule is seated correctly in the tube. Refit the clevis to the inner cable, screw on until inner cable thread is level with inside of the clevis. Fit clevis onto the thin web of the clutch pedal using two plain 1/4" washers from the 'Miscellaneous' bag to reduce the gap. Apply a small amount of grease to the pin and secure clevis with the pin and retention clip. Tighten the inner cable lock nut against the clevis.

Figure 53: Clutch cable connection



1. Clevis
2. Two plain washers
3. Pin & retainer
4. Clutch cable

Figure 54: Clutch release arm



1. Cable inner
2. Release arm
3. Plastic ferrule

Route the cable under the inlet manifold, curve round and fit into the clutch bracket. Ensure plastic ferrule is seated correctly. Back-off the cable adjuster nuts, apply a small amount of grease onto release arm then fit the inner cable into the clutch release arm as per photo (figure54). Fit plastic cover onto gearbox housing to cover release arm.

Adjust outer cable nuts to set pedal height, clutch pedal to be level to 10mm below brake pedal. Check operation when engine is running.

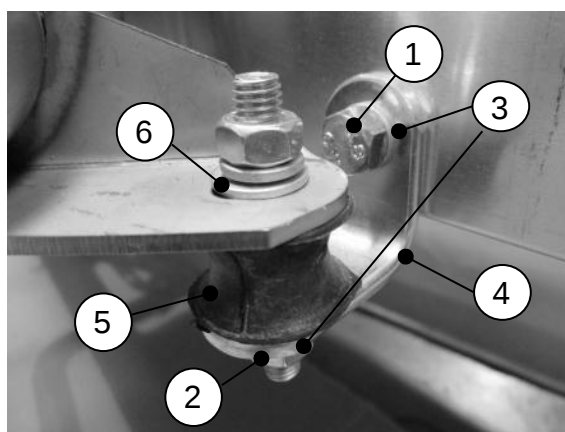
Lock both outer cable nuts together at each end of cable; take care not to change the clutch adjustment.

7.6) Exhaust systems

The standard exhaust system consists of a collector assembly which also incorporates the catalytic converter and a one piece silencer and tail pipe.

Refer to Figure 55. Bolt the two exhaust mounting brackets (polythene bag marked 'exhaust') to the LH side of the car using Setscrew item 1 and Spring Washer item 3 from fastener pack 30X020A. Secure the Bobbins to the brackets using Nut item 2 and Spring Washer item 3.

Figure 55: Exhaust mounting



- | | |
|------------------|-----------------|
| 1. Setscrew | 4. Bracket |
| 2. Nut | 5. Bobbin |
| 3. Spring washer | 6. Plain washer |

Figure 56: Catalyst downpipe



Loose fit catalyst downpipe and gasket to the turbo outlet flange using two black flange head bolts M8 x 58 and two M8 flange nuts, tighten the bolts and nuts finger tight and then in an alternating pattern before final torque to 24Nm.

Fit the Lambda probe into the threaded hole in the catalyst, torque to 45Nm and connect the probe plug to the corresponding socket from the engine wiring loom. Secure the Lambda probe connection and wiring to the chassis, ensuring that it cannot contact the hot exhaust or any moving part.

Figure 57: Catalyst heat shield



1. Heat shield
2. M6 Screws

Fit catalyst top heat shield with two M6 x10 flange head screws and tighten to torque ref Table 10.

Undo the large worm drive clips and feed them through the channels on the inside of the silencer guard. Fit the silencer guard to the silencer body and tighten the clips. Ensure that the clip drives are not at the bottom of the silencer where they could contact the road.

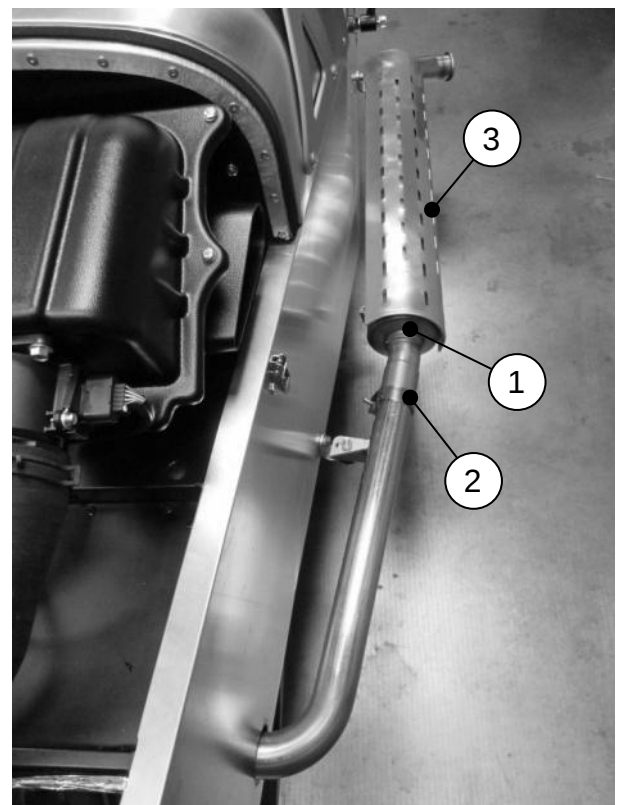
NOTES

For a neater appearance position the clips with the drive screw towards the ground so that the clip 'tail' is out of sight beneath the exhaust.

Loosely fit an exhaust clamp to the silencer inlet then slide the primary pipe

into the silencer, do not tighten clamp. Pass the primary pipe through the hole in the body side, loosely fit the exhaust clamp then connect to the downpipe, at the same time, position the primary pipe and silencer onto the mounts. Ensure pipe and silencer are sufficiently engaged together, and then fit the M8 nuts (2), spring washers (3) and flat washers M8 x 16 OD to the mounts. Tighten clamps and mount fixings, ensuring that the mounts are not in a stressed state. It may be necessary to reposition the guard slightly.

Figure 58: Exhaust arrangement

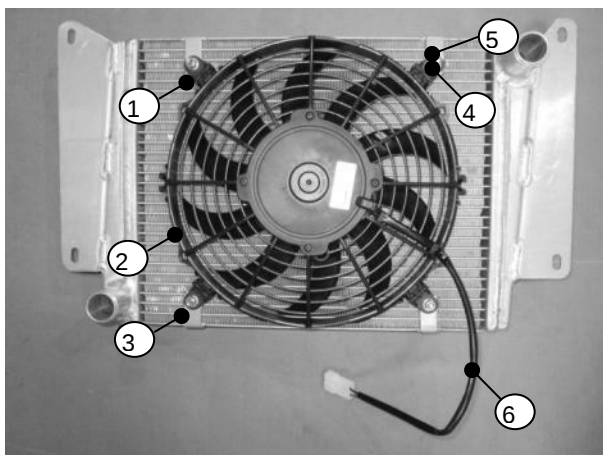


1. Silencer
8. Exhaust clamp
9. Silencer heat shield

7.7) Cooling system

Use torque settings in Table 10. Ref Fig 59 fit the four fan legs (polythene bag marked 'cooling') to the cooling fan. Locate the fan legs, onto the captive studs and secure using M6 flat washers and M6 half nyloc nuts, ensuring the fan electrical connector is located on the lower RH side.

Figure 59: Radiator/fan prior to fitting

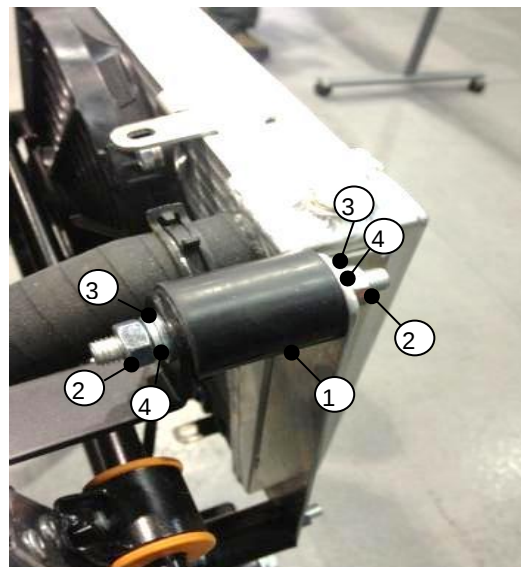


- | | |
|------------------|-------------------------|
| 1. Fan legs | 4. Flat washers |
| 2. Cooling fan | 5. Half Nyloc nuts |
| 3. Captive studs | 6. Electrical connector |

Ref Fig 60 and fit the four rubber radiator bobbins to the front of the chassis, secure using nuts, plain washers and spring washers provided in the cooling pack. Mount the radiator to the bobbins using four M8 nuts, M8 spring and flat washers provided in fastener pack. Locate the two-pin plug, containing the black/green and black wires, situated on the upper front diagonal chassis member. Connect the two-pin plug to the cooling fan electrical

connector. Secure the cable to the chassis members using cable ties.

Figure 60: Radiator mounts



- | | |
|--------------------|-------------------|
| 1. Radiator bobbin | 3. Flat washers |
| 2. Nuts | 4. Spring washers |

Figure 61: Coolant RH Inlet hose



Fit hose between main water pipe on engine and radiator, secure with clamps.

Figure 62: Coolant LH outlet hose

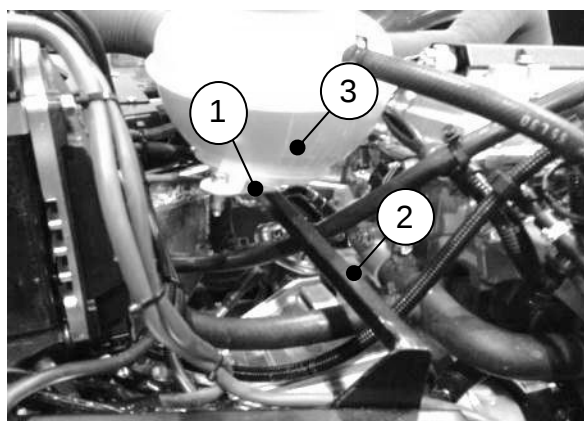


Fit hose between engine water pump and radiator, secure with clamps.

Fit the expansion bottle mounting bracket support to the chassis, immediately behind the engine, refer to Fig 63, and secure using four M5 x 12 hex flange bolts. Tighten to 7Nm.

Fit the expansion bottle mounting bracket on the top of the support, refer to Fig 63, and secure using M8 x 55 hex flange head bolt, plain washer and nyloc nut. Tighten to 23Nm.

Figure 63: Coolant expansion bottle and mounting bracket

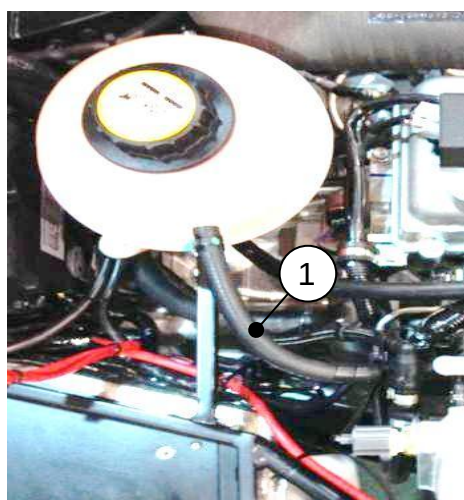


1. Expansion bottle mounting bracket
2. Expansion bottle mounting bracket support
3. Expansion bottle

The round coolant expansion bottle sits on the mounting bracket and is secured using an M6 x 20 setscrew, plain washer and Nyloc nut, torque to 11Nm.

Refer to Fig 64 for correct orientation of the expansion bottle hose connection.

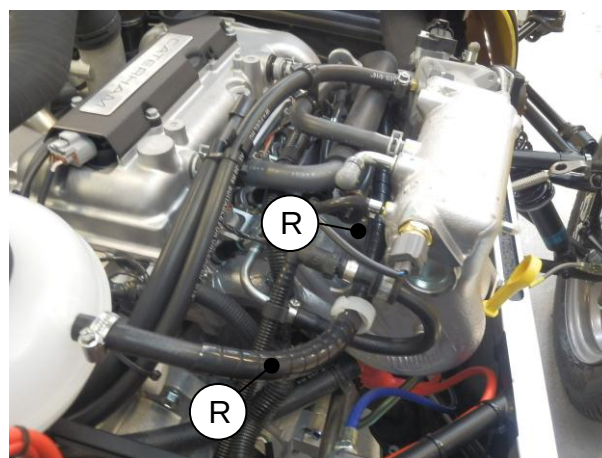
Figure 64: Expansion bottle orientation



1. Expansion bottle hose

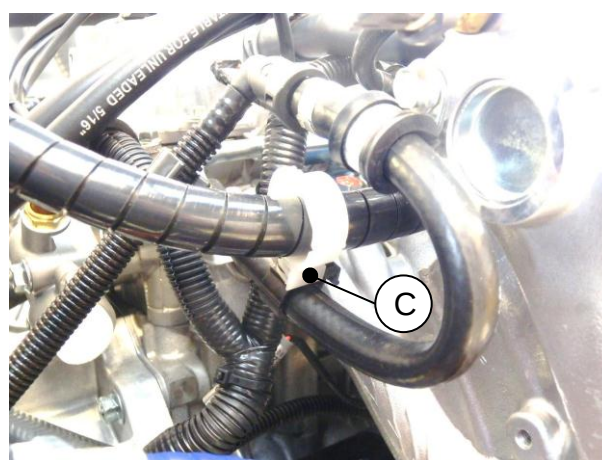
7.7.1) Water bleed hoses

Figure 65: De-gas hose route (R)



Route the de-gas hose between the fuel feed hose and fuel rail, and along the inner curve of the intake manifold.

Figure 66: De-gas hose clipping (C)



Fit together the hose clips for diameters 16-18mm and 10-12mm. Fit clip assembly so that the 16-18 end is attached to the de-gas hose and the 10-12 end is attached to the uncovered section of the fuel pipe just behind the quick connector.

Figure 67: Throttle by-pass hose



Fit double 'c' between hose and chassis rail as per figure 67

7.7.2) Heater and associated hoses

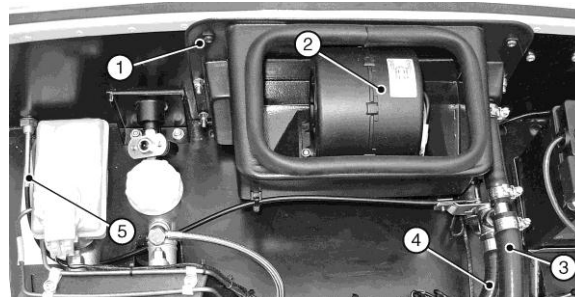
Remove and retain the four screws, nyloc nuts and washers and the two washer plates securing the diffuser panel to the heater. Position the diffuser panel on the inside surface of the scuttle, with the air vents facing down and insert the four screws from the inside. Pass the heater harness through the large hole in the scuttle panel and locate the heater over the screws, secure with the washer plates, nyloc nuts, washers and two additional screws from the fastener pack, refer to Fig 68. Connect the heater harness connector heater to the matching plug, located under the dashboard.

NOTE

Cars not fitted with a heater will be supplied with a blanking plate. Apply a

small amount of silicon sealant around the edge of the plate to seal it.

Figure 68: Heater installation

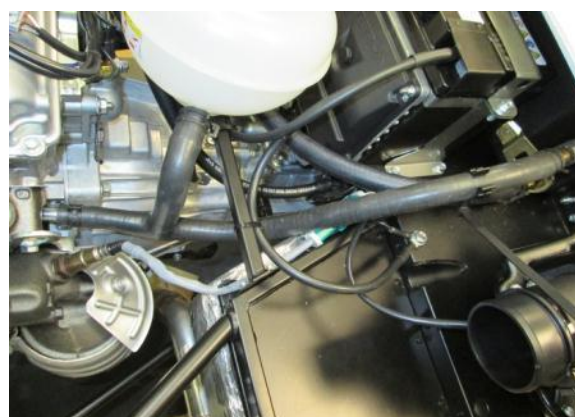


- | | |
|----------------------|-------------------------|
| 1. Washer plate | 4. Heater outlet hose |
| 2. Heater | 5. Heater control cable |
| 3. Heater inlet hose | |

Heater hoses are supplied as one pre-formed 'T' piece and one straight length. Rubber lubricant can be used to assist fitment of hoses.

Before fitting any hoses remove the bungs from the ends of the heater pipes.

Figure 69: Preformed heater hose route



Fit the short end of the preformed hose to the engine inlet, near to the exhaust downpipe, then the formed bend onto the header tank. Route the long straight end

under the header tank bracket support and fit onto the top heater valve outlet. Secure hose ends with clamps provided.

Cut a 240 mm length of hose from the straight length and cut this into two 120 mm pieces. Use the 120 mm pieces to connect the heater inlet and outlet to the heater valve.

Figure 70: Heater hose > main water pipe



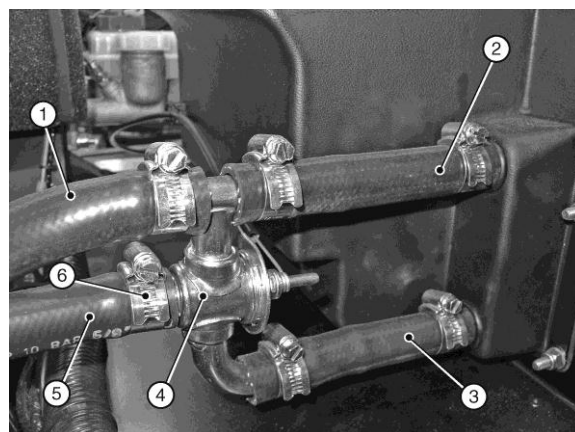
Use the other cut length of heater hose (500mm long) to go between the main water pipe and the lower heater valve inlet.

Ensure that the hoses are routed to avoid chafing, use cable ties as necessary.

NOTE

On cars where no heater is fitted the preformed hose long straight is connected to the main water pipe.

Figure 71: Heater valve arrangement



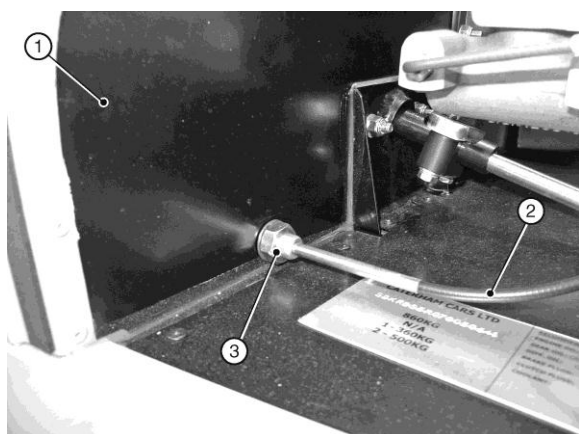
- | | |
|----------------------|-----------------------|
| 1. Hose to large 'T' | 4. Heater valve |
| 2. Heater outlet | 5. Hose to Water Rail |
| 3. Heater inlet | 6. Hose clip(s) |

Remove and retain the locknut and washer from the heater control cable and pass it from inside the cockpit, through the hole in the front face of the scuttle, refer to Figs 72 and 73. Secure the cable in place using the locknut and washer provided.

Figure 72: Heater control location



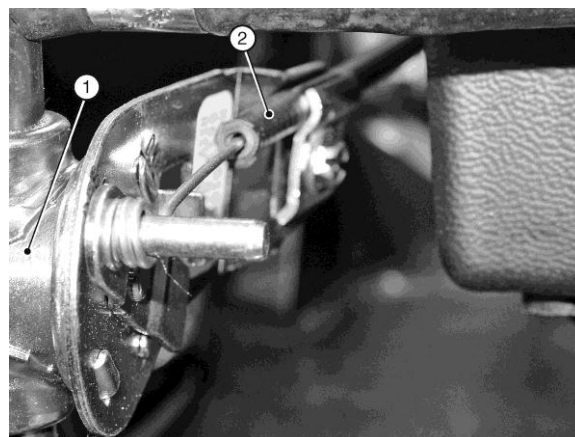
Figure 73: Heater control cable



1. Scuttle panel
2. Heater control cable
3. Locknut

Connect the other end to the heater control valve by sliding the eyelet on the inner cable over the peg on the heater valve operating arm, then slide the outer cable under the adjacent clamp and tighten the screw to secure in place, refer to Figure 74. Ensure that the valve travels through its full range when operated from inside the car. This can be adjusted by slackening the clamp that locates the outer cable to the valve and sliding the cable one way or another.

Figure 74: Heater control cable attachment



1. Heater valve
2. Heater control cable

Warning

Due consideration should be given to the highly flammable nature of petroleum or alcohol based products and their vapours. Serious burns can result from incorrect use.

Fill the cooling system with a 50% antifreeze solution (refer to Owner's Handbook for Caterham recommended coolant). Add the coolant solution to the expansion bottle.

Ensure that the heater valve is in the fully open position (control knob pulled towards the driver).

7.8) Air inlet system

The airbox is mounted on three rubber bobbins secured to the heater tray panel. Use torque settings in Table 10.

From the Airbox pack, screw the 3 rubber mounts into the threaded fixing in the heater tray, then position the air filter lower housing onto the mounts, secure with 3 large flat washers, spring washers and M5 nuts. Place the air filter element into the lower housing.

To mount the mass air flow meter, open up the large round hole in the airbox top housing to allow the mass air flow meter to sit against the housing (observe air direction arrow on meter). Use the mass air flow meter as a template – mark the 2 fixing positions on the airbox top housing, see figure 75 for position of holes, then drill two 6.5mm diameter holes. Secure the mass air flow meter into the airbox top housing with two M6 x 20 hex flange head bolts, flat washers and nyloc nuts on the inside of the airbox housing.

Figure 75: Mass air flow meter mounting



Fit the air filter then the top housing, secure with six M5 x 30 pan head screws with flat washers.

Figure 76: Compressor outlet pipe assembly

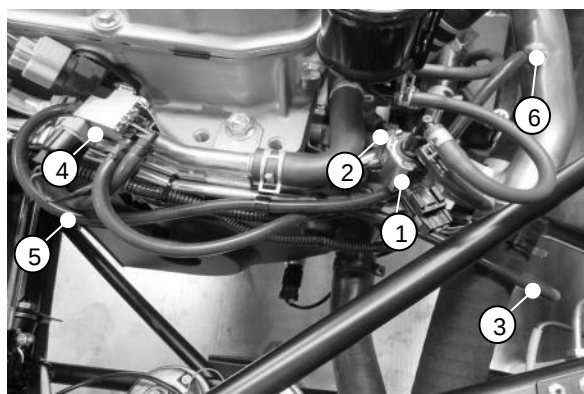


Figure 77: Compressor outlet



Fit the compressor outlet pipe assembly to the engine, ensuring that the gasket is aligned and fitted between the pipe flange and the compressor. Secure with the two M6 x 25 cap head screws, spring and flat washers already fitted to the engine and torque to 10Nm. Fit hose onto compressor stub, then move clamp to secure hose to compressor outlet.

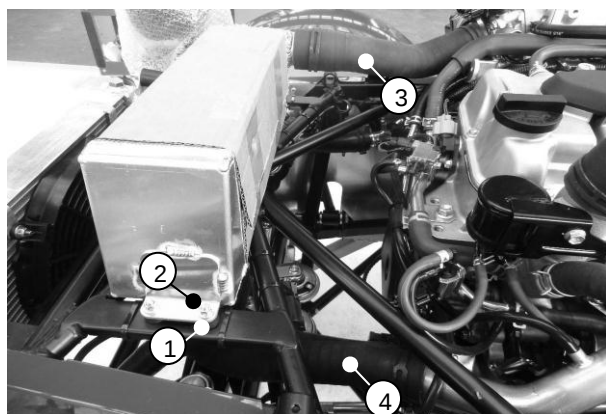
Figure 78: Vacuum hose connections



- | | |
|-----------------------|---------------------------|
| 1. Vacuum solenoid | 4. RH solenoid |
| 2. Water pipe lug | 5. RH solenoid hose |
| 3. By-pass valve hose | 6. Compressor outlet port |

Fit the loose vacuum solenoid (connected to engine by hoses) to the water pipe lug at LH front of engine using M5 hex nut supplied. Connect the vacuum hose from the By-pass valve on to the right hand solenoid (free port), and the vacuum hose from the right hand solenoid to the port on the compressor outlet pipe. Secure with spring hose clamps.

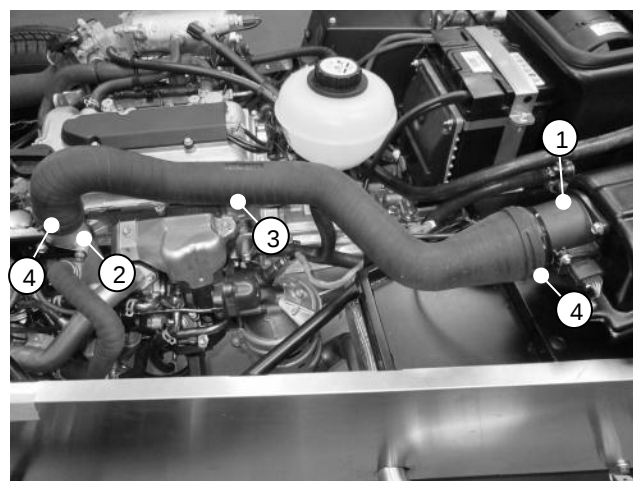
Figure 79: Intercooler



- | | |
|---|----------------------------|
| 1. Rubber mounts | 3. Upper intercooler hose. |
| 2. Plain nuts, plain washers and spring washers | 4. Lower intercooler hose. |

From the Airbox pack, fit the 4 short rubber mounts to the intercooler with 4 x M5 plain nuts, spring and flat washers. Fit the intercooler to the chassis and secure with 4 x M5 plain nuts with spring and large flat washers. Torque all nuts to 5Nm. Fit the top intercooler hose between throttle body and intercooler, secure hose with spring clamps. Fit the lower 90 degree intercooler hose between the compressor outlet pipe and the intercooler. Secure with spring clamps.

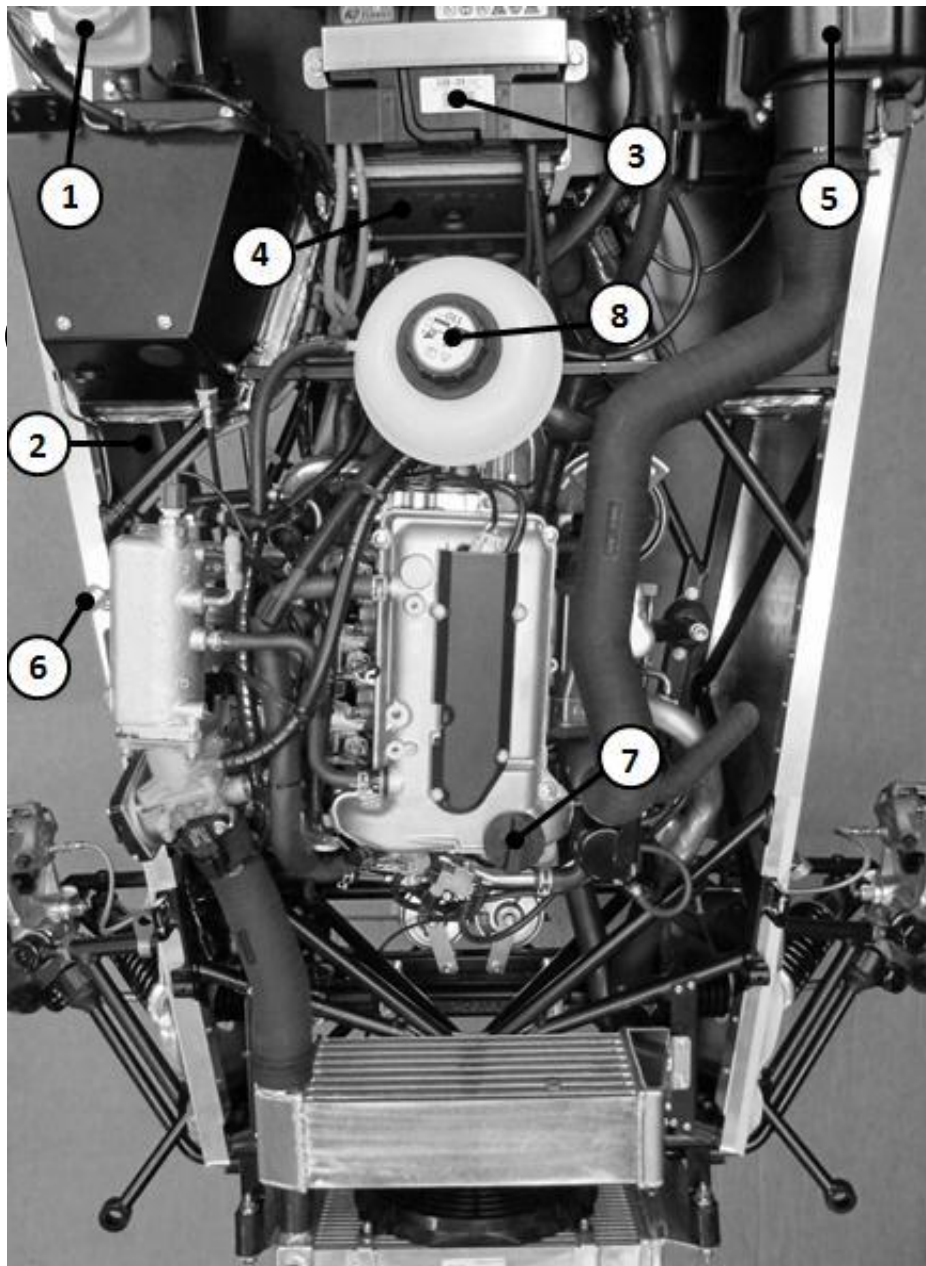
Figure 80: Air intake and trunking



- | | |
|----------------|----------------|
| 1. Air filter | 3. Hose |
| 2. Turbo inlet | 4. Hose clamps |

Fit the long hose between the air filter housing and turbo inlet and secure with spring hose clamps.

Figure 81: Suzuki engine bay overview



1. Brake Fluid Reservoir

5. Air Box

2. Windscreen Washer Fluid

6. Dip stick

3. Battery

7. Engine Oil Filler Cap

4. ECU

8. Coolant Filler Cap

8.0) Installation of the differential

Place the axle casing on the work bench with the differential aperture upwards. Ensure mating faces are clean and free from defects. Coat one mating surface with recommended gasket sealer. Lower the differential into position and ensure mating faces are touching and secure with eight M8 x 23 hex head bolt/washers with blue patch lock from rear suspension pack. Tighten fixings in a circular pattern, final torque to 23Nm

Figure 82: Differential into axle



Position rubber disc valve onto breather spigot top then the spring and then position the cap over the spring/rubber disc onto the spigot, lightly tap cap onto spigot until indents in cap align with groove on spigot. Ensure cap is free to rotate and move a small amount up and down and will not come off the spigot.

Figure 83: Axle breather



Fit drain and level plugs with their sealing washers

9.0) Rear suspension

Note: Fit the roll over bar (17.0) and handbrake lever & cables (9.6.6) before starting the rear suspension.

Warnings

- 1. Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.**
- 2. Use appropriate eye protection whilst working under the car.**
- 3. Both imperial and metric threads are used on the brake pipes and hoses. To aid recognition, a small notch is machined into the hexagon of the metric unions on the pipes.**

The following section covers the rear suspension assembly of your Caterham.

9.1) General

Copper grease should be applied to all fixings prior to assembly (excluding brake pipe nuts and items secured with Loctite).

9.2) Preparation

It is recommended that the lower chassis tubes and wiring that will be under the rear axle are protected with thick card secured in place.

9.3) Assembly of the rear suspension

Fit propshaft into gearbox, then rest onto the rear cross member.

Fit axle into chassis from the left hand side, be careful when passing over chassis and wiring.

Connect propshaft to differential using four M8 x 22 hex head bolt with attached spring washers, torque to 23Nm.

Fit Panhard rod into chassis clevis, secure in place with M12 x 55 hex head bolt (fastener pack 3GZ1141B) and M12 washer. Do not fully tighten until final adjustment section later. Do not fit panhard rod to axle until after diff fill (9.6.10).

9.4) Rear spring/damper assemblies

From the Suspension bag fit a 34mm long x 10mm ID x 12.7mm OD sleeve into the top and bottom bushes of the damper unit (close coils of spring are at the top). Align the top bush with the top mounting and insert the top mounting bolt (2) through the access holes provided in the seat back panel.

Do not fully tighten until the final adjustment section later.

The lower spring/damper mounting is secured to the boss welded to the underside of the axle. Pass hex head bolt M10 x 130mm through the boss, then fit M10 x 30mm OD snubber washer, the spring/damper unit and another snubber washer. Secure with an M10 Nyloc nut.

Do not fully tighten until the final adjustment section later.

Figure 84: Rear damper to axle



Fit the rear end of the radius arm between the brackets on the top of the axle using hex head bolt M12 x 65 and M12 washer, passed from inside to out, secure using a M12 nyloc nut and M12 washer. Do not fully tighten until the final adjustment section later.

Figure 86: Radius arm fixing detail



9.5) Radius arms

9.5.1 Upper radius arms

From the Suspension bag fit a 34mm x 10mm ID x 12mm OD sleeve to the front bush of the top radius arm. Fit the top radius arms to the middle chassis bush. The arms are fitted using M10 x 70 mm cap head bolts passed from the inside of the cockpit through an M10 x 21mm OD washer, then the radius arm and a M10 x 30mm OD snubber washer secured with nyloc nut.

Do not fully tighten until the final adjustment section later.

Figure 85: Upper radius arm front fixing



9.5.2 Lower radius arms

Fit lower radius arm to chassis using hex head bolt M12 x 90 and large diameter washer inserted from outside, secure with M12 nyloc nut and M12 washer. Radius arm secured to axle as per upper arm.

Do not fully tighten until the final adjustment section later.

9.6) Axle completion

9.6.1) Half shaft oil seal fitting

Insert oil seal protector into end of axle, concave side outwards, as far as possible.

Figure 87: Axle seal protector



Insert oil seal into end of axle, steel to outside, use suitable sized tool - knock seal into recess until fully in against oil seal protector

Figure 88: Axle oil seal



9.6.2 Half shaft fitting

Apply a small amount of grease onto the seal lip. Slide half shafts into axle; align splines by turning shaft a small amount. Half shafts identified by R (right hand shaft) or L stamped in outer edge of brake back plate. Align bearing with end of axle and the gently tap end of half shaft to insert bearing into end of axle, taking care not to hit wheel studs. Position brake wheel cylinder to top and secure each

back plate/half shaft to axle with 4 M8 x 15 hex flange head 10 grade bolts and torque to 23Nm. Slide on the brake drums over the brake shoes, aligning with the wheel studs until located on centre spigot.

9.6.3). Fitting of rear brake pipes and hose

Fit the brake hose adaptor into the right hand side rear brake cylinder, concave end (M10 thread) into the lower cylinder port. Torque to 10Nm

Figure 89: RH rear brake cylinder



1. Brake hose adaptor

NOTES

1. The rigid brake pipe may need slight realignment.
2. Sharp kinks must not be created.

Fit the rigid brake pipe between brake wheel cylinders, top port on RH and lower port on LH. Larger bends to right hand side. Torque to 10Nm

Figure 90: Axle brake pipe



Secure to axle with plastic pipe clips, insert grommet into axle top hat brackets x 3 then tap clip down into the grommet. Push pipe into clips

Figure 91: Brake pipe > axle clips



9.6.4) Rear brake hose

NOTE

All connections should initially be made finger tight.

Fit the rear brake bulkhead connector into chassis cross member and secure with plain nut. Torque nut to 10Nm. Fit female brake pipe nut to bulkhead connector, tighten to 10Nm.

The rear braided hose can now be fitted. Connect the 90 degree brake hose end to the bulkhead connector and the straight

fitting to the brake wheel cylinder. Tighten both ends to 10Nm.

9.6.5) Wheel speed sensors

Remove the metal and plastic brackets from the wheel speed sensor wires, as shown in figure 92, by prising open the clamped end. **Care must be taken not to damage the sensor wiring.**

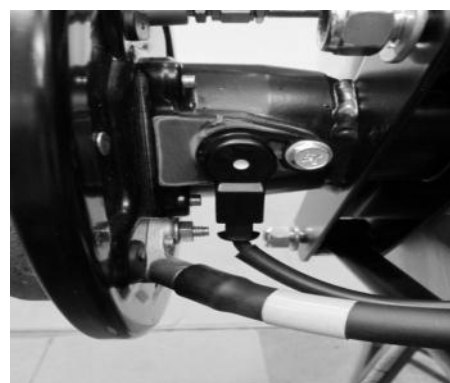
It is possible that the clamps may be already removed

Figure 92: Sensor bracket removal



Fit the 2 wheel speed sensors with the wiring pointing downwards (the sensors are handed), secure using M6 x 15 hex flange screw, tighten to 10Nm.

Figure 93: Speed sensor



Route wiring cable along lower radius arms ensuring a loop is formed onto the radius arm as figure 94. Secure to radius arms with tie wraps – loop onto chassis then tie wrap to chassis as figure 95. Connect sensors to main wiring harness.

Figure 94: Sensor cable route

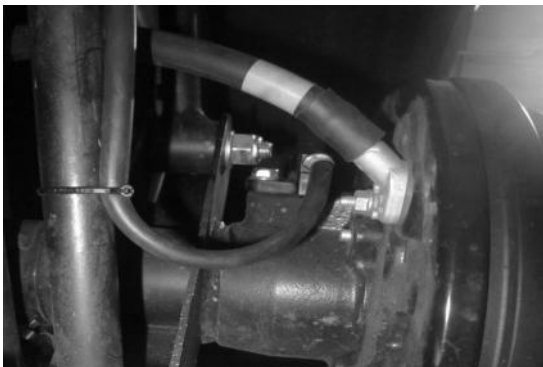


Figure 95: Sensor cable securing



9.6.6) Handbrake mechanism

Warnings

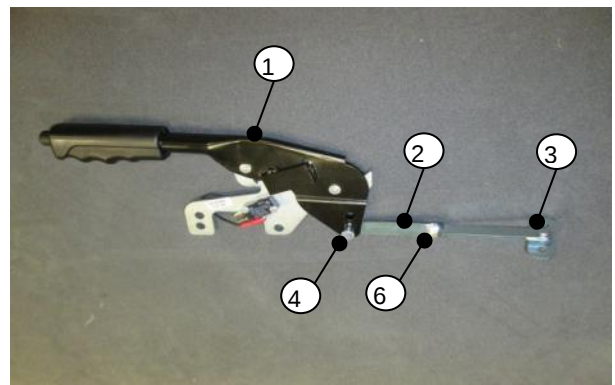
- 1. Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.**
- 2. Use appropriate eye protection whilst working under the car.**

Note: The handbrake lever mechanism should be installed before the propshaft and rear axle.

From fastener pack 30P012A secure the handbrake assembly to the chassis using screws Item 4) and nyloc nuts 9). There are two holes at the front of the handbrake lever assembly – use the lower hole to secure the lever into the chassis.

Connect the electrical spade connector to the switch on the handbrake.

Figure 96: Handbrake assembly



1. Handbrake assembly
2. Link arm
3. Compensator
4. M8 x 25 hex head screw
5. M6 x 20 hex head screw

Fit the link arm to the handbrake lever, insert an M8 washer each side of the link arm, then secure with an M8 x 25 hex head bolt and M8 nyloc nut. Tighten until the link arm is still movable and the bolt thread is protruding through the nyloc nut. Apply a small amount of grease between

the link arm and the compensator. Fit the compensator arm to the link arm with M6 x 16 hex head bolt, M6 nyloc nut and washers. Tighten until the link can just still move and the bolt thread is protruding through the nyloc nut.

There are 2 handbrake cables, marked on the aluminium back plate ends for left or right, see Figure 97

Figure 97: Handbrake cable identification



Insert inner cable through the back plates and drop the cable nipple into the silver lever on the inside of the rear most brake shoe see figure 98

Figure 98: Handbrake cable onto shoe lever



Figure 99: Handbrake cable arrangement



Pass the cables over the axle. Fit the right hand cable into the left hand side cable abutment bracket in the tunnel and the left hand cable into the right hand abutment bracket, so that the cables cross above the axle centre. Fit an adjustment nut and washer each side of the abutment bracket. Ensure the clevises are fitted onto the inner cable until the inner cable thread is level with inside of the clevis. Apply a small amount of grease to the pin and secure clevis to the compensator with the pin and retention clip. Tighten the inner cable lock nut against the clevis.

Figure 100: Handbrake cable adjuster



The handbrake cables should not be adjusted until the transmission tunnel cover (interior trim) has been fitted, as the handbrake lever is required to be in the vertical position during fitment of the trim.

9.6.7) Handbrake adjustment

Handbrake adjustment can only be carried out after the brakes have been bled and the foot brake operated hard a number of times to work the automatic rear brake adjusters.

Adjust each handbrake cable separately by moving the nuts fitted each side of the brackets above the differential. Adjust each cable to get the compensator to be approximately 90 degrees to the link arm. The handbrake should be set to lock the rear wheels on three clicks of the ratchet mechanism. Ensure that the drums are not binding on the brake shoes and tighten the second nut to lock the adjuster. Repeat checks to ensure the brake are not binding.

9.6.8) Final adjustments

Warnings

- 1. Never work underneath a car without supporting it on axle stands or equivalent. Do not rely on a jack alone.**
- 2. Use appropriate eye protection whilst working under the car.**

The rear suspension fixings should be torqued in the design position (kerb + 75kg). A method of obtaining this position is to fill the car fluids to the recommended levels (full tank of fuel) and have 75kg in the cockpit and have the car supported on axle stands under the axle so that the weight of the car is taken up through the spring damper units. Ensure that all the suspension securing bolts are tightened as detailed in Table 16.

Table 16: Torque figures for rear suspension

Location	Torque (Nm)
Rear damper bolts upper	54
Rear damper bolts lower	70
Panhard rod	61
Radius arm upper front fixing	47
Radius arm upper rear fixing	61
Radius arm lower (both ends)	61
Differential	23
Half shafts	23

9.6.9) Filling of differential

Warnings

Oils - prolonged and repeated contact may cause serious skin disorders:

- 1. Avoid contact with the skin as far as possible and wash thoroughly after any contact.**
- 2. Keep out of reach of children.**
- 3. First aid treatment should be obtained for open cuts and wounds.**
- 4. Use appropriate barrier creams.**

It is recommended that the differential is filled with Shell Spirax S3AX 80w90 oil. Refer to your Owner's Handbook for a complete list of recommended lubricants.

NOTE

This operation is made easier if the boot floor has been removed to allow access.

Ensure the filler plug is to hand. Fill the differential with approximately 1.3 litres of Shell Spirax S3AX 80w90 oil until the oil runs out of the filler hole. Screw the filler plug in and tighten.

9.6.10) Completing Panhard Rod

Fit Panhard rod into axle clevis, secure in place with M12 x 65 hex head bolt (fastener pack 3GZ1141B), 2 x M12

washers and full Nyloc nut. Do not fully tighten until final adjustment section later.

10.0) Interior and trim

The following section details the interior trim of your Caterham, including transmission tunnel top and carpeting, footwell and boot carpeting, seat belts/harnesses, seating and mirrors.

10.1) General

Before fitting the carpets, ensure that all operations that require access under the carpets have been completed.

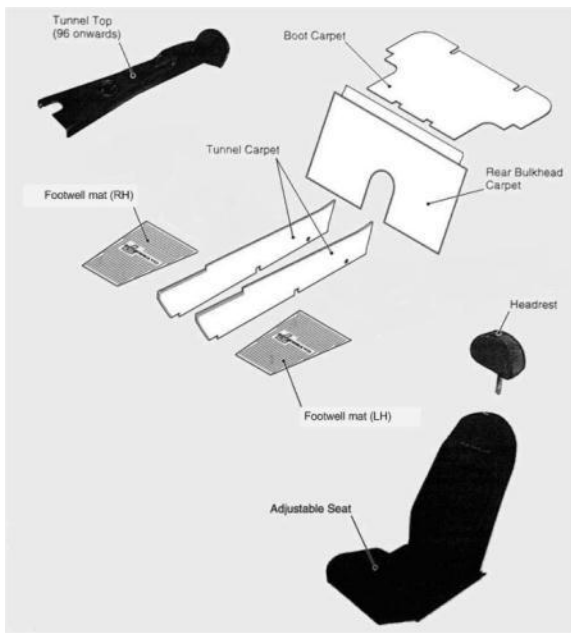
The items specified in Table 17 will be required during procedures detailed in this section.

Table 17: Special tools required for interior and trim

Item	Remarks
Adhesive	Contact adhesive
Durable dot fastening tool (Part No. 76068)	Supplied in chassis pack

It is recommended that a dry run is completed before cutting or gluing the carpets in the final position.

Figure 101: Carpets



10.2) Seat back carpets

Warning

Ensure adhesive is applied in a well-ventilated area. Follow instructions on adhesive packaging. Care must be taken whilst working in a confined area e.g. The footwell.

The carpet that covers the seat back area has a vinyl strip along the upper edge. Lay the carpet into place ensuring that the carpet covers the aluminium seat back right down to the floor. Apply adhesive to the vinyl strip and stick to the square tube at the top of the seat back panel.

The seat back carpet will need to be cut to allow the seat belt through it. Mark the carpet where the inertia reel seat belt exits the seat back and cut a slot.

The carpet must fit flat at the transmission tunnel. If necessary, small cuts should be made in the area of the corners to allow the tabs on the carpet to hinge out against the transmission tunnel.

Once the carpet has been fitted around the transmission tunnel apply adhesive to the carpet and press into position against the seat back. It is only necessary to apply adhesive as far down as the top of the transmission tunnel as the remainder of the carpet is behind the seats.

10.3) Transmission tunnel carpet

Attach the small aluminium transmission tunnel cover on the rear of the transmission tunnel top using the 5/32" rivets provided.

The transmission tunnel carpets are handed so ensure that the correct carpet is fitted to each side.

Coat the transmission tunnel with adhesive and stick the transmission tunnel carpets to the transmission tunnel. Ensure that good adhesive coverage is maintained, particularly in the forward section of the transmission tunnel.

10.4) Transmission tunnel top

NOTE

Do not attempt to fit the tunnel top until the tunnel carpet adhesive is completely dry.

The transmission tunnel top incorporates a padded armrest, the gear lever gaiter and the handbrake gaiter.

Pull the handbrake near vertical. Fit the transmission tunnel top, ensuring that the handbrake and gear lever locate in the respective gaiter and press firmly into position over the sides of the transmission tunnel carpets.

Screw the gear knob into position and lock with a grub screw.

10.5) Rubber footwell mats

Place the mats in the respective footwell (mats are handed).

They are secured into the footwell using the three poppers fitted at the rear of the footwell.

Attach 3 popper bases (fastener pack ZIT03 Item 2) to the rear of the front footwell using rivets (1) through which need to be drilled in the floor panel.

Stick masking tape to the underside of the carpet in the approximate position of the floor mounted poppers and lay the carpet into position. Press down firmly on the carpet so that the bases make an impression on the masking tape. Make appropriate holes in the carpet and rivet together the popper (3) and fastener button (4), using the Durable Dot

fastening tool, refer to Table 1. Ensure that the fastener button is uppermost on the carpet.

NOTE

For correct use of the popper fastener tool, refer to weather equipment section.

Fit the footwell mats into place and secure using the poppers.

10.6) Boot carpet

Boot carpet may be affixed to the boot interior side and front panels. Apply adhesive and secure the carpet shape into the relevant space.

Secure the boot board to the chassis.

The boot carpet is laid into position and requires no adhesive. It will be necessary to cut the carpet to fit around the fuel filler pipe. Tuck the edges of boot carpet down the sides of the aluminium honeycomb boot board at the rear and the sides taking care not to damage the aluminium body panel.

Fit the fuel filler cover plate into position and drill through the cover plate into the boot board using a 2 mm drill. Attach the cover plate using self-tapping screws (fastener pack ZCH01 Item 7). It may be necessary to relocate the fuel filler hose clips to fit the cover.

10.7) Side and knee trim panels

NOTES

1. If specified, the optional sill protectors and roll cage must be fitted before the installation of the knee trim panels, side panels and associated piping, can be completed.

2. If specified, optional Arm rest bracket (escutcheon bracket) must be fitted with side panel/sill protectors (sill protectors are optional).

Not all of the rivets used to secure the interior side panels into place will have been fitted. This is to allow fitting of sill protectors and to provide access to the front roll cage mountings, if required.

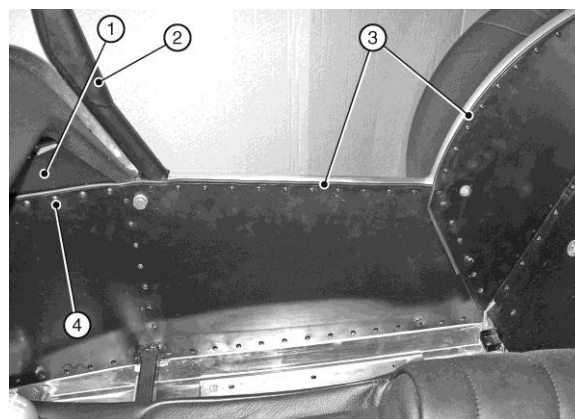
Warning

When drilling the sill protectors take care not to drill through both sides of the chassis tube.

If necessary, position the sill protector on the sill, with the long edge between the chassis tube and trim panel, press down on the sill protector and drill (5/32") through the existing holes in the trim panel, through the sill protector and through the existing holes in the chassis tube. Position a length of trim piping with the flat portion between the interior side panel and the chassis tube and cut to

length. The piping should reach from the front of the knee trim panel to just behind the point where the side panel meets the rear wheel arch panel, refer to Figure 141. Ensure that the rounded edge of the piping sits neatly along the top edge of the side panel.

Figure 102: Side panel detail



1. Knee trim panel
2. Roll cage (optional)
3. Piping
4. Self-tapping screws

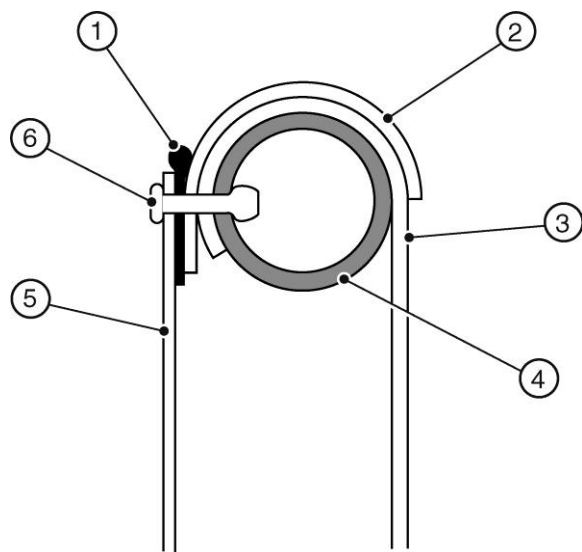
Position the pre-bent and drilled knee trim panel between the piping and the chassis tube, secure the knee trim panel, piping and side panel to the chassis tube using self-tapping screws (fastener pack ZCH01 Item 8).

NOTE

For optional arm rest bracket fitment, do not fit rivets into 3-4 central rivet holes. (Please see arm rest bracket fitment section in the weather equipment section).

Fit the sill protector between the piping and the chassis rail and align the holes drilled previously. Drill through the holes again to pierce the flat portion of the piping and secure the sill protector, piping and side panel using rivets (5), refer to Figure 142.

Figure 103: Trim fixings



- | | |
|------------------------------|-----------------|
| 1. Piping | 4. Chassis tube |
| 2. Sill protector (optional) | 5. Side panel |
| 3. Body skin | 6. Rivet |

Fit the piping and secure the curved section of side panel in a similar manner. Ensure that this section of piping overlays the horizontal section. Cut a series of 'V' shaped notches in the flat portion of the piping so that it follows the curve of the side panel neatly.

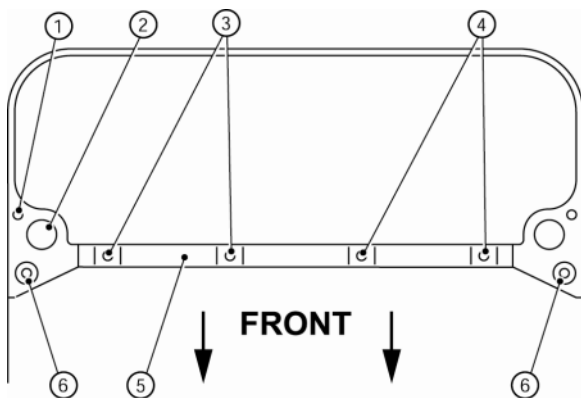
10.8) Inertia reel seat belt

If specified, the inertia reel seat belts will have been positioned by Caterham, however, none of the visible chassis mountings will be tightened. The belts should be tightened at the same time as the interior trim is fitted. The top and bottom mountings should be tightened to 47 Nm.

10.9) Four point harness

The harness should be fitted after the seat back carpet, tunnel carpets and boot cover, has been fitted (if specified). Locate the threaded mounting holes in the top of the chassis, (refer to Fig 143), and carefully cut away the material covering the holes.

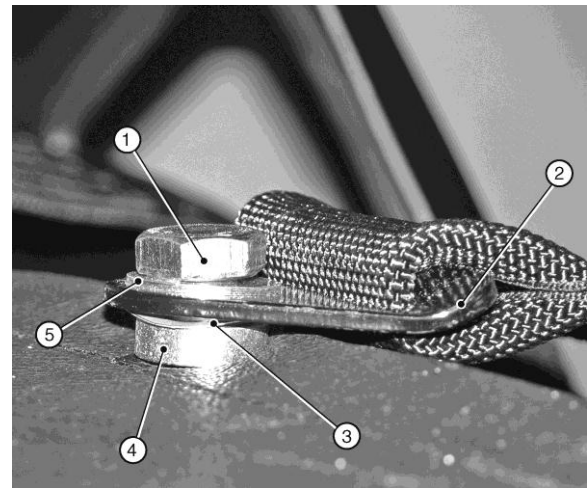
Figure 104: Mounting holes four-point harness upper



- 1. Roll over bar mounting
- 2. Roll over bar locating recess
- 3. Drivers harness mounting
- 4. Passenger harness mounting
- 5. Chassis member
- 6. Inertia reel mounting

From the mounting kit supplied with the harness, assemble a 7/16" UNF x 1 3/4" bolt, plain washer next to the bolt head, and pass through the broad shoulder strap, crinkle washer and through the bush. Ensure the smaller diameter of the bush is closest to the bolt head. Screw the bolt into the harness mounting point, refer to Figure 144.

Figure 105: Shoulder strap with track day roll over bar



- 1. Bolt
- 2. Shoulder restraint
- 3. Crinkle washer
- 4. Bush
- 5. Plain washer

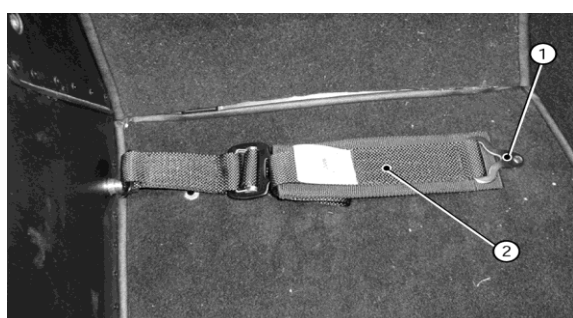
To fit the outboard lap strap, assemble a 7/16" UNF x 1" bolt, with a plain washer next to the bolt head, pass through the outboard lap strap crinkle washer, and through the bush. Ensure the smaller diameter of the bush is closest to the bolt head. Insert the bolt in the threaded boss

and tighten to 48 Nm, refer to Figure 145.
Ensure lap strap buckle is uppermost.

NOTE

Use of a longer bolt to secure the outer lap strap will result in damage to outer body side panel.

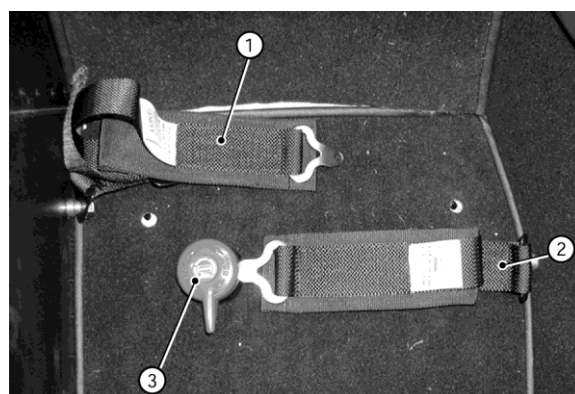
Figure 106: Outboard lap strap



1. Buckle
2. Outboard lap strap

To fit the inboard lap strap, assemble a 7/16" UNF x 1" bolt, with a plain washer next to the bolt head, pass through the inboard lap strap, crinkle washer, and through the bush. Ensure the smaller diameter of the bush is closest to the bolt head. Insert the bolt into the threaded boss and tighten to 47 Nm, refer to Figure 146. Ensure lap strap buckle is uppermost.

Figure 107: Lap straps



1. Outboard lap strap
2. Inboard lap strap
3. Buckle

10.10) Six point harness

The six-point harness is fitted in the same way as the four point, with the exception that the crutch straps are bolted to the chassis brackets protruding from the rear lower crossmember behind the seat.

10.10.1) Standard floor

To fit the crutch strap drill an 11 mm hole through the two crutch strap mounting points located at the rear of the cockpit and through the floor of the cockpit. Assemble an M10 x 25 bolt with a plain washer next to the bolt head. Pass the bolt through the hole in the crutch strap, through the crinkle washer and top hat spacer, down through the chassis mounting, ensuring the strap is offset downwards, and through the cockpit floor. Secure the bolt in place using a plain

washer and nyloc nut. Tighten to 47 Nm. Ensure the crutch strap fixing plate has the bend facing the cockpit floor.

10.10.2) Lowered floor

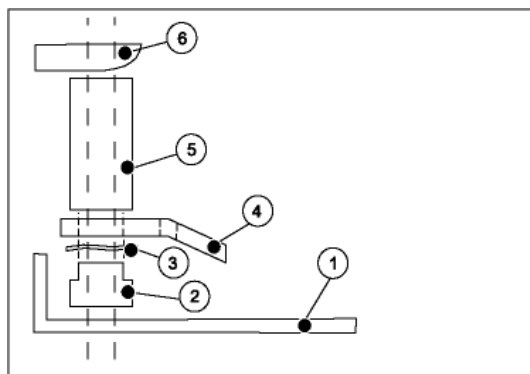
Drill a 7/16" hole through the crutch strap-fixing bracket then through the floor pan directly below it.

Lay out the crutch strap to assure the correct orientation and assemble the harness eyelets and spacers, refer to Fig 147.

Insert the long 7/16" x 3" bolt upwards through the floor pan and assembled spacers detailed above. Secure in place using the plain washers and nyloc nuts supplied. Tighten all fixings to 61 Nm.

Fit the shoulder and lap straps as detailed previously.

Figure 108: Crutch strap spacer location



1. Lowered floor pan
2. Top hat spacer bush
3. Crinkle washer

4. Fixing eyelet
5. Aluminium Spacer
6. Crutch strap fixing bracket

10.11) Seats

10.11.1) Standard cloth or leather seats

The adjustable seats are supplied attached to the seat runner. Place the seat into position and secure the front mountings by passing setscrew (fastener pack ZSE03 Item 1) down through the mounting and securing using plain washer (3) and nyloc nut (2). Slide the seat fully forward and pass setscrew (1) down through the rear mountings and secure using plain washer (3) and nyloc nut (2). Tighten the fastenings.

10.11.2) Composite seats

10.11.2.1) Adjustable seats

Fit the runner with the adjusting handle to the RH side of the seat, with the handle facing forwards and inboard of the runner. Secure the front mounting using reduced head cap head bolt (fastener pack ZSE06 Item 2) through the round hole, then through two thick spacers (8) and into the threaded seat base. Secure the rear with cap head bolt (2) through the square hole, through 1 thick spacer (8), 1 thin spacer (7) and into the threaded seat base, refer to Fig 148.

Figure 109: Adjustable seat



- 1. Spacers
- 2. Adjusting handle

Fit the LH runner in the same way as the RH runner ensuring that the outer part of the runner is towards the seat base. Secure using bolt (2), one thick spacer (8) and one thin spacer (7) on each fixing, ensuring they are between the runner and the seat. Torque all fixings to 14 Nm.

Ensure that the harness option specified has been installed prior to fitting the seat. Place the seat into position, feeding the lap and shoulder straps through the apertures in the seat body and the crutch strap (if specified) through the aperture in the seat base, refer to Fig 110. Ensure that the harness straps are not twisted.

On low-floor cars the seat adjusting handle must pass beneath the square

chassis tube and through the aperture in the vertical section of aluminium panel.

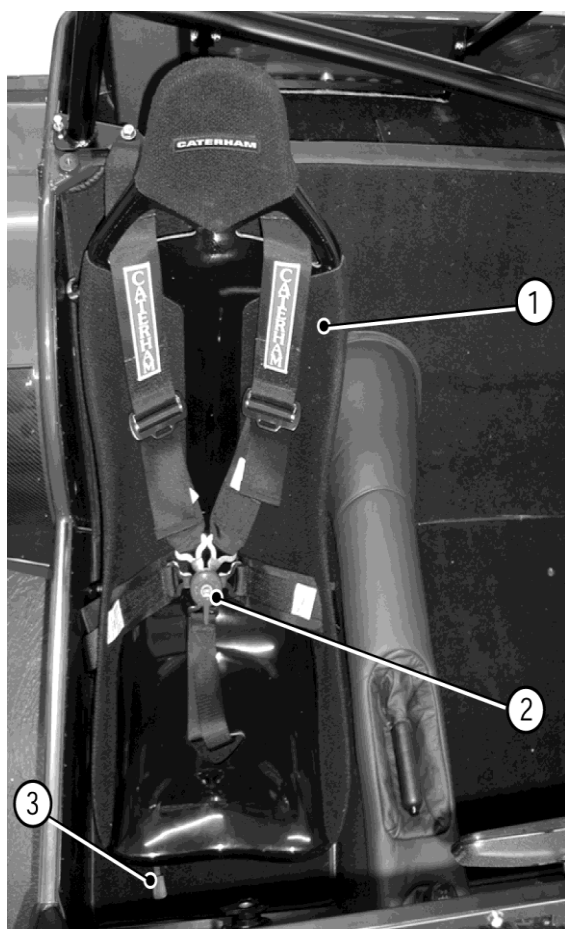
Secure the front mountings with bolt (2) passed down through the runner and secure under the floor using plain washer (5) and nyloc nut (4).

Slide the seat fully forwards and pass a bolt (2) down through the rear holes in the runner and secure under the floor using plain washer (5) and nyloc nut (4).

NOTE

If the car has a honeycomb floor, bolt (1) is passed through the runner, through spacer (6) and secured using plain washer (5) and nyloc nut (4).

Figure 110: Composite seat and six-point harness



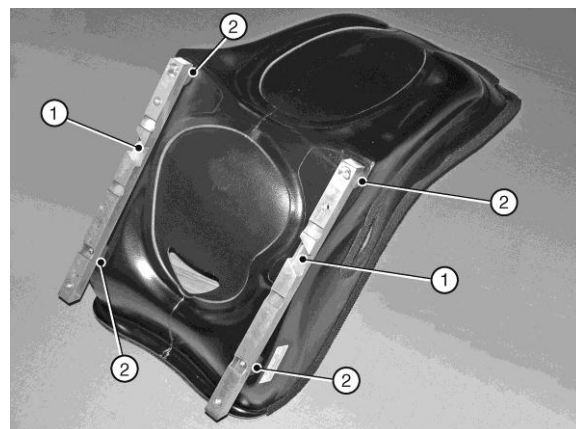
- 1. Composite seat
- 2. Six-point harness
- 3. Seat adjuster

10.11.2.1) Fixed seat

The fixed seat is bolted to the floor via two 25 mm square section, aluminium tubes. This tube has a series of cut-outs on one side and plain holes in the opposite side. It is important that this tube is fitted in the correct orientation. The cut-outs must face away from the seat base, allowing flush fitment to the floor. The large cut-out must be biased towards the rear of the seat. Both tubes are identical

and are fitted in the same orientation, refer to Fig 111.

Figure 111: Fixed seat



- 1. Large recess
- 2. Spacer

Position the square section aluminium tubes on the seat base and pass bolt (fastener pack ZSE05 Item 2) through the large hole in the underside of the spacer and into the small hole opposite, through one thick spacer (8) and into the threaded seat base. Torque all fixings to 14 Nm.

Ensure that the harness option specified has been installed prior to fitting the seat. Place the seat into position feeding the lap and shoulder straps through the apertures in the seat body and the crutch strap (if specified) through the aperture in the seat base, refer to Fig 110. Ensure that the harness straps are not twisted.

Secure the seat with bolts (2) and plain washers (5) passed upwards through the floor into the threaded bosses in the aluminium tubes.

10.12) Minor trim items

10.12.1) Scuttle edge trim

This strip (chassis kit) is designed both to finish off the scuttle around the dashboard tidily and to protect the occupants from the hard aluminium edge. Cut the trim to length and secure by firmly pushing the trim into place by hand. The scuttle edge trim is an IVA requirement.

10.12.2) Nose badge

The oblong nose badge (polythene bag marked 'miscellaneous') is mounted on the nose cone of the vehicle. It is self-adhesive and is fitted over the 2 holes in the nose cone. Before removing the paper to reveal the adhesive on the underside of the badge, carry out a trial fit to ensure the badge will sit square.

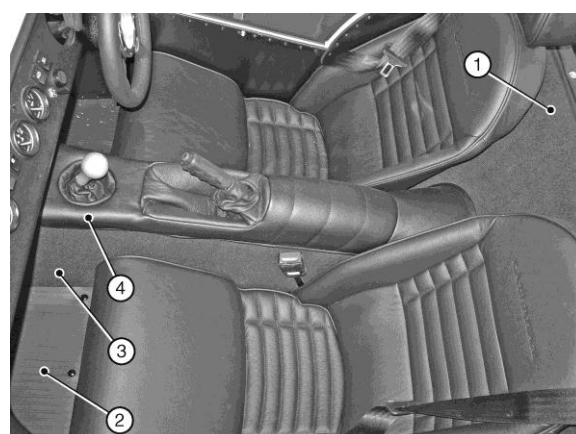
10.13) Rear view mirror

The centre mounted mirror is a legal requirement and must be fitted. The mirror has a self-adhesive pad and should be stuck as high as possible on the interior of the windscreen on the centre line of the car. Prior to removing the paper backing from the self-adhesive pad ensure the area where the mirror is to be

placed has been thoroughly cleaned using an alcohol based degreaser. Note that the mirror can be inverted on its stalk to minimise windscreen obstruction.

On Superlight models without a windscreen, the mirror must be secured to the scuttle top on the centreline of the vehicle. Ensure that the area where the mirror is to be placed has been thoroughly cleaned using an alcohol based degreaser.

Figure 112: Completed interior



1. Rear bulkhead carpet
2. Footwell carpet
3. Tunnel carpet
4. Tunnel top

NOTE

Items may differ from those shown, dependant on the chosen specification.

11.0) Fibreglass

The following section details the fibreglass components of your kit including cycle wings, rear wing protectors and rear wings.

11.1) Front cycle wings

An alternative method of fixing the front cycle wings to the stays, to that detailed below is to bond the wings to the stays with a polyurethane adhesive following the adhesive manufactures instructions.

The cycle wing stay arms may require shortening to allow the arms to sit flat against the underside of the wing and to be centralised over the tyre.

The front cycle wings are not handed, but they will be marked for the repeater position. The repeaters should be near the leading edge of the wing, on the outside.

Piping (polythene bag marked 'IVA') should be fitted around the edge of the cycle wing. This is an IVA requirement, refer to the IVA section.

It is easier to fit the front indicator repeaters to the cycle wings prior to fitting them to the cycle wingstay.

Warnings

1) Use appropriate eye protection whilst carrying out drilling operations.

2) Use a suitable face mask to prevent inhalation of dust when drilling fibreglass or carbon fibre.

3) When drilling fibreglass use tape on the surface over the drill holes to prevent damage to the gel coat or painted finish. Slow drill speeds must be used.

Drill through the cycle wing at the pre-marked points using a 5 mm drill. Then enlarge the centre hole to approximately 15 mm.

Feed the repeater wire through the cycle wing from the outside then secure the base using the nuts supplied.

The cycle wing will have been marked with the positions for the front two mounting bolts for each wing. These should be drilled through using a 5 mm drill.

The front cycle wings bolt to the tubular wingstays which are rigidly mounted to the front uprights.

Fit the front wheels ensuring that the steering rack is centred. Place the cycle wing over the wingstay so that the bolt holes are over the centre line of the forward wingstay tube such that the wing overhangs evenly on either side of the tyre. The wing can be held in position using masking tape. It is possible that the wingstay will need to be bent to allow the

cycle wing to fit centrally over the tyre. Mark the positions for the bolt holes onto the wingstay.

Remove the cycle wing and, with the tyre protected, centre punch the wingstay. Drill the holes through the wingstay using a 6 mm drill. Ensure that the drill cannot contact the tyre.

Drill an additional hole in the underside of the front wingstay, near the open end, using a 5/32" drill. Remove all sharp edges on the inside and outside of the wingstay tube.

Loosely fit the cycle wing to check the alignment of the cycle wing and wingstays relative to the tyre. The cycle wing should be checked to ensure that it is centrally located over the tyre. Remove the cycle wing. Place a strip of masking tape across the tyre underneath the drilled wingstay. Using a ruler held at 90° to the surface of the tyre, mark 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 position to the wingstay tube. Centre punch and drill using a 6 mm drill as for the front holes.

Refit the cycle wing, loosely bolting it at the front and aligning it over the tyre and then carefully remove the wheel without disturbing the wing. Masking tape can be

used to hold the wing in place. Carefully mark the underneath of the wing with the bolt hole positions and then remove the wing. Drill a small pilot hole from underneath the cycle wing, taking care not to damage the gel coat/painted surface. Check alignment of the holes with the wingstay, adjusting if required, then drill through from the top of the cycle wing with a 5 mm drill.

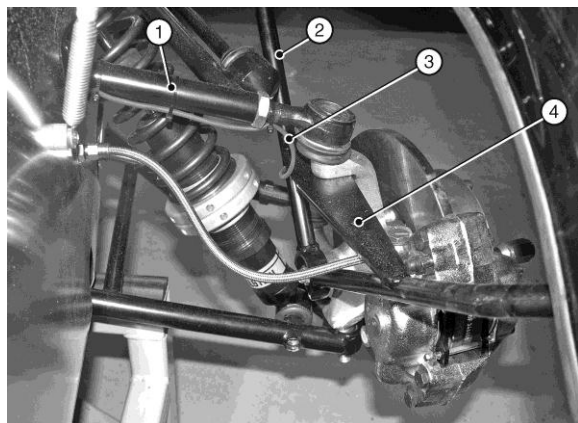
Place a strip of self-adhesive foam (fastener pack ZFG12 Item 7) on the top of each cycle wingstay tube. Cut two rubber grommets in half to provide four rubber washers. Pass screw (5) through the manufactured washers and down through the cycle wing and wingstay. Secure using washers (4) and nyloc nuts (2). Tighten until the rubber washer is slightly larger than the screw head. The black wire from the indicator repeater is the earth lead and should be attached to the front wingstay using a pop-rivet in the 5/32" hole drilled at Para 10. Remove paint to ensure a good contact.

Route the green wire, from the indicator repeater, inside the wingstay until it emerges from the pre-drilled hole near the wingstay brace. From the wingstay, the wire must be routed along the rear of the upper wishbone ball joint, and the upper wishbone. Secure using small cable ties at 50 mm intervals, refer to Fig 112.

NOTE

To comply with SVA requirements the green repeater wire must be covered with heat shrink sleeving.

Figure 65: Indicator repeater wiring



1. Upper wishbone
2. Front wingstay
3. Repeater wire
4. Wingstay brace

Once inside the aluminium body skin, the green wire should be fitted into the 6 pin econoseal plug. It is recommended that this connection is made at the same time as the headlamp and indicator wiring.

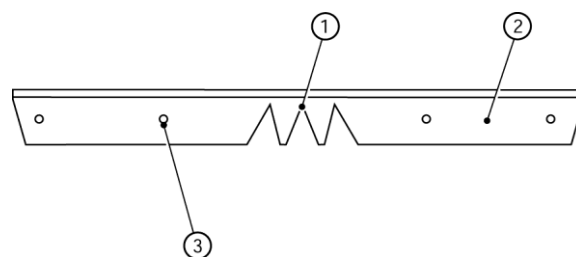
11.2) Rear wing protectors (Stone guards)

NOTE

It is advisable to fit the wing protectors to the wings before fitting the wings to the car. Once the wings are fitted, when drilling holes for the inner row of rivets, there is very little clearance between bodywork and drill chuck.

The wing piping (fastener pack ZWS01 or ZWS02 (option) Item 2) fits between the rear wing protector and the rear wing. Cut the piping to length and fit around the top, outer and lower edges of the wing protector so the bead is against the edge of the protector. 'V' shaped notches (refer to Fig 114) should be cut to allow the piping to smoothly follow the shape of the protector. Position the piping under the protector, ensure correct orientation of the protector (refer to Fig 117) and drill through the existing holes into the piping with a 1/8" drill.

Figure 114: Rear wing protector piping



1. 'V' shaped notch
2. Wing piping
3. Holes

The wing protector should be placed on the lower front of the rear wings. The correct position can be obtained by placing the lower angled edge approximately 5 mm up from the lower edge of the wing and the inboard side of the protector tight up against the inboard

side of the wing (the side of the wing that bolts to the car).

NOTES

1. The protectors are supplied flat so will need to be gently shaped to follow the contour of the wing.

2. The protective film on stainless steel wing protectors should be removed from around the rivet heads before fitting. The protected side faces outward.

Position the protector on the rear wing and mark one of the corner holes. Ensure correct spacing and orientation. Drill the hole using a 1/8" drill. Fit the rear wing piping into position under the protector and rivet into position using rivet (1).

NOTE

Carbon fibre wing protector uses black rivets and the stainless steel wing protector uses plain rivets.

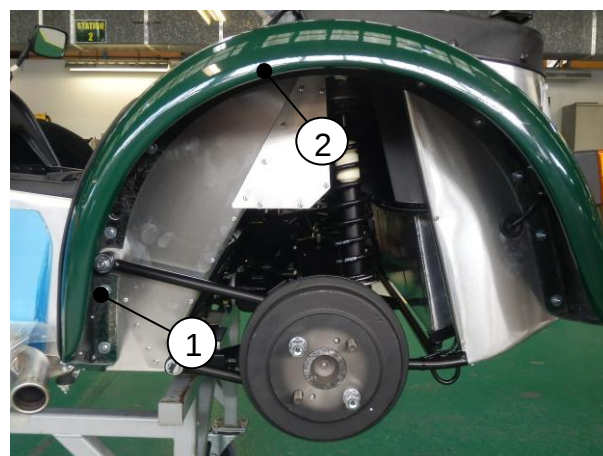
Attach the wing protector working outwards, one rivet at a time, from the corner ensuring that the wing piping is in the correct position. Drill 1/8" holes and attach using rivets (1).

11.3) Rear wings

The rear wings are provided pre-drilled with both the wing fixing holes and further

holes for the suspension arms. To enable the wing to be fitted to the car you will need to trim out the fibreglass from the larger holes to enable fitment over the radius arms, refer to Fig 115). The wings are supplied in this way to maintain their strength prior to them being fitted to the car. An alternative fixing method would be to remove the suspension arms then refit them once the wing is secured in place.

Figure 115: Rear wing fitment



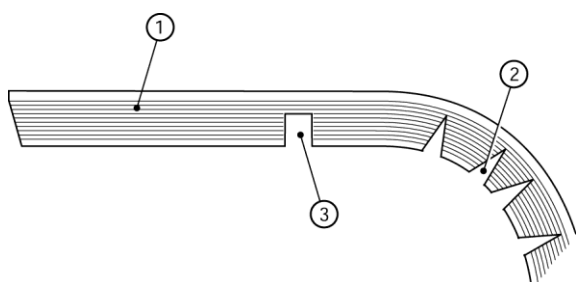
- 1. Rear wing fixings
- 2. Rear wings

Offer the rear wing up to the side of the car and bolt in place using a setscrew (fastener pack ZFG12 Item 1) and plain washers (3) into rivnuts at the front of the rear wing and bolts (1), plain washers (3) through the rear of the wing and secured using plain washers (3) and nyloc nuts (2). The setscrews used to secure the rear upper section of the wing should be

passed through the body from inside the boot. Loosely fit all fasteners.

Wing piping (6) is provided to fit between the rear wing and the car body. The wing piping should be positioned against the rear wing and cut to length. The wing piping has six ribs running longitudinally. 'V' shaped notches, refer to Figure 116, should be cut to the sixth rib to allow the piping to smoothly follow the curve of the rear wing. Where the wing mounting bolts occur, rectangular shapes should be cut to the fifth rib to accommodate.

Figure 116: Wing piping



1. Wing piping
2. 'V' Shaped notches
3. Rectangular notches

Secure the rear wing ensuring that the bead of the wing piping is protruding. Do not over tighten fixings, refer to Figure 117.

Figure 117: Rear wing



1. Piping between wing and panel
2. Piping on three sides of wing protector

12.0) Lighting

The lighting kit includes all the parts needed to make the car comply with the lighting requirements of IVA. It is imperative that these instructions are adhered to in order to fulfil the legal requirements of the lighting.

If fitted, remove the lead from the battery negative terminal.

12.1) Headlights and front indicators

Fit a length of edge strip (polythene bag 'IVA') to the underside edge of the indicator cone. It is an IVA requirement that the edge strip covers the entire edge of the mounting cone, including the portion directly beneath the lens.

Remove the lens from the front indicator. Ensure that the drainage hole on the indicator seal is at the bottom, line up the holes in the indicator base with the holes in the indicator cone and secure using three setscrews (fastener pack 30L002A Item 3) and nyloc nuts (6). Do not over tighten. Replace the lens.

Tighten the two grub screws securing each headlight bracket into the chassis. Tighten to 7 Nm.

Remove the headlight rim by undoing the clamping screw located on top of the headlight bowl and unhooking the lens

from the headlight bowl. Remove the plug from the back of the headlight bulb and remove the sidelight housing from the reflector.

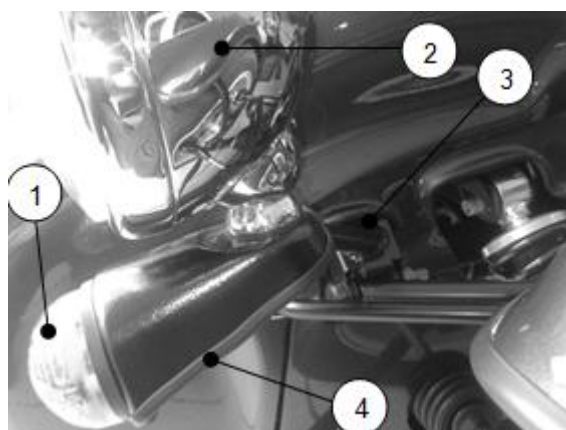
Remove the securing nut and lock washer from the headlight mounting stud and smear a thin layer of oil to the thread. Insert the headlight harness and headlight mounting stud through the indicator cone and into the headlight bracket.

Refit the headlight securing nut and lock washer and tighten until the headlight unit cannot move freely, this will aid assembly, however, these nuts will need to be slackened off to allow the headlights to be correctly adjusted, refer to Figure 118.

NOTE

Ensure that the locating tag on the headlight shell engages with the recess in the mounting stud.

Figure 118: Headlight and indicator LH



- 1. Indicator cone
- 2. Headlight unit
- 3. Headlight bracket
- 4. Indicator cone

Pass the black indicator earth wire (terminated in a ring terminal) through the hollow headlight unit mounting stud and secure to the earth screw at the base of the headlight unit. Pull excess wire into headlight unit.

Refit the sidelight housing into the reflector and refit the plug to the headlight bulb. Hook the bottom of the headlight rim into the lip on the headlight bowl and swing the headlight rim up into position. Secure using the clamping screw.

Feed the headlight wiring and the green indicator wire through the hollow headlight bracket so that it exits into the engine bay.

The headlamp wires can be “shortened” to equal lengths by gathering the excess wires into the headlamp bowl.

12.2) Front indicator repeaters

The front indicator repeaters are fitted at the same time as the front cycle wings, refer to cycle wing section within the fibreglass chapter.

12.3) Front wiring electrical connections

Locate the 2 loose econoseal plugs supplied in the chassis pack (2 part black plug and yellow insert). Take the six wires (the sixth wire is the indicator repeater wire which may not be fitted at this point) and push them into the back of the loose black plug ensuring that the connections click into place. If they do not locate correctly turn them through 180° and try again. Refer to Table 18 for the correct terminal position within the connector.

Table 18: Front lighting wiring connections

Function	Wiring loom colour	Light unit wire colour
Earth	Black	Black
Headlight (dipped beam)	Blue/red	Blue/red
Headlight (main beam)	Blue/white	Blue/white
Indicator RH	Green/white	Green
Indicator LH	Green/red	Green
Repeater RH	Green/white	Green
Repeater LH	Green/red	Green
Sidelight	Red	Red

Once the indicator repeaters have been fitted and all the connections have been

located into the plug, fit the yellow insert into the front of the plug. Connect the plug to the wiring loom and secure the cables to the chassis.

12.4) Rear lights

The kit includes two identical rear light assemblies which comprise of tail, brake and indicator lights. They are mounted on rubber blocks which ensure that the lights are vertical when fitted and are secured with four self-tapping screws. Turn one light unit around on the rubber block and ensure that the amber indicator lens is on the outside.

Warnings

1) Use appropriate eye protection whilst carrying out drilling operations.

2) Use a suitable face mask to prevent inhalation of dust when drilling fibreglass or carbon fibre.

3) When drilling fibreglass use tape on the surface over the drill holes to prevent damage to the gel coat or painted finish. Slow drill speeds must be used.

The rear wings have been pre-drilled with two holes for the rear light assemblies. The outermost hole has been drilled to 30 mm and this takes the wiring and the econoseal plug. The innermost takes one

of the retaining screws. Enlarge the innermost hole using a 4 mm drill.

Remove the lenses from the rear light assemblies along with the bulbs noting that the indicator uses a single filament bulb and the brake light uses a double filament bulb.

NOTE

The rear light assemblies are not 'handed'. One of the metal baseplates must be inverted to create a LH/RH pair with the indicator fitting to the outside edge of each light.

Using the metal baseplate as a guide, drill a 4mm hole through the rubber block in each corner. Ensure that the drill is kept at 90° to the baseplate.

Feed the electrical wiring and the econoseal plug through the 30 mm hole, ensuring that the grommet is passed through the hole. Attach the rear light unit at the lower inboard corner using screw (2). Do not over tighten. Ensure that the rear light unit is horizontal and drill through the rear light unit into the rear wing. Remove the light unit. Clear away the swarf and refit the light unit using screws (1) on the upper holes and screws (2) on the lower holes.

Do not over tighten. Replace the bulbs and lens cover ensuring correct

orientation of the lens cover (indicator to the outside).

Connect the econoseal plug to the corresponding socket protruding from a hole inside the rear wing. Ensure that the plugs are correctly mated and push the plug inside the rear side panel. Fit the grommet to the hole in the body side panel.

For reference the rear electrical connections are detailed in Table 19.

Table 19: Rear lighting wiring connections

Function	Wiring loom colour	Light unit wire colour
Rear light RH	Red/white	Red
Rear light LH	Red/black	Red
Brake	Green/mauve	Green
Left indicator	Green/red	Green
Right indicator	Green/white	Green
Earth	Black	Black

Secure the wiring inside the body using cable ties.

12.5) Reversing light and fog light

The reversing light and the fog light are fixed to the rear panel and the wiring connections have been made at the factory.

12.6) Rear number plate light

Remove and retain the cross-point screw retaining the light cover and lens; remove and retain the cover and lens, remove and retain the two nuts and spring washers from the metal baseplate.

Pass the wire from the chassis loom through the RH upper hole of the light bracket on the chassis and through the back of baseplate. Fit the baseplate to the bracket and secure with the nuts and spring washers. Ensure that the baseplate studs earth to the bracket through the nuts (remove paint from the bracket as necessary).

NOTE

Cars that are not supplied with a spare wheel bracket will be pre-fitted with a number plate light bracket located below the lower chassis tubes.

Remove and discard the two brass bullet connectors supplied in the light. Shorten the wire to a convenient length, strip back sufficient insulation and attach (crimp) a male bullet connector. Insert the bullet connector into the central terminal on the light. Replace the lens, cover and cross-point screw.

12.7) Testing

Reconnect the battery negative lead. Check all the lights for correct operation.

In the event that there are problems, check that the bulbs have not been damaged during transit and replace as necessary. If the problem persists, check every earth point on the chassis both on the wiring loom and the battery earth lead. If the problem is related to a particular system or side, check the fuse box located under the dashboard in the passenger side of the cockpit. Further information on fuse identification can be found in your Owner's Handbook.

12.8) Headlight beam setting

If possible, the headlight beam setting should be carried out using professional equipment. If such equipment is not available, proceed as detailed below:

1. Position the car on a firm level surface, 2m from a vertical surface (measured from the front edge of the lower lip of the nose cone). Slacken the headlight securing nuts and switch on the lights (dipped). Adjust the lights until the brightest spot of each light pool (at the apex of the dip-beam cut-off) is 650 mm above the ground.

2. Measure the distance between the centres of the headlights on the car and the distance between the centres of the bright spots on the wall. Adjust the headlights as necessary until the two measurements are approximately the

same. When alignment is satisfactory, re-check the vertical measurement and tighten the headlight securing nuts.

3. The alignment will be tested and adjusted during the post build check. If the car is not being submitted for a post build check, we strongly advise kit builders to get the headlights professionally adjusted.

13.0) Weather equipment

This section explains how to perform the initial fitment of the weather equipment. The tool identified in Table 20 will be required. If the specification for your car included hood fitment, instructions on how to refit, remove and fold for storage can be found in your Owner's Handbook.

Table 20: Additional tools required for weather equipment

Item	Description
Durable Dot fastening tool	Part No. 76068 (supplied in fastener pack ZBC02)

Correctly fitted weather equipment is shown in Figure 119.

Figure 119: Weather equipment



13.1) Fitting of hoodsticks and hoodstraps

NOTE

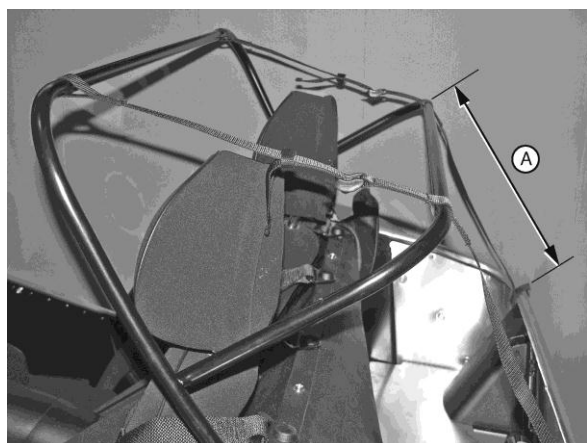
Whichever option of roll over protection has been specified must be fitted before the hoodsticks.

Remove the inner hoodstick from the hoodstick assembly and feed the end loop of hoodstraps over the front hoodstick and loop in the centre of the hoodstraps over the rear hoodstick, ensuring that the adjusting buckle faces downwards when the hoodsticks are erect, refer to Figure 120.

Reassemble the hoodstick assembly and attach to the triangular brackets on the chassis using the fixings provided. Ensure that one plain washer is fitted under the head of the screw and the other between the fixing bracket and the hoodstick.

Before fitting the hood, you must first secure the rearward part of the hoodstick in the correct position. To obtain the correct positioning, measure the distance 'A' from the top surface of the rear chassis tube to the centre of the rear hoodstick. Standard chassis 395 mm, refer to Figure 120.

Figure 120: Hoodstick spacing

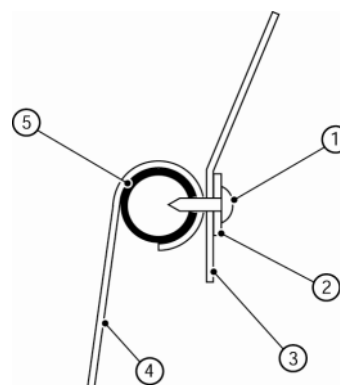


Drill two 7/64" holes into the upper chassis tube, one either side, on the inside rear edge of the boot, opposite the outermost popper base (145 mm from the roll cage mounting lug). Make a small hole in the loose end of each hoodstrap and using the two self-tapping screws (fastener pack ZWE05 Item 10) and washers, fix the straps to the rear panel, on the inside of the top chassis rail, refer to Figure 121.

NOTES

- 1. With the hoodstraps taut, check the position of the rear hoodstick, as this will affect the tension of the hood when finally adjusted.*
- 2. For a neater appearance, popper bases may be used with the self-tapping screws used to secure the hoodstraps.*

Figure 121: Hoodstrap fixing



1. Screw
2. Washer (or popper base)
3. Hoodstrap
4. Rear body skin
5. Chassis tube

13.2) Hood fitting

With the hoodsticks in the upright position and the adjusting buckle fully slackened, drape the hood over the car and attach it to the windscreen with the pre-fitted fasteners. Start with the two outer most fasteners and ensure that the felt seal is correctly located along the top face of the windscreen frame.

Move to the rear of the car and attach the back of the hood, again with the pre-fitted fasteners.

Tension the hood by adjusting the hood straps until the front hoodstick is in line with the stitched darts in the hood. Use the Velcro lined sleeve stitched to the inside of the hood to capture the front

hoodstick, as this will ensure that it is correctly adjusted.

The front popper base for the side of the hood can now be fitted. To do this, pull the side of the hood down and assess the approximate position for the popper base. Apply several layers of masking tape to this area.

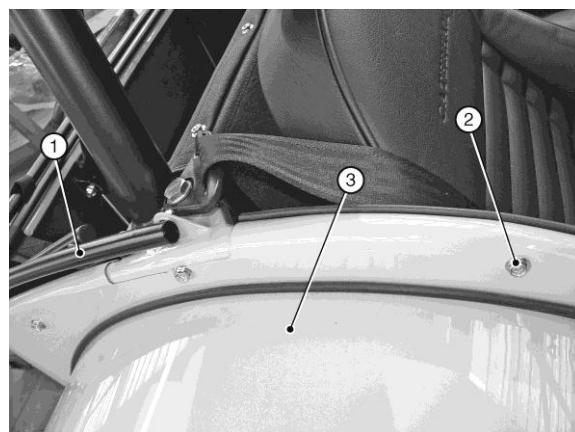
Pull the side of the hood down again and press on the fastener to create an imprint in the masking tape. Drill a 3/32" hole through the centre of the impression, remove the tape and secure a popper base using a self-tapping screw.

NOTE

Care should be taken while drilling hole on curve of the chassis tube.

Repeat the above procedure for the remaining popper bases along the cockpit and boot sides, refer to Figure 122.

Figure 122: Hood side fasteners



1. Hoodstick
2. Popper base
3. Rear wing

13.3) Sidescreen fitment

Using the setscrews (5) and nyloc nuts (13) attach the sidescreen hinges to the outside of the windscreen stanchions with the eyelet towards the rear of the car, refer to Fig 123. Fit the brass hinge pins (8) into the 4 remaining hinges. Now slide the hinges with the pins fitted into the top of hinges attached to the car.

Figure 123: Hinge and side screen fitting



1. Windscreen stanchions
2. Sidescreen hinges

The sidescreen is constructed using a steel frame around the window section. This is covered with the vinyl which continues away from the frame giving a soft flexible area of about 35 mm around the outside. The correct position for the sidescreen is with the soft part at the top, tucked up between the two parts of the hood that make up the seal along the top of the door aperture and the soft area towards the front, tucked inside the stanchion. The lower rear radius of the sidescreen should follow the lower edge of the hood and the metal frame at the top should be just below the top of the door aperture.

With the hood still fitted and correctly tensioned, offer up the sidescreen into position and mark the position of the four

fixing holes. (For ease of marking, it may help to run a strip of masking tape down the front edge of the sidescreen).

Warning

Use appropriate eye protection whilst carrying out drilling operations.

Next, remove the sidescreen and place it on a solid surface and protect the window from damage caused by swarf, before drilling the holes for the fixings. The metal frame inside the sidescreen is very hard, so it is advisable to centre punch and drill through with a 3 mm pilot hole, then finally with a 5 mm drill, to enable fitment of the hinge.

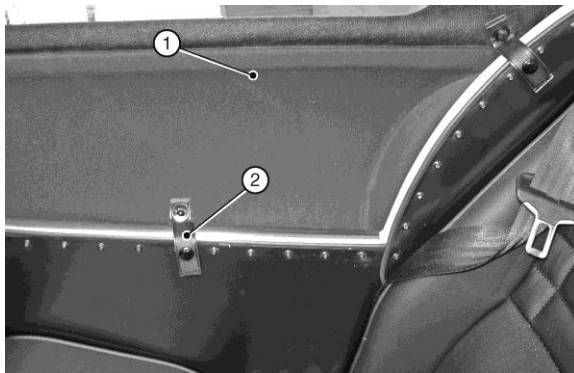
Remove the top part of the hinges from the chassis and secure them to the outside of the sidescreen, using setscrew (5) and nyloc nut (13), with the pin towards the front and pointing downwards. Fit IVA covers to the nuts on the inside of the sidescreen and fit IVA protectors to the non-chamfered ends of the hinge halves, refer to Figure 125.

Refit the sidescreen by sliding the pins down into the hinges on the car. With the sidescreen closed, tuck the top in between the flap of the hood.

Each sidescreen is held shut by two vinyl straps and fasteners. From inside the car, pull the straps in over the top edge of the

chassis and mark the place for the fastener base. Drill a 5/32" hole in line with the rivets holding the side panel in place. (You will be drilling into a round tube so care should be taken to avoid the drill wandering as it hits the tube).

Figure 124: Sidescreen straps



1. Sidescreen
2. Vinyl strap

NOTE

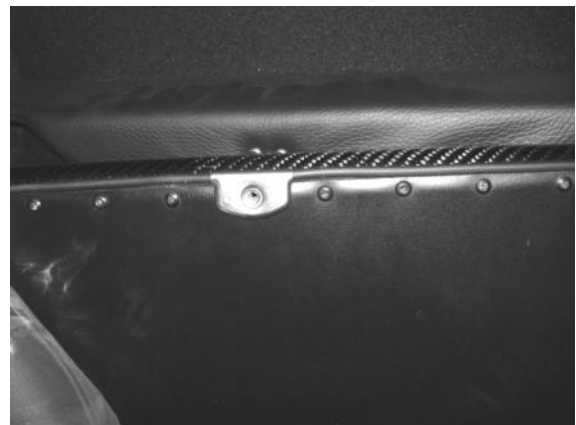
Optional arm restraints are available. If these have been specified on your car then only the top strap is required to locate the sidescreen.

Attach a popper base (2) using rivet (1). Next, pull the strap down over the popper base and mark the centre to position the fastener. Whilst doing this, ensure the sidescreen is pulled tight up against the body of the car to reduce draughts and water ingress. Fix a fastener to the marked position on the strap using the durable dot tool, refer to figure 133. Repeat this process for all fixing straps.

13.4) Arm rest bracket fitment (escutcheon bracket)

Optional arm rest bracket needs to be fitted at this stage. Stick the masking tape on the interior panel in the middle over the rivet holes. Hold the side screen tight against the car and press mark the arm rest popper position on the masking tape. Normally, the popper will line up with one of the rivet holes on the side panel. Push fit the escutcheon bracket and line up the marked position with the centre of the bracket (Bracket should fit over the inside panel and rubber trim). Drill the marked popper position through the bracket (5/32" drill size). Refer to figure121.

Figure 125: Arm rest bracket



13.5) Exterior mirrors

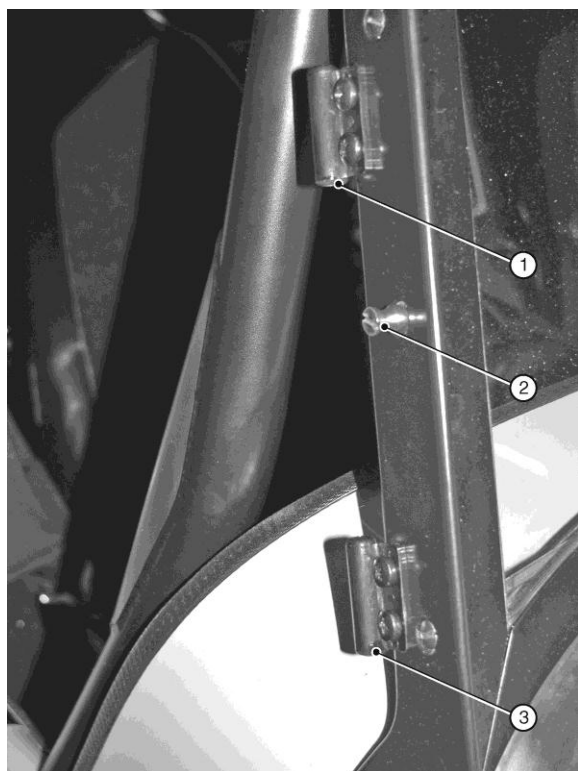
NOTE

After the IVA inspection, the mirrors may be fitted to the side screens but in order to pass IVA inspection, the mirrors must be fitted to the windscreen stanchions.

13.5.1) Fitment to screen stanchion

Remove and retain the central, slot-head screw, in the screen stanchion and screw in the IVA mirror stalk adaptor, refer to Fig 126. Fit a fibre washer and the mirror stalk over the adaptor and tighten the grub screw to secure the stalk (ensure that the large recess in the stalk faces rearwards).

Figure 126: IVA mirror stalk adaptor



- 1. IVA protector (1/2 grommet)
- 2. Mirror stalk adaptor
- 3. Hinge

Remove the mirror head from the original stalk, noting the relationship of all parts. Assemble the mirror head to the IVA stalk

and adjust as required (retain the remains of the original mirror for use post-IVA).

13.5.2) Fitment to side screens

Exterior mirrors are fitted to the sidescreens, towards the front, just below the clear window panel. Locate the holes pre-drilled in the metal frames (approximately 130 mm from front corner and 104 mm apart) then drill through the material with a sharp 5 mm drill. Attach the mirrors to the hidden metal frame of the sidescreen using the countersunk screws (6), washers (14) and secure with nyloc nuts (13).

Figure 127: Mirror fitted to side screen



- 1. Mirror
- 2. Hinges
- 3. Screen stanchion

Plastic M5 caps (polythene bag marked 'IVA') should be fitted to the nuts securing the mirror to the sidescreen. These can

be secured in place using a little silicone sealant.

13.6) Boot cover

When correctly fitted, the boot cover should be as shown in Figure 128.

Figure 128: Boot cover



The boot cover is designed to attach permanently to the top of the bulkhead behind the seat and clip onto the same fasteners as those provided for the hood at the rear of the car. It is designed to fit over the hoodsticks when not in use, therefore, it is essential that these are fitted prior to fitting the boot cover. When the hood is erected, the boot cover is folded away and stored in the boot.

The boot cover is designed to fit around the roll bar, since these vary according to specification, ensure the correct boot cover has been supplied. There is a special boot cover designed for use with the roll cage.

NOTE

For cars fitted with harness type seat belts go to 'Note' in Boot cover section.

All boot covers have a metal insert along the forward edge, with pre-drilled holes to locate the fastener bases. The forward edge of the boot cover should align with the front edge of the seat bulkhead. Ensure that the boot cover is centrally located and mark the holes through the forward edge of the boot cover. Drill a 7/64" hole through each marked location and fit a popper base (fastener pack ZBC02 Item 5) secured with a self-tapping screw (6).

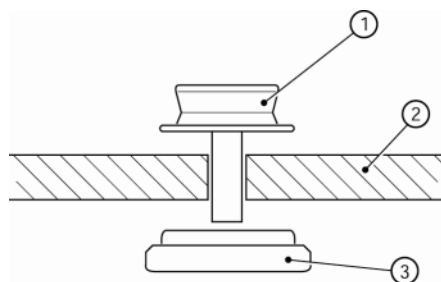
If harness type seat belts are being fitted, the metal insert in the boot cover must be removed. Align the boot cover as previously described and mark the location of the four threaded bosses. Punch a hole in each of the marked locations and fit the harness shoulder strap securing bolts through the boot cover.

Additionally, fit four fasteners (5) using screws (6) in the following locations; one fastener 1 1/4" either side of the car centreline and one fastener at the midpoint between each pair of shoulder restrains. If a tonneau cover is to be fitted, the position of the fasteners will have to be adjusted accordingly.

Stretch the boot cover over the luggage area. Secure around the rear stays of the roll over bar using the Velcro and establish locations for the remaining fasteners (boot cover fastens to the hood fastenings on the body). Fit the popper bases (3) and buttons (4), starting from the rear centre working outwards and then forwards.

If a tonneau cover is to be fitted, then the forward button on each side is substituted by a popper base (fastener pack ZTC01 Item 6), assembled as shown in Fig 167 and fitted to the fastener socket (4) using the punch provided (for correct usage of fastener fixing tool refer to figure 133).

Figure 129: Forward fastener boot cover

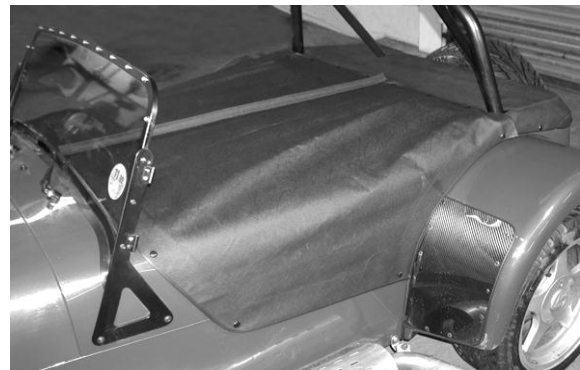


1. Popper base
2. Boot cover
3. Fastener socket

13.7) Tonneau cover

When correctly fitted, the tonneau cover should be as shown in Figure 130.

Figure 130: Tonneau cover



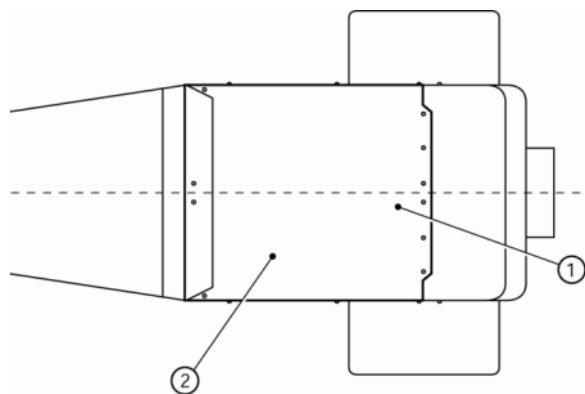
Before the tonneau cover can be fitted, both the boot cover and seat belts must be installed and the detachable head restraints must be removed. The tonneau cover should be fitted with the steering wheel in place. However, if a Quick Release (QR) column has been specified to function as an anti-theft device and is intended to be removed when the car is unattended, then this should also be removed prior to fitting the tonneau.

Carefully align the tonneau along the centre line of the car and stretch it so that there is about 25 mm of tonneau ahead of the fasteners fitted to the centre of the scuttle. Mark and fit two fasteners (4) and buttons (5) in the tonneau to correspond with these fasteners.

Carefully measure the positioning of the rear edge of the tonneau relative to the fastener bases securing the front of the boot cover, ensuring that the rear edge of the tonneau is exactly parallel to the seat bulkhead and it is properly centred, refer

to Fig 131. Mark the position of the fastener bases and fit the six fasteners (4) and buttons (5) across the back. It is important that these fasteners are located correctly, as these set the correct tension for the whole cover. It should not be stretched so tight that it puts tension on the fittings, nor so loose as to allow water to collect on it. Bear in mind it will not stretch so well in cold weather.

Figure 131: Tonneau cover positioning

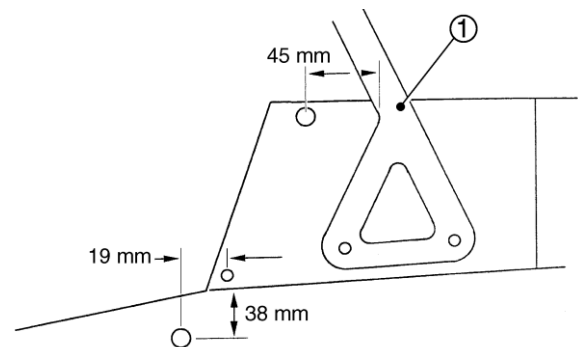


- 1. Tonneau cover
- 2. Boot cover

Starting with the passenger side, mark and drill a 5/32" hole and fit a further fastener (3) securing the rivet (1) on the scuttle, 45 mm inward from the lower edge of the windscreen support where it joins the triangular base, refer to Fig 132. 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, mark and drill a 5/32" hole and fit a further fastener (3)

securing with a rivet (1). Fit a fastener (4) and button (5) in the tonneau to correspond.

Figure 132: Tonneau cover fasteners (front)



- 1. Windscreen support

Mark and drill a 5/32" hole and fit a further fastener (3), securing with rivet (1) 38 mm below the rear lower edge of the scuttle, 19 mm rearward of the centreline of the large scuttle securing rivet. Stretch the tonneau and secure with a fastener (4) and button (5).

Mark, drill a 5/32" hole and fit a further fastener (3) securing with rivet (1) 50 mm down from the top rear of the sill and 45 mm forward of the wheel arch. Pull down the tonneau and secure with a fastener (4) and button (5).

Unzip the tonneau when fitting the fasteners to the driver's side, leaving the rear fasteners in place along the seat bulkhead. Repeat the fitting procedure as per the passenger's side, 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.

NOTE

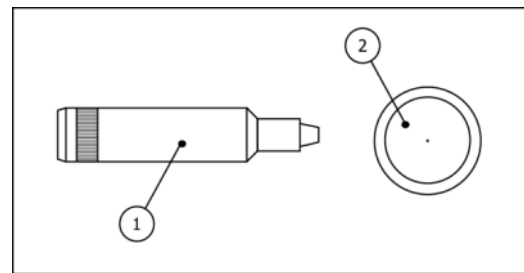
If a roll cage is fitted, additional fasteners must be fitted to the body, to match the tonneau cover fasteners on either side of the Velcro-fastened splits for the roll cage forward supports.

13.8) Correct usage of fastener fixing tool

The fastener tool, Figure 133, consists of two parts; the dished base part and the punch.

- Place the base on a solid surface dished side upwards
- Put the fastener button through the material and rest it in the dished part of the base
- Then place the fastener socket over the tube part of the button so that the cupped section is facing upwards
- Place the punch on the end of the tube and hit it with a hammer until the tube has peened over gripping the two parts together

Figure 133: Durable Dot fastener tool



1. Punch
2. Dished base

14.0) Wheel fitment

Warning

Re-tighten wheel nuts after 200 miles.

The wheel nuts can settle into the wheels over the first few hundred miles causing loss of torque so should be re-tightened to the correct torque after approximately 200 miles.

Many of the tyres supplied by Caterham are directional. Check that the tyre orientation is correct before fitting the wheel to the car.

Fit the Caterham badges into the recess of the wheel centre caps, then push the caps in from the inside of the wheels, ensure fully in before fitting the wheel.

Figure 134: Wheel centre caps



Fit the wheel using the wheel nuts provided, ensuring that the cone on each wheel nut is correctly located in the wheel. The wheel nuts should not be over tightened. It is recommended that they are

tightened whilst the car wheels are on the ground. Torque the wheel nuts to 100 Nm.

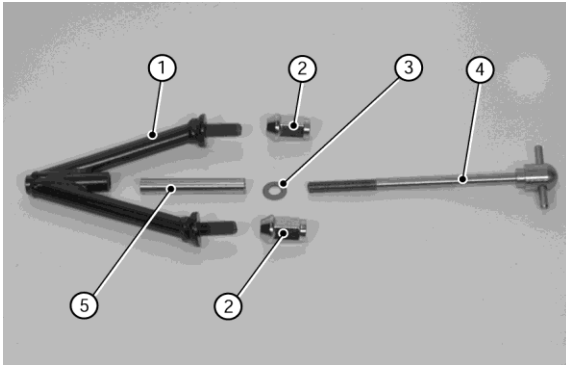
14.1) Spare wheel fitment

NOTE

If specified for your kit, the spare wheel carrier will have been fitted at the factory. Locate the mounting wishbone, Figure 135 (1) (polythene bag marked 'spare wheel') and secure to the spare wheel using two wheel nuts (2). The wishbone should be placed on the inboard side of the spare wheel.

Place the spare wheel in the spare wheel carrier, with the point of the mounting wishbone inboard of the wheel. Care must be taken to avoid damage to the paintwork whilst locating the spare wheel. Assemble the spare wheel bolt (4), fibre washer (3) (located in polythene bag marked 'miscellaneous') and spacer (polythene bag marked 'spare wheel') (5). Secure the spare wheel to the car, using the assembled spare wheel bolt through the centre of the mounting wishbone. Ensure wheel nuts and spare wheel mounting bolt are tight.

Figure 135: Spare wheel mounting items



1. Mounting wishbone
2. Wheel nuts
3. Fibre washer
4. Spare wheel bolt
5. Spacer

15.0) Start up procedure and final checks

This section details the operations, adjustments and checks that should be carried out prior to starting the car for the first time. **Refer to your Owner's Handbook for recommended lubricants and capacities.**

15.1) Brake system – filling and bleeding

Prior to filling the brake master cylinder, recheck all brake connections, including factory fitted connections, from the brake master cylinder to each calliper and rear drum back plate. Ensure that they are correctly tightened.

Warnings

- 1. Brake fluid is poisonous; wash affected areas immediately in case of skin contact and seek medical assistance if fluid is swallowed or enters the eyes.**
- 2. Brake fluid is hygroscopic. Ensure that fluid comes from freshly opened container.**
- 3. Brake fluid is corrosive to paintwork, powder coat and plastic components. Care should be taken to avoid spillage at all times.**

Remove the brake master cylinder cap and protect the surrounding scuttle paintwork with clean cloths, to prevent possible fluid leakage causing damage to the paintwork.

Ensure the rear brake drums are fitted before brake bleeding.

Ensure all bleed nipples on the calipers and on the 1 rear brake bleed nipple, which is on the LH brake back plate, are closed, then fill the brake master cylinder with fresh brake fluid that complies with SA3J 1703F DOT 4 specification. Replace the master cylinder cap.

Remove and retain the dust cap from the LH rear brake back plate bleed screw. Place a length of flexible hose over the bleed screw and place the other end of the tube into a clean glass container. Pour in sufficient brake fluid to cover the end of the tube.

Depress the brake pedal several times to build up pressure and maintain pressure on the brake pedal.

With pressure maintained on the brake pedal, unscrew the bleed screw and allow the compressed air and brake fluid to flow into the container. Tighten the bleed screw before the brake pedal is released. Repeat this process until no more air bubbles can be seen in the brake fluid.

NOTE

Ensure brake fluid level remains above half full level in the brake master cylinder.

Tighten bleed screw and remove flexible hose. Replace dust cap. Carry out the procedure in the following sequence, LH front caliper and finally RH front caliper.

It may be necessary to repeat the brake bleed procedure several times before a firm, high, brake pedal is achieved.

15.2) Coolant

Check all coolant hose securing clips are tight and that the coolant level is visible in the coolant expansion bottle.

15.3) Fuel

Warning

Due consideration should be given to the highly flammable nature of petroleum or alcohol-based products and their vapours. Serious burns can result from incorrect use.

Check the security of the push-fit fuel pipe connection at the fuel rail.

Remove the fuel filler cap and add 15 litres of 98 octane unleaded petrol to the fuel tank.

15.4) Engine/gearbox fasteners

Check that all engine and gearbox mounts and fasteners are tight.

15.5) Gearbox oil

Warnings

Oils - prolonged and repeated contact may cause serious skin disorders.

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

2. Keep out of reach of children.

3. First aid treatment should be obtained for open cuts and wounds.

4. Use appropriate barrier creams.

Figure 136: Gearbox oil fill plug



Remove the gearbox oil filler and level plugs. Add approximately 1.2 litres of gearbox oil to the gearbox until it dribbles out of the level hole. Replace the filler and level plugs.

Due to the restricted access it may help to make a filling tube using a small funnel and hose.

15.6) Rear axle oil

Remove the filler/level plug from the rear of the axle casing and add approximately 1.3 litres of axle oil until it dribbles out of the level hole.

15.7) Engine oil

Refer to Table 21 for an initial fill quantity.

The engine will be delivered with oil added which is sufficient to start and run the engine at idle before checking and topping up as detailed in your Owner's Manual.

Table 21: Engine oil

Engine type	Initial fill Qty
Wet sump	Already filled

The engine oil should be filled via the screw cap on the top of the engine. Remove the cap from the cam cover and slowly pour in the oil, allowing time for the oil to run to the bottom of the engine. Replace the cap and tighten by hand only.

Check around the engine area, both under the vehicle and within the engine compartment, for any visible leaks (oil or coolant). Check all wiring and hoses to ensure that they are correctly located, particularly near any moving parts, for example, alternator or cooling fan.

15.8) Start up

Apply handbrake and check that the gear lever is in the Neutral position.

Connect the red lead from the starter motor to the battery, including the red lead on the main harness. Finally connect the black earth lead to the battery.

Warnings

1. The electric radiator fan is controlled by the engine control unit, which operates when the ignition is in the 'on' position. Whilst working on a hot engine ensure that the ignition is switched off.

2. Do not remove coolant expansion bottle cap whilst coolant is hot. Take precautions to prevent scalds.

Check under the car to ensure that there are no visible leaks. De-activate the immobiliser.

Turn the ignition key to position II and listen for the fuel pump to prime. If no sound is heard, switch OFF the ignition and reset the inertia switch by pressing the rubber button on top until it clicks. Turn ignition key to position II again and the pump should now prime.

Turn the ignition switch to position III so that the engine turns over until the engine starts. Some models are fitted with a pushbutton starter switch. If this is the case on your vehicle, turn the ignition switch to position II (red ignition light ON) and depress the button to operate the starter motor.

Do not allow the engine to run for more than one minute without checking the oil level. With the engine turned off, using the

dipstick as a level, top up the oil system until oil is visible between the 'Min' and 'Max' marks. This will ensure enough oil is in the engine to perform the initial run and warm up. The final check for the engine oil level will be performed later in this Section. Check around and under the engine for any visible signs of leaks.

Once you have checked and topped up the oil level as required, restart the engine and leave running until it is warm. Ensure that the oil pressure gauge continues to be above the red area at idle.

Allow the engine to run until the cooling fan cuts in (this should be at approximately 98°C). Switch off the engine.

NOTE

Should the temperature exceed 98°C without the cooling fan cutting in, switch OFF the engine immediately to avoid damage. Contact the Caterham technical helpline, as it is possible that there is an air lock in the cooling system.

Check the car for visible leaks.

Finally, check the engine oil as detailed in the Owner's Handbook. If in any doubt, please contact Caterham cars.

15.9) Front suspension and steering alignment

The front suspension is adjustable for both camber and castor angles. The top wishbones normally come from the factory pre-adjusted, although you may wish to reset or change the basic settings. Factory recommended settings are shown in Table 22.

Table 22: Recommended suspension alignment - road use

	Front	Rear
Tracking	0° + 0° -05' Toe-out	N/A
Camber	0.0° - 0.5° (Negative)	N/A
Castor	3.75° - 4.25° (0° 20' variation left to right, front)	

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.

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.

Initial toe-in settings for driving to a service agent, for post build checking, can be set visually by ensuring the outside edge of the front tyres lines up with a point on the rear tyres ~ 50 mm in from the outside edge, with the steering wheel centred. This approximate setting will not cause either dangerous handling or unnecessary tyre wear for limited initial mileage. Initial tracking of wide track cars can be set by visually aligning the outside edges of the front and rear wheels.

It is recommended that distinctly different settings are used for race, hill climb or sprint applications. Caterham can provide a range of anti-roll bars and a competition parts brochure is available from the Parts Department at the factory.

15.10) Final checks

Warning

Re-tighten wheel nuts after 200 miles

The wheel/tyre combinations supplied by Caterham, are pre-inflated to approximately 40 psi (2.8 bar) to ensure that the tyre is correctly seated on the wheel rim and must be reduced prior to driving. Tyre pressures should be checked in accordance with Table 23.

Table 23: Tyre pressures

Wheel type	Tyre type/size	Front (psi)	Rear (psi)
5Jx14	Avon ZT5	22	26
ET39	155/65R14 75T	Cold	Cold
		23.5 Hot	27.5 Hot

Some tyres supplied by Caterham are directional. As a result, any spare tyre supplied will only be treaded in the correct direction for one side of the car. If the spare tyre needs to be fitted to the side where the rotation is incorrect this should be done only as a means to get you home and must be rectified before any further use of the vehicle. Ensure that the tyres are fitted with the correct orientation.

Ensure that no wires or brake hoses are in such a position to chafe, or to contact, moving or hot components. Particular care should be taken with wires close to the exhaust manifold.

Before the car is used, ensure that all bolts securing suspension, steering and brakes are correctly tightened, refer to Table 24.

Table 24: Torque figures for final checks and start up procedure

Location	Washers	Torque Nm
Front lower wishbone front	Spring and plain	81
Front lower wishbone rear	Plain spacer	81
Front upper wishbone front	N/A	34
Front upper wishbone rear	N/A	34
Front spring damper top	Spring and plain	20
Front spring damper bottom	Loctite	20
Upright top ball joint	N/A	54
Upright bottom fixing	N/A	54
Front anti-roll bar clamps	N/A	20
Steering rack clamps	Plain under nut	11
Steering column universal joint	N/A	20
Steering column clamp plate	Spring and plain under bolt head	14
Track rod end to upright	N/A	34
Differential mounting	Attached to bolt	23
Propshaft	Attached to bolt	23
Rear spring damper top	N/A	54
Rear spring damper bottom	See assembly instructions	70
Panhard rod	See assembly instructions	61
Radius arm top front M10	See assembly instructions	47
Radius arm all others M12	See assembly instructions	61
Brake unions	N/A	10
Wheel nuts	N/A	100
Engine mounting rubbers	Plain between chassis and nut	20
Engine mounting to rubbers	Spring under bolt head	41
Exhaust catalyst to manifold	N/A	25
Lambda sensor	N/A	45
Engine to Gearbox	N/A	63
Starter motor	N/A	23
Gearbox mount to chassis	Plain between chassis and nut	20
Gearbox mount to mounting bracket	N/A	50
Gearbox mount bracket to gearbox	N/A	23
Expansion tank bracket	Plain under bolt head and nut	10

Location	Washers	Torque Nm
Seat belt/harness bolts	See assembly instructions	47
All roll over bar fixings	See assembly instructions	20

16.0) Individual vehicle approval and registration

IMPORTANT: The nature of the IVA test means that changes or additions to the requirements can happen with no notice. Therefore, the following information MUST be read in conjunction with the 'IVA Checklist' that will be provided in addition to this guide, or can be downloaded from the Caterham website. Information contained in the IVA Checklist may supersede advice given in the following section.

All Caterham cars will have to be inspected under the IVA regulations in order to be registered for road use.

The inspectors have all been trained to the same standard but may interpret certain regulations differently. Each test station will have received a detailed explanation of what a Caterham is and what European regulations it complies with. The inspectors therefore should have reasonable product knowledge and have a contact number at Caterham if required.

It is recommended that the car is presented in a clean condition as this will greatly improve the inspector's demeanour.

It is also advisable to take an emergency kit with you to the test station. This should consist of a basic toolkit, cable ties, push on trim and a length of rubber hose. In the event of components needing tightening for adjustment or a non-compliance, the emergency kit may save you taking the car away and having to re-present it at a later date.

You should remember that any modification made to the car subsequent to passing the IVA inspection may prevent it from passing an MOT at a later date. For example if a competition exhaust is fitted the original catalyst equipped system would need to be retained in order to meet MOT emission standards. The MOT is an inspection of the vehicle's condition and will be carried out in the same manner as for normal production cars. Items such as internal/external projections, noise and fields of visibility will not be inspected at an MOT.

16.1) Requirements

The following items are checked under the IVA inspection:

- Anti-theft Devices
- Defrosting and Demister System
- Wiper and Washer System
- Seats and their Anchorages
- Seat Belts
- Seat Belt Anchorages

- Installation of Seat Belts
- Interior Projections
- Radio Interference Suppression
- Glass and Glazing
- Lamps, Reflectors and Devices
- Rear View Mirrors
- Tyres
- Exterior Projections
- Protective Steering
- Vehicle construction and design
- Brakes
- Noise
- Exhaust Emissions
- Speedometers

The examiner will conduct an engineering assessment rather than the more thorough test that full European Type Approval entails. In some cases (brakes, noise, emissions etc.), there will be a physical test either on a rolling road or within the grounds of the test centre.

The inspection will not require any part of the car to be dismantled and will be carried out at Vehicle Inspectorate test stations.

The inspection is anticipated to take approximately four hours and can be booked between 0800-1700 Monday to Thursday or 0800-1630 on Friday. There is a fee payable for this service. An additional fee will be charged if an inspection is required outside these hours.

16.2) How to apply for the inspection

The inspection has to be formally booked in advance therefore you must:

- Obtain an application form from your local Vehicle Registration Office (VRO) or Vehicle Inspectorate Office (HGV Station).
- Complete the form and return it along with the test fee to:

IVA section
The Vehicle and Operators
Services Agency
91/92 The Strand
Swansea
SA1 2DH

0870 6060 440
<http://www.vosa.gov.uk>

You will then receive confirmation of the inspection which will give details of the time and location. Where possible, the inspection will be carried out at the Vehicle Inspectorate test station you have selected.

16.3) Inspection refusal

The test station may refuse to inspect your car for the following reasons:

- You arrive at the test station later than your appointment time
- You have not paid your fee
- There is insufficient fuel or oil for the test. You will be required to have a **full** tank of fuel

- The car is presented in a dangerous or such a dirty condition that the test is not feasible
- A device designed to be readily opened cannot be opened (e.g. bonnet padlocked)
- The vehicle presenter does not remain with the car to operate controls etc. as requested

16.4) Inspection data

16.4.1) Design weight

You will be asked to specify the maximum gross weights and maximum permitted axle weight during your application for a test date. This will then be checked by weighing the car without passengers and luggage (kerb weight) and then using a formula to calculate the theoretical gross weight. The following weights should be quoted:

Maximum Gross Weight – 733Kgs

Maximum Permitted Front Axle Weight – 296Kgs

Maximum Permitted Rear Axle Weight – 437Kgs

16.4.2) Towing

It is not recommended that the Seven is used for towing, therefore, when asked the question; the answer is 'Not Applicable'.

16.4.3) Speedometer

The speedometer is compatible with this vehicle.

16.5) Checking and preparing the car prior to inspection

It is recommended that the checks and operations detailed in the following paragraphs are completed prior to taking the car for the inspection.

16.5.1) Wiper and washer system

Carry out a full system check prior to the inspection. Ensure the screen washer bottle is full, the wiper blades contact the windscreen and the washer jets are correctly adjusted. Ensure all hoses are secure as the system will be checked under pressure.

16.5.2) Radio interference suppression

Caterham supplied ignition leads are suppressive. If you choose not to use the Caterham supplied ignition leads and have supplied your own leads, ensure they are clearly marked as suppressive.

16.5.3) Lamps, reflectors and devices

If you have built your car using the components and information supplied, the car will comply with IVA lighting requirements. Ensure that repeater indicators are fitted to the front wings.

16.5.4) Rear view mirrors

These should be set up for maximum visibility. Ensure that the windscreen mounted mirror and both screen stanchion mirrors are in place. It is also worth removing the hood, or arriving without it altogether, as this improves both visibility and access.

16.5.5) Noise

Tailpipe noise will be tested. Though the silencer is brand new, the efficiency is increased when the internal packing has expanded against the inner wall. It is therefore recommended that you allow the car to idle as much as possible prior to taking the car to the test centre. This will also allow a layer of soot to settle which will help deaden the 'ring' of the new silencer.

16.5.6) Emissions

All Caterham cars are supplied with catalytic converters and will meet the test requirements.

16.5.7) General construction

This should be checked at the Post Build Check stage, however, if you are not using that service, ensure that chafing of brake pipes and the wiring looms is not possible. If you have followed the procedures detailed in the Assembly

Guide then you should not have any problems at this stage of the inspection.

16.5.8) Protective steering

All standard Caterham steering wheel types have a removable pad fitted. This pad must be in place during the inspection.

16.5.9) Brakes

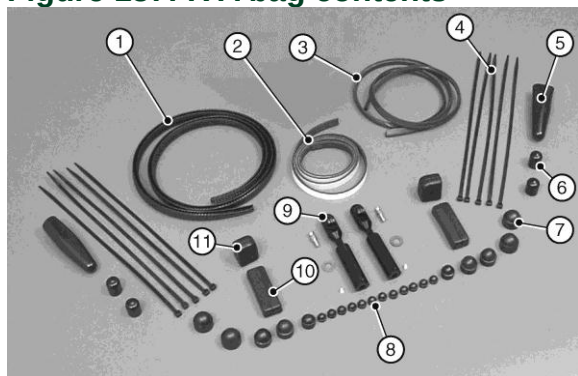
The braking system will be subjected to a thorough test (on brake rollers) so it is imperative that you take the time to bleed the brakes correctly. The performance of the brakes often improves dramatically after a small amount of use. Frequent application of the brakes on the way to the test centre will help the brakes bed in.

Ensure the handbrake is correctly adjusted and does actually lock the rear wheels.

16.5.10) Interior and exterior projections

Supplied with the kit is a polythene bag marked 'IVA', refer to Figure 175. It is essential that these items are fitted prior to presentation at the IVA Testing station.

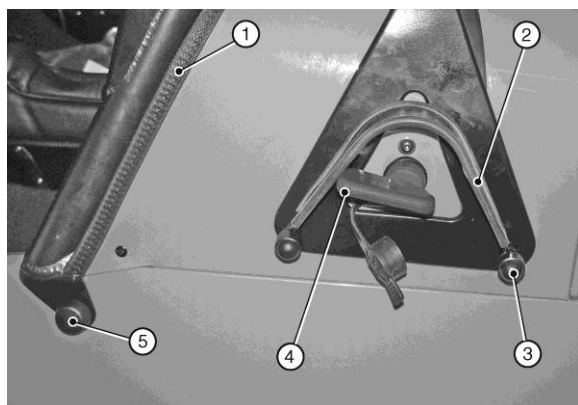
Figure 137: IVA bag contents



- | | |
|---------------------|-----------------------------------|
| 1. Scuttle trim | 7. Bolt head covers |
| 2. Foam tape | 8. Nut covers |
| 3. Edge trim | 9. IVA mirror stalks and fittings |
| 4. Cable ties | 10. Rear bonnet catch cover |
| 5. Track rod sleeve | 11. Front bonnet catch cover |
| 6. Flexible covers | |

Ensure that the scuttle edge trim (Figure 137 Item 1) is fitted to the edges of the scuttle around the dashboard.

Figure 138: IVA scuttle trim and battery master switch



1. Scuttle edge trim
2. Eyebrow edge trim
3. IVA cover
4. Battery master switch sheath
5. IVA cover (optional roll cage)

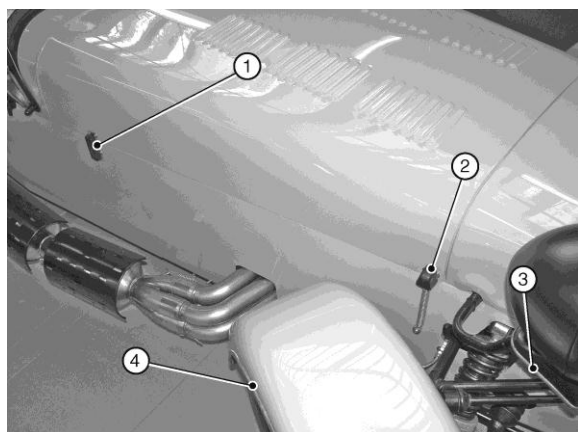
Apply the self-adhesive Velcro strips around the sides and bottom of the fuse box cover. Attach the other half of the Velcro fastening to the Velcro already attached to the fuse box cover. Locate the cover over the fuse box sticking it in place. (R400 only).

The '7' in the nosecone grill is not IVA compliant and therefore should be fitted behind the mesh grill in order for your car to pass the IVA test.

The edge trim should also be secured to the edges of the front cycle wings (Fig 139 Item 4), the edge of the black plastic housing around the rear fog and reverse lights and the edges of the indicator cones. Cars fitted with the detachable wind deflector will also require edge trim along the top edge of the deflector and around the edges of the mirrors.

The caps (Figure 140 Item 3) should also be fitted to the nut and bolt head of the top wishbone front mounting.

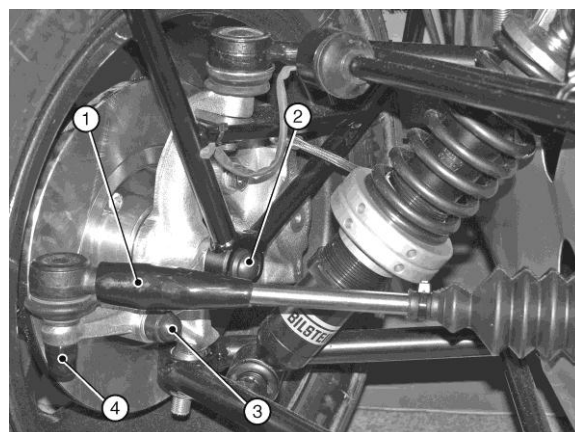
Figure 139: Bonnet catches



1. Rear bonnet catch cover
2. Front bonnet catch cover
3. Edge trim (indicator cone)
4. Edge trim (cycle wing)

The bonnet catch covers (Figure 139 Items 1 and 2) should be pushed over the respective bonnet catch. The covers (Figure 139 Item 7) should be fitted to the shoulder strap mounting bolts (Only required if this 4 or 6-point harness option is specified). The sleeves (Figure 140 Item 1) should have been fitted over the track rod locknuts during the front suspension build.

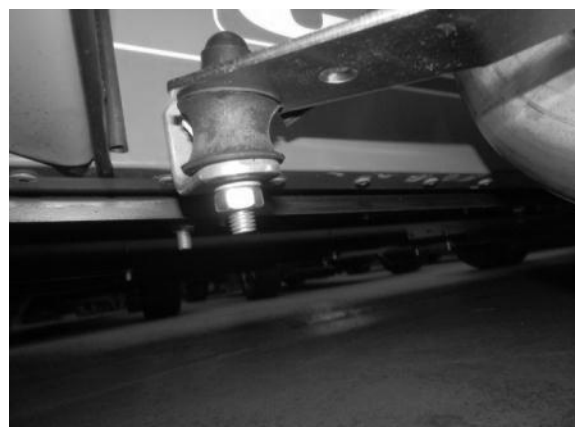
Figure 140: Front suspension



1. Track rod sleeve
2. Stub axle cover
3. Steering arm nut cover
4. Track rod end nut cover

Covers (Figure 140 Items 2, 3 and 4), should be fitted over the inner stub axle nuts, the steering arm nuts, the track rod end nuts and the two wheel nuts that hold the spare wheel to the spacer wishbone (if fitted). Covers (Figure 141 Item 1) should be fitted to the exposed nuts securing the exhaust bobbin and the exhaust bracket and an off-cut of scuttle edge trim should be fitted to the upper edge of the exhaust silencer bracket.

Figure 141: Exhaust mounting



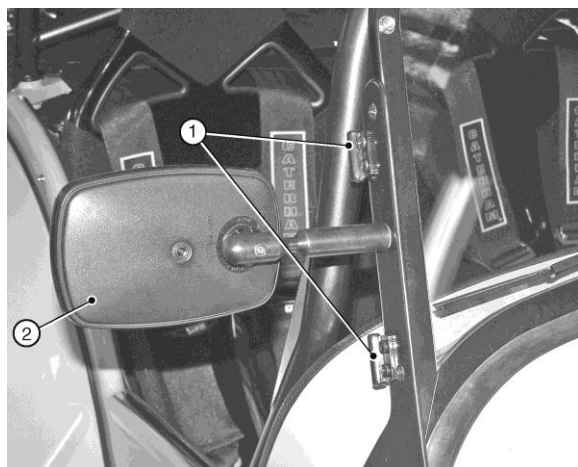
The sharp edge of each side screen hinges should be protected as shown in Fig 142. The protectors are made by cutting grommets in half and fixing them in place with superglue.

NOTE

The hinge halves fitted to the side screens must be protected in a similar manner.

Road wheels are exempt from external projections with the exception of the spare wheel. Ensure the wheel is positioned such that any balance weights are behind the spare wheel carrier.

Figure 142: Side screen hinges



1. Grommets
2. Rear view mirrors (IVA position)

16.5.11) Race cars and IVA

There are several parts that are mandatory on race cars which are not IVA friendly. Ideally these parts should be fitted after the car has been submitted for its IVA test, but if this is not possible then

these parts will need to comply with the IVA criteria.

Fire Extinguisher. The 'T' handle that operates the fire extinguisher will need to be removed and the boss in the dash covered.

Track day roll over bar/roll cage. All fixings will need to be covered. If the track day roll over bar petty strut is supplied, this will need to be removed and the hole in the side panel must be covered.

Battery Master Switch. The edges of the master switch key will not pass IVA. A rubber sheath for the key is included in the IVA kit and this must be fitted for the test. The eyebrow must be fitted with edge trim and the fixing bolts will need protective caps, refer to Figure 138.

16.6) Registration procedure after IVA inspection

If your vehicle fails the IVA inspection for any reason, you will be allowed to take the car away to rectify it.

Upon successful completion of the IVA inspection, you will be issued with a certificate to confirm that the car has passed to the standard required. This certificate is officially called a Minister's Approval Certificate (MAC) and must be retained. In order to register your car you must submit the MAC, a completed

application for registration form (currently V55/5), insurance certificate and your certificate of newness (with full CKD De Dion kits only), along with your Vehicle Excise Duty (VED) fee for either six months or twelve months, to your local Vehicle Registration Office (VRO). In addition, a registration fee will be levied by

DVLA to cover administration costs throughout the vehicle's life (sending out VED reminders etc.).

The car will be subjected to an MOT inspection three years after it was first registered.

16.7) Location of vehicle inspection test stations where the IVA test can be carried out

Aberdeen

Cloverhill
Bridge of Don Industrial Estate
Aberdeen AB23 8EE
01224 702357

Beverley

Oldbeck Road
Off Grovehill Road
Beverley
East Yorkshire HU17 0JG
01482 881522

Birmingham

Garretts Green Industrial Estate
Birmingham B33 0SS
0121 783 6560

Bristol (Avonmouth)

Unit 10, I.O. Centre
Poplar Way West
Avonmouth
Bristol BS11 0QL
01179 381157

Cardiff (Llantrisant)

School Road
Miskin
Pontyclun
Mid Glamorgan CF72 8YR
01443 224701

Carlisle

Brunthill Road
Kingstown Industrial Estate
Carlisle CA3 0EH
01228 528106

Chelmsford

Widford Industrial Estate
Chelmsford
Essex CM1 3DR
01245 259341

Derby

Curzon Lane
Alvaston
Derby DE21 7AY
01332 571961

Exeter

Grace Road
March Barton Trading Estate

Exeter

Devon EX2 8PU
01392 278267

Gillingham

Ambley Road
Gillingham
Kent ME8 0SJ
01634 232541

Glasgow (Bishopbriggs)

Crosshill Road
Bishopbriggs
Glasgow G64 10A
0141 772 6321

Leighton Buzzard:

Stanbridge Road
Leighton Buzzard
Bedfordshire LU7 4QG
01525 373074

Liverpool (Speke):

C/O South Liverpool Commercials
Woodend Avenue
Speke
Liverpool L24 9NB
0151 4860050 or 0151 5474445

London–North (Edmonton)

Anthony Wharf
Lea Valley Trading Estate
Edmonton N18 3JR
020 8803 7733

London–South (Mitcham)

Redhouse Road
Croydon
Surrey CR0 3AQ
020 8684 1499

London–West (Yeading)

Cygnets Way
Willow Tree Lane
Yeading
Hayes
Middlesex UB4 9BS
020 8841 9205

Manchester–North (Chadderton)

Broadgate
Broadway Business Park

Chadderton

Oldham OL9 9XA
0161 947 1000

Newcastle-upon-Tyne

Sandy Lane
Gosforth
Newcastle-upon-Tyne NE3 5HB
0191 236 5011

Norwich

Jupiter Road
Hellesden
Norwich NR16 6SS
01603 408128

Nottingham

Main Road
Watnall
Nottingham NG16
0115 938 2591

Shrewsbury

Unit 6 Levens Drive
Harlescott
Shrewsbury SY3 7EG
01743 462621

Southampton (Northam):

Unit R, Centurian Industrial Estate
Bitterne Road West
Southampton SO18 1UB
02380 837397

Taunton

Taunton Trading Estate
Norton Fitzwarren
Taunton
Somerset TA2 6RX
01823 282525

17.0) Options

These fitting instructions are supplied in addition to the normal assembly guide delivered with your kit. They are specific to the additional equipment required when using your car for competition purposes. This document is supplied with new kits and as instructions to customers purchasing upgrades for an older car. IVA notes have been included for customers needing to register a new vehicle.

It is important that these instructions are read in conjunction with your assembly guide, in particular with regard to the preliminary information that can be found at the front of the guide.

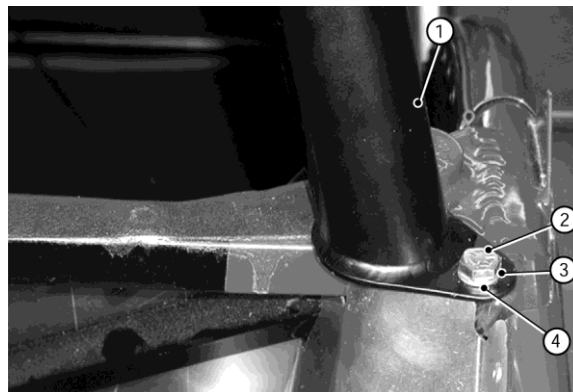
17.1) Standard roll over bar

Insert the bosses, on the underside of the roll over bar main hoop into the bucket bushes located at each end of the seat belt header rail towards the rear of the cockpit, refer to Figure 181. Locate the rear diagonals of the roll over bar into the mounting brackets at the rear of the boot compartment. Secure the roll over bar to the chassis using set screws (fastener pack 30P010A Item 2), spring washers (6) and washer (5).

The rear diagonals are secured to the brackets by bolt (1) and nyloc nuts (4) with a

plain washer (5) under the bolt head and nyloc nut. Tighten all fastenings to 20 Nm.

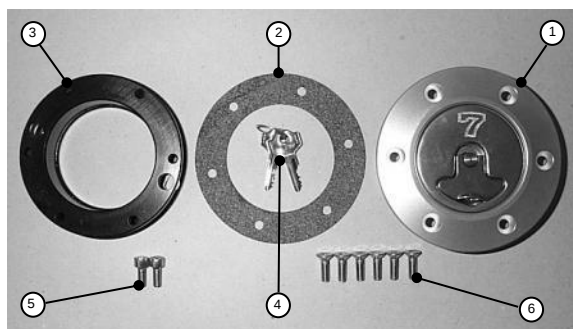
Figure 143: Standard roll over bar



- | | |
|---------------------------|------------------|
| 1. Standard roll over bar | 3. Spring washer |
| 2. Set screw | 4. Plain washer |

17.2) Aero fuel filler cap

Figure 144: Aero fuel filler cap



- | | |
|-----------------|---------------------------------|
| 1. Filler cap | 5. M5 x 12 cap head screws (x2) |
| 2. Gasket | 6. M5 x 16 CSK head screws (x6) |
| 3. Neck adapter | |
| 4. Keys | |

Warning

There is always a risk of fire or explosion when working on fuel tanks. Take the utmost care with preparations.

If the Aero filler cap is to be retro fitted, the original cap must first be removed as follows. Undo the two self-tapping screws and remove the black filler neck cover inside the boot. Remove the boot carpet to prevent it getting dirty.

Figure 145: Filler cover and boot carpet removed



Warning

Wear appropriate eye protection whilst carrying out drilling operations.

Remove the old cap with the the key and block the filler hole with tape or cloth. Remove the two self-tapping screws that retain the top of the filler neck to the filler boss, the rubber hoses will then allow the filler neck to be pulled out of the way.

Drill out the six rivets that retain the old filler boss. This must be done very carefully to avoid damage to the back panel. It is recommended that this is done with a hand or air drill to eliminate the sparks caused by an electric drill.

Figure 146: Drill out the six rivets



The old filler boss can then be carefully pulled away from the back panel.

Figure 147: Old filler boss removed



Take the gasket supplied with the kit and carefully align the hole in the gasket with the hole in the back panel. Ensure two of the fixing holes are positioned at 3 o'clock and 9 o'clock.

Figure 148: Gasket positioned on back panel



Mark the new hole positions and carefully centre punch the marks. Take great care, drill the holes (6 mm diameter).

Figure 149: Carefully drill new holes



Fit the black spacer to the filler neck using the two M5 cap head screws supplied in the kit. The spacer will be a tight fit on the neck

due to the O-ring and it must be pulled up evenly. The holes for the spacer are slotted to allow for correct alignment with the holes in the back panel. Tighten the screws fully after the alignment has been checked.

Figure 150: Spacer fitted to filler neck



Re-position the filler neck and gasket up against the back panel. Push the filler flange through the hole in the panel. Care must be taken to ensure correct orientation of the flange (One of the four 'scallops' has been enlarged to enable a petrol pump nozzle to pass further into the neck. It is important that this larger scallop is orientated towards the top), refer to Fig 152. Retain with the six M5 x 16 CSK head screws and pull these up evenly to ensure the flange locates correctly on the O-ring.

Figure 151: Fit flange



Remove all drillings from the inside of the boot and re-fit the boot carpet. Reposition the filler neck cover and retain it using the two self-tapping screws.

Figure 152: Job complete

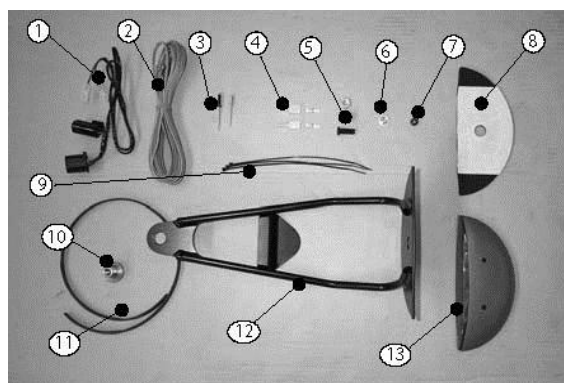


All that remains is to remove the tape or cloth from the neck and fit the new cap.

NOTE

Remember to fit the key to the new cap to your key ring.

Figure 153: Kit contents for high level brake light



1. Wiring sub loom
2. Wiring to high level brake light
3. Rivets (x2)
4. Male Lucar terminals and shrouds
5. Nut and plastic bolt from light kit
6. Replacement popper
7. Rubber grommet
8. Sticky pad
9. Cable ties
10. Larger spare wheel boss
11. Cable insulation
12. Light support bracket
13. High level brake light

17.1.1) Fitting the bracket

If retro-fitting, the spare wheel must first be removed from the car.

Working from inside the boot, unscrew the 5/8" nut which holds the spare wheel boss to the back panel, and remove the boss, taking care not to drop the large washers.

Warning

17.3) High level brake light

Wear eye protection when carrying out drilling operations.

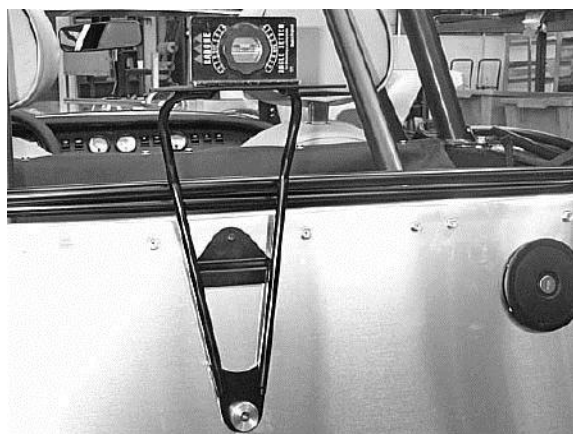
Centre mark a point 25 mm below the top of the back panel, on the vehicle centre line. Centre punch this, and drill a 5/32" hole, taking care not to damage the back panel. In the case of the SV, simply remove the central hood/boot cover popper using a 5/32" drill, as shown in Figure 155.

Figure 154: Drilling central popper on SV



Using masking tape to protect the paintwork from damage, position the bracket as shown in Fig 156, passing the new, larger spare wheel boss through the bracket and back panel, ensuring only one large washer is used in between the back panel and spare wheel support channel. Secure the boss using the 5/32" nut, finger tight only.

Figure 155: Alignment of bracket



Using a spirit level, refer to Figure 156, adjust the bracket until the light platform is exactly parallel to the top of the back panel, and mark from inside the boot through the previously drilled hole, onto the bracket.

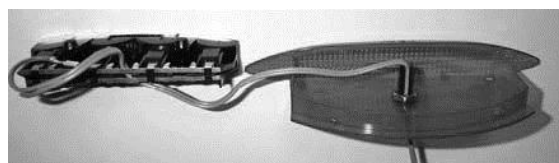
Remove the bracket, centre punch and drill the hole using a 5/32" drill. Re-fit the bracket, and secure the upper mounting using the large black rivet, or for an SV the smaller countersunk rivet passed through the replacement popper. Apply threadlock, and tighten the 5/8" nut to 34 Nm.

17.3.2) Light and wiring connections

If painting of the light casing is required, follow the instructions supplied with the light.

Split the light and feed the terminated end of the supplied wires through both the hole in the base of the light unit, and the nut supplied with the light unit. Insert the plastic bolt from the underside, and tighten nut to secure in place as shown in Fig 157. Connect the terminals to the male connectors on the metal strips on the bulb holder.

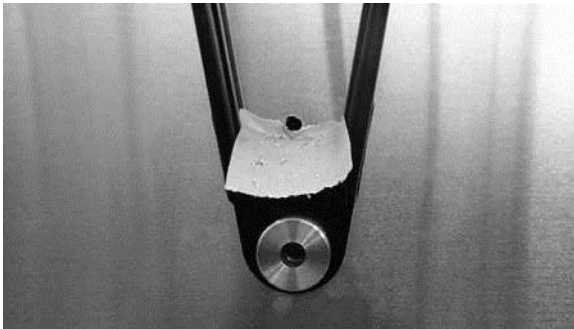
Figure 156: Wire routing through light unit



Centre mark a point on the vehicle centre line, 35 mm above the edge of the spare

wheel mounting boss. Centre punch, and carefully drill a 1/4" hole, as shown in Figure 157. Masking tape can be used to protect the paintwork. Push the supplied rubber grommet into the hole.

Figure 157: Drilled hole above spare wheel boss

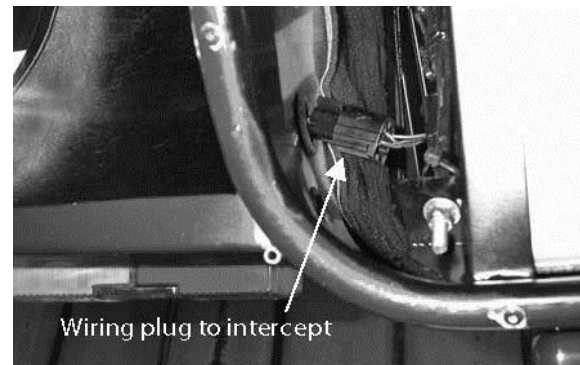


Warning

Disconnect the negative (-) terminal from the battery before carrying out electrical work.

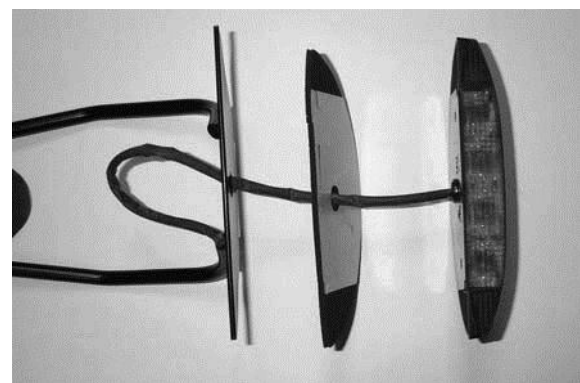
Working from inside the boot, unscrew the four retaining screws that secure the fuel filler neck cover, and remove it. From under the right and rear corner of the car, feed the terminated end of the supplied sub-loom up into the boot area, through the hole exposed by removing the filler neck cover. Disconnect the wiring plugs leading to the rear light cluster, and connect the plugs from the sub loom in between, as shown in Fig 158.

Figure 158: View from under RHS rear corner



Re-assemble the light unit, and feed the cable insulation over the wires. Push them through the hole in the sticky pad and the hole in the platform on the bracket, then use the sticky pad to fix the light in place, shown in Fig 159. Feed the wires down through the RH support tube of the bracket, then through the rubber grommet into the boot area, shown in Fig 160.

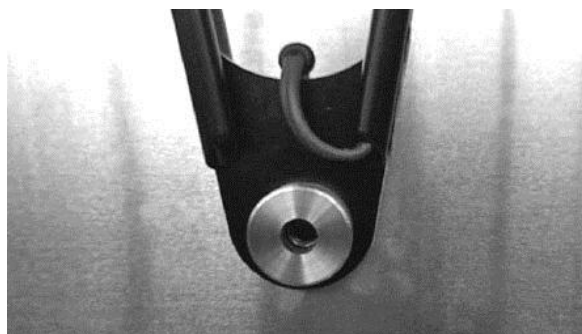
Figure 159: Exploded view of assembly



Cut the wires from the light unit to length so the connections can be concealed behind the filler neck cover, and terminate with the male Lucar terminals and shrouds. Connect these to the sub-loom; grey/red to the green/purple, and grey to the black wire.

Use the cable ties provided to tidy and secure the wiring, and re-fit the filler neck cover.

Figure 160: Wires from support tube entering boot



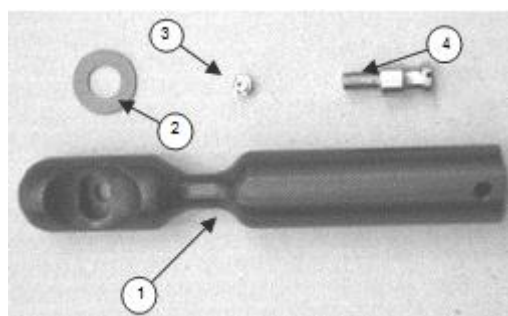
Reconnect the battery and, with the aid of an assistant, check to ensure that the high-level brake light operates in conjunction with the brake lights in the rear clusters. Re-fit the spare wheel. The completed assembly is shown in Fig 161.

Figure 161: Completed assembly



17.4) IVA mirror fitting instructions

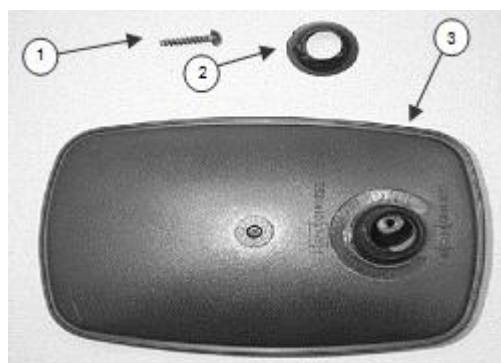
Figure 162: Kit contents for mirror fitting



1. Mirror stalk
2. Fibre washer
3. M5 grub screw
4. Fixing stud

The side screen mirror (part number 291 0074 01) must first be dismantled from its mounting arm using a T20 Torx bit. Retain the mirror section, Torx screw and plastic cup. Setting aside the arm (see fig 162).

Figure 163: Dismantled mirror



1. Torx screw
2. Plastic cup
3. Mirror

Parts taken from the mirror (figure 163.) now need to be assembled with the mirror mount. Place the plastic cup against the

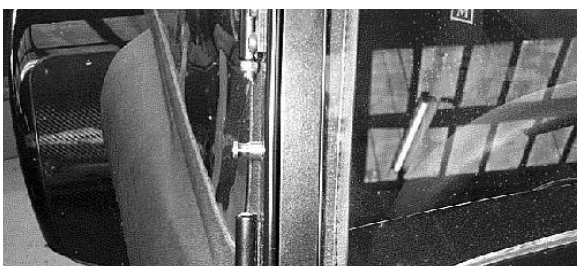
hole cut in mirror casing. Inside the mirror section there is a small swivelling arm, this is placed into the machined slot of the mirror mount. The flat on the swivelling arm faces towards the right (looking at figure 162). The Torx screw should then be inserted from the rear of the mount to secure the stalk and mirror together (see figure 164).

Figure 164: Assembled mirror



Insert M5 grub screw into threaded hole (right hand side of mount looking at Figure 162) until top of screw is just flush with surface of mount.

Figure 165: Stud located on stanchion



If fitted, remove the centre of three windscreen-securing screws and replace with supplied stud (shown in Fig 163) using flat blade screwdriver. See Fig 165.

Place fibre washer over stud now located in side screen. The previously assembled

mirror will now slide over the stud located on the side screen. See Fig 166.

Figure 166: Final fitted assembly



Adjust the mirror position to allow for optimum vision and lock in place by tightening M5 grub screw

18.0) Wiring diagrams

Figure 66: Caterham 7 160 Main Wiring Harness

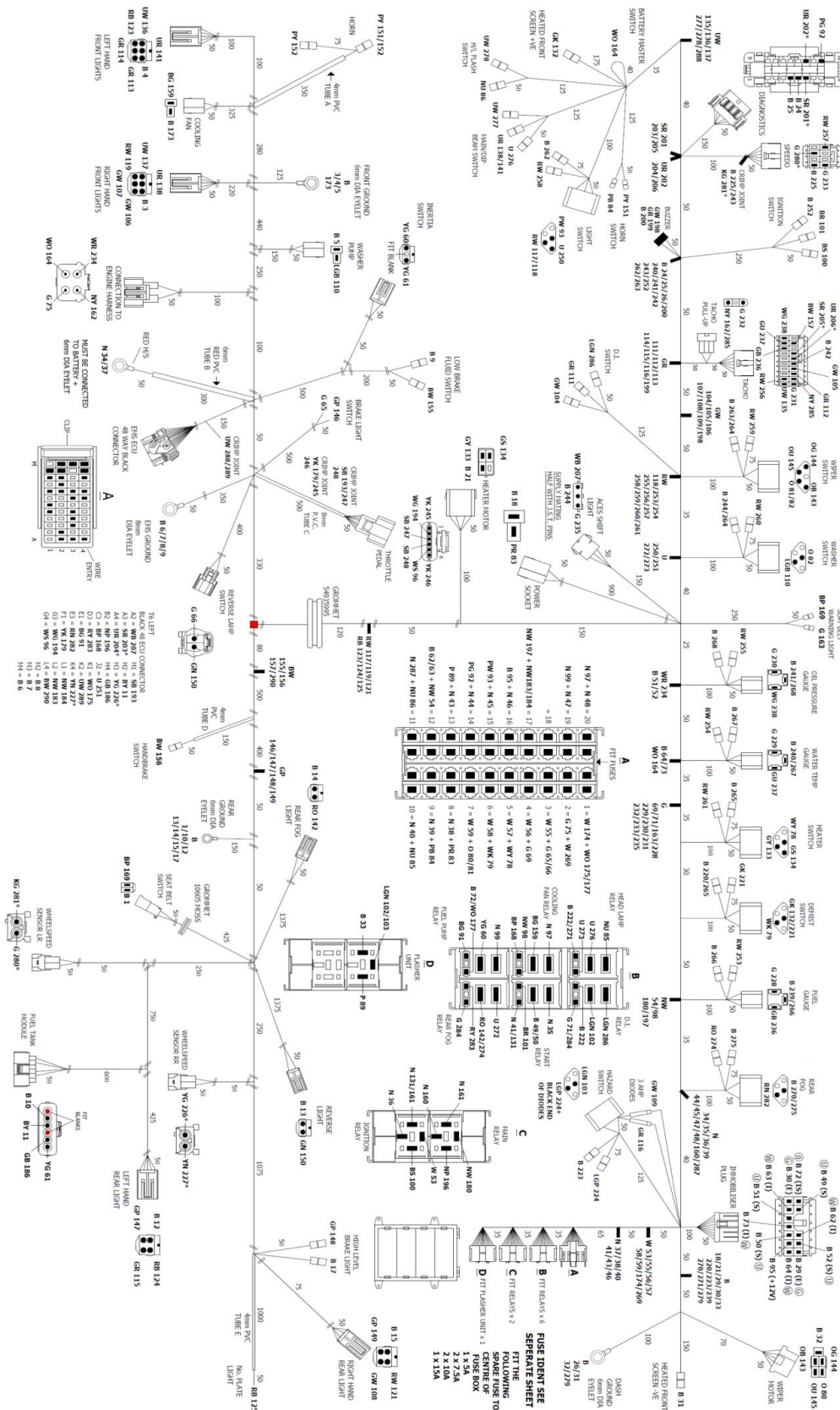


Figure 67: Engine harness (160)

