SECTION 14

OPTIONAL EXTRAS

Contents

There are a wide range of extras available for the Caterham Seven and the attachment of the most popular items are covered by this section.

14.1 Heater-Recirculating Type

1.1 The heater kit includes all the items necessary to install a heater in an existing live axle car.

1.2 The heater unit itself is fitted to the horizontal bulkhead above the occupants' feet and operates by recirculating air from above the gearbox and ducting warm air down through slots into both footwells.

1.3 It is held down by four self tapping screws and plain washers so the first step is to lay the unit in place and mark the positions for 1/8" holes to be drilled, checking that it does not foul the steering column. You will also need to mark out on the chassis where the outer ducts locate relative to the bulkhead so that the self adhesive foam seals can be correctly located and stuck on the bulkhead. With these in place, the heater can be screwed into position.

1.4 The heater is wired using 3 connections, the black wire to earth, the red wire to the green/purple on the loom and the white wire to the green/yellow on the loom. The earth is connected to one of the self tapping screws locating the unit. It will be necessary to drill a 3/8" hole in the vertical bulkhead behind the heater approximately 5" up and 15" in from the left hand side edge of the chassis in order that the wires can be passed through a grommet to connect with the loom.

1.5 Attach one end of the 5/8" diameter rubber tubing to the 5/8" connection on the water pump, using a jubilee clip and, mounting it as per diagram 10.5, attach its other end duly trimmed to length, to the left hand connection on the heater with another jubilee.

1.6 Attach the shorter length of 5/8" diameter tubing to the 5/8" connectoon the inlet manifold and connect it in turn to the connection on the heater using Jubilee clips. Clip the pipes together so that they run in parallel above the engine with the three clips provided.

1.7 In order to get the heater operational it will be necessary to bleed the air out of it first. This can be done by disconnecting the hoses above the inlet manifold and slowly filling the heater with a water/antifreeze mixture, with the radiator cap removed until the water level in the header begins to rise.

14.2 Heater Control Valve (Recirculating Heater)

2.1 For those wishing to obtain better control over their heaters a control valve is available which is used to cut off or reduce the supply of hot water to the heater. This kit is available under Caterham part No. HV01 and consists of the valve, its operating cable and the necessary fixings.

2.2 The valve locates in the heater input hose which is the right hand one as viewed from the driver's seat. It is therefore necessary to remove a section of this hose 5cm long in line with the forward edge of the pedal box. Place a jubilee clip over each end of the hose and insert the control valve, operating lever uppermost, and secure the clips.

2.3 The operating control locates under the scuttle above the driver's right knee, and a hole 1/2" (12.5mm) diameter must be drilled in the vertical face of the scuttle at the bottom right hand side, taking care that this is positioned to avoid any obstructions.

2.4 Feed the cable through from inside the car and secure the cable outer to the scuttle using the nut and shakeproof washer threaded onto it, the washer on the engine bay side and use the spring clip to attach it to the control valve body.

2.5 With the control handle pushed fully home and the lever on the valve in the shut (left viewed from the driving seat) position, the inner cable is passed through the hole in the lever and bent back on itself so that the lever can be pushed shut or pulled open.

2.6 Finally the cable is secured to the outside face of the pedal box using the 2 'P' clips provided and we suggest that these are fitted in place of the existing clips holding the brake pipe.

14.3 Rear Wing Protectors

3.1 These consist of stainless steel panels which are attached to the lower front of the rear wings with 5/32" pop rivets. These are supplied flat and will need to be gently bent to suit the contour of the wings.

3.2 Cut the rubber wing piping strip to fit around the lower outer and upper edges, cutting darts in its flange in order to take up a smooth curvature.

3.3 With the panels pressed against the wing piping strip between the rear wing and chassis, drill through the existing holes and rivet the panels into place on the wing capturing the beading. It is easiest to drill the inside holes with the wings away from the body.

14.4 Oil Cooler (Ford Engines Only)

4.1 The oil cooler plumbing connects to the engine using a special adapter fitted to the oil filter housing. First remove the filter and then fit the aluminium casting containing the oil cooler connections into its place securing with the special 1" sleeve nut provided. Ensure that the rubber seal between this and the oil filter housing is lightly greased to both help tightening and prevent leaks and that the nut is not over tightened since to do so will damage the oil pump/filter housing.

4.2 IMPORTANT: De Dion cars must have a Capri type oil pump fitted or the filter will foul the diagonal chassis tubes at the front of the engine bay. When fitted the connections taking the pipes to the cooler should ideally face to the right hand side of the car leaving sufficient clearance for the unions. The oil filter can now be replaced and should be pre-filled with oil to prevent an air lock occurring in the oil pump. Oil filters must not be re-used.

4.3 The oil cooler is located in front of the radiator. This is held by two special brackets which are attached to the radiator using the existing mountings at the bottom and the spare holes in the radiator flange at the top. Note that these brackets are not handed and the oil cooler is suspended above them. (see Fig 14.4A and 14.4B)

4.4 There are two oil pipes provided in the kit, the ends which attach to the oil pump/filter housing using 90^0 unions, while at the oil cooler the right hand union is straight and the left hand uses a 90^0 union. This allows the pipes to be fitted parallel to each other and for tidiness they can be secured together with tywraps.

4.5 The oil pipes should be routed upwards from the cooler, over the radiator and down over the front chassis cruciform to the engine. Take great care that these pipes do not foul the steering mechanism or rub on any sharp edges.

14.5 Competition 4 - 1 Exhaust System

5.1 The Competition type stainless steel exhaust system is available for all engine variants including Ford, Vauxhall and Rover power plants. It differs from the standard system by having a large bore 4 into 1 manifold leading into a larger bore silencer which exits to the side in front of the left-hand rear wheel. Please note that Vauxhall and Rover engines manufactured after 1.1.93 must have a catalyst to pass the MOT test. We do not offer a 4-1 competition catalytic exhaust system.

5.2 You should be aware that this system is considerably louder than the standard system described in 10.8 but releases more power. However, it does not meet RACMSA silencing restrictions when fitted to certain engine variants so check with the factory first if competition is envisaged.

5.3 On chassis designed for Ford engines, the aperture provided in the body skin is intended to take the standard 4 into 2 into 1 exhaust system and hence is too small for this option. To enlarge it we recommend that you use a small pair of CURVED tinsnips and enlarge the aperture sufficient to allow about 1/4" clearance around the system. This work will have been completed at the factory on Vauxhall and Rover powered cars. We also suggest that you cover the area around it with masking tape which serves the dual role of protecting the paintwork if appropriate and enabling you to mark clearly where cutting is necessary.

5.4 The aperture is enlarged as follows:

i) Fit the dual pipe serving cylinders 2 and 3 onto the engine (Rover and Ford engines - Vauxhall engines use individual primary pipes) and temporarily secure with 5/16" UNC Allen bolts and springwashers (Ford), or to studs securing with appropriate nuts. This should fit through the existing aperture although trimming at the lower edge will be needed. Mark where the aluminium skin is to be cut and having removed the manifold cut as required.

ii) Replace the dual pipe and now in addition test fit the rear pipe which serves No. cylinder. Once again mark where the body skin is to be cut away and remove both parts of the manifold before trimming.

iii) Repeat this exercise with the forward No. section.

iv) Finally finish off any sharp edges with a half round or round file and bolt the manifold loosely into place using suitably enlarged gaskets to the cylinder head.

5.5 The manifold pipes can now be fed into the fabricated 4 into 1 piece and secured using the two 1/4" x 3/4" UNF bolts, plain washers and nylocs. Tighten the manifold on the cylinder head

5.6 The silencer mounting bracket and rubber bobbin attaches in the same way as with the standard system (10.9.4). Slide the silencer unit over the end of the 4 into 1 piece, again using Firegum, and secure the rear of the silencer to the bobbin using a plain washer and 5/16" UNF nyloc nut.

5.7 Use the clamp provided to secure the silencer to the 4 into 1 piece twisting the silencer to make certain that the side pipe is not too close to the ground.

5.8 Finally attach the exhaust guard using long Jubilee clips in the same way as with the standard system (10.9.8). The adjuster clip should be positioned in the gap between side bodypanel and the silencer, such that it is above the level of the base of the silencer.

14.6 Tonneau Cover

6.1 Tonneau fitting varies slightly according to whether the chassis is fitted with a De Dion or Classic live Axle since a different form of top spring/damper mounting is employed.

De Dion cars

6.2 Before the tonneau can be fitted both the boot cover and seat belts must be installed, and the steering wheel and head restraints must be removed (if specified).

6.3 Carefully align the tonneau along the centre line of the car and stretch it across so that there should be about 1" of tonneau ahead of the popper centres. Mark and fit two poppers at the front to correspond with the bases just fitted.

6.4 Carefully measure the positioning of the rear edge of the tonneau relative to the popper bases securing the front of the boot cover ensuring that its rear edge is exactly parallel to the seat bulkhead and that it is properly centred. Mark the positions of the popper bases and fit the six poppers across the back. It is very important to locate these poppers correctly as these set the correct tension for the whole cover. It should not be so tight that it puts too much stress on the fittings, bearing in mind that it will not stretch as well in cold weather, nor so loose that water can collect on it.

6.5 Working one side at a time, starting with the passenger side, mark and drill a hole and fit a further popper base on the scuttle approximately 1 3/4" inward from the lower inner edge of the windscreen support where it joins its triangular base (see

figure 14.6). Stretch the tonneau carefully into position taking care to pull the tonneau far enough forward to achieve a little clearance in front of the rear wing and fit another fastener.

6.6 Carefully pull the rear edge of the tonneau over the side of the car and mark and fit a fastener to secure it to the boot cover side.

6.7 Mark, drill and fit a popper base 3/4" below the rear lower edge of the scuttle, 1" rearward of the centreline of the large securing rivet. Again stretch and fit the tonneau with a fastener.

6.8 Carefully pull the rear edge of the tonneau over the side of the car and mark and fit a fastener to secure it to the boot cover side.

6.9 Mark, drill and fit a popper base at a point 2" down from the top rear of the doorway and 1 3/4" forward of the rear wheelarchs. Pull down the tonneau to achieve an even fit to the wheelarch and fit the final fastener.

6.10 Un-zip the tonneau and refit the steering wheel when fitting the first fastener leaving the rear fasteners in place along the seat bulkhead. Repeat the fitting procedure taking care to stretch the tonneau away from the vehicle centreline towards the windscreen stanchion just sufficient to prevent bagginess in front of the steering wheel.

Fastening the zip will correctly tension the tonneau.

Classic Live Axle Cars

6.11 Tonneau fitting is generally similar to the above instructions except that the rear shock absorber spindles protrude above the bulkhead and eyelets are fitted to the tonneau which fit over them. This means that the location of the rear of the cover is accurately fixed and therefore saves the careful measuring required for a De Dion car. Fit the rear fasteners according to the logical location given by the spindles but otherwise follow the instructions in the same way as with De Dion cars.

14.7 Wind Deflectors

7.1 The Wind Deflectors available from Caterham Cars locate onto the mountings fitted to the sides of the windscreen used for the sidescreens.

7.2 These are manufactured from ICI cast acrylic sheet of high quality and are 10 times more impact resistant than glass.

7.3 It is extremely important however that they are not cleaned with any solvents as it is likely that the surface will be damaged. Use soap and water and rinse off, or use "Mr Sheen" or similar polish. The occasional use of "T" Cut will remove any polish build up, and any small scratches, but do not use a power tool buffer.

14.8 Side Sill Protectors

8.1 These consist of pre-formed stainless steel plates which fit over the upper edge of the cockpit sills to protect paintwork from being damaged while entering or leaving the car.

8.2 To fit these accessories, first drill out the rivets holding the inner trim panels to the upper chassis tube along the bottom edge of the cockpit so that the longer edge of the "U" shaped protectors can be slotted down between the tube and the trim.

8.3 Having aligned the protectors and ensuring that they are flush with the top of the tubes, drill through the existing holes in the trim into the protectors and rivet both trim and protectors into place.

14.9 Adjustable Platform Shock Absorbers (Classic Only)

9.1 For owners wishing to use their cars for competition purposes, the specification of this option enables the front and rear ride height to be adjusted in order to cater for springs of varying length and to be able to run their cars lower than standard.

9.2 These units are adjusted using the lower spring platforms which are threaded onto the damper body. The platform is comprised of two rings the upper of which bears on the spring and the lower is used to lock the upper one in position.

9.3 In order to adjust the platforms special 'C' spanners should be used. Although it is possible to use a pair of screwdrivers there is a risk of damaging the notches in the rings designed to accept 'C' spanners.

9.4 These dampers are supplied from Caterham Cars with springs fitted but it will be necessary to adjust them to obtain the correct ride height as follows:

i) Adjust the front until the lower wishbones are horizontal which will mean that the top links of the front suspension will slope slightly downwards and inwards. As a secondary check measure the dimensions as shown on Fig. 14.9.

ii) Adjust the rear until, without driver or passenger, the dimension 'B' on the diagram is approximately 15mm higher than 'A'.

9.5 In order to achieve an even ride height from side to side you can either measure the distances from the bottom of the dampers to the underside of the locking rings or count the number of threads exposed.

9.6 It is recommended that in order to prevent the exposed threads becoming corroded or blocked with road dirt they are firstly greased and then covered with protective tape.

9.7 We also strongly recommend that you do not lower the car relative to these settings as handling will deteriorate due to substantial use of the bump stops which prevent the car's suspension from operating properly, the available wheel travel is by the very nature of the vehicle limited.

9.8 In addition, by running the car excessively low, the car's ground clearance is reduced which is likely to lead to damage to the engine sump.

9.9 If for competition purposes you still wish to reduce the ride height we suggest that you use stiffer springs to keep the car off the bump stops and fit a Dry Sump oil system to the engine in order to increase ground clearance.

9.10 De Dion cars are supplied with adjustable platform shock absorbers as standard, these adjust by moving the sporing platforms up and down by removing the retaining circlip and placing it in an alternative groove as required. Spacer shims of 1mm and 2mm thickness are available for fine tuning the ride height.

14.10 Battery Master Switch

10.1 A master switch kit has been produced by Caterham Cars to enable the fitment of an Autolec battery master switch, primarily for competition purposes, but also for security. This contains the following components:

1 Autolec Battery Master Switch with fixing bolts
1 Main Cable (red) Starter Solenoid to Master Switch
5 Female Lucar connectors and insulating covers
1 Male Lucar connector
3 Ring terminals (2 x 1/2", 1 x 5mm)
1 Protection "Eyebrow" and fixing bolts
All necessary cables and sufficient cable ties

Please refer to the wiring diagram Fig. 14.10. with this kit.

10.2 We recommend fitting the switch in the triangular section of the right hand windscreen stanchion and a scale template is included on Fig. 14.10 Trace or cut out this template and use it to mark and drill three holes in the aluminium.

10.3 Remove the rubber cap from the switch and insert it from the inside of the scuttle securing with the bolts supplied. The rubber cap can be replaced on the switch but leave the key out for the time being.

10.4 Remove the existing battery to starter solenoid cable (red) completely though it is reused later.

10.5 Disconnect the two brown wires from the positive terminal of the battery, cut off their terminals and join the bare wires together. Solder to this joint the additional brown wire provided insulating well with insulating tape, and attach the 1/2" ring terminal to the other end.

10.6 This new wire is routed along the chassis tube above the gearbox, up through the wiring loom grommet in the transmission tunnel cover and then behind the dashboard to the switch, connecting it to either of the main terminals.

10.7 Attach the new red main battery cable to the starter solenoid and following the chassis members, run this above the gearbox, through the wiring grommet and along to the switch attaching it to the same terminal as the brown wire.

Ford Engined Variants

11.8 Unclip the black plastic cover from the rear of the steering lock, protecting the ignition switch terminals, and remove the terminal with the two white wires attached to it.

10.9 Using the male Lucar connector, connect this to one of the white wires contained in the kit and having attached a female Lucar connector and an insulator to the other end of the wire, connect it in turn to one of the 'Z' terminals on the back of the master switch.

10.10 Attach a female Lucar connector and insulator to each end of the second white wire and connect this between the remaining 'Z' terminal and the ignition switch where the twin white wires were disconnected.

Rover K Series Cars

10.11 Disconnect the purple power lead in the main loom from the brown lead in the engine loom. Extend and connect the purple lead to one side of the terminal Z on the battery master switch. Extend and connect the brown wire to the other terminal Z on the battery master switch, see Figure 14.10.

All Variants

10.12 Solder each of the black wires supplied to each end of the resistor contained in the Autolek kit and insulate with tape. Attach an insulated Lucar connector to one wire and the 5mm ring terminal to the other. Connect the Lucar end to the 'W' terminal on the master switch and earth the ring terminal to metal at a convenient point.

10.13 Fit the green wire with suitable connectors and attach it between the remaining 'W' terminal on the master switch and the main terminal to which the brown and red wires have been attached.

10.14 Finally the original red battery cable removed earlier should be routed from the remaining terminal on the master switch, through the grommet, and along the chassis tube to the positive terminal on the battery. CAUTION do not connect to the battery until the cable is routed and connected to the master switch.

10.15 Tie all cables to the existing loom using the cable ties provided and take care to ensure that all connections are well insulated and no wires are hanging loose.

10.16 To test the system, turn the master switch to the on position and check that the lights work. Start the engine and while the engine is running turn the master switch to off, the engine should immediately die. If there is a fault recheck your wiring and if this cannot be traced contact Caterham Cars.

10.17 Please note that on no account should you reconnect the battery or run the engine until the switch wiring is complete or damage can be done to the alternator.

10.18 On K Series cars it is not advisable to switch the engine off on the master switch except in emergencies as this will wipe the memory of the ECU. While no permanent damage will be done, it will result in initial rough running until the ECU has been able to re-programme itself.

10.19 On Vauxhall Injection cars, to protect the E.C.U., the E.C.U. needs a permanent power feed that is not switched by the cut out switch. To provide this, remove the white wire from the plug connecting the engine harness to the vehicle loom. (N.B. this wire should be removed from the engine harness side) Extend this wire and fit a ring terminal to its end, where it bolts to the positive terminal of the battery.

10.20 Where the cut off switch has been fitted for racing purposes it will also be necessary to fit the "eyebrow" shield around it to prevent the switch being damaged in a side on accident. This is fitted to the windscreen stanchion by substituting the existing plated caphead bolts for the longer bolts supplied with the kit.

14.11 Flush Fuel Filler Cap (Standard on injected cars)

11.1 It is mandatory for racing and advisable for other forms of motorsport to fit a flush fuel filler which will not be torn off in the event of a rear end impact. Accordingly a kit is provided which consists of a new filler neck and retaining bezel, a plastic locking cap and the necessary fastenings. If you have fitted the standard filler cap already it should be removed along with the back panel grommet and the rubber hose.

11.2 Using the two self tapping screws provided attach the retaining bezel to the filler neck, noting that one of the six rivet holes in this collar should be at the top.

11.3 Cut down the original filler hose by removing a section from either end measuring 3" on the inside by 3.5" on the outside. If in doubt test fit the hose in place removing smaller amounts until it fits correctly as in 12.4 below.

11.4 Push the shortened hose onto the back of the filler neck and loosely assemble onto the petrol tank. Insert the filler cap through the hole in the back panel and capture the filler neck assembly by turning the key in the lock.

11.5 Using the holes in the bezel as a guide, mark and drill six 1/8" holes in the back panel for the retaining rivets and secure passing the rivets through from the outside.

11.6 The jubilee clips retaining the filler hose can now be tightened, and any fire protecting cover replaced. Note that as the cap supplied is not vented, it will be necessary to drill an extra 1mm hole through the cap if symptoms of fuel starvation are suffered.

14.12 Fuel Tank Protection Kit

12.1 This kit is again needed for competition purposes and contains seven pieces (six on injected cars) of 1/2" aluminium honeycomb shaped to fit around the fuel tank. Firstly it will be necessary to remove the roll over bar, boot floor and the tank itself.

12.2 Referring to Fig. 14.12 the first panel to be fitted is the centre rear panel which is secured using a thin smear of silicon sealant to the inside face of the back panel.

12.3 Remove the self adhesive foam strips from the angle brackets which support the tank and drill five 5/32" holes evenly spaced in each. Drill corresponding holes in the tank undertray noting that the crushed edge faces backwards and rivet this into place. Fit new pieces of self adhesive foam and replace and resecure the fuel tank.

12.4 Attach the two rear side plates and both end plates directly to the fuel tank using silicon sealer, pressing firmly into place. On injected cars the fuel pump is located on

the right hand side of the tank and therefore it is not possible to fit this part of the protection kit.

12.5 Finally replace the wooden boot board with the honeycomb one provided (rear only for De Dion), securing with self tapping screws in the same way. It may be necessary to trim this slightly in order to obtain a good fit. The roll over bar and fuel tank filler can now be replaced.

14.13 Floor Impact Protection Panels

13.1 To provide additional protection for the driver (RHD cars only) 1/2" honeycomb panels are available for all chassis types which fit onto the cockpit floor. These are secured using a thin bead of silicon sealant close to the edge of the underside of each panel, and a heavy weight should be used to hold them in place until the sealant has dried. These panels may need to be trimmed using tin-snips or a file to obtain a tight fit.

13.2 Both this kit and the fuel tank kit in 14.12 are fitted using silicon sealant. This is available along with a suitable frame applicator from Caterham Cars under part numbers 76828 and 76829 respectively.

14.14 Competition Rollover Bar

14.1 Before fitting the rollover bar it will first be necessary to remove the rear spring damper units in order to gain access to the lower mounting points (De Dion only). (See Section 7.4)

14.2 The rollover bar is slotted into the recesses provided in the bulkhead behind the cockpit, and is secured from underneath by 5/16" x 1" bolts and lockwashers into the threaded holes provided in each vertical member of the bar. Leave these bolts loose for the time being so that the bar can be moved to allow alignment of its other fixings.

14.3 The rear diagonals are secured to the brackets provided at the rear of the boot compartment using 5/16" x 2" bolts and nylocs with a plain washer under both the boltheads and nylocs.

14.4 The main mounting flange is attached using 5/16" x 1" bolts, plain washers and lockwashers at the rear outside edge, and by the 7/16" x 1" bolts holding the full harness seatbelts at the inner edge. When all the bolts are located they can be fully tightened and the rear spring damper units replaced.

14.5 The diagonal brace is fitted between the top of the rollover bar and the inside edge of the cockpit on the passenger side (RHD cars). It is supplied in two halves so that it can be adjusted exactly to fit each individual chassis.

14.6 The forward and lower mounting is to a bush located within the chassis and normally hidden behind the trim panel. It can be found approximately one inch below the point at which the dashboard tube is welded to the top of the chassis rail.

14.7 Drill out six 3/16" rivets holding the top edge of the trim panel in place around this point and ease the panel away from the chassis until the exact location of the bush is identified. Drill a small pilot hole through the trim panel and enlarge so that a 7/16" bolt can be fitted through, taking care when doing so that the thread in the bush is undamaged. When this can be done replace the trim using new dome headed rivets.

14.8 The top half of the brace is secured to the top of the rollover bar with a 7/16" x $2\frac{3}{4}$" bolt and nyloc with plain washers under both the bolt head and nyloc, while the bottom section is secured to the bush in the side panel using another 7/16" x $2\frac{3}{4}$" bolt, plain washer and lock washer.

14.9 The two halves are held together by another 7/16" bolt, nyloc and washers after first drilling through both sections to suit.

14.10 We strongly recommend that all parts of the rollover bar likely to be contacted by either the driver's or passenger's heads be protected. We suggest that you obtain some foam pipe lagging of appropriate size and tape it to the bar using canvas tank tape or similar.

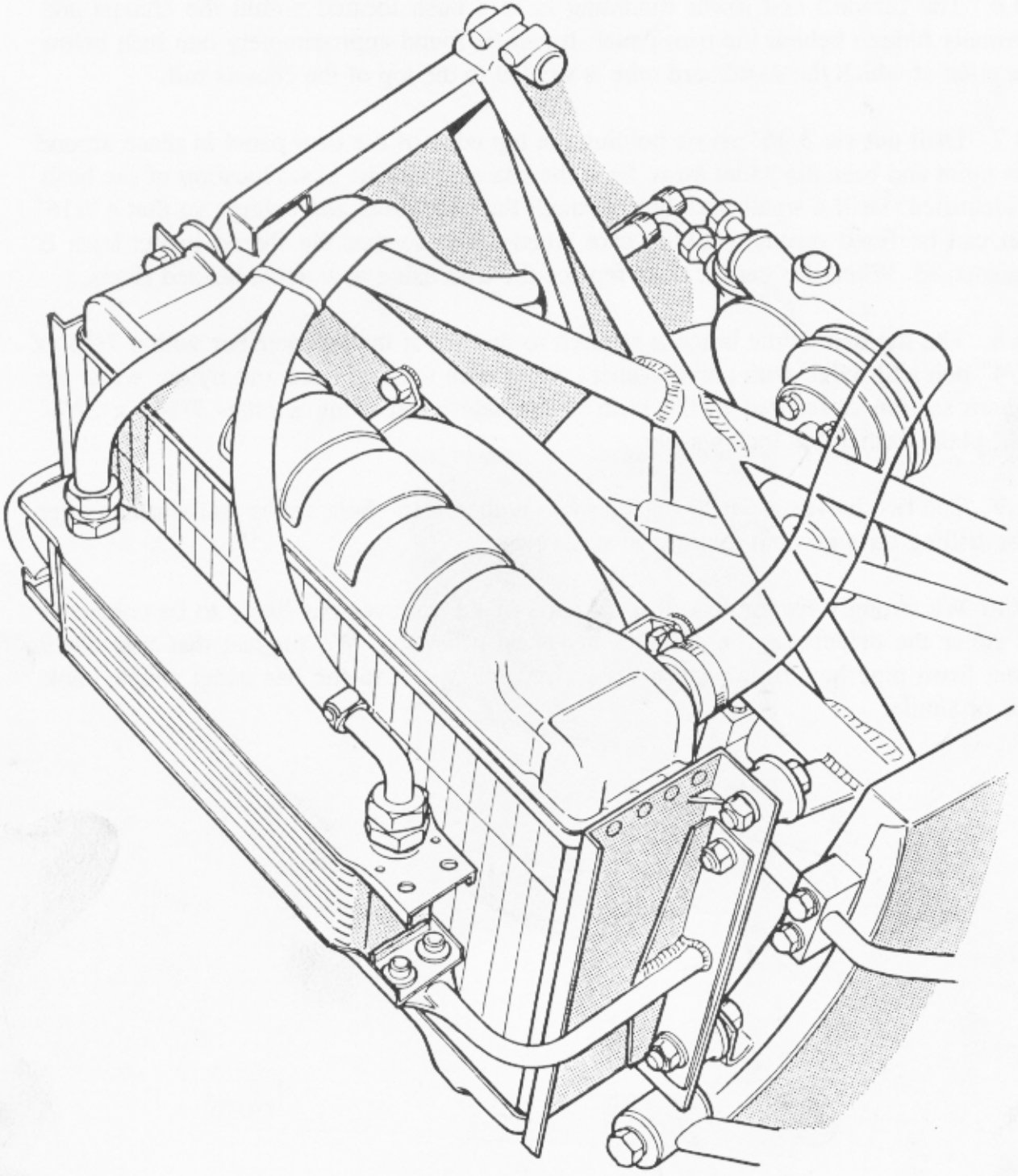


Figure 14.4A Oil Cooler Pipes Layout (Front View)

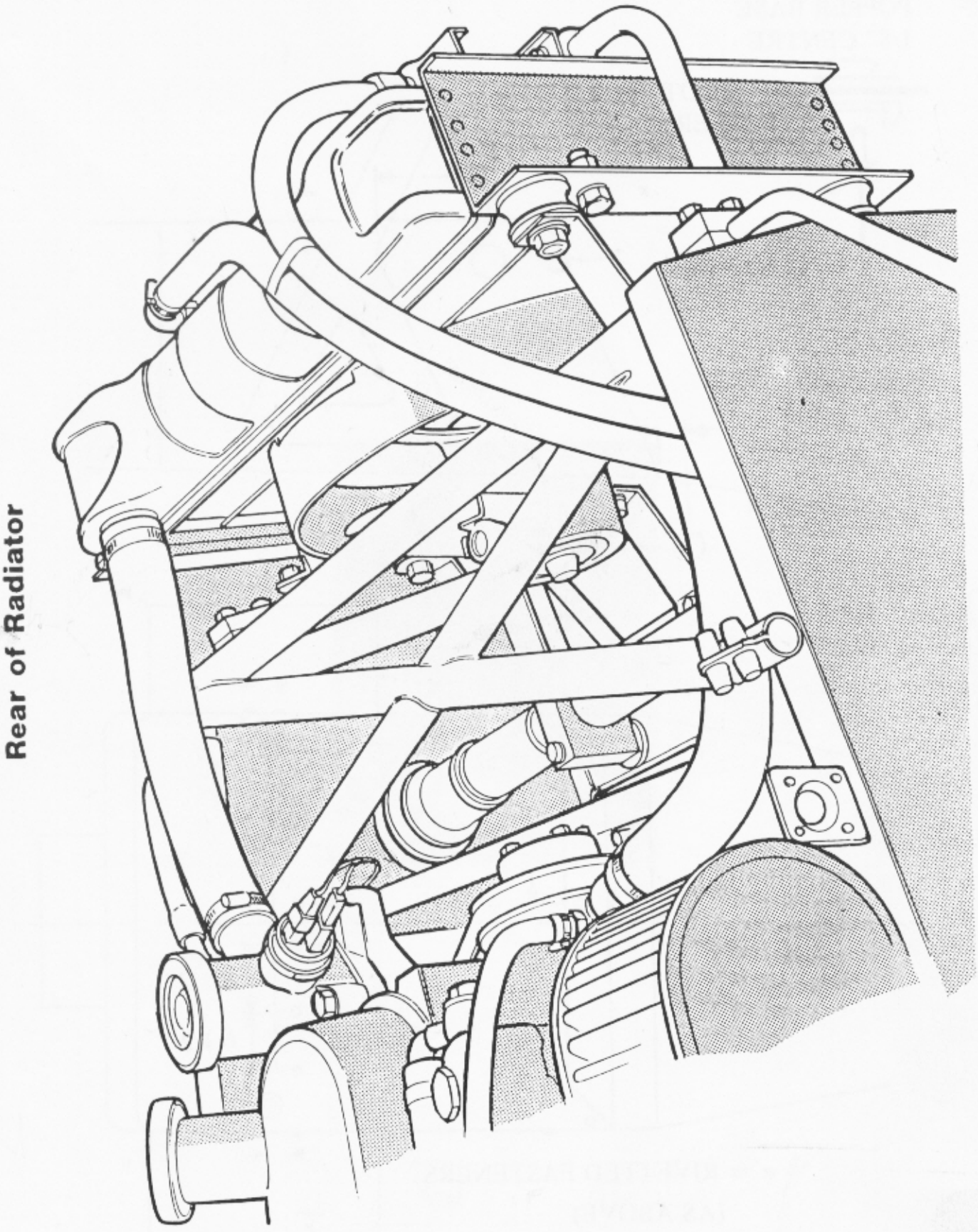


Figure 14.4B Oil Cooler Pipes Layout (Rear View)

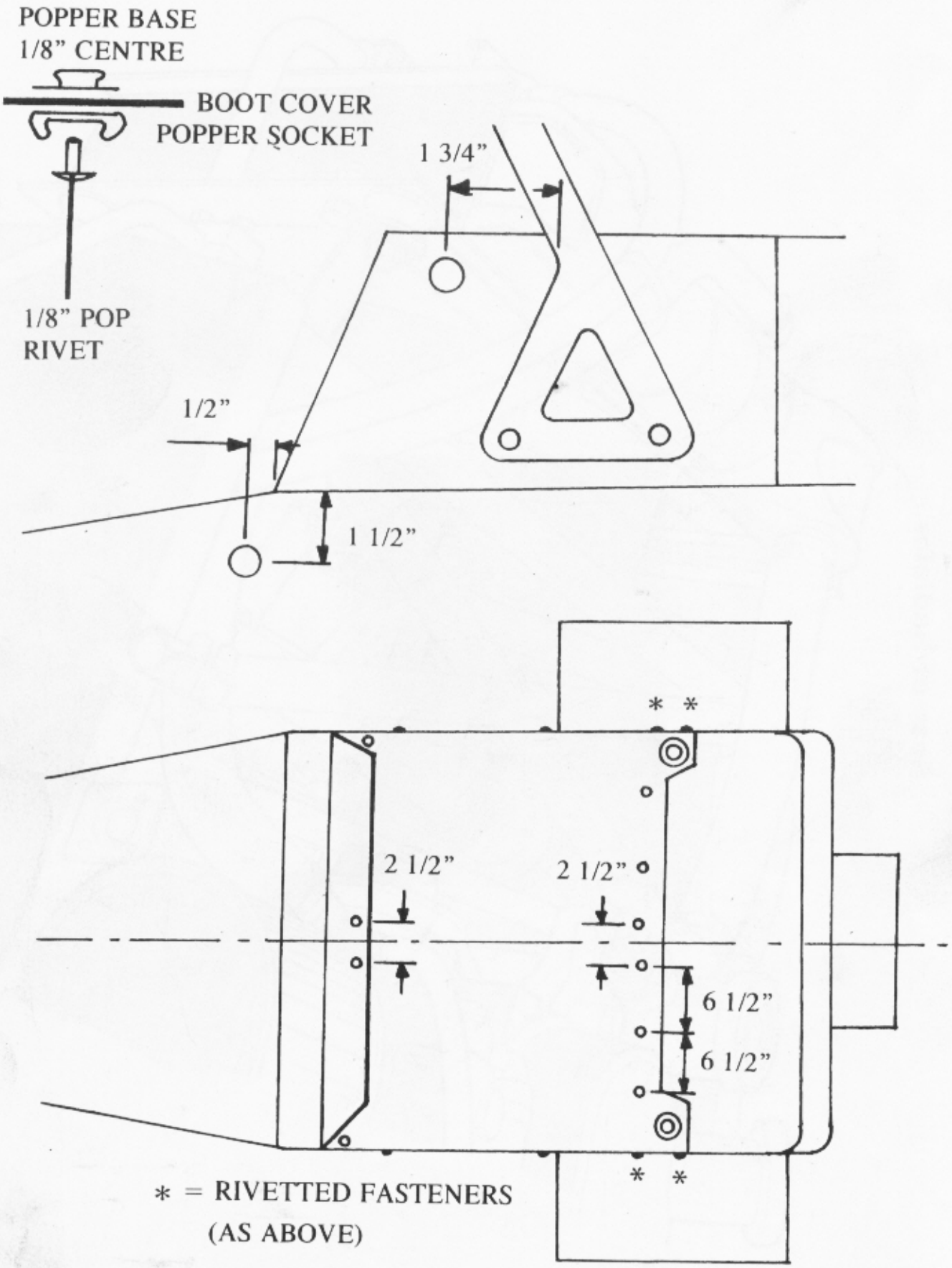
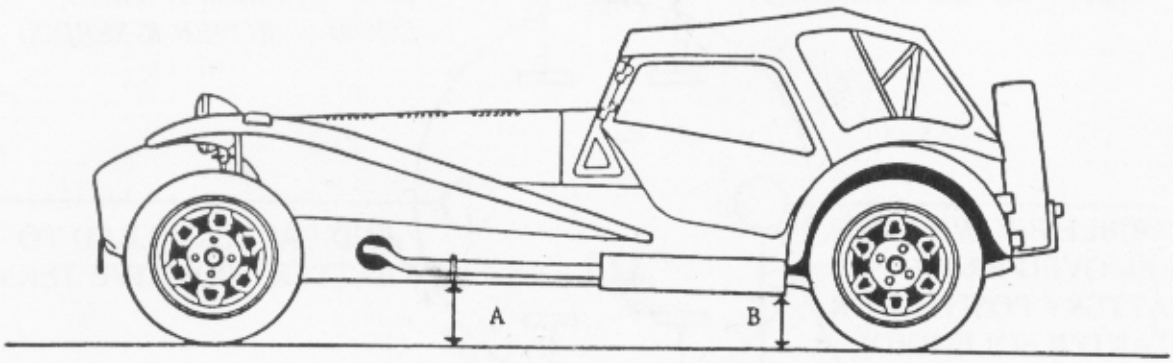


Figure 14.6 Tonneau Cover Fitment

RIDE HEIGHT AND GEOMETRY SETTINGS



A - 140mm (Measured between forward edge of floorpan and ground)

B - 155mm (Measured just in front of the rear wheel arch)

-These should be accurate to within a tolerance of +/- 10mm.
-Ensure that the rear ride height is always approximately 15mm higher than the front.

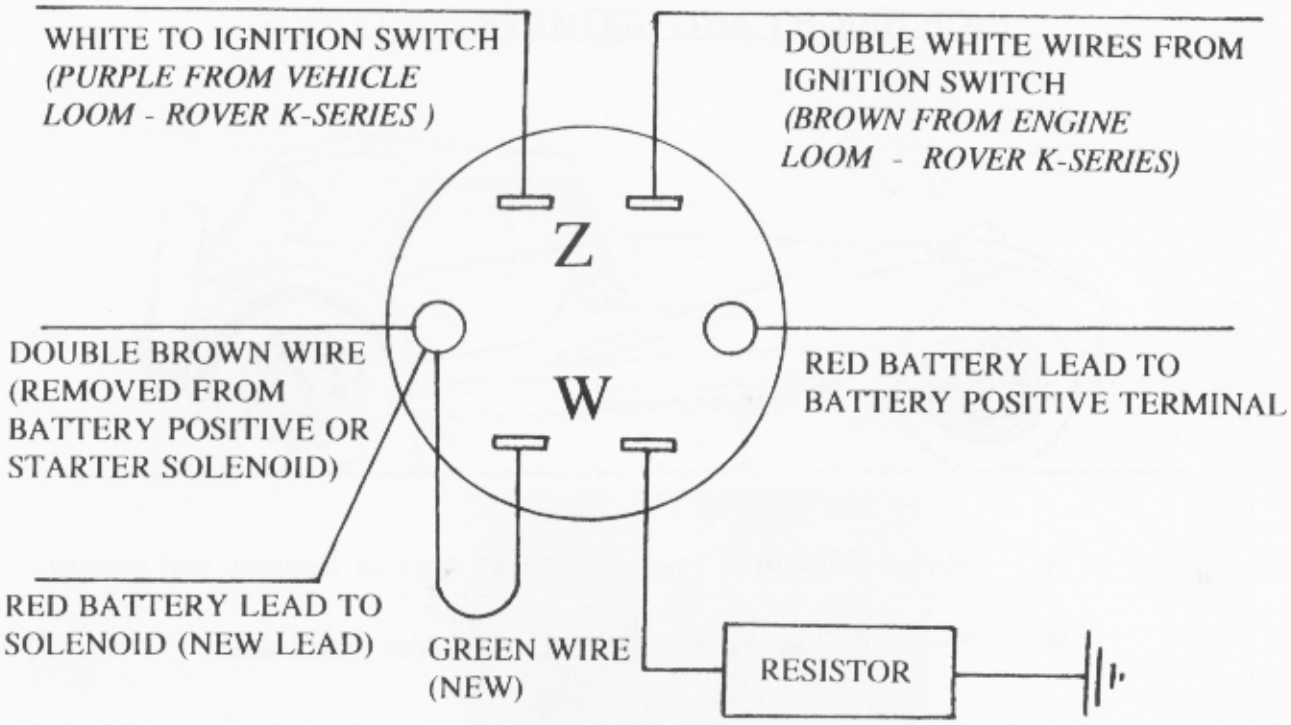
CLASSIC

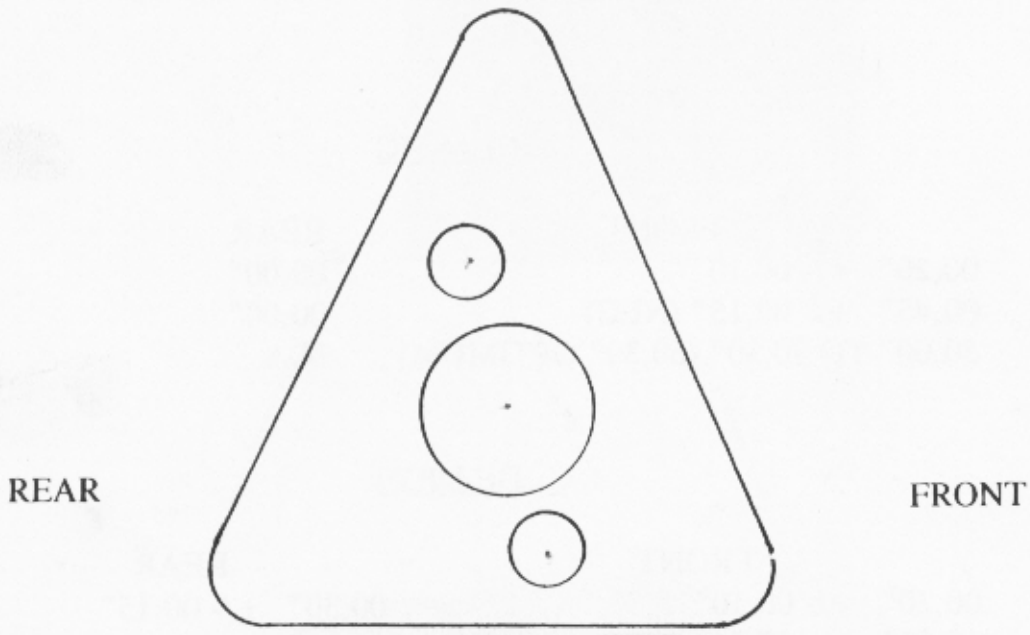
	FRONT	REAR
TOE IN	00,20" +/- 00,10"	00,00"
CAMBER	00,45" +/- 00,15" (NEG)	00,00"
CASTOR	50,00" TO 70,30" (60,30" OPTIMUM)	N.A

DE DION

	FRONT	REAR
TOE IN	00,20" +/- 00,10"	00,30" +/- 00,15"
CAMBER	10,00" +/- 00,15" (NEG)	10,00" +/- 00,15" (NEG)
CASTOR	30,30" +/- 10,00"	N.A

Figure 14.9 Ride Height and Geometry Settings





TEMPLATE FOR MASTER SWICH
(SHOWN ACTUAL SIZE)

Figure 14.10 Battery Master Switch Connections

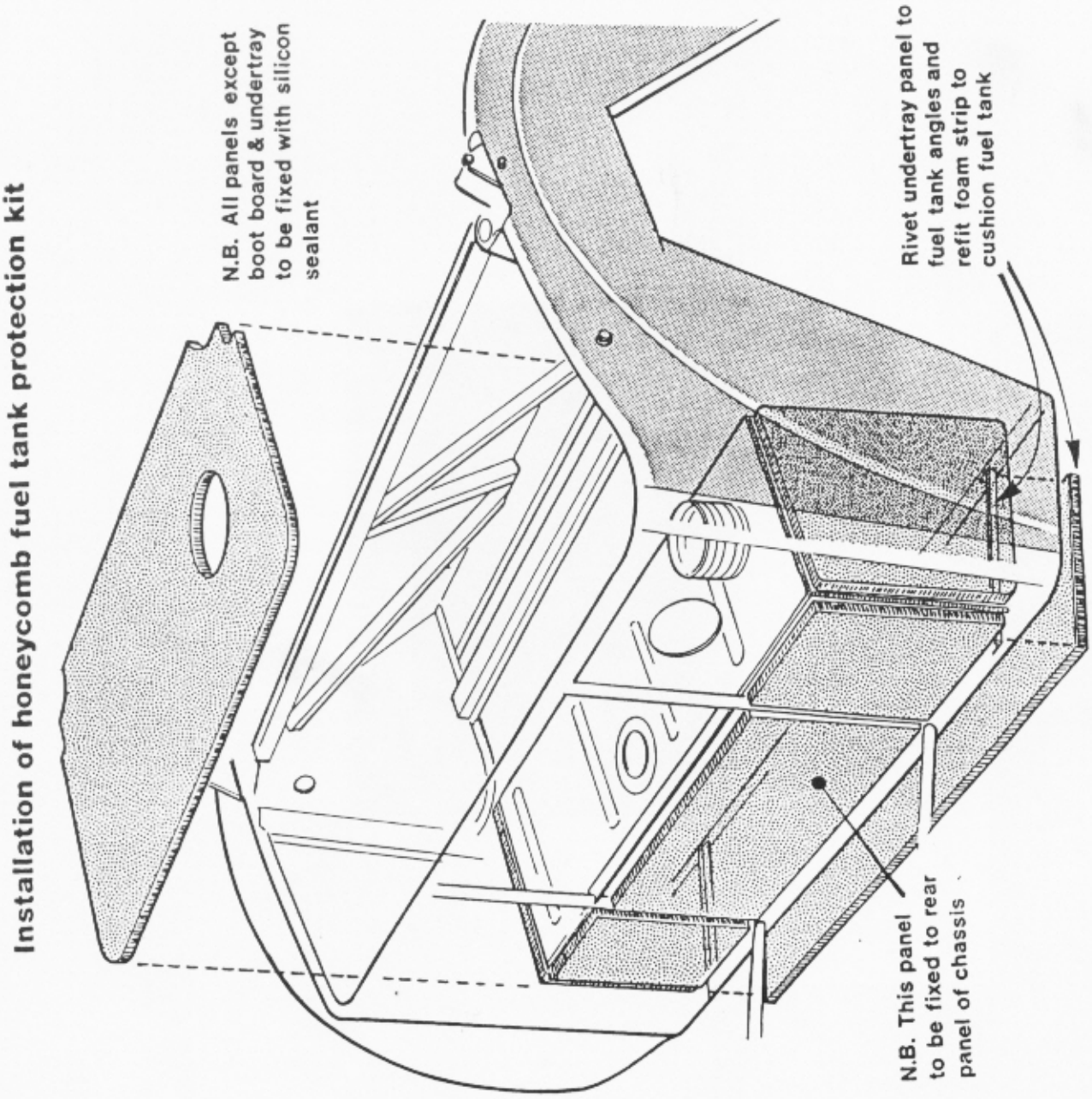


Figure 14.12 Fuel Tank Protection Kit