
MOJO

Donor Components

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The Sylva Mojo SE is base primarily on components sourced from a MK 4 or 5 Ford Fiesta in either 1250, 1400 or 1600cc capacity. 1.4 or 1.6 engines from a Focus can be used when coupled to a rod change Fiesta, Puma or Ka gearbox. The 1.7 Puma engine can be used for those seeking ultimate performance.


Ford Fiesta MK 4/5

- Engine - ECU and loom can be used to keep costs down
- Fuel pump - including electrical connector
- Gearbox
- Drive shafts including CV joints - Fiesta MK 4/5 drive shafts can be modified by Sylva or unmodified Fiesta MK 2 shafts may be used.
- Gear linkage
- Pedals - brake pedal modified on exchange
- Clutch master cylinder
- Clutch master cylinder to slave cylinder link pipe
- Wheel and tyres - 14" wheels or greater to clear rear disc brakes

Ford Fiesta MK 2

- Front uprights including hubs - steering arms removed
- Drive shafts - see above

Ford Capri 1.6 or 2.0

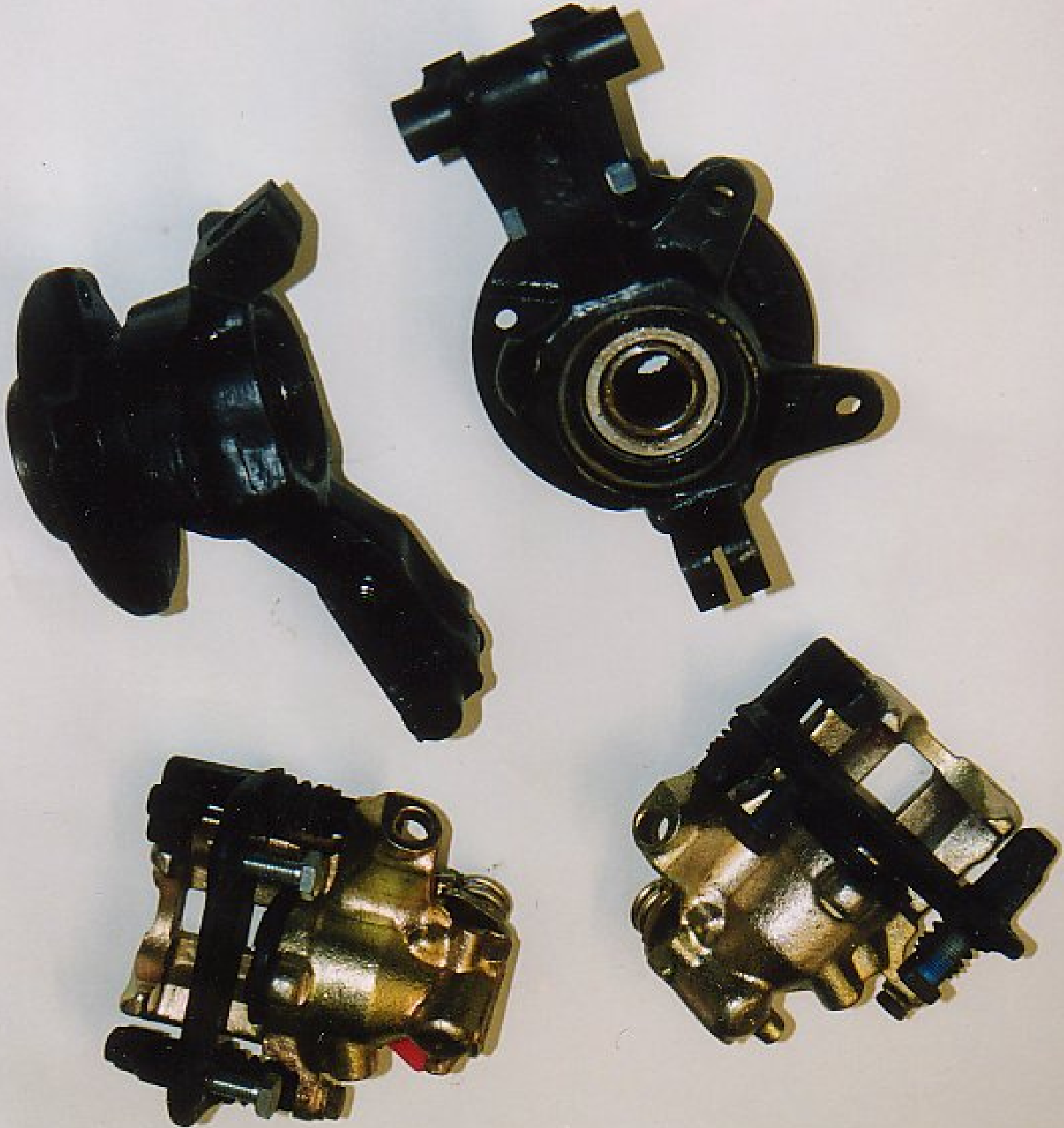
- Front struts including hubs - modified by Sylva
- Front M16 brake calipers

Ford Sierra

- Steering column including switches if desired
- Rear brake calipers including mounting brackets non-vented V6

Misc

- VW Polo radiator
- R2000 track rod ends
- Vauxhall Astra gear linkage
- Montego lower steering link
- Rover 214 header tank



Prepare and panel your chassis

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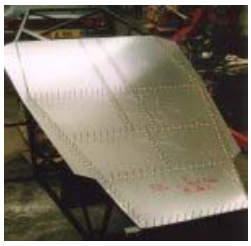


Prepare chassis

Most people these days will have their chassis powder coated, it seems expensive but bare in mind that if applied correctly on a sand blasted surface it will last a long time and add to the resale value of your car. The alternative is hand painting which requires much preparation and is unlikely to yield a first class finish at a reasonable cost. Whatever method used it will only maintain its protective qualities if cleaned and polished at regular intervals. Where it cannot be maintained other forms of protection could be added. After powder coating the suspension components and engine bearers they need to have the rubber bushes inserted. Try to find someone with a hydraulic press for this job as even a good vice will struggle and could break if you are really unlucky. Before pushing the bushes into place file a slight chamfer around the opening to ease the bush in, the powder residue inside will help as it acts as a lubricant. If pushing the bushes in to an untreated component some grease will need to be applied.

Fit water pipes

Prior to fitting the aluminium panels it is a good idea to install any components in the tunnel as access will become restricted. In particular the water pipes need to be fitted but before doing so cut them to a length that leaves enough room to get the hoses on later. One of the pipes could be bent to point it towards the top of the radiator to reduce the number of hose bends needed, this can be achieved by carefully pulling the tube around a fixed point like a tree!! Do not try too much of a bend as the tube will quickly wrinkle if not previously annealed. The ends of the tube need to be wire brushed radially to achieve a good grip for the hoses. Fit the pipes, stacked on the drivers side of the tunnel, using P clips at three positions secured to the chassis tubes as the photographs. These could be made up from scraps of 16g. alloy if it is difficult to obtain 11/4"dia. Clips strong enough.

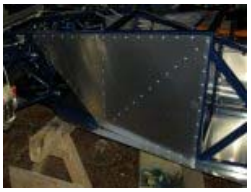
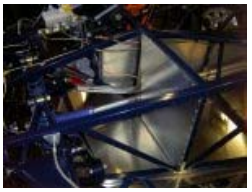
Fit aluminium panels and fuel lines

Your kit is supplied with 1.5mm. 1.2mm. and 1mm. NS4 grade aluminium sheet polycoated one side for protection during assembly. This marine grade is hard enough to work structurally and but is soft enough to work with hand tools. Larger sheets can be awkward to handle so having someone around for this job is a good idea as is a flat surface to lay out on. If a jig saw is to be used to cut the sheet this is especially important. ProSnip shears are excellent for most cutting operations but a small hand guillotine might be a sensible purchase if you think this might not be the only kit you buy. A pair of wooden trestles about 12" tall will be very useful and will save your back unnecessary pain. The panels are riveted in place with 4mm. dia. alloy rivets at approx 50mm. ctrs. with the exception of the floor which is fixed with 4.8mm. dia alloy rivets at 40mm. ctrs. They could be given additional strength by applying an adhesive like Sikaflex. It is useful to have in your tool kit at least four pip pins, these will temporarily hold the panel you are working on in place while other operations are in progress.

First panels to work on are the tunnel sides; these are formed using the 1.2mm. sheet. Start by using two pieces of wood and a small clamp to use as an angle gauge to mark the seat back slope. Measure from the sloping seat back forward to the footwell ends (note that the drivers side extends into the pedal box so is

longer). Mark this onto the sheet then allow another 20mm. for the folded return at the back edge. From this you have the overall size of the of the panel and can cut away for the cross tubes and fold the 20mm. flange so that it can be laid into the chassis for final marking of the upper edge. When cut to the final shape trial fit and mark on the inside face the pattern of the frame so that you can pilot through for the rivets and seat belt bolt. Important! Rivet in place only the drivers side panel at his stage as you will need access for lots of future operations however it is a good idea to predrill the passengers side panel as it will be much harder to do later when all the other panels are in place.

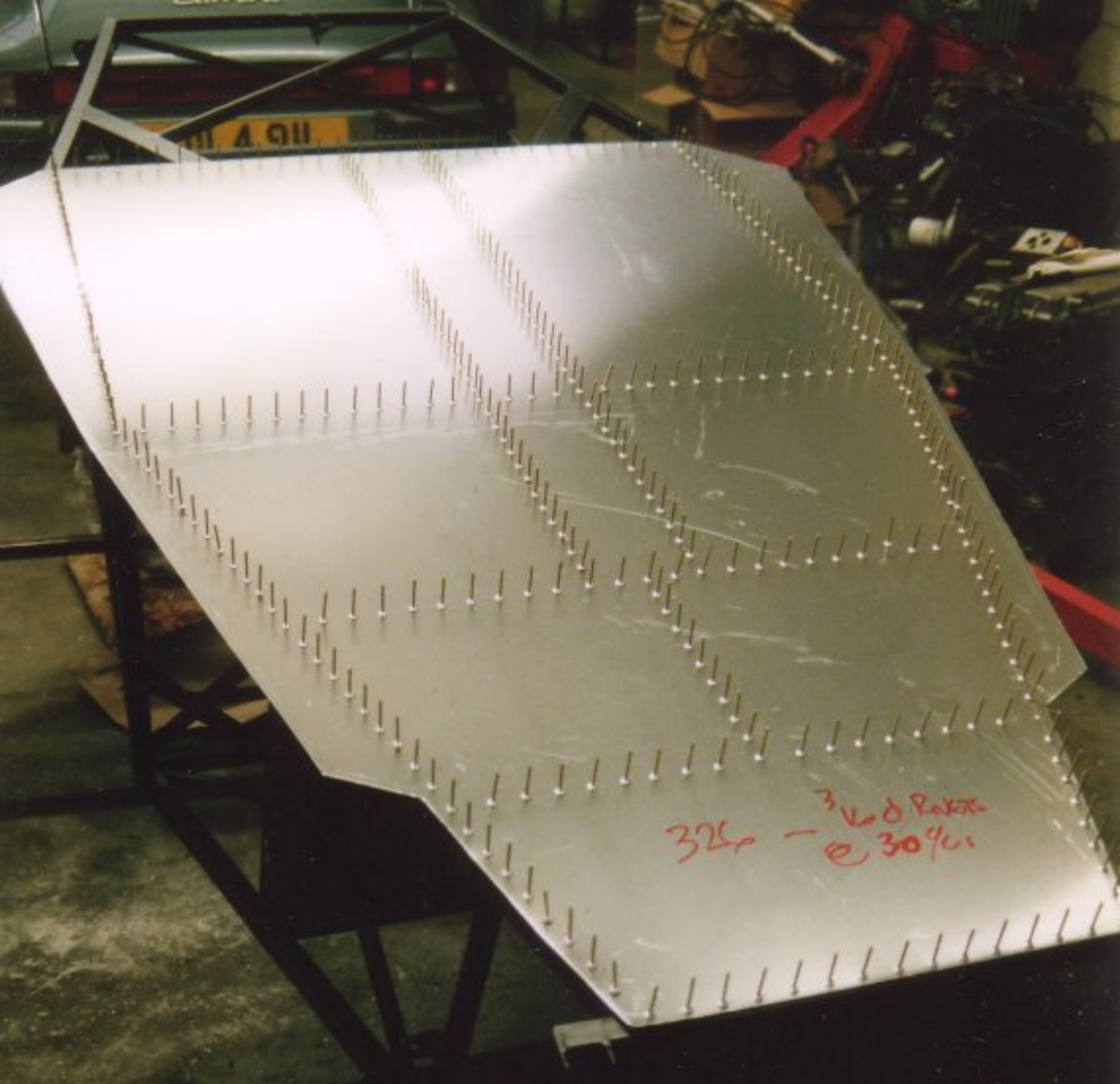
The fuel injected Ford engine needs two 8mm.(5/16") dia. fuel lines, these can now be fitted through the tunnel with P clips. Allow enough length in the engine bay to reduce the amount of rubber hose needed. Mark the ends of one pipe so that later you won't struggle to identify the correct connections.


The floor can now be fitted; this is 1.5 thick and can be marked out by carefully placing the chassis on top and marking around the tubes. This panel extends from the seat back to the cross frame in front of the fuel tank. It will extend beyond the chassis sides to connect to the plan profile of the GRP body.

Now the footwell ends can be formed and fitted using 1.5 or 1.2 off cuts. The passenger side is relatively easy, the driver side will take some thinking about as it fits on the reverse face of one tube one side a cardboard template might be a good idea. Just forward of the gear lever position the tunnel top can be closed off. The remaining tunnel top will need to be removable and could be self tapped in place although rivnuts are much preferred. To ease through he SVA test this removable panel could sandwich a length of wing piping to give a smooth edge.

The sides are made from 1.2mm sheet and run from the front of the footwell to the vertical tube in the middle of the chassis on the outside face. From this tube back to the seat back the panel is fitted to the inside face of the chassis and is shaped to the contour of the GRP sides, this can really only be carried out later when the body tub has been fixed. The seat backs, formed from 1.5mm. sheet, meet at the centre above the tunnel and extend to the top cross member. Note that on the outside edge they will need a 20mm fold to connect to the sloping chassis sides. These seat backs will be fitted much later in the build to ease access to the engine bay. They could incorporate access hatches for servicing later.


325 – 3rd Point
@ 30%

Suspension and Steering

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Front Suspension

The rack is bolted in place with the two pressed steel brackets and rubbers with M8 bolts; note that Ford Capri brackets are the same as Escort. The upper rocker arms bolt in place using M12x220 bolts, steel tube ferrule and nylon bushes. First press the top hat nylon bushes into the arms, measure the overall length of this assembly and trim the ferrule tube down to a fraction longer (approx1/2mm). this is necessary so that when fitted and fully tightened the whole assembly does not lock up tight. With the ferrule to the correct length, by hand, try to push it into the nylon bushes. Because the bushes shrink when pushed into the arm they need to be carefully relieved to give a snug fit. This can be achieved without a reamer tool by cutting a slot in an old bolt, fitting it into a drill and sliding some production paper in the slot and slowly removing excess nylon until the correct push fit is achieved. Grease all the components prior to assembly and check that when tight the arm moves radially freely. The rocker arms are asymmetrical but can only fit in one position in order to align with the lower shock mounting.


The rubber suspension bushes used throughout the rest of the suspension have a central tube ferrule which must clamp rigidly between the mounting lugs. The holes are oversize to allow easy alignment; if the bolts are correctly tightened this will not affect the strength of the connection as the "clamping" force of the bolt does all the work.

Fit the 200lb. springs to the 12" long front shockabsorbers winding the spring base up to give about 10mm. of preload and install to the rockers and corresponding chassis lugs using M12x60 bolts with the body of the shock in the lower position making sure that the adjuster is accessible. Fit the lower wishbones to the chassis using M12x70 bolts with the outer threaded end angled up. It is possible that the wishbones may distort very slightly during the welding process so a little bit of leverage may be required with a large flat blade screwdriver. Prepare the lower rod end by stretching the rubber dust seal over it and adding the lock nut, tube ferrule and spacers then wind them into the threaded end of the wishbone until the end of the thread is reached this will be a reasonable starting point for the wheel camber.

The modified front uprights can be assembled with the bearings, hub, disc, calliper and pads as for the Capri after the top ball joint has been screwed tightly into place with the lock washer tapped over. Offer this assembly up to the end of the rocker arm and locate the ball joint into the tapered hole and fix with the nut provided and then with the weight taken you can align the lower rod end and fit with the 1/2"unf. bolts supplied. If you have a spirit level align it with the disc with the hub more or less in the straight ahead position and adjust the lower ball joint to get a vertical setting of zero camber. The track rod end is extended with the hexagon extension provided; you may need to chamfer the inside of the TRE in order to get a snug fit. With the rack centred you can now ascertain what is needed to be trimmed off the end of the steering arms in order to obtain the correct toe in setting and when done screw the parts together with lock nut and SVA friendly sleeve slid over. Do not tighten as the wheel alignment will be carried out at a later stage. Note that it is not always necessary to fit the extension so before cutting anything do a rough alignment to check, if there is at least 20mm. of thread in the TRE you will be OK. Measure twice cut once as they say!

Steering Column

The non adjustable Sierra column comes with an aluminium yoke which can be removed. You may wish to utilize the Sierra switches but if not all of the switchgear and mounting lugs can be cut off to give a smooth finish. Otherwise it is fitted as it comes. If it is a later adjustable column all of the mechanism can be removed including the outer convoluted section by drilling out the spot welds on the lower section. Whichever column is used the upper end is mounted to the bracket provided using an exhaust clamp and the lower inner column is located in the standard nylon Sierra bulkhead bearing. Between the end which protrudes through the firewall and the splined rack spindle a steering extension link fabricated from the original Sierra part and a corresponding Montego/Maestro link is fitted. (The fibre coupling on the Sierra link will take the articulation but can give a notchy feel to the steering).

Rear Suspension

Fit the 300lb. springs to the 13" long rear shockabsorbers in the same manner as the front and hang them on the lugs provided using M12x60 bolts and offer the lower wishbones in place and locate on the corresponding lugs.

Now fit to the chassis with M12x70 bolts. The upper wishbones are mounted with the angle flange facing up, use the long M12x250 thro' bolts provided to attach to the chassis. To these arms bolt the Fiesta ball joints after they have been shaved down one side to clear the angle flange with M10x30 bolts provided. The Mk. 2 Fiesta front hubs are used on the rear of the Mojo and if that is not strange enough they are also inverted! The calliper mounting lugs face to the rear. The steering arms being redundant need to be carved off with a hacksaw. These uprights are bolted onto the Fiesta struts with two 12mm bolts the outer hole for which is used as the lower pivot, the other hole is used to bolt the two angle spacers / stiffeners provided one each side of the forging. With these bolted in place with M12x50bolts slide the M12x180 bolt thro' the outer bush on the lower wishbone and offer up the upright to it. Once in place slide 5 washers up to the spacer then slip one rod end side spacer on.

The toe link is bolted to the wishbone with one M10x25bolt and when the protective boot and locknut has been fitted to the rod end it can be screwed in place and correspondingly slid on the thro' bolt. Now fit the last side spacer and locknut and rotate the upright to meet the upper ball joint. Tap the ball joint shaft into the aperture and slide the pinch bolt into place.

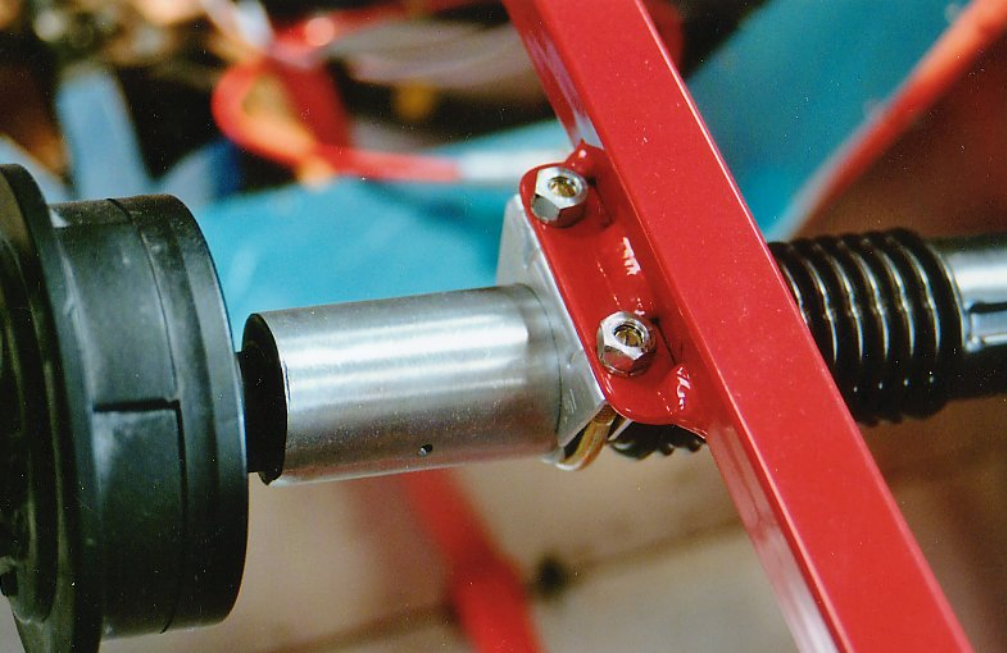
The rear suspension is now in place, do not tighten yet as the drive shafts have yet to be fitted. On the Fiesta the wheels are held on with bolts, if you prefer these can be replaced with studs at this stage to keep front and rear the same.

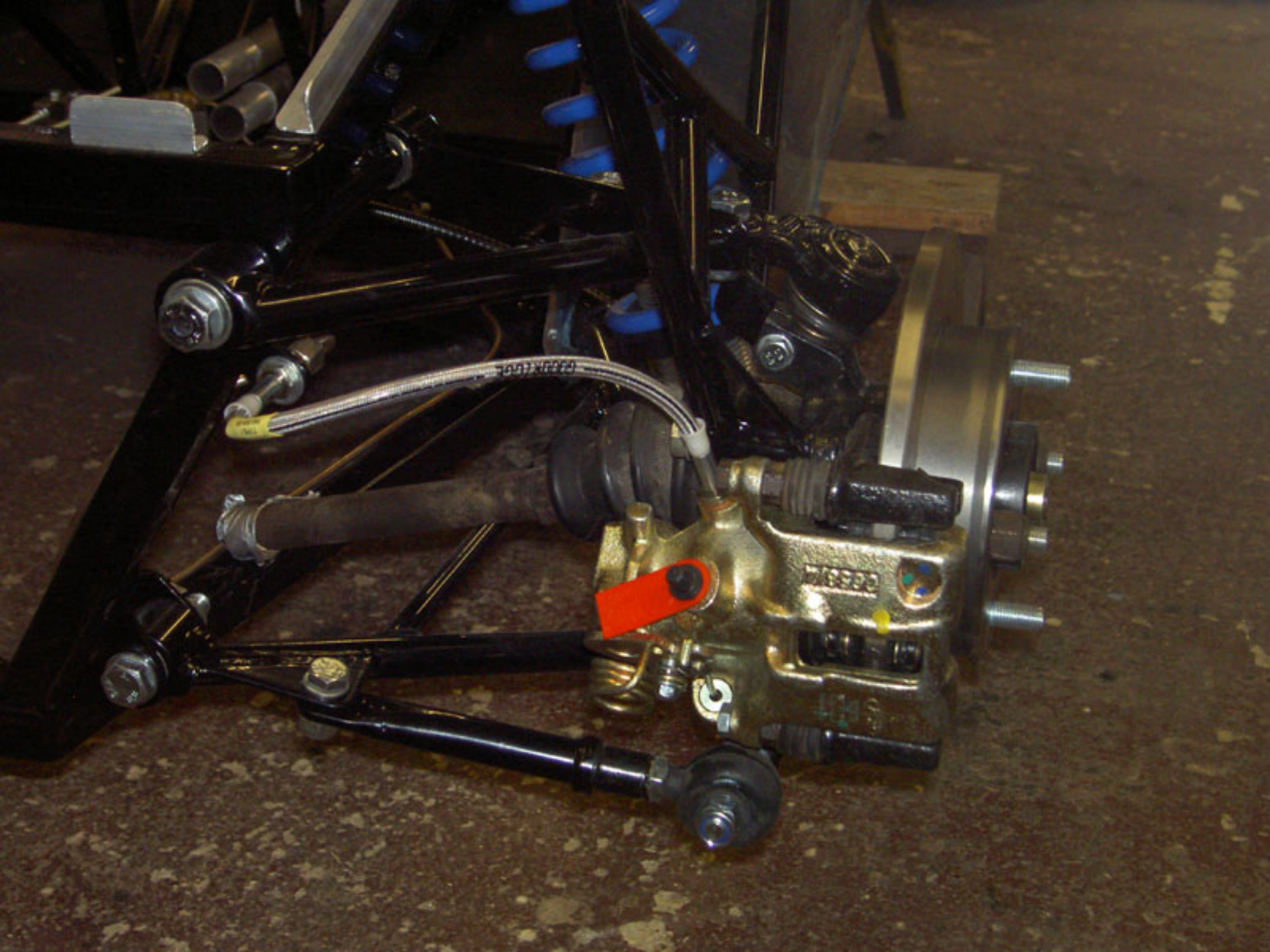


The discs used on the rear are from the smaller engined Fiestas and the callipers are from the V6 Sierras. The separate brackets supporting these needs to be modified by trimming down the threaded portion to centre the calliper and disc. Use some old wheel nuts flat side facing the disc to temporarily hold them in place and offer up the calliper and you will find that these threaded lugs need to be trimmed down until they are flush with the main body to achieve this. Note that

the callipers fit with the nipple uppermost.

You can now fit the wheels to make the chassis mobile.






Mountfield

Pedal box, clutch and brake lines

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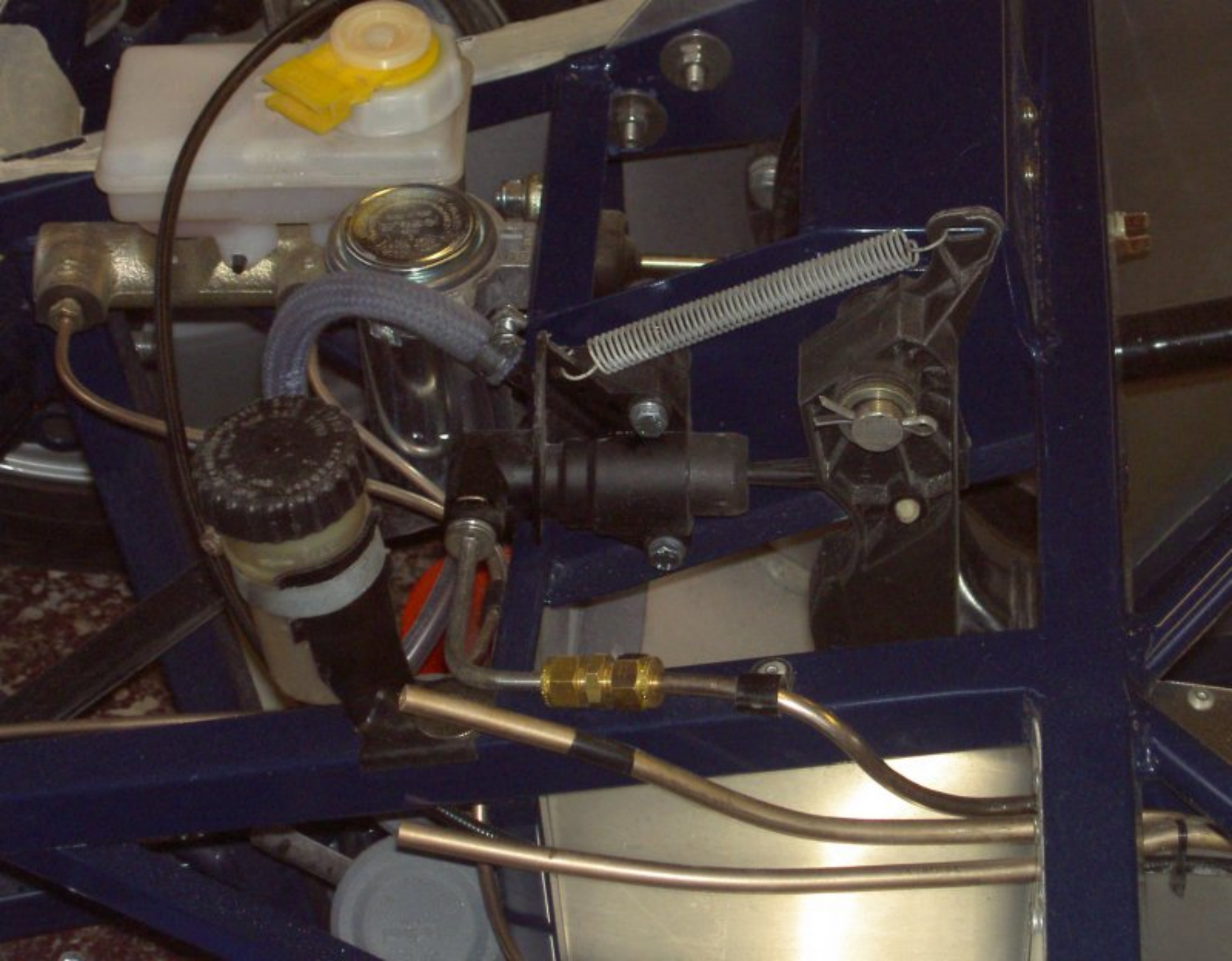
The pedal box is fabricated to accept standard Fiesta Zetec SE pedals and clutch master cylinder. The steel brake pedal will be modified on exchange by Sylva. The plastic moulding for the master cylinder needs to be trimmed down to fit its new application being careful not to cut off something vital in doing so. It will also need its own reservoir, a motorcycle breakers will yield just what is needed at modest charge. The brake master cylinder bolts to the face of the box with two M8 bolts. Temporarily offer in place the spindle and pedals, this will enable you to position the clutch master cylinders horizontal plane and bolt in place withM6 bolts. Also the correct spacing can be determined and the tube spacer can be cut down. One of the spacers doubles as a spring so keep a little tension so that it does not rattle. Both the pedals need a return spring; after fitting the clutch pedal the extended pushrod will establish the for and aft position of the pedals so tighten the brake master cylinder clevis to match. The spindle is retained with two spring clips one on the outside of the box the other on the inside forcing the pedals together. Position the accelerator pedal in the aperture to correspond with the other pedals and drill to suit. Fabricate a support to take the throttle cable from alloy angle making sure that it will not engage with the GRP nose cone. The cable is fed through the tunnel ensuring that it cannot drop onto the hot water pipes or tangle with the gear mechanism, do not anchor it down to securely or it will be very difficult to retrieve should it ever need to be replaced. The clutch pipe into the master cylinder is a dedicated fitting but the pipe can be cut off carefully and connected to a corresponding 6mm(1/4”).dia. pipe which is run down the tunnel to the engine bay.


The brake lines need two three way unions, one positioned centrally on the front cross frame and one at the rear end of the tunnel. From the brake master cylinder run a brake pipe to each of these securing at regular intervals making sure that no moving parts can make a connection. From these run lines to the lugs on the chassis provided for the braided hoses which in turn bolt to the callipers. Refer to the photographs for a guide to the positioning of the pipes. The braded hoses need first to be bolted into the callipers using copper washers, trial fit finger tight first to make sure they seat correctly and if not cut the ends down so that the washer is pinched when tightened. The other end can then be bolted to the lugs. Before attempting to bleed the system make sure that all the connections are tight and loosen the rear callipers, removing the lower bolt, so that they can be rotated enough to put the nipple uppermost. This is important in order to get all of the air out of the system. Do not put off the bleeding operation till later! The handbrake cables cannot be fitted till after.



Fuel tank and pump, Radiator and fan and header tank and Battery

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Fuel tank and pump



The alloy Sylva fuel tank is fabricated to accept the Fiesta in tank fuel pump and sender. It is unlikely that the sender can be matched to the instruments so can be discarded. The mounting bracket for the pump will need to be cut and extended so that the pick up is as close to the bottom of the tank. This can be achieved by folding a piece of 16g. sheet to the profile of the original and bolted in place, because of the additional length the modified support is going to act as a pendulum so needs to be adequate. The pump in its new lower position needs a new feed pipe which must be made from the correct high pressure fuel hose which will need to be suitable for fuel immersion as both inside and out will be in contact with petrol. Because of the length it is recommended that the middle portion of this should be rigid pipe secured with an alloy P clip. Also the wiring needs to be renewed being very careful to avoid any high resistant connections or connections that could be affected by the petrol for obvious reasons! Fit the assembly in the tank after the chosen sender unit has been fitted thus allowing you to view the action of the float in the limited space. A standard Fiesta fuel filter must be mounted adjacent to the tank for the feed line which is denoted by the white coloured connection on the tank. The fuel pipes can now be fitted both front and rear using suitable high pressure hose. It is recommended that a non return valve is fitted to the tank breather on the filler neck or at least a coiled tube venting to the underside of the chassis. The tank itself must be held in securely using an aluminium strap and might be best sat on a rubber mat.

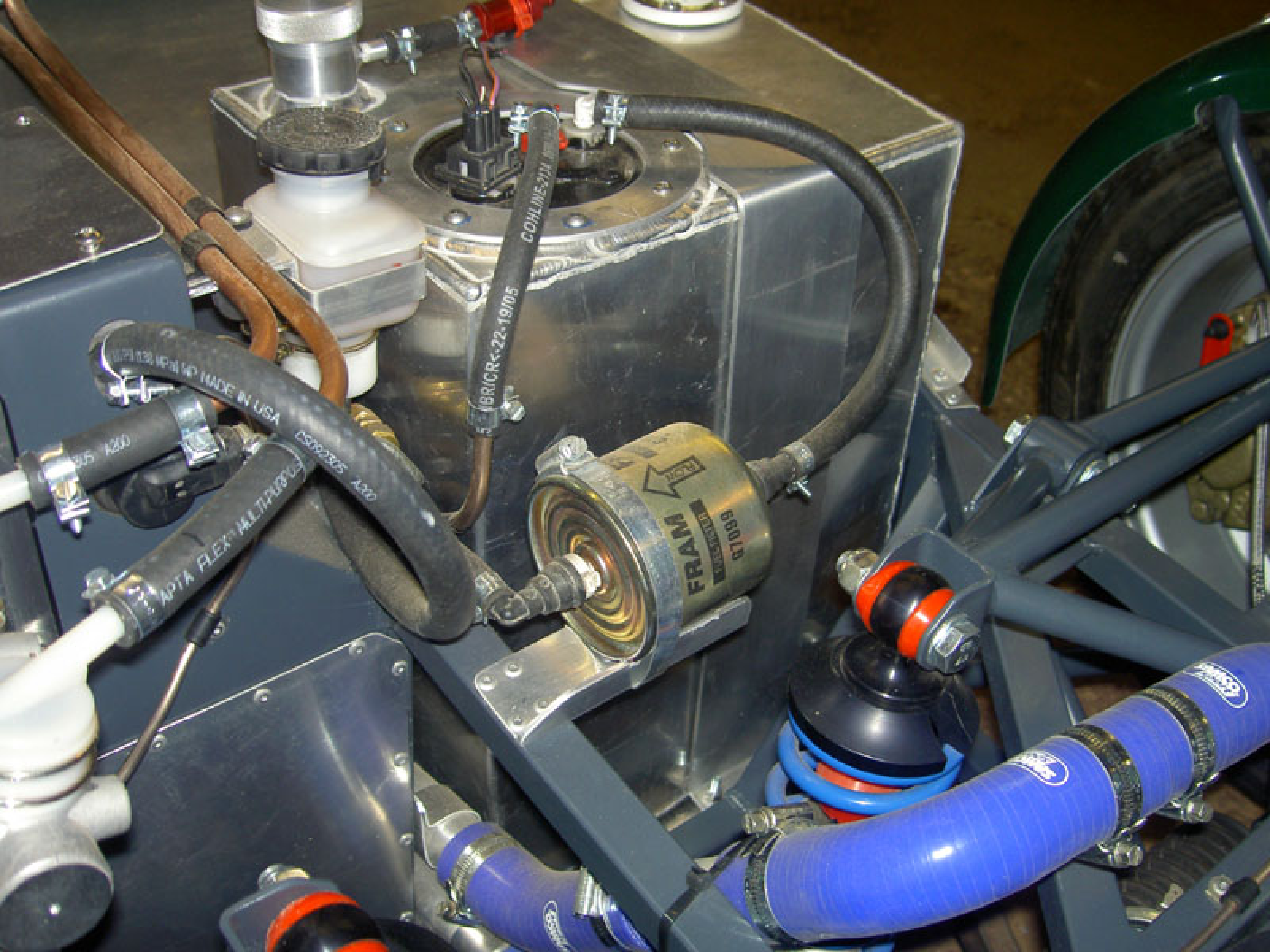
Radiator and fan and header tank


The light weight radiator used is from a 1400 VW Golf, it has a boss for a fan sensor which could be used or blocked off if a dash mounted switch is preferred. The GRP nose cone is restrictive so before mounting the radiator offer it up to gauge the best location. Mounting can be achieved by tapping the fan mounting bosses to accept M6 bolts and fabricating folded 16 gauge aluminium side brackets which in turn are riveted to the chassis tubes. Try to allow enough room between the radiator and the frame for a rear mounted fan assembly which is always better behind the radiator. Most after market fans are very narrow and fit by simply pushing plastic clips through the core. The hoses can now be installed as per the pictures throughout; shiny new silicon hoses can be used but are expensive, your local motor factor may have some old stock hoses he would sell off at a bargain

price which would yield the bends you need. A header tank will need to be fitted as high in the engine bay as possible, the small bleed hose will attach to the connection at the end of the cylinder head. The other pipe needs to be connected to a T piece as low down on the radiator hose as possible making sure that all pipes clear gear linkage etc. Do not fill the system yet as you may have to change the temperature sensor to suit the ECU and/or the gauge.

Battery

It is possible to buy very small gel batteries which being so close to the starter will be more than able to start a Zetec engine; however they are quite expensive so a Mini battery well just about fit in front of the gearbox on a cradle fabricated from aluminium angle. A battery cut off switch mounted nearby will give the car a degree of security at a modest cost. Ensure the battery cannot move or it will be an MOT failure.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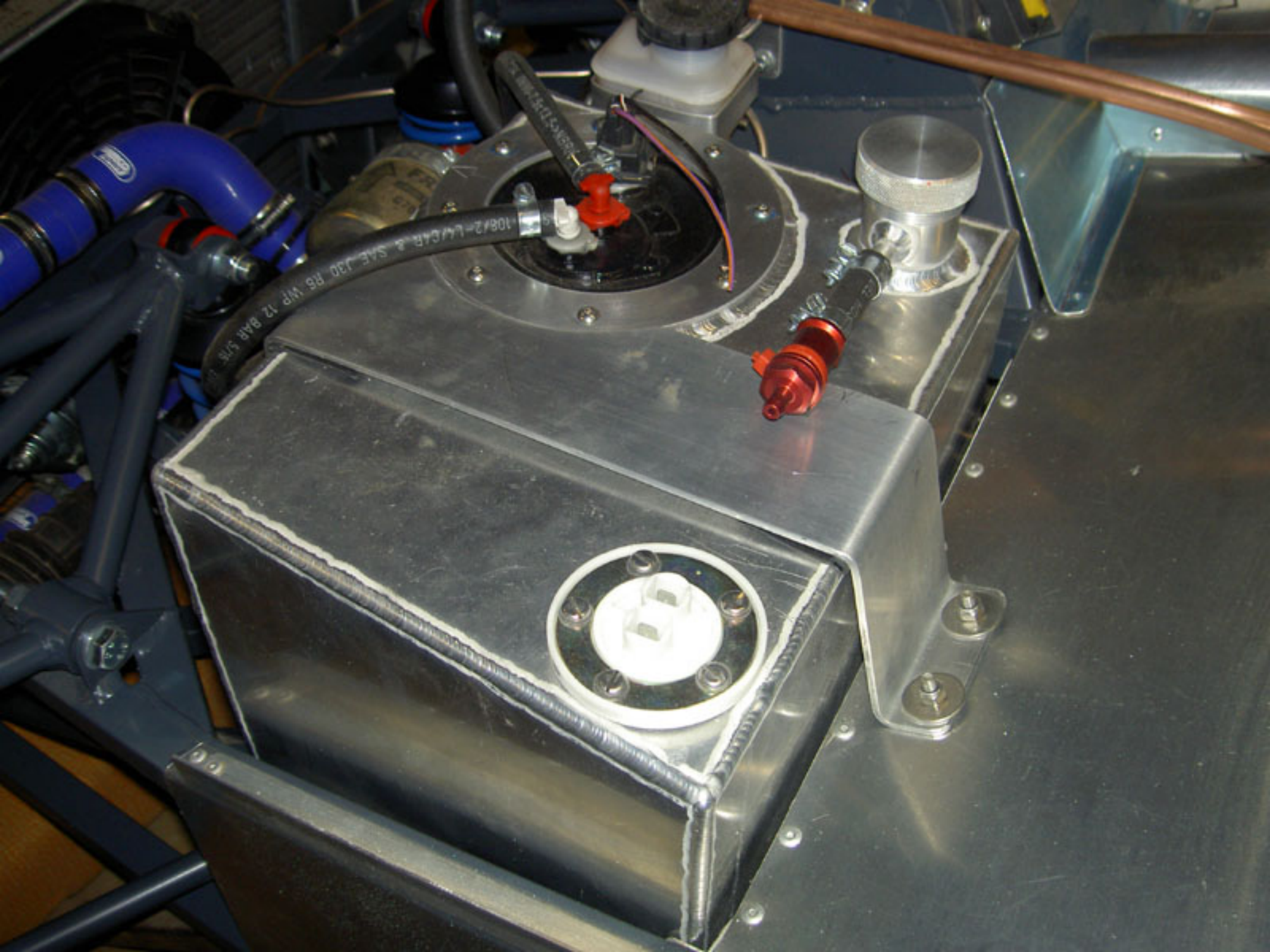


RALEIGH

Engine gearbox and drive shafts

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The engine can be installed complete with gearbox and all ancillary components attached i.e. starter, alternator fuel injection etc. Although no modifications are required it is a good idea to check the clutch for excessive wear. The larger engines mostly have power steering and air con. pumps bolted to the block and of course won't be needed. After removal you could fit the 1250 belt and tensioner. (note that the Focus engine has a different diameter front pulley and will need a different length belt). Prior to dangling the engine into the engine bay it is important to offer up the engine bearers to the fixing positions both on the engine and chassis, it being much easier to rectify an slight hole position discrepancies with the engine out of the car. The long bearer should mount first on the three bolt extrusion on the upper gearbox casing; the secondary fixing to the rear of the box will almost certainly need prizing around a little.





The shorter bearer mounts to the three bolt alloy protrusion on the front of the cylinder head; this will need a little filing to give a radius on its outer edge to match the bearer. Protect the roll bar and other vulnerable parts prior to the installation and try to have someone on hand to assist. The most difficult part of this operation is trying to find room under the chassis for the legs of an engine hoist, on its wheels it is too low and on trestles you have to move the rearmost forward to get it in and when the engine is in place the whole lot tries to overbalance!. Get the engine roughly in place and fit the long bearer to the three bolts mentioned earlier then pull the assembly up to the lugs on the chassis. When in place the other bearer should be easy to fit. Fit using M12x70 bolts and the short bearer will need an M12x100 bolt. The Zetec SE engine gearbox assembly comes with a centre drive shaft and bearing bolted to the block, this has a tripod type CV joint. The gearbox side has the same type of joint and with the rubber gaiter removed the drive shafts will pull easily out. These need to be shortened by cutting and welding. The outer CV needs to be the Fiesta Mk.2 XR2 which has a matching spline.

It is possible to utilise the original manifold with its close coupled catalyst along with a stainless silencer and reduce the build cost dramatically. Most will opt for the dedicated Sylva system which simple bolts to the head although two brackets will need to be fabricated to pick up on the lower wishbone bolts to support the cat silencer with rubber bobbins. The boss for the lambda sensor will need to be drilled out if required before fitting the U shaped link pipe. Make sure this clears the brake hose adjacent and if necessary trim to suit.


Ford
Zetec-S


F243 DWA

Gear linkage and lever

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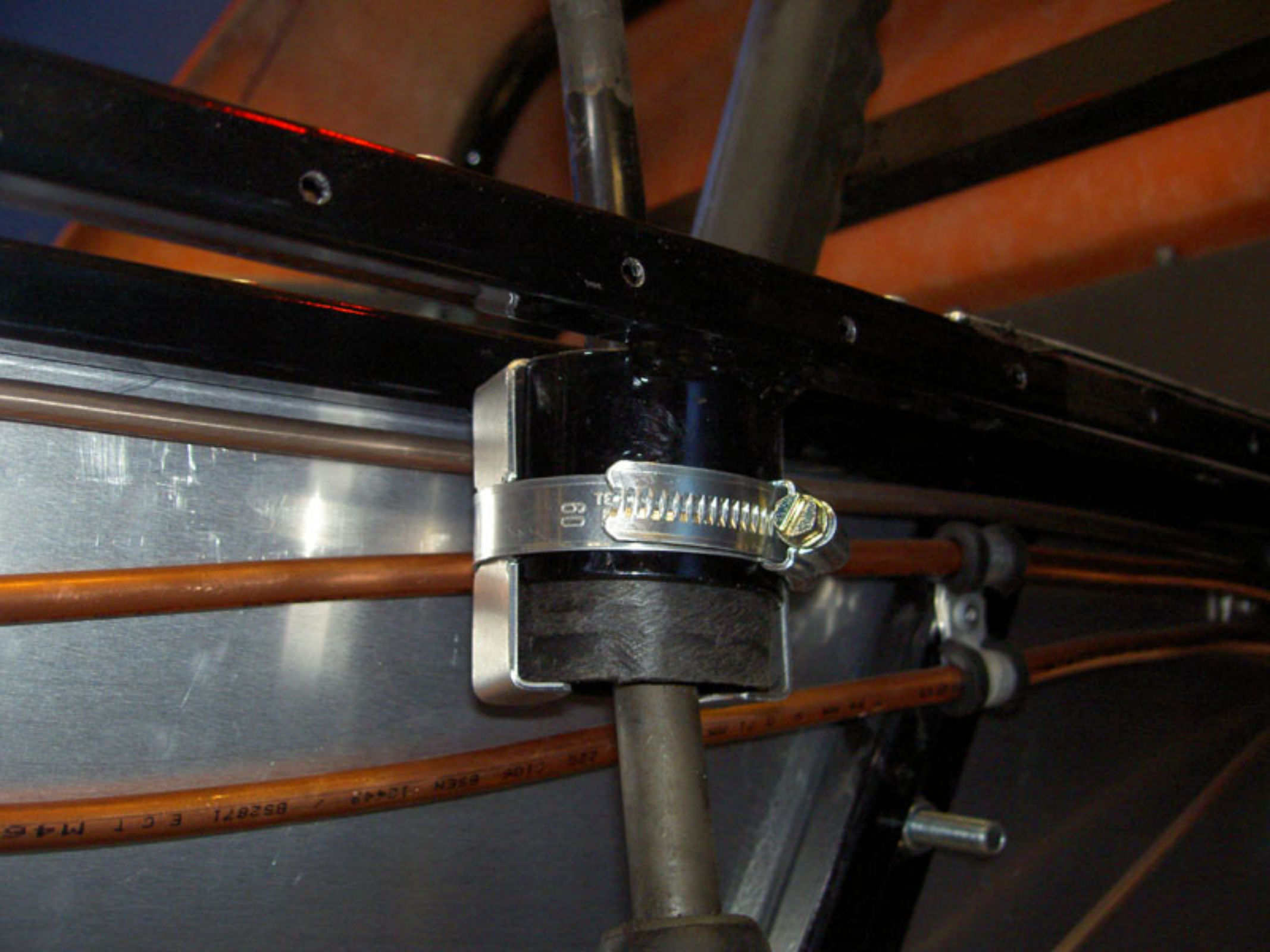
A gearshift transfer bar and bearing is supplied with the kit, the bar slides over the shaft protruding from the rear of the box and runs under the bell housing. It is restrained at the front of the box in a linear bearing mounted in a bracket bolted to two of the bell housing bolts. The bearing is held in this bracket with one clamp bolt and it important that this is not overtightend or it will crush the bearing and destroy itself. Some protection to this bearing can be achieved by wrapping gaffer tape round each end as it in an extremely exposed place. The gear lever itself is the one from the Fiesta Zetec SE. It swivels in a plastic housing the sides of which must be discarded by cutting away with a hacksaw and knife to leave the main body and the cylindrical gear lever bearing housing. This is mounted in the split steel housing on the chassis and held in place with a “Jubilee” clip. Once again do not over tighten or the shift will be impaired. To stop the lever from sliding down and rotating make up a bracket to bolt to the aluminium tunnel side. This assembly is installed to point the change rod to the rear so that it can be connected by means of the original Ford universal joint to the translink. Both of these modifications need to be carefully assessed if the Mojos’ much lauded gearchange is to be achieved. Make sure that on final assembly both lever and gearbox are in the neutral position. The gearlever can be cut down if preferred but it is a mistake to cut it too short making a snatchy change.



Handbrake

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The handbrake lever supplied is bolted to the brackets just below the tunnel top with M8 bolts. Special cables need to be made up, a single with 8mm.dia. eyelet one end from the first hole on the lever to give maximum leverage and the other end an M6 thread. The two cables from the callipers need outer cables to fit the calliper casing and the 14mm. dia. holes in the supporting lug on the chassis. One end of the inner cable needs an end the same as the Sierra caliper and the other an M6 thread. The three cables will coincide at a point behind the lever and join with a spacer with three 6dia. holes. As an alternative in the photographs you will see a pivoted devise which has been taken from an MGF and allows a degree of balance to the rear brakes. With the wheels off the ground adjust the cables to give an even pull to both callipers at about three clicks of the lever ratchet. Use cable ties to secure the cables around the rear suspension. Once again do not fit and operate the hand brake until the brakes have been bled!

Body and Dashboard


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Cycle Wings

Offer the wings to their stays after the chosen wheels have been fitted so that they can be centred correctly and mark where the small cut outs will be needed. With some wheel tyre combinations it may be necessary to manipulate the stays to get the correct clearances. When you are happy with the position of the wings remove them and go around the glass fibre edges with production paper to give a bit of a radius to keep SVA man happy. Now mix a little body filler, spread some on each wing stay and quickly refit the wings ensuring that they stay where you intended. When set this will hold them in place whilst drilling and bolting and fill any gap between the two surfaces. Bolt on with 6mm. stainless steel button head socket cap screws and large stainless washers. Do not be tempted to try and bond the wings on to keep a flush outer surface as the bolts act to strengthen the assembled parts.

Dashboard

The dash board can be installed temporarily at this stage. There are various ways to form a dash and it is a part of the car that will stand out as a very personal touch. Two GRP dash mouldings are available from Sylva, one placing the instruments directly in front of the driver and one offset to the centre. This one can accommodate the donor car instruments with a little modification. An aluminium or even plywood dash could be formed and covered with leather cloth with a little imagination. Instruments are available to suit all tastes so spend some time exploring the alternatives and get creative. Sit in the car with the correct steering wheel to ascertain good visibility for all the instruments and asses the ergonomics for the switchgear. The dash board upper surface will need to accommodate a screen demister if a full screen is planned and before the body is located is a good time to explore the options. Various ceramic electric heaters are available (some are next to useless so try before buy)or a heavily modified Fiesta or Mini heater unit could be used.

Main Body Tub

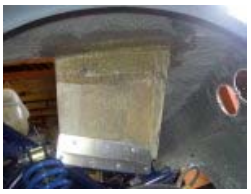
The GRP body panels are supplied in a base gel finish for final preparation and painting by the customer. Due to the complexity of the mould shapes it may be necessary to carry out small repairs particularly to the edges. Also the flash lines will need to be sanded off: these are points at which the production moulds are joined . If you are having the painting done professionally they will carry out this process.

Before fitting the main tub it is a good idea to protect the surrounding chassis rails with masking tape. Also fit guides to the chassis sides where your elbow would be, set back to the width of the GRP. Cut the recess for the roll bar in the cross piece behind the seat first and carefully lower the tub down onto the chassis manipulating it around the front wishbones. It will take a surprising amount of tweaking without failure! Once in place secure it to the aluminium floor extensions front and rear with M6 bolts. Push the lower front body in towards the chassis before bolting. A line of rivets will finish the connection when the panting is completed. Also after painting when you have centred the tub a line of rivets can be applied to the cross tubes and side rails at the front and across the rear bulkhead.

The rear section incorporating the rear wings can now be offered up. The main tub has been cut off just over the rear wheel arch it being an adaptation of the earlier

Mojo 2 body that incorporated the rear cross piece. Trim this so that the wheels centre in the arch and the front of the rear wheel arch aligns at the lowest point with the main tub lower edge projection. Attach with small bolts at these contact points to aid alignment. Ensure that the rear has not dropped by laying the engine cover temporarily in place and the surrounding gap remains constant. This relatively heavy structure needs to be anchored to the rear chassis tubes using bonded in aluminium or GRP sheet riveted to the rear upper chassis tubes. When you are satisfied that the panel is square and true carry out the final fix using glass fibre mat and resin. Kits are available for this purpose from motor factors or you could scrounge some from a local GRP fabricator. Do not try to lay too much up in one hit on vertical surfaces as the weight will cause a landslide! A heavy lay up will generate a good deal of heat and can distort the surrounding body panel.






The engine cover itself will need trimming away around the roll bar struts and is best hinged at its leading edge. Rubber over centre catches at the rear are the easiest method of securing although if you intend to fabricate some form of storage container in the engine bay a lock may be preferred.

Back to the front of the car and bolt in place the bonnet hinge frame. This attaches to the rocker arm bolt and tabs on the lower chassis cross tube. Each end of this must be relieved of any paint and greased so that the hinge plates can be slid in place making sure that they can rotate freely. Now offer the bonnet to the main tub and temporarily hold down with gaffer tape. When you are happy with its positioning drill through the tabs and bolt in place. You may need to put spacers here to set to the level required. The rear edges can be attached using rubber over centre catches each side.

All lights, wiper, washer and mirrors need to be temporarily fitted and edges trimmed back as required especially in the cockpit area. The screen surround could be sanded down inside or even filled with filler to give a smooth internal finish. Remember that you may later wish to fit side screens. With all or the panels suitably prepared and secured it is now time to carefully remove them and send them off for painting. With all of the panels back in place contact your local RAC Windscreen supplier and arrange for them to visit and bond the screen into place. These engineers carry a roll of universal screen edging which is bonded in conjunction with the glass in order to fill the surrounding gap. Remember that this is the last time you will easily be able to gain access to the dash area so make sure all of the wiring functions correctly the demist and wiper operate correctly.


F51SEE


F243 DVA
mojo
F51 SEE

Lights, Wiper, washer, loom and ECU

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Lights

The headlights needed are 5 ¾ diameter and should be purchased as a complete unit with bowl and rim. The wing mounted front indicators are easy enough to fit however it is worth filing the underside of the lens to the profile of the wing radius so that when fitted it doesn't split when tightened down. The wire goes through a hole beneath the light and will need to be extended to reach the chassis, it must be secured especially beneath the mudguard to stop it falling on the tyre. Side repeaters can be fitted just below the screen surround but make sure you choose a position that does not coincide with a chassis tube. The rear stop tail lights and indicators are 90mm diameter and fit into the recessed positions provided. Adjacent to these stick the reflectors in place. A fog light will be needed and can be mounted on a bracket near the exhaust outlet on the offside of the car, make sure it is at least 100 mm. from the brake light. Provision must be made for the support of the number plate ands its illumination light. Straps fabricated from aluminium strip or angle can be attached to the recessed bodywork around the silencer.

Wiper

A single blade wiper system as found on cars such as the Fiat Uno and some Citroens cane be installed very easily as they mount directly behind the arm with the spindle being one of the supporting mediums. The arm will need to be cut down and a shorter blade purchased. The arm must park for the SVA so study the wiring carefully. An after market bag type washer system is the easiest to install and are not expensive.

Loom and ECU

Lots of companies offer loom assembly service a favourite being Premier Looms. No loom will be specific to your car and will need adapting during the installation, not as daunting as it might sound. Basically the battery supplies power from the positive(+) terminal to the fuse box and from there to the switches; when activated these feed the component which is earthed to the chassis which in turn is connected to the negative (-) terminal back on the battery. The exception to this is the starter motor which does not have a fuse and because it draws a significant load from the battery requires a much heavier wire than all of the others. For this reason it is important to have the heavy battery negative lead bolted directly to the engine or box. The battery power is replenished by the alternator when the engine is running and once again because of a heavier load this wire and the one from the battery to the fuse box is slightly larger. Some components are switched by means of a relay; a relay is a switch, it has the fused power in one side and the output to the component on the other or alternatively earth one side and earth line from the component the other. To connect these a bar is activated by an electro magnet energised by a low current power from the dash switch, the reason for this added complication is that some dashboard switches are unable to cope with the load requirement of the component. Other instants are the fuel pump which for safety reasons is switched by the ECU. The power for the ECU should come directly via a fuse from the battery and this will need to be switched by means of a relay. With all this in mind for such a simple loom it is not out of the question to design your own loom using the Fiesta to supply the majority of wires. It is wise to purchase some crimp on spade and ring terminals (Premier Looms supply a crimping tool with there loom) and some multiplugs in order to do a neat job. The first part of the loom to install is through the tunnel, as you can see from the photographs it is possible to fit a handbrake warning light switch in front of the lever and the wire to this can be patched into the loom at this time. With this in place you can finally fit the passenger alloy panel to the tunnel. This job requires a degree of dexterity to get those front rivets in place!! The layout of the remainder of the loom will be dependent on the type of instruments and switchgear you have chosen. However if you can position the fuse box and any relays on the drivers side of the scuttle you may be able to utilise the free area on the passenger side

as a stowage compartment. The most common problem associated with the wiring is due to poor earthing. All electrical components need to be earthed to the chassis which being powder coated sometimes needs to be sanded back to bare metal to achieve a good connection; a pop rivet is not a suitable connector! The engine can only run if it has a ”brain” to tell the spark plugs when to fire and how much fuel it needs for a given load. The ECU (electric control unit) does this job by taking information from the throttle position sensor, temperature sensor, crank position sensor and the lambda sensor. Using a predetermined “map” it translates the information to send signals to the fuel injectors, coils (mounted on the end of the head), idle control valve (next to the throttle butterfly) and fuel pump. Clearly this is not a job for the amateur although kits are available for the brave. Plenty of companies can provide the necessary ECU unit but not all can provide a plug in loom which could leave you patching your own together. The most crucial thing you cannot see or touch this being the “MAP”. This not only tells the engine when to spark in which cylinder but also how much fuel to feed each cylinder at any given moment. Most manufacturers have a start up map but only time on a rolling road will give ultimate power and economy. Emerald do have a map for the 1400 and1600 Ford engines with the Sylva exhaust. Spend some time on the phone before committing. It is of course not impossible to fit the original Ford ECU complete with an adapted loom but you will have to have the original key in order to operate the immobilizer. Not perhaps the job for a novice but would save a massive chunk of money.

Wheel alignment, final check for SVA and Registration

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Wheel alignment and final check for SVA

At last, fill the gear box and engine with oil, water system with a water/antifreeze mix, cross your fingers and turn the key. Hopefully everything will run as expected and you can prepare for the SVA. Before motoring of to the nearest test centre it is not a bad idea to go for an MOT which will ascertain as to whether your brakes are functioning correctly, the emissions are OK and headlamp aim is spot on. They will also find the bolts you have left off or loose (yes it can happen) and you will need an MOT for the registration purpose anyway. Before you do any thing there is one final and very important job to do. The suspension first needs to be set for height by winding the spring mounts on the shock absorbers to give approx. 120 mm ground clearance at the front of the chassis and about 140mm at the rear. To align the wheels first set up two string lines one each side of the car at wheel centre line height these need to be parallel and centred around the centreline of the car; this can be achieved by measuring into the centre of each wheel and establishing the same dimension both sides front and rear. This will be different both ends as the track is wider at the rear. Next thing to do is swing the steering wheel from one lock to the other and back to a centre point to establish a centre point. Because the wheel is mounted on a hexagon shaft it is not possible to get an exact centre point so when close centre the wheel, the track rod ends can take out the anomaly. Next check the camber settings for each wheel. Both front and rear wheels needs to have approx 1degree of negative camber, easily achieved on the front with the adjustable rod ends; at the rear it may be necessary to slot the upper ball joint mounting holes. If you do not have access to a camber gauge use a plumb bob or spirit level placed against the outside face of the tyre; when it touches the tyre at the bottom it should show a gap at the top in a corresponding position of about 10mm. This done check again the string line dimensions as they will have been disturbed in the process. A good starting point for the wheel alignment will be with all four wheels running parallel to just a smidge of toe in (very technical word “smidge”) Alter the toe links on the rear and the track rod ends at the front to achieve this measuring the distance from the string line to the wheel rim at the front and rear or each wheel, it should give no more than about 0.5mm more on the front reading. Lock everything off and cover the front track rod ends with the sleeve for the SVA. Finally check the tyre pressures which should be 18psi. at the front and 20 at the rear. Much has been written about the SVA so it would be pointless to duplicate it hear but the actual test is not much more than a glorified MOT test so do not be intimidated. Apply to Swansea Vehicle Inspectorate (01792 45888) and they will send you an application form for your SVA and give you a list of testing stations. Approach the test as if you are going to fail but take loads of tools with you and you may get through without a retest.

Registration

With your test certificate, insurance certificate, some dosh you can now go to your Local Vehicle licensing Centre to register the car. Unbelievably even though the SVA test centre is also government run they will still want to inspect the car looking at the chassis and engine number. They are particularly interested in the receipts to ensure the parts are legally come by. This done they will issue you with a new registration number, tax disc and away you go. Just one thing, most kit car accidents occur within the first week of registration so please take it easy in your new personal hot rod. Happy motoring. Sylva!