How to build your own
LOCOST GTS

Welcome:
As you are reading this build manual you are either contemplating the purchase of a GTS Tuning Locost GTS or you have already done so. Thank you for your interest in this product, and I hope you enjoy the experiences of building and then driving your Locost GTS.

Darren George
Proprietor GTS Tuning

Important:

The model described within the text of this manual may be altered without prior notice.

Safety:
You will not need to use welding equipment in the assembly of your Locost GTS, and you should not need to use grinding equipment, unless you are making your own custom changes to the components. However, it is very important that you take sensible safety precautions.

You should wear goggles when drilling and riveting and wear protective gloves when handling fibreglass components.

The torque wrench settings for each bolt are either listed in the build manual or can be found in the Haynes manual for the donor vehicle. If you are unsure please do not guess at the figures and consult with GTS or an experienced trained motor vehicle engineer. If you do not currently own a torque wrench then it is recommended that you invest in one, or perhaps hire one from a hire shop.

You will find it easier to work on your Locost GTS on chassis supports for the initial stages of the build. Two sturdy workmates, or four axle stands may prove suitable for use, check manufacturers weight limits before use, remember your completed car could weigh as much as 500kgs. Do not however use bricks, building blocks or wooden packing cases, as they are liable to topple, or in the case of wooden packing cases crush under weight of your car. GTS can provide purpose made trestles which are suitable for the complete build, contact us for further details.

Do not connect the battery's positive terminal until the full installation of the wiring loom and all earth cables have been completed. If possible it is a good idea to check resistances of each circuit before connecting the battery, if you get full scale deflection on your meter then you know you have a short and can sort it before connecting the battery.

Do not fill the fuel tank until the car is complete, and all tests have been completed.

Always have a fire extinguisher at hand.

Safety and Conditions:

All parts supplied by GTS Tuning and its suppliers, are tested for quality and suitability for purpose; but you, the customer are solely responsible for the safety and quality of any new or used parts that you source. In all cases you are ultimately responsible for the safety, suitability of purpose and quality of the final product.

Use the correct equipment or tools for the job in hand, and always seek professional advice for those areas you are unfamiliar or uncertain about. Great care must be taken during the build, and due consideration given to personal, electrical and mechanical safety. GTS Tuning cannot be held responsible for any injuries or damage to persons or property arising from the building or use of your vehicle.

Although you are allowed to drive the vehicle to the SVA centre, this is not recommended, unless the vehicle has been fully checked and tested by an independent qualified person. If this is a problem then take the vehicle to the test centre on a trailer or similar.

It is recommended that you obtain a copy of the SVA manual, in order to ensure that your vehicle is built to the required standards.

The following instructions are intended only as a guide, and may not be complete. Whilst every effort has been made to ensure that they are, to the best of our knowledge, correct, GTS Tuning cannot accept responsibility for any damage to persons or property, or any costs incurred, that result from following this build sequence, or any of the additional advice given.

The permutations for building this car are too broad to cover in detail. These instructions cover just one particular build, and are intended to be sufficient to cover the majority of requirements. However our technical team are always on hand if you need any additional help with a specific task.

By continuing with the project it is assumed that you agree with, and accept the above conditions.

The Donor Car:

The cheapest and simplest option for your build is to buy a complete car. Any Ford Sierra 2WD drive car will provide all the donor parts you need, except for the steering rack and radiator. The steering rack comes from any Ford Escort Mk 2 (1975-80). GTS Tuning can provide new high ratio steering rack (part number TAS-187). The recommended radiator comes from a Mk 1 VW Polo.

Check for excessive smoke, and any transmission whines or rattles. It's not a disaster if the donor car has these faults, but, it will mean that the offending part will need reconditioning. The parts required to recondition Sierra components are fairly easily available, some direct from GTS.

The Sierra will provide you with one of the following engines:

- Pinto
- CVH
- DOHC

All of these engines can be used, but at present only Pinto and CVH engines mounts are available from GTS. You will also normally get a Type 9 gearbox (preferred) but on some later models the gearbox used was the MT75. The MT75 can be used although the chassis and its mounts are designed to accept the Type 9.

Other engines, not from a Sierra, can be fitted. Along with other car engines are a number of motorbike engines. The following list shows the engines that GTS can provide mounts for:

Car:

- Ford Focus Zetec,
- Ford Duratec
- Toyota 4AGE

Bike:

- Triumph Daytona/Sprint
- ZX9R
- R1
- Fireblade

All motorbike engine mounts are in the form of cradles. The chassis is slightly different for motorbike engines so the decision of what engine is to be fitted needs to be taken before placing the order for your kit.

Before disassembly of the donor car, take plenty of pictures of the components as they are installed so you can use these for future reference. Having the Haynes manual for the car is also a great help.

EBay, trade magazines and the internet are all good places to look for reference material and donor car components. For example a Haynes manual can be picked up regularly from EBay for £3 or so. There are specialist companies that deal with donor parts, and their details can be found in kit car magazines.

Donor parts to keep:

- Registration document, chassis plates and number plates
- Engine and all ancillaries
- Gearbox and bell housing. (Toyota and Duratec engines require different bell housings)
- Gearbox mounting (can be bought new from GTS part number PEM5418)
- Complete clutch assembly for exchange.
- Steering column, complete with all plastic ancillaries and wiring plugs.
- Steering column down link (for exchange at GTS)
- Hand brake lever and switch (keep connectors and a length of wire)
- Differential assembly, complete with drive shafts. (Very important to keep the long M12 mounting bolts as well)
- Prop shaft. Can be shortened or exchanged for new. Refer to Dwg 6. (Or can be bought new from GTS part number GTS-3005)
- Front uprights and hubs (for exchange at GTS)
- Front brake discs, callipers and bolts (may need to be exchanged, remember to keep the calliper mounting bracket when exchanging callipers as this is not included).
- New brake discs are available from GTS (part number DBD-4844, brake pads DB-164)
- Rear brake drums, back plates, bolts etc. Or; Rear brake discs, callipers (may need to be exchanged)
- Horn (available new from GTS part number HORN)
- Water pipes
- Wheels and nuts (even if replacing)
- Battery and battery leads
- Relays and fuses
- Header tank
- Washer bottle and pump (if intending to have windscreen)

Preparation of the donor parts:

For details of how to make a electrolysis plant for cleaning all rusted parts please see http://www.bhi.co.uk/hints/rust.htm and the thread at Locostbuilders.co.uk at http://www.locostbuilders.co.uk/viewthread.php?tid=9158

GTS recommends you replace all brake pads and discs, and that the callipers are checked carefully for any signs of damage to the seals or pistons. If the piston is seized in the bore then it should be exchanged for new.

New seals and pistons can be purchased from Ford dealers, although exchanging the units for new can save a lot of time for a relatively small additional cost. Most motor factors can provide new callipers in exchange. Remember to keep the calliper mounting brackets.

After inspection of the calliper you can mask the piston surface and have them grit blasted before painting with high temperature paint. This is also true of the other donor parts. Be careful to fully protect seals and sealing surfaces prior to blasting. Look in the Yellow Pages for local blast cleaning companies.

Check the wheel bearings and replace as required. It will be easier to check the wheel bearings prior to removal from the donor. With the wheel jacked up you shouldn't feel any movement when you rock the top and bottom of the tyre. Also check for any bearing rumbles when you spin the wheel.

Check and replace oil seals in both the gearbox and differential.

It's worth taking the head off the engine and checking the condition of the cam shaft, valves and pistons etc. At the same time you can de-coke the head and replace anything that's worn. Always change the cam belt and use new head bolts especially on CVH engines. The CVH engine is prone to having the heads warp if overheated, so whilst it's off put a steel rule over the block mating face and check that the head itself is flat.

If the engine is high mileage it may pay you to check and replace the bottom end bearings and seal. Check the crankshaft condition at the same time. You should not be able to see any scores on the bearing journals.

Replace the water pump, sump gaskets, rocker cover gasket and head gasket.

Tips:

For the early stages of construction mount the chassis on trestles that place the chassis at a comfortable height to work on.

All fixings mentioned in this build manual, will need to be supplied by the customer with the exception of the suspension nuts, bolts and washers which are provided with the starter kit.

All bolts should point down when placed in the vertical plane. This stops components from becoming disassembled should nuts fall off.

Bolt heads should be held in position and nuts turned, washers should therefore be placed under nuts rather than bolt heads.

Fixings list:

- Bright zinc plate bolts of grade 8.8 or higher are what is required for the majority of applications. In each case a Nyloc or Kaynut with a plain or spring washer should be used. The suspension bolt pack comes with 26 M12 x 70 mm bolts; these mount the front wishbones, and the rear axle, trailing arms and panhard rod. 8 of them are used to mount the 4 shocks absorbers.
- Master cylinder (Sierra) - 2 x M8 x 25mm bolts, nuts and washers
- Master cylinders (Twin) - 4 x M8 x 25mm bolts, nuts and washers
  2 x 5/16" UNF locknuts
- Accelerator pedal - M8 x 40 bolt, nut, and washer
- Clutch pedal - M8 x 40 bolt, nut, and washer
- Brake pedal - M8 x 40 bolt, nut, and washer
- Steering rack - 2 x M8 x 25mm bolts, nuts and washers
- Bottom ball joints - 4 x M8 x 20 bolts, nuts and washers
- Steering column - 2 x M8 x 30mm bolts, nuts and original thick washers
- Fuel tank - 4 x M6 x 20mm socket head cap screws. 4x M6 rivnuts
- Hand brake - 2 x M8 x 25mm nuts, bolts and washers.

- Hand brake cables - 2x M8 Nyloc nuts
- Gearbox mounting- 2x M8 x 20mm bolts, nuts and washers
- Differential - 2x original M 12 bolts, nuts and washers
- Drive shafts - 8x M10 original bolts
- Panels – 250x 4mm captive head pop rivets
- Bodywork - 20x M6 x 15mm bolts
  20x M6 rivnuts

Tools Required:

- Tin Snips
- Hacksaw
- Files
- Allen Keys Metric/Imperial
- Spanners
- Screw Drivers
- G-clamps/quick clamps
- Electric Drill
- 4mm drill bits
- Rivet gun

Materials:

- 4mm rivets
- Sheet of 18swg aluminium
- P-clips (various sizes to suit fuel pipe, wiring loom and brake pipe)

Chassis Preparation:

If you purchased your chassis from GTS it may have been powder coated as this is an option. It will also include a bulkhead panel in both foot wells.

Your first job is to assemble the master cylinder(s) into the foot well bulkhead. There is pre-drilled a hole in this bulkhead the same size as the location diameter on the Sierra master cylinder. There are several sizes of Sierra master cylinder and depending on which one you have you may need to open this hole out to suit. To do this you can use a tile or hole saw.
When your master cylinder will locate in this hole, you can then use the cylinder as a template for drilling the two mounting holes in the foot well bulkhead. Once drilled attach master cylinder with two nuts, bolts and washers.

Next you need to fit a panel either side of the transmission tunnel in both the drivers and passenger foot well. This panel is square of dimensions 12.5" by 9". You will also need to cut out of each corner of this panel so that the panel can fit around the 1" tubes of the chassis. (dwg l) You can cut these corners out using either a hacksaw or tin snips. After cutting this panel file every edge to remove any burrs.

Once you have trial fitted the panel, clamp the panels to the transmission tunnel and drill 4mm holes in three positions along each of the top and bottom edges and in 5 positions along the front edge of the panel (as shown in dwg 1) The back edge is left for the moment, as later there will be another longer panel that overlaps this edge and can be drilled and riveted at the same time.

GTS can provide pre-cut transmission tunnel panels part number GTS-3033. Further notching out is required. To cut your own panels refer to dwg 2. You will need to notch out the bottom edge of this panel to fit over the chassis tubes that make up the floor of the car. Again this can be done using tin snips or a hack saw. To cut out three sides of a square simply cut down each side and use a pair of pliers to gently work the tongue of material that is left, until it breaks off. Again run a file around every edge to remove any burrs.

It is well worth notching the panel on one side of the transmission tunnel then using this as a template for the other side.

When you have finished notching the panels clamp them in position and drill (4mm) through the panel and into the chassis in each corner and then at 75mm spacing along each edge. You can now put these panels to one side. Do not fit them at this time, as you will find it easier to assemble the parts in the transmission tunnel without these panels. We drill these panels at this stage as it is easier to drill and mark out along the bottom edge without the floor pan in the way.

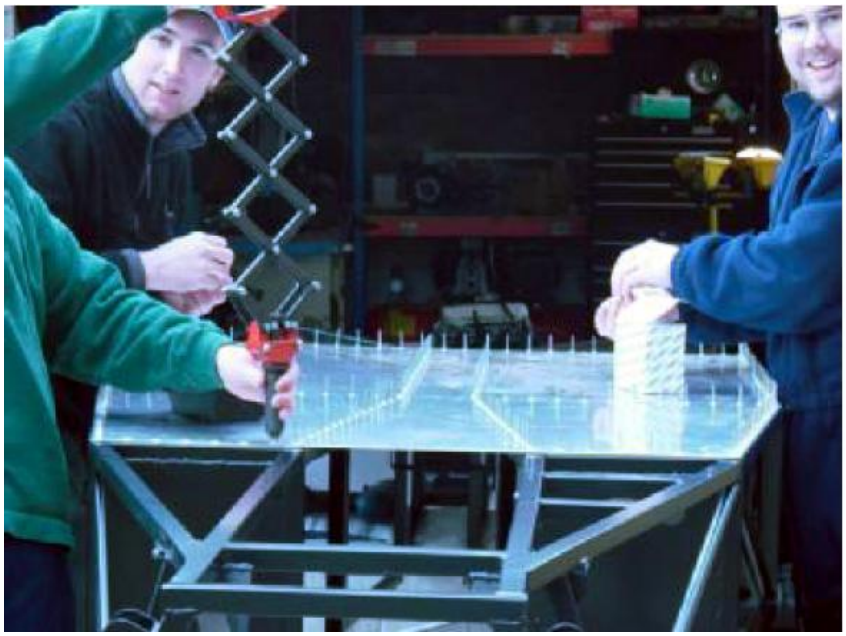
Next you can move onto fitting the seat back bulkhead. GTS can provide this pre-cut (part number GTS-3034) but further notching out may be required. If you wish to cut your own panel then you can refer to dwg 3. You will need to trial fit this panel, and mark out holes for the hand brake cable tubes that are pre-fitted through the seat back bulkhead. You can make these holes with a drill and file as required.

Again you should clamp this panel in place and drill and rivet in each corner before fitting rivets at 75mm intervals along each edge and along the centreline of each diagonal tube forming the seat back bulkhead. At this point you should decide whether to fit aluminium infill (part number GTS-6035) panels to cover over the area by the trailing arm brackets. If you do wish to fit these then you can refer to dwg 5, for details of the shape required or you can order them pre-cut from GTS. You can always cover this area later when fitting the interior trim/carpeting. If you do decide to make and fit aluminium panels here then you should leave out the rivet holes for the seat back bulkhead in this area. This is so you can share the rivet holes for both the infill panel and seatback bulkhead.

At this stage you will find it easier to turn the chassis over so you can work on the bottom more easily. The next stage is to fit the aluminium floor. We fit steel strips in each side of the cockpit which the seats can be mounted too as this is stronger than relying on the aluminium

alone, when fitted you can happily stand on any area of the aluminium floor without fear of damaging it. We use an aluminium riveted floor so it's easy to replace should it get damaged in use. We also use it as we have no concerns over it corroding or causing distortion to the chassis unlike a welded steel item.

The floor pan is available pre-cut from GTS (part number GTS-3036) or you can refer to dwg 4 if you wish to cut your own. If you are cutting your own floor we recommend using 16swg aluminium sheet for this.



As with the other panels the floor is clamped in position and then drilled and riveted at 75mm intervals.

Fuel pipes, brake pipes and wiring loom:

The next job is to drill holes on the inside of the transmission tunnel that will mount the P-clips which hold the fuel pipes, brake pipes and wiring loom.

The fuel pipe and wiring loom must not be mounted together, so you should run them in opposite top corners of the transmission tunnel. As the fuel outlet from the GTS fuel tank is on the passenger side of the car you should place the fuel pipe on this side of the transmission tunnel.

In the drivers side top corner you should place the brake pipe and wiring loom clips. For SVA you must not allow the copper brake pipe to touch the chassis. To prevent this from happening you can space the pipe off the chassis by putting small sections of fuel piping over the brake pipe in the areas where you will have the P-clips.

The GTS brake line kit provides three mounting brackets for use with flexible brake lines. One of these brackets needs to be fitted inside the transmission tunnel, at the back (on the 2" tube that forms part of the seat back bulkhead) and on the drivers side. Two holes are provided in the bracket and 4mm rivets hold it to the chassis. After using the bracket to position the holes you may want to paint it to prevent corrosion.

GTS supplies and recommends the use of the Premier Wiring Systems Easy Fit wiring loom for Sierra based vehicles. The instructions for which are included with the looms contents.

Polybush preparation:

Due to manufacturing tolerances with the U brackets, the poly bush tubes and the wishbone ends, you can get a situation where built up bush assemblies don't fit in the U-brackets. The inner sleeves and the U-brackets have a nominal manufactured dimension of 46mm. In some cases it will be required to file the ends of the inner sleeves such that they fit the U brackets nicely. The inner sleeves should be between 45mm and 46mm when finally assembled. Each inner sleeve should be heavily de-burred after sizing to aid assembly into the poly bush.

Please refer to dwg 7, this drawing shows how the polybush should be assembled. You should lubricate the inner steel tube well before assembly. The polybushes themselves will be a tight fit into the wishbone tubes, and will require the careful use of a vice in order to assemble them.

The drawing shows the required tube size for the poly bushes. This is a reference for anyone making their own wishbones and or U-brackets. The Locost GTS comes with U-brackets with a nominal dimension of 46mm and the wishbones tubes are sized as per the recommendation on the drawing.

Always keep the inner sleeves well lubricated during the life of the bush.

Steering Rack & Column:

Once you have your Mk2 Escort steering rack, extended UJ & connecting shaft cleaned up & painted you are ready for assembly. It is advisable to fit new rubber gaiters to the rack, filled with grease. You can now bolt the rack in place onto the support plate with four M8 X 35mm bolts & Nyloc nuts. With the rack now in place you can assemble the column through the foot well bulkhead and bush provided and secure at the upper support brackets. From here you can trial fit the extended U/J & linkage shafts which will need to be removed later to install the engine.

De Dion Axle mounting:

The De Dion axle is mounted using four trailing arms and one panhard rod. The panhard rod will require a 1/2" bore with 1/2" UNF threaded rod end. The other end of the panhard rod is polybushed and you should follow the directions elsewhere in this manual for the fitting of the polybushes here and also in each end of the trailing arms.

You will need to make sure that the diff is already fitted. The drive shafts are fitted to the De Dion tube after its assembly in the car.

Fit two trailing arms to either side of the chassis, the brackets for these are on the outside of the chassis beside the driver and passenger near the seat back bulkhead. Next fit the De Dion tube by passing it into the rear of the chassis from one side. Attach the four trailing arms into the brackets on the axle. Beware that the shock absorber lower mounts are on the top of the De Dion axle and therefore these must be fitted so they face up.

Next attach the panhard rod to its U-bracket which is mounted on the passenger (RHD cars) side of the chassis right at the back of the car. Then adjust the rod end so that you can attach this to the mounting position on the back of the De Dion axle.

You can now fit the drive shafts, as per the details shown in the Haynes manual for the original Sierra. They are mounted using M10 bolts, which clamp the hubs to the De Dion axle.

You can now fit the shock absorbers. We have found the easiest way to do this is to fit the top of the shock to the chassis first so that it hangs down and then you can lift the axle up to meet the lower end of the shock. Both ends use an M12 x 70mm nut and bolt.

Once fitted you can refer to the details in your Haynes manual for fitting your chosen brake setup to the rear axle.

Side Panel Fitting:

All references to the trimming of the side panels should be taken from the creases in them, the crease lines up with the crease in the chassis, where the parallel cockpit sides start to taper into the engine bay area.

The side panels will need trimming to fit around the trailing arm U-brackets and the front suspension mounting brackets. The easiest way to do this is to carefully measure from the crease in the chassis back to the trailing arm mounts, transfer these measurements to the side panels and carefully trim using a hack saw blade, and file or Dremel type grinder.

Now you can offer the side panel up to the chassis and mark out on the inside of the panel the clearance holes for all the suspension brackets. Later on you may also need to mark out a hole for the exhaust. At this point you should give though to how much clearance the wishbones will need so that they may articulate as well.

Once you have successfully trimmed one side panel you can offer the other side up to it and transfer the pattern of holes over directly.

The ideal way to fix the side panels is using a few rivets on the under side and in any other area where they will be disguised, i.e. under the rear wings, scuttle and nose. These items are held on with rivnuts and bolts, so you can also mount the side panels by using these items to sandwich the side panels to the chassis.

Front wishbone mounting:

You will require 5 off M12 x 75mm long bolts with Nyloc nuts for each side of the car. Beware that the side panels will require fitting before the wishbones are finally assembled.

Firstly make sure you have fitted the polybushes to each wishbone as per the guide elsewhere in this build manual. Then assemble your lower ball joints into the lower wishbones. These use M10 nuts and bolts. Next assemble the camber adjusters, lock nuts and top ball joints into the top wishbones.

Fit the lower wishbones (longer ones) into the lower wishbone brackets on the front of the chassis, such that the final arrangement will look as in the photo below. Now fit the top wishbone, and then offer the upright up to it making sure that you have first installed the mushroom adaptor. Fit the top and bottom ball joints into the uprights. Now fit the shock absorber. Fit the lower end to the lower wishbones, and then lift the assembly so that the top of the shock absorber will fit into its bracket on the chassis. You should at this stage fit your cycle wing mounts. They fit using the lower ball joint and nut, and the long M12 bolt that clamps the mushroom insert into the upright, once fitted you will need to bend the flat plates of the cycle wing mounts over your wheel and tyre combination, so that you can fit your cycle wings.

You can now fit the track rod end onto the steering rack and then into the upright. You can now go round and tighten all the nuts and bolts and especially the ball joints into their respective tapered holes.

For SVA purposes you will be required to fit a plastic cap to each of the nuts and bolt heads on the suspension that are visible from the outside.

Brakes:

Torque Wrench Settings:

- Calliper carrier bracket to hub carrier bolts: 38-45 Ibf ft
- Front calliper guide bolts: 15-18 Ibf ft
- Rear calliper guide bolts: 23-26 lbf ft
- Master cylinder to bulkhead nuts: 15-18 Ibf ft

You can use two types of braking circuit on your Locost GTS. You can use either the standard Sierra type tandem master cylinder, or the race car derived twin master cylinders with adjustable brake balance bar.

The Sierra system is of the dual circuit hydraulic type. The front and rear circuits are operated independently from a tandem master cylinder, so that in the event of a hydraulic failure in one circuit, full braking force will still be available to two wheels through the remaining circuit.

A deceleration sensitive valve is incorporated in the rear brake hydraulic circuit. The valve regulates the pressure applied to the rear brakes and reduces the possibility of the rear brake locking under heavy braking.

Precautions:

Hydraulic braking fluid is poisonous, wash off immediately and thoroughly in the case of skin contact and seek immediate medical advice if any fluid is swallowed or gets into the eyes. Certain types of brake fluid are flammable and may ignite when allowed to contact hot components. Brake fluid is a very effective paint stripper and care should be taken to avoid contact with painted surfaces. Wash off any spillage with copious amounts of water. Finally it is hydroscopic (it absorbs water from the air) old fluid may thus be contaminated and not fit for further use. Make sure replacement fluid comes in a sealed container.

Fitting the deceleration sensitive valve:

The deceleration sensitive valve should be located on the left hand side of the transmission tunnel (at the widest part, at the entrance to the engine bay). The valve must be mounted at 30 degrees from the horizontal plane. The early type of valve must be fitted with the cover bolts facing forwards and up, and on the later type valve must be fitted with the smaller diameter stepped end facing forwards and up. The mounting holes on the valve bracket will give you

an indication of the angle the valve should be mounted. If you mount it such that these two holes are vertically inline you will have mounted the valve at the correct angle.

The upper/forward most end of the valve needs to be connected to the rear circuit outlet from the master cylinder and the rearward/lower end should be connected to the rear brake cylinders/callipers.

Master cylinder:
The primary port is the port that feeds the rear brake circuit and is the port closest to the foot well bulkhead panel via which the cylinder is connected to the chassis. The secondary port is at the end of the master cylinder, the port furthest away from the foot well bulkhead, and it's this port that supplies the front brake circuit.

Twin brake master cylinder fitting:
If you have ordered a twin brake master cylinder set up then these instructions are for your particular set up. Before assembling the pedals into their respective brackets, you need to fit both master cylinders.

First of all you will need to make two holes in the foot well bulkhead panel into which the master cylinders will fit. These holes should be ?? diameter, ?? centres distance, ??mm from the floor of the chassis and the centre point between the cylinders should be central to the pedal mounting bracket.

Fit the 0.625" bore master cylinder into the right side hole and use it as a template to drill the two 8mm mounting holes, secure the master cylinder with two M8 x 25mm bolts, with Nyloc nuts and washers.

Fit the 0.7" master cylinder into the left hand side hole and drill the mounting holes as above and, secure with M8 bolts as above.

Fit the 5/16" UNF locknuts to the actuating arms of each master cylinder, before, assembling the balance bar into the brake pedal. Leave the longer section of threaded balance bar to the right hand side of the car. Fit the barrel nuts into the aluminium trunions and then screw one of these assemblies onto each end of the balance bar such that there is a minimum gap between each trunion and the pedal bush. Set the balance bar to the mid position (in the centre of the pedal bush). Screw the actuating arms of each master cylinder into the trunions and make sure that the balance bar moves freely during pedal application.

The system is gravity fed using a double reservoir (available from GTS part number SVA-TWIN-RES (Hi-spec) with a low fluid level sender as required for SVA.

The master cylinder is fed with fluid to the front side of the master cylinder, using 3/8" UNF push on nipples. If necessary, use a simple bracket to mount the reservoir above the master cylinders (you can mount this off the top chassis rails). Use two hydraulic hoses from the two outlets of the reservoir to the push on nipples on each master cylinder; secure each end using jubilee clips.

Clutch, Brake and Throttle Pedals:

In the centre of the rounded end of both the clutch and throttle pedal drill and tap a M6 hole. The respective cables will be attached, after assembly into the chassis, using a 20mm bolt, washer and Nyloc (or Kaynut) nut. Be sure to check that the cable eye can pivot freely on the bolt.

To provide the clutch and throttle pedal with a forward stop you can mount a suitable spring over the cable between the bottom of the pedal and the chassis tube. You can use a split nylon bush each end to provide the spring with alignment and support.

The brake pedal comes without a hole in which to mount the clevis and pushrod that activates the master cylinder. You drill the 8mm diameter hole where you want it to give you your preferred pedal feel and effort. The pushrod clevis fits around the pedal arm and is secured using the 8mm pin provided.

All three pedals, clutch, brake and throttle, use a common pivot arrangement consisting of a 25mm long bush (5/8" outside diameter x 8mm inside diameter) inside of a 16mm inside diameter bush that's welded directly to the pedal arm. The inner bush is nominally 1 mm wider than the pedal bush and the pedal mounting brackets clamp the inner bush using an M8x40mm bolt.

Fuel Tank Fitting:

The GTS fuel tank (part number GTS-8007) has mounting feet with pre-drilled holes. These mounting feet are designed to fit inside the two stiffening tubes in the rearmost section of the chassis. There is a 4-5 mm clearance on each side so that you can use rubber matting or foam strips to isolate the tank from the chassis.

Place the fuel tank mounting feet inside of the tubes mentioned above, the fore and aft position of the fuel tank is determined by the position of the panhard rod. It is therefore advisable to have fitted the panhard rod prior to this stage.

The fibreglass back panel comes flush to the rearmost tube and mounts at the same angle, so the fuel tanks rear most position is such that its back face is flush with this back panel line. It is advisable to leave some clearance to the back panel.

Mark the bolt position on the chassis by using the fuel tank mounting feet as a template, drill and fit M6 rivnuts in these four positions. Remember to transfer these holes to the rubber isolating material also. Then fit the fuel tank using M6x20mm socket head or button head cap screws.

Fuel Tank Filler neck assembly, flush fitting, "Aircraft" style:

The back panel and the fuel tank should be fitted prior to this stage. The fuel filler neck will be assembled and bolted directly to the back panel of the bodywork.

Make sure at this stage that the fuel tanks filler neck is covered so as to stop debris from entering as you drill the holes to mount the fuel filler neck.

To mark the position of the fuel filler neck you can either cover the approximate area in masking tape or use a non-permanent marker pen. At this stage refer to the two drawings (dwg? And dwg ?). Dwg ? defines the position of the filler assembly on the back panel, this

should make sure that the funnel of the filler neck is in line with the filler neck on the tank. Dwg ? defines the size of the main filler neck hole to be made and also the size and PCD of the mounting holes.

To cut the main hole use a hole saw of correct size or slightly smaller, then finish the hole using 320 grade wet and dry paper. You can fit the filer assembly at this stage and use this as the template for the mounting hole position. Remove the filler assembly and drill off each hole (5.2mm diameter).

On the inside of the back panel you use the nut plate into which the 6x 5mm screws fit (use a 3mm Allen key), on the outside of the back panel you fit the provided seal between the back panel and the fuel filter itself.

To complete the operation, fit the rubber hose between the tank and fuel filler assembly using a jubilee clip on each end.

Windscreen washer reservoir mounting:

Fit the windscreen washer bottle before fitting the bodywork as it makes access easier.
The washer bottle is positioned on the engine side of the left hand foot well bulkhead panel. Mark off and drill the two 6.5mm diameter holes through the foot well bulkhead panel, using the mounting bracket as a template.

Fix the mounting bracket to the bulkhead panel using two M6x20mm long screws, plain washers and Nyloc (or Kaynut) nuts.

Nose cone mounting:

The nose cone has a return flange moulded to it that fits against the chassis. To fit it you simply need to fit two M6 rivnuts to the top rails of the chassis at the front of the engine bay. Transfer these holes position to the nose on the return flange and drill a 6.5mm diameter holes one on each side. From the inside of the engine bay you will be able to use an M6 x 20mm hex head bolt and large repair washer to clamp the nose via its flange to the chassis. You may need to trim some of the nose cones flange in areas to give clearance for parts like the radiator mounts etc.

Scuttle Mounting:

The back edge of the scuttle should mount so that it is inline with the crease in the chassis, where the parallel sides of the cockpit meet the tapering section of the engine bay. But before you do this it is worth trial fitting the nose and bonnet, so you can make note of the exact position of the scuttle.

4 rivnuts fitted into the chassis underneath the scuttle should be used, two on each side. These hole positions should then be transferred by using relative positions to the scuttle, and 6.5mm holes drilled though the scuttles flange. Using 4 M6x20mm bolts and repair washers you can bolt the scuttle directly to the chassis.

Bonnet catch fixing:

GTS recommends use of the rubber type over centre latch as supplied by GTS and Car Builders Solutions. These fit using 4 rivets per catch and we recommend using 4 catches, two on each side of the bonnet. Fit one close to the scuttle and one close to the nose on each side.

Back Panel Mounting:
The back panel will need a small amount of trimming, around where the curved section fits to cockpit sides. The back panel has a moulded flange where it can be riveted to the underside of the chassis at the very back of the car, where the fuel tank mounts.

You can fix the back panel to the chassis by riveting under the rear wings so they don't show.

When fitting the rear wings you will use rivnuts in the chassis, and you can sandwich the back panel between the wings and chassis as additional fixings.

Rear Wing Mounting:
Before making any fixings for the rear wings apply double sided tape to the return flanges so you can temporarily fix them to the chassis/back panel/side panels and check for correct alignment.

You have three points of reference for fitting the rear wings and making sure the rear wheels fall in the centre of the wing. The wings have angled features, the biggest angle mounts to the rear of the car. The points at the bottom of these angled features will line up with the bottom of the back panel at the rear and the bottom of the side panel at the front. The third point of reference is the junction of the back panel and side panel, where your elbow would be if sat in the car. If you line the wing up such that the wings curvature lies on this junction, the wing should be in the centre of the wheel.

Once you are happy with the position of the wing, you should drill through the wings return flange in about 6 positions, 3 of which should hit the chassis so you can fix rivnuts. The other three positions will be in the back and side panels so you can bolt through with M6 nuts, bolts and large repair washers to fix the wings.

Front Cycle Wing mounting:
The conventional method for fitting the front wings is to use button head screws, and drill through the wing to the mounting bracket below (be careful of the tyre). The cycle wing brackets should already have been bent to follow the tyres form as described in the suspension section of this manual.

We have found however that the use of a strong adhesive works well. GTS can provide the appropriate adhesive, and it means that should they ever come off in an accident you can usually pick them up, polish them and glue them straight back on. Bolted wings tend to get badly damaged in knocks and apart from using replacement wings you have to use successively bigger fasteners each time to repair the holes in the wings where the fasteners were pulled through.

Appendix A –EFI parts:

If you are using the EFI pinto engine then you also need to keep the following

- Air flow meter
- Plenum chamber
- Fuel injectors, rail, throttle body etc.
- Engine bay wiring loom
- ECU and mounting bracket Amplifier
- Fuel pump
- Fuel inertia switch
- Fuel filter, connectors and mounting bracket

For advice and specialist parts for the Zetec and Ford Duratec engine you can contact Raceline on 01483 811978 or www.raceline.co.uk

Appendix B –Fitting the Zetec Engine:

The Zetec engine as used in the Mondeo and Focus are relatively easy to fit, although they do require a few specialist components.

The standard intake system is physically too big to fit into the engine bay, and therefore needs to be replaced with after market throttle bodies, and ECU. You can use carburettors and we recommend using the Weber twin 40 DCOE type. With both the throttle bodies and the carbs you will need a new inlet manifold to suit.

ECU's for this engine are very common, although we recommend using the Omex system, and they provide systems that will run the full throttle bodied engine as well as a 3D system for use with carbs.

You will also require a shortened sump. Your sump can be modified for around £95, but we recommend the use a of a bespoke cast aluminium sump from Raceline. Raceline also supply a water rail and alternator and fitting kit for these engines, which makes installation easier.
For advice and specialist parts for the Zetec engine you can contact Raceline on 01483 811978 or www.raceline.co.uk

Appendix C – Fitting the Duratec Engine:

For advice and specialist parts for the Ford Duratec engine you can contact Raceline on 01483 811978 www.racline.co.uk