

This is the rear top corner of the Zero body tub, showing the tail-lamp mounting holes, and the 2mm holes for a dzus fastener mounting plate. Drill all the dzus fastener holes like this.



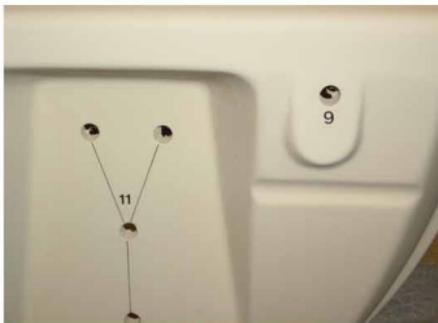
Top rear bulkhead. These holes are for fixing the rear damper top mount.



Top rear bulkhead. Picture shows tail panel hinge hole, and to the right, a fuel tank mounting hole. To the left are holes for bulkhead plates through which pass the wiring loom and fuel pipe.



Centre rear bulkhead. Holes for handbrake cable (left) and flexi brake hose. Both beveled by stainless bulkhead plates.

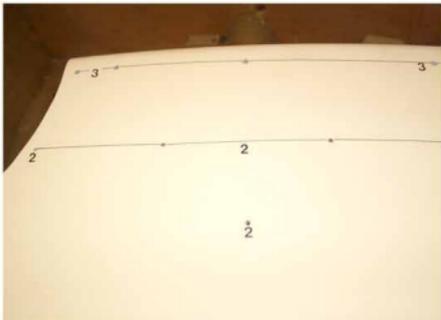


Lower rear bulkhead (right) shows rear chassis mounting holes. Drill all four. The 9mm hole is for mounting the fuel tank. Repeat all on left hand side.



Tail panel rebate with dzus fastener dimple.

Body Preparation.



The next seven pictures show holes in the body tub which will be used for fixing the leather/vinyl cockpit trims and the tonneau cover press studs.



Unlike the previous holes which were marked with moulded dimples, these two rows are marked with a pencil.



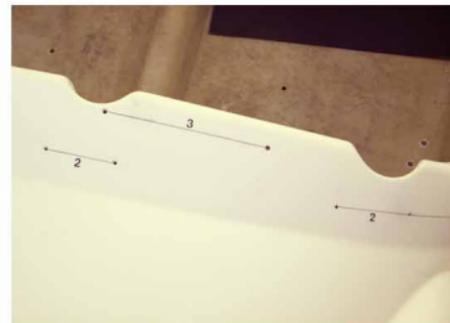
Their vulnerability to being rubbed away and lost mean it is essential to pilot drill these holes at the earliest opportunity after receiving the body tub.



After all these holes have been pilot drilled (2mm). The final hole size can wait until after the body has been painted.



This is a good idea as the painting process will slightly fill in the holes, reducing the diameter.



These lower four pictures show the right hand side of the tub. Of course, repeat the exercise on the left.

Body Preparation.



This picture shows the cutout and fixing holes for the steering wheel faring. At this stage only pilot drill the holes.

The body tub and chassis parts in these pictures have been intentionally prepared with flat primer to achieve maximum visibility in the photographs. The body tub was thoroughly flattened down to remove any wax and a thin coat of polyester spray filler/primer (two part).

The chassis and suspension parts were shot-blasted and sprayed immediately with a two part etch primer. This is also a good way for you to deal with these components followed by finished paintwork.

For the purpose of this building guide and picture clarity we will build the whole car in primer only.



After drilling or piloting all the holes in the top, sides and back. Turn the body upside down, on four old tyres to cradle and protect the top side.



Place the chassis in position as in the picture, and locate it by inserting two M10 bolts through the rear and two in the front surface, as above.



Now using the chassis as a template, mark or drill the chassis fixing holes in the bottom surface of the tub. Starting at the front, follow the picture sequence accurately.



If when drilling fibreglass your drill bit pulls through violently, leaving a ragged hole, it means the drill bit cutting edge is too sharp.

Body Preparation.



This picture also shows a line of holes for mounting the gear lever. Countersink the other side of the two centre ones. There are also six heat shield holes to pilot drill.



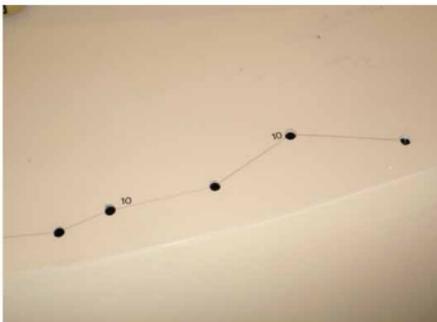
Above is the third cross tube from the front.



Pictured above is one of the large chassis outriggers,



This picture shows the fourth chassis cross-tube with body fixing holes, exhaust hanger and small outrigger as well as a sill panel hole.



On each side of the floor are a series of dimple marks running full length. Carefully drill these 10mm diameter. They are for fixing the sill panels and a seat belt mount.



After drilling all the holes in the floor, turn the tub the right way up and drill the holes in the front luggage space. The large steering column hole (above). Its return slopes down to the rear. Make it 35mm high at the front and 20mm high at the rear.

Body Preparation.



The holes for the steering column lower bearing and battery cutout switch are marked with dimples on the under side. Pilot drill from underneath and drill finished size from the top.



The picture above shows the bottom right hand corner of the fascia and luggage space moulding. It is also the point where the cockpit trim meets the fascia.



There are corresponding 22mm holes in the rear luggage diaphragm position as above except the height above the pencil line will be 35mm.

The second picture on this page shows a 22mm hole which is duplicated also on the left hand side. These holes will eventually be for the wiring on the right side, and the fuel pipe on the left.

To position these holes, first place the cockpit trim side moulding in position and draw a pencil line along its lower edge as shown. The 22mm hole must be 20mm above the pencil line, and as close to the body side as possible. Repeat on the left.

Wear a dust mask for these dusty operations.



Next, with your jigsaw with RIF blade cut out the scuttle to correspond with the steering wheel fairing. The cut line has been marked with a pencil. Cut very carefully slightly to the waste side of the line. Set your jigsaw to cut with zero forward throw on the blade.



This will mean slow but accurate. Also cut the return on the scuttle marked with a pencil line, shown above.



Make all these trimmed edges tidy and fair- sanding them to the final shape with an appropriately curved block and 40 grit Skittl paper as shown above.



You will two hole mark dimples on the fascia moulding. Drill them both 3.5mm and using these holes attach the aluminium fascia panel. With a sharp pencil carefully mark all the instrument and fixing holes.



Cut all the holes accurately as marked or drill to the diameters shown above.



There are many flashlines which need to be removed from the body tub. Carefully rub them away with 40 grit Skittl paper on a flat block. Don't be concerned about leaving deep scratches, they are easily corrected with a skim of resin rich polyester body filler.

Rear Suspension.



At this point in the build, your chassis and body parts will be finish painted and ready to be fastened together but before that, fit the steering rack to the chassis, use the U-clamps and the four black socket cap screws with washers under the heads. You may need to enlarge the clamp slots at one end with a round file.



Leave the clamp screws loose enough for the rack to be rotated for its final position. With some assistance, carefully lower the body tub into position on the chassis, rotating the rack if necessary. Put in all the stainless fixing bolts, M8 button heads through the floor, the M10 socket caps...>



...through the rear (last picture) and the M8 socket caps through the front bulkhead. On the floor the bolt heads are on the inside, and on the bulkheads the heads are on the outside. Always use the large thick washers against the fibreglass and the small washers against the steel.



If there is any small misalignment in the predrilled holes, ease them with a round file. Don't hammer or force the bolts through. Tighten the floor bolts first, followed by the bulkhead bolts.



Rear suspension. Remove excessive paint or powder coating from inside the swing arm bush housings and push in the Nylontron top hat bushes. Through those bushes fit the stainless crush tubes. Fit this to the car as in the picture, using the large flat washers to shim the end float.



Don't force them in. Only fit them if they go in easily. Tighten the bolts to lock up the crush tube.

Next fit the rear damper top mount to the top of the rear bulkhead using the stainless M8 socket caps and nylocs with large washers on the inside and small washers outside.

Front Suspension.



Front suspension. Take the large lower wishbones and identify left and right (the damper bracket is further out and to the front). Check bush housings for excessive paint. Push the bushes in. They have a nylon outer shell and a bonded crush tube.



Fit the lower wishbones to the chassis (see pictures). Using the large thin washers to shim any end float as before with the swing arm. Leave the bolts slightly slack and fit the damper and spring top and bottom with 1/2" UNF black socket caps, washers and nylocs.



Through the threaded hole in each wishbone bush housing using a 6mm drill, drill a hole through the nylon bush shell. Screw into the hole an M8 socket grub screw with a little loctite. It only needs to go through the nylon.



Take the two upper wishbones, they are identical however, they do have a short leg and a long leg, which goes to the front. This is important as it sets the castor angle. As before, check the bush housings for excessive paint.



The upper wishbone bushes are urethane top hats with a separate stainless crush tube. Put the bushes in each end of the housing and push in the crush tube with some of the special lubricant supplied. Fit to the car (See pictures).



Use the M10 black socket cap bolts (the long ones to the rear). Don't fit washers under the heads of the front bolts. Otherwise small washers against the steel and large thick washers against the fibreglass. Tighten up to lock up the crush tubes.

Front suspension/ brakes.



Fit the longer ball joints with their spreader plates and then fit the steering upright which has the wheel hub already attached (See picture).



Into the threaded tube of the upper wishbone, screw the top ball joint with its locknut. Leaving about 3 threads exposed, attach to the ball joint taper, the ball joint bracket and then fix to the top of the steering upright with M12 socket caps and washers.



Fit driveshaft outboard end and tighten to pull the bearing halves together. Assemble trackrod end as in the picture. Set the steering as if straight ahead and with a spirit level, check that the wheel hub face is vertical. If not, correct to vertical with top ball joint thread in/out.



As above, fit pedal box and master cylinder. Before fitting, check fibreglass surface for irregularities. The pedalbox must be a snug and comfortable fit before putting in the bolts. Use a small disc grinding stone if necessary.



Fit the front discs. Just held in position by the two countersunk screws. Fix together your front calipers with their respective stainless brackets. Use the M10 socket caps, washers and nylocs. Then, including the locking tab plate in the assembly, fasten the caliper to the steering upright.



Refer to picture above. Use the special M12 x 1.5 bolts and stainless spacer bobbins. Use Loctite on these threads.



Lotus Elise pads. When fitting pads, check that they are not tight, top to bottom. File off metal backing slightly if necessary. Check also the pad thickness, they must not be installed tight. Remove friction material with 40 grit Skittl if necessary.



Take the rear spindle assembly out of its bag. You'll need to paint it to stop it going rusty. Best to use two pack etch primer. But only on the flange and caliper bracket. Fix the spindle to the swing arm (see picture) with the M10 black socket caps, nylocs and a little Loctite on the threads.



Fit onto the rear spindle the disc with its oil seal, inner and outer bearings with grease, washer and nut. Only tighten tight enough to eliminate the slack in the bearing. It must not be overtightened. Finish off by fitting the nut locking cap and split pin.



Next fit the rear caliper as shown with two M12 socket caps and nylocs. Then fit the C shaped stainless yoke with special M12 x 1.5 hex bolts with Loctite on the threads (see above) and simultaneously the brake pads, making sure the slots in the pads engage properly with the yoke.



For subsequent rear pad removal and replacement, undo the two long socket caps and keep the yoke to caliper joint semi-permanent. Assemble and fit the handbrake as its shown above. Make two 20mm holes in the diaphragm about 30mm apart for the handbrake cable and the copper-nickle brake pipe.



The holes for these items are already cut in the rear bulkhead. Thread the cable through from the handbrake to the caliper (study pictures for route). Carefully coax the cable into the correct position through the swingarm and P-clip it in place.



Before moving onto brake pipes (copper nickle) it is important to note that the stainless bulkhead plates are unique to Blackjack Cars (previous picture). They are used on the Zero wherever a pipe, cable or wires pass through to the bulkhead. Front or rear, there are two centre hole sizes, 11mm and 17mm.

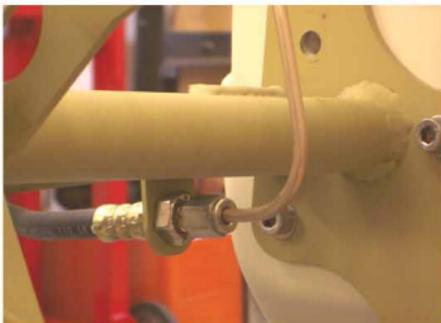


You custom make the gaskets in 3mm rubber sheet with a punch and a stanley knife.

Brake pipes. There are three different copper nickle pipe, all with unions fitted. The following five pictures show how these pipes are routed through the car. Follow these routes and clip positions faithfully.



But before proceeding with that, you must loosely fit the three black flexi rubber hoses. The two short ones to the front and the long one through the swing arm to the rear (see pictures). This will provide definitive end positions for your rigid pipes.



Next, tap the M6 threads in the bulkhead chassis yoke for the brake pipe P clips and the three M8 threads to mount the oil filter. (See picture). Take the smallest of the copper nickle pipes (the easiest) it goes from the front of...>>



...the master cylinder to the flexi hose end ust below it. To make these really neat bends you need a short piece of round steel tube clamped vertically in your vice with a short piece of radiator hose pushed over it (total diameter about 30mm).



This device is a soft faced formed for pulling your pipes around. It will help you to bend the pipes with a fixed radius and no flats or kinks. Approach this task thoughtfully. Don't be in a hurry, you can do it!!



Plan your bends carefully, use a felt pen to mark the centre of the bends whilst the tube is still straight. Take one tube at a time and gently encourage them to fit until you can connect up and loosely screw on the unions by hand.



Where the long pipe is routed through the ca. P clips should be set at around 150mm apart. Thread the whole pipe through and then start fixing and final bending from the master cylinder at the front finishing up with any spare length in a loop at the rear (see above).



When you have installed your rigid brake pipes now you can permanently fix the flexi pipes. At the calliper ends, fix crushable copper washers at both sides of the banjos. At the front, cable tie the banjo necks to the locking tabs. Don't overtighten the banjo bolts.



Repeat for the rear, except that to stop the rear banjo from rotating it should nestle in the valley of the calliper casting. (See above).



Finally, on the brakes, secure the rear flexi hose and handbrake cable where they pass through the swing arm with double P clips in two places. Slide the cables through the clips to achieve a natural flowing shape with generous bends before tightening the clips.



A note on springs and dampers. Dampers for the Zero ae special aluminium units with adjustable damping and ride height. Fit the spring and wind up the lower seat until the spring is no longer loose plus another three full turns. Then bolt them in place with the 1/2" UNF socket caps, washers and nylocs.

Anti-roll bar.



Fit the anti-roll bar across the front bulkhead. You will have to undo the short brake pipe to gain access. Picture above the spaces under the clamp and the rubber bush with split. Assemble left and right ends like this and bolt it all to the bulkhead with stainless M10 socket caps.



With small washers under the heads and large thick washers and nylocs on the fibreglass side. The chassis for this exercise should be supported on stands, with the full front suspension on full droop. Fit together the ARB link tubes and the 1/2" UNF rod end bearings with lock nuts. Wind them right in.



Position the ARB so that the gap between the end of its arms and the chassis top tube is about 8-10mm. Adjust and fit the links to maintain this gap. The bend in the link is to the top. Use 1/2" UNF socket caps at the bottom. Check the pictures for spacer configuration.