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LOTUS ELAN M100 HARDTOP

*** For less than £500 ***

(With heated rear screen if required)

Full instructions for producing one.

A STORY.

Every Elan M100 enthusiast knows that Peter Stevens designed this car, when he was employed by Lotus.

Not so many know that after he left Lotus, he set up his own car design consultancy and one of his clients was MG / Rover.

Hardly anybody knows that his first consultancy job for MG / Rover was to design a hardtop for the MGF (probably because it may not be true)

However, rumour has it that he knew GM had given “the chop” to the Lotus Elan M100 because there was not sufficient profit in it. He was aware that he had designed a hardtop for the Elan, which would never go into production, so he pulled the drawing out of a drawer or from his computer, reworked the edges and fitted it to the MGF. (fact or fiction ?)



LOTUS
DESIGN
FOR
HARDTOP
(Not made)

The story may be purely fictional but the underlying information is correct, an MGF hardtop fits the Elan almost to the millimetre. The front corners are the same width as the Elan's windscreen and when these points are touching the screen, the rear of the MGF hardtop just clears the Elan boot lid to allow it to open. Even the rear clasps to hold down the hard top align with the B post on the Elan.

Check out the picture (above) of the factory Elan hardtop (not made) from Mark Hughes book on the development of the Lotus Elan (p181), you will see a marked similarity to the MGF hardtop, which may be purely co-incidental.

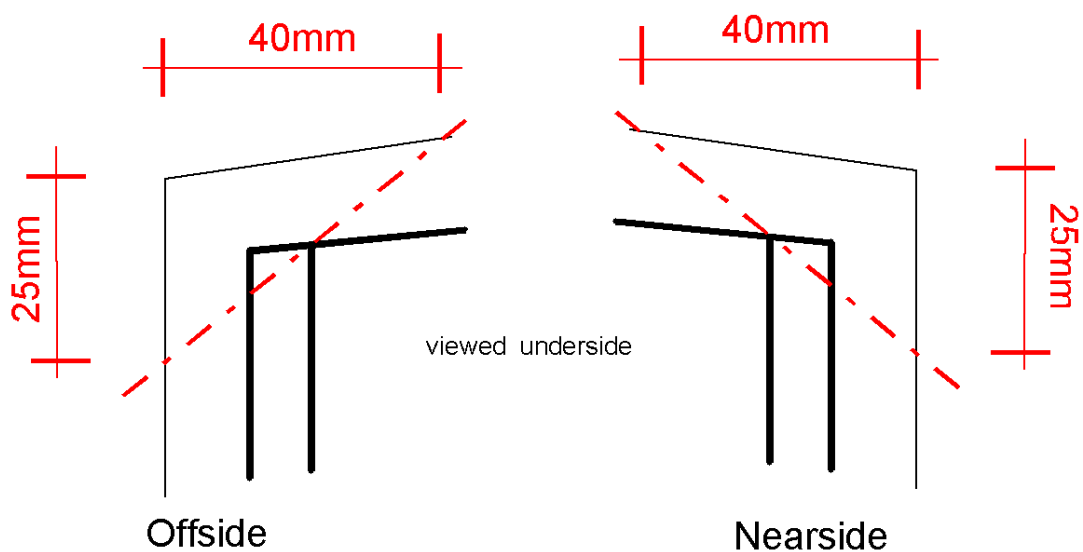
THE FOLLOWING INFORMATION WILL TELL YOU IN DETAIL HOW TO FIT AN MGF HARDTOP TO AN ELAN M100 AND IF YOU PAY ABOUT £300 FOR THE MGF HARDTOP (EBAY) YOU CAN COMPLETE THE PROJECT FOR UNDER £500.



DETAILED INSTRUCTIONS ON ALTERATIONS REQUIRED TO FIT THE HARDTOP.

1. Lay the hardtop upside down on something soft so it does not get scratched.
2. Remove the front catches by undoing the three set screws on each with a suitable allen key.
3. Remove the two push plugs at the rear of the headlining to release the lining and insulating board. Store safely for later re-use.

4. Remove the rubber seals from each side door closing by carefully ungluing each end and then carefully pulling the seal off the "T" push fixings. After removing the seals pull out the "T" push fixings with a pair of pliers or mole grips, re-fit the "T" push fixings into the rubber seal and set aside for later re-use. **Leave the rear seal of the hardtop in place and adjust as necessary.**
5. Lower the electric windows on your Elan and place the hardtop on the car. With the back of the hardtop just clearing the boot lid the front corners should project over the windscreen corners. Inside the car mark how much needs to be cut from the corners and its the under rails (see diagram 1). Remove hardtop and cut off corner on each side. When the hardtop is re-fitted to the car it will sit in the correct position, place a soft pad beneath each corner to protect the hardtop and the screen surround.



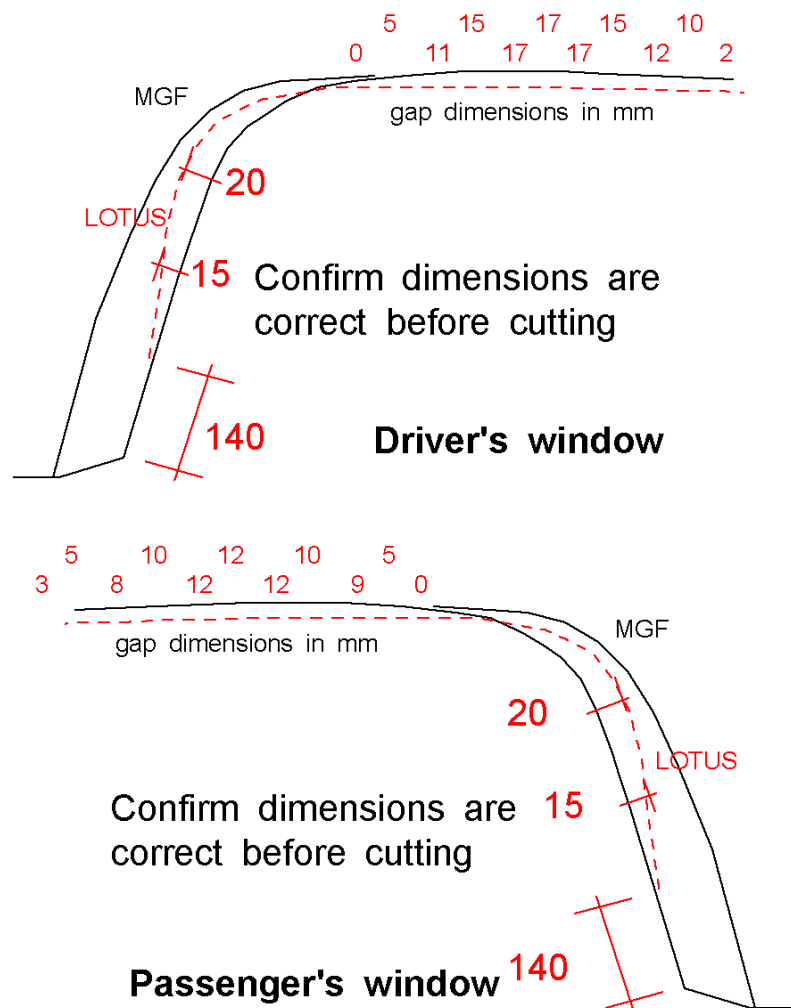
Confirm dimensions are correct before cutting



6. The hardtop should now be in the right position to check the tolerances and decide what alterations are necessary. Elan electric windows have adjustment tolerances **so each installation may be slightly different**. Also MGF hardtops are not exactly similar in every respect so some modification of instructions may be necessary.



7. With each door open raise each side electric window in turn and gently bring door towards closed position until it touches the hardtop, mark with a permanent marker how much needs to be cut away from the hardtop to clear the glass. When both sides are marked remove the hardtop and cut away as necessary.



8. With the hardtop back on the car it should now be possible to have it in the correct position with both doors closed and the windows raised. Check the tolerances for opening and closing both doors and the boot lid. These should operate without touching the hardtop. The boot lid tolerance may be quite tight but bear in mind when the hardtop is clamped down the tolerance will increase slightly.



PREPARATION FOR ALTERATIONS WITH GLASS FIBRE.

1. With the hardtop in the correct position on the car there are five areas of alteration to be marked with a permanent marker. One each side at door window heads and three on the leading edge of the hardtop.
2. The window heads are the simplest ones, check that the gap on either side of the car is similar. Bear in mind that there may be differing window adjustment on each side of your car so check each leading corner of the hardtop is in a similar position in relation to the top corner of the windscreen and that the rear edge of the side screen is in a similar position to the hardtop on each side of the car. Mark at 50mm centres on the hardtop along the side window head, measure the gap allowing a 2mm tolerance to the glass and mark each dimension on the hardtop.
3. On the leading edge of the hardtop, because the MGF screen has a slightly different profile it is necessary to reduce the height at the outer ends and build up the centre section.

LAYING UP THE GLASS FIBRE.

1. Firstly, you have to decide whether to lay up the glass fibre with the hardtop in place on the car, or do it separately. The former is more accurate, the latter is safer as it is a messy job and resin spilled on your "pride and joy " is too terrible to contemplate.
2. I decided on the risky option because a prototype was necessary to establish the correct lines. So lots of protection is needed to exposed surfaces. The abutting edges of door glass and windscreen top were carefully wrapped with cling film. This allows a correct profile to be maintained and prevent resin sticking to the glass surfaces. Ensure there are no gaps, rips or tears in the cling film.



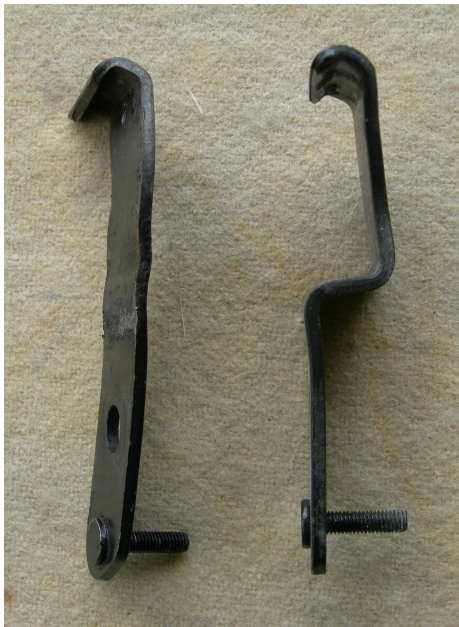
3. The next step is to make up templates to support the wet glass fibre, small hardboard templates can be used at the door glass head as the gap is quite small and can be held in place with a couple of discreetly places screws.
4. The front edge is more complicated, I used a thin plywood former supported by short braces screwed in to the hardtop cross beam. If I make another one I would consider using a thin aluminium sheet as a permanent former screwed or pop riveted to the cross beam. This permanent aluminium would allow accurate fixings to be attached for the hood catches before laying up.



5. Glass fibre and resin are then applied to all the edges to be modified, building up to a suitable thickness. If a closing seal is to be used on the leading edge a removable packer should be used to prevent the glass fibre from filling that gap. It is much easier not to put in too much glass fibre than to cut it back when set.
6. The glass fibre should be built up to just below the finished surface level. Its top surface at this stage is quite rough so grinding off may be necessary between coats to maintain the required profile.
7. When you feel the correct profile is almost achieved, spend some time flattening the top surface to a smooth curve, taking particular attention to "feathering in" the edges to the existing hardtop surface.
8. I used some body filler to make good small imperfections before rolling on two layers of veil (fine woven glass fibre). More rubbing down and finally coating with top coat resin achieved the desired roof line.
9. I attached two pieces of "L" angle plastic above the door glass upper edge to provide more protection for rain shedding from the roof but careful attention to the rubber seals can achieve similar results.
- 10 Spray an aerosol of similar colour and compatible paint to the hardtop's altered edges. It is easier to spot minor imperfections when the whole unit is one colour, adjust as necessary. If you have spraying facilities the finished paint job can be applied, or a local body shop can provide the finished surface

FINAL FIXINGS AND SEALS.

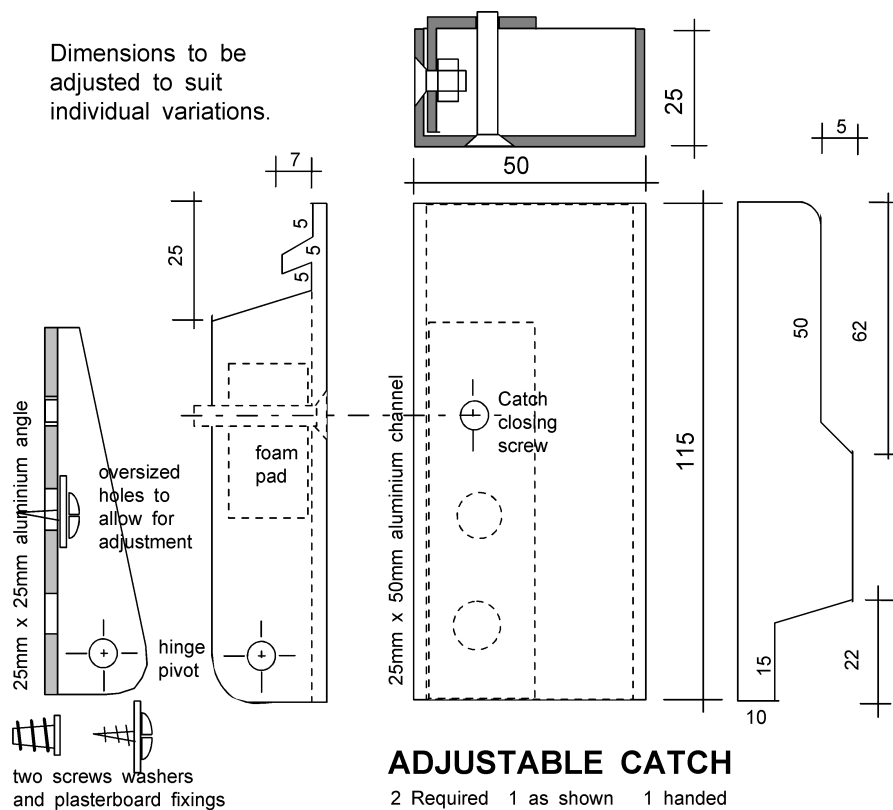
1. The MGF hardtop has a rubber pipe seal to the rear edge, this should be checked for alignment and adjusted if necessary. No part of the hardtop should directly touch the Elan's bodywork. A tube of Sikaflex 291 adhesive is useful for re-bedding the seal if minor adjustments are necessary.
2. The leading edge seal can be the Lotus seal from a soft top, but these are expensive and difficult to obtain, the MGF seal is fixed to the screen, not the hardtop so I do not know if it could be used. I used an "L " section polyethylene seal glued with Sikaflex to the leading edge but there are many proprietary seals on the market which can be purchased by the metre and could be suitable.
3. Rear holding down catches are best achieved by using the original MGF catches, which pull over and clip shut for security. If the mating catch can be obtained from a breakers yard these can be straightened and bolted to the body work via a small section of aluminium angle hidden beneath the "B" post trim.



4. Front catches are more difficult, I tried the OEM Elan hood catches but there is no facility for adjustment of position so very accurate fixings for the catches, laid up in the glass fibre are essential for success (see section on permanent aluminium template). They also cost about £70 each so this adds considerably to the finished costs.



5. I decided that as the hardtop is fitted once in Autumn and is probably not removed until Spring, immediate operational catches are not essential. The more important factor is an ability to adjust the catch for optimal positioning. The "made up" catch shown in the drawing is manufactured from a section of aluminium angle and aluminium channel, it is fully adjustable and clamps by tightening one set screw.



6. Coarse screw plasterboard fixings can be glued into prepared holes in the fibreglass cross beam to provide effective fixing points. Oversized holes in the catches and plate washers allow adjustment of the catch before final tightening in position required, The catches are unobtrusive when using the car.



7. With all four fixing points attached and front and back seals in position the hardtop is now set and securely attached to the car. When the hardtop is completed do some short test runs to bed in the fixings and check for security, the last thing you need is the hardtop coming loose on a motorway.
- 8 The only other items needing attention are the door glass seals and the interior head lining .
- 9 Door seals can be reused from the original MGF hardtop, but it is necessary to build up the centre of the channel into which the seal fits. The build up changes the profile of the seal channel to follow the line of the Elan glass otherwise there would be large gaps

between the seal and the top of the glass. When the correct profile is obtained in the channel, it can be drilled to accept the "T" fixings for the seal and the seal fitted and checked for door closing. Accuracy in this is essential as a door slammed onto a tight seal may break the glass, but some seal compression is necessary for a watertight joint. Other types of seal sold by the metre may be available which would be suited to the job

- 10 Finally the headlining carcass can be modified by extending the leading edge of the carcass to follow the Elan line. It is then necessary to re-cover the carcass with a stretchy cloth finish. To maintain a good line to the finished headlining it may be preferable to only attach the cloth at regular intervals and allow it to stretch between fixings.

This is an accurate description of how I produced the prototype hardtop shown in the pictures. I am sure that there are some improvements which could be made to the method employed and when others make a similar hood no doubt improvements will come forward.

DISCLAIMER.

All information contained on this CD is given in good faith but relies on the constructor to provide a level of competence to complete the construction properly. If in any doubt of the suitability of the finished article it should be checked by a professional mechanic before using on the public highways.

Ken Read.
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