Of Trackdays and Rollbars

With the trackday season soon to start, questions about the different types of roll over protection have been doing the rounds on Club forums. The Lotus Seven Club has long mandated that cars that take part in its trackdays need to be equipped with a "trackday" rollbar (also referred to as an "FIA" or "MSA compliant" rollbar), or indeed a full cage. Other trackday organisers may not insist on the same safety standards, so why does the Club take this position?

Questions about the Club's requirements when it comes to rollbars allowed on its trackdays come up fairly regularly. For those who may not be aware, the Club's position was set some twenty years ago by the Management Team of the time. However, it has been a while since we discussed the rationale behind this decision so, prompted by recent discussion on BlatChat, we thought it was an appropriate time to revisit the subject.

Firstly, what is a Rollbar / Rollover bar?

Rollover bars have been standard fitment to Caterham Sevens since the 1980s, although they were a popular option even before then and many Lotus and earlier Caterhams had them fitted. Rollover bars (sometimes just called 'rollbars') and roll cages are constructed from tubular steel, bolted to the chassis at a number of points to form a strong structure to provide a car's occupants with additional protection if the car is involved in an accident.

The Background

Trackdays are immense fun – most owners would recognise that a Seven is naturally at home on circuit. If you haven't had the chance to try your car on track yet, there is a treat awaiting you. What's more - Club organised trackdays (typically great value for money, where you are sharing the track with other members only, where the driving standards are courteous, and the cars' performances are pretty closely matched) make the perfect introduction to circuit driving.

Trackdays are generally pretty safe too. Tight rules only allow overtaking by consent, on the straights and on one side of the track, and any form of timing is prohibited. These rules are rigidly enforced, which should make car-to-car contact all but impossible. Having said that, you can never reduce the risk of accidents to zero, and some twenty years ago, the Club's Management Team undertook a review of its trackday rules to maximise members' safety at its events.

Up until 1995, the Club had accepted any street legal Lotus or Caterham Seven on its trackdays – the events were treated as innocent fun, with the view that as long as people were sensible, no harm would come. During that year however, a number of things conspired to change the collective mind of the Management Team. Firstly, on our trackdays around that time there were two serious accidents. One of them was with a child in the passenger seat - this led to the introduction of the 17 year minimum age rule. Secondly, at Silverstone that year, RMA (who were organising Club trackdays at the time) were criticised by track management for what they viewed as the inadequacy of the rollover protection on some cars. RMA advised us that they agreed with the criticism and that if we wanted them to continue to organise our trackdays, a minimum of an "FIA type bar" would need to be mandatory. The Club agreed with this decision, and has held this position ever since.

What is a "Trackday" or "FIA" bar?

This is a much less simple to define that you may think. What we typically refer to within our regulations is actually shorthand. There are a number of companies who can supply

appropriate parts however; Caterham Cars sells designs for both S3 and SV chassis which fully comply with our requirements and which are viewed by many as a simple safety upgrade for road and track. Caterham refers to the designs within its online parts store as both "Trackday" and "FIA" rollover bars – the term "Trackday roll bar" is used throughout this article for simplicity. Other compliant options are available however, including designs such as those fitted to old Lotus 7s in competition. lf you wish to have a non-standard rollbar design manufactured (perhaps for a very early car) then you should be guided by the instructions outlined in the Motor Sport Association (MSA's) "Blue Book". The design requirements are too lengthy to appear in full here, but include aspects such as the minimum material thicknesses and that it must be manufactured from cold drawn steel tubing. Strictly speaking, this design of rollbar is only deemed to be "FIA compliant" (ie for competition motorsport) when it also has a Petty Strut fitted (see below). However, the Club does NOT require this on our non-competitive trackdays.

So, what is wrong with the standard roll over bar?

Nothing actually. However, if you are going to use the car on a Club track day, there are a number of reasons why the Club took the decision to mandate the use of the stronger and taller "trackday" bar as a minimum. The standard Seven rollbar is made from seam welded steel (i.e. the tubing starts off as a flat strip of metal, formed into a tube through a series of rollers before the seam is welded together). The trackday bar however is made from "cold drawn" steel, so has no join along its length which could potentially crack and fail. Another important aspects is rollbar height - when you put on a helmet, your head protrudes at least 30mm higher than it would otherwise. This means that in the case of a roll over accident, your head is more likely to hit the ground. Trackday bars offer more clearance (which should be a minimum of 50mm from the top of the helmet head to an imaginary line from the top of the roll bar to the front of the engine). Of course, we are all different heights, and other aspects such as seat design, floor type etc all come into play here too. "Tall" Trackday bars can also be specified to provide additional clearance for drivers and passengers who require the additional clearance.

What about the Petty Strut then?

There have been questions as to whether the forward-running bracing strut known as a 'Petty' strut (which is available with the Caterham Trackday bar) is mandatory on Club trackdays. The Club does not insist that one be fitted although if you have one, and are not carrying a passenger, it may be worth considering.

What about seatbelts / harnesses?

Since we introduced the rollbar rule, some people argued that we should go further still, and insist for example on 4 point belts being fitted. Amongst some Area Representatives however, the fear was expressed that if we carried on adding safety requirements, before we know it only full-on competition cars would be allowed on track - not what our Club is all about. This perspective was widely accepted, but we do still firmly recommend the use of at least 4 point harnesses. The article published in Lowflying September 2015 "Buckle Up" provides a good reminder about correct harness use…

So, has the Club gone too far in the pursuit of safety? Same will no doubt think so, but we can only analyse the position objectively, and do what we think is right, and I hope that you also now at least understand why we insist on what we do.

What will it cost me?

New from Caterham, the trackday roll over bar for a S3 car is £320.30 inc VAT. You will probably also need to either change (or adapt) your boot cover too - the diagonals on the trackday bar are beefier than on the standard bar, meaning that the original boot cover will not fit snuggly. Either the cut-outs can be enlarged, or a specifically designed cover can be bought. A standard Caterham hood should fit fine over a trackday rollbar, although some aftermarket "half hoods" may not.

Some people will say that this is a high entry price for a track day. However, considering that Club track days are normally far more keenly priced than commercial ones, the investment is not so great, and you will reap the benefits every time you drive the car. It's also worth considering that if you are buying a new car, your upgrade cost will be much less if you specify the items from new.

How easy is it to fit?

We hope to bring you a step-by-step guide to upgrading to a trackday bar in a future edition, but it's a process which is well within the grasp of most members. Of course, Caterham or any other specialist garage would also be happy to fit it for you… *LF*

Roll bar and cage types – a pictorial guide

The details here describe each of the commonly seen 'standard' structures from the minimum to the maximum level of protection. These notes and the pictures should be studied in conjunction with the article on the previous pages.

Standard roll bar: This is the bare minimum of protection, even for a small driver. Please note that this type of rollbar is not allowed on Club-organised trackdays.

"Trackday" roll bar: This is the minimum requirement for all Club-organised trackdays. There are a number of different styles, depending on age, but all use stronger, larger bore tubes than the standard bar, contain at least one diagonal tube and can be used in competitive motorsport events.

When being used for motorsport it states in the MSA Blue Book that the top of the driver's helmet must be a minimum of 50mm below the imaginary line in our pictures and in the Club Speed Championship, the 'Petty strut' must also be fitted. A Petty strut is an additional bar that joins the top of the roll bar to the chassis via a boss located in the passenger's cockpit side; this provides extra triangulation and therefore strength. The strut is a bolted-in, removable item so this is a good road/ track compromise.

Roadsport cage: Further tubes run from the top of the roll bar forward to a point near the top corners of the windscreen and down to the dash panel to form a complete cage. This gives the occupants even more protection but makes the car more difficult to get into. Windscreen and weather protection can still be used, although erecting the hood is a little more difficult than with a roll bar. More track-orientated than road.

SLR cage: This first appeared in the slr race series, hence the name. It has more tubes than the Roadsport cage, including lower side members that bolt to the chassis in four places either side of the car giving the occupants some side impact protection and also contributing to a stronger structure. The level of protection given is as good as it gets from a standard structure but it does have some drawbacks: weather gear can't be fitted so you will get wet if it rains. Apparently a windscreen can be fitted but you still can't fit the weather gear and I've yet to see a screen on a car equipped with this type of cage. Entry and exit from the car is best done by climbing up on top of the cage which will certainly get you noticed in the local supermarket car park. Track focussed.

A cautionary word about cages:

There are two important facts about cages which are worth bearing in mind; firstly, not all chassis contain all the bushes needed to fit the SLR cage but these can be retro-fitted without damage to the paintwork if needed. Secondly, cages- by their very nature-surround the occupant's head with hard, unforgiving tubes which could be highly dangerous to occupants who are not wearing appropriate head protection even on the road in a relatively small accident. Even if it seems that your head can't touch the tubes when you're strapped into the car, the forces present in an accident could well result in contact being made; roll bar padding alone is not sufficient so it's advisable to use a crash helmet on the road.

Standard bar, standard floor. Note, it appears that the headrest is making helmet clearance worse here.

Trackday bar, standard floor

Trackday bar, lowered floor

Tall Trackday bar, standard floor

Roadsport cage, standard floor (separate side-intrusion bar also fitted)

Tall Roadsport cage, standard floor (separate side-intrusion bar also fitted)

SLR cage, standard floor

SLR cage, lowered floor