

Technical Report

Upgrade of FV1200 to FV1600

At the present time CAMS have deemed that all Formula Vees changing from 1200 to 1600 engines will be treated as new vehicles and as such must meet all the safety structure requirements detailed in section 9.4.1 of the Formula Vee Technical Manual (CAMS bulletin B03/045 with revisions).

The rationale is that the requirements of this section represent the appropriate level of driver protection for an open wheel car of this performance potential, in the light of current knowledge and expectations for driver safety. The fact that a vehicle may have previously been log booked as a 1200 is, in CAMS eyes, not relevant as the car is now a 1600 engined car.

If you upgrade your car you will have to apply to your State Association to be inspected for a Formula Vee Compliance Certificate, arrange with your CAMS State Office for the car to be given a pre-event inspection by a CAMS scrutineer and then apply to CAMS to be issued with a new logbook.

Whether it be a new car or upgraded car there are 4 areas you must address:

1) Main Rollover Protection (Roll bar)

This must be a Solo Roll Bar complying with CAMS schedule J for rollover protection, i.e.:

The main roll hoop must be 38mm dia. x 2.5 mm thick or 40mm dia. X 2mm thick Cold Drawn Welded or Cold Drawn Seamless Steel Tube.

Bends shall have a minimum radius of 3 times tube diameter on the centre line.

There must be a single rearward facing brace of the same specification as the main hoop. The brace shall be straight and attached to the main hoop by welding or one of the approved connections shown in Schedule J. If a line is taken from the top of the roll hoop to the front roll structure (generally taken as being at the dashboard) then the driver's helmet must be 50mm below this line.

If your roll bar meets this exact specification you need take no further action. If your roll bar does not meet this exact specification it will have to be modified or alternatively you may be able to apply to CAMS for a Rollover Protection Certificate (now known as an Integral Safety Cage Certificate). For details see further on.

2) Chassis Side Impact Protection

In the area of the chassis bounded by the firewall / roll bar support, the top and bottom chassis rails and the front roll structure:

The maximum area enclosed by any set of adjoining chassis members shall not exceed 0.1 sq.m (e.g. 400mmx250mm).

All chassis members shall be 25x25x1.6 steel tube or sections of equivalent strength (e.g. 32x1.6 round, I will publish a list on the website. If a brace section does not meet the minimum requirements it may still be used but it does not count in the maximum opening calculation).

The minimum height of the top rail shall not be less than 500mm above the lower edge of the bottom rail at the firewall.

There must be adequate cross bracing of the floor area (steel tubes as above, not just the floor pan)

3) Side Intrusion Panels

Aluminium sheet 2mm thick, alloy 5052-H32, 6061T6 or alloy of equivalent strength or;

Two layers of Bi-directional Kevlar 250gm cloth bonded with epoxy or vinyl ester resin.

These shall be attached around their perimeter to the chassis using 4.8mm steel rivets at 150mm maximum and not less than 50mm centers.

Alternatively a Kevlar panel such as above may be bonded to form part of the bodywork.

4) Front Rollover Structure

The specification on this is that it should be of “adequate” strength and must be integrated into the main chassis structure or have suitable bracing.

Normally taken as being at the front of the cockpit or just forward of this.

Integral Safety Cage Certificate

This is a new form of certification for roll bars that don't meet the requirements as described in section (1) and is aimed at being more applicable to space-framed cars, such as Formula Vees. It was introduced by CAMS on 1st March 2005.

Certification requires either proof testing of the rollover structure or an engineering analysis by an FIA accredited Engineer or Organisation. Needless to say, both of these methods are complicated and expensive and are not a practical alternative for most competitors.

Explanatory notes and application forms are available off the CAMS website.

Recent Developments

CAMS has for sometime acknowledged that Schedule J is aimed at Rollover Structures post-fitted to unitary construction production cars and is not ideally applicable to purpose built racing cars.

The CAMS position is that rollover protection specifications for this type of vehicle would be more appropriately be included as part of the vehicle specifications and accordingly Formula Vee has been invited to submit a proposal for such a specification, which if submitted in time, could be included in the 2006 Formula Vee Technical Regulations.

I have initiated steps to have a specification drafted by two of our members who have appropriate engineering qualifications.

This will enable us to formulate a specification allowing greater flexibility as regards configurations of rollover structures and can be tailored to specific Formula Vee requirements.

Please bear in mind that regardless of this, the specification will have to be based on current strength requirements and will be unlikely to legitimise most pre 2000 rollover structures.

For any queries on the above please contact your State Technical Director.

Paul Corcoran