

Technical Regulations for all AWDC Trials.

AWDC Technical Regulations for Prototype Class - Last Update 19/03/25

Revision Notes: Clarification of 4WS in Prototype.

MS UK Section	MS UK Regulation ID	Regulation
Scrutineering		
J	3.1	Before taking part in any competition, or practice for any competition, all vehicles must be presented to the event Scrutineers for examination and approval. The fact of obtaining a Scrutineer's approval at pre-event scrutiny does not indicate that the Scrutineer is accepting any responsibility for the safety or the roadworthiness of the vehicle, nor does it indicate that the vehicle complies in all respects with the Regulations. Please note that pre-event scrutineering or logbook inspection by a scrutineer is only a spot check of a limited number of key safety and eligibility features of a vehicle's condition. Alone it will not guarantee that the vehicle meets all applicable regulations or standards.
J	3.1.1	
Chassis & Body		
J	5.2.1	5.2.1. Be fitted with bodywork including a driver (and passenger) compartment isolated from the engine, fluid filled batteries, gearbox, hydraulic reservoirs pressurised above atmospheric pressure, transmission shafts, chains, belts and gears, brakes, road wheels, suspension components including their operating linkages and attachments, petrol/fuel tanks, oil tanks, water header tanks, catch tanks and fuel system components (other than where such components comply with 5.13.1 and 5.13.2) such as to prevent there being a hazard.
J	5.2.1	Front engine vehicles to be fitted with a bonnet covering the engine and all its' major components.
J	5.2.1	Exposed transmission shafts, gears and chains to be guarded such as to prevent their being a hazard.
J	5.2.1	Where a radiator is not isolated from the driver/passenger compartment a suitable deflector to be fitted to prevent fluid directly coming into contact with the vehicle's occupants.
J	5.2.2	Cars must have a protective bulkhead of non-flammable material between the engine and the driver/passenger compartment capable of preventing the passage of fluid or flame. Gaps must be sealed with suitable flame proof material that completely closes any gap at all times.
J	5.2.2	Magnesium is prohibited for bulkheads.
J	5.2.3	Have a complete floor of adequate strength rigidly supported within the driver/passenger compartment.
J	5.2.4	Not have the space normally occupied by passengers encroached upon in such a way that may impede extrication of the driver from that side, but may have the passenger seats removed.
J	5.2.6	Cars must have mudguards which present no sharp edges and cover the complete wheel (flange+rim+tyre) around an arc of 120 degrees. This minimum coverage must:
J	5.2.6	a) be achieved with a continuous surface of rigid material within which ventilation louvres may be fitted. The tyre must not be visible when viewed from above. When viewed from the rear, the tyre must not be visible above any point 50mm or more above the axle centre line
J	5.2.6	b) extend forward ahead of the axle line
J	5.2.6	c) extend downward behind the wheel.
J	5.19.1	All vehicles must comply with Safety Regulations as itemised under their Specific Technical Regulations and as detailed under the section headed Competitor Safety (Section K).
J	5.19.2	The vehicle occupant(s), seated in their normal position, wearing normal equipment, with seat belts fastened and the steering wheel in place, must be able to evacuate the cockpit in a maximum of 7 seconds. If the vehicle is a single seater, the maximum time to exit the cockpit is 5 seconds.
J	5.20.1	Be of sound construction and mechanical condition and be well maintained.
J	5.20.2	Have positive fastenings for all doors and all hinged or detachable parts of the bodywork.
J	5.20.3	Have no temporary parts incorporated in their construction.
J	5.20.12	Not carry or pass any liquids in or through any tubes comprising part of the chassis structure, or safety roll-over bar.
P	56.1	The vehicle must have a minimum wheelbase of 127cm (50in).
P	56.2	56.2. Unless rear-engined, vehicles must have a bonnet or metal casing of solid flame retardant material covering or surrounding the engine, which is secured by fasteners of adequate strength and with a positive locking action.
P	56.2.1	56.2.1. Windscreens must be erected unless the event takes place wholly on private property or the SRs state otherwise.

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P	56.2.2	56.2.2. Tailgates may be removed.
P	56.2.3	56.2.3. Be equipped with mudguards for all wheels which present no sharp edges and cover the complete wheel (flange+rim+tyre) around an arc of 120 degrees. This minimum coverage must:
P	56.2.3	a) be achieved with a continuous surface of rigid material within which ventilation louvres may be fitted. The tyre must not be visible when viewed from above
P	56.2.3	b) extend forward ahead of the axle line
P	56.2.3	c) extend downward behind the wheel.
P	60.2.2	Vehicles must be fitted with a substantial towing point front and rear, painted in a contrasting colour, unless the SRs state otherwise.

AWDC

Front and rear recovery points should be bolted with suitable grade fasteners and should allow quick connection of a recovery rope. i.e 50mm tow ball/hook.
OR

Front and rear recovery points may be enclosed (a loop) but a stamped, suitably rated D-shackle should be on hand for recovery.

AWDC

Recovery points should be coloured in a colour which is easily visible and contrasts the surrounding bodywork.

AWDC

Each vehicle should be equipped with a nylon rope of a minimum 25mm diameter. This rope must have a closed loop at each end and be of at least 4.5 metres in length. The use of chain or wire bond is prohibited. Polypropylene or hemp ropes are not advisable. N.B. Marshals may use any equipment approved by the Clerk of the Course. The use of a kinetic type rope is prohibited.

AWDC

If the vehicle has windows fitted, a suitable tool for breaking windows in the event of an emergency should be fitted inside the vehicle.

AWDC

Vehicle bodywork is free, but should not present additional hazards.

Seats & Belts

J	2.1	All seat safety belts must be complete units sourced from a recognised manufacturer and fitted in accordance with the manufacturers' instructions, MS UK recommendations or FIA requirements. (See Drawing Nos. 39, 40, 41, 42 and 44.) Where the vehicle manufacturer's standard safety belts and associated fitments are not utilised, bolts must be of a minimum 7/16in UNF or M12 (grade 8.8).
J	2.2	All seats should be correctly located and securely anchored in such a way as to allow no movement in squab or backrest. When installing a Competition Seat, carry out the following checks before selection or purchase:
J	2.1.10	The anchorage points to the rear should be positioned so that the strap from the shoulder is as near horizontal as possible. It should not be located on the floor directly behind the driver/co-driver.
J	2.1.11	Seat belts once involved in a serious accident should be discarded as they are likely to have stretched. Belts subjected to oil, acid or heat should be replaced.
J	2.1.2	Four point. Two shoulder straps and one lap strap, with four anchorage points on the chassis/body shell or roll over bar of the vehicle, one either side of the driver and two to the rear of the driver's seat.
J	2.1.3	Five point. Two shoulder straps, one lap strap and one strap between the legs with five anchorage points on the chassis/body shell or roll over bar of the vehicle, one either side of the driver, two to the rear of the driver's seat and one between the legs.
J	2.1.4	Six Point. Two shoulder straps, one lap strap and two straps between the legs, with six anchorage points on the chassis/body shell or roll over bar of the vehicle, one either side of the driver, two to the rear of the driver's seat and two between the legs.
J	2.1.8	It is not permitted to mix parts of seat belts. Only complete sets as supplied by manufacturers are to be used.
J	2.1.9	Only one release mechanism is permitted on each seat belt configuration and this must be available for the wearer to operate whilst seated in the competing position.
J	2.2.1	Supports must be attached to the shell/chassis via at least 4 mounting points per seat using bolts with a minimum diameter of 8mm and counterplates, according to drawing No. K32. The minimum area of contact between support, shell/chassis and counterplate is 40 sq cm for each mounting point. In Series Production Cars manufacturers' standard seat mounting points may be used. If quick release systems are used, they must be capable of withstanding vertical and horizontal forces of 18000N, applied nonsimultaneously. If rails for adjusting the seat are used, they must be those originally supplied with the homologated car or with the seat.
J	2.2.2	The seat must be attached to the supports via 4 mounting points, 2 at the front and 2 at the rear of the seat, using bolts with a minimum diameter of 8mm and reinforcements integrated into the seat. Each mounting point must be capable of withstanding a force of 15000N applied in any direction.

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J	2.2.3	The minimum thickness of the supports and counterplates is 3mm for steel and 5mm for light alloy materials. The minimum longitudinal dimension of each support is 6cm.
J	2.2.4	Headrests. On all vehicles where it is not mandatory (13) it is strongly recommended that a head restraint in the form of a headrest be fitted, as near to the driver's/co-driver's helmet as possible, to prevent whiplash of the neck and spine in case of impact. It is recommended that they comply with 13.
K	5.3.1	Have a normal adequate seat for the driver.
K	5.3.2	The seat must be rigidly located within the compartment and must not tilt, hinge or fold unless it is a production seat fitted with a serviceable locking mechanism preventing independent operation.
K	5.3.3	It must support and retain the driver within the vehicle.
K	5.3.4	The seat cushion (i.e. the part on which the occupant sits) when uncompressed, must not be less than 15.25cm below the top edge of the adjacent body side or door.
K	5.3.5	Any other seats fitted must similarly comply and all seats must face forward.
K	5.3.7	If a single seater, the maximum time for a driver to get in or out of the vehicle must not exceed 5 seconds.
P	56.3.1	The rearmost part of these seats must not be behind the rear wheel axis.
P	56.3.2	In the case of non production cars, the rearmost part of any additional seat must not be more than 38cm behind the rear wheel axis.

AWDC	Vehicles must have a minimum of a 4 point harness.
AWDC	There is no requirement for passenger seats to be fitted.
AWDC	Vehicles must have a suitable harness/seatbelt cutting device fitted inside the car, one for every occupant. It should be mounted somewhere easily reachable with the occupants securely belted in.

Engines

J	5.4.1	If forced induction is used, the coefficient will be 1.7:1. unless stated otherwise in Specific Technical Regulations or SRs.
J	5.4.2	Be equipped with a positive method of throttle closing by means of external spring/springs so that in the event of failure of any part of the throttle linkage the throttle(s) are sprung closed.
J	5.4.3	Vehicles fitted with electronic throttle control as standard original manufacturer's equipment for that vehicle are exempt from this requirement.

Suspension

J	5.5.1	Be fitted with sprung suspension between the wheels and the chassis.
J	5.5.2	Suspension must be controlled to avoid fouling of wheels on chassis or bodywork.
P	56.5	Vehicles must be fitted with sprung suspension between wheels and chassis, unless originally manufactured otherwise.
P	56.5.1	Where the top mounting of the shock absorber, whether or not it is fitted with a coil spring, is mounted directly to a main member of the roll-cage, a brace must be fitted between the mounting point and the chassis or those members of the vehicle frame acting as the chassis.
P	56.5.2	It is prohibited to mount the shock absorber by drilling and/or welding a stud or bolt directly to the roll cage (if a cage is fitted).
P	56.5.3	All mountings must be made with reinforcements in material at least the same thickness as the roll cage wall thickness.
P	56.5.4	The recommended mounting is shown in Appendix 1, drawing number 56.5.

Brakes

J	5.6.1	Be fitted with brakes that are operative and capable of stopping the vehicle as required.
J	5.6.2	Non-ferrous disc brakes are prohibited unless a Standard Part for that vehicle, or specifically authorised by the MS UK for a class or category of car.
J	60.3.2	Independently operated rear brakes are Permitted.

AWDC	Brakes should be capable of locking all 4 wheels when stopped from a moderate speed.
AWDC	A handbrake should be fitted to the vehicle which is mechanically completely separate from the main braking system. It should also have a locking mechanism which can hold it on without assistance.

Steering

J	5.7.1	Have a steering wheel with a continuous rim not incorporating any reflex angles in its basic shape (except for Drag Race vehicles). 'D' shape wheels are permitted.
J	5.7.4	Have steering movement controlled to avoid fouling of wheels on chassis or bodywork.

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K	14.1.3	Steering Wheels. The types least likely to inflict injuries due to breakage should be selected. Uncovered wooden rims should be avoided.
AWDC		All steering controls should be operated by the driver ONLY. This includes independent/fiddle brakes, rear steer, front steer.
AWDC		Full hydraulic steering is allowed.
AWDC		Four Wheel Steering is Allowed.
AWDC		All steering joints and connections should be free of play and well maintained.

Wheels

J	5.8.1	Have not less than four road wheels and tyres (excluding the spare).
P	56.6	Vehicles may not be fitted with duplicated driving wheels unless Permitted by the SRs. The SRs may permit the use of TUV Approved hub adapters/wheel spacers up to a maximum of 30mm in depth.
AWDC		Reversing of standard un altered road wheels is prohibited

Tyres

J	5.9.4	The fitment and/or use of pressure control valves to wheels and/or tyres is not permitted.
AWDC		Any restrictions included in event specific requirements on aggressive tyre treads (open centered, dumper or very aggressive tread patterns) due to site limitations must be adhered to regardless of class.
AWDC		A spare wheel need not be carried.
AWDC		The use of tyre chains and studded tyres by competitors is prohibited.
AWDC		There is no maximum tyre size.

Cooling

J	5.10.1	Have any fluid carrying lines or tubes carrying coolants through the driver/passenger compartment painted red, and if non-metallic to be internally or externally metal braided hydraulic pressure hose.
J	5.10.2	Screwed hose clips (e.g. 'Jubilee Clips') may only be used in conjunction with a suitably swaged pipe.
K	14.1.7	Radiator Caps. These caps should be positioned or shielded in such a way that hot water or steam cannot scald the driver of the vehicle if they become opened or broken in an accident.
AWDC		All open radiators, expansion bottles whether front or rear mounted, must be covered in such a manner that nobody can burn themselves on the hot open/unprotected areas of the radiator. Special attention should be made to protect occupants from hot water from an exploding radiator or expansion bottle.

Transmission & Axles

J	5.11.1	Have the transmission outside the driver/passenger compartment, beneath the floor or secured in casings or coverings of solid material.
J	5.11.2	Be equipped with a reverse gear in normal working order.
K	14.1.8	Clutch and Bell Housing Protection. It is recommended that a shield be placed to guard the clutch/ bellhousing and to protect in case of clutch/flywheel derangement. This can be a 1/8in steel plate or equivalent.
AWDC		Vehicles with automatic transmissions must have a starter inhibiting switch allowing it to start in park and/or neutral only.
AWDC		An unlimited number of traction aids are allowed. These are: - Any form of front locking Diff (locker, LSD, Welded). - Any form of Rear locking Diff (locker, LSD, Welded). - To run rear fiddle brakes. - To run front fiddle brakes.

Oil & Fuel Systems

J	5.12.1	Have any oil lines passing through the driver/passenger compartment protected and, if nonmetallic, to be of internally or externally metal braided hydraulic pressure hose.
J	5.13.1	Have any fuel lines passing through the driver/passenger compartment protected and, if non-metallic, to be internally or externally metal braided hydraulic pressure hose or fuel lines complying with FIA specifications.
J	5.13.2	They may only be joined by screwed sealing joints or vehicle manufacturers approved joint.
J	5.13.3	If fitted with fuel fillers in a closed boot, or under closure, have collector/spill trays incorporated to drain outside the vehicle.
J	5.13.4	Use Pump Fuel (see definition Nomenclature and Definitions) except, subject to prior written authority having been given by the MS UK, where permitted otherwise under event SRs, and Championship Regulations.
J	5.13.5	If using LPG, the entire system must conform with Construction and Use regulations and LPG Industry Technical Association Code of Practice No. 11.

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J	5.13.6	If using non-pump fuel have a 3 inch diameter 'Day-Glo' orange disc affixed immediately adjacent to the Competition Numbers on both sides.
K	14.1.2	Fuel Tanks and Pipes – every effort should be made to isolate fuel tanks and pipes from the driver/passenger compartment. The risk of fuel spillage from accident damage can be reduced by use of bag type tanks or by coating metal tanks with GRP. Tanks should be located so that they are given maximum protection by the structure of the vehicle. Vents should be designed to avoid spillage if the vehicle becomes inverted.
K	14.1.2	Fuel Fillers – these should be designed and located to reduce risk of damage. Filler caps should not be liable to open in the case of an accident. Simple screw caps are effective. The positive locking of the fuel filler caps is recommended. The filler pipe to the tank should be of minimum possible length and not protrude beyond the bodywork (6).
P	59.1.4	For Orienteering Events all vehicles must carry a small spill kit complying with J5.20.13.

Electrical Systems

J	5.14.1	If located in the Driver/Passenger compartment, where a Passenger/Co-Driver is present the battery must be situated behind the base of the Driver's or Passenger/Co-Driver's seat. Any wet batteries in driver/passenger compartment must be enclosed in a securely located leak-proof container.
J	5.14.2	Have batteries duly protected to exclude leakage of acid and to protect terminals from short circuiting and producing sparks.
J	5.14.5	Have the battery earth lead, if not readily distinguishable, identified by a yellow marking.
K	8.1	The circuit breaker, when operated, must isolate all electrical circuits with the exception of those that operate fire extinguishers.
K	8.5	The triggering system location must be identified by a Red Spark on a White-edged Blue triangle (12cm base), and the 'On' and 'Off' positions clearly marked.
K	14.1.1	(a) Batteries – precautions should be taken to reduce the possibility of acid burns from batteries in case of accidents. Batteries should be secured within a non-conductive leak-proof compartment.
K	14.1.1	(b) Electrical System – all wiring should be secured and well protected to reduce the risk of fire from electrical short circuits.

AWDC

Modified vehicles and AVT vehicle must be equipped with a circuit breaker. This must isolate the battery from all electrical circuits and must cut the engine at the same time. The switch location is optional. For modified vehicles the operation must be possible from both inside and outside the vehicle. The circuit breaker control(s) must be identified by a red spark on a white edged blue triangle. If a diesel engine is fitted with an electric stop it must be connected to the circuit breaker. If it is a pull cable stop system a second cable must be fitted next to the isolator switch and marked clearly "pull to stop engine" on a plate 75mm x 50mm white background with red lettering. Recommendation only for RTV class.

Exhausts

J	5.16.1	Have the exhaust system isolated from the driver/passenger compartment (e.g. beneath the floor or secured in casings of solid material).
J	5.16.2	Have no part of the exhaust system protruding to the rear of the bodywork more than 15cm.
AWDC		Vehicles may have front exit exhaust. Hot surfaces must be covered or shielded with suitable material.
AWDC		If all enveloping body is fitted, have supplementary protection for exhaust systems that protrude outside the bodywork.

Silencing

J	5.17.1	The reason for Silencing (SOUND CONTROL) is to reduce environmental impact and to keep Motor Sport running. Environmental Protection legislation has increased the pressure on activities generating noise and Local Authorities have the power to suppress any noise source deemed to be causing a nuisance. Our system of control is acceptable to most Environmental Bodies and must be considered as part of eligibility to Compete in events.
J	5.17.7	Temporary Silencers, by-pass pipes or the inclusion of temporary parts to achieve silencing requirements are prohibited.
J	5.18	Details of sound test available in blue book under J5.18

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AWDC

In all AWDC events, vehicles must conform to a maximum permitted noise level as laid down in the current MS UK 'Blue book'. The current requirement as listed in the 2018 MS UK blue book is a Max of 100dB at 0.5m with the engine at 2/3 maximum revs. Continuous noise testing will take place during events and competitors will be advised of excessive noise. WARNING: Temporary silencers, bypass pipes and the inclusion of temporary parts to achieve silencing requirements are prohibited. Officials may refuse to carry out noise checks on vehicles utilising temporary parts in exhaust systems. Please refer to section E of the current MS UK Yearbook. Measurements to be taken at 4500 rpm max (or two thirds throttle opening if no tachometer fitted or diesel engine) with engine at normal working temperature.

Windscreens and Sidescreens

AWDC

If fitted, to have windscreens of either laminated glass or plastic, of a minimum thickness of 4mm (except STV or where the standard equipment is used). plastic sidescreens, where fitted, should also have a minimum thickness of 4mm unless fitted otherwise by the original manufacturer.

AWDC

The use of mesh or net hinged sidescreens on open vehicles to retain the limbs of driver and passenger in the event of a roll-over is advised. The use of a sun roof with glass is not permitted in Modified vehicles it has to be replaced with a metal panel.

Roll Over Protection System (ROPS)

The basic purpose of the roll over bar is to protect the driver/passenger if the vehicle turns over or is involved in a serious accident. This purpose should not be forgotten, and in consideration of this, it is strongly recommended by AWDC that all roll bars and/or ROPS should be built in accordance with the MS UK specifications detailed in Sections (K) or (P). Following these guidelines will lead to a proven and recognised design suitable for offroad motorsport.

The ROPS must be designed to withstand compression forces resulting from the weight of the vehicle coming down on the roll bar/cage structure, and to take fore and aft loads resulting from the vehicle skidding along the ground on its roll structure.

Within AWDC, full rollcages for standard classes are optional and for all modified classes full roll cages are mandatory .

The minimum requirement for standard classes is a screen or roof frame which extends past the height of driver and passenger and fitted by the manufacturer. It is strongly recommended to fit a central roll hoop with rear bracing bars and central diagonal for any open topped vehicle competing in the standard classes. Details of these are available in the MS UK Blue Book section (K) page 179 as illustration 1.

AWDC

For all modified vehicles, the roof space between the A and the B bars should be covered with a solid panel with a minimum thickness of 2 mm.

The panel must be fitted with screws in at least six points (as a minimum fasteners should be M8, ISO standard 8.8) or welded with a minimum of six welding seams, each with a minimum length of 5 cm. If the roof is attached with screws, it's recommended to use mounting lugs welded to the rollcage. Mounting through the tubes is prohibited. The minimum requirement is one seam/screw in each corner of the roof, one in the middle of the A-bar and one in the middle of the B-bar.

A space of at least five cm between helmet and plate is recommended.

It is highly recommended that all vehicles should be fitted with a roof panel as detailed above. If such a roof panel is not fitted, all of the occupants must use an MS UK approved helmet.

As a minimum, a full 6 point ROPS should be fitted to all modified class vehicles.

AWDC

AWDC strongly recommends that ROPS are designed and built in accordance with the MS UK Blue Book. This not only ensures that all ROPS built will follow a recognised and proven structure, but it is also easier for our scrutineers to check its suitability and safety at an event.

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AWDC

Any structure which doesn't follow the guidelines in the MS UK Blue Book should be built to the same high standards:

- All welding should be of a good standard. A well presented weld doesn't necessarily mean a strong weld, but a poor looking weld is never an indication of good strength.
- All bends should be well formed without kinking or flattening of the tube.
- All materials used should be suitable for use in ROPS.
- The structure should incorporate loops within its design.

Definitions

K	1.1.1	Safety Cage. A structural framework designed to prevent serious bodysell deformation in the case of a collision or a car turning over.
K	1.1.2	Rollbar. Structural frame or hoop and mounting points.
K	1.1.3	Rollcage. Structural framework made up of a main rollbar and a front rollbar (or two lateral rollbars), their connecting members, one diagonal member, backstays and mounting points (see drawings K5 and K6).
K	1.1.4	Main Rollbar. Structure consisting of a near vertical frame or hoop located across the vehicle just behind the front seats.
K	1.1.5	Front Rollbar. Similar to main rollbar but its shape follows the windscreen pillars and top screen edge.
K	1.1.6	Lateral Rollbar. Structure consisting of a near vertical frame or hoop located along the right or left hand side of the vehicle. The rear legs of a lateral rollbar must be just behind the front seats. The front leg must be against the screen pillar and dashboard such that it does not unduly impede entry or exit of driver or co-driver.
K	1.1.7	Longitudinal Member. Longitudinal tube which is not a part of the main, front or lateral rollbar, for example, a backstay.
K	1.1.8	Diagonal Member. Transverse tube between a top corner of the main rollbar or upper end of a backstay and a lower mounting point on the opposite side of the rollbar or backstay.
K	1.1.9	Framework Reinforcement. Reinforcing member fixed to the rollcage to improve its structural efficiency.
K	1.1.10	Reinforcement Plate. Metal plate fixed to the bodysell or chassis structure under a rollbar mounting foot to spread load into the structure.
K	1.1.11	Mounting Foot. Plate welded to a rollbar tube to permit its bolting or welding to the bodysell or chassis structure, usually onto a reinforcement plate.
K	1.1.12	Removable Members. Structural members of a safety cage which are able to be removed.
K	1.1.13	Harness Bar. A transverse tubular member attached across either the main hoop or backstays to accept harness mountings.
K	1.2.1	ROPS must be designed and made so that, when correctly installed, they substantially reduce the risk of injury to the occupants. The essential features of an efficient ROPS are that it is designed to suit the particular vehicle, is of sound construction, has adequate mountings and is a close fit to the bodysell.
K	1.2.2	The ROPS must not unduly impede Driver and Co-Driver access to the vehicle. Members may intrude into the interior space by passing through the dashboard, front side trim, rear side trim, and rear seats which may be folded down. ROPS must not extend beyond the front upper or rear suspension mounting points of the vehicle, with the exception of backstays which may extend beyond the rear suspension mounting points if necessary to achieve the required 30° angle. Any modification to a homologated ROPS (other than fitment of Roof Reinforcement, Windscreen Pillar Reinforcement, Doorbars and Harness Bars) is prohibited. Tubes must not carry any fluids.
K	1.2.3	Compulsory Diagonal Member. Different ways of fitting the compulsory diagonal member (see drawings K5 and K6). The combination of several members is permitted.
K	1.2.4	Optional Reinforcing Members. Each type of reinforcement (see drawings K7 to K12) may be used separately or combined with others.
K		Technical Requirements

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K	1.3.1	Main, Front and Lateral Rollbars. These frames or hoops must be made in one piece without joints. Their construction must be smooth and even, without ripples or cracks. The vertical part of the main rollbar must be as straight as possible and as close as possible to the interior contour of the bodysell. The front leg of the front rollbar or a lateral rollbar must be straight, or if it is not possible, must follow the windscreen pillars and have only one bend unless a windscreen pillar reinforcement [1.3.5(e)] is fitted. The mounting foot must not be rearward of the foremost point of the rollbar. Where the main rollbar forms the rear legs of a lateral rollbar (see drawing K6), the connection to the lateral rollbar must be at roof level. To achieve an efficient mounting to the bodysell, the original interior trim may be modified around the safety cage and its mountings by cutting it away or by distortion. However, this modification does not permit the removal of the complete parts of upholstery or trim. Where necessary, the fusebox may be relocated to enable a rollcage to be fitted. Mounting of ROPS to the Bodysell. Minimum mountings are: · 1 for each leg of the main or lateral rollbar. · 1 for each leg of the front rollbar. · 1 for each backstay (see 1.3.3).
K	1.3.2.	Each mounting foot of the front, main and lateral rollbars must include a reinforcement plate of a material of at least the same thickness as the wall of the tube to which it is being welded (minimum 3mm). Each mounting foot must be attached by at least three bolts, minimum M8 150 grade 8.8, on a steel reinforcement plate at least 3mm thick and of at least 120cm² area which is welded to the bodysell (see drawings K13 to K18). The mounting feet may alternatively be welded direct to the reinforcement plate. This does not apply to backstays (see 1.3.3).
K	1.3.3	Backstays. These are compulsory and must be attached near the roofline and near the top outer bends of the main rollbar on both sides of the car. They must make an angle of at least 30° with the vertical, must run rearwards and be straight and as close as possible to the interior side panels of the bodysell. Their materials specification, diameter and thickness must be as defined in 1.4.1. Forward facing stays are permitted if an angle of 30° cannot be achieved with Backstays, providing they do not unduly impede Driver and Co-Driver access to the vehicle. Their mountings must be reinforced by plates. Each backstay should be secured by bolts having a cumulative section area at least two thirds of that recommended for each rollbar leg mounting in 1.3.2 above, and with identical reinforcement plates of a least 60cm² area (see drawing K19). A single bolt in double shear is permitted, providing it is of adequate section and strength (see drawing K20) and provided that a bush is welded into the backstay. The mounting feet may alternatively be welded direct to the reinforcement plate. Diagonal Members. At least one diagonal member must be fitted. Their location must be in accordance with drawings K5 or K6 and they must be straight. The combination of several diagonal members is permitted. Where two diagonals in the form of a cross are used, at least one of the diagonals must be a single piece tube.
K	1.3.4	The attachment points of the diagonal members must be so located that they cannot cause injuries. They may be made removable but must be in place during events. The lower end of the diagonal must join the main rollbar or backstay not further than 100mm from the mounting foot. The upper end must join the main rollbar not further than 100mm from the junction of the backstay joint, or the backstay not more than 100mm from its junction with the main rollbar. They must comply with the minimum specification set out in 1.4.1. A diagonal member fixed to the bodysell must have reinforcement plates as defined in 1.3.3.
K	1.3.5	Optional Reinforcement of ROPS. The diameter, thickness and material of reinforcements must be as defined in 1.4.1. They must be either welded in position or installed by means of demountable joints. Reinforcement tubes must not be attached to the bodysell.
K	1.3.5	(a) Transverse Reinforcing Members: The fitting of two transverse members as shown in drawing K9 is permitted. The transverse member fixed to the front rollbar must not encroach upon the space reserved for the driver or co-driver. It must be placed as high as possible but its lower edge must not be higher than the top of the dashboard.

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K	1.3.5	(b) Doorbars (for side protection): Longitudinal members must be fitted at each side of the vehicle (see drawings K9 and K12). They may be removable. The side protection must be as high as possible but not higher than one half of the total height of the door aperture measured from its base. Where two members in the form of a cross are used, at least one of the members must be a single piece tube. Where configuration 12(j) is used a reinforcing gusset must connect the tubes along the horizontal length.
		(c) Roof Reinforcement: Reinforcing the upper part of the rollcage by adding members as shown in drawing K10 is permitted.
K	1.3.5	(d) Reinforcement of bends and junctions: The reinforcement of the junction between the main rollbar or the front rollbar and the longitudinal members is permitted as shown in drawing K12 as is the reinforcement of the top rear bends of the lateral rollbars. The ends of these reinforcing tubes must not be more than half way down or along the members to which they are attached.
		(e) Windscreen Pillar Reinforcement: A tube the upper end of which must be less than 100mm from the junction between the front (lateral) rollbar and the longitudinal (transversal) member and the lower end less than 100mm from the front mounting foot of the front (lateral) rollbar, as shown in drawing K62. The tube may be bent on condition that it is straight in side view and that the angle of the bend does not exceed 20°.
K	1.3.6	Protective Padding. Where the driver's or codriver's bodies or crash helmets could come into contact with the ROPS, non-flammable padding should be provided for protection (1.6.6).
K	1.3.7	Removable Members. Should removable members be used in the construction of a ROPS, the demountable joints used must comply with an approved type (see drawings K21 to K30). The screws and bolts must be of adequate diameter and of ISO Standard 8.8 or better. FIA homologated demountable joints are also permitted. Demountable joints must not be used as part of a main, front or lateral rollbar because they act as hinges in the principal structure and allow deformation. Their use is solely for attaching members to the rollbars and for attaching a lateral rollbar to a main rollbar (see drawing K2). In this last case, hinged joints in drawings K21 to K30 must not be used.
		Guidance on Welding. All welding should be of the highest possible quality with full penetration and preferably using a gas shielded arc. Although good external appearance of a weld does not necessarily guarantee its quality, poor looking welds are never a sign of good workmanship. When using heat-treated steel the instructions of the manufacturer must be followed (special electrodes, gas protected welding). It is to be emphasised that the use of heat-treated or medium carbon steels may cause problems and that bad fabrication may result in a decrease in strength (caused by brittle heat-affected zones) or inadequate ductility.
K	1.3.8	Harness Bars. Minimum dimensions 38mm x 2.5mm or 40mm x 2.0mm. Cold Drawn Seamless Carbon Steel with minimum tensile strength of 350N/mm ² . Harness straps may be attached by looping around the tube or by threaded fixings using inserts as drawing No. 44 welded into the tubes(s).
K	1.3.9	1.4.1. Specifications of the tubes used: Minimum Material Cold Drawn Seamless Unalloyed Carbon Steel, containing a maximum of 0.3% of carbon. Note: For an unalloyed carbon steel the maximum content of additives is 1.7% for manganese and 0.6% for other elements.
		Minimum Yield Strength 350 N/mm ² Minimum Dimensions (Ø in mm) a) Mandatory tubular members 45 x 2.5 (1.75" x 0.095") or 50 x 2.0 (2.0" x 0.083"). 38 x 2.5 (1.5" x 0.095") or 40 x 2.0 (1.6" x 0.083") – only for roll cages/bars approved prior to 1.1.95. b) Optional tubular members 38 x 2.5 (1.5" x 0.095") or 40 x 2.0 (1.6" x 0.083").

Cross country regulations also allow the following materials:

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Materials and dimensions must comply with K.1.4.1 or be to EN10255 (BS1387) medium weight, blue band: i.e. 42.30 x 3.2mm for vehicles up to 1000kg and 48.00 x 3.2mm for vehicles exceeding 1000kg. Optional tubular members may be added to K1.4.1. or EN10255 (BS1387) medium weight. 30.00mm x 3.2mm. Materials may not be mixed.

P	57.1	
K	1.4.2	In selecting the steel, attention must be paid to obtaining good elongation properties and adequate weldability.
K	1.4.3	The tubing must be bent by a cold working process and the centreline bend radius must be at least three times the tube diameter. If the tubing is ovalised during bending, the ratio of minor to major diameter must be 0.9 or greater.
		ROPS manufacturers may make application to the MS UK for a Roll Over Protection System (ROPS) Certificate to be issued.
K	1.5.1	Note: ROPS manufacturers wishing to make application for such a certificate should contact the MS UK Technical Department in order to obtain details of the requirements to be met and the fees payable. Subject to these requirements being met a ROPS Certificate will be raised and issued. Duly authorised copies of this certificate containing a drawing, photographs, a copy of the manufacturers declaration that the ROPS meets the required regulations should be available to event Scrutineers.
K	1.5.2	Each ROPS manufactured after 1.1.97 for which the MS UK or the FIA has issued a ROPS (Rollcage) Certificate must bear an identification plate which details the manufacturer and the manufacturer's part number allocated to the cage. Details of this identity plate are to be included on the ROPS (Rollcage) certificate.

Fire Extinguishers

K		<i>Existing vehicles competing prior to 1st January 2019 may comply with the following until 1st January 2022. New build vehicles from 1st January 2019 must comply with Appendix 3.</i>
K		<i>Appendix 3. A fire extinguisher/extinguishing system must be carried on all vehicles, the minimum requirement being that the system be charged with one of the permitted extinguishants and be operable by the driver whilst normally seated either by manual operation or by a mechanically/electrically assisted triggering system.</i>
K		<i>All extinguishers must be serviced in accordance with the manufacturers guidelines, or <u>every 24 months</u>, whichever is sooner, or replaced.</i>
K	3.1	Capacities. Extinguishers are classified as Small, Medium or Large, and designated as Hand-Held or Plumbed-In. Dry powder extinguishers are prohibited.
K	3.1.1	Small, Hand operated.
K	3.1.2	(a) Medium, Plumbed-In, for discharge into both cockpit and engine compartment.
K	3.1.2	(b) Medium, Hand-Operated, for discharge into both cockpit and engine compartment.
K	3.1.3	Large, Plumbed-In, for discharge into both cockpit and engine compartment.
K	3.1.4	Large, Plumbed-In, for discharge into Engine compartment, plus Medium, Hand-Held for Driver or Rally Co-driver use.
K	3.1.5	Hand-operated for cockpit (International).
K	3.1.6	Permitted Extinguishants <u>AFFF, ZERO 2000</u> .
K	3.4	Hand-held extinguishers
K	3.4.1	Must not be carried loose but should be retained in positive quick release brackets, secured to the vehicle by a minimum of two 6mm bolts.
K	3.4.2	Extinguishers with pressure gauges are recommended.
K	3.4.3	The tare weight of the unit must be clearly marked on the cylinder.
K	14.1.4	Fire Extinguishers. Even small extinguishers carried in a vehicle can extinguish or contain fires before they develop seriously. Minimum recommendation is for a 1.75 litre AFFF extinguisher or equivalent with BS4123/EN3 approval (EN3 minimum size is 2 litre AFFF) and a rating of at least 34B. More sophisticated equipment is required in many events and full vehicle systems are highly recommended (see 3).

Fire Extinguishers - Appendix 3 for new build vehicles from 1st January 2019

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K	3.2.1	Where a hand-held fire extinguisher is required the vehicle must be equipped with at least one fire extinguisher in compliance with 3.2.2 to 3.2.7 hereunder or with FIA Standard 8865-2015 (Articles 3.2.2 to 3.2.5 hereunder do not apply in the latter case).
K	3.2.2	Permitted extinguishants: AFFF, Clean Agent, powder or any other extinguishant homologated by the FIA Minimum quantity of extinguishant: • AFFF foam (includes: FireSense, Zero 2000, F-TEC etc) 2.4 litres
K	3.2.3	• Gas (includes: Novec 1230, FX G-TEC/N-TEC, Viro3, Zero 360, Extreme etc) 2.0 kg • Powder 2.0 kg All extinguishers must be pressurised according with the manufacturer's instructions. Powder extinguishers must be pressurised to 8 bars minimum, 13.5 bars maximum. Furthermore, each extinguisher must be equipped with a means of checking the pressure of the contents. The following information must be visible on each extinguisher:
K	3.2.4	• Capacity • Type of extinguishant • Weight or volume of the extinguishant • Date the extinguisher must be checked, which must be no more than two years after either the date of filling or the date of the last check, or corresponding expiry date. All extinguishers must be adequately protected. Their mountings must be able to withstand a deceleration of 25g. Furthermore, only quickrelease metal fastenings (two minimum), with metal straps, are accepted. Antitorpedo tabs are required. It is prohibited to mount bottles outside the main structure.
K	3.2.5	The extinguishers must be easily accessible for the driver and the codriver
K	3.2.6	
K	3.2.7	

AWDC

Fire extinguishers must be carried by all vehicles and must:

- not be older the 2 years from visibly marked tested date.
- be Foam type extinguisher.
- be a minimum of 2.0kg.