2019

MSA DRAG RACING VEHICLE CONSTRUCTION

AND

GENERAL SAFETY REGULATIONS

VEHICLE CONSTRUCTION AND GENERAL SAFETY REGULATIONS

In interpreting these construction and class regulations and specifications the principle of "what is not specifically permitted is disallowed" (GCR 226) shall apply. These construction rules apply to all classes. The class regulation may restrict these rules or permit further modifications. It follows that the class regulations are subject to these regulations unless specifically stated otherwise. They shall be viewed in the narrowest sense and in the interpretation of these regulations; officials shall have regard only to what is stated and not what is implied. Throughout the rules aluminium sheet of 1.6 mm may be utilised to replace metal plate with a thickness of 1 mm, provided the use of aluminium is not specifically excluded. Whenever reference is made to the weight of vehicles it shall include fuel and the competitor after completion of a run.

CR 1 AEROFOIL

A positive locking device to prevent movement is mandatory. No part of the rear foil to be within 150mm of tyres. Spring loaded spoilers, wings or canards prohibited. Adjustment of airfoils, wings or spoilers not permitted during runs. Front overhang for all vehicle spoilers is a maximum of 1016mm. All front overhangs are measured from centerline of front spindle to forward most point on vehicle.

CR 2 ALIGNMENT

Each car, regardless of class, must have sufficient adjustment of front alignment to ensure proper handling of the car at all speeds.

CR 3 ANTI-BLOWBACK DEVICE

This is mandatory for TF/D, TAD, A/D, TF/FC, TA/FC, A/F TF/CA, AA/CA, BB/CA and SA. Brace or device must be installed that will prevent the clutch can or adaptor shield from being blown backwards in the event of a flywheel and/or clutch explosion. Minimum material requirement is OD .083" wall chrome moly tubing with 10mm fasteners. **Ball lock pins prohibited!**

CR 4 ARM RESTRAINTS

Arm restraints are mandatory for all Funny cars and open cockpit vehicles capable of running faster than 11.99 seconds. Restraints must be adjusted so that the driver's arms cannot extend beyond the confines of the roll cage, shoulder hoop, etc.

CR 5 AUTOMATIC TRANSMISSION PROTECTION

5.1 The following vehicles using OEM automatic transmissions must be fitted with an approved scatter blanket or a protective shield:

- 5.1.1 All Dragsters and open cockpit Altereds.
- 5.1.2 All vehicles using transmission brakes.
- 5.1.3 All supercharged vehicles (including nitrous) that run faster than 10.50 seconds over the quarter-mile.
- 5.1.4 All vehicles; regardless of classification, that run faster than 9.99 seconds over the quarter-mile.

5.2 The protective shield must be fabricated from a minimum of 3mm aluminium and must cover the main body of the gearbox, offering 180º of protection (pan rail to pan rail). It must be securely mounted with two steel straps passing under the transmission.

5.3 A 3mm aluminium flex plate shield covering the top 180º measuring 25mm either side of the front and rear of flex plate must be mounted securely to chassis, frame or other suitable member to protect the driver from exploding fragments.

5.4 Alternatively, a 13mm thick piece of conveyer belting may be securely wrapped around the required areas or fastened permanently to the floor pan inside the vehicle.

Note: Where other than original torque converters are used all mounting tabs and spacers must be suitably reinforced. All transmission lines must be high pressure-type hoses.

CR 6 AUTOMATIC TRANSMISSION GEAR SHIFTERS

Any non-OEM automatic floor mounted automatic transmission shifter (i.e. homemade) must be equipped with a spring loaded positive lockout device to prevent the shifter from accidentally being put into reverse gear. A functional neutral safety switch is mandatory.

CR 7 BALLAST

Any material used for the purpose of adding to the vehicle's total mass must be permanently attached as part of the car's structure and must not extend behind the rear of the body or above the height of the rear tyres. Ballast carried in the boot or the trunk will only be permitted if the class allows. No extra fire extinguishers will be allowed as ballast however, all fire extinguishers must be operational as per fire extinguisher regulations. No liquid other than the fuel being used to propel the vehicle is permitted behind the front firewall. A maximum of 100kgs removable mass, if class permits, may be added. Not more than 40kgs may be mounted as one single removable mass by at least two 12mm steel bolts or equally strong straps or clamps and must be purposely made weights. (If more than 40kgs is needed, more than one unit is required).

CR 8 BATTERIES

8.1 All wet cell car batteries must be located outside the driver or passenger compartment and must be securely mounted with metal hold-down straps and 10mm bolts if battery is relocated from stock or other than stock hold-downs are utilized.

8.2 In open cars where acid spillage over the driver can occur in an accident, some form of covering over the battery is required to prevent this situation.

8.3 A maximum of two batteries may be fitted provided their combined weight does not exceed 50kgs. Onus is on the competitor to prove their vehicle's combined battery weight is under the acceptable limit. If two batteries are fitted, it needs to be marked that way at the isolator switch and both batteries need to be in the same compartment.

8.4 Any car with a battery fitted, running quicker than 9.99 seconds and any single purpose Drag Racing vehicle must incorporate a battery isolation switch capable of shutting of current flow and be operable from the exterior of the vehicle.

8.5 It is also recommended that sedan vehicles with trunk-mounted batteries have a trunk key permanently fitted to the lock. A cut-off switch must be connected to the positive side of the electrical system. The "ON" and "OFF" positions must be clearly indicated with the words "**ON** and **OFF**".

CR 9 BATTERY LOCATION MARKERS

A three-inch equilateral triangle, colored blue, is required on all vehicles fitted with a wet cell battery or batteries to accurately indicate the battery location. Should the colour of the marker not contrast sufficiently with the vehicle body colour, an additional white border, 2cm wide is required. If a vehicle incorporates at" Battery Cut-Out" switch, the location marker may be placed around the switch to indicate the position. Where more than one battery is fitted in different locations, a marker is required to indicate the position of both batteries.

CR 10 BRAKES

Brakes must be in good working order with two wheel hydraulic brakes (rear wheels only) as a minimum requirement for vehicles under 910kg. Four-wheel hydraulic brakes are required where noted under class requirements. Lightening of backing plates, brake drums and/or brake shoes by cutting or trimming metal are not permitted. Cooling holes must be drilled in such a manner that they do not weaken the unit, and must carry cooling scoops. The drilling of cooling holes in cast iron disc rotors is prohibited. If a hand brake is fitted, the brake handle must be inside of the body confines or driver's compartment. Front wheel drive vehicles may use rear brakes as staging brakes provided the vehicle is fitted with a parachute as a back-up stopping device. Brake lines must be attached to chassis as per OEM style: No Tie-straps and must be routed inside the frame or body and be enclosed in a 45cm length of 3mm wall thickness steel tubing and securely mounted where the brake lines pass the flywheel/bell housing area. All brake lines on any rear-engine car must be routed inside of the approved steel tubing or be of braided steel construction where they pass the flywheel/bell housing area. A supplementary or back-up brake system is compulsory on all cars. All pedals must be covered with a non-slip material.

CR11 BURNOUTS

No person is permitted to hold or touch vehicles during burnouts (including motorcycles). Motorcycles are not permitted to do "U" turns after burnouts.

CR12 CLUTCH

All cars, except those fitted with a torque converter, must have a foot-operated clutch. All pedals must be covered with a non-slip material.

CR13 COOLING SYSTEM

If a cooling system is utilized, it must be installed in the stock location for the body style used. Front engined Dragsters must have the system installed in front of the engine. In the event of a rear-engined Dragster with a radiator mounted in front of the motor, a deflector must be installed from frame rail to frame rail and to the top of the roll cage. No anti-freeze may be used in drag classes such as all vehicles running in Top Eliminator, all Altereds and Modifieds.

CR14 DEFLECTOR PLATE

All rear-engined vehicles must have a deflector plate to protect the driver from the engine. Plates must extend from top blower pulley to bottom pulley and be at least 25mm wider than each pulley for supercharged cars, whilst others must have plate covering from shoulder height to bottom of chassis. Minimum attachment for any plate is four 10mm high tensile bolts.

CR15 DELAY BOXES

Any electrical, pneumatic, mechanical or other device attached to existing components that intentionally creates a delay between the driver releasing the clutch, transbrake, etc., and the forward movement of the vehicle will be considered a delay device and is prohibited.

CR16 DRIVELINES

16.1 On any car where the driver sits over or behind the engine, a suitable protective shield of 3mm minimum thickness steel plate must be installed over these units with universal joints securely mounted to the rear and centre section and the gearbox tail housing. Couplings are highly recommended in place of U-joints wherever possible. For those units with straight couplings, the minimum requirement is 2mm thickness aluminium which must contain an inspection cover for the removal and inspection of the coupling and must be securely mounted or as noted in the Class Requirements.

16.2 In place of a cross member in the immediate vicinity of the front universal joint, all competition cars using open drive shafts must have a 360° retainer loop of 6mm thickness and 50mm width securely mounted and located within 150mm of the front and rear universal joints to support the drive shaft in the event of a U-joint failure. Open drivelines passing any part of the driver's body must be completely enclosed in a 3mm thickness steel plate securely mounted to the frame or frame structure. All cars using open Hotchkiss-type drivelines must have radius arms, traction bars, or some suitable pinion support to prevent rear end housing rotation. It is highly recommended that a torque tube be used to enclose all drivelines.

CR17 DRIVELINE ANTI-ROTATION DEVICE

An anti-rotation device is required in any vehicle where the driver sits over or behind the rear-end (differential).

CR18 DRIVER'S COMPARTMENT

All interior panels (firewalls, floors, wheel tubs, doors, etc.) within the driver's compartment of enclosed-cockpit vehicles where the driver is located behind the engine must be constructed of materials other than magnesium and/or non-flammable materials.

CR19 ENGINE

With the exception of exhibition vehicles, all engines used in the Drag Racing must be of automotive type origin. Crankshaft centre lines may not exceed 600mm from the ground in any class.

CR20 ESCAPE HATCH (FUNNY CARS)

A working escape hatch must be installed in the roof of all Funny Car bodies that have enclosed side windows to permit easy driver exit. See through types are prohibited. Minimum size is 500mm x 500mm. Roof hatch must be permanently attached and hinged at the front and must have a release mechanism operable from both inside and outside the car.

CR21 EXHAUST

21.1 Each car, regardless of class, must be equipped with exhaust pipes to direct the exhaust gasses out of the car body to the rear or side of the car away from the driver, fuel tank and strip surface. Individual exhaust stacks must incorporate a metal connecting strap to prevent loss of one or more stacks during competition. If an exhaust exits through the bonnet, it MUST be angled / re-directed away from the driver's side of the compartment / windscreen.

21.2 All Turbo charged vehicles with an open exhaust system must have a steel cross welded into the tailpiece of the exhaust system to contain any turbo debris in case of a turbo failure.

CR22 FIRE EXTINGUISHERS AND FIRE BLANKETS

22.1 An on-board fire extinguisher system is mandatory under certain class requirements. When required, a minimum 1kg capacity extinguisher securely mounted (no tie-straps) and within easy reaches of the driver when he/she is wearing a safety harness.

22.2 If the extinguisher is not fitted with a gauge, it must have an empty/full stamp and a recent inspection/service label. It is the responsibility of the competitor to weigh the extinguisher prior to each event.

22.3 Funny cars – All cars must be fitted with a manually controlled pull-type only, on-board fire extinguisher system with the primary nozzle(s) directed to protect the driver. Bottles and lines must be permanently mounted, i.e. no hose clamps or cable ties.

22.4 In the case of more than one bottle, each bottle must have its own steel distribution tubing and nozzles. Nozzle placement is extremely important. Two nozzles are placed at the front of the engine directed into the compartment on either bank of the exhaust headers whilst another nozzle or nozzles should be positioned into the drivers' compartment using an atomizing unit placed at the drivers' feet or near the steering column.

22.5 Upon activation of the system, the contents of the bottle(s) must be totally discharged. Partial discharge systems are not permitted. The bottles must be mounted in such a manner that should an explosion or failure of any mechanical component of the vehicle occur, the bottles will be protected from flying parts as well as being high enough to not come into contact with the track surface, following a loss of tyres or wheels.

22.6 Bottles should be protected from excessive temperature and remote cables must be metallic without plastic coatings that will melt and jam the mechanism in cases of fire.

22.7 "Fire Windows" measuring no greater than 60 square centimeters on either side of the firewall in the vicinity of the valve covers to warn driver of fire are mandatory. Best results are obtained from laminated safety glass or fire resistant plastics like Lexan or Plex 70.

CR23 FIRE BLANKET

Blankets may be fireproofed by immersing in a solution of 240 grams of Boric Acid dissolved in 5 liters of water. Hand-wring and hang to dry. Repeat after each wash. It is recommended that each entrant have a treated fire blanket on hand in the pit area.

CR24 FIREWALLS

Each car must be equipped with a flame proof and fuel proof firewall extending from the body sides and from the top of the engine compartment upper seal, i.e. hood, cowl or deck, to the bottom of the floor and/or belly pan. The firewall must be constructed to provide a leak proof bulkhead between the engine and driver's compartment. All holes or openings must be sealed with metal or a fireproof material.

CR25 FLASH SHIELDS

Injector tubes may extend through individual holes in the hood/bonnet, but carburettors must not be openly exposed or uncovered. In place of a hood/bonnet, carburettors must be equipped with a metal flash shield or velocity stack that prevents fuel from being siphoned into the air stream or blown into the driver's face.

CR26 FLOORS

All cars without floors must be equipped with floor pans made of steel or aluminum that must extend the full length and width of the driver compartment to the rear of the driver's seat. Cars equipped with floors or belly pans made of fiberglass or other breakable material must have metal sub floors. In all cars with OEM fiberglass floors, a cross member (minimum 2 inches x 2 inches, .083-inch wall-thickness square tubing) must be installed between frame rails for proper driver's seat, seat belt, shoulder harness and crotch strap installation. Belly pans and sub floors enclosing engine or driver compartment must contain suitable drain holes so that liquids and foreign matter cannot collect, thus creating a fire hazard. Minimum .032-inch aluminium or .024-inch steel. In certain instances, a panel made of composite material may be substituted for steel or aluminium. Use of magnesium prohibited.

CR27 FLYWHEELS

All vehicles in competition with the exception of sedan vehicles known not to be capable of quarter-mile performances better than 11.99 seconds are required to be fitted with either a steel or alloy flywheel or an acceptable scatter shield as outlined in the following regulation. No excessively machined unit of cast iron or any other material will be accepted. Vehicles revving over 6000 rpm may not make use of any cast flywheels and/or cast iron inertia rings attached to the flywheels. Inertia rings / weights MUST be made out of Steel.

CR28 FLYWHEEL SHIELDS (Vehicles quicker than 11.99 seconds)

28.1 All rear-wheel drive manual gearshift vehicles capable of running 11.99 seconds or faster, must be equipped with a suitable shield made of 6mm minimum steel plate securely mounted to the frame or frame structure and completely surrounding the bell housing (full 360°) to protect frame, driver and bystanders from fragments in case of clutch/flywheel disintegration.

28.2 Alternatively, a 13mm thick piece of conveyer belting may be securely wrapped around the required area or fastened permanently to the floor pan inside the vehicle. Any vehicle utilising an aluminium bell housing, regardless of performance, must at minimum adhere to the conveyer belting regulation.

28.3 Shields must not be attached to the bell housing in any way. The flywheel shield must be constructed in such a manner that it covers the top, sides and rear of the enclosed bell housing completely, shielding the transmission bell and mounting flange to stop fragments entering the driver's compartment.

28.4 The 6mm steel plate must at minimum extend forward to a point 25mm ahead of the flywheel and also another 25mm past the rear of the clutch and pressure plate.

28.5 An engine support strap either in the form of a 3mm steel motor plate, 6mm T6 aluminium motor plate or aircraft quality cable (chain is unacceptable) must support the rear of the engine in case of clutch of flywheel disintegration. This requirement is mandatory on all vehicles using a manual gearbox from Street Modified upwards unless it is evident that the headers, frame rails, etc., will prevent the engine from dropping to the surface of the track.

28.6 Vehicles using a conventional clutch/pressure plate/flywheel to drive an automatic gearbox must comply with the aforementioned flywheel shield rule.

28.7 A totally enclosed 360° one-piece bell housing/adaptor fabricated from 6mm steel plate and securely mounted using all available engine/transmission mounting points is acceptable in lieu of conventional shields and is recognised as a better alternative to the above method of concealing a clutch/flywheel explosion.

28.8 Flywheel shields are highly recommended on all vehicles including streetcars revving higher than 5000 RPM.

28.9 All Front Wheel drive or transverse mounted applications using a clutch and running a 11.99 or quicker must be equipped with a flywheel shield made of 6mm thickness steel plate. This shield must surround the bell-housing completely except for area of bell-housing adjacent to the differential axle shaft. This shield may be multi-piece, with pieces bolted together using minimum 10mm or 3/8"8.8 grade high tensile bolts and must be attached to engine and bell-housing.

CR29 FLYWHEEL SHIELDS

Vehicles fitting classifications TF/D, TAD, A/D, TF/FC, TA/FC, A/F, TF/CA, AA/CA, BB/CA and Super Altered. The use of a shield constructed to the following specifications is mandatory in all clutch-equipped vehicles running in the above classes over the 1/4 mile.

29.1 All existing bolt holes must be utilized to secure the flywheel shield.

29.2 Vent holes must be contained below the crankshaft centre line and limited to a maximum 10cm.

29.3 A clutch inspection and maintenance hole may be cut on the back face of the housing. The hole may not be longer than an area covering 90° of the housing rear surface area.

29.4 No part of the rotating clutch assembly may extend past the forward edge of the inspection hole on housings with a radiused back.

29.5 A cover for the inspection-hole must be at least 6mm thick and be fastened with at least six 10mm high tensile bolts.

29.6 The abovementioned inspection-hole cover must incorporate a 6mm fillet welded precisely to fill the hole so it is flush in the inside of the housing.

29.7 Starter motor pocket if utilised, must be of the same material and thickness as the bell housing.

29.8 Scalloping of bell housing flange is accepted if at least 6mm of material is maintained between the radius and edge of the flange.

29.9 Motor plate must be of 6mm aluminium T6 plate or 3mm steel for full coverage style with a minimum hole for crank flange to pass through.

29.10 A crower glide clutch-adjustment slot (one only) is accepted if made precisely to the specifications as outlined in the illustration using a 6mm steel cover.

CR30 FRAME/CHASSIS

All butt-welds must have visible reinforcement. Flush grinding of welds is not permitted. The use of materials other than steel is permitted providing it can be proven the material and welding thereof is stronger than its equivalent in steel. Refer also to roll cage regulations.

CR31 FUEL

31.1 Service station pump petrol, aviation fuel, racing fuel, ethanol and methanol as sold to the general public through normal retail outlets is permitted. Off the shelf Sasol Racing blends are permitted according to class requirements.

31.2 Approved International Fuels

(a) VP Racing Fuels:
U4.4, C-10 (Unleaded), 110, C-11, C-12, C-14+, C15, C-16, Q-16, NOS, C19, C21, C23, C25, U2, U4, MR1, MR9, MR10, MR12, MS109, Motorsport 103, Motorsport 105L, VP Import and Street Blaze 100 are permitted.

(b) Philips/Trick:
B25, B32, B33, B37

(c) Sunoco:
Standard, Supreme, Maximal, Supreme NOS

(d) Torco:
Mach 104, 110, 112, 114, 116, 116NOS, 118, 118NOS

(e) 76:
Competition 100 (Unleaded), Competition 110, Super Stock 114, Pro Stock 118, Pro Stock+.

WARNING: The current method to increase octane in both leaded and unleaded petrol is to increase the amount of aromatic hydrocarbons such as benzene, toluene, xylene and associated compounds. The higher the concentration of certain aromatic hydrocarbons, the higher the octane rating. These compounds cause cancer. The higher the concentration in petrol, the higher the risk of leukaemia (blood cancer) and other cancers.

The use of Hydrazine or any other chemicals (other than nitro and alcohol blends) designed to alter volatility or chemical composition of the permitted fuel, is totally banned. Use or possession of such material at the Drag strip carries severe penalties.

31.3 The use of Nitromethane will only be permitted in "Exhibition" or "Top Fuel" classified vehicles.

31.4 The use of Methanol / Ethanol or "E85" fuel will be permitted in the Top Eliminator, Senior Eliminator, Super Competition Eliminator, Competition Eliminator and Street Modified Classes.

31.5 Any vehicle that uses methanol / Ethanol, as fuel must indicate its use by displaying an orange circle of 100mm diameter with an M / E inside the circle.

Drivers are advised to study the safety requirements set out under CR 31.2 read with CR55.4 and CR 55.5.

Note: Refer to special MSA circular on approved fuels.

CR32 FUEL SYSTEMS AND FUEL TANKS

32.1 Wherever permitted in class regulations, fuel tanks and fuel lines should be located ahead of the engine. Fuel blocks, if used, must be mounted at least 150mm forward of the flywheel/bell housing area.

32.2 Fuel lines in the flywheel/bell housing area must be enclosed in a 3mm wall thickness; 450mm length of steel tubing securely mounted or alternatively re-routed outside the chassis or frame rails as a protection against fuel lines being severed in a clutch/flywheel explosion.

32.3 In the event of a fuel line passing the supercharger drive areas, a compulsory steel tube protection is required if braided steel line with suitable aircraft qualify fittings is not utilised.

32.4 Fuel tanks located in front of the vehicle's grille and outside the protected areas of the body, frame and wheels, must be protected against collision damage by some means of encasement, (i.e. steel bump bars).

32.5 All supercharged and/or fuel injected vehicles as well as vehicles using an altered fuel system (other than electric pumps), must have a quick action positive fuel shut-off valve of control within each

reach of the driver and must be located in the main line between the fuel tank and carburettor(s) or injection unit.

32.6 It is mandatory that fuel pumps be located away from the flywheel area wherever possible.

32.7 Under no circumstances are any fuel tanks, lines, fuel pressure gauges or other units containing fuel permitted in the driver's compartment. All tanks must be completely isolated from the driver's compartment by a firewall completely sealed so as to prevent any fuel from entering. All vehicles where a fuel line passes the driver must be fitted with metal lines except for a maximum of 30cm of approved flexible fuel hose to allow for connection purposes only. Recognised steel braided flexible lines may be used in lieu of solid metal lines.

32.8 Top of fuel tank must be below top of vehicle's rear tyres. All fuel tanks must have a positive locking fuel cap and be vented to the outside of the body or have a built-in check valve.

32.9 When allowed by class requirements, all fuel cells must have a metal box protecting the part of the cell that would be outside bodylines or trunk floor. All fuel cells must have a pressure cap and be vented to the outside of the body, or have a built–in check valve.

32.10 Where the fuel tank is located in front of the driver and engine in the rear (rear-engined Dragsters) fuel lines must be isolated from the driver's compartment with a sub-floor or by use of steel braided liens. The adding of fuel while an engine is running is strictly prohibited and is grounds for exclusion.

32.11 Industry approved push lock hose and fittings where applicable without the use of hose clamps permitted.

CR33 GOGGLES

Windproof, shatterproof goggles or visors must be worn by all drivers of vehicles not having windscreens. Fire resistant goggles and/or facemask material are mandatory for supercharged or nitro-burning vehicles.

CR34 HARMONIC BALANCERS

34.1 All sedan or bakkie type vehicles running quicker than 11.99 seconds and all Dragsters, Funny Cars and vehicles where the engine is NOT enclosed must be fitted with either an explosion-proof harmonic balancer or an harmonic balancer scatter shield.

34.2 The harmonic balancer scatter shield must be constructed of 6mm thick steel plate securely fastened with at least two 10mm high tensile bolts in such a manner as to contain or deflect fragments should the balancer disintegrate. The width and circumference of the outer ring must be covered and the front of the shield should extend down at least to the level of the rubber ring in order to retain fragments or to prevent the outer ring from coming forward. A 10mm diameter hole may be drilled in the shield for timing mark purposes. No other openings are allowed.

34.3 Vehicles using a steel outer ring do not require a shield but the outer ring must have some positive means of preventing it from moving forward. This can be achieved by having a step on the back of the ring or a front retaining plate equal to the other diameter of the ring made from minimum 3m steel plate or 6mm alloy plate.

34.4 All pulleys/crank hubs/harmonic balancers must be positively fixed to the crankshaft by bolts or pins.

CR35 HEAD PROTECTION

In any car where a roll bar or roll cage is installed, a padded head protector must be provided at the back of the driver's head and constructed to prevent whiplash upon impact. The roll bar or cage must be padded wherever it touches the driver's helmet or other body contact area. A seat, which incorporates a correctly adjusted headrest to within 100mm of the back of the helmet, is acceptable.

CR36 HELMETS

36.1 All drivers/riders in all classes must wear a properly affixed SABS approved, or its equivalent, safety helmet while in practice or competition on the Drag strip.

36.2 Open-faced helmets are permitted in closed cars provided it can be established that a face masks or respirator is necessary such as in FC vehicles and methanol burning sedans. However, full-face helmets with built-in respirators are the accepted norm for this purpose.

Note: Helmets are inspected as an essential part of the vehicle's safety equipment. Helmet straps should be worn beneath the chin. Chin guards or other devices that prevent the proper location of helmet straps are prohibited. The helmet of any competitor involved in an accident, collision or upset must be surrendered to the SANDRA or MSA Steward at the event for inspection.

CR37 HYDRAZINE

No Hydrazine is allowed in any class under any circumstances.

CR38 IGNITION SYSTEMS

38.1 Except for fuel injected vehicles with a mechanical fuel shut-off, all vehicles must have a positive action on/off switch in good working order within easy reach of the driver and clearly marked "ON/OFF".

38.2 Each car in competition must have a positive-action on/off switch, capable of de-energizing the entire ignition system, in good working order, located within easy reach of the driver. "Momentary contact" switch prohibited. Magneto "kill button"-type switches are prohibited. All ignition systems and/or components wiring harnesses and attachments must utilize those supplied by the ignition system manufacturer. The wiring harness must be used in an unaltered manner consistent with the manufacturer's installation and instruction books.

CR39 INTERCOOLERS

There is no restriction on intercoolers but no external cooling by any liquids that may leak onto the track may be used on the pre-race line-up area or on the track.

CR40 INSPECTION

Each vehicle, regardless of class, must complete and satisfactorily pass the inspection of the Technical Inspectors before being allowed a trial run or to participate in any Drag Racing event. All nuts, bolts and component parts on each vehicle's suspension system, chassis and running gear must be secured with lock nuts, lock washers, cotter pins or safety locking wire and must have at least one full thread showing through the nut.

CR41 JACK AND JACKSTANDS (TRESTLES)

No work may be done under any vehicle in the pit area while it is supported by only one jack. Additional safety devices such as jack stands are required to ensure safety in the event of jack failure.

41.1 Engines may not be started while driving wheels are off the ground and not supported by adequate jack stands.

41.2 Failure to observe these jack stand rules are grounds of instant exclusion.

CR42 LATCHES

Where a body is of the "flip-top" type, the latch must be located in the centre of the front face of the body. All vehicles with left-off doors must have safety pins or locks fitted to the hinges.

CR43 LAUNCH CONTROL/TWO-STEP/TRANSBRAKE

Driving wheels must be off the ground and on trestles with the driver inside the vehicle.

CR44 LIFTING DEVICES

Any form of mechanical, hydraulic or other leverage-type device for raising a vehicle's driving wheels and tyres off the strip surface in the starting area is prohibited.

CR45 LIQUID OVERFLOW/CATCH TANKS

All machines with any type of liquid capable of dumping or spilling on the track surface, must have a "catch can" to recover the excess liquids. Minimum capacity for all vehicles is one litre. Overflow may be routed into headers on cars, which are supercharged or burn nitro or methanol.

CR46 MAGNAFLUX CERTIFICATES

As protection against parts failure, each vehicle owner should voluntarily obtain a Magnaflux inspection certificate for altered or welded parts. Magnaflux certificates may be required by the scrutineer on any modified or welded parts.

CR47 NITROUS OXIDE SYSTEMS

46.1 Nitrous oxide bottles must be securely mounted in the boot or rear of the vehicle. Any such vehicle using a nitrous oxide system is required to have a leak-proof bulkhead between the boot of the vehicle and the driver's compartment.

46.2 Where no boot space exists in a vehicle (i.e. hatchbacks), the nitrous oxide bottle can be securely mounted (no hose clamps or cable ties) with steel brackets in the passenger's compartment.

46.3 All nitrous oxide systems not isolated from the driver by a leak-proof bulkhead must be equipped with a relief valve and be directly vented to the outside of the driver's compartment utilising a flexible fuel line to disperse gas leakage into the atmosphere.

46.4 Where nitrous lines pass the converter or flywheel area, they must be encased in 3mm thickness steel tubing for 450mm or alternatively be re-routed outside the chassis or frame rails. All flexible nitrous lines must have a high pressure rating of 1500psi as minimum.

46.5 The use of any agents other than nitrous oxide as part of, or mixed with this pressurised fuel system is strictly prohibited.

46.6 Bottle shut-off valves must be equipped with an on/off tap. Any bottles requiring a special key are not permitted. Only cylinders designed for the use and storage of nitrous oxide and that are equipped with a safety pressure valve are acceptable.

46.7 All bottles must be securely mounted, stamped with minimum DOT-1800 pound rating and identified as Nitrous Oxide. Nitrous Oxide bottle(s) located in the driver compartment must be equipped with a relief valve and vented outside of compartment. System must be commercially available and installed per manufacturers recommendations.

46.8 External heating of bottle(s) with open flame is prohibited.

CR48 NIGHT LIGHTING

All vehicles racing at night is recommended to be fitted with an operative red taillight or reflective tape. (Refer to class regulations.)

CR49 NUTS AND BOLTS

The use of ultra-high tensile Allen and star head bolts of the type commonly referred to as "unbrako" in areas where lateral impact may be experienced is not permitted.

CR50 OCCUPANTS

No more than one person is permitted in any vehicle during its participating in qualifying and/or competition run-offs. Any time a vehicle is started, whether in the pits, staging lanes or anywhere else on the Racing facility, a competent driver must be in the driver's seat.

CR51 OIL CONTAINMENT DEVICE (ENGINE)

Engine diaper or catch-pan device to capture oil and debris in event of engine failure is highly recommended or mandatory for vehicles doing 10.999 seconds or quicker when / as class require. (Refer to class regulations). If catch-pan device is used, the catch-pan must employ a lip of adequate height on all sides and must be curved inward, so as to contain oil.

CR52 OIL SYSTEM

Accu-sump, dry sump, oil filters, oil supply lines etc., are prohibited in the driver's compartment. Only an oil pressure gauge and line is permitted in the driver's compartment.

CR53 PARACHUTES

All parachutes to be manufactured by a recognized DRAG RACING EQUIPMENT MANUFACTURER and must be suitable sized and suitable mounted as per the manufacturer's instructions.

53.1 (a) STOPPING DISTANCE EXCEEDING 600 METRES

- Any car capable of exceeding 300km/h and with four wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 280km/h and with two wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 250km/h (and slower than 300km/h) and with four wheel brakes, a minimum of ONE parachute mandatory. (Two parachutes recommended).
- Any car capable of exceeding 230km/h (and slower than 280km/h) and with rear wheel brakes only, a minimum of ONE parachute mandatory. (Two parachutes recommended).

53.1 (b) STOPPING DISTANCE LESS THAN 600 METRES (AND OVER 500 METRES)

- Any car capable of exceeding 280km/h and with four wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 260km/h and with two wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 230km/h (and slower than 280km/h) and with four wheel brakes, a minimum of ONE parachute mandatory. (Two parachutes recommended).
- Any car capable of exceeding 220km/h (and slower than 260km/h) and with rear wheel brakes only, a minimum of ONE parachute mandatory. (Two parachutes recommended).

53.1 (c) STOPPING DISTANCE LESS THAN 500 METRES

- Any car capable of exceeding 260km/h and with four wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 240km/h and with two wheel brakes, TWO parachutes mandatory.
- Any car capable of exceeding 230km/h (and slower than 260km/h) and with four wheel brakes, a minimum of ONE parachute mandatory. (Two parachutes recommended).
- Any car capable of exceeding 220km/h (and slower than 240km/h) and with rear wheel brakes only, a minimum of ONE parachute mandatory. (Two parachutes recommended).

53.2 Technical inspectors should observe the proper operation of the chute/s and also inspect the same for worn or ragged pilot or drogue chutes.

53.3 The parachute release cable should be mounted solidly to a frame tube or other suitable member, no further back than 25mm from the 'D' ring or release lever.

53.4 Drag chutes must have their own independent mounting brackets and must not be mounted to the same bracket as the safety harness.

53.5 If a safety release pin or hook is used, a clear indicator tag or flag must be attached to this item.

CR54 PARACHUTE RELEASE/RIP CORD

If the ripcord or release cable is attached to the frame or body and passes by the flywheel/clutch area, it must be enclosed in a protective steel pipe as explained in the section on BRAKES. (Article 10).

CR55 PARACHUTE USE

In all instances the 'chute' must be seen to be deployed by the end of the speed traps where considered necessary by stewards. Failure to deploy a 'chute' under competition conditions (where considered necessary by stewards) will be seen/treated as 'faulty' vehicle preparation and renders the driver liable to reprimand, or if failure continues, suspension. The onus is on the driver to ensure the 'chute/s' is packed and maintained correctly. The Safety Officer or MSA Steward may at his discretion ask for the parachute to be deployed during any run to satisfy himself that all parachutes are working correctly.

CR56 PINION SUPPORT

All vehicles using an open driveline must have radius arms, traction bars or some suitable pinion support to prevent rear-end housing rotation.

CR57 PROPYLENE OXIDE

The use of Propylene Oxide is prohibited in all classes/categories.

CR58 PROTECTIVE CLOTHING

58.1 All vehicles capable of running quicker than 10.99 seconds on the quarter-mile together with vehicles which have fabricated or modified firewalls and/or floor (which includes wheel wells) require the driver to wear Nomex or wool one/two piece driving suits as a minimum, plus non-flammable shoes and stocks.

58.2 Vehicles running slower than 10.99 seconds, which have not been modified either in the firewall or floor areas require the driver to wear at minimum, a long sleeved upper garment, long trousers, shoes and socks. The wearing of short pants and/or short sleeve shirts is prohibited and drivers are urged to wear a full overall that has been treated in the same manner as a fire blanket. (See FIRE extinguishers AND FIRE BLANKETS).

58.3 In both the above instances, drivers should note that "takkies" or any footwear capable of burning or melting are not permitted to be worn by any competitor while racing. No Nylon clothing is permitted under any circumstances.

58.4 Drivers of vehicles using Methanol as a fuel and/or capable of times faster than 9.99 seconds and speeds faster than 230 kph plus all mechanically-supercharged vehicles are required to wear a minimum two layer fire resistant one piece overall or two piece driving suit (pants and jacket). Nomex or wool socks and underwear, fire resistant boots, gloves and facemask are all mandatory. Onus of proof of compliance is on the entrant.

58.5 Drivers of vehicles using Ethanol as a fuel and/or capable of times faster than 9.99 seconds and speeds faster than 230 kph are required to wear a minimum two layer fire resistant one piece overall or two piece driving suit (pants and jacket). Nomex or wool socks and underwear, fire resistant boots, gloves and facemask are all mandatory. Onus of proof of compliance is on the entrant.

58.6 Safety Apparel & Equipment (Clothing)

Such fire retardant clothing must be in a good condition and should ideally carry an FIA stamp of approval or one of the identification labels as listed below:-

Race Suits:

As from 2008 all local **race suit** manufacturers will include a permanent visible identification label on the back collar, to indicate compliance with the following approved fire retardant fabrics and finishes:-

NOMEX	KERMAL
DIAMOND	TER
PYROVATEX	CARMYTH
AFLAMMIT	KARVIN
PROBAN	DELTA C

It's highly recommended that 100% Nomex sewing thread or a similar flame retardant thread is used in the manufacture of the garment for all stitching and box quilting.

LEVEL 1: Single layer one (1) piece race suit

LEVEL 2: Double layer one (1) piece race suit

LEVEL 3: Double layer one (1) piece race suit of which at least one (1) layer is comprised of Nomex / Diamond fabric

CR59 PUSH BARS

Tow or push starts not permitted. Each vehicle in competition should be equipped with a suitable bumper-height pushing attachment to facilitate emergency pushing. Push bars should be designed to prevent push car from riding up onto rear wheels of Dragster.

CR60 REAR-END

(WELDED SPIDER-GEARS IN REAR-ENDS ARE PROHIBITED IN ALL CLASSES.)

CR61 ROLL BAR/CAGE GENERAL REGULATIONS

The following regulations apply to all roll bars and roll cage specification requirements:

61.1 Steel tube shall be round in section and electrical resistance welded with full to penetration. Arc welding and in particular, TIG Heliarc welding preferred.

61.2 Welding must be free of slag and porosity whilst the process of flattening bars to necessitate joint welding is prohibited. All pipes must be notched to provide an acceptable joint where two bars meet.

61.3 No sleeving of roll bar/cage structure is permitted under any circumstances. All bending of pipes must be done with an approved process (e.g. Mandrel). Flush grinding of welds is prohibited.

61.4 All vehicles must have a 3mm sight hole drilled in relevant areas of the roll bar/cage structure to allow scrutineers to check wall thickness of tubing.

61.5 On enclosed vehicles (e.g. Sedans, Bakkies, Coupes, etc.) which are constructed in such a way that the body could separate from the chassis/roll cage in an accident, steel mesh or net of a maximum 75mm mesh is required to be fitted into the roll cage structure above the driver's head.

61.6 Threaded pipe or fittings, lap welded pipe, magnesium or aluminium pipe or tubing is not permitted.

61.7 On any vehicle where the standard flooring or any part of the standard structure has been removed, the roll cage must incorporate a rocker or sill bar to tie the front and rear of the cage together.

61.8 Any vehicle where standard flooring or any part of the standard structure has been removed or lightened (i.e. gutted), regardless of performance, must have a roll bar as a minimum requirement.

61.9 No material such as aluminium or copper will be allowed.

CR62 "ROLL BAR" STRUCTURAL REQUIREMENTS – ALL ENCLOSED VEHICLES

62.1 All enclosed vehicles (i.e. Sedans, Bakkies, Coupes, etc.) capable of running **faster than 12.00 seconds and slower than 10.50**seconds are required to fit a minimum three-point roll bar structure. All open vehicles, i.e. convertibles, sports cars, roadsters and the like, must have roll bar protection regardless of performance.

62.2 All roll bars must be a minimum of 42mm x 3mm wall thickness, mild steel, and be within 150mm of the rear of the driver's helmet. The main hoop must extend at least 75mm in height above the driver's helmet whilst in the normal driving position, and be at least as wide as the driver's shoulders. **Roll bars can be bolted together by minimum of a 10mm (GRADE 8.8) bolts with flanged supports plates.**

62.3 The roll bar must be adequately supported to prevent forward or lateral collapse in case of a spin out, collision or upset. Braces must be of the same diameter and wall thickness as the roll bar and intersect at a point not more than 100mm from the top of the main hoop.

62.4 Roll bar mounting points must be securely fastened to frame or frame rails either by **10mm (8.8 grade) bolts and flanged supports** or approved welding methods or by using a minimum 150mm x 150mm x 3mm steel plate on top and bottom of the floor securely bolted together with at least four 10mm or 3/8"8.8 grade high tensile bolts and nuts to sandwich the floor.

62.5 If the car has no frame structure, the roll bar must be fitted using a minimum 150mm x 150mm x 3mm steel plate as a foot to which each bar is welded then another steel plate of the same dimensions must be bolted under the body with at least 109mm nuts and bolts to sandwich the floor as an adequate anchorage.

62.6 No pop rivets or fastening bolts will be allowed for any structural support/fitting of roll bars unless it is FIA approved or OEM fitted.

CR63 "ROLL CAGE" STRUCTURAL REQUIREMENTS – ALL ENCLOSED VEHICLES

63.1 All enclosed vehicles (i.e. Sedans, Bakkies, Coupes, etc.) capable of running **quicker than 10.50** seconds are required to be fitted with a roll cage designed to protect from any angle (360°) and mounted at a minimum six points to the following minimum specifications:

63.2 Main roll cage hoops – 38mm x 3mm wall thickness, mild steel, or alternatively 1 ½" x 083" chrome moly.

63.3 Side/cross bars – 32mm x 2.6mm wall thickness, mild steel, or alternatively 1 ¼" x .065" chrome moly.

63.4 Roll cage mounting points must be securely fastened to frame or frame rails by approved welding methods, i.e. arc or preferably TIG Heliarc).

63.5 If the car has no frame structure the roll cage must be fitted using a minimum 150mm x 150mm x 3mm steel plate as a foot to which each bar is welded then another steel plate of the same dimensions must be bolted under the body using at least four 10mm nuts and bolts to sandwich the floor as an adequate anchorage.

CR64 "ROLL CAGE" STRUCTURAL REQUIREMENTS – DRAGSTERS, FUNNY CARS, ETC.

64.1 For all Dragster, Funny car and open-wheel, space frame type vehicles, specifically designed for Drag Racing, regardless of performance, the following minimum specifications will apply to the driver's compartment.

64.2 **Roll Cage:** Vehicles weighing under 370kg may use minimum 34mm x 3mm wall thickness, mild steel or 1⅜ x .083" chrome moly. All vehicles over 370kg must use a minimum 38mm x 3mm wall thickness mild steel or alternatively 1¼ x .065" chrome moly for cage tubing. Cage must be attached to shoulder hoop at six points for Funny Cars or open wheelers and five points for Dragsters. Front of driver's helmet must be a minimum of 75mm behind the front roll cage hoop.

64.3 **Shoulder Hoop, Top and Bottom Frame Rails, Uprights and Cross-members:** A minimum 32mm x 3mm wall thickness, mild steel or alternatively 1¼" x .065" chrome moly.

64.4 **Diagonals:** A minimum of 19mm x 3mm wall thickness mild steel or alternatively ¾ x .058" chrome moly.

CR65 SAFETY BELTS AND HARNESSES

65.1 All vehicles regardless of performance or age must be fitted with a minimum lap/sash, three-point quick release driver's seat belt in good operating condition and complying with the South African road ordinance requirements for safety belts.

65.2 Enclosed vehicles, vehicles (i.e. Sedans, Bakkies, Coupes, etc.) capable of running quicker than 11.99 seconds in any bracket or class are required to have a minimum four-point safety belt/harness in good operating condition fitted for driver protection.

65.3 All vehicles capable of running quicker than 11.00 seconds including heavily modified street cars and/or all space frame vehicles specifically designed for Drag Racing, i.e. Dragsters, Funny Cars, Altereds, etc., are required to have a centre locking, five point "inverted V" type racing harness as described below.

65.4 In all circumstances, belts must be in good condition and securely fastened to the frame or a suitably reinforced mounting so that all fittings are in a direct line with the direction of pull.

65.5 If the belt mounting point requires reinforcement, a minimum 75mm x 75mm x 6mm plate must be used to adequately anchor the harness at each mounting point.

65.6 Under no circumstances are bolts to be inserted through belt webbing. In any vehicle requiring a roll bar as minimum structural protection, inertia reel belt/harness assemblies are not permitted.

65.7 All harnesses must be installed in such a manner that they will limit the travel of the driver's body, both upward and forward. Shoulder straps mounted behind the driver must be above a theoretical line of 40° down from horizontal, but not above the horizontal.

65.8 Protective plates are mandatory where belts wrap around any frame area exposed to potential abrasion, especially in an accident or in the event of wheel loss.

65.9 Belts to be worn and securely fastened at all times while the vehicle is driven and propelled by its own engine.

65.10 DEVICE SPECIFICS

(a) APPROVED SPECIFICATION

Only those harnesses which comply with one of the following standards will be approved by MSA for use in the specified categories:

i 1. FIA
ii 2. SFI
iii 3. FMVSS

In all instances the relevant international standard / approval will be clearly indicated on the harness by means of an integral label.

FIA LABEL

The main label identifies the harness belt system and carries all information required by the FIA, i.e. Manufacturer, Last year of use and FIA homologation number. The label is sewn onto the harness belt portion permanently fixed to the buckle.

Content of the FIA homologation number:

- "B" = harness restraint with 4 straps in contact with the body.
- "C" = harness restraint with 5 straps in contact with the body.
- "D" = harness restraint with 6 straps in contact with the body.
- Homologation number issued by the FIA, e.g. 136.
- "T" = for rotary buckle version (Turn)
- "P" = for push button buckle version (Push)

Digits representing the year of issue in respect to the standard the harness belt is homologated under. In terms of the above international standards only those harnesses with a minimum of 3" (approx. 75mm) shoulder straps with 2" (approx. 50mm) or 3" (approx. 75mm) waist straps are approved. In terms of the approved international standards safety harnesses with 3/4/5/6 mounting points are permitted, although it is recommended that an anti-submarine (crutch) strap be utilized. The only exception to the above specification is the combination 2" / 3" shoulder straps fitted to those FIA approved safety harnesses specifically intended for use in conjunction with the HANS head restraint system, in which case the relevant FIA label will clearly state "FOR HANS USE ONLY". It should be noted that approval of this particular harness is only valid should the product be used in conjunction with the HANS head restraint system which must be produced at scrutineering. The addition of shoulder pads is strongly recommended where the use thereof is practical within the specific application.

(b) NON COMPLIANCE

The approval of safety harnesses that comply with the above international standards will be considered to have expired in the event of the following:

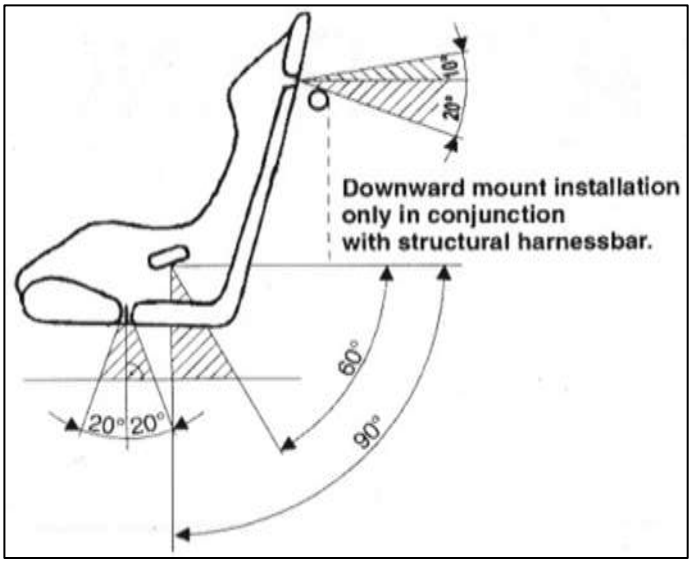
1. FIA approval - Date of expiry as indicated on label
2. SFI approval - Date of manufacture as indicated on label + 5 years
3. FMVSS approval - Date of manufacture as indicated on label + 5 years.

The approval of safety harnesses that comply with the above international standards will no longer be approved in the event of the following: Excessive wear (fraying) exceeding a total of 3mm on any of the shoulder and waist straps. It is apparent that the safety harness has been modified from its original form or repaired in some manner. The individual safety harness components (shoulder straps / waist straps) are different colours. Anti-submarine (crutch straps) are however exempt from this requirement. The date of expiry or manufacture as per the label that appears on each of the safety harness components differs.

(c) INSTALLATION

When installing a safety harness the manufacture installation instructions should be followed carefully so as to ensure that the performance of the product is optimised. All fittings, nuts, bolts, etc. used during the installation process must be suitable for the purpose of safety harness installation so as to allow the harness to perform as intended. Annexure J, Article 253-42 of the FIA regulations clearly specifies the correct installation procedure.

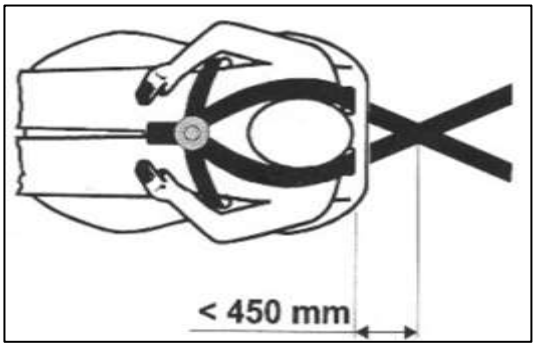
- Figure 1 shows the strap angles required for proper safety harness installation. In order to ensure correct anchorage and performance in the event of an incident it is important that these angles be met. Use of an improper anchorage or routing of any strap will reduce safety harness performance and increase the risk of serious injury or Death.



Never run the shoulder straps downwards from the backrest slots without a strap support bar which can withstand the load applied to it during a crash. The seat backrest is not designed to accommodate this load and may collapse in the event of an accident, thereby greatly increasing forward movement of the occupant which can cause serious injury or death.

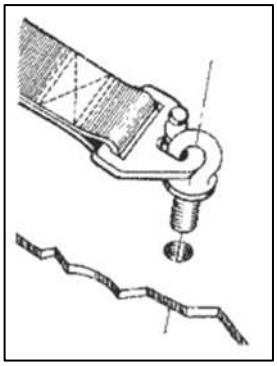
An anti-submarine (crutch) strap routed towards the rear may cause serious injury during a crash as it is not designed to be a body restraint and is only intended to keep the lap belt in place during a crash so as to reduce the risk of "submarining". Similarly the anti-submarine strap should never be run over the front line of the seat as such an installation will eliminate its intended function.

In those instances where the shoulder straps anchorage points are located more than 450mm from the rear of the backrest, it is important that the shoulder straps cross each other at the same level as that which the shoulder straps pass through the seat. Improperly installed shoulder straps may slip the shoulders during a crash and thereby increase the risk of severe head and neck injury or even death.



i. Eye-Bolt Installation (number)

The minimum length of an eye-bolt used in the installation of a safety harness should be 25mm, ideally used in conjunction with a spring washer to secure the bolt from loosening. Always make sure that the eye-bolt is positioned in the direction the belt will pull in a head on collision. Eye-bolts should be tightened to a minimum torque of 40Nm using a reliable torque wrench.



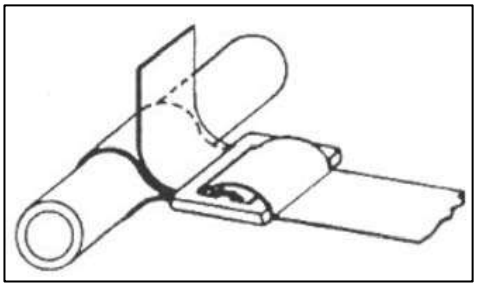
It is recommended that the anchorage points of the vehicle manufacturer be utilised wherever possible in respect to mounting of the safety harness. Any drilled anchor point must be properly reinforced to accept the load which will be applied thereto during a crash.

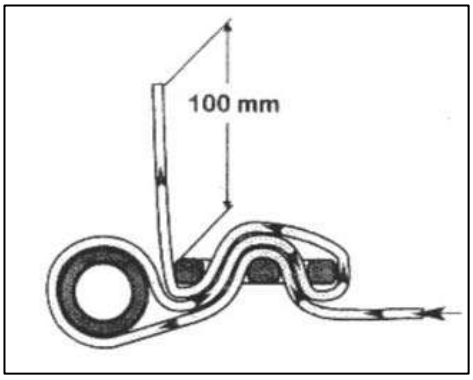
ii. Wrap-around Installation

Strap attachment to a weak roll cage can cause the bar to fail and result in serious injury or death. It is recommended that the roll cage manufacturer be contacted to ascertain crossbar strength and the ability thereof to withstand loads from the shoulder straps in the event of an accident.

Incorrect attachment of the strap to the adjuster can cause the belt to pull out of the adjuster in the event of an accident. Always follow the manufacturer installation instructions regarding the correct manner in which to run the strap through an adjuster when making use of a wrap-around installation.

The adjuster must be positioned as close as possible to the roll cage and the shoulder straps should be threaded through the adjuster with the protruding strap at least 100mm long.





(d) NECK RESTRAINT

Neck brace compulsory for vehicles running quicker than 9.99 seconds. Highly recommended for vehicles running slower than 10.00 seconds.

CR66 SAFETY HUBS

66.1 All vehicles in competition, other than genuine streetcars with original engines, must be equipped with a satisfactory means of axle retention. A minimum of 3mm thick steel plate reinforcement for standard bearing retainers is required.

66.2 Whenever possible, approved aftermarket axles or internal safety hubs should be utilised in lieu of standard items.

66.3 In place of internal type safety hubs, a minimum of four hooks per driving wheel must be attached to the backing plate with a minimum of two 6mm high tensile bolts per hook.

66.4 Each hook must be made of 6mm minimum thickness steel plate at least 25mm width firmly mounted to retain the drum, hub and wheel in the event of axle failure. The attention of competitors is drawn to the possibility of handling hazards in the event of an axle shaft breaking while the vehicle is fitted with a locked rear-end.

CR67 SEATING

67.1 The driver's seat in any vehicle in competition must be so constructed, braced and mounted in such a way that it will give full back and shoulder protection to the driver in the event of a vehicle upset, spinout or collision.

67.2 The driver's seat must be supported on the bottom and back by a frame or cross member.

67.3 Plastic kitchen-type and magnesium seats are not permitted, however, properly braced, framed, supported and constructed seats of aluminium or fibreglass (accessory seats) are acceptable.

67.4 Rear seat may be removed if an approved roll cage is present in certain classes.

CR68 SHOCK ABSORBERS

Each car in competition must be equipped with one operative shock absorber for each sprung wheel. Shocks must be either hydraulic or friction type, securely mounted and in good working order. (See class requirements).

CR69 STARTERS

All vehicles must be self-starting, other than those competing in Top Eliminator Cars or Bikes.

CR70 STEERING

70.1 Each vehicle's steering system will be inspected to determine its condition and must be considered safe by the scrutineer. Steering wheel "play" must be at a minimum. Drag link and tie rods must be secured and keyed. All altered or modified steering systems will be closely checked for insecure welds and faulty parts.

70.2 All rod ends must be a minimum 10mm shank diameter and must be installed with flat washers to prevent bearing pull out. Hollow rod ends are prohibited. All tubes into which rod ends are inserted must be drilled for thread engagement inspection.

70.3 The use of female Heimi joints is not permitted except in the installation of rack and pinion steering where a Heimi joint is used to replace the original ball joint and no welding is involved. Any vehicle with rack and pinion steering and a beam or tube axle must have the steering mounted on the axle and incorporate a universal-joint steering shaft. The length of shaft forward of the joint must be equal to and travel through the same arc as the radius rods locating the axle.

70.4 All steering boxes, sectors and shafts must be mounted to the frame or suitable cross member and cannot be mounted in any case to the bell housing and/or bell housing adaptor shield.

70.5 On long wheelbase vehicles, a secondary steering shaft stop must be installed to prevent the long steering shaft from injuring the driver in case of frontal impact. A collar or U-joint pinned at cross member or bracket, etc. is acceptable.

CR71 STEERING WHEELS

71.1 A full steering wheel is required with a minimum of 300mm diameter.

71.2 Dragsters, Funny Cars and open-wheel, space frame vehicles designed specifically for Drag Racing may use a twin grip steering wheel having a minimum inside width of 180mm across the grips.

71.3 Commercially available quick-disconnect steering wheels are permitted.

CR72 SUPERCHARGERS

72.1 All vehicles equipped with belt driven superchargers must have a guard fitted to prevent fuel line damage in the event of belt loss. This is not required where steel braided hose is used in conjunction with aircraft quality connections or where lines themselves are shielded.

72.2 All superchargers used in competition must be correctly set up for high performance use incorporating heavy-duty components applicable to Drag Racing requirements.

72.3 Types:

72.3.1 Roots-type:

Maximum size permitted 14-71; 482.6mm maximum rotor case length; 285.75mm maximum case width; 6.35mm minimum case thickness; 6.35mm minimum front plate thickness. 300 minimum rear plate thickness. Maximum rotor cavity diameter is 148.34mm. Rotor helix angle may not exceed that of a standard 71-series GM-type rotor (4° per 25.4mm). Maximum overdrive may not exceed 70%.

72.3.2 Roots-type High Helix:

Must adhere to the same maximum case dimensions and maximum rotor cavity diameter as standard Roots. Rotor helix angle may not exceed 6.5° per 25.4mm, (123.5° total over 482.60mm maximum rotor length). Maximum overdrive may not exceed 70%.

72.3.3 **Screw-Type:**

Must meet SF1 Spec 34.1. Maximum case length 406.40mm, maximum case width 406.40mm, minimum case and front plate thickness 6.35mm, minimum rear plate thickness 7.62mm. Manifold pressure release mechanism (in addition to burst panel in supercharger) plus supercharger restraint system is mandatory. Under no circumstances may a screw supercharger overdrive exceed the following overdrive limits:

ENGINE DISPLACEMENT	MAXIMUM OVERDRIVE	
	WHIPPLE	PSI
8194 CUBIC CENTIMETRES OR LARGER	1.60	2.25
7375 - 8193 CUBIC CENTIMETRES	1.52	2.15
LESS THAN 7375 CUBIC CENTIMETRES	1.44	2.04

72.3.4 Variable multi-speed supercharger devices are prohibited regardless of the supercharger type.

72.3.5 Aluminium studs (supercharger to manifold) are mandatory on all superchargers.

72.3.6 Supercharger restraint systems are mandatory.

CR73 SUPERCHARGER RESTRAINTS

73.1 All belt-driven supercharger devices must have as a minimum, a supercharger restraint system in conjunction with aluminium shear bolts (strip studs) at all mounting points as mandatory to prevent the supercharger from being blown free of the engine.

73.2 All vehicles competing in Top Fuel, Top Fuel Funny Car or Top Fuel Competition Altered must be fitted with a ballistic supercharger protection device meeting SF1 specification 14.2.

CR74 SUSPENSION

74.1 All vehicles must have a full suspension of the type produced by automobile manufacturers, i.e. springs, torsion bars, etc.).

74.2 Rigid-mount front/rear axles are permitted when so indicated by class requirements. Where more than one pair of radius rods are used to locate a front axle, rods must be of the same length.

74.3 Traction bars or other devices used to transmit rear-axle torque to the frame, thus preventing violent rear-spring "wind-up" under acceleration or deceleration, are considered safety equipment and are therefore accepted where class permits. Traction devices, if used, may not be longer in overall length than one-half of the wheelbase of the vehicle on which they are installed. No portion of any traction device may extend lower than the level of the lower edge of the rear rim.

74.4 All rod ends (steel minimum) incorporated into either a "ladder bar" or "four link" suspension system must have a minimum 19mm shank diameter (chrome moly 16mm). Rod ends must thread a distance at least equal to 1.5 times the diameter of the shank into the bars they are inserted. Each bar must be drilled to allow for thread engagement inspection and either a strap or some other means of prevention must be attached at the front of both the "ladder bar" and/or "four link" system to stop them coming into contact with the track if the rod ends fail.

CR75 THREAD ENGAGEMENT INSPECTION HOLE

All bars which incorporate the use of rod ends must have a 3mm inspection hole drilled a minimum of 1.5 times the rod-end shank diameter along the bar to allow scrutineers to check for adequate thread engagement.

CR76 THROTTLE LINKAGE

Regardless of class, each vehicle must have a foot throttle incorporating a positive-acting return spring attached directly to the carburettor throttle arm. A positive stop or over-ride prevention must be used to keep linkage from passing over centre and sticking in an open position. In addition to return springs, some means of manually returning the throttle to a closed position by use of the foot must be installed on all vehicles using any other than standard or altered linkage system. All vehicles fitted with superchargers/blowers must have some means of returning the throttle to a closed position by use of the foot. Choke cables and brazed or welded fittings on steel cable are not allowed.

CR77 TOWING RING/HOOK

It is recommended that all cars have some kind of towing ring or hook affixed to the front of the vehicle so as to help reduce the time required to clear the track should a vehicle failure occur.

CR78 TOW VEHICLE

Any vehicle used as a tow car must have the competition number displayed prominently on the windscreen. Crewmembers must be inside the cab or completely inside the bed of the truck. Nobody is to be seated on the tailgate, standing on running boards or otherwise. They are all to be seated completely inside the vehicle.

CR79 TRACTION CONTROL

Under review.

CR80 TRANSMISSION

80.1 All vehicles in competition must be equipped with reverse gear.

80.2 Air shifter bottles must be stamped with Dot-1800 pound rating (minimum) and be securely mounted, i.e. no tie-wraps or hose clamps.

CR81 TYRES

81.1 Tyres will be visually checked for condition, pressure, etc. and must be considered safe by the scrutineer prior to any runs by the vehicle. Implement tyres are prohibited and all street tyres must have a minimum of 1mm tread depth over 100% of the tread area at the completion of the day's racing.

81.2 All street tyres must be Dot approved with grooves made by the tyre manufacturer.

81.3 All vehicles capable of exceeding 260kph are required to have front tyres specifically built for Drag Racing use, i.e. Goodyear or Mickey Thompson Front Runners etc.)

81.4 Any make or type of road tyre, racing tyre or drag slick (see class requirements) is permitted on vehicles slower than 260kph provided the speed rating of the tyre is adequate for that particular vehicle's performance.

81.5 Under no circumstances will re-threaded tyres be allowed on any vehicle.

81.6 Either steel or good condition rubber valve stem caps are required on all wheels and tyres.

81.7 Tyre pressure should be as per manufacturer's recommended pressure guidelines.

81.8 Dot approved tyres with no grooves will be classified as slicks.

CR82 VENT TUBES/BREATHERS

Mandatory on all Top Eliminator vehicles and accepted in all other classes. Where used, the tubes must terminate into an acceptable, permanently attached catch-tank with a capacity of four litres per engine. The catch-tank must be able to keep over-flow off the track and a sight glass or tube is recommended to verify that tank is empty prior to each run.

CR83 WEIGHT

83.1 All weights are applicable after a vehicle has completed a run and must include driver.

83.2 All Drag Racing venues (when and where applicable) must have available for the duration of a race meeting, a suitable weighing facility in accordance with the requirements of the Drag Racing Commission.

83.2.1 Current certification and/or assizing certificate(s) must be present with the promoters.

83.2.2 Suitable test weigh/s must be available.

83.2.3 The scale/s present on the day **shall at the discretion of the Clerk of Course be deemed correct**.

83.2.4 The weighing and measuring devices used by the event officials shall be the standards that will determine a vehicle's compliance with the rules.

83.2.5 It is the onus of the competitor to ensure that his/her vehicle is weighed by officials if/when applicable to ensure their vehicle complies with the correct weights as laid out in the MSA Drag Racing Handbook for the current year e.g.:

- After every record breaking run,
- To class a vehicle when necessary prior to the start of the days racing and,
- Prior to first round of eliminations if a competitor has dialed on the record.

83.3 MINIMUM WEIGHTS

83.3.1 SEDAN CARS (RE: ALTEREDS, PRO-STREET, STREET CARS, ETC.)

a. INTERNAL COMBUSTION ENGINES (excluding Rotaries)

i. Up to 2600cc Engine Capacity

FRONT WHEEL DRIVE

- Normally Aspirated	-	730kg
- One Power Adder	-	820kg
- Two Power Adders	-	910kg

REAR WHEEL DRIVE

- Normally Aspirated	-	840kg
- One Power Adder	-	870kg
- Two Power Adders	-	960kg

ii. Over 2600cc Engine Capacity

All vehicles - 1000kg

b. ROTARY ENGINES

- Normally Aspirated	-	840kg
- One Power Adder	-	950kg
- Two Power Adders	-	1000kg

83.3.2 FUNNY CARS

- C/FC - 800 kg
- B/FC - 800 kg

- A/FC - from 8271cc up to 10130cc – 900 kg
  - from 10131cc up to 13600cc – 1000 kg
- C/TFC - 800 kg
- B/TFC - 900 kg
- A/TFC - 1000 kg
- TA/FC - 818 kg
- TF/FC - 1100 Kg

83.3.3 **DRAGSTERS AND COMPETITION ALTEREDS:**

- D/D - 770 kg
- C/D - 770 kg
- B/D - 770 kg
- A/D - from 8178cc up to 9600cc – 850 Kg
  - from 9601cc up to 13400cc – 950 Kg
- D/TD - 770 kg
- C/TD - 770 kg
- B/TD - 900 kg
- A/TD - 900 kg
- D/CD - 770 kg
- C/CD - 770 kg
- B/CD - 770 kg
- A/CD - 770 kg
- TA/D - 770 kg
- TF/D - 1000 kg
- C/CA - 750 kg
- B/CA - 800 kg
- A/CA - 850 kg
- CC/CA - 750 kg
- BB/CA - 800 kg
- AA/CA - 850 kg
- TF/CA - 1000 kg

CR84 WEIGHT DISTRIBUTION

84.1 Each vehicle must have an adequate percentage of its weight carried on the front wheels to ensure proper handling ability at all times. Additional front-end weight will be required by the scrutineer on vehicles experiencing excessive wheel stands or carrying the front wheels during acceleration.

84.2 Weight Distribution on FWD vehicles

On FWD vehicles special notice needs to be taken of the weight distribution of the vehicle for safety reasons. On de-acceleration or braking, a vehicle that is very light in the rear can become unstable and/or lock the rear wheels during hard braking.

If the weight distribution (percentage) Front to Rear, of a vehicle falls into the range of (F) 70 (R) 30 to (F) 80 (R) 20, a Parachute is mandatory as a supplementary brake-system regardless of speed attained.

If the weight distribution Front to rear, is equal to or greater than (F) 80(R) 20, a parachute AND independently braked rear wheels are mandatory, regardless of speed attained.

CR85 WHEELBASE

Minimum wheelbase is 2.20 meters. Maximum wheelbase variation from left to right is 50mm. Refer to individual class requirements.

85.1 Cars

a. All vehicles (except Factory Street) running under 11.99 and not quicker than 10.00, 2.2 meter minimum (Engine swap allowed).

b. All vehicles (except Factory Street) running 9.99 and quicker, 2.3 meter minimum (Engine swap allowed).

Note: Further restrictions and/or allowances may also apply, refer to individual class requirements.

CR86 WHEEL WELLS:

See Class Requirements.

CR87 WHEELS

87.1 All hubcaps must be removed. Scrutineers must check for loose lugs, cracked wheels, worn or oversize lug holds, spindles, axle nuts, cotter pins, etc. Snap-on hubcaps are not permitted on any class of vehicle during competition. Stock mag wheels may use lug nuts as supplied from the factory.

87.2 Each vehicle must be equipped with automotive-type wheels with a minimum diameter of 1325mm unless class regulations state otherwise. Rim width for enclosed, i.e. Sedan, bakkie, Coupe, etc. vehicles must be a minimum of 75mm.

87.3 Motorcycle rims or lightweight automotive wire wheels acceptable on front of Dragster only, provided total weight of vehicle does not exceed 900kg including the driver. Each wire rim must be equipped with 3mm minimum diameter steel spokes properly cross-laced to provide maximum

strength. All available spoke holes in rim and hub must be laced, and omissions to lighten wheels are not permitted.

87.4 Where it can be established that a "beam breaker" shield is required on wire rims, it is mandatory for a competitor to securely and permanently fit a device to clearly cut the start line staging beams before entering a competition.

87.5 Maximum rim width on any vehicle is 406mm.

87.6 No rear wheel discs or covers permitted in any category and the use of sports car or automotive wire wheels is restricted to vehicles to which they were originally fitted.

87.7 Either steel or good condition rubber valve stem caps are required on all wheels.

CR88 WHEEL STUDS

A wheel stud must protrude from the outer face of the wheel by a distance at least equal to the diameter of the stud. Scrutineers are required to check the fit by removing at least one lug nut on each rim if it is not readily recognizable that the stud extends through the rim far enough.

CR89 WHEELIE BARS

Wheelie bars are permitted as per class regulations. Wheels must be non-metallic. Wheelie-bar wheels must turn freely at starting line, any preload is prohibited. Wheelie bars must be fixed. Hydraulics, pneumatics, electronics, etc. or any adjustment or movement during run is prohibited. Using wheelie-bar wheels as "fifth wheel" sensing device is prohibited.

CR90 WINDOW NETS

90.1 All enclosed vehicles with doors, i.e. Sedans, Bakkies, Coupes, etc.), requiring the use of a "roll cage" (i.e. those capable of 10.50 or quicker) must be fitted with a driver-side ribbon-type window net with minimum dimensions of 450mm x 600mm or alternatively properly adjusted arm restraints.

90.2 Net must be attached to the inside of the roll cage top bar and also to the intrusion bar. The net must be permanently attached at the bottom either by hose clamping to the intrusion bar or some other acceptable method whilst the top must be clipped at each end to eyebolts or a seat belt-type fastener. Chief start line Marshall must ensure competitors have net or restrains correctly fastened before going into stage. Rubber shock cords are not acceptable for mounting net.

CR91 WINDSCREENS AND WINDOWS

91.1 On open bodied vehicles, a metal, plastic or Plexiglas deflector must be installed to divert wind, liquids, foreign matter, etc., over the driver's helmet. The wind deflector must be securely mounted and installed in such a manner that it does not in any way obstruct the driver's frontal view.

91.2 Windshields, when called for in class requirements, must be safety glass, Plexiglas or other shatterproof material. The front screen must be clear, without tinting or colouring except factory-tinted safety glass.

91.3 Tinting of side windows cannot be such as to prevent visibility of driver through side windows at night events. Where Funny Cars have full side windows fitted, a 150mm diameter opening must be provided to facilitate access from the outside.