Class, Technical and Safety Regulations

Approved by SCCA BoD, 12/2021

SCCA ENDURO TECHNICAL & SAFETY REGULATIONS

1.1. CLASSES

All cars competing in SCCA sanctioned Enduro races must comply with the requirements of the Enduro Rules. Enduro classes may be supplemented with other classes to accommodate local demand and interest, and shall be detailed in the event Supplemental Regulations. This may include, but is not limited to, SCCA Road Racing General Competition Rules (GCR) classes. It is not permitted to combine Sports Racing or Formula Category classes with non-Sports Racing or Formula Category classes in Enduro competition, although separate Enduro events specifically for Sports Racing and/or Formula Category class cars is permitted.

A. Eligible Vehicles

SCCA Enduro Classes are designed for mass-produced vehicles that started life as road-going cars and have been modified for racing purposes. While certain modifications are permitted, vehicles shall retain their general appearance and be recognizable to the average enthusiast.

The abbreviations in parentheses are the class identifications as required in 1.2.G. Identification Markings.

B. Enduro Classes

Enduro 1	(E1)
Enduro 2	(E2)
Enduro 3	(E3)
Enduro 4	(E4)

C. National Class Table

The SCCA Enduro class table assigns vehicles to a specific class or classes. Mass-produced engines from another manufacturer may be fitted within a vehicle. The starting displacement is then adjusted based on modifications to the vehicle, including drivetrain, suspension, chassis and aerodynamics. Vehicles may run "up" in class if desired (i.e. a car eligible for Class E3 is also eligible for E1 and E2), but one class will be designated for each race. Elements in the class worksheet shall be reflected in a vehicle declaration sheet for each event.

Each class will have a total adjusted displacement limit. Each vehicle will start with the stock displacement of the installed engine, with modifiers adjusting the displacement based on performance modifications to the vehicle.

1. Displacement (based in cubic centimeters (cc)):
    a. Engine displacement is based on the following formula using stock engine dimensions:
        i. (3.1416 x bore^2 x stroke x # of cylinders)/4000
    b. Cylinders may be up to 1.2mm (0.047") over bore from stock
    c. Modifiers in the class table will be applied after displacement measurement.

2. Minimum weight
    a. 1 lb./cc of displacement including drivetrain multiplier adjustments, but excluding other adders or subtractors.
    b. Official vehicle weights are without driver and with a full fuel load.
    c. Minimum weight for all classes shall not be less than 2,000lbs. or more than 3,300lbs.
    d. Underweight cars may increase adjusted displacement by 0.2L per 100lbs, with a maximum allowance of 250lbs. at +0.5L. This must be reflected on the vehicle declaration form.
    e. Overweight cars that are not carrying any ballast may decrease adjusted displacement by 0.2L per 100lbs., with a maximum allowance of 250lbs. at -0.5L. This must be reflected on the vehicle declaration form.
    f. Cars may not carry more than 250lbs. of ballast. See 1.2.A.6 - Ballast.

3. Fuel Capacity
    a. Fuel capacity is by class
        i. E1: 20 gallons
        ii. E2: 17 gallons
        iii. E3: 15 gallons
        iv. E4: 14 gallons
    b. Fuel capacity is measured by filling tank/cell and then pumping the entire fuel system (inclusive of surge tanks, auxiliary tanks, etc.) from a fuel test port in the engine bay until it begins pushing air.
    c. Vehicles with OE fuel tanks that are larger than allowed in a class:
        i. Vehicles with OE gas tanks that are larger in capacity than the eligible class may run the greater capacity in the next fastest class. For example, a vehicle legal for E3, but utilizing the stock tank for that car that holds 18 gallons may run in E2. The car must otherwise be compliant for E3.
        ii. Cars eligible for E1 with OE gas tanks larger than the class limit are subject to a class table adjustment.

4. Tire width limit
    a. Classes will have a tire width limit, as marked on the tire, as follows:
        i. E1: 295
        ii. E2: 255
        iii. E3: 245
        iv. E4: 225

5. Adjustments will be made to the vehicle's displacement for:
    a. Drivetrain
        i. Forced induction: x2 multiplier
        ii. Non-OE Sequential transmission: x1.25 multiplier
        iii. Non-OE gear case (doesn't match chassis or swapped engine) and/or dog-ring engagement: x1.15 multiplier
        iv. Note: Rotary engines (two-rotor) use 2.5L as a base displacement
    b. Suspension
        i. Any dampers with remote reservoirs, more than one adjustment and/or adjustable spring perches (coil-overs): Add 0.5L
        ii. Relocated Suspension pickup points: Add 1.0L
    c. Aerodynamic
        i. Front splitter extending beyond the front bumper as viewed from above: Add 0.25L
        ii. Aftermarket rear wing: Add 0.25L
    d. Fuel capacity
        i. Vehicles with unmodified OE fuel tanks that are over capacity for a class may compete in the next faster class. See 1.1.C.3.c.i.
        ii. E1 class vehicles with unmodified OE fuel tanks that are over capacity: Add 0.1L of displacement for each partial gallon over capacity.

1.2 TECHNICAL REGULATIONS

A. Vehicle Chassis and Body

1. Unibody: Major chassis/unibody modifications are limited to fuel system installation, roll cage installation and driver safety cell modifications (including drop floors to accommodate larger drivers). Non-essential body items and trim may be removed for the purposes of weight reduction. OEM firewall between the cockpit and the engine compartment shall be intact to prevent the passage of flames from the engine compartment to the cockpit. Any holes in the firewall must be of the minimum size for passage of controls and wires and must be completely sealed.

2. Bodywork
    a. Vehicles must retain the general original silhouette and all major bodywork pieces, bumpers, facias and doors. Body panel (front and rear, wheel arches, fenders and quarter panels) modifications are permitted to facilitate installation of maximum width tires for the chosen class. This includes rolling or flattening any interior lip on the wheel opening, or the addition of flares. Cars with plastic/composite fenders may remove any interior wheel opening lips, but the resulting material edge shall be no thinner than the basic fender material thickness. All tires must fit within the bodywork as viewed from above.
    b. Body panels shall be securely mounted. Fender skirts and hub caps shall be removed. The hood and engine compartment shall be securely fastened. Hood fasteners must be removable with simple tools; no fastener requiring a key to open it is permitted.
    c. It is recommended that all vehicle doors be able to be opened from both inside and outside of the vehicle. Doors may be modified/gutted to accommodate roll cage/side impact structures. Door windows may be removed or replaced per 1.2.4.
    d. Openings in the bodywork may be temporarily covered with tape for the purpose of regulating airflow. Bodywork openings may be closed off using close-out panels or screens mounted behind body openings. Bodywork seams may not be taped except to temporarily secure it after contact.
    e. Convertibles
    Convertible tops and attaching hardware shall be completely removed. It may be replaced with an OEM hardtop if one is available. Aftermarket hardtops are permitted but may not change the aerodynamic profile of the vehicle.
    f. Fasteners are free provided they are of the same material family and diameter as the fastener it is replacing.
    g. Stock mirrors may be replaced or removed.
    h. Bumper covers shall be in place. Bumper cores and crush structures hidden by the cover may be replaced with a structure designed to perform the same function.

3. Aerodynamic Modifications
    The following aerodynamic modifications may be subject to modifiers in the class table.

    a. Front Air Dam/Spoiler
        i. Shall be mounted to the body and may not protrude more than the thickness of the material (0.5" limit) beyond the overall outline of the body when viewed from above, perpendicular to the ground, or aft of the forward most part of the front fender opening.
        ii. Openings are permitted for the purposes of ducting air to the brakes, cooler(s) and radiator(s).
        iii. An undertray may be added. The undertray may close out the area from the leading edge of the bodywork (including the spoiler/air dam) back to the forward most part of the front fender wheel opening.
    b. Splitter
        i. A splitter (horizontal, single plane aerodynamic device attached to the lower front of the vehicle, protruding forward) may be added to divert air and produce downforce through vertical pressure differential.
        ii. Splitters shall have no vertical deviations and may protrude three (3) inches from the forward points of the front bumper,

and be no wider than the outside edge of the front wheels when pointed straight.

c. Rear Wings are limited to single-element rear wings, 720 square-inch maximum.
   i. For sedans, coupes and sports cars, wings may not be higher than the highest point of the roofline and must be completely contained between the rear axle center line, the sides of the vehicle and rear-most point of the rear bumper as viewed from above.
   ii. For convertibles with windshields, wings may not be higher than the highest point of the windshield or hardtop, whichever is higher. Convertibles without windshields may not extend higher than 10" above the deck/trunk lid. Wings must be contained between the rear axle center line, the sides of the vehicle and the rear-most point of the rear bumper as viewed from above.
   iii. For wagonbacks/hatchbacks/notchbacks, wings may not extend higher than 10" above the roofline. Wings must be contained between the rear axle center line, the sides of the vehicle and the rear-most point of the rear bumper as viewed from above. For this subsection, a wagonback/hatchback/notchback style body (or variations of these) is a car in which the rear edge of the roofline is no more than 28.0 inches forward of the rearmost bodywork as measured along the vehicle longitudinal centerline.

4. Glass
   Rear and side windows may be replaced with polycarbonate options. Front windshields must be OE-equivalent safety glass. All polycarbonate windows or windshields must be adequately fastened, and forward-facing windshields must feature a reinforcement to prevent collapse, and must be a minimum thickness of 3/16". NACA-ducts may be installed in side windows to aid in driver or drivetrain cooling.

5. Detachable roof panels (sunroofs) shall be removed. All glass panels in the roof must be removed. Movable or removable metal or composite panels in the roof may be either removed or positively secured in the closed position. Any openings in the roof resulting from the removal of a panel may be covered with panels of stock contour made of aluminum or the same material as the stock surrounding roof structure. Drivers of cars without a sunroof panel shall wear arm restraints.

6. Ballast may be added to all cars as required, to meet minimum weight, provided it is securely mounted in the front passenger compartment, rear passenger compartment or trunk, and serves no other purpose.

7. Cockpit and Interior
   a. The following items must be removed: tool kit, spare tire, supplemental restraint systems (SRS) and passive restraint systems.
   b. The following items may also be removed: Headliner, sun visors, carpet including pad and insulation, soundproofing, OEM seats, all trim pieces, dashboard, gauges, heating and air conditioning systems, window winding mechanisms, central locking systems, audio system and any other systems fitted to the original car solely for the comfort of the driver and/or passengers.
   c. The following items may be installed: Safety equipment/structures, racing seat(s), controls necessary for driving, instrumentation and gauges, electronic equipment, radio, camera, battery, replacement door panels/interior trim.
   d. Cool suit systems may be installed. Water tank mounts shall be of a safe and secure design.
   e. Driver ventilation systems may be installed.
   f. All installed interior components shall be attached to/contained in the chassis in such a way as to be able to withstand 25g deceleration. Any sharp edges shall be covered, padded, protected, etc. to prevent injury to driver, crew, course workers and officials.
   g. All cars shall be equipped with a forward-facing video camera, recording at all times when on track. The video card shall be made available to the series upon request, including during the competition. Teams should have spare cards available in the event a video card is collected by the Race Director for review.
   h. Hand controls may be approved on a case-by-case basis. Such approval shall be in writing from the Road Racing Technical Manager and shall be in the entrant's possession at all competitions.
   i. Mirrors shall provide driver visibility to the rear of both sides of the car.

8. Electrical System
   a. Batteries
      i. Batteries type and size are free.
      ii. Battery location is unrestricted within the bodywork. If located in the driver/passenger compartment, vented wet cell batteries shall be in a nonconductive marine type container or equivalent. The hot terminal shall be insulated on all cars. All batteries (on-board power supplies) shall be attached securely to the frame or chassis structure independent of the marine type container.
      iii. Vehicles using a Lithium Battery must display the green and black Lithium Battery decal near the kill switch.

b. Exterior lighting systems
   i. Standard headlights, headlight operating ancillaries, turn signals, and parking light assemblies may be removed and replaced with a plate of identical shape and size of the lens. Standard headlight assemblies may be replaced with aftermarket units of equal dimension. Vehicles with pop-up and/or hidden headlights may modify and/or remove the headlight assemblies as long as the headlight cover and any other external hardware are properly secured in the stock closed location.
   ii. Events running into darkness may require the use of headlights and tail driving lights. Utilizing stock assemblies, or upgraded stock assemblies, is the easiest way to accomplish this.
   iii. OE taillight assemblies shall be retained, with two functioning red brake lights at all times. OE driving lights shall be retained and utilized during rain or low light situations as directed by race control. When required, vehicles must have a minimum of one functioning driving light/rain light on the rear of the vehicle.
   iv. Auxiliary headlights may be allowed by the event supplemental regulations.
   v. Exposed glass headlights shall be taped. Lights mounted on or below the bumper shall be removed, and all resulting holes shall be covered to prevent air passage through said holes unless used for approved ducting. Lights mounted within the bumper may be removed or covered and any resulting holes shall be covered to prevent air passage through said holes unless used for approved ducting.
   vi. Rookie Light
      1. Vehicles with driver(s) on a Rookie license shall illuminate an amber-colored LED light on the rear of the vehicle when the Rookie is driving the car. The light shall easily be viewed by drivers in cars following behind. Light shall be a minimum of 4" wide.
      2. e.g.: https://www.lightinthebox.com/en/p/6led-light-bar-flash-emergency-car-vehicle-warning-strobe-flashing-blue-red-white-yellow-amber_p7668639.html
c. Each car must be fitted with at least one effective windshield wiper assembly, which must be in working order throughout the event
d. Master Switch
   i. All cars shall be equipped with a master switch easily accessible by the driver and from outside the car. The master switch shall be installed directly in either battery cable and shall cut all electrical circuits but not an on-board fire system. Solenoid-style master switches are permitted. All terminals of the master switch shall be insulated to prevent shorting out. It shall be clearly marked by the international marking of a spark in a blue triangle and mounted in a standard location. Off position shall be clearly indicated at the master switch location.

Kill Switch
Item #2606

9. Towing Eyes
All cars shall have a towing eye or strap, front and rear, that does not dangerously protrude from the bodywork when the car is racing, to be used for flat towing or hauling the vehicle. These towing eyes or straps shall be easily accessible without removal or manipulation of bodywork or other panels. Towing eye minimum ID 2 inches.

The required tow eyes must be strong enough to tow the car from a hazard such as a gravel trap. Front tow eyes shall be mounted in front of the front axle. Rear tow eyes shall be mounted to the rear of the rear axle.

B. Suspension and Steering

1. Pickup Points
Suspension pickup points on unibody or frame must remain in OEM locations or will be subject to a Class Table modifier. Pickup points may be reinforced if needed for durability. Suspension bushings, bearings and ball joints are unrestricted.

2. Uprights
Suspension knuckles/uprights shall be OE or OE equivalent and swaps from other same manufacturer vehicles are permitted if they bolt on without modification. Knuckles/uprights may be reinforced.

3. Adjustments
   a. Suspension arms are permitted to be aftermarket and/or adjustable for process of camber/caster alignment, alignment correction and vehicle setup.
   b. To adjust camber, vehicles equipped with MacPherson strut suspension may use eccentric bushings at control arm pivot points, eccentric bushings at the strut to bearing carrier joint, and/or use slotted adjusting plates at the top mounting point.

c. Shims, plates and/or eccentric bushings may be used on other forms of suspension to adjust camber and caster. Independent rear suspension holes may be slotted and reinforced for the purposes of camber and/or toe adjustment.

4. Shocks/Struts/Dampers
   Shock absorbers and struts may be replaced with single-adjustable units with unmodified spring perches without a Class Table modifier. Multi-adjustable and/or coil-over (adjustable perch) dampers are permitted but subject to a Class Table modifier. Quantity of spring and shock absorber/struts must remain as stock. Computer controlled or driver adjustable valving adjustment is not permitted unless supplied that way by the vehicle manufacturer.

5. Springs
   Any springs or torsion bars can be used, including helper springs.

6. Steering
   a. All steering components, except for the steering wheel, column, tie rods and toe links, must be original equipment supplied by the manufacturer. These parts may be strengthened, provided the original part can still be identified.
   b. Cars equipped with power steering as standard equipment can modify, substitute, disable and/or remove the power pump, related hoses and mounting brackets.
   c. The steering wheel may be replaced with an aftermarket, or racing steering wheel. An all-metal quick release coupling on the steering wheel may be added.
   d. Steering wheel locks shall be removed or disabled.
   e. A collapsible steering column shall be used.

7. Anti-roll/stabilizer bars
   Anti-roll/stabilizer bars are free and may be added, removed or substituted. Driver adjustable stabilizer bars are not permitted. When a car's anti-roll bar also acts as a suspension locating device, the bar's attachment points and pivot points on the chassis and suspension control arms must remain in the stock locations.

8. Active Suspensions and Traction Control Systems
   Active suspensions and traction control systems are permitted as installed by the automobile manufacturer and unmodified.

9. Vehicle track may be increased up to 5% of stock to facilitate installation of maximum width tires for the class.

C. Drivetrain and Related Accessories

1. Engine
   Engine internals are free, but engine must be mass-produced and sourced from a major vehicle manufacturer. Engine and transmission swaps from other vehicles are permitted but must be sourced from a major vehicle manufacturer. Subframes may be modified or replaced to accommodate engine and transmission swaps. Relocation of suspension pickup points through this process is subject to a class table modification.

2. Transmission
   Transmission internals are open to modification. Non-OE gear case, H-pattern dog engagement and non-OE sequential transmissions are subject to a modifier in the class table. Automatic transmissions are permitted.

3. Differential
   a. Final drive ratio, internal differential components, bearings, bearing carriers, hubs, universal joints and CV joints are unrestricted.
   b. Electronic control of the differential is prohibited unless as delivered by the manufacturer.
   c. Driveshaft and half shafts may be aftermarket, but shall be the OEM-type and use steel or aluminum. Multi-piece driveshafts may be replaced by one-piece driveshafts, and vice-versa.
   d. Differential housings may be substituted by another of the same manufacturer for the purpose of durability. A vehicle may substitute with a differential from another manufacturer if performing a similar engine swap.

4. Cooling
   a. Vehicle cooling systems are open to modification to withstand endurance race use, including the addition of transmission and differential coolers.
   b. Intake air cooling: Cars utilizing forced induction may install intercoolers. The number, type and location of intercoolers are free.
   c. Water spray systems: Water may not be sprayed on any intercoolers, radiators, etc. while on course.

5. Accumulators
   An accumulator (e.g., Accusump) may be installed. Location is free, but it shall be securely mounted within the bodywork. All oil lines that pass into or through the driver/passenger compartment shall be of metal braided hose (e.g., Aeroquip).

6. Exhaust system
   a. Exhaust systems are open to modification, but must include one (1) muffler at minimum, with exhaust routed rearward to the

midpoint of the vehicle, or behind the driver's most rearward point, whichever is further toward the rear of the vehicle. Cars must be compliant with the SCCA Sound Control limit of 103dB as measured per SCCA GCR regulations.

b. If the exhaust system is routed in such a way that damage to it could cause hot exhaust to contact any part of the fuel system, there shall be a metallic heat shield protecting the fuel system components.

D. Ignition and Fuel

1. The ignition system is unrestricted.
2. A programmable ECU is permitted. Engine calibration (spark and fuel) is free.
3. Fuel injectors and fuel rails must remain the original number and mounting locations, but are otherwise free. Fuel pumps and fuel filters are free in type, size and number.
4. Cars produced with an electronic throttle body may use the OEM electronic throttle body. The OEM electronic throttle body may be converted to manual actuation and the actuation cam on a manual throttle body may be changed to alter the opening/closing rate of the butterfly. Vehicle/engine combinations with manual OEM throttle bodies may be converted to an OEM electronic throttle body of the same inner diameter as the original OEM throttle body.
5. Components upstream of the throttling devices are free (cold air intake, filter, etc.).
6. Intake manifolds are free, provided they use a throttle body of the same number and OE size of the vehicle, or the swapped engine (if it has been swapped).
7. Carbureted vehicles may replace carburetor
8. Gasoline-powered vehicles must run on readily available unleaded gasoline with a maximum octane of 93. A spec fuel may be declared in the event supplemental regulations.
9. Carburetor Fuel Inlet Fitting
   On all carburetors with a non-threaded fuel inlet fitting, the fitting shall be replaced by drilling and tapping the carburetor body for a threaded fitting.

E. Brakes

1. Brake calipers are unrestricted in size and piston count. When alternate calipers are used, they must be mounted in the same location and orientation as the OEM calipers. OE caliper mounting tabs may be modified or removed to facilitate installation.
2. Brake rotor size is unrestricted, and must be made of ferrous material, and can be cross-drilled and/or slotted. A two-piece hat and rotor design may be utilized, but the hat must be made of ferrous or aluminum material.
3. Brake ducting is permitted.
4. Original-equipment Anti-Lock Brake (ABS) systems are permitted as delivered by manufacturer, or may be disabled. Non-OE ABS systems are not permitted.
5. Brake lines may be relocated, and rubber lines may be replaced with stainless steel braided brake lines.
6. Dual-circuit braking systems are required. Any dual-circuit brake master cylinder(s) and pedal assembly may be fitted. Pressure-equalizing and proportioning valve devices are unrestricted
7. Brake pad friction material is free.

F. Wheels and Tires

Aftermarket wheels may be used. Non-metallic wheel construction is prohibited. Tires may not have a UTQG rating of less than 200. Classes may have specific tire size maximum dimensions.

G. Appearance and Identification

1. Advertisements and Graphics
   Advertising and graphics (names, symbols and logos) may be displayed on cars provided they are in good taste and do not interfere with identification marks and SCCA logos.

2. Appearance
   Be proud of your racecar. While we recognize that time and resources may create a range of visual presentations, cars that are neat and clean instill more confidence in officials and your competitors. In addition, cars kept in such condition tend to alert of potential problems sooner – something that can help your team avoid lost time and poor results. Cars that are dirty, show substantial bodywork damage, structural or surface rust may not be approved for competition.

3. Identification Markings
   Each car shall carry identification numbers and class letters per a and b, below, SCCA logos per c, below; and any markings required by the Supplemental Regulations.
   a. Numbers and Class Letters
      Numbers shall be placed on the front, both sides and the rear of the car so that they are legible. Numbers may be 1, 2 or 3 digits. Class letters shall be placed on both sides and the rear of the car so that they are legible. Duplicate car numbers within the same run group is prohibited.
   b. Size of Numbers and Class Letters
      Numbers shall be at least 8" high, with a 1.5" stroke on a contrasting background on the front and sides. The distance between 2 numbers shall be at least as wide as the stroke of the numbers. Rear numbers and class letters shall be at least 4" high, with a 0.5" stroke on a contrasting background. Metallic (reflective) numbers and class letters are prohibited.
   c. SCCA Logo

Each car competing in an event shall display the official SCCA Enduro decal (Figure 1) unobstructed and prominently on both sides of the car and adjacent to the side numbers. A third logo shall be displayed on the front of the car unobstructed and prominently near the front number. Logos and decals of sanctioning bodies other than SCCA shall be removed or covered (car and driver's suit).

Figure 1

Drivers are encouraged to display one of the logos shown in Figure 2 on their fire suit in a location based on Figure 3.

Figure 2
Official SCCA Logo

White patch/black letters
Item #3618
(4.5 x 1.75 Inches)

Black patch/white letters
Item #3619
(4.5 x 1.75 Inches)

Item #3632
(3.5 x 1.0 Inches)

SCCA patches for purchase are only available in the monochrome versions shown above. Variations of the SCCA approved logotype may be used in accordance to the logotype graphic standards found at www.scca.com/pages/logotype.

Figure 3
SCCA Uniform Patch (Right Side Preferred)

d. Mobility Decal
If a driver will need assistance getting out of their car, the Mobility & Impairment decal (Figure 4) shall be displayed on the driver's door.

Figure 4

H. Other

1. Cryogenic treatment of components is permitted.
2. SCCA may install a data collection device on any vehicle at any time during the event. Devices are not to be tampered with, disabled, turned off, etc. by participants.

I. Prohibited Items

1. Air jacks cannot be used during the race.
2. Center-lock wheels
3. Air/Nitrogen/Pneumatic wheel guns in pit lane. Battery-powered is permitted.

1.3 VEHICLE DOCUMENTATION

A. Vehicle Logbooks

Each car shall have a complete and up-to-date logbook.

1. The standard SCCA Vehicle Electronic Logbook will be used by all competitors at all SCCA Enduro competitions.
2. A complete description of the vehicle, its safety roll bar/roll cage, and the required photographs must be present in the places provided. All changes of ownership of the vehicle must be recorded.
3. The Vehicle Logbook must be issued by a Nationally licensed Technical Inspector, who will complete the required vehicle information in the SCCA Electronic Logbook System. He will conduct a thorough inspection of the vehicle, as provided in Section 1.4, Safety Systems and Equipment. The logbook issue date is the date of registration.
4. Each vehicle will receive a tamper-proof Vehicle Logbook decal, which shall be affixed to its roll bar in a visible area in the main hoop plane and correspond to the electronic logbook entry.
5. If a car is protested or inspected during an event and found to be non-compliant, the results of this protest or inspection must be noted in the logbook by the Race Director or his designee.
6. If a car is involved in an accident or is damaged as a result of mechanical failure, the damage must be noted in the Vehicle Logbook by the accident investigator or Chief Technical Inspector.

1.4 SAFETY SYSTEMS AND EQUIPMENT

A. Vehicle Safety Equipment

1. Roll Cages

   All cars must utilize a roll cage compliant with the following specifications. These specifications apply to all vehicles registered (issued an SCCA logbook) after 1/1/08. Cars registered before 1/1/08 may continue to compete with their previous roll cage as specified in SCCA Road Racing GCR Appendix I or comply with the following specifications.

   a. Definition

      The roll cage consists of the main hoop, front hoop, side protection and braces as specified in these rules.

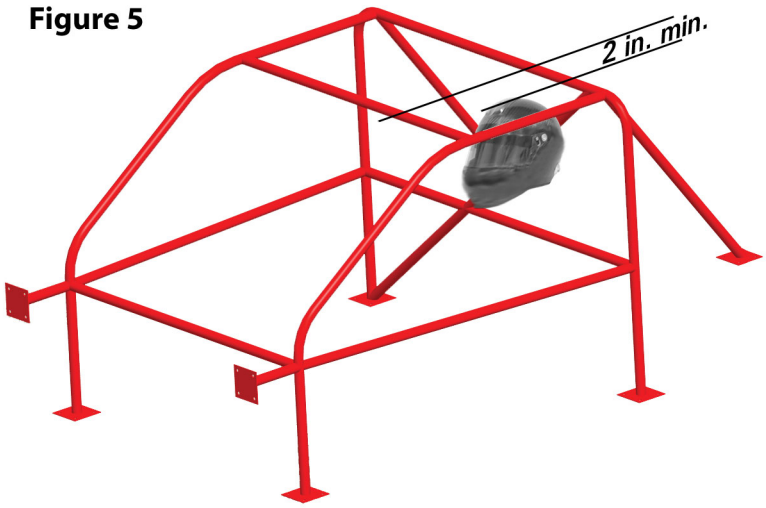
   b. Main Hoop

      i. The main hoop (behind the driver) must be the full width of the cockpit for all cars. It must be one continuous length of tubing with smooth bends and no evidence of crimping or wall failure. The main hoop must maintain a single plane.

         a) On all closed cars, the main hoop must be as close as possible to the roof and “B” pillars.

         b) On open cars retaining the windshield frame the main hoop must be full height for the entire width of the hoop. The top of the main hoop must be at least 2 inches above the driver’s helmet as illustrated in figure 5.

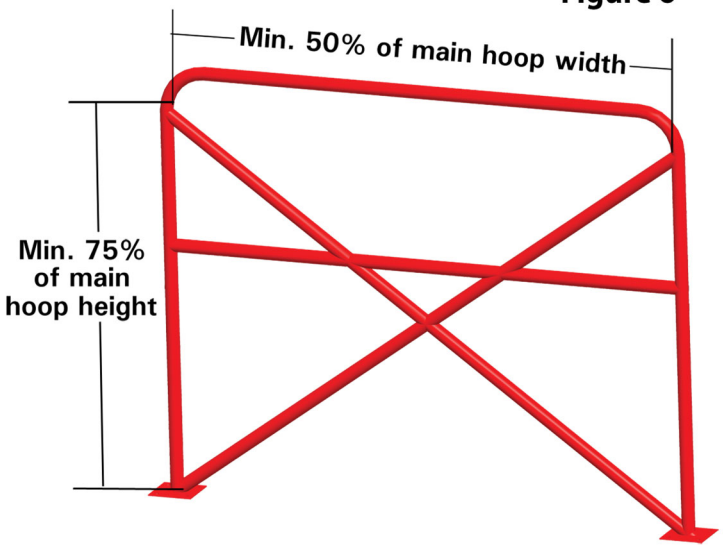
Figure 5



ii. Main Hoop Bracing

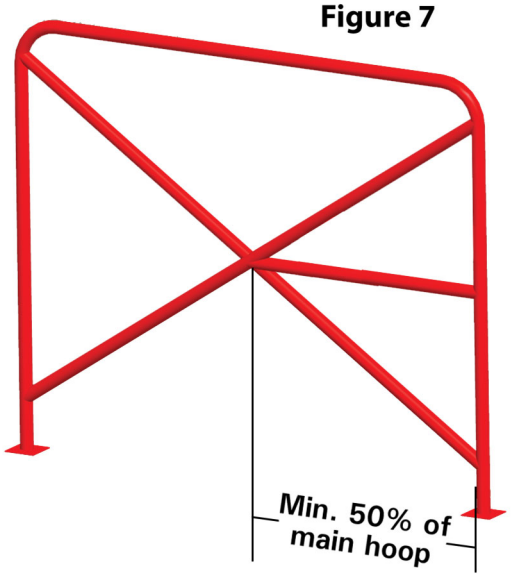
a) Main hoops shall incorporate a diagonal brace. The brace shall either be in the plane of the main hoop, or extend from the top of one rear brace (described in 9.4.B.2.c) to the bottom of the opposite rear brace. Automobiles with mid mounted engines can have the lower mounting point attach to the frame of the automobile within six inches of the main hoop. In the case of braces in the plane of the main hoop, the brace must span at least 50% of the width of the main hoop, and at least 75% of the height of the main hoop as shown in figure 6.

Figure 6



b) Cars must incorporate a main hoop horizontal brace at the approximate level of the driver's shoulders but not lower than the shoulder belt mounting point as described in section 9.3. Driver's Restraint Systems. If a double-diagonal "X" brace is used in the plane of the main hoop, a half-width horizontal brace may be used behind the driver's seat to mount the seat back and shoulder harness as shown in figure 7.

Figure 7



c) Cars must have 2 braces extending to the rear from the main hoop and attaching to the frame or chassis. Braces must be attached as near as possible to the top of the main hoop (not more than 6 inches below the top), and at an included angle of at least 30 degrees.

d) On cars where the rear window/bulkhead prohibits the installation of rear braces (e.g. Honda Del Sol), the main hoop shall be attached to the body by plates welded to the cage and bolted to the stock shoulder harness mounting points. This installation design must incorporate a diagonal bar connecting the top of the main hoop to the lower front passenger side mounting point (Petty Bar). Alternatively, the rear window may be removed and a clear, lexan replacement installed. The rear cage braces may pass through this replacement window and through the engine cover or bodywork to allow connection to the frame or unibody. Such allowances shall be noted on the car's specification line.

c. Front Hoop

i. The front hoop (side hoop) must follow the line of the A-pillars (whether they are retained or removed) to the top of the windshield and be connected by horizontal bars to the top of the main hoop on each side (as close to the roof as possible). Instead of a single front hoop, two side hoops (down tubes) may be used. Alternatively, a top "halo" hoop following the roof line from the main hoop to the windshield with forward down tubes following the A-pillars to the floor may be used. Regardless of which one of the two approved tubing configurations there shall be a tube connecting the two A-pillar tubes at the top of the windshield.

ii. All cars except those also holding an SCCA logbook for SCCA GCR T4, Improved Touring, Spec Miata, and B-Spec classes must incorporate a horizontal front hoop brace at the approximate level of the dashboard. It is recommended that cars competing in T4, Improved Touring, and Spec Miata classes also have the front hoop brace.

d. Side Protection

Two side tubes connecting the front and main hoops across both door openings are mandatory. Tubes that are welded to any part of the same mounting plate are considered to be connected to one another (see 9.4.E.3 below). NASCAR-style side protection or one bar bisecting another to form an "X" is permitted. Door side tubes may extend into the front door. The stock outside door latch/lock operating mechanism shall not be removed or modified unless specifically authorized in the category rules.

e. Roll Cage Attaching Points

i. The roll cage must attach to the vehicle structure within the passenger compartment in a minimum of 6 points with no maximum. Six (6)-point cages shall incorporate, at minimum, attachment points for the front hoop, main hoop and rear braces from the main hoop. The roll cage shall be integrated into the frame or chassis.

ii. Mounting Plates

a) Mounting plates welded to the structure of the car shall not be less than .080 inches thick and no more than 0.25 inches thick. Plates may be on multiple planes but shall not be greater than 15 inches on any side.

b) The thickness of mounting plates bolted or riveted to the structure of the car must not be less than the thickness of the roll hoop or brace that they attach to the chassis, and must be backed up with a plate of equal size and thickness on the opposite side of the chassis panel. The maximum area of each mounting plate must be 144 square inches. Plates may be on multiple planes but shall not be greater than 15 inches on any side.

c) Fasteners for bolted or riveted mounting plates must be Grade 5/Metric 8.8 or better with a minimum diameter of 5/16".

f. Tubing

i. Seamless or DOM mild steel tubing (SAE 1020 or 1025 recommended) or alloy steel tubing (SAE 4130 or T45) , or Docol R8 tubing must be used for all roll cage structures. Alloy and mild steel tubing may not be mixed. ERW tubing is not allowed.

ii. The following table shows the minimum allowed tubing outer diameter and wall thickness by vehicle weight:

Vehicle Weight	Tubing Size (inches) (outer diameter x wall thickness)
Up to 1700 lbs	1.375 x .080
1701 - 2699 lbs	1.500 x .095 1.625 x .080
2700 lbs and up	1.50 x .120 1.750 x .095 2.00 x .080

iii. For purposes of determining tubing sizes, the vehicle weight is as raced without driver, fuel and ballast. The minus tolerance for wall thickness should not be less than .010" below the nominal thickness.

iv. The required tubing elements must meet the material minimums set forth above. Optional tubing elements may be any size.

v. The minus variance of tubing wall thickness due to manufacturing tolerances is limited to .010 inch.

vi. Either an inspection hole between 3/16 and 1/4 inch diameter must be drilled in a non-critical area of the front and rear hoops, as well as one of the supplemental braces to facilitate verification of wall thickness; or alternatively, wall thickness may be determined by non-invasive means and noted in the logbook as inspected by such means.

g. Basic Design Considerations

i. All portions of the roll cage subject to contact by the driver must be padded with a minimum 1 inch of material. Padding that meets or exceeds SFI 45.1 or FIA 8857-2001 (curved padding), or SFI 45.2 or FIA sports car head rest material (flat padding) specification is recommended.

ii. No portion of the roll cage shall have an aerodynamic effect by creating a vertical force.

iii. The radius of all bends in the roll cage (measured at centerline of tubing) must not be less than 3 times the diameter of the tubing.

iv. It is recommended that all joints of the roll cage be welded. All welding must include full penetration, no cold lap, no surface porosity, no crater porosity, no cracks, no whiskers, and so forth. Welds shall be continuous around the entire tubular structure. Procedures for welding alloy steel shall be in accordance with accepted industry practice. It is recommended that a certified AWS D1.1 welder do all welding.

v. It is recommended that gussets be used at all joints.

vi. Any number of additional tube elements is permitted within the boundaries of the cage structure. Such tube elements may pass through any mandatory or optional bulkhead or panel separating the driver/passenger compartment from the trunk/cargo area/fuel tank/fuel cell area provided the bulkhead is sealed around such tube elements.

vii. Removable roll cage bracing is acceptable in one of the following configurations:

a) If one tube fits inside another tube to facilitate removal, the removable portion must fit tightly and must bottom by design, and at least 2 bolts must be used to secure each joint. The telescoping section must be at least 8 inches long. The minimum bolt diameter is 3/8 inch.

b) Removable bracing may incorporate connectors of the double-lug, double ear-type, tapered, or muff-type as shown in figures 8 and 9. The double-lug type must include a doubler, gusset, or capping arrangement to avoid distortion or excessive strain caused by welding. Double ear-type joints must be fully welded at all the mating surfaces.

Figure 8

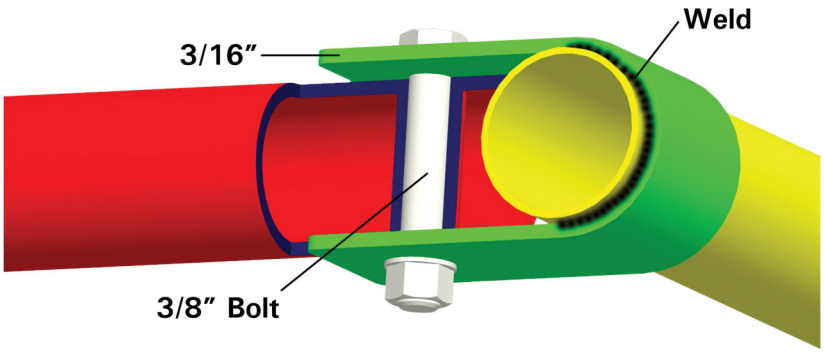
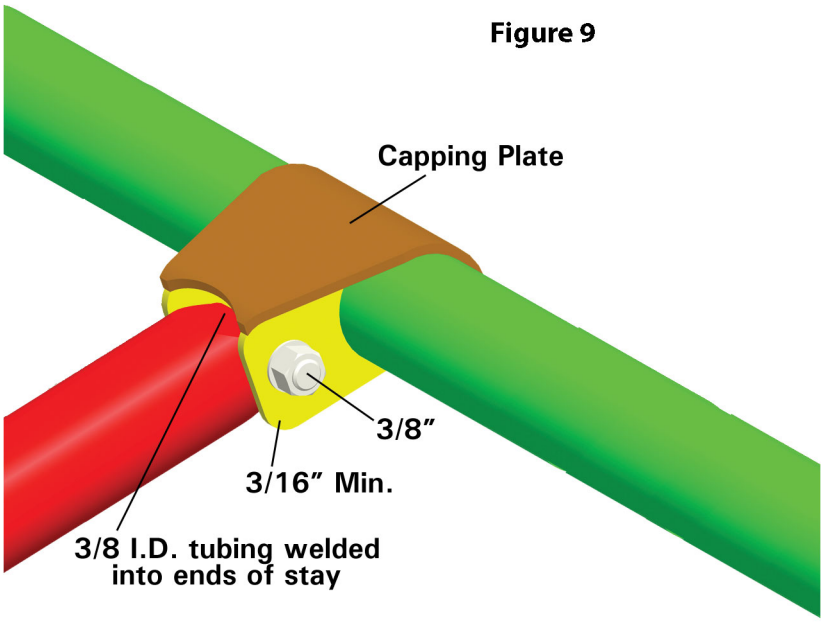


Figure 9



h. Manufacturer Supplied/FIA/MSA Homologated Roll Cages

i. Cars may compete with FIA or FIA-Approved Test Houses homologated cages provided the cage was built by the manufacturer or a manufacturer designated shop/team and approved for use. Cars must have the FIA identification plate attached to the cage along with a letter from SCCA Technical Services certifying the origins of the car, or confirmation that the cage was certified by an FIA-Approved Test House.

ii. Cars may compete with an approved Motorsport UK Roll Over Protection System Certificate. All related engineering drawings and documents shall be submitted to SCCA Technical Services. Cars must have MSA identification plate attached to the cage along with a letter from SCCA Technical Services certifying the cage was approved by the MSA.

2. Driver's Restraint System

All drivers in SCCA sanctioned speed events shall utilize either a 5, 6, or 7-point restraint harness meeting the following specifications. A 7-point restraint harness is recommended. Arm restraints are required on all open cars including open Targa tops, sunroofs and T-tops. Arm restraints shall not be worn in a manner which limits the ability of the driver to provide visible signals to other competitors while on track. The restraint system installation is subject to approval of the Chief Technical Inspector.

a. Drivers shall be able to exit the vehicle within 15 seconds from "race ready," defined as having all safety equipment (suit, helmet, gloves, etc.), restraints, nets, radio connection and driver comfort items (helmet blower, cool suit, etc.) in place, to being outside of the vehicle. Drivers may be asked to perform this ability at the request of an official.

b. The shoulder harness shall be the over the shoulder type. There shall be a single release common to the seat belt and shoulder harness. When mounting belts and harnesses it is recommended that they be kept as short as reasonably possible to minimize stretch when loaded in an accident.

The shoulder harness shall be mounted behind the driver and supported above a line drawn downward from the shoulder point at an angle of 20 degrees with the horizontal. The seat itself, or anything added only to the seat shall not be considered a suitable guide. Guides must be a part of the roll cage or a part of the car structure.

Only separate shoulder straps are permitted. ("Y" type shoulder straps are not allowed.) "H" type configuration is allowed.

c. The single anti-submarine strap of the 5-point system shall be attached to the floor structure and have a metal-to-metal connection with the single release common to the seat belt and shoulder harness.

d. The double leg straps of the 6 point or 7-point system may be attached to the floor as above for the 5-point system or be attached to the seat belt so that the driver sits on them, passing them up between his legs and attaching either to the single release common to the seat belt and shoulder harness or attaching to the shoulder harness straps. It is also permissible for the leg straps to be secured at a point common to the seat belt attachment to the structure, passing under the driver and up between his legs to the seat belt release or shoulder harness straps.
All straps shall be free to run through intermediate loops or clamps/buckles.

e. Each seat (lap) and shoulder belt of the harness (5, 6, or 7 points) shall have an individual mounting point (i.e. 2 for seat belt and 2 for shoulder belt minimum). 6 or 7-point system anti-submarine straps may share a mounting point with one or both seat (lap) belt(s). The minimum acceptable bolts used in the mounting of all belts and harnesses is SAE Grade 5/Metric 8.8. Mounting hardware, including eye bolts, as provided by the belt manufacturer, may also be used for mounting belts and harnesses. Where possible, seat belt, shoulder harness, and anti-submarine strap(s) should be mounted to the roll structure or frame of the car. Where this is not possible, large diameter mounting washers or equivalent should be used to spread the load. Bolting through

aluminum floor panels, etc., is not acceptable. Holes in the roll cage to accommodate the installation of the harness must be bushed and welded completely.

f. All driver restraint systems shall meet one of the following: SFI specification 16.1, 16.5, or FIA specification 8853/98, 8853-2016 or 8854/98.
   i. Restraint systems meeting SFI 16.1 or 16.5 shall bear a dated SFI Spec label. The certification indicated by this label shall expire on December 31st of the 5th year after the date of manufacture as indicated by the label. If for example the manufacture date is 2014 the fifth year <u>after</u> the date of manufacture is 2019. SFI labels, with expiration dates, expire on December 31st of the labeled expiration date.
   ii. Restraint systems homologated to FIA specification 8853/98 and 8854/98 will have a label containing the type of harness designation ('C-###.T/98 or D-###.T/98) and date of expiration which is the last day of the year marked. All straps in this FIA restraint system will have these labels.
   iii. If a restraint system has more than one type of certification label, the label with the latest expiration may be used.

g. Harness Threading: Assemble in accordance with manufacturer's instructions. If no manufacturer instructions are given, use the methods shown in Figures 10-15.

Figure 10

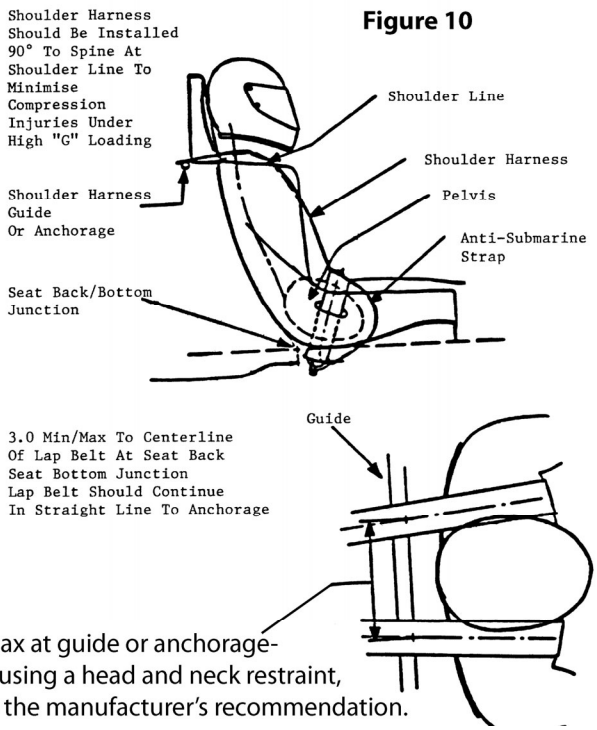


Figure 11

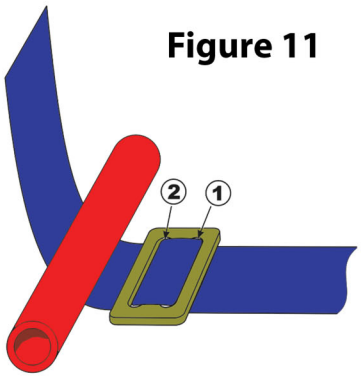


Figure 12

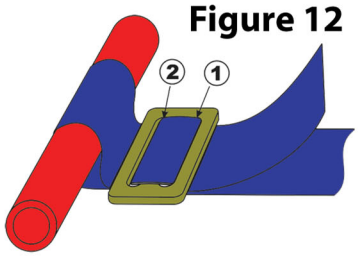


Figure 13

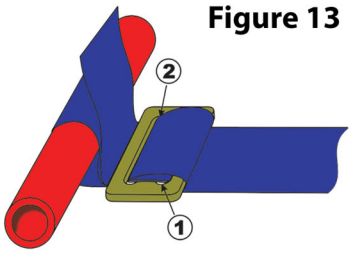


Figure 14

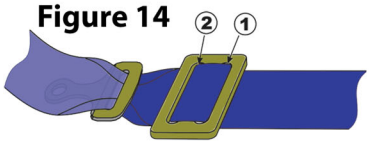
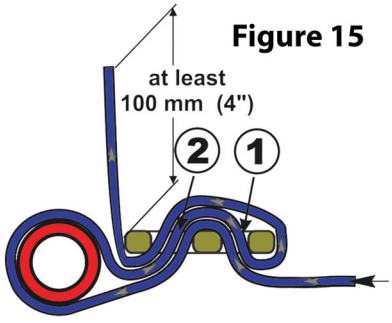


Figure 15



3. Fire System

All cars shall be equipped with an On-Board Fire System.
It is recommended that all cars employ onboard fire systems that meet the following requirements:

- Systems certified to SFI specification 17.1 or 17.2, or
- Those listed by the FIA on Technical List No. 16

The following information must be visible of the unit:

- Certification label
- Capacity
- Type of extinguishing agent
- Weight, or volume, of the extinguishing agent

Cars shall meet the following regardless of registration date:

iv. The fire system cylinder shall be securely mounted in such a manner that it can be checked during a technical inspection and may be removed for weighing periodically for compliance to full weight shown on the cylinder. (Weight is without valve assembly.)

v. Manual or automatic release is allowed. The release mechanism shall be within reach of the driver when belted in the car.

vi. All on-board fire systems shall be identified with two circle "E" decals–one at the release location and the second on the outside bodywork in line with or as near to the release location as possible.

On Board Fire System
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4. Firewall and Floor

Firewall and floor shall prevent the passage of flame and debris into the driver's compartment. Insulation or heat-resistant material may be added to the interior (cockpit) surfaces of the firewall, floor, and transmission tunnel.

5. Fuel Cell Specifications

Stock fuel tanks located between the axle center lines and within the main chassis structure (i.e., frame rails, etc.) may be used in its stock location or replaced with a safety fuel cell. Stock fuel tanks outside of these dimensions must be replaced with a safety fuel cell.

All safety fuel bladders shall be constructed and certified in accordance with the FIA FT-3 or higher (FT-3.5, FT-5, etc.) or SFI 28.3 specifications. Fuel cells do not time out and have no expiration date. All safety fuel cells shall consist of a foam-filled fuel bladder enclosed in a metal container at minimum.

There is no restriction of fuel cell capacity or dimensions of the fuel cell, except where otherwise specified.
The installation of more than one cell is permitted.

a. Installation

Internal body panels may be modified to accommodate the installation of fuel cells as long as modifications serve no other purpose. If installation includes encroachment into the driver's compartment, a metal bulkhead must prevent exposure of the driver to the fuel cell. The fuel cell must not be installed any closer to the ground than 6 inches, unless enclosed within the bodywork or OEM floor pan.

i. There must be a metal bulkhead between the driver/passenger compartment and the compartment containing the fuel cell. This includes fuel cells that are flush mounted with driver/passenger compartment panels or otherwise exposed to the driver/passenger compartment.

ii. Fuel cells must be located within 12 inches of the standard tank. The 12 inch measurement is taken from the perimeter of the stock and alternative fuel cell. Fuel filler location is unrestricted with installation of a safety fuel cell.

b. Container

The bladder shall be installed in a container of .036 inch steel, or .059 inch aluminum that fully surrounds the bladder.

c. Fuel Cap and Vents

A positive locking fuel filler cap (no Monza/flip type) shall be used. Fuel pickup openings and lines, breather vents, and fuel filler lines shall be designed and installed so that if the car is partially or totally inverted, fuel shall not escape. Fuel filler necks, caps, or lids shall not protrude beyond the bodywork of the car.

If the fuel filler cap is located directly on the fuel cell, a check valve is not required, provided the filler cap is a positive locking type and does not use an unchecked breather opening. If the filler cap is not located on the fuel cell, a check valve must be installed on the fuel cell to prevent fuel from escaping if the cap and filler neck are torn from the tank.

Fuel cell breathers shall vent outside the car and away from the exhaust.

d. Rotary Molded Cell
The use of rotary molded fuel cells not having a bladder, or not contained in a metal can, is allowable in those cars that do not require the use of a fuel cell, but where they are an allowed option.

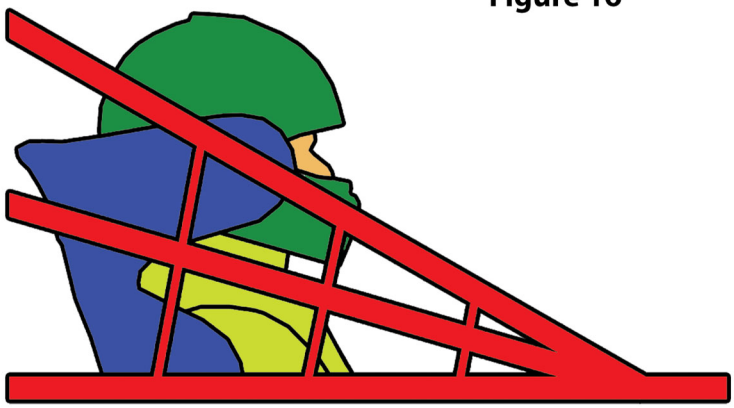
e. Fuel Tank Filler Doors
On vehicles where a stock fuel tank is allowed, the unleaded fuel filler trap door and restrictor plate in the filler neck may be removed.

f. Dry-break fillers will be permitted. Details TBD.

6. Fuel, Oil and Water Lines
All fuel, oil, and water lines, including gauge and vent lines, that pass into or through the driver/passenger compartment, shall be of steel tube or metal braided hoses or protected by a wall–like bulkhead container (Cool suit lines are exempt). The driver shall not be exposed to header tanks. Heat shielding between fuel/oil lines and fuel/oil filters and exhaust components is strongly recommended.

7. Inside Net
An inside net running between the main roll hoop and the dash is recommended for all vehicles. It is recommended that the lower strand of the net pass the shoulder and run horizontally from the cage to the dash. The upper strand should pass the Cg of the helmet in the side view. The net should run parallel to the center of the car in plain view and be as close to the seat as possible. It is recommended that the net be tensioned tightly and have a way to quickly disconnect it in case the driver needs to exit through the car in an emergency. Metal collars, or some other equivalent method, should be used to keep the strands of the net from moving along the roll cage. If possible, the recommended mounting method is to wrap the net strands around the back of the seat and attach them to the main hoop upright. However, teams should consult the net manufacturer to verify their recommended method of mounting.

Figure 16



8. Seats
The driver's seat shall be a one-piece bucket-type seat and shall be securely mounted, so as to provide fore/aft and lateral support.

Mounting structures for racing seats may attach to the floor, cage and or center tunnel. Seat mounting points forward of the main hoop, between the center line of the car and the driver's side door bar and rearward of the front edge of the seat bottom are not considered cage attachment points in classes with limitations on the number of attachments.

A system of head rest to prevent whiplash and rebound, and also to prevent the driver's head from striking the underside of the main hoop shall be installed on all vehicles. Racing seats with integral headrests satisfy this requirement.

The head rest on non-integral seats shall have a minimum area of 36 square inches and be padded with a minimum of one inch thick padding. It is strongly recommended that padding meet SFI spec 45.2 or FIA Sports Car Head Rest Material. The head rest shall be capable of withstanding a force of two-hundred (200) lbs. in a rearward direction. The head rest support shall be such that it continues rearward or upward from the top edge in a way that the driver's helmet can not hook over the pad.

Stock passenger seats shall be removed. A passenger seat meeting all the specs of the driver's seat may be installed in the front passenger seat position. The seat may not be occupied during SCCA racing events.

9. Window Safety Nets

Window safety nets shall be used on the driver's side window of all closed cars unless these are factory (OEM manufacturer) prepared cars with fixed Lexan front door windows as noted on a Specification Line. All window nets shall meet SFI Specification 27.1., and shall bear an "SFI Spec 27.1.,Label" to that effect. Alternatively, window nets that meet the requirements of FIA J253.11 may be used. Competitors must provide proof of meeting the FIA standard, either via certification or physical measurement. (Note: Window nets need not be dated.) The window net shall be equipped with a quick release device and when released it shall fall down, thus not having to be flipped up on the roof. Nets shall be attached to the roll cage; plastic buckles, cable ties, hose clamps, and elastic cords are not permitted. Holes in the roll cage to accommodate either support rod are unacceptable unless bushed and welded completely. Refer to figures 17 and 78, "Proper Window Net Installation," for additional information on mounting methods. Closed cockpit Sports Racing cars may use arm restraints in lieu of a window net. Legends Cars are not required to have window net.

Figure 17

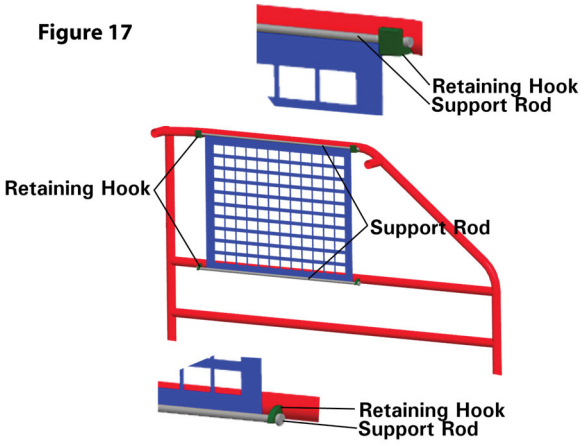
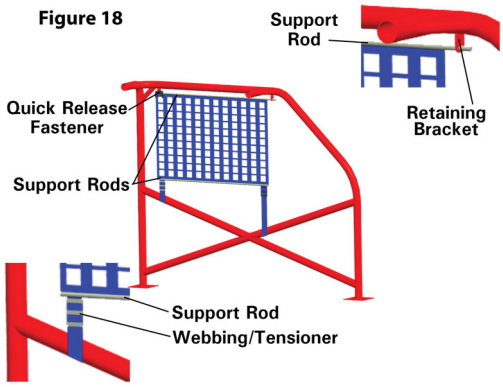


Figure 18



B. Driver's Safety Equipment

1. Annual Inspection

At or before the first event of the calendar year, all driver's safety equipment will be inspected by a licensed scrutineer. The scrutineer performing the inspection shall affix a dated, non-removable sticker or decal on the left side of helmets that comply with Section 1.4.B.3.b., to indicate that all driver's safety equipment has been inspected and is in compliance with this section. This sticker or decal, which shall be placed on the helmet in a manner such that it is visible from outside the car with the driver seated and belted in the normal driving position, may be checked by grid or scrutineering personnel on the starting grid. The presence of other externally visible driver's safety equipment (gloves, balaclava, and suit) may also be checked by grid or scrutineering personnel on the starting grid.

2. Reinspection

Throughout the racing season, a check of the condition and legality of driver's safety equipment should periodically be done by scrutineers in impound by group or class with the concurrence of the Race Director or Chief Steward.

3. Required Equipment

The following required equipment shall be in good condition and free of defects, holes, cracks, frays, etc.

a. Driving suits that effectively cover the body from the neck to the ankles and wrists. One-piece suits are highly recommended. All suits shall bear an SFI 3.2A/1, SFI 3.4 or higher certification label or FIA 1986 Standard or FIA Standard 8856-2000 homologation label. Underwear of fire-resistant material shall be used, but is optional with suits carrying an FIA Standard 1986 Standard or FIA Standard 8856-2000 label or SFI 3-2A/5 or higher (e.g., /10, /15, /20) certification label.

b. Crash helmets approved by the Snell Foundation with Snell sticker 2015 or later Special Application SA2015/SAH2015, or SA2020/SAH2020, or by the SFI with a SFI Sticker SFI 31.1/2015 or newer, or by the FIA standard 8859-2018 or FIA 8860-2004 or newer. SFI labeled helmets must have a year printed on the label to be valid. Each driver's helmet shall be labeled with a minimum of the driver's name. The use of a head and neck restraint system that has been certified in accordance with SFI 38.1 or FIA 8858-2002 or 8858-2010 is required; an SFI 38.1 or FIA 8858-2002 or 8858-2010 label must be properly affixed to the device. Accident damaged helmets should be sent by the driver or his or her representative to the Snell Memorial Foundation, 3628 Madison Ave., North Highland, CA. 95660 (ph.) 916-331-5073 (attn. Edward B. Becker). Details of the accident should be included. Freon based total loss helmet cooling systems are not allowed.

c. Gloves made of leather and/or accepted fire-resistant material containing no holes.

d. Socks made of accepted fire-resistant material.

e. Face coverings (balaclavas) of accepted fire-resistant material for drivers with beards or mustaches. Hair protruding from beneath a driver's helmet shall be completely covered by fire resistant material. As an alternative to balaclavas, a full helmet skirt of accepted fire-resistant material may be used. Double-layer balaclavas are recommended. If balaclavas are used voluntarily, they shall be of accepted fire-resistant material.

f. Goggles or face shields, preferably made of new impact resistant materials, for drivers of open cars.

g. A driver's restraint system meeting SCCA standards shall be always used while on the track.

h. Shoes, with uppers of leather and/or nonflammable material that at a minimum cover the instep. Ventilation pinholes by the manufacturer are allowed.