Modified (AM, BM) - Appendix A

MODIFIED CATEGORY

All listed weights are with driver except where noted otherwise. Weights not listed default to the appropriate SCCA® Club Racing GCR (General Competition Rules) reference. "Car" is defined in Section 12. In the Solo® Rules Sections where preparation allowances are specified and if there are conflicts with the GCR allowances, the Solo® Rules shall take precedence.

MODIFIED CLASS A (AM)

Cars with a minimum weight of 900 lbs. with driver and a minimum 72" (182.9 cm) wheelbase, plus Formula SAE as specified in Section 18.5. Club Racing GCR-compliant Formula S (FS) and A Sports Racer (ASR) vehicles may compete in this class.

MODIFIED CLASS B (BM)

All Formula Cars or Sports Racers compliant under the current Club Racing GCR Sections 9.1.1.A.1 a-h or 9.1.8.D.1 A-H, unless specifically classed elsewhere, with the following exceptions:

A. Spec tires are not required.

- B. Minimum wheelbase of 80" (203.2 cm).
- C. Sports Racers and all Open-Wheel Cars including Formula Atlantics:
 - 1. Turbocharged and supercharged engines are not permitted.
 - 2. May use any automobile-based 2v/cyl engine up to 1300 cc, any 2-stroke motor up to 900 cc, any 4v/cyl or more engine up to 1005 cc.
 - Minimum weight with driver (lbs.):1020
 - 3. May use any 2v/cyl automobile-based production engines up to 1615 cc.
 - Minimum Weight with driver (lbs.):1110
 - 4. May use any 4v/cyl or more engine up to 1615 cc. May use any 2-stroke up to 1300 cc or Mazda 12A rotary with any porting and any carburetion. May use fuel injection without weight penalty as required by the GCR.
 - 5. May use any engine up to 3000 cc.
 - Minimum weight with driver (lbs.):1285
 - 6. Minimum rim width:.....none
 - 7. Maximum allowed rim width (in.):15
 - 8. Transmissions No restriction on mechanical shift sequence/pattern, use of transverse types (motorcycle transmission or similar), number of gears, or use of CVT in any vehicle.
 - 9. Minimum width for all cars shall be no less than 57" as measured at the narrowest end of the car at the tire outer sidewalls with a minimum 14 psi of tire pressure.

- 10.All prohibited cost control items in P2 per GCR Section 9.1.8.D.A apply to formula cars as well as sports racers with the following Solo® changes to the list:
 - a. All chassis/tub over 75% composite are allowed and incur no weight penalty unless under either 96" wheelbase or 66" rear sidewall-to-sidewall outside width (measured with tire pressure at least 14 psi), in which case minimum weight is increased by 50 lbs.
 - b. Direct injection for non-automobile engines incurs a weight adjustment of an additional 25 lbs.
- D. Formula 2000 and Formula Continental per GCR/FCS:

 - 2. Rim width:.....unrestricted
 - 3. Airfoil maximum size per Formula Atlantic rules.
- E. Aerodynamic restrictions for Sports Racers:
 - 1. The total area when viewed from the top of front and rear wings shall not exceed 8 sq. ft. (0.743 m²). Area calculation is of the airfoil element plan view and does not include side plates. Side plate area and element profile are unrestricted.
 - 2. Cars with underbody features built in excess of P2 aerodynamic allowances (2015 GCR Section 9.1.8.D and 9.1.8.E) must meet a weight penalty of 50 lbs. and must be constructed within the following limitations:
 - a. For the full width of the body the floor pan will be a minimum of 45% of the wheelbase; the lower surface (surface licked by the air stream) shall not exceed ± 1 " (2.54 cm) deviation in any longitudinal section through the plane forming the bottom of the tub or chassis floor. The 45% minimum (of the wheelbase) dimension is measured from the point that the surface meets the full width of the body (behind the front wheel or in front of the rear wheel). (This is not to be interpreted as requiring a floor pan beneath the motor, transaxle, transmission, or final drive housing.) See figure.



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- b. No aerodynamic devices (e.g. "skirts," body sides, etc.) may extend more than 1 cm (0.394") below this lower surface anywhere on the car to the rear of the front axle. Seat bucket or other protrusions shall not circumvent this rule.
- 3. The current GCR P2 underbody aero specifications shall apply to all sports racers and production cars as recognized in DM and EM running in BM as sports racers.
- 4. Production cars running in BM must have the tires as viewed from above at least half covered. Cycle fenders may be used to comply with a sports racer classification.
- F. Aerodynamic restrictions for Formula Atlantic (all open-wheel in BM) shall follow the current Club Racing GCR Formula Atlantic Preparation Rules with the following Solo® allowances:
 - 1. Wings and all other aerodynamic devices front and rear may match but shall not exceed sports racer P2 GCR maximum height (45.25" per P2 GCR 9.1.8.D.D.2).
 - 2. Front wing width may match but shall not exceed overall front width as measured at the tires. Front wing elements may not extend behind the front wheel centerline.
 - 3. Rear wing width shall not exceed the Club Racing FA specs with the exception that endplate gurney lips are not included. Endplate Gurney lips shall not exceed 7 cm (2.756") additional width per side and shall not deviate more than 10° from vertical. No part of the entire rear wing assembly, including wing elements and end plates, shall extend more than 1 m (39.37") to the rear of the rear wheel center-line.
 - a. Except for cars meeting the dimensions of subsection F.3.b herein, the rear wing element assembly maximum plan view fore-aft dimension shall not exceed 70 cm (27.56").
 - b. For cars 66" wide or more at the rear tires and which also meet a weight of 1180 lbs, the fore-aft dimension of the rear wing element assembly plan view shall not exceed 90 cm (35.43").
 - 4. Side pod or other parts not considered chassis are not required to attach or stay above a line situated 1 cm (0.4") above the chassis bottom (this is an exception to GCR 9.1.1.A.1.g.10).
 - 5. Flexible ground sealing is permitted on cars 66" wide or more at the rear tires and which also meet a weight of 1180 lbs.

MODIFIED CLASS C (CM)

A. Modified Class C (CM) allows the Solo® Vee and the following SCCA® Club Racing GCR-compliant cars: Spec Racer Ford (SRF), Formula F (FF). Within the limitations of the GCR, additional frame bracing, suspension and steering changes, relocation of ancillary components (radiators, batteries, etc.), and their associated mounting brackets is

permitted. Nothing in these rules is to be construed as overruling any GCR construction requirements or limitations except for those safety items which the Solo® Rules do not require. The purpose of these rules is to maintain the value of these cars for Club Racing and therefore their market value, and to prevent special Solo®-only Formula F vehicles. Exceptions to the Club Racing GCR for all cars in this class:

- 1. Spec tire requirements do not apply.
- 3. Only cars produced by the following manufacturers are eligible for FF in this class: ADF, Alexis, Anson, Caldwell, Citation, Crossle, Dulon, Eagle, Elden, Forsgrini, Gemini, Hawke, Konig-Heath, LeGrand, Lola, Lotus, March, Merlyn, Mondiale, Piper, PRS, Reynard, Royale, Stohr, Swift, Tiga, Titan, Van Diemen, Winkleman, and Zink. The SEB may add to this list at any time, effective upon notification of the membership.
- B. Other Club Racing GCR-compliant Formula Cars
 - 1. Formula Vee (FV)
 - 2. Formula First (FST)
- C. Solo® Vee as per the following definition: Solo® Vee is based on Club Racing Formula Vee (FV) and all cars shall meet all specifications described in the Club Racing GCR Sections 9.1.1.C.1, C.2, C.3, C.4, C.6, C.7, C.8, C.9, C.10, C.11 and C.12 except as amended in these rules. No permitted or alternate component or modification shall additionally perform a prohibited function.
 - 1. Engine Choices
 - a. Any standard 1600 cc or smaller air-cooled automobile engine manufactured by Volkswagen (VW) for sale in VW vehicles available to the general public for purchase in the US is allowed.
 - Solo® Vee engines may increase compression up to and including 10:1 ratio with OE bore and stroke. Compression ratio may be increased by additional machining of any factory machined surface on the cylinder heads only. Fuel injection is prohibited. Valve size may be increased to a maximum of 40.0 mm intake and 35.5 mm exhaust. Port location may not be changed from OE standard. Machining of any type in the combustion chamber such as, but not limited to, valve unshrouding is prohibited. Valve guide centers shall remain OE standard. OE standard heads shall be used; however, alternate VW heads with casting numbers 040 101 355 or 043 101 375 may be substituted. Any single carburetor (regardless of the number of venturis) is permitted. Multiple carburetion is restricted to a maximum of

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two 44 mm carburetors with 28 mm ventures. If a balance tube is used between manifolds runners, it shall be restricted to one $\frac{1}{2}$ " (0.500", 50.8 mm) ID pipe. Any intake manifold not having a plenum chamber is permitted.

OR

- 2. Increase bore up to and including 94 mm maximum per cylinder, total displacement of 1915 cc. Machining to allow the installation of the cylinders is permitted. No other combustion chamber machining (such as, but not limited to, unshrouding of the valves) is permitted. Valve guide centers must remain OE standard. Increased displacement engines up to 1915cc are restricted to maximum valve sizes 39 mm intake and 32 mm exhaust. Port location may not be changed from OE standard. OE standard heads shall be used; however, alternate VW heads with casting numbers 040 101 355 or 043 101 375 may be substituted. A maximum compression ratio of 9:1 is permitted. Compression ratio may be increased by additional machining of any factory machined surface. Any single carburetor may be used. Multiple carburetors are prohibited. Any intake manifold not having a plenum chamber is permitted.
- b. There shall be no mixing of allowances (e.g., carburetors from 1 above and displacement from 2 above).
- 2. Engine Components
 - a. Mixing of parts between different air-cooled engine models is permitted. All parts must meet VW specifications for engines delivered for use in the US in VW vehicles unless otherwise noted herein.
 - b. Balancing of all moving parts is permitted provided balancing does not remove more material than necessary to achieve balance.
 - c. Parts from alternate manufacturers or remanufactured parts are permitted provided said parts are of the same material, are dimensionally identical, and meet all original VW specifications for engines delivered for use in the US in VW vehicles. This would include VW replacement heads as specified without raised ports and aluminum engine cases. Aftermarket magnesium engine cases may also be substituted.
 - d. The flywheel from either the alternate engine or from the 1200 cc engine may be used. Minimum flywheel weight is 12 lbs. Any single-disc clutch may be used. The transmission housing may be machined to provide clearance when using the alternate engine/ flywheel assembly.
 - e. Any exhaust system which terminates more than 3" (7.62 cm) behind the rearmost part of the body may be used.

- f. Counterweighted crankshaft and 8-dowel pinned crankshaft-toflywheel mounting are allowed. All journal dimensions and relationships with each other must remain as standard. Crankshaft journals may be ground undersize a maximum of 0.030" (0.762 mm) less than standard dimensions. Crankshaft pulley is unrestricted.
- g. Deep sump oil pan up to 2.5 qt. (2.37 L) additional capacity is permitted. The installation of baffles housed completely within the oil pan and crankcase is permitted. The use of any standard VW oil pump is permitted. Dry sump systems are permitted. Replacement of oil gallery plugs with threaded plugs is permitted. Oil filters and oil coolers are unrestricted provided that they are securely mounted completely within the bodywork. A pressure accumulator (e.g., Accusump®) may be fitted.
- h. Camshaft and valve train components are unrestricted with the following exceptions:
 - 1. Pushrods shall be made of metal.
 - 2. Valve lifters (tappets) shall be dimensionally and functionally identical to and made of the same material as the standard VW parts.
 - 3. Roller camshafts are prohibited.
 - 4. Rocker arms shall be standard ratio VW.
 - 5. Valve guide material is unrestricted provided that the distance between valve centers and the angles of the valves does not change.
- i. Porting, polishing, and machining of the intake and exhaust ports is permitted. The addition of material in any form is prohibited. Valve seat angles are unrestricted.
- j. Compression ratio may be increased by additional machining of any factory machined surface on the cylinder heads only. Installation of a spark plug hole repair utilizing standard thread repair methods (e.g., Heli-Coil®) is permitted providing that the spark plug centerline is not changed.
- k. Complete or partial removal of any cooling duct component. Removal of the fan and the fan housing is permitted. Any electric fan is permitted for cooling the engine or engine oil.
- l. Voltage regulator, generator, and/or generator stand may be removed.
- m.One or more batteries may be used.
- n. Any ignition system that utilizes a distributor for spark timing and distribution may be used. Distributor shall require no modification to the engine for installation. Internal distributor components and distributor cap may be substituted.

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- o. Valve covers are unrestricted and may be bolted on.
- p. Electric radiator/engine cooling fan(s) may be installed.
- 3. Transaxle
 - a. Aftermarket shift forks/shift rod/mounting parts and alterations required for their installation is permitted with the intent of facilitating reliable H-pattern shifting.
 - b. This allowance does not include sequential shifting (push button or single axis lever movement) mechanisms or electric/gas assist. Cable/hydraulic actuating mechanisms are allowed.
 - c. Any primary or final drive gears of any origin may be used. This does not allow the use of alternate transaxles. A reverse gear is not required.
 - d. A device for locking-out reverse gear may be used.
 - e. A limited-slip differential (LSD) is permitted.
- 4. Bodywork
 - Bodywork to the rear of the main roll hoop may be removed.
- 5. Front Suspension

The front suspension shall be standard VW Type 1 sedan H-beam front suspension (i.e., link pin or ball joint) or an exact replica of one of them and dimensionally identical. Aluminum H beams are prohibited. The following modifications are permitted:

- a. Lugs welded, brackets attached by welding or otherwise, and holes drilled in the H-beam to permit attachment of the beam to the chassis, and components wholly or partially to the beam. Brackets may be welded to the torsion arms for the sole purpose of actuating the shock(s) and/or external mounted anti-roll bar and shall perform no other functions.
- b. Open springs. Torsion bars may be used in conjunction with coils or may be removed entirely. "Coil-overs" are permitted.
- c. Removal of the shock towers above the upper H-beam tube centerline.
- d. Relocation of the shock dampers. Shock dampers and their actuation are free.
- e. The use of any anti-roll bar or bars, internal or external, mounting hardware, and trailing arm locating spacers. The anti-roll bar fitted as part of the standard suspension may be removed. Anti-roll bars may not be cockpit adjustable.
- f. Replacement of torsion bar rubbers with spacers of another material.
- g. Installation of any ride height adjuster(s).
- h. Removal of the drum brake backing plates.
- i. In the link pin suspension, non-standard offset link pin bushings

in order to obtain desired negative camber. Clearancing of carrier or trailing arm to prevent binding is permitted. The rubber portion of the bump stop may be removed. Caster, camber, toe-in, and link pin inclination are free.

- j. In the ball joint suspension, the camber/caster adjusting replaced with an aftermarket nut of different design. Caster, camber, and toe-in are free.
- k. Any wheel bearings that fit the VW sedan spindles and brake drums or disc brake hubs without modification.
- 1. Steering column altered or replaced. Steering wheel is free and may be detachable. Steering mechanism is free but tie rods must attach to the spindle using existing steering arm, a modified steering arm, or a suitable new or modified bracket welded to the spindle. Ball joints in the tie rods may be replaced with rod ends.
- 6. Wheels
 - a. Any wheels and tires are allowed. Resulting track changes are allowed. Studs may be substituted for wheel attachment bolts in the original location. Bolt pattern may be changed.
 - b. 4- or 5-lug wheel hubs may be used. Wheel mounting lug bolts may be replaced with studs.
- 7. Rear Suspension
 - a. The rear axle and tube assembly shall be standard VW Type 1 sedan (up to 1966) swing axle (no outer pivot point for a half shaft) with axle location provided by a single locating arm on each axle. The rear axle tube may be rotated about its axis. The standard shock mounting and brake pipe brackets may be removed.
 - b. The rear axle bearing retainer flange mating surface may be machined or shims may be installed under the rear axle bearing for the sole purpose of adjusting bearing axial float.
 - c. Springs, shock dampers, their actuation, anti-roll bars, and camber compensating devices are unrestricted, as are cables, straps, or other positive stops used to limit positive camber.
- 8. Braking System Front and Rear
 - a. Standard VW Type 1-3 brake components, disc or drum, may be used including any standard VW Type 1-3 original. Use of aftermarket hubs, disc or drum brake components in the front or rear of the vehicle, or any combination thereof is unrestricted as long as the units chosen are deemed safe.
 - b. Caliper housing material may be removed on the outer radius surface of the outer piston housing to clear the inside of the rotating wheel.
 - c. Any type lining or pad material may be used.

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- d. Adapter plates may be fitted to allow mounting of front or rear brake calipers.
- e. Cross-drilling or grooving of rotors is permitted. Rotors made of a ferrous material shall be used on both the front and rear of the car.
- f. Caliper mounting is free. Rotors must be of ferrous material. Hubs and hats may be made of ferrous material or aluminum.
- g. The car shall be equipped with a dual braking system operated by a single control. In case of a leak or failure at any point in the system, effective braking power shall be maintained on at least 2 wheels.
- h. A separate hand brake is not required. Removal of the hand brake and operating mechanism is permitted.
- i. Brake lines may be of any suitable material, including steel braided lines.
- 9. Weight

MODIFIED CLASS D (DM)

Modified Production and GT cars with internal combustion engine displacement 2000 cc and under as follows:

- A. The Mazda 12A and 13B Rotary engines are permitted in DM with the following restrictions:
 - 1. No replacement of cast iron engine case segments with aluminum.
 - 2. On the 12A engine, only side and rotor housings from 1974-86 engines shall be used.
 - 3. No replacement of 12A or 13B sections, such as side plates, with those from other series engines (i.e., Renesis-type parts).
 - 4. On 12A engines: no peripheral-porting or J-porting is allowed. Bridge-porting that does not cut into the water O-ring is permitted. On 13B engines, 4- and 6-port: Maximum porting permitted is street-porting. No bridge-porting, J-Porting, or peripheral-porting.
- B. Weight with driver vs. computed displacement (lbs.):
 - Piston engines, normally-aspirated up to & including 1800 cc 1280
 - 12A rotary engines, normally-aspirated w/ porting restriction 1280
 - Piston engines, normally-aspirated 1801-2000 cc1380
 - 13B rotary engines, normally-aspirated w/ porting restriction 1380
- C. Performance Adjustments (lbs.):

•	AWD A	dd 200
•	Modified Tub	Add 40
•	TCSA	dd 200

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• ABS and/or SCS (no additional weight adjustment).....Add 250

D. Weight Bias Adjustment with driver sitting in the driver's seat (lbs.):

- RWD with less than 51% weight on drive wheels Deduct 35
- FWD......Deduct 35
- AWD.....Not affected

MODIFIED CLASS E (EM)

Modified Production and GT cars as follows:

A. Weight with driver vs. Displacement (lbs.):

- Piston engines up to & including 3200 cc OHC......1700
- Piston engines up to & including 4500 cc pushrod/OHV1700
- Piston engines unlimited displacement 1800

B. Performance Adjustments (lb.):

- AWD...... Add 300

- ABS and/or SCS (no additional weight adjustment)...... Add 375
- C. Weight Bias Adjustment with driver sitting in the driver's seat (lbs.):
 - RWD with less than 51% weight on drive wheelsDeduct 50
 - FWD......Deduct 50

Modified class F (FM)

- A. Club Racing GCR-compliant Formula 500 (F5) with the following exceptions (listed weights are with driver):
 - 1. F5 cars manufactured prior to the current requirement for rubber vibration isolation need not conform to the current GCR Section 9.1.1.D.3.C.
 - 2. F5 cars manufactured prior to January 1, 1990 need not comply with crushable structures as defined in the current GCR Section 9.1.1.D.9.
 - 3. F5 cars manufactured prior to January 1, 1990 which utilize a 73" (185.42 cm) wheelbase may compete even though the driver's feet extend beyond the front edge of the wheel rims.
 - 4. Minimum weights with driver (lbs.):

•	Kawasaki engine7	25
•	AMW engine	00
•	Rotax 493 & 494 engine80	00
•	Rotax 593 engine	50
•	600 cc motorcycle engine8	75
•	Wheelbase of 73" or less with 440 engine	25
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- 5. Rotax 493- & 494-powered cars are permitted to use 34 mm or 38 mm Mikuni round-slide carburetors. AMW powered cars may use either the 38 mm AMW carburetors or update to the 38 mm Mikuni round-slide carburetors. In order to accommodate the use of the approved Mikuni VM 38mm sidedraft carburetors on the AMW engine, the use of the AMW intake manifold (part #2736-00) is permitted as are the AMW rubber attachment boots, gaskets, and/or hardware required for the use of this manifold. Competitors using the Rotax 494 RAVE engine are required to use the 494 non-RAVE rotary valve (Rotax part #924509 or 924508, Ski Doo prefix 420, 147 degree designation that opens @ 135° BTDC and closes @ 64° ATDC) in their engine. RAVE valves shall be blocked in the "full open" position or left as delivered. No other alterations are permitted. 494 RAVE and non-RAVE parts may not be interchanged between the two engines unless specifically noted.
- 6. Competitors utilizing the Rotax 493 engine may leave the manufacturer's specified intake balance tubes in place or, at their option, completely remove the tubes and make the alterations required to plug the remaining holes. No unnecessary alterations are permitted if the competitor chooses to remove the tubes. The Rotax 493 engine is limited to a Y-pipe exhaust manifold and single expansion chamber as are the Rotax 494 and AMW engines.
- 7. F5 cars may utilize the Rotax 593 engine (1999 and up; bore: 76 mm, stroke: 65.8 mm) using 38 mm Mikuni roundslide carburetors as an alternate 2-cylinder, 2-cycle, liquid-cooled engine in FM. Such engines must use inlet tract restrictors (Cometic gasket #MA0242S-P1020A), one in each tract immediately after the carburetor. Use of the 2003 and up "HO," "SDI," "RS," and "E-TEC" 593 variants is not permitted.
- 8. All F440 & F500 engines may use any water thermostat. It may be modified or completely removed as necessary to aid water cooling. The water bypass may be blocked and alternate water cooling plumbing may be used. Electric water pumps may be used.
- 9. F440 & F500 cars in FM are not required in Solo® to have the sidepods now mandated by Club Racing if they were manufactured prior to 1984 in which that requirement was added to the GCR. Sidepods may not be removed from a car which was originally manufactured with them. The measurements for the height, the maximum width (bodywork), and the distance from the tires to the sidepods as specified in the GCR, Bodywork D.9.C, shall have an allowance from the GCR of ±1" (±25.4 mm). It is the intent of this allowance to maintain the ability of the sidepod(s) to continue to hold such items as fuel tanks, battery, and radiator(s), but not to allow sidepods to be used for ground effects to achieve aerodynamic downforce on the vehicle.

10.Electric radiator/engine cooling fan(s) may be installed.

B. Dwarf Cars®, 600 Racing Inc Legends Cars®, and Baby Grand Cars® Vehicles built and prepared to Western States Dwarf Car Association® (WSDCA®), US Legend Cars International®, or MMRA® Baby Grand® specifications are assigned to Modified Class F (FM).

NOTE: If any conflict exists between the WSDCA®, US Legend Cars®, or Baby Grand® Rules and the Solo® Rules, the Solo® Rules shall take precedence.

- 1. Cars prepared to these specifications are required to comply with the appropriate rules from their sanctioning body, except for the items listed below:
 - a. Any tire (including recaps) meeting the applicable portions of Section 3.3 are allowed.
 - b. Any differential and final drive gear ratio may be used.
 - c. Any shock absorber may be used.
 - d. Any wheel up to 10" wide and any diameter may be used.
 - e. Any anti-roll bar may be used.
 - f. Any air filter is allowed.
 - g. Any ballast is allowed provided it is mounted securely per the Solo® Rules.
 - h. Any battery may be used.
 - i. Engine does not need to be sealed but must conform to the appropriate rule set.
 - j. Minimum weight with driver (lbs.):1250
- 2. WSDCA®, US Legend Cars®, and Baby Grand® specific items not required are as follows:
 - a. INEX-approved manufactured metal seat. Mounting guidelines still apply.
 - b. Seatbelt harness dating requirements.
 - c. Quick-release steering wheels.
 - d. Fire extinguishers.
 - e. Fire-retardant driver suit and gloves.
 - f. Neck braces.
 - g. Head and neck restraints (HNR).
- 3. Current Solo® Rules override WSDCA®, US Legend Cars®, and Baby Grand® rules for the following items:
 - a. Helmets.
 - b. Car number and class designation.
 - c. Exhaust system, muffler, and tailpipe.