



2009 NORRA COMPETITION RULES

Originally Published AUGUST, 1972, Updated August 2009

(This issue supercedes all previous issues of the NCR)

I. Purpose:

NORRA's purpose is the revival, promotion and historical preservation and use of Off Road racing vehicles, operated in a spirit of safety consciousness among their drivers and crews and maintained in an atmosphere of friendly competition at NORRA events. The object is to present a venue for vehicles that are accurately prepared to a period configuration and specification, so as to recreate a lost era in motor sports. Appearance of the vehicle and authenticity of its configuration is a vital component of NORRA acceptance.

Vintage Off Road Racing is an amateur sport where the pleasure of "Taking Part" must exceed the desire to "Win at All Cost." All competitors must know the limits of their skills and of their machines.

II. Vehicle Eligibility:

A. Definitions:

1. Eligibility period: A historic period beginning with 1955 and ending in 1989.
2. Time line: A date that defines an eligibility period.
3. Period specification: The configuration of a vehicle as raced during the eligibility period.
4. Continuation vehicle: A make or model that was manufactured after the end of an eligibility period, but is identical to those produced during the eligibility period.
5. Replica: A race vehicle whose actual construction was by other than the original manufacturer, or at a date later than the original production run, but still accurately meets the period specifications of the original.
6. Year of Manufacture: (YOM) Actual year vehicle was built
7. Year of Preparation (YOP) Year represented by newest racing specifications found on the vehicle, regardless of YOM

B. Acceptance: All vehicles must have a current Vehicle Information Sheet (VIS) and photo on file before an entry will be accepted. NORRA may accept non-complying vehicles including replica vehicles from time to time at its discretion. Participation at an event or the issuance of a logbook is no guarantee of continued acceptance.

C. Competition Categories: NORRA defines 11 Competition Categories at the present time. These may be combined or divided from time to time depending on the schedule and entries at a particular event. NORRA reserves the right to alter these groups as necessary to provide safe and fair competition. **Each Race Group has a sheet that shows the classes and any rules (GSR) that are particular to that Race Group.**

III. Vehicle Preparation:

These rules are general in nature and may not apply to every vehicle accepted by NORRA. It is not possible for NORRA to publish rules that will accurately define the period authenticity for all eligible vehicles. It is therefore the responsibility of each competitor to research the proper period specification for his vehicle, and to present it as such. **Supplemental Regulations (SR) are published for most Makes & Models and they give specific details on permitted options and modifications.** The (SR) are to be used in conjunction with the NORRA Competition Rules (NCR). When in conflict the (SR) takes precedence. For each Competition Category, the (NCR) contain details that apply to that group only and these should be considered when preparing a vehicle. Proof of any unusual specification or configuration is the responsibility of the competitor. Updating or backdating within a recognized model (body type) production span is allowed as long as it does not cross an eligibility time line. Continuation vehicles may be accepted, but they must be backdated to the eligibility period.

1. **A. Body:** The body configuration should be as raced "in period". Fender flares and fender widening are only permitted on production vehicles if the vehicle raced in that configuration during the eligibility period.
2. Interiors must be neat and finished. Supplemental gauges are allowed.

Driver's seat must be replaced with a racing type seat. Loose carpeting must be removed.

3. The grill must be in place on production vehicles. Bumpers may be removed.
 4. Production vehicles prepared to 1970 or earlier specifications should have headlights. Production vehicles prepared to 1971 or later specifications may have headlights removed and use the opening for brake ducting.
 5. Historically significant markings and graphics are encouraged.
- B. Wheels:** Wheel diameter must be as originally fitted with these exceptions; 12" to 13", 14" to 15", and 15" to 16". The standard width may be increased by 3". Any other diameter or width must be a specifically listed option. See (SR).

C. Tires: See Group lists and (SR).

D. Engine: The correct engine displacement is required. The entrant must, with certainty, disclose the actual engine displacement. Engines must be of the original type; size and design as originally fitted by the fabricator or manufacturer, and be in the correct location. The following modification restrictions apply:

1. An overbore of 1.2mm or .047" is permitted unless class rules prohibit it.
- The standard stroke must be retained.**
2. Wet sump may not be converted to dry sump.
 3. Induction system must be as provided by the manufacturer.
 4. Blocks and heads must be of the same material and design as provided by the manufacturer. Modern aftermarket blocks and heads are prohibited unless they are identical to the originals.

5. An **Engine Certification Form (ECF)** may be required in certain categories.

E. Electrical system:

1. Electronic ignition is allowed, but the trigger and distribution of spark must be from the distributor for vintage class vehicles, new technology vehicles are permitted to use current state of the art technology.
2. All vehicles should have a working charging system unless they historically ran without one. Production vehicles without charging systems will have 25# added to their official weight figure.
3. Vehicles with a generator may be converted to a modern type alternator.

F. Transmissions: Must be functionally equivalent to the unit provided by the manufacturer (See SR for options). Gear ratios are free with no increase in the number of forward speeds. Reverse must work.

G. Suspension: The system of suspension (spring and shock type) for vintage class vehicles may not be changed except for updating to current componentry, and must attach to the stock mounting locations.

1. Anti-roll bars may be added or deleted.
2. Spring rates & heights are free within ride height restrictions.
3. Vehicles with leaf spring rear axles may add axle-locating devices (traction bars). All vehicles with live axles may add a transverse locating device (Panhard bar, Watt's link, etc.).
4. All hubs, spindles, axles, axle housings, drive shafts, lug bolts, control arms, mounting points and other suspension parts may be strengthened or replaced for safety.

H. Brakes: Braking system must be of the same type as was standard or optional, or may be updated to current state of the art.

1. Dual braking systems are required. A working hand brake is acceptable in lieu of dual master cylinders.
2. Lining material is free.
3. Alternate rotors and drums of the same diameter and thickness are permitted. Rotors may be drilled or grooved.
4. Alternate calipers or wheel cylinders are permitted.
5. Brake ducting is permitted. Backing plates may be removed or modified for this purpose.



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I. Alternate Parts: Any replacement part allowed under these or the SR must be similar in design and appearance to the standard part.

J. General:

1. All fluid filled lines and containers must be secure and free of any leaks. Catch cans are required on all openings or vents that could expel fluids. Coolant overflow should have a separate catch can. All drain plugs should be safety wired.
2. All vehicles must have at least one working brake light.
3. All vehicles must have mirrors fitted which provide clear view to the rear, and along both sides of the vehicle.
4. Hoods, deck lids, doors and other bodywork must be securely fastened. Doors may be pinned as long as provision is made for quick exit from the vehicle. Louvers may be added to engine covers and fenders.
5. There must be an electrical cut-off switch to isolate the battery and cut off the ignition. Such switch must be accessible from outside the vehicle and be clearly marked.
6. Batteries must be securely mounted with a metal hold down device. The hot terminal of the battery and the cut-off switch must be insulated against grounding.
7. Competition numbers must be displayed legibly and neatly on both sides of the vehicle, using a minimum height of 8" and a stroke of 1.25", fixed on a contrasting background. Class letters should be 6" in height. Magnetic or static adhesion numerals are not acceptable.
8. Headlights and other glass lenses must be covered or taped.
9. Coolant, ANTI-FREEZE, or Non-slippery water wetting agent is permitted.
10. The firewall and floor shall prevent the passage of flame and debris to the driver's compartment. All holes must be properly sealed.
11. All 4 wheeled vehicles must have some form of a metal or composite roof over the driver/co-driver for their protection. Driver/Co-Driver windows must have SFI approved netting.
12. All vehicles should have a logbook that is presented at tech inspection. Any discrepancies noted at the last event should have been rectified. Vehicles not having a logbook will be issued one after the Chief of Tech is satisfied that the vehicle meets all of the eligibility and safety requirements, and that the owner is an NORRA member. Logbooks from other organizations will be honored.

IV. Driver Eligibility:

A. Definitions

Member: Holds current NORRA Driver's Membership License and Medical. All others, even if they hold other vintage licenses are Nonmembers.

Current Medical: Applicants must present a Medical History Form completed by Applicant and Physical Examination Form completed by your physician within the last 2 years. Anyone over 40 must have an EKG as part of this examination.

B. Acceptance: NORRA reserves the right to exclude any participant from a sanctioned NORRA event. Acceptance at all events is usually on a first come, first serve basis. However in the event of over subscription, NORRA members are given preference over Non-members.

V. Responsibility:

It is each competitor's responsibility to obtain, understand and comply with all Rules and Regulations including Supplemental Regulations, which apply to his vehicle. Non-compliance may result in exclusion or disqualification. Ignorance of these rules is no defense.

VI. Safety Equipment:

A. Seat belts: All vehicles must be equipped with a standard 5 or 6 point driver restraint system. Y-type harnesses are not permitted. The lap & shoulder belt webbing must be 3" wide. The crotch strap webbing may be no less than 2" wide. Belts must be in excellent condition. Undated belts and dated belts over 5 years old are subject to replacement at the direction of the Chief of Tech. The mounting hardware and all attachment points must exceed the strength of the actual belt. Snaps must be pinned or safety-wired.

B. Arm restraints: Properly adjusted arm restraints are highly recommended in open production vehicles and racing vehicles where the driver sits in an upright position. Sedans and coupes may have either a window net or the driver may use an arm restraint on the arm nearest the window. Arm restraints should be attached to the forearm and limit the movement of the driver's hands to just above helmet.

C. Roll Bars: Suitable roll bars are required on all vehicles. The top of the main hoop must be 2" inches above the driver's helmet. The actual design is left up to the vehicle owner, but should follow sound engineering standards. NORRA publishes a separate sheet of roll bar guidelines. There must be a padded headrest within 3" of the driver's helmet. All parts of the vehicle or roll bar that could come in contact with the driver's head must be padded.

D. Fire Extinguishers: All vehicles must be equipped with a dry chemical or Halon fire extinguisher of at least 2.5 pounds, securely mounted with a metal quick-release device, in the cockpit within reach of the driver. On-board fire suppression systems are highly recommended.

E. Electric fuel pumps: It is recommended that all vehicles equipped with an electric fuel pump be also fitted with an oil pressure controlled cut-off switch. (NAPA 701-1577)

F. Firewalls: There shall be a firewall separating the driver's compartment from the engine and fuel tank. Undertrays should have drain holes. These items should be constructed as to prevent fluids and flames from passing into the cockpit.

G. Fuel Cells: All vehicles must have a fuel cell that meets FIA FT-3 specification.

H. Towing eyes: All vehicles should have a dedicated towing eye or other means to attach a tow strap to the front of the vehicle. A similar device is recommended at the rear. The roll bar is not considered a good place to attach a tow strap.

I. Exhaust system & ventilation: Exhaust systems must end to behind the driver's position. Coupes must have an exhaust system designed so that gasses cannot enter the driver's compartment. The driver's window must be fully open on closed production vehicles.

J. Helmets: It is required that all drivers wear an automobile (SA) rated racing helmet of SA00 or later Snell approval or equivalent FIA specification. "M" rated (Motorcycle) helmets must be used in motorcycle competition. All drivers must wear adequate eye protection. The driver's name, DOB and any special medical information should be clearly labeled on the back of the helmet. Head and neck restraints are encouraged.

K. Suits: All drivers must wear a suit that covers the body from the neck to the wrists and ankles. The suit and any underwear must be made of an approved fire resistant material such as Nomex, etc. The combination of suit and underwear must total a rating of at least 2 layers. All drivers must wear gloves.



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The National Off Road Racing Association, Inc. (NORRA) has established these NORRA Competition Rules, which shall also be known as the "NCR."

All requests for interpretations of NORRA rules, either Supplementary or General, must be submitted, in writing, to Michael Pearlman/Michal Noval, Executive Directors of NORRA. Interpretations, rulings, or rule changes made by NORRA must be signed by Michael Pearlman/Michael Noval. Any interpretation, ruling, or rule change not signed by Michael Pearlman/Michael Noval will not be valid.

1.0 TERMINOLOGY

The following nomenclature, definitions, and abbreviations shall be used in the NCR, in all Supplementary Regulations and Entry Applications, and for general use.

Automobile — A self-propelled land vehicle that has at least four wheels that contact the road surface. The wheels must not be mounted on a common line; in other words, the wheels must make at least two tracks. At least two wheels must be used for steering and at least two must propel the vehicle.

Category — Vehicles may be segregated into categories. A vehicle's basic specifications determine the category for which it qualifies.

Class — Vehicles in a category may be grouped into classes. The class for which a vehicle qualifies can be determined by the displacement of its engine or by its pounds per horsepower ratio, or by any other method listed in the NCR or the Supplementary Regulations for the event in which the vehicle is entered.

Co-driver — A person who occupies the passenger seat of an automobile while the automobile is competing in a race.

Contestant — A person named to compete in a race as either a driver, co-driver, or rider.

Driver — A person named to be the driver of an automobile that is entered in a race.

Entrant — A person or organization whose entry is accepted for an event.

Entry — A vehicle that has been accepted by an event's organizers to take part in a sanctioned event.

Entry Application — A form supplied to prospective entrants by an event's organizers on which an entrant lists the information pertinent to the entrant, the vehicle being entered, and the driver, co-driver, or rider, as applicable, required by the organizers.

Event — A program that consists of one or more races.

Fuel — Any liquid, gas, solid, etc. that can be burned in the cylinders of an internal combustion engine. This definition includes gasoline, alcohol, nitro methane, diesel fuel, turbine and jet fuels, additives used to raise a fuel's octane rating or to cause it to exert greater pressure as it burns, etc.

Motorcycle — A self-propelled land vehicle that has either two or three wheels that contact the road surface. One wheel of two-wheel motorcycles must be behind the other so both wheels follow a common line that parallels the vehicle's normal direction of travel; in other words, both wheels must form a single track. Only one wheel may be used for steering and only one wheel may propel the vehicle.

Three-wheel motorcycles are of the side-car type. The motorcycle itself conforms to the definition of a two-wheel motorcycle and the third wheel is mounted on a platform or boom of some type so it follows a line parallel with the line followed by the motorcycle's two wheels. A three-wheel motorcycle makes two tracks. Only one wheel may be used

for steering and only one wheel may propel the vehicle.

NORRA Chapters — Geographic separations of NORRA established for the administration of NORRA policies and the NCR under the direction of the NORRA Board of Directors.

Pump Gasoline — Any grade of automotive gasoline that is available at roadside stations.

Race — A contest between one or more vehicles that are competing against the clock, or between two or more vehicles that are competing directly against each other.

Rider — A person named to be the rider of a motorcycle in a race.

Sanction — The documentary authority, granted by NORRA, to organize and hold an event.

Supplementary Regulations — Regulations which are normally consistent with the NCR and which define special or additional rules for a specific event. When Supplementary Regulations don't agree with the NCR, the Supplementary Regulations are to be followed.

Vehicle — An automobile or motorcycle, as defined in this section.

2.0 SAFETY EQUIPMENT

NORRA's primary intent when prescribing specifications for safety equipment for vehicles that will compete under the NCR is to provide adequate protection to all competitors and spectators. NORRA does not want to restrict the general or specific design of any vehicle or the development of vehicles but it does want to encourage all competitors to give safety requirements full attention. Each NORRA safety recommendation is to be considered the minimum and not the maximum.

2.1 Body Restraints

All vehicles except motorcycles must have a seat belt and shoulder harness for each occupant. The belt and harness must be of the five-point suspension competition type, with metal-to-metal buckles. A five-point belt and harness arrangement differs from just a belt and harness by having a fifth strap that extends down from the buckle to a point on the vehicle's floorpan or frame below the seat. The strap must be attached to the floorpan or frame as close to the front edge of the seat as practicable so that it will exert maximum restraint to the upward movement of the belt and harness if the occupant's body should exert an upward force on the harness. Belts and harnesses must be in good condition and installed in a manner acceptable to the Technical and Safety inspectors. Whenever a vehicle is being driven in competition, each occupant in it must have his belt and harness properly buckled so they hold him *securely* in the vehicle.

2.2 Protective Head Gear

Each contestant must wear a safety helmet whenever his vehicle is being ridden or driven in competition. Contestants must provide their own helmets. Helmets must be in the full-coverage type, be approved by either the Department of Transportation (DOT) or the Snell Memorial Foundation, or be certified in some other way to guarantee that they conform to current specification. Helmets approved by DOT must have a DOT sticker and helmets approved by the Snell Memorial Foundation must have a current SNELL sticker.

2.3 Fire Extinguishers

All vehicles except motorcycles shall be equipped with a dry chemical type fire extinguisher that has a rating of not less than 2.5 pounds, or its equivalent in another type. The extinguisher must be securely mounted in the driver's compartment within easy reach of both the driver and co-driver.



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2.4 Roll Bars

All vehicles except motorcycles shall be equipped with a roll cage that will protect the occupants in case the vehicle overturns. Roll bars and roll cages must withstand fore and aft loads as well as compression forces. Tubing dimensions, construction, and installation shall conform to Rule 17 of the NCR.

2.5 Flywheel Protection

Vehicles that have engines with more than 2500 cc (152.5 cubic inches) and flywheel and clutch assemblies or automatic transmissions so-located that injury to their occupants could be sustained in the event of flywheel or clutch bursting or automatic transmission exploding must have some sort of protection for their occupants. For a flywheel and clutch assembly, this protection may be either an approved explosion-proof bellhousing or a steel scattershield. For an automatic transmission, the protection may be either an approved blanket-type shield or a steel-reinforced floorpan.

The minimum requirements for steel scattershields are 1/4-inch thick material, a width of 6 inches, and 360 degrees of protection.

2.6 Protective Clothing

*****SEE NORRA R&R Suits:** All drivers must wear a suit that covers the body from the neck to the wrists and ankles. The suit and any underwear must be made of an approved fire resistant material such as Nomex, etc. The combination of suit and underwear must total a rating of at least 2 layers. All drivers must wear gloves.

2.7 Fuel

All vehicles shall use pump gasoline except when "competing in the alternative fuels category as defined in the Supplementary Regulations.

2.8 Fuel Tanks

- Auxiliary fuel tanks may be added to the vehicles in all categories provided they are mounted securely and filled from and vented to the outside of the vehicle.
- All fuel tanks mounted outside the vehicle so they are exposed to crushing forces under any condition of crash or upset must be equipped with a burst-proof bladder.
- No GI cans or fuel containers of similar construction or purpose will be allowed in or on a vehicle during a race.
- All fuel tanks must be of approved fuel cell design (see rule SR####)

All cars must be equipped with a safety fuel cell complying with these specifications. Fuel cells shall be constructed and certified in accordance with the FIA FT-3 specification. 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.

1. Installation

- Internal body panels may be modified to accommodate the installation of fuel cell.
- If installation includes encroachment into the driver's compartment, a metal bulkhead must separate the fuel cell from the driver's compartment.
- There must be a metal bulkhead between the driver/passenger compartment and the compartment containing the fuel cell.

- Fuel filler location is unrestricted.

2. Filler Cap and Vents

- A positive locking fuel filler cap 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 rolled over 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.

2.9 Windscreen

If a vehicle has a windscreen, the windscreen must be of non-shatterable material. (All vehicles in Categories 1, 2, 9, and 10 must have a full windshield of transparent non-shatterable material

2.10 Firewalls

Except as provided in this paragraph, all automobiles shall have a firewall between their passenger compartment and their engine and between the passenger compartment and the fuel tank. Firewalls must be constructed of metal, which may be either steel or aluminum, and so designed and installed that they prevent the passage of gasoline from a ruptured fuel tank of broken fuel line into the driver and co-driver compartment and prevent flames that might originate at the engine or fuel tank from playing directly onto the driver or co-driver.

3.0 VEHICLES

Organizers of NORRA events shall provide races for vehicles of one or more of the following categories:

Category 1 Production two-wheel drive passenger vehicles pre-1989.

Category 2 Production two-wheel drive utility vehicles pre-1989.

Category 3 Single-seat two-wheel drive vehicles and modified and non-production two-wheel drive vehicles raced with only one occupant pre-1989.

Category 4 Modified and non-production two-wheel drive vehicles raced with two occupants pre-1989.

Category 5 Production four-wheel drive vehicles pre-1989.

Category 6 Modified and non-production four-wheel drive vehicles pre-1989.

Category 7 Motorcycles of 125 cc and under pre-1989.

Category 8 Motorcycles over 125 cc pre-1989.

Category 9 Baja Bug vehicles pre-1989.

Category 10 Production mini-pickup trucks pre-1989.

Category 11 Alternative Fuels Vehicles
Manufacturers Class
Open Class

****Events for complete categories or classes within categories**



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may be scheduled.

3.1 Identification Marks

Each vehicle shall carry identification numbers, class letters, or other marks required by the Supplementary Regulations. Numbers shall be placed on at least both sides and the top of each automobile. Numbers used shall meet the approval of the Chief Timer and Scorer as well as the Chief Technical and Safety Inspector.

Numbers on all vehicles except motorcycles shall be at least ten inches high with a 1 1/2 to 2-inch stroke width on a contrasting background

Numbers on motorcycles shall be at least six inches high with a 1 to 1 1/2-inch stroke width. Number plates on motorcycles must be located ahead of the exhaust pipe opening so the numbers on them will not be obliterated by exhaust gases.

Preferably, numbers on all vehicles shall be painted. Stick-on numerals made of plastic or fabric of some type may not be used because of their susceptibility to damage from brush and rocks.

3.2 Advertising On Vehicles

Advertising, names, and symbols may be displayed on vehicles provided they are in good taste and do not interfere with identification marks.

3.3 Mechanical Condition Of Vehicles

The Chief Technical and Safety Inspector shall have the responsibility for inspecting and certifying each vehicle for safety before it is allowed to practice for a race or take part in a race.

A vehicle that does not pass inspection, or which is presented for re-inspection without the corrections specified by the Chief Technical and Safety Inspector, or which takes part in a race before being inspected, may be disqualified from the event.

Vehicles that have been altered or damaged after they have been approved at the technical and safety inspection shall be subject to re-inspection or approval.

4.0 TECHNICAL AND SAFETY INSPECTION

Prior to the start of an event, all vehicles will be inspected to determine whether they meet the following requirements:

- (a) Eligibility for category and class entered and compliance with the NCR in effect at that time and the Supplementary Regulations for the event. A vehicle must compete in the category and class for which its design, modifications, or other specifications qualify it. Vehicles that aren't eligible for the category and/or class in which they are entered will be re-categorized and/or reclassified as necessary.
- (b) Suitability for competition.
- (c) Appearance, which must be neat and clean. Specifically, vehicles that are dirty, either externally or in the engine or passenger compartments, or that show body damage, or that have not undergone proper repairs after being damaged, or that are partially or totally in primer, shall not be approved for competition.
- (d) Tires shall be in good condition, as determined by the inspectors.
- (e) Brakes shall be pedal operated, work directly on each of the four wheels of an automobile or on each of the two wheels of a motorcycle, and be in perfect working order.
- (f) Fenders shall be securely attached to the frame or body.

Fenders on vehicles required to have fenders may not be secured to the vehicle with quick-release or breakaway fasteners. Removal of fenders for any reason other than damage incurred during an accident will cause the vehicle to be disqualified from the event. Fiberglass fenders that will be broken by the tires when the suspension works will not be allowed.

- (g) Exhaust system shall direct exhaust gases into the atmosphere behind the vehicle's occupants.
- (h) Hood and engine compartment parts shall be securely fastened.
- (i) Front suspension and steering shall be of suitable design and in proper order.
- (j) Leakage of fluid of any type will not be allowed.
- (k) Headlamps, tail lamps and brake-actuated lamps in operating condition will be provided on all vehicles when required by Supplementary Regulations.
- (l) Seats shall be securely mounted.
- (m) Body restraints shall be properly mounted and in good condition.
- (n) Roll bars and roll cages shall be properly constructed and mounted.
- (o) Firewall and floor shall prevent the passage of flame and debris into the driver's compartment.
- (p) Skid plates shall be vented to prevent accumulation of liquids.
- (q) (Mirrors, when required by the Supplementary Regulations, shall provide visibility to the rear of the vehicle.
- (r) Fire extinguisher shall be securely mounted in the cockpit.
- (s) Extra gasoline tanks shall be properly mounted and vented.
All hoses used for fuel lines that aren't equipped with integral threaded connectors on their ends must be securely clamped to the fittings or metal tubing to which they connect.
- (t) Spares and extra equipment shall be securely fastened.
- (u) Batteries must be placed, secured, and covered as necessary so that in the event of vehicle upset acid from their cells cannot flow directly into the driver's compartment.
- (v) An oil cooler mounted ahead of the driver and passenger compartment must have some sort of shroud behind it that will prevent oil from the cooler or its lines blowing back onto the driver or passenger.

5.0 ROLL BARS AND ROLL CAGES

Roll cages are required in all automobiles. Currently the only approved roll cages are of the high front hoop (top of windshield) design. Specific installations are subject to approval by the Technical and Safety Inspectors.

1. Basic Design

- a. The basic purpose of the roll cage is to protect the driver if the car turns over, runs into an obstacle or is struck by another car. It shall be designed to withstand compression forces from the weight of the car coming down on the rollover structure and to take fore/aft and lateral loads.
- b. Forward braces and portions of the main hoop subject to contact by the driver's helmet (as seated normally and restrained by seatbelt/shoulder harness) shall be padded with a minimum thickness of 1/2".
- c. Material: All roll cages should be constructed of



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mild steel tubing, or alloy steel tubing can be used for all roll cage structures.

2. Vehicle Weight

- a. These are minimum sizing requirements:
 - Up to 2900 lbs. 1.5 x .120
 - 2900-4500 lbs. 1.75 x .120
 - Over 4500 lbs. 2.00 x .120
- b. Hoop specifications:
 1. Main hoop: 4 bends max., totaling 180° ± 10°
 - a) One continuous length of tubing shall be used for the main hoop member with smooth continuous bends and no evidence of crimping or wall failure.
 - b) Main roll hoop (behind the driver) shall extend the full width of the driver/passenger compartment and shall be as near the roof as possible. It shall incorporate a diagonal lateral brace to prevent lateral distortion of the hoop.
 2. Front hoop: 4 bends max. or Front down tubes: 2 bends max.
 - a) The front or side hoops shall follow the line of the front pillars to the top of the windshield (as close to the roof as possible) then horizontally to the rear attaching to the main hoop.
 - b) These two side hoops are to be connected together by a tube over the top of the windshield, or a front hoop following the line of the front pillars and connected by horizontal bars to the main hoop on each side at the top may be used.
 - c) A top "halo" hoop following the roofline from the main hoop to the windshield with forward down tubes following the line of the front pillars to the floor.
 - d) The front or side hoops may extend through the dash pad. This includes the forward part of the door panel if it is an extension of the dash panel.
 - e) One bar is recommended in a horizontal plane between forward cage braces in the dash area.
 3. Rear hoop supports: No bends.
 - a) Bracing: The main roll hoop shall have two braces extending to the rear attaching to the frame or chassis.
 - b) Braces shall be attached as near

as possible to the top of the main hoop not more than six inches below the top and at an included angle of at least thirty degrees.

4. Side Protection:
 - a) Side tubes connecting the front and rear hoops across both door openings are recommended.
5. Mounting Plates:
 - a) Each mounting plate shall be at least .120 thick if welded and .180 thick (with appropriate backing plates) if bolted.
 - b) There shall be a minimum of four bolts per mounting plate if bolted.
 - c) Each mounting plate shall not be greater than 100 square inches
 - d) Whenever possible, mounting plates shall extend onto a vertical section of the structure.
6. Hardware:
 - a) All hardware shall be Grade 5 or better. 3/8" minimum diameter.
 - b) All fasteners shall be attached with either locking nuts and/or safety wired.

Note: Any number of additional reinforcing bars are permitted within the structure of the cage.

If any of the above bend requirements cannot be met, all components of the roll cage shall be fabricated from the tubing size(s) listed for the next heavier category of automobiles.

3. General Guidelines

- a. For purposes of determining tubing sizes, the vehicle weight is as raced without fuel and driver.
- b. An inspection hole at least 3/16 inch diameter shall be drilled in a non-critical area of the main hoop to facilitate verification of wall thickness.
- c. All welds shall be visually inspected for cracks and undercutting.
- d. It shall be bolted and/or welded to the car.
- e. It shall attach to the car at no more than eight (8) points, consisting of the basic cage with six (6) points and two optional braces.
- f. No braces shall pass through the front firewall.
- g. A maximum of two gussets per roll cage joint are allowed.
- h. Square tubing or water pipe will not be accepted under any circumstance.

NORRA recognizes that there is continual progress and considerable variety in the design and construction of competition automobiles. As a result, the application of the following



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specifications for roll cages may not be practical for all automobiles. NORRA also recognizes that there may be roll cage designs and installations that are sound and acceptable but which do not conform completely to the following specifications. There is no desire on the part of NORRA to restrict ingenuity of design in this respect; however, all roll bar and roll cage installations must fulfill the basic purpose of driver and co-driver protection. With this in mind, all roll cages, regardless of their type, on automobiles entered in NORRA-sponsored or sanctioned events will be subject to approval by the Technical and Safety Inspector.

6.0 REQUIREMENTS AND RECOMMENDATIONS

A vehicle that has a steel "sunroof" panel in its steel top must have the panel closed and inoperable during the event. If the panel is made of any material other than steel, the vehicle must have a steel cover securely attached fully covering the opening.

Preferably, the roll cage should extend the full width of the automobile's cockpit to provide maximum support area on all types of soil but under no circumstance shall the distance between the inner surfaces of the vertical members that form a hoop's sides or that support a roll cage be less than fifteen inches wide. The rear hoop of a roll cage must be at least six inches behind the driver's helmet when the driver is in his normal driving position and its top surface must be at least three inches above the helmet. If the automobile is to have a passenger, the same measurements apply to clearances for the passenger's helmet. The lower surface of the front hoop of the roll cage must be above the level of the driver's eyes when he is sitting in his normal driving position. The part of the front hoop that is above the driver's head must be connected to the same part of the rear hoop by at least two longitudinal members that are spaced as far apart as practicable so they and the hoops form a protective rectangle of steel tubing above the driver's compartment. The longitudinal members should be located so they will give the automobile's occupants as much protection as possible in the event of a roll over or if the top of the roll cage should be hit by another vehicle while the automobile is lying on its side. The longitudinal members must be made from the same material used for the hoops and be securely welded to the hoops. Their upper surface must align with the upper surface of the hoops. The side bars must be formed from tubing of the same material and dimensions as that used for the roll cage and be securely welded to the cage's front and rear members.

These roll bar and roll cage requirements and recommendations are based on practical experience with such structures as used on many types of racing vehicles built and used over a period of many years. However, they are not to be construed as a guarantee of any sort by NORRA or anyone else that roll bars and roll cages built to comply with them will give a vehicle's occupants protection from injury or death in the event of an accident of the type in which a roll bar or roll cage is supposed to be effective. They will be modified from time to time as new experience dictates.

SECTION I

PRODUCTION AUTOMOBILES

Production Two-Wheel Drive Automobiles

Category 1 Production two-wheel drive passenger vehicles.

Category 2 Production two-wheel drive utility vehicles.

Category 10 Production two-wheel drive Mini-Pickup trucks.

A passenger vehicle is a vehicle that has a frame and suspension systems of the types used for sedans and other purely passenger-type vehicles. This places station wagons and vehicles like Rancheros and El Caminos in the passenger vehicle category.

A utility vehicle is one that has a frame and suspension systems of types not used for passenger vehicles, such as those used for pickup trucks.

Vehicles of the Van type that have side windows are passenger vehicles. Vans that do not have side windows are utility vehicles.

Production Four-Wheel Drive Vehicles

Category 5 Production four-wheel drive vehicles.

Production four-wheel drive vehicles shall normally be those which are series-produced with normal road touring equipment in quantities of at least 500 within a 12-month period.

Vehicles in this section shall be recognized according to their manufacturer's complete designation, including name, model number, and engine displacement.

Vehicles in this section must be raced as they are normally delivered to the public except that they may be up-dated or back-dated to the specifications of a vehicle of the same make and model but of a different year and except for the alterations and modifications permitted by these rules.

Vehicles in this section may be divided into classes. Classes will be determined by dividing a vehicle's factory advertised weight by the cubic inch displacement of its engine.

Class A — 9.50 to 11.29 pounds per cubic inch

Class B — 11.30 to 12.49 pounds per cubic inch

Class C — 12.50 to 14.99 pounds per cubic inch

Class D — 15.00 to 16.99 pounds per cubic inch

Class E — 17.00 or more pounds per cubic inch

Vehicle Alterations And Modifications

The following alterations and modifications are expressly allowed on all vehicles in Categories 1, 2, 5, and 10. Only alterations or these rules are allowed. Any alteration or modification not listed is to be construed as not applicable to vehicles in these categories.

Volkswagen Engine Exceptions and Restrictions

The displacement of any Volkswagen engine may be increased as much as desired by replacing its cylinders, pistons, and crankshaft with others.

The only restriction for carburetion is that superchargers are not allowed.

A 411 Volkswagen engine may be used only in vehicles in which it is standard equipment.

Small Engine Exceptions and Restrictions

The cylinder displacement of any engine that has a standard displacement of 2000 cc (122 cubic inches) or less may be increased as much as desired by enlarging its cylinders and replacing its pistons and crankshaft with others. The cylinder block and cylinder head used must be identical to those that were standard equipment for the engine.

The only restriction for carburetion is that superchargers are not allowed.

Engine (and its accessories)



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Any engine that has a cylinder block of the same basic design and size as the one in the vehicle originally as standard equipment may be used. For instance, 265 through 350 cubic inch Chevrolet V8 engines use the same basic cylinder block. They may be used interchangeably. However, one of the larger Chevrolet V8 engines, such as 396 or 427, may not be installed in place of one of these engines because it uses a different basic cylinder block. An exception to this restriction is that any engine that has a basic cylinder block of a type that was available as optional equipment in the vehicle when the vehicle was purchased new may be used. For instance, some Chevrolets have been available with either a six-cylinder engine, a small-block VS (265 through 350 type), or a large-block V8 (396-427, etc., type) depending on the purchaser's choice. In these cases, any type of engine that was standard or optional may be used.

(a) Any operation normally associated with blueprinting an engine is permitted.

(b) Aluminum cylinder blocks and/or cylinder heads may not be used as replacements for standard cast-iron parts unless they are readily available at a reasonable price to anyone who wants to buy them.

(c) Crankshaft: No restrictions other than that the piston stroke provided by the crankshaft must remain standard for the engine in which the shaft is used. (Note Volkswagen and Small Engine Exceptions and Restrictions.)

(d) Pistons: No restrictions.

(e) Compression ratio: No restrictions.

(f) Camshaft: No restrictions.

(g) Valve Springs: No restrictions

(h) Carburetor(s): The carburetor or carburetors installed on the engine by its manufacturer may be replaced with another or others of the same or different make that have a venturi or venturis of the same or different diameter provided the same number of carburetors as that on the engine originally is used.

Carburetor adapters are permitted. The intake manifold or manifolds may be altered or replaced with another or others. (Note Volkswagen and Small Engine Exceptions and Restrictions.)

(i) Any battery ignition system may be used provided it does not require modification of the method by which its distributor is driven.

(j) Air cleaner: No restrictions.

(k) Oil filter and cooler: No restrictions.

(l) Fuel pump: A mechanical fuel pump of greater delivery capacity may be installed. An electric fuel pump may be used with or in place of a mechanical pump.

(m) Fan: No restrictions.

(n) Replacement of the generator or alternator with a unit of different make and/or higher output is permitted provided attachment and driving methods similar to those for the original equipment are used.

(o) Exhaust system: No restrictions other than that the exhaust system must direct the exhaust gases into the atmosphere behind the vehicle's occupants. Mufflers are not required.

Driveline

(a) Clutch: No restrictions.

(b) Transmission: Any manual or automatic transmission provided by the vehicle's manufacturer is permitted.

(c) Transfer case: Any mass-produced transfer case is permitted.

(d) Transaxle or rear axle assembly: Any trans- axle or rear axle assembly that is provided by the vehicle's manufacturer is permitted.

(e) Limited-slip differential: No restrictions.

Chassis.

(a) Steering gear: No restrictions.

(b) Brakes: Cooling devices are permitted. Disc brakes may be installed if the brakes used are available from the manufacturer of the vehicle.

(c) Suspension: Front and rear suspension systems may be strengthened by adding material or replacing parts with stronger ones but the basic design of the systems may not be changed. Suspension springs and their mounts may be modified provided the original spring type and mounting method are retained.

(d) Shock absorbers: No restrictions.

(e) Wheels and tires: No restrictions other than that dual wheels are not permitted and the tires must not contact the body or parts of the chassis during suspension deflection and when the wheels are steered through their full range of movement. Inner fender panels may be altered to provide tire clearance. Wheel openings in the body or fenders may be enlarged to the extent of increasing their radius a maximum of three inches. Alterations to wheel openings must be done in a workmanlike manner.

(f) Frame or integral body-frame: The frame or a body that does not have a frame may be raised by suspension jacking to increase ground clearance, provided that this modification does not in any way interfere with nor limit movement of the front wheels or any part of the steering mechanism when the wheels are steered through their full range of movement, nor affect wheel alignment, and provided that the front suspension system type isn't changed. .

(g) Guards and shields: Guards and shields may be attached to the underside of the vehicle for protection against road hazards.

(h) Wheelbase: The wheelbase of Category 1, 2, and 10 vehicles must be within 1-inch of the measurement stated in factory specifications for the vehicle's year and model.

Body

(a) Interior alterations: The steering wheel, instruments, and front seats may be replaced with others of different make or type and the rear seat may be removed. Door trim panels and other trim panels inside the vehicle may be removed. Floor mats may be removed. The windshield may be replaced with transparent non-shatterable material. (The vehicle must have a full windshield.) Glass other than the windshield may be removed or replaced with transparent non-shatterable material. Lift mechanisms for windows may be removed if the windows are removed or fixed securely in place or the mechanisms are replaced with other mechanisms that will raise and lower the windows and hold them securely in any position. The body must have a full floorpan, from front to rear.

(b) Doors: Doors may be welded or otherwise secured in their closed position but the welds or securing device must not show from the outside of the vehicle and the doors must appear to be operable.

(c) Fiberglass body panels may be used if they do not change the vehicle's appearance from that provided by the standard metal parts they replace. The term "panels" refers to any part or all of a body

(d) Bodies may be raised on their frames, to provide additional ground clearance for the underside of the body. The maximum a body may be raised is the amount that places its lower edge at the same height as the lower edge of the frame.

Category 5 vehicles only: The top, doors, windshield, and tail gate may be removed. The hood may not be removed.

Category 2 and 10 Vehicles: The tail gate may be removed from pickup trucks.

General

(a) Tubes, hoses, wires, and cables for air, water, fuel, brake fluid, and electric current may be changed, modified, or relocated without restriction with the exception that plastic hose may not be used for any liquid that will burn, such as gasoline or any type of oil (engine, transmission, brake fluid, etc.).

(b) Perfecting operations involving machine work or special treatments are permitted on any parts provided the finished parts are identifiable as the original series-produced parts.

SECTION 2



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MODIFIED AND NON-PRODUCTION VEHICLES

Category 3 Single-seat two-wheel drive vehicles and modified and non-production two-wheel drive vehicles raced with only one occupant.

Category 4 Modified and non-production two-wheel drive vehicles raced with two occupants.

Category 6 Modified and non-production four-wheel drive vehicles.

The above categories may be further divided or grouped by the Supplementary Regulations for a particular event.

Any type of engine, transmission, axles, body, and chassis may be used in the construction or modification of vehicles built to compete in these categories.

Category 9 Baja Bug vehicles.

The vehicle must be a small Volkswagen sedan, hardtop or convertible that has been modified to give it less front and rear overhang. Fiberglass parts, including the body if it is an exact copy of the original, may be used. The vehicle must have four Volkswagen-type fenders that have been bobbed. Preferably, the parts used for the body modifying should be from a kit made for the purpose. The vehicle must have a finished appearance.

(a) Body: The vehicle must have a full windshield and a full floorpan. The windshield may be either the original shatterproof glass or some other transparent shatterproof material.

(b) Chassis: Center steering is not allowed. No other restrictions.

(c) Engine: Must be a Volkswagen (411 may be used). No modification restrictions. A supercharger may be installed.

All vehicles in this section must conform to Rules 8, 9, and 17 of the NCR and to the Supplementary Regulations for the event in which they are to compete.

SECTION 3 MOTORCYCLES

Category 7 125 cc or under, two-wheel or three-wheel types.

Category 8 More than 125 cc, two-wheel or three-wheel types.

Actual engine displacement shall be the factor for category determination. Engines that have more than 125.000 cc as a result of boring, stroking, or both place their motorcycles in Category 8.

Alterations and modifications to motorcycles shall be made at the discretion of their owners and riders; however, before they compete in any race, all motorcycles shall be inspected by the Technical and Safety Committee to ascertain whether they are in safe operating condition

SECTION 4 ALTERNATIVE FUEL VEHICLES

Category 11 Alternative Fuel Vehicles

Vehicles running in class 11 are open class vehicles with no restriction other than the requirement that they use an alternative fuel technology (Alternative Fuels in this case means all propulsion modes other than pump or racing gasoline). This Category is intended to be a technology showcase in which competitors are encouraged to demonstrate current state of the art propulsion systems be it diesel, E-85, Electric, Fuel Cell, Solar or any other similar technology or combination thereof. Vehicles in this class may be either motorcycles or 3 or 4 wheeled vehicles. This Category also features a Manufacturers Group that will allow Alternative Fuel Vehicle Manufacturers to highlight their current state of the art vehicles.