



2021 New London-Waterford Speedbowl X-Car Rules

(Last Updated: 3-14-21)

Changes from the 2020 rulebook have been highlighted in red.

2021 NLWS X-Car Competition and Tech Contacts:

Bill Roberts - *New London-Waterford Speedbowl Race & Competition Director*
Email: *BillR@speedbowlct.com*

Joe Delorimiere - *New London-Waterford Speedbowl Wednesday Technical Director*
Email: *grip340@aol.com* – Phone: 860-514-1713

All references to the New London-Waterford Speedbowl in the following rules may be referred to as (NLWS) as an abbreviation of the speedway name and deemed an official recognition of the New London-Waterford Speedbowl in this **2021** rulebook.

Drivers & Car Owners are required to familiarize one's self with the General Track Rules as well as the X-Car rulebook.

By registering as an owner or driver you agree to be knowledgeable and bound by the contents found in these divisional rules and in the General Rules.

6.0 General X-Car Division Rules

A. The 4 Cylinder X-Car Division is designed to promote greater interest in stock car racing and to allow new and inexperienced drivers and car owners to compete. Any competitor who has previously participated in a "higher" sanctioned racing division at any Speedway may be **eligible** to compete in any 4 Cylinder X-Car event with specific approval from the **New London-Waterford Speedbowl**. **Driver eligibility is solely the decision of the NLWS Track Officials.**

B. In the following rules you will see the term "stock OEM" used. This means "original equipment manufacturer". These parts must come on your standard production car.

C. No carbon fiber or titanium parts allowed.

D. None of the following will be allowed in or on any engine or driveline component or part: abrasive cleaning, acid dipping, chemical milling, coating, epoxying, finishing, grinding, painting, plating, polishing, porting, etc.

E. The rules herein are for the **New London-Waterford Speedbowl** only, with no expressed or implied agreement with any other Division or Speedway as to their interpretation and/or method of inspection.

F. All equipment must be approved by track officials. No equipment is considered to be approved by reason of having passed through a technical or safety inspection unobserved. No car will be considered as having passed inspection for the event until the finish is made official.

G. All engine models, equipment changes, or modifications not specifically addressed in this rule book must be submitted in writing to the **New London-Waterford Speedbowl** for consideration of approval prior to competition.

H. All equipment is subject to the approval of the **New London-Waterford Speedbowl** Officials.

I. Once a car has been presented to the **New London-Waterford Speedbowl** Officials for pre-race or post-race inspection the entire car and all of its components become subject to inspection. This includes but is not limited to items verbally designated for inspection before or following a particular event.

J. All rule changes and updates made during the course of the season for the current rulebook will be posted to the **New London-Waterford Speedbowl** website (www.speedbowlct.com). This will serve as the only form of official notification until the publication of the **2022 New London-Waterford Speedbowl rule book**.

K. SAFETY EQUIPMENT (All Divisions):

Helmets: SA2005, SA2010 or SA2015 rated full-face helmets are mandatory for all motor vehicle events. The helmet and a face shield or other acceptable eye protection must be worn at all times during any event.

Seatbelts: Each car must be equipped with an SFI rated and approved 5 or 6-point seat belt system. The belt latching mechanism must provide a common connection and release for the lap belts, shoulder belts, and the anti-submarine (crotch) belt(s). The seat belts must be installed in accordance with the directions provided by the belt supplier and/or manufacturer. The belts must be bolted to the roll cage/frame using the appropriate diameter Grade 8 bolts, washers, and locknuts. Where the shoulder harness lays across your shoulders, it must pass over a bar located at shoulder height, and the belts must pass through the cut-out in the seat without contacting the seat cut-out. Date stamps must be visible and must indicate that all belts are no more than 3 years old.

Please refer to the following information regarding seat belt installation:

http://www.circletrack.com/safety/ctrp_0712_seat_harness_mount/index.html

Seats: Each car must be equipped with a commercially manufactured aluminum oval track racing seat. The seat must be securely and professionally mounted to the roll cage, utilizing a minimum of 3/8" diameter Grade 8 bolts, washers, and locknuts. The seat must be installed in a steel frame that is welded to the roll cage structure. It cannot be attached to the floorboard. The installation of the seat must be acceptable to track officials. All seats are required to have commercially manufactured and padded head supports, shoulder supports, and leg supports (2 of each). The 6 supports must be installed in accordance with the directions provided by the supplier and/or manufacturer.

Please refer to the following information regarding seat installation:

http://www.stockcarracing.com/howto/134_0406_seat_mounting/index2.html

Window Nets: An SFI rated nylon window net must be installed in the left side door window opening. It must be positioned to cover the driver. The window net must be rib type, made from 3/4" or 1" wide nylon material with a minimum 1" and a maximum of 2-1/4" square opening between the ribs. The minimum window net size is approximately 22" wide by 16" high. All window net mounts must be a minimum 1/2" diameter solid steel rod on the bottom and a minimum 1" wide by 3/16" thick flat steel bar, or a minimum 1/2" diameter solid steel round bar on the top, with mounts welded to the roll cage. The window net, when in the closed position, must fit tight and be secured with a lever-type quick release latch acceptable to Track Officials. The lever must be secured by a detent ball in the lever and may be supplemented by a Velcro® fastener only – pins or clips will not be permitted. The latch must mount at the top in the front to roof bar (#3) and release from the inside. Date stamps must be visible and must indicate that the net is no more than 3 years old.

Fire Safety: Each car must have an approved fire extinguisher or Fire Bottle type suppression system installed for the driver's safety. All extinguishers and systems must be securely and mechanically fastened, and be fully functional and operational. The fire extinguisher or system must be of an approved class of 1301 Halon or equivalent.

Fire Suits; Each driver must wear an SFI rated and approved fire suit, and should wear SFI approved undergarments, including a top, bottom, and socks.

Gloves and Shoes: SFI approved fire retardant racing gloves and shoes are mandatory.

L. Driver Eligibility – All drivers must be at least 16 years of age or higher to compete in the X-Car division. All drivers under the age of 18 must have a completed waiver form on file with the New London Waterford Speedbowl.

6.0.1 Scoring Transponder Location

Transponder mounting brackets will be installed on the inside (or outside) of the right rear frame rail. The round post of the bracket must be on top and the square tab on the bottom flush with the lower edge of the frame rail. The bracket must be mounted with its center line exactly 12" to the rear of the rear axle centerline and must be completely vertical to the ground. Transponders are required on the cars at all times. Any car not registering a transponder signal during practice will be black-flagged to be made aware of their scoring transponders failure and is required to remedy it before proceeding further in the event.

Transponders are available from: AMB, US, Inc. 32 Highlands Parkway, Suite 104 Smyrna, GA 30082 Tel 678-816-4000 Fax 678-816-4001

Approved Models

A. Open to most American or Metric 4 cylinder, 2 or 4-door, front wheel drive cars.

No Rear Wheel Drive Vehicles Allowed.

Additional vehicles **not** eligible for competition are:

- Mitsubishi MIVEC
- Toyota VVTL
- Porsche VarioCamPlus
- Nissan VVL
- Ford SVT
- Mid-engine or rear engine cars.
- Rotary engine cars.
- All-wheel drive cars.
- Turbo/Super charged cars.
- Cars with 4 wheel or all-wheel steering.

B. Only cars determined to meet the applicable specifications are eligible to compete in the 4 Cylinder X Car division. You must call the **New London-Waterford Speedbowl** to find out if your make/model car is eligible for competition **if it does not fit into the above listed guidelines.**

Car Body Requirements

A. The car body must be STOCK OEM and retain all factory listed dimensions, lines and angles. All body mounts must be in stock location and OEM dimension.

B. Wheel openings may be trimmed for tire clearance.

C. EXTERIOR: All bolt-on components and trim must be removed.

D. INTERIOR: All bolt-on components and flammable material must be removed. The left interior door Steel Support Panel may be removed.

E. BODY: All body panels, except the driver's side door, must have all of the interior panels left intact. Cars that have any gutting done to any panels other than the driver's side door and areas required for roll cage installation may be assessed a weight penalty. Sun/moon roofs must be completely covered and welded with 24 gauge (.024") minimum magnetic sheet steel, and be neat appearing.

F. The Vehicle Identification Number (VIN) of car being used must be on the windshield bed/dashboard and be clearly visible.

Car Weights

~~After a competitor 2nd win, they will not be allowed to have a handicapped starting spot higher than 6th in any feature event. Also the previous weeks Feature Winner will start LAST in the following weeks feature event, regardless of how many wins they have.~~

A. All lead weight will be mounted in minimum of 25 lbs. blocks, securely mounted in a position designated by **New London-Waterford Speedbowl** Officials.

B. 100 lbs. will be added each time you refuse pre-race or post- race inspection. Also a loss of handicap for the next 2 attended events will be assessed.

C. No ballast weight allowed, except for weight which was added at the direction of NLWS Officials.

D. Cars may be weighed at any given time. There is no weight rule however weights may be checked on occasion by the New London Waterford Speedbowl Technical Staff. Weight may be adjusted in the spirit of competition at any time by NLWS Officials during the season. In 2018 a minimum weight rule made be made effective for all cars.

Detailed Car Body Requirements

A. WINDSHIELD: All factory STOCK OEM glass must be removed. The factory stock glass windshield must be replaced with 1/8" thick polycarbonate (lexan). The windshield must be bolted or riveted in along all four sides. You may not use ~~side windows, quarter windows, or a rear window.~~ **Side and Quarter windows are allowed.** Windshield must be supported in center top to bottom and braced to windshield bar.

B. REAR VIEW MIRROR: One approved 2" x 10" or smaller single panel rear view mirror mounted in the center of the car is allowed. If the mirror is larger than 2" X 10" it must be painted black to obscure anything larger than the allowable 2" X 10" area. Mirrors that do not meet this rule will be removed for that event. One 1"-3" spot mirror is allowed.

C. FIREWALLS: The front firewall must completely seal the driver's compartment from the engine compartment. The rear firewall must completely seal the driver's compartment from the fuel cell/trunk area. All holes in either firewall must be suitably covered with a minimum of .024" / 24 gauge magnetic steel sheet.

D. BUMPERS: The factory STOCK OEM bumpers made for your car must be used or you may construct your front and rear bumper using 1-3/4" .095 Round Tubing. Fabricated bumpers must follow the contour of the bumper cover(s) and be firmly attached to them using 2 round head bolts on each tube. Bumpers must be a double (stacked) round tube across the entire width of the front of the car. Excessive bracing/reinforcing will not be allowed. You may not compete without a securely, mechanically fastened front and rear bumper. Bumpers and bumper mounts may not be reinforced.

Engine

A. The engine and all of its components must remain unmodified and completely STOCK OEM for your car according to your VIN Code.

B. The engine must be the one that either comes with, or is available in, your make and model car. The engine and all of its components must remain STOCK OEM.

C. You may not do any modifications or machining to any part of the engine or its components. The only acceptable work allowed is normal /standard overhauling, including rings and bearings, and other parts without milling and over-boring, etc...

D. The block, rotating assembly, cylinder head, carburetor or injection system, camshaft(s) and valve train, and intake manifold must remain unmodified and completely STOCK OEM.

E. The Stock OEM compression ratio must be maintained for your make/model/year.

F. Fuel injectors will be inspected and must match factory stock OEM for your make/model car.

G. The use of poly type engine mounts is acceptable.

H. Air filter/housing: The STOCK OEM air filter housing with a paper filter must be used. Cold Air Boxes, or any other aftermarket components are not allowed. Air Boxes located behind the engine in its stock location, may be relocated within the engine compartment, however, no added duct work will be permitted for said air intake system.

I. FUEL PUMP: The STOCK OEM electric or mechanical fuel pump must be used. All electric fuel pumps must be wired through the oil pressure switch so when the engine stops running, the fuel pump stops running. You may not compete without having your electric fuel pump wired in this manner.

J. MISC: The pulleys, oil pan, valve cover(s), and timing cover must remain unmodified and completely STOCK OEM for your engine / car.

Car Electrical System

A. The alternator, starter, ignition system, and engine management controls must remain unmodified and completely STOCK OEM for your engine / car, according to your VIN Code.

B. Computer chip must be the STOCK OEM chip for your engine / car according to your VIN Code.

C. All electrical switches must be located on the dash panel or within easy reach of the driver.

D. A master battery switch must be installed within reach of the driver and clearly marked "on" & "off".

E. Battery: The battery may either be placed in the stock location or be moved to a secure box located behind the driver's seat. If placed behind the driver, the battery must be encased in a metal or plastic box and secured appropriately. The battery must be completely sealed from the driver's compartment. Gel Batteries are permitted and recommended.

Engine Cooling System

A. WATER PUMP: Must be completely STOCK OEM for your engine according to the VIN Code.

B. FAN: Must be STOCK OEM for your car.

C. RADIATOR: Must be STOCK OEM for your car or an aftermarket racing type radiator that mounts in the stock location. Water and "water wetter" brand additive are the only coolants allowed. A 1 gallon over flow can, mounted under the hood must be used.

Engine Exhaust System

A. EXHAUST MANIFOLD: The unmodified, STOCK CAST OEM exhaust manifold must be used. OEM factory headers will be allowed. Aftermarket headers are not allowed. All Headers must be a Direct Fit Factory Replacement.

B. EXHAUST PIPE: The STOCK OEM exhaust pipe must be used back to the muffler.

C. MUFFLER: An unmodified Lobak # RCM-25-12-25 or Moroso #94050 muffler must be used. The muffler should be installed so it is removable for tech inspection processes. **Exhaust system must extend rearward past the driver and exit towards the ground at a 90-degree angle.**

Drive Train

D. REAR END / TRANSAXLE / TRANNY: The driveline and all of its components must remain unmodified and completely STOCK OEM for your car according to your VIN Code. The driveline unit must be an "open", "single leg" unit, allowing only one wheel to drive the vehicle. You may not do any modifications or machining to any part of the driveline or its components. The only acceptable work allowed is normal rear end, transaxle, transmission, driveshaft and CVJ rebuilding. STOCK OEM standard or automatic transmissions are allowed. All clutch / pressure plate / flywheel components must remain unmodified and completely STOCK OEM for your car according to your VIN Code. Flywheel, clutch and clutch covers will be weighed. The use of poly type transmission mounts are acceptable.

E. WHEELS: The STOCK OEM steel wheels or equivalent aftermarket steel wheels may be used.

Wheels must meet the following criteria:

Wheels must be steel, 13" or 14" diameter, and a maximum of 7" wide.

All four wheels must be the same width, and backspace. Maximum 4" **Backspace** allowed. The tires cannot extend outward beyond the fenders and quarter panels. You may not alter the shape of the fenders and quarter panels to meet this rule. If your tires stick out beyond your fenders or quarter panels, you may be assessed a 100 lb. weight penalty.

F. TIRES: Any DOT street legal, 60 series or numerically higher "H" rated (or less) with a UTOG wear rating of 350 or higher may be run. Tires must be 13" or 14" diameter. Radial Tires only, no racing, bias-ply, or tube type tires allowed. All four tires must be the same size. Example: If you run 205/70-14's, then all four tires must be 205/70-14's.

Legend Car Tire Option

C. TIRES: The tires must be sets of 4 "INEX" marked Federal tires as delivered by U.S. Legend Cars International. Federal Tires must be mounted and used in the direction indicated on the sidewall. Tires may not be soaked, softened, siped (razor cuts), needled, grooved or recapped.

B. Hardness -If any federal tire is softer than 58 points on the New London Waterford Speedbowl Inspector's durometer, the driver will face penalties from probation to an indefinite suspension. Tire warmers and any other means of artificially warming tires are prohibited.

C. TIRE TREAD DEPTH: When the tire corner/sidewall wears into the two triangle indicators in a row between the tread and Federal striped band around the sidewall or the tire shows cords (belts) at any point on the tire, that tire will be confiscated, destroyed or drilled by the technical inspector. There is no disqualification for violation of this rule unless more than one tire is below the minimum tread depth. If this rule is violated on two different occasions at the same event or two tires on the car at the same time, that driver will be disqualified. If the wear bar is cut out or tampered with, that tire shall be destroyed immediately and a disqualification will be applied.

D. The new Hoosier tires being used on the legend cars are not approved for use at this time.

Suspension

A. Front Suspension Components: All of the front suspension components must be the unmodified, STOCK OEM components that came on your car, per the VIN Code. The only exception is the Front Spindles, which may be altered to achieve a maximum camber of 6 degrees.

B. Rear Components: All of the rear suspension components must be the unmodified, STOCK OEM components that came on your car, per the VIN Code. The only exception is the Rear Toe Adjusters which may be altered to assist with setup. Maximum Rear Toe is +1/2" / -1/2".

C. Swaybar: Must be STOCK OEM for your car. Maximum front swaybar diameter is 1-1/4". You may run a STOCK OEM rear sway bar if your car was originally equipped with one, per your VIN Code. Stock sway bar links must be run, no adjustable links.

D. Coil Springs: Springs must fit in the STOCK OEM spring pockets. Springs must be the same diameter from side to side, and must be within 1/2" in free height from side to side. Spring rubbers are allowed and MUST be fully encased between the coils of the spring. Only one rubber per spring is allowed. A single fabricated steel spring spacer is permitted to assist with achieving minimum frame/chassis height as listed below. Maximum spacer height of 1" is allowed for a spacer. One spacer allowed per spring.

E. Leaf Springs: Springs must fit in the stock location and use stock mounting hardware. Springs must be identical from side to side.

F. Torsion Bars: Torsion bars must fit into stock location and use stock mounting hardware. Bars must be identical from side to side.

G. Shocks / Struts: The shocks / struts must be unmodified, STOCK OEM or direct replacement shocks / struts. They must match from side to side. Racing or adjustable shocks / struts are not allowed. All mounting holes, locations, and hardware must remain STOCK OEM.

H. Spindles & hubs, upper and lower a-frames, and rear trailing arms: Must be the unmodified, STOCK OEM components that came on your car, per the VIN Code. All mounting holes, locations, and hardware must remain STOCK OEM.

I. The only modification of the suspension allowed is as follows:

-Upper a-frame bolts may be replaced to allow camber / caster adjustments.

-All caster/camber hardware must be approved by **New London-Waterford Speedbowl** Officials.

-Strut towers may be slotted for camber / caster adjustments.

-Maximum camber allowed in the front is +/-6 degrees.

-Maximum camber allowed in the rear is +/-3 degrees.

-Minimum Frame/Chassis Height of 4 1/2" at all times with the driver in the car. This may be checked pre or post-race. Driver must have all safety gear with the (Helmet/HANS/Firesuit/Etc.) during pre and post-race inspections.

-No other modifications are allowed. -All mounting holes, locations, and hardware must remain STOCK OEM. -Factory STOCK OEM wheelbase must be maintained, plus or minus 1/2".

J. No unapproved poly type or hard bushings will be permitted for use.

K. Any modifications to the Front or Rear Suspension that do not meet the approval of the New London Waterford Speedbowl staff will have to be corrected and may be deemed illegal.

Steering System

A. Steering ~~box~~ rack, power steering pump and reservoir, , tie-rods and sleeves must be the unmodified, STOCK OEM components that came on your car, per the VINCode.

B. All mounting holes, locations, and hardware must remain STOCK OEM.

Brake System

A. BRAKE COMPONENTS: The fully operational STOCK OEM 4-wheel hydraulic disc/drum brake system must be used.

B. All brake components must be STOCK OEM.

C. All brake components must be in their STOCK OEM location.

D. No brake components may be altered for weight reduction.

Fuel

A. DEFINITION: The word "Fuel", whenever used in this document shall be understood to mean automotive gasoline which complies with the specifications given in this section.

B. FUEL SPEC'S: Pump gas must be used, no racing fuel. You may not mix or blend any fuels, or use any additives. Several testing procedures will be utilized to insure that all racers use only approved fuels. Icing or cooling of the fuel system is not permitted at any time. Gasoline may be tested and certified at any event through the application of various chemical analyses as considered appropriate by officials.

C. FUEL SYSTEM: Fuel cells, containers, or check valves which appear to be damaged will not be allowed in competition. Fuel cell vent check valves are mandatory.

D. FUEL CELL: The use of a commercially manufactured fuel cell is mandatory. The maximum fuel cell capacity, including the filler spout and overflow, is 22 gallons. No material other than standard foam as provided by the fuel cell manufacturer is permitted to make the fuel cell meet the 22-gallon capacity. Effective 2018 the maximum Fuel Cell Capacity allowed will be 16 Gallons.

E. FUEL CELL CONTAINER: The use of a magnetic steel fuel cell container is mandatory. The fuel cell must be encased in a steel container of not less than 22 gauge (.030") steel. Fuel cells must be fitted within the container so that the maximum capacity, including filler spout will not exceed 22 gallons.

F. FUEL CELL AND FUEL CELL CONTAINER INSTALLATION: The floor of the trunk must be removed in the area directly below the fuel cell to allow any spilled fuel to escape the car. The area being removed can be no larger than the fuel cell itself. Cars that have more trunk floor material removed must add 22 gauge (.030") in its place. The fuel cell and fuel cell container must be installed as far forward as possible, centered in the chassis, behind the rear wheel centerline. The fuel cell may be no lower than the frame rails at the point it is mounted. A "cage" for the cell must be made out of 1" minimum steel tubing. This "cage" must be attached to the cars frame rails or uni-body using 1" (minimum) steel tubing. The fuel cell container must be secured on top by 1" x 1" square steel tubing or 1" x 1/8" thick steel straps, two lengthwise and two crosswise. The straps must be located as close to the fuel filler/check valve housing as possible.

G. FUEL FILLER: The fuel cap must be painted white with an "X" and your car number on it for identification.

H. FUEL CELL VENT: A 1" maximum ID vent to outside of body at left rear corner must be used. A fuel vent check valve is mandatory.

I. FUEL LINES: Only one fuel line is permitted from fuel cell to fuel pump, and one fuel line permitted from fuel pump to carb/injection unit. The fuel line can be no larger than 1/2" ID. The fuel line from cell to pump must remain under floor of car.

J. FUEL SHUT-OFF: A 1/4 turn fuel shut-off valve is required in the fuel line. Fuel shutoff must be located in passenger side of driver's compartment, clearly labeled and easily accessible by safety personnel. The valve must be open when the handle is aiming front to back, and the valve must be closed when the handle is aiming left to right.

Accessories

Radios

- A.** One-way communication from the Race Director/Tower to the driver is mandatory.
- B.** A scanner or Raceceiver must be used.
- C.** The preferred scanner is the Raceceiver scanner used by 600 racing.
- D.** If a scanner other than the Raceceiver is used it must be locked onto the track tower frequency. Monitoring the track is your responsibility. You may be placed at the tail end of the field for failure to monitor the track frequency.
- E.** No other type of communication, one way or two way, is permitted. Drivers found using any type of communicating device other than the Raceceiver or scanner locked on track frequency will be disqualified for that event.
- F.** If the Raceceiver is not working, you may be black flagged from the event if it presents a problem on the race track.

Electronics

- A.** No onboard computers, automated electronics, recording devices or digital readout gauges of any kind are permitted.
- B.** All teams must get approval before using any in-car camera equipment.
- C.** All Video Recording Devices must be registered with the New London Waterford Speedbowl.
- D.** A Video Camera Registration Form must be filled out and on file with the New London Waterford Speedbowl prior to using any recording devices.

6.16 Roll Cage

- A.** All bars described must be made with 1-3/4"x .095" wall (HREW or DOM) steel tubing. If your car does not have a frame to attach the cage to, then 2" x 3" rectangular tubing extending as far forward and rearward as possible inside the passenger's compartment. All of the bars must land within the driver's compartment. No bars may extend forward or rearward beyond the front and rear firewalls.
- B.** A "main roll cage hoop" must be installed over the driver's head, tight against the roof, out to the doors and down to the frame or steel plates.
- C.** A "roof hoop" (halo) must attach to the main hoop on each side, as high as possible, made as wide as possible, and extend as far forward as possible toward the windshield.

- D.** Two "front down bars" (one on each side) must be installed from the forward outer radius of the roof hoop (halo) and run forward and down along the front window post to the floor area by the drivers and passenger's feet, being welded to the frame or the steel plates.
- E.** A minimum of four "driver's door bars" must be convex in shape, curving out towards the door skin. They must be welded from the main roll cage hoop to the front down bar. The door bars should be evenly spaced from top to bottom.
- F.** A minimum of three "passenger door bars" must be straight bars, evenly spaced from top to bottom, welded in the same locations as the left side door bars.
- G.** Two "rear down bars" (one on each side) must be installed from the top of the main hoop (backside) down to the frame before the rise in the frame (by the base of the rear firewall). These two bars may not extend through the rear firewall.
- H.** A "shoulder bar" must be installed at shoulder level, left to right, between the two uprights of the main roll cage hoop, at shoulder height.
- I.** A "petty bar" must be installed from the middle (left to right) of the "shoulder bar" and angle forward and down to the bottom of the right side "front cage down bar" or attach to the frame or the steel plate in that area. The petty bar must not extend forward through the firewall.
- J.** A "dash bar" must be installed by joining the two front down bars together, left to right, at the dashboard height.
- K.** A "middle windshield bar" must be installed in the middle (left to right) of the Dash bar, curving forward and up toward the windshield, and attaching to the middle (left to right) of the forward bar of the roof halo.
- L.** Two bars, (one on the driver's side, one on the passenger side) attached to the front down bars and extending forward and down, landing at the base of the front firewall must be installed for added foot protection. The driver's side bar must also be padded.
- M.** An "ear" bar, located vertically by the driver's head is mandatory. It should be placed as far forward as possible, while still allowing the driver easy entry and exit from the car. Additional bars maybe added for safety but must not extend through the front or rear firewall for attaching purposes. Additional bars must attach to the floor boards, the frame, or the sub-frame. Commercially manufactured roll bar padding must be used on all bars within driver's reach. No car with less than the minimum roll cage standards will be allowed to compete. All mandatory roll cage tubing must be placed as described.
- N.** A rear hoop is allowed (optional) on all cars. If installed it must be made of 1-3/4" x .095 Wall round steel tubing (HREW or DOM). Due to the various types of cars being run the only requirement is that the rear hoop attaches horizontally to the 2 "rear down bars" on each side and is adequately supported.
- O.** A magnetic steel anti-intrusion plate (door bar plate) made from a minimum thickness of .080 must be securely welded to the outside of the left side door bars. The anti-intrusion plate(s) must fill the area between the horizontal centerlines of the top and bottom door bars, and vertical centerlines of main roll bar, and the left front roll bar leg. The plate(s) must be formed to match the curvature of the door bars. Individual plates, if used, should be made as large as possible. All plate(s) must have the corners welded. To facilitate emergency removal of the left side door bars, the anti-intrusion plate(s) must have four (4) 2-1/4 inch diameter holes cut in the anti-intrusion plate, to allow the "jaws of life" to get access to the roll cage door bars.

P. All cars must have a foot protection bar, made from 1-3/4" diameter roll cage tubing installed on the left side of the roll cage. The foot protection bar must be located at the pedal assembly, when viewed from the side and above. The foot protection bar must be installed between the left front roll cage "down bar" and the left frame rail.

New London-Waterford Speedbowl officials reserve the right to interpret any and all of the above the written rules in any way, under the guidelines of the published X-Car division rules.