

14. TECHNICAL SPECIFICATIONS

14.1. General

14.1.1. INDYCAR shall maintain a technical site on (IRIS) for Members to submit questions and INDYCAR to provide technical information or provide various technical updates when necessary.

14.1.1.1. The only binding means of communication shall be in writing.

14.1.2. Questions submitted by close of business on Friday will be answered by the close of business the following Wednesday. Modifications must be approved seven (7) days prior to the date of intended use. Safety and critical issues will be answered as soon as practical.

14.1.3. All parts provided by an Approved Supplier must be used as supplied without modification unless otherwise approved by INDYCAR and stated in these Rules or in update bulletins.

14.1.4. Approved Suppliers must submit bulletins to INDYCAR for approval prior to releasing bulletins to Entrants.

14.1.5. All original Manufacturer identification markings and/or tags must remain as supplied.

14.1.6. INDYCAR decides the factors in inspection, and it may vary by Entrant, portion of Event and/or Event.

14.1.6.1. INDYCAR decides the order of inspection.

14.1.6.2. Entrants are required to have the tools necessary to fulfill work as requested by INDYCAR.

14.1.6.3. A penalty may still be issued, even if the Car or part completed inspection at an earlier Event and/or earlier portion of the same Event.

14.1.7. Tape is not permitted as a single source of attachment for any component.

14.1.8. Once Qualifications has begun and throughout the remainder of the Event, the aerodynamic configuration of the Car can only be changed by the addition and/or removal of approved individual parts and not by the changing of assemblies. Parts damaged during the Race may only be replaced by an exact matching part or assembly.

14.2. Development Areas, Reproduction Parts, and Direct Purchase Parts

14.2.1. Development Areas

14.2.1.1. The following areas are open for development. The mating parts must remain as supplied, and the areas must otherwise comply with the Rules.

14.2.1.1.1. Water pipes,

14.2.1.1.2. Oil pipe (at least a six (6) inch flexible section must remain at the radiator end of the pipe),

14.2.1.1.3. Oil/greases,

14.2.1.1.4. Radiator screens (mesh and honeycomb),

- 14.2.1.1.5.** Blockers as Homologated,
- 14.2.1.1.6.** Radiator duct internal vertical turning vanes may be added,
- 14.2.1.1.7.** Dampers and inerters (Rule 14.12),
- 14.2.1.1.8.** Treatments and coatings on the gearbox/differential,
- 14.2.1.1.9.** Fuel cell collector pot (the fuel cell collector pot must remain inside the fuel cell, must have a drain valve at the base of the collector, and must fill during an INDYCAR performed fuel cell capacity check),
- 14.2.1.1.10.** Plumbing of the fuel cell lines,
- 14.2.1.1.11.** Refueling hose-to-tank connector,
- 14.2.1.1.12.** Front and/or rear radiator panels (mounted on the front or back side of the radiator, and the panels must be flat and may only have a small return for the purpose of providing a fixing to maintain the location),
- 14.2.1.1.13.** Internal brake ducting (must be completely contained within the brake scoop and brake backing plate),
- 14.2.1.1.14.** Bushings,
- 14.2.1.1.15.** Plumbing,
- 14.2.1.1.16.** Spacers,
- 14.2.1.1.17.** Drive peg extensions,
- 14.2.1.1.18.** Pushrod ends,

14.2.1.1.19. Anti-roll bar adjusters must be submitted to INDYCAR via IRIS for approval,

14.2.1.1.20. Bolt head types,

14.2.1.1.21. Pedal heads must be submitted to INDYCAR via IRIS for approval

14.2.1.1.22. Hoses/fittings/nuts and bolts,

14.2.1.1.23. Heat shielding other than fabrics or sleeving must be submitted to INDYCAR via IRIS for approval.

14.2.1.1.24. Seals – except for those listed in Rule 14.19.

14.2.1.1.25. Studs – except for those listed below:

Commercial Part Number	Dallara Ref. Code	Application
IR1204A019	IR1222050	SWY F Mainplane
IR1204B025	IR322030	Beam Wing, RC F Mainplane
IR1204B039	IR1222095	New (optional) RC F Mainplane
IR1207B016	IR1222004	Caliper Stud M10
IR1208A005	IR345079	Rear Rocker Main Stud

IR1208A014	IR1222014	Rear Suspension Clevis Stud 7/16, with dowel
IR1208A015	IR1222013	Rear Suspension Clevis Stud 7/16 w/o dowel
IR1221A001	IR1222042	Lower Engine Stud, Honda Installation
IR1221A002	IR1222041	Upper Engine Stud, Honda Installation
IR1221B003	IR1222033	Bellhousing to Gearbox Stud 7/16
IR1221B009	IR1222031	Bellhousing to Gearbox Stud 7/16
IR1222A001	IR1222058	Lower Engine Stud, Chevy Installation
IR1222A002	IR1222056	RH Upper Engine Stud, Chevy Installation
IR1222A003	IR1222057	LH Upper Engine Stud, Chevy Installation

14.2.2. Reproduction Parts

14.2.2.1. The parts listed below may be reproduced or purchased directly from Dallara. The parts must be consistent with the approved drawings including material. Any variations from the approved drawings must be submitted to INDYCAR via IRIS for approval. Specific details and drawings related to each part are available on IRIS.

14.2.2.1.1. Airjack receptacle (the airjack receptacle must remain in the INDYCAR-approved location)

14.2.2.1.2. Pedal stems,

14.2.2.1.3. Pedal brackets,

14.2.2.1.4. Rockers,

14.2.2.1.5. Anti-roll bar blades,

14.2.2.1.6. Anti-roll bars, and

14.2.2.2. The parts listed below may be reproduced or purchased directly from Approved Suppliers. The reproduced part must be consistent with the original approved part including material. Any variations from the approved part must be submitted to INDYCAR via IRIS for approval.

14.2.2.2.1. Refueling hose-to-probe connectors (Rapid Prototyping & Engineering, Inc. part #INDYCAR 0512).

14.2.3. Direct Purchase Parts

14.2.3.1. Entrants may purchase the following parts directly from the INDYCAR Approved Supplier:

14.2.3.1.1. Water radiators:

- PWR Water Radiator IR1215A001
- Mezzo Water Radiator IR1215A009

14.2.3.1.2. Oil radiators:

- PWR Eng/G Box Oil Cooler IR1216A001

14.2.3.1.3. PFC Brakes:

14.2.3.1.3.1. Rotors,

14.2.3.1.3.2. Pads,

14.2.3.1.3.3. Disc bells, and

14.2.3.1.3.4. Disc mounting hardware and bobbins.

14.2.3.1.4. Fuel Safe fuel cell bladder.

14.3. Technical Inspection

14.3.1. The responsibility remains with the Entrants to make sure Cars conform to all Rules throughout the course of an Event.

14.3.2. The responsibility remains with the Entrants to make sure all parts used on Track have successfully completed technical inspection prior to Qualifications and Race.

14.3.3. Reference planes and '0' coordinates

14.3.3.1. All measurements shall be taken from the reference plane or '0' coordinates. These shall be established by Dallara and cannot be modified.

14.3.3.2. References will be measured using the following coordinates:

- a) "X" coordinate is defined as the relative location fore and aft of the front face of the forward chassis bulkhead - "0" being the forward face of the chassis. These measurements will be referred to as +/- the "X" line, with - (negative) being forward.
- b) "Y" coordinate is defined as the location laterally from the chassis centerline, Driver's right hand side being positive.
- c) "Z" coordinate is defined as the location vertically with the bottom of the skid being 0 'Z', + (positive) being up.

The bottom of the skid establishes the "chassis reference plane." For purposes of technical inspection, the "chassis reference plane" is 1.000 inches above the plane established using "Tech Tool Monocoque Nosepin Machined Plate, IR1201977" and the gearbox reference puck as defined in "Xtrac Technical Bulletin 020" and "Dallara Technical Bulletin #13.01.

14.3.4. The engine and gearbox installed angle is minus 0.10 degrees to 0.10 degrees relative to the '0' line.

14.3.5. INDYCAR may inspect, impound and/or confiscate any Car, part, equipment, item, or data associated with a Car or its operation during an Event at any time. INDYCAR is not responsible for

damage or loss as a result of inspection procedures, impounding, or confiscation.

14.3.5.1. Entrants must submit to INDYCAR via IRIS (under the Technical Data section) a complete Cosworth dataset from the outing that contains the fastest lap after practice session one (1), Qualifications, and the final practice session, within one (1) hour after completion of the session. INDYCAR may request additional datasets.

14.3.6. INDYCAR may examine any Car involved in a crash and determine if it is suitable for further participation and all Members shall cooperate in the preparation of damage reports, photographs, videotaping and impact recording analysis.

14.3.7. Chassis, nose and attenuator structural repairs may only be made by Dallara.

14.3.8. Chassis-repair forms must be submitted to INDYCAR for approval prior to the Car participating in the next Event.

14.3.9. After a crash, an Entrant must present the following items and any others to INDYCAR, upon request

- a) Driver's Helmet
- b) Driver's Head Restraint System
- c) Driver's Seat
- d) Chassis Headrest
- e) Steering Wheel
- f) Ear Pieces

INDYCAR will inspect the items. Any item that does not successfully complete inspection must be repaired, re-certified or replaced by the Entrant at the Entrant's cost prior to use.

14.3.10. The maximum amount of fuel allowed in the Car when coming through Entrant-initiated technical inspection is 6 gallons. The Car must be empty of fuel when being weighed.

14.4. Car Weight and Driver Equivalency Weight

14.4.1. Car Weight

14.4.1.1. The minimum weight shall include all lubricants, coolants and camera or dummy camera housings. Fuel, Driver, drink bottle and contents and Driver equivalency weight are excluded.

14.4.1.1.1. Minimum weight for Road/Streets & Short Oval Events – will be 1610 pounds.

14.4.1.1.2. Minimum weight for Speedway Events – will be 1580 pounds.

14.4.1.2. The only approved ballast location is the keel.

14.4.1.3. Entrants are permitted one drink bottle per Car. The drink bottle must be installed in the side pod but cannot be installed during Qualifications.

14.4.2. Driver Equivalency Weight

- 14.4.2.1.** INDYCAR specifies the Driver Equivalency Weight. INDYCAR shall notify each Entrant of its Driver Equivalency Weight.
- 14.4.2.2.** Driver Equivalency Weight must bring the combined weight of the Driver and Driver ballast to 185 pounds.
- 14.4.2.3.** INDYCAR may weigh any Driver and adjust the Driver ballast accordingly.
- 14.4.2.4.** Drivers over 185 pounds are allowed a Car weight reduction equal to the amount the Driver exceeds 185 pounds.
- 14.4.2.5.** The Driver ballast weight tolerance is 0.00 to + 1.00 pounds. The Driver Equivalency Weight must be installed and secured in the designed location forward of the seatback. This location may only be used for Driver ballast.
- 14.4.2.6.** In addition to the above specified location, a 10 pound (tolerance 0.00 to + 0.50 pounds) Driver ballast weight may be added to the front face of the pedal bulkhead as per approved drawing supplied by Dallara. This location may only be used for Driver ballast and only for Drivers requiring 10 pounds or more ballast.
- 14.4.2.7.** The Driver Equivalency Weight must be a hard dense metal.
- 14.4.2.8.** Violation of this Rule may result in a minimum \$100,000 fine and/or other penalties.

14.4.2.9. All Drivers are reweighed at technical inspection within fifteen (15) minutes after completion of practice session one (1) of a Race Event. Drivers must wear the following personal safety equipment: uniform, underwear (top and bottom), socks, and shoes.

14.4.2.9.1. A Driver late for weigh in loses ten (10) minutes from the end of the next practice session.

14.4.2.9.2. A Driver failing to appear for weigh in may not participate in practice and/or Qualifications until he/she has completed the weigh in.

14.4.2.10. Driver ballast changes are subject to the following:

14.4.2.10.1. A Driver weight change of plus or minus 3 pounds: Car and/or Driver weight will remain unchanged, and Entrants may not change their Driver ballast.

14.4.2.10.2. A Driver weight change of more than plus or minus 3 pounds: Entrants must change their Driver ballast before the current Race's Qualifications.

14.4.3. A Driver weight change of more than plus or minus 7 pounds: Entrants may be subject to penalty

14.5. Chassis

14.5.1. Timing Transponder – The timing transponder must be used in the designated location as supplied by INDYCAR at all times.

14.5.2. On Board Fire Equipment - Each Car must have the Dallara supplied built-in operable fire extinguishing equipment with a minimum content of 2.250 liters in the Dallara/INDYCAR specified location. The U.S. Department of Transportation approved fire suppressant used must be AFFF-M-E fluid.

14.5.3. Impact Recorders - All Cars must make provisions for the installation of an impact recorder.

14.5.3.1. The impact recorder supplied by INDYCAR and used without modification, must be securely bolted using four (4) bolts to the main chassis structure in the Dallara/INDYCAR specified location.

14.5.3.2. The impact recorder download block and indicator lights must be located in the Dallara/INDYCAR specified location.

14.5.4. Mirrors Lens - The minimum mirror glass dimension is 6.000 inches wide by 2.000 inches tall with a corner radius of 0.375 inches. No portion of the mirror lens may be recessed in the mirror housing by more than 0.250 inches. The standard Dallara mounting location for the lens must not be moved and the housing must be trimmed to comply with the 0.250-inch dimension.

14.5.4.1. The top of the mirror housing must be between 0 degrees to +7 degrees (nose down) in the longitudinal axis and between +0.5 degrees (outboard down) to -3.5 degrees (inboard down) in the transverse axis.

14.5.5. Cockpit – Cars must have fitted all the Dallara supplied cockpit panels and EPP foam panels in the footbox, leg and seat area. No modifications can be made without prior INDYCAR approval.

14.5.6. Windscreen – All windscreens must be approved by INDYCAR prior to use.

14.5.7. Seating System

14.5.7.1. Each seat must be manufactured for a specific Driver. Each seat must have a unique identification tag from the seat manufacturer and be date stamped. All seats must be inspected and approved by INDYCAR before use and will be subject to re-inspection by INDYCAR at any time. INDYCAR may require a seat to be replaced.

14.5.7.2. The Driver's seat must conform to the Driver's anatomy and be constructed of an INDYCAR- approved material that will permit support and energy-attenuation both laterally and rearward. This material must fill as much of the cockpit under, behind and to the side of the Driver as possible. The seating system must be in place when the Car is inspected.

14.5.7.3. When the Driver is seated, there must be a smooth transition of energy-attenuating materials between the top of the seat and the cockpit rim padding, including the rear headrest. There must be no projections that could provide a fulcrum between the Driver's head and neck.

14.5.8. Seat Belts - An approved seat belt with an approved quick-release mechanism must be used. Both the fastening design and condition of the belt is subject to inspection by INDYCAR. Life of the belts in use shall not exceed 5 years and must be date-stamped by the manufacturer. All belts must conform to the following SFI specifications: 3 inch SFI 16.1, 2 inch SFI 16.5 or FIA 8853/98 or equivalent specification as approved by INDYCAR.

14.5.8.1. Seat belts must be worn in such a manner that they are tight and pass around the pelvis at a point below the anterior superior iliac spine.

14.5.8.2. Seat belts may not pass over the sides of the seat. They must come through the seat at the bottom on each side thereby wrapping and holding the pelvis over the greatest possible area.

14.5.8.3. 6-point (crotch) belts must be connected to the main belt quick-release mechanism and securely attached to the chassis.

14.5.8.4. Seat belts which have had to withstand a crash in excess of fifty (50) Gs must be replaced.

14.5.9. Shoulder Harness – Two (2) over-the-shoulder straps must be used. HANS® specific double-shoulder belts are also permitted provided they are mounted and used according to manufacturer specifications. Both the fastening design and condition of the straps is subject to inspection by INDYCAR. Life of the straps in use shall not exceed two (2) years and must be date-stamped by the manufacturer. Belts should be attached level with the top of the Driver's shoulders or at a slightly downward angle.

14.5.9.1. Mounting of all belts must use the manufacturer supplied mount and use the supplied mounting positions unless otherwise approved by INDYCAR.

14.5.10. Headrest -Headrests must be used as supplied by Dallara (Oval Events: IR1201B033, Road/Street Course Events: IR1201B032 or

IR1201B033). Oval headrests (IR1201B033) may only be covered with decal.

14.5.10.1. All headrests must be inspected and approved by INDYCAR before use and will be subject to confiscation and re-inspection by Officials at any time. INDYCAR shall affix stickers to the headrests signifying approval for use. At any time, Officials may remove the approval stickers and require the headrests to be re-inspected and refurbished by Dallara before INDYCAR may consider them for re-approval.

14.5.10.2. Headrests must be attached by the Dallara supplied mechanism. The headrest must be in place during technical inspection.

14.5.11. Additional Headrest Padding – Additional side padding must not exceed the height of the stock headrest as viewed from the side. Additional rear padding must not exceed the height or width of the headrest as viewed from the front. All padding must be contained in the original headrest dimensions as looked at in plan view.

The additional headrest padding, if used, must consist of separate pieces; left side, right side and/or rear. The side pieces are restricted to 15.000 inches in overall length and must have a minimum 3.000 inch leading edge taper from the front edge when viewed from the top (plan view).

The additional padding must be removable independently of each other without the use of tools. All additional padding must be manufactured completely of foam, each piece may have a single layer Kevlar backing to assist in the mounting providing that it remains flexible and does not

interfere with the original function of the stock headrest.

Any covering used on the additional padding must remain flexible and be approved by INDYCAR. Additional padding may not be taped along any surface. All additional pads and coverings must be inspected and approved by INDYCAR prior to use.

14.5.12. Roll Hoop – The Drivers helmet must be a minimum of 7.000 inches below the chassis mounting face of the roll hoop camera.

14.5.13. Car Tracking System, In-Car Cameras and On Board Video Equipment

14.5.13.1. Car Tracking System – The INDYCAR-approved car tracking system must be installed in the designated location(s) on each Car and must be operational at any time the Car is participating in on-Track Events.

14.5.13.2. In-Car Cameras – Upon INDYCAR's request, on board cameras must be used as supplied by Broadcast Sports, Inc. If INDYCAR does not request an on-board camera be used, dummy camera equipment must be used.

14.5.13.3. On Board Video Equipment - Entrants may use their own on board camera during non-televised practice sessions only. If used, it must be mounted directly in front of the rollhoop camera location and the mounting must be pre-approved by INDYCAR.

14.5.14. Additional Cameras – Any additional camera may only be used with prior INDYCAR approval.

14.6. Dimensions

14.6.1. Wheelbase

14.6.1.1. The maximum wheelbase is 121.500 inches and minimum is 117.500 inches.

14.6.1.2. The wheelbase of the Car, left to right, may have a maximum variance of 0.750 inch.

14.6.2. Track Width (measured at axle center line)

14.6.2.1. A maximum shim of 4mm may be used under the top rear wishbone studs and the rear toe link studs only. Spacers must be the same thickness for both front and rear wishbone legs.

14.6.2.2. Oval Events – Front and rear are limited to a minimum of 75.750 inches and a maximum of 76.750 inches.

14.6.2.3. Road & Street Course Events - Front and rear are limited to a minimum of 75.500 inches and a maximum of 76.500 inches.

14.6.3. Track Width Offset

14.6.3.1. Oval Events – The Car can be between 0.150 inches off center to the left or 0.600 inches off center to the right.

14.6.3.2. Road & Street Course Events – A maximum of plus or minus 0.250 inches is permitted left or right of center.

14.7. Aerodynamics - All Aero Kits

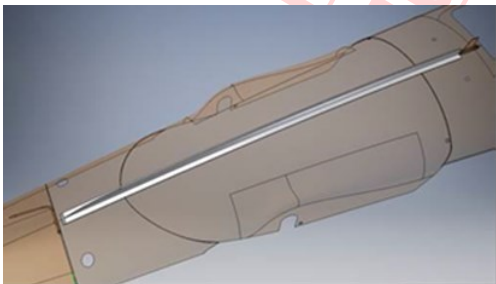
14.7.1. Engine installation components specific to each Aero Kit must be used as supplied by the approved Engine Manufacturer.

14.7.2. Attachments or devices that are movable or adjustable while the Car is in motion and which may affect airflow or aerodynamics are not permitted.

14.7.3. Wickers

- a)** Maximum height of 1.000 inches;
- b)** Maximum mounting face 0.750 inches long;
- c)** Securely fixed with a minimum of three (3) mechanical fasteners if greater than 6.000 inches in length;
- d)** Wickers less than 6.000 inches must have a minimum of 2 mechanical fasteners;
- e)** Must be at 90 degrees to the trailing edge;
- f)** Must be rigid, a consistent thickness, and be between 0.043 and 0.100 inches thick;
- g)** Must be parallel, stepped or tapered in profile with no sharp corners;
- h)** The only form of fastener permitted for the rear wing wicker attachment is bolts. No tape or adhesive is permitted.

14.7.3.1. Center Line Wicker - At all Events, chassis' run with a Honda Aero Kit must be fitted with a center line wicker as supplied by Aerodine Composites. A chassis run with a GM or Dallara Aero Kit must not be fitted with a center line wicker.



14.7.4. Front Wing

All Events

14.7.4.1. Paint, adhesive film, or any other substance may not be added to the underside of the mainplane from a point two (2) inches behind the leading edge of the wing to the trailing edge of the wing. .

Road / Street & Short Oval Events

14.7.4.2. The maximum overall width of the mainplane is 59.100 inches and minimum is 58.800 inches.

14.7.4.3. The bottom surface of the wing mainplane shall be no less than 2.850 inches above the chassis reference plane.

14.7.4.4. The maximum amount of front wing deflection will be 0.300 inches with a suspended load of 75 pounds applied at each outer end of the front wing end fences.

14.7.4.5. Shimming of the front wing mainplane is permitted to achieve heights and wing angle within the Rules.

14.7.4.5.1. The front wing mainplane angle must be set at 1.92 degrees, nose down plus or minus 0.15 degrees.

Indianapolis 500® Mile Race & Speedway Events

14.7.4.6. The front wing deflection allowed will be 0.425 inches with a suspended load of 50 pounds applied at each outer end of the front wing end fences.

14.7.5. Rear Wing

All Events

14.7.5.1. No shimming of the rear beam wing (IR1527238) is permitted.

14.7.5.1.1. No paint or other coatings including filler may be used on the beam wing or beam wing flaps (IR1527242LH & IR1527242RH).

14.7.5.2. The top surface of the mainplane must be covered with a one-piece decal wrap. The mainplane wrap must start at the trailing edge and extend one (1) inch around the leading edge of the lower surface. The mainplane wrap may have printing and decals applied, provided the printing or decals are approved by INDYCAR prior to use.

14.7.5.3. One 2.0 inch strip of helitape may be placed along the leading edge of the mainplane, provided it is applied 1.0 inch below and 1.0 inch above the centerline of the leading edge of the mainplane. The rear wing mainplane may not be painted.

14.7.5.4. During initial technical inspection at each Open Test and Race, the rear wing mainplane must be presented without the mainplane wrap, if requested by INDYCAR.

14.7.5.5. The wheel guard angle is a minimum of 88.50 degrees and a maximum of 91.00 degrees in the "X-Z" plane and the "Y-Z" plane.

Road / Street & Short Oval Events

14.7.5.6. The rear wing mainplane must be set at 0.0 degrees plus or minus 0.50 degrees.

14.7.5.7. The mainplane trailing edge height, as measured from the chassis reference plane is 28.060 inches plus or minus 0.050 inches.

Indianapolis 500® Mile Race & Speedway Events

14.7.5.8. When the Dallara mainplane is used (IR1205B001), the mainplane trailing edge height, as measured from the chassis reference plane, is 27.960 - 28.210 inches.

14.7.5.9. The rear wing end plate camera must be set at 0.0deg +/-0.50deg. The only exception is if the rear wing mainplane angle is adjusted after the Race has started.

14.7.6. Sidepod / Underwing

14.7.6.1. For all Events, the 2015 underwing IR1203A032/33 must be used. The underwing protectors IR1203A034/35/37 & 38 are mandatory at all times.

14.7.6.2. Standard sidepods / underwing as supplied in technical inspection must be able to fit and be fastened at any time, utilizing all original fasteners.

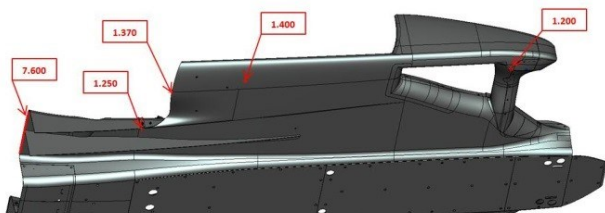
14.7.6.3. Sidepods and underwings must be able to withstand two (2) load checks.

a) The maximum front deflection allowed will be 0.275 inches with a suspended load of 75 pounds.

b) The maximum rear deflection allowed will be 0.200 inches with a suspended load of 75 pounds.

14.7.6.4. No paint may be added to the underwing surface from a point 2.000 inches behind the leading edge of the underwing. From this point after, only clear coating may be applied.

14.7.6.5. The underwing step plane heights must adhere to the following illustration. The heights of 1.200 inches, 1.250 inches, 1.370 inches and 1.400 inches have a tolerance of plus 0.200 inches and minus 0.000 inches.



14.7.6.6. The complete underwing as provided by Dallara cannot be modified or altered. The underwing must be used in the configuration designated by INDYCAR for any specific on-Track Event.

14.7.6.7. Ballast cannot be bolted or bonded to the underwing.

14.7.6.8. The exit of the underwing height is 7.600 inches with a tolerance of plus 0.050 inches and minus 0.050 inches.

14.7.6.9. Overall width of the bodywork may not exceed 79.100 inches.

14.7.7. Bodywork

14.7.7.1. An Entrant's Car must be able to fit a standard IndyCar Series chassis and standard INDYCAR tech parts must fit the Entrant's Car.

All intended shapes and radii must remain as designed.

14.7.7.2. All included fasteners must remain and be in the locations as delivered. Entrants are permitted to add extra fasteners.

14.7.7.3. The sidepods and/or shelves, fuel cell covers, buckeye covers and exhaust outlet panels must remain removable.

14.7.7.4. The sidepods and/or shelves, fuel cell covers and underwing to tub may be blended to reduce the mounting lip. There must be a distinct join line defining each part from its mounting surface.

14.7.7.5. The anti-intrusion panel, the 2014 chassis reinforcement panels and the 2015 FLWB anti-intrusion plate (Dallara etching must remain visible) may be blended until there are no distinctions between parts.

14.7.7.6. The headrest to the chassis cockpit rim interface may be blended, provided no material is added to the headrest.

14.7.7.7. All of the remaining underwing parts (splitters, sidewall extensions etc.) must remain as supplied with the exception of adding extra fasteners or the permitted trim to the underwing sidewall.

14.7.7.8. All other parts may be fitted to reduce gaps and uneven heights. In these instances, the chassis should remain as supplied to ensure standard parts can fit. No tongue-and-groove, dovetail, or other types of body fitting will be allowed.

14.7.7.9. Tape may be applied to bodywork and chassis junctions or openings providing there is no change to the intended shape or profile of the original part.

14.7.7.10. Bell housing cooling duct (Dallara part #: IR1221A004) is optional. The mating part bonded to the radiator inlet duct may be removed.

14.7.8. Skids – application according to Rule 14.8.4. and Rule 14.9.5.

14.7.8.1. Flat Skids

14.7.8.1.1. Skids must be made to the drawings supplied by Dallara. Split lines may be moved, and original puck holes may be removed.

14.7.8.1.2. Skids must be made from 3.0mm material or 0.125 inch material.

14.7.8.1.3. Approved materials are brass, carbon, stainless steel, aluminum, jabroc and plastic.

14.7.8.2. Domed Skids

14.7.8.2.1. Domed skids must be used as supplied by Dallara, except:

14.7.8.2.1.1. clear coat may be added,

14.7.8.2.1.2. unused holes may be filled,

14.7.8.2.1.3. domes may be repaired to their original intended profile, and

14.7.8.2.1.4. the front skid leading edge forward of the front two mounting screws may be smoothed.

14.7.8.2.2. Domed skid wear is not allowed on the front domed skid (IR1203A041) or the mid domed skid (IR1203A042).

14.7.8.2.3. Indianapolis 500 titanium bottoming plate procedure:

14.7.8.2.3.1. New plates must be used as supplied by Dallara for Saturday Qualifications.

14.7.8.2.3.2. These plates must be removed after Saturday Qualifications and will be impounded by INDYCAR.

14.7.8.2.3.3. These plates must be refitted for Sunday Qualifications.

14.7.8.2.3.4. These plates must be removed after Sunday Qualifications and will be impounded by INDYCAR.

14.7.8.2.3.5. These plates must be refitted for the Race.

14.7.8.2.4. Speedway titanium bottoming place procedure:

14.7.8.2.4.1. New plates must be used as supplied by Dallara for Qualifications.

14.7.8.2.4.2. These plates must be removed after Qualifications, and will be impounded by INDYCAR,

14.7.8.2.4.3. These plates must be refitted for the Race.

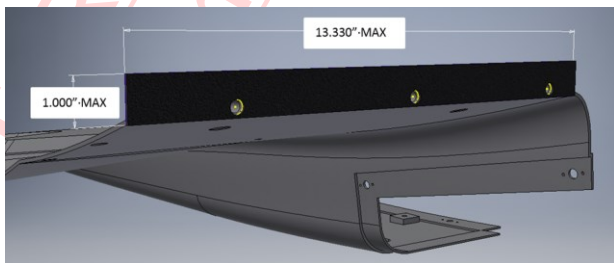
14.7.8.2.4.4. INDYCAR may require an Entrant to fit a new set of bottoming plates.

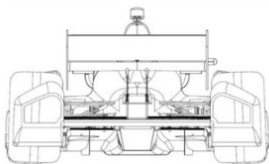
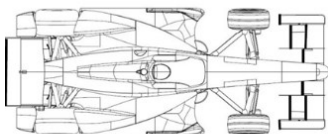
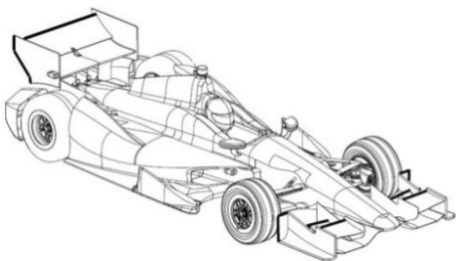
14.8. Aerodynamics - Dallara Aero Kit

14.8.1. Wickers – Wickers are permitted in the following places (see illustrations) and have the following restrictions:

14.8.1.1. Road/Street Courses/Short Oval Events

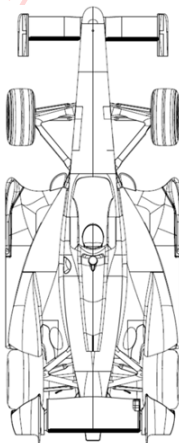
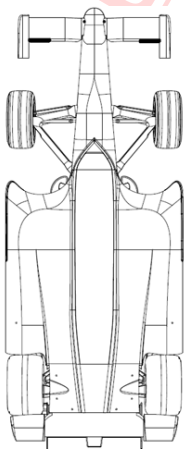
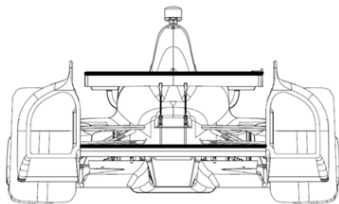
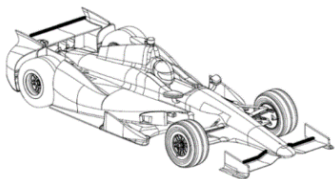
- a)** Must be mounted on the top surface of wing elements at the trailing edge;
- b)** Rear wing end fence wickers are only permitted on Road/Street Course Events.
- c)** The front end plate wicker (Dallara part #IR12-04B023) may be trimmed to increase brake cooling.
- d)** On the underwing trailing edge, Road/Street & Short Oval Events only





14.8.1.2. Indianapolis 500® Mile Race and Speedway Events

- a) Must be mounted on the top surface of wing elements at the trailing edge, with the exception of Rule 14.7.2.2.b;
- b) A single reverse wicker may be mounted on the bottom outboard trailing edge of the front wing with a maximum length of 6.000 inches.



14.8.2. Front Wings

All Events

- 14.8.2.1.** The complete front wing assembly must be used as supplied without modification and used in the configuration designated by INDYCAR.
- 14.8.2.2.** The trailing edge thickness of the front wing mainplane and flaps must be 0.075 inches plus 0.050 inches or minus 0.025 inches.
- 14.8.2.3.** The overall thickness of the end fence is 0.800 inches plus or minus 0.050 inches.

Road / Street & Short Oval Events

- 14.8.2.4.** The lower flap width is 14.910 inches, plus or minus 0.050 inches.
- 14.8.2.5.** The upper flap width is 14.930 inches, plus or minus 0.050 inches.
- 14.8.2.6.** The width of the end fence foot is 6.000 inches, plus or minus 0.050 inches.

Indianapolis 500® Mile Race and Speedway Events

- 14.8.2.7.** The overall width of the mainplane is maximum of 58.350 inches and minimum of 58.050 inches.
- 14.8.2.8.** The bottom surface of the wing shall be no less than 4.400 inches above the chassis reference plane.
- 14.8.2.9.** The width of the end fence foot is 4.870 inches plus or minus 0.050 inches.

14.8.2.10. The bottom edge of the end fences must be a minimum of 2.550 inches above the chassis reference plane.

14.8.3. Rear Wing

All Events

14.8.3.1. The complete rear wing assembly must be used as supplied without modification and used in the configuration designated by INDYCAR.

14.8.3.2. The overall width of the mainplane is 41.720 inches, plus or minus 0.050 inches.

14.8.3.3. Shimming of the rear wing mounting blocks is permitted to achieve heights, set back and wing angle within the Rules.

14.8.3.4. The trailing edge thickness of the rear wing mainplane and flaps must be 0.080 inches, plus 0.050 inches minus 0.025 inches.

14.8.3.5. No part of the rear wing mainplane may extend rearward of the differential axle centerline more than 26.188 inches.

14.8.3.6. The top edge of the end fence must be parallel to the chassis reference plane, plus or minus 0.250 degrees.

14.8.3.7. The maximum amount of rear wing mainplane deflection is 0.100 inches with a 250lb. load applied.

Road / Street Courses & Short Oval Events

14.8.3.8. The maximum amount of rear flap deflection is 0.500 inches with a 100lb. load applied.

14.8.3.9. The overall width of the flap is 41.700 inches, plus or minus 0.050 inches.

14.8.3.10. Flap(s) must be covered with a one-piece decal wrap. It may have printing and decals applied, providing the printing or decals are approved by INDYCAR prior to use. One 2.000 inch strip of helitape may be placed along the leading edge of the flap provided it is applied 1.000 inch below and 1.000 inch above the centerline of the leading edge of the flap.

14.8.3.11. The overall thickness of the end fence is 0.430 inches plus or minus 0.050 inches.

14.8.3.12. Rear wing slot gap - The flap angles are in degrees. The slot gaps are in inches.

Top Flap Angle	Min.	Std.	Max.
10	0.250	0.359	0.389
36	0.300	0.412	0.442
38	0.300	0.408	0.440
46	0.290	0.399	0.429

Speedway Events

14.8.3.13. The mainplane trailing edge height, as measured from the chassis reference plane is 27.960 - 28.210 inches.

14.8.4. Race Location Specific Configurations

Dallara Aero Kit Race Location Specific Configurations	Phoenix	Indianapolis 500	Texas*	Iowa	Pocono	Gateway*	Road & Street
Rear Mainplane IR1205B001	M	0° -> -10.5°	-4° -> -10.5°	M	0° -> -10.5°	M	M
Rear Flap IR1205C002 max angle	Max 19°	-	-	Max 19°	-	Max 31°	O
Rear Mainplane End Cap IR1205B011(RH)/12(LH)	-	M	M	-	M	-	-
Rear Indy Wheel Guard IR1205A019/20	U	M	M	U	M	U	U
Standard Rear Wheel Guard IR1205A003/04	M	U	U	M	U	M	M
Rear Wing Wicker	O	O	U	O	O	O	O
Rear Wing End Plate Wickers	U	U	U	U	U	U	O
Side Wall IR1203A007/08	U	O	O	U	O	U	U
+9mm Side Wall IR1203A007/08	U	O	O	U	O	U	U
Trimmed Side Wall IR1203A007/08	U	O	O	U	O	U	U
Underwing Strake IR1203A003/04	U	U	U	U	U	U	U
Sidepod Top Infill IR1202A031/32	U	O	O	U	O	U	U
SWY Front Brake Backing Plate IR1210E001/02	M	O	O	M	O	M	U
Rear Wheel Backing Plate IR1210H001->011	U	O	O	U	O	U	U
2/3 Radiator Inlet Shutter IR1202A029/30	O	O	O	O	O	O	O
Underwing Knob protector IR1203A039/40	O	O	O	O	O	O	O
Skid	F	D	D	F	D	F	F

*Subject to additional restrictions

M= Mandatory

O= Optional

U= Unapproved

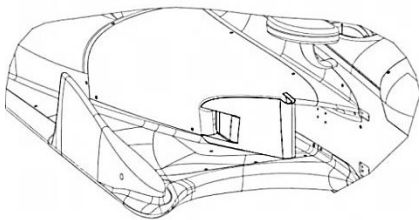
F= Flat

D= Domed

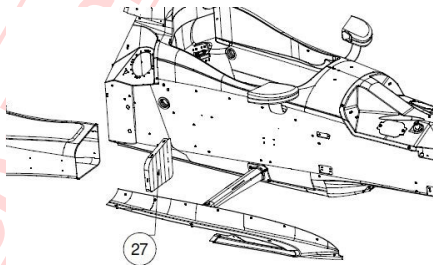
14.8.5. Sidepods / Underwing

14.8.5.1. Only the following types of radiator blanking are approved:

- a) **Dallara Inlet Shutter** – Entrants are permitted to trim the standard Dallara inlet shutter in the specified locations and are permitted to add mounting flanges to the backside of the panel.



- b) **Dallara Blanking Panel** –This part may be manufactured by an Entrant or purchased from Dallara. Panels must be mounted perpendicular to the Car centerline in the approved location at the entrance to the radiator inlet duct.



14.8.5.2. The three (3) screws that hold the two (2) sidepod halves together may be changed to Tridairs but the locations must remain “as is”.

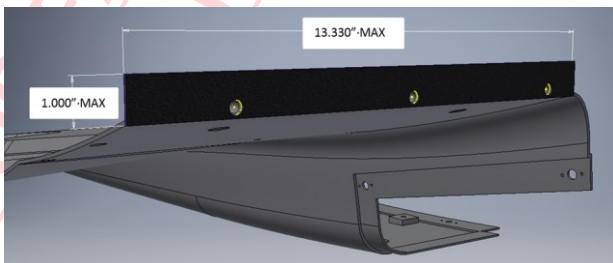
14.9. Aerodynamics – Non Dallara Aero Kits

14.9.1. Non Dallara Aero Kit Approved Suppliers must supply their respective Entrants and INDYCAR with a list of Homologated Aero Kit components and location of such components on the Car.

14.9.1.1. Aero Kit Approved Suppliers will be advised of allowable tolerances for technical inspection.

14.9.2. Wickers – Wickers are permitted in the following places:

- a) Where Homologated (and must fit entirely within the Volume box)
- b) On the underwing trailing edge, Road / Street & Short Oval Events only



- c) On the beam wing trailing edge at Road / Street & Short Oval Events

- d) On the Dallara beam wing flaps (IR1205A023/024) where mandatory, made to drawing IR1527241_Rev3 as per approved drawing supplied by Dallara and using the original supplied mounting holes
- e) On the Road Course Events front wing mainplane trailing edge inboard of the flap

14.9.3. Front Wings

All Events

14.9.3.1. The front wing assembly must be used as supplied without modification and used in a configuration as Homologated.

Indianapolis 500® Mile Race and Speedways

14.9.3.2. The bottom surface of the wing shall be no less than 4.300 inches above the chassis reference plane.

14.9.3.3. The bottom edge of the end fences must be a minimum of 2.530 inches above the chassis reference plane.

14.9.3.4. The maximum amount of front mainplane deflection will be advised by bulletin.

14.9.4. Rear Wing

All Events

14.9.4.1. The rear wing assembly must be used as supplied without modification and used in a configuration as Homologated.

14.9.4.2. The rear wheel guard must be used as supplied without modification and used in a configuration as Homologated.

14.9.4.3. 2015 Homologated rear wheel guards must have blanking panels installed at the Indianapolis 500® Mile Race and all Superspeedway Events.

14.9.4.4. The maximum amount of rear flap deflection will be advised by bulletin.

Indianapolis 500® Mile Race

14.9.4.5. The maximum amount of rear mainplane deflection will be advised by bulletin.

14.9.5. Race Location Specific Configurations

Manufacturer Aero Kit Race Location Specific Configurations	Phoenix	Indianapolis 500	Texas*	Iowa	Pocono	Gateway*	Road & Street
Rear Mainplane IR1205B001	M	0° -> -10.5°	-4° -> -10.5°	M	0° -> -10.5°	M	M
Aero Kit Indy 500 Rear Mainplane	-	O	U	-	U	-	-
Rear Wing Wicker	O	O	U	O	O	O	O
Max Rear Wing Flap Height	Z=32.65	-	-	Z=32.65	-	Z=35.44	Z=35.44
Side Wall IR1203A007/08	U	O	O	U	O	U	U
+9mm Side Wall IR1203A007/08	U	O	O	U	O	U	U
Trimmed Side Wall IR1203A007/08	U	O	O	U	O	U	U
Underwing Strake IR1203A003/04	U	U	U	U	U	U	U
SWY Front Brake Backing Plate IR1210E001/02	M	O	O	M	O	M	U
Rear Wheel Backing Plate IR1210H001->011	U	O	O	U	O	U	U
Homologated Optional Components	O	O	O	O	O	O	O
Underwing Knob protector IR1203A039/40	O	O	O	O	O	O	O
Dallara beam wing flaps IR1205A023 & IR1205A024	U	M	M	U	M	U	U
Skid	F	D	D	F	D	F	F

*Subject to additional restrictions

M= Mandatory

O= Optional

U= Unapproved

14.9.6. Sidepods / Underwing

- 14.9.6.1.** The inboard bell housing and gearbox stays must be used as Homologated and be fixed in the neutral position.
- 14.9.6.2.** The Dallara underwing stays must remain as supplied or as Homologated by the Aero Kit Approved Suppliers.
- 14.9.6.3.** The Dallara radiator box stays must be fitted at all times and used as supplied.
- 14.9.6.4.** The sidepods and engine cover must be used as supplied without modification and used in a configuration as Homologated.

14.10. Fuel System

- 14.10.1.** The fuel system must remain as supplied by Dallara, with the following exceptions:
 - a)** Standard elephant trunk (IR1214C002) must be used but the foot may not be less than 3.000 inches from the floor of the fuel cell. Breather holes may be added or removed.
 - b)** Standard fuel bladder vent (IR1214C001) must be used but can be modified for fuel cell height. Breather holes may be added or removed.
 - c)** Plumbing of the fuel cell lines are open to development.
 - d)** Filters may be added or changed.
 - e)** Pressure sensors may be added provided they otherwise comply with the Rules.

14.10.2. The maximum capacity of the fuel cell shall be 18.500 U.S. Gallons.

14.10.2.1. The only approved method of fuel cell volume reduction is by the addition of fuel cell airtight balls inside the fuel cell.

14.10.3. Lanyard-secured self-sealing breakaway valves must be used on the supply and return lines. All installations are subject to the approval of INDYCAR.

14.10.4. In the event a fuel cell buckeye is not being utilized at a Race Location, a blanking plate with a minimum thickness of 0.250 inches must be securely fitted utilizing all of the holes in the fuel cell.

14.11. Steering and Suspension

14.11.1. Steering wheels must incorporate an approved quick release mechanism.

14.11.2. Only the Dallara supplied parts and rack and pinion options may be used. Modifications to the pinion bearing are permitted with INDYCAR approval.

14.11.3. Only the Dallara supplied suspension parts may be used. Steel steering arms may be updated to the Dallara drawing below.

Part Number	Dwg Number
IR1206H004	IR1255103
IR1206H005	IR1255107
IR1206H006	IR1255116

14.11.4. Suspension parts may not be controlled or activated electronically, with the exception of the weight jacker.

14.11.5. One weight jacker may be used at Oval Events only. This must be fitted on a rear damper of the Car with a maximum travel of 0.500 inch. This must be controlled through the approved control box to which no modifications are permitted.

14.12. Dampers and Inerters

14.12.1. Damper is a mechanical device utilizing hydraulic fluid to dissipate energy.

14.12.2. Each corner must have one damper and one spring. Helper springs, bump rubbers and packers are permitted, provided they are fitted with the primary spring.

14.12.3. Front and rear third control springs, bump rubbers and packers are permitted. No front or rear third dampers, inerters or any other device are permitted nor any modification to the manufacturer supplied parts.

14.12.4. Carbon and/or titanium springs are not permitted on the dampers or the front/rear third element.

14.12.5. The dampers must operate independently on each corner of the suspension; they must react directly to the input of that corner as connected to the suspension system.

14.12.6. The damper must be attached at one end to the chassis mounting point and the other end directly to the suspension rocker.

14.12.7. Connecting dampers side-to-side or front to rear is not permitted.

14.12.8. Dampers cannot be adjusted by the Driver.

14.12.9. The damper assembly must be contained within the approved designated volume. This CAD file is available from Dallara.

14.12.10. No independent inerters or mass dampers are permitted.

14.13. Driveshafts / Hubs

14.13.1. Only Dallara parts may be used as supplied.

14.13.2. Dallara wheel lock parts must be used as supplied.

14.13.3. Upright bearings must be used as specified by Dallara.

14.14. Suspension Wheel/Wing Energy Management System (SWEMS)

14.14.1. General

14.14.1.1. SWEMS must be used as supplied by ARCR/Amick Associates and approved by INDYCAR.

14.14.1.2. All mounting points must be free of sharp edges.

14.14.1.3. The SWEMS must be replaced if damaged or as required by INDYCAR.

14.14.2. Front and Rear Suspension

14.14.2.1. Three (3) 100kN SWEMS per suspension corner mounted as specified by Dallara.

14.14.3. Rear Wing SWEMS

14.14.3.1. Two (2) 100kN SWEMS mounted as specified by Dallara or the Aero Kit Homologation.

14.14.3.1.1. One (1) SWEMS between the mainplane and the attenuator

14.14.3.1.2. One (1) SWEMS between the attenuator and the gearbox

14.14.4. Nose SWEMS/Indianapolis 500/Speedway Events

14.14.4.1. Two (2) 30kN SWEMS mounted as specified by Dallara.

14.14.4.2. One (1) 30kN SWEMS connecting the left and right Speedway front wing mainplane end ribs or Speedway front wing end fences as specified in the Aero Kit Homologation.

14.14.5. Beam Wing/Wheel Guard SWEMS

14.14.5.1. Two (2) 30kN SWEMS connecting the attenuator to the left and right beam wing end ribs as specified by Dallara.

14.14.5.2. Two (2) 30kN SWEMS connecting the beam wing end ribs to the wheel guard as specified in the Aero Kit Homologation.

14.14.6. Underwing SWEMS

14.14.6.1. One (1) 10kN SWEMS per side mounted as specified by Dallara.

14.15. Brakes

All Race Locations

14.15.1. Only brake parts as supplied by Approved Suppliers and approved by INDYCAR are allowed.

14.15.1.1. PFC – discs, pads, disc bells, and drive pegs

14.15.1.2. Brembo – master cylinders and calipers

14.15.1.3. Dallara – disc guards

14.15.2. Cars must be equipped with a dual-braking system to operate the brakes effectively on all four (4) wheels. The use of computer logic to control any function of the braking system is not permitted.

14.15.3. Any devices designed to push or pull back caliper pistons or pads are not permitted (pull back brakes in any form are not permitted).

14.15.4. The following brake disc guards must be used:

- Front L/R IR1210E008 / IR1210E007
- Rear L/R IR1210H013 / IR1210H012

Road/Street Course Events

14.15.5. The following brake ducts are permitted:

14.15.5.1. Front

- IR1210F001/2 Main inlet Front Brake Duct Road Course

- IR1210F009/10 Main Inlet Front Brake Duct RC – OPTIONAL
- One Aero Kit Approved Supplier Main Inlet Front Brake Duct as Homologated.

14.15.5.2. Rear

- IR1210G005/6 Main Inlet Rear Brake Duct RC, -25.4mm
- IR1210G007/8 Optional Brake Scoop
- One Aero Kit Approved Supplier Main Inlet Rear Brake Duct as Homologated.
- One Aero Kit Approved Supplier Snorkel as Homologated.

14.15.6. Only tape, flat panels, or panels that follow the front contour of the brake duct may be used to regulate the airflow in the brake duct.

14.15.7. The minimum disc thickness is 0.866 inches.

14.15.8. The minimum pad thickness is 0.472 inches.

Oval Events

14.15.9. The minimum disc thickness is 0.826 inches.

14.15.10. The minimum pad thickness is 0.432 inches.

14.16. Wheels

14.16.1. The rim width for front wheels is limited to 10.000 inches. The rim width for rear wheels is limited to 14.000 inches.

14.16.2. The only wheel designs approved by INDYCAR are BBS, OZ and Avus. Only INDYCAR-approved finishes may be used on wheels.

14.16.3. The use of wheel covers or inserts is prohibited.

14.16.4. Any machining or modification of an approved wheel requires the approval of INDYCAR.

14.16.5. The wheel offset may not be modified from design. Subject to Rule 14.16.4, the wheel may be shimmed to bring the wheel back to the designed specification (with the addition of a spacer). The following tolerance must be adhered to when measuring from the high point of the wheel inboard flange to the wheel mounting face.

- Front wheel min. 6.125", max. 6.225"
- Rear wheel min. 7.750", max. 7.850"

14.16.6. Wheels must be NDT (non-destructive testing) inspected by an INDYCAR-approved inspection station prior to the Entrant's first on-Track Event, prior to the Indianapolis 500® Mile Race Event and prior to the Pocono Event.

14.16.7. The service life of wheels is six (6) years from the in-service date, or the equivalent of six (6) years in service use. Wheels may only be used beyond the six (6) year period with INDYCAR approval. Wheels used only at the Indianapolis 500® Mile Race will be considered to have used ½ of a year's wheel life.

14.16.8. A copy of all wheel serial numbers must be submitted to INDYCAR for approval before the designated on-Track Events. Serial numbers must be visible while wheel is mounted on Car.

14.17. Heating and Cooling

14.17.1. No forms of heating may be used on a Car when the Car is outside its assigned garage.

14.17.2. The following forms of cooling are permitted outside the assigned garage:

- a) Cooling towels applied to bodywork;
- b) Driver cooling fans; and
- c) Brake cooling fans (in assigned Pit Box only)
- d) Electronic box cooling fans, through the radiator inlets or direct application only (in assigned Pit Box).

14.17.3. Cooling the inside of the fuel cell is not permitted at any time.

14.17.4. The only permitted form of cooling while in the garage must be done with blown ambient air with up to two (2) fans that have ducts or shrouds extending no longer than one (1) diameter from the fan blades in either direction and the air may not be cooled in any form as it passes through the fan. The fans can only be used to flow air into the front of the radiator boxes. No component may be installed nor any fluid may be added to the Car at any time at a temperature below that of the ambient air with the exception of the Driver's drink bottle. Use of chemicals to cool the air and/or Car components is also prohibited.

14.18. Gearbox/Differential

14.18.1. Only gearbox parts and gear ratios provided by Xtrac may be used with the exception of Rule 14.18.3.c.

14.18.2. Treatments and coatings are open to development; the Xtrac logo/etching must remain on all original parts.

14.18.3. Original rotary lip seals that are etched with the Xtrac part number and logo must be used as below:

- a) 00P-100-0111A, 40x52x7 Lipseal, Used in Front Cover (Input Shaft) and Rear Cover (Starter Shaft).
- b) 00P-100-0109A, 98x120x12 Lipseal, Used in Side Cover (LH Output Flange) and Maincase (RH Output Flange).
- c) Remaining gearbox seals are open.

14.18.4. The approved paddle shift gear selection system must be used at all Race Locations. The paddle shift system must be used as supplied and without modification.

14.18.5. The gearbox must maintain all six (6) fully meshed gears during an on-Track Event. Reverse gear must be operational throughout all on-Track Events.

14.18.6. Entrants must provide seal locations comprised of two (2) drilled holes with a minimum of 0.032 inches in each of the following locations:

- a) Gearbox to bellhousing
- b) Gearbox rear and side covers
- c) Bellhousing to the Engine
- d) Engine to the bulkhead

14.18.7. All parts of the differential assembly must be used as supplied by Xtrac.

<u>XTRAC DIFFERENTIAL PARTS</u>			
Part	Part Number	Mandatory (M)	Optional (O)
Septa Seal	109-0350	-	O
Modified Grub Screw	00P-137-0043A	-	O
Disc Spring	00P-190-002B	-	O
Quad Ring Seal	109-0348	M	-
Quad Ring Seal	109-0349	M	-
Preload Piston	1011-449-012A	M	-

14.18.8. The differential clutch stack may be re-arranged and any combination of 10 total friction (199-290-007A) and drive plates (094-290-008A) may be used, provided all parts remain as supplied.

14.18.9. The disc spring (00P-190-002B) is available in multiple stiffnesses from Xtrac and are all approved for use. The disc spring must remain on the right side of the differential assembly in the Xtrac approved location and shimming is not permitted.

14.18.10. The side gear ring (ramps) and cross pin must be used as supplied.

14.18.11. The preload piston is permitted to have inert gas, air or fluid behind the preload piston.

14.18.12. At Oval Events either an Xtrac supplied spool or differential with blocker must be used.

14.19. Airjack

14.19.1. Entrants must leave the airjack receptacle in the INDYCAR-approved location.

14.20. Electronics

14.20.1. General

14.20.1.1. Entrants must not connect to the Car until released by INDYCAR at the completion of Qualifications, the Race, and/or as directed by INDYCAR.

14.20.2. Ignition Switch

14.20.2.1. All Cars must be equipped with an ignition switch that can be activated by the Driver. The ignition switch must be clearly marked.

14.20.3. Fire Bottle Switch

14.20.3.1. The Dallara supplied fire bottle switch must remain in the specified location.

14.20.4. Master Switch

14.20.4.1. The master switch must be used as supplied by Dallara.

14.20.4.2. The switch must energize the on-board fire extinguisher and shut off the ignition.

14.20.4.3. The switch must be clearly marked by a decal supplied by INDYCAR. Entrants must not disconnect the switch.

14.20.4.4. When a master switch is pulled, it must remain in that state until manually reset.

14.20.5. Rain Lights

14.20.5.1. Only the Dallara-supplied rain light may be used.

14.20.5.2. The assembly must be mounted to the attenuator in the INDYCAR-specified location.

14.20.6. Electronic Logic Processors

14.20.6.1. The use of electronic logic processors or devices to electronically control any Car function or to interrupt direct input or control from the Driver to an INDYCAR-approved control unit is not allowed, except for INDYCAR-approved electronic control units. Such approved units include control of the following:

14.20.6.1.1. Engine,

14.20.6.1.2. Clutch,

14.20.6.1.3. Gearbox, and

14.20.6.1.4. Weight jacker.

14.20.6.2. Only the INDYCAR-approved data acquisition system may be used.

14.20.6.3. Electronic data of any type may not be transmitted wirelessly to a Car.

14.20.7. Chassis Sensors

14.20.7.1. The following sensors may only be used as supplied by Approved Suppliers:

- 14.20.7.1.1.** Throttle pedal sensor (Cosworth or McLaren);
- 14.20.7.1.2.** Gear position sensor (Cosworth or McLaren);
- 14.20.7.1.3.** Gearbox temperature sensor (Cosworth or McLaren);
- 14.20.7.1.4.** Front and rear push rod load cells (Cosworth or bf1systems); and
- 14.20.7.1.5.** Wheel speed sensors (Cosworth or McLaren)
- 14.20.7.2.** The following additional chassis sensors are allowed:
- 14.20.7.2.1.** Tire pressure sensors;
- 14.20.7.2.2.** Brake pedal position;
- 14.20.7.2.3.** Brake master cylinder displacement;
- 14.20.7.2.4.** A maximum of two (2), 3-axis chassis accelerometers;
- 14.20.7.2.5.** A maximum of four (4) single axis hub accelerometers, 1 per corner;
- 14.20.7.2.6.** Strain gauged suspension parts;
- 14.20.7.2.7.** Strain gauged steering shaft;
- 14.20.7.2.8.** Beacon receiver;
- 14.20.7.2.9.** Laser ride height;

14.20.7.2.10. Gyro or angular rate sensors;

14.20.7.2.11. Roll bar positions;

14.20.7.2.12. Weight jacker position;

14.20.7.2.13. Clutch position;

14.20.7.2.14. Any pressure sensor, limited to diaphragm-type;

14.20.7.2.15. Any temperature sensor;

14.20.7.2.16. Fluid level sensor; and

14.20.7.2.17. Piezoelectronic sensor.

14.20.7.3. No modifications may be made to any chassis or aerodynamic part to accommodate sensor mounting or sensor target.

14.20.7.4. Any sensors listed above may be fitted to the Engine only with the Engine Manufacturer's approval.

14.20.7.5. Entrants may relocate the rear laser, only if the laser remains inside the bodywork and rear end cover (IR-1203A009). The location and mounting must be submitted on IRIS for INDYCAR approval.

14.20.8. Weight Jacker

14.20.8.1. The weight jacker position can only be controlled by the Driver.

14.20.9. Track Condition Radio (TCR)

14.20.9.1. The TCR and antenna must be mounted in the INDYCAR-specified location.

14.20.9.2. The TCR dash light must be mounted in the INDYCAR-specified location.

14.20.9.2.1. A minimum of two (2) TCR steering wheel lights must activate simultaneously with the TCR dash lights.

14.20.10. Black Flag Indicator

14.20.10.1. A black flag indicator (text, and/or light) must be included in the dash/steering wheel configuration.

14.20.10.2. INDYCAR triggers the black flag indicator through the timing transponder.

14.20.11. Car Position Display

14.20.11.1. The LED Display Panel must be used as supplied and in the position specified by INDYCAR.

14.20.11.2. The Car Position Display panel must be connected and operational during all on Track activities.

14.20.12. Chassis and Engine Looms

14.20.12.1. Chassis and Engine looms must be used as supplied by Cosworth and the Engine Manufacturers.

14.20.13. Push to Pass Parameters

14.20.13.1. The total overtake time per push and the maximum number of push to pass activations per Race are as follows:

INDYCAR CONTROLLED PUSH TO PASS PARAMETERS			
<u>Event</u>	<u>Total Pushes</u>	<u>Time Per Push</u>	<u>Total Time</u>
St. Petersburg	10	15	150
Long Beach	10	20	200
Barber	10	20	200
IMS Road Course	10	20	200
Detroit	10	15	150
Road America	10	20	200
Toronto	10	20	200
Mid Ohio	10	20	200
Watkins Glen	10	20	200
Sonoma	10	15	150

14.20.14. Any attempt to reset NOvertakeRemaining during a Race Event is not allowed.

14.21. Data Logging and Telemetry – Chassis and Engine

14.21.1. At any Event where Cosworth Live on Air telemetry is supported or at any Event where point-to-point telemetry is utilized, the following data must be transmitted via CAN or serial to INDYCAR:

Channel Name	Hz
Car Number	10
Vehicle Speed	100
Engine Revs	100
Engine Throttle	100
Gear Number	10
Front Brake Pressure	10
tOvertakeRemaining	10
NOvertakeRemaining	10
Tire Type	1
Tire Pressure	1
Tire Temperature	1
Front Left Tire Sensor ID	1
Front Right Tire Sensor ID	1
Rear Left Tire Sensor ID	1
Rear Right Tire Sensor ID	1
Steering Angle	100
Lap Distance	10
Longitudinal Acceleration	10
Lateral Acceleration	10
Vertical Acceleration	10
GPS Position - Latitude	10
GPS Position - Longitude	10
GPS Position - Altitude	10

14.21.2. At all Events, Engine Manufacturers are provided with a pre-Event bulletin with the required ECU software version and parameter values for the locked INDYCAR calibrations. The bulletin is provided no later than forty-eight (48) hours before the start of the practice session one (1) for a given Race Event or Open Test.

14.21.3. At all Events, Engine Manufacturers must log the channels as specified by INDYCAR in the pre-Event bulletin in the ECU on all Cars.

14.22. Fuel

14.22.1. Fuel must be used as supplied by INDYCAR with no modification (e.g. removal or addition).

14.22.2. The addition of any performance-enhancing substance to the fuel, air, or fuel/air mixture is prohibited.

14.22.3. The fuel contained in the Car's fuel system must not be cooler than five (5) degrees Fahrenheit below ambient temperature.

14.22.4. Fuel allotments are as follows:

14.22.4.1. For Indianapolis 500® Mile Race and Superspeedway Races, the quantity of fuel allotted in the pit tank is equal to 4mpg for the Race distance. The Race distance includes parade and pace laps.

14.22.4.2. For Road/Street Courses/Short Oval Races, the quantity of fuel allotted in the pit tank is equal to 3mpg for the Race distance. The Race distance includes parade and pace laps.

14.22.4.3. For all Races, each Entrant may choose the quantity of fuel in the Car prior to entering Pit Lane for the Race.

14.22.4.4. For all Races, Entrants are not permitted to have their fuel hose hooked up to the Pit Lane tank when the Race allotment of fuel is dispensed into the tank. Entrants are not permitted to hook-up and flood the fuel hose until 1-hour prior to the “Grid the cars” call on the Team Broadcast Frequency.

14.22.5. Prior to Gridding, each Entrant will be permitted to plug in its fuel hose to top off its Car’s fuel tank.

14.22.6. Portable containers are not permitted on Pit Lane.

14.22.7. Fuel may not be stored in the Entrant’s garage.

14.22.8. NFPA (National Fire Protection Association), state and/or local code are a part of the Rules.

14.23. Refueling

14.23.1. The use of the MSE (MS1233) fuel probe sensor and system is mandatory.

14.23.2. All refueling nozzles and refueling receptacles must be returned to the manufacturer for servicing prior to the Entrant’s first Race, Indianapolis 500® Mile Race, and Pocono Race.

14.23.3. During a Race, all refueling must be performed by the INDYCAR-approved dry-break disconnect system. During refueling, only the fuel hose and vent hose can be attached to the fueling

system. The fuel flow must be gravity-flow only and the vent hose must not have any evacuation assist devices attached.

14.23.3.1. The refueling coupling must be used as supplied by Red Head Valves - Model VF 1100 M-3 fuel probe with Red Head Valves Model VF 1100 F-3 receiver.

14.23.3.2. All refueling hoses must be used as supplied by the Salem Republic Rubber Company (part #P7310-7F-A1298-030-1050GG). Refueling hoses must have a minimum length of ten (10) feet.

14.23.3.3. Fuel hose supports may not be longer than forty-eight (48) inches and must be approved by INDYCAR prior to use.

14.23.3.4. The inside diameter of all refueling hoses, fittings and connectors shall not exceed three (3) inches.

14.23.4. Only Dallara supplied fuel cell and vent systems may be used.

14.23.5. Entrants may be required to demonstrate the performance of all system parts prior to use. All refueling probes and fuel hoses must be inspected and sealed by INDYCAR before being placed on fuel storage tanks prior to each on-Track Event.

14.23.6. Practice Fueling

14.23.6.1. A single hose with a maximum outside diameter of 1.500 inches incorporating an approved self-closing valve at the tank end must be used.

14.23.6.2. Fuel may only be added through the dry-break vent system. The Engine must be shut off during any practice refueling. A crewmember must operate fire equipment during any refueling.

FOR FAN USE ONLY
Amendments not included