2020 Technical Car Construction Regulations Summary of Changes

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Introduction

- This document seeks to highlight the main technical car specification changes in the 2020 BriSCA F2 *"Car Construction Regulations and Drivers' Information"* book. The changes are highlighted in the book itself, however, this document has been produced as a quick-reference guide for drivers, car constructors, and engine builders.

- While car specifications are enjoying a period of stability, there have been some necessary minor changes for safety (as previously communicated), and some tidying-up/clarifications as requested by drivers/officials.

- The changes documented here are listed in numerical regulation order, and are extracted directly from the printed document. Additionally, to aid understanding, there is either a brief explanation of each change, or details of when it was previously communicated.

- Despite extensive input to these regulation changes by driver representatives from the BDF, it is recognised that there may be some feedback / questions generated from the wider driver population. Any feedback / questions should be directed to the following:
    - Individual BDF members
    - The BDF group via the contact section of the BriSCA F2 website:
      http://www.briscaf2.com/information/contact-drivers-forum.ashx
    - Adrian Blackwell, BriSCA F2 Chief Technical Consultant, directly, or via email to:
      BriSCAF2Tech@outlook.com

Ballast

202.02.03 ***The use of solid steel bar and/or plate, exceeding the maximum 3mm permitted thickness stated above, is explicitly permitted for the following purposes:***

- Mounting steering components
- Mounting suspension components, including leaf-springs
- Mounting bolt-on bumpers
- Mounting wheel-guards
- Mounting brake master-cylinders
- ***Front uprights / stub-axles***
- Engine mounts
- ***Seat mounts,*** protection plate and headrest plate
- Prop-shaft hoops
- Roof plate and ***wing mounts***
- Nerf-rail to chassis mounting sacrifice plates (to prevent chassis leg damage when cutting off / welding-on nerf-rails)

Explanatory Info:
(1) This is NOT a change to the regulations, but a correction to the 2019 printed regulations that was originally highlighted, corrected, and re-published in March 2019.

Wheel-Guards

206.04 The wheel-guard MUST be bolted to its mounts at BOTH ends using high-tensile nuts and bolts of a MINIMUM 12mm diameter ***(It is recommended that nuts and bolts of a minimum 16mm diameter are used)***. Where an original leaf spring incorporating a rubber/polyurethane bush at one end is used as a wheel-guard and a mounting bolt runs vertically through the bush, a MINIMUM diameter 10mm bolt is permitted, but it MUST be mounted in double-shear ***(It is recommended that a nut and bolt of a minimum 12mm diameter are used)***. An example guide to fitment is illustrated in Technical Diagram 11.

Note(s) for 2021:

- ***The recommended use of 16mm / 12mm nuts and bolts for mounting the wheel-guard(s) will be monitored during 2020, with the intention of making these the minimum sizes from 1st January 2021.***

Explanatory Info:
(1) This change was discussed and agreed with the BDF in October 2019, and published in December 2019.

Independent Front Suspension

214.02.02 The top wishbone mounting brackets***, and fitment position of the wishbones on the brackets,*** MUST be ~~of equal length on both sides of the car~~ ***symmetrical about the centre-line of the car when viewed from the front/rear. The inset/outset of the wishbone, relative to the chassis rail, MUST be equal on both sides of the car.***

Explanatory Info:
(1) This wording change does not affect the requirement of the existing regulation. The change merely tidies up a loophole and seeks to add clarity with regard to the transverse offsetting of wishbones and their mounting brackets (which has NOT been permitted for many years).

Wheel Balance Weights

216.13 ***Wheel-balance weights are NOT permitted, and MUST be removed from any wheel prior to use.***

Explanatory Info:
(1) This change was discussed and agreed with the BDF in October 2019, and published in December 2019.

Prop-Shaft Retention and Protection

219.05 Prop-shaft *Retention* Hoop(s) / Tunnel

219.05.01 Where the rear of the gearbox tail-shaft (or drive flange for gearboxes without a tail-shaft), is located behind the front edge of the driver's seat, a MINIMUM of 1 steel hoop MUST be fitted around the prop-shaft, designed to ~~catch~~ ***retain*** the prop-shaft in the event of a breakage. ***The retention hoop MUST be*** attached to the seat base, chassis rail(s), a chassis cross-member, or ~~a~~ ***the*** steel cab floor.

219.05.02 Where the rear of the gearbox tail-shaft, (or drive flange for gearboxes without a tail-shaft), is located in front of the front edge of the driver's seat, a MINIMUM of 2 steel hoops MUST be fitted around the prop-shaft, designed to ~~catch~~ ***retain*** the prop-shaft in the event of a breakage. ***The retention hoops MUST be fitted*** one at each end ***of the prop-shaft, and be*** attached to the seat base, chassis rail(s), a chassis cross-member, or ~~a~~ ***the*** steel cab floor.

219.05.03 As an alternative to ***one or more*** prop-shaft ***retention*** hoops, the use of a prop-shaft ***retention*** tunnel is permitted.

219.05.04 A prop-shaft ***retention*** tunnel along the entire length of the prop-shaft is a permitted alternative to the 2-hoop requirement. Where the rear of the gearbox tail-shaft, (or drive flange for gearboxes without a tail-shaft), is located in front of the front edge of the driver's seat, and only a partial length prop-shaft ***retention*** tunnel is fitted on one end, then a MINIMUM of 1 steel ***retention*** hoop MUST also be installed around the opposite end of the prop-shaft.

219.05.05 Any folded/curved-up section of the cab floor does NOT constitute one of the mandated prop-shaft ***retention*** hoops.

219.05.06 All prop-shaft ***retention*** hoops MUST be constructed from a MINIMUM material size of 25mm x 3mm flat bar, and be secured either by welding or the use of 8mm MINIMUM size high-tensile nuts and bolts.

219.05.07 All prop-shaft ***retention*** tunnels, where prop-shaft ***retention*** hoops are not installed, MUST be constructed from 3mm MINIMUM thickness steel plate, and be secured to the gearbox, chassis, or steel cab floor either by welding or the use of a MINIMUM of four (in number) high tensile 8mm MINIMUM size nuts and bolts.

219.06 Prop-shaft Protection Cover

219.06.01 ~~Venray (Netherlands) Only –~~ In all cases where the rear of the gearbox tail-shaft, (or drive flange for gearboxes without a tail-shaft), is located in front of the front edge of the driver's seat, a metal prop-shaft ***protection cover*** ~~tunnel~~ MUST be installed, ***designed to prevent the driver's legs/clothing from catching on the rotating prop-shaft.*** This requirement is in ADDITION to the prop-shaft ***retention*** hoop requirements above.

219.06.02 ***The prop-shaft protection cover must be constructed from metal sheet with a MINIMUM material thickness of 1mm, and be*** securely fitted to the chassis/floor/gearbox ~~for the purpose of preventing the driver's clothing from catching on the prop-shaft~~.

219.06.03 ***The prop-shaft protection cover MUST be installed inside/underneath any prop-shaft retention hoop(s) for ease of scrutineering.***

219.06.04 The ***prop-shaft protection cover*** ~~tunnel~~ MUST extend from the rear of the gearbox to behind or level-with the vertical plane from the front edge of the driver's seat, and MUST completely cover the prop-shaft***/rotating components***.

219.06.05 Modification, lightening, drilling or perforation of the ***prop-shaft protection cover*** ~~tunnel~~ (except for any required mounting-bolt holes) is NOT permitted.

219.06.06 ***A prop-shaft retention tunnel, installed between the rear of the gearbox/tail-housing and the front edge of the driver's seat, and constructed from 3mm steel plate, is deemed to satisfy the protection requirements above. An additional prop-shaft protection cover is not required in such cases.***

Explanatory Info:

(1) A mandatory prop-shaft cover is now required on all cars where the rear of the gearbox tail-shaft, (or drive flange for gearboxes without a tail-shaft), is located in front of the front edge of the driver's seat.

(2) Additional wording changes have been made to highlight the distinction between retention hoops (designed to retain the prop-shaft in the event of a breakage), and the protection cover (designed to prevent the driver's legs/clothing from catching on the rotating prop-shaft).

(3) This change was discussed and agreed with the BDF in October 2019, and published in December 2019.

Fuel Tanks

222.02.01 ***Only one fuel tank is permitted.***

222.02.13 If fitted outside of the main chassis rails, the fuel tank MUST be protected from intrusion ***from BOTH the side (e.g. another car's bumper coming under the nerf-rail) AND underneath (e.g. on-track debris, or the top of a fence-post).*** ~~by an additional single~~ ***The intrusion protection must be constructed from*** steel plate (MINIMUM 2mm in thickness) or steel tubes (MINIMUM specification of 25mm CHS/SHS x 2mm wall thickness)***, subject to the regulations above regarding the lamination/stacking of plates and bars***. Any steel plate used may be a MAXIMUM of 3mm in thickness.

Explanatory Info:
(1) A loophole has been closed with regard to the number of permitted fuel tanks.
(2) Clarification has been added to clearly state that the fuel tank protection must be designed/installed to protect against intrusion from the side and underneath.
(3) This change was discussed and agreed with the BDF in October 2019, and published in December 2019.

Transponders

227.04 The transponder MUST be securely mounted a MINIMUM of 1800mm (1.8m) back from the front bumper ***(measured to the centre of the transponder signal face that points to the ground)***, and approximately 450mm from the ground. Care should be taken to ensure a clear line of signal from the transponder to the ground.

227.05 ***The transponder MUST be mounted such that it points vertically downward, or rearward. Angling the transponder such that it points forward from the vertical is NOT permitted.***

Explanatory Info:
(1) Clarity has been added to the method of transponder location measurement.
(2) A regulation has been added to prevent advantage being gained from angling the transponder forwards to trigger the timing and scoring system loop earlier than a non-angled transponder.

Throttle Return Springs

230.09 **Throttle Return Springs –** ALL throttle mechanisms MUST be fitted with two ***effective*** return springs to reduce the likelihood of a stuck throttle.

230.09.01 The ***return*** springs MUST be fitted to the throttle mechanism within the engine compartment, NOT the throttle cable, or pedal.

230.09.02 ***The return springs MUST be securely attached to the throttle mechanism and the chassis or fixed engine component. Attaching the return springs with cable ties is NOT permitted.***

230.09.03 ***Any integral spring on the throttle cable does NOT count as one of the required return springs (if the cable snaps, this spring has no effect).***

230.09.04 The small spring attached to the throttle on the carburettor body does NOT count as one of the required ***return*** springs.

Explanatory Info:
(1) Inconsistent interpretation of the 2019 regulations by both drivers and scrutineers led to certain throttle return spring installations being deemed within the regulations at some meetings, then out-with them at others.
(2) While certain installations technically conformed to the regulations in 2019, they were ineffective in helping to prevent a stuck throttle.
(3) These changes seek to clarify the regulations for scrutineers and drivers, confirming that two effective return springs are required on the throttle mechanism on the engine.

Inlet Manifold – Pinto & Zetec

231.12.09 ***Painting, coating, or other protection of the inlet manifold is NOT permitted.***
233.17.09 ***Painting, coating, or other protection of the inlet manifold is NOT permitted.***

Explanatory Info:
(1) This was noted in the 2019 regulations.

Oil Pump – Pinto

231.14.04 ***High-capacity oil pumps are NOT permitted.***

Explanatory Info:
(1) This was noted in the 2019 regulations.

Flywheel & Clutch – Pinto

231.15.02 The total weight of the complete flywheel assembly, including clutch, cover, driven plate, ring-gear and all mounting bolts, ***but NOT including the thrust bearing,*** MUST be at least a MINIMUM of 12.31Kg.

Explanatory Info:
(1) For the avoidance of doubt, the exclusion of the thrust bearing in the weighing of the complete flywheel assembly is now specifically noted, although this has been the checking procedure in use for many years.

Coils – Pinto

231.16.07 ***A standard aftermarket replacement epoxy-filled "dry" coil may be used ONLY IF it…***
- ***Directly cross-references to the original Ford 2.0-litre SOHC NE (Pinto) item (e.g. FINIS 6 077 429 / part No. 79BB-12024-AA)***
- ***Is freely available over the counter from high-street or trade motor factors***
- ***Does NOT introduce any performance enhancements above and beyond the original Ford design***
- ***Is not a performance enhanced product, such as a coil designed for a Cosworth model***

Such coils have NOT been tested in conjunction with the mandated rev. limiter, and therefore usage is entirely at the driver's own risk.

231.16.09 ***A scrutineer or appointed BriSCA F2 technical official reserves the right to require any coil to be replaced until its compliance with these regulations has been confirmed.***

Explanatory Info:
(1) The temporary acceptance of standard "dry" coils on the Pinto engine, introduced in 2019 to help diagnosis of misfire issues in the ignition system when using the mandatory rev. limiter, is being permitted in 2020.
(2) Technical officials, however, reserve the right to require a coil to be swapped if its compliance with the regulations cannot be immediately determined on inspection at the track.

Rev Limiter Wiring

231.16.19 ***Any*** modification of the ~~associated~~ wiring loom, ***and/or associated components, other than as described below,*** including but not limited to shortening, lengthening, ***adding additional wiring,*** or otherwise altering ~~it~~ ***them***, is NOT permitted.

231.16.20 ***Shortening the length of the original supplied wiring (from the unconnected ends), is permitted on the following wires only, as per the OMEX installation instructions:***
(i) the 5 wires to the Motorcraft (or equivalent) amplifier module, from the 5-way connection plug, and/or

(ii) the 6 wires to the distributor (2 wires), coil (2 wires), positive feed (1 wire) and earth (1 wire), from the 6-way connection plug,

Wires/terminals must NOT be removed from the supplied plug connectors, and additional wiring must NOT be added.

Wiring (Regulations added mid-season 2018, but missed out of the printed 2019 regulations)

231.16.23 The use of the coil positive feed terminal as a wiring distribution point is NOT permitted.

231.16.24 In order to minimise electrical interference with the rev. limiter, the ONLY permitted wiring connections to the coil are as follows:

(i) Pink wire from the 6-way rev. limiter connection plug to the "positive" terminal

(ii) Yellow wire from the 6-way rev. limiter connection plug to the "negative" terminal

(iii) HT wire from the centre of the distributor to the "HT" terminal

(iv) An optional connection from a rev. counter to the "negative" terminal

Explanatory Info:

(1) The rev. limiter wiring regulations have been updated in line with the instructions supplied by OMEX. The regulations have not changed.

(2) The final two regulations were updated and published in 2018, but were missed out of the printed 2019 edition of the regulations. This has been corrected; it is not a change in regulations.

Materials, Finishing and Reworking - Zetec

233.06.04 The use of cleaning processes is permitted, ***subject to the following***;

- The ***internal/working*** surface finish MUST remain standard and must NOT be affected by the ***cleaning*** process in any way.
- ***Industrial surface cleaning of the external surface of engine components, which may result in a polished or roughened finish, is permitted.***

Explanatory Info:

(1) It is recognised that engine-builders wish to produce professional looking products, and drivers take pride in presenting a clean and tidy looking car. To help them in this area, the external cleaning of engine components (which may result in a polished or roughened finish), is now permitted. The internal/working surface finish must remain standard, as has always been the case.

Cylinder Head – Zetec

233.12.09 Removal of the unused inlet camshaft sensor, and sealing the resultant hole with a core-plug, is permitted.

Explanatory Info:

(1) The inlet camshaft sensor serves no purpose on the engine when used in a BriSCA F2, and can cause injury when working on the engine due to the way it protrudes.

Inlet Manifold Thread repair

233.17.10 ***Repair of the threads, e.g. through the use of heli-coils, for the studs/bolts used to attach the carburettor to the manifold is permitted. The stud/bolt thread holes MUST remain in their original location.***

Explanatory Info:

(1) A stripped thread is no reason for the scrapping of an otherwise serviceable inlet manifold, and therefore a repair is now permitted.

Water Pump Pulley – Zetec

233.22.05 ONE of the following drive pulleys MUST be used on the water pump:

- ***The original unmodified standard Ford pulley.***
- ***A modified standard Ford pulley – The original standard Ford pulley may be modified to add material for the purpose of drive-belt retention. Removal of original material is NOT permitted.***
- ***The BriSCA F2 approved/supplied replacement pulley – Modification of this item is NOT permitted.***
- ***A replacement pulley manufactured for Zetec engines used on oval circuits – Any such pulley MUST be (i) comparable in design to the BriSCA F2 approved pulley, (ii) at least the same diameter (NOT smaller) across the driven surface as the original Ford component, and (iii) weigh a MINIMUM of 400g.***

233.22.06 ~~The fitment of two additional pulleys, one in front of the crankshaft damper and one on the water pump, for the express purpose of reversing the direction of the water pump to match the crankshaft when using a reverse impeller, is permitted.~~

Explanatory Info:

(1) Up to now, according to the regulations, the only permitted water-pump pulley has been the original un-modified item, or the BriSCA F2 approved/supplied item.

(2) This change simply gives drivers the option to modify the standard item (within set limits) to overcome belt retention issues when using the original rotation direction impeller, or use a replacement pulley supplied by BriSCA or another manufacturer, subject to the design requirements listed, if using a reverse rotation direction impeller.

Safety Equipment

Driver Protection

234.01 Refer to the ORCi "Safety Equipment Specification Regulations" detailed in Chapter 15 for details of mandatory driver safety equipment. This information is correct as of 6th February 2020.

234.02 Refer to the ORCi website (http://orci.co.uk) for the most up-to-date regulations.

Race Receivers

234.03 A Race Receiver MUST be used in ALL races, practise, and qualifying sessions.

234.04 The driver's Race Receiver MUST be switched on and operational at ALL times when on the racetrack, enabling direct one-way wireless communication between a nominated official and all drivers.

Explanatory Info:

(1) A race receiver is now mandatory for all drivers in all ORCi formulas, with the exception of Bangers.
