EFRA ANNUAL SECTION MEETING

HOTEL NH Wien Airport,
Vienna Austria
4-5th of November 2017

AGENDA ELECTRIC SECTIONS – GENERAL.

1. CHAIRMAN'S WELCOME — Mr. Chris Hardisty & Mr. Paul Worsley

The Electric Chairmen opened the meeting at --

2. APOLOGIES FOR ABSENCE – ELECTRIC GENERAL

Apologies have been received from:

Member Countries presents. Section subscription.

COUNTRY	PRESENT	SECTION SUBSCR
AUSTRIA		
BELARUS		
BELGIUM		
BULGARIA		
CROATIA		
CZECH REP.		
DENMARK		
ESTONIA		
FINLAND		
FRANCE		
GERMANY		
GREAT BRITAIN		
GREECE		
HUNGARY		
IRELAND		
ITALY		
LUXEMBOURG		
MONACO		
NETHERLANDS		
NORWAY		
POLAND		
PORTUGAL		
RUSSIA		
SLOVAK REP.		
SLOVENIA		
SPAIN		
SWEDEN		
SWITZERLAND		
TURKEY		
TOTAL		

Other persons present:

3. MINUTES OF 2016 SECTION MEETING

November 2016 – Vienna, Austria

Matters arising from the minutes:

The minutes were checked and accepted as written at the AGM 2016

The following person was elected to check the minutes of this year:

4. CORRESPONDENCE RECEIVED

5. RULE PROPOSALS (Does / May affect all Electric Sections)

Note: The EFRA Committee has studied all received proposals and has come to an opinion over each one, The EFRA Section Chairman will inform the floor of such positions.

APPENDIX 3 A ELECTRIC CARS GENERAL

THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **2.1.**

MODIFIED BRUSHLESS MOTORS:
1 Sensorless as well as sensored motors are allowed.
2 The motor has to be rebuildable . Ball bearings are allowed.
3 If the motor is sensored:
It must use a six position JST ZH connector model number ZHR-6 or equivalent connector with 6JST part number SZH-002T- P0.5 26-28 AWG contacts or equivalent.
Wire sequence must be as follows:
Pin #1 - Black wire ground potential
Pin #2- Orange wire phase C
Pin #3- White wire phase B
Pin #4 - Green wire Phase A
Pin #5- Blue wire temp control, 10K thermistor referenced to ground potential
Pin #6- Red wire +5.0 Volts DC +/-10%
Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (Where the X denotes the stile of header), or equivalent.
The power connector has to be clearly marked A, B, C:
A for phase A, B for phase B and C for phase C
4 "05" Size specifications
Can: Overall maximum diameter is 36,02mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Overall minimum diameter is 34,0mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Maximum length is 53,0mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name. Minimum length is 50,0mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires.
Motor mounting holes must be on 1,00 inch (25.0 - 25.4mm) centres.
Stack/Stator: The stack or backiron must be continuous. The laminations have to be one after the other without anything in between. Stack/backiron minimum length 19.3mm, maximum 21.0mm measured across the metal surfaces of the laminates and not including any coatings. The thickness of the stack/backiron laminations is 0.35 +/- 0.05mm. All laminations must be of the same material. Inside diameter of stack or windings equals the central space between the laminations or assembly of windings and must accept "plug" gauges of 12.5mm minimum, 16.0mm maximum. These dimensions to be measured with the centre of the "plug" gauge in-line with the centre of the motor can. (ie. concentric to can).
Winding: Delta and Y wounded stators are permitted. Only circular (round) pure copper is permitted. There is no turn limit.
Rotor: Output shaft diameter must be 0,125" (3.175mm). Only one piece, two poles Neodymium or Ferrite magnetic rotors are permitted.The rotor will be identified with the manufacturers name or logo and the unique part number. Applies to all rotors in new motors or new optional rotors starting from 1st. April 2015 onwards.
Magnet: Minimum length 23,0mm. Maximum 27,0mm. Magnet minimum diameter 12,0mm, maximum 15,5mm.
5 All motors must have the original manufacturer's logo or name permanently marked by the manufacturer into the end bell or end-plate.
6. If the stator cannot be easily removed from the assembled motor for technical verification of sizes or construction, then the Can/Sleeve must have:-
Slots or holes that will allow measurement of the stator length.
Slots or holes to allow visual appraisal of the laminates used in the stator.
Rule to be applied to any new range of motor starting 01.01.12. Existing motors without these features are not

excluded.
7. No hybrid motors allowed (mixing of parts from different manufacturers), with the exception of Rotors in Modified Motors only.

Proposal:

MODIFIED BRUSHLESS MOTORS:
1 Sensorless as well as sensored motors are allowed.
2 The motor has to be rebuildable . Ball bearings are allowed.
3 If the motor is sensored:
It must use a six position JST ZH connector model number ZHR-6 or equivalent connector with 6JST part number SZH-002T- P0.5 26-28 AWG contacts or equivalent.
Wire sequence must be as follows:
Pin #1 - Black wire ground potential
Pin #2- Orange wire phase C
Pin #3- White wire phase B
Pin #4 - Green wire Phase A
Pin #5- Blue wire temp control, 10K thermistor referenced to ground potential
Pin #6- Red wire +5.0 Volts DC +/-10%
Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (Where the X denotes the stile of header), or equivalent.
The power connector has to be clearly marked A, B, C:
A for phase A, B for phase B and C for phase C
4 "05" Size specifications
Can: Overall maximum diameter is 36,02mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Overall minimum diameter is 34,0mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Maximum length is 53,0mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name. Minimum length is 50,0mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires.
Motor mounting holes must be on 1,00 inch (25.0 - 25.4mm) centres.
Stator: The stator must be continuous. The laminations have to be one after the other without anything in between. Stator minimum length 19.3mm, maximum 21.0mm measured across the metal surfaces of the laminates and not including any coatings. The faces of the end laminates of the stator must be free of any coatings or mouldings for 1mm from the outer circumference to allow direct measurement across the metal faces of the stator ends (to be applied to any new motor range submitted from 01.03.18). The outer circumference edges of the end laminates must be complete with no material removed, to allow accurate measurement. The thickness of the stator laminations is 0.35 +/- 0.05mm. All laminations must be of the same material. Inside diameter of stator must accept "plug" gauges of 12.5mm minimum, 16.0mm maximum. Winding: Delta and Y wounded stators are permitted. Only circular (round) pure copper is permitted. There is no turn limit.
Rotor: Output shaft diameter must be 0,125" (3.175mm). Only one piece, two poles Neodymium or Ferrite magnetic rotors are permitted.The rotor will be identified with the manufacturers name or logo and the unique part number. Applies to all rotors in new motors or new optional rotors starting from 1st. April 2015 onwards.
Magnet: Minimum length 23,0mm. Maximum 27,0mm. Magnet minimum diameter 12,0mm, maximum 15,5mm.
5 All motors must have the original manufacturer's logo or name permanently marked by the manufacturer into the end bell or end-plate.
6. If the stator cannot be easily removed from the assembled motor for technical verification of sizes or construction, then the Can/Sleeve must have:-
Minimum two pairs of slots or holes (each exposing 3mm of stator ends minimum), in line with the centre-line of the stator, that will allow measurement of the stator length.
Slots or holes to allow visual appraisal of the laminates used in the stator.
Rule to be applied to any new range of motor starting 01.01.12. Existing motors without these features are not excluded.
7. No hybrid motors allowed (mixing of parts from different manufacturers), with the exception of Rotors in Modified Motors only.

Remarks:

Remove the reference to 'backiron' designs. Not have been submitted in the ten years of Brushless use. Remove the reference to 'stack'. We use stators. Many manufacturers are producing stators which are below minimum length and are obscuring this with coatings or machining. We need to specify the stator construction to ensure this detail can be checked easily. Suggest Homologation Officer re-writes complete Rule 2.1 for easier reading.

Proposed by EFRA, Worsley Paul

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **2.2.**

'SPEC' BRUSHLESS MOTORS (21.5T, 17.5T, 13.5T and 10.5T "wind" limit)
The following rules have been agreed by various International organisations.
1 Only sensored motors are allowed in the Spec. classes.
2 The motor has to be rebuildable. Ball bearings are allowed. The motor must be constructed to allow easy replacement of the; rotor, bearings and front End-Bell.
3 Sensor connection requirements:
The motor must use a six-position JST ZH connector model number ZHR-6 or equivalent connector with 6 JST part number SZH-002T-P0.5 26-28 awg. contacts or equivalent.
Wire sequence must be as follows: -
Pin #1 - Black wire ground potential
Pin #2 - Orange wire phase C
Pin #3 - White wire phase B
Pin #4 - Green wire phase A
Pin #5 - Blue wire temp control, 10 k Thermistor referenced to ground potential
Pin #6 - Red wire + 5.0 volts d.c. +/- 10%.
Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (where the X denotes the style of the header), or equivalent.
The motor power connectors have to be clearly marked A, B, C.
A for phase A. B for phase B. C for phase C
It is not mandatory that sensored Speed Controls have to be used, or that the sensor "harness" has to be connected.
4 The Can. (Based on "05" size specifications).
The overall dimensions of the assembled motor do not include: - solder tabs, lead wires or the original manufacturer's logo or name.
Overall maximum diameter is 36.02mm measured at whatever point yields the maximum dimension. Overall minimum diameter is 34.0 mm measured at whatever point yields the minimum dimension. Maximum length is 53.0 mm measured from the mounting face of the motor to the furthest point of the end bell. Minimum length is 50.0 mm measured from the mounting face of the motor to the furthest point of the end bell. Motor mounting holes must be on nominal 25.0/25.4 mm centres.
5 The Stack/Stator: Slot-less stators are not allowed. The stator must be continuous laminations having the same overall shape, being one after the other without anything in between. The laminations must be of one homogeneous material without cut-outs, holes or hollow sections other than for the three slots of copper coil wires and the three grooves for the screws used to hold the entire assembly together. Stator minimum length 19.3mm, maximum 21.0 mm measured across the metal surfaces of the laminates and not including any coatings. The thickness of the stator laminations is 0.35 +/- 0.05 mm. The Inside diameter of the stator must accept a "plug gauge" of 14.50 mm +0/-.005 diameter, clearing the stator, plus its windings and the electrical collection ring at any end of the stator.
6 The Winding: Only three slot (phase) 'Y' (star) wound stators are allowed. No delta wound stators allowed. Only circular (round) pure copper magnet wire permitted. The three slotted stator must be wound with: -
21.5T Class:- 21.5 turns of 2 wires at: 0.724 mm. maximum wire dia.
17.5T Class:- 17.5 turns of 2 wires at: 0.813 mm. maximum wire dia.
13.5T Class:- 13.5 turns of 2 wires at: 0.724 mm. and 2 wires at: 0.574 mm) maximum wire dia.
10.5T Class: - 10.5 turns of 2 wires at: 0.813 mm.and 2 wires at: 0.643 mm) maximum wire dia.
Dimensions are before lacquer coating
The electrical circuit through the windings can only be from the ends of the wires forming the designated number of turns.
NOTE: The above metric wire diameter sizes are direct equivalents to the nominal AWG sizes previously shown. (Reference to AWG sizes removed for simplicity).
7 The Rotor: Shaft diameter must be 3.175mm where the pinion gear locates. Only one piece, two pole Neodymium bonded or sintered, or Ferrite (ceramic) magnetic rotors are permitted. Magnet length will be 25.00 +/- 1.00mm, not including any non-magnetic balancing aids. Magnet outside diameter will be 12.20/12.51mm (min./max. with no further tolerance) for the entire length of the magnet. The shaft outside diameter where the magnet is mounted will be 7.25mm +/- 0.15mm, with this diameter extending beyond the magnet to facilitate measurement.
The rotor will be identified with the manufacturer's name or logo and the unique part number. Applies to all rotors in new motors or new optional rotors from 1st. April 2015 onwards.
8 All motors must have the original manufacturer's logo or name moulded/engraved into the end bell/plate. A unique marking or feature that is difficult to remove must be incorporated into the assembled motor to identify the motor is either a 21.5T, 17.5T, 13.5T or 10.5T Spec. Class motor. Motors introduced from 2011 onwards must have the "wind" # etched/engraved onto the outer surface of the motor on a part of the motor that cannot easily be seperated from the stator windings.
9 If the stator cannot be easily removed from the assembled motor for technical verification of sizes or construction, then the Can/Sleeve must have :- Slots or holes that will allow measurement of the stator length. Slots or holes to allow visual appraisal of the laminates used in the stator.(Rule to be applied to any new range of motor starting 01.01.12. Existing motors without these features are not excluded.)
10.No hybrid motors allowed (mixing of parts from different manufacturers).

Proposal:

'SPEC' BRUSHLESS MOTORS (21.5T, 17.5T, 13.5T and 10.5T "wind" limit)
The following rules have been agreed by various International organisations.

1 Only sensored motors are allowed in the Spec. classes.
2 The motor has to be rebuildable. Ball bearings are allowed. The motor must be constructed to allow easy replacement of the; rotor, bearings and front End-Bell.
3 Sensor connection requirements:
The motor must use a six-position JST ZH connector model number ZHR-6 or equivalent connector with 6 JST part number SZH-002T-P0.5 26-28 awg. contacts or equivalent.
Wire sequence must be as follows: -
Pin #1 - Black wire ground potential
Pin #2 - Orange wire phase C
Pin #3 - White wire phase B
Pin #4 - Green wire phase A
Pin #5 - Blue wire temp control, 10 k Thermistor referenced to ground potential
Pin #6 - Red wire + 5.0 volts d.c. +/- 10%.
Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (where the X denotes the style of the header), or equivalent.
The motor power connectors have to be clearly marked A, B, C.
A for phase A. B for phase B. C for phase C
It is not mandatory that sensored Speed Controls have to be used, or that the sensor "harness" has to be connected.
4 The Can. (Based on "05" size specifications).
The overall dimensions of the assembled motor do not include: - solder tabs, lead wires or the original manufacturer's logo or name.
Overall maximum diameter is 36.02mm measured at whatever point yields the maximum dimension. Overall minimum diameter is 34.0 mm measured at whatever point yields the minimum dimension. Maximum length is 53.0 mm measured from the mounting face of the motor to the furthest point of the end bell. Minimum length is 50.0 mm measured from the mounting face of the motor to the furthest point of the end bell. Motor mounting holes must be on nominal 25.0/25.4 mm centres.
5 The Stator: Slot-less stators are not allowed. The stator must be continuous laminations having the same overall shape, being one after the other without anything in between. The laminations must be of one homogeneous material without cut-outs, holes or hollow sections other than for the three slots of copper coil wires and the three grooves for the screws used to hold the entire assembly together. Stator minimum length 19.3mm, maximum 21.0 mm measured across the metal surfaces of the laminates and not including any coatings. The faces of the end laminates of the stator must be free of any coatings or mouldings for 1mm from the outer circumference, to allow direct measurement across the metal faces of the stator ends. The outer circumference edges of the end laminates must be complete with no material removed to allow accurate measurement. The thickness of the stator laminations is 0.35 +/- 0.05 mm. The Inside diameter of the stator must accept a "plug gauge" of 14.50 mm +0/-.005 diameter, clearing the stator, plus its windings and the electrical collection ring at any end of the stator.
6 The Winding: Only three slot (phase) 'Y' (star) wound stators are allowed. No delta wound stators allowed. Only circular (round) pure copper magnet wire permitted. The three slotted stator must be wound with: -
21.5T Class:- 21.5 turns of 2 wires at: 0.724 mm. maximum wire dia.
17.5T Class:- 17.5 turns of 2 wires at: 0.813 mm. maximum wire dia.
13.5T Class:- 13.5 turns of 2 wires at: 0.724 mm. and 2 wires at: 0.574 mm) maximum wire dia.
10.5T Class: - 10.5 turns of 2 wires at: 0.813 mm.and 2 wires at: 0.643 mm) maximum wire dia.
Dimensions are before lacquer coating
The electrical circuit through the windings can only be from the ends of the wires forming the designated number of turns.
NOTE: The above metric wire diameter sizes are direct equivalents to the nominal AWG sizes previously shown. (Reference to AWG sizes removed for simplicity).
7 The Rotor: Shaft diameter must be 3.175mm where the pinion gear locates. Only one piece, two pole Neodymium bonded or sintered, or Ferrite (ceramic) magnetic rotors are permitted. Magnet length will be 25.00 +/- 1.00mm, not including any non-magnetic balancing aids. Magnet outside diameter will be 12.20/12.51mm (min./max. with no further tolerance) for the entire length of the magnet. The shaft outside diameter where the magnet is mounted will be 7.25mm +/- 0.15mm, with this diameter extending beyond the magnet to facilitate measurement.
The rotor will be identified with the manufacturer's name or logo and the unique rotor part number. Applies to all rotors in new motors or new optional rotors from 1st. April 2015 onwards.
From 01.04.18 only one 'optional' rotor will be allowed for any range of new motor submitted (includes all wind Classes). 8 All motors must have the original manufacturer's logo or name moulded/engraved into the end bell/plate. A unique marking or feature that is difficult to remove must be incorporated into the assembled motor to identify the motor is either a 21.5T, 17.5T, 13.5T or 10.5T Spec. Class motor. Motors introduced from 2011 onwards must have the "wind" # etched/engraved onto the outer surface of the motor on a part of the motor that cannot easily be seperated from the stator windings.
9 If the stator cannot be easily removed from the assembled motor for technical verification of sizes or construction, then the Can/Sleeve must have :- Minimum two pairs of Slots or holes (each exposing 3mm of stator ends minimum), in line with the centre-line of the stator that will allow measurement of the stator length. Slots or holes to allow visual appraisal of the laminates used in the stator.(Rule to be applied to any new range of motor starting 01.01.12. Existing motors without these features are not excluded.)
10.No hybrid motors allowed (mixing of parts from different manufacturers).
Remarks:

Remove the reference to 'stack'. We use stators. Many manufacturers are producing stators that are below the minimum length allowed and obscuring this detail with coatings or machining. We need to specify the stator

construction to ensure this detail can be checked. Some manufacturers are producing as many as eight optional rotors. As these motors are used for 'Stock Class Racing', this should be limited. Suggest the Homologation Officer re-writes the complete Rule 2.2 for easier reading.

Proposed by EFRA, Worsley Paul

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **3.1.1.**

Lithium Based (LiPo/LiFe) Batteries can be approved, but must conform to the following :-
1. Lithium Based (LiPo/LiFe) battery packs must have a hard, protective case that completely envelopes the cell(s). The case should be made from ABS or a similar material. The two halves of the case must be factory sealed in a way that any attempt to open the case will destroy the case. The only opening in the case that is allowed, is for the exit of wires or pin type connections. Batteries to comply with the weights specified on the EFRA homologation list, (maximum tolerance for manufacturers is +/- 4%).
The maximum case sizes are as follows:
4S Batteries: Length: 139.0mm, Width: 47.0mm (the max. width includes any side exit wires), Height: 48.2mm (Chassis location features additional to this dimension are allowed) 2S Batteries: Length: 139.0 mm, Width: 47.0 mm. (The max. width includes any side exit wires). Height: 25.10 mm. (Chassis location features additional to this dimension are allowed)
Saddle-Pack cells are allowed, but must comply with the above dimensions.
Saddle-Pack cells must have a combined dimension of 139.0mm max when placed end to end.
1S Batteries: Length: 93.0mm, Width: 47.0mm. (Side exit wires are allowed outside this dimension). Height: 18.5mm. (Chassis location features additional to this dimension are allowed)
2. Individual cells used in the construction of the battery pack shall be rated with a nominal voltage of no more than (LiPo 3.8v/LiFe 3.3v). Individual cells may be wired in parallel.
For 4S Packs:- the maximum connection "In Series" is four, to give a Final pack voltage of (LiPo 15.2v/LiFe 13.2v) nominal. For 2S Packs, the maximum connection "In Series" is two, to give a maximum Final pack nominal voltage of (LiPo 7.6v/LiFe 6.6v).
For 1S Packs, cells can only be connected in parallel to give a maximum Final pack nominal voltage of (LiPo 3.8v/LiFe 3.3v).
NOTE: Cells with a nominal voltage of 3.8v cannot be used at EFRA events until 1st. April 2017 for 4S and 2S, 1st. March 2017 for 1S. (Previously approved 3.7v nominal cells are not restricted). The maximum charging cut-off will remain at 4.20v per cell.
3. The battery pack shall have leads extending from the case for the positive and negative electrical connections using wire of adequate size to handle discharge rates acceptable to racing applications.
Alternatively, the case shall have internal connection points for these wires clearly marked positive and negative so the user can apply the lead wires. Any type of metal connections that are incorporated in the battery pack by the manufacturer must be substantially below the major surface of the plastic casing, to prevent any "short circuit" if placed on a conductive surface.
Any type of connection adaptors added, that are conductive and protrude above the level of the plastic case must be removed before the battery is removed from the car.
4. The case must have the original suppliers label intact, stating:- the Part #, the rated nominal voltage and the chemistry (Lipo/LiFe), the rated energy capacity of the pack in Wh. and the 'C' rating of the pack. The Brand name/logo shall be easily readable.
NOTE: For 2017 onwards, Saddle Pack batteries supplied as two individual batteries (not hard wired together), will show the nominal battery voltage for each battery on the labels, not the combined voltage.
5. All LiPo/LiFe packs must be charged with a LiPo/LiFe-capable charger using the industry standard CC/CV (Constant Current/Constant Voltage) charge profile.
6. 4S LiPo/LiFe batteries may be charged to a maximum of 16.80v (LiPo) resp. 14.80(LiFe).
2S LiPo/LiFe batteries may be charged to a maximum of 8.40v (LiPo) resp. 7.40v (LiFe).
1S LiPo/LiFe batteries may be charged to a maximum of 4.20v (LiPo) resp. 3.70v (LiFe).
Overcharging is a serious safety hazard and will not be tolerated.
7. Any competitor found to be charging cells using a charger that is not specifically designed for LiPo/LiFe cells, or using a charge profile other than the industry standard CC/CV, will be penalised at the event.
Any competitor found to have charged LiPo/LiFe cells to above the values detailed in rule 3.1.2 (6) above will be penalised. The different guidelines for use and homologation of LiPo/LiFe-Batteries are published on the EFRA webpage (www.EFRA.ws). A copy of the guidelines for the end-user must be included in the driver's packages for EC's.
8. LiPo/LiFe drive batteries must be in a "Lipo sack" at all times when being charged or discharged. This applies to any discharging procedures except during a race or when using organiser supplied resistors. Anybody not doing this, will be penalized at the event.
LiPo sack is defined as a receptacle designed for the purpose of charging LiPo/LiFe batteries and of a suitable construction as to contain a LiPo/LiFe fire.
9. Modifications to the original battery case, by removal of material or any modification that could be deemed to

affect safety is not allowed.

Proposal:

Lithium Based (LiPo/LiFe) Batteries can be approved, but must conform to the following :-
1. Lithium Based (LiPo/LiFe) battery packs must have a hard, protective case that completely envelopes the cell(s). The case should be made from ABS or a similar material. The two halves of the case must be factory sealed in a way that any attempt to open the case will destroy the case. The only opening in the case that is allowed, is for the exit of wires or pin type connections. Batteries to comply with the weights specified on the EFRA homologation list, (maximum tolerance for manufacturers is +/- 4%).
The maximum case sizes, including any manufacturer incorporated plugs or connections are as follows:
4S Batteries: Length: 139.0mm, Width: 47.0mm (the max. width includes any side exit wires), Height: 48.2mm (Chassis location features additional to this dimension are allowed) 2S Batteries: Length: 139.0 mm, Width: 47.0 mm. (The max. width includes any side exit wires). Height: 25.10 mm. (Chassis location features additional to this dimension are allowed)
Saddle-Pack cells are allowed, but must comply with the above dimensions.
Saddle-Pack cells must have a combined dimension of 139.0mm max when placed end to end.
1S Batteries: Length: 93.0mm, Width: 47.0mm. (Side exit wires are allowed outside this dimension). Height: 18.5mm. (Chassis location features additional to this dimension are allowed)
2. Individual cells used in the construction of the battery pack shall be rated with a nominal voltage of no more than (LiPo 3.8v/LiFe 3.3v). Individual cells may be wired in parallel.
For 4S Packs:- the maximum connection "In Series" is four, to give a Final pack voltage of (LiPo 15.2v/LiFe 13.2v) nominal. For 2S Packs, the maximum connection "In Series" is two, to give a maximum Final pack nominal voltage of (LiPo 7.6v/LiFe 6.6v).
For 1S Packs, cells can only be connected in parallel to give a maximum Final pack nominal voltage of (LiPo 3.8v/LiFe 3.3v).
NOTE: Cells with a nominal voltage of 3.8v cannot be used at EFRA events until 1st. April 2017 for 4S and 2S, 1st. March 2017 for 1S. (Previously approved 3.7v nominal cells are not restricted). The maximum charging cut-off will remain at 4.20v per cell.
3. The battery pack shall have leads extending from the case for the positive and negative electrical connections using wire of adequate size to handle discharge rates acceptable to racing applications.
Alternatively, the case shall have internal connection points for these wires clearly marked positive and negative so the user can apply the lead wires. Any type of metal connections that are incorporated in the battery pack by the manufacturer must be substantially below the major surface of the plastic casing, to prevent any "short circuit" if placed on a conductive surface.
Any type of connection adaptors added, that are conductive and protrude above the level of the plastic case must be removed before the battery is removed from the car.
4. The case must have the original suppliers label intact, stating:- the Part #, the rated nominal voltage and the chemistry (Lipo/LiFe), the rated energy capacity of the pack in Wh. and the 'C' rating of the pack. The Brand name/logo shall be easily readable.
NOTE: For 2017 onwards, Saddle Pack batteries supplied as two individual batteries (not hard wired together), will show the nominal battery voltage for each battery on the labels, not the combined voltage.
5. All LiPo/LiFe packs must be charged with a LiPo/LiFe-capable charger using the industry standard CC/CV (Constant Current/Constant Voltage) charge profile.
6. 4S LiPo/LiFe batteries may be charged to a maximum of 16.80v (LiPo) resp. 14.80(LiFe).
2S LiPo/LiFe batteries may be charged to a maximum of 8.40v (LiPo) resp. 7.40v (LiFe).
1S LiPo/LiFe batteries may be charged to a maximum of 4.20v (LiPo) resp. 3.70v (LiFe).
Overcharging is a serious safety hazard and will not be tolerated.
7. Any competitor found to be charging cells using a charger that is not specifically designed for LiPo/LiFe cells, or using a charge profile other than the industry standard CC/CV, will be penalised at the event.
Any competitor found to have charged LiPo/LiFe cells to above the values detailed in rule 3.1.2 (6) above will be penalised. The different guidelines for use and homologation of LiPo/LiFe-Batteries are published on the EFRA webpage (www.EFRA.ws). A copy of the guidelines for the end-user must be included in the driver's packages for EC's.
8. LiPo/LiFe drive batteries must be in a "Lipo sack" at all times when being charged or discharged. This applies to any discharging procedures except during a race or when using organiser supplied resistors. Anybody not doing this, will be penalized at the event.
LiPo sack is defined as a receptacle designed for the purpose of charging LiPo/LiFe batteries and of a suitable construction as to contain a LiPo/LiFe fire.
9. Modifications to the original battery case, by removal of material or any modification that could be deemed to affect safety is not allowed.
Remarks:

All incorporated plugs or connectors should be within the moulded case dimensions.

Proposed by EFRA, Worsley Paul

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **7.1.1.**

European Championships are held in the following classes:
1/10 Off-Road Modified, 2WD & 4WD as separate classes.
1/12 Modified, using no less than 6.5 turn modified brushless and blinky.
1/12 Spec using 13.5 T Spec. brushless and blinky.
1/10 Touring Cars Modified & 1/10 Touring Cars using 13.5T Spec. Brushless
1/10 Formula One using 21.5T Spec. Brushless.
Starting May 2016, only motors included on the EFRA Homologation Lists are allowed at EC and GP events in the above Classes.

Proposal:

European Championships are held in the following classes:
1/10 Off-Road Modified, 2WD & 4WD as separate classes.
1/12 Modified, using no less than 6.5 turn modified brushless and blinky.
1/12 Spec using 13.5 T Spec. brushless and blinky.
1/10 Touring Cars Modified & 1/10 Touring Cars using 13.5T Spec. Brushless
European Cup 1/10 Formula One using 21.5T Spec. Brushless.
Starting May 2016, only motors included on the EFRA Homologation Lists are allowed at EC and GP events in the above Classes.
Remarks:

Remove F1 as an EC, the numbers are low the price is high. Continue to run it but as an "open" meeting alongside the TC EC.

Proposed by EFRA, Hardisty Chris

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

6. ITEMS FOR GENERAL DISCUSSION.

The Section Chairman thanked all participants for a constructive meeting, and being no further business the meeting was closed at

MEETING TO CONTINUE WITH ELECTRIC OFF-ROAD SECTION MEETING.

EFRA ANNUAL GENERAL MEETING
HOTEL NH Wien Airport,
Vienna Austria
4-5th of November 2017

AGENDA ELECTRIC - OFF-ROAD.

1. CHAIRMAN'S WELCOME — Mr Paul Worsley

The Electric Off-road Chairman opened the meeting at

2. APOLOGIES FOR ABSENCE

Apologies have been received from:

COUNTRY	PRESENT	SECTION SUBSCR	REQUESTED:				
			EC	EC	WC		Max33%
			Buggy 2wd	Buggy 4wd	WC		%
AUSTRIA							
BELARUS							
BELGIUM							
BULGARIA							
CROATIA							
CZECH REP.							
DENMARK							
ESTONIA							
FINLAND							
FRANCE							
GERMANY							
GREAT BRITAIN							
GREECE							
HUNGARY							
IRELAND							
ITALY							
LUXEMBOURG							
MONACO							
NETHERLANDS							
NORWAY							
POLAND							
PORTUGAL							
RUSSIA							
SLOVAK REP.							
SLOVENIA							
SPAIN							
SWEDEN							
SWITZERLAND							
TURKEY							
		TOTALS					

Allocations can be changed till December 21th 2017.

Other persons present:

3. MINUTES OF 2016 SECTION MEETING

November 2016 –Vienna, Austria:

Matters arising from the minutes:

The minutes were accepted as written at the AGM 2016.

The following person was elected to check the minutes of this year:

4. CORRESPONDENCE RECEIVED

. Any correspondences from the 2017 season……

5. CHAIRMAN'S REPORT

A full report of the Season is presented by the Section Chairman

6. PRESENTATIONS FOR APPLICATIONS EC AND GP'S 2018/19

The section has reviewed the applications to host coming EFRA events:

Year/Date	Alt. Date	Status	Country	Venue
2018		IR	Belgium	Kampenhout
2019		EC	Slovakia	Trencin
2019		WC	Denmark(TBC)	Odence
2019		WC	Reims	France
2019		WC	Slovakia	Trencin
2019		WC	Spain	Valladolid
2019		WC	Italy	Pinerolo
2019		WC	Great Britain	Retford

Final Race calendar 2018

Year/Date	Alt. Date	Status	Country	Venue
2018		EC	Reims	France

Future Race calendar Championships

Year/Date	Alt. Date	Status	Country	Venue
2019				

Nominated Tyres for the 1/10th. Off-Road EC:

Allocations were made to each country as printed in the table form under item 2 on the agenda.
All Federations MUST confirm their FINAL Allocation Numbers for each event to the relevant Section Chairman by 21th. December LATEST.

7. RULE PROPOSALS.

No proposals received

8. ELECTION OF SECTION CHAIRMAN.

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Paul Worsley is willing to restand

9. ANY OTHER BUSINESS

10. ITEMS FOR GENERAL DISCUSSION.

The Section Chairman thanked all participants for a constructive meeting, and being no further business the meeting was closed at

MEETING TO CONTINUE WITH ELECTRIC TRACK SECTION MEETING.

EFRA ANNUAL GENERAL MEETING

HOTEL NH Wien Airport,
Vienna Austria
4-5th of November 2017

AGENDA ELECTRIC - TRACK.

1. CHAIRMAN'S WELCOME — Mr Chris Hardisty

The Electric Track Chairman opened the meeting at

2. APOLOGIES FOR ABSENCE

Apologies have been received from:

Member Countries presents, section subscription, allocations etc:

COUNTRY	PRESENT	SECTION SUBSCR	EC 1/12		EC 1/10 Touring	WC 1/12	WC 1/10
AUSTRIA							
BELARUS							
BELGIUM							
BULGARIA							
CROATIA							
CZECH REP.							
DENMARK							
ESTONIA							
FINLAND							
FRANCE							
GERMANY							
GREAT BRITAIN							
GREECE							
HUNGARY							
IRELAND							
ITALY							
LUXEMBOURG							
MONACO							
NETHERLANDS							
NORWAY							
POLAND							
PORTUGAL							
RUSSIA							
SLOVAK REP.							
SLOVENIA							
SPAIN							

SWEDEN							
SWITZERLAND							
TURKEY							
TOTAL			**0**	**0**	**0**	**0**	**0**

Allocations can be changed till December 21th 2017.

Other persons present:

3. MINUTES OF 2016 SECTION MEETING

November 2016 – Vienna, Austria

Matters arising from the minutes:

The minutes were checked and accepted as written at the AGM 2016.

The following person was elected to check the minutes of this year:

4. CORRESPONDENCE RECEIVED

. Any correspondences from the 2017 season……

5. CHAIRMAN'S REPORT

. A full report of the Season is presented by Section Chairmen

6. PRESENTATIONS FOR APPLICATIONS - EC AND GP'S 2018/19

The section has received the following applications to host coming EFRA events. These proposals have reached us in time, no other proposal will be accepted after distribution of the agenda.

Year/Date	Alt. Date	Status		Country	Venue
2018		EC	1/12	Netherlands	Sittard
2018		EC	1/12	Slovakia	Trencin
2019		EC	1/10	Slovakia	Trencin
2019		EC	1/12	Slovakia	Trencin
2019		EC	1/10	Netherlands	Rucphen

Final Race calendar 2018

Year/Date	Alt. Date	Status		Country	Venue
2018		EC	1/12		
2018		EC	1/10	Austria	Wiener Neustadt
2018		WC	1/10 1/12	South Africa	Welcome

Future Race Calendar Championships

Year/Date	Alt. Date	Status	Country	Venue
2019				

Tyres for the 1/10th Touring Car EC 2017:

Allocations were made to each country as printed in the table form under item 2 on the agenda

7. ALLOCATIONS

Allocations were made to each country as printed in the table form under item 2 on the agenda.
All Federations MUST confirm their FINAL Allocation Numbers for each event to the relevant Section Chairman by 21th. December LATEST

8. RULE PROPOSALS

APPENDIX 3 B ELECTRIC CARS REQUIREMENTS FOR ELECTRIC ON ROAD CLASSES

THE RULE SHOULD BE DELETED:

Existing Rule: **7.1.2.**

The rear bumper cut-line to be maximum 35 mm from track surface, as detailed in GBS drawings. This will be measured with the chassis on a 15.0 mm block, so based on a 5 mm ground clearance the dimension used will be 45.0 mm.

Remarks:

Deleted as unnecessary. See other changes

Proposed by BRCA, Hill Janet

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE DELETED:

Existing Rule: **7.1.3.**

A wing may be fitted to the rear of the body but not on the roof or above the roofline

Remarks:

Roofline rule removed, other changes dictate where wing may be mounted (rear of body only)

Proposed by BRCA, Hill Janet

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE DELETED:

Existing Rule: **7.1.4.**

The wing may overhang the rear of the body of the car by 10 mm.

Remarks:

To be deleted as unnecessary. See other changes

Proposed by BRCA, Hill Janet

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **7.2.**

MEASUREMENTS AND WEIGHTS
(NOTE: Heights measured with chassis on 15.0 mm block, based on 5 mm ground-clearance)

Maximum overall width (with body): 195 mm
Maximum overall width (without body): 190 mm
Minimum height (to top of the roof): 115 mm (ready to run)
with chassis on 15mm block: 125 mm (ready to run)
Rear bumper "cut-line" height (with chassis on 15 mm block): 45 mm (maximum)
Maximum wheelbase: 270 mm
Minimum weight: 1350 gram
Wing: maximum width: 190 mm
Wing: chord dimension (inc. any extensions): 40 mm. (max.)
Wing end-plates/side-plates: 20 mm (height) max. x 40mm. max.
Maximum wheel rim diameter (excl. ribs): 50 mm.

Wheel nuts and/or axles must not protrude more than 2.0 mm beyond the wheel/tyre outside face.
The use of multiple-speed transmissions (gearboxes) and slipper clutches is not allowed.
All cars must have independent suspension operating on all four wheels (no PRO 10 cars allowed).
Only a fixed single ratio transmission is allowed and it may not include a mechanical device/s between the drive motor output and the gearbox input for the purposes of controlling torque (e.g. slipper clutches).

Proposal:

MEASUREMENTS AND WEIGHTS
Maximum overall width (with body): 195 mm
Maximum overall width (without body): 190 mm
Minimum weight: 1350 gram
Wing: maximum wing size including endplates: 190w x 40d x 20h mm
Wings to be mounted directly to the body (no spacer between shell and wing), on the moulded mounts provided at the back of the shell. All features (front splitter/bumpers) from the original moulding must remain on the shell.
Maximum wheel rim diameter (excl. ribs): 50 mm
The use of multiple-speed transmissions (gearboxes) and slipper clutches is not allowed.
All cars must have independent suspension operating on all four wheels (no PRO 10 cars allowed. Only a fixed single ratio transmission is allowed and it may not include a mechanical device/s between the drive motor output and the gearbox input for the purposes of controlling torque (e.g. slipper clutches).
Remarks:

As body shells must meet GBS rules before being allowed at EFRA events the basic shape of the body will already meet the specifications. Roof height rule is unnecessary as mounting the body shell too low will mean the wheels rub on the inside of the body which will have a detrimental effect on the handling. Rear bumper cut lines unnecessary and simply adding the section about some of the front splitters and bumpers MUST remain on the body limits how low a car body can be mounted. Wing chord is an unnecessary rule as the basic size Is already in the rules. Axle length rule has caused problems if anyone wants to run narrow wheel hexes

Proposed by BRCA, Hill Janet

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **7.3.2.**

At EC's it is only allowed to use the tyres that were agreed by the section meeting at the EFRA AGM together with the race organiser (race organiser will make their recommendation). For dry weather racing there will be a single control slick tyre with insert and will come pre-glued to the wheel (insert, tyre and wheel to be same for all drivers) and commercially available via model/hobby shops. For wet/damp conditions there will also be a pre-

glued control set of tyres. For use at the EC, the tyres must be bought from the organiser. For each competitor there must be at least 1 set of dry and wet weather tyres available to be bought for practice at the EC.
Price fixed for each EC event at 60 Euro for 3 dry weather sets, this price only for tires used at eve

Proposal:

At EC's it is only allowed to use the tyres that were agreed by the section meeting at the EFRA AGM together with the race organiser (race organiser will make their recommendation). For dry weather racing there will be a single control slick tyre with insert and will come pre-glued to the wheel (insert, tyre and wheel to be same for all drivers) and commercially available via model/hobby shops. For wet/damp conditions there will also be a pre-glued control set of tyres. For use at the EC, the tyres must be bought from the organiser. For each competitor there must be at least 1 set of dry and wet weather tyres available to be bought for practice at the EC.
Maximum price fixed for each EC event at the AGM. The supplier of the tyre must guarantee that the wheels tyres are of the same batch/production run. They must be the only source of supply for the event.
Remarks:

There is a need to open the choice and allow tyre manufacturers to supply the right product for the event. Tyres must be fit for purpose and competitively priced. This proposal removes the price limit allowing it to be set to a fair and completive level each year. We can also set or include the price of the designated "wet" tyre for the event. We must have the guarantee that all the tyres/wheels are the same and have somewhere in the rules that it's a single source supply e.g. we wouldn't want any teams to bring their own and supply the organiser.

Proposed by EFRA, Hardisty Chris

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **7.3.3.**

2 sets of 4 dry weather tyres are allowed for qualifying, and 1 additional set of 4 dry weather tyres is allowed for finals. Tyres from qualifying may be used in the finals. 1 set of 4 wet weather tyres is allowed to be used for both qualifying and finals.
For Modified only: 5 sets of 4 dry weather tyres are allowed for qualifying, and 1 additional set of 4 dry weather tyres is allowed for finals. Tyres from qualifying may be used in the finals. 1 set of 4 wet weather tyres is allowed to be used for both qualifying and finals.

Proposal:

2 sets of 4 dry weather tyres are allowed for qualifying, and 1 additional set of 4 dry weather tyres is allowed for finals. Tyres from qualifying may be used in the finals. 1 set of 4 wet weather tyres is allowed to be used for both qualifying and finals.
For A finals only : 1 new set per final may be used. Tyres from qualifying may be used in the finals. 1 set of 4 wet weather tyres is allowed to be used for both qualifying and finals.
Remarks:

Make all qualifying equal. Only drivers that make the A have a chance of being Champion, we can give all the final that chance and let them all race for it.

Proposed by EFRA, Hardisty Chris

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **8.5.**

Wings:
Front and rear wings must be made of a molded ABS Style plastic similar to a Tamiya Style wing. Front and rear wings made of Lexan material will not be allowed (this includes bolt on Lexan front wings over a smaller ABS plastic wing).
Wings equipped with any type of remote adjustment or DRS are not allowed.

Proposal:

Wings:
Front and rear wings must be made of a molded ABS Style plastic and to a design to be decided at the AGM.
Front and rear wings made of Lexan material will not be allowed (this includes bolt on Lexan front wings over a smaller ABS plastic wing).
Wings equipped with any type of remote adjustment or DRS are not allowed.
Remarks:

To maintain conformity we can specify which type/design or even brand. This removes the possibility of "custom" made wings. There is now possibility of printing wings at home, could become very silly unless controlled.

Proposed by EFRA, Hardisty Chris

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

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APPENDIX 9 PROCEDURE FOR BODY-APPROVAL (1/8 TRACK, 1/10 TRACK, ELECTRIC TRACK & LARGE SCALE)

THE RULE SHOULD BE AMENDED TO READ:

Existing Rule: **1.a.**

Bodies for 1:10th, 1:8 class and Electric Track. Anyone who wishes to have a body tested and homologated must submit 2 samples before December 1st to the body homologation officer.
Bodies will be checked and verified between December 1st and february 28th and will be put on the EFRA webpage for publication on March 1st.
After publication no other bodies will be added to the list before the end of the running year.

Proposal:

Bodies for 1:10th, 1:8 class and Electric Track. There will be 3 (three) time windows per year during which the bodies can be checked and verified by the homologation officer: the first going from January 1st to February 15th, the second from May 1st to June 15th and the third from September 1st to October 15th. Anyone who wishes to have a body tested and homologated must submit 2 samples of said body during the 28 days (4 weeks) before the opening of each examination window. Within 2 weeks from the end of each examination period, the officer will notify the manufacturers about the results and will update the approved body list accordingly, so that the bodies will become legal.
Remarks:

The developments done on bodyshells throughout the year are conspicuous, therefore we believe it would be good for both EFRA and the manufacturers to have the chance to update the body list at least 3 times a year so that we can mantain a consistent volume of testing, production and sales throughout the year. Especially when a body doesn't pass the examination, with the old rule it would take a year to make modifications and get the body approved. Since we believe that there's big room of improvement over 10th scale bodies, the chance to work in a more dynamic and flexible way would be a huge plus.

Proposed by XTREME, Boni Cristian

Seconded by: ..... o Not Seconded
The proposal: o Passed Unanimously o Passed with .... for, ... against and .... abstentions.
o Rejected with .... for, ... against and .... abstentions. o Amended

This proposal needs to be discussed, and brought back to the general meeting, as it affects other sections

9. ELECTION OF SECTION CHAIRMAN.

The Section Chairman Chris Hardisty is willing to restand:

10. ANY OTHER BUSINESS

11. ITEMS FOR GENERAL DISCUSSION.

The Section Chairman thanked all participants for a constructive meeting, and being no further business the meeting was closed at