



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

PUBLISHED VERSION Page 1 of 13 – issued 13/03/2024

### 1: SPORTING REGULATIONS - GENERAL

#### 1.1: TITLE & JURISDICTION:

The **ARMED FORCES RACE CHALLENGE** is organised and administered by the 750 Motor Club Ltd in accordance with the General Regulations of Motorsport UK (incorporating the provisions of the International Sporting Code of the FIA) and these Championship Regulations.

- MOTORSPORT UK Championship Permit CH2024/R034**
- MOTORSPORT UK Championship Grade: D.**
- Race Status: Inter-Club.**

#### 1.2: OFFICIALS:

- Co-Ordinator:** G.Groombridge, Donington Park, Castle Donington, Derbyshire, DE74 2BN  
☎ 01332 814548; ✉ [giles@750mc.co.uk](mailto:giles@750mc.co.uk).
- Promoter:** ~~Nicola Slater~~, Fly Motorsport Ltd, 71-75 Shelton St, Covent Garden, London. [info@flymotorsport.co.uk](mailto:info@flymotorsport.co.uk)
- Eligibility Scrutineer:** B.Blackmore, Deputy: S. Dockray
- Championship Stewards:**  
C. Emmerson      T. Gregory      I.Sowman

#### 1.3: COMPETITOR ELIGIBILITY:

- Entrants must:
  - be fully paid up members of the 750 Motor Club and
  - be Registered for the Championship and
  - be in possession of a valid MOTORSPORT UK Entrants Licences.
- Drivers and Entrant/Drivers must:
  - Be current Members of the 750 Motor Club and
  - be Registered for the Championship and
  - be in possession of valid Competition Licence, (Race Inter-Club as a minimum)
  - Or be in possession of the highest grade of national Race licence or valid FIA International Licence, together with their ASN's written consent ((H)26.2. and FIA ISC Article 2.3.7.b applies)
  - A member of either British Army Motorsports Association, Royal Navy Royal Marines Motorsports Association or the Royal Air Force Motorsports Association
  - If participation in the Championship requires absence from education a driver, in full time school education is required to have the approval of their head teacher and a letter stating such approval from their school in order to fulfil registration for the Championship. A driver shall not take time out of their education to participate in motor sport without the prior written approval of their education establishment.
  - Eligibility for Military Graduates Drivers' Cup must be current serving as defined in 1.4.4a-c and have not held any MOTORSPORT UK race licenses prior to 2022 AND be entered in a BMW 116 Trophy specification car as defined in these regulations (Section 6.)
- All necessary documentation must be presented for checking at all rounds when signing-on.

#### 1.4: REGISTRATION:

- All competitors must register for the championship online with the Registration Fee paid prior to the Final Closing date for the first round being entered.
- The Registration Fee for the season is £100 payable upon registration.
- Registration numbers will be the permanent Competition number for the Championship. Numbers 1 to 10 are reserved for the top 10 finishers in the **2023** championship.
- All competitors of AFRC will be a member of one of the following teams:
  - British Army. Current serving members of the British Army.
  - Royal Air Force. Current serving members of the Royal Air Force.
  - Royal Navy / Royal Marines. Current serving members of the Royal Navy or Royal Marines.

d. Veterans / Emergency Services. UK Armed Forces Veterans, Sponsored Reservists and UK Emergency Service members (police, ambulance, fire, HM coastguard).

e. Guests. Any competitor who doesn't fit into any of the teams listed at Para a-d above who have been accepted to compete in AFRC by the Championship Coordinator.

#### 1.5: CHAMPIONSHIP ROUNDS:

The **ARMED FORCES RACE CHALLENGE** will be contested over the following rounds:

Date	Circuit	Round/s
27 April	Brands Hatch	2
1 June	Oulton Park	2
6 July	Anglesey	2
3 August	Snetterton 300	2
21 September	Croft	2

#### 1.6: SCORING:

17. Members of the 'Guest' team will NOT score individual championship points but will be classified in the individual round results and eligible for individual round class awards. Individual championship points will be awarded to the top 15 finishers on the PI (Performance Index) table from the Army, RAF, RN/RM and Veterans team competitors as follows:  
1<sup>st</sup>-20, 2<sup>nd</sup>-17, 3<sup>rd</sup>-15, 4<sup>th</sup>-13, 5<sup>th</sup>-11, 6<sup>th</sup>-10, 7<sup>th</sup>-9, 8<sup>th</sup>-8, 9<sup>th</sup>-7, 10<sup>th</sup>-6, 11<sup>th</sup>-5, 12<sup>th</sup>-4, 13<sup>th</sup>-3, 14<sup>th</sup>-2, 15<sup>th</sup>-1.
- The totals from all qualifying rounds less two will determine the final championship points positions.
- Novice championship points will only be awarded to competitors who have not held a MOTORSPORT UK car racing licence prior to 2021 and haven't yet started six races.
- Ties for end-of-season award winning places shall be resolved, when more than one competitor have equal totals, by taking into account the highest number of 1<sup>st</sup> places, 2<sup>nd</sup> places etc from the races they are counting as their best total (i.e. their finishing position in dropped rounds do not get taken into account). If that fails to find a winner their highest or subsequent highest dropped scores will be added to their existing total score until a conclusive result is found.

#### 1.7: AWARDS:

- All awards are to be provided by the Organising Club unless agreed otherwise.
- Per Event: Awards of 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> overall in each round at each event. 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> in Class in each round.
- Championship Trophies to:
  - 1<sup>st</sup> overall
  - Highest Placed Novice
  - Inter-Service Drivers Champion (highest place from 1.4.4a/b/c)
  - Military Graduates Drivers' Cup
- Bonuses:
  - Per Round: Not applicable.
  - Championship: Not applicable
- Presentations: Garlands and Trophies are to be provided for presentation at the end of each race. Prize money and Bonuses shall be posted to the Entrants within one month of the results being declared final after each season.
- Entertainment Tax Liability: Not applicable.



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 2 of 13 – issued 13/03/2024

7. Title to all Trophies: In the event of any Provisional Results or Championship Tables being revised after any provisional presentations and such revisions affecting the distribution of any awards the Competitors concerned must return such awards to the 750 Motor Club Competitions Secretary in good condition within 7 days.

### 2: CHAMPIONSHIP EVENT MEETINGS & RACE PROCEDURES

#### 1. ENTRIES:

1. Competitors are responsible for sending in correct and complete entries with the correct entry fee prior to the closing date for entries before each event.
2. Incorrect or incomplete entries (Including Driver to be Nominated Entries) are to be held in abeyance until they are complete and correct and the date of receipt for acceptance of entry purposes shall be the date on which the Meeting Organiser receives the missing or corrected information or fee.
3. Any withdrawal of Entry or Driver/Car changes made after acceptance of any entry must be notified to the Meeting Organisers in writing. D25.1.12. applies.
4. The Entry Fee for each event shall be specified in the SRs and on the entry form.
5. Reserves will be listed in the Final List of Entries published with Final Instructions or in a Bulletin. In the case that events are fully subscribed Serving military personnel as per 1.4.3a-c will take priority over 1.4.3d-e entries. This sifting will occur 3 weeks prior to that particular event and will be first come first served for 1.4.3a-c and last come first to become a reserve for 1.4.3d-e. Within 3 weeks prior to the event there shall be no prioritisation of entries.
6. The co-ordinator reserves the right to refuse or cancel an entry from a competitor in breach of 4.2.2. Entries refused prior to events will be refunded, there shall be no refunds of registration fees.

2. **BRIEFINGS:** Organisers should notify Competitors of the times and locations for all briefings in the Final Instructions for the meetings. Competitors must attend all briefings.

#### 3. QUALIFICATION PRACTICE:

1. Should any Practice session be disrupted the Clerk of the Course shall not be obliged to resume or re-run the session; the decision of the Clerk of the Course shall be final.
2. Each driver shall complete a minimum of 3 laps in the car to be raced, and in the correct session, in order to qualify (MOTORSPORT UK Regulations Q4.5).

4. **RACES:** Should any race be disrupted the Clerk of the Course shall not be obliged to resume or rerun the race ((Q)5.4.) (1.6.4. above applies)

#### 5. STARTS:

1. All cars will be released to form up on the grid prior to the start in formation as specified on the grid sheet.
2. The start will be via Standing start. The minimum Countdown procedures/audible warnings sequence shall be:-
  - I. 1 minute to start of Green Flag/Pace Lap - Start Engines/Clear Grid.
  - II. 30 Seconds - Visible and audible warning for start of Green Flag/Pace Lap.
  - III. A five second board will be used to indicate that the grid is complete.
  - IV. The red lights will be switched on five seconds after the board is withdrawn.
3. Any car removed from the grid after the 1 minute stage or driven into the pits on the Green Flag lap shall be held in the pitlane and may start the race after the last car has passed the startline or pitlane exit, whichever is the later to take the start from the grid.
4. Any driver unable to start the Green Flag/Pace lap or start are

required to indicate their situation as per MOTORSPORT UK Regulation (Q)12.13.2. In addition any driver unable to maintain grid positions on the Green Flag Lap, to the extent that ALL other cars are ahead of them, may complete the Green Flag lap but MUST remain at the rear of the last row of the grid but ahead of any cars to be started with a time delay.

5. In the event of any starting lights failure the Starter will revert to use of the National Flag.

6. **SESSION RED FLAG:** Should the need arise to stop any race or practice, RED LIGHTS will be switched on at the Startline and RED FLAGS will be displayed at the Startline and at all Marshals Signalling Points around the Circuit. This is the signal for all drivers to cease circulating at racing speeds, to slow to a safe and reasonable pace and to return to the pit lane, during practice, and to the starting grid area, during a race, unless otherwise directed by officials. Cars may not enter the Pits unless directed to do so. Work on cars already in the Pits must cease when a race is stopped.

#### 7. PITS, PADDOCK & PITLANE SAFETY:

- 1 Pits & Paddock: Competitors must ensure that the MOTORSPORT UK, Circuit Management and Organising Club Safety Regulations are complied with at all times.
2. Pitlane: The outer lane or lanes are to be kept unobstructed to allow safe passage of cars at all times. The onus shall be on all Drivers to take all due care and respect the pit lane speed limits.
3. Refuelling: May only be carried out in accordance with the MOTORSPORT UK General Regulations, the Organising Club Regulations, Circuit Management Regulations and the SRs or Final Instructions issued for each Circuit/Meeting.
4. Speed Limit: Pit Lane Speed Limit will be 60 km/h.

8. **RACE FINISHES:** After taking the Chequered Flag drivers are required to:

- I. progressively and safely slow down
- II. remain behind any competitors ahead of them,
- III. return to the Pit Lane Entrance/Paddock Entrance as instructed,
- IV. comply with any directions given by Marshals or Officials
- V. keep their helmets on and harnesses done up while on the circuit or in the pitlane.

9. **RESULTS:** All Practice Timesheets, Grids, Race Results are to be deemed Provisional until all vehicles are released by Scrutineers after Post Practice/Race Scrutineering and/or after completion of any Judicial or Technical Procedures. (MOTORSPORT UK regulation (D)26.3.)

10. **TIMING MODULES:** The 750 Motor Club utilises transponder-based timing and competitors must have a compatible transponder fitted and working and advise the race organisers of its number prior to the event. Compatible transponders include the AMB TRANX 260 and MyLaps X2.

11. **QUALIFICATION RACES:** If any event is oversubscribed the Organising Club may at their discretion run Qualification Races.

12. **OPERATION OF SAFETY CAR:** The Safety Car will be brought into operation and run in accordance with Section Q, 3 of the MOTORSPORT UK General Regulations.

13. **ONBOARD CAMERAS:** All cars in official competitive sessions (practice/qualification/races) shall carry a video camera with clear view ahead of the driver's vision and also where possible showing the driver inputs. This footage should be provided upon request by any official.

### 3: SPECIFIC CHAMPIONSHIP REGULATIONS

1. By registering for the Championship all competitors and their associates commit to positively promote and demonstrate the



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 3 of 13 – issued 13/03/2024

Motorsport UK's Respect Code which is appended to these regulations.

Where any reports of disrespectful conduct are judged to be well founded the Championship organisers may issue warnings or require remedial actions and/or report the matter to the Championship Stewards who may impose appropriate penalties which can include loss of Championship points and/or race bans through to Championship Expulsion and referral to Motorsport UK.

It is imperative that we promote the safety and wellbeing of young people and adults at risk. In addition to this all participants must be aware of their behaviour and conduct at all times and abusive language and harmful behaviour will not be tolerated. Any such incidents must be reported to the Championship Coordinator and/or Safeguarding Officer who will also relay the report Motorsport UK. Details of the Motorsport UK Policies and Guidelines are available at [www.motorsportuk.org/resource-centre](http://www.motorsportuk.org/resource-centre) by selecting Policies and Guidelines.

2. AFRC will be scored by applying the AFRC Performance Index (PI) formula. The PI is calculated as follows:

$$\text{PERFORMANCE INDEX} = \frac{\text{FASTEST LAP TIME (seconds)}}{\text{AVERAGE LAP TIME (seconds)}}$$

A PI score will be awarded for each round. All laps will be considered when calculating the PI:

3. If a competitor visits the pits during the race, the in and out laps will still be considered towards the PI.
4. If a competitor fails to complete a race, a PI will still be awarded for achieving the following:
  - a. A minimum PI of 75 will be awarded to all drivers who sign on.
  - b. A minimum PI of 80 will be awarded to all drivers who qualify (must complete three laps to qualify) and are recorded on the official race results sheet as DNS/Non-starter.
  - c. A minimum PI of 90 will be awarded to all drivers that start a race; however, the PI will be reduced by 5 for any competitor that does not complete that race.
5. The highest six scores of all Army, RAF, RN/RM and Veterans team competitors will be added to form a Team score, which are added together to calculate a Team Champion. If there are less than six competitors from a team the lowest score will be repeated until six scores have been added together.
6. At each Round of the championship Race 1 grid positions will be determined by each competitors fastest lap time in Qualifying. At double header meetings, the grid positions for Race 2 will be determined by the competitors second fastest lap time in Qualifying.
7. In the event a safety car is utilised during the championship races, the lap times accrued during the safety car period will ~~not~~ be considered towards the performance index calculation.
8. The Championship co-ordinator reserves the right to request the fitting of a 750MC owned data logging system to any car prior to competition. Failure to comply will result in disqualification.

#### 4: SPECIFIC CHAMPIONSHIP PENALTIES:

In accordance with Section C of the current MOTORSport UK Yearbook

#### 4.1: INFRINGEMENT OF TECHNICAL REGULATIONS:

1. Arising from post practice Scrutineering or Judicial Action:  
Minimum Penalty: The provisions of MOTORSport UK Regulations: C3.3.

2. Arising from post race Scrutineering or Judicial Action: Minimum Penalty: The provisions of MOTORSport UK Regulations: C3.5.1 (a) and (b).

For infringements deemed to be of a more serious nature the Clerk of the Course will invoke the provisions of Regulation C3.5.1 (c).

#### 4.2: ADDITIONAL SPECIFIC CHAMPIONSHIP PENALTIES:

1. In the case of a driver being disqualified from a race, the Clerk of Course will impose the penalties set out in MOTORSport UK Regulation C3.5.1 a & b and may impose the penalty set out in MOTORSport UK Regulation C3.5.1 c.
2. In order to maintain standards of conduct, the Championship Organisers will monitor all Officials/Observers reports of adverse behavior at race meetings. If any individual is included on two such reports during one racing season the Championship Organisers will request the Clerk of Course at future race meetings to consider specific observation of that driver's conduct.
3. The Clerk of Course may impose a "Stop-Go" or "Drive through" penalty during a race in accordance with MOTORSport UK Regulation Q.12.6.
4. Any Competitor who is penalised under the Championship Sporting Regulations at any stage of a Championship event and receives an allocation of penalty points on their race license in accordance with MOTORSport UK Regulations, will receive a deduction of championship points, equal to the number of penalty points which were allocated. Double headers will be considered as two separate rounds.  
If a competitor receives penalty points on their licence the round in which the penalty points were awarded may not be used as a dropped score round.
5. Championship Stewards are also empowered to consider any request from the Championship co-ordinator to penalise any Competitor for any breach of Championship regulations and, after holding a formal hearing if they deem it necessary, to impose a penalty in accordance with MOTORSport UK Regulation C.2.1.1 (subject to the rights of appeal provided for in Section C.)
6. One or more of the following may be imposed by the Championship Stewards as appropriate:
  - a) Reprimand
  - b) Fine. The may be also applied in the case of a driver receiving three reprimands from the Championship Stewards in one season.
  - c) Time or Grid Penalties
  - d) Suspension from all or part of the Championship. This may also be applied in the case of a driver receiving two fines from the Championship Stewards in one season.

#### 5: TECHNICAL REGULATIONS

##### 5.1: INTRODUCTION:

The aims of the Armed Force Race Challenge Championship (hereby referred to as the 'AFRC') are as follows:

- a. To promote Motorsports within the Armed Forces community by providing an effective entry level into circuit racing for Armed Forces members (and veterans) that also allows experienced members to continue competing as and when Service commitments allow.
- b. To facilitate the development of novices by providing a simple format where they can practice their race-craft, car development skills and benefit from the guidance of our more experienced competitors.
- c. To provide a means of awarding an Inter-Services motor racing champion in addition to individual Service champions.
- d. By leaving the technical regulations as open as possible and by rewarding pace rather than finishing position, AFRC encourages effective car preparation, design innovation, develop team building, good relations with fellow Armed Forces competitors plus provide



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 4 of 13 – issued 13/03/2024

development, training and support to improve our members capabilities.

### 5.2: GENERAL DESCRIPTION:

The **ARMED FORCES RACE CHALLENGE** is for road based sports and saloon cars. Non-road based racing cars are not permitted. For the benefit of doubt, single seaters and cars never produced for the road are not permitted. Low production number / one-off kit cars will be considered on a case-by-case basis.

The class structure will be organised on a bhp (at flywheel) per tonne (weight including driver) basis as follows:

Class	Definition
A	300bhp/tonne
B	240bhp/tonne
C	180bhp/tonne
D	135bhp/tonne
116	Complying with 116 Trophy regulations at Appendix 1

Drivers must declare their vehicle power at the flywheel and vehicle weight at the time of registration. Drivers may be requested to take their vehicle (at their own expense) to one of the Championship designated rolling roads either prior to participation or after competing (including the 750 Motor Club mobile MAHA dyno) where the car will be power tested in order to assess whether it is within the correct class limit. Failure to comply will result in disqualification the designated rolling road centres for the Championship (including the 750 Motor Club mobile MAHA dyno) will all use MAHA LPS 3000 or FPS 2700 equipment.

A list of designated locations can be found in Appendix 1 to these regulations.

Entries for cars exceeding the maximum figure might be considered by the coordinator, consideration will be given to the circumstances around the entry. Competitors are reminded that MOTORSPORT UK Q9.1.2 will apply.

No Class A entry will be accepted from a driver required to display a novice cross.

### 5.3: SAFETY REQUIREMENTS:

Cars must comply with the relevant sections of MOTORSPORT UK Regulations K. Roll cages must be as per MOTORSPORT UK Yearbook section K1.

### 5.4: GENERAL TECHNICAL REQUIREMENTS & EXCEPTIONS:

All cars must comply with the requirements of sections **J** and **Q13** of the current MOTORSPORT UK Yearbook. All vehicles must be of sound construction and mechanical condition and be well maintained.

### 5.5: ACCEPTABLE CARS:

See 5.2.

### 5.6: BODYWORK:

#### MODIFICATIONS PERMITTED

**General:** The addition of colourless safety film to the glass is permitted.

**Interior:** All standard interior trim, floor coverings and roof linings may be removed. Heating and air-conditioning systems along with their associated wiring and ducting may be removed. The dashboard may be removed. Standard instrumentation may be removed and replaced with non-standard items. The driver's seat must be replaced with appropriate racing seat, the passenger seat may be removed. Side windows need not be operable; they may be removed or replaced with plastic as per MOTORSPORT UK regulation J5.20.8. The rear window on closed cars or those with hardtops may be replaced with plastic as per MOTORSPORT UK regulation J5.20.8.

A scrutineering card display pocket (supplied with registration pack) may be fitted to the left rear window on Saloon cars.

**Exterior:** The construction and materials of the following bodywork parts is free.

Front Bumper; Front Wings; Bonnet; Doors; Rear Quarter Panels; Engine Bay Cover; Rear Bumper; Boot Lid.

The lips in the inner wheel arches may be ground down and seam welded to allow clearance for wheels. Wheel wells may be reshaped but must not have any material added or removed. Material may be removed from non-structural areas of the chassis (such as the boot floor). Material may be removed from structural areas of the chassis, provided that such modification does not compromise the integrity of the chassis. If material is removed to allow clearance for the engine or gearbox then it is permitted to introduce material to compensate, provided that any strengthening of such areas must be in keeping with the vehicle's original construction. Apertures may only be created in the front and rear cabin bulkheads for the purpose of routing wiring and pipework. All such areas must be correctly sealed and competitors are encouraged to use existing apertures where possible. Aerodynamic aids such as flat underbody, splitters, spoilers, diffusers and canards may be added inline with Motorsport UK Yearbook. Rear wings may be hard mounted to the chassis using any means. The standard engine bay cover locking mechanism must be disabled; only bonnet pins may be used to secure the engine bay cover in the closed position. A scrutineering display pocket (supplied with registration pack) must be fitted to the left side of the dashboard on open-top & kit cars.

#### Silhouette

**Ground Clearance:** It is permitted to alter the ride height. Under no circumstance can any part of the bodywork, or of the suspended part of the car excluding the exhaust system, be below a horizontal plane passing 50mm above the ground, the car being in normal racing trim with the driver aboard. A gauge of 50mm may be used by Scrutineers before or after races or practice to check the ground clearance; the vehicle may be stationary or moving during any testing.

#### MODIFICATIONS PROHIBITED

**General:** It is not permitted to close panel gaps on an access panel to which access is required (i.e. bonnet, engine bay cover and boot lid) with tape.

**Interior:** Any in contravention of 5.6.1.

**Exterior:** Any in contravention of 5.6.1.

**Silhouette:** Any in contravention of 5.6.1.

**Ground Clearance:** Any in contravention of 5.6.1.

### 5.7 ENGINE

Any production engine produced by any manufacturer may be fitted to the vehicle.

#### MODIFICATIONS PERMITTED

Modifications to head and block are free, but must be based on original standard parts. Crankshaft, connecting rods, pistons, valves, camshafts and manifolds are all free. Cylinder capacity may be increased or decreased by modifying cylinder bore and/or piston stroke. Petrol and Diesel engines are permitted. Variable valve systems are permitted.

#### MODIFICATIONS PROHIBITED

None

#### LOCATION



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 5 of 13 – issued 13/03/2024

Engines must retain their original position and orientation within the car.

### OIL/WATER COOLING

Water radiators are free in terms of number, location and capacity. Engine and gearbox oil coolers are permitted and are free. Additional ducting is permitted. Sump type and material is free. Oil control systems (such as an accumulator sump) are also permitted.

### INDUCTION SYSTEMS

Induction systems are free. Forced induction may be added to naturally aspirated engines. The crankcase breather must recirculate or vent directly to a catch tank.

### EXHAUST SYSTEMS

Exhaust systems are free but must comply with MOTORSPORT UK regulations J 5.16.1 - 5.16.5.

### IGNITION SYSTEMS

Ignition systems are free. Engine management systems (ECUs) are free, provided that they do not provide any kind of traction control. ECU maps are free but the driver must not be able to change the map from inside the car, forced induction systems must not be adjustable physically or electronically from inside the car.

### FUEL DELIVERY SYSTEMS

Fuel delivery systems including pumps, injectors, filters and tanks are free subject to meeting MOTORSPORT UK safety requirements.

### 5.8 SUSPENSION

Suspension is free, dampers and springs are free. It must not be possible for the driver to make any changes to the suspension settings whilst seated in the cockpit. The wheelbase and track may be modified by using bolt on hub extensions or wheel offsets. Wheels must remain within the bodywork.

### 5.9 TRANSMISSIONS

Gearboxes are free.

### PERMITTED MODIFICATIONS

Differentials are free but may not be electronically controlled.

### PROHIBITED MODIFICATIONS

The use of any aftermarket electronic traction control device is prohibited. Gearbox and final drive ratios are free.

### 5.10 ELECTRICS

#### EXTERIOR LIGHTING

All cars must be fitted with two rear brake lights which must be fully functional at all times, all other exterior lights are optional with the exception of 5.10:2

Forward facing white lights must be fitted.

#### REAR WARNING LIGHT

A rear warning light must be fitted in accordance with K5.1.

#### BATTERIES

There are no restrictions on type or location of batteries, subject to MOTORSPORT UK regulations. A battery and electric starter motor must be fitted and be capable of repetitive starts. No external (slave) batteries may be used

#### GENERATORS

A fully working alternator and pulley must be fitted and electrically connected so that the standard battery charging function is providing a charge to the onboard battery.

### 5.11 BRAKES

#### Permitted Modifications

Brake callipers, disks and pads are free. Deformation or removal of back plates is permitted. Fitting of alternative brake piping/hosing is permitted. Brake bias valves are permitted but must not be operable

by the driver whilst seated. ABS where fitted may be disabled or removed. Cars not originally fitted with ABS may be retrofitted with the ABS system from the same model only.

**Prohibited Modifications:** Carbon discs are not permitted.

### 5.12 WHEELS / STEERING

Steering rack is free and may be either powered or manual. If fitted with a steering lock, this should be rendered inoperative, unless the vehicle is driven to the circuit on the highway.

#### PERMITTED OPTIONS

Wheels may be steel or alloy only.

#### PROHIBITED OPTIONS

Magnesium wheels are not permitted

#### CONSTRUCTION & MATERIALS

As above.

#### DIMENSIONS

Wheel Diameter must be no greater than 18". Wheel width must be no greater than 10". Offset is free.

### 5.13 TYRES

Any MOTORSPORT UK List 1A, 1B or 1C tyre is permitted. Diameter, width and aspect ratio are free. No alteration to the tyre from the manufacturer's specification is permitted. Re-cutting, re-grooving or in any other way modifying the tread pattern is not permitted. All the manufacturer's data must be clearly visible. Buffing of sidewalls to remove data is prohibited. The use of tyre heating/heat retention devices, tyre treatments and compounds is prohibited.

All non-road legal racing wet tyres are prohibited.

### 5.14 VEHICLE WEIGHT

There is no minimum vehicle weight

### 5.15 FUEL TANK / FUEL

#### TYPES

Free. A non-return valve must be incorporated in the vent system.

#### LOCATIONS

If present, the standard fuel tank must be in standard position. The location of aftermarket tanks is free subject to meeting MOTORSPORT UK safety criteria.**3. Fuel:** Only petrol as defined in **Section B Nomenclature & Definitions, Pump Fuel a)** section of the MOTORSPORT UK Yearbook for the current year and complying may be used.

### 5.16 SILENCING

All vehicles must comply with the relevant maximum noise limits set out in **MOTORSPORT UK Blue Book regulation J. Chart 5.18.**

### 5.17: NUMBERS & CHAMPIONSHIP DECALS

#### 1. Positions:

Championship Sponsor's decals must take preference to any other decals. Failure to comply will render the vehicle and driver ineligible to race.

2. Suppliers: Sponsors and Club decals will be available at the first Championship race in which the vehicle is entered.



### APPENDIX 1: Nominated MAHA Rolling Roads :

#### **Marlin Motor Engineers (Milton Keynes)**

Unit 4-5 Wellington Place  
Bletchley  
Milton Keynes  
Buckinghamshire  
MK3 5NA  
Tel: 01908 366256

#### **TI Motorsport (Stoke)**

TI Motorsport LTD  
Tegiwa House  
Sutherland Road  
ST3 1HZ  
Tel: 01782 950315

#### **Revivals (Duxford)**

Revivals Garage  
Lodge Road  
Thriplow, Royston  
Herts  
SG8 7RN  
Tel: 01763 208043

#### **Alive Tuning (Louth)**

Unit 1 & 2  
Meridien Centre  
Belvoir Way  
Fairfield Industrial Est.  
Louth  
Lincolnshire  
LN11 0LQ  
Tel: 01472 812900

#### **750 Motor Club (Mobile Dyno)**

Donington Park  
Castle Donington  
Derbyshire  
DE74 2RP

#### **Star Performance (Kirkcaldy)**

Unit 1D Frances Industrial Park  
Wemyss Road  
Dysart  
Kirkcaldy  
Fife  
KY1 2XZ  
Tel: 01592 655595



### Section 6 – Military Graduate Drivers' Cup

#### 6: TECHNICAL REGULATIONS

##### 6.1: INTRODUCTION:

a) The following Technical Regulations are set out in accordance with the MOTORSPORT UK specified format and it should be clearly understood that if the following texts do not clearly specify that you can do it, you must work on the principle that you cannot. By registering from the series, you agree to abide to regulations and random checks by officials and by scrutineers. The fact that some modifications are mentioned as prohibited does not imply that others are allowed.

b) **STANDARD:** The word 'standard' used within these technical regulations as a description of components is to be interpreted as per 'Standard Part' defined in Section B – Nomenclature & definitions in the MOTORSPORT UK Yearbook. Checking will be by comparison to spare parts supplied by the manufacturer's official agent or by any other means necessary to ensure compliance.

c) **STANDARD PATTERN:** The phrase 'standard pattern' used within these technical regulations as a description of components is to be interpreted as per 'Standard Part' defined in Section B – Nomenclature & definitions in the MOTORSPORT UK Yearbook. Checking will be by comparison to spare parts supplied by the manufacturer's official agent or by any other means necessary to ensure compliance.

##### 6.2: GENERAL DESCRIPTION:

The 116 Trophy is for competitors participating in the BMW E87 5-Door, 5-Speed (1596cc n45 engine.) Only UK & European 2004-2006 domestic market cars in right hand drive are permitted. There are no restrictions on the transport of cars to and from the circuit.

Cars will run in one class. Non scoring "Invitational Cars" may be admitted at the discretion of the cup coordinator, The 116 Trophy technical regulations are intended to allow competitors to produce race cars that are safe, affordable and of a near identical level of performance, with the emphasis placed firmly on driver ability. Competitors are therefore asked to keep this in mind when building or modifying race cars and are encouraged to seek guidance from the Series Co-ordinator where appropriate. A modification that gives a performance advantage at a high financial cost will almost certainly be illegal, or possibly outlawed in future regulations. Competitors seeking to gain a power advantage can expect to exceed the maximum power allowed for the 116 Trophy Series of **130 bhp** at the flywheel, tested on a Series nominated MAHA Dyno. The 116 Trophy is not a development formula. **IF ITS NOT IN THESE REGULATIONS IT IS NOT PERMITTED.**

**Examination of vehicles.** The organisers (in addition to any other powers they may have under these regulations) reserve the right before or after any race in the Series to designate any one or more of the competing cars for special eligibility scrutineering. Competitors must be prepared, with tools and spare parts as necessary, to enable inspection of components, or to have units sealed at the circuit for later inspection by an Eligibility Scrutineer at the Competitor's expense.

Upon such selection being made the competitor shall immediately place the car under the control of the organisers and be deemed to have permitted all such scrutineering, examination and testing as the organisers may reasonably require. The organisers have the right to:

a) Examine the car at the circuit for such period as they may reasonably require and take fuel samples.

b) Retain the car for detailed examination at premises chosen by the organisers. If the organisers elect to retain the car they shall make it available for collection by the competitor at least seven days prior to the qualification session for the next race in the Series unless the car is found to be in breach of these regulations.

c) Seal the car and any of its components in such a manner as they may choose and require the competitor at their own expense to present the car at any other premises chosen by the organisers for detailed examination within a specified period and / or remove the car by transporter at no expense to the competitor to an appointed location. The competitor will be advised in writing of the time, date and location of the subsequent testing or eligibility examination.

The overseen stripping of the engine or any required component will be undertaken by the competitor and / or mechanic / technician nominated by the competitor.

d) The scrutineer can at their discretion request the removal of any part for their further inspection and testing. If the scrutineer decides to retain any part for further inspection over a race weekend, a fully eligible replacement part will be provided by the scrutineer at the time of removal, allowing the competitor to continue racing.

e) The colour scheme for any car is free but the car must be presented in a good, clean condition and any damage sustained must be made cosmetically good, to the approval of the Series before the next event. Failure to do so will be considered non-compliant. Cars must have all decals affixed as per the issued decal sheet The Series will deem any cars not carrying all decals to be non-compliant.

##### 6.3: SAFETY REQUIREMENTS:

Roll cages: Only the 6-point roll cages authorised by 116 Racing LTD are permitted (see Appendix 6.1.)

Other: Extinguishers must comply with MOTORSPORT UK regulation K 3.1. Seat belts must be FIA homologated and as per K2.1.2 , 2.1.3. or 2.1.4.

##### 6.4: GENERAL TECHNICAL REQUIREMENTS & EXCEPTIONS:

All cars must comply with the requirements of sections J and Q13 of the current MOTORSPORT UK Yearbook. All vehicles must be of sound construction and mechanical condition and be well maintained. Water hoses, oil hoses and their associated clips are free. Fasteners (e.g. nuts, bolts) are free. Rose Joints of any type are prohibited [except where fitted to mandatory items]. The organisers reserve the right to refuse entry from any car of which the preparation is of a poor standard (including the external appearance) and which is likely to bring the Series into disrepute.

##### 6.5: CHASSIS:

No chassis stiffening is permitted except that derived from the fitting of the roll cage. Seam welding is strictly forbidden, Cutting, grinding, drilling, or acid dipping to remove components or material from the chassis is strictly forbidden. It is prohibited to change the standard thickness of the



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 8 of 13 – issued 13/03/2024

shell, by dipping or sandblasting. Seam sealer may only be removed up to a maximum of 50mm from the periphery of roll cage mounting feet. It is forbidden to remove seam sealer from anywhere else on the interior or exterior of the shell.

Towing eyes must be fitted front & rear and must have a minimum internal diameter of 60mm; (note the tow eye may be of either a suitable rigid or flexible material bolted to the chassis). 1 single hole per tow wire is permitted in the front/rear bumpers. The plastic "Jack Fixture" (BMW Part No: 31 11 6 761 462) fitted to the front subframe and the 4 x plastic "Lift Supports" fitted to the vehicle sills (BMW Part No: 51 71 7 237 195) may be removed.

### 6.6: BODYWORK:

#### 1. Modifications Permitted:

1. General: Mandatory fitment of laminated windscreen. Door windows and rear windscreen must be standard glass. Safety film on the glass is permitted. It is permitted to replace rear door glass with polycarbonate in order to facilitate the fitment of vents or NACA ducts to cool the driver.

2. Interior: Driver's seat must be replaced with a competition seat fitted in accordance with K2.2. All passenger seats, floor coverings, roof lining, sound deadening materials, radio/stereo units, speakers and associated wiring may be removed. Redundant interior metal brackets such as rear seat mountings may be removed, however competitors should bear in mind that if the removal of any material results in weakening the structural integrity of any panel, then the Clerk of the Course (at their own discretion) will be fully authorised to exclude the vehicle from competing.

Spare wheel & associated parts, and all tools must be removed.

Rear plastic battery box can be removed and hole covered by a strong aluminium or carbon fibre panel

Additional instruments are permitted, but the original dash binnacle and instrument cluster, must be retained and fitted in their original positions. The main body of the standard dashboard must be retained and securely fitted in its original position, however localised trimming is permitted to allow roll cage fitment and the addition of aftermarket switchgear or pull cables. Glove box lid must be in place, hinges can be removed.

Steering wheel may be changed. Air bags must be disabled if the standard steering wheel is used. Glass sunroofs must be removed or replaced as per MOTORSPORT UK regulation Q13.10.6. It is permitted to remove air-conditioning if fitted, the original heater matrix, mechanism and blower must be retained and in full working order .

An interior (standard or non-standard) rear view mirror must be fitted to the left of the driver.

Rear Doors Can Be Striped of redundant electrics and window lifting parts. The centre console must be retained but the arm rest may be removed. If the original interior door panels are removed they must be replaced with strong aluminium or composite sheeting - this must be executed to a high standard with no sharp edges and with smooth surface.

3. Exterior: Bonnet, Front Wings, Front Bumper, Rear Bumper, Doors And Tailgates must remain standard.

Only The BMW E87 ES /SE and Sport bodywork is permitted, Msport Bumpers and Side Skirts are prohibited. Door mirrors must be fitted on both sides of the vehicle, only standard OEM mirrors are permitted

The original number of front windscreen wiper arms/blades must remain and be fully functioning, the rear wiper can be removed, all weather strips/channels must be retained.

The standard engine bay cover locking mechanism must be disabled; only bonnet pins may be used to secure the engine bay cover in the closed position. The left-hand lateral underbody shield (BMW Part No: 51757059389) must be retained in order to protect pipework on the underside of the vehicle. The engine undertray and plastic wheel arch liners may be removed.

4. Silhouette: All cars have to retain the original E87 ES/SE or Sport profile. It is permitted to remove the front fog lamps, the front and rear bumpers may not be aesthetically modified in any way, and retain standard in appearance (other than for localized trimming to allow fitment of towing straps). The rear bumper must retain its diffuser insert which must not be modified in anyway.

5. Ground Clearance: It is permitted to alter the ride height. Under no circumstances can any part of the bodywork, or suspended part of the car excluding the exhaust system, be below a horizontal plane passing 65mm above the ground. The car should be in normal racing trim with the driver aboard and steering in straight ahead position. A gauge of 65mm may be used by Scrutineers before or after races or practice to check the ground clearance; the vehicle may be stationary or moving during any testing. There is no tolerance to this measurement.

#### 2. Modifications Prohibited:

1. General: Other than those panels detailed in 5.6.1.3 the exterior of the car must be standard for the model being raced. All of the bodyshell and any replacement body panels must be of original shape, material and thickness.

2. Interior: A full width dashboard must be used.

3. Exterior: It is not permitted to increase the width of the wheel arch by the addition of material to, or the deformation of, the outside of the wheel arch but the inside lip may be. Bonnet must remain in the normal position and, when closed, must not have any non-standard gaps at any of their edges. Fitment of tape, sealant or addition of any material of any type to close body gaps (e.g. bonnet to wing) is prohibited. It is not permitted to add any non-standard material or structure to the underbody or outer floor plan.

4. Silhouette: Any in contravention of 5.6.1.4.

5. Ground Clearance: Any in contravention of 5.6.1.5.

### 6.7: ENGINE:

The only permitted engine is the BMW N45 B16. All internal engine parts must be original or OEM unmodified pattern parts from the N45 B16. (No internal engine components from the N45 B20S engine are permitted)

It is the competitor's responsibility to ensure that no prohibited modifications have been carried out if they are using an engine not assembled by them. Checking of engine parts will be by comparison to spare parts supplied by the manufacturer's official agent or by any other means necessary to ensure compliance.

Drivers may be requested to take their vehicle (at their own expense) to one of the Series designated rolling roads either prior to participation or after competing (including the 750 Motor Club mobile MAHA dyno) where the car will be power tested in order to assess whether it is compliant. Failure to comply will result in disqualification.





# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 9 of 13 – issued 13/03/2024

The designated rolling road centres for the Series (including the 750 Motor Club mobile MAHA dyno) will all use MAHA LPS 3000 or FPS 2700 equipment. The maximum permitted power must be within the stated peak flywheel horsepower of **130bhp**, Drivers are advised to check the power of their cars prior to using one of the designated MAHA rolling road centres listed in Appendix 6.2.

### 1. Modifications Permitted:

No modifications are permitted beyond the repair or adjustment No other modifications are permitted beyond the repair or adjustment processes specifically specified by the manufacturers 'workshop manual. Engine and gearbox must remain in its standard location . lowering of engine or moving towards bulkhead is prohibited

Replacement of the Standard Dual Mass Flywheel by the TTV Racing aftermarket flywheel is permitted (see Appendix 6.1.)

### 2. Modifications Prohibited:

Any other than those permitted in 5.7.1. It is specifically prohibited to modify the cylinder head in anyway. Skimming the head and reboring the cylinders is prohibited. The engine block bore must measure a maximum of 84mm The OE 72mm crankshaft must be retained The removal of material as a means of lightening any internal engine part is prohibited. The removal or addition of materials as a means of balancing any internal engine part is prohibited. Camshaft profiles and cam timing must remain as standard

### 3. Location:

Position and mounting method must be standard for the e87 N45 B16 model.

### 4. Oil/Water cooling:

Water radiators must remain standard, aftermarket electric fans are permitted. The standard water pump and pulley must be used. An aftermarket oil pressure sender and remote cockpit gauge is permitted, the sender must be fitted to the oil filter body housing using the OEM blank provided. It is permitted to remove the standard oil filter housing (BMW part no. 11427530668) and replace with alternative E87 1-Series oil filter housing (BMW part no. 11427508966), in order to fit either:

- a) BMW heat exchanger (for hot climates) part no. 11427508967 and associated pipework.
- or
- b) Aftermarket take off plate 116T001 (available from 116 Racing Ltd for registered drivers) in order to fit aftermarket oil cooler and associated pipework.

No other modifications are permitted to the oil system.

### 5. Induction Systems:

The complete induction system must remain as standard

No modifications are permitted to the induction system apart from the fitment of a larger diameter BMW throttle body (BMW Part No. 13541439580 or pattern equivalent), and its associated parts. These include Air Boot (BMW Part No 13717555289 or pattern equivalent), Mass Air Flow Meter (BMW Part No 13627533853 or pattern equivalent) and Airbox (BMW Part No 13717543163). All parts must be unmodified and complete, and the standard 116i air probe must be fitted and operational. A foam or paper air filter element must be fitted and complete but the type is free, either aftermarket or BMW Part No 13717532754. The crankcase breather may vent directly to a catch tank and any holes in the air filter housing associated with the breather system may be blanked off.

### 6. Exhaust systems:

Exhaust systems must exit at the rear of the vehicle. The standard exhaust manifold and system must be replaced with the Klarius system (see Appendix 1) which must remain unmodified. Catalytic converters must be retained, all exhaust gasses must pass through the catalytic converters, emissions testing may be carried out to ensure compliance.

### 7. Ignition systems:

The only ECU permitted is the 116 Series ECU (see Appendix 6.1.) No alternative or additional ECU is permitted; spark plugs are free. All original engine sensors must be fitted and operational. The OBD port must remain accessible and fully functional in order to allow diagnostic testing and ECU interrogation.

### 8. Fuel delivery systems:

It is permitted to replace the fuel lines and filter. Fuel pumps and pressure regulator must be standard and unmodified. Fuel Pressure testing may be carried out at any time to ensure that the fuel rail pressure does not exceed production limits.

## 6.8: SUSPENSIONS:

### 1. Permitted modifications:

It is a Mandatory for all cars to run with the Gaz 116 Trophy Suspension Kit including top mounts, which must be unmodified.

Anti-roll bars must be production BMW E87 ES/SE N45 116i 2004-2006 items of the following diameter bars (see Appendix 6.1):

Front Diameter =26.5mm, Rear Diameter = N/A. - Front anti-roll bar drop links are free.

It is permitted to fit the following E90/92/92 M3 Track Control Arms to allow a wider range of front negative camber adjustment to a maximum of -4 degrees – BMW part nos. 31102283577 (LH) and 31102283578 (RH) **in addition to the following E90/92 M3 Tension Arms – BMW part nos. 31102283575 (LH) and 31102283576 (RH.)** These may be BMW OEM or pattern parts but must be unmodified. Suspension bushes may be replaced

with either standard rubber OEM bushes or any aftermarket polyurethane bush, **the use of adjustable or eccentric bushes is permitted.** It is prohibited to use solid bushes such as alloy. Rose joints are not permitted other than on top mounts supplied with the suspension kit. Maximum front castor and camber is set using the mandatory adjustable top mounts

It is permitted to add a gusset to the rear toe arms on the rear axle, this gusset must be welded in place and are available for purchase from 40 Forty Racing see Appendix 6.1 or alternatively manufactured to the exact drawing in Appendix 6.3 of these regulations.

### 2. Prohibited modifications:

Modifications to the suspension pick-up points are prohibited; this includes altering (including slotting) the suspension strut mounting points on the chassis and where the suspension attaches to the front and rear subframes.

Rear adjustment of castor and camber can only be set using OEM components. Front camber may not exceed 4.00 degrees Negative.

Front and Rear Strut Braces Are Prohibited

### 3. Wheelbase:



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 10 of 13 – issued 13/03/2024

The wheelbase must be standard for the model being raced; wheels must fit into original wings front and rear without any rolling of the arches, brackets/tabs on the wing for holding the original plastic under arch trims may be folded out of the way or removed. The track may only be changed by using wheels of a maximum offset of ET20, wheel spacers are prohibited.

### 6.9: TRANSMISSIONS:

#### 1. Permitted modifications:

The only permitted gearbox options are the standard Getrag Type F 5 speed manual as fitted to the BMW E87 N45 116i 2004-2006 Dual Mass flywheels may only be replaced with original or pattern items or converted to the single mass flywheel option as shown in Appendix 6.1. Clutches may be replaced with aftermarket options but must be single plate only. The original manual gear lever may be replaced with any OEM BMW Part.

The standard E87 116i open diff assembly and casing must be used and unmodified in all respects including the 3.6:1 final drive ratio.

#### 2. Prohibited modifications:

Aftermarket limited slip, locked, locking, torque biasing or spring preloaded differentials or similar are prohibited.

#### 3. Transmissions & Drive ratios:

The use of any aftermarket traction control device is prohibited. Final drive ratio must be 3.6:1 (see 5.9.1)

### 6.10: ELECTRICS

#### 1. Exterior Lighting:

Must be as per standard fitment and be fully operational.

#### 2. Rear Warning Light:

A rear fog light to MOTORSPORT UK regulation K5.1 must be fitted.

#### 3. Batteries:

Battery is free but may be relocated. A battery and electric starter motor must be fitted and be capable of repetitive starts. No external (slave) batteries may be used.

#### 4. Generators:

A fully working standard alternator and standard pulley must be fitted and electrically connected so that the standard battery charging function is providing a charge to the on-board battery.

5. No cutting out of excess wiring from the engine loom.

### 6.11: BRAKES

#### 1. Permitted modifications:

1. All cars must have the standard ABS / DCS system in full working order. Front brake callipers must be standard. Front brake disks Must be standard or standard pattern of a maximum diameter of 284mm.

Rear brake callipers must be standard. Rear brake disks must be standard or standard pattern of a maximum diameter of 280mm.

Brake pads are free. Deformation or removal of back plates is permitted, brake fluid is free. Flexible hoses may be replaced with aftermarket parts. The braking system must remain fully operational in all aspects at all times (excluding the handbrake.)

#### 2. Prohibited modifications:

It is not permitted to use any drilled or grooved discs A hydraulically-operated handbrake is not permitted. Rear brake hydraulic line locks are not permitted.

### 6.12: WHEELS / STEERING

#### 1. Permitted modifications:

An original, unmodified E87 116i BMW steering rack must be used. The steering lock should be rendered inoperative, unless the vehicle is driven to the circuit on the highway. ~~MOTORSPORT UK regulation Q19.6.~~

2. Prohibited modifications: No machining or other modification of the road wheels are permitted. Power assistance of the steering may not be disabled, the standard PAS pump and pulley must be used.

3. Construction & Materials: Magnesium wheels are prohibited. The only permitted wheel options are OEM 16" BMW wheels as per 5.12.4 or Revolution CR10 wheels as per 5.12.4 which are available from Demon Tweeks (contact Nick Smith – Tel: 01978 663064 Email: nicks@demon-tweeks.co.uk)

4. Dimensions: 16" x 7"J et20 only.

5. Wheel Spacers: Wheel spacers are prohibited; competitors should ensure that wheel bolts are of sufficient length to adequately secure each wheel. Wheel hubs may be fitted with conversion studs to accept wheel nuts.

### 6.13: TYRES

1. The only permitted tyres for the competitor are the Nankang NS2-R in 205/45/16 size or any Motorsport UK List 1A tyre in 205/45/16 size.

### 6.14: VEHICLE WEIGHT:

1130 kgs excluding driver

Random checks will be carried out during the season and no car should ever be below this minimum weight.

### 6.15: FUEL TANK / FUEL

1. Types: Standard 52L tank must be fitted, it is permitted to fit a dry break refuelling system to the standard filler neck in accordance with Section J of the MOTORSPORT UK Yearbook. The standard fuel filler cap can be removed to facilitate fitment of this system.

2. Locations: Tank must be in standard position.

3. Fuel: Only fuel as defined in Section B Nomenclature & Definitions, Pump Fuel a) section of the MOTORSPORT UK Yearbook for the current year may be used; fuel which exceeds the stated RON (max) levels in Appendix 6.1 of Section B Nomenclature & Definitions is prohibited even if it is sold/promoted as being legal for UK Competition and/or obtainable from 'roadside' pumps. The use of additives by teams which boost the octane



# Armed Forces Race Challenge

## Sporting & Technical Regulations 2024

**PUBLISHED VERSION** Page 11 of 13 – issued 13/03/2024

rating (RON) in any petrol is prohibited. At the end of practice and the race at least 3 litres of petrol from the tank of the competing car must be available to the scrutineers for analysis.

### 6.16: SILENCING:

All vehicles must comply with the relevant maximum noise limits set out in MOTORSPORT UK Yearbook regulation J. Chart 5.18.

### 6.17: NUMBERS & SERIES DECALS

As 5.17

### Appendix 6.1: Mandatory & Optional Parts

Mandatory Parts	Supplier	Contact
MSA Approved ROPS GRID (Gosling Racing – Independent Design) OR Custom Cages Part (BM1B/22NA)	116 Racing	07465 424912
116 Trophy Exhaust System	Klarius	07967 645522
116 Trophy Suspension Kit	Gaz Shocks	01268 724585
Nankang NS2-R Tyres (set of 4)	Nankang UK	0121 5005010
116 Trophy ECU	End Tuning	07967 603576
Optional Parts	Supplier	Contact
116 Trophy Primary Silencer Box Delete Pipe	Klarius	07967 645522
116 Trophy Sump Baffle	JC Racing	01845 527777
Lightweight Flywheel	TTV Racing	01473 730996
Rear Toe Arm Gussets (Pair)	40 Forty Racing	07825 7558443
BMW E90/E92 M3 Track Control Arms	BMW	N/A
Heat Exchanger (For Hot Climates)	BMW	N/A
Revolution CR10 Wheels	Demon Tweeks	01978 663064
Race Door Cards (carbon effect) full kit	R.C.D.C	07860 216772
Powerflex Suspension Bushes	116 Racing	07465 424912



### Appendix 6.2: Nominated Rolling Roads

Marlin Motor Engineers  
(Milton Keynes)  
Unit 4-5 Wellington Place  
Bletchley  
Milton Keynes  
Buckinghamshire  
MK3 5NA  
Tel: 01908 366256

Revivals  
(Duxford)  
Revivals Garage  
Lodge Road  
Thriplow, Royston  
Herts  
SG8 7RN  
Tel: 01763 208043

750 Motor Club (Mobile Dyno)  
Donington Park  
Castle Donington  
Derbyshire  
DE74 2RP

TI Motorsport  
(Stoke)  
TI Motorsport LTD  
Tegiwa House  
Sutherland Road  
ST3 1HZ  
Tel: 01782 950315

Alive Tuning  
(Louth)  
Unit 1 & 2  
Meridien Centre  
Belvoir Way  
Fairfield Industrial Est.  
Louth  
Lincolnshire  
LN11 0LQ  
Tel: 01472 812900

Raceworx Performance Centre (Scotland)  
Unit 2  
Block 1 Hunting Park,  
Livingston  
EH54 5QS  
Tel: 07483 161958

~~RE Performance (Swindon)  
Scuderia House,  
Newcombe Drive,  
Swindon  
SN2 1EG  
Tel: 01793 278069~~

### Appendix 6.3: Rear Toe Arm Gusset

	<p><b>OVERVIEW</b></p> <p>The idea is to manufacture 2 support brackets for the rear subframe. These brackets would support the lower arm mounting point to reduce the risk of bending when riding kerbs. The plates are designed to create little to no extra torsional stiffness in the rear subframe and are purely to aid in the reliability of the vehicle.</p> <p>The plates will be manufactured from 2mm S275 mild steel so that is as close as possible to the original subframe material. Included with the kit will be 2 support brackets ready bent to shape and a fill piece to fill a hole in the original subframe</p>															
<p><b>IMAGES</b></p> <p>From the images to the left you can see how the items fit into place on the standard subframe. There is scope in the future to further support this mounting point by tying both sides together, although this will then increase torsional rigidity at the same time hence why it was not implemented at present.</p>	<p><b>3D DESIGN</b></p>															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Parts List</th> </tr> <tr> <th>Qty</th> <th>Item</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Offside Support</td> <td>S275</td> </tr> <tr> <td>1</td> <td>Nearside Support</td> <td>S275</td> </tr> <tr> <td>1</td> <td>Fill Piece</td> <td>S275</td> </tr> </tbody> </table>	Parts List			Qty	Item	Material	1	Offside Support	S275	1	Nearside Support	S275	1	Fill Piece	S275
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