



2023

# Northern Regions Regional Standing Supplementary Regulations

## VW Challenge Championship



Version 3

4 October 2023

Ref: 162917

## REVIEW AND AMENDMENTS

Motorsport South Africa (MSA) will periodically review these rules and will present the revised version to all members for agreement to publish the updated version.

Amendments and updates to the rules will be recorded in the Amendment Record, detailing the updated version, date of approval of the amendment and a short summary of the amendment.

### AMENDMENT RECORD

<i>Modified SSR / Art</i>	<i>Date Applicable</i>	<i>Date of Publication</i>	<i>Clarifications</i>
ART 2.5.7	04.10.2023	04.10.2023	Regulation amendment
ART 2.5.10	04.10.2023	04.10.2023	Regulation added
ART 3.8	04.10.2023	04.10.2023	Regulation amendment
ART 5.4	04.10.2023	04.10.2023	Regulation amendment
ART 6.9 & 6.10	04.10.2023	04.10.2023	Regulation amendment
ART 6.15	04.10.2023	04.10.2023	Regulation added
ART 16.8.1 & 16.8.4	04.10.2023	04.10.2023	Numbering correction
ART 16.9.9	04.10.2023	04.10.2023	Regulation amendment
ART 10.4	04.10.2023	04.10.2023	Regulation amendment
ART 16.3, 16.4.1, 16.16.15	04.10.2023	04.10.2023	Numbering correction
ART 16.18.2	04.10.2023	04.10.2023	Regulation amendment
ART 17.10	04.10.2023	04.10.2023	Regulation amendment
ART 17.4 & 17.16.15	04.10.2023	04.10.2023	Numbering correction
ART 17.18.2	04.10.2023	04.10.2023	Regulation amendment
ART 18.13.11, 18.6.16	04.10.2023	04.10.2023	Numbering correction
ART 18.18.2	04.10.2023	04.10.2023	Regulation amendment
ART 16.14.12	20.06.2023	20.06.2023	Regulation amendment
ART 16.16.3	20.06.2023	20.06.2023	Regulation deleted
ART 17.14.13	20.06.2023	20.06.2023	Regulation deleted
ART 17.16.3	20.06.2023	20.06.2023	Regulation deleted
ART 18.10	20.06.2023	20.06.2023	Regulation amendment
ART 18.14.14	20.06.2023	20.06.2023	Regulation amendment

ART 18.16.3	20.06.2023	20.06.2023	Regulation amendment
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## 1. VALIDITY OF THESE REGULATIONS

These regulations shall apply for the calendar year of 2023. The championship is held under MSA's general competition rules, standing supplementary regulations for car circuit racing, as well as these regulations.

Although care was taken to cover all possible modifications and allowances, "grey" areas might still appear. The VW Challenge Technical Committee reserves the right to allow, or not allow, such modifications not covered.

## 2. DEFINITION

"VW Challenge" - A class of racing that complies with the following regulations:

### 2.1. Aim of the Championship

To declare an overall Northern Regions Motorsport "VW Challenge" Champion and a Northern Regions Champion in each class.

### 2.2. Controllers of the Championship

The Controllers of the 2023 "VW Challenge" Championship will be the MSA Northern Regions Motorsport Committee, together with the "VW Challenge" Club.

### 2.3. Practice/Testing

No 'away race' circuit may be used or hired for practice/testing, by either the competitor or their vehicle, from midnight on the Saturday following the previous race meeting prior to a scheduled championship race meeting at the particular circuit, until the start of official practice as detailed in the SR's for the event in question (an 'away race' is deemed to be one held at Dezzi, Phakisa, East London, Aldo Scribante and Killarney).

### 2.4. Spare or 'T' cars

No spare or 'T' cars are allowed. The car used by the competitor in his/her first official practice at a race meeting is the car nominated by the competitor to be used for the rest of the event in question.

### 2.5. Qualifying and Racing

2.5.1. There shall be two (2) races at each race meeting, except where a *force majeure* event prevents a second race from being completed, in which case the race meeting may be concluded with 1 race.

2.5.2. Races shall be not less than 24 kilometres in length and will take place from a standing start (See SSR 38). The Qualifying session shall be not less than 25 minutes (split up into 2x sessions of 10 minutes each with a 5-minute break between sessions. The CoC will allocate each session to the relevant classes dependant on the size of entry on the day) . In the event that a Qualifying practise session is abandoned before 6 min 40 seconds (66%), the fastest lap time in the last practise session or championship points may be used to determine grid positions, and shall be announced and determined at the discretion of the CoC

2.5.3. Grid positions for Race 1 will be determined according to the fastest lap times posted during the official qualifying session. The starting positions for Race 2 shall be determined by the fastest lap time in the first heat.

2.5.4. Non-qualifiers will start from the back of their class on the grid. Should there be more than one non-qualifier, their grid positions will be determined by the current championship points standing of the competitor.

2.5.5. Classes will be separated on the starting grid by at least two rows for all races but can be reduced at the discretion of the CoC.

2.5.6. Qualifying sessions will take place and be conducted per instructions of the SR's of the day.

**2.5.7. The organisers must allocate at least 45 (Forty-five) minutes of practice sessions to VW Challenge prior to the commencement of official qualifying and such sessions shall have official timing. All competitors must have timing transponders fitted for each practice session (if timing transponders are available).**

2.5.8. A lap board will be present and shown at the start or finish line at every race meeting displaying the number of remaining laps of that heat.

2.5.9. If classes are to be split for their respective races the organisers will allocate another race between the split race to allow officials time to complete their duties in Parc Fermé before the split race.

2.5.10. In case of a safety car intervention, the leaders of class B and/or class C are required to maintain a minimum distance of 5 car lengths and a maximum distance of 10 car lengths from the car in front of them. All other competitors should comply with SSR 45 x).

## **2.6. Championship Scoring**

- 2.6.1. Points will be awarded on 10-8-6-5-4-3-2-1 basis. In order for any competitor to score full points there must be at least eight (8) starters per class. Should a class not have eight (8) starters points will be awarded on a sliding scale, dropping the highest points scoring positions. The minimum number of starters required per class in order to score points is three (3).
- 2.6.2. To be classified as a starter a competitor must participate in any official timed practice session, or in at least one of the two races (heats) listed in the regulations for the event. For avoidance of doubt, a starter is a competitor who cannot request a refund of his/her entry fee in terms of GCR 110 ii).
- 2.6.3. Pole position in each class will score one (1) additional point per class for the first race (heat) only.
- 2.6.4. Fastest race lap of each race (heat) will score one (1) additional point per class. Please note that the Point scored for fastest lap will not be scored if a competitor is disqualified for a technical infringement. Should a competitor set the fastest lap but fail to be classified due to a non-finish then the point will be allocated to that competitor.
- 2.6.5. Class points may not be transferred from one class to another.
- 2.6.6. The champion will be the competitor with the highest number of points scored overall at the end of the racing season, irrespective of class.
- 2.6.7. Any competitor who, for the first time, joins any class in one of the last three events of the series will be excluded in the scoring towards championship points but will still classify as a starter.
- 2.6.8. In the case of ties, these will be resolved in favour of the competitor with the greater number of wins, then second places and so on.
- 2.6.9. Competitors may not race in more than one Class during any given event.
- 2.6.10. Let N be the number of race meeting during the season. Should there be more than six race meetings during the season, each competitor's N - 1 race meeting results, out of the scheduled N races of the 2023 calendar, shall count for the purpose of determining the final championship outcome. Refer to GCR 234. Should there be six or less race meetings during the season, all race meetings will count for the purpose of determining the final championship outcome.
- 2.6.11. All cars that have completed two thirds of race distance must be weighed after each race, unless otherwise stated by the Clerk of the Course. Cars need to proceed to Parc Fermé directly after being weighed, unless otherwise stated by the Clerk of the Course. Should a competitor fail to complete a race and be towed from the circuit, they must report to Parc Fermé and be weighed (subject to the car being able to be pushed onto the scales). Failure to report could result in a penalty unless excused by the Clerk of the Course or Technical Consultant.

## **2.7. Eligibility of Competitors**

The championship is open to all paid up members of the "VW Challenge" Club who are holders of a valid MSA regional or national competition license.

## **2.8. Championship Race Dates**

The race dates counting towards the championship will be as published and/or as amended by Motorsport South Africa.

## **3. COMPETITORS CODE OF CONDUCT (REFER GCR 154).**

- 3.1. Competitors will abide by MSA regulations at all times. No competitor shall drive or conduct himself in a manner that brings the sport and/or club into disrepute. Competitors remain subject to disciplinary action imposed by MSA and/or the VW Challenge Committee. The competitor will be granted the opportunity to defend their case to the committee. All members are to comply with GCR 172.
- 3.2. All competitors must attend drivers briefing. Competitors that do not attend the drivers briefing without approval by the CoC, will be penalised 3 (three) grid positions for the first race by the CoC.
- 3.3. Dangerous or unsafe driving is not acceptable. Bumping and/or pushing of other vehicles on the circuit is not allowed and any drivers found doing this will be penalised by the Clerk of the Course in terms of GCR 157. The Clerk of the Course must consider infringements at previous events which resulted in penalties being imposed, when imposing penalties under this heading.

- 3.4. Any competitor who disadvantages another competitor by bumping said competitor's vehicle, even unintentionally, that also results in the loss of place(s) during a race, will generally be penalised so as to finish behind the competitor that was disadvantaged. More severe penalties will be applied in the case of repeat offenders at the discretion of the Clerk of the Course.
- 3.5. The vehicle ahead of any other vehicle in any 'train' of two or more vehicles on the circuit may only change direction once in a straight line from the exit of one corner up to and including the entrance to the next corner unless involved in a genuine overtaking manoeuvre.
- 3.6. When attempting an overtaking maneuver coming into a turn

**3.6.1 Entering the Corner (Phase 1)**

- a. Two or more cars entering the braking zone of a corner together, it is expected of each driver that such cars will exit the corner without contact.
- b. The lead car may enter the braking area in which ever way he or she wishes, inside middle or outside.
- c. Once the lead car has entered the braking zone with a car in close proximity the lead car may not change direction or block the challenger. The onus for a clear and clean overtaking manoeuvre lies with the challenger as he or she has a clear view of what is in front and the knowledge of the anticipated line that the lead car should or would take through the corner, unless the lead car makes a premature or sudden direction change in the braking area any result in contact will be the fault of the challenger.

**3.6.2 Middle of the corner (Phase 2)**

- a. If the challenger is on the inside in the braking area at the turning point and his front bumper is behind the centre of the leaders B pillar he will withdraw and forfeit the corner to the lead driver to take his normal line.
- b. It must be remembered that the lead car has to and will, turn with the aim of apexing unless the inside challenger is alongside and past the B pillar at the turn in point.
- c. If at the turn in point, the inside car is past the B pillar of the outside car, the car on the outside cannot turn in and take the normal racing line and must give space for the car on the inside to take the corner.
- d. If the outside cars front bumper is past the B pillar of the inside car at the turning point and remains ahead of the B pillar at the midway point of the corner, the inside car must allow the outside car enough room through the corner to exit the corner.
- e. Any bumping of the lead car from the back on the rear bumper is the fault of the challenger.

**3.6.3 Exiting the corner (Phase 3)**

- a. From the Apex out, if the outside car is past the inner cars B pillar at the turn in point and remains there at the midway point of the corner, the inner car will take extra care not to drift wide under power forcing the outer car wide and ultimately off the circuit at the exit.
- b. This is exaggerated in front wheel drive cars and drivers should exercise extra caution. The inner car should exercise extra caution to avoid contact i.e. by lifting of the throttle, applying brakes or taking extreme evasive actions. If there is no evidence of evasive action this will certainly count against the inside car. At the same time the outside car must also take extra care not to crowd the inside car inwards of the racing line.

**3.7 Defensive Driving:**

- 3.7.1 The vehicle ahead of any other vehicle on the circuit may only change direction once in a straight line from the exit of one corner up to and including the entrance to the next corner. (Eg. If you exit a corner on the outside and move across to the inside line to defend the next corner, you must stay on the inside line entering the next corner
- Where the natural line exiting a corner is on the outside, but the driver then needs to move across the track to the opposite side for entry of the next corner (eg, from a left hand corner to a right hand corner and vice versa), any deviation from the "normal" racing line will count as a direction change.)

- 3.8 To assist the CoC in adjudication of driving conduct, all competing cars must be fitted with at least a forward-facing video camera, in a position determined by the TC and must also show the position of the steering wheel, during all official practise sessions, qualifying and all races. Should the CoC or Race Officials require footage, during an incident related investigation or at any time during a race weekend for whatsoever reason,, from any race

participant, and the participant fails to present the requested footage in a reasonable time, he/she will be penalised with a minimum of a three (3) place penalty in the race that they did not have footage of and/or a 5-point penalty which will be deducted off the competitor's total championship points for the season. Repeat offences could include exclusion of the race, races and/or qualifying. This video material is to be made available to race officials in the case of incidents.

The footage must be downloaded onto the club's laptop which will be made available on any official practice day, official qualifying and during races on race day. The CoC must be able to view the footage with media supplied by the competitor in VLC Media Player for Windows. Any footage that requires special software will not be viewed on the club's laptop and the onus is on the competitor to convert the footage to the correct format for any official to view. No video footage will be considered if presented via the video camera's built in viewing screen or on a mobile phone or tablet. **The competitor is responsible for providing any cables required to copy the footage onto a laptop.**

- 3.8.1 Competitors involved in a racing incident, where it is unclear who caused the incident, and where investigation is required, the party(s) that does not have footage available will automatically be found as the guilty party. Should none of the involved parties be able to produce the requested footage, the decision will be left to the CoC's discretion.
- 3.8.2 Review of Incidents. In the event of conflicting incident reports from competitors and/or marshals and no suitable video material being available on the day, the CoC reserves the right to hold over any decision/sanction until a later date or the following race meeting, or when video evidence (if any) can be obtained. The onus is on the competitor to obtain and make available any video material to support their case. Every competitor is obliged to remain at the circuit for at least one hour after the publishing of the final race results. If a competitor does not make him/herself available when required by the CoC, a decision will be made without consideration of circumstances in incidents relating to that competitor.
- 3.8.3 Yellow/Red Cards will be issued at the discretion of the CoC.
- 3.8.4 It is not required for a yellow card to be issued prior to a red card being issued. The CoC at his sole discretion may issue a competitor with a red card based on the severity of any incident.
- 3.8.5 A yellow or red card will be issued to any competitor found to be guilty of unsporting behaviour. This may include but is not limited to contact between cars in any official practice session or race heat. This card may also be issued for any other rule contravention. Cards carry over to the next season. Cards apply irrespective of class a driver race in.
- 3.8.6 Refer to GCR 175. A competitor may receive a summons to complete an incident report, present their footage, or appear before the Stewards or the CoC by means of either a personal visit to request their attendance, a telephone call, SMS, email, or by means of WhatsApp messages to their relevant class groups at any official practice session or race day. Failure to comply with this instruction will result in a penalty at the discretion of the CoC.
- 3.8.7 Distributing videos or commenting on any form of social media platform while an incident is being investigated is not permitted. The CoC at his sole discretion can issue a penalty if any competitor is found to have contravened this rule.
- 3.9 If yellow card competitors cause an incident during any of the following three (3) race meetings, the CoC will issue a RED card and an immediate one race meeting ban.
- 3.10 When a competitor returns after a one race meeting ban, the yellow card will be applicable for a further 3 race meetings following the ban.
- 3.11 Yellow cards are to be displayed on the front and rear windows next to the competitor's number and next to the competitor's name on the side windows.
- 3.12 Competitors racing under a yellow card will carry a 30kg penalty over and above the usual weight for the class.
- 3.13 Any driver or entrant found guilty of having brought the series into disrepute may have their membership of the Club suspended or even terminated by the VW Challenge Committee, subject to the competitor's normal rights of appeal to MSA.
- 3.14 A competitor receiving a yellow card will lose 2 championship points for the first yellow card during a season and 5 points for any yellow cards after that. A competitor receiving a red card will lose 5 championship points.
- 3.15 The committee will supply a panel consisting of a minimum of 1 (one) person to overview driver conduct matters when called upon by the CoC. The panel may make recommendations to the CoC. The CoC in turn will make the ultimate and final decision on the matter within the bounds of the rules.

#### **4. SPONSORS DECALS / COMPETITION NUMBER EXPOSURE.**

- 4.1. Refer to GCRs 246 and 249.

- 4.2. Series sponsors decals must, on the onus of the competitor, be displayed at all times and must take preference over individual/ personal sponsors. The layout of sticker placement is shown on the VW Challenge website [www.vwchallenge.co.za](http://www.vwchallenge.co.za).
- 4.3. Decals may not be tampered with or altered in any way.
- 4.4. Day or series sponsors decals will be displayed where so decided and indicated by the VW Challenge Committee. Should a competitor need to place the decals in different positions, they need to obtain written approval from the Committee.
- 4.5. The applicable areas are the bonnet, the top and bottom of the windscreen, the top and bottom of the back window, the front and back number plate, the number backings on both front doors and rear windows.
- 4.6. The VW Challenge Committee reserves the right to revise the abovementioned and/or add additional areas for the series sponsors of the VW Challenge. Numbers must be displayed on the windscreen.
- 4.7. The letters designating the class must be the Committee-specified size. Only series sponsor decals and branding is allowed on the front windscreen, together with the competitor's number on Black (Class A), Blue (Class B) and Red (Class C) backing.
- 4.8. Any competitor not running the correct stickers in the correct positions will be penalised by 30 seconds in a race and excluded from qualifying.

## 5. ELIGIBILITY OF CARS

- 5.1. Only Polo 9N and 6R are allowed.
- 5.2. Cars must be registered with the Volkswagen Challenge Technical Committee and be submitted for inspection to determine their eligibility.
- 5.3. Cars not meeting the safety and aesthetic standards judged by the Volkswagen Challenge Committee will not be allowed to race.
- 5.4. The ~~VW Challenge Committee~~ **TC in consultation with the CoC reserves** the right to have racing cars inspected at random.

## 6. GENERAL

- 6.1. Only modifications and allowances detailed herein are allowed.
- 6.2. What is not specifically mentioned as allowed is expressly forbidden.
- 6.3. All components not referred to or specifically mentioned in these regulations will remain in completely standard specification.
- 6.4. Ignorance of the Regulations will not be accepted as an excuse.
- 6.5. If there is any uncertainty as to the legality of the modification it is the responsibility of the competitor to seek clarification in writing from the VW Challenge technical committee. This must be done before the vehicle in question is entered in a race.
- 6.6. All novice competitors must have completed drivers' instruction prior to the first race. The committee's decision is final as to whether or not the competitor is allowed to race.
- 6.7. Any novice will race three consecutive race meetings with a red streamer affixed to the top of the rear window.
- 6.8. The CoC may at his discretion decide where a rookie competitor will be positioned on the grid for the official races e.g. a rookie class A competitor with slower times than Class B competitors may be placed at the back of the Class B grid.
- 6.9. When the TC is called upon to inspect a competitor's vehicle or any component thereof at either an official race day or at a technical inspection, the TC's decision on the legality of the vehicle or component will be given in writing to the CoC. **final and his decision will not be protestable.**
- 6.10. A 3 (three) race ban will be imposed on any competitor found to have contravened the rules by means of a technical infringement by the **TC** CoC more than once in a 24-month period. **This decision will not be protestable.**
- 6.11. The TC will seal the engine, gearbox and any other parts that he deems necessary at the safety inspection. Should the competitor require to remove any seal from the car, this must be done with the TC's approval prior to the said seal being removed. The TC can, at his own discretion, request the part that was sealed with said seal be removed in his presence and the TC can then inspect the part for compliance with the VW Challenge Technical Regulations. The TC needs to inform the CoC before such an inspection is carried out.
- 6.12. If at any stage during the racing season a part sealed at the technical inspection in 6.11 above, is found to be non-compliant with the VW Challenge Technical Regulations, the competitor or any other competitor who raced the car since the seal was fitted, will be penalised retrospectively for all race meetings since the seal was fitted.
- 6.13. Should the TC notice anything untoward while conducting technical checks in parc ferme unrelated to the specific check being carried out, the TC has the right to inspect such parts. If the part is found to be non-compliant during this check, a penalty will be imposed by the CoC.
- 6.14. **Should the TC not be at the track during a race meeting, the CoC can appoint a scrutineer to fulfil the duties of the TC in terms of rule 15, 16.16.11, 17.16.11 and 18.16.11 or any other duty in these rules.**

## **7. ADDITIONS AND AMENDMENTS**

Any provision unforeseen in drawing up these regulations and specifications, or any additions or amendments to be made thereto, shall be the subject of an appendix to this circular to be issued by MSA which will have the same authority and effect as if it were part of these regulations and specifications.

## **8. DECLARATION OF CHAMPION**

The MSA Northern Regions Motorsport Committee will, at its sole discretion, declare the winners of the championship. It is entitled to withhold such declaration if deemed necessary.

## **9. DATA LOGGING AND TELEMETRY**

- 9.1. Data logging of car and competitor performance is allowed in all classes.
- 9.2. Telemetry: With the exception of pit boards or hand signals, any communication, whether this be data and/or voice between the car/driver and the pit whilst driving on the track, is not allowed.

## **10. CLASSES**

There will be three classes, namely:

- 10.1. Class A: VW 16v 2.0L FSi
- 10.2. Class B: VW 8v, 2.0L engines with limited modifications.
- 10.3. Class C: VW 16v, 1.6L CLSA engines.
- 10.4. Class X: Experimental class, as approved by the technical committee, where cars that do not comply technically with Classes A, B or C can be tested from time to time to obtain data for future development of VW Challenge. Cars in Class X will not score towards any championship. The Committee is responsible to decide in which class each class X car will start.
- 10.5. VW Academy Class where technical regulations are managed by VW Motorsport.

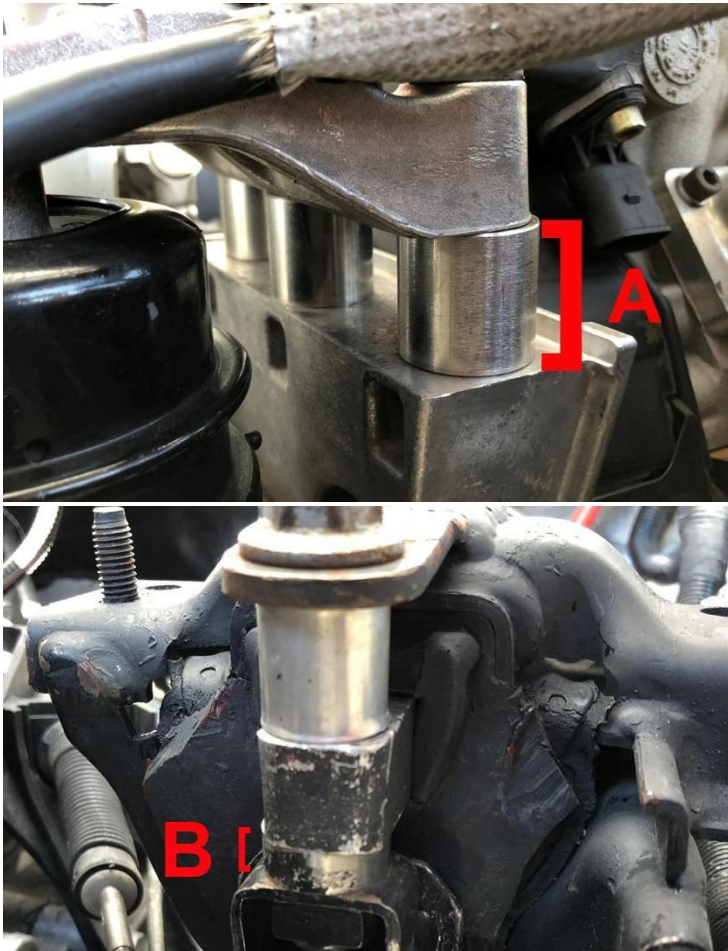
## **11. ENGINES (GENERAL)**

Engine specifications and general measurements are available from the Technical Committee. All specifications are subject to 0.5 % tolerance except where no tolerance is allowed.

### **Classes A and B**

- 11.1. Oil coolers are free of restriction, but the quality of the oil cooler and oil cooler pipes is subject to approval by the TC. This will be checked at the annual Safety Check and randomly during the year.
- 11.2. Spark plugs are free of restriction.
- 11.3. Gaskets are free of restriction.
- 11.4. The breather system must discharge into a catch tank of 1 litre minimum capacity, and this must be empty at the start of practice and each heat.
- 11.5. Sumps may be baffled but remain wet sumps. Engine and gearbox sump plugs, and oil filters must be wire locked.
- 11.6. The position of the radiator may not be changed and remain as per standard OE with regards to vertical and horizontal positioning. Larger radiators may be fitted.
- 11.7. Alternators must be operative at all times, but all pulleys' sizes may be changed.
- 11.8. Engine mounting position must remain standard, but the material is free. New Polo's must use original or VW Motorsport type engine mountings.
  - 11.8.1 In Class A, in order to ensure that the motor is level a spacer of no more than 40mm may be fitted on the driver's side/engine side (A in Figure below) and no more than 15mm on the gearbox side (B in the Figure below).





11.8.2 There are 2 types of mountings permissible to be used, namely:

- 11.8.2.1. The standard mounting as supplied by VW, measuring 230mm between the two centres of the bolt holes (this part noted as obsolete); or
- 11.8.2.2. An aftermarket unit manufactured which complies with the measurement listed in 11.8.2.1 above, subject to a tolerance of +/-2mm being permissible when measured by the TC.

- 11.9. Service items such as filters, gaskets, lubricants, air, fuel and oil filters, bolts, fasteners and bearings may be sourced from any recognised aftermarket supplier of standard replacement parts.
- 11.10. Ducts may be added to increase airflow through radiator but must be fitted without protruding from the grill or any other part of the exterior of the car.

#### **Class C**

- 11.11. Oil cooling is free from restriction, but the quality of the oil cooler and oil cooler pipes is subject to approval by the TC. This will be checked at the annual Safety Check and randomly during the year.
- 11.12. Gaskets are free from restriction.
- 11.13. The breather system must discharge into a catch tank of 1 litre minimum capacity, and this must be empty at the start of practice and each heat.
- 11.14. Sumps may be baffled but remain wet sumps. Engine and gearbox sump plugs, and oil filters must be wire locked.
- 11.15. The position of the radiator may not be changed and remain as per standard OE with regards to vertical and horizontal positioning.
- 11.16. Alternators must be operative at all times

#### **12. CYLINDER BLOCKS**

- 12.1. Only VW mass-produced blocks available through commercial outlets are allowed. No aluminium blocks may be used in class B or class C.
- 12.2. Engine blocks which may have been damaged may be re-sleeved to return them to the original specifications.

#### **13. BODYWORK AND GENERAL**

- 13.1. No built-out panels are allowed, but fender lips may be rolled inwards to accommodate larger tyres.
- 13.2. Class A and B - Front valance/cradle may be cut to achieve better airflow and foglamps maybe removed in all classes.

- 13.3. Outside shell appearance for all cars must appear original as per Volkswagen SA.
- 13.4. Paint colours may be changed, and sticker patterns applied.
- 13.5. Body parts e.g., doors, boot, bonnets, bumpers must remain visually original externally but may have the insides lightened.
- 13.6. The front and rear spoiler is allowed to be of a type that is mass produced and must be similar in all regards to the standard OE SA spec spoiler for that specific vehicle
- 13.7. Splitters, aerofoils or aerodynamic devices designed to improve down force are not allowed. A VW Polo 6R rear spoiler is allowed. The part number is: 6R0 071 646. A bottom engine cover' (belly pan) from a Polo may be used. It may not have fins built into it.
- 13.8. Taping up or filling gaps in bonnets, doors etc. to aid aerodynamics are not allowed.
- 13.9. Headlights and taillights must remain and be operable. Brake lights and rear indicators must be fully functioning. Class A cars must run with their headlights on during qualifying and races for safety reasons. Class B and C cars must only run with their headlights when the race is declared a wet race or when instructed to by the CoC.
- 13.10. Racing seat and steering wheel are free of restriction but must be securely fitted and technically approved.
- 13.11. Steering column may be lowered and extended but must be technically approved.
- 13.12. Pedals must remain in original position with a maximum additional extension of 10mm towards the driver by fitting a plate or rubber covering on top of the pedals. No further method of extending this reach to the pedals is allowed.
- 13.13. Full roll cages in compliance with GCR 239 are compulsory. The roll cage may protrude through the firewall and be connected to the front shock turrets. Roll cages must have at least six mounting points with at least one diagonal brace and a driver's door bar. A hole must be drilled in the main hoop to enable the scrutineers to check the pipe wall thickness.
- 13.14. Heater boxes, interior trim and all passenger seats may be removed except for the dashboard, which shall remain standard apart from localised cutting for roll cages but may be an exact replica of the original and of any material.
- 13.15. Any form of instrument cluster may be used. Additional instruments may be fitted to measure engine performance.
- 13.16. Cut-off switches must be fully operational from inside and outside the car and shall be clearly marked.
- 13.17. Bonnet lock mechanism(s) must be operable from outside the vehicle and clearly marked, bonnet safety latch and window safety nets must be fitted.
- 13.18. With the exception of windscreens all other glass may be substituted with Lexan with minimum thickness of 3 mm. They must be fitted in to the body with standard rubbers or pop rivets which may not be visible.
- 13.19. The battery may be positioned anywhere in the car. If the battery is positioned in the engine bay, it needs to be fastened securely by means of brackets and the positive terminal must be protected by means of a non-conductive cover. If the battery is positioned within the cabin of the vehicle, it needs to be placed in a non-conductive battery box which is fastened to the body of the vehicle by means of 8mm bolts.
- 13.20. Transponders will be mounted on the roll cage between the rear side window and the roll cage behind the B-Pillar or on the rear side window itself.
- 13.21. Any form of electronic driver aid excluding data logging is strictly forbidden. This includes, but is not limited to, flat shifting using a switch to cut engine revs when the clutch is engaged.
- 13.22. Soft towing straps must be fitted to the front and rear of all cars. OMP soft tow straps or similar.
- 13.23. All vehicles are required to be presented for annual safety and general check to the TC prior to the vehicle participating in its first race of the season. A safety check sticker will be applied to the A pillar roll bar visible from outside for inspection, the sticker will display the year that it is valid for. It is the responsibility of the competitor to ensure that their vehicle has been checked and that a valid sticker is applied.
- 13.24. Seam welding of front fenders / repairing of wheel arches and fender trays will be allowed only due to damage caused by accidents. Seam welding of the floor pan is prohibited.

#### **14. FUEL**

- 14.1. Only standard 95 Octane petrol, freely available to the South African public, from dispensing pumps at commercial filling stations, at the designated filling station as specified in terms of rule 15.10, is allowed.
- 14.2. Octane booster, as approved by the Technical Committee, may be used at the coastal races only.
- 14.3. The VW Challenge Committee and/or Technical Committee and/or VW Challenge Technical Consultant have the authority to nominate participants to use a control fuel as and when supplied. The Participant will be responsible for the payment of the fuel provided.

#### **15. FUEL TESTING**

- 15.1. The following test method will apply to all events and classes as approved by MSA and the VW Challenge Committee. The test instrument will be the Digatron FT64 which must be clearly identified by a serial number or identifying mark and will be the only instrument of the day to be used. Only MSA approved TC's may perform fuel testing.

- 15.2. The only calibration on the instrument of the day will be the reading from the reference sample fuel kept by the TC.
- 15.3. A clearly marked reference sample will be kept by the TC or CoC.
- 15.4. The difference in reading between the reference sample that is applicable and the competitor's fuel sample may not be more than 5, this value may be changed by the TC of the event before qualifying. Fuel testing can be done at any time during the event.
- 15.5. The temperature difference may not be more than 2 degrees Fahrenheit. If the temperature is not within limits, the fuel tank of the competitor must be sealed, and the car impounded. The competitor's fuel temperature will be allowed to equalize to the reference sample and a new reading obtained no later than 30 minutes before publication of the final results.
- 15.6. The minimum amount of fuel in the tank at any time may not be less than 2 litres, the fuel may be decanted into a suitable container for the necessary testing to be done.
- 15.7. It is the responsibility of the competitor to be present at all times when readings of the fuel are done and to check with the TC that the fuel used by competitor is within the set parameters.
- 15.8. The CoC or the TC may at any time have competitors fuel replaced with controlled fuel. The participant will be responsible for the payment of the fuel provided.
- 15.9. A penalty of exclusion will apply for any infringement of the above and is not protestable. Repeat offenders will have their race club membership revoked.
- 15.10 A bulletin will be issued on the Wednesday of race week detailing the designated fuel point for each respective racetrack. Competitors will be required to purchase adequate fuel from the designated fuel pump as stipulated in the bulletin. It is advisable to request a receipt when purchasing fuel.

## **16. CLASS A 16V 2.0L**

### **16.1. PISTONS AND RINGS**

- 16.1.1. Only standard NA (Normally Aspirated) pistons Polo Cup JE Piston Part 301327 or the VW Motorsport Supplied alternative copy are allowed.
- 16.1.2. Oversize pistons are not allowed. 82.5mm standard.
- 16.1.3. Minimum piston weight with rings and gudgeon pin is 330 grams.
- 16.1.4. Pistons in 16.1.1 may only be modified by removing metal on the underside of the piston for balancing purposes.
- 16.1.5. Inlet pockets on pistons may be deepened by 1.2 mm

### **16.2. CONNECTING RODS**

- 16.2.1. Any aftermarket connecting rod may be used, as long as the rod has a minimum weight of 510 grams.

### **16.3. CRANKSHAFTS**

- 16.3.1. May be balanced and reground.
- 16.3.2. Lightening is allowed by drilling and grinding.
- 16.3.3. Knife edging of webs is not allowed.
- 16.3.4. Side edging thickness of Web must remain standard (casting marks must remain visible).
- 16.3.5. Minimum weight of Crankshaft + Timing Wheel + Oil Pump gear is 14.8 Kg
- 16.3.6. Cast steel crank and forged steel crank may be used.
- 16.3.7. Only 2000cc crankshaft (92.8 mm stroke).

### **16.4. FLYWHEEL AND CLUTCH**

- 16.4.1. The Clutch plate is free from any restriction apart from being a single plate clutch.
- 16.4.2. May be lightened and balanced.
- 16.4.3. Min weight: Flywheel & pressure plate, excluding pressure plate to flywheel bolts: 7.5Kg.

### **16.5. INDUCTION SYSTEMS**

- 16.5.1. Air filter elements are free of restriction.
- 16.5.2. Throttle bodies and inlet manifold will be supplied by the association and may not be reworked.
- 16.5.3. An air box as supplied by the association will be used.
- 16.5.4. The inlet port splitter must be removed.
- 16.5.5. Front air box aperture size 355mm x 125mm.

### **16.6. CYLINDER HEADS**

- 16.6.1. Valves may remain standard as per OE specification or an exact aftermarket replacement may be used. Valves may not be modified in any way.
- 16.6.2. Only standard OE or exact replacement functional hydraulic followers may be used.
- 16.6.3. Only FSI 16V hydraulic head may be used.

- 16.6.4. Cylinder head must remain standard but may be skimmed. Only one chamber can be repaired to match the volume of the 3 undamaged chambers. The aim being to salvage the cylinder head rather than replacing it.
- 16.6.5. Valve springs and retainers may remain standard as per OE or an alternative valve spring kit from either Supertech (Part number SPRK-A2416-N2) or LOBA (Part number 7010200) may be used. All valve seats must remain standard 45-degree seat angles. Only the valve seat material i.e. not the cylinder head material may be machined.
- 16.6.6. Rocker/finger bearing pins may be welded to prevent separation.

## 16.7 COMPRESSION RATIO

- 16.7.1 12.0:1 maximum.

## 16.8 CAMSHAFTS

- 16.8.1 The rotary position of the camshaft to the crankshaft at TDC will be checked using the VWC Technical Committee's calibrated tool where:
  - 16.8.1.1 Exhaust must be 5.27mm +/- 0.05mm
  - 16.8.1.2 Intake must be 5.77mm +/- 0.05mm
- 16.8.2 Cam hydraulic duration will be measured with a Checking height of 0.07 mm.
- 16.8.3 Camshafts as supplied by VW Motorsport for Polo Cup or exact copies produced by van der Linde Developments. No Tolerance. Please see Annexure 4.
- 16.8.4 The rotary position of the camshaft to the crankshaft may be changed by using an adjustable Vernier pulley in order to achieve 16.8.1. The same fixed cam timing will be used for all cars as determined by the technical committee.
- 16.8.5 Variable Valve Timing is not allowed.
- 16.8.6 A cylindrical spacer, with the following specifications Height 6mm (tolerance ±1mm), outside diameter 13mm (tolerance ±1mm), may be fitted, not obligatory, on the cam tensioner piston.

## 16.9 GEARBOXES AND DIFFS

- 16.9.1 Only genuine VW 6-speed manual shift gearboxes may be used, as available on local models.
- 16.9.2 No automatic gearshift gearboxes in any form allowed.
- 16.9.3 No limited slip differentials or differential preloading by shimming or machining.
- 16.9.4 Short shift gear linkage allowed.
- 16.9.5 Linkage bushings may be changed for a harder material.
- 16.9.6 Drive shaft lengths may be modified to prevent C.V. joint failure.
- 16.9.7 Synchro rings may be removed.
- 16.9.8 Only 6-speed Gearboxes with gear ratios with a tooth count of:

First Gear	3.7777	34 : 09
Second Gear	2.2666	34 : 15
Third Gear	1.6500	33 : 20
Fourth Gear	1.2692	33 : 26
Fifth Gear	1.0344	30 : 29
Sixth Gear	0.8648	32 : 37
Final Drive	3.9375	63 : 16

- 16.9.9 A 3<sup>rd</sup> and 4<sup>th</sup> gear replacement set is available from VW Motorsport and will be allowed. The 4<sup>th</sup> rear has a tooth count of 33/26 or 1.2692. VW Motorsport will also provide a 3<sup>rd</sup> gear replacement which will also be allowed. When the 3<sup>rd</sup> gear replacement is available the specifications of the 3<sup>rd</sup> gear VW Motorsport replacements will be published in a bulletin.
- 16.9.10 See Annexure 1 for modification to 3rd/4th selector pins.
- 16.9.11 A spacer is allowed beneath the pivot bolt of the clutch fork.
- 16.9.12 Selector forks may be welded for rigidity.
- 16.9.13 Selector shaft bottom support is free from restriction.

## 16.10 MANAGEMENT SYSTEMS

Only Dicktator management, modified for a rev limiter set at 7200rpm and certified as such by Dicktator, may be used.

### 16.11 IGNITION SYSTEMS

Must run Wasted Spark Coil Pack.

### 16.12 FUEL SYSTEMS

- 16.12.1 Any injector rail may be used.
- 16.12.2 Fuel pressure regulators are free of restriction.
- 16.12.3 More than one fuel pump is allowed.
- 16.12.4 Fuel pumps are free of restriction.
- 16.12.5 Exterior additional fuel surge tanks are allowed but must comply with the fuel regulations in the GCR's. The competitor must take full responsibility of the installation.
- 16.12.6 Fuel radiators/coolers or cooling of fuel in any way is not allowed.
- 16.12.7 Fuel injectors are free, but the original specification, part no. (Polo Cup) 06A 906 031 injectors are recommended.

### 16.13 EXHAUST SYSTEMS

16.13.1 Exhaust manifold lengths:



- 16.13.2 1) 650mm, 2) 680mm, 3) 690mm, 4) 720mm
- 16.13.3 I.D. of primary pipes: 41.5mm (+/- .03mm) single wall only, ie. No internal pipes or double wall tubes.
- 16.13.4 The collector must be 4 into 2 into 1 and dimensions must be as per annexure 5. Annexure 6 and Annexure 7 are for reference purposes.
- 16.13.5 Must comply with GCR 245 and exhaust must exit at the rear of the car in the original position and direction.
- 16.13.6 The exhaust outlet pipe may not be recessed towards the inside of the bodywork of the vehicle, i.e. recessed further than the bottom part of the bodywork or bumper/spoiler where the exhaust protrudes. The exhaust must also not protrude beyond the perimeter of the vehicle.
- 16.13.7 The exhaust may not be larger than 63mm OD from the collector to the silencer and must follow the original route of the standard OE exhaust system.
- 16.13.8 Only one silencer box may be used and must be behind the rear axle, from the silencer back the exhaust is free of restriction.
- 16.13.9 Exhaust system heat wraps and ceramic coating on the manifold is free.
- 16.13.10 Standard exhaust heat shields must be fitted where the exhaust passes the fuel tank.

### 16.14 SUSPENSION

- 16.14.1 Top shock turrets must remain in standard position except for modifications in terms of 16.14.16
- 16.14.2 Standard VW OE steering rack and standard mounting positions only, except for the Beetle (9C) which may be spaced up to 20mm, power steering may be disconnected. If power steering is used it must be a standard VW part.
- 16.14.3 Bush material is free however must be dimensionally identical to standard items.
- 16.14.4 Pick-up points on body / chassis may not be changed or moved.
- 16.14.5 Steering knuckles must be a standard VW OE part and match the specific model of that vehicle.
- 16.14.6 P2 and P3 may use a rose joint in replacement of the rear control arm bush but must be in the standard position.

- 16.14.7 Ball joints and their mountings may not be slotted. For camber purposes only, P2, P3, may be fitted with ball joint adaptor plates allowing a maximum additional extension per side of 25mm. P2 Polos are allowed to use P3 control arms. The maximum track width must still be adhered to.
- 16.14.8 Droop may be limited.
- 16.14.9 Hubs of 4 or 5 stud type specification are allowed in all classes.
- 16.14.10 Camber/Caster plates with a maximum caster offset of 40 mm are allowed and may be fitted on top or directly below the turret.
- 16.14.11 Standard knuckle must be used without any alteration. Ackerman angle or bump-steer may not be altered.
- 16.14.12 ~~No anti-roll bars may be fitted.~~ Anti-roll bars and material are free. The roll bar may be fitted remotely in its working principle. The control/s for adjusting the anti-roll bar/s may not be in reach of the driver whilst in his seat. The working of the anti-roll bar may not be adjusted at any time whilst the car is moving, whether automatically, manually, electronically via GPS or any other method. Any change to its setting/s may only occur whilst the car is stationary in the pits.
- 16.14.13 Rear axle may be stiffened by fitting fixed stiffeners.
- 16.14.14 Shock makes AST, Bilstein, Koni, Gabriel, Monroe, Sachs, Wietec, Armstrong, Spax, AVO, Sax, KW or Traxion coil over type shocks are allowed. Only single bump and single rebound adjustable shocks is allowed.
- 16.14.15 Short rear shock absorbers may be accommodated by adding brackets to top and/or bottom mounting positions.
- 16.14.16 To accommodate long front absorbers front strut tower may be lengthened but 40mm castor offset must still be adhered to.
- 16.14.17 External gas canisters are allowed.
- 16.14.18 Helper springs may be fitted.
- 16.14.19 Spacer/mounting plate may be fitted between stub axle and rear axle assembly to allow for the calliper to be shimmed with stub axle.

## **16.15 BRAKES**

- 16.15.1 Boosters may be removed, but standard VW master cylinder must be retained.
- 16.15.2 Discs may be slotted and/or cross-drilled.
- 16.15.3 Rear brakes can be drums or discs.
- 16.15.4 Friction material is free.
- 16.15.5 Brake balance adjustment is allowed in car within reach of driver.
- 16.15.6 Any standard VW single piston floating calliper, aftermarket brake pads and discs up to a maximum of 288mm diameter allowed.

## **16.16 WHEELS AND TYRES**

- 16.16.1 No chrome plated or split rims are allowed. Rim size 15 inch, 7J max. A-line rims as per Annexure 8 are forbidden to be used in competition.
- 16.16.2 Tyres are 195/55/15 DUNLOP DIREZZA 036.
- 16.16.3 Tyres will only be marked by the TC when identified as new and unused. A previously marked tyre will be allowed at the next race and marked once identified.
- 16.16.4 Tyres may not be skimmed. If the TC suspects any tampering, he may insist on the tyres being changed for other suitable used tyres that the TC approves.
- 16.16.5 For the first race meeting of the competitor's season, the competitor must start with 4 new tyres for the qualifying session. Should the competitor fail to qualify, the competitor will start the race with these 4 new tyres.
- 16.16.6 The VW Challenge Committee has the authority to appoint an official tyre marker at a race meeting.
- 16.16.7 At any given race meeting, four tyres will be positively identified by the technical committee or scrutineer prior to the start of qualifying and these tyres must be used for the remainder of the race meeting.
- 16.16.8 It is the responsibility of the competitor to ensure their tyres are marked.
- 16.16.9 It is the responsibility of the competitor to ensure that the tyre markings remain on the tyre, as the use of unmarked tyres during the meeting, inclusive of qualifying, can result in the exclusion of the competitor concerned.
- 16.16.10 The only time four new i.e., unmarked tyres may be used is at a competitor's first race of a new race season.
- 16.16.11 At the discretion of the technical consultant/scriutineer a damaged or defective tyre may be replaced during a race meeting with a tyre of similar wear.
- 16.16.12 In the event of a competitor replacing/building a new car they must transfer their current tyres to their new car.
- 16.16.13 Pressure controlling "pop-off" valves or nitrogen may not be used.



- 16.16.14 Two new tyres must be used at every race meeting. The new tyres will be marked by the TC and must remain on the front axles of the car for the duration of the race weekend. Tyres may be moved on same axle i.e. left to right only. The committee will also exercise the option that additional tyres can be credited if the previous or following race is at an abrasive track.
- 16.16.15 Should another competitor use a car previously raced in the season, that car has to comply with the tyre allocation in terms of 16.16.10 and 16.16.14 for the competitor that raced the car ~~the car~~ previously. That implies that the new competitor will only be allowed two new tyres in terms of 16.16.14 and not four in terms of 16.16.10.

## **16.17 SPECIFICATION SHEET**

All specifications are subject to 0.5 % tolerance except where no tolerance is allowed. (P2 refers to 9N Polo and Vivo, P3 refers to new 6R Polo).

- 16.17.3 Ground Clearance: 120 mm minimum, Note: The measurements above are taken with the driver in the car from the centre of the bolt on the front inner lower control arm (standard mounting point) to the ground.

### **16.17.4 Front and rear Track Width:**

- This measurement will be taken at the bottom of the wheel (closest to the ground) from the widest part of the outer edge of the rim where it meets the tyre. See Annexure 3
- The widest part of the opposing two-wheel rims, no tolerance, 1740 mm for all models
- The wheelbase of a car may not be increased from the standard wheelbase. Wheelbase is measured from back of rear rim to back of front rim. The wheelbase on the various models shall not exceed:
  - Polo P2 (9N) wheelbase 2460mm (plus 5mm) maximum
  - Polo P3 (6R) wheelbase 2470mm (plus 5mm) maximum
- Front control arms may not be pushed or spaced forward in any way.
- Vehicles with a sub frame may not modify the sub frame or it's mountings in any way from standard and standard diameter mounting bolts must be used.
- Rear axle mounting points may not be slotted or modified to allow wheelbase to be lengthened or shortened.

## **16.18 CAR MASS (Including driver)**

- 16.18.3 The vehicle mass is as car is raced. At no time of the event may a car weigh less than stipulated. No tolerance.

**16.18.4** All cars must be weighed after qualifying and after both race heats.

- 16.18.5 Where the scales being used to weigh race cars at a circuit have been assessed as required by the regulations, they shall be deemed correct at the discretion of the Technical Committee (or its nominated representative/s).

- 16.18.6 Location of ballast is free of restriction within the cabin area or boot of the vehicle.

- 16.18.7 Vehicles may not be lightened by the removal of exterior bodywork.

- 16.18.8 The ballast weights will be bolted securely.

- 16.18.9 Minimum weight: 1090kg.

## **CLASS B 8V 2.0L**

### **17.1 PISTONS AND RINGS**

- 17.1.1 Only single squish pad pistons may be used.
- 17.1.2 0.5mm maximum oversize pistons are allowed. 82.5mm is standard.
- 17.1.3 Minimum piston weight with rings and gudgeon pin is 370grams.
- 17.1.4 The pistons may be lightened by removing metal from the underside of the piston.

### **17.2 CONNECTING RODS**

- 17.2.1 Only Standard OE VW connecting rods are to be used. Connecting rods may not be modified other than specified below:
- 17.2.2 Short Block: connecting rods may be lightened and balanced. Minimum weight 550 grams includes bolts and nuts, excludes bearing shells.
- 17.2.3 Long Block: connecting rods may be lightened and balanced. Minimum weight 580 grams includes bolts and nuts, excludes bearing shells.

### **17.3 CRANKSHAFTS**

- 17.3.1 May be balanced and reground.
- 17.3.2 Lightening is allowed by drilling and grinding.
- 17.3.3 Knife edging of webs is not allowed.
- 17.3.4 Side edging thickness of Web must remain standard (casting marks must remain visible).

- 17.3.5 Min weight: 13.5 kg no tolerance.
- 17.3.6 Only 2000cc crankshaft (92.8 mm stroke).

#### **17.4 FLYWHEEL AND CLUTCH**

- 17.4.1 Clutch plates are free of restriction apart from being a single plate.
- 17.4.2 May be lightened and balanced.
- 17.4.3 Min weight: Flywheel & pressure plate, excluding pressure plate to flywheel bolts: 7.2 Kg.

#### **17.5 INDUCTION SYSTEMS**

- 17.5.1 Additional air pipes may be used to supply the engine air intake with cool air.
- 17.5.2 Air Filter elements are free of restriction.
- 17.5.3 Throttle bodies may be modified to take alternate throttle position sensors.
- 17.5.4 MP9 or 2E manifold and throttle body.
- 17.5.5 Inlet manifold may not be gas flowed other than matching the ports to the cylinder head up to 80mm. (NB: the inlet manifold only, not the cylinder head).
- 17.5.6 Throttle body must remain standard with the exception of a hole of up to 8mm to aid idling and may be modified to take separate throttle position sensors.
- 17.5.7 Standard Polo or Citi Life air filter housing must be used (upper and lower cones in the box may be removed). The inlet hole in the air box may be closed and moved to a different position but has to remain the same internal diameter of 77mm.
- 17.5.8 The standard connecting pipe between the throttle body and air filter housing may be replaced with a non-standard airtight pipe with a maximum internal diameter of 63mm at any point and not exceeding 350mm in length, such as in the picture below:



#### **17.6 CYLINDER HEADS**

- 17.6.1 Valves must remain standard except valve stems may be shortened or lengthened.
- 17.6.2 Only standard OE or exact replacement functional hydraulic followers may be used.
- 17.6.3 Minimum valve stem diameter is 7mm.
- 17.6.4 Only standard Gemtec or 2E, AGG or ADY 8v hydraulic head – max 40 mm intake and 34 mm exhaust valves allowed. Zero tolerance.
- 17.6.5 No gas flowing allowed but only one chamber can be repaired, Cylinder head may be skimmed.
- 17.6.6 Standard Gemtec, 2E, AGG or ADY OE valves and valve springs and retainers only. Three angle seats are allowed.

#### **17.7 COMPRESSION RATIO**

- 17.7.1 10.8:1 Maximum. No tolerance.



## 17.8 CAMSHAFTS

- 17.8.1 The rotary position of the camshaft to the crankshaft may be changed by using an adjustable Vernier pulley.
- 17.8.2 Cam hydraulic duration will be measured with a Checking height of 0.07 mm.
- 17.8.3 Only 288-degree duration (crank angle). Tolerance  $\pm 1.0$  degree.
- 17.8.4 Max 11.7mm cam lift.
- 17.8.5 Lobe Separation 108 to 110 degrees. Tolerance  $\pm 1.0$  degree.

## 17.9 GEARBOXES AND DIFFS

- 17.9.1 Only genuine VW 5-speed manual shift gearboxes may be used, as available on local models.
- 17.9.2 No automatic gearshift gearboxes in any form allowed.
- 17.9.3 No limited slip differentials or differential preloading by shimming or machining.
- 17.9.4 Short shift gear linkage allowed.
- 17.9.5 Parts must be VW OE or identical replacement parts.
- 17.9.6 Linkage bushings may be changed for a harder material.
- 17.9.7 Drive shaft lengths may be modified to prevent C.V. joint failure.
- 17.9.8 The inspection plate "green plate" on the side of the gearbox must be wire locked.
- 17.9.9 Synchro rings may be removed.
- 17.9.10 Only 3.94 diff ratio allowed.
- 17.9.11 Only the following gear ratios are allowed:

First Gear	3.455
Second Gear	1.944 or 2.120
Third Gear	1.444
Fourth Gear	1.129
Fifth Gear	0.894 or 0.912

## 17.10 MANAGEMENT SYSTEMS

Only SA manufactured systems that are freely commercially available:

- Dicktator
- Perfect Power XMS
- Mr. Turbo EFI 1
- Splitronics **Pluto 2/ Saturn Venus 3**
- Gotech MFI X
- PowerMods **MFI V1**

Should a competitor want to use a locally produced management system not listed, they need to apply to the technical committee.

## 17.11 IGNITION SYSTEMS

- 17.11.1 Individual coils per cylinder (coil on plug) are not allowed.
- 17.11.2 May run Wasted Spark Coil Pack.

## 17.12 FUEL SYSTEM

- 17.12.1 Plastic injector rails may be used.
- 17.12.2 Fuel pressure regulators are free of restriction.
- 17.12.3 More than one fuel pump is allowed.
- 17.12.4 Fuel pumps are free of restriction.
- 17.12.5 Exterior additional fuel surge tanks are allowed but must be comply with the fuel regulations in the GCR's. The competitor must take full responsibility of the installation.
- 17.12.6 Fuel radiators/coolers or cooling of fuel in any way is not allowed.
- 17.12.7 Only original spec injectors may be used, part no: 037906031AA or Digifant injector rails, part no: 037133313J may be used.

## 17.13 EXHAUST SYSTEMS

- 17.13.1 Exhaust systems material and construction is free of restriction. No ceramic coating (both inside and outside of exhaust) or wrapping any part of the system will be allowed.
- 17.13.2 Must comply with GCR 245 and must exit at the rear of the car in the original position and direction.

- 17.13.3 The exhaust outlet pipe may not be recessed towards the inside of the bodywork of the vehicle, i.e., recessed further than the bottom part of the bodywork or bumper/spoiler where the exhaust protrudes. The exhaust must also not protrude beyond the perimeter of the vehicle.
- 17.13.4 The exhaust may not be larger than 63mm OD from the collector to the silencer and the exhaust must follow the original route of the standard OE exhaust system.
- 17.13.5 Only one silencer box may be used and must be behind the rear axle, from the silencer back the exhaust is free of restriction.
- 17.13.6 Standard exhaust heat shields must be fitted where the exhaust passes the fuel tank.

## **17.14 SUSPENSION**

- 17.14.1 Top shock turrets must remain in standard position except for modifications in terms of 17.14.15
- 17.14.2 Standard VW OE steering rack and standard mounting positions only, power steering may be disconnected. If power steering is used it must be a standard VW part.
- 17.14.3 Bush material is free however must be dimensionally identical to standard items.
- 17.14.4 Original mounting pick-up points on body / chassis may not be changed or moved.
- 17.14.5 Steering knuckles must be a standard VW OE part and match the specific model of that vehicle.
- 17.14.6 P2 and P3 may use a rose joint in replacement of the rear control arm bush but must be in the standard position.
- 17.14.7 Shocks / uprights may be slotted to achieve camber settings only.
- 17.14.8 Ball joints and their mountings may not be slotted. For camber purposes only P2, P3 may be fitted with ball joint adaptor plates allowing a maximum additional extension per side of 25mm. These adaptor plates may not be used to alter the lower control arm angle in any way. P2 Polos are allowed to use P3 control arms. The maximum track width must still be adhered to.
- 17.14.9 Droop may be limited.
- 17.14.10 Hubs of 4 or 5 stud type specification are allowed.
- 17.14.11 Camber/Caster plates with a maximum caster offset of 40 mm are allowed and may be fitted on top or directly below the turret.
- 17.14.12 Ackerman angle may not be altered.
- 17.14.14 No anti-roll bars may be fitted. The rear axle may not be stiffened in any way. -Shock makes Bilstein, Koni, Monroe, AVO or Sax coil over type shocks are allowed.
- 17.14.15 Short rear shock absorbers may be accommodated by adding brackets to top and / or bottom mounting positions.
- 17.14.16 To accommodate long front absorbers front strut tower may be lengthened but 40mm castor offset must still be adhered to.
- 17.14.17 External gas canisters not allowed.
- 17.14.18 Spacer/mounting plate may be fitted between stub axle and rear axle assembly to allow for callipers to be shimmed with stub axle.
- 17.14.19 The position of the rear spring must remain in the factory position.
- 17.14.20 Helper springs may be fitted.

## **17.15 BRAKES**

- 17.15.14 Boosters may be removed, but standard VW master cylinder must be retained.
- 17.15.15 Discs may be slotted and/or cross-drilled.
- 17.15.16 Rear brakes are discs.
- 17.15.17 Front brake pads are to be only ATE racing pads compound 106. Rear brake pad material is free.
- 17.15.18 Brake balance adjustment is allowed in car within reach of driver.
- 17.15.19 Standard VW single piston floating calliper with ATE brake pads and discs up to a maximum of 288mm diameter.

## **17.16 WHEELS AND TYRES**

- 17.16.1 No chrome plated or split rims are allowed. Rim size 15 inch, 7J max. A-line rims as per Annexure8 may not be used.
- 17.16.2 Tyres are 195/55/15 DUNLOP DIREZZA 036.
- 17.16.3 Tyres will only be marked by the TC when identified as new and unused. A previously marked tyre will be allowed at the next race once identified.
- 17.16.4 Tyres may not be skimmed. If the TC suspects any tampering, he may insist on the tyres being changed for other suitable used tyres that the TC approves.

- 17.16.5 For the first race meeting of the competitor's season, the competitor must start with 4 new tyres for the qualifying session. Should the competitor fail to qualify, the competitor will start the race with these 4 new tyres.
- 17.16.6 The VW Challenge Committee has the authority to appoint an official tyre marker at a race meeting.
- 17.16.7 At any given race meeting, four tyres will be positively identified by the technical committee or scrutineer prior to the start of qualifying and these tyres must be used for the remainder of the race meeting.
- 17.16.8 It is the responsibility of the competitor to ensure their tyres are marked by the official tyre marker before official timed practice.
- 17.16.9 It is the responsibility of the competitor to ensure that the tyre markings remain on the tyre, as the use of unmarked tyres during the meeting, inclusive of qualifying, can result in the exclusion of the competitor concerned.
- 17.16.10 The only time four new i.e., unmarked tyres may be used is at a competitor's first race of a new race season.
- 17.16.11 At the discretion of the technical consultant/scriutineer a damaged or defective tyre may be replaced during a race meeting with a tyre of similar wear.
- 17.16.12 In the event of a competitor replacing/building a new car they must transfer their current tyres to their new car.
- 17.16.13 Pressure controlling "pop-off" valves or nitrogen may not be used.
- 17.16.14 Two new tyres must be used every race meeting. The new tyres will be marked by the TC and must remain on the front axles of the car for the duration of the race weekend Tyres may be moved on same axle i.e. left to right only. The committee will also exercise the option that additional tyres can be credited if the previous or following race is at an abrasive track.
- 17.16.15 Should another competitor use a car previously raced in the season, that car has to comply with the tyre allocation in terms of 16.16.10 and 16.16.14 for the competitor that raced the car the car previously. That implies that the new competitor will only be allowed two new tyres in terms of 16.16.14 and not four in terms of 16.16.10

## 17.17 SPECIFICATION SHEET

All specifications are subject to 0.5 % tolerance except where no tolerance is allowed. P2 refers to 9N Polo and Vivo, P3 refers to new 6R Polo)

- 17.17.3 Ground Clearance:
  - 125 mm minimum
  - Note: The measurements above are taken with the driver in the car from the centre of the bolt on the front inner lower control arm (standard mounting point) to the ground.
- 17.17.4 Front and rear Track Width:
  - This measurement will be taken at the bottom of the wheel (closest to the ground) from the widest part of the outer edge of the rim where it meets the tyre. See annexure 3.
  - The widest part of the two opposing wheel rims, no tolerance:
    - P2 & P3: 1740mm
  - The wheelbase of a car may not be increased from the standard wheelbase. Wheelbase is measured from back of rear rim to back of front rim. The wheelbase on the various models shall not exceed:
    - Polo P2 (9N) wheelbase 2460mm (plus 5mm) maximum
    - Polo P3 (6R) wheelbase 2470mm (plus 5mm) maximum
  - Front control arms may not be pushed or spaced forward in any way.
  - Vehicles with a sub frame may not modify the sub frame or it's mountings in any way from standard and standard diameter mounting bolts must be used.
  - Rear axle mounting points may not be slotted or modified to allow wheelbase to be lengthened or shortened.

## 17.18 CAR MASS (Including driver)

- 17.18.3 The vehicle mass is as car is raced. At no time of the event may a car weigh less than stipulated. No tolerance.
- 17.18.4 All cars must be weighed after qualifying and after both race heats.
- 17.18.5 Cars need to proceed to Parc Fermé directly after being weighed unless otherwise stated by the Clerk of the Course. The technical committee can at any time adjust the weights to keep competition fair.
- 17.18.6 Where the scales being used to weigh race cars at a circuit have been assessed as required by the regulations, they shall be deemed correct at the discretion of the Technical Committee (or its nominated representative/s).

- 17.18.7 Location of ballast is free of restriction within the cabin area or boot of the vehicle.
- 17.18.8 Vehicles may not be lightened by the removal of exterior bodywork.
- 17.18.9 The ballast weights will be bolted securely.
- 17.18.10 Minimum weight: 1050 kg.

## **18 CLASS C - 1600 16v CLSA engines.**

### **General**

Point scoring in class C is limited to competitors that have not won a national championship. Any National Champion may not compete in Class C.

### **18.1 PISTONS AND RINGS**

- 18.1.1 Only standard commercially available and unmodified 76.5mm pistons and rings are to be used.

### **18.2 CONNECTING RODS**

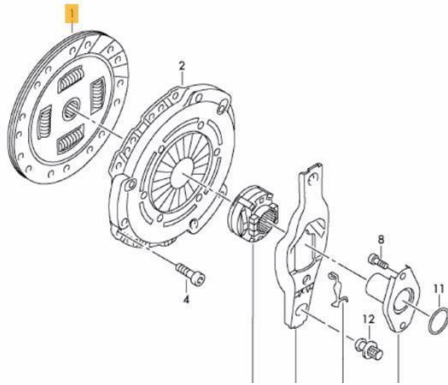
- 18.2.1 Only standard commercially available and unmodified connecting rods are to be used. See Annexure 2 – 318.

### **18.3 CRANKSHAFTS**

- 18.3.1 Only standard commercially available and unmodified crankshafts may be used. See Annexure 2 – 319.

### **18.4 FLYWHEEL AND CLUTCH**

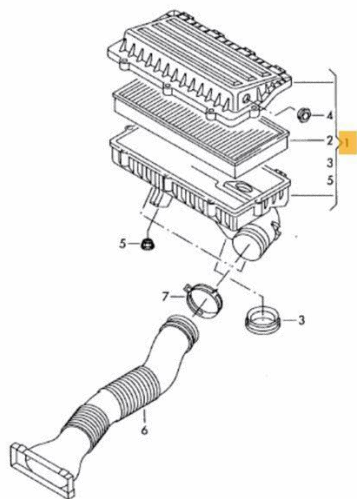
- 18.4.1 Only standard or equivalent replacement aftermarket clutch and flywheel components are to be used. See Annexure 2



- 18.4.2 Assemblies must remain standard and unmodified.
- 18.4.3 Min weight: Flywheel & pressure plate, excluding pressure plate to flywheel bolts: 8.5 Kg.

### **18.5 INDUCTION SYSTEMS**

- 18.5.1 Only standard commercially available and unmodified air intake system is to be used from cowl duct to cylinder head.
- 18.5.2 Air filter elements must be fitted at all times and be standard or equivalent aftermarket of paper construction and may not be modified in any way.



## 18.6 CYLINDER HEADS

- 18.6.1 Cylinder heads must remain standard and unmodified See Annexure 2 – 321.: Intake valve: 29.5mm face, 100.6mm +/- 1.5mm, length 5.95mm +/- 0.2mm Stem Exhaust valve: 25.95mm face 100.6mm +/-1.5mm, length 5.95mm +/- 0.2mm Stem

## 18.7 COMPRESSION RATIO

- 18.7.1 Compression ratio may not be modified standard 10.5:1 No tolerance.

## 18.8 CAMSHAFTS

- 18.8.1 Camshafts must remain standard and unmodified see annexure 2 – 325.  
 18.8.2 Camshaft timing must remain standard and unmodified to OE specification.  
 18.8.3 A cam chain tensioner non return stop may be fitted

## 18.9 GEARBOXES AND DIFFS

- 18.9.1 Only standard and unmodified VW 1600 CLSA 5-speed manual shift gear boxes with a tooth count of:

First Gear	3.4545	11 : 38
Second Gear	1.9545	22 : 43
Third Gear	1.2813	32 : 41
Fourth Gear	0.8810	42 : 37
Fifth Gear	0.6731	52 : 35
Final Drive	4.5333	15 : 68

- 18.9.2 The rubber in the standard gearbox mountings (Upper and lower) may be exchanged for polyurethane. The mounting may not be modified in any other way.  
 18.9.3 Only standard and unmodified differentials are allowed.  
 18.9.4 Only standard and unmodified cable shift gear linkages are to be used.  
 18.9.5 Only standard and unmodified driveshafts are to be used.

## 18.10 MANAGEMENT SYSTEMS

- 18.10.1 Only Dicktator 60-2 management systems and wiring harnesses supplied by Dicktator for VW Challenge are to be used or PowerMods PMODS-V1 or PMODS-V2 management systems may be used. Only the wiring harnesses supplied by Dicktator or PowerMods respectively for VW Challenge are to be used

## 18.11 IGNITION SYSTEMS

- 18.11.1 Only standard and unmodified coil on plug coils are to be used or equivalent aftermarket.  
 18.11.2 Only standard specification sparkplugs are to be used:
- NGK ZFR6T-11G
  - Champion KC8ZMCC

- Bosch FR7HC+

## 18.12 FUEL SYSTEM

- 18.12.1 The fuel system must remain as standard for the chassis except for the addition of a fuel surge tank and high-pressure pump between the factory fuel pump and fuel filter. The fuel surge tank and additional fuel pump must comply with the fuel regulations in the GCR's. The competitor must take full responsibility of the installation.
- 18.12.2 Only standard 4 bar fuel pressure regulators (in filter) are to be used. Fuel pressure may not exceed 4 bar.
- 18.12.3 Fuel pumps are free of restriction.
- 18.12.4 Fuel radiators/coolers or cooling of fuel in any way is not allowed.
- 18.12.5 Fuel pressure will be checked by the TC via the check valve on the fuel rail.

## 18.13 EXHAUST SYSTEMS

- 18.13.1 Must comply with GCR 245 and must exit at the rear of the car in the original position and direction.
- 18.13.2 The exhaust outlet pipe may not be recessed towards the inside of the bodywork of the vehicle, i.e., recessed further than the bottom part of the bodywork or bumper/spoiler where the exhaust protrudes. The exhaust must also not protrude beyond the perimeter of the vehicle.
- 18.13.3 The exhaust must follow the original route of the standard OE exhaust system.
- 18.13.4 Only association approved exhaust branch manifolds are to be used.
- 18.13.5 Heat shields fabricated from aluminium are allowed on the exhaust manifold and must follow the route of the exhaust manifold and attach to the exhaust branch only.
- 18.13.6 The exhaust manifold may not be coated or wrapped from flange to the knuckle.
- 18.13.7 The rest of the exhaust may only be a single pipe that must exit at the rear of the car in the original position and may not be larger at any point than 57mm OD, except for the silencer.
- 18.13.8 The silencer must be placed behind the rear axle and must also have an inlet and outlet OD of maximum 57mm and may have no internal megaphone shaped parts.
- 18.13.9 The tailpipe after the maximum 57mm outlet of the silencer is free.
- 18.13.10 The standard under car exhaust heat shielding must be fitted from the firewall to the rear bumper (3 pieces).
- 18.13.11 No rigid heat shielding, or reflective plates maybe attached to the exhaust system other than those specified in **18.13.5**.

## 18.14 SUSPENSION

- 18.14.1 Top shock turrets must remain in standard position except for modifications in terms of 18.14.20.
  - 18.14.2 Standard and unmodified steering rack with standard and unmodified mounting positions only.
  - 18.14.3 Power steering may not be disconnected at any time.
  - 18.14.4 Rubber control arm and rear axle bush material may be substituted for polyurethane without and other modification.
  - 18.14.5 Original mounting pick-up points on body/chassis may not be changed or moved.
  - 18.14.6 Steering knuckles must be a standard and unmodified VW OE part and match the specific model of that vehicle.
  - 18.14.7 P2 and P3 may use a rose joint in replacement of the rear control arm bush but must be in the standard position.
  - 18.14.8 Shocks/uprights may be slotted to achieve camber settings only.
  - 18.14.9 Ball joints and their mountings may not be slotted. P2 Polos are allowed to use P3 control arms. The maximum track width must still be adhered to.
  - 18.14.10 Top and bottom stress bars are allowed.
  - 18.14.11 Front and rear suspension droop may be limited.
  - 18.14.12 Hubs may be 4 or 5 holes but must use M12 or M14 studs and nuts. No bolts.
  - 18.14.13 Ackerman angle may not be altered.
  - 18.14.14 No anti-roll bars allowed. The rear axle may not be stiffened in any way.
  - 18.14.15 Rear axle must remain standard and unmodified. P2 may use P3 rear axles and vice versa.
  - 18.14.16 Camber/Caster plates with a maximum caster offset of 40 mm are allowed and may be fitted on top or directly below the turret.
  - 18.14.17 Rear springs must remain in their factory intended positions. May be height adjustable.
  - 18.14.18 Shock absorbers allowed:
    - Non-gas assisted, externally adjustable, 1 way rebound only Koni shocks.
    - Locally assembled, gas assisted Bilstein shocks.
    - Locally assembled, non-adjustable, gas assisted Sax shocks.
- Any Class C Competitor's Shock absorber information / specifications will be available to all Class C competitors.

- 18.14.19 Short rear shock absorbers may be accommodated by adding brackets to top and / or bottom mounting positions.
- 18.14.20 To accommodate long front absorbers front strut tower may be lengthened but 40mm castor offset must still be adhered to.
- 18.14.21 External gas canisters not allowed.
- 18.14.22 Helper springs maybe fitted.
- 18.14.23 Spacer/mounting plate may be fitted between stub axle and rear axle assembly to allow for calliper to be shimmed with stub axle.

#### **18.15 BRAKES**

- 18.15.1 Boosters may be removed, but standard and unmodified VW master cylinder must be retained.
- 18.15.2 Discs may be slotted and/or cross-drilled.
- 18.15.3 Rear brakes can be drums or discs.
- 18.15.4 Front brake pads are to be only ATE racing pads compound 106. Rear brake pad/shoe material is free.
- 18.15.5 Brake balance adjustment is allowed in car within reach of driver.
- 18.15.6 Standard VW single piston floating callipers with aftermarket brake pads and discs up to a maximum of 288mm diameter.
- 18.15.7 Standard OE adjustable brake compensating load valve is allowed.

#### **18.16 WHEELS AND TYRES**

- 18.16.1 No chrome plated or split rims are allowed. Rim size 15 inch, 7J max. A-line rims as per Annexure 8 may not be used.
- 18.16.2 Tyres are 195/55/15 DUNLOP DIREZZA 036.
- 18.16.3 Tyres will only be marked by the TC when identified as new and unused. A previously marked tyre will be allowed at the next race once identified.
- 18.16.4 Tyres may not be skimmed. If the TC suspects any tampering, he may insist on the tyres being changed for other suitable used tyres that the TC approves.
- 18.16.5 For the first race meeting of the competitor's season, the competitor must start with 4 new tyres for the qualifying session. Should the competitor fail to qualify, the competitor will start the race with these 4 new tyres.
- 18.16.6 The VW Challenge Committee has the authority to appoint an official tyre marker at a race meeting.
- 18.16.7 At any given race meeting, four tyres will be positively identified by the technical committee or scrutineer prior to the start of qualifying and these tyres must be used for the remainder of the race meeting.
- 18.16.8 It is the responsibility of the competitor to ensure their tyres are marked by the official tyre marker before official timed practice.
- 18.16.9 It is the responsibility of the competitor to ensure that the tyre markings remain on the tyre, as the use of unmarked tyres during the meeting, inclusive of qualifying, can result in the exclusion of the competitor concerned.
- 18.16.10 The only time four new i.e., unmarked tyres may be used is at a competitor's first race of a new race season.
- 18.16.11 At the discretion of the technical consultant/scriutineer a damaged or defective tyre may be replaced during a race meeting with a tyre of similar wear.
- 18.16.12 In the event of a competitor replacing/building a new car they must transfer their current tyres to their new car.
- 18.16.13 Pressure controlling "pop-off" valves or nitrogen may not be used.
- 18.16.14 Two new tyres must be used at the 4<sup>th</sup> and 7<sup>th</sup> race meetings.. The new tyres will be marked by the TC and must remain on the front axles of the car for the duration of the race weekend. Tyres may be moved on same axle i.e. left to right only. Tyres may not be banked.
- 18.16.15 The committee will also exercise the option that additional tyres can be credited if the previous or following race is at an abrasive track.
- 18.16.16 Should another competitor use a car previously raced in the season, that car has to comply with the tyre allocation in terms of 16.16.10 and 16.16.14 for the competitor that raced the car the car previously. That implies that the new competitor will only be allowed two new tyres in terms of 16.16.14 and not four in terms of 16.16.10

#### **18.17 SPECIFICATION SHEET**

Chassis specifications and general measurements are available from the Technical Committee. All specifications are subject to 0.5 % tolerance except where no tolerance is allowed.

- P2 refers to 9N Polo and Vivo



- P3 refers to new 6R and 6C Polo
- 18.17.3 Ground Clearance: 125mm minimum.  
This measurement will be taken with the driver in the car from the centre of the bolt on the front inner lower control arm (standard and unmodified mounting point) to the ground.
- 18.17.4 Front and rear Track Width: 1730mm maximum  
This measurement will be taken at the bottom of the wheel (closest to the ground) from the widest part of the outer edge of the rim where it meets the tyre. See annexure 3.
- 18.17.5 Wheelbase  
The wheelbase of a car may not be increased from the standard wheelbase. Wheelbase is measured from back of rear rim to back of front rim.  
The maximum wheelbase will not be more than:
  - Polo P2 (9N) wheelbase 2460mm (plus 5mm) maximum
  - Polo P3 (6R) wheelbase 2470mm (plus 5mm) maximum
- 18.17.6 Front control arms may not be pushed or spaced forward in any way.
- 18.17.7 Vehicles with a sub frame may not modify the sub frame or it's mountings in any way from standard and standard diameter mounting bolts must be used.
- 18.17.8 Rear axle mounting points must remain standard and unmodified and may not be slotted or modified to allow wheelbase to be lengthened or shortened.

#### **18.18 CAR MASS (Including driver)**

- 18.18.1 The vehicle mass is as car is raced. At no time of the event may a car weigh less than stipulated. No tolerance.
- 18.18.2 All cars must be weighed after qualifying and after both race heats.
- 18.18.3 Where the scales being used to weigh race cars at a circuit have been assessed as required by the regulations, they shall be deemed correct at the discretion of the Technical Committee (or its nominated representative/s).
- 18.18.4 Should it be necessary to add ballast to attain the required minimum mass, weight(s) added is/are to be bolted securely inside the cabin of the vehicle. (Ballast installation must comply with MSA GSR's and the competitor takes responsibility for the installation thereof).
- 18.18.5 Vehicles may not be lightened by the removal of exterior bodywork.
- 18.18.6 Minimum weight: 1020kg.



## ANNEXURE 1

[illegible]

## ANNEXURE 2

### 318. CONNECTING ROD

a) Material	<u>Steel</u>	b) Big end type	<u>Split</u>
c) Interior diameter of the big end (without shell bearings)		<u>50.6</u>	+0.1 - 0 mm
d) Length between axes	<u>138.0</u>	± 0.1 mm	
e) Minimum weight	<u>0.400</u>	g	<u>With cap, bolts and shell bearings</u>

C5-1) Connecting rod from ¾ on big end side



C5-2) Connecting rod from ¾ rear on small end side



### 319. CRANKSHAFT

a) Type of manufacture	<u>One piece</u>	b) Material	<u>Steel</u>
c) Manufacturing process	Cast <input type="checkbox"/>	Forged <input checked="" type="checkbox"/>	
d) Number of bearings	<u>5</u>	e) Type of bearings	<u>Plain sliding</u>
f) Diameter of bearings	<u>50.0</u>	+0 - 0.1 mm	
g) Bearing caps material	<u>Cast iron</u>	h) Min. weight of bare crankshaft	<u>11842</u> g

C6-1) Crankshaft from ¾ front



C6-2) Crankshaft from ¾ rear



CLASS C FLYWHEEL, CLUTCH AND PRESSURE PLATE



321. CULASSE / CYLINDERHEAD

a) Number

1

b) Material

Aluminium alloy

e) Angle between intake valve and cylinder head gasket plane

22.5

deg $\pm$ 30°

f) Angle between exhaust valve and cylinder head gasket plane

21.0

deg $\pm$ 30°

C8-1) Bare cylinderhead seen from top (camshaft side)



C8-2) Bare cylinderhead seen from underneath (chamber side)



C8-3) Bare cylinderhead seen from intake side



C8-4) Bare cylinderhead seen from exhaust side



C8-5) Bare cylinderhead seen from timing side



C8-6) Bare cylinderhead seen from flywheel side



C8-7) Combustion chamber



325. CAMSHAFT

- |                                   |                                 |                                 |             |
|-----------------------------------|---------------------------------|---------------------------------|-------------|
| a) Number                         | <u>2</u>                        | b) Location                     | <u>DOHC</u> |
| c) Drive system                   | <u>Chain</u>                    | d) Number of bearings per shaft | <u>3</u>    |
| f) Type of valve operation system | <u>Mechanical roller rocker</u> |                                 |             |

ANNEXURE 3





## ANNEXURE 4

VAN DER LINDE DEVELOPMENTS CC  
C/O Precision & Industrial  
Kya Sand  
Randburg  
Tel: (011) 704-1063

CAM PRO PLUS Cam Card Report

10:20:21

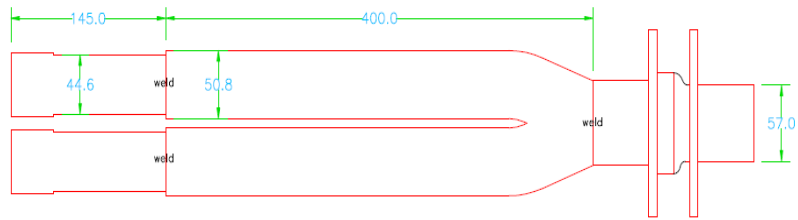
05/02/2020

Pg 1

Spec.	Value			
File	C:\Users\Workshop2\Documents\test.CPP			
Lobes	I1, E1			
Lobe Separation	129.6	Cam Deg.		
Checking Height	1.00	mm		
Valve Overlap	-10.3	Crank Deg.		
	Intake		Exhaust	
Centerline	129.55	ATDC	129.55	BTDC
Open	3.99	ATDC	68.17	BBDC
Close	72.48	ABDC	6.32	BTDC
Duration	248.5	Crank Deg.	241.8	Crank De
Area	596.2	mm Deg.	576.5	mm Deg.
Lash	0.000	mm	0.000	mm
Rocker Ratio	1.68		1.68	
Peak Cam Lift	6.5988	mm	6.6056	mm
Peak Valve Lift	11.0860	mm	11.0975	mm
Lift @ TDC	0.767	mm	0.655	mm
Spec.	Value			
Checking Height	1.27	mm		
Valve Overlap	-18.6	Crank Deg.		
	Intake		Exhaust	
Centerline	129.55	ATDC	129.55	BTDC
Open	8.10	ATDC	64.40	BBDC
Close	68.54	ABDC	10.51	BTDC
Duration	240.4	Crank Deg.	233.9	Crank De
Area	591.3	mm Deg.	572.0	mm Deg.
Lash	0.000	mm	0.000	mm
Rocker Ratio	1.68		1.68	
Peak Cam Lift	6.5988	mm	6.6056	mm
Peak Valve Lift	11.0860	mm	11.0975	mm
Lift @ TDC	0.767	mm	0.655	mm
Spec.	Value			
Checking Height	0.07	mm		
Valve Overlap	43.1	Crank Deg.		
	Intake		Exhaust	
Centerline	129.55	ATDC	129.55	BTDC
Open	20.32	BTDC	91.28	BBDC
Close	101.05	ABDC	22.74	ATDC
Duration	301.4	Crank Deg.	294.0	Crank De
Area	608.2	mm Deg.	587.6	mm Deg.
Lash	0.000	mm	0.000	mm
Rocker Ratio	1.68		1.68	
Peak Cam Lift	6.5988	mm	6.6056	mm
Peak Valve Lift	11.0860	mm	11.0975	mm
Lift @ TDC	0.767	mm	0.655	mm

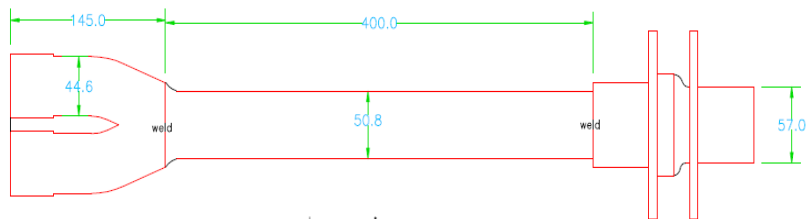
VW Challenge Class A

## Annexure 5: VW Challenge Class A Collector Model



side view

all dimensions are in MM



top view



Annexure 6:



Annexure 7:



Annexure 8:

