REGULATIONS AND SPECIFICATIONS FOR THE 2011 NORTHERN REGIONS MOTORSPORT VW CHALLENGE CHAMPIONSHIP, KNOWN IN THE MEDIA AS THE "GOLDWAGEN CHALLENGE"

MSA NORTHERN REGIONS MOTORSPORT CIRCULAR NR 15/2011 *(157368/134)*

VALIDITY OF THESE REGULATIONS

These regulations apply for the calendar year of 2011. The championship is held under MSA's general competition rules, standing supplementary regulations for car circuit racing, as well as these regulations.

1. DEFINITION

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

1.1 Aim of the Championship

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

1.2 Controllers of the Championship

The Controllers of the 2011 "VW Challenge" Championship will be the MSA Northern Regions Motorsport Committee, together with the "VW Challenge" branch of the Sports Car Club of South Africa.

1.3 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 one week 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 Phakisa, Lichtenburg, East London, Aldo Scribante or Killarney).

During official practice (i.e. the Friday morning from the first practice session) a driver may under no circumstances practice in a session not designated for his/her class.

The penalty for a driver not adhering to these practice rules will be that the offending driver will start from the back of their class on the starting grid for both races at the affected event.

1.4 Spare or 'T' cars

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

1.5 Grid

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 finishing order of the first heat. 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 at the discretion of the CoC. Classes will be separated on the starting grid by two rows for all races or as decided by the Clerk of the Course.

1.6 Championship Scoring

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).

(a) Pole position in each class will score one (1) additional point per class per race (heat).

(b) Fastest race lap of each race (heat) will score 1 additional point per class.

(c) To be classified as a starter a competitor must participate in the official practice session listed in the regulations for the event, or in at least one of the two races (heats).

(d) Class points may not be transferred from one class to another. The champion will be the competitor with the highest number of points scored overall at the end of the racing season, irrespective of class. 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.

(e) Drivers may not race in more than one class during any given event.

(f) An additional five (5) points will be awarded to each competitor who participates in any 'away race' as per clause 1.3 above. By participation it is meant that the competitor must have taken part in at least one of the official practice sessions and/or the official qualifying session and/or at least one of the races.

(g) Each competitor's best eight (8) race meeting results, out of the scheduled races on the Protour calendar, shall count for the purpose of determining the final championship outcome.

1.7 Domicile

The championship is open to all holders of a valid MSA competition license.

1.8 Championship Race Dates

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

1.9 Classes

There will be four classes, namely:

1.9.1 **Class A:** VW 8v, 2E (Note: '2E' refers to 'long-block' 2.0L 2E variants) 1984cc modified engines with hydraulic heads. All Class A cars must use standard petrol freely available to the South African public from dispensing pumps at commercial filling stations within the proximity of the race meeting.

1.9.2 **Class B:** VW 8v, 1830cc engine with limited modifications with hydraulic heads. All Class B cars must use standard petrol freely available to the South African public from dispensing pumps at commercial filling stations within the proximity of the race meeting.

1.9.3 **Class C:** VW 8v, 1640cc standard engines with hydraulic heads. All Class C cars must use standard petrol freely available to the South African public from dispensing pumps at commercial filling stations within the proximity of the race meeting.

1.9.4 **Class D:** VW 8v, 2E (Note: '2E' refers to 'long-block' 2.0L 2E variants) 1984cc engines with limited modifications with 2E hydraulic heads.

Competitors must use standard petrol freely available to the South African public from dispensing pumps at commercial filling stations within the proximity of the race meeting.

For 2011 only, ex-Polo Cup 8V cars may use the 2.0L short-block as per Appendix 1 and may use GCR240 compliant racing fuel. Gearbox must be fitted with a 3.94 Diff. (except 2010 Polo Cup spec cars that may use 4.25 diff). Note: No new build Polo Cup spec cars will be allowed to participate in Class D. Only ex-Polo Cup cars that participated during 2010 in Class P or previously competing bona fide Polo Cup cars will be accepted. During the 2011 racing season, if a 2010 Class P spec vehicle damages the motor, the motor may be replaced with a 2E Class D spec motor, but then the inlet manifold and exhaust system as per Class D 2E cars and 3.94 diff must be fitted. For 2012 the short-block/2010 spec Polo's will not be permitted.

The Class D rules will be re-clarified in 2011 where re-clarification is found to be necessary to close any loopholes that may exist.

In the event of a technical strip the results and information from the strip will be made available to all Class D drivers by the TC.

Cars/drivers wishing to join Class D must first approach the committee with their car's technical specifications before being permitted to join the class. During 2011 cars joining Class D with different suspension specifications will be accommodated, but will be subjected to a racing weight as specified by the technical committee. There will be no leeway on engine specifications in Class D except as noted above.

Class P spec cars racing in Class D: VW 8v, 1984cc Polo Cup cars from 1997 till 2002, i.e. Polo Classic or VW 8v, 1984cc Polo Cup Cars from 2003 i.e. Polo Hatchback.

2. DRIVERS CODE OF CONDUCT (REFER GCR 154)

2.1 Drivers will abide by MSA regulations at all times. No driver shall drive or conduct himself in a manner that brings the sport and/or club into disrepute. Drivers remain subject to disciplinary action imposed by MSA and/or the VW Challenge Committee. The driver will be granted the opportunity to defend their case to the committee.

2.2 Dangerous or unsafe driving is not acceptable.

Yellow/Red Cards will be issued at the discretion of the CoC. The VW Challenge committee can

suggest a yellow/red card to the CoC, who could enforce a three race meeting yellow card (observation) or a red card (a race points loss, and/or a race ban).
If yellow card competitors cause an incident during the following three (3) race meetings, the CoC, at his/her discretion, will issue a RED card and an immediate one race meeting ban. 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.
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. ELIGIBILITY OF CARS

3.1 Only right-hand drive VW passenger vehicles based on those sold officially through VW dealers in South Africa, will be permitted.

3.2 Cars must be registered with the Volkswagen Challenge Technical Committee, and be submitted for inspection to determine their eligibility.

3.3 Cars not meeting the safety and aesthetic standards judged by the Volkswagen Challenge Committee will not be allowed to race.

3.4 The VW Challenge Committee reserves the right to have racing cars inspected at random.

4. SPONSORS DECALS / COMPETITION NUMBER EXPOSURE

4.1 Refer to GCRs 246 and 249.

4.2 Series sponsors decals must be displayed at all times and take preference over individual/ personal sponsors. Decals may not be tampered with or altered in any way. Day or series sponsors decals will be displayed where so decided and indicated by the VW Challenge Committee. 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 passenger windows. 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. 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 class and number. Any driver not running the correct stickers in the correct positions will, at the discretion of the CoC, be fined, otherwise penalised or excluded from the race/s.

5. ENGINES (GENERAL)

5.1 Data logging and telemetry:
Data logging of car and driver performance is permitted in all classes. In order to control cost only dash-type data loggers or GPS-type data loggers are permitted. Any combination of the following specified parameters may be logged during unofficial practice, official practice, qualifying and races:
Engine: oil pressure, oil and water temperature. Fuel pressure and temperature. Exhaust gas temperature and single lambda reading. Battery voltage. RPM. Transmission: Gearbox and differential temperature. Chassis: vehicle speed through GPS input. Vehicle speed through input from single rpm sensor mounted on the drive shaft. Lateral, longitudinal and vertical G-forces. Steering input. Throttle position. Front and rear brake line pressures. Ambient temperature, barometric pressure. Lap times. Telemetry i.e. any communication, whether this be data and/or voice between the car/driver and the pit whilst driving on the track is not allowed.

5.2 Oil coolers are free of restriction.

5.3 Spark plugs are free of restriction.

5.4 May run Wasted Spark Coil Pack. Individual coils per cylinder are not permitted.
Wasted Spark Coil Pack is not permitted in Classes C & D.

5.5 Gaskets are free of restriction.

5.6 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. The water tank/container used to store water for the windscreen washers may not be used as the catch tank.

5.7 Sumps may be altered but remain wet sumps. Engine and gearbox sump plugs and oil filters must be wire locked. The inspection plate ("green plate") on the side of the gearbox must be wire

locked.

5.8 The position of the radiator may not be changed, but larger radiators may be fitted.

5.9 Alternators must be operative at all times, but bigger pulleys are allowed.

5.10 Engine mounting position must remain standard, but the material is free. New Polo's must use original or VW Motorsport type engine mountings. For new models (Golf4/5 and Beetle) 2 out of 3 engine mountings must remain original. (Engine mounting on the driver side/engine side can be manufactured).

5.11 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.

5.12 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.

6. EXHAUST SYSTEMS

6.1 Exhaust systems are free of restriction, except as provided for in clause 6.2 below. Must comply with GCR 245 and must exit at the rear of the car in the original position and direction. 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. The exhaust must follow the original route of the standard OE exhaust system in Classes C & D.

6.2 Class D is to use the standard 2E OE exhaust manifold only. Other than machining and matching the exhaust manifold to the cylinder head up to 10mm into the exhaust manifold (NB: the exhaust manifold only, not the cylinder head) as well as machining the exhaust manifold up to 10mm into the exit of the exhaust manifold, the exhaust manifold may not be flowed or modified in any way. The downpipe from the exhaust manifold to the knuckle must have an OD that may not be larger than 45mm at any point and may not be longer than 1 meter in total length. The rest of the exhaust may only be a single pipe that must follow the original route of the standard exhaust system and 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. The silencer must also have an inlet and outlet OD of maximum 57mm and may have no internal megaphone shaped parts. A chrome embellisher pipe may be fitted over the 57mm OD tailpipe. For 2011, ex-Polo Cup 2010 8V spec cars participating in Class D must use the exhaust system as per Appendix 1.

7. CYLINDER BLOCKS

7.1 Only VW mass-produced blocks available through commercial outlets are permitted. No aluminium blocks may be used.

7.2 Oil Cooler is free of restriction.

7.3 Valve Timing: The rotary position of the camshaft to the crankshaft may be changed by using the adjustable vernier pulley.

7.4 Sleeving of engine blocks. Engine blocks which may have been damaged may be re-sleeved to return them to the original specifications.

7.5 Class D: Maximum piston deck height protrusion is 1.000mm and minimum is 0.700mm. –The deck height will be measured at the highest point of the piston protrusion. The piston will be centered to eliminate any piston protrusion variance caused by the piston tilting over to either side due to a variance in cylinder bore or piston wear.

2010 Class P spec cars racing in Class D: The only permissible engines are the 8v 1984cc capacity unit as supplied by VW Motorsport under identification code VWMSPC.

Ignition timing: Static ignition timing may be set by means of adjusting the distributor position.

8. INDUCTION SYSTEMS

Additional air pipes may be used to supply the engine air intake with cool air.

8.1 Class A:

VW 8v, 1984cc. Citi Golf Life and/or 2E manifold & throttle body. Manifold may be gas flowed and cut. 300° H cam maximum. Throttle body may be re-worked, but butterfly and spindle must remain standard in profile with a maximum diameter of 56mm with the exception of an 8mm hole to aid idling. Air filters and connecting pipes are free of restriction. Throttle body may be modified

to take separate throttle position sensors.

8.2 Class B:
VW 8v, 1830cc. Citi Golf Life manifold, throttle body and injectors. Other than matching the ports to the cylinder head up to 80mm, the inlet manifold may not be flowed. Throttle body must remain standard with the exception of an 8mm hole to aid idling. Standard Polo or Citi Life air filter housing and connecting pipe must be used (upper and lower cones in the box may be removed). Filters are free of restriction. Throttle body may be modified to take separate throttle position sensors.

8.3 Class C:
VW 8v, 1640cc. MP9 Citi Golf manifold, throttle body and injectors. Inlet manifold may not be flowed. Throttle body must remain standard with the exception of an 8mm hole to aid idling. Standard Polo or Citi Life air filter housing and connecting pipe must be used (upper and lower cones in the box may be removed). Filters are free of restriction. Throttle body must remain standard, but may be modified to take separate throttle position sensors.

8.4 Class D:
VW 8v, 1984cc. Intake Manifold: 2E OE manifold or MP9 Citi Golf Life Intake manifold with map sensor on top of the intake manifold allowed only.
Throttle body: 2E or Citi Golf Life. Injectors: Part number: 037906031AA only. Other than matching the inlet manifold ports to the cylinder head up to 10mm into the inlet manifold, the inlet manifold may not be flowed or modified in any way (NB: the inlet manifold only, not the cylinder head). Throttle body must remain standard with the exception of an 8mm hole to aid idling. Standard Polo or Citi Life air filter housing must be used (upper and lower cones in the box may be removed, but the box must remain standard in all other aspects. Additional holes may not be cut into the box). A pipe leading cold air to the air filter housing may be used. Filters are free of restriction. For 2011, ex-Polo Cup spec 8V cars participating in Class D will use the intake system as per Appendix 1.

9. PISTONS AND RINGS

9.1 For 1600 and 1800cc, only single squish pad pistons may be used, 1mm maximum oversize is allowed. Minimum piston weight with rings and gudgeon pin is 375 grams for 1600 and 425 grams for 1800. Pistons may not be modified in any way except to remove metal on the underside of the piston for balancing purposes. At least one piston must remain unmodified.

9.2 For 2000cc only single squish pad pistons may be used, oversize is not allowed. Minimum piston weight with rings and gudgeon pin is 370 grams. The piston skirt may be shortened and the piston lightened by removing metal from the underside of the piston. Kombi pistons may be used and lightened by shortening the piston skirt and removing metal from the underside of the piston. Kombi piston part number - Goldwagen: A843, Midas/Alert/general outlets: RP83045. Whichever piston is used in Class D, these pistons may not cause or result in any engine dimensions or specifications being deviated from as stipulated in Class D.

9.3 In Class A and D all four pistons may be modified in this manner.

9.4 2010 Class P spec cars racing in Class D: Refer to Class P rules for the specifications.

10. CONNECTING RODS

10.1 VW or replacement parts are to be used.

10.2 1600 & 1800cc: Conrods may be lightened and balanced. Minimum weight 550 grams includes bolts and nuts, excludes bearing shells.

10.3 2000cc: Conrods may be lightened and balanced. Minimum weight: 580 grams includes bolts and nuts, excludes bearing shells.

10.4 2010 Class P spec cars racing in Class D: Refer to Class P rules for the specifications.

11. CRANKSHAFT

11.1 Only 2000cc crankshafts for 2000cc motors, 1800cc crankshafts for 1800cc motors and 1600cc crankshafts for 1600cc motors

11.2 Stroking is not permitted.

11.3 May be balanced and reground.

11.4 Lightening is allowed by drilling and grinding.
Min weight for 1600 & 1800cc: 11.5 kg no tolerance.
Min weight for 2000cc: 13.5 kg no tolerance.
Knife edging of webs is not allowed. Side edging thickness of Web must remain standard (casting marks must remain visible).
Class D: For balancing purposes, only the crankshaft webs may be drilled and no other machining, polishing or grinding of the webs is permitted.

11.5 2010 Class P spec cars racing in Class D: Refer to 2010 8v Class P rules for the specifications.

12. FLYWHEEL AND CLUTCH

12.1 Class A, B, C & D:
Clutches are free of restriction.
May be lightened and balanced.
Min weight: Flywheel & pressure plate, excluding pressure plate to flywheel bolts: 5.8Kg

12.2 2010 Class P cars racing in Class D:
Please refer to 2010 8v Class P rules for the specifications.

13. CYLINDER HEADS AND COMPRESSION RATIO

Only Technical Committee approved commercially available VW casting. No tolerance.

13.1 Class A:

13.1.1 8v hydraulic Head – max 40 mm intake and max 34 mm exhaust valves allowed. Zero tolerance
13.1.2 Minimum valve stem diameter is 7mm.
13.1.3 May be gas flowed.
13.1.4 Only standard or genuine specification hydraulic followers may be used as per Annexure 11 in Polo rules.
13.1.5 Valve springs and retainers free, dual valve springs can be fitted and modifications to take double valve springs.
13.1.6 Valves may be shortened or lengthened.

13.2 Class B & C:

13.2.1 8v hydraulic head – max 40 mm intake and 34 mm exhaust valves allowed.
13.2.2 Minimum valve stem diameter is 7mm.
13.2.3 No gas flowing allowed.
13.2.4 Only standard or genuine specification hydraulic followers may be used.
13.2.5 Standard valves, single valve springs and retainers.
13.2.6 Three angle seats are allowed.
13.2.7 Valves may be shortened or lengthened.

13.3 Class D:

13.3.1 2E OE 8v hydraulic head only – max 40 mm intake and 34 mm exhaust valves allowed.
13.3.2 Standard 2E OE valves and valve springs and retainers only.
Single valve spring and retainer must be fitted with 7mm valve stem as per OE.
Double valve spring and retainers must be fitted with 8mm valve stem as per OE.
13.3.3 No gas flowing allowed. No material may be removed or added to the combustion chambers and ports.
13.3.4 Only standard or genuine specification hydraulic followers may be used.
13.3.5 Valve head may not be modified.
13.3.6 Valve stem may be shortened or lengthened.
13.3.7 Standard valve seat only. Valve seat must be 45 degrees.
13.3.8 Maximum inlet seat throat diameter to be no greater than 34.8mm and no less than 34mm measured at the parallel section of insert.
13.3.9 Maximum exhaust valve seat throat diameter to be no greater than 29mm and no less than 28mm measured at the parallel section of insert.
13.3.10 The throat directly under the valve seat may not be altered in any way.
13.3.11 No second cuts or swirling permitted.
13.3.12 Minimum intake valve seat width to be no less than 2mm
13.3.13 Minimum exhaust valve seat width to be no less than 2.5mm

13.3.14 Minimum combustion cc is 29.0cc.
13.3.15 No polishing or reworking of the ports is allowed.
13.3.16 Thickness of head gasket compressed (minimum): 1.6mm
13.3.17 2010 Class P spec cars racing in Class D: Refer to class P rules

14. COMPRESSION RATIO

14.1 Class A: 11.500:1 maximum. No tolerance.
14.2 Class B: 10.500:1 maximum. No tolerance.
14.4 Class C: 10.500:1 maximum. No tolerance.
14.3 Class D: 10.200:1 maximum. No tolerance. Participating 8v Class P spec cars in Class D must conform to 2010 8v Class P rules in all regards.
2010 Class P spec cars racing in Class D: Please refer to class P rules. Mapping of fuel injection will be optimal at 11.1:1 compression ratio, although 11.47 is allowed.

15. CAMSHAFTS

15.1 Class A: Maximum 300 degree hydraulic duration. Vernier cam gears allowed.
15.2 Class B: Maximum 288-degree hydraulic duration. Vernier cam gears allowed.
15.3 Class C: Maximum 254 degree hydraulic duration with 10.2mm lift, as per standard Citi Life Fuel Injected model. The standard 1.6 A, B, D and H cams are permitted. The original hydraulic G cam, with identical specification, is also permitted. No aftermarket grinding or any other modification of the cam is permitted. Vernier cam gears are allowed.
15.4 Class D: Only 288-degree hydraulic duration with max 11.7mm lift. Vernier cam gears allowed. All components in the operating train of the valve gear must be of standard production quality, dimensions and tolerances, especially in regard to their operating geometry.
Base circle diameter: Inlet = 34 mm; Exhaust = 34mm
Nose to base circle: Inlet = 45.7mm; Exhaust= 45.7mm
2010 Class P spec cars racing in Class D: Refer to class P rules

16. GEARBOXES AND DIFFS

Class A, B, C & D: Only genuine VW 5-speed manual shift gearboxes may be used, as available on local models. No automatic gearshift gearboxes in any form allowed.
16.1 Class A:
3.94 or 4.25 diff ratio allowed. No limited slip differentials. Short shift gear linkage allowed. Ratios may be mixed, but must be VW replacement parts. Linkage bushings may be changed for a harder material**.**
16.2 Classes B, C & D:
Only 3.94 diff ratio allowed. No limited slip differentials. Short shift gear linkage allowed. Ratios may be mixed, but must be VW replacement parts. Linkage bushings may be changed for a harder material.
16.3 Class C & D gearboxes must use the same gearbox ratios for the entire 2010 racing season. The gearbox must be sealed from the first race the car is entered/raced. The competitor has to request in writing if the gearbox seal is to be broken – This will be done under observation of the technical representative who will check the ratios are not altered.
16.4 2010 Class P spec cars racing in Class D:
8v's will use the standard close ratio 5 speed gearbox. Please refer to the technical specifications in the Class P 8v rules.

17. SUSPENSION

17.1 General
(a) Top shock turrets must remain in standard position.
(b) Standard steering rack and standard mounting positions only, power steering may be disconnected.
(c) Bush material is free however must be dimensionally identical to standard items.
(d) Pick-up points on body / chassis may not be changed or moved.
(e) Steering knuckles must be a standard VW part. Tie rods may be modified by adding rose joint and/or spacers in order to correct bump steer. Ackerman angle may be altered.

(f) Golf II, III, IV and Polo may use a rose joint in replacement of the rear control arm only in the standard position.
(g) Shocks / uprights may be slotted to achieve camber settings only.
(h) Ball joints and their mountings may not be slotted. For camber purposes the new Polo 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. The maximum track width must still be adhered to.
(i) Top and bottom stress bars are allowed in all classes.
(j) Steering rack mounting on MK1 Golf/Jetta/Fox must be reinforced.
(k) Drive shafts may be modified to prevent C.V. joint failure.
(l) Mk1 Golf/Jetta/Fox knuckle maybe machined to accommodate 40 mm hub and bearing for safety reason only (all classes). Mk1 Golf/Jetta/Fox may use Golf3 knuckle, hub & bearing.
(m) Mk1/2/3 Golf/Jetta/Fox may use new Polo/Golf 4 rear stub axle with pressed wheel-bearing, for safety reasons, with modifications to allow the fitment of the currently used brake calipers. Must remain 4 stud type specification (all classes).
(n) Unless where specifically indicated these specifications do not apply to class P.

17.2 Class A:

Camber/Caster plates are allowed - maximum caster offset of 40 mm.
Anti-roll bars and material are free.
Coilover type shocks allowed.
Rear axle may be stiffened by fitting fixed stiffeners.
Shock makes allowed for class A:
Bilstein, Koni, Gabriel, Monroe, Sachs, Wietec, Armstrong, Spax, Leaders, Sax or Traxion.
External gas canisters permitted.

17.3 Class B:

Adjustable camber plates allowed.
Anti-roll bars are free. Rear anti-roll bar must fit directly onto rear axle and must follow the contour of the rear axle. The roll bar may not be fitted remotely in its working principle.
Coilover type shocks allowed.
Rear axle may be stiffened by fitting fixed stiffeners along the straight edge of the axle only.
Rear axle control arms may be strengthened by welding in a gusset plate of maximum 5mm thickness.
Shock makes allowed for class B:
Bilstein, Koni, Gabriel, Monroe, Sachs, Wietec, Armstrong, Spax, Leaders, Sax or Traxion.
External gas canisters not permitted.

17.4 Class C:

Adjustable camber plates not allowed. Original spec top mounting must be used in the original mounting position. Mounting may be stiffened.
Only original spec anti-roll bars may be used and must fit into standard mounting positions.
Springs must fit into the original standard OE seating position. Only one spring per shock may be used.
Shocks makes allowed for class C:
Only GT Shocks as supplied by Ian Glass, or identical dimension shocks supplied by Traction/Steve Hurley (at the same commercially available price), which are strictly non gas assisted are allowed. Standard OE Gabriel or Armstrong shocks allowed (the shortened Gabriel shock also allowed). Specialised shocks such as Bilsteins not allowed.
Rear axle may be stiffened by fitting fixed stiffeners along the straight edge of the axle only. Rear axle control arms may be strengthened by welding in a gusset plate.

17.5 Class D:

Camber/Caster plates are allowed in all cars - maximum caster offset of 40 mm.
Anti-roll bars are free. Rear anti-roll bar must fit directly onto rear axle and must follow the contour of the rear axle. The roll bar may not be fitted remotely in its working principle.
Rear axle may be stiffened by fitting fixed stiffeners along the straight edge of the axle only. Rear axle control arms may be strengthened by welding in a gusset plate.
Shocks makes allowed for class D:

Only the GT coil-over type Shocks or large OE coil type shocks as supplied by Ian Glass, which are locally manufactured, non gas assisted, using locally manufactured parts are allowed. The rear shocks are the non-threaded height adjustable type i.e. the shocks are ride height adjustable using spacers. The shocks are sealed and may not be tampered with. The front coil-over shocks are the non-threaded height adjustable type i.e. the shocks are height adjustable using spacers. Only one spring per shock allowed. The shocks are sealed and may not be tampered with. Standard OE Gabriel or Armstrong shocks allowed. The shortened Gabriel shock also allowed, but both types may only use one spring per shock that fits into the original seating points. Specialised shocks such as Bilsteins which also use helper springs will be allowed in 2011. Class Rep will provide the TC and scrutineers with all the Class D cars weight and suspension specifications.

Any Class D competitor's Shock absorber information/specifications will be available to Class D competitors through GT Shocks. 8v Class P competitors who race in Class D will use the 2010 Class P shock absorbers/suspension specification or may convert to the Class D shock/suspension specification.

2010 Class P spec cars racing in Class D:

As per the Class P rules for the Polo Classic cars, with the following latitudes:

The front anti-roll bar may be disconnected.

Front control arms – Polo Classic: A rear uniball bush will be fitted (Part no 6Ks 407 181). Spring rates and damping are free. Refer to the Class P rules.

McPherson strut units as specified in the Class P rules must be used without modification except for the slotting to facilitate additional camber adjustment.

Front castor plates – A special front castor plate as per class P rules will be used.

The rear shock absorber top mountings remain standard and may not be altered. The rear camber and toe-in may be adjusted by means of utilising 4-point shims.

Ride heights are free.

18. BRAKES

18.1 Class A:

Any standard VW brakes, or aftermarket discs and brake pads up to a maximum of 288mm diameter allowed with single piston floating calliper, booster may be removed, but standard VW master cylinder must be retained. Discs may be slotted and/or cross-drilled. Rear brakes can be drums or discs. Friction material is free. Adjustable brake balances are allowed in car within reach of driver.

18.2 Class B & C:

Standard Mk1 1800 GTi calliper or Golf Mk3 calipers with aftermarket discs and brake pads, discs or as per standard model, up to a maximum of 256mm diameter. Discs may be slotted and/or cross-drilled.

Rear brakes can be drums or discs. Friction material is free. Booster may be removed, but standard VW master cylinder must be retained.

Standard adjustable brake compensating load valve is allowed.

Adjustable brake balances are allowed in car within reach of driver.

18.3 Class D

Mk1 Golf/Jetta/Fox: May use standard Mk1 1800 Gti calipers or Golf Mk3 calipers. Disks and friction material are free.

288mm diameter discs with single piston floating caliper only allowed.

Booster may be removed, but standard VW master cylinder must be retained.

Discs may be slotted and cross-drilled. Rear brakes can be drums or discs.

Adjustable brake balancers are allowed in-car within reach of driver.

2010 Class P spec cars racing in Class D:

Both brake discs and calipers (Spitze) will remain as supplied with the vehicle as built by VW Motorsport, up to a maximum of 288mm diameter as per Polo rules Appendix 1.

Friction material is free.

19. BODYWORK AND GENERAL

(a) Any VW right hand drive passenger vehicle body shell type, as sold officially at VW

dealers in South Africa may be used. Rear wheel drive Beetle and Mk1 Scirocco not allowed. 2010 Class P spec cars racing in Class D: Refer to Class P 2010 rules.

(b) No built out panels are allowed, but fender lips may be rolled or fenders flared to accommodate larger tyres specified.

(c) Front valance may be cut to achieve better airflow to radiators only.

(d) Outside shell appearance for all classes must appear original as per Volkswagen SA.

(e) Body parts e.g. doors, boot, bonnets must remain as original specification and may not be modified in any way other than the insides that may be altered, but still maintaining the integral structural strength of the component.

(f) The rear spoiler must be similar in all regards to the standard OE spec spoiler.

(g) The front spoiler is allowed to be of a type that is mass produced and must be technically approved. Splitters, aerofoils or Aerodynamic devices designed to improve downforce are not allowed. Taping up or filling gaps in bonnets, doors etc. to aid aerodynamics are not allowed.

(h) Headlights must remain and be operable. The inner lights may be removed, but must be covered (with solid covers or wire mesh) as approved by the Association Technical Committee. Polo may remove spotlight from within the headlight unit as approved by the Association Technical Committee.

(i) Racing seat and steering wheel must be securely fitted. Steering column may be lowered. Driver seat and steering wheel are free.

(j) Full roll cages in compliance with GCR 239 are compulsory. 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.

The roll cage should include a 'sissy' bar that runs horizontally behind the driver's seat to stop the driver's seat from moving backwards in the case of an accident.

(k) Heater boxes, interior trim and all passenger seats may be removed except for dashboard, which shall remain standard apart from localised cutting for roll cages.

(l) Any form of instrument cluster may be used. Additional instruments may be fitted to measure engine performance.

(m) Cut-off switches must be fully operational from inside and outside the car and shall be clearly marked.

(n) Bonnet clips and safety nets must be fitted (as per MSA Handbook).

(o) With the exception of windscreens all other glass may be substituted with Perspex, Lexan type material with minimum thickness of 3 mm. They must be fitted in to the body with standard rubbers and pop rivets which may not be visible. (all classes).

(p) The battery must be positioned in the original position.

(q) Fuel radiators/coolers or cooling of fuel in any way is not permitted.

(r) 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.

(s) Any form of electronic driver aid (not referring to data logging) actively and/or passively assisting the driver with inter alia, but not limited to the control of brakes and/or engine performance and/or handling/control of the vehicle whilst on the track, is not permitted. This implies that all driver aids or variants inter alia, but not limited to, commonly referred systems such as "ABS" and/or traction-control and/or launch-control and/or stability control is strictly forbidden.

(t) Engines will sealed for no longer than two races, except where TC with approval of CoC requests an immediate strip.

20. WHEELS AND TYRES

(a) No chrome plated or split rims are allowed. Rim size 15 inch, 7J max.

(b) Tyres for all classes are DUNLOP DZ03G H1 compound 195/55-R15, or as approved by the Association Technical Committee.

(c) In Class A 2 new tyres will be allowed every race meeting. In all other classes 1 tyre will be credited per race meeting meeting and can be used at the discretion of the competitor

i.e. a competitor can use one new tyre every race or 2 new tyres every second race. The TC will keep a record of this and the competitor should request the use of new tyres from the TC. The committee will also exercise the option that 2 tyres can be credited, if the previous or following race is at an abrasive track. Only the new tyres may be unmarked tyres which will then be marked - The old tyres must be previously marked tyres i.e. used officially/marked at a previous race meeting. The only time four new i.e. unmarked tyres may be used is at a competitor's first race of a new race season or as agreed upon by the committee. 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. 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. The VW Challenge Committee has the authority to appoint an official tyre marker at a race meeting. Competitors, who do not park at the designated parking areas, are themselves responsible to ensure their tyres are marked by the official tyre marker before official timed practice.

(d) At the discretion of the technical consultant/scrutineer damaged or defective tyres may be replaced during a race meeting with a tyre of similar wear.

(e) Pressure controlling "pop-off" valves may not be used.

21. FUEL

21.1 Refer to GCR 240 and the mentioned fuel limitations per individual class. Only 2010 Class P cars racing in Class D complying fully as per Appendix 1 may use 98 octane unleaded racing fuel complying with MSA specifications. All classes may use 98 octane unleaded racing fuel complying with MSA specifications at the coastal races.

21.2 Fuel pressure regulators are free of restriction.

21.3 The VW Challenge Committee and/or Technical Committee and/or VW Challenge scrutineer has 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.

22. MANAGEMENT SYSTEMS

Except in Class A, only original spec injectors may be used, part no: 037906031AA.

22.1 Class A:

The original spec Injectors may be flowed in Class A only.

The Golf 4 Turbo type Injectors, part no: 06A906031 or 06A906031BA may be used as an alternative in Class A, but must remain standard.

Only original MP9, Dastech Unichip, Dictator, Perfect Power, Mr. Turbo, Gotech (i.e. SA manufactured systems that commercially cost less than R5500 are permitted. Plastic injector rails are allowed.

22.2 Class B, C & D:

Only original MP9, Dastech Unichip, Dictator, Perfect Power, Mr. Turbo, Gotech (i.e. SA manufactured systems that commercially cost less than R5500 are permitted. Polo steel and plastic injector rails may be used.

For cars running in Class D according to 2010 Class P rules, these cars will run strictly as per Appendix 1.

2010 Class P spec cars racing in Class D:

Engine Control unit. All units are sealed and may not be remapped in any form. Piggy-back systems are strictly forbidden. Mapped memory chips may be obtained from Class representative. Rev limiters are set at 7000 RPM. All ECU's may be collected from individual competitors and redistributed to others at any time during a race meeting, at the discretion of the technical consultant in consultation with the clerk of the course.

23. SPECIFICATION SHEET

23.1 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.

23.2 Ground Clearance:
Classes A & D: 110mm minimum for Golf4 & Beetle
120mm for P2 & P3 Polo
130mm minimum for all other model cars
Class B & C: 135mm 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.
2010 Class P spec cars racing in Class D: Ride Heights are free.

23.3 Spoiler minimum height of 50mm.

23.4 Front Track Width:

(a) Classes B, C & D:
The widest part of the two opposing wheel rims, no tolerance:
MK1: 1670mm
MK2 & P1: 1710mm
Mk3, P2: 1730mm
Mk4, Mk5, Mk6, Beetle, P3 Polo: 1740
(P1 refers to old 6K Polo, P2 refers to 9N Polo, P3 refers to 6R Polo)
This measurement will be taken at the bottom of the wheel (closest to the ground) from the outer edge of the wheel (rim) bead face.
Class A: Track width: As above and may also be widened by a further 10mm.

(b) 2010 Class P spec cars racing in Class D:
As per 2010 8v Class P rules and 2010 national Polo Cup rules.

24. CAR MASS (Including driver)

The vehicle mass is as car is raced. At no time of the event may a car weigh less than stipulated. No tolerance.
Minimum weight may be changed by the association committee from time to time during the season.

24.1 Class A:
Minimum weight: 1050kg

24.2 Class B:
Minimum weight: 1000kg

24.3 Class C:
Minimum weight: 940kg

24.4 Class D:
Minimum weight: 1050kg for 2010 Class P spec cars racing in Class D
1040kg for cars running Bilstein i.e. any specialized shock/springs
1020kg for cars running coil-over/spacer GT shock/springs
1010kg for cars running large coil springs and GT shocks.
990kg for cars running standard OE Gabriel or Armstrong shocks

Specialised shocks/springs refer to Bilstein, Koni, Gabriel, Monroe, Sachs, Wietec, Armstrong, Spax, Leaders, Sax or any shocks/springs not listed above.
The above weights are to accommodate the different suspension spec cars joining the VW Challenge series in Class D. The technical committee can at any time during the 2011 season adjust the above weights to keep competition fair.

Note: 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).

24.6 Location of ballast is free of restriction within the cabin area or boot of the vehicle for Classes A, B, D and 8v Class P vehicles racing in Class D. Location of ballast for Class C will be 20kg max in the passenger seat area, the rest of the weight must be secured under or directly behind the driver's seat ahead of the fuel tank.
Vehicles may not be lightened by the removal of exterior bodywork. Ballast weight may not be

bolted to the floor or wheel well only. The ballast weights will be bolted in to strengthening bars or plates that run across the floor that are welded or affixed to the roll cage or car's integral structure. The weights in the wheel well can be secured as mentioned above or using a bar that is affixed to the roll cage bar running above the wheel well. The bolts used to secure the weights must be minimum 20mm diameter using at least 5mm thick washers that are at least 100mm in diameter. Attachments must be approved by the VW Challenge Association Technical Committee or MSA Scrutineers.

25. GENERAL

25.1 Only modifications and allowances detailed herein are permitted. What is not specifically mentioned is expressly forbidden. All components not referred to or specifically mentioned in these Regulations will remain in completely standard specification. Ignorance of the Regulations will not be accepted as an excuse. 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.

25.2 All novice drivers must have completed drivers' instruction prior to the first race. The committee's decision is final as to whether or not the driver is permitted to race. Any novice will race three consecutive race meetings with a red streamer affixed to the top of the rear window.

25.3 Soft towing straps must be fitted to the front and rear of all cars if the standard tow hooks protrudes beyond the bumper.

26. 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.

27. 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.

Appendix 1

2010 Class "P", VW Challenge Rules
For the POLO CLASSIC (Sedan) body type
and the POLO PQ24 (Hatchback) body type

Note: The specifications below shall apply equally to both types of vehicles mentioned above, unless where specified by the term Sedan where the POLO CLASSIC will be referred to or Hatchback where the POLO PQ24 series will be referred to**.**

Chassis and coach work

1. Vehicle dimensions

1.1 Wheel base (nominal): Sedan 2450 mm Hatchback 2460 mm
1.2 Overall length (nominal): Sedan 4095 mm Hatchback 3897 mm
1.3 Track Width: 1740 mm (previously 1700 mm)
The widest part of the two opposing wheel rims = 1740mm. This measurement will be taken at the bottom of the wheel (closest to the ground) from the outer edge of the wheel rim, car unladen.
1.4 Ride heights are free of restriction.

2. Wheels

2.1 Material of wheel rim: Aluminium Alloy
2.2 Material of wheel centre: Aluminium Alloy
2.3 Maximum rim width: 7J
2.4 Rim diameter: 15

3. Tyres

3.1 Standard tyre size and profiles: DUNLOP DZ03G H1 compound 195-55-R15
3.2 No pressure controlling through "pop-off" valves may be used.

4. Steering gear

4.1 Type: Rack and Pinion
4.2 Power assistance permitted

5. Brake system

5.1 Number of master cylinders: 1 (one)
5.2 Servo assisted: Yes
5.3 Type of servo unit(s):
Sedan: Bendix 6K2 612 100 F or Bendix 6K2 612 100
Hatchback: Bendix 6Q2 612 105K
5.4 Brake pressure regulator fitted: Yes
5.5 Braided steel hosing may be used.

6. Brake assemblies – disc and caliper type

6.1 Disc material – Front = Steel; Rear = Steel
6.2 Caliper material – Front = Steel; Rear = Steel
6.3 Ventilated disc – Front = Yes; Rear = No
6.4 O/D of disc: Sedan: Front = 288 mm maximum; Rear = 225 mm
Hatchback: Front = 288 mm maximum; Rear = 232 mm
6.5 No of wheel cylinders per wheel: Front = 1 (one); Rear = 1 (one)
6.6 No of pads per wheel: Front = 2 (two); Rear = 2 (two)

7. Suspension

7.1 Front Suspension
7.1.1 Type: McPherson strut
7.1.2 Description of control arms and locating members: Wishbone – Standard (VW) Polo as

applicable.

7.1.3 Description of springing medium: Coil spring, rate free

7.1.4 Front stabiliser rod diameter: 20.22mm (may be disconnected)

7.1.5 Castor plate See Annexure F

7.2. Rear Suspension

7.2.1 Type: Beam axle

7.2.2 Description of springing medium: Coil spring, rate free

7.2.3 Rear stabiliser rod diameter: Not fitted

8. Shock absorbers

8.1 Sedan: Only the Bilstein units supplied by Afrishox may be used. See Annexure B for a technical drawing of the shock absorbers.

Hatchback: KW shock absorbers as supplied by VW Racing OR in order to reduce costs SIMILAR dual tube hydraulic units from Bilstein, Koni, Gabriel, Monroe, Sachs, Wietec, Armstrong, Spax, Leaders, Sax. Traxion may be substituted. No mono tube gas shock absorbers or external gas cannisters will be allowed.

8.2 Spring rate and damping free.

Engine – 4-stroke Piston Type (Applicable to both vehicle types)

9. Identification and description

9.1 Manufacturer: VW Motorsport/Voldi Works Team (Pty) Ltd/VW Racing

9.2 Identification code: VWMSPC

9.3 Total engine capacity: 1984 cc

9.4 No of cylinders: 4 (four)

9.5 Bore diameter (maximuml): 82.555mm

9.6 Stroke (nominal): 92.8mm

9.7 Swept volume per cylinder (nominal): 496.074 cm^3

9.8 Volume allowance: ± 3 cm^3

9.9 Finish: Machined

9.10 Thickness of head gasket compressed (minimum)*: 1.6mm ±0.10 Part no 050 103 383 A

9.11 Compression ratio (maximum)*: 11.47:1 ± 0.1 (Note: 11.0:1 is the suggested compression ratio to be used with 98 RON fuel as per GCR 240).

9.12 Type of valve operation: SOHC

9.13 Deck height of piston above block: 0.8mm maximum, 0.5 mm suggested.

* See Annexure C

10. Cylinder block (1HS 103 019 cast no 1HS 103 021 F)

10.1 Material of block: Cast iron

10.2 Material of working face of bores: Cast iron

10.3 Cylinders: BORED IN BLOCK

10.4 Number of main bearings: 5 (five)

10.5 Material of main bearing caps: Cast iron

10.6 Re-sleeving of block: Yes

10.7 Only blocks supplied by VW Motorsport/Voldi Works Team (Pty) Ltd/VW Racing are allowed.

11. Crankshaft (Part no 053 105 101 C / new 053 105 101 H)

11.1 Material of crankshaft: Alloy steel

11.2 Finish: as Forged/Machined

11.3 Main journal diameter: 54 mm Nominal (-0.022 to -0.042)

11.4 Crank pin diameter: 47.8mm (-0.022 to -0.042)

11.5 Vibration damper fitted: Free

11.6 Mass of crank shaft (bare): 13.6kg (new part).

In order to return crankshafts to a serviceable condition, cutting of the big ends and main bearing journals is permitted, down to a maximum undersize of 40 thou as specified by the manufacturer. All grinding of journals must be concentric to the original journal diameter. The stroke of the

homologated VW crank must remain within the original manufacturer's tolerances. The minimum mass of any authorised crankshaft (bare) shall be 13.6kg (This is the minimum after any balancing). For balancing purposes, only the crankshaft webs may be drilled and no other machining, polishing or grinding is permitted.

11.7 Mass of the crankshaft flywheel complete with ring gear: 3.950 kg (±50g)

12. Connecting rods (part 1HS 105 401)

12.1 Material: Steel alloy
12.2 Finish: as Forged/machined
12.3 Length between centres (nominal): 144mm - may be machined to reduce the deck height of the pistons.
12.4 Type of bearing attachment: Locating Tag
12.5 Type of gudgeon pin fitting: Slide fit in bush
12.6 Minimum mass of conrod complete with bearing cap, bolts, nuts but less big end bearings: 0.660kg (removal of material for balancing purposes is only allowed on the conrod cap.)

13. Piston and rings

13 A Part no: FPA 107 103 - assembly

13.1 Piston top shape: Dished (with squish pad)
13.2 Volume of piston protrusion into combustion space. See annexure C
13.3 Volume of depression in piston crown (if applicable). cm^3. See annexure C.
13.4 Height from gudgeon pin centre to the highest point of piston crown: 30.4mm
13.5 Overall length of piston 59.34mm
13.6 Piston mass (bare): 314g
13.7 Piston material: Aluminium alloy
13.8 Location of gudgeon pin: circlips
13.8 Gudgeon pin diameter (nominal): 20 mm
13.9 Gudgeon pin length (nominal): 57mm
13.10 Ring widths: Top = 1.5mm; 2 = 1.5mm; 3 = 2.00mm

OR

13 B Piston Part no 22S 107 065 F; Ring Part no 053 198 151 B KOL

13.1 Piston top shape: Dished (without squish pad)
13.2 Volume of depression in piston crown (if applicable) .cm^3. See annexure C
13.3 Height from gudgeon pin centre to the highest point of piston crown: 29.25 mm
13.4 Overall length of piston 58.00mm ±0.20mm
13.5 Piston mass (bare): 300 +-2g
13.6 Piston material: Aluminium alloy
13.7 Location of gudgeon pin: circlips
13.8 Gudgeon pin diameter (nominal): 20 mm
13.9 Gudgeon pin length (nominal): 57 mm, weight 0.10kg ±0.01
13.10 Ring widths: Top (1) : 1.5mm; (2) 1.5mm; (3) 2.0mm

Note: Competitors may use either of 13A or 13B but not a mix of these.

14. Cylinder head (Part no: 1 HS 103 373 A/B/C)

(Also identified by RED dot, and A stamped by no 1 plughole.)

14.1 Cylinder head will be controlled by volumes of the combustion chamber, inlet port and exhaust port. No modifications to the cylinder head will be permitted whatsoever.
14.2 Material: Aluminium alloy
14.3 Number of ports: Inlet = 4 (four); Exhaust = 4 (four)
14.4 Inlet port dimensions (head): See Annexure A
14.5 Exhaust port dimensions (head): See Annexure A
14.6 Inlet port finish: As cast.
14.7 Exhaust port finish: As cast
14.8 Valve seats – Type and material
Inlet = Steel; Exhaust = Steel

14.9 Valve guide length: Inlet = 27.5mm; Exhaust = 31.0mm.
14.10 Valve seat free.
14.11 The cylinder head if damaged may be reworked to return it to its original state. No polishing or reworking of the ports is allowed.

15. Valve gear
15.1 No of valves per cylinder: 2 (two)
15.2 No of camshafts: 1 (one)
15.3 Type of camshaft drive: Toothed belt

16. Valves (part no's: Inlet 078 109 601 B; Exhaust: 048 109 611 B) See Annexure A.
16.1 Valve location inlet: in head; Exhaust: In head
16.2 Valve material inlet: Steel alloy; Exhaust: Steel alloy
16.3 Valve head shape inlet: Dished; Exhaust: Flat
16.4 Valve head diameter inlet: 39.5mm ±0.15mm; Exhaust: 32.9mm ±0.15mm
16.5 Valve stem diameter: Inlet 7 (seven) mm; Exhaust: 7 (seven) mm
16.6 Valve length overall inlet: 91.85mm; Exhaust: 91.15mm

17. Valve springs (Part no: 078 109 623 C)
17.1 No of springs per valve: 1 (one)
17.2 Type of retention: Cap and cotters
17.3 Outlet diameter: 29.42mm ±0.2
17.4 Inner diameter: 21.00mm ±0.2
17.5 No of windings: 6.94 ±0.1
17.6 Free length: 45.8mm

18. Valve Timing (nominal, as adjustment is allowed)
To be specified in degrees of crankshaft rotation. Relative timing as implied below shall remain unaltered. (Recommended setting = 2.9mm lift at TDC)
18.1 Inlet valve opens at 34 degrees. BTDC with 0mm clearance
18.2 Inlet valve closes at 74 degrees. ABDC with 0mm clearance
18.3 Exhaust valve opens at 74 degrees. BBDC with 0mm clearance
18.4 Exhaust valve closes at 34 degrees. ATDC with 0mm clearance

19. Valve lift
Total valve lift: Inlet = 11.7mm; Exhaust = 11.7mm (hydraulic followers)

21. Cam followers / valve lifters
Manufacturer Ina **OR** as supplied by VW part no 050 109 309 J
Note: The parts may not be mixed in any form.
Type: Hydraulic

22. Camshafts
22.1 Material single: Chilled cast iron.
22.2 Location: in cylinder head

23. Cam dimensions
(All components in the operating train of the valve gear must be of standard production quality, dimensions and tolerances, especially in regard to their operating geometry.)
23.1 288-degree hydraulic duration. Vernier cam gears allowed.Dimension "A" (base circle diameter) *. Inlet = 34 mm; Exhaust = 34mm
23.2 Dimension "B" Nose to base circle)*. Inlet = 45.7mm; Exhaust= 45.7mm
*Please refer to Annexure A

24. Inlet manifold (Part no 1HS 133 223)
(No modification to the inlet manifold is permitted.)

24.1 Material: Aluminium alloy
24.2 Dimension Sketch of ports. See Annexure A
24.3 Dimension sketch of ports / openings – throttle body. See Annexure A
24.4 Internal finish: As cast / fettled

25. Exhaust

25.1 Exhaust system is free of restriction but must comply with GCR 245 and must exit at the rear of the vehicle, in the original position and direction. The exhaust must also follow the route of the standard OE exhaust system.
25.2 Dimension sketch of ports – Engine Side. See Annexure A. These dimensions taken ±5mm into port. Localised variations at the mating face are permitted - to a maximum of 0.5mm.
25.3 Dimension Sketch of outlet openings: See Annexure A
25.4 Description of internal finish: As cast or extruded

Cooling system

26. Radiator

26.1 Type: Brazed aluminium and plastic, cross flow **OR** radiator fan housing assembly with dual electric fan motors.

27. Cooling fan:

Cooling fans are free of restriction

28. Capacity

28.1 Total capacity of cooling system: Max 7 litres

Fuel system

29. Fuel tank

29.1 Capacity: 45 litres (with another ±7 litres available if expansion volume is filled)
29.2 Location: under boot floor.
29.3 Diameter of inlet pipe from fuel filler orifice: 55 mm nominal.

30. Fuel pump

30.1 Type: Rolling element
30.2 Location: in tank

31. Fuel filter

31.1 Type: Full-flow, disposable
31.2 Location: on top of the fuel tank.

Induction system

32. Air Cleaner

32.1 Make/Type: Free. VW Polo Standard part or equivalent recommended. No inlet air ducting allowed except standard ducting as referred to in 32.3 below.
32.2 Filter medium: Paper or synthetic material.
32.3 The rubber connection to the headlamp surround and the headlamp surround behind the right hand headlight grille is not compulsory.

33. Fuel injection

33.1 Make: Bosch
33.2 Type: MP 9.0
33.3 Location of injectors and part no. : Inlet manifold, P/N: 037 906 031 AA
33.4 Injector pump type: Rolling Element (see under Fuel pump)
33.5 Type of fuel metering: Electronic, mapped
33.6 Plenum chamber material: part of inlet manifold
33.7 Plenum chamber dimension sketch: See “Inlet manifold”
33.8 Diameter of butterfly: 56mm (nominal)

33.9 Schematic layout of fuel injection system: See Annexure D
33.10 Fuel pressure regulator free. 3.0 Bar pressure recommended.

34. Lubrication system
34.1 Type: Wet sump, with windage tray
34.2 Oil filter type: Paper element, full-flow
34.3 Oil pump type: gear
34.4 Location of oil pump: in sump
34.5 Oil cooler type: Free *(Note this is optional and does not have to be fitted).*
34.6 Location of oil cooler: Free

35. Ignition system
35.1 Description: Bosch MP 9.0

36. Distributor (part no: 1HS 905 205)
36.1 Make: Bosch
36.2 Model no: N/A
36.3 Description: Fixed type, hall sensor only

Clutch assembly and Flywheel
37. Clutch driven plate (Part no LUK Special or Sachs Standard)
37.1 Type: single dry plate
37.2 O.D.: 210mm
37.3 No of plates: 1 (one)

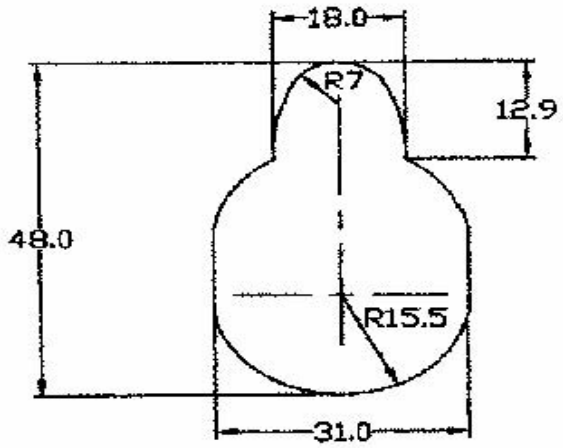
38. Pressure plate: Part no (LUK Special or Sachs standard)
38.1 Type: VW type

39. Gearbox
39.1 Make: VW
Sedan: Based on DGT, with Short final drive
Hatchback: Based on DUU, with Short final drive
39.2 Manual
39.3 Ratios: see Annexure E
39.4 The polypropylene ball ended linkage of the gear shift lever mechanism may be replaced with the metal ended linkage (part no 1H071174SP)

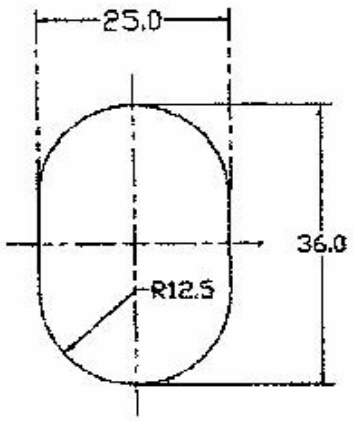
40. Final drive front
40.1 Make: VW
40.2 Type of diff: conventional, mechanical
40.3 Limited slip: No
40.4 Ratio of diff: 4.25:1
40.5 Diameter of crown wheel: 184mm
40.6 No. of teeth on crown wheel: 68
40.7 No. of teeth on pinion: 16

Drawings of Engine ports- tolerances on dimensions : -2%, +4%

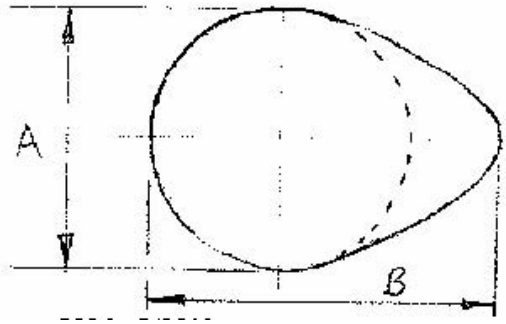
Inlet Port



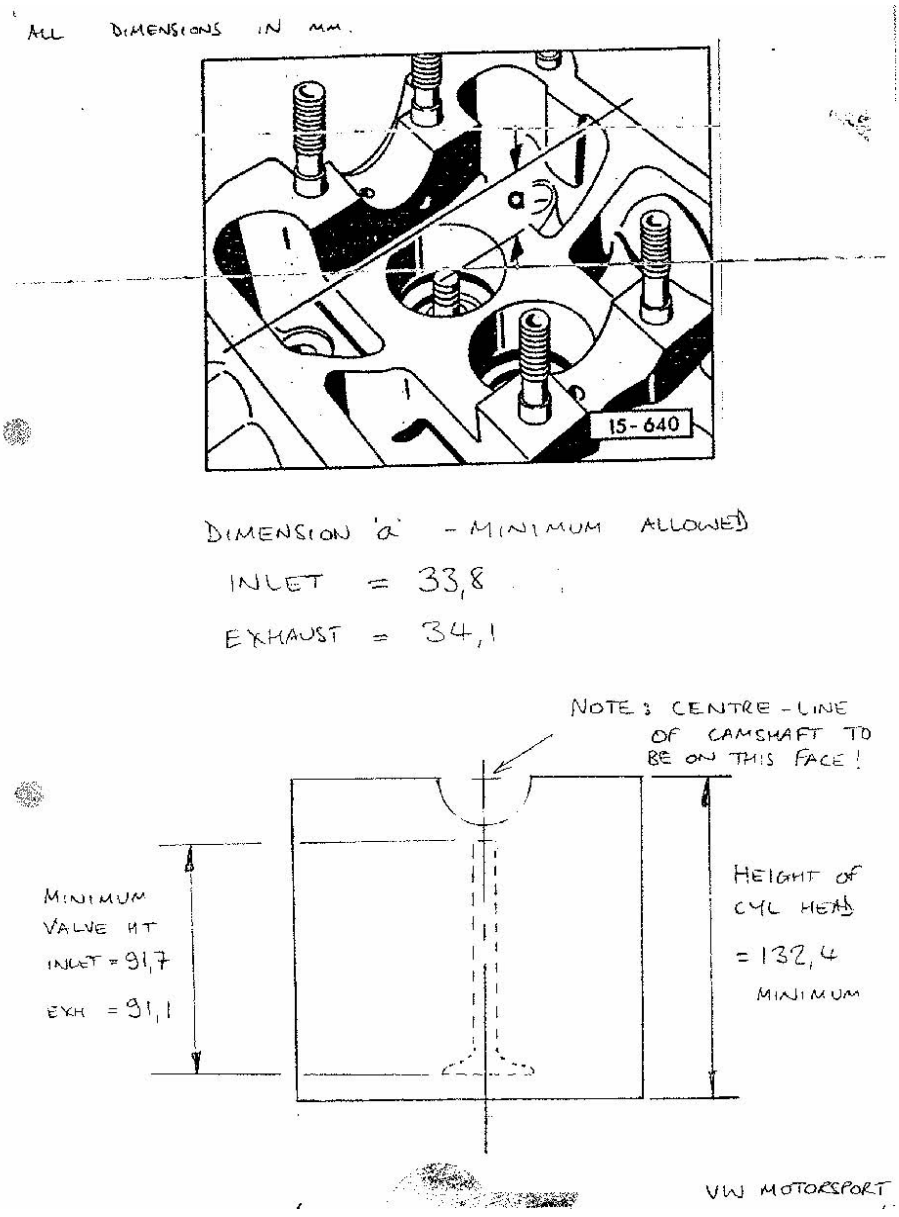
Exhaust Port



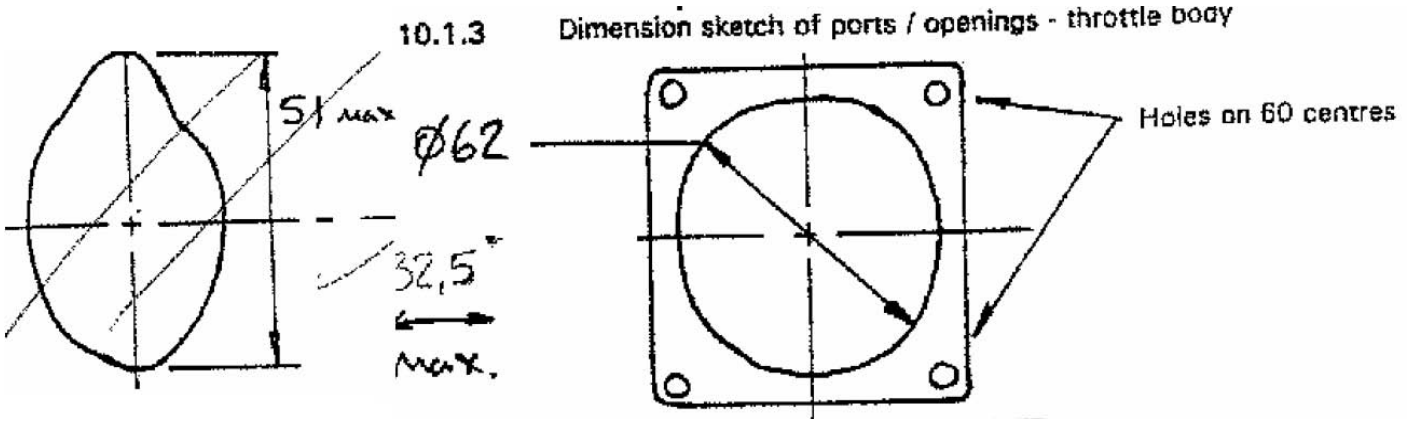
Camshaft dimensions:



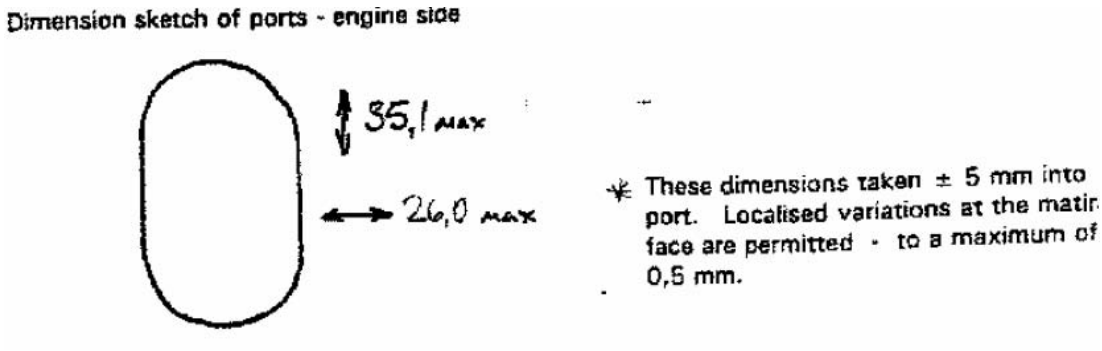
Valve stem dimensions:

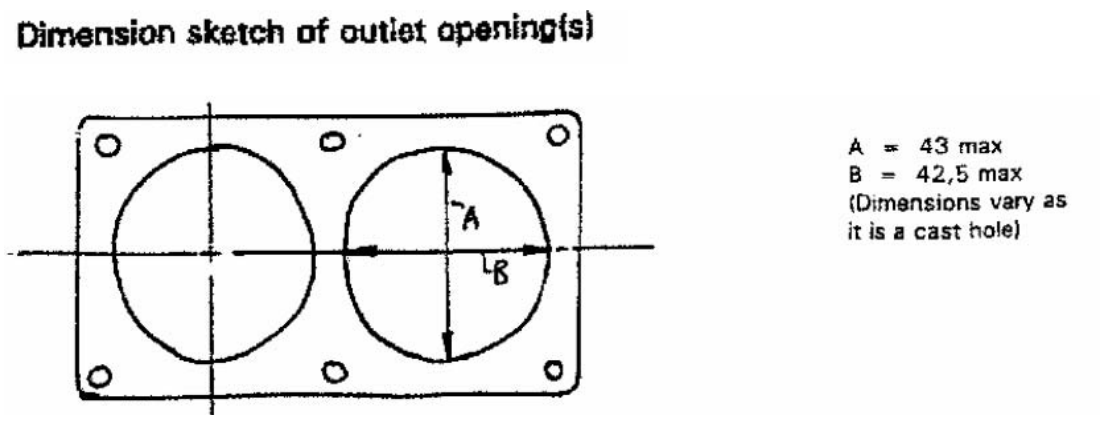


Inlet manifold:

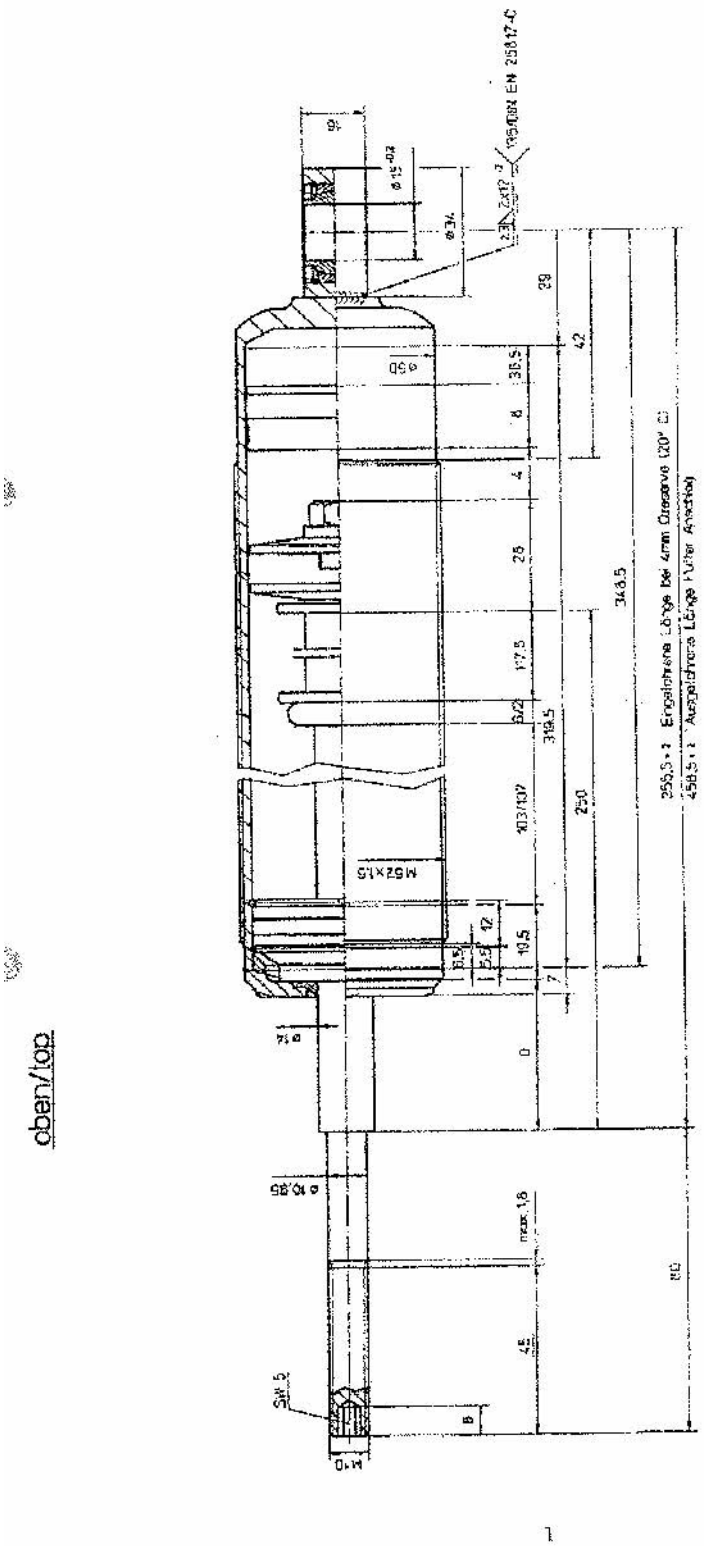


Exhaust manifold:

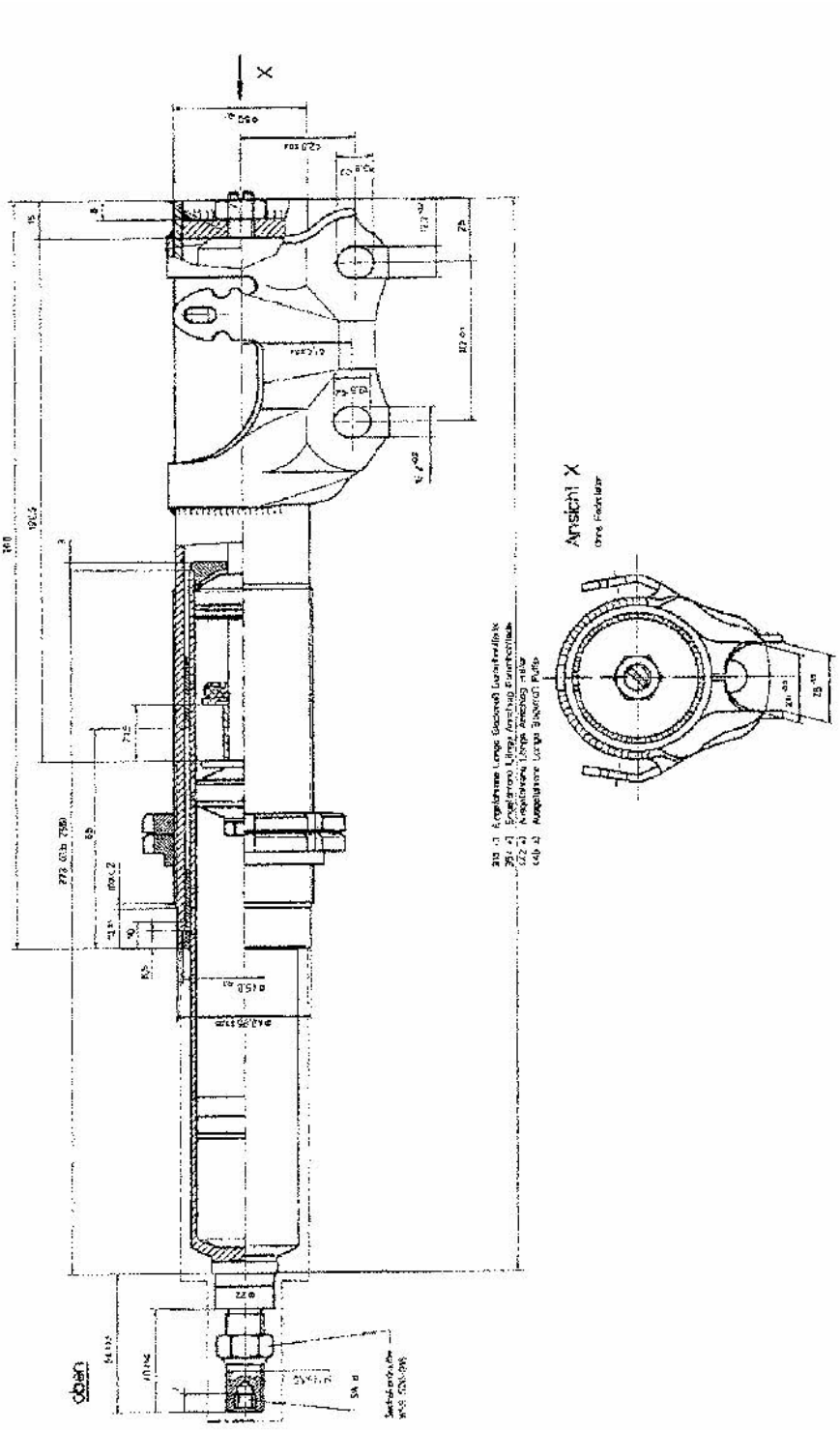




Polo Classic: Rear shock absorber



Polo Classic: Front shock absorber



Compression ratio calculation for the old style block/piston

INPUT DATA DERIVED DATA

BORE, mm	82.5		Swept Volume per cylinder	496.073
STROKE, mm	92.8			
CYLINDER HEAD VOLUME	28.500		(Minimum allowed)	
VOLUME @ 2mm BTDC	22.500		PISTON VOLUME @ TDC	11.809
THEORETICAL STROKE VOLUME OF 2mm STROKE	10.691			
GASKET THICKNESS	1.600		GASKET VOLUME	8.762
GASKET DIAMETER	82.5			

CALCULATION

TDC VOLUME @ TDC HD VOLUME + PISTON VOLUME @ TDC + GASKET VOLUME.

TV = 8.500 + 11.809 + 8.762 = 49.070

COMPRESSION RATIO = TDC VOLUME + SWEPT VOLUME / TDC VOLUME

COMPRESSION RATIO = 49.070 + 496.073 / 49.070 = **11.11:1**

NOTE:
ALLOWABLE VARIATION, CAUSED BY DIFFERING CYLINDER HEAD VOLUMES IS LIMITED TO THE RANGE 11.01 : 1 TO 11.11 : 1

Compression ratio calculation for the NEW style block/piston

INPUT DATA DERIVED DATA

BORE, mm	82.5 ±0.04		Swept Volume per cylinder	
				496.074
STROKE, mm	92.8			
CYLINDER HEAD VOLUME	27.76		(Minimum allowed)	27.4
VOLUME @ 2mm BTDC	21.7		PISTON VOLUME @ TDC Minimum allowed	11.00357 10.7
THEORETICAL STROKE VOLUME OF 2mm STROKE	±10.5			
GASKET THICKNESS	1.600		GASKET VOLUME	8.58
GASKET DIAMETER	82.6			

CALCULATION

TDC VOLUME @ TDC HD VOLUME + PISTON VOLUME @ TDC + GASKET VOLUME.

TV = 27.76 + 11.00375 + 8.58 = 47.34375

COMPRESSION RATIO = TDC VOLUME + SWEPT VOLUME / TDC VOLUME

COMPRESSION RATIO = 47.34375 + 496.074 / 47.34375 = **11.47:1**

NOTE:
ALLOWABLE VARIATION, CAUSED BY DIFFERING CYLINDER HEAD VOLUMES IS LIMITED TO THE RANGE 11.47 : 1 ±0.1

General view of system

2.0l

The system overview applies to the ~~1.4~~ ltr. engine with Bosch Motronic MP 9.0

Sensors

Intake manifold pressure sender G 71 and intake air temperature sender G 42

Hall sender G 40

~~Lambda probe G 39~~ NOT USED

~~Knock sensor G 61~~ NOT USED

Coolant temperature sender G62

Throttle valve control unit J 338 with:
Throttle valve positioner potentiometer G 88
Throttle valve potentiometer G 69
Idling switch F 60

Additional signals

Engine control unit J220 Bosch Motronic MP 9.0

NOT USED.

Immobilizer control unit J362

Diagnostic connection

USED FOR IGNITION TIMING.

SSP 168/7

Actuators

Ignition transformer N 152 with ignition transformer output N 157

Injectors N30-33

Fuel pump relay J 17

NOT USED

Activated charcoal system solenoid valve N 80

Throttle valve control unit J 338 with: Throttle valve positioner V 60

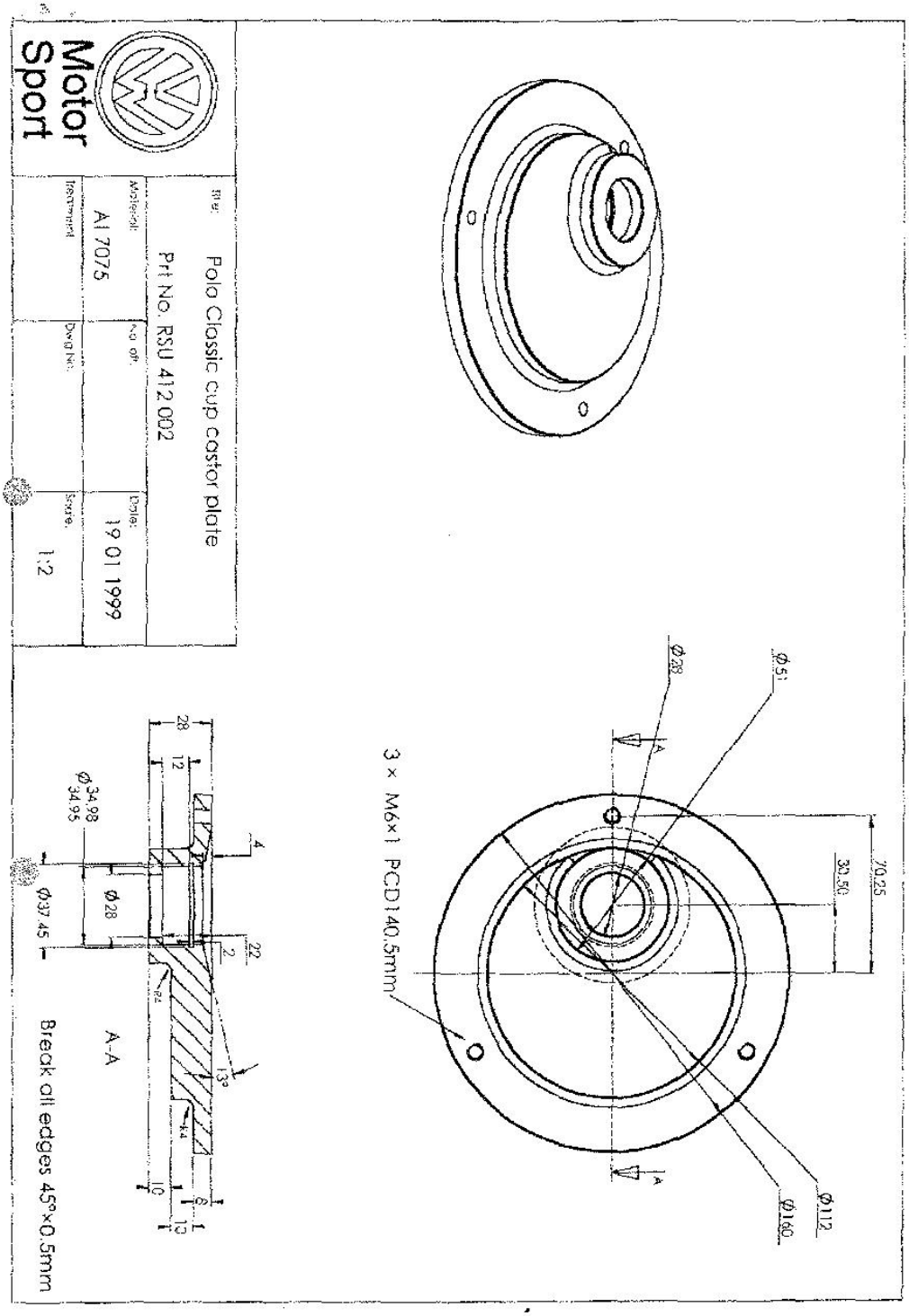
Additional signals

GEAR RATIO CHART

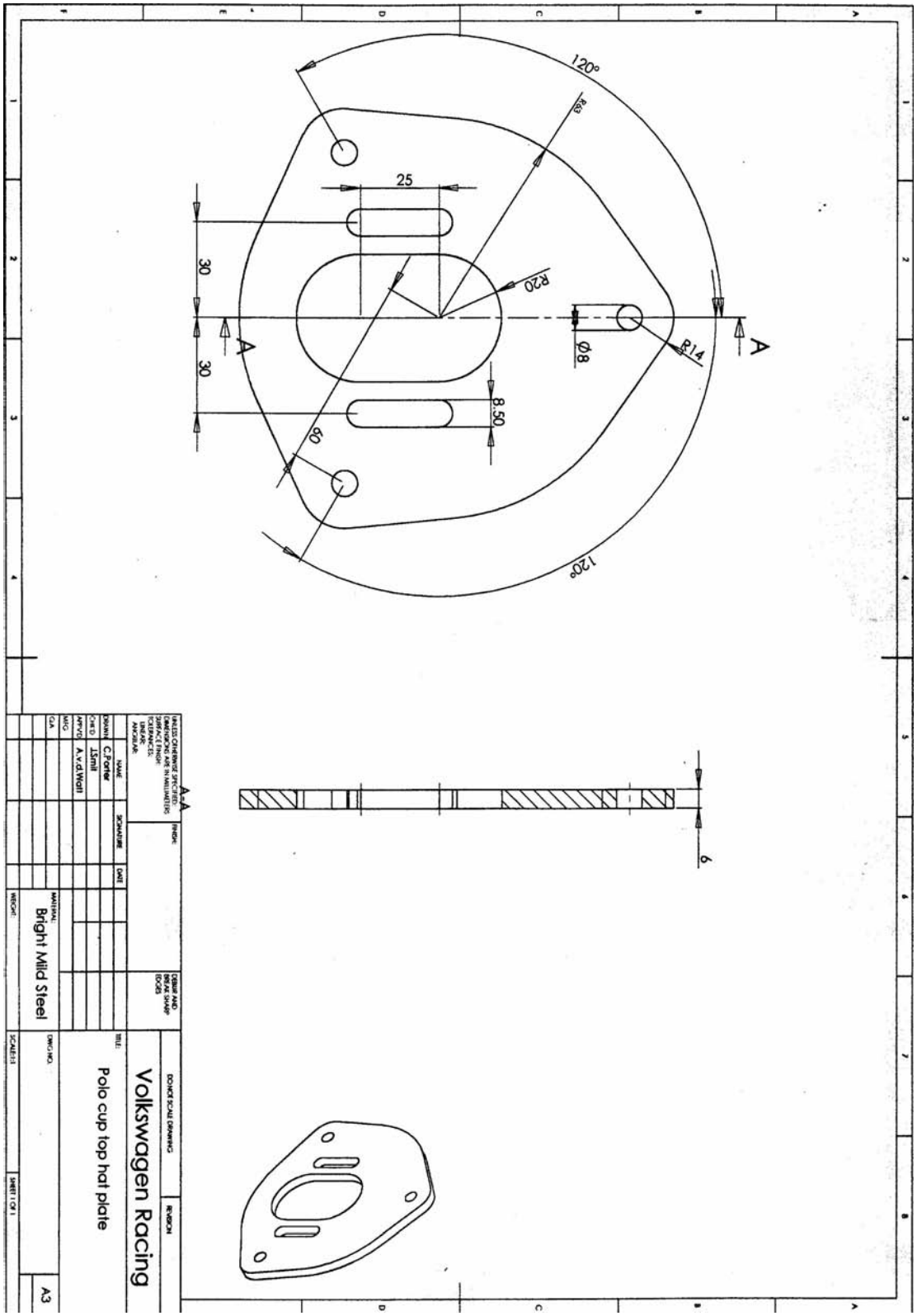
TOOTH COUNT			Numeric ratio	
			Gear	Overall
First gear	38 : 11		3.455	14.682
Second gear	35 : 18		1.944	8.264
Third gear	39 : 27		1.444	6.139
Fourth gear	35 : 31		1.129	4.798
Fifth gear	42 : 47		0.894	3.798
Reverse gear	38 : 12		3.167	13.458
Final drive	68 : 16		4.250	

Optional fifth gear ratio only for East London: 0.85

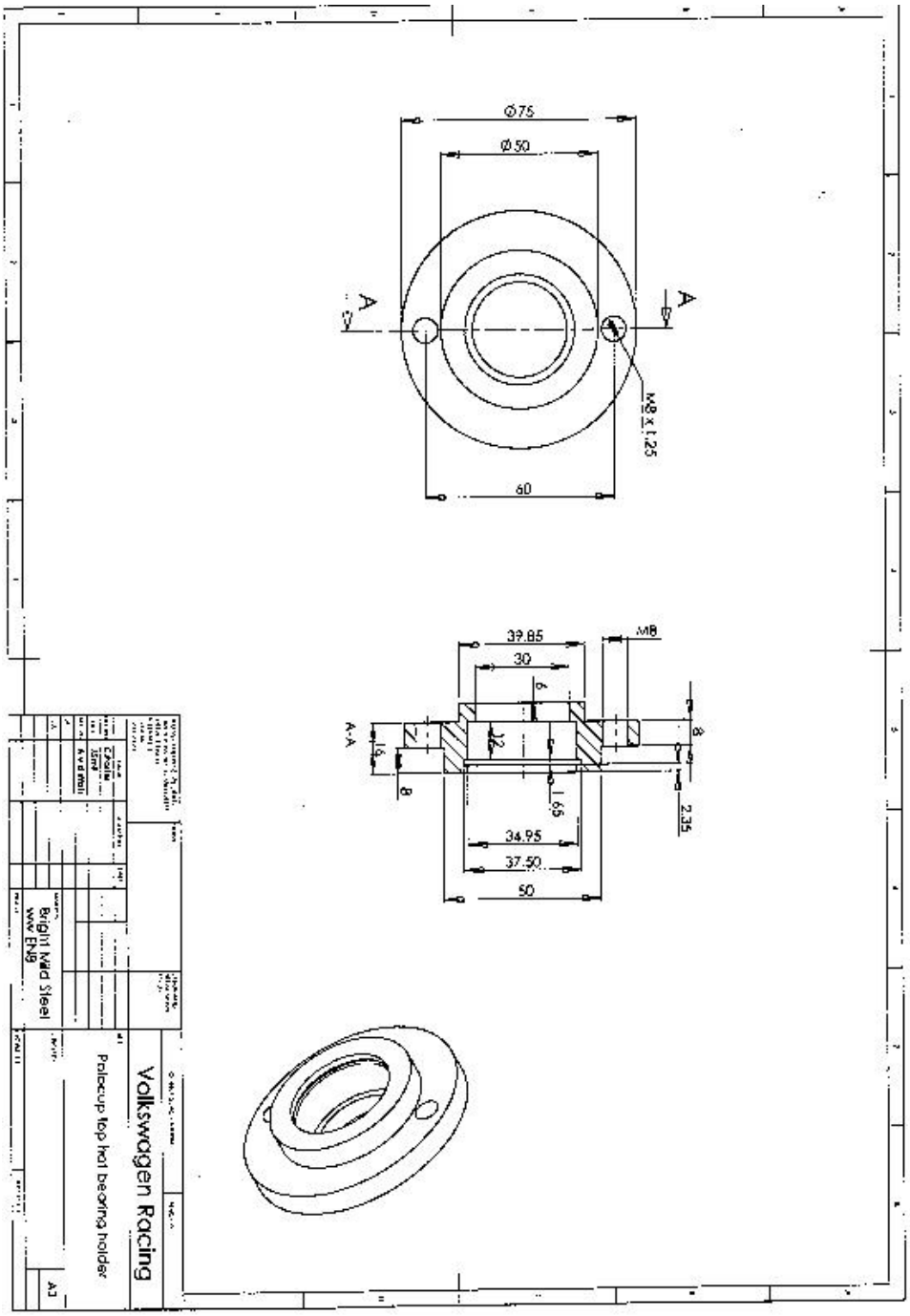
Polo Classic : Castor plate



Polo Hatchback : Castor plate



Polo Hatchback : Bearing holder



Polo Hatchback : Shock absorber washer