PORSCHE
MOTORSPORT

911 GT3 RSR

Technical Handbook MY 2009

911 GT3 RSR

2009 Model

This technical information will give you the possibility to reference data, adjustment values and working procedures and make the maintenance and repair work on the vehicle easier.

We wish you every success with your GT3 RSR

911 GT3 RSR, MY 09 Competition Car

This race car is specifically designed for participation in One-Make Cup competitions.

For obvious reasons, measurements referring to bodywork dimensions of the production cars cannot be used as reference. Porsche accepts no guarantee that the vehicle conforms to the regulations.

The car cannot be registered for road use and does not comply with German road traffic regulations.

Illustrations, descriptions and schematic drawings serve exclusively as presentation for the text. Porsche Motorsport accepts no liability for the completeness and conformity of the contents of this brochure with respect to the legality of the current regulations.

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Contents

1. General technical data

Engine type	M 97/81
Gearbox type	G 97/70
Number of gears	6-speed sequential

1.1. Dimensions

Maximum lengths	[mm]	4443
Maximum width across front axle	[mm]	1841
Maximum width across rear axle	[mm]	1957
Maximum wheelbase	[mm]	2370

1.2. Weight

Dry weight ACO	[kg]	1220
Dry weight FIA	[kg]	1245

2. Engine

The engine is based on the power unit fitted to the road approved GT3 RS and is specially modified for motorsport purposes.

The engine is fitted with a dry sump lubrication system; the oil tank is mounted directly on the engine. The engine oil is cooled by an oil-water heat-exchanger integrated in the cooling system.

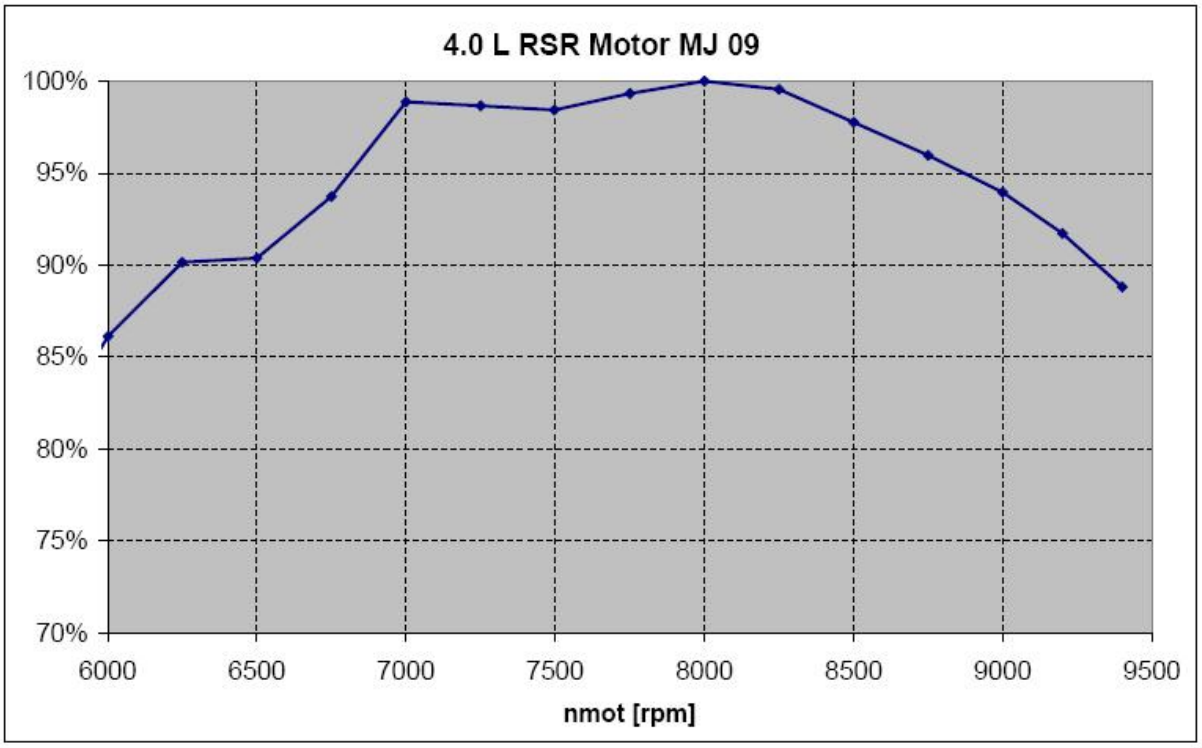
Induction is made through a carbon-intake system equipped with two restrictors and six single-throttle butterflies.

Two restrictors each with a diameter of 28.6 mm are fitted. The restrictor size (diameter) is subject to local championship regulations, and can be adjusted by event organisers to limit power. Each competitor is responsible that their vehicle conforms to the valid regulations.

2.1. Engine technical data

Engine type		M97/81
Design		Six-cylinder boxer
Cylinders		6
Bore	[mm]	102.7
Stroke	[mm]	80.4 mm
Cubic capacity	[cm^3]	3996
Compression ratio		appr. 15 : 1
Inlet valve diameter	[mm]	42
Inlet valve lift	[mm]	14.6
Point of maximum inlet valve lift	[deg]	110 after TDC
Exhaust valve diameter	[mm]	34
Exhaust valve lift	[mm]	13,75
Point of maximum exhaust valve lift	[deg]	110 before TDC
Cooling media		Water cooled
Lubrication		Dry sump lubrication Oil-water heat-exchanger

2.2. Engine power curve



2.3. Engine lubrication

The 911 GT3 RSR is equipped with a dry sump lubrication system. The oil tank is mounted to the engine.

The engine oil is cooled by an oil-water heat-exchanger integrated in the cooling system.

2.3.1. Fluid levels

The volume of the complete oil system including pipes and hoses and heat-exchanger is approximately 11 litres.

2.3.2. Checking the oil level

The oil-level display is used to check the oil level quickly during endurance races. This enables the pit-crew to make a rapid assessment of the oil consumption without reverting to the time-consuming “dip-stick method”.

Checking the oil level:

- Bring the engine to operating temperature
- Engine running at idle speed or immediately after engine switched off
- Wait at least 3 seconds after the engine has stopped

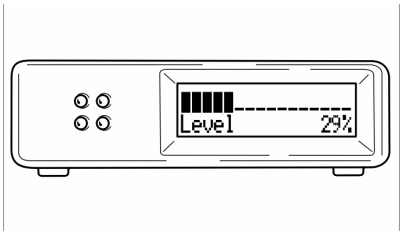
Oil level:

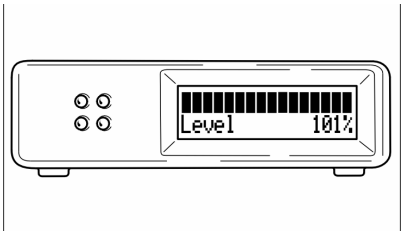
- Oil level for normal operation (tests etc): 80 -100 %
- Pre-race: Fill oil tank to 100% and add an additional 1 litre of oil

Oil level display:

- From 98 % 6.0 litres in oil tank
- 50 % 4.6 litres in oil tank
- 30 % 4.1 litres in oil tank
- 2 % 3.5 litres in oil tank

The LED warning lamps in the display start to flash when the level is less than 30%. Oil should be added if the oil-level drops below 70% for longer than 3 seconds during a pit stop.





2.3.3. Adding oil

The equipment shown below is required for re-filling or adding engine oil.

Supplier:

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Fliederstr. 10

D – 69517 Gorxheimertal

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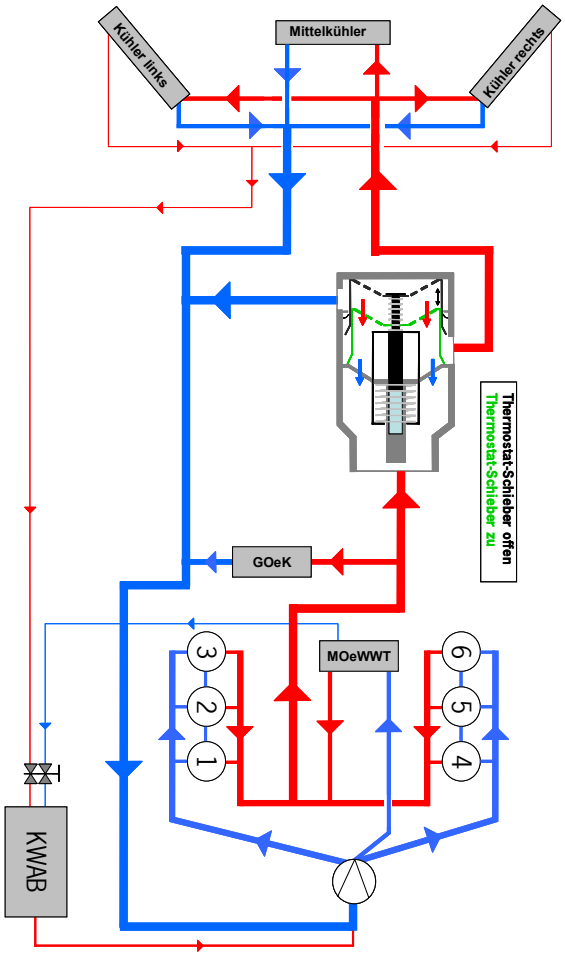
www.sobek-motorsporttechnik.eu

2.4. Engine cooling system

The GT3 RSR cooling system is standard cooling system specially modified for racing purposes. To achieve maximum system efficiency the following points must be observed:

- A mesh is mounted in front of the air intakes in the front nose section to protect the radiators from stone damage. Under no circumstances should another mesh (mesh size / porosity) be fitted as this has a negative effect on the system's thermal efficiency.

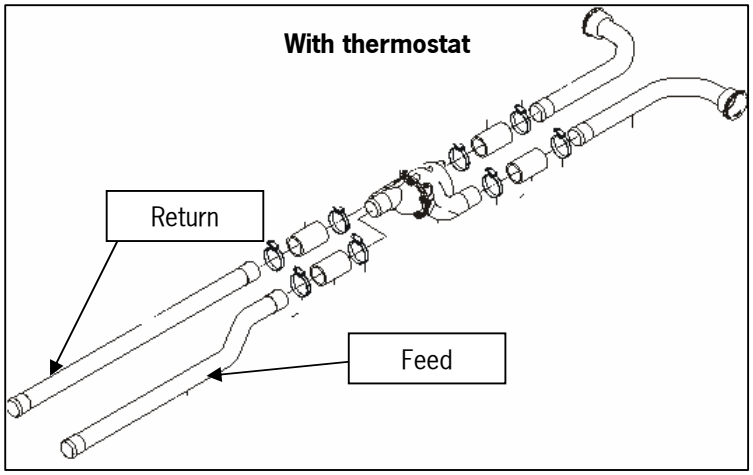
- The cooling air exiting from the centre cooler is exhausted through an outlet in the front section. These openings are also covered, as stipulated in the regulations, with a wire mesh. The exit duct wire mesh is identical to the air-intake mesh, and should also not be replaced by a different mesh.

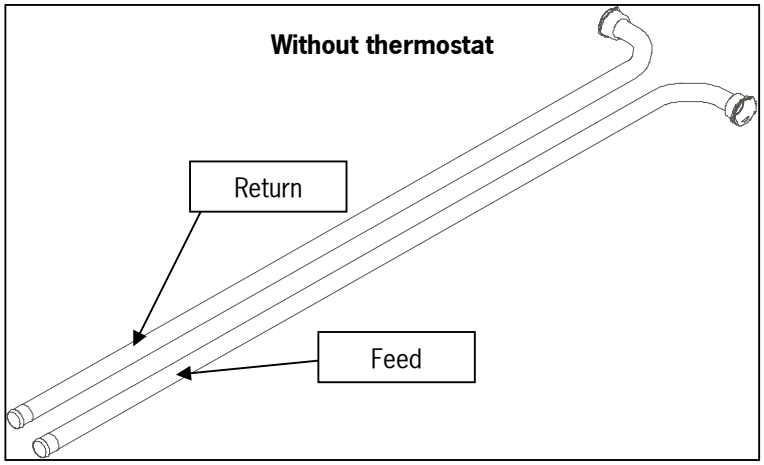


2.4.1. Thermostat

The GT3 RSR has a factory fitted thermostat which accelerates warming-up of the engine in cold weather. Water pipes without a thermostat are available to purchase as option from sport component sales (see parts catalogue).

In warmer conditions the thermostat should be removed as the temperature level with thermostat is higher than without thermostat.





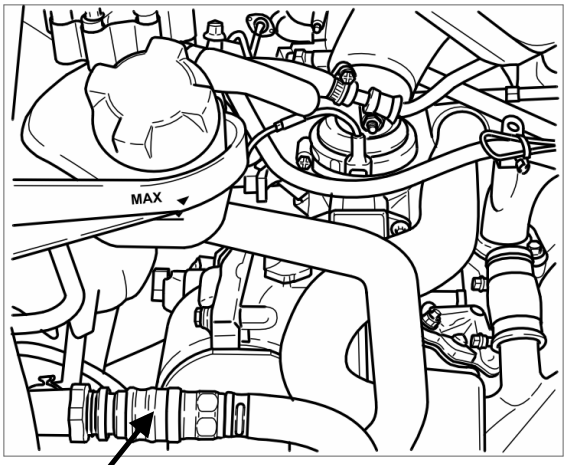
The thermostat begins to open at 81 °C and is completely opened at 86 °C water temperature.

2.4.2. Coolant levels

The cooling system has a volume of approximately 22 litres. Porsche Motorsport recommends that 2 litres of anti-corrosion additive (part number: 997.106.907.90) are added, which protects the water galleries and other cooling system parts from corrosion, reduces cavitation, lubricates the water pump and increases the boiling point of the cooling water. The cooling system must not be used without anti-corrosion additive. The coolant remains fluid to temperatures of -15°C in delivery specification.

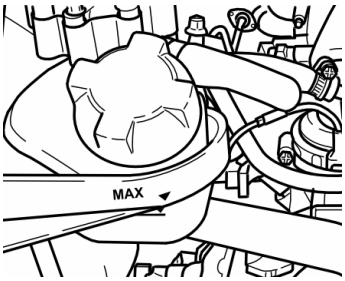
2.4.3. Filling the cooling system

A quick-release coupling is integrated in the area of the expansion tank. The water system can be filled and bled quickly and safely via this coupling – after an engine change for example.

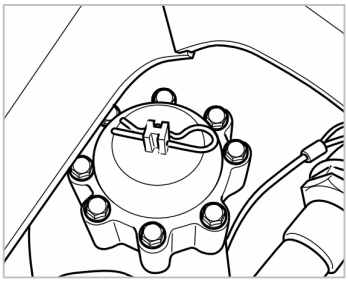


Attention: When the water system has reached its operating temperature, the expansion tank cap should under no circumstances be opened and the pressure released. Since the operating temperature has already been achieved the water pressure cannot be built up again. This system pressure is necessary to increase the coolant boiling point.

A valve in the expansion tank allows the exhaust of steam at a pressure of 1.4 bars, and the release of water at a pressure of 1.8 – 2.0 bars. Air is drawn through the valve as the cooling system cools down.



The bleed valve in the standard production car improves the initial reaction from the heating system; the valve remains open in the race car system allowing the system to be bled continuously.



A special filling system available from Sobek should be used to fill the water system. The filling system consists of an electric pump that pumps water from a tank into the system.

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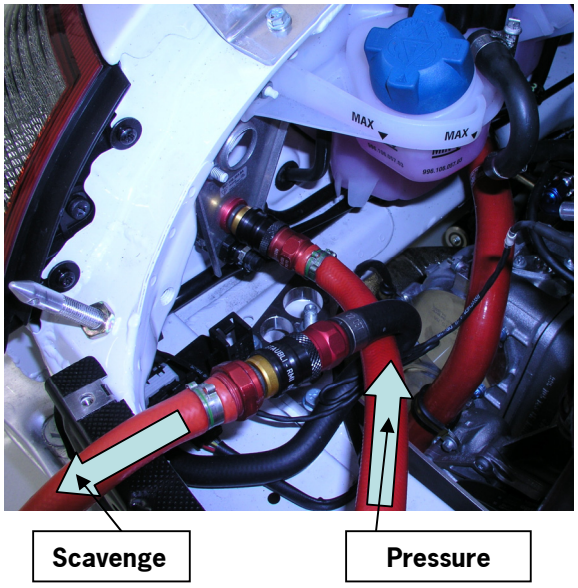
Filling the system should be carried out as follows:

- Disconnect the quick release fittings in the engine bay and connect the corresponding fittings with those of the filling system.



- Switch on the pump. The system will be filled.
- The device must run for ten minutes to guarantee that the system is correctly filled and bled
- Warm-up the engine (80°C) and, if required, fill the reservoir to the maximum level with the filling device attached
- **The expansion tank cap must be closed throughout the entire procedure**

2.4.3.1. Filling the cooling system with engine at normal operating temperature:

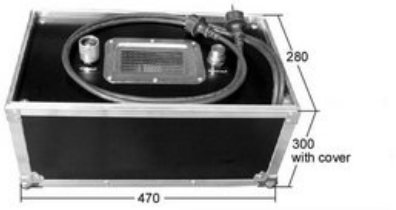
A special filling system to fill the engine water system when the engine is at normal operating temperature is also available from Sobek. This appliance consists of a fluid reservoir with a coupling. The reservoir is charged with a pressure of 2.5 – 3.0 bars.

The system filling procedure should be carried out as follows:

- Disconnect the quick release fitting in the engine bay and connect the filling system coupling to the corresponding end of the quick-release fitting.
- The system is filled via the expansion tank.

2.4.3.2. Heating of the filled cooling system

For the heating of an already filled system Sobek offer an extern heating unit.



2.5. Induction system

- Carbon fibre induction system equipped with restrictors and single throttle butterflies
- 2 x 28.6 mm restrictors

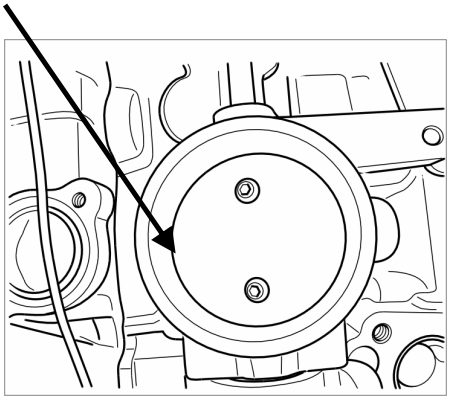
The restrictors fitted correspond with the FIA and ACO Technical Regulations for GT2 vehicles.

2.6. Throttle butterflies

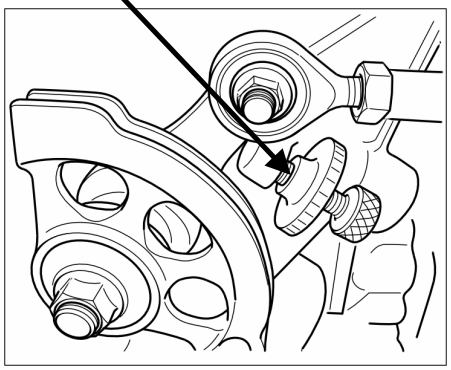
- 6 x single throttle butterflies

2.6.1. Basic throttle butterfly adjustment

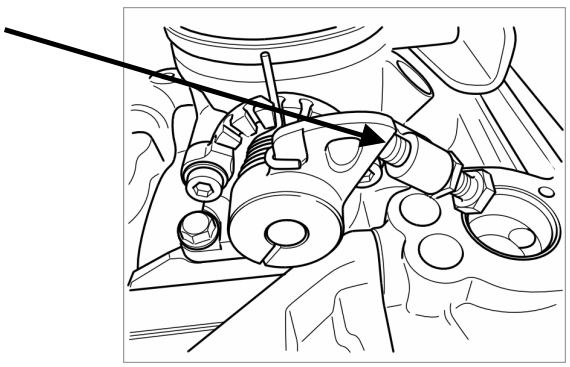
1. Connect the measurement device to both the throttle butterfly potentiometers, completely loosen the throttle butterfly rod and completely remove the idle screw.
2. Check the gap with a feeler gauge (0.05 mm in “induction stroke” and in direction of crankshaft rotation!) on the two centre cylinders (cylinder 2 & 5) and adjust with basic setting stop where necessary.



3. Loosen both potentiometers and adjust so that the difference between left and right is as small as possible (ideally both are identical). These values should be documented as they are required later.
4. Adjust the idle screw so that there is a gap of approximately 2-3 mm between the idle stop and the cam disc (this is important for the “working range” of the idle screw).



5. Now reconnect the right-hand rod (cylinder-bank 2) without play and tighten so that the value on the display does not change or, if at all, very slightly.
6. Completely loosen the idle-speed adjustment screw.
7. Reconnect the left-hand rod (cylinder-bank 1) and tighten so that the value for point 3 is achieved.
8. Check whether both throttle butterfly mechanisms touch the basic setting stop when the throttle rod is connected.
9. Check whether both banks run at even-speeds when different throttle angles are applied (1V, 2V, 3V, 4V). The deviation should not be greater than 0.05V.



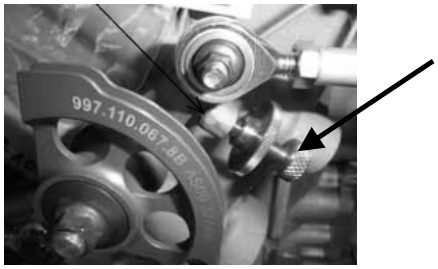
2.6.2. Throttle butterfly potentiometer calibration

The throttle butterfly potentiometer must always be recalibrated if:

- ECU was changed
- Engine was changed
- Throttle butterfly potentiometer was changed
- Implausible throttle butterfly position values are displayed

The following steps must be taken to calibrate the potentiometer:

1. Loosen the idle-speed adjustment screw



2. Disconnect throttle cable (see 7.1.1)
3. In Modas activate “Set Throttle closed” (potentiometer current wdk_u is saved in variable wdkP1_x)
4. Open the throttle butterfly manually till the throttle butterfly potentiometer current wdk_u = wdkP1_x + 3.4 V
5. In Modas activate “Set Throttle closed” (potentiometer current wdk_u is saved in variable wdkP2_x). The difference between wdkP2_x and wdkP1_x must always be 3.4 V
6. Reconnect throttle cable
7. Tighten idle-speed adjuster screw till the throttle butterfly value 0.5 - 0.8 % is displayed (engine idle speed: 2000 +/- 200 rpm)

2.6.3. Full throttle adjustment

Adjust the throttle pedal stop-screw so that full-throttle equals 100 % (wdkba_w)

Attention: Only the adjustment screw under the throttle pedal should be used to set full throttle. It is essential at full throttle, i.e. when the throttle pedal is touching the stop, that there is sufficient play in the throttle cable on the engine and that the throttle cable movement is limited by the adjuster screw and NOT by the cable.

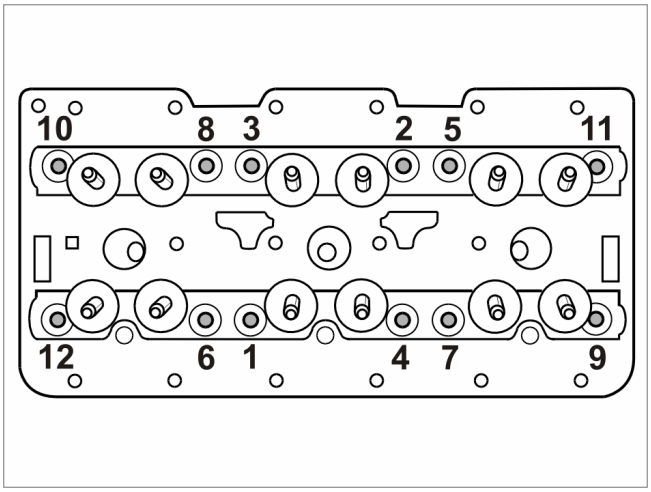
2.7. Working on the engine

2.7.1. Mounting the cylinder head

The 911 GT3 RSR cylinder head is based on the GT3 RS version and was specially modified for motorsport use.

The following procedure should be adhered to when mounting the cylinder head:

1. Lightly oil the threads and mating faces
2. Tighten the bolts initially to 30 Nm in the following sequence, and then wait 15 minutes



3. Completely loosen the bolts in the reverse sequence
4. Initially tighten the bolts to 20 Nm, before finally tightening to 120° torque angle

2.7.2. Connecting-rod bolt mounting instructions

1. Thoroughly clean the mating faces, bolt threads and the tapped bores with cleaning grade petrol and nylon brush
2. Smear PLB 05 grease on the bolt threads and mating faces

Tightening procedure:

3. Tighten both bolts to 25 Nm
4. Loosen one bolt and fit the bolt strain gauge

5. Tighten to the required elongation: + 0.160 – 0.005 mm
6. With a torque wrench check to see if a minimum torque of 55 – 90 Nm was achieved
7. Loosen the second bolt and follow the above mentioned sequence

The bolts can be used three times if the above mentioned tightening procedure is adhered to.

The connecting rods have a coated surface. Care must be taken that no visible damage occurs to the connecting rod surface when dismantling and assembling the engine.

DO NOT polish the connecting rods.

2.7.3. Valve clearance

The valve clearance is measured between the cam follower and the cam lobe heel when the engine is cold. The valve clearances should be checked, and adjusted if necessary, after the engine has run for approximately 300 km.

Inlet valve clearance [mm]	0.20 – 0.22
Exhaust valve clearance [mm]	0.20 – 0.22

2.7.4. Valve spring adjustment

The valve springs are set based on spring travel. The setting is the same for inlet and exhaust valves.

The following procedure must be adhered to:

1. Compress the complete spring assembly (outer and inner spring and upper and lower valve spring seats) till coil-bound with a spring balance, before reducing the stack height slightly (0.7 – 1.0 mm)
2. Record the spring stack height (seat to upper edge of spring seat)

3. Add the valve-lift to the measurement resulting from the procedure described above. The resulting value is the fitted spring stack height
4. Fit the valve and upper spring seat to the cylinder head, close the valve by pulling the spring platform
5. Measure the distance between the upper edge of the spring seat and the valve spring seat
6. Compensate for the difference between the calculated measurement and fitted-spring-length with shims during assembly

2.7.5. Pistons

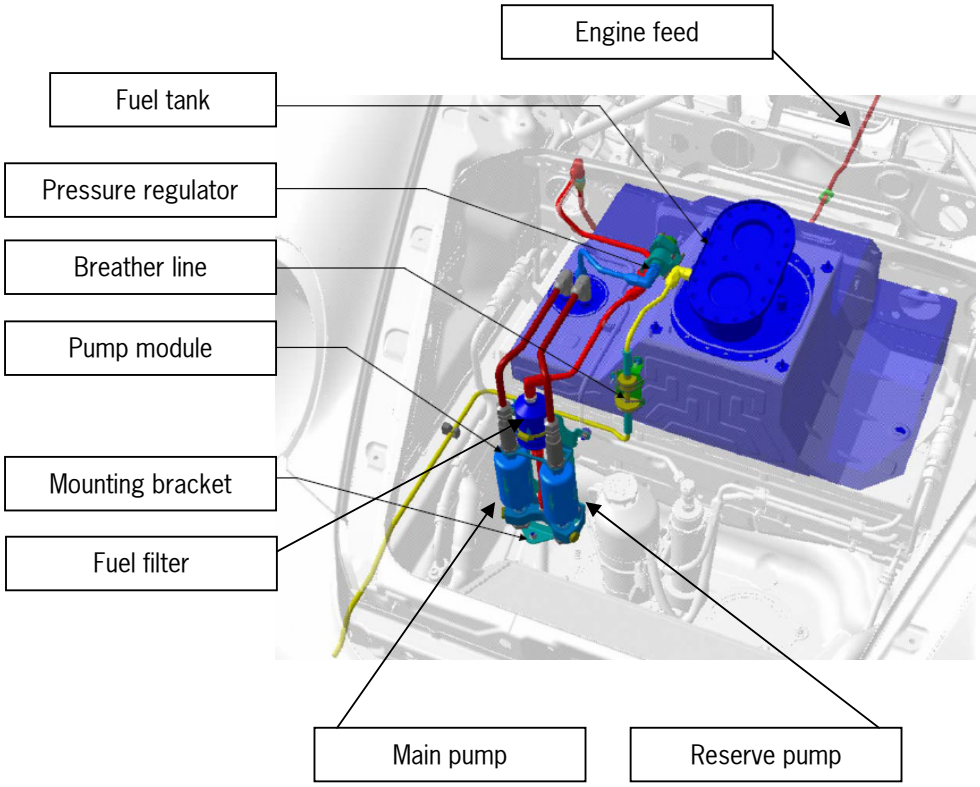
- The light-alloy pistons have a diameter of 102.7 mm
- The piston crown is cooled by sprayed oil
- The difference in weight between the individual piston / connecting rod units must not exceed 5 g

2.8. Engine component tightening torques

Component	Bolt dimensions	Tightening torque [Nm]
Crankshaft and crankcase		
Connecting rod	M9	see 2.7.2
Oil pump	M8	23
Bolt / nut crankcase	M8	23
V-belt pulley to crankshaft	M14 x 1.5	170
Plug screw for pressure release valve	M18 x 1.5	40
Oil drain bolt, crankcase	M20 x 1.5	50
Water drain bolt, cylinders 1-3	M10 x 1	10
Water drain bolt, cylinders 4-6	M16 x 1.5	10
Flywheel	M10	90
Cylinder head		
Cylinder head bolt	M10	see 2.7.1
Camshaft housing		
Camshaft housing on cylinder head	M8	Initial torque: 23 Final torque: 28
Anti-knock sensor	M8	23
Spark plugs	M12 x 1.25	20
Spark plugs should only be tightened a maximum of five times		
Camshaft wheel on camshaft	M12 x 1.5	30 + 90°
Timing chain case to crankcase	M8	23
Valve cover to camshaft housing	M6	9.7
Timing chain-case cover	M6	13
Ancillary components		
Alternator-belt pulley on alternator		55
Exhaust manifold to cylinder head		23
Lambda sensor	M18 x 1.5	50
Clutch to flywheel	M8 x 45	33

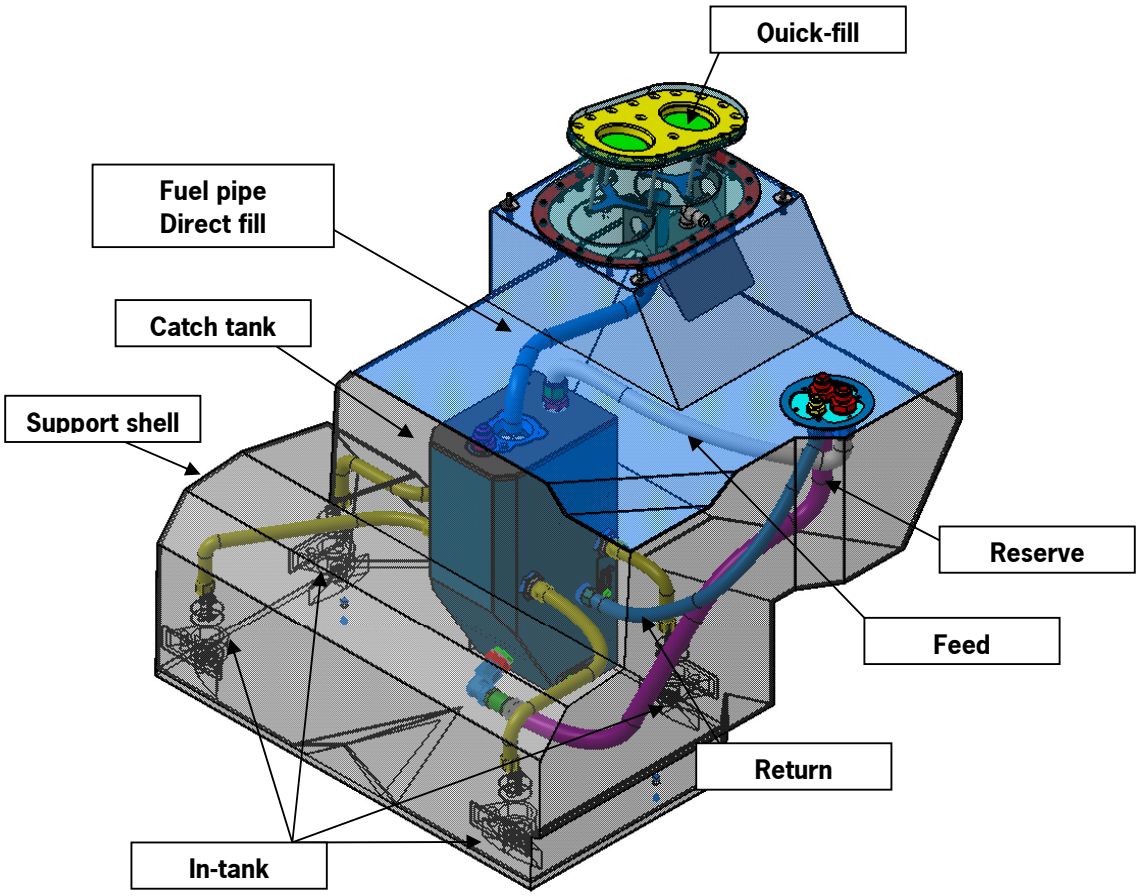
3. Fuel and exhaust system

3.1. Fuel system



- No-return fuel system
- FT3 safety fuel cell
- System volume: 93 l
- Integrated 6 litre catch tank (option: 10 litre)
- 4 in-tank pumps
- Vane type main and reserve pumps
- Fuel pressure regulator (5 bar) mounted to tank

3.2. Fuel tank



Attention: The fuel tank volume must be measured and adjusted before the first competition to ensure that the capacity does not exceed that stated by the relevant regulations.

Both the main and reserve fuel pumps are of the electrical vane type.

The fuel filter is located in the front luggage compartment and should be replaced after approximately every 24 hours of use. A scavenge filter element is mounted before the pump which should be cleaned after every race. The fuel system can be drained from the quick release coupling mounted on the left hand side of the engine bay.

Attention: The fuel pumps should not be activated under any circumstances if tank-engine quick release couplings are disconnected. Fuel pressure peaks in the system can cause leakage, and in the worst case the system pressure can exceed the burst pressure of the fuel filter.

3.2.1. Fuel

Only fuel supplied by the race organisers or regular pump fuel should be used. Fuel with up to 10 – 15 % Ethanol (E10) can be used. Additives or cleansing agents can damage the fuel cell.

DO NOT drill holes in the area of the fuel cell.

DO NOT use sharp objects when removing the fuel cell from the car

3.2.2. Reserve pumps

A reserve fuel pump is fitted as standard and is activated from a switch mounted on the dashboard. A warning lamp in the push button is illuminated when the reserve pump is running.

3.2.3. Main and in-tank pumps

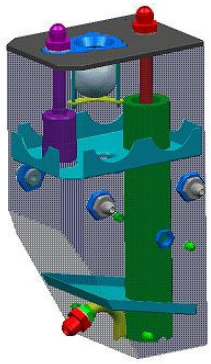
A switch mounted on the dashboard can be used to switch between the various main and in-tank pump modes:

- Service: Normal operation
- Middle position: Fuel pumps off
- In-tank service: Only the in-tank pumps are in operation

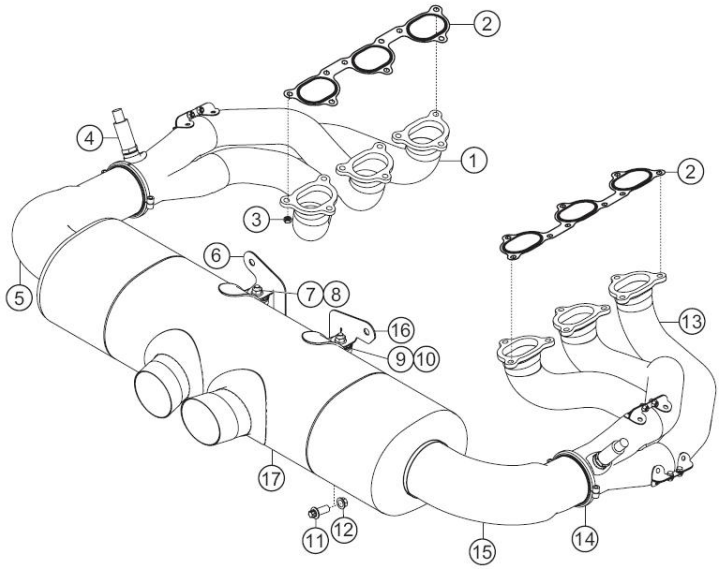
3.2.4. Catch tank

The catch tank fitted as standard has a volume of 6 litres. For long circuits such as Le Mans an optional catch tank is available with a capacity of 10 litres (double tank design).

Via an optional suction pipe the effective reserve volume can be adjusted to different tracks.



3.3. Exhaust system



4. Gearbox

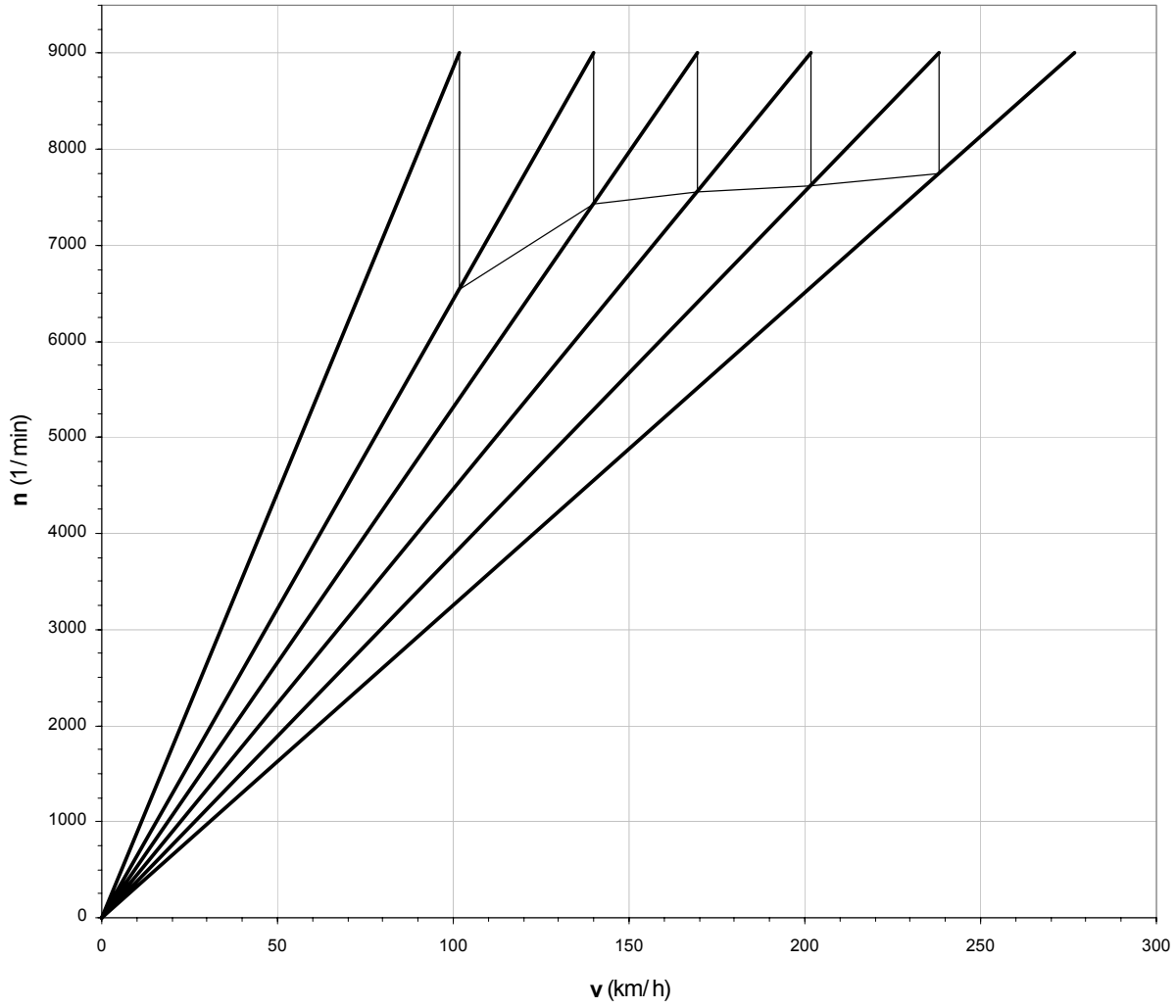
The six-speed sequential gearbox fitted to the GT3 RSR is fitted with a limited slip differential, an oil filter and a water / oil heat-exchanger for cooling purposes. All gear ratio pairs can be changed individually to suit driver preference, engine and the circuit characteristics. The gear pairs are uniquely matched and should never be mixed. If one gear is damaged the gear pair should be replaced.

4.1. Gearbox technical data

Gearbox type		G 97/70
Design		Sequential
Number of gears		6
Standard gear ratios *		
Drop Gear	25/32	1.28
Crown wheel & pinion	9/26	2.89
1st gear	13/41	3.15
2nd gear	17/39	2.29
3rd gear	19/36	1.89
4th gear	22/35	1.59
5th gear	23/31	1.35
6th gear	25/29	1.16
Lubrication		Gearbox mounted oil pump Oil – water heat-exchanger
Lubricant		Mobil 'Mobilube' SHC
Oil capacity after newly build		4.0 litre
Limited slip differential		
Locking value, drive		45 % (dynamic)
Locking value, overrun		65 % (dynamic)

** If no gear ratios specified by customer*

4.2. Gear ratio diagram



4.3. Gear ratios available

1st gear		2nd gear		3rd gear		4th gear		5th gear		6th gear	
13/42	3.23	**15/41**	2.73								
		15/39	2.60								
		16/39	2.44								
13/41	3.15	**15/39**	2.60								
		17/40	2.35								
		17/39	2.29								
		18/39	2.17								
				17/38	2.24						
				18/39	2.17						
				18/38	2.11						
				18/37	2.06						
				18/36	2.00						
				19/37	1.95						
				19/36	1.89						
				20/37	1.85	**20/37**	1.85				
				20/36	1.80	**20/36**	1.80				
				20/35	1.75	**20/35**	1.75				
						20/34	1.70				
						22/36	1.64				
						22/35	1.59				
						23/36	1.57				
						23/35	1.52				
						23/34	1.48				
						20/29	1.45				
								24/34	1.42		
								25/35	1.40		
								24/33	1.38		
								23/31	1.35		
								25/33	1.32		
								24/31	1.29		
								26/33	1.27		
										24/30	1.25
										27/33	1.22
										26/31	1.19
										25/29	1.16
										30/34	1.13
										26/29	1.12
										31/34	1.10
										26/28	1,08
										31/33	1.06

The maximum operation time of 12 hrs for the 3rd gear 18/37 must not be exceeded.

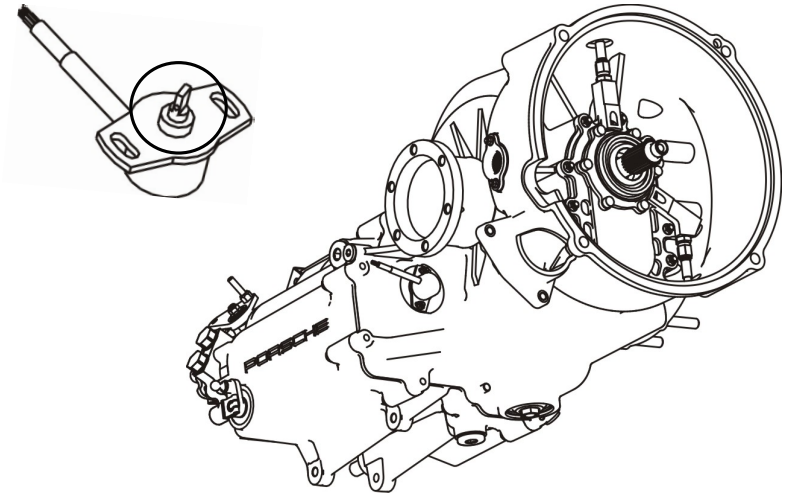
4.4. Gear position recognition

To determine the gear selected electronically a potentiometer, in which a defined current drops subject to the gear selected, is mounted to the gearbox. The gear recognition is required for the power interruption when shifting gear.

4.4.1. Gearbox potentiometer calibration

The gear position sensor must be recalibrated after repairs are carried out on the gearbox or if the gear ratios are changed.

- Turn on the ignition and switch to the "Warm up Modus" in the MoTeC display
- Select 6th gear. Turn the wheels to ensure that 6th gear is correctly engaged
- The value in the display must be 4.75 V (refer to Modas handbook)
- 6th gear must shown in the display



4.5. Differential

The limited-slip differential has a locking torque of 45 % / 65 % (power / overrun) (dynamic locking value).

The differential is checked by means of a friction test in which the preload and wear of the clutch disc plates are determined.

4.6. Clutch

The GT3 RSR is equipped with a three-plate 5½ inch carbon-fibre clutch

Attention: The carbon fibre clutch is specially designed for motorsport use. To prevent excessive wear or overheating, the clutch should not be slipped when driving (manoeuvring or during unloading and loading)

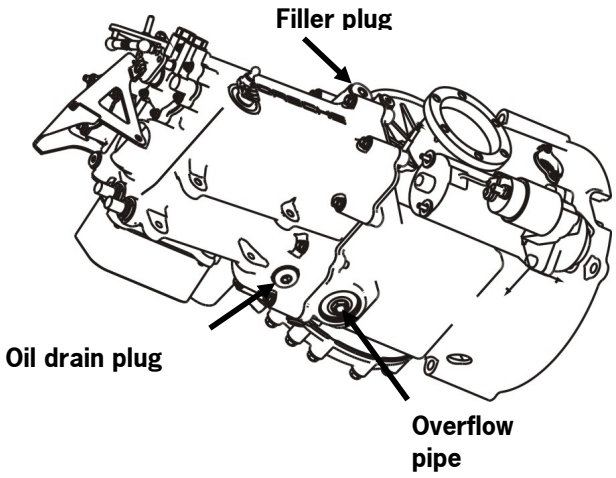
Due to an optimised central release unit sealing the 2009 model is not fitted with a 0.2 bar minimum pressure valve.

4.7. Working on the gearbox

The dismantling, assembly and maintenance of the gearbox is described in this section. This gives you the possibility to replace damaged or worn parts. In the event of more comprehensive damage, which necessitates the replacement of gearbox housings, we strongly recommend that this is undertaken by Porsche Motorsport. Complex measurement and adjustment, which could not be included in these instructions, are necessary to guarantee that the gearbox works perfectly.

4.7.1. Oil capacity

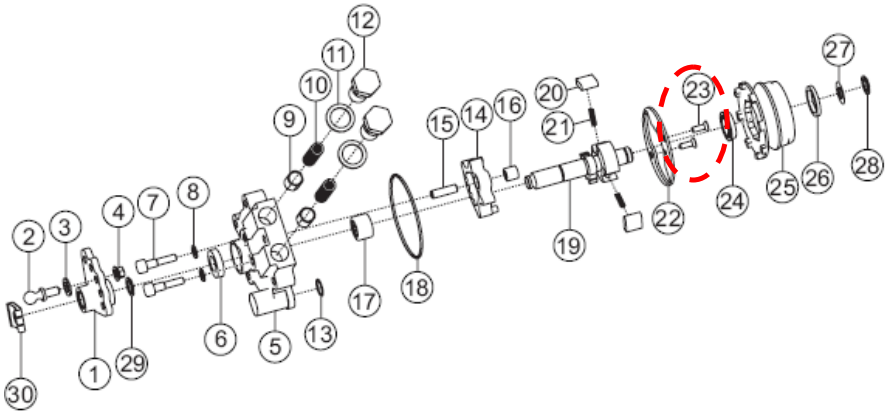
- Open the overflow pipe on the lower side of the gearbox (M6 socket cap screw)
- Add Mobilube SHC through the oil fill opening till the oil overflows from the above mentioned tube (approx. 3 litres for a newly build gearbox)
- Close the oil overflow pipe and add 1.0 litre of oil



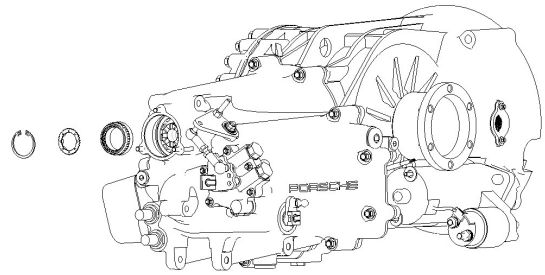
Porsche Motorsport recommends the use of Mobil Mobilube SHC.

4.7.2. Shift module

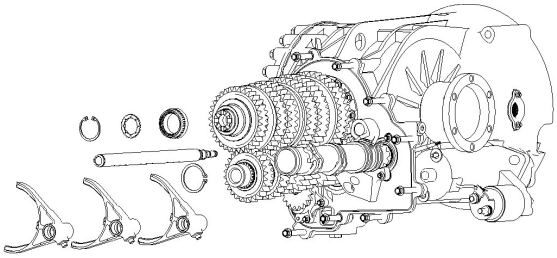
While assembling / disassembling the shift module it is important that the countersunk screws M4 x 12 are used with Loctite 270.



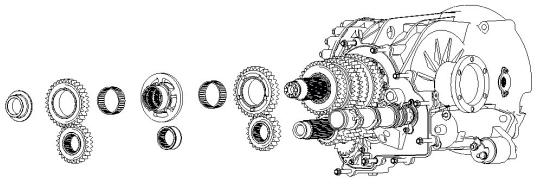
4.7.3. Changing gear ratios



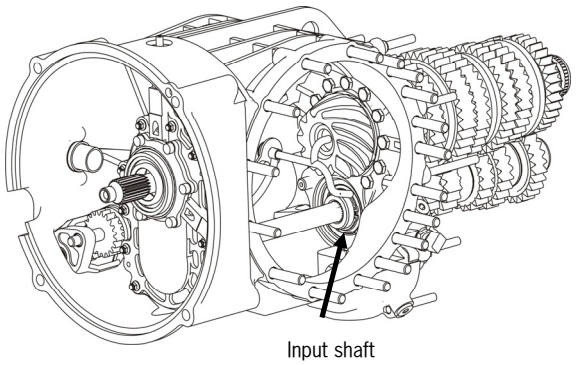
- Lock the gearbox
- Open closure plate on gear ratio housing
- Remove circlip from the M32 x 1.25 nut
- Remove anti-rotational safety
- Loosen M32 x 1.25 nut
- Completely remove gear ratio housing



- Extract shift rod
- Remove shift forks
- Remove circlip from input shaft
- Remove M 32x1.25 nut from pinion shaft



- Remove gear ratios, bushes, needle-roller bearings, hubs, dog-rings and spacer bushes.



Input shaft circlip

- To change the 1st and 2nd gear shaft remove the differential
- Remove reverse-gear shaft support
- Remove oil pump drive gear
- Remove 35x1.5 circlip from input shaft (differential side)

Ensure that the washer under the circlip (part of bearing inner race) is seated correctly when fitting the input shaft. Ensure that the marking on the gears on the input shaft (fixed gears) face to the outside.

4.7.4. Mounting the clutch

The following points should be observed when mounting the clutch:

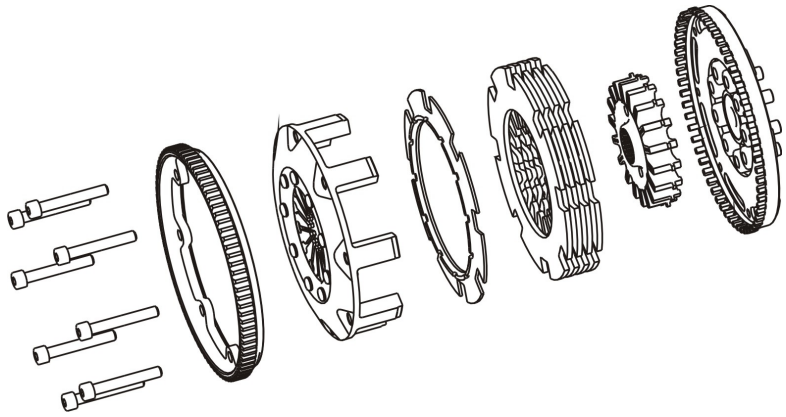
- Place the pressure plate into the cage. The flat side of the pressure plate is marked with an arrow; this must be positioned to the left-hand side of the cage foot close to the "Sachs Race Engineering" inscription (see assembly drawing).
- The intermediate plates and drive plates are marked with notches on the outer and/or inner diameters. The intermediate plates must lie on the left-hand side of the cage-foot next to the inscription "Sachs Race Engineering" (see assembly drawing).
- Fit the intermediate and drive plates alternatively in the housing, whereby a notched plate is fitted each time (see assembly drawing).
- Please ensure that the hub is fitted in the correct position between the plates (see assembly drawing)

Attention: The clutch plates should be refitted in the original sequence and orientation. Please observe the markings on the edges.

The clutch hub must have at least 0.25 mm axial float. This dimension is of particular importance before the clutch reaches its maximum wear.

No greasy or oily substances should contaminate the clutch plates.

The splined section of the gearbox input shaft must mesh over the entire length of the drive hub. The gearbox input shaft bearing-journal must be smeared lightly with copper grease (Porsche part number 000.043.004.00) before assembly.



4.7.4.1. Release bearing

Under no circumstances whatsoever must gearbox come into contact with the clutch release bearing seal otherwise the seal can swell which, in the worst case, can result in the seal not functioning correctly.

Also, when handling the seal both hands and the working environment must be clean and free of residual oil (this also applies to engine oil and other oils).

According to the manufacturer the seal is only compatible with hydraulic fluids of specification DOT4 and DOT5.

4.7.5. Gearbox maintenance

The following work should be carried out regularly:

- Check gear ratio teeth, dogs and dog-rings
- Check the shift collars
- Check the gear hub and gear roller bearings for signs of wear and pitting
- Check the oil for signs of metallic debris

The following work should be carried out after a total running time of approximately 30 hours:

- Check the crown wheel and pinion for pitting
- Replace the pinion bearing (4-point bearing)
- Replace the oil filter
- Replace the shift cable

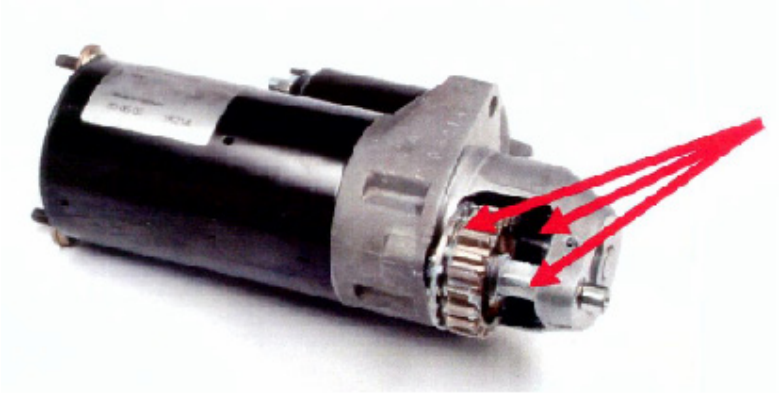
4.7.5.1. Starter motor maintenance

The starter motor maintenance includes the following work:

After every race:

Remove clutch dust and other dirt from the starter pinion, the starter shaft and intermediate shaft.

After cleaning the starter pinion, starter shaft and intermediate shaft thoroughly lubricate with Bosch grease (available from Bosch Motorsport order number: 5 994 420 005).



Every 6000 km:

After every 6000 km we recommend that the starter motor is sent to Bosch Motorsport for a general overhaul.

Bosch Engineering GmbH Motorsport
An der Bracke 9
D - 71706 Markgröningen
Tel.: 0711 811 3981
www.bosch-motorsport.com

4.8. Gearbox component tightening torques

Component	Bolt dimensions	Tightening torque [Nm]
Gearbox closure plate	M6	9.7
Gear ratio housing	M8	25
Pinion shaft nut	M32 x 1.25	180
Differential closure plate	M10	55
Reverse-gear shaft support	M6	9.7
	M8	25
	M8 x 35 plus Loctite 243	25
Joint flange	M10	45
Retaining clamp 4-point bearing	M8 plus Loctite 270	40
	Always use new Simmonds nuts when reassembling	
Oil pump housing	M6	9.7
	Always use new Simmonds nuts when reassembling	
Gearbox mount on gearbox	M8	30

5. Suspension

Both the front and rear suspension have been modified to suit the demands of competition and to enable the accurate and easy adjustment of camber, wheel alignment, ride height, spring rate and damper rates.

The front suspension is of the independent McPherson strut type with aluminium wishbones and the rear suspension is multi-link with 'LSA – System' (light, stable, agile).

All the suspension links are fitted with spherical bearings to reduce play and improve steering precision. Dampers, adjustable in both bump and rebound, are fitted as are adjustable anti-roll bars and coil springs to further improve the handling and enable the car to be tuned to suit conditions. The adjustability of these components enables the car to be set-up to suit most tracks and weather conditions.

5.1. Front suspension

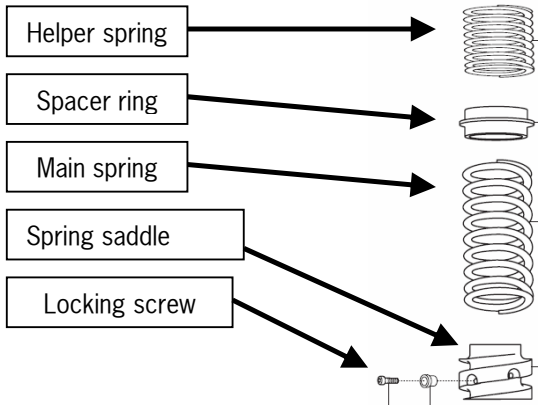
- McPherson strut suspension
- Adjustable main spring (via spring saddle)
- Adjustable 4-way dampers
- Adjustable anti-roll bar

5.1.1. Front springs

The front coil spring has a three-step adjustment range, the corresponding spring rates are listed in the table below:

Colour	Part number	Pos. 1	Pos. 2	Pos. 3
Blue-purple	997.343.531.9B	190 N/mm	210 N/mm	230 N/mm
Gold-yellow (standard)	997.343.531.9D	220 N/mm	240 N/mm	260 N/mm
Grey	997.343.531.9E	240 N/mm	265 N/mm	290 N/mm

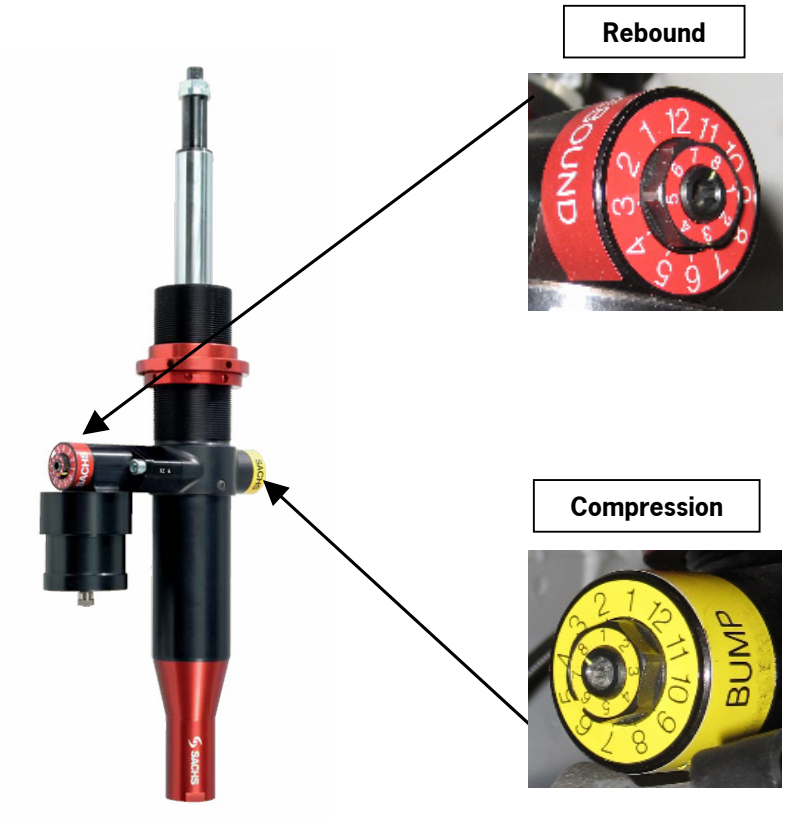
The spring is twisted into or out of the spring saddle in the individual positions to achieve each spring rate. The maximum spring stiffness is achieved by screwing the spring completely into the spring saddle.



Changing the spring rate (spring stiffness) directly affects the vehicle ride height as well as the toe. The ride height must be adjusted by four revolutions to compensate for one step in spring rate change. For example, when the spring rate is softened by one step the ride height must be lowered four turns to compensate. If the spring rate is stiffened the ride height must be raised by four turns. Changing the ride height about 1 mm changes the toe about 0.24`. The ratio of the front spring is 0.869. The thread pitch of the spring saddle is 1.5.

5.1.2. Front damper

A 4-way damper (Through Rod) adjustable in bump and rebound (compression / droop) is fitted to the front axle. The bump and rebound damping forces are adjustable in both the low and high-speed piston range. Both softer and harder are adjusted on the valve block.



5.1.2.1. Rebound

The rebound is adjustable in both the high and low speed range. The low-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

The high-speed adjustment range has 12 positions (1 = less damping forces, 12 = higher damping forces).

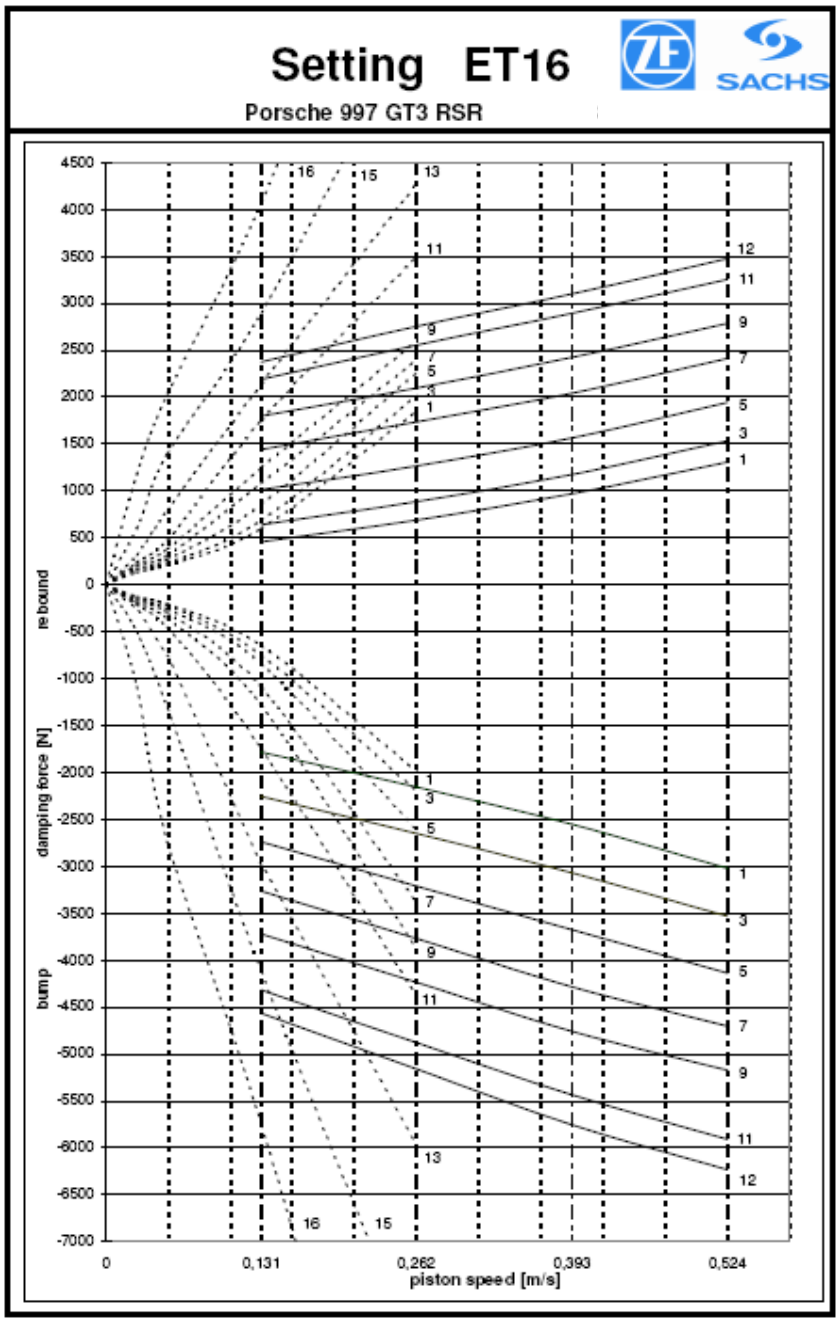
5.1.2.2. Bump

The bump is adjustable in both the high and low speed range. The low-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

The high-speed adjustment range has 12 positions (1 = less damping forces, 12 = higher damping forces).

Attention:
When changing the existing dampers for those of another manufacturer, it is necessary to ensure that the recommended ride height and spring travel values are retained. Porsche AG does not accept any liability for any subsequent damage to the suspension or related components.

5.1.2.3. Front damping force diagram

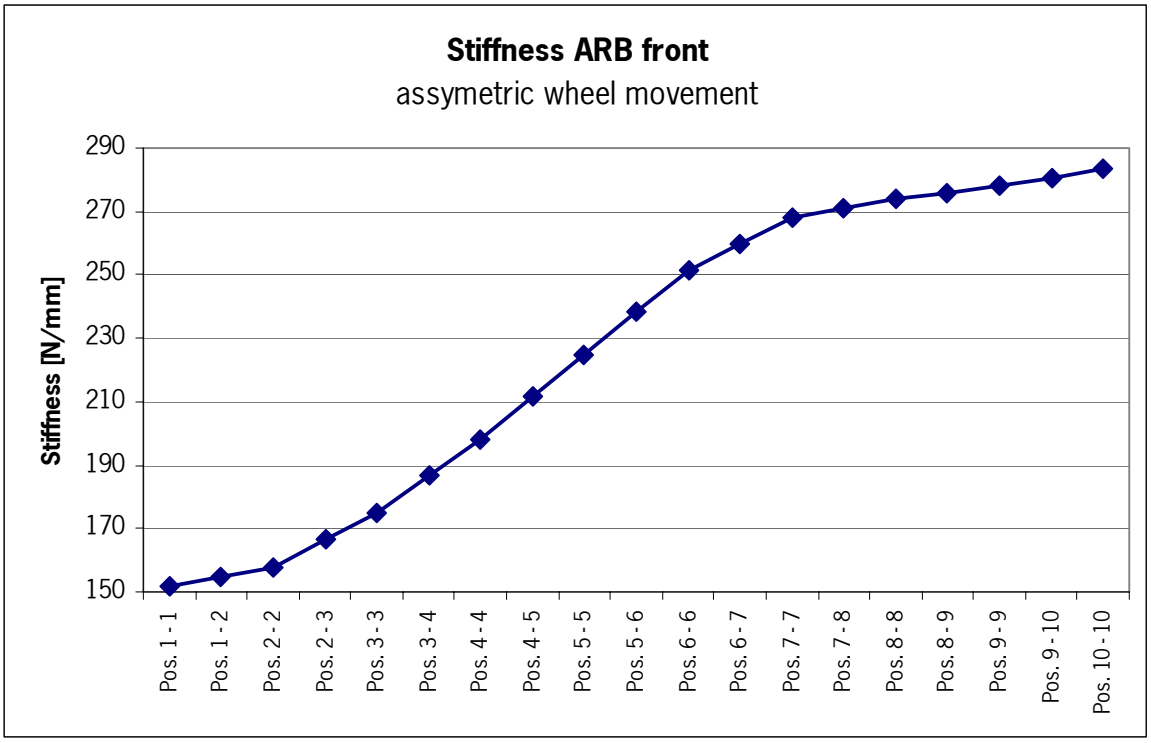


5.1.3. Front anti-roll bar

The front anti-roll bar has a 10 position adjustment range on both sides, each position results in a 10° change in angle of the blade. The maximum stiffness of the anti-roll bar is achieved when the blade is aligned parallel to the anti-roll bar link. The minimum stiffness is achieved when the blade is aligned at 90° to the anti-roll bar link.

Always use suitable tools to rotate the blade as incorrect tools can cause damage. Notches or other damage can cause the blade to break.

In the following diagram the stiffness relative to non-parallel wheel movement and dependent on blade position is represented:



5.1.4. Steering system

The 911 GT3 RSR is fitted with a servo assisted rack and pinion steering system.

5.1.4.1. Steering system maintenance

System leak check:

With the engine idling, rotate and hold the steering wheel in the full lock position to ensure the greatest possible system pressure is achieved. Check all the lines, pipes and fittings for leakage. When implementing the test this level of system pressure should be held for an absolute maximum of ten seconds. If it is necessary to repeat this procedure, a pause of at least 10 seconds should be made between tests.
The electric servo pump is located in the luggage compartment. The fluid reservoir is mounted directly on the pump.

The fluid level is checked with the steering in the straight-ahead position and with the engine running at idle speed.

Attention: The rack and pinion steering and servo pump should, under no circumstances be repaired or dismantled. Damage to the power steering system can occur through a lack of oil circulating in the hydraulic system. Due to the high system pressure even a small loss of fluid through leakage can damage the servo pump.

Bleeding the steering system:

This procedure is best carried out by two people.

To fill the complete steering system after fitting a new steering rack, oil lines or because of excessive hydraulic fluid loss, start and then immediately stop the engine several times. This procedure causes the fluid level in the reservoir to sink rapidly, therefore ensure that the reservoir is refilled constantly with 'Pentosin' (000.043.206.56) as the engine runs. The reservoir must never be allowed to run dry during this procedure.

The electric hydraulic pump only operates when the engine is running. Fill the reservoir before starting the engine to bleed the system. Recheck the reservoir level immediately after the engine has started.

Rotate the steering wheel quickly and repeatedly from one lock to the other to allow air in the cylinders to escape. To prevent unnecessary system pressure spikes do not rotate the steering wheel against the stops with any more force than required.

Check the fluid level constantly during this procedure. If the oil level continues to sink, add "Pentosin" oil till the reservoir fluid level remains constant and no air bubbles surface in the reservoir when the steering wheel is turned back and forth.

Check the fluid level with the dipstick integrated into the reservoir top when the hydraulic pump is running.

5.2. Rear suspension

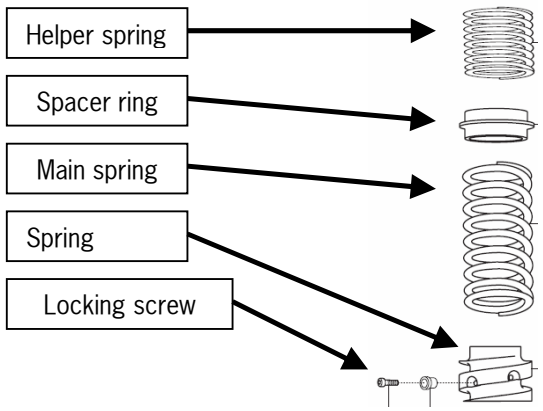
- Multi-link suspension
- Adjustable main spring (via spring saddle)
- Adjustable 4-way dampers
- Adjustable anti-roll bar

5.2.1. Rear springs

The rear coil spring has a four-step adjustment range, the corresponding spring rates are listed in the table below:

Colour	Part number	Pos. 1	Pos. 2	Pos. 3	Pos. 4
Green (standard)	997.333.531.9A	220 N/mm	240 N/mm	260 N/mm	280 N/mm
Nut brown	997.333.531.9C	250 N/mm	275 N/mm	295 N/mm	320 N/mm
Black (gloss)	997.333.531.9D	290 N/mm	310 N/mm	330 N/mm	350 N/mm

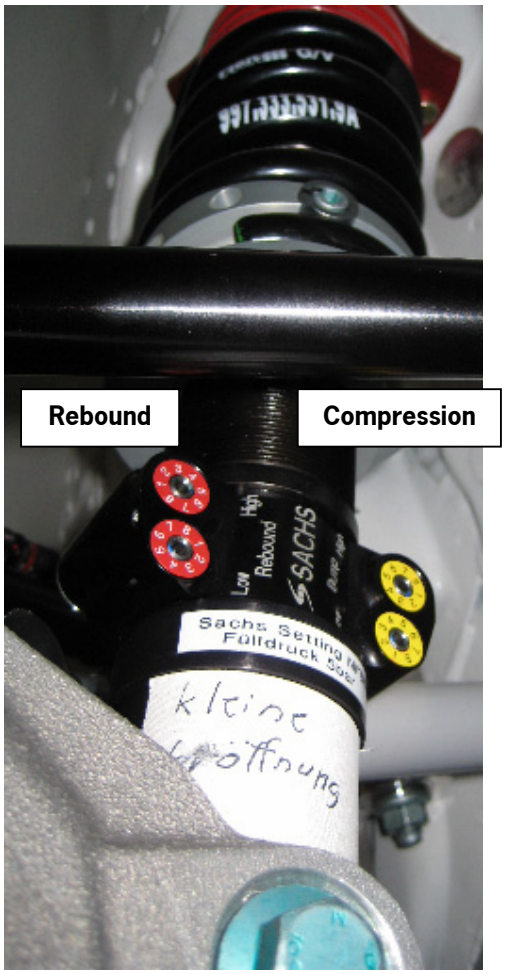
The spring is twisted into or out of the spring saddle in the individual positions to achieve each spring rate. The maximum spring stiffness is achieved by screwing the spring completely into the spring saddle.



Changing the spring rate (spring stiffness) directly affects the vehicle ride height as well as the toe. The ride height must be adjusted by four revolutions to compensate for one step in spring rate change. For example, when the spring rate is softened by one step the ride height must be lowered four turns to compensate. If the spring rate is stiffened the ride height must be raised by four turns. Changing the ride height about 1 mm changes the toe about 0.57`. The ratio of the front spring is 0.818. The thread pitch of the spring saddle is 1.5.

5.2.2. Rear damper

A 4-way damper (Through Rod) adjustable in bump and rebound (compression / droop) is fitted to the rear axle. The bump and rebound damping forces are adjustable in both the low and high-speed piston range. Both softer and harder are adjusted on the valve block.



Sachs offer a special tool for dismounting the rear damper. The part number for this tool is 001795000085.

5.2.2.1. Rebound

The rebound is adjustable in both the high and low speed range. The low-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

The high-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

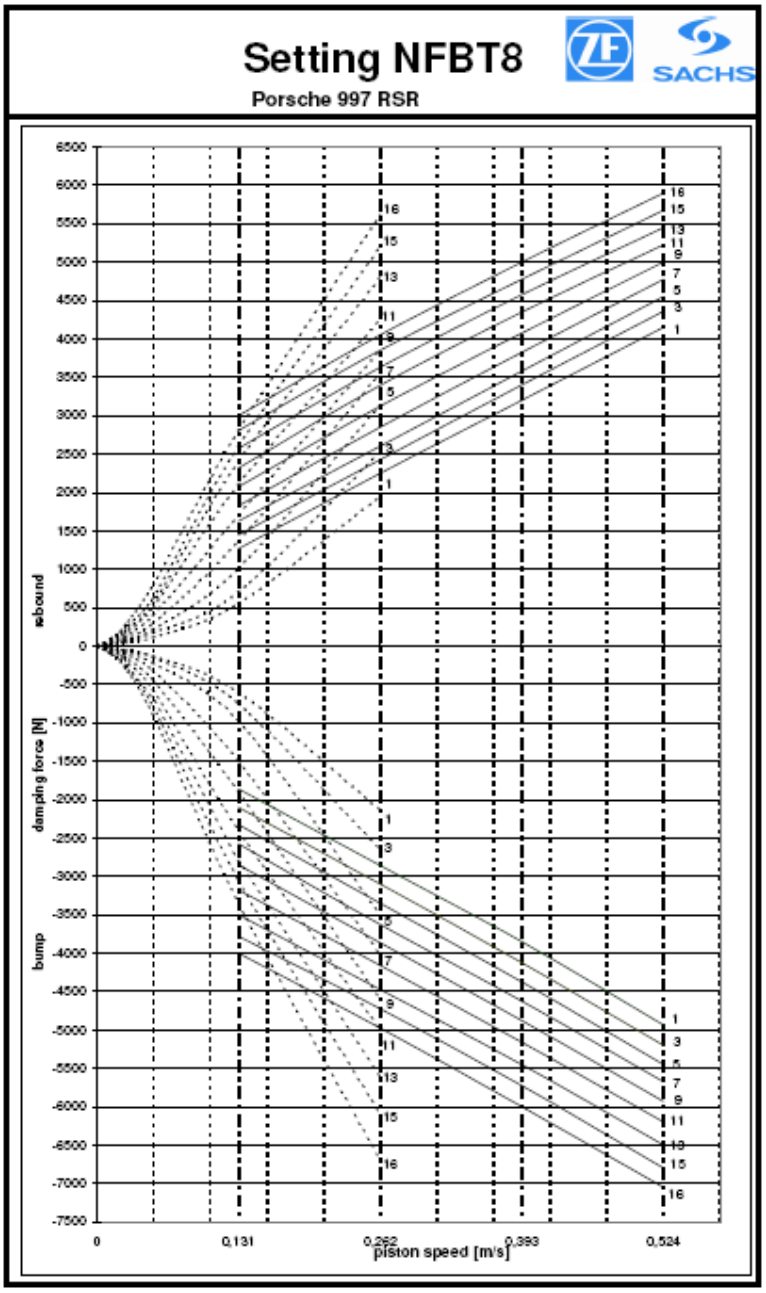
5.2.2.2. Bump

The bump is adjustable in both the high and low speed range. The low-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

The high-speed adjustment range has 16 positions (1 = less damping forces, 16 = higher damping forces).

Attention:
When changing the existing dampers for those of another manufacturer, it is necessary to ensure that the recommended ride height and spring travel values are retained. Porsche AG does not accept any liability for any subsequent damage to the suspension or related components.

5.2.2.3. Rear damping force diagram

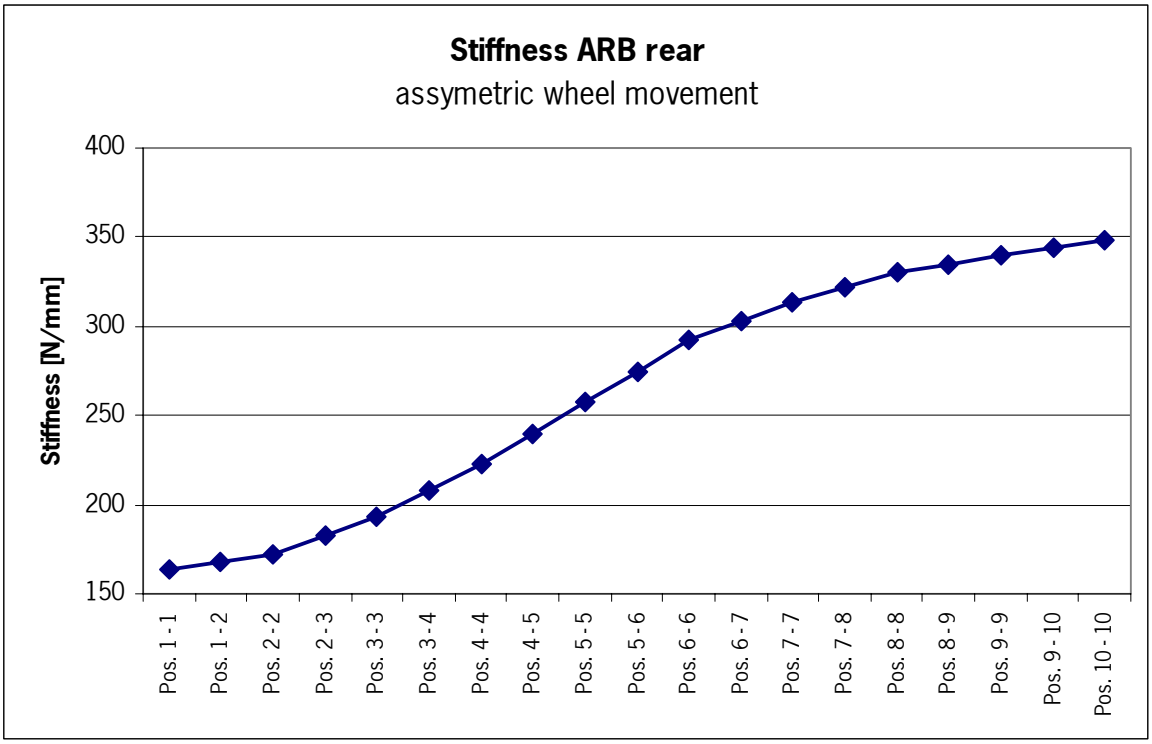


5.2.3. Rear anti-roll bar

The front anti-roll bar has a 10 position adjustment range on both sides, each position results in a 10° change in angle of the blade. The maximum stiffness of the anti-roll bar is achieved when the blade is aligned parallel to the anti-roll bar link. The minimum stiffness is achieved when the blade is aligned at 90° to the anti-roll bar link

Always use suitable tools to rotate the blade as incorrect tools can cause damage. Notches or other damage can cause the blade to break.

In the following diagram the stiffness relative to non-parallel wheel movement and dependent on blade position is represented:



5.2.4. Driveshafts

It is recommended that new cars and/or newly fitted driveshafts should be run-in for approximately 100km at a maximum speed of 200km/h at low torque.

Attention: Only use Optimoli HT1LF grease to repack the joints when servicing the driveshafts:

Grease quantity outer joint:	**90 g**
Grease quantity inner joint:	**100 g**
Porsche part number:	**000.043.110.01**

5.3. Basic wheel alignment

Note: In the event of an accident or any other damage occurring to the suspension every component, including those not directly affected, should be measured, checked for cracks and, where necessary, replaced (e.g. steering, wishbones, uprights, ball-joints, centre lock wheel nuts and all fasteners).

The wheel alignment should be carried out using an optical and/or electronic or mechanical suspension alignment device. The measurement procedure described in device the operating instructions should be followed.

Electronic suspension alignment devices can be purchased from the following company:

Beissbarth GmbH
Hanauer Straße 101
D-80993 München
Telephone: +49-(0)89-14901-0
Telefax: +49-(0)89-14901-285
www.beissbarth.com

A wheel alignment jig is available from Porsche Motorsport: Part number 997.450.351.90

The following points must be followed before alignment can begin:

- Set the front and rear tyre pressures to hot running pressure, if set-up wheels are used their dimensions must correspond with the tyre dimensions at the relevant tyre pressure
- Measure the wheel alignment, including camber, toe-in, ride height and corner weights with the fuel cell half full and the appropriate driver ballast placed in the driver's seat.
- Put the car on the corner-weight scales.
- The suspension spherical bearings and wheel bearing play must be checked (wheel bearing play cannot be adjusted) and replaced where necessary.
- Place all four wheels on the swivel plates.
- Lock the steering in the straight ahead position. Check that the steering wheel lock from left to right is equal when the steering wheel is in the straight ahead position.

5.3.1. Front axle

5.3.1.1. Ride height

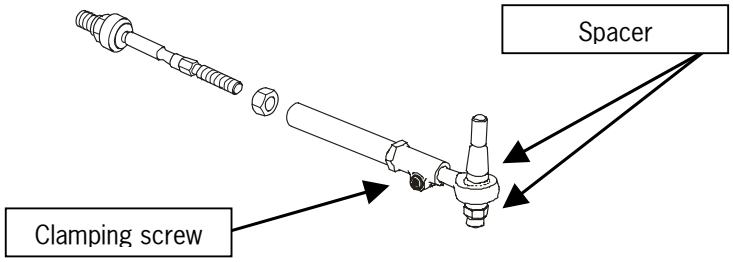
The car must be placed on a level surface (set-up platform) to check the ride height. The front and rear suspension should be loaded and unloaded (compressed) several times to allow the suspension to settle.

The front ride height is measured between the tyre contact patch area and the under floor in the centre of the front track. See table for basic settings.

The ride height is adjusted by rotating the spring platform.

5.3.1.2. Toe-rod

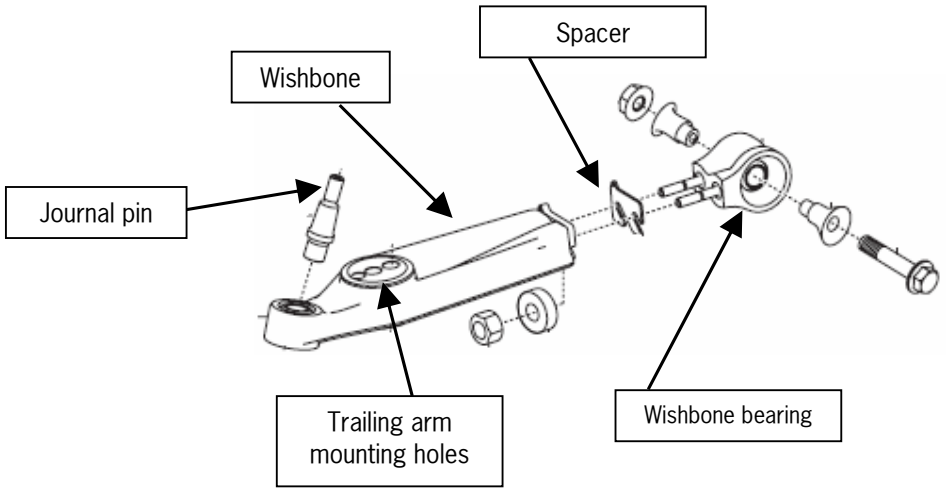
The toe-rod length can be set using the clamping screw.



In addition, the toe-rod mounting position on the upright can be changed in z-direction using spacers; in this case the bump steer characteristics are influenced. Porsche Motorsport provides a special tool to remove the trunnion pin: 997.450.349.9B

5.3.1.3. Wishbone

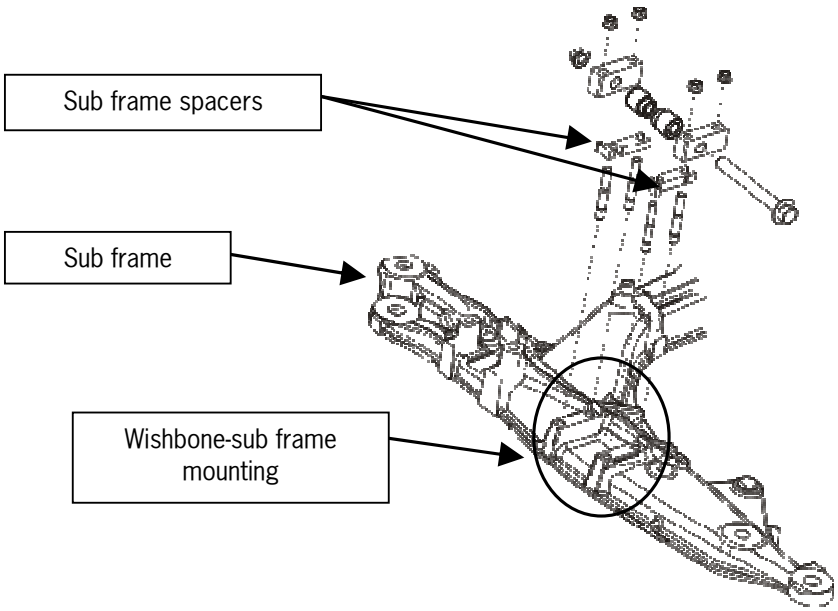
The front wishbone can be adjusted as follows:



- Spacers: The wishbone length can be adjusted using different spacers, a 1 mm adjustment in length equates to a camber change of approximately 3'.
- Trailing arm mounting hole: The mounting position of the trailing arm should not be changed (wheel clearance)
- Trunnion pin: Two trunnion pins of different lengths are available for the front wishbone
- Porsche Motorsport provides a special tool to remove the trunnion pin: 997.450.345.9B

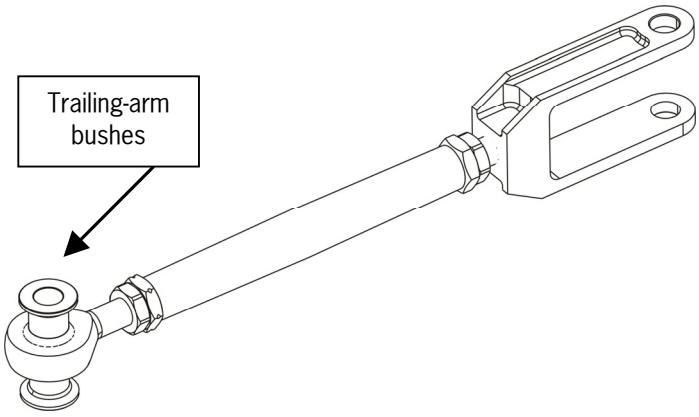
5.3.1.4. Sub frame

The wishbone mounting position on the sub frame can be adjusted in z-direction using different spacers:



5.3.1.5. Trailing arm

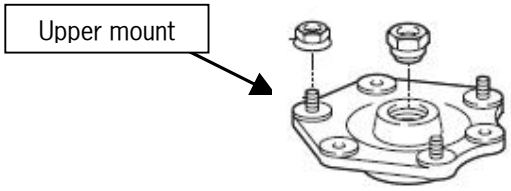
The front axle trailing-arm can be adjusted as follows:



- Trailing arm bushes: The trailing-arm mounting position on the sub frame in z-direction can be adjusted using various bushes
- The trailing-arm length can be adjusted using the threaded bar and locking nuts, adjusting the trailing-arm directly affects the wheelbase

5.3.1.6. Upper-mount

The upper-mount position can be adjusted by using the slots in the car body.



5.3.2. Rear axle

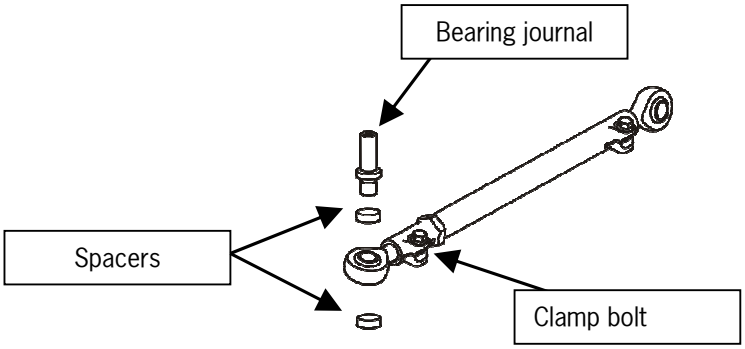
5.3.2.1. Ride height

The rear ride height is measured between the tyre contact patch area and the under floor in the centre of the rear track, the service hatch should not be used as measuring point for the ride height. See basic setting table for values.

Ride height adjustment is made by rotating the spring perch.

5.3.2.2. Toe-rod

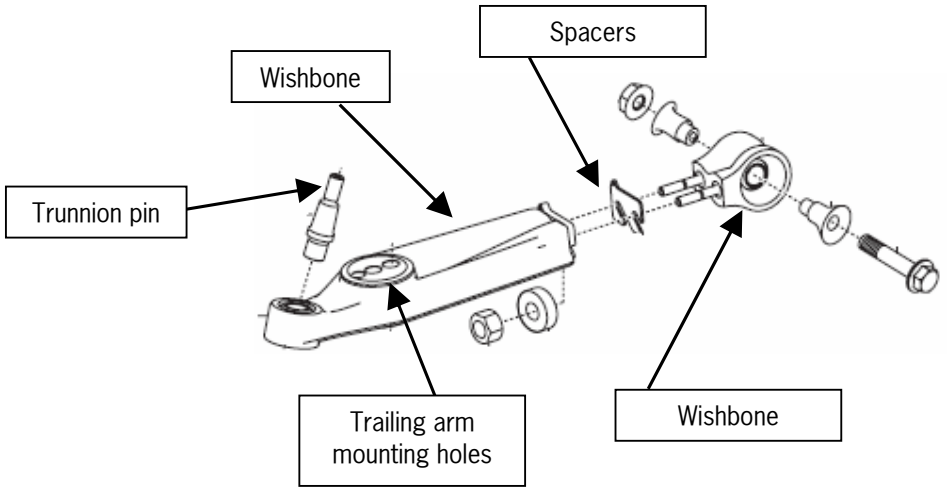
The length of the toe-rod can be adjusted using the clamp bolt.



In addition, the toe-rod mounting position on the upright in z-direction can be varied using spacers, the bump steer characteristics are influenced as a result. Porsche Motorsport provides a special tool to remove the trunnion pin: 997.450.349.9B

5.3.2.3. Lower wishbone

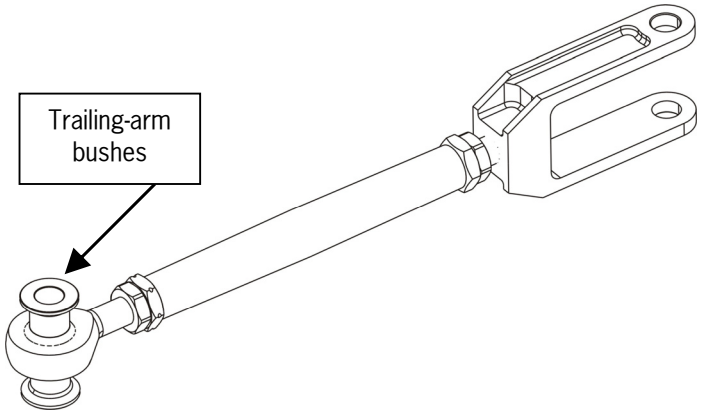
The rear lower-wishbone can be adjusted as follows:



- Spacers: The wishbone length can be adjusted using different spacers, a 1 mm adjustment in length equates to a camber change of approximately 10'.
- Trailing arm mounting hole: The mounting position of the trailing arm should not be changed (wheel clearance)
- Trunnion pin: Two trunnion pins of different lengths are available for the rear wishbone
- Porsche Motorsport provides a special tool to remove the trunnion pin: 997.450.345.9B

5.3.2.4. Trailing arm

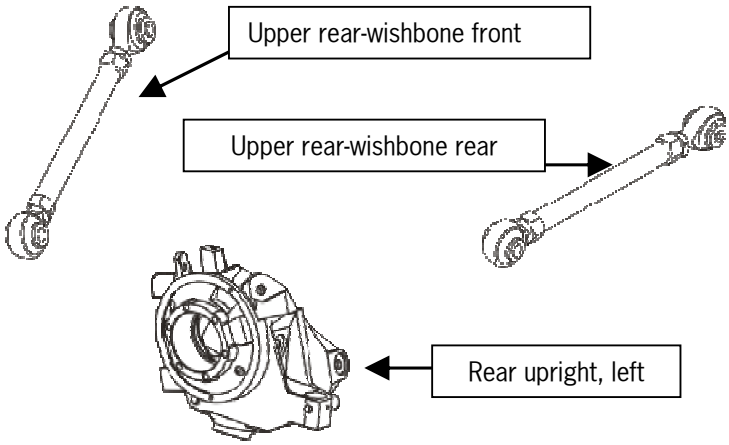
The rear axle trailing-arm can be adjusted as follows:



- Trailing arm bushes: The trailing-arm mounting position on the sub frame in z-direction can be adjusted using various bushes
- The trailing-arm length can be adjusted using the threaded bar and locking nuts, adjusting the trailing-arm directly affects the wheelbase

5.3.2.5. Upper wishbone

The upper wishbone length can be adjusted using the threaded bar and locking nuts (wheelbase changes!)



5.3.3. Summary of suspension geometry adjustment components

	Front axle	Part number	Rear axle	Part number
Lower wishbone				
+ Spacer [mm]	10	996.341.543.95	10	996.341.543.95
	7	996.341.543.93	7	996.341.543.93
	3	996.341.543.92	3	996.341.543.92
	2	996.341.543.91	2	996.341.543.91
	1	996.341.543.90	1	996.341.543.90
	0.8	996.341.543.98	0.8	996.341.543.98
	0.6	996.341.543.97	0.6	996.341.543.97
	0.3	996.341.543.96	0.3	996.341.543.96
+ Trunnion pin [mm]	72 (z=4)	997.341.413.9D	76 (z=0)	997.341.413.9E
	76 (z=0)	997.341.413.9E	80 (z=-4)	997.341.413.9F
Trailing arm				
+ Bush [mm] Adiustment: 10mm	28 8	997.331.567.9A 997.331.567.9E	28 8	997.331.567.9A 997.331.567.9E
Adiustment: 5mm	13 23	997.331.567.9B 997.331.567.9D	13 23	997.331.567.9B 997.331.567.9D
Adiustment: 0mm	18 18	997.331.567.9C 997.331.567.9C	18 18	997.331.567.9C 997.331.567.9C
Toe-rod				
+ Spacer [mm] (on trunnion pin)	6	996.347.235.91	6	996.347.235.91
	4	997.347.235.9B	4	997.347.235.9B
	2	997.347.235.9A	2	997.347.235.9A
Sub frame				
+ Spacer mounting wishbone [mm]	10	997.347.712.9A	–	–
	5	997.347.712.9B		
	2.5	997.347.712.9C		

5.3.4. Suspension set-up

The basic settings for the suspension are listed in the following table. These settings can be used as the basic set-up for the majority of race tracks.

Basic settings				
		Front axle left / right	**Rear axle left / right**	**Notes**
Ride height		60 mm	70 mm	
Camber		3° 40`	3°30`	
Toe		-5` / -5`	+15` / +15`	Single wheel toe
Main spring	Type	Gold yellow	Moss green	
	Position	1	3	1= soft 4=hard
Helper spring		40-60-30	60-60-50	
Bump stop		30 mm	25 mm	
Damper setting	Low speed bump	5	5	
	High speed bump	9	8	
	Low speed rebound	6	7	
	High speed rebound	8	7	
Anti-roll bar		3/3	4/4	
Toe-rod height		4 mm	8 mm	
Trailing arm length*		362 mm	372 mm	
Trailing arm position		z = -10 mm	z = 0 mm	
Sub frame spacer		7.5 mm	–	
ARB drop-link length		233 mm	160 mm	
Upper wishbone length*			Front 261 mm Rear 255 mm	

* to achieve 2369mm wheelbase

5.4. Suspension component tightening torques

Component	Bolt dimensions	Tightening torque [Nm]
Front axle		
Fuel cell guard on chassis	M12 x 1.5 x 50	100
Fuel cell guard on sub frame	M12 x 1.5 x 50	100
Sub frame on chassis, rear	M14 x 1.5 x 50	160
Wishbone to sub frame	M12 x 1.5 x 90	120
Wishbone on upright	M12	75
Trailing arm to chassis	M14 x 1.5 x 110	160
Trailing arm to wishbone	M14 x 1.5 x 75	160
Anti-roll bar on sub frame	M10	65
Drop link on anti-roll bar	M6	10
Thrust bearing on chassis	M8	33
Piston rod on thrust bearing		75
Spring platform lock nut		50
Support wishbone to subframe	M8	23
Stud bold support wishbone to subframe	M8 x 45	10
Front upright		
Wheel bearing cover x 6	M8 x 35	37
Brake shroud on upright	M6 x 16	10
Wheel-speed sensor	M6 x 16	10
Multi function coupling x 2	M6 x 30	10
Brake caliper to upright	M10	73
Wheel hub on upright	M22 x 1.5	470
Drive pegs on wheel hub	M8	37
Damper tube clamp	M12 x 1.5 x70	70
Wheel nut		500 + 25
Track rod on upright	M12 x 1.5	75
Anti-roll bar drop link on upright	M10	50
Steering		
Steering rack on sub frame	M10 x 45	70
Track rod on steering rack	M18 x 1.5	90
Universal joint on steering rack	M8 x 35	37
Steering column to frame, upper	M10 x 100	46
Steering wheel to column	M16 x 1.5	45
Steering column lateral support	M8 x 40	23
Carrier frame lateral support	M8	23
Oil line on steering rack	M10 x 20	23

Component	Bolt dimensions	Tightening torque [Nm]
Rear axle		
Stud on chassis, front	M12 x 1.5	46
Stud on chassis, centre	M12 x 1.5	46
Stud on chassis, rear	M12 x 1.5	46
Side part on chassis, front	M12 x 1.5	110
Side part on chassis, centre	M12 x 1.5	110
Side part on chassis, rear	M12 x 1.5	110
Trailing arm on wishbone	M14 x 1.5 x 75	160
Trailing arm on side part	M14 x 1.5 x 100	180
Wishbone to side part	M12 x 1.5 x 100	100
Trunnion on upright	M12 x 1.5	75
Trunnion on wishbone	M8	45
Wishbone on upright	M12 x 1.5	75
Control arm 1 on side part	M12 x 1.5 x 83	110
Control arm 2 on upright	M12 x 1.5	110
Control arm 2 on side part	M12 x 1.5 x 100	110
Control arm 3 on upright	M12 x 1.5 x 80	110
Cross brace on side part	M10 x 40	65
Sub frame on side part (upper)	M12 x 1.5 x 80	110
Sub frame on side part (lower)	M12 x 1.5 x 80	110
Diagonal brace on chassis	M10 x 40	65
Diagonal brace on subframe	M12	110
Piston rod on thrust bearing		75
Thrust bearing on chassis	M10	23
Damper strut to upright	M12 x 1.5 x 70	75
Rear upright		
Wheel bearing cover x 6	M8 x 35	37
Wheel speed sensor	M6 x 16	10
Multi function coupling x 2	M6 x 30	10
Multi-line bracket on upright	M6	10
Brake shroud on upright	M6 x 16	10
Wheel nut		500 + 25
Driveshaft	M22 x 1,5	470
Drive pegs on wheel hub	M8	37
Driveshafts		
Driveshaft to flange	M10 x 50	81
Centre nut on driveshaft	M22 x 1.5	470

5.5. Sachs damper service information

Sachs recommends that the dampers are serviced after approximately 5,000 km or once per race season. For this purpose and also for repair or changing pipes the components can be sent directly to Sachs Race Engineering or to a Sachs service partner. New dampers can only be purchased from Porsche Motorsport.

Service partners for Germany:

ZF Sachs Race Engineering GmbH
Ernst-Sachs-Straße 62
97424 Schweinfurt
Phone +49 9721 983258
Fax: +49 9721 984299

Gallade Technologiezentrum am Nürburgring
Rudolf-Diesel-Straße 11 – 13
53520 Meuspath
Phone +49 2691 9338-54
Fax +49 2691 9338-50

Service partner for the UK:

BG Motorsports Ltd
47 – 48 Silverstone Circuit
Silverstone, Northants NN12 8TN
Phone +44 1327 855200
Fax +44 1327 855201

Service partners for the USA:

ZF Sachs Race Engineering NA
15811 Centennial Drive
Northville, MI. 48168
Phone +1 734 416 6200
Fax +1 734 416 1948

Oceanshore Motorsports
David Glenn
5892 John Anderson Highway
32136 Flagler Beach, FL
Phone +1 386 6731936
Fax +1 386 6731184

Service partner for Asia:

Enable Inc. Technical center
1 – 36 Ootsuzaki Ogakie-cho
Kariya-shi, Aichi-ken, 448-0813
Japan
Phone +81 566 62 86 05
Fax +81 566 62 86 07

6. Wheels and braking system

6.1. Wheels

The following three-piece wheels are supplied with the car:

Front axle:	BBS 11 x 18" offset 34 mm
	Tyre dimensions: 27/65-18
Rear axle:	BBS 13 x 18" offset 12.5 mm
	Tyre dimensions: 31/71-18

6.1.1. Centre lock wheel nut

The aluminium wheel nuts are marked as follows:

Right-hand side of car =	left-hand thread, colour blue
Left-hand side of car =	right-hand thread, colour red

Porsche recommends that the wheel nuts are also changed during a long distance race (after approximately 6 hours running) and to inspect and service them, which means cleaning the thread, visual inspection and re-grease with Klüber Nontrop RB3 999.917.507.00.
Wheel nut tightening torque 500+25 Nm.

Please check the setting (tightening torque) of the wheel gun. Tests have shown that the centre-lock threads can be damaged if the wheel gun is incorrectly set. The above mentioned procedure must be strictly adhered to. A control test must also be carried out to ensure that the required tightening torque is also achieved (also different wheel guns supplied by a different manufacturer and specification).

Two different wheel guns are necessary for both vehicle sides (Source of supply: refer to 10.3)

The smooth operation of the wheel safety-mechanism integrated in the centre lock must be checked.

Note: Porsche AG strongly recommends that the wheels are cleaned and a comprehensive visual inspection is carried out after every practice session or race.

Check for cracks on both the inner and outer faces of the spokes, damage to the centre lock mating face and deformation to the wheel well and the fasteners. Careful attention should be paid to the mileage of the wheels. Use the collected data to ensure that wheels are used in rotation, therefore ensuring a balanced and even usage and helping to identify early the need for spares.

6.2. Brake system

The GT3 RSR is fitted with a dual circuit brake system incorporating two separate brake master cylinders. The front to rear brake balance ratio is set by rotating the brake balance knob.

Attention: Turning the adjuster knob allows an incremental adjustment of the brake bias to the front or rear axle. Changing the brake bias affects the handling characteristics of the car; therefore only small incremental adjustments (e.g. a quarter of one turn) should be made.

6.2.1. Brake system technical data

	Front axle	Rear axle
Brake master cylinder diameter [mm]	18.8	18.8
Brake disc diameter [mm]	380	355
Brake disc thickness [mm]	32	32
Brake pad	Pagid RS 19 yellow	Pagid RS 19 yellow
Brake pad thickness [mm]	26.5	26.5
Brake caliper	6 piston aluminium monobloc	4 piston aluminium monobloc
Brake caliper piston diameter [mm]	28, 30, 38	28, 36
Brake fluid	Endless RF - 650 Racing Super Fluid	

6.2.2. Brake force distribution

In the basic setting the following pressure distribution gives the maximum brake pressure:

- Front axle **50 bar**
- Rear axle **49 bar**

Direction of rotation of brake force adjuster:

- Ant-clockwise: Brake balance towards front axle
- Clockwise: Brake balance towards rear axle

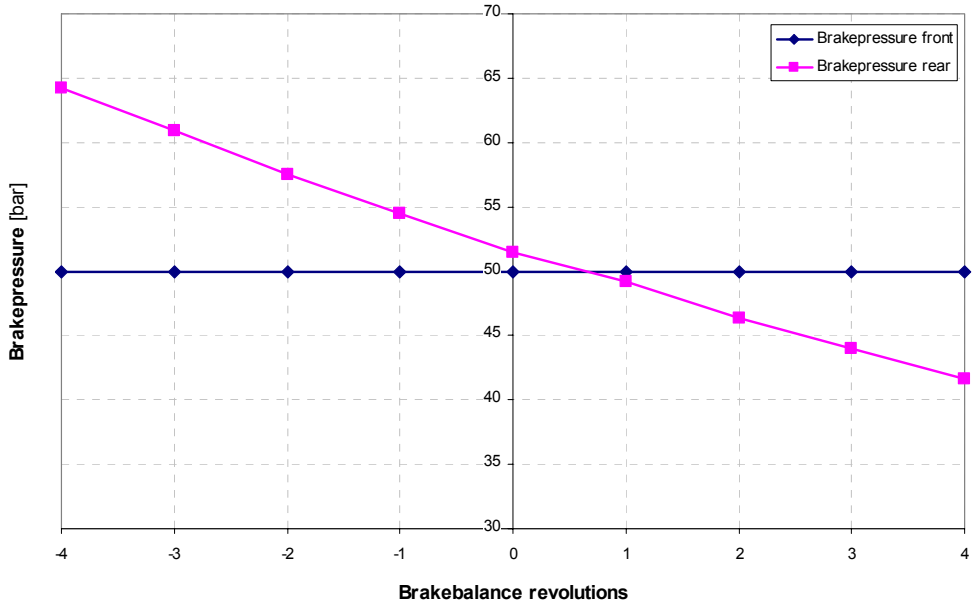
The basic setting is adjusted as follows:

- Rotate the adjusting knob clockwise to the stop
- Rotate the knob 7 revolutions in the anticlockwise direction

This setting corresponds with the above mentioned pressure distribution. Check using manometers to ensure that the pressure is correct.

The brake pressure distribution relative to balance bar position is indicated in the following diagram:

Brakebalance 911 GT3 RSR Model 2009 (997)

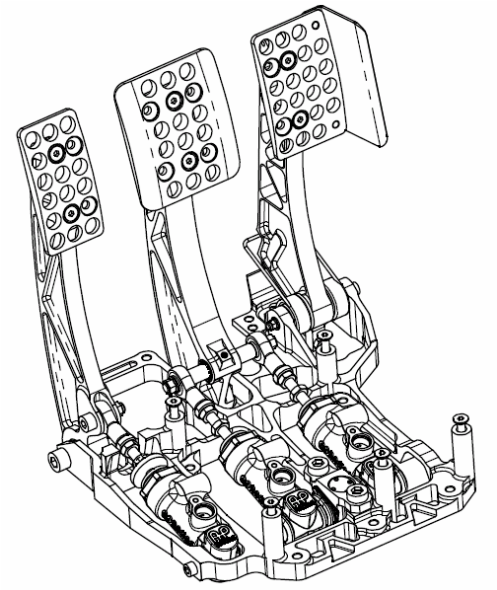


6.2.3. Brake system, endurance racing

Porsche Motorsport offers an optional two-piece brake caliper and 35 mm think brake discs (front axle only) for endurance races. The parts required are listed in the parts catalogue.

7. Pedals and changing gear

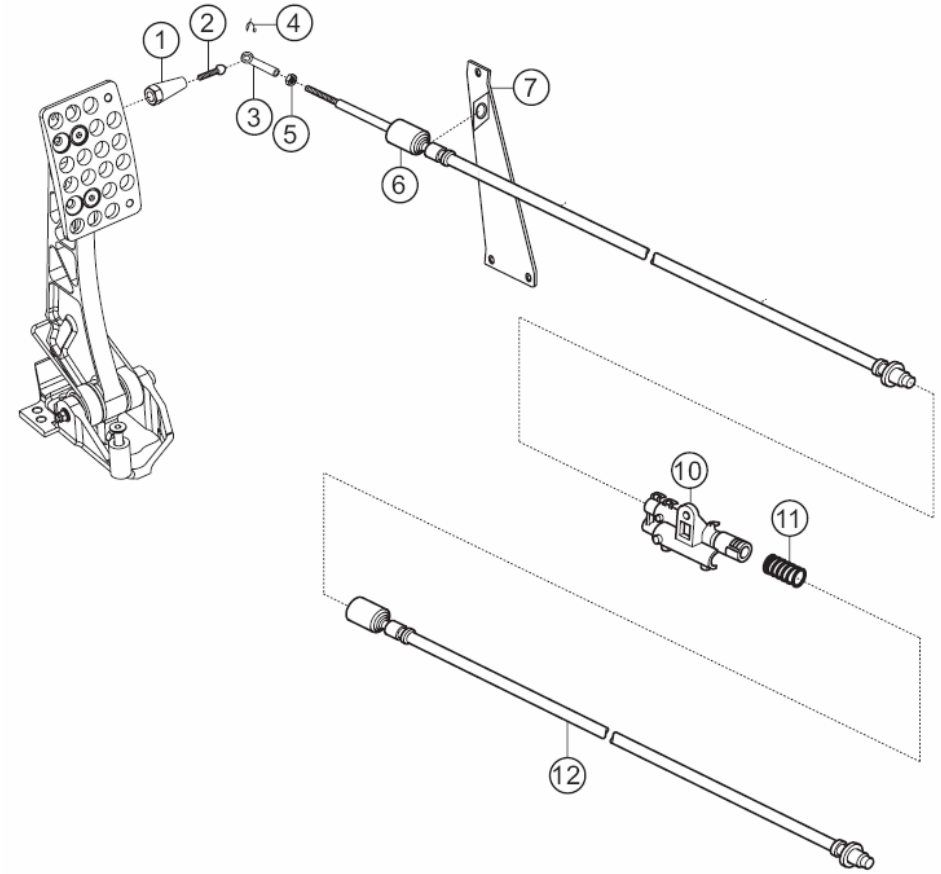
7.1. Pedals



The pedals are mounted completely on an aluminium console.

- The clutch and brake pedal have no mechanical stops
- In contrast, the throttle pedal has two stops, one each for idle and full throttle
- The full throttle stop is mounted on the chassis

7.1.1. Throttle cable



1 Spacer
2 Ball pivot
3 Ball socket
4 Safety clip
5 Lock nut
6 Forward throttle cable
7 Forward throttle cable bracket
10 Connecting element
11 Spring
12 Rearward throttle cable

The two throttle cables are connected in the cockpit on the gear lever mounting bracket by a connecting element (10) equipped with a spring to reduce play.

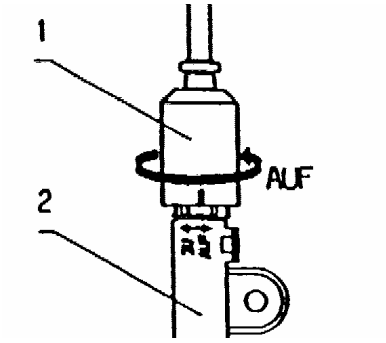
7.1.1.1. Connecting the throttle cable to the throttle pedal

- Screw the ball socket (3) six turns onto the thread on the cable and lock with the lock nut (5)
- Set the throttle cable without play with the threaded part in the forward throttle cable bracket (7) and lock with the lock nut
- The correct position of the throttle cable is approximately in the middle of the threaded part

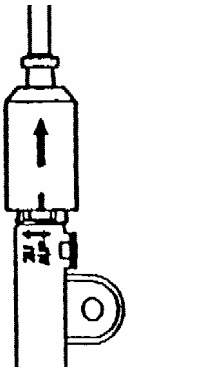
7.1.1.2. Tension free adjustment of throttle cable

The procedure described is required for work such as calibrating the throttle butterfly potentiometer.

Unscrew the quick adjustment cap (1) to the thread stop



The throttle cable is now tension free and work such as calibrating the throttle butterfly potentiometer can be carried out.



7.1.1.3. Connecting the throttle cable

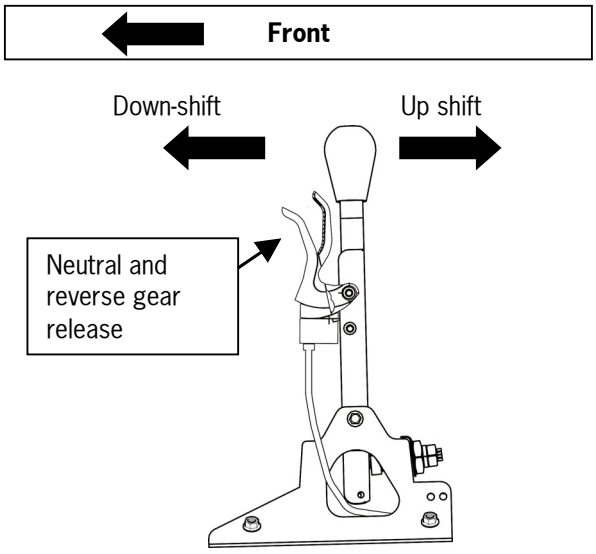
Tighten the screw cap (1) until it clicks clearly into place. In the closed position the marking on the screw cap must cover the marking 'ZU' on the connection piece (2).

The throttle cable must be in the “ZU” position under normal operating conditions.

7.2. Changing gear

A gear lever force sensor is integrated in the gear knob, which activates an ignition cut, and therefore a cut in propulsion, when pulled or pushed. This allows full power up shifts to be made.

Attention: It is absolutely necessary to change gear as quickly as possible. Shifting gear too slowly can cause an increase in wear or damage to the dog-ring teeth



To prevent damages of the gearbox Porsche Motorsport recommend the following points:

- Change gears as fast as possible
- Do not touch the shift lever if no shifting is needed
- Always apply an intermediate throttle application when downshifting

7.2.1. Neutral and reverse gear release

To shift from 1st gear to neutral the release lever must be activated.

Sequence: 1st gear → neutral → reverse gear

7.2.2. Gear shift force sensor

- The open-circuit voltage of the sensor must be between 2.41 and 2.59 V (check with Modas)
- Active at engine speeds greater than 2,800 rpm, not dependent on speed
- Torque interruption only under power

8. Chassis

The 911 GT3 RS chassis forms the basis of the 911 GT3 RSR race cars. The chassis is fitted with an FIA homologated roll-cage for safety purposes.

The 911 GT3 RSR chassis has the following features:

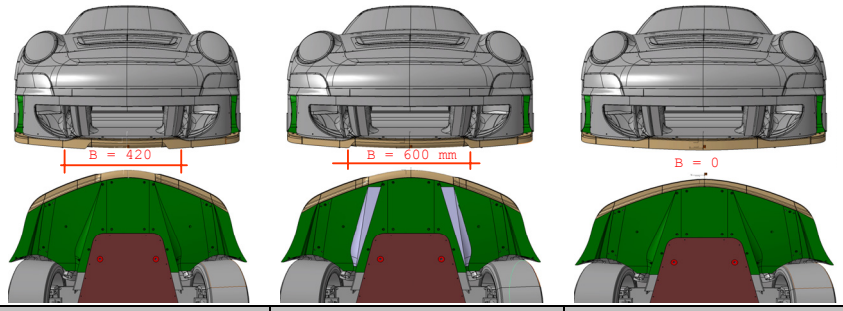
- Carbon fibre boot lid with quick release fasteners
- Carbon fibre bonnet with quick release fasteners
- Carbon fibre front and rear fenders/wings
- Carbon fibre nose section with additional air intakes for engine and brake cooling
- Carbon fibre doors with integrated side window frame
- Carbon fibre rear bumper
- Retro-fit parts and cockpit interior in Carrara-White
- Adjustable rear wing
- Plastic rear side windows
- Bonded plastic rear screen
- Bonded front screen
- FIA homologated roll cage

Attention: DO NOT under any circumstances modify the roll-cage, as its structural integrity will be compromised. DO NOT weld additional brackets, or drill holes in the tubes. If in doubt please contact Porsche Motorsport.

All unnecessary panels and sound proofing materials have been removed to reduce weight.

8.1. Aerodynamics

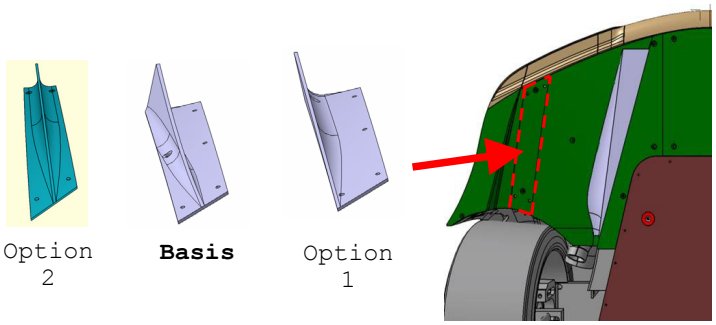
8.1.1. Front end



	Basis		Low Downforce		High Downforce	
Spoiler lip middle	**1x**	**997.505.983.9C** B = 420 mm	**1x**	**997.505.983.9D** B = 600 mm	**1x**	**997.505.983.9E** B = 0 mm
Spoiler lip outer	**2x**	**997.505.985.9C**	**2x**	**997.505.985.9D**	**1x**	**997.505.985.9E**
Diffusor left	**-**	**-** Angle 16 deg	**1**	**997.504.579.9A** Angle 8 deg	**-**	**-** Angle 16 deg
Diffusor right	**-**	**-** Angle 16 deg	**1**	**997.504.580.9A** Angle 8 deg	**-**	**-** Angle 16 deg

8.1.1.1. Strakes

Three different type of strakes are available fort the front underbody:

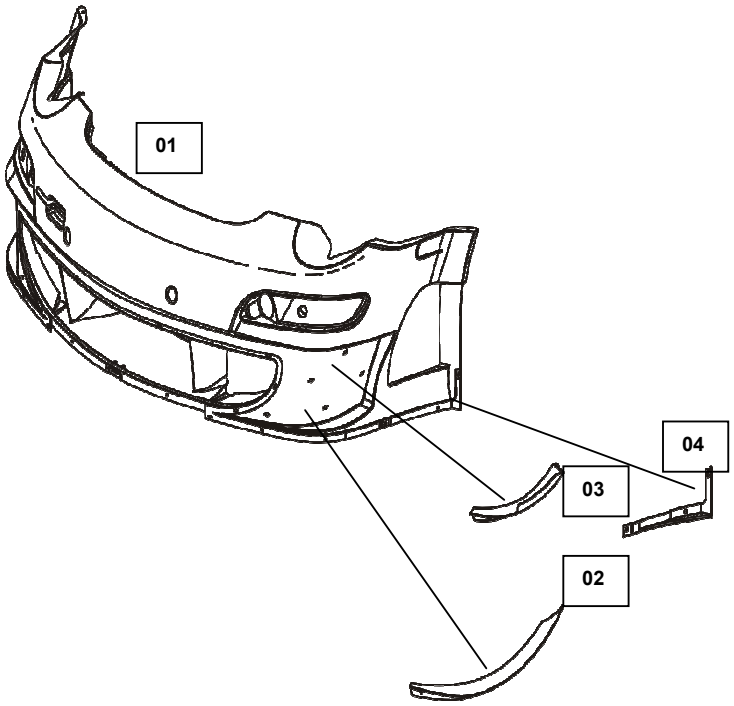


Basis: 997.575.383/384.9C

Option 1: 997.575.383/384.9D

Option 2: 997.575.383/384.9A (same as 2008 model)

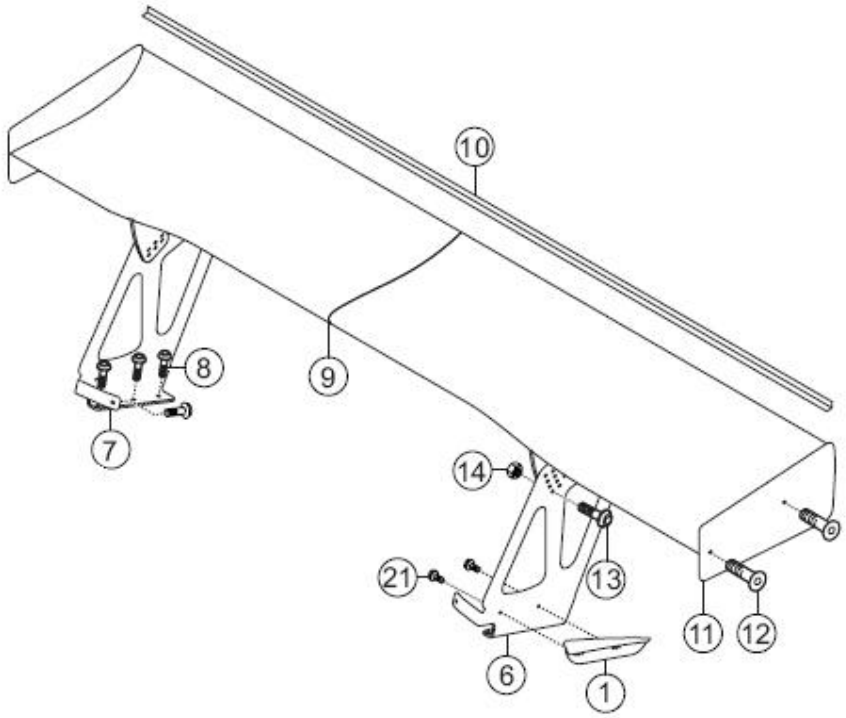
8.1.1.2. Front bumper fairings



01	997.505.980.9F FFF	Bumper front
02	997.505.373/374.9B	Spoiler lower
03	997.505.333/334.9C	Spoiler upper
04	997.505.375/376.9B	Spoiler

8.1.2. Rear end

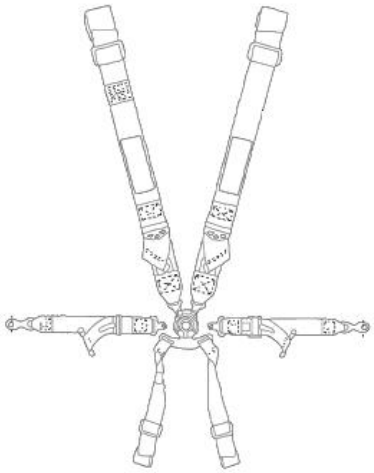
8.1.2.1. Rear wing



Due to a regulation change the rear wing of the 2009 model is fitted with a 15 mm gurney (pos. 10).

8.2. Seat and safety harness

- Six-point safety harness
- Race bucket seat



9. Electric

9.1. Alternator

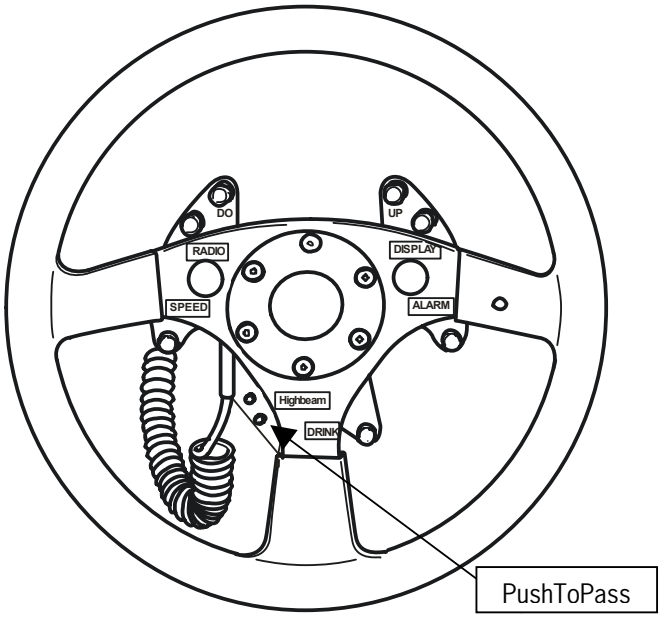
- TAG 140 A (G-Type)

9.2. Battery

- 12 V, 50 Ah

9.3. Steering wheel

- Race steering wheel with quick-release coupling



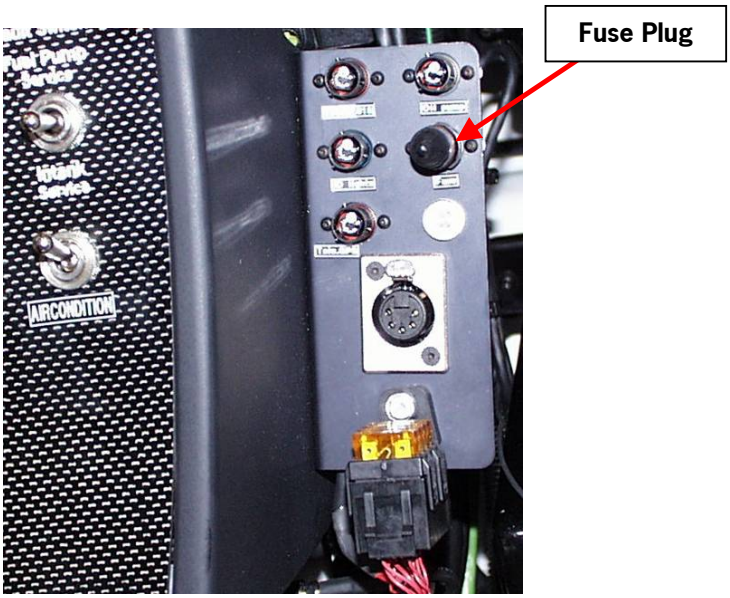
RADIO:	Push to talk
SPEED:	Speed Limiter
HIGHBEAM:	Headlight flash, if the button is pressed for about 1 second the headlights stay on till the next time the button is pressed
DRINK:	Activate drink bottle
ALARM:	Reset MoTeC alarm
DISPLAY:	Scroll through display pages, if the button is pressed for about 3 seconds the function “Master Retry” in the PDM is requested

UP:	Traction control setting +1
DO:	Traction control setting -1
Push-to-Pass	If this button is pressed Map 3 is selected independently of the current map position

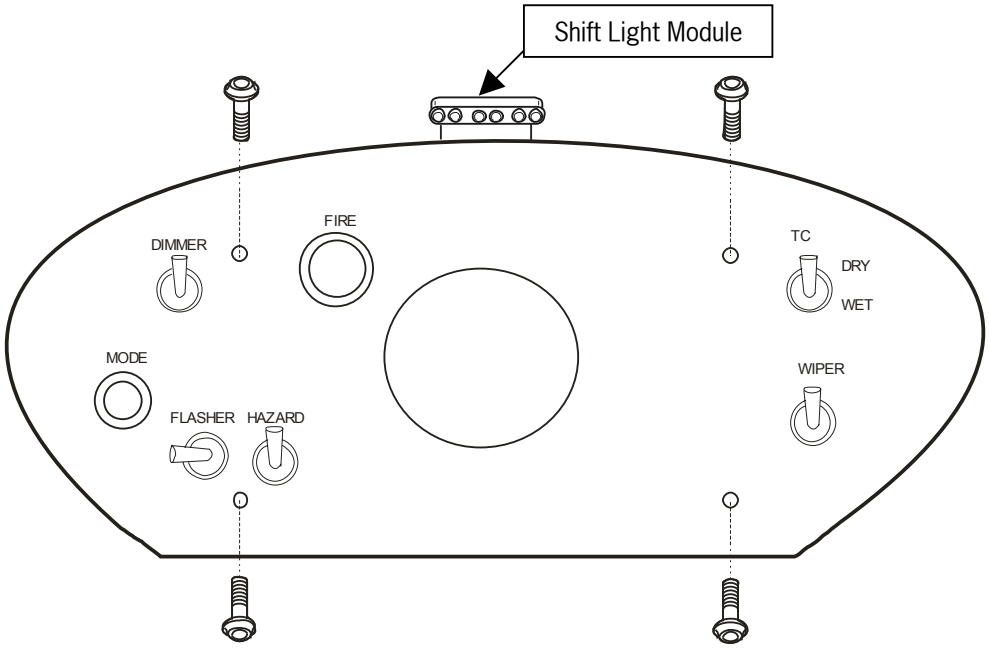
9.4. Wheel-speed sensors

The front and rear wheel-speed sensors are protected by an electronic fuse (fuse plug). This prevents the ECU outputs shutting down completely in the event of a short circuit.

The fuse is located in the co-driver foot well alongside the centre console:

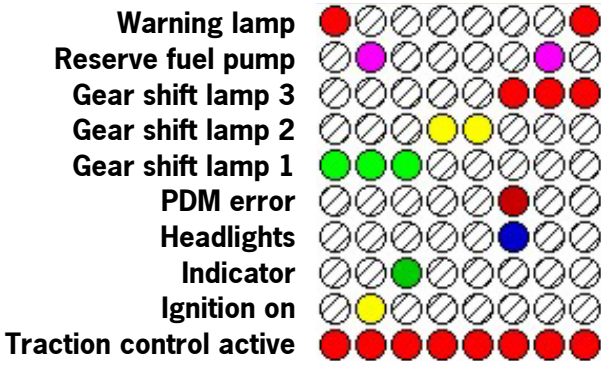


9.5. Dashboard

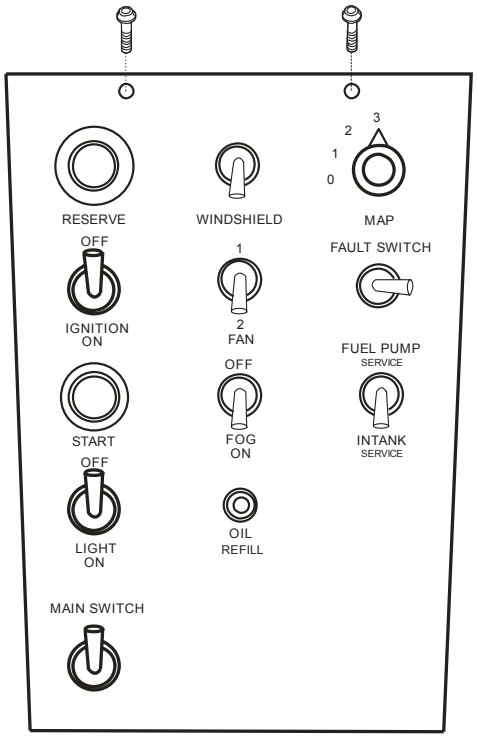


FIRE:	Activate fire extinguisher system
DIMMER:	MoTeC display Shift Light Module brightness
MODE:	MoTeC display mode (warm-up, race, practice)
FLASHER:	Indicator
HAZARD:	Warning indicators
TC:	Select traction control map
	DRY: Dry track
	WET: Wet track
WIPER:	Wiper (on/off)

9.5.1. Shift Light Module



9.6. Centre console



RESERVE:	Reserve fuel pump
IGNITION:	Ignition
START:	Start engine
LIGHT:	Headlights
MAIN SWITCH:	Main power supply
WINDSHIELD:	Heated front screen
FAN:	Driver cooling (on/off)
FOG:	Fog lights
OIL REFILL:	Oil is pumped from the extra tank to the oil tank (only fitted to cars with an extra oil tank)
MAP:	Engine mapping
FAULT SWITCH:	Switch to PDM emergency mode
FUEL PUMP:	Fuel pump Service: Normal operation Middle position: Fuel pump off Intank service: Only in-tank pumps run

9.7. PDM

The PDM32 (Power Distribution Module) from MoTeC is fitted to the GT3 RSR. The PDM32 replaces conventional fuses and relays and, as a result, simplifies the wiring loom in the car. In addition, the PDM has a diagnostic function.

MoTeC PDM32

9.7.1. Connection PC PDM

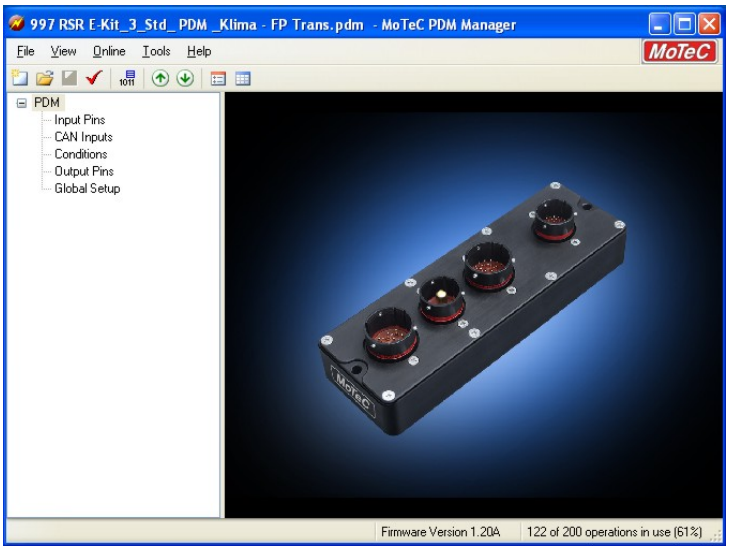
The MoTeC PDM Manager software is used to configure the PDM and display measurement data. The connection from PDM to PC is made via a USB-to-CAN-Converter (UTC). The interface in the car is located to the right of the centre console.

MoTeC UTC

UTC car interface

9.7.2. MoTeC PDM Manager

After opening the PDM Manager the application start screen is displayed:

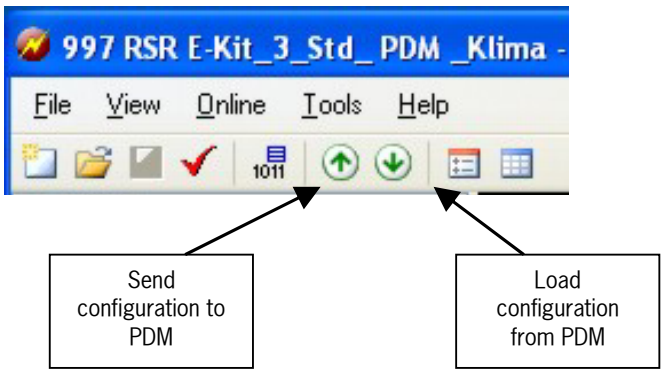


9.7.2.1. PDM configuration

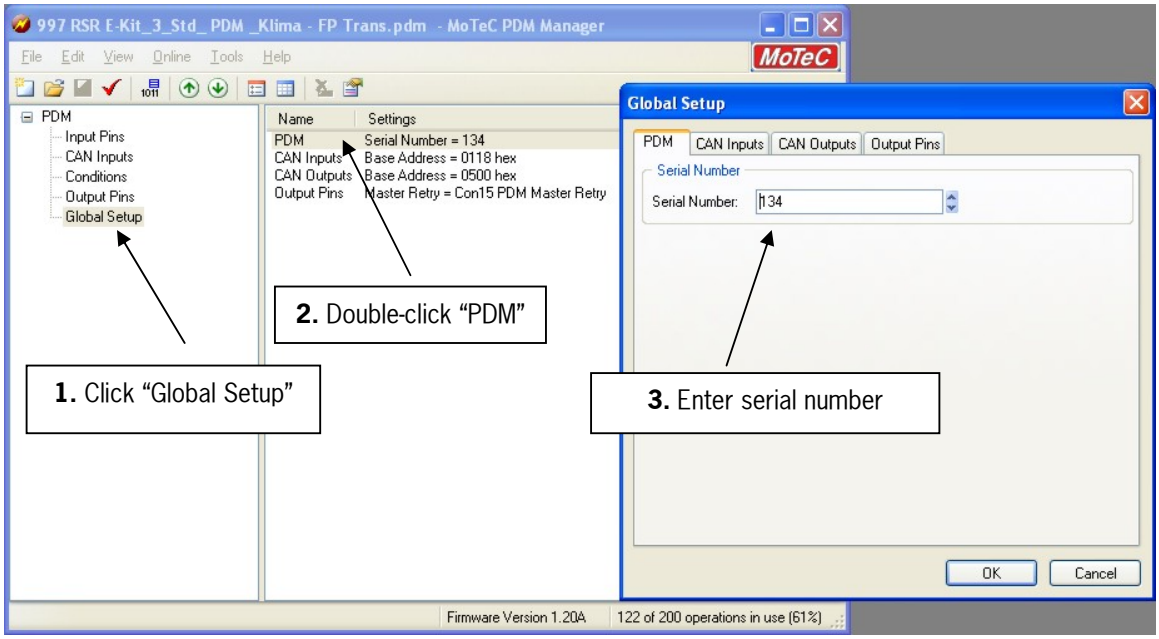
The PDM requires various settings to function correctly. These are, for example, the maximum output current and the conditions under which the output should be activated. These settings are saved in a configuration file on the PC.

Attention: Before the standard delivery configuration is changed it should be downloaded from the car to the computer and saved to be able to reload the standard delivery configuration at any time.

A configuration can be either sent to the PDM or loaded from the PDM in the PDM Manager:

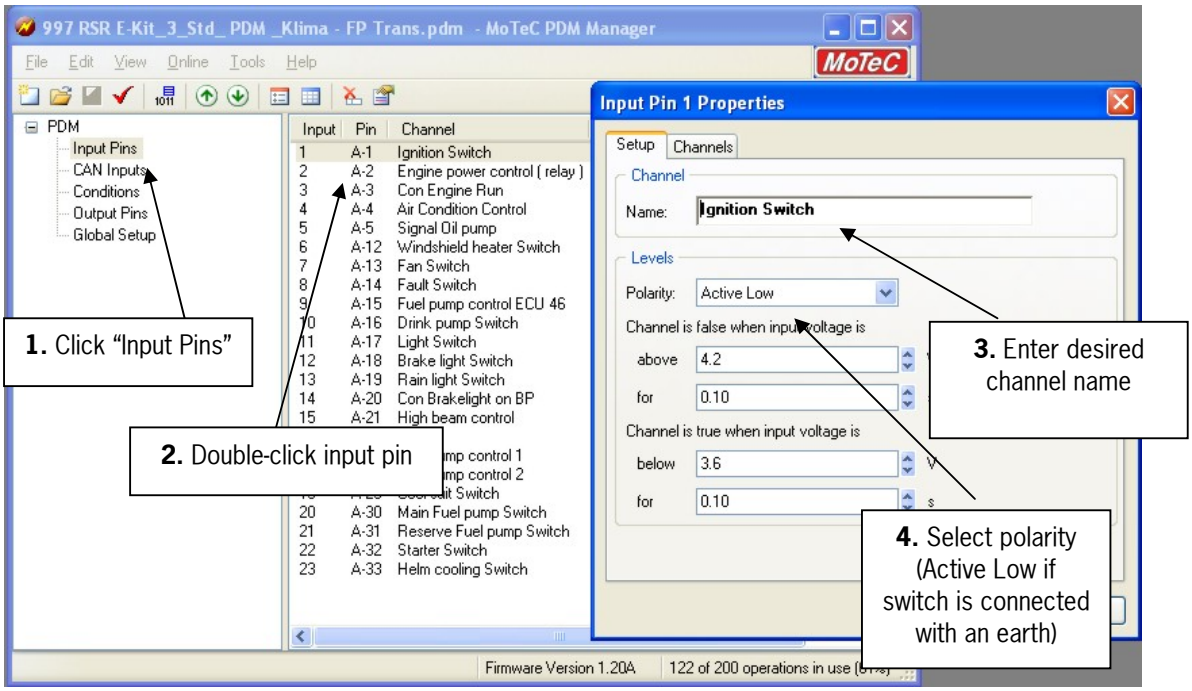


If a configuration must be sent from the PC to the PDM in the car the serial number of the PDM fitted to the car must be entered:



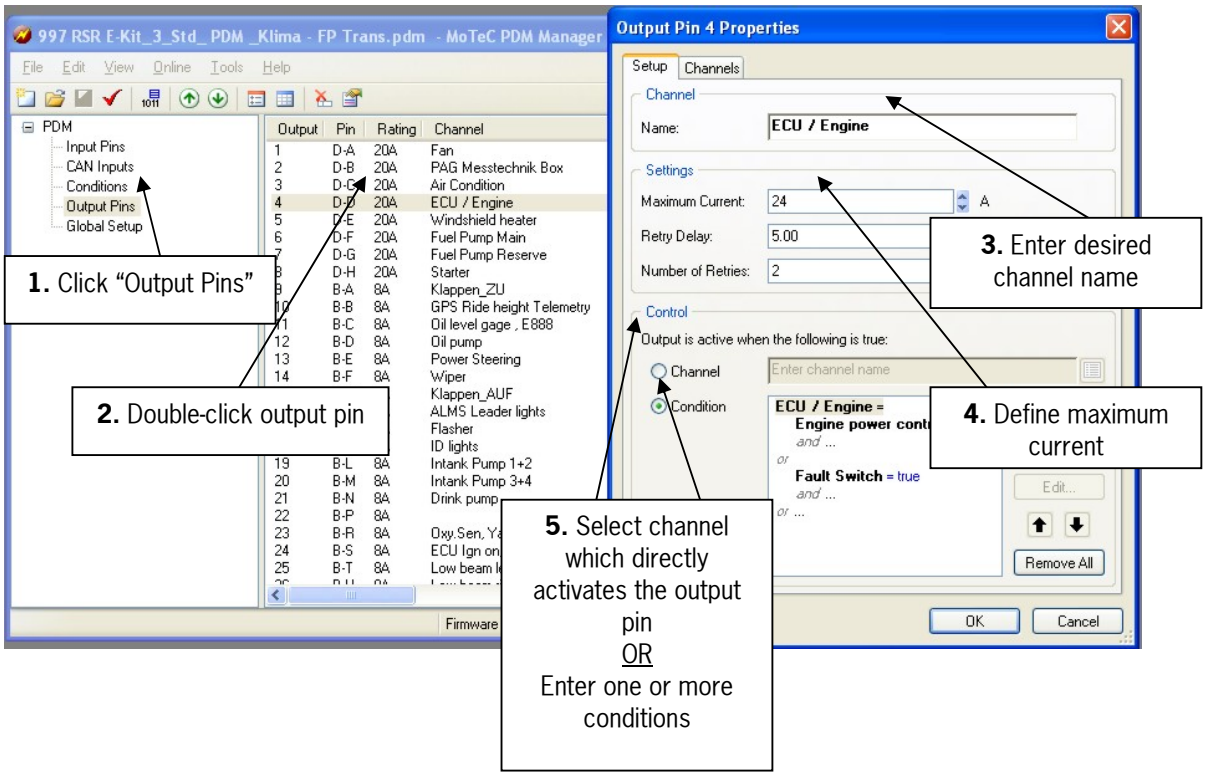
9.7.2.2. Assigning input channels to input pins

The assignment of an input channel to an input pin is made as follows:



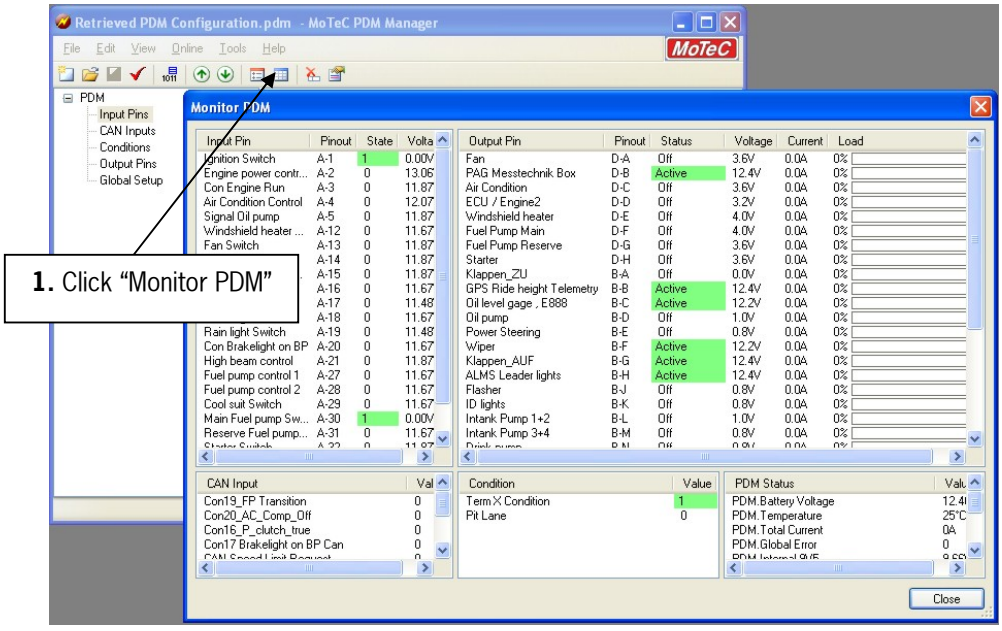
9.7.2.3. Assigning output channels to output pins

The assignment of an output channel to an output pin is made as follows:



9.7.3. Diagnostic

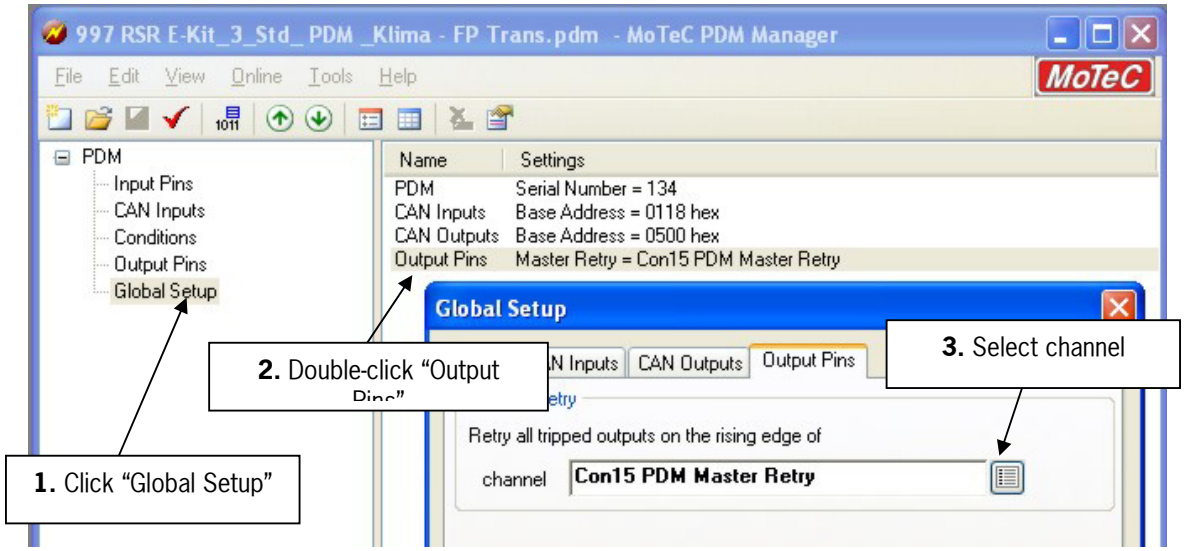
For diagnostic purposes it is possible to view online the status as well as the voltage and input and output currents:



9.7.3.1. Master Retry

The function “Master Retry” switches on every output that is currently in error state. If the error remains during ‘switch on’ the normal repeat sequence, which is initiated in the event of an error, is instigated.

The Master Retry configuration is made in the PDM Global Setup:



The Master Retry is triggered via the increasing slope of a channel (e.g. CAN input or input pin).

Pressing the ‘Display’ button on the steering wheel for approximately 3 seconds activates a Master Retry.

9.8. Engine Control Unit (ECU)

The GT3 RSR is equipped with a Bosch MS 4.0 ECU specially developed for motorsport applications. The Bosch MS 4.0 can be programmed with special software. The ECU is programmed exclusively by Porsche Motorsport. If an engine is overhauled by Porsche Motorsport the ECU should be delivered with the engine to run them both together on the dynamometer.

The Bosch ECU is mounted close to the battery box. As a safety precaution the ECU should always be disconnected from the wiring loom and removed from the car if welding work is carried out.

9.8.1. MODAS

With the MODAS software various parameters can retrieved from the ECU and modified.

Variable input parameters include tyre diameter as well as gearbox ratios which are required to calculate the vehicle speed.

In addition, errors occurring are saved in an error log that can be retrieved for analysis.
A description of the MODAS software is included with the race car.

The Laptop used must have the following minimum system requirements:

- WINDOWS 98, 2000, XP (NT is not supported)
- 64 MB RAM
- 233 MHz Processor
- 4 Gigabyte free hard disk space
- Parallel Port for vehicles older than 2008 else USB port
- CD–Rom drive

A copy of the MODAS user instructions is included with the car.

10. Accessories and tools

10.1. Fire extinguisher system

The car is equipped with an FIA homologated fire extinguishing system using AFFF as extinguishing agent. The extinguishant cylinder has two separate chambers each with a two kilogram capacity. The extinguishing agent is discharged through three nozzles located in the engine bay and a further three located within the cockpit.

The system operates between -15° C and +60°C. The extinguisher cylinder must be protected from frost (remove from vehicle).

The operating pressure of system is 14 bars, and should be checked regularly using the manometer mounted to the extinguisher bottle.

Attention: The extinguishing agent, extinguisher cylinder and flexible pipes should be replaced after a maximum of 2 years from the date of manufacture by original spare parts.

10.1.1. Fire extinguisher activation

The extinguisher system is live when the toggle switch on the trigger box is set in the “System Active” position. The extinguisher is discharged by pressing the dash mounted push button and/or the push button in the windshield apron.

10.1.2. Extinguisher system error analysis:

Battery check:

- Hold the toggle switch on the trigger box in the "Battery Check" position
- If the battery charge state is good the trigger box warning lamp will blink

Warning lamp does not glow:

- Check battery charge state (refer to 'Battery Installation')
- Check the cable connection to the firing buttons (refer to 'Trigger box wiring harness')
- Check fire button function

Battery installation:

Attention: The toggle switch on the trigger box must be set in the 'System Inactive' position.

- Remove the trigger box cover and change the battery. Ensure that the battery poles are connected correctly. Only Alkaline batteries should be used.

Checking the firing button:

Attention: The toggle switch on the trigger box must be set in the 'System Inactive' position.

- Throw the toggle switch in the luggage compartment
- If the switch is functioning correctly the trigger box warning lamp will glow
- Return the switch to the original position
- Press the dashboard mounted push button
- If the switch is functioning correctly the trigger box warning lamp will glow

Trigger box connection:

The firing button '1' is connected to the terminals '3' and '4', firing button '2' with the terminals '5' and '6'.

Attention: Incorrectly connected cables can fire the extinguisher system.

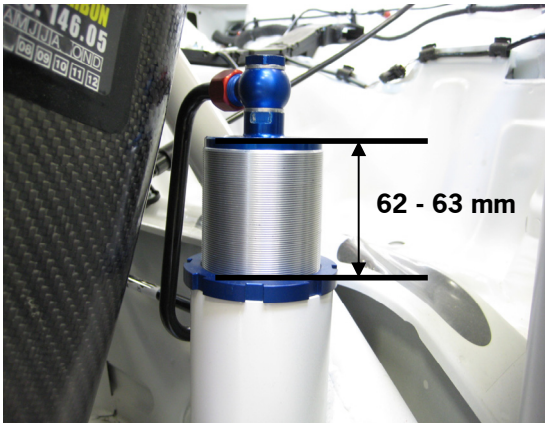
10.2. Air-jack system

- The exhaust valve must always be open (pulled out) to ensure that the air-jack cylinders are completely retracted when the car is running
- Never work under the car when the car is raised on the air-jack system without the air-jacks being blocked with 'safeties'
- To prevent damage to the air-cylinder end stops never operate the system without the full weight of the car as resistance.
- To let down the car slowly a service valve is mounted to the rear right air-jack.
- Max pressure. Operating pressure approximately 35-38 bar
- Never use mineral oil based cleaning agents
- Never open the air jacks: There is residual pressure in the system even when jacks are retracted!
- Porsche Motorsport recommends that the system is overhauled after 2000 lifts or two years
- The torque setting for the grooved nut (air-jack fixed mount) must be checked during the standard maintenance procedure

  Torque setting grooved nut rear 45 ± 5 Nm

  Torque setting grooved nut front 45 ± 5 Nm

  See picture below for position of rear air-jack in the mounting tube



- If a loose or incorrectly tightened air-jack is discovered this must be changed immediately
- Please refer to the manufacturer's product description (Krontec) for further safety measures

KRONTEC
Maschinenbau GmbH
Pommernstraße 33
D - 93073 Neutraubling
www.krontec.de

10.2.1. Car lift system

- Never use a third party product as this can lead to damage to the air-jack cover or piston tube

10.3. Wheel guns

Porsche Motorsport recommends the use of “Paoli” wheel guns.

The wheel guns can be purchased from the following company:

Paoli
Dino Paoli S.r.l.
Via Guido Dorso 5
42100 Reggio Emilia
Italy

Tel: +39 0522 300 828
Fax: +39 0522 304 864
www.dinopaoli.com
E-Mail: info@dinopaoli.com

11. Car maintenance

Porsche Motorsport recommends that the following maintenance work is carried out after the corresponding mileage:

11.1. After approx. 200 km and/or first test

- Visual inspection of all systems, hoses and cables etc. for leakage, damage or chafing
- Check all the security relevant fasteners for the defined torque
- All suspension mounting bolts
- Driveshafts
- Engine mountings
- Gearbox mountings

11.2. After approx. 8 hours and/or a race weekend

Engine

- Check compression
- Check and/or renew spark plugs
- Check belt tension
- Check clutch wear

Suspension

- Renew brake fluid
- Check brake pads
- Check brake discs
- Check dampers for leakage (visual inspection)
- Check wheel bearing play
- Check all suspension spherical joints for play
- Check driveshafts for play, wear and leakage
- Check suspension bolt tightening torque
- Check wheel alignment

11.3. After approx. 30 hours running

Engine

- Complete engine rebuild
- Crack check and measure all components
- Renew cylinder heads
- Renew pistons / cylinder liners
- Renew main and con-rod bearings
- Check clutch wear

Gearbox

- Complete gearbox rebuild
- Crack check and measure all components
- Renew all bearings
- Check crown wheel and pinion, crack check
- Check gear ratios
- Renew oil filter
- Check clutch release mechanism

Suspension

- Service brake system n
- Check driveshafts for play, wear and lea
- Check wheel bearing play
- Check all suspension spherical joints for play and friction free motion
- Replace all filters
- Visual inspection of all systems, hoses and cables etc. for leakage, damage or chafing
- Crack check uprights and suspension links

12. Options

Porsche Motorsport offers the following kit as option for the 911 GT3 RSR:

12.1. Light kit

For races in the dark Porsche Motorsport offers a light kit comprised of the following components:

- Xenon headlights
- Extra headlights
- Start number lighting
- UV cockpit lighting

A detailed list including part numbers can be found in the parts catalogue.

12.2. Air-conditioning unit

Porsche Motorsport offers an air-conditioning unit for the RSR. The air-conditioning kit is comprised of the following components:

- Compressor
- Condenser
- Pipes and hoses
- Air-conditioning unit
- Set of seals
- Compartment partition wall
- Ventilation

A detailed list including part numbers can be found in the parts catalogue.

Imprint

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