



PORSCHE



911 GT3 Cup

Technical Handbook, 2008 Model

Forward

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 911 GT3 Cup.

Dr.Ing.h.c. F. Porsche
Aktiengesellschaft
Vertrieb Sonder- und
Rennfahrzeuge



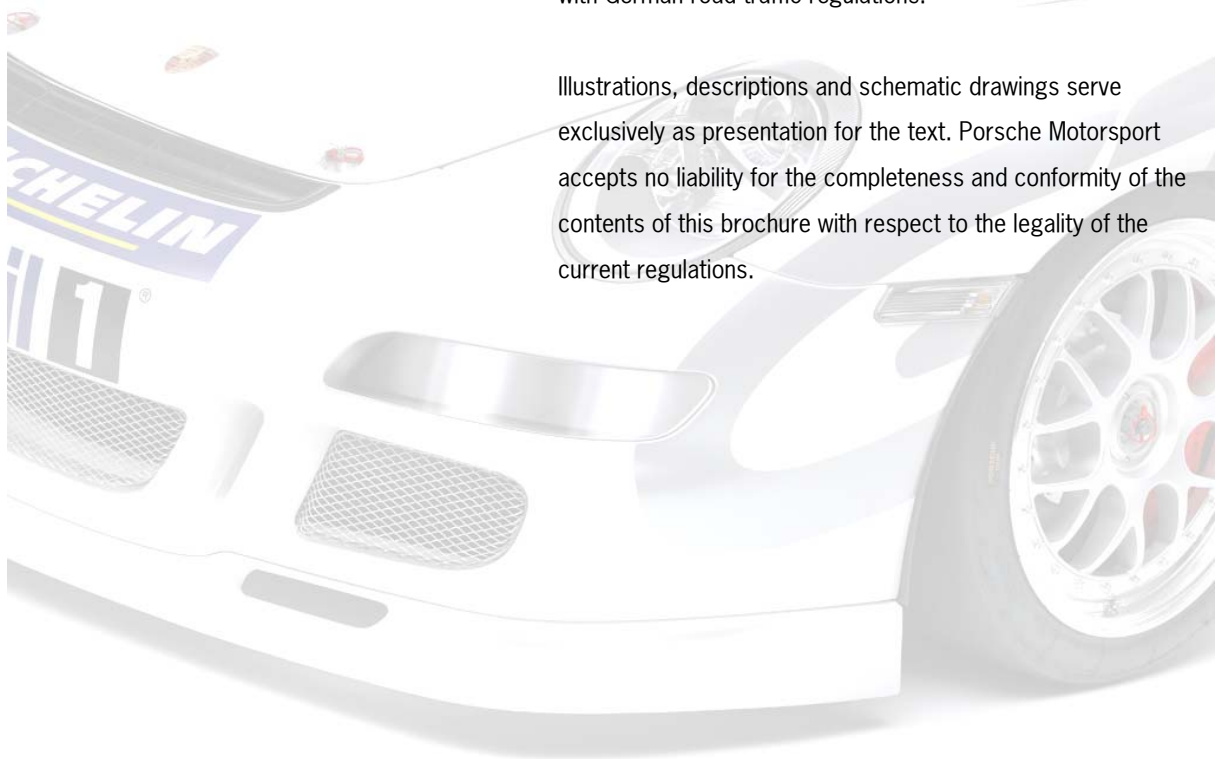
911GT3 Cup 2008 Model competition car

This 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 can not 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.



For guarantee refer to sales contract

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The delivery of parts is made only against payment in cash or cash in advance.

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Safety instructions

Important safety instructions are marked in bold page numbers

Only for Service CD:

To jump directly to a specific chapter click on the appropriate line.

By using the arrow keys on the keyboard it is possible to page through the chapter.

By pressing the "BACK" button at the bottom of every page it is possible to return to the contents page.

General Technical Data

Chassis number: from	WPO ZZZ 99 Z8S 7 98001
Car model:	997 830
Engine model:	M 97/75
Gearbox model:	G 97/ 60
Number of gears:	6

Weight

Dry weight:	approx. 1170 kg
Dry weight Supercup (PCCB)	approx. 1130 kg

Dimensions

Overall length (mm)	4450
Maximum width (mm)	1815
Wheelbase (mm)	2355
Front track width (mm)	1516
Rear track width (mm)	1561



Engine Technical Data

Engine model	M97/75
Construction	Six-cylinder boxer
Type of cooling	water cooled
Number of cylinders	6
Cylinder bore (mm)	99.98
Stroke (mm)	76.4
Actual cubic capacity	3598 cm ³
Compression ratio	12.0 (- 0.4):1
Maximum power	309 kW / 420 PS
Maximum power at	7500 r.p.m.
Maximum torque	410 Nm
Maximum torque at	6500 r.p.m.
Maximum engine revs in 1 st to 6 th gears	8400 r.p.m.



Valve timing

Inlet valve diameter (mm)	41
Inlet valve lift (mm)	12.5
Exhaust valve diameter (mm)	35.5
Exhaust valve lift (mm)	11.1
Maximum inlet valve lift	105° after TDC
Maximum exhaust valve lift	115° before TDC

Camshaft adjustment:

Set the camshaft timing with the camshaft timing and adjustment tools.

Camshafts:

Inlet valve camshaft: Engine M 97/75 race component
Exhaust valve camshaft 911 GT3 RS

Camshaft housing:

Engine M 97/75 modified 911 GT3 RS production component

Piston/cylinder:

Piston clearance 0.02 – 0.05 mm

Crankcase:

Crankshaft: The two-piece aluminium alloy crankcase is a production 911 GT3 RS component. The forged crankshaft has 8 bearings.

Crankshaft bearings:

The crankshaft bearings are the same as those used in the 911GT3 RS engine.

Notice:

The term 911 GT 3 RS refers to the production car version.

Connecting rod:

Because the connecting rods have a shot peened surface care must be taken that no visible damage occurs when removing or fitting. The connecting rod must not be polished.

Connecting rod bolts:

Attention: The connecting rod bolts must always be renewed when the engine is completely overhauled. The surface of the mating faces must not be damaged.

Tightening procedure:

Attention: The threads and mating faces must be lubricated with engine oil.

Initial torque: 30 Nm +/- 10 % (mating torque)

Final torque: 1 x 60° +/- 2° torque angle

Piston:

The light-alloy pistons are 99.95 mm in diameter. The position of the inlet valve pocket should be noted when fitting the piston. The underside of the piston crown is cooled by sprayed oil. The weight difference between all the piston/connecting rod assemblies must not be greater than 5 grams.

Cylinder:

The cylinders are manufactured from a high-strength light-alloy with Nicasil coating and have a bore of 99.98 mm.

Cylinder head:

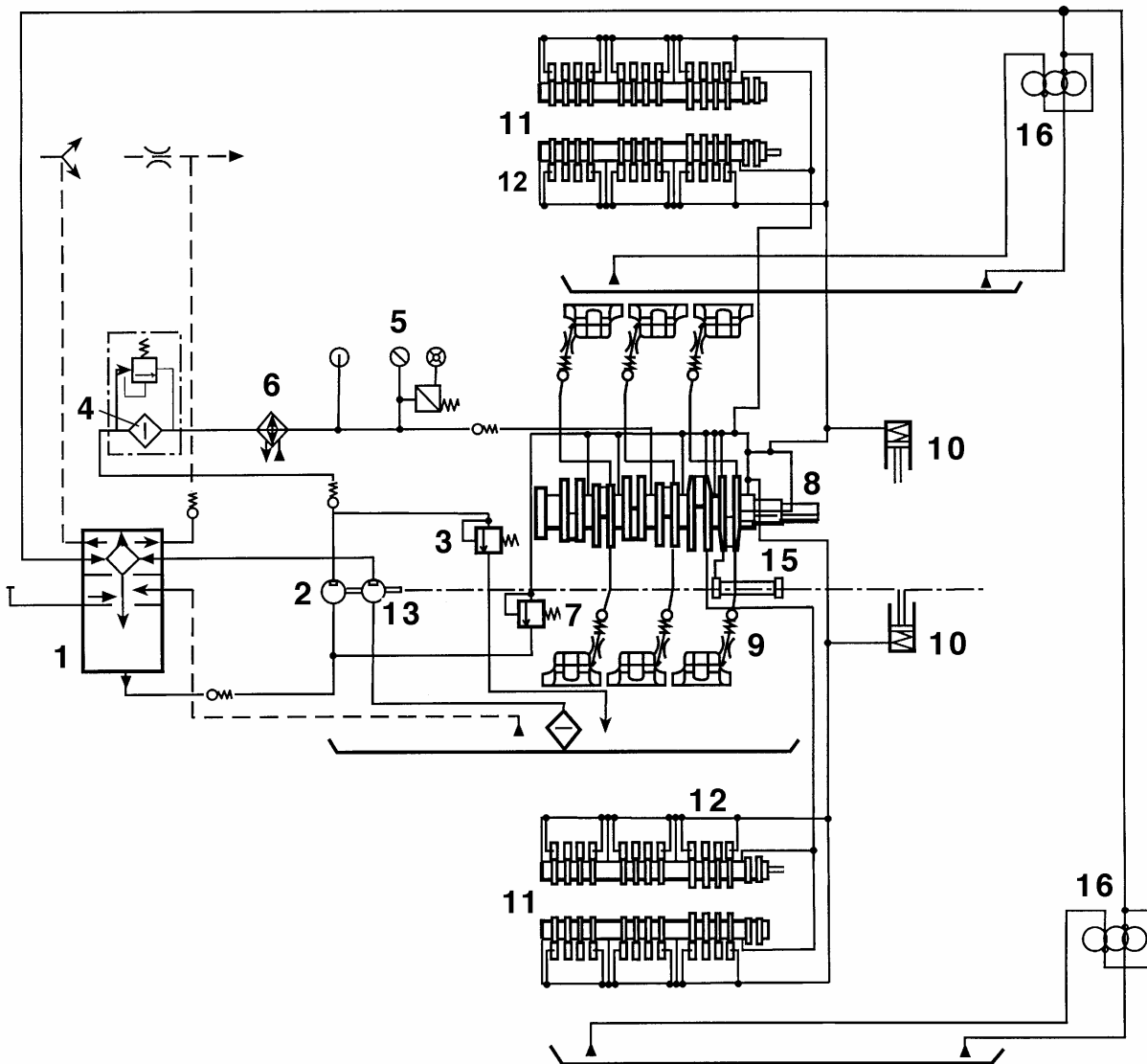
The cylinder head is a GT3 RS production component.

Engine lubrication:

The 911 GT3 Cup engine is fitted with a dry sump lubrication system.

The oil tank is mounted to the engine.

An oil/water heat-exchanger is mounted to the engine (production GT3 RS).



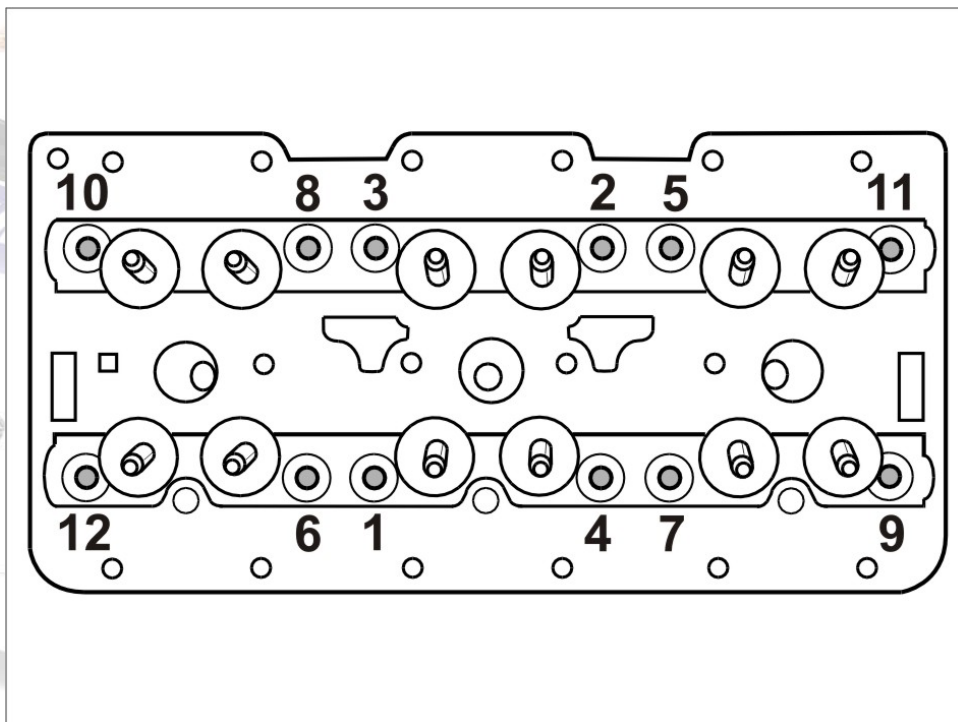
- | | |
|-------------------------------------|--------------------------------|
| 1 – Oil tank | 9 – Piston cooling |
| 2 – Pressure pumps | 10 – Timing chain tensioner |
| 3 – Safety valve | 11 – Camshafts |
| 4 – Oil filter | 12 – Hydraulic valve lifter |
| 5 – Oil pressure gauge (Production) | 13 – Crankcase scavenge pump |
| 6 – Oil/water heat-exchanger | 15 – Balance shaft |
| 7 – Pressure relief valve | 16 – Cylinder head supply pump |
| 8 – Main bearing | |

Cylinder head mounting:

The following procedure must be adhered to when fitting the cylinder head. The nut mounting faces and threads must be lightly oiled when tightening.

1. Initial tightening to 30 Nm in accordance with tightening sequence given below. Wait fifteen minutes before step 2.
2. Completely loosen all the nuts in reverse sequence.
3. Final tightening to 20Nm + 120° torque angle in the tightening sequence given below.

Tightening sequence:



Valve timing

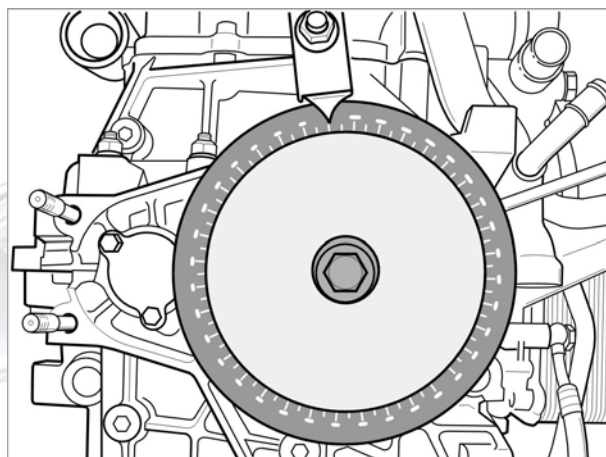
Inlet valve diameter	41 mm
Inlet valve lift	12.5 mm
Exhaust valve	35.5 mm
Exhaust valve lift	11.1mm
Maximum inlet valve lift	105° after TDC
Maximum exhaust valve lift	115° before TDC

Adjusting the valve timing on the GT3 Cup engine model 2008. Camshaft opening lead/closing lag (105° / 115°) with special tool 000 721 996 10 and accessories.

Description:

Set cylinder number 1 to TDC using a dial gauge indicator

Fit degree wheel 996 450 131 00



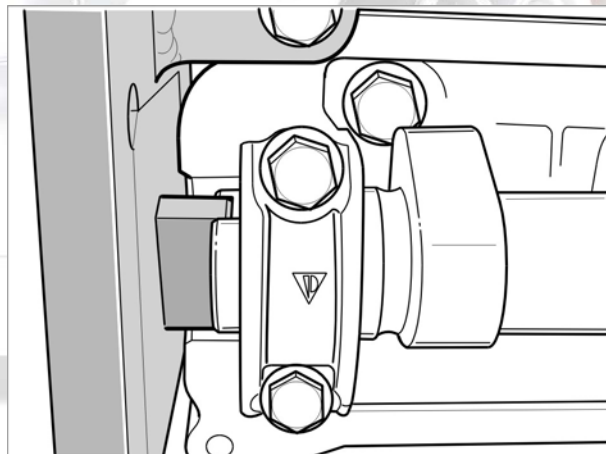
Fit the camshaft 1 - 3 at the TDC exhaust / inlet valve overlap and fix the inlet and exhaust valves with the special tool 000 721 966 10 with inlet special tool **996 450 *******, and exhaust special tool **000 721 *******.

Mount the chain tensioning tool 00072194010.

Tighten camshaft wheels to approximately **30 Nm** torque.

Remove the special tool from the camshaft slits.

Rotate the crankshaft 360°



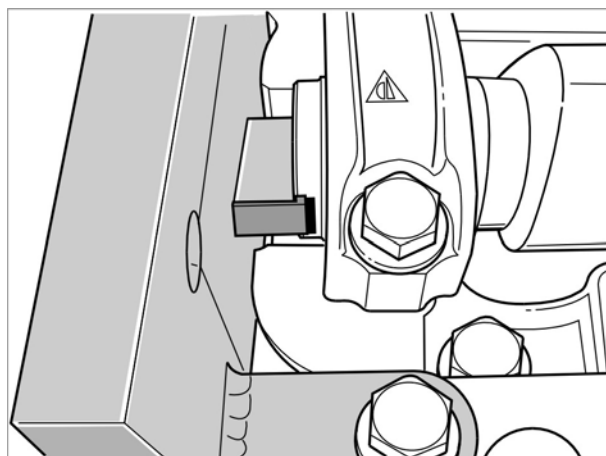
Fit the camshaft 4 - 6 at TDC exhaust / inlet valve overlap and fix the inlet and exhaust valves with the special tool 00072196610 with inlet special tool 9964501*****, and exhaust special tool 000721*****.

Tighten camshaft wheel to approximately **30 Nm**.

Remove the special tool from the camshaft slits.

Set engine to Cyl 1 TDC exhaust / inlet valve overlap

Rotate the engine three turns, and then pretension the chain tension tool to the marks.



Set the cylinder 1 to exhaust / inlet valve overlap TDC.

Fit the special tool and, if necessary, correct the camshaft position.

After tighten the timing chain sprockets as instructed

30 Nm + 90° torque angle.

Rotate the crankshaft 360°

Set the cylinder 4 to exhaust / inlet valve overlap TDC.

Fit the special tool and, if necessary, correct the camshaft position.

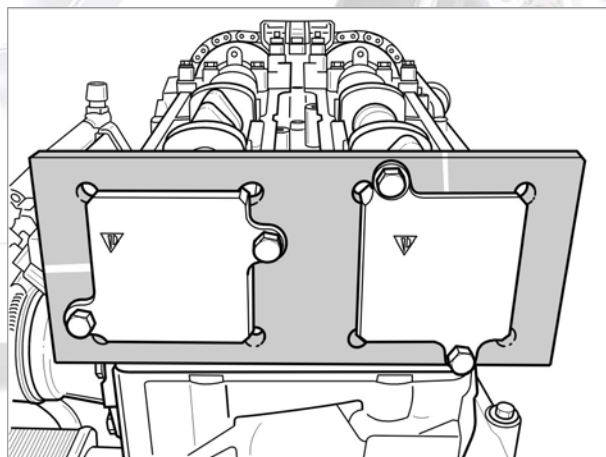
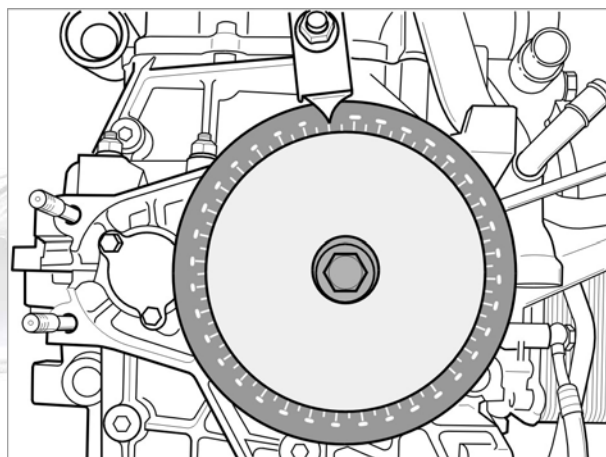
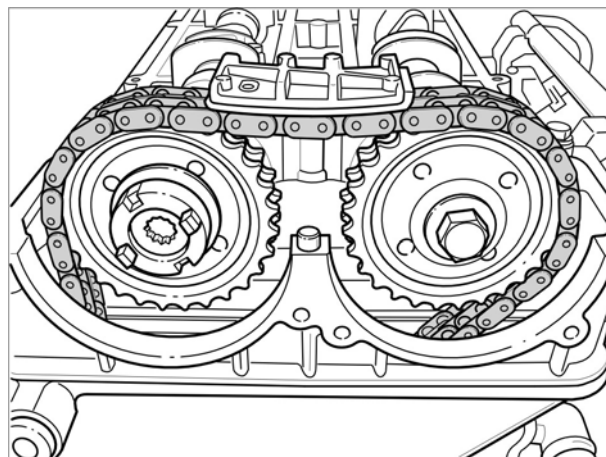
After tighten the timing chain sprockets as instructed

30 Nm + 90° torque angle.

Attention:

Remove camshaft block before tightening.

When tightening hold the camshaft pulleys with special tool 00072196531.



Setting jig	000.721.966.10
Retaining spring, exhaust side	000.721.966.12
Retaining spring inlet side cylinder 1 – 3	996.450.*****
Retaining spring inlet side cylinder 4 – 6	996.450.*****

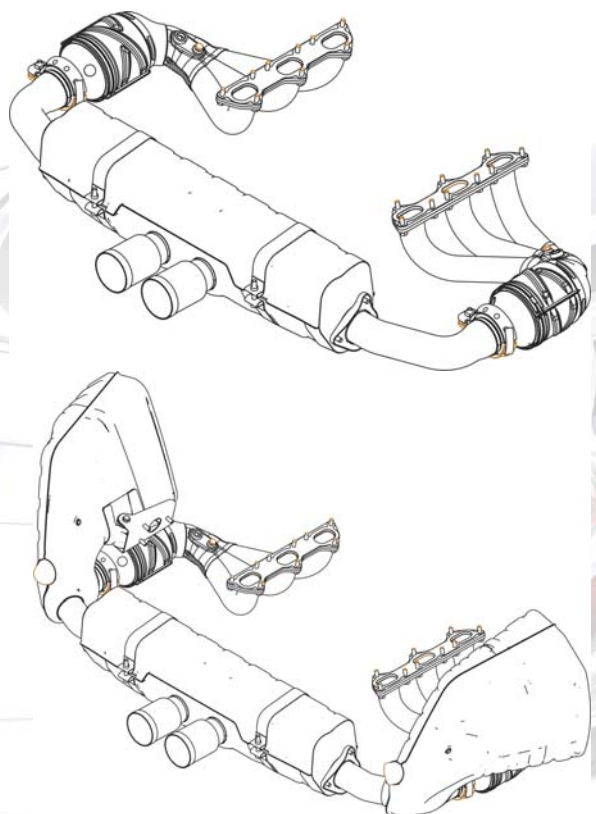
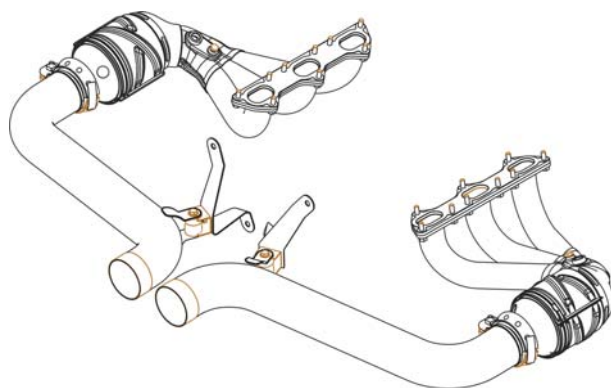
Valves:

The exhaust valves are sodium filled standard GT3 production specification.

Exhaust system:

Exhaust system with cat-manifold (integrated catalytic converter) and silencer.

Noise emissions are subject to country specific regulations.

**Delivery version
without presilencer****Delivery version
including presilencer****Supercup version**

Engine cooling:

The engine cooling is made by a water/oil heat-exchanger fitted to the water cooling system.

Induction system:

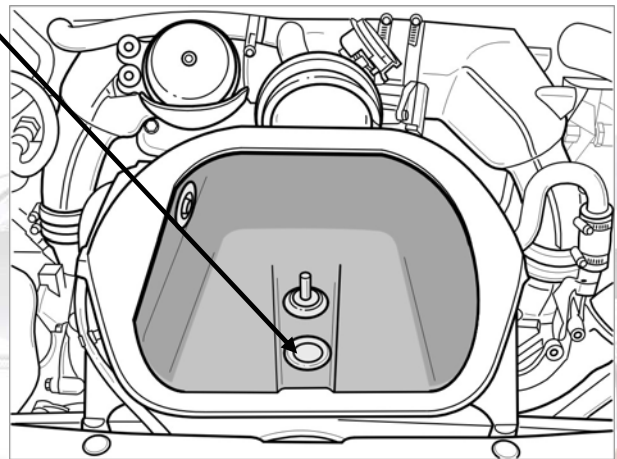
Multi-stage – resonance – induction channel

Central air intake plenum

Replaceable air filter in boot lid

Attention:

The rubber sleeve in the connecting part must be removed when racing in the rain.



Air filter element:

Attention:

Do not clean the air filter element with high-pressure.

Carefully remove the air filter element

Place the filter in a suitable water filled container.

Allow the filter to dry (without air pressure or hot air gun)

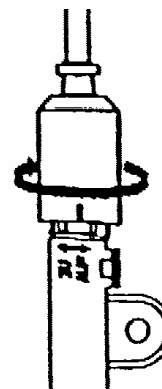
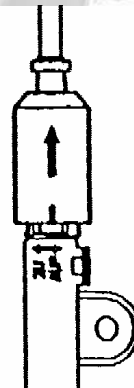
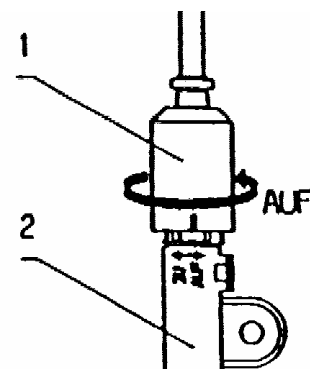
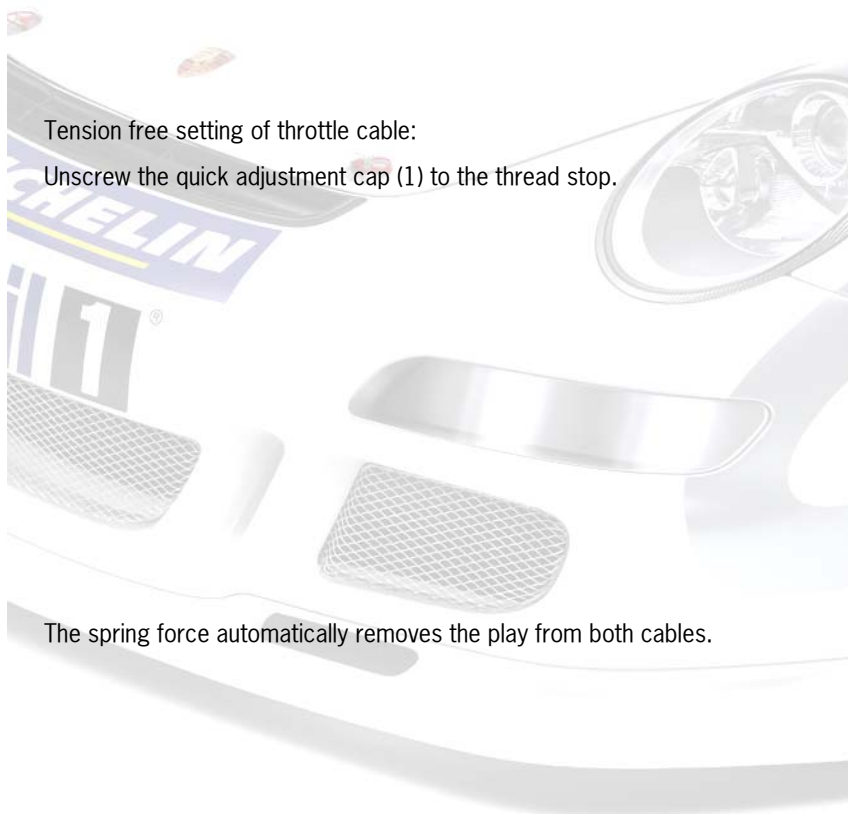
Afterwards impregnate the filter with filter oil spray.

Throttle cable adjustment:

The throttle cable adjustment is made on the connecting part

The two throttle cables are joined with the connecting piece in the cockpit behind the drivers' seat. This connection part removes the play from the cables by means of a spring. The adjustment of the connection part is carried out as described in step 1.

The throttle cable adjustment is made in 3 steps:



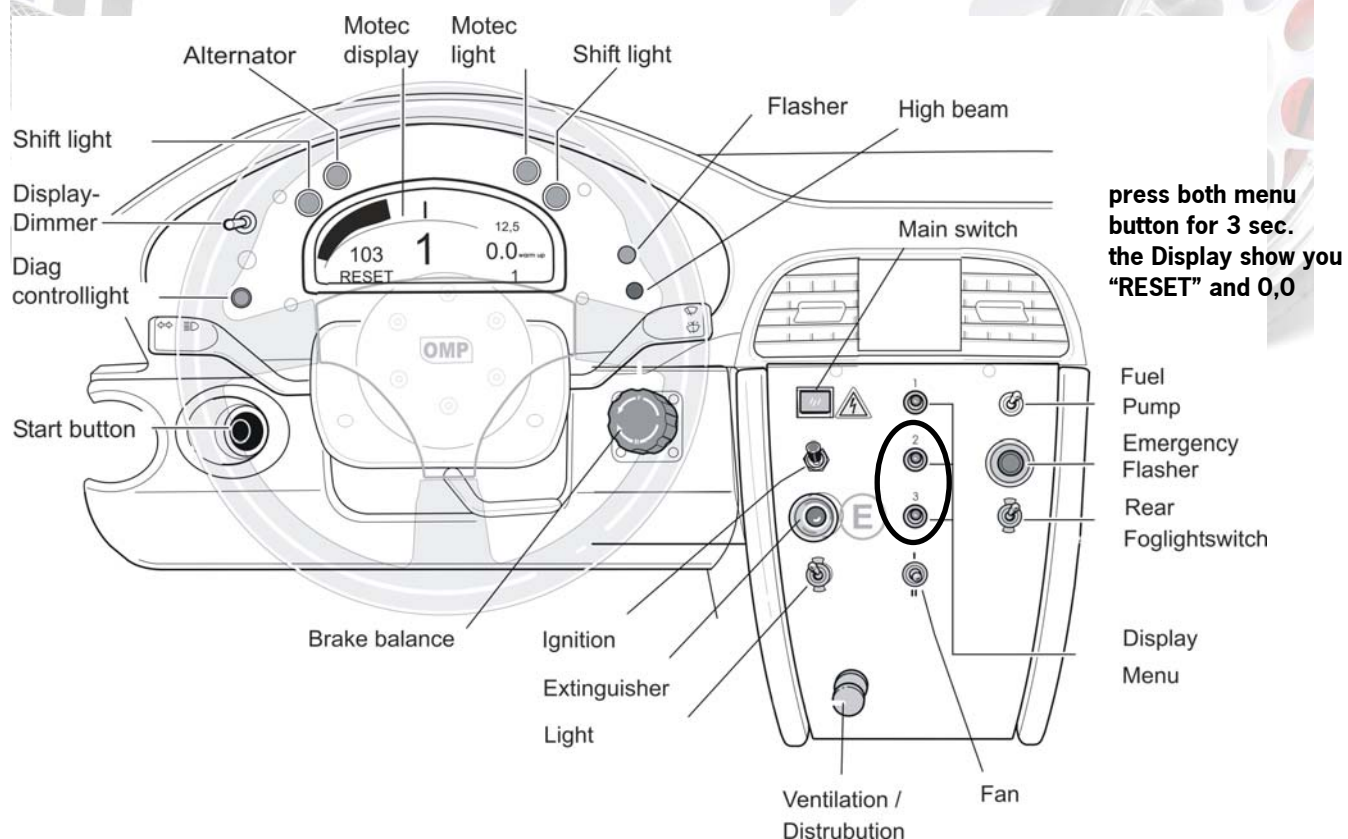
Tighten the screw cap (1) until it clicks clearly into place. In the closed position, the marking on the screw cap must cover the marking 'Zu' on the connection piece (2).

Re-setting the throttle

Re-setting the throttle is always necessary if the ECU or the throttle sensor were changed or replaced.



- Disconnect throttle cable
- Rotate the knurled screw (idle adjustment screw) anti-clockwise till a gap is visible between the cam-disc and the idle adjustment screw (throttle completely closed).
- select warm up mode in Motec display
- press both menu button for 3 sec
- the Display show you "RESET" and 0,0
- Open throttle 6,5% with the idle adjustment screw (refer to Motec display).
- Lock idle adjustment screw
- Connect throttle cable
- heck full throttle (refer to Motec display 100%)



All component tightening torques listed are given in Newton metres. Please ensure that your torque wrench is calibrated correctly!

Crankshaft and crankcase:

Connecting rod		
(see section connecting rod)	M10 x 1.25	30Nm +60°
Oil pump	M8	23
Crankcase studs	M10 x 1.25	50
Crankcase nuts & bolts	M8	23
Flywheel to crankshaft	M10 x 1.25	90

Always renew bolts after flywheel removal

V-belt pulley to crankshaft	M14 x 1.5	170
Plug screw for pressure release valve	M18 x 1.5	40
Crankcase oil drain screw	M20 x 1.5	50

Cylinder head and valve train:

The exact procedure for tightening the cylinder head bolts is described in the section 'Cylinder head'.

Camshaft housing on cylinder head

Initial torque	M8	23
Final torque	M8	28
Knock sensor on cylinder casting	M8	23
Spark plugs	M12 x 1.25	20

Attention: The spark plugs should be tightened a maximum of 5 times.

Camshaft pulley to camshaft	M12 x 1.5	30 +90°
Timing chain case to crankcase		23
Valve cover to camshaft housing	M 6	9.7
Camshaft bearing cap		13

Ancillary components:

Alternator belt pulley		55
Exhaust manifold to cylinder head		23
Lambda sensor	M18 x 1.5	50
Clutch to flywheel	M8 x 45	33

Clutch

5 ½" 3-plate sintered bronze clutch with central release mechanism

Mounting instructions:

With multi-plate clutches care should be taken that the splined hub is as well aligned as possible with the sintered plates.

(Special alignment tool, Porsche Nr. 996.450.335.90)

Smear the splines lightly with grease and slide the clutch plates along the splined input shaft till the hub moves easily on the shaft. Remove excess grease.

Make sure no grease is smeared on the clutch plates.

Wear:

Sintered clutch plate, new thickness 2.6 mm

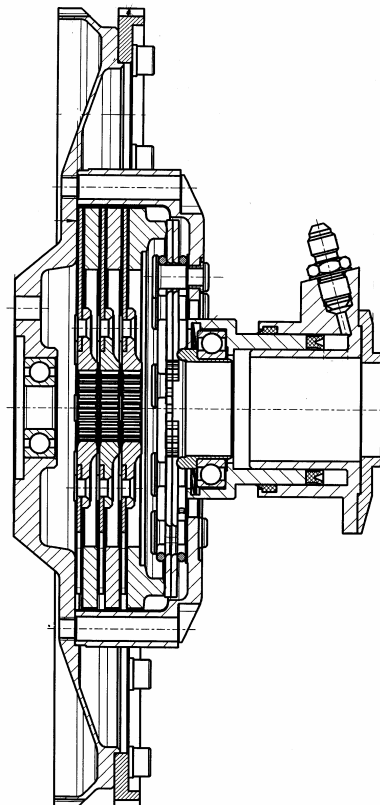
Replace clutch plates when minimum thickness is: 2.2 mm

The diaphragm spring clamping force remains constant to this minimum thickness, reduces when minimum thickness exceeded.

Fluid:

Endless RF - 650

Assembly diagram:



Gearbox G 97 / 63

The Porsche six-speed sequential gearbox is fitted with a limited slip differential, and 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 discarded.

Only one gear ratio set is allowed in the one-make cup races.

When filling the gearbox with oil for the first time, i.e. when the complete system, including cooler, filter and oil lines are dry, the system capacity is 3.6 litres. Following a gear ratio change only 3.0 litres of oil should be added. The use of Mobil 'Mobilube' SHC gearbox oil is recommended.

Production gear ratio set:

Crown wheel and pinion		8/32
1 st gear	12/38	997.302.961.6E
2 nd gear	15/32	997.302.962.6C
3 rd gear	18/31	997.302.963.6E
4 th gear	20/28	997.302.964.6J
5 th gear	23/26	997.302.966.9N
6 th gear	29/27	997.302.966.9L

Limited slip differential:

The locking torque of the differential is 40 % (power) and 60 % (braking) (Dynamic locking value).

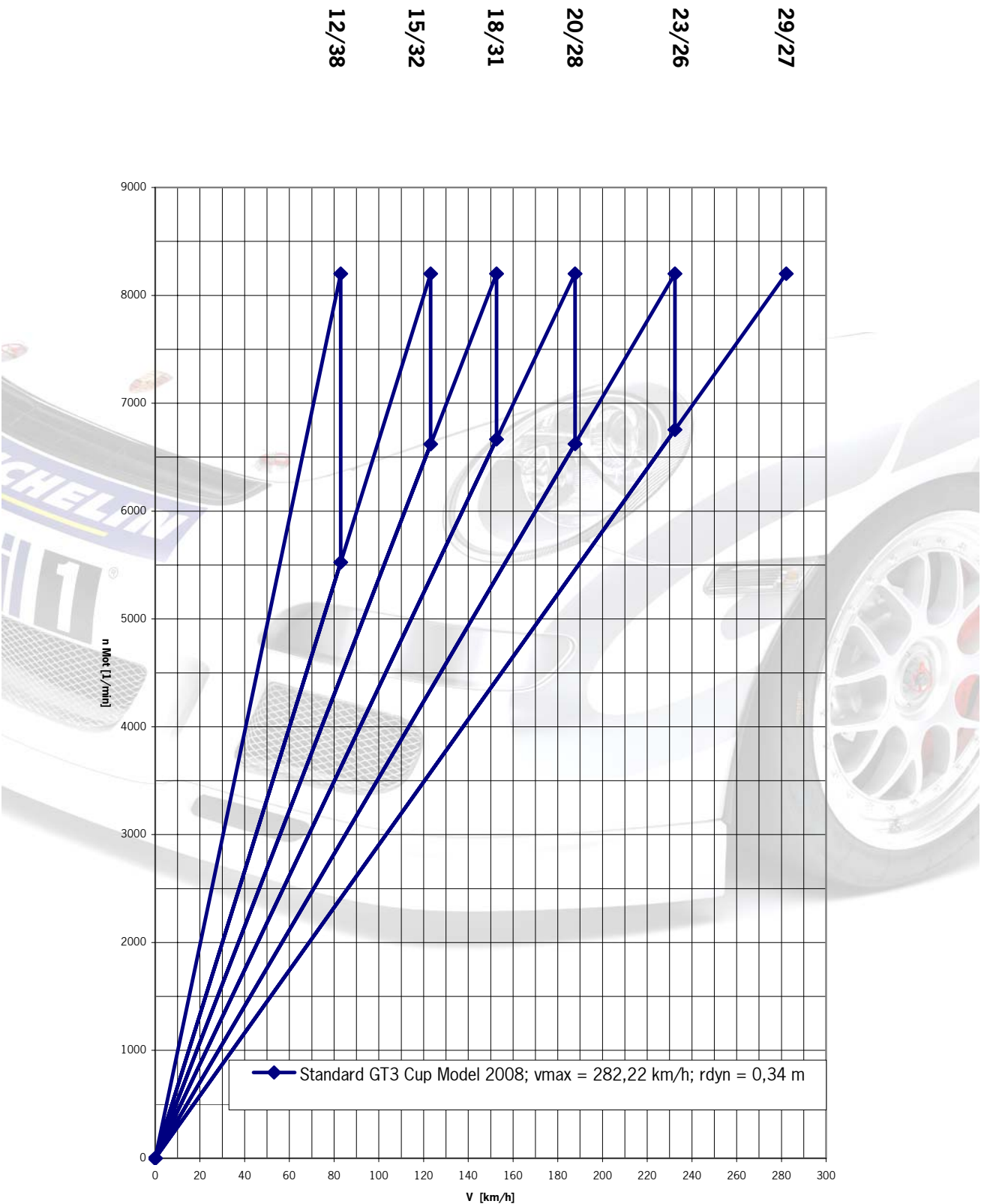
The differential lock is checked by means of friction force measurement in which the preload and wear of the clutch plates is checked.

See page 18

Gearbox mounting:

A solid gearbox mount reduces the relative movement of the complete drive train. The result is improved handling particularly during weight transfer due to on/off throttle application. Using the solid gearbox mounting increases the noise level in the cockpit.

Gear ratio chart 911 GT3 Cup Type 997 model 2008



Changing gear:

The car is equipped with a six-speed sequential gearbox, which means that all gears are selected in sequence. Up shifting is made by pulling the gear lever rearwards and down shifting by pushing the gear lever forwards. The shift mechanism is connected to the gearbox by a push/pull shift cable.

A gear lever force sensor is integrated in the gear knob, which activates an ignition cut, and therefore a cut in propulsion, when pulled. 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 teeth.

Due to wear, always blip the throttle and use the clutch when down shifting.

Gearbox maintenance:

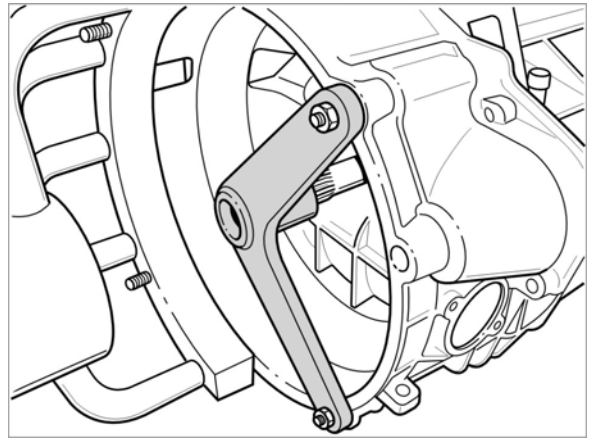
The following work should be carried out after a total running time of **approximately 2000 km:**

- Check gear ratio pairs (gear teeth and dog teeth)
- Check the dog rings.
- Check the gear hub and gear roller bearings for signs of wear and pitting.
- Check the oil for signs of metallic debris.
- Check the crown wheel and pinion for pitting
- Replace the pinion bearing (4-point bearing)
- Replace the oil filter
- Replace the shift cable

Note: The gearbox disassembly and assembly instructions are described in this brochure. These give you the possibility to replace damaged or worn parts. In the event of more comprehensive damage, which requires the replacement of castings, we recommend that this work is carried out by Porsche Motorsport. Intricate measurement and adjustment work, which is not described in these instructions, is required to ensure that the gearbox works perfectly.

Dismantling the gearbox:

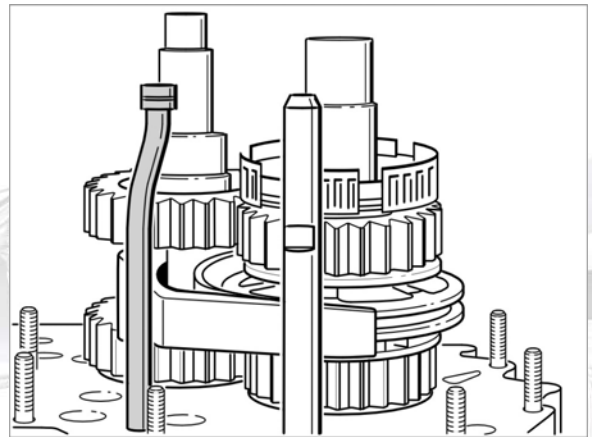
Clamp the input shaft using the special tool



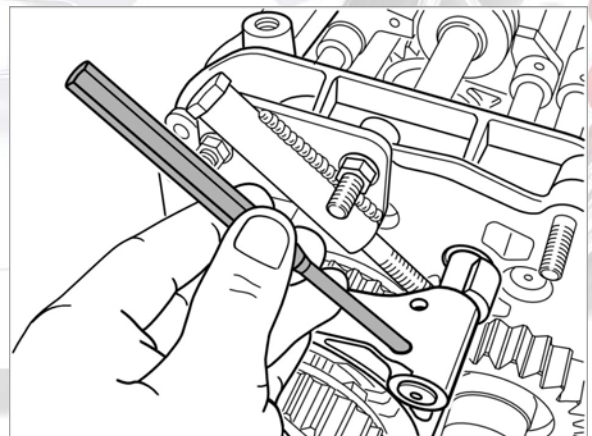
Remove the gearbox cover nuts and then slide off the cover.

Remove the oil pipe retaining screws before pulling out the oil pipe.

Engage 1st gear



Drive out the 5th / 6th gear selector fork roll-pins with a suitable drift.

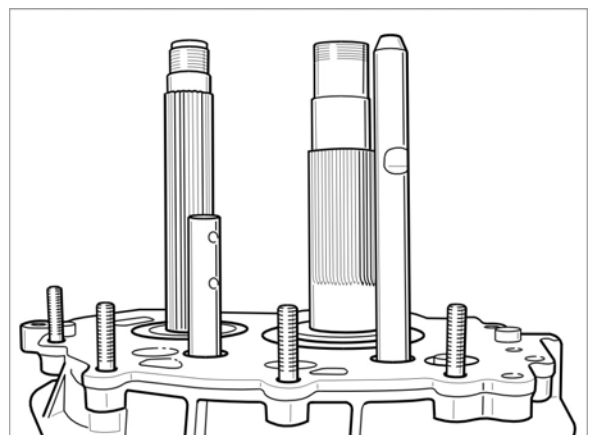


Attention: When removing the roll-pins, make sure the selector fork rod is properly supported.

Remove the collared-nuts from the input and pinion gear shafts.

Remove the reverse gears and rollers bearings.

Remove the 5th and 6th gear ratio wheels, hubs, dog rings and the 5th / 6th gear selector fork etc.



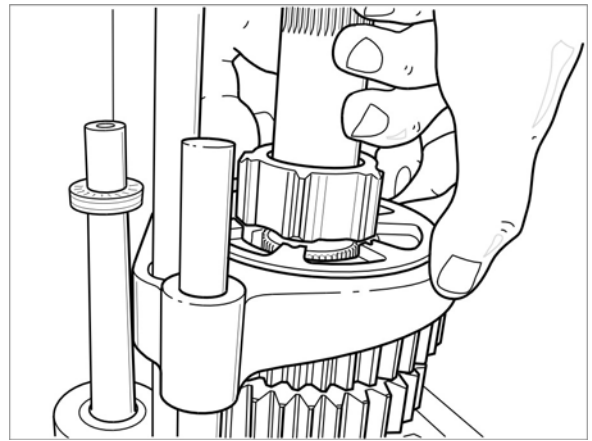
Remove the gear housing nuts and take off the housing.

Remove roller bearing.

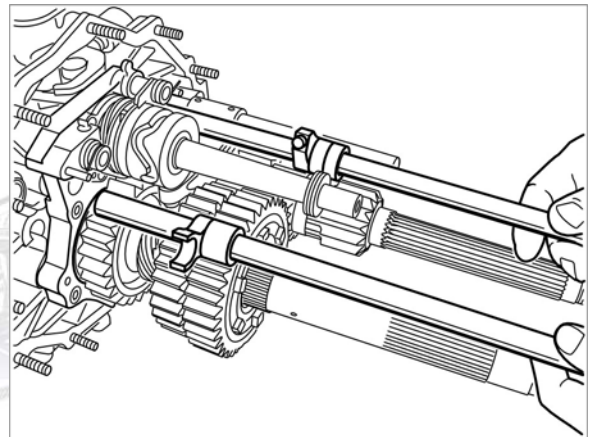
Remove the 1st gear ratio wheel.

Remove the 1st / 2nd gear dog-ring hub.

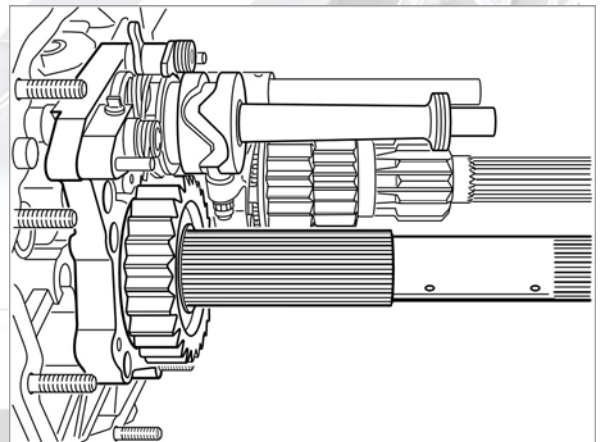
Remove the selector rod including the 1st / 2nd gear selector fork.



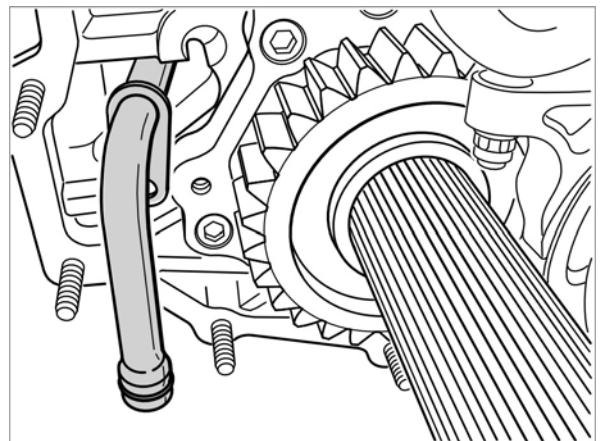
Remove the 5th / 6th gear selector rod and reverse gear.



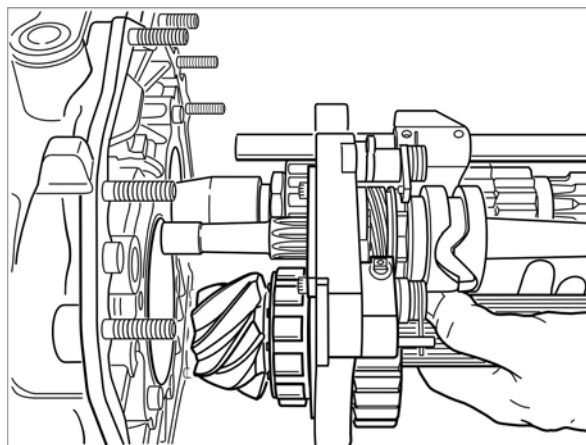
Remove all gear ratios, hubs etc from the pinion gear shaft.



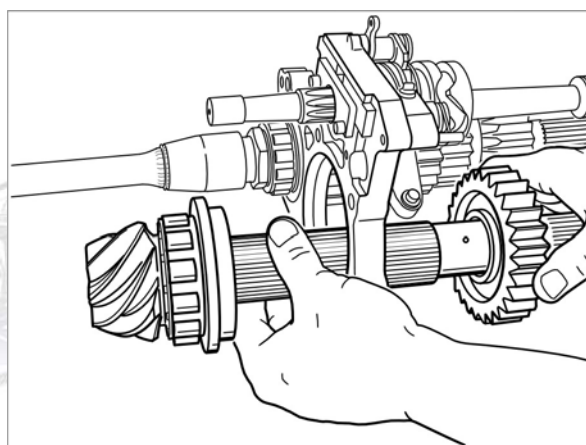
Loosen the oil scavenge pipe and twist to the side.



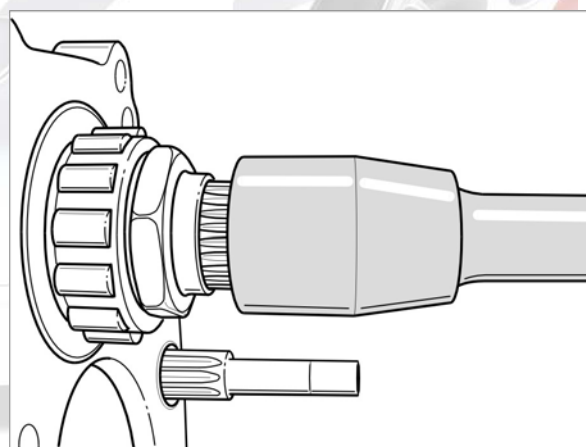
Loosen the mounting plate (7x M8 cap head socket screws)
and remove completely.



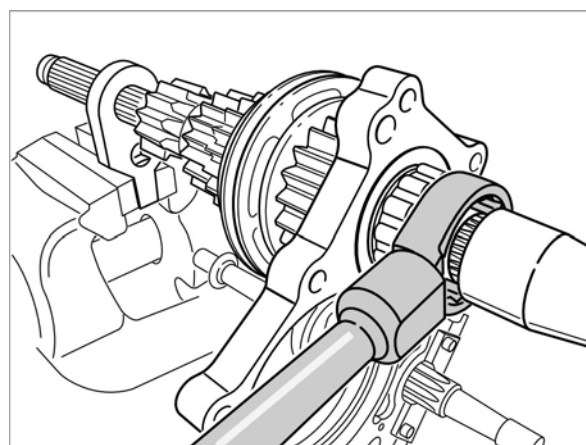
Pull the pinion gear shaft out of the mounting plate.
After the removing the mounting plate, remove the selector rod
with the 3rd / 4th gear selector fork.



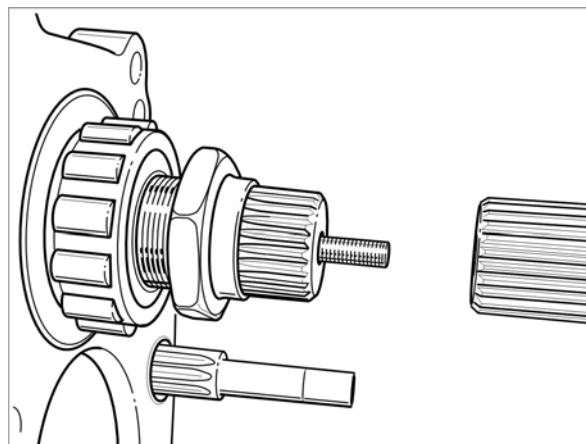
Remove the circlip and sliding sleeve from the input shaft.



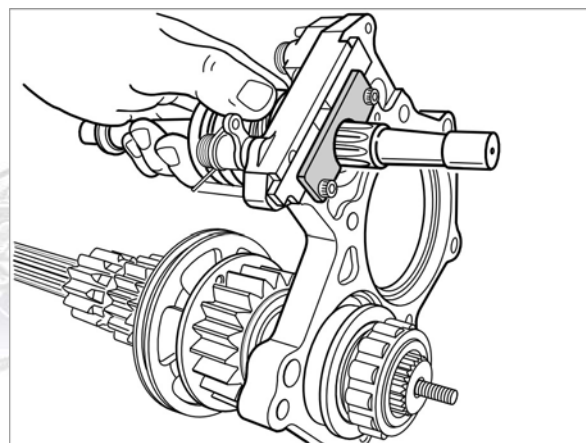
Clamp the input shaft with the special tool and loosen the
collared nuts.



Separate input shaft



Pull the input shaft out of the mounting plate.



Limited slip differential:

The limited slip differential has a basic locking torque of 40% (power) and 60% (braking). (Locking rate dynamic).

Notice:

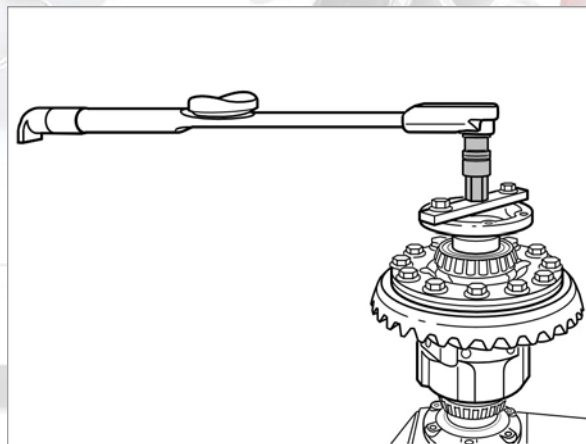
In the event of repair work being carried out always replace the complete clutch pack.

Change individual plate's is not permitted.

When reassembling the differential smear all the friction faces, pressure plates and the axles with gearbox oil.

To check the basic locking torque, a flange with two bolts should be mounted in a vice; the second flange with the connection piece should be fitted to the differential.

Turn the diff with a torque wrench. A basic torque of between 90 Nm and 180 Nm should be achieved.

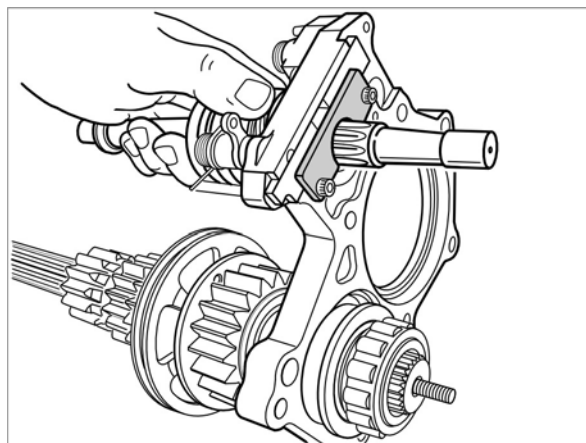


Gearbox assembly:

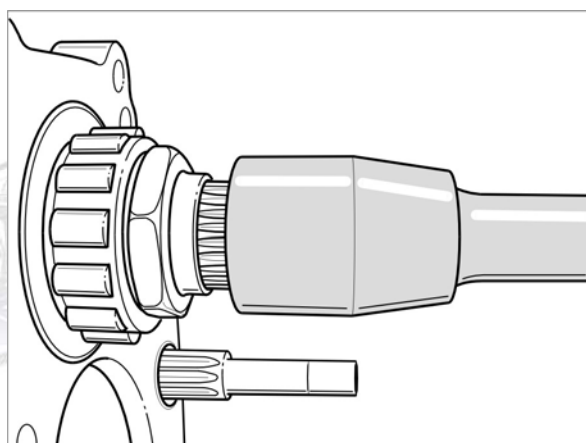
Fit the splined 2nd gear and the 3rd and 4th idler gear wheels etc to the input shaft before pushing the complete shaft through the mounting plate.

Clamp the input shaft using the special tool.

Tighten the collared input shaft nut to 220 Nm.



Bolt together the split input shaft and fit the sliding sleeve and circlip.

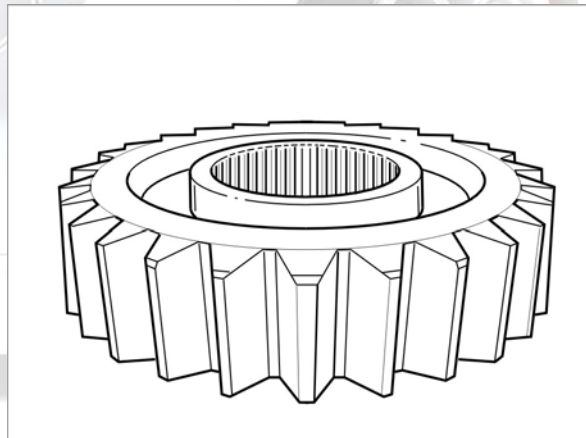


Fit the selector rod with the 3rd / 4th selector fork and push the cam follower into selector barrel track.

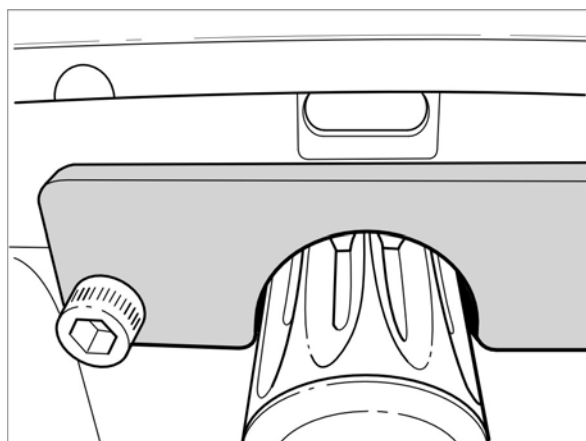
Push the pinion gear shaft into the mounting plate.

Fit the splined 4th gear wheel to the pinion gear shaft.

Attention: The 3rd/4th fixed gear wheel is not symmetrical and must be mounted with the raised surface facing the mounting plate.

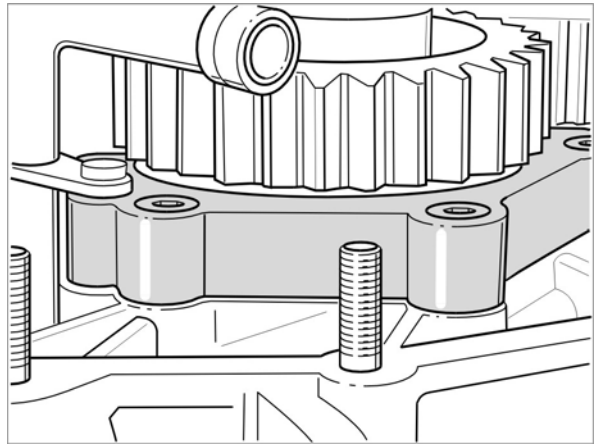


Mount the gear selector barrel-drive in position before fitting the mounting plate.

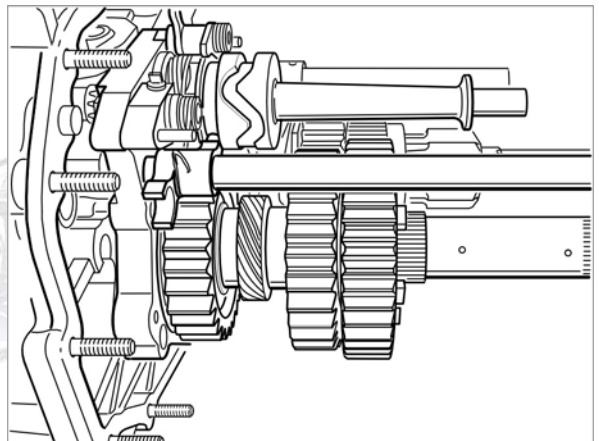


Fit the complete mounting plate to the differential housing and tighten (7x M8 cap head screws). Lightly coat the threads with Loctite 243.

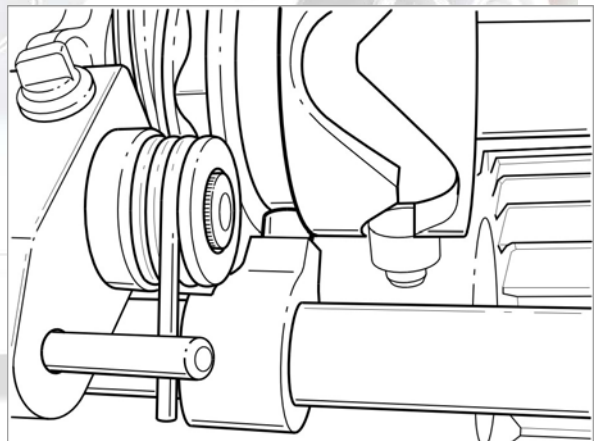
Attention: The gearbox must be positioned vertically before fitting the mounting plate.



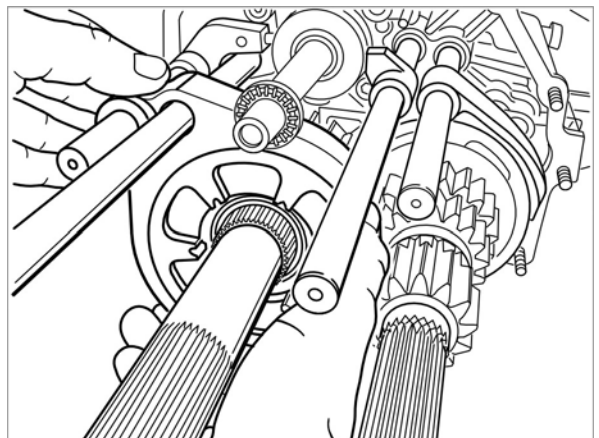
Rotate the selector barrel to the 1st gear position.
Slide the oil pump drive, spacer, 3rd gear, bearing hub, needle roller bearing and 2nd gear to the shaft.



Mount the reverse gear gear-shift rod.

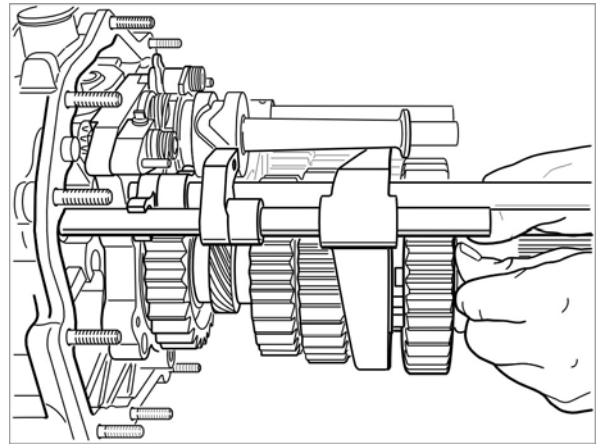


Slide on the dog-ring, 1st / 2nd selector fork and selector rod.



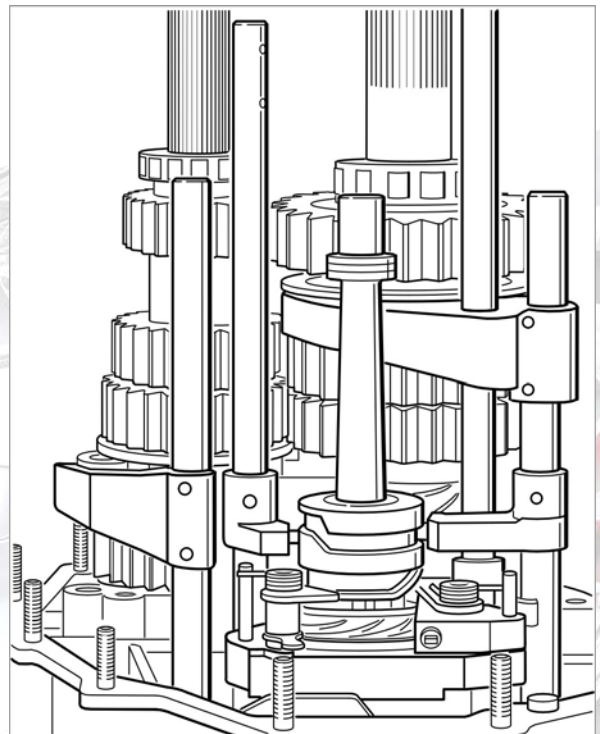
Fit 1st gear dog-ring hub.

Push the 1st gear idler wheel onto the shaft.

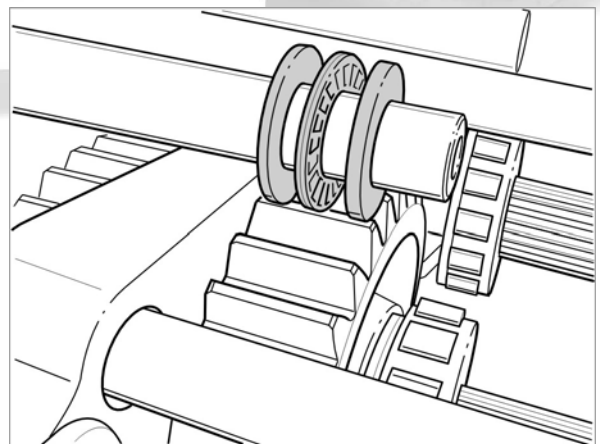


Fit the 5th / 6th gear selector rod with cam follower.

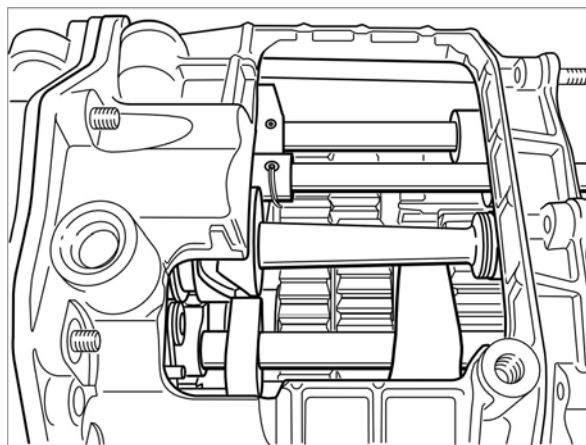
Fit the roller bearing.



Fit the axial needle roller bearing and spacer ring to the selector barrel.

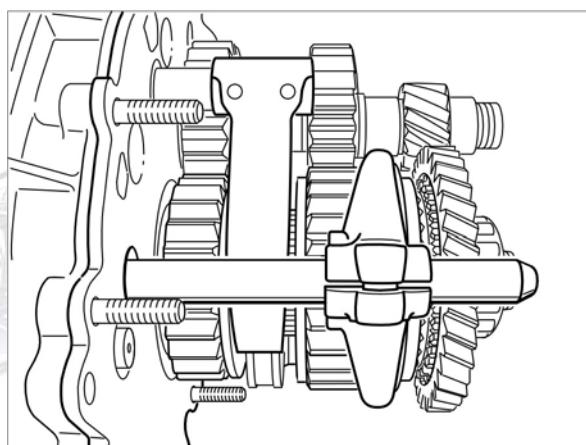


Mount the cut away gear cluster housing. Part 996.450.319.9A



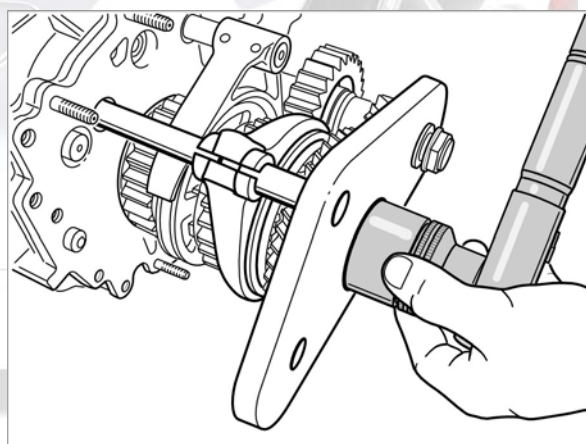
Fit the splined 6th gear spacer hub and the 6th gear idler wheel, guide hub, dog-ring, selector fork and 5th gear idler wheel to the pinion gear shaft. Fit the splined 5th gear wheel to the input shaft.

Fit the reverse gear and afterwards the selector fork.



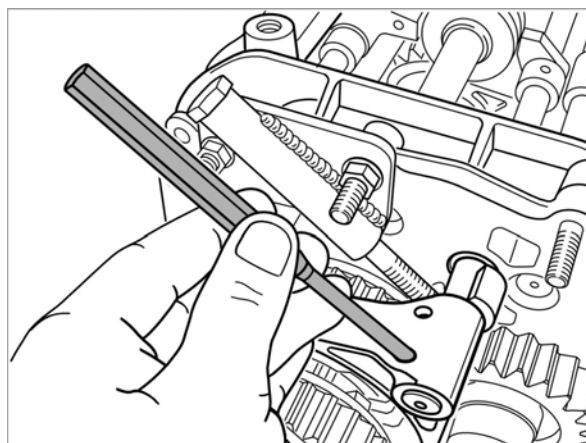
Tighten the collared input shaft nut to 220 Nm torque.

Tighten the collared pinion shaft to 330 Nm torque.



Secure the 5th / 6th gear selector fork with the roll-pin.

Attention: When pressing in the roll-pin always support the selector fork with special tool 996.450.315.9A.

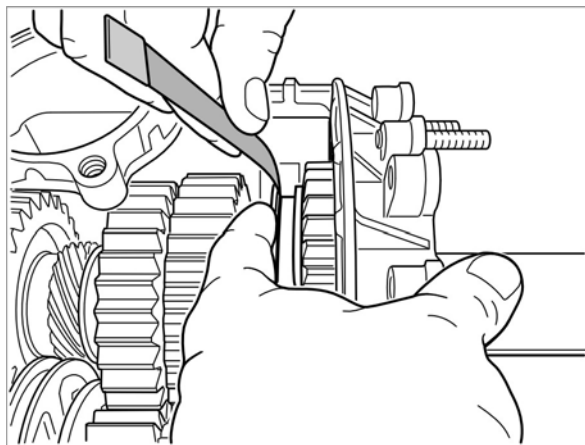


Check the free play of the 1st/2nd and 5th/6th gear dog-ring guide hubs.

Select the gears and bring the dog-ring into position by hand.

There should be 0.1mm play, on each side, between the dog-ring and selector fork.

Attention: Insufficient gear-selector fork play can be adjusted by fitting the spacer ring H3. (H3 spacer ring, see sketch in appendix).



Loosen the collared input and pinion gear shaft nuts.

Remove the reverse gears, 5th / 6th gears etc

Remove the cut away housing and fit the gear wheel housing

Fit the reverse gears, 5th / 6th gears etc

Tighten the collared input and pinion shaft nuts.

Fit the special reverse gear tool 996.450.311.9A.

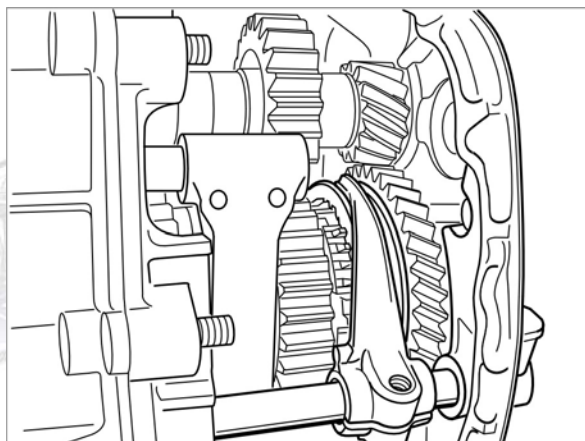
Engage reverse gear by rotating the selector barrel.

Slide the selector fork and dog-ring till reverse gear is fully engaged.

Attention: There must be play on both sides between the selector fork and dog-ring.

Tighten the clamping screw in this position.

Attention: The reverse gear selector fork clamp screw must only be tightened when the cut away housing is in position



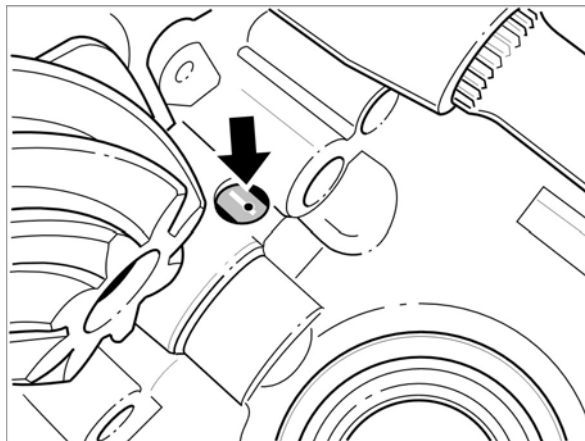
Remove the cut away gearbox cover.

Fit the oil tube, without the use of excessive force, to the casing and locate in position with the retaining screw.

Attention: If fitted incorrectly, the oil tube can collide with the gear shift forks.

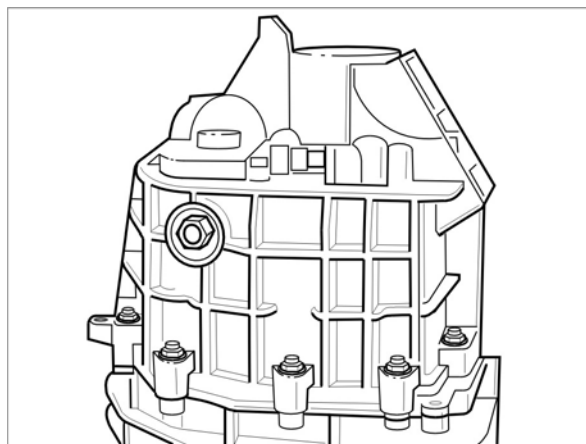
When the oil tube is fitted correctly it is visible through the bore in the differential housing.

This visual check is only possible with the differential removed.



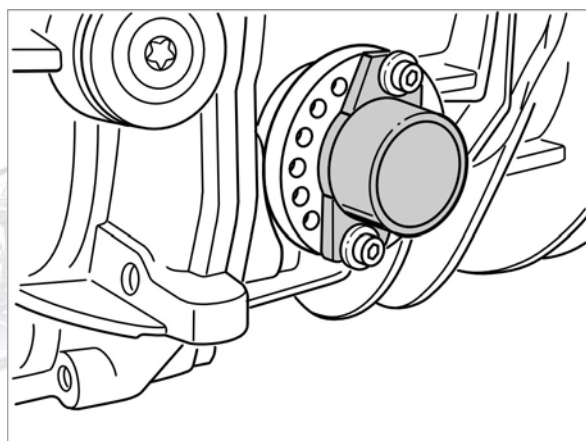
Smear the gearbox cover mounting faces lightly with sealing compound.

Tighten the gearbox cover (M8 spring washers and nuts).

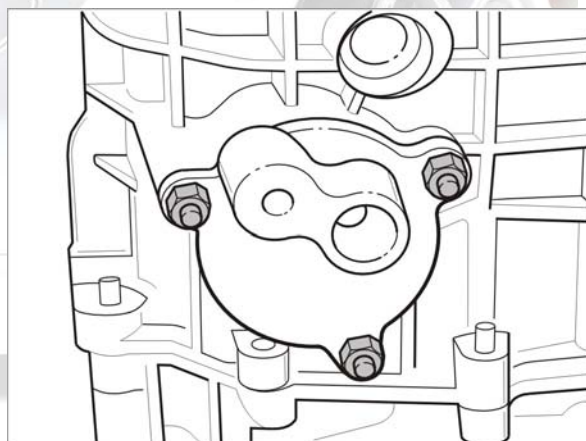


Fit the drive shaft and gear recognition potentiometer as marked during removal.

Attention: The potentiometer MUST be adjusted after the gearbox has been fitted to the car (refer to Potentiometer Adjustment).



Mount the oil pump.



Changing the selector barrel:

To remove the locking pawl neutral latch and alignment pawl, unscrew the selector barrel and lock.

Raise the selector barrel.

Attention: When removing the barrel, make sure that the locking pawls, springs etc do not fall out.

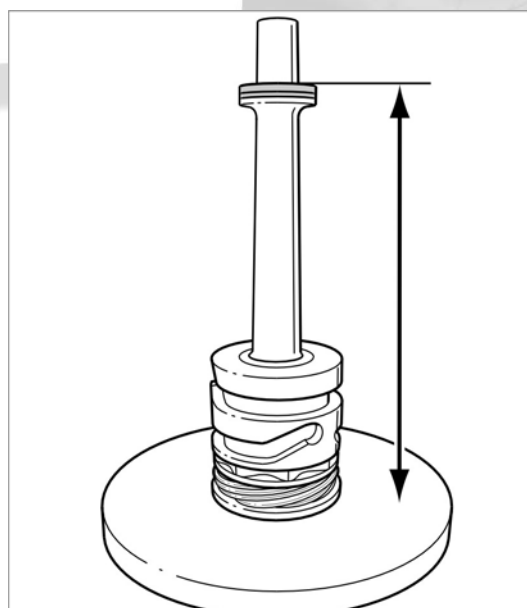
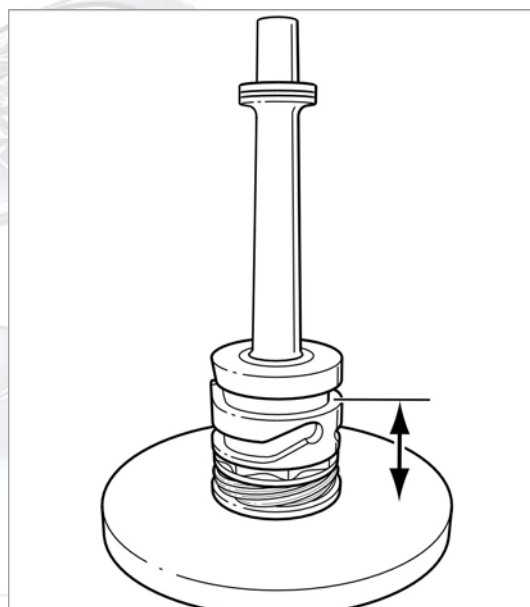
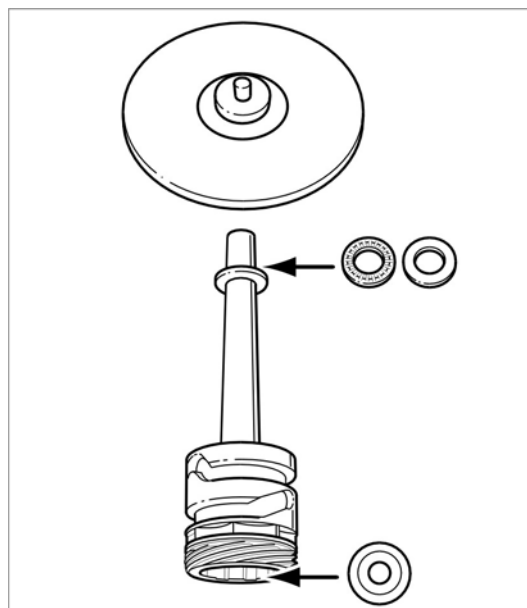
Attention: When replacing the selector barrel, the position of the barrel track must be fitted in exactly same position.

Place the old selector barrel, with spacer washers, on the special base plate. The barrel must sit correctly on the bearing spacer ring.

Determine the dimension of the old selector barrel between the 3rd/4th track.

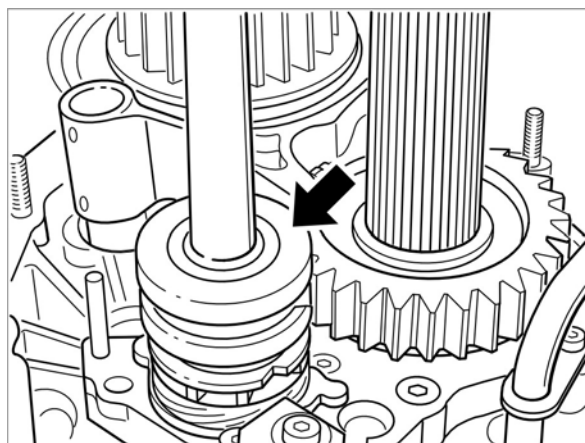
Set the new selector barrel in position and determine the dimension as above.

Calculate the spacers required, place in the new selector barrel and check the dimension.



Set the new selector barrel in position and determine the dimension as above.

Calculate the spacers required, place in the new selector

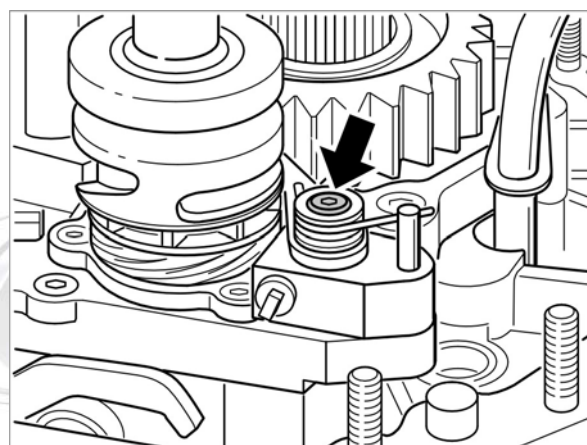


barrel

and check the dimension.

Replacing the selector barrel alignment pawl.

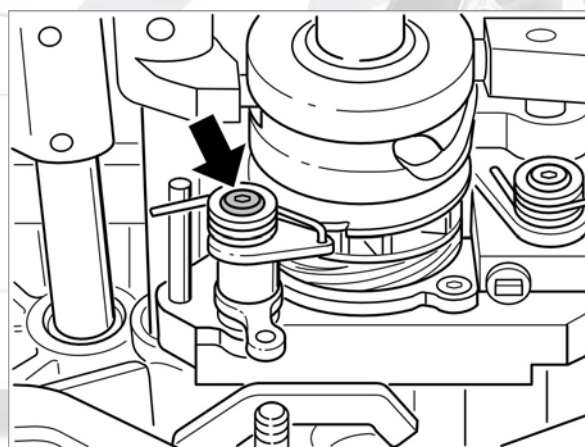
When replacing the selector barrel alignment pawl bolt it must be secured with Loctite 243.



must

Locking pawl neutral latch replacement

When replacing the locking pawl neutral latch bolt it must be secured with Loctite 243.



Adjustment of the gear recognition potentiometer

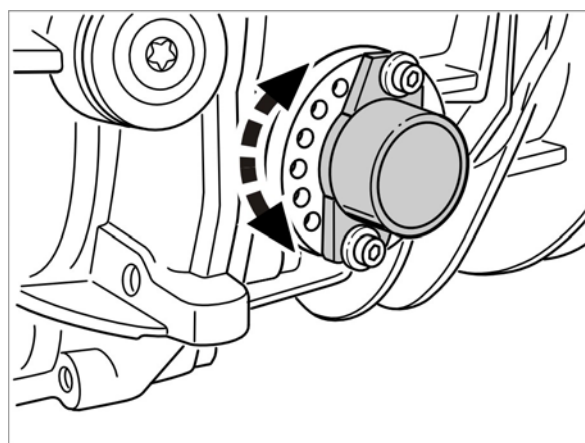
Connect the laptop to the vehicle, switch on the ignition and the MODAS programme. Select the "Warm up mode".

Select 6th gear. Turn the wheels to make sure that 6th gear correctly engaged.

The value in the display must read 3.85 Volt.

To adjust the value, rotate the potentiometer till the correct appears in the window.

The display must show 6th gear.



start

is

figure

Gear shift mechanism:

Gear lever with gear shift force sensor to cut engine propulsion

Function:

The sensor is only active at engine speeds greater than 2800 rpm.

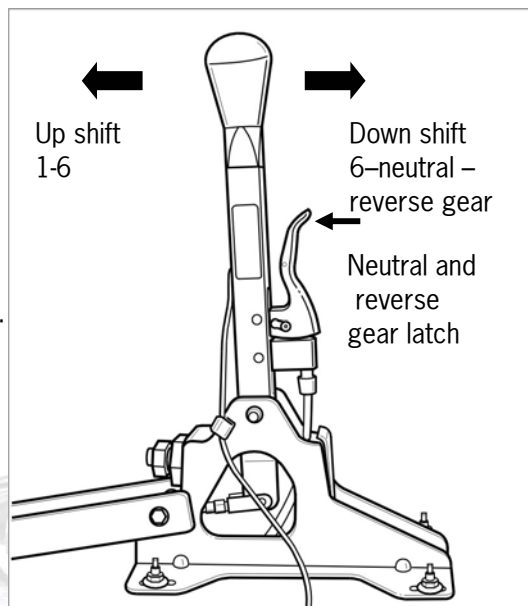
Sensor is not speed dependent.

Ignition cut only occurs under power.

Selecting neutral and reverse gear:

The release lever must be moved to change from 1st gear to neutral.

Sequence: 1st gear – neutral – reverse gear.



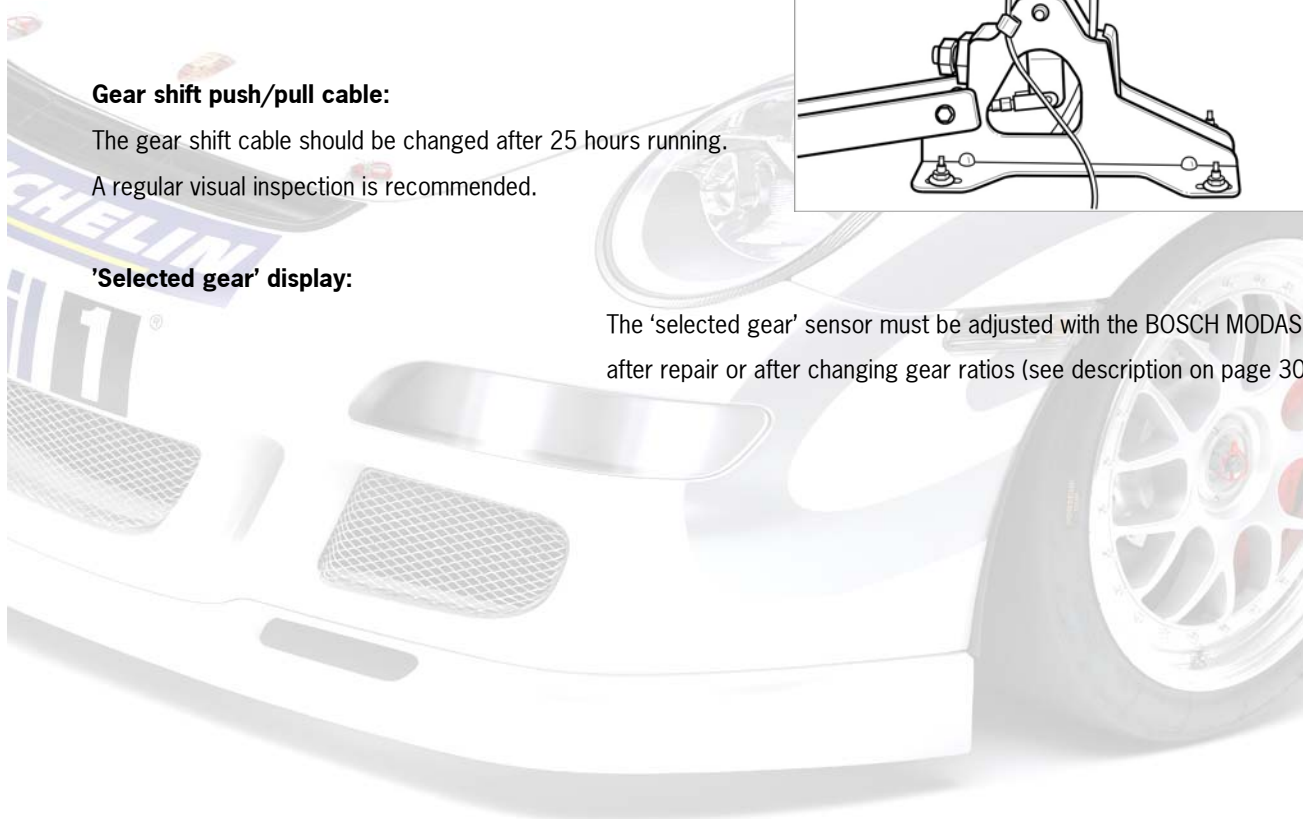
Gear shift push/pull cable:

The gear shift cable should be changed after 25 hours running.

A regular visual inspection is recommended.

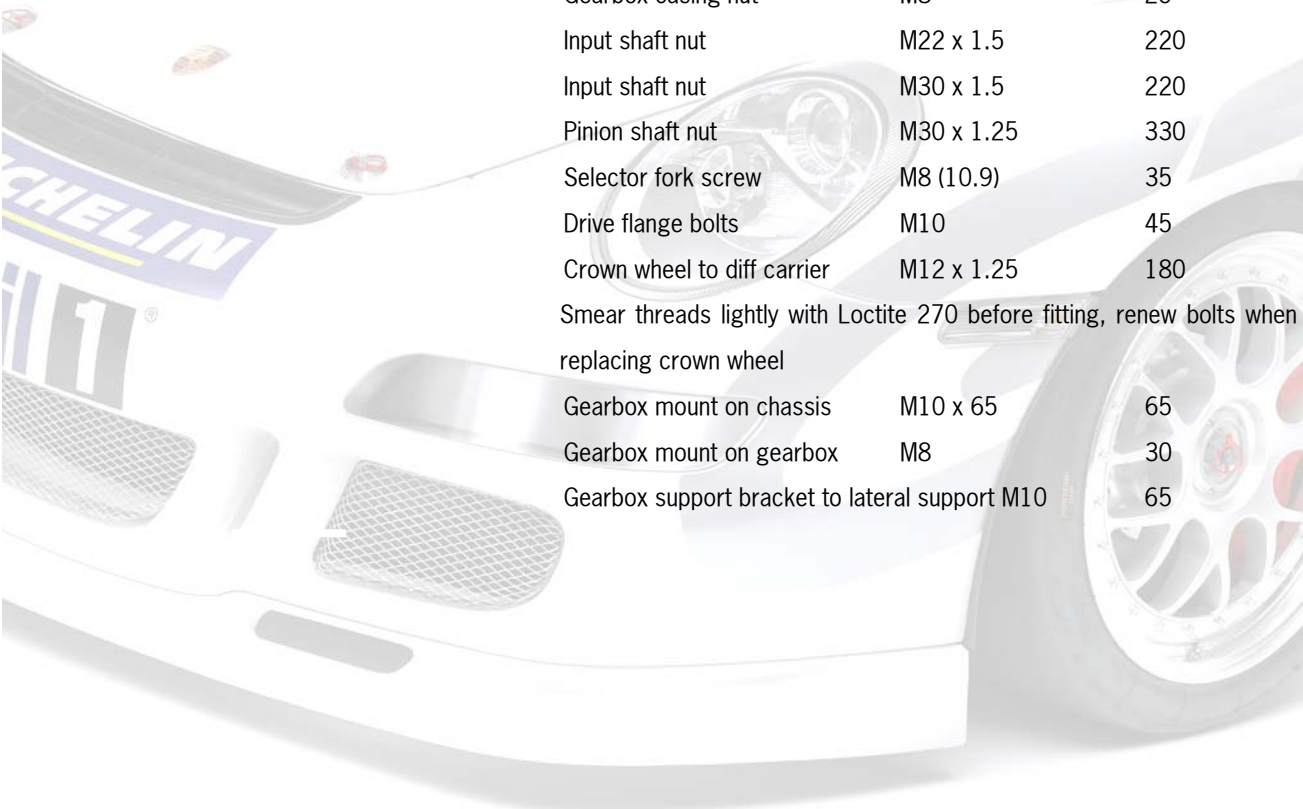
'Selected gear' display:

The 'selected gear' sensor must be adjusted with the BOSCH MODAS System after repair or after changing gear ratios (see description on page 30)



Gearbox component tightening torques

All component tightening torques listed are given in Newton metres. Please ensure that your torque wrench is calibrated correctly!

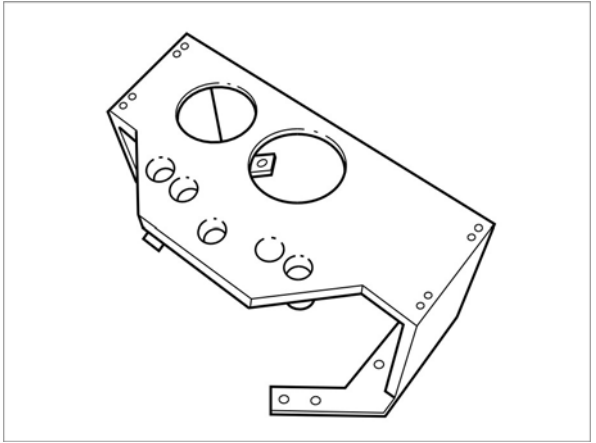


Oil fill plug	M22 x 1.5	40
Oil drain plug	M22 x 1.5	40
Gearbox casing nut	M8	25
Input shaft nut	M22 x 1.5	220
Input shaft nut	M30 x 1.5	220
Pinion shaft nut	M30 x 1.25	330
Selector fork screw	M8 (10.9)	35
Drive flange bolts	M10	45
Crown wheel to diff carrier	M12 x 1.25	180
Smear threads lightly with Loctite 270 before fitting, renew bolts when replacing crown wheel		
Gearbox mount on chassis	M10 x 65	65
Gearbox mount on gearbox	M8	30
Gearbox support bracket to lateral support	M10	65

Special tools

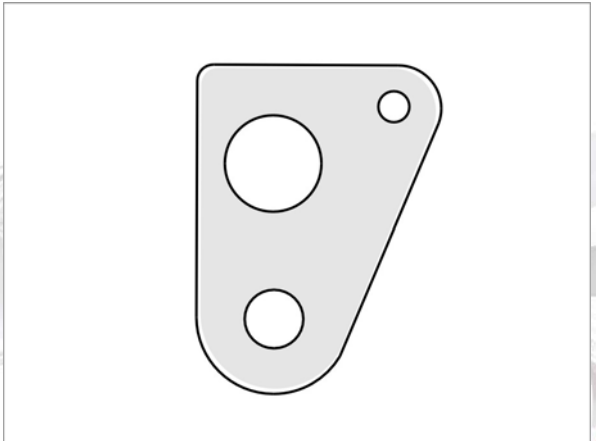
Gear ratio housing tool

Part number 996.450.310.9A



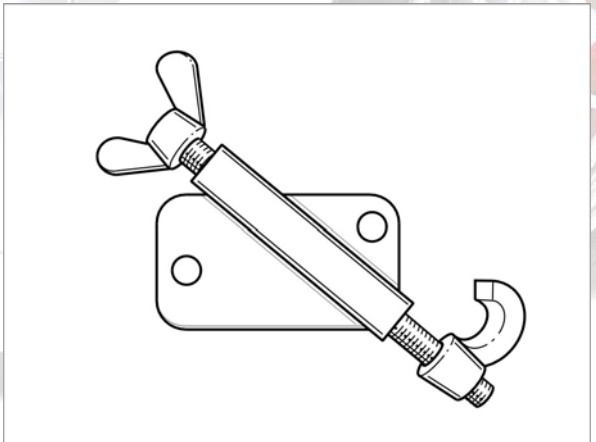
Reverse gear tool

Part number 996.450.311.9A



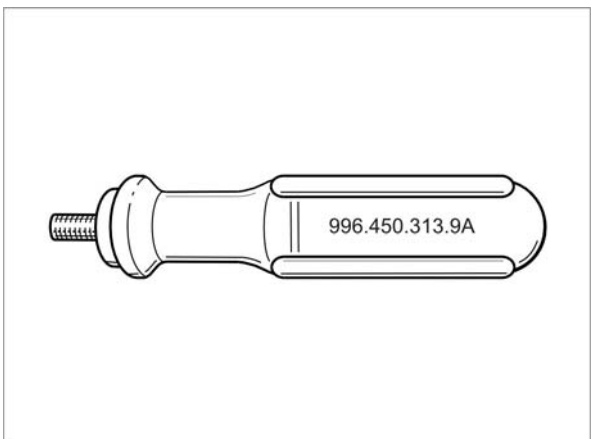
Inner shift rod tool

Part number 996.450.315.9A



Shift grip

Part number 996.450.313.9A



Fluid capacities

Fuel tank

Tank capacity 90 litres.

Gearbox oil

When gearbox new 3.8 litres

After changing gear ratios about 0.6 litres remains in the gearbox

Engine oil

Approximately 10 litres

Engine cooling fluid

Approximately 22 litres

The car is delivered with 11 litres of Porsche cooling fluid and approximately 11 litres of water.

It is recommended that 4 litres of Porsche cooling fluid and approximately 18 litres of water are used when refilling the cooling system.

Recommended products

Engine oil

Mobil 1 (0W - 40)

Engine cooling fluid

Porsche cooling fluid part number: 999 917 781 00 (min 2 L)

For Supercup races supporting F1 events the cooling water must be mixed with 2 L of anti-corrosion fluid:

Part No.: 997.106.907.90.

Gearbox oil

Mobilube SHC

Steering servo oil

Pentosin

Fuel

98 RON Super plus lead free

Brake and clutch fluid

Endless RF - 650 Racing Super Fluid, part number. 996.355.960.90

Air jack system

Air pressure (operating pressure approximately 26 bar)

Suspension

Front axle

- Independent suspension
- Centre lock wheels
- McPherson strut with double clamped upright
- Multi adjustable anti-roll bar
- Non-adjustable dampers
- Rack & pinion steering with electro-hydraulic assistance.
- Main spring: 100 - 60 - 260
- Helper spring: 75 - 60 - 43

Rear axle

- Independent suspension
- Multi-link axle with spherical bearings.
- Centre lock wheels
- Multi adjustable anti-roll bar
- Non-adjustable dampers
- Main spring: 130 - 60 - 260
- Helper spring: 60 - 60 - 50

Wheels

- 3-piece BBS race wheel:
- Front 9J x 18, offset 43
- Rear 11J x 18, offset 30

Tyres

- Car delivered with Michelin rain tyres:
- Front 24/64-18
- Rear 27/68-18

Brake system

- Dual circuit hydraulic brake system
- Separate front & rear brake cylinders
- Adjustable brake balance with balance bar system
- Aluminium monobloc brake caliper
- Ventilated brake discs

General maintenance and adjustments

Work on the front or rear axles

Repair

In the event of an accident or any other damage occurring to the suspension, every component NOT directly affected MUST be inspected. In this case, inspected means measured, crack detected and replaced where necessary (e.g. steering, wishbones, wheel carrier and suspension arms, rod-end bearings and joints, mounting bolts and wheels).

Anti-roll bar adjustment:

The anti-roll bar stiffness can be infinitely adjusted by rotating the lever arm at the end of the anti-roll bar. The M6 cap head screw on the front face must be loosened to turn the lever arm. The maximum stiffness of the anti-roll bar is achieved by setting the lever arm parallel with the anti-roll bar drop link. The minimum stiffness of the anti-roll bar is achieved when the lever arm is positioned at 90° to the anti-roll bar link. The lever arms should be adjusted together and set equally on each side. When rotating the lever arm do not damage the material with unsuitable tools. Grooves or notches or any other type of damage can lead to the lever arm breaking.

Changing the wheel bearings:

When replacing faulty wheel bearings please note the following points:

Press the wheel bearing out of the upright.

Heat the upright to 110°C before fitting the new wheel bearing

Drop the wheel bearing in by hand.

The wheel bearing should be seated correctly on the bearing face of the upright after fitting.

Tighten the wheel bearing cover to the given torque.

Check wheel bearing cover bolt torque after approximately 200 km.

Centre lock wheel nut:

Wheel nut tightening torque 460 Nm

The centre bolt and wheel nut must be cleaned regularly.

After cleaning the wheel nut re-grease the threads and mating face.

When remounting or fitting a new centre bolt, smear a small quantity of grease on the mounting faces and the internal threads.

Tighten the centre bolt to 470 Nm torque, continue tightening till the lugs in the safety ring lock into the grooves in the hub.

Use only 'Optimoly HT – Paste' to grease the centre lock components.

Working on the rear axle

Driveshafts:

It is recommended that new driveshafts are run in for 100 kilometres at a maximum speed of 200 km/h and at low torque. **Driveshafts that have already been fitted and run in a particular direction must not be swapped from left to right or vice versa.**



Inspection and mounting of the servo steering

Important notice:

The rack and pinion steering and servo pump must not be repaired and/or dismantled.

Checking the hydraulic fluid level:

The fluid level of the servo steering is measured using the dip stick fitted to the servo oil reservoir cap.

The engine must be running at idle speed when checking the fluid level

Do not turn the steering when checking the fluid level.

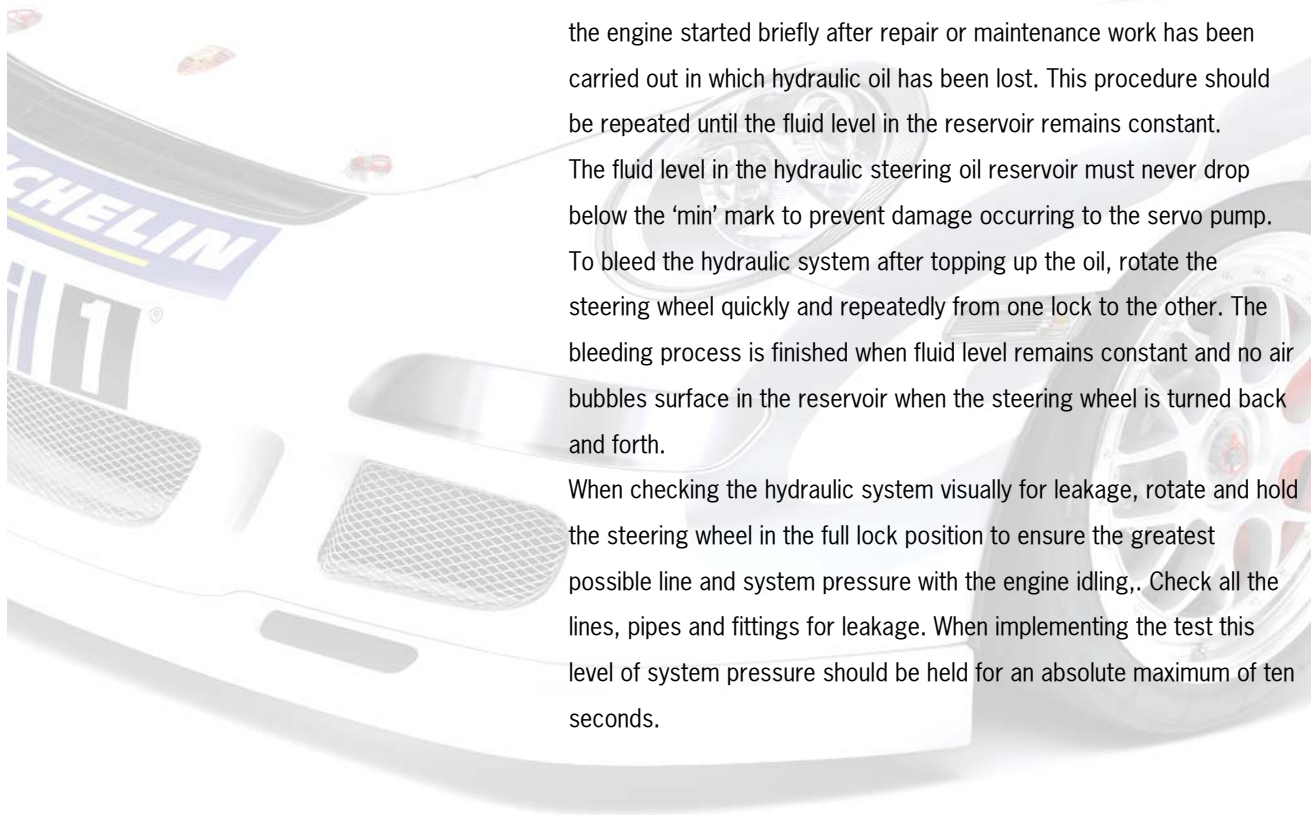
Filling and bleeding the steering system:

The hydraulic steering oil reservoir must be filled to the 'max' mark and the engine started briefly after repair or maintenance work has been carried out in which hydraulic oil has been lost. This procedure should be repeated until the fluid level in the reservoir remains constant.

The fluid level in the hydraulic steering oil reservoir must never drop below the 'min' mark to prevent damage occurring to the servo pump.

To bleed the hydraulic system after topping up the oil, rotate the steering wheel quickly and repeatedly from one lock to the other. The bleeding process is finished when fluid level remains constant and no air bubbles surface in the reservoir when the steering wheel is turned back and forth.

When checking the hydraulic system visually for leakage, rotate and hold the steering wheel in the full lock position to ensure the greatest possible line and system pressure with the engine idling,. 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.



Suspension alignment

Miscellaneous:

Measuring and aligning the front and rear 911 GT3 Cup suspension is similar to the alignment procedure for a standard road-going Porsche. The suspension alignment can be made with any suitable optical or electronic system or the optional Porsche Motorsport alignment system (part nr. 997.450.351.90 / 997.450.561/562.90).

The following steps must be carried out to achieve the suspension alignment values given by Porsche:

- All suspension arms and bearings must without play.
- Fuel tank half-full (40 litres)
- 75 kg ballast placed on driver seat.
- Inflate all four tyres to a pressure of 2 bars.

The following procedure is recommended when checking the complete wheel alignment:

- Disconnect the anti-roll bars
- Adjust the ride height
- Adjust the rear axle camber first and then the toe.
- Adjust the front axle camber first and then the toe.
- Re-adjust ride height and set corner weights
- It is not possible to adjust the castor
- The corner weights are adjusted by changing the ride height, the smallest possible corner weight difference between the left and right hand side of each axle is recommended.

Front axle:

All the front suspension alignment values should be adjusted with the steering wheel locked in the straight ahead position.

The basic camber adjustment is made by the addition or removal of the adjustment shims between the lower wishbone and the wishbone bearing.

The fine adjustment is made on the McPherson strut thrust bearing.

The McPherson strut thrust bearing must be centred before setting the basic camber value.

Rear axle:

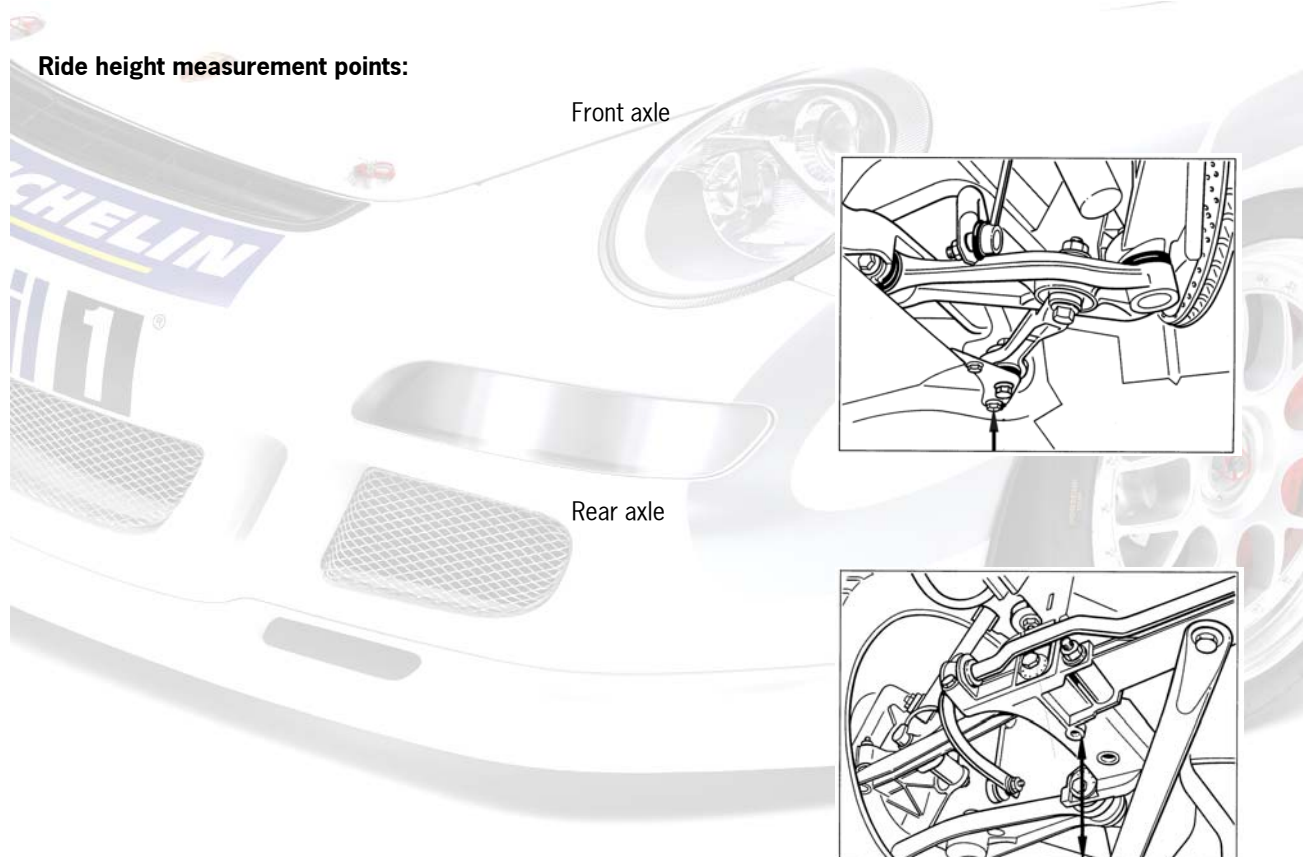
The camber is adjusted by the addition or removal of the adjustment shims between the lower wishbone and the wishbone bearing.

The fine adjustment is made by adjusting the eccentric camber bolt in the lower wishbone.

Suspension measurements and settings:

Basic settings for Michelin tyres (as delivered)		
	Front axle	Rear axle
	Left/right	Left/right
Ride height	77 mm	115 mm
Camber	- 4°	- 4°
Toe setting(total)	0'	+ 34'
Anti-roll bar	75°	45°
Main spring	100 - 60 - 260	130 - 60 - 260
Helper spring	75 - 60 - 43	60 - 60 - 50
Rear wing setting		P 10

Ride height measurement points:



Air jack system:

The air jack system is maintenance free and should not be lubricated.

Operating pressure 26 bar

Only use dry and oil free compressed air

To guarantee that the air jack pistons have returned completely the exhaust valve should be open (pulled out) when the car is in motion.

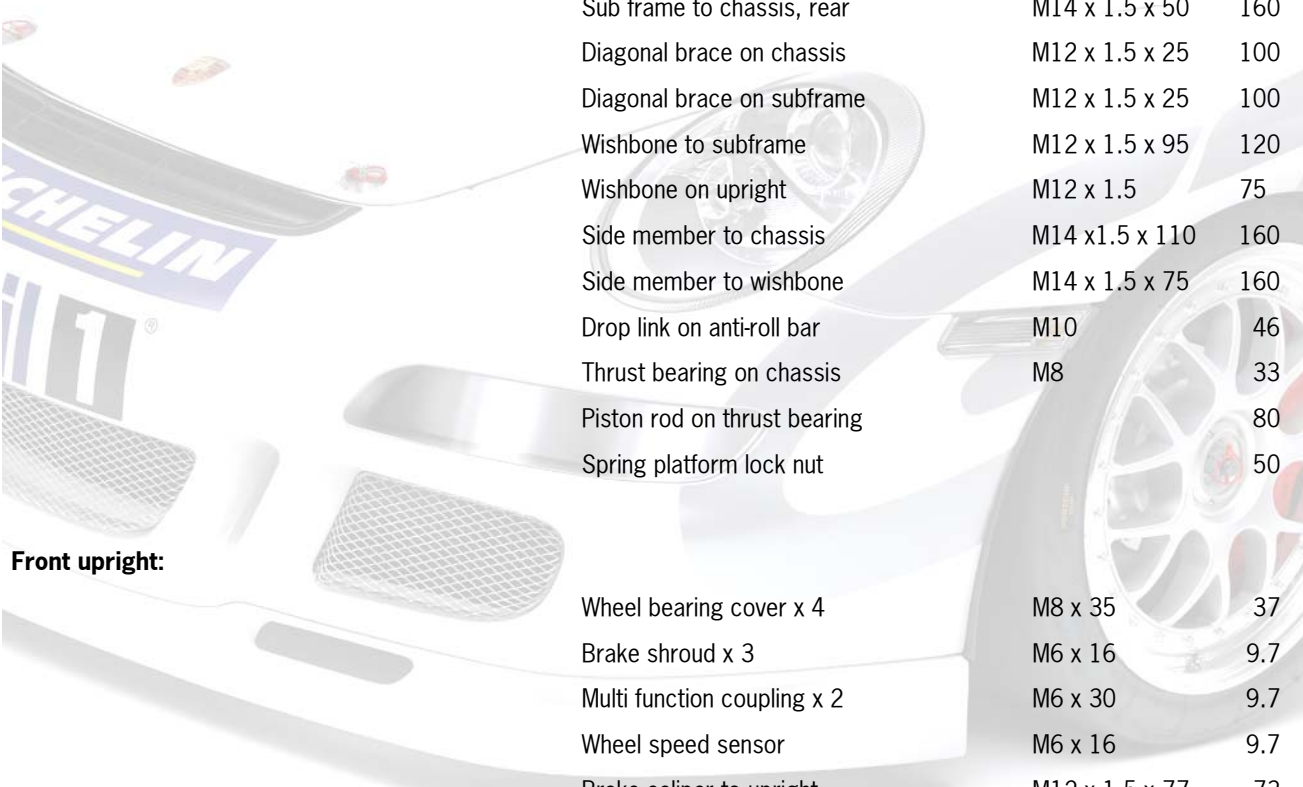
Never work under the car with the air jacks extended without

proper axle stands. To prevent damage occurring to the internal cylinder end stops never pressurise the system without the car being on the ground (never without the air jack having to lift the vehicle). The air jacks can be overhauled by Porsche Motorsport when required.

Suspension component tightening torques

All component tightening torques listed are given in Newton metres. Please ensure that your torque wrench is calibrated correctly!

Front suspension:

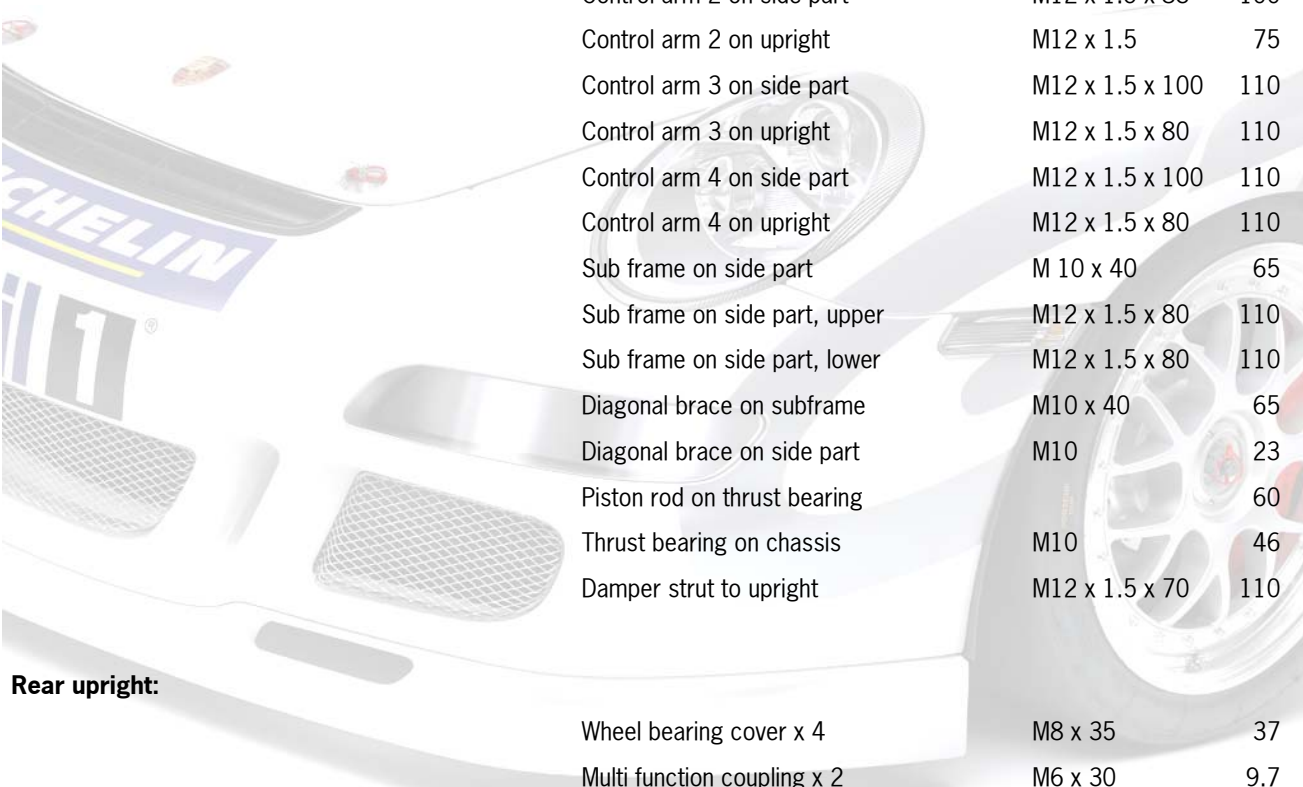


Shear plate on subframe, front	M10 x 30	65	46
Shear plate on subframe, rear	M10 x 30	65	46
Shear plate on chassis	M12 x 1.5 x 25		100
Sub frame to chassis, rear	M14 x 1.5 x 50		160
Diagonal brace on chassis	M12 x 1.5 x 25		100
Diagonal brace on subframe	M12 x 1.5 x 25		100
Wishbone to subframe	M12 x 1.5 x 95		120
Wishbone on upright	M12 x 1.5		75
Side member to chassis	M14 x 1.5 x 110		160
Side member to wishbone	M14 x 1.5 x 75		160
Drop link on anti-roll bar	M10		46
Thrust bearing on chassis	M8		33
Piston rod on thrust bearing			80
Spring platform lock nut			50

Front upright:

Wheel bearing cover x 4	M8 x 35		37
Brake shroud x 3	M6 x 16		9.7
Multi function coupling x 2	M6 x 30		9.7
Wheel speed sensor	M6 x 16		9.7
Brake caliper to upright	M12 x 1.5 x 77		73
Damper tube clamp x 2	M12 x 1.5 x 70		85
Centre bolt	M22 x 1.5		470
Wheel nut			460
Track rod on upright	M12 x 1.5		75
Anti-roll bar drop link on upright	M 10		46

Rear suspension:



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
Side member on wishbone, lower	M14 x 1.5 x 75	160
Side member on side part	M14 x 1.5 x 100	180
Wishbone to side part	M12 x 1.5 x 100	100
Wishbone to upright	M12 x 1.5	75
Control arm 2 on side part	M12 x 1.5 x 83	100
Control arm 2 on upright	M12 x 1.5	75
Control arm 3 on side part	M12 x 1.5 x 100	110
Control arm 3 on upright	M12 x 1.5 x 80	110
Control arm 4 on side part	M12 x 1.5 x 100	110
Control arm 4 on upright	M12 x 1.5 x 80	110
Sub frame on side part	M 10 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 subframe	M10 x 40	65
Diagonal brace on side part	M10	23
Piston rod on thrust bearing		60
Thrust bearing on chassis	M10	46
Damper strut to upright	M12 x 1.5 x 70	110

Rear upright:

Wheel bearing cover x 4	M8 x 35	37
Multi function coupling x 2	M6 x 30	9.7
Brake caliper to upright	M12 x 1.5 x 77	73
Multi line bracket on upright	M6	9.7
Brake shroud	M6 x 16	9.7
Wheel nut		460

Steering:

Steering rack on subframe	M10 x 45	65
Track rod on steering rack	M16 x 1.5	80
Universal joint on steering rack	M8 x 35	23
Steering column to frame, upper	M10 x 100	46
Steering column to frame, lower	M14 x 1	20
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	20

Pedal assembly:

Brake balance adjuster on chassis	M8	23
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Brake balance adjuster on chassis,

Aluminium spacer	M8 x 154 x 80	23
Pedal spindle in pedal mount	M14 x 1	8
Pedal spindle on PLB	M8	10
Brake pedal to push rod, no grease	M8 x 1	23

Brake system:

Brake disc to hub	M6 x 16	12
Brake disc to disc bell	M 6	9.7
Brake pipe bracket on subframe	M6 x 16	9.7

Driveshafts:

Driveshaft to flange	M10 x 50	81
Centre bolt on driveshaft	M22 x 1.5	470

Cooling system maintenance

General information:

The cooling system can be filled, bleed and emptied from a quick release coupling fitted in the bleed line leading from the front mounted side coolers, rearwards to the expansion tank in the engine bay.

The valve in the expansion tank allows the exhaust of steam at a pressure of 1.4 bar (+/- 0.1 bar), and the release of water at a pressure of 1.8 – 2.0 bars.

The bleed valve on the expansion tank fitted to the race car is permanently open.

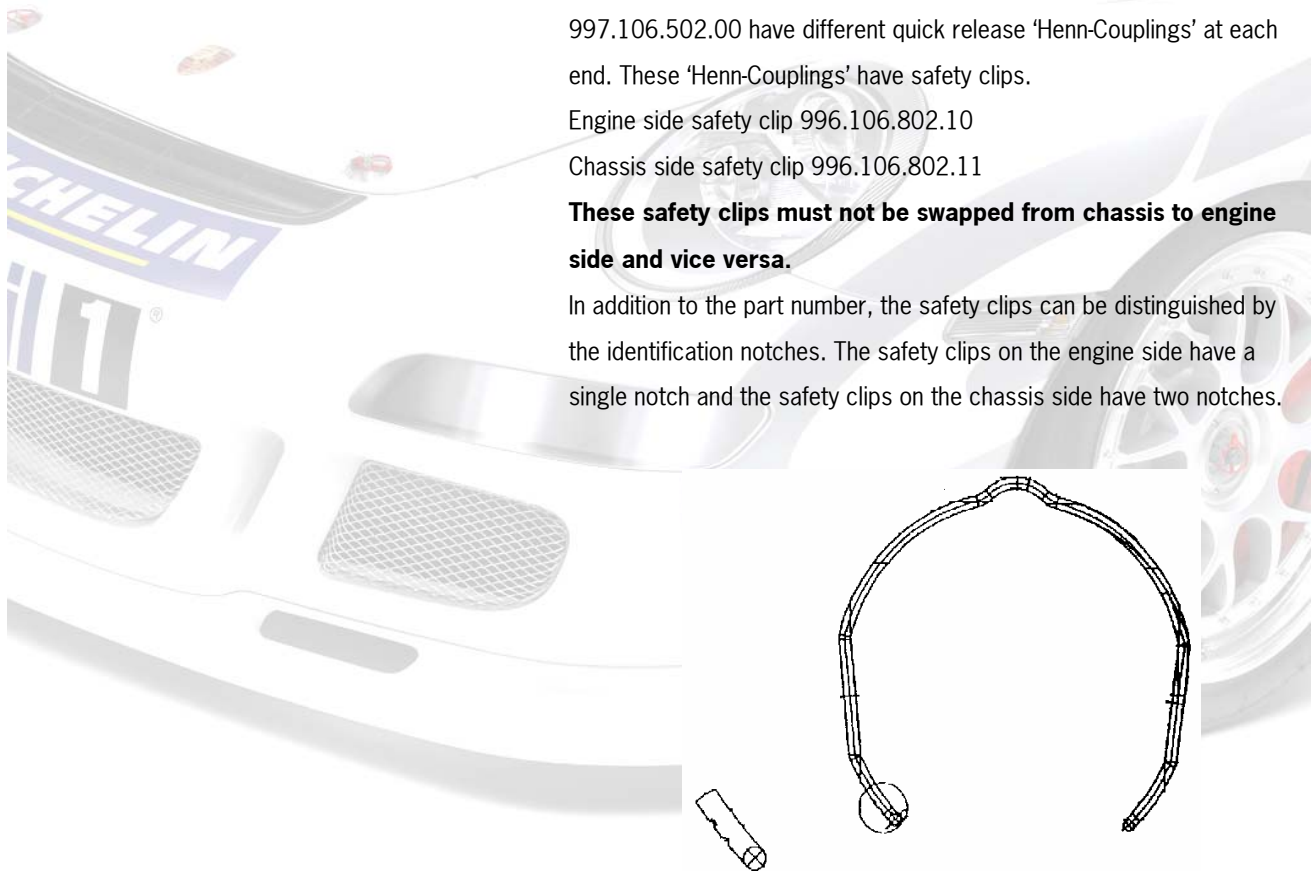
The cooling water feed pipe 996.106.610.01 and return pipe 997.106.502.00 have different quick release 'Henn-Couplings' at each end. These 'Henn-Couplings' have safety clips.

Engine side safety clip 996.106.802.10

Chassis side safety clip 996.106.802.11

These safety clips must not be swapped from chassis to engine side and vice versa.

In addition to the part number, the safety clips can be distinguished by the identification notches. The safety clips on the engine side have a single notch and the safety clips on the chassis side have two notches.



An electronic cooling system filler specifically suited to the 997 GT3 Cup can be purchased directly from Sobek.

Bernd Sobek - Mattern

Fliederstrasse 10

D - 69517 Gornheimertal

Tel +49 (0) 6201 2051

Fax +49 (0) 6201 21834

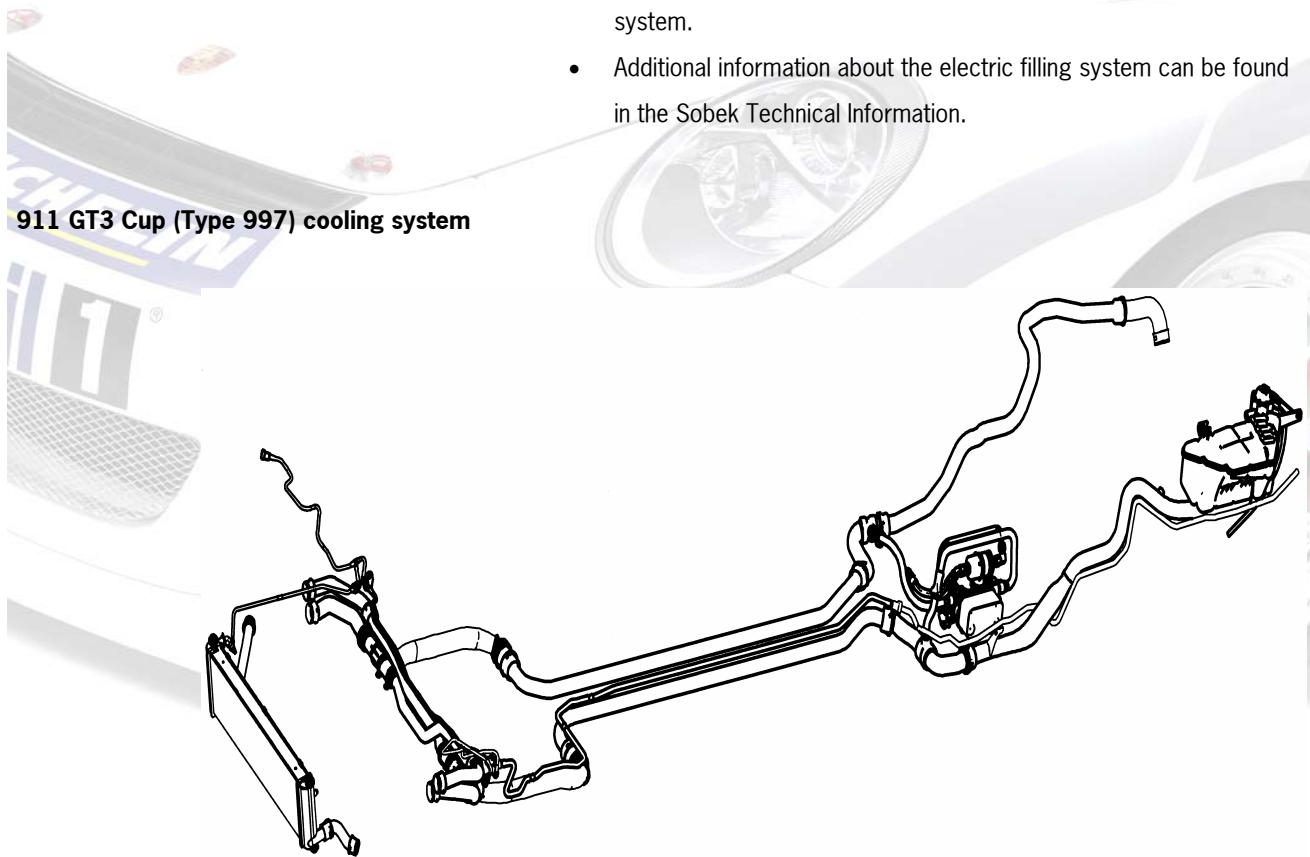
e - mail info@sobek-mattern.de

Filling the cooling system (engine cold) with an electronic filling system

To fill the cooling system when the engine is cold, open the quick release coupling and connect the electronic filling system.

- Switch on the pump and fill the cooling system with the cooling fluid valve open.
- Leave the filling system connected and allow the cooling fluid to circulate through the system to ensure that the cooling system is pre-bled sufficiently.
- Afterwards disconnect the filling system and warm the engine up. If the system level drops, top up the system to the 'max' mark on the expansion tank by connecting the pressure bottle to the closed system.
- Additional information about the electric filling system can be found in the Sobek Technical Information.

911 GT3 Cup (Type 997) cooling system



Brake system 911 GT3 Cup

The Porsche 911 Cup car has a twin-circuit hydraulic brakes system with two separate main cylinders.

The front to rear brake balance can be changed by adjusting the brake balance adjuster bar.

Vehicles which are intruded to be used at the Porsche Michelin Supercup will be equipped with ceramic brake discs (PCCB).

For these vehicles a Technical Information will be issued separately.

Front brakes:

Brake discs: Ventilated, Steel, D=380mm B=32mm

Brake pad: Pagid P50 (light green)

Pad thickness: 13mm without backing plate
18mm with backing plate

Brake caliper: 6-piston aluminium monobloc

Caliper pistons with Zirkonoxide inserts

Rear brakes:

Brake discs: Ventilated, Steel, D=350 mm B= 28 mm

Brake pad: Pagid P50 (light green)

Pad thickness: 13mm without backing plate
18mm with backing plate

Brake caliper: 4-piston aluminium monobloc

Caliper pistons with Zirkonoxide inserts

Brake system notes

Brake callipers:

The dust covers can be removed form the brake calipers when driving. It is possible to overhaul the brake calipers, the necessary spare parts can be purchased from Porsche Motorsport sales department.

Brake fluid:

Only Endless RF - 650 Racing Super Fluid brake fluid should be used.

Brake master cylinders and balance bar:

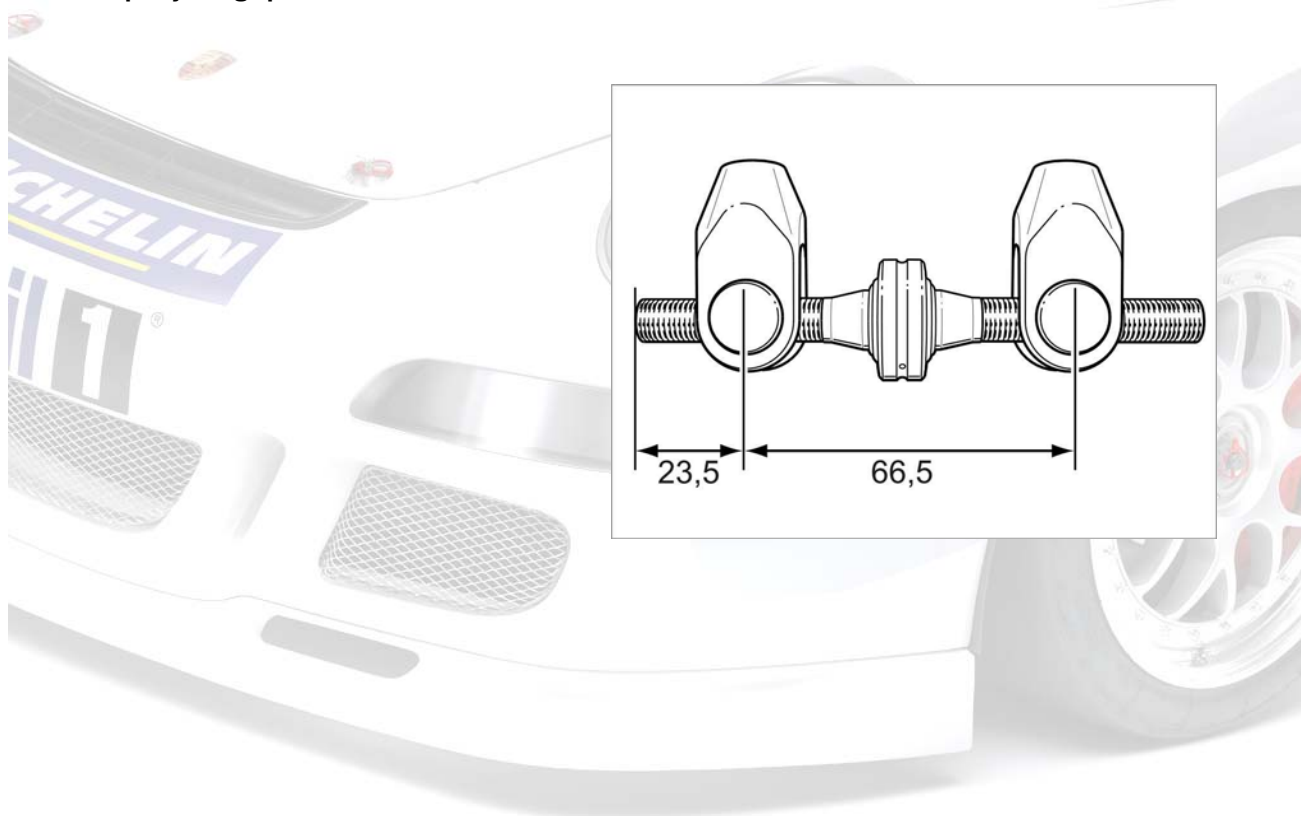
The two brake master cylinders supplying each brake circuit have different bore diameters:

- Front axle 20.6 mm (orange marking)
- Rear axle 19.05 mm (green marking)

The front to rear brake balance can be adjusted by turning the adjuster shaft.

When the car is delivered, the brake balance is set to 40 bar on the front and 38 bar on the rear axle. Rotating the adjuster wheel clockwise increases the brake pressure on the rear. Rotating the adjuster anti-clockwise increases the brake balance on the front axle.

Basicsetup adjusting spindle:



Brake balance display and brake force distribution

The brake force distribution is shown in the Motec – Display.

Display Setup “Practice”

The adjustment range is from - 7 to + 7

Attention:

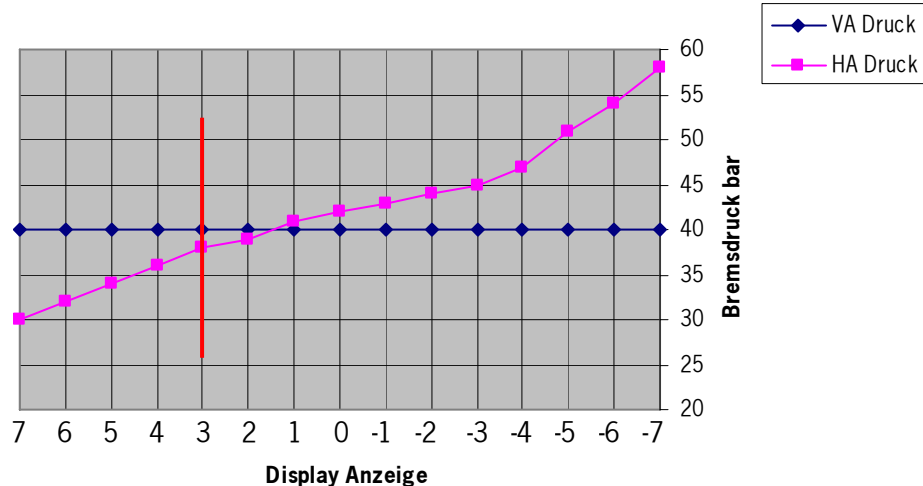
- The potentiometer is set initially to zero.
- Only remove the transport safety lock and operate the potentiometer when the complete assembly is fitted to car and the shaft has been mounted to the balance bar. The balance bar **MUST** be set in the middle position before fitting the potentiometer.
- The display values must not exceed +7 or -7 when rotating the balance bar (the potentiometer will be severely damaged if rotated beyond these values).
- Potentiometers removed from the car should be set to zero with the MoTeC System before being refitted.

Direction of rotation “-“ balance to rear (- 7 = max rear pressure)

Direction of rotation “+” balance to front (+7 = max front pressure)

Basis setup **+3** = front axle 40 bar rear axle 38 bar

Bremskraftverteilung 911 GT3 Cup MJ 2006 Stahlbremsanlage



Brake system 911 GT3 Cup PCCB

The Porsche 911 Cup car has a twin-circuit hydraulic brakes system with two separate main cylinders.

The front to rear brake balance can be changed by adjusting the brake balance adjuster bar. The brake discs are made of Ceramic Composite (PCCB – Brake discs)

Front brakes:

Brake discs: Ventilated, PCCB floating, D=380mm B=34mm

Brake pad: Pagid P50 (light green)

Pad thickness: 13mm without backing plate

18mm with backing plate

Brake caliper: 6-piston aluminium monobloc

Caliper pistons with Zirkonoxide inserts

Brake discs: Ventilated, PCCB floating, D=350 mm B= 28 mm

Brake pad: Pagid P50 (light green)

Pad thickness: 13mm without backing plate

18mm with backing plate

Brake caliper: 4-piston aluminium monobloc

Caliper pistons with Zirkonoxide inserts

Rear brakes:

Brake system notes

PCCB Brake discs:

The PCCB brake discs should be handled very carefully. Care should be taken that no damage occurs when fitting wheels or when cleaning the cooling holes with a drill bit. Brake discs with mechanical damage must be replaced. The PCCB brake disc wear can ONLY be determined by the weight reduction and not by the reduction in the disc thickness.

The wear indicators on the brake discs are irrelevant for racing purposes. Weighing scales with a fine scale are recommended to weight the discs, and documentation indicating the weight compared to mileage completed. To guarantee accurate PCCB brake disc wear records, the new weight and a consecutive number is engraved on the disc bell. The weight reduction of the brake duct may not exceed 100g, when compared with the new weight. The brake disc wear is reached when the weight reduction is more than 100g. To make a reliable wear calculation the brake disc must be free from brake dust, rubber pick-up and any other dirt. The brake disc assembly must not be disassembled. The PCCB brake disc must be bedded in carefully when new, to guarantee a long life and high brake performance. When bedding-in the disc, the disc temperature must not exceed 250°C. The surface appearance changes from matt to shiny after the bedding

process is complete. All four brake discs should be bedded in equally. To achieve this, it may be necessary to increase the brake balance to the rear. S

Brake callipers:

The dust covers can be removed from the brake calipers when driving. It is possible to overhaul the brake calipers, the necessary spare parts can be purchased from Porsche Motorsport sales department.

Brake fluid:

Only Endless RF - 650 Racing Super Fluid brake fluid should be used.

Brake master cylinders and balance bar:

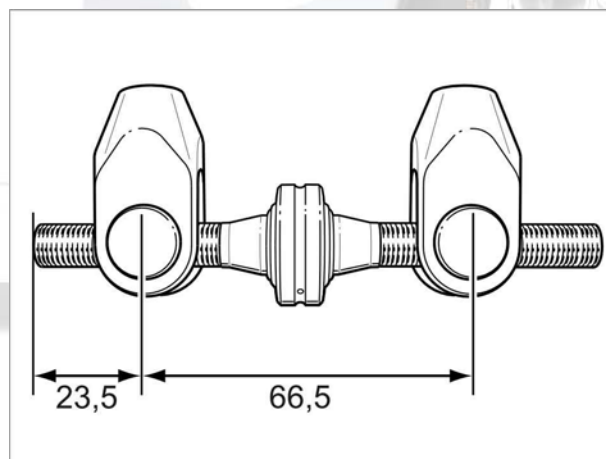
The two brake master cylinders supplying each brake circuit have different bore diameters:

- Front axle 20.6 mm (orange marking)
- Rear axle 17.8 mm (blue marking)

The front to rear brake balance can be adjusted by turning the adjuster shaft.

When the car is delivered, the brake balance is set to 40 bar on the front and 43 bar on the rear axle. Rotating the adjuster wheel clockwise increases the brake pressure on the rear. Rotating the adjuster anti-clockwise increases the brake balance on the front axle.

Basicsetup adjusting spindle:



Brake balance display and brake force distribution

The brake force distribution is shown in the Motec – Display.

Display Setup “Practice”

The adjustment range is from - 7 to + 7

Attention:

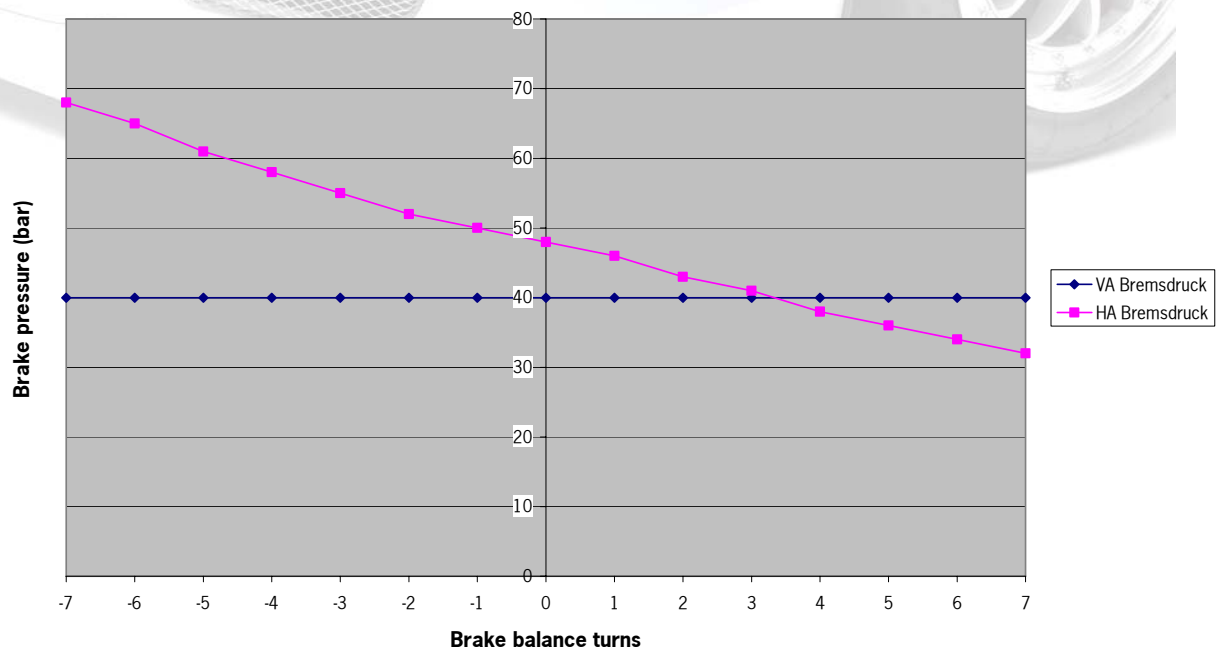
- The potentiometer is set initially to zero.
- Only remove the transport safety block and operate the potentiometer when the complete assembly is fitted to car and the shaft has been mounted to the balance bar. The balance bar **MUST** be set in the middle position before fitting the potentiometer.
- The display values must not exceed +7 or -7 when rotating the balance bar (the potentiometer will be severely damaged if rotated beyond these values).
- Potentiometers removed from the car should be set to zero with the MoTeC System before being refitted.

Direction of rotation “-“ balance to rear (- 7 = max rear pressure)

Direction of rotation “+” balance to front (+7 = max front pressure)

Basis setup +2 = front axle 40 bar rear axle 43 bar

Brake balance 911 GT3 Cup MY 2005 (997)



Chassis

Construction

- Weight optimised road going 2004 911 GT3 RS shell.
- Interior without insulation.
- Integral roll-cage in accordance with DMSB guidelines
- CFC boot lid with integrated RAM – Box and engine air filter
- Adjustable CFC rear wing
- GT3 Cup front end with upper cooling air exit duct and front spoiler
- GT3 Cup rear end from CFC
- CFC doors and CFC window frame
- Polycarbonate side door windows, rear and front screens

Fuel tank

- Production 90 litre tank.

Seat

- OMP racing bucket seat (driver's side only) optimised for HANS Safety system.

Safety harness

- Schroth 3" six-point harness without ASM – adapted for HANS Safety System.

HANS system

- All cars from the 2004 model onwards are optimised for the HANS safety system.

HANS Safety System supplier:
Schroth Safety Products GMBH
Postfach 2440
59714 Arnsberg
Germany

Fire extinguisher system

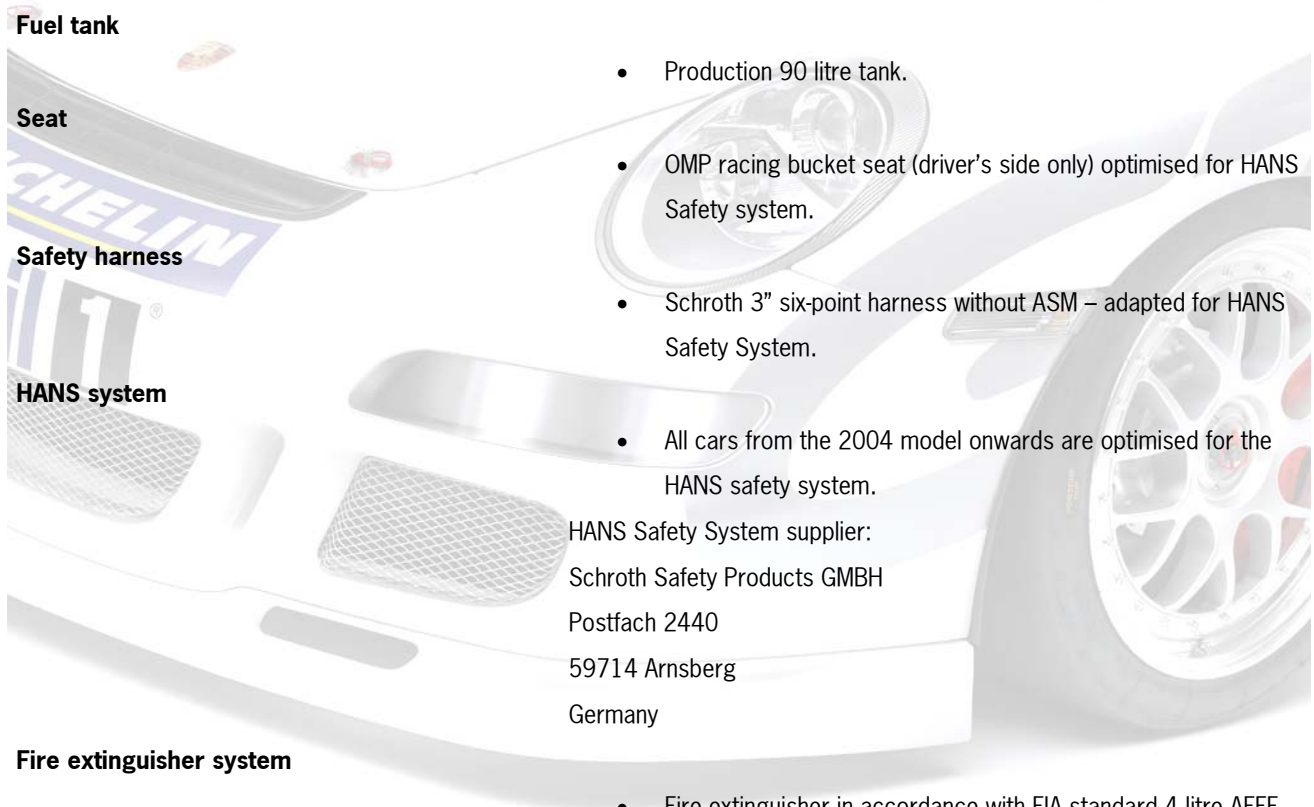
- Fire extinguisher in accordance with FIA standard 4 litre AFFF

Exterior colour

- Carrara white B9A

Interior colour

- Primer (without top coat)



Dashboard:

Dashboard with Motec Display.

The Motec Display can be programmed freely and has a 1 Mb memory for data recording.

(Optional 4 Mb memory)

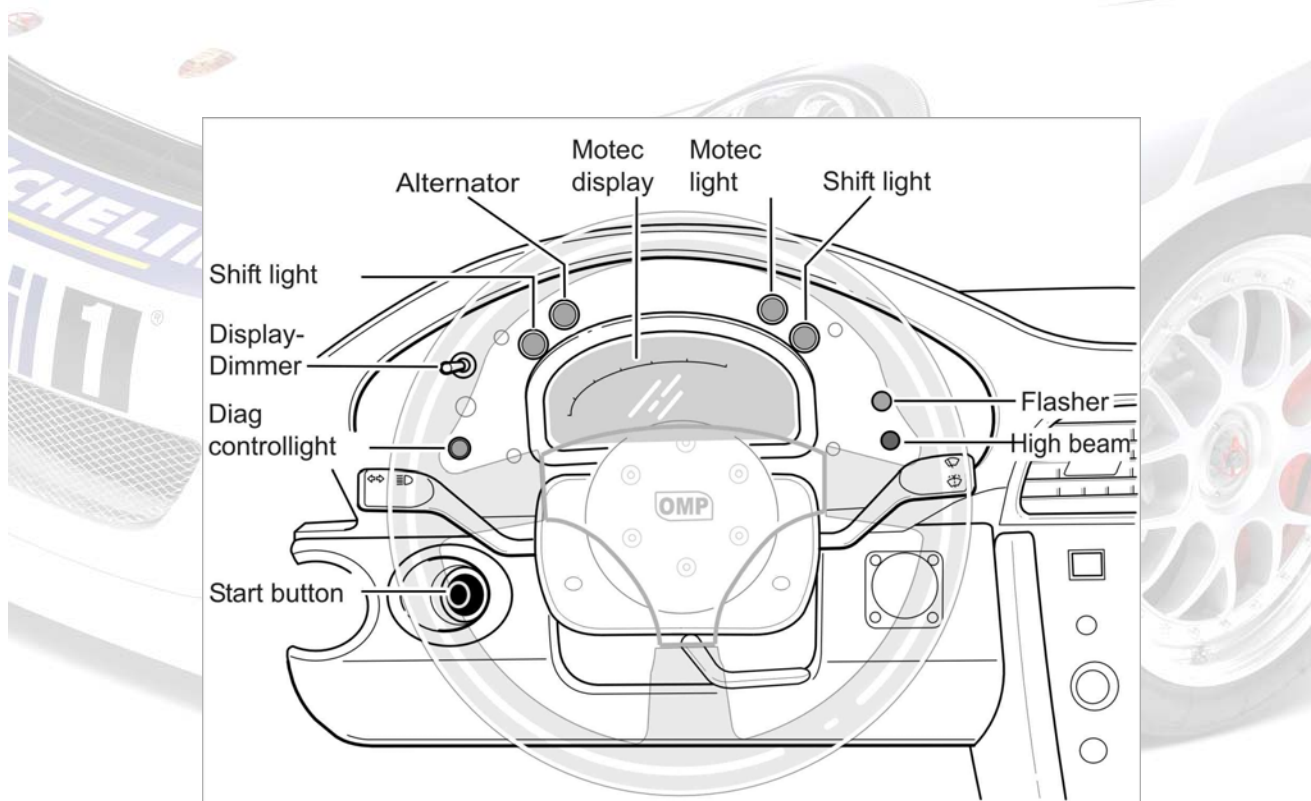
Driver cooling / windscreen ventilation:

The fan has three possible settings:

“Pushed in” position: 100% foot well, ventilation ducts and driver cooling

“Pulled out” position: 100% windscreen ventilation

The air distribution is variable in the position between “pushed in” and “pulled out”.



Analogue freely programmable

CAN blocked

Race:

- Engine revs
- Vehicle speed
- Lap time
- Water temperature
- Oil temperature
- Oil pressure
- Fuel pressure
- Gearbox oil temperature
- Lap consumption
- Total consumption
- Gear indicator
- Reverse gear indicator

Practice:

- Engine revs (bar graph)
- Engine revs (digital)
- Vehicle speed
- Brake balance
- Lap time
- Water temperature
- Oil temperature
- Oil pressure
- Fuel pressure
- Gear indicator
- Reverse gear indicator
- Battery voltage
- Time remaining for data recording

Warm-up:

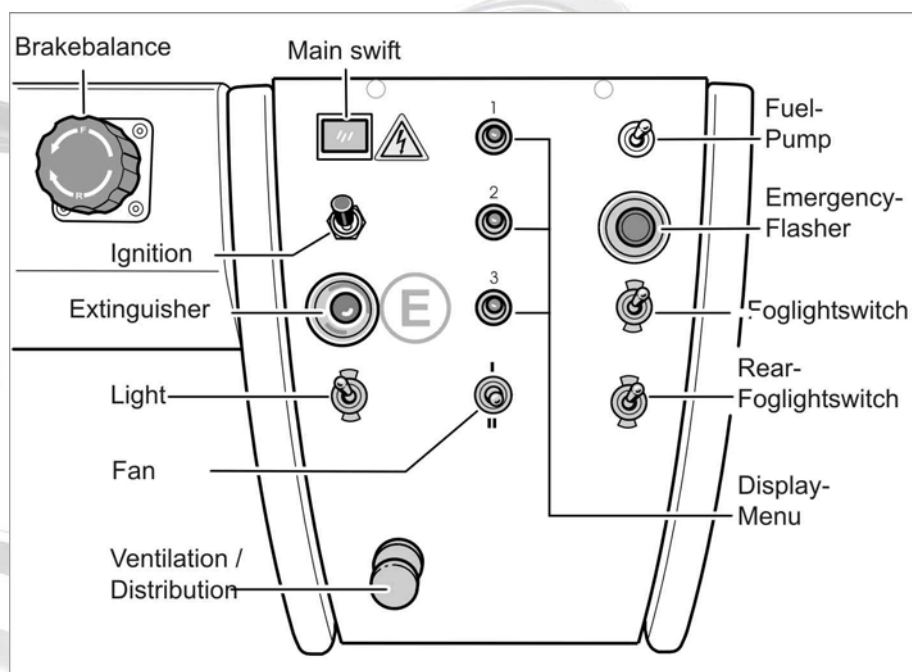
- Engine revs
- Water temperature
- Battery voltage
- Oil temperature
- Gear indicator
- Reverse gear indicator
- Fuel pressure
- Throttle angle
- Gear potentiometer – voltage indicator
- Gear shift sensor voltage indicator



Standard sensors fitted in car:

- 4 x wheel speed sensors
- Clutch system pressure sensor
- Acceleration sensor
- Fuel level
- Lap Trigger
- Fuel pressure sensor
- Oil pressure sensor
- Engine speed sensor
- Water pressure sensor

Centre console:



“Diag Control Light”:

The “Diag Control Light” is controlled by electronic errors (sensors) which occur at a particular frequency, or are permanently active. The lamp indicates MS3.1 system errors.

A special software programme is required to delete the errors (Bosch Modas), which must be purchased from Porsche Motorsport.

Fuel pump switch:

Position “Service”

The pump runs with the ignition (only to drain any remaining fuel in the tank).

Position “Bosch”

Pump only runs when the engine is running.

Data logging:

Motec Display with 1 Mb data logging memory.

Option:

- Steering angle sensor in connection with 2 Mb memory

Interface:

CAN: When using the CAN interface in connection with a data acquisition system (not Motec) the terminating resistor must be re-located.

The Cup Motec System is distributed exclusively worldwide by Brückle – Motorsport.

If you require information or a system please contact Brückle – Motorsport directly.

Information directly from:

Brückle - Motorsport

Consulting GMBH

Werner Brückle

Zennerstr. 29

D 81379 München

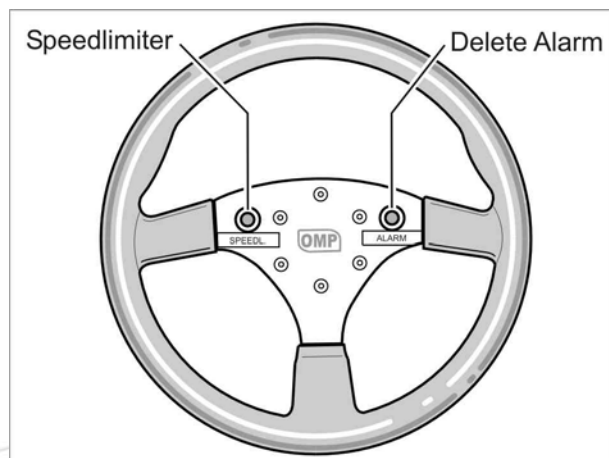
Tel. +49 89 72308198

Fax +49 89 72308199

E – Mail : werner.brueckle@t-online.de

Steering wheel:

Steering wheel with buttons to activate pit lane speed limiter and to reset the alarm display in the Motec display

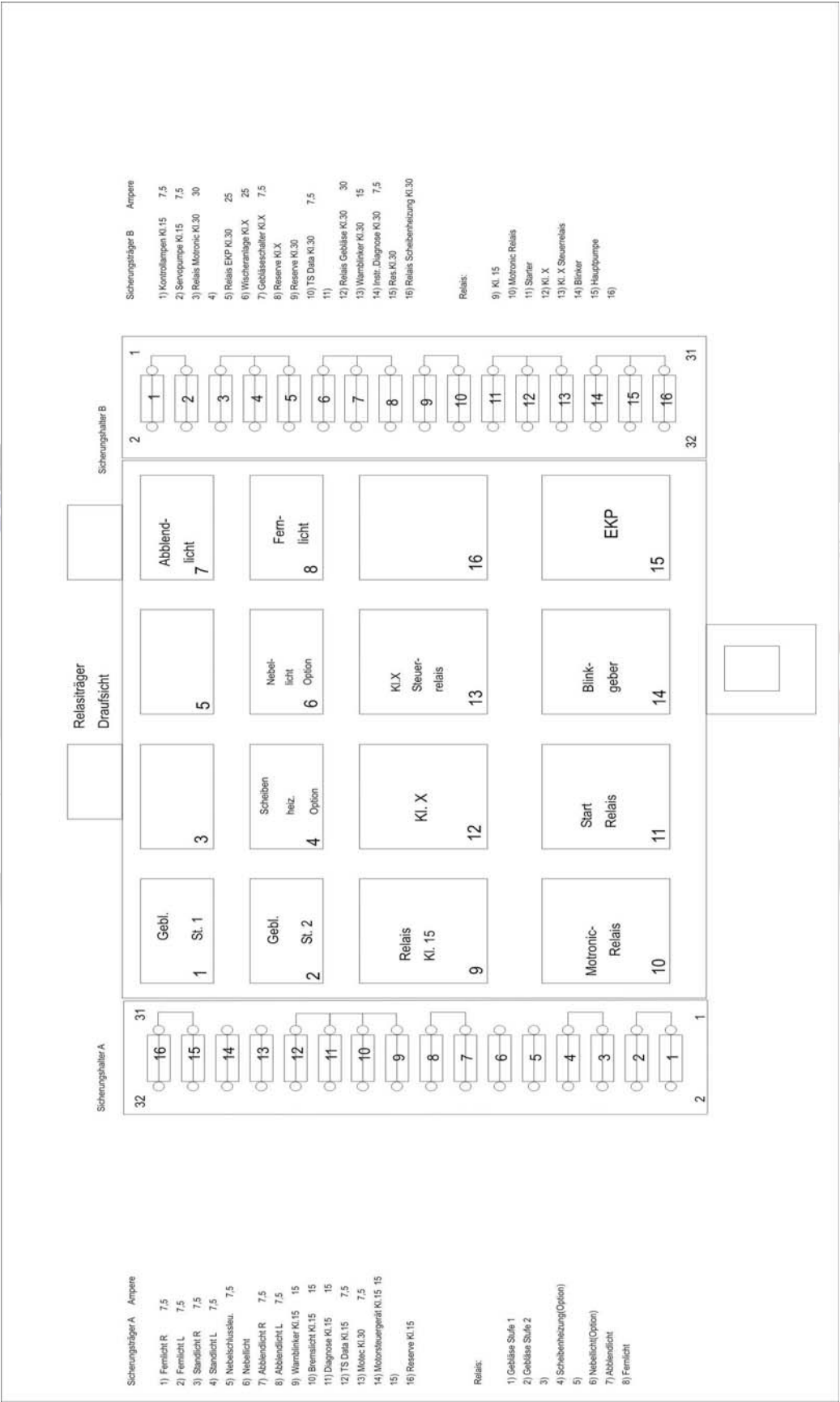


Pit lane speed limiter is programmed to 50 km/h, but can be re-programmed with the Bosch Modas system.

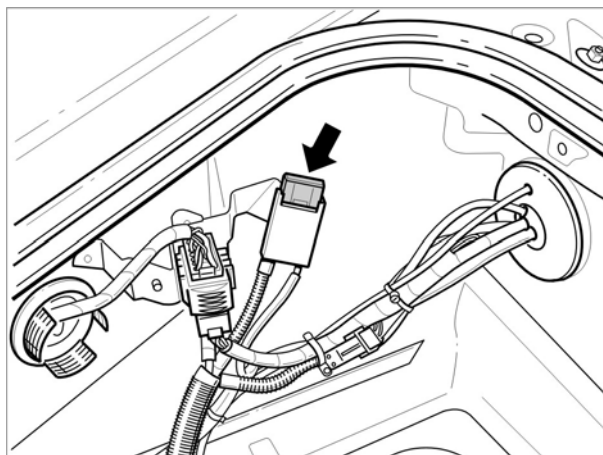
Battery main relay:

Only operate the master switch approximately 10 seconds after having switched off the engine with the ignition switch.

Relay and fuse layout



Location of main fuse for steering hydraulic



Boot, front right (80 Amp)



Modas operating instructions

Application use:

Modas is an application tool that represents measured variables (RAM variables) and adjustable variables (parameters and graphs) in various used displays. It was developed to recall standard measured values and to adjust the most important adjustable values quickly.

To install the software, load the enclosed CD and start the SETUP.EXE file. MODAS must be checked.

System requirements:

Hardware:

Notebook: Operating system WIN95/98, Win 2000, Windows XP, 166 MHz; 32 MB Ram; LPT1 interface
KIC2 interface with Modas release

The connection between the PC and ECU is made through a KIC2 interface. MODAS release (licence) is made via the KIC2 interface.

Files:

ASAP and CFG files:

Information about the page and display format can be found in the configuration file MODAS.CFG and/or MODAS.CFV. The information about the ECU programme status is saved in the editable files *.A2L and/or *.A2V. Project and programme version specific files are saved in the MODAS sub directory \CONFIG.

The files are created by Bosch Motorsport and may not be changed!

Bin file:

When MODAS is started for the first time, a binary file is created that allows the software to start faster in the future.

Log file:

This is a protocol file with the following entries:

- Date and time of the MODAS request
- Loading of the Binary file
- Project names
- Configuration file name
- Name of the A2L file loaded
- Number of measured variables and adjustable variables
- Opening and closing of the parameter file
- Documentation of the changes

The MODAS.log file is in the sub-directory

Modas\LOGFILES

It can be edited through the menu bar with 'Par-File', ,open 'Log-File'.

Parameter files:

With the help of the parameter files, values can be changed and saved without a connection to the control unit. When the computer is reconnected to the ECU the saved values can be transferred to the ECU. Changing the adjustable values is possible without a direct connection to the ECU.

The functions are activated in the '**Parameter File Manager**' in the Menu tool bar.

Create Par.File:

If the "Create Par.File" was clicked, any adjustable value can be immediately accessed. On the Modas display the values of the adjustable value can be changed. Adjustable values have numerical fields with a white background. All values that are changed are entered in the new Parameter file.

The changes made can be saved by clicking "**Save**" or "**Par.File->Save created Par.File**".

Save created Par.File:

The previously created parameter files can now be saved, logically in the Modas sub-directory:

Modas\Parameter\dateiname.par

Download PAR-File to ECU:

Transmits the given parameter file to the control unit.

Upload PAR-File to MODAS:

Retrieves the current parameter files from the control unit.

Copy PAR-File to MODAS:

Copies any *.par parameter file from disc to the Modas sub-directory
\Modas\Parameter

Copy PAR-File to A:

Copies any *.par parameter file to disc.

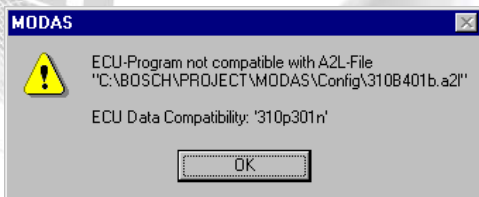
Open LOG-file:

Opens the protocol file MODAS.LOG

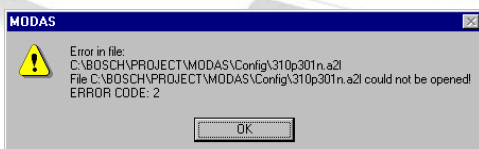
Programme start:

MODAS is started from the GT3 Toolbox.

MODAS makes a connection to the control unit through the KIC2-Interface and checks the programme version in the control unit when the programme is started. If different programme versions are detected between the control unit and MODAS configuration, an error dialogue box similar to the following picture appears:



If the system does not find the description file given in the MODAS configuration drive, the user is requested to load the description file belonging to the programme version in the control unit from the disk drive.



If the description file belonging to the configuration file is not available the following error dialogue box is displayed:

MODAS starts without a page view after the dialogue box has been confirmed. Through the menu bar **'File -> load ASAP-File'** a description file can be chosen and loaded.

A connection to the control unit via the K-line is made if the programme version in the control unit corresponds with the description file. The start page appears on which the most important engine measured variables are displayed. The KIC-button in the lower right-hand corner of the screen changes from red to green. If the connection is recognised as being broken, the button changes back to red after about 15 seconds.

Measurement and adjustable variables:

Measured values, parameters and indices can be represented in a display. A maximum of 20 measured or adjustable variables can be displayed or 10 measures and 10 adjustable variables.

The parameter and graph values are displayed in the adjustable fields. The corresponding calibration points are displayed to the right-hand side of the graphs. The calibration points cannot be modified. Individual values in the graphs can be displayed and changed by clicking the arrow. Jumping directly to any calibration point can be made by double-clicking the calibration point value, entering the desired calibration point and pressing the RETURN key.

The measured variables have a grey background and the adjustable values a white background. The name of the variable is in the foreground, and the units are displayed behind the actual value. Supplementary information (full description of variable) about the measured or adjustable variables is super-imposed when the mouse pointer hovers over a field.

The adjustable field are activated by mouse click; the entry of numbered values is made with the keyboard. Decimal numbers are entered with a decimal point, negative signs are entered with the 'minus' key after having entered the number. Every value must be confirmed by pressing the 'RETURN' key.

If adjustable variables are changed the SAVE button glows red. The changed values are transferred to the control unit's reference page by clicking the SAVE button. When data is being transferred the KIC-button changes colour to red. When the data transfer is finished the colour of the SAVE button changes to grey again, and the KIC-button to green. The connection to the control unit can now be interrupted without data loss.

Macros:

The user can start a macro sequence by mouse click. If a macro is started adjustable variables are set to pre-defined values.

Views

Displays and pages:

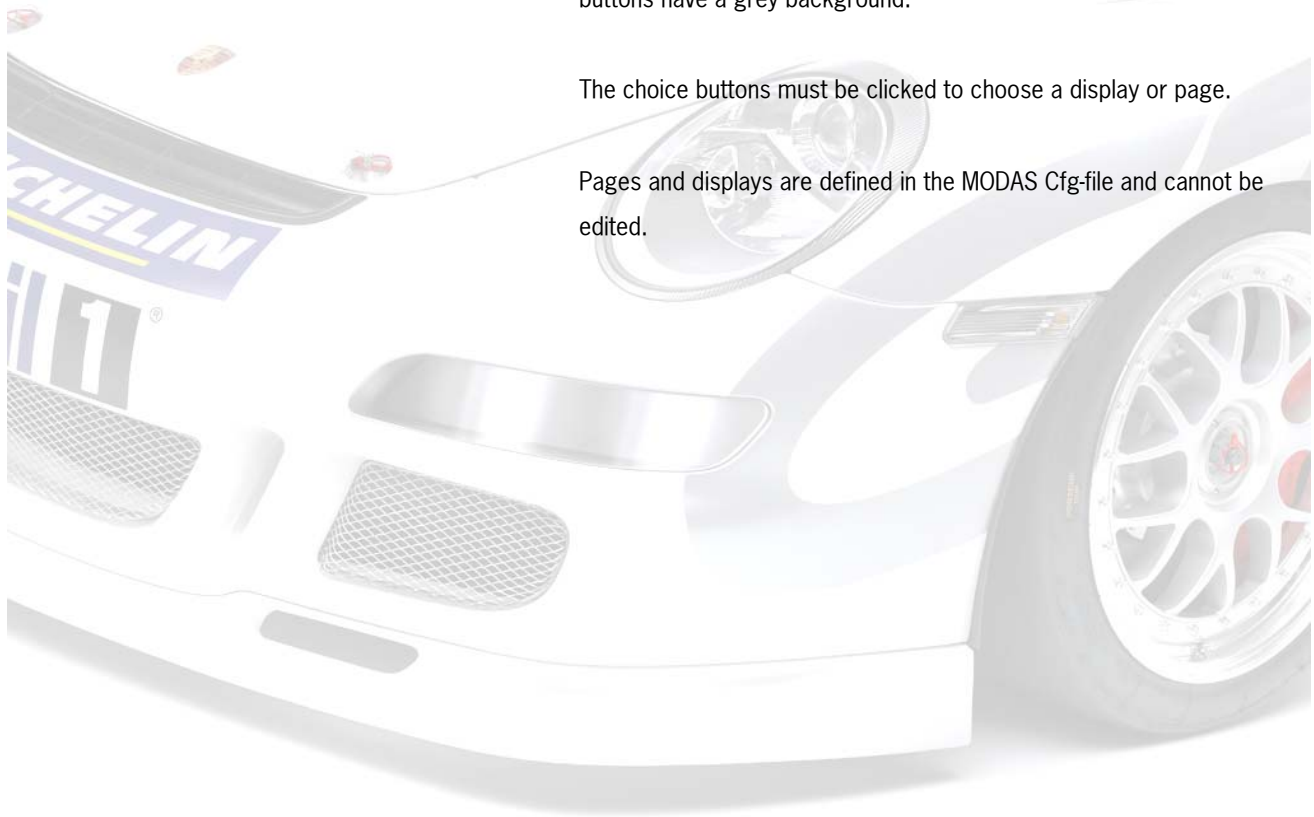
Displays and pages are distinguished as follows:

A display is limited to the representation of measured and adjustable variables, and the Macro buttons. One page can contain up to 10 displays with their display choice buttons.

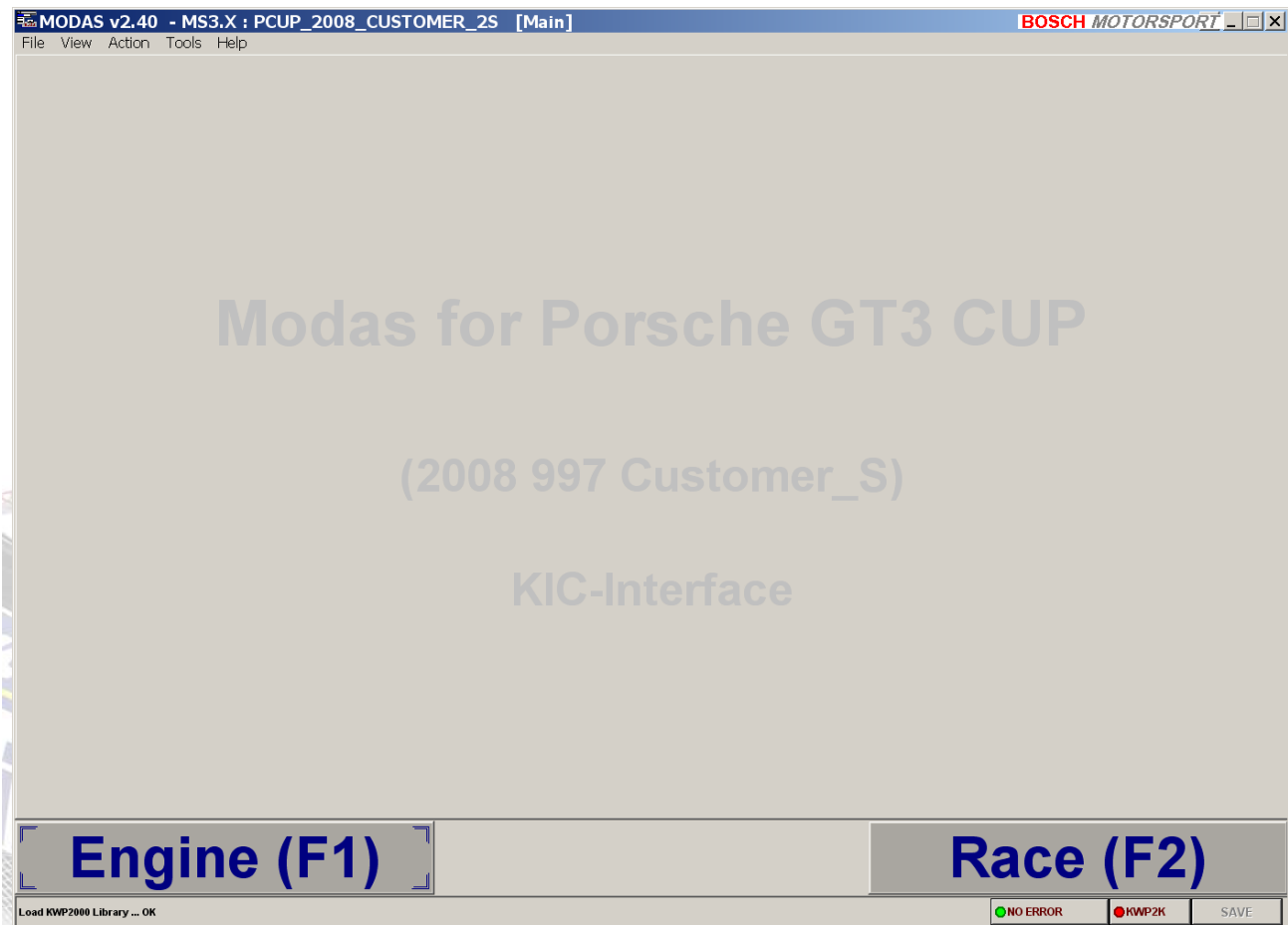
The display choice buttons remain the same only when the choice of displays is changed. Display choice buttons are white; page choice buttons have a grey background.

The choice buttons must be clicked to choose a display or page.

Pages and displays are defined in the MODAS Cfg-file and cannot be edited.



Bosch Modas



Start page Bosch Modas Porsche GT3 Cup Mj 2008

MODAS v2.40 - MS3.X : PCUP_2008_CUSTOMER_2S [Display]			BOSCH MOTORSPORT	
File View Action Tools Help				
nmot_w	Engine revs	1/min	pcrank_rel	Crankcase pressure
wdkba_w	Throttle angle	%	ub	Battery voltage
lamsoni_w	Lambda cylinder 1-3	-	lamsoni2_w	Lambda cylinder 4-6
fr_w	Regulation factor 1-3	-	fr2_w	Regulation factor 4-6
tmot	Water temperature	°C	pwater	Water pressure
toel	Engine oil temperature	°C	poel	Oil pressure
tgear	Gearbox oil temperature	°C	pfuel	Fuel pressure
tans	Intake air temperature	°C	pu_w	Ambient pressure
rl_w	Relative air mass	%	pclutch_w	Clutch pressure
oillevel	Engine oil tank level	%		
ESC (F1)		Display(F2)	Throttle(F3)	Min/Max(F4)
		Lifetime/Cons(F5)		
Init communication device (KIC2) failed! kwp200Lib-Error: "Error initializing Centronics interface!"				<div> <div>NO ERROR</div> <div>KWP2K</div> <div>SAVE</div> </div>



MODAS v2.40 - MS3.X : PCUP_2008_CUSTOMER_2S [Throttle] BOSCH MOTORSPORT

File View Action Tools Help

uwdk_w	Raw voltage throttle	volt	b_dkcal	
wdkba_w	Throttle angle. Re-set	%		
wdklm_w	Throttle angle	%		
B_su	Resoklappe1	.	Set Throttle Check Reso1 Check Reso2	
B_su2	Resoklappe2	.		
Error throttle position sensor	Error throttle poti.	.	engine stopped	Engine stopped
ESC (F1)		Display(F2)		Throttle(F3)
		Min/Max(F4)		Lifetime/Cons(F5)
Load KWP2000 Library ... OK NO ERROR KWP2K SAVE 				

Error throttle position sensor:

Throttle sensor defect -> Display TRUE

uwdk_w Voltage must increase with throttle angle

wdkba-w is zero (0) when throttle reset, wdk_w and wdklm are equal after reset

Check Reso 1 Function reset throttle 1

Check Reso 2 Function reset throttle 2

MODAS v2.31 - MS3.1 : PCUPKU1P [Lifetime/Cons] BOSCH MOTORSPORT

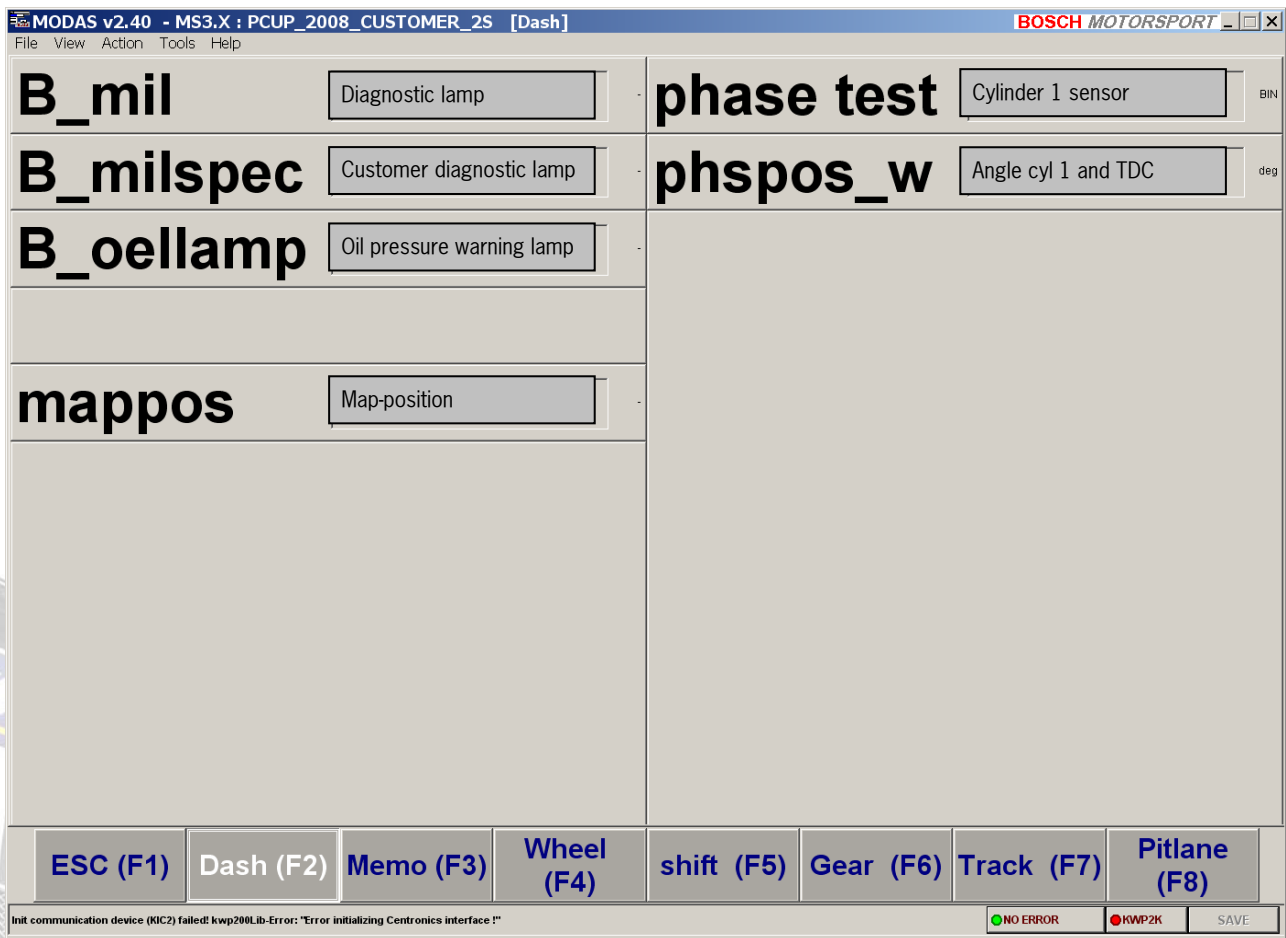
File View Action Tools Help

ltecu_w	Run time ECU	h	ecunumb_w	ECU number	-	Clr Dist
						Clr Cons
ltdistkm_w	Vehicle mileage	km				Clr Lra
ltdistm_w	Vehicle mileage	m				Clr Knock
ltmot_w	Run time engine	h				
ltmotmo_w	Over rev 1	s				
ltmotm2_w	Over rev 2	s				
ltmotmx_w	Max revs	1/min				
kvges_w	Fuel consumption	Ltr				
ESC (F1)		Display(F2)		Throttle(F3)		Diagnose(F4)
				Min/Max(F5)		Lifetime/Cons(F6)
Can't get KIC identifier [12]						● NO ERRORS ● KWP2K SAVE

Start | MSD-GT3 | MODAS v2... | C:\Huber\GT... | Microsoft Wor... | Microsoft Pow... | 12:10

Template for lifetime and mileage

ltecu_w	run time ECU, cannot be reset
ltmotmo_w	period engine revs exceed 8200 1/min
ltmotm2_w	period engine revs exceed 8700 1/min
ltmotmx_w	maximum revs cannot be reset
kvges_w	fuel consumption since last reset
Button Clr cons	to reset fuel consumption
Button Clr dist	to reset vehicle mileage
Button Clr lra	not used
Button Clr knock	not used



B-mil Display TRUE if diagnostic lamp is activated, engine not running always TRUE

B-milspec Display TRUE if customer specific parameter exceeded
GT3 RSR -> fuel pressure, water temperature, oil temperature

B-oellamp Display TRUE if oil pressure warning lamp is activated

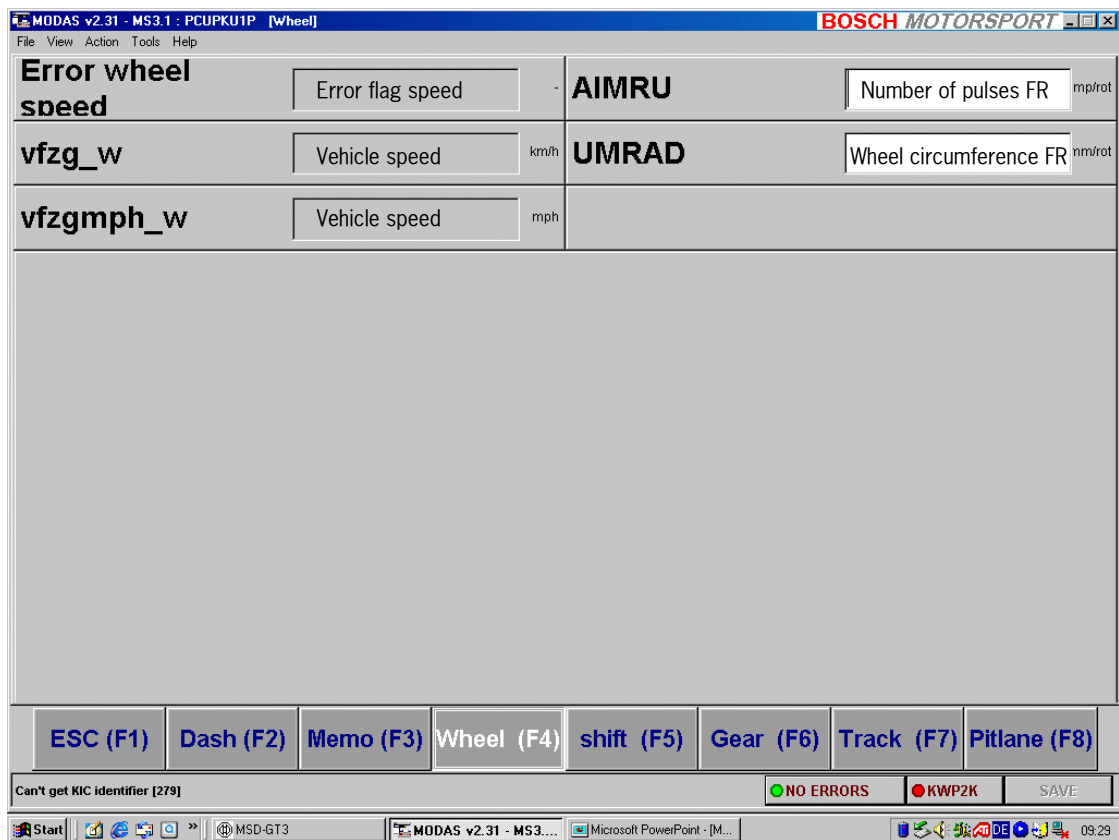
phase test When cylinder 1 identified -> display 1-0-1-0-1-0...

phspos_w if display < 25° at idle speed and/or < 27° - 30° at full throttle (data recording) -> angle
between crankshaft and flywheel not OK

MODAS v2.31 - MS3.1 : PCUPKU1P [Memo]		BOSCH MOTORSPORT	
File View Action Tools Help			
Real time year	Real time year	Set real time year	Read Clock
Real time month	Real time month	Set real time month	Set Clock
Real time day	Real time day	Set real time day	
Real time hour	Real time hour	Set real time hour	
Real time minute	Real time minute	Set real time minute	
Real time second	Real time second	Set real time second	
Flag memory			
Flag flashcard detect.			
Flag new init. Flashc.			
Flag recording active			
<div> <div>ESC (F1)</div> <div>Dash (F2)</div> <div>Memo (F3)</div> <div>Wheel (F4)</div> <div>shift (F5)</div> <div>Gear (F6)</div> <div>Track (F7)</div> <div>Pitlane (F8)</div> </div>			
Can't get KIC identifier [216]		NO ERRORS	KWP2K SAVE

Start MSD-GT3 MODAS v2.31 - MS3... Microsoft PowerPoint - [M... 09:27

Used for Bosch memory only

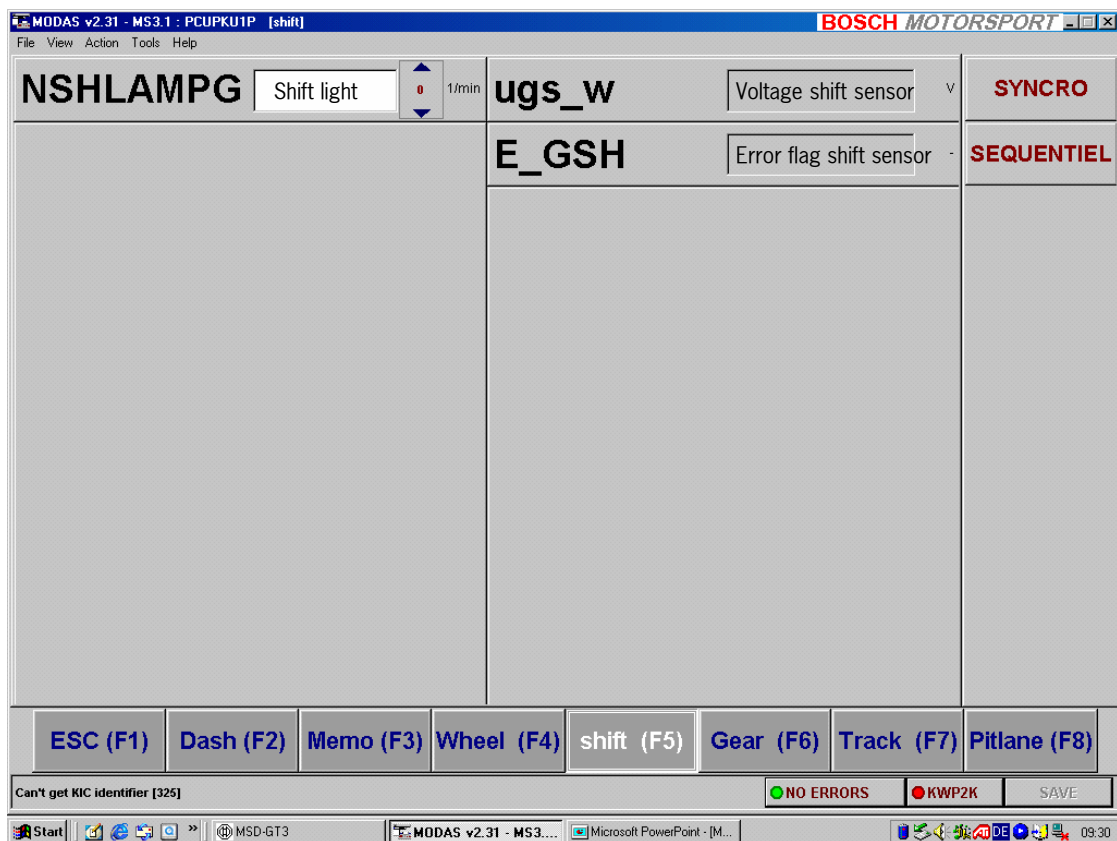


ERROR wheel speed

error speed detection = display TRUE

E-vradxx

error



NSHLAMPG

shift light

ugs_w

neutral shows 2.5 V
upshift = voltage rises (to 3.5 - 4.0 V) cut off starts at 2.9 V

E-GSH

error gearshift sensor = display TRUE

BUTTON SYNCHRO

code for synchronised gearbox
must be flashed to reference page by using: Action/Flashing/Workingpage to reference

Page

BUTTON SEQUENTIEL

code for sequential gearbox
must be flashed to reference page by using: Action/Flashing/Workingpage to reference

Page

MODAS v2.31 - MS3.1 : PCUPKU1P [Gear]				BOSCH MOTORSPORT	
File View Action Tools Help					
CWGANGI	Code gear detection	-	gangi	Detected gear	- Gear Ratio
gangp	Gear from gearpoti	-	gangu	Det. Gear from ratio	- Gear Poti
ugang_w	Voltage gearpoti	v	ugang_off	Offset gear poti callib.	v
B_gangp	Flag gear det. by poti	-	ugang_c	corr. volt. gera poti	v CAL GEAR
			UVGANG12	Threshold ratio1-2	- ZERO GEAR
			UVGANG23	Threshold ratio2-3	-
			UVGANG34	Threshold ratio3-4	-
			UVGANG45	Threshold ratio4-5	-
			UVGANG56	Threshold ratio5-6	-
Error gear position sensor					
<div> <div>ESC (F1)</div> <div>Dash (F2)</div> <div>Memo (F3)</div> <div>Wheel (F4)</div> <div>shift (F5)</div> <div>Gear (F6)</div> <div>Track (F7)</div> <div>Pitlane (F8)</div> </div>					
Can't get KIC identifier [430]				<div> <div>NO ERRORS</div> <div>KWP2K</div> <div>SAVE</div> </div>	

- CWGANG** code for gear detection
by gear poti = 1 oder Button Gear poti must be flashed to reference page by using:
Action/Flashing/Working Page to Reference Page
- ugang_w** Voltage gear poti, set to 3.85 V in 6. Gear
- CAL GEAR** calibrates gear potentiometer to 3.85 V
must be flashed to reference page by using: Action/Flashing/Working Page to Reference Page
do basic setting manually, calibration max. +0.2 V
- ZERO GEAR** reset offset (ugang_off) to 0
must be flashed to reference page by using: Action/Flashing/Working Page to Reference Page
- UGANGP, UGANGPHP, UGANGCAL, UGANGMN, UGANGMX, D_UGANG -> nicht bearbeiten

MODAS v2.31 - MS3.1 : PCUPKUIP [Track]		BOSCH MOTORSPORT		
lapctr	Lap counter laps	LLAP	Track length m	
B_lappin	Flag Lap triggef. ECU -		CLR LAP	
B_laptrg	Flag Lap trigger -			
		FLLAPMIN		Factor min. tr. length -
		FLLAPMAX		Factor max. tr. length -
		VFZLAPMN	Min. speed km/h	
ESC (F1)		Dash (F2)	Memo (F3)	
Wheel (F4)		shift (F5)	Gear (F6)	
Track (F7)		Pitlane (F8)		
Can't get KIC identifier [471]		<div> <div>NO ERRORS</div> <div>KWP2K</div> <div>SAVE</div> </div>		

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CWVMAX code for pitspeed-Limit
0 for km/h or Button Pitlane (km/h)
1 for mph or Button Pitlane (mph)
must be flashed to reference page by using: Action/Flashing/Working Page to Reference Page

Error wheel speed:Error vehicle speed = display shows TRUE

Pitlane Button switch pressed = display1

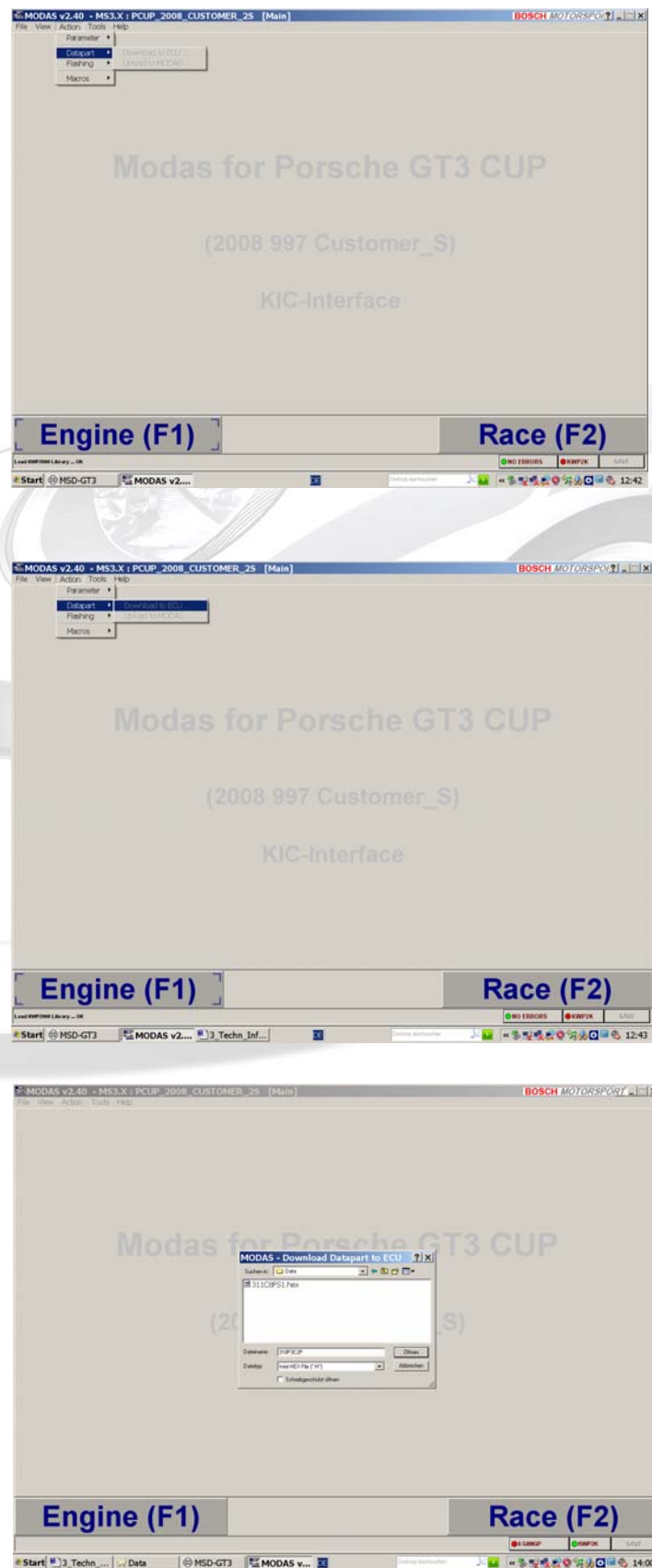
Loading data files (hex. files)

1. Action

2. Datapart

3. Download to ECU

4. Open in corresponding
file window



Fire extinguisher system:

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

The fire extinguisher is activated by a push button mounted on the dashboard or by the emergency switch located on the left hand side of the windscreen cowl.

The system's operating range is between -15° C and +60°C. The extinguisher cylinder must be protected from frost and should never be stored where the ambient temperature can drop below -15°C.

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 new spare parts.

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 by pushing the button located on the windscreen cowl.

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:

The following points should be checked if the warning lamp does not glow:

Check battery charge state (refer to 'Battery Installation').

Check the cable connection to the 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.

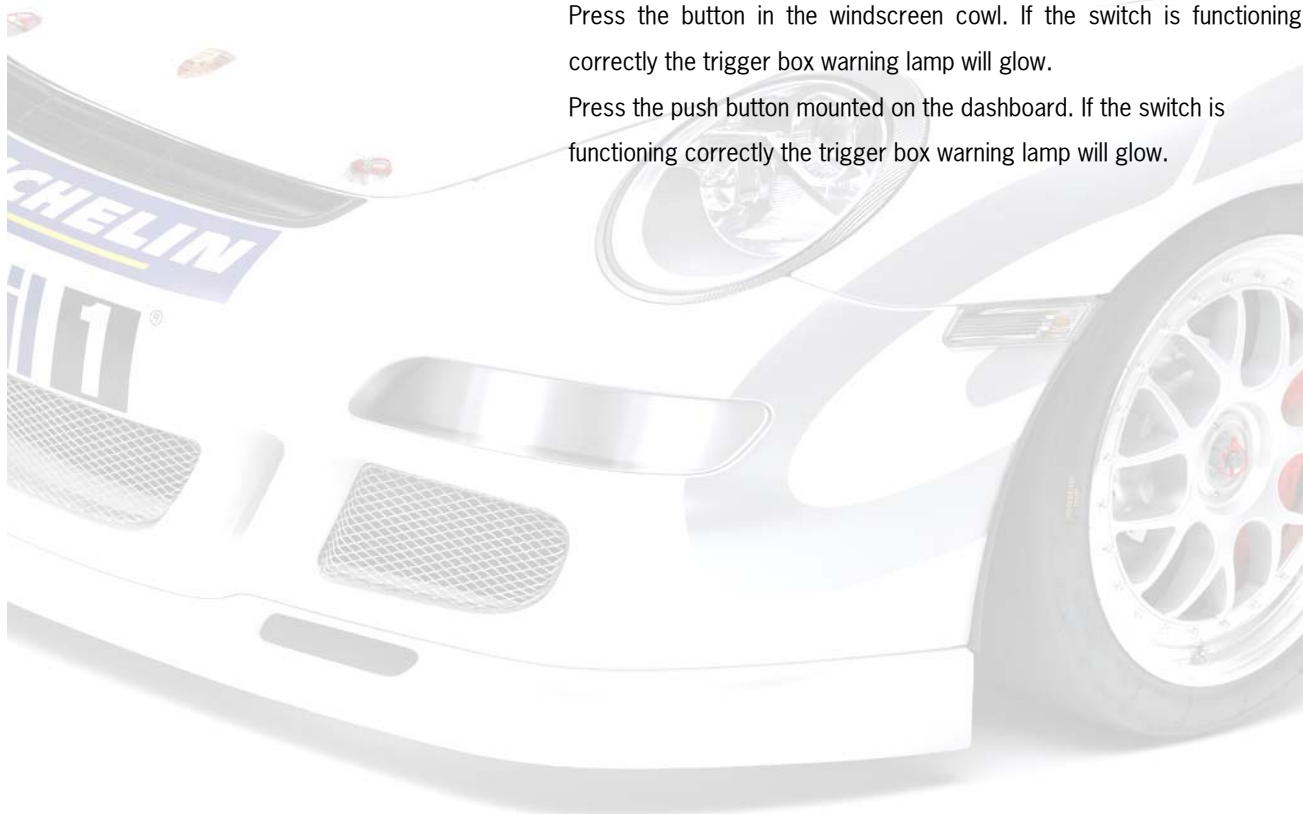
Remove the trigger box cover and change the battery. Ensure that the battery poles are connected correctly. Only Alkaline batteries should be used.

Checking the firing button:

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

Press the button in the windscreen cowl. If the switch is functioning correctly the trigger box warning lamp will glow.

Press the push button mounted on the dashboard. If the switch is functioning correctly the trigger box warning lamp will glow.



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