CUPRA LEON VZ TCR

WORKSHOP USER MANUAL v1

CUPRA RACING

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INTERNAL

1. INTORDUCTION

Workshop Manual details the key points to control or consider for the car maintenance.

The following listed documents complement the information contained here and must be downloaded from the on-line VAG Motorsport platform and kept on hand for car maintenance.

From CUPRA RACING

- Suspension manual: Kinematics, set up and diagrams.
- Electric-electronic manual: Electronic structure, devices information and schemes
- Driver briefing manual: Quick view of steering wheel and central console buttons and display pages information.

From the suppliers, the following manuals:

- Sadev gearbox
- Hewland gearbox
- EcuMaster display
- MARELLI Wintax & Sysma
- Sadev Hydraulic shifting

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2. CAR FEATURES

AREA	FEATURES
Bodyshell	CUPRA Leon bodyshell motorsport adapted and lightened / CUPRA Safety-cage ASN/FIA homologated / airjack lifters
Bodywork	CUPRA design / fully carbon fibre bodywork parts
Engine	4 cyl 2.0 cc turbocharged w. intercooler / Marelli mts. ecu srg-141 - logger integrated / double radiator cooling system / wet oil sump
Transmission	2WD 6-speed sequential gearbox and slip differential w. external preload adjustment. Multi disc sinter-metallic motorsport clutch Paddle shift
Electronics	Advance display unit 7" and keyboard CUPRA multifunctional steering wheel module Power box modular concept / no fuses Full led headlamps
Suspension	Front McPherson / 2-way strut / coil spring / 3x ARB options Rear suspension 4 arms-multilink axle / 2-way strut / 3x ARB options
Fuel tank	100lts motorsport fuel tank FT3 homologated
Brakes	Adjustable pedal box brake with spherical bearing mounted master cylinders / brake bias adjustable & rear brake pressure limiter 6-piston Monoblock calliper / 378 mm steel ventilated discs 2-piston Monoblock calliper / 272 mm steel solid disc
Steering	Electrical power assisted rack and pinion / Mts. SW
Rims	18x10 inch CUPRA Racing design
Internal equipment	Customized racing carbon seat & 6 points safety harness HANS compatible Flat steering wheel 330mm with shifting paddles & quick release system Lifeline fire extinguisher system

OPTIONAL

ABS	Bosch M5 motorsport ABS system kit
External refuelling	Optional cap and cap less system kit
Exhaust with silencers	Silencer pipe

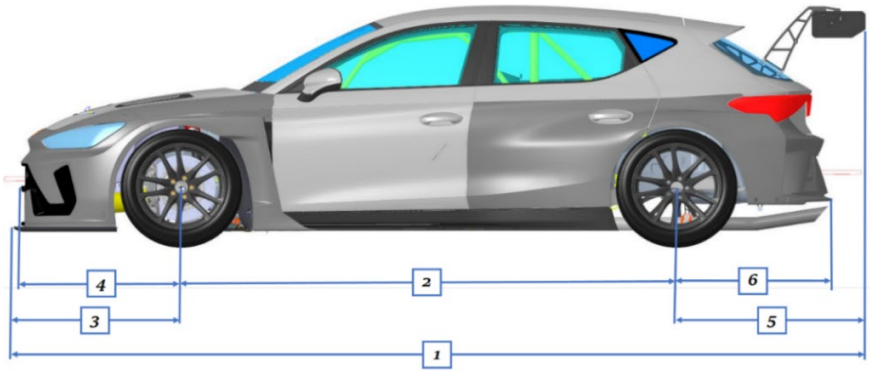
**Specifications subject to change*

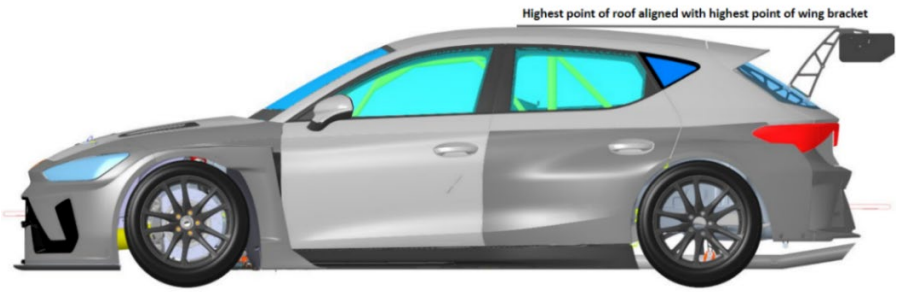
INTERNAL

2.1. Car dimensions

Bodywork parts fixing have tolerances to aid in a good fit. Is it advisable to periodically check that they are in accordance with the regulations.

DESCRIPTION	VALUE	Ref.
OVERALL LENGTH	4673 +10mm / -35mm	1
WHEELBASE	2706 ± 10 mm	**2**
OVERHANG FRONT SPLITTER	899± 10 mm	**3**
OVERHANG FRONT BUMPER	927 ± 10 mm	**4**
OVERHANG REAR WING	1040 ± 10 mm	**5**
OVERHANG REAR BUMPER	848 ±10mm	**6**
OVERALL BODYWORK WIDTH	1950 -1%	**7**





IMPORTANT: Bodywork measures must respect TCR Technical Regulations art. 4.4: *"No elemer the rear wing including side plates and brackets may be located beyond the following limits:"*

X= 1050 mm from rear acle centerline

Z= Highest point of roof

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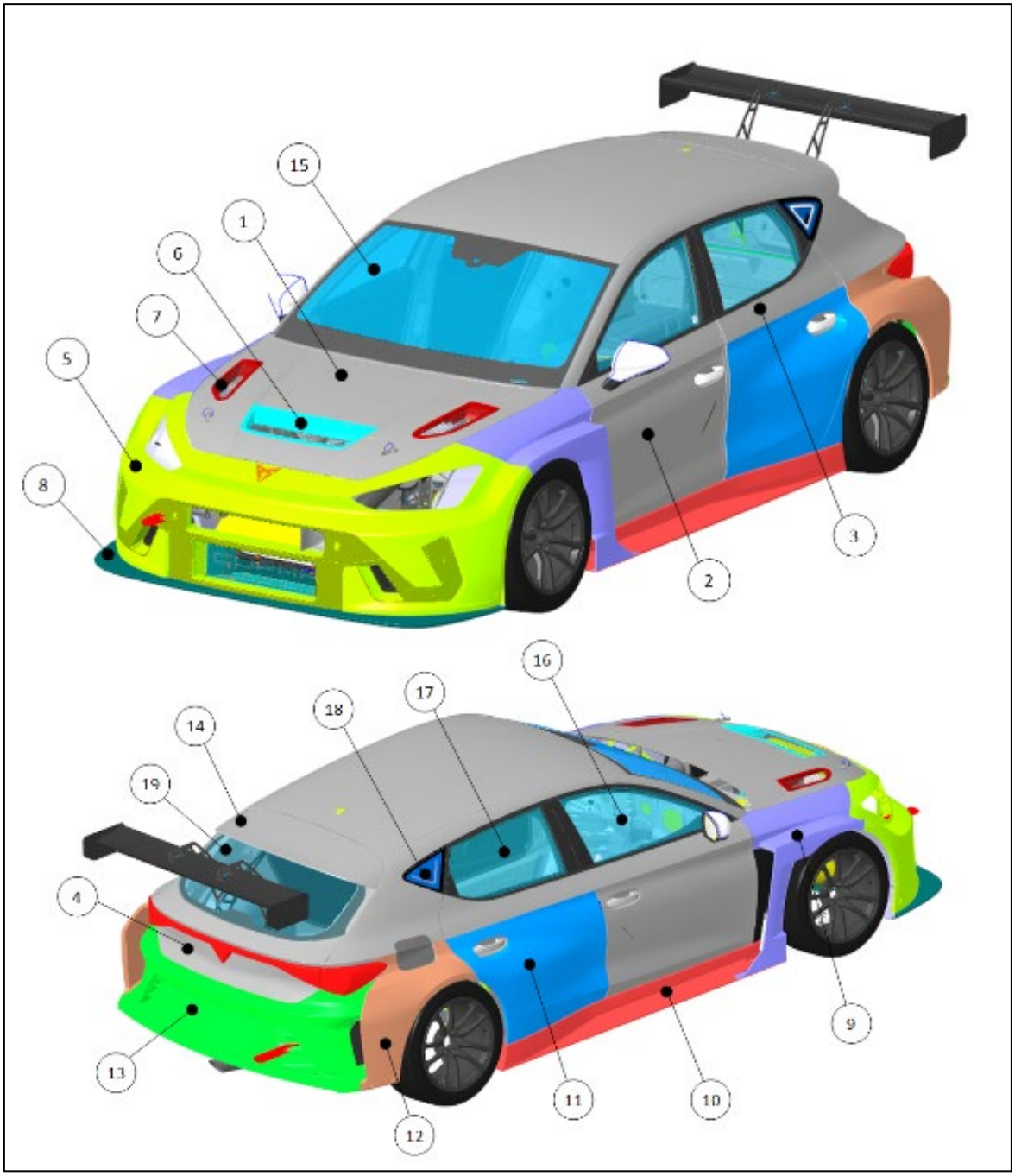
2.2. Bodywork features

Description	Code and finishing
Fiber parts spares finishing	Carbon raw finishing
Bodyshell color	Vapor Grey / code **A7C**
Some black areas on bumpers and others	Black Satin / code **9B9**

*Spare parts in composite material are delivered in Carbon raw (no painted or primed)
*Spare parts in metal material are delivered in primed KTL



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METALLIC MATERIALS			
Identification	**Part**	**Material**	**Minimum Weight**
1	**Engine Bonnet**	**Steel**	**11600** g
2	**Front Door**	**Steel**	**15200** g
3	**Rear Door**	**Steel**	**11700** g
4	**Boot Lid**	**Steel**	**11000** g

PLASTIC MATERIALS			
Identification	**Part**	**Material**	**Minimum Weight**
5	**Front Bumper**	**Composite**	**3300** g
6	**Central Bonnet Opening**	**Composite**	**100** g
7	**Lateral Bonnet Opening**	**Composite**	**60** g each
8	**Front Splitter**	**Composite**	**5750** g
9	**Front Fender**	**Composite**	**950** g
10	**Side Sill**	**Composite**	**2150** g
11	**Rear Door Fender**	**Composite**	**1250** g
12	**Rear Fender**	**Composite**	**680** g
13	**Rear Bumper**	**Composite**	**3200** g
14	**Boot Spoiler**	**Plastic**	**2700** g

GLAZING				
Identification	**Part**	**Material**	**Minimum Thickness**	**Glass and Polycarbonate: Minimum Weight**
15	**Windscreen**	**Glass**	**4.31** mm	**11600** g
16	**Front door window (Left & Right)**	**Glass**	**3.75** mm	**3000** g
17	**Rear door window (Left & Right)**	**Glass**	**3.05** mm	**2300** g
18	**Rear side window (Left & Right)**	**Glass**	**3.05** mm	**300** g
19	**Rear window (Make: Kasiglas)**	**Polycarbonate**	**4.00** mm	**2750** g
15 OPTION	**Windscreen (Make : Plastics 4 Performance)**	**Polycarbonate**	**5.85** mm	**8200** g
15 OPTION	**Heated Windscreen (Make: Plastics 4 Performance)**	**Polycarbonate**	**7.15** mm	**9600** g
17 OPTION	**Rear door window (Left & Right)**	**Polycarbonate**	**4.00** mm	**1700** g

*Use Original CUPRA Racing spare parts only (certified)

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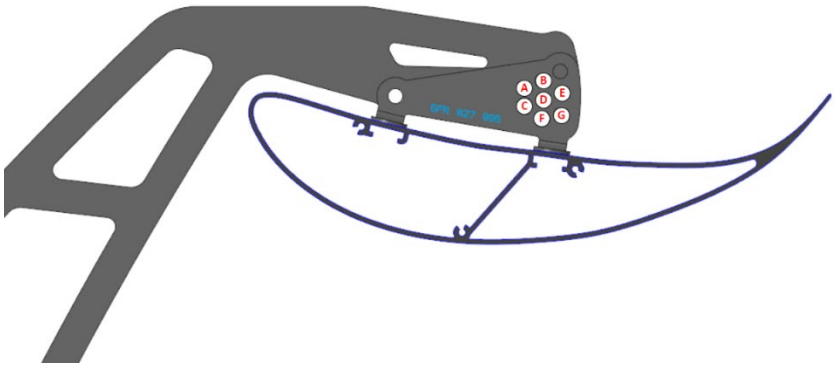
2.3. Bodywork adjustments

Rear wing

Rear Wing	Shape according to TCR regulations
Wing Width	1392 ±1 mm (including lateral plates)

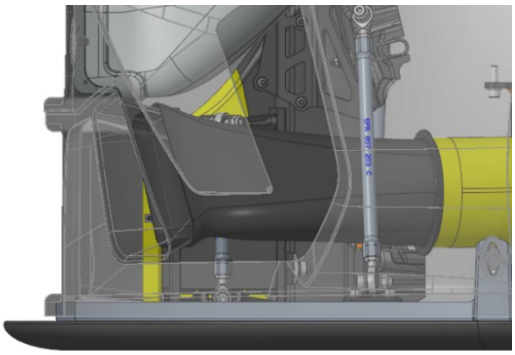


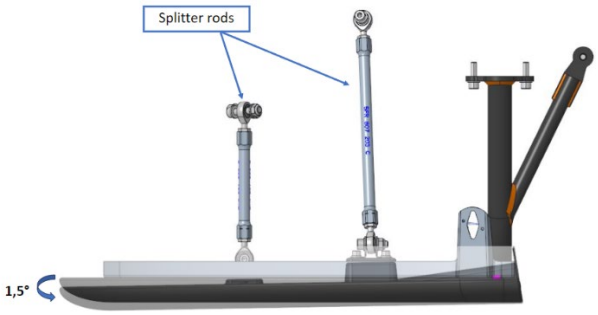
Angle	Position
-5º	A
-7.5º	B
+2.5º	C
0º	D
-2.5º	E
+7.5º	F
+5º	G

Front splitter

Use the front splitter adjustment to modify front downforce.

1. Adjustment **angle ± 1.5º**
2. Consider the **rake** for a right splitter set up.





- Check periodically the **splitter lib** is in good conditions. A loss of the **adjusting rubber lib** can generate vibration on the car.

INTERNAL

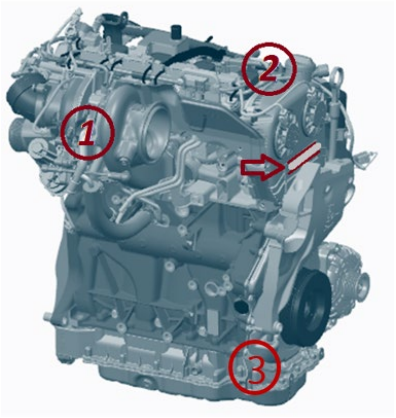
3. ENGINE

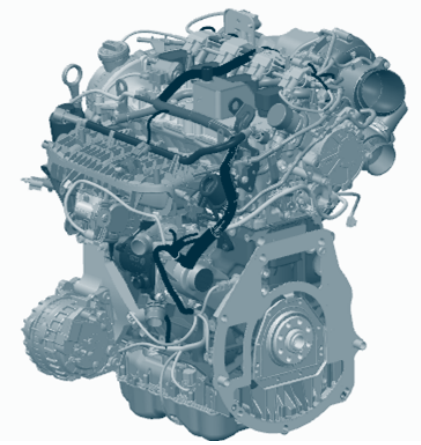
The engine is std from series and has no internal modifications. It is a robust piece and does not usually break down. In case of serious damage, it must be replaced. Repair service is not offered.

3.1. Engine features

DESCRIPTION	FEATURES
Engine ID letters	DNF
Maximum power	250 kW (340 hp) at 6250 rpm
Maximum torque	420 Nm / 2500 -5500 rpm
Maximum rpm	7000 rpm
Fuel	Ron 98
Fuel consumption	Approx... 0,5 l/km
Turbocharger	Volkswagen AG. (Sealed)
Lubrication	Wet sump / Catch Tank
High fuel pump	Volkswagen AG
Distribution	Chain (Sealed)
Engine Cooling	Mechanical Water Pump / Electronic Thermostat
Fan	Motorsport fan / ECU managed
Spark plugs	NGK R-9º

Manufacture seals and engine identification:
The engine has 3 seals. Maintain always them in good conditions. If you have any needs, please contact with CUPRA RACING.





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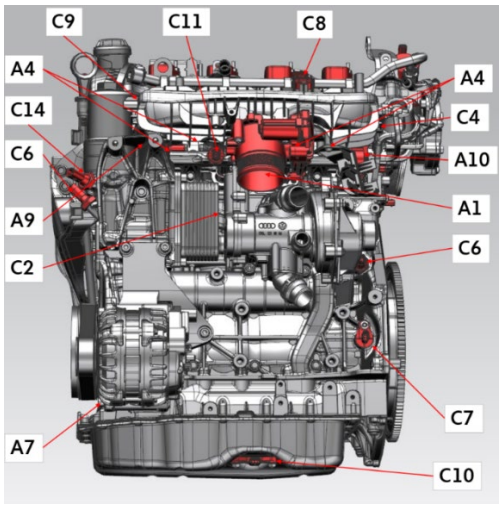
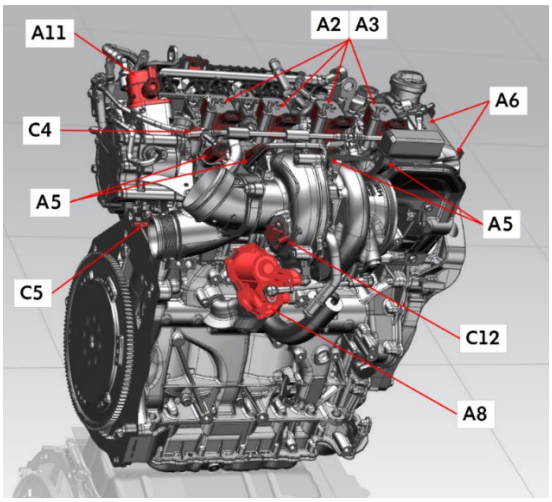
3.2. Sensors and actuators location





Sensor	*Description*	*Actuator*	*Description*
C2	KNOCKING SENSOR	A1	THROTTLE VALVE
C4	CAM SPEED (2)	A2	INJECTION COIL
C5	WATER TEMPERATURE	A3	SPARK PLUG
C7	ENGINE SPEED	A4	DI INJECTOR
C8	BOOST PRESSURE AND TEMPERATURE	A5	EXHAUST CAM ADJUNTMENT
C9	INTAKE MANIFOLD FLAPS POTENTIOMETER	A6	VARIATION VALVE
C10	ENGINE OIL LEVEL AND TEMPERATURE	A7	OIL PRESSURE REGULATOR
C11	FUEL PRESSURE (HP)	A8	WASTE GATE REGULATOR
C12	TURBOCHARGER SPEED (Not functional, used as plug)	A9	COIL PISTON VALVE
C13	LAMBDA PROBE	A10	INTAKE MANIFOLD VALVE
C14	OIL ENGINE PRESSURE	A11	FUEL PUMP (HP)

IMPORTANT: An actuator calibrations process is mandatory in case of any of the following engine actuators has been replaced, or the complete engine.

1. **Turbo charger waste gate**
2. **Engine throttle**
3. **Foot throttle**

See the process of the calibration on the Cupra Leon Electric & electronic manual or Marelli Sysma manual.

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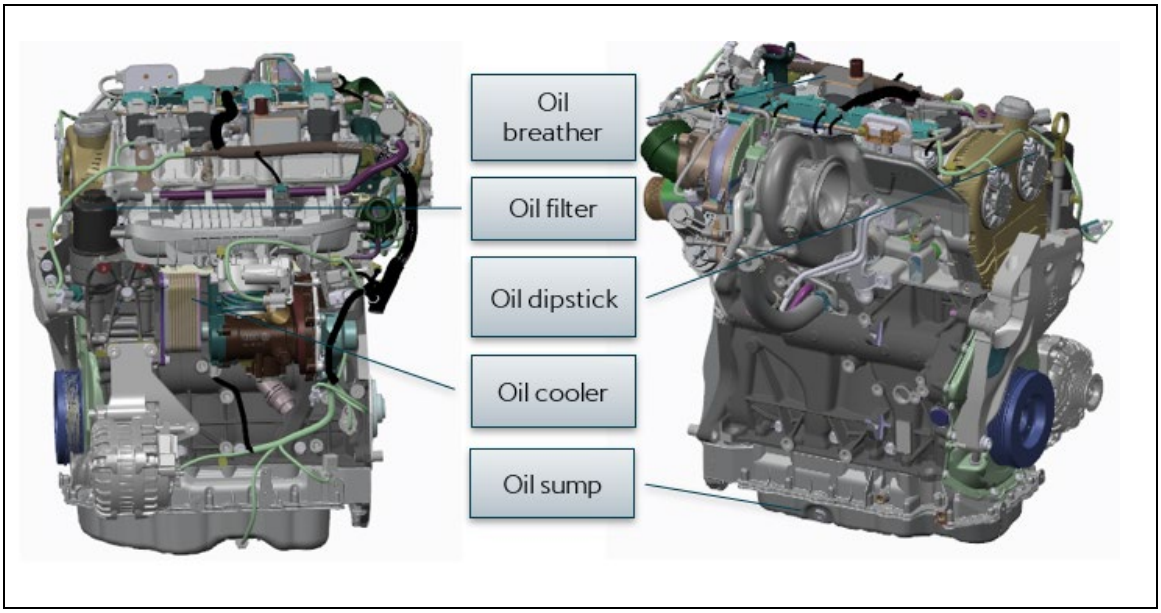
3.3. Engine lubrication

DESCRIPTION	FEATURE
Engine oil system	Wet sump / mechanical oil pump / breather with catch tank and oil cooler
Oil capacity	4.7 L
Oil level	Use dipstick mark max level / oil level check >60ºC
Type of oil (recommended)	5W-30 LL 507
Oil cooling	Exchanger Water-oil
Operating oil pressure	4 ± 0.3 bar



3.4. Engine water cooling

DESCRIPTION	FEATURE
Engine cooling system	Double water radiator in parallel mounting
Cooling capacity	8 lts
Type of coolant	G-12 evo
Coolant concentrate	33% G-12 evo with 67% distilled water
Drive system	Mechanical water pump main /auxiliary water elec. Pump for turbo / electronic thermostat
Fan operating range	ECU management Operating range 92°C to 87°C *Switched-off with speed up to 100 km/h

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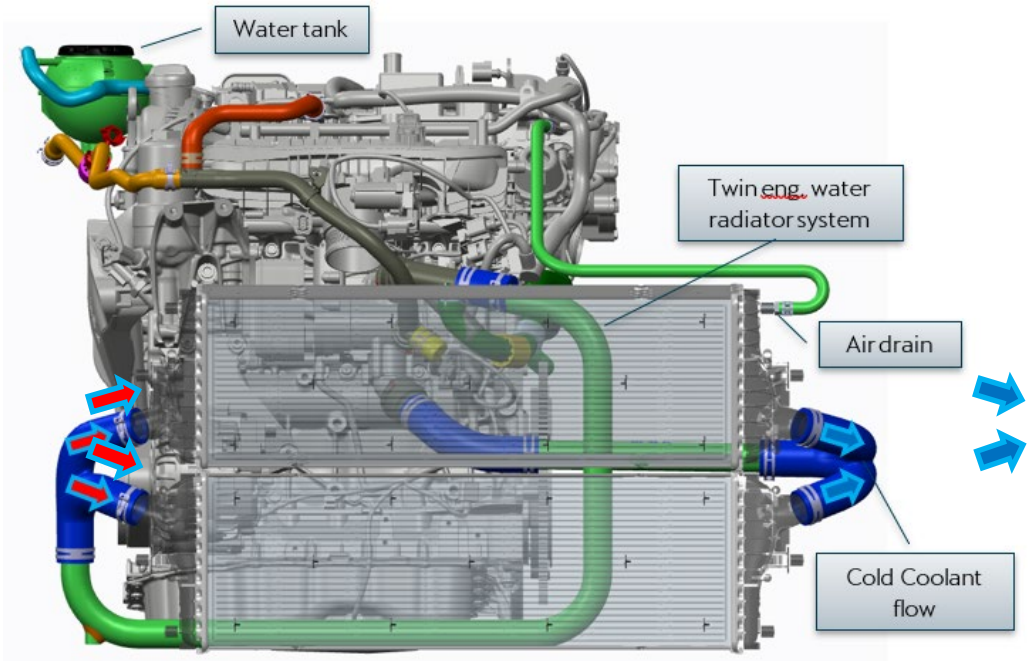
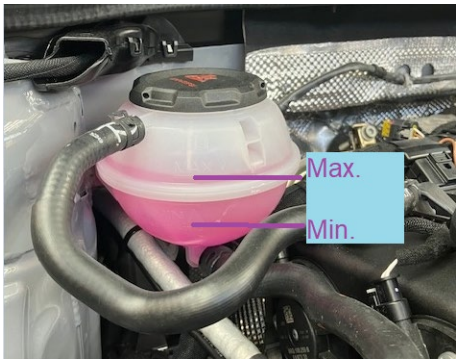
Water cooling system view:

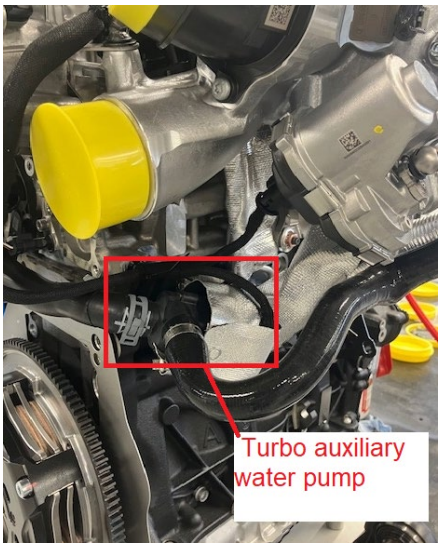


- Check eventually the water radiator core vanes are in good conditions.
- Coolant G12-evo mixture lower than 33% might cause internal corrosion and a wrong thermostat mechanism operation.



- The engine coolant expansion bottle level variation between cold and hot conditions can be higher than road cars, due to the bottle is small. To find the level on the minimum after the session is normal. Level must be check in cold conditions and have to be at Max mark.

- **Auxiliary engine water pump:** This auxiliary pump is used to cool down the turbo and specially when the engine is stopped suddenly.



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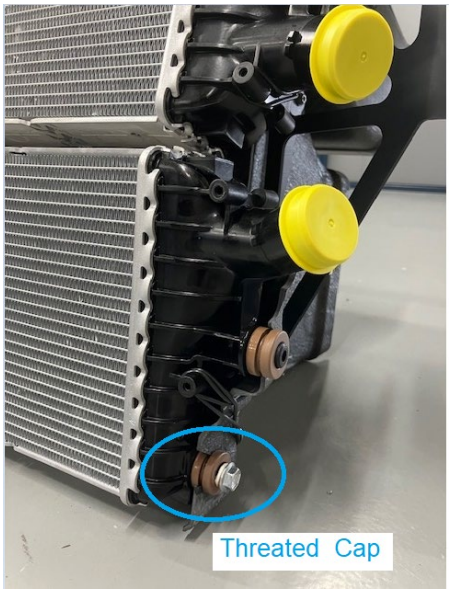
- To inform the driver about the optimum conditions to stop the engine, display shows a turbo icon and when the icon is **green** lighted the turbo is saved, and engine can be stopped. In case to stop the engine suddenly becomes mandatory and icon is in **orange**, switching OFF the ignition to stop the car and switch ON again to activate the auxiliary turbo cooling.
  From orange to green takes approximately about 1 minute.

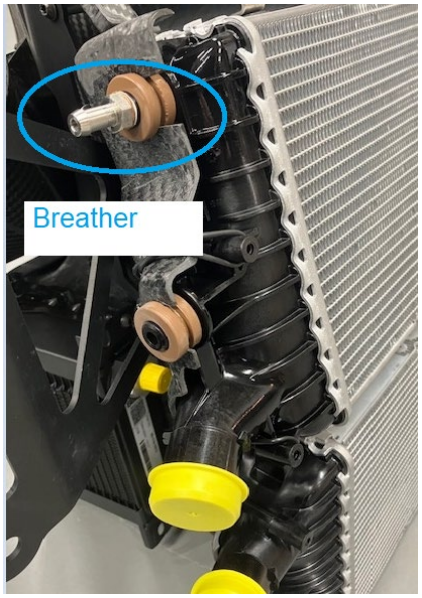
Engine water radiator:

- Water Radiator Twin system. Check periodically the vanes are in good condition and inside of the panel is clean.
- There is only one engine water radiator reference in the catalog, so with one spare you can cover both positions.
- They are always served with a screw cap on the position of the breather fitting. To mount it at the up position, you must replace the cap with the breather fitting. You can recuperate from the old one or you can buy it on the catalogue.

Pictures 1



Picture 2



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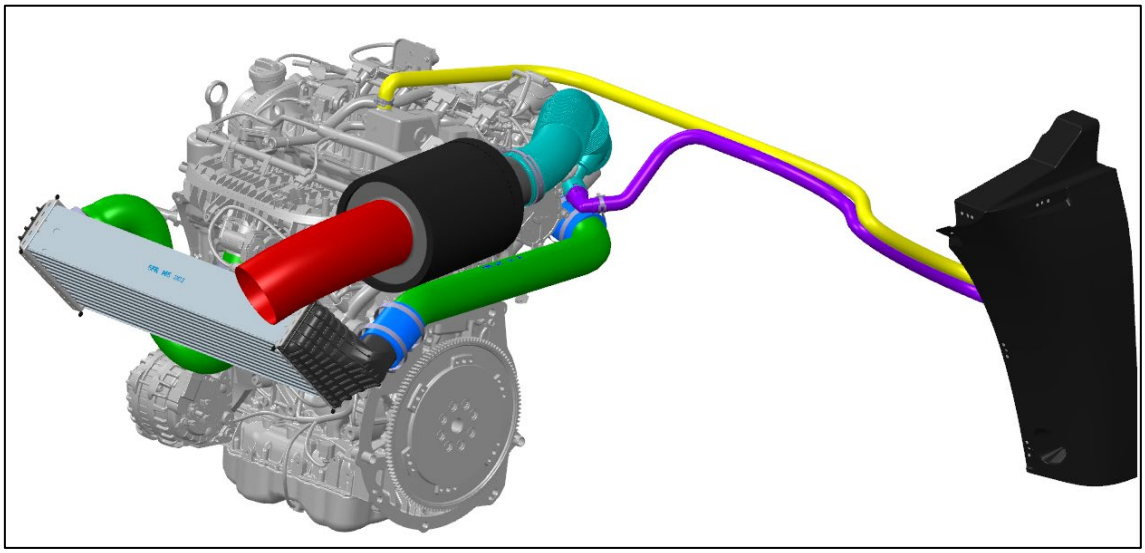
3.5. Engine air intake system

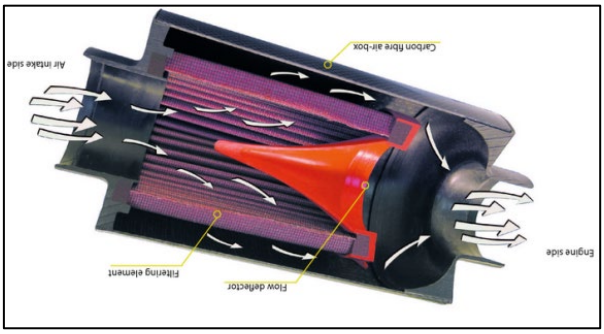
DESCRIPTION	FEATURES
System	Air-air intercooler / Capacity 8L (certified)
Airbox BMC	Carbon Dynamic Airbox Reinforced cotton air filter -6 layer-



- **Intercooler:** Duct without mesh. Check eventually the intercooler core vanes are in good conditions. Clean and straighten the core if it is necessary. Clean and dry very well the silicon hoses before install them.

- **Air filter**: CDM /Carbon Dynamic Air box.

  Maintain the air filter in optimum conditions. Turbo charger impeller turbine life depends on it.
  In circuits with sand or dirty extreme the air filter maintenance is essential after every session.
  Is advisable to have three spare filter elements in optimum conditions, so cleaned and oiled, and replace them during the racing weekend.
  Use BMC air filter washing kit detergent and BMC oil to recuperate and prepare the filter elements for the next use.



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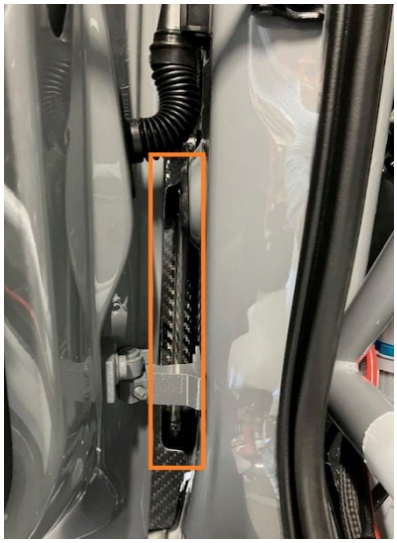
- **Catch tank:** Catch tank reservoir it is allocated inside the Elephant-fuss, positioned under front fender left.
  A peephole is available in a transparent silicon pipe, visible from the driver door side. Check the peephole level and eventually drain the catch tank because at the bottom of the reservoir might have small amount of condensation fluids (gasoline&oil) not visible from the exterior.
  In case of high presence of fluid:
  1. Check oil dipstick level.
  2. Second check the engine cylinders leakage

  Please note that the engine catch tank is usually empty. In case there is a considerable level of oil in the reservoir, this could be due to damage to the engine hardware. Check cylinder compression.

1) Cath tank scheme.	***2) Peephole in position***
	

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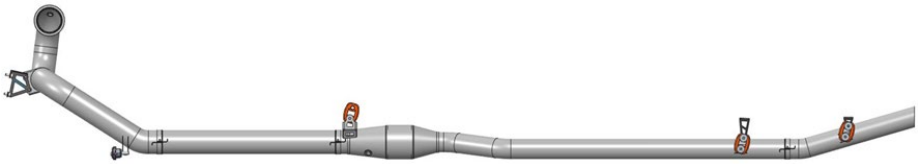
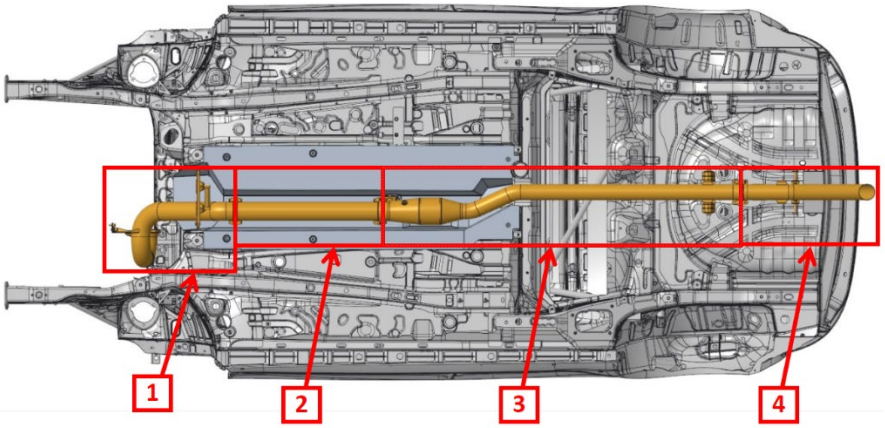
3.6. Exhaust system

DESCRIPTION	FEATURES
Exhaust diameter	Downpipe Ø88.9 / Ending Ø76
Catalytic Homologation	DMSB-CAT-1-31/20
Noise level std exhaust	115 dB
OPTIONAL:	*See parts catalogue*
Silencer (pipe nº 2)	*95 dB (see notes below)*
Isolated pipes	*Down pipe (std part nº1) Isolated*
	Intermediate and Catalytic (nº 2&3) Isolated.

- Noise level measure process is always subject to environment circumstances and may vary.





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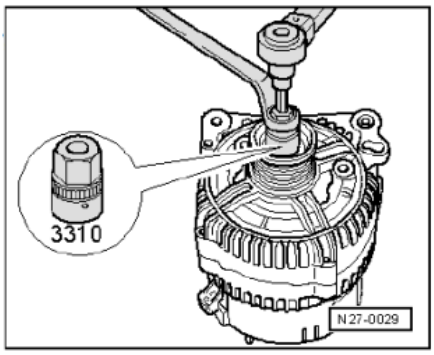
3.7. Alternator

DESCRIPTION	FEATURES
Alternator	VW original part / 90 Amp / fix pulley
Type of belt	Continental Poly-V Belt ELAST

Special Poly-V-belts DIN 7867 for drives with fixed centre distances without tensioner. Use specific tools exist on the market to remove and mount the elastic bell.

Process to tighten the alternator pulley:

- Disassemble the poli-V bell
- Disassemble the alternator from the engine and hold it at the mounting points
- Remove the pulley nut M16x1.5
- Remove the old paint fixing marks (usually in yellow)
- Tightening torque: **Loctite 270 + 90 Nm**
- Add fixing paint mark for periodic control



Use std tooling existing in the market for the operations with the Elast belt.

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4. TRANSMISSION

CUPRA Leon VZ TCR car model is certified with two brands of transmissions. **SADEV** and **HEWLAND**.

Leon VZ TCR	**Sadev ST90-17 Cupra**	**Hewland CFT200 Cupra**
Gearbox assy. part number	5FR300046B	5FR300046C
Homologation weight	38,8 ±0,5 kg	45 ±0,5 kg
Ratio 1st gear	12/28	15/33
Ratio 2nd gear	16/28	17/30
Ratio 3rd gear	18/26	17/25
Ratio 4th gear	20/24	20/25
Ratio 5th gear	25/25	23/24
Ratui 6th gear	25/21	23/20
Final Drive	15/58	15/57
Diff type	Mechanical / external preload adjustable	Mechanical / external preload adjustable
Diff ramps anlge º homolog.	46/31 - 55/27	45/30 30/30 45/45 60/45
No. Pressure rings	2	3
Core plates	8	6
Friction plates	8	4
Gearbox oil capicity w. cooler	1,8 L	2,5L
Gbx cooler & pipes capacity	0,3 L	0,25 L
Oil	**RACING-GEAR-OIL 75W-140**	

Shifting System	Hydraulic	Pneumatic
Operating pressure	54 to 60 bar	8 to 12 bar

To carry out the maintenance and service of the gearbox, download and follow the SADEV User Manuals, available on the motorsport online platform, section USER MANUALS.

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4.1. SADEV transmission

All the details and technical information to manage, check or repair the gearbox are detailed in the Technical Manual Sadev ST90.17 CUPRA.

Gear box Potentiometer:

Calibration tables

Gears	voltage (V)
R	0.633
N	1.167
1	1.70
2	2.223
3	2.767
4	3.30
5	3.833
6	4.367

CONTACTLESS ANGLE SENSOR FOR BARREL: +0.5V to +4.5V

SENSOR: F0089072

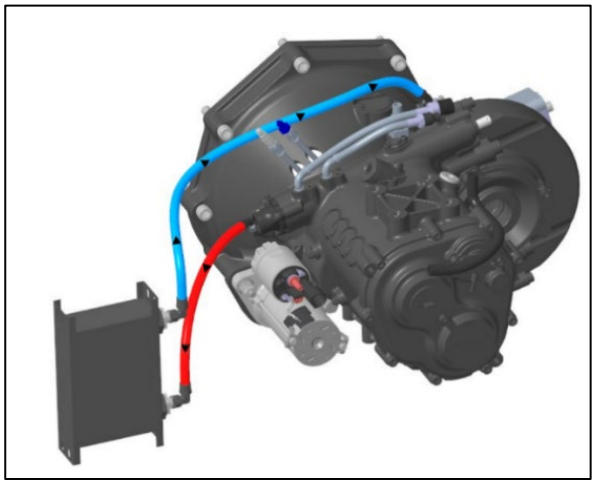
Nota Bene: Sensor adjusted in our factory = 2.767V ±0.05 in 3rd gear

- A: +5Vdc
- B: Ground
- C: Output signal terminal (0.5V to 4.5V) (± 1%)
- temperature range: -40 ° C to 140 ° C Max. current: 25mA

Gearbox oil and cooling lines:

	SADEV
Gearbox oil capacity	**1,5 L**
Gbx cooler & pipes capacity	**0,3 L (1.8L total)**
Recommended oil type	**RACING-GEAR-OIL 75W-140**
Oil replacement	**Sprint races: 150 km** **Endurance: whole race**

- Cooling oil line: Follow the line scheme to prevent an air bubble remaining in the cooler.
- Oil drain cap has magnet. If debris are stuck, open and inspect gbx internals.



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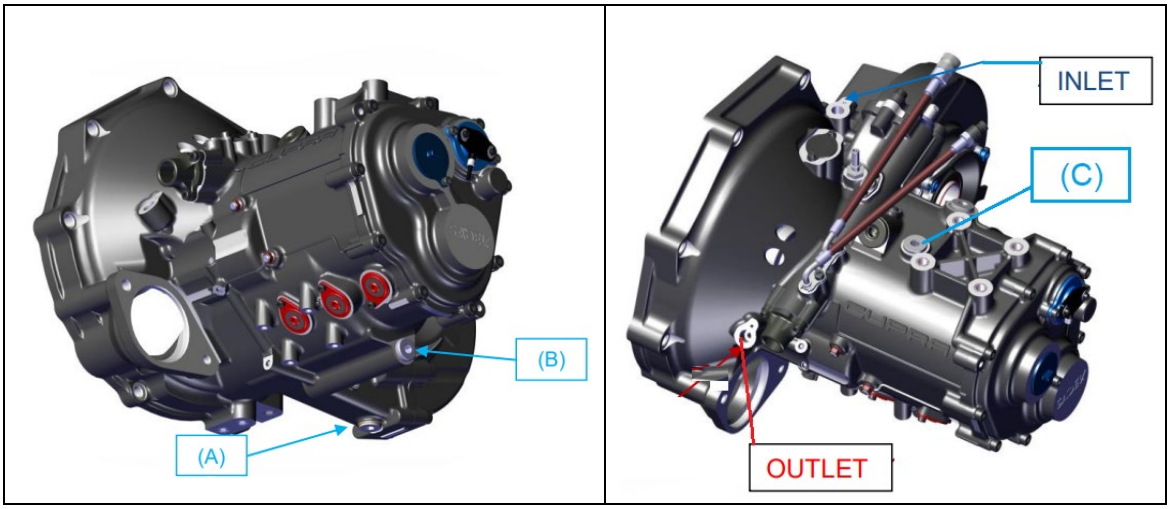
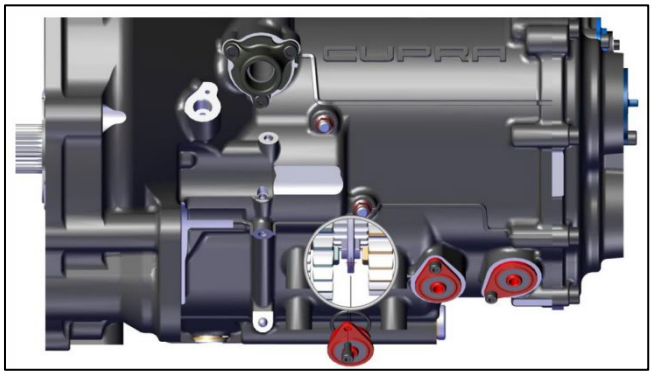


TO DRAIN THE GEARBOX:

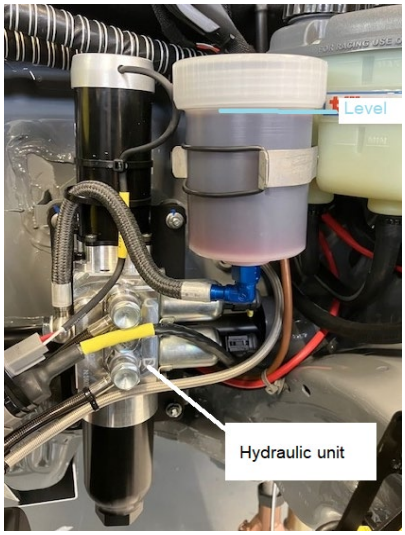
- Disassemble the drain magnet plug **(A)** and clean it up.
  Pump suction screen SADEV (B) clean the suction screen at every oil change.
  Fill in plug **(C)**

- Use dog caps located on the cluster housing for a quick dog ring inspection.



Shifting system

DESCRIPTION	**SADEV ST90-17**
System Type	Hydraulic
Hydraulic pump	Electric
Operating pressure	54 to 30 bar
Actuator	Hydraulic piston integrated
Hydraulic oil	DEXRON III IGOL ATF 130
Oil volume	70 cm3

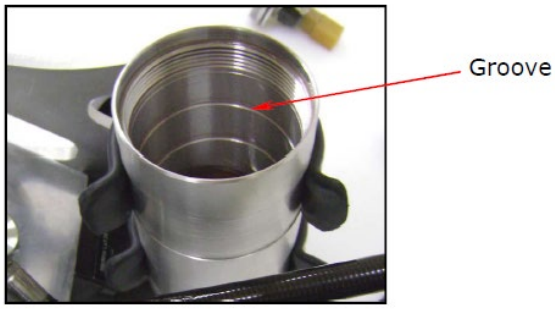


INTERNAL

Hydraulic unit oil level adjustment

Maintenance once per year. See Sadev Hydraulic shifting manual available on the platform.

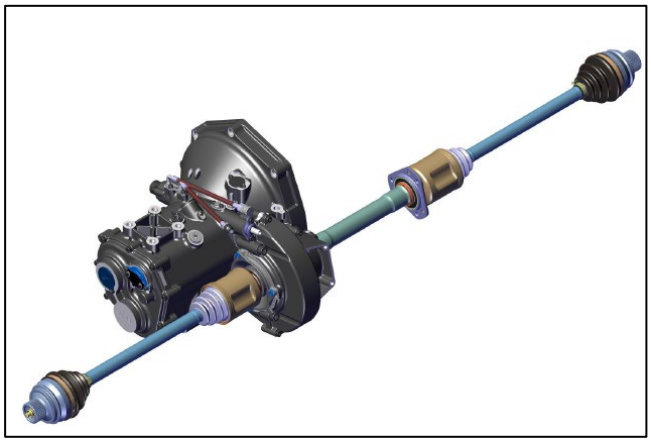
If you must adjust the oil level, proceed as follows:



- Unplug the electric motor plug.
- Use the high-pressure oil in the accumulator (<5bar) by operating the Up valve and down valve with paddles.
- Open the oil tank.
- Adjust the oil level up to the upper groove (into the tank)
- Close the oil tank.
- Pressurize the oil tank with a manometer (or bicycle pump) up to 3.5 bar, Careful, a too high pressure can destroy the unit.
- Connect the electric motor plug.

Drive shaft:

CV-Joint grease qty 1**20gr.**
Tripod joint grease qty **120gr Sadev**



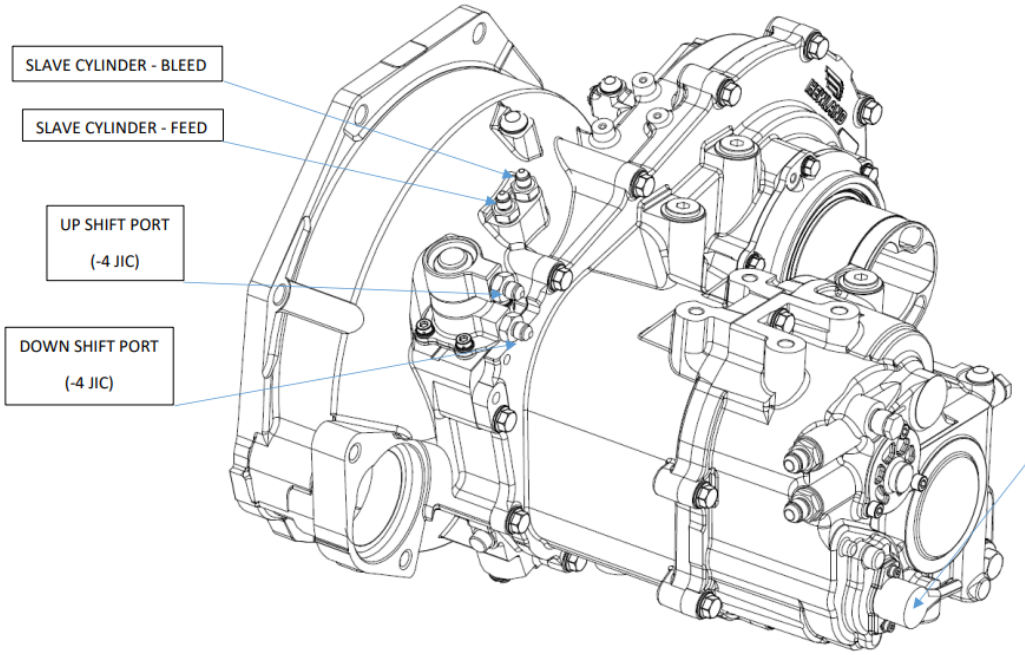
- Due to the force of the driveshaft spring (1a) in the scheme below, the tripod remains in position without the use of the circlip (5).
  Circlip is not fitted to production vehicles.
- Drive shaft left and right are symmetric. Once used, it is advisable to maintain the rotation sense.
- Due the wide wheel camber range options, in the operation of camber change, the tripod housing boot could remain in tension. Relax the clamp of the tripod boot in the shaft.
- Sadev drive shaft includes a spring (1a in the picture) that maintain the tripod housing in position. The tripod housing spline circlip is not necessary.
- IMPORTATN: Do not put the car on the floor without tight the CV joint. **(200 Nm + 180º).**

INTERNAL

4.2. HEWLAND Transmission

All the details and technical comments on how to manage and check or repair the gearbox are detailed in the CFT-200 User Manual

Gear box Potentiometer:



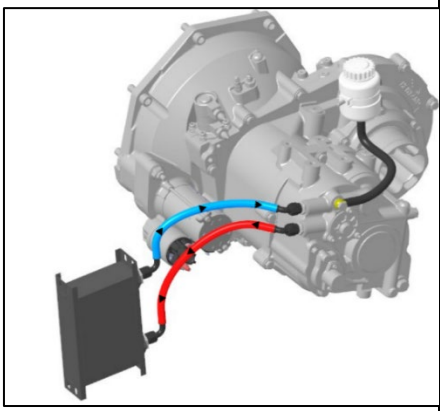
ELC-030 – W Connection Table	
Pin	**Connection**
Pin 1	Not connected
Pin 2	Gear Position
Pin 3	+5v
Pin 4	Not connected
Pin 5	ANA Ground

When setting semi auto system refer to the below table for gear position voltages.

Estimated Potentiometer values	
Gear	**V+**
R	0.53
N	1.10
1	1.65
2	2.22
3	2.78
4	3.35
5	3.91
6	4.47

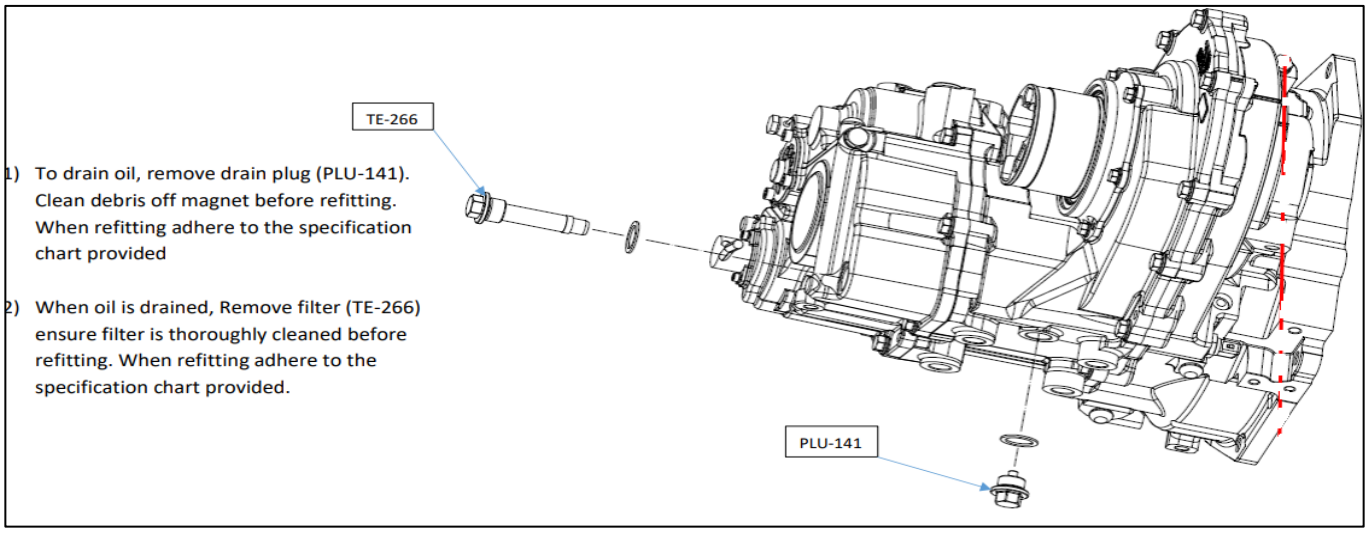
Gearbox oil and cooling lines:

	HEWLAND
Gearbox oil capacity	**2,25L**
Gbx cooler & pipes capacity	**0,25 L (2.5L total)**
Recommended oil type	**RACING OIL 75W-140**
Oil replacement	**Sprint races 150 km / Endurance whole race**



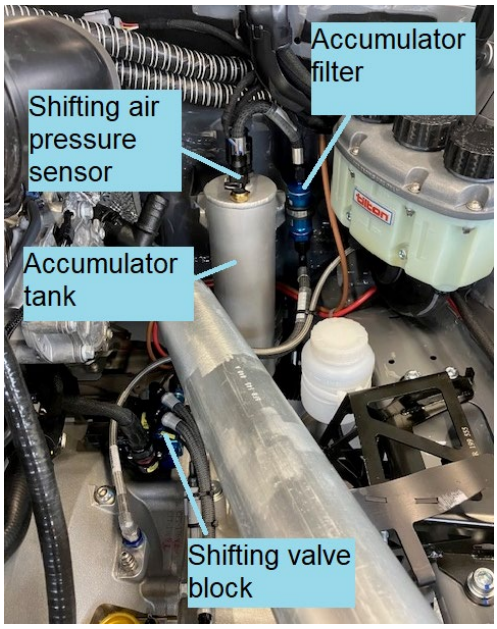
INTERNAL

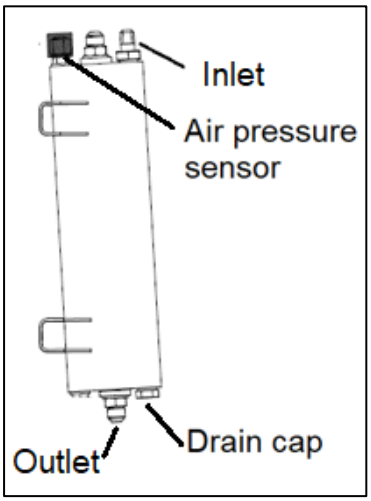
- Cooling oil line: Follow the line scheme to prevent an air bubble remaining in the cooler.
- Oil drain cap has magnet. If debris are stuck, open and inspect gbx internals.



Shifting system

DESCRIPTION	HEWLAND CFT-200
System Type	Pneumatic
Compressor	Electric
Working pressure	8-10 bar
Actuator	Pneumatic piston
Filter	1- Compressor foam pre filter 2- Accumulator pot outer filter



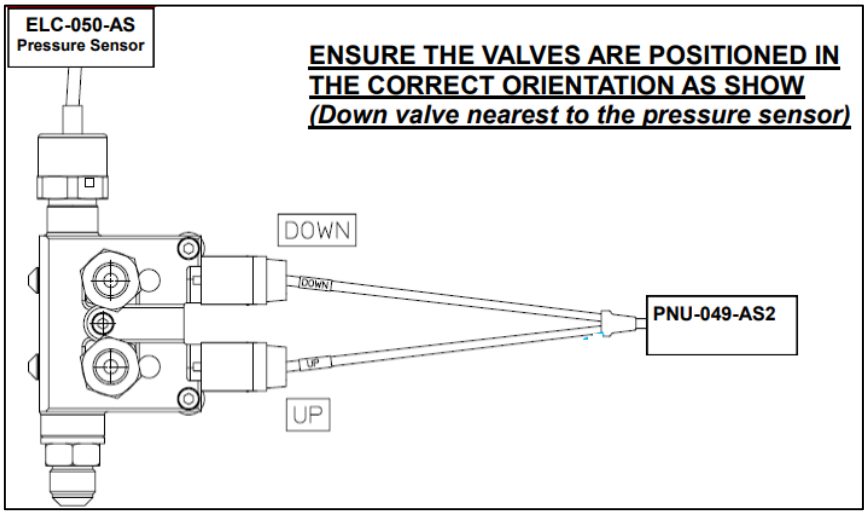


INTERNAL

Hewland Pneumatic Shifting system & maintenance:

- Drain the air pressure pot pre-filter periodically. Due to the air condensation, the reservoir might contain some water. To drain the accumulator tank periodically is important to maintain the electric-pneumatic valve block in optimum conditions.

- An important part of the shifting system is the actuator. I is recommended to clean and grease the PNU.060 for a proper operation. See “Hewland shifting valve block maintenance” manual.



Drive shaft:
CV-Joint grease qty 1**20gr.**
Tripod joint grease qty **120gr Sadev**

- CV Joint tightening on the wheel hub. IMPORTATN: Do not put the car on the floor without wheel bearing bolt load. Tighten the driveshaft CV joint with the car lifted**. (200 Nm + 180º).**

INTERNAL

4.3. Clutch

DESCRIPTION	FEATURES
Clutch	Alcon / Twin plate racing clutch
Cutch Diameter	Ø184mm (7,25”)
Clutch Master cylinder	Ø15.9 mm
Discs	Two sintered / fulcrum disc ø157mm adapted to CUPRA

Before installation onto the vehicle ensure:

1. The clutch fits the flywheel correctly.
2. The mounting bolts are the correct length.
3. All parts are fitted to the clutch in the correct orientation (see installation drawing).
4. The driven plate(s) are free to move on the input shaft.
5. The pressure and floater plates are free to move on the cover legs.
6. *See Alcon clutch care and installation drawing manual in the online platform for detailed information.
7. Inform the driver when the clutch or discs are new and a smoth bedding process is necessary.

Clutch sleave cylinder:
Sadev gbx use a std. sleave cylinder from AP Racing Ø 54.
Hewland gbx use std. part Hewland. See Hewland CFT-200 parts catalogue.

It is available to inspect or replace the O-rings one a season or if the clutch suffers an overheating.

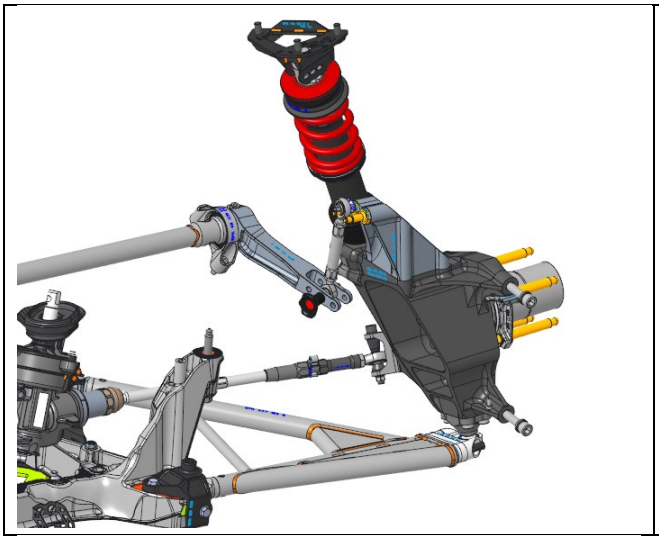
AP Racing	Hewland CFT-200
	

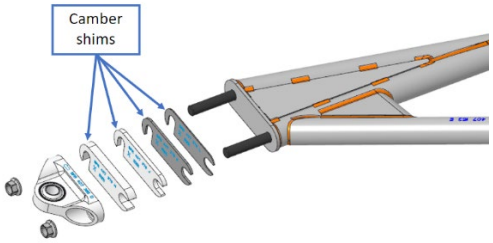
INTERNAL

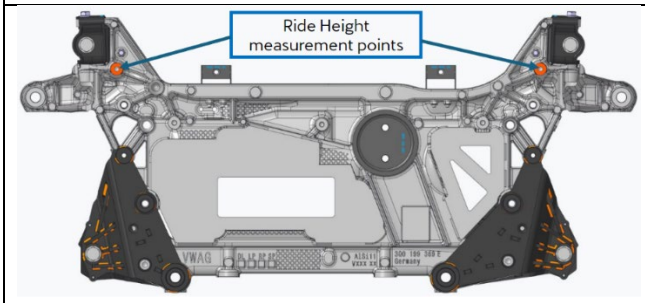
5. SUSPENSION

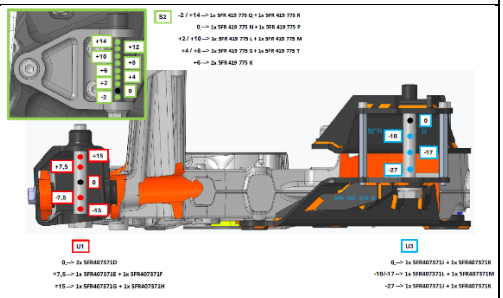
To fine set-up the car's suspension and kinematics you will find all the explanations and comments in the suspension manual, available at the online platform VAG Motorsport

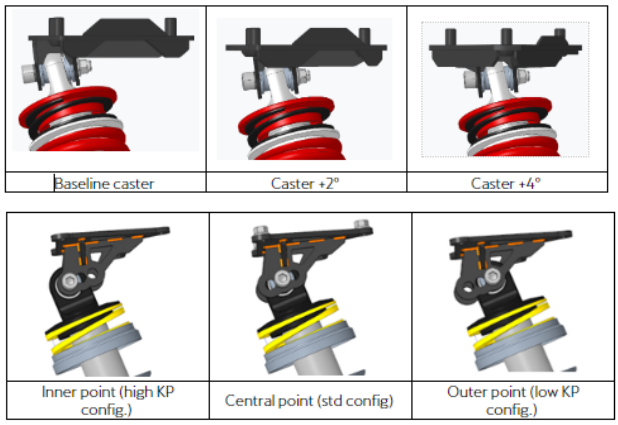
Tightening torques, see PDM's documents available in the parts catalog.

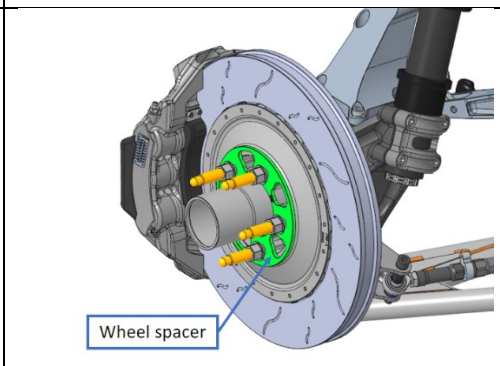












INTERNAL

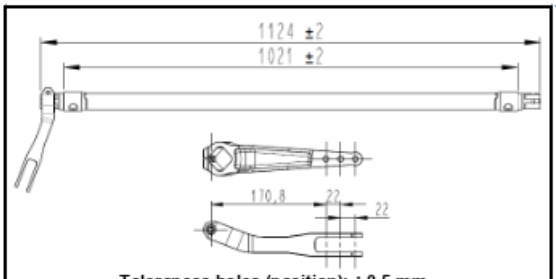
5.1. Running gear Optional parts:

Wheel spacer	*Wheel spacer Option*
 Thickness: Grey: 2mm – Blue: 3mm – Red: 5mm – Black: 10mm Material: Aluminium Maximum pairing thickness: 35mm	 Picture from 5mm spacer (red). All spacers same geometry Thickness: Grey: 2mm – Blue: 3mm – Red: 5mm – Black: 10mm Material: Aluminium Maximum pairing thickness: 30mm
Wheel nut	*Wheel nut Option*
 Material: Steel	 Material: Copper Coated Steel
Wheel attachment front	*Wheel attachment front Endurance* *Not available on the catalogue*
	
Wheel attachment rear	*Wheel attachment rear Endurance* *Not available on the catalogue*
	

INTERNAL

5.2. Set up Optional parts:

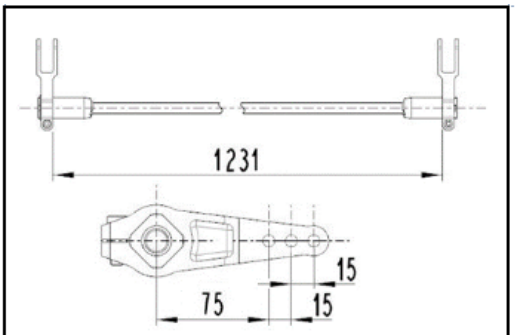
Front Antiroll bars



Tolerances holes (position): ± 0.5 mm
Tolerances Length of bar: ± 2 mm

Material	Steel			
Diameters (±0.2 mm) x thickness (±0.15 mm)	28x2	30x3	35x3	mm
Minimum weight (without levers)	1870	2590	2990	g

Rear antiroll bars



Tolerances holes (position): ± 0.5 mm
Tolerances Length of bar: ± 2 mm

Material	Steel			
Diameters (±0.2 mm) x thickness (±0.15 mm)	Ø18x2.0	Ø22x2.0	Ø25x3.0	mm
Minimum weight (without levers)	1440	1620	2150	g

Top mount std.

Top mount Caster +2°

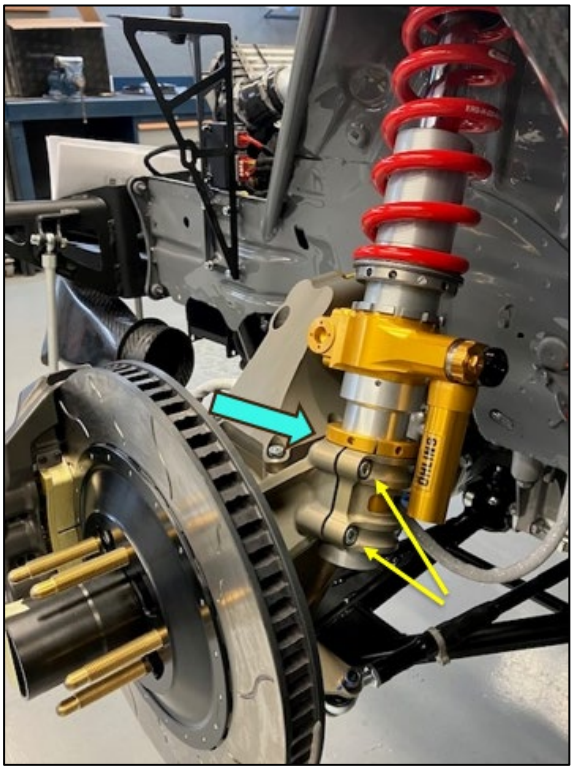
Top mount Caster +4°

INTERNAL

5.3. Öhlins shock absorber

Front	Rear
	
TTX 46 FRONT FEATURES > TTX-technology > 2-way adjustable, compression and rebound > McPherson strut > 46 mm piston > Through rod 30 mm > Blow-off (shimmed) > High-frequency piston > Length adjustable *Please make sure to order the correct Length adjuster depending on vehicle yearmodel, please see table to the right.*	**TTX 36 REAR FEATURES** > TTX-technology > 2-way adjustable, compression and rebound > 36 mm piston > 14 mm shaft > Length adjustable > Possible to upgrade with blow-off (not included) > Possible to upgrade with high-frequency piston (not included)

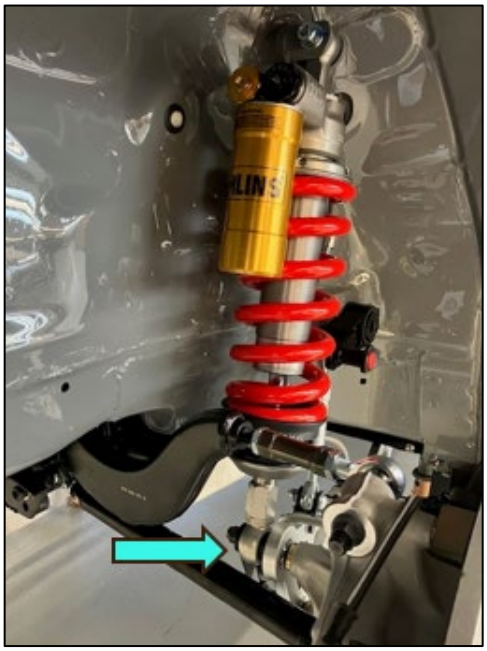
- It is advisable to usually check that the shock absorber lifting nut is properly seated on the upright
- It is available to usually check the damper fixation to the upright.



- Spare part set available at the CUPRA VZ TCR catalogue.
- Use Car Suspension Manual for dampers managing and set up details.
- For reparation or service contact Öhlins dealer

INTERNAL

- Is it advisable to check the rear upright damper fixation stud. Specially in circuits where might be a compression stroke hit. To carry out this check, you must remove the shock absorber from its position.



5.4. Bilstein shock absorber

		OPTIONAL PART: BILSTEIN 2-way adjuster 10 adjustment clicks bump /rebound. Front: 20mm upright height regulation Front: 115mm stroke (75mm free + 30mm bump-stop (5KN / 7mm) + 10mm packer) Rear: 113mm stroke (48mm free + 35mm bump-stop (5KN / 7mm) + 3x10mm packer)

INTERNAL

5.5. Steering rack

Steering	Electrical steering rack / Motorsport data set
Type	Electric assisted
Steer rack stopper	36 mm
Turning radius	8.6 m

Zeroing the steering rack:

Electronic steering angle “zero” is already calibrated.
Steering angle = 0º ±1,5º.
Steering angle >1,5º the recommendation is to loosen up the column steering hub and mechanically centre the 0º on the rack.

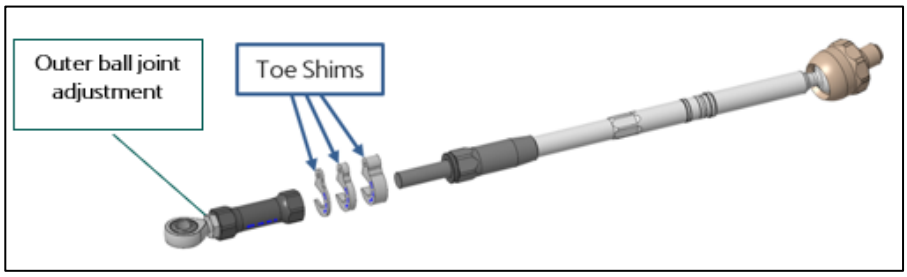
Toe adjustment

Fine adjustment can be made via ball joint threat.
Quick adjustment can be made via Toe Shims. This system permits a quick set up change by replacing wishbone camber shims at the same time.

The available thickness of shims are: **0.8, 1, 1.2 ,2, 5** and **10 mm**.

ΔToe shims	ΔToe per wheel at rim
+0.2mm	+0.7mm
+1.0mm	+3.5mm

The maximum recommended thickness of toe shims is 26mm.



Toe shims have a hole ready to pass through a wire seal. The idea is to prepare toe shims packages in combination with camber shims packages as well for a quick set up change.

CAUTION: To wash the steering rack when it is electrically disconnected, cover the sockets connectors. Water could enter the electronic part.

INTERNAL

6. BRAKES

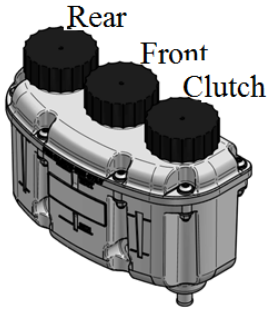
6.1. Brake system features

Pedal Assembly	TILTON Pedal Assembly Floor Mounts 2 Pedal / Pivot mount master cylinders.
Master Cylinder Type	Spherical-Bearing mount master cylinder
Balance Bar	Remote brake Bias adjuster wheel
Rear Brake Limiter	AP 7 Proportioning valve
Hand Brake	Aluminium lever with lock system
Brake fluid	Castrol SRF

6.2. Pedal box features

MASTER CYLINDERS CHART *(AVAILABILITY ON PARTS CATALOGUE)			
POSITION	**DIAMETER (MM)**	**DIAMETER (INCH)**	**TILTON MC TYPE**
FRONT BRAKE	17,78 MM	7/10"	78 SERIES
REAR BRAKE	20,64 MM	13/16"	78 SERIES
HAND BRAKE	15,88 MM	5/8"	76 SERIES

Reservoir distribution



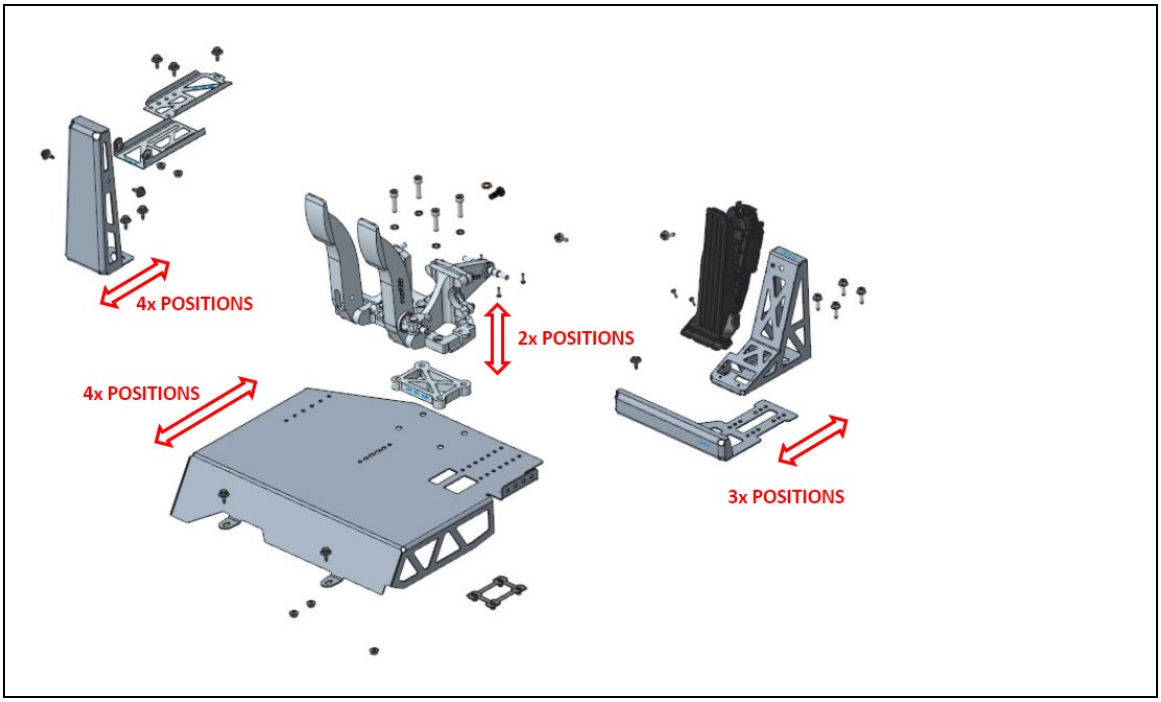
- 2P-pedalbox floor mounting Serie800-EVO with bearing in clevis.
- For pedal box maintenance document available on the VAG platform.

Foot rest and pedals adjustements.

- For tallest drivers, exist a pedal box elevator-spacer. See Catalogue.

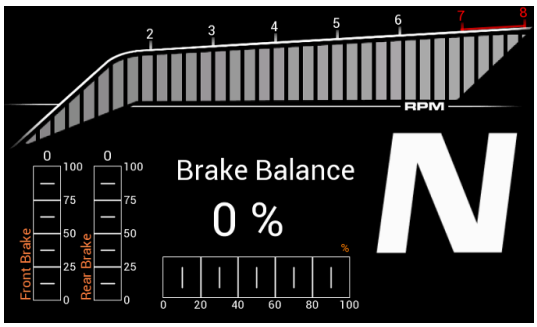
INTERNAL

- Steering wheel and column position are also adjustable



6.1. Brake balance adjustment

- Use the display “brakes” screen to see the pressure values.
- Turn the brake adjuster wheel to adjust the brake balance.

	Brake pressure for checking	Brake %
	Front 15 bar Rear 11 bar (Std recommended)	60/40 (Std recommended)

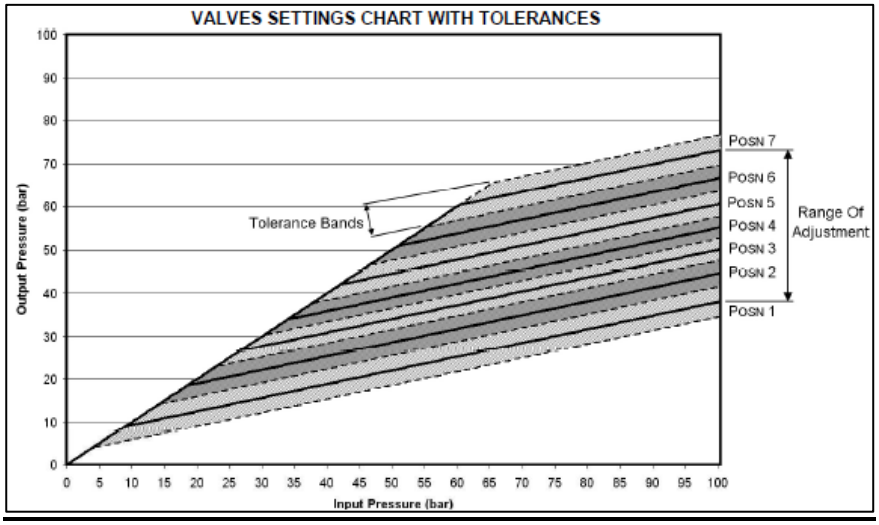
- Two brake bias adjusters are homologated.
  - Car delivered with **Tilton** std.
  - **Monit** digital available on the market. (plug and play)

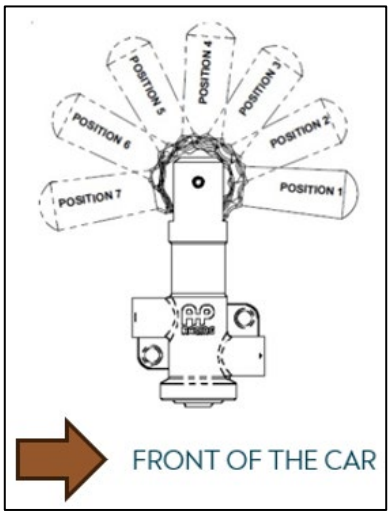
 on car delivery	 Optional (market)

INTERNAL

<u>Rear brake limiter with</u> 7 proportioning valve:

Proportioning valve is used to reduce the hydraulic line pressure and therefore braking effort of the rear brakes to compensate for varying road/track conditions or vehicle handling characteristics.





Position 1: lever in the frontward position in the car.
Position 7: lever in the backward position in the car.

- To better purge the rear brake line, it is advisable place **position 1** (needs less pressure to circulate the brake fluid)
- Includes in your workshop check list the proportioning valve position check.

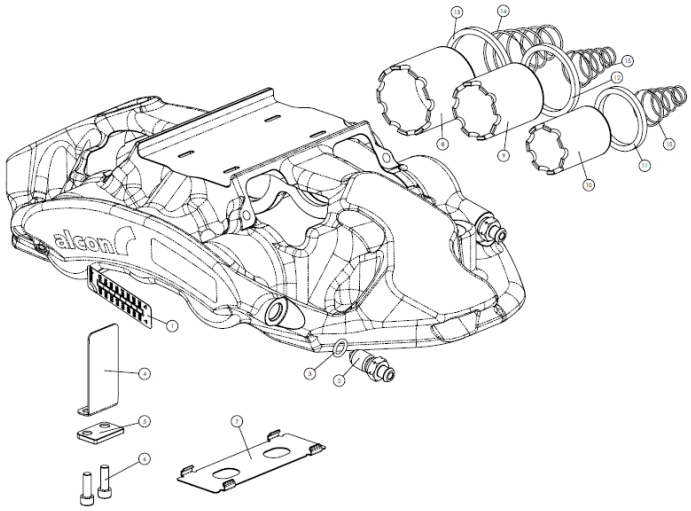
INTERNAL

6.2. Brake callipers and discs

AREA	DESCRIPTION
Calliper	Front: 6P Monoblock billet aluminium alloy Rear: 2P Monoblock billet aluminium alloy
Pistons	Front: Stainless steel / Ø27.0 /31.8 / 38.1 mm / ventilated Rear: Stainless steel / Ø34.9 mm
AKB springs	2kg anti-knock back springs front and rear caliper
Discs	Alcon front disc Ø 378 x33 mm - 68 vanes / TAB drive Rear Ø210 x 10 mm solid disc CUPRA
Front Disc bell	Aluminium anodized hard (TAB drive)
Brake Pads thick	Front 25 mm / Rear 14mm
Pad shape	Front: Pad shape PAGID 1539 Rear: Pad shape PAGID 3102 // Pad shape PAGID 3109
Brake fluid (on delivery)	Castrol SRF 600

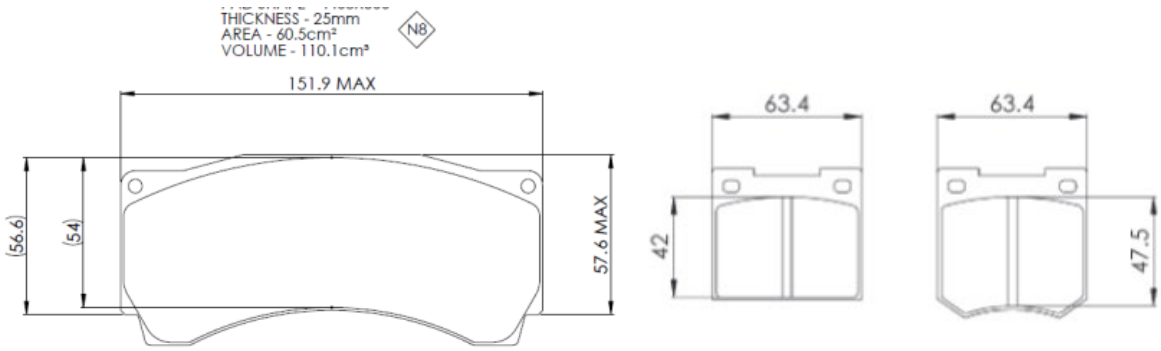
To maintain the calliper in good conditions, proceed as follows:

- Check the calliper wear plate periodically and change if the wear is significant.
- Change the piston seal periodically.



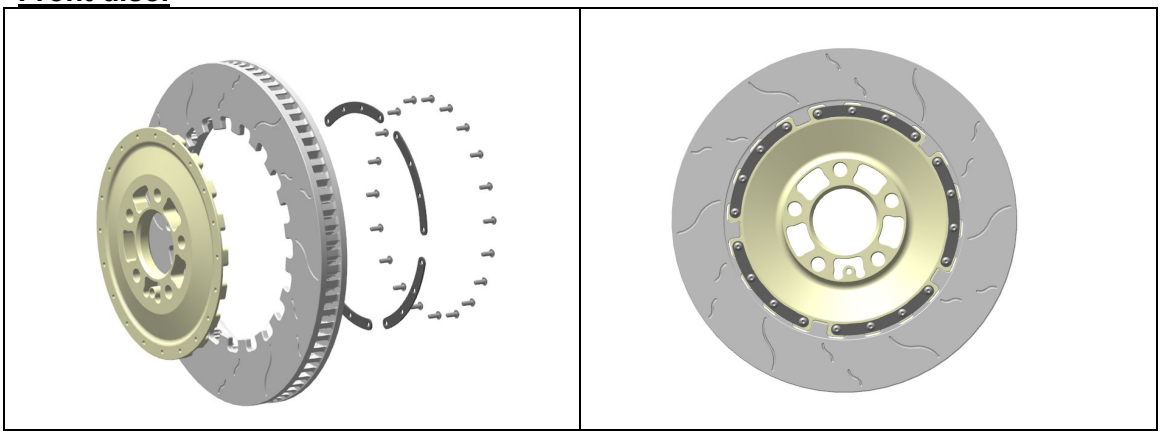
Use Alcon repair kit only. Available on the parts catalogue

Pad shape measures



INTERNAL

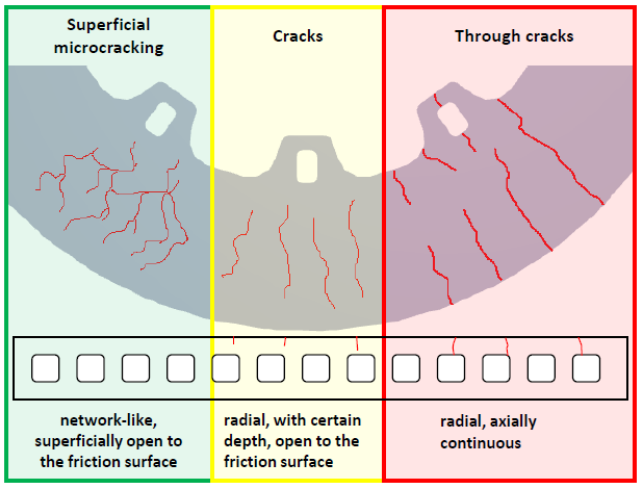
Front disc:



Recommended limit for disc replacement:

Depending on the use, the discs may have wear or even appears crack sooner than expected.
Replace the discs when conditions are as follows:

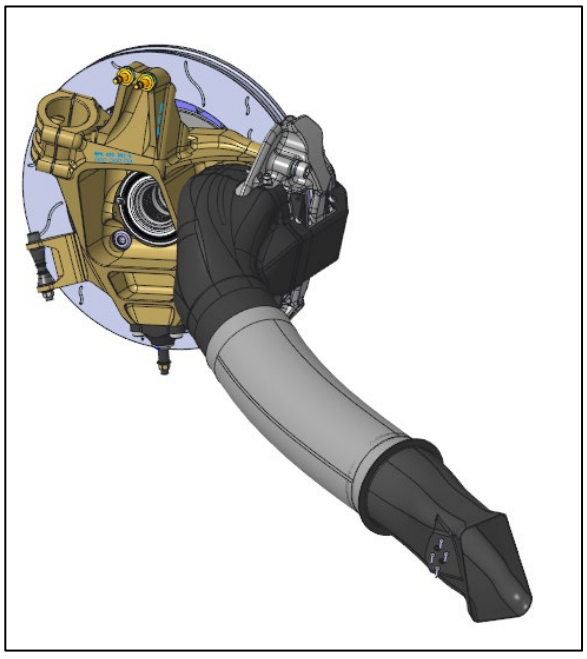
1. As soon as a crack has reached one of the borders inner or outer diameters, independent of crack length.
2. As soon as a grown microcrack has reached a length over 50% of the D annulus value, without reaching any of the borders. D= (outer diameter -- Inner diameter)



Brake cooling:

The fibre carbon brake ducting is subject to continuous movement, vibrations of the wheel on kerbs and others. Periodic monitoring is recommended.

1. Check the ducting material frequently, especially the area more closed to the disc. Change the part in case of carbon fibre is not in good conditions.
2. Check small calliper ducts brackets *(inside duct)* have no cracks.
3. Check that there are no traces of tire rubber inside the ducting or disc vanes after each run.



INTERNAL

7. ELECTRIC

Main devices:

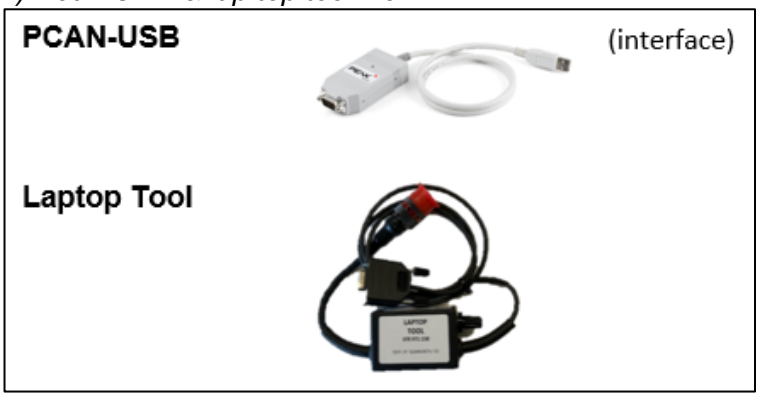
DEVICE	MANUFACTURER	Qty.
ECU	MARELLI	1
Power Box	E-Race	6
Gate Way	Ecotron	1
Keypad	ECUMASTER, 12 buttons	1
Display	ECUMASTER 5,5”	1
Steering Wheel Module	CUPRA	1

To connect the PC to the car socket, use the following cables.

Data logger Acquisition	**Standard Ethernet cable**	Buy on the market
Display / Others	**Peak-CAN interface set**	Cupra Catalogue

1) Ethernet cable view:

2) Peak-CAN & lap top tool view:



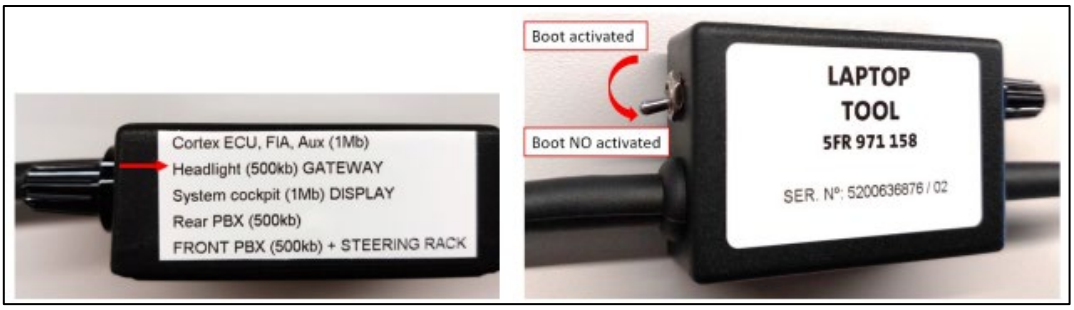
PC interface “Peak-CAN-USB Laptop Tool”
Interface required to connect the Personal Computer to the electronic car structure.

- **Peak-CAN-USB Laptop tool** includes a rotary switch that permits you to connect your PC with the car and change between the different CAN lines on the electronic structure of the car and enables you to reprogram modules as Display, GPS, Gateway and steering rack.

- **Ethernet cable** used to connect PC to the MARELLI ECU through Wintax4 and Sysma software.

1) View of the Laptop tool casing:

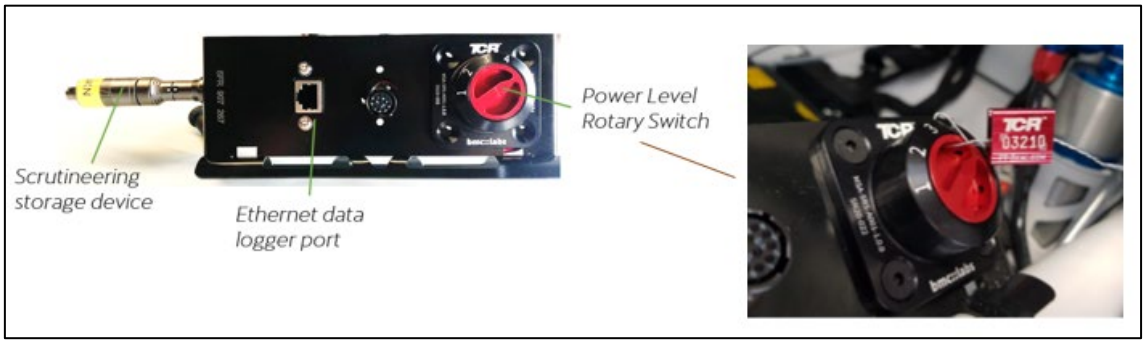
INTERNAL



TCR rotary:

TCR races are subject to the TCR Technical Bulletin BoP. The engine power can be adjusted by the rotation of the rotary wheel and must be according to the Bulleting value and sealed.

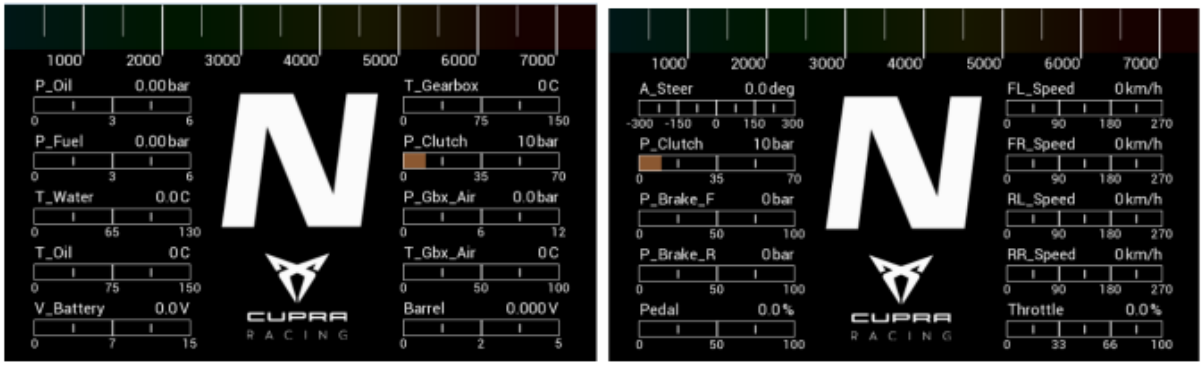
- Maintain the seal in good conditions.
- Advise TCR technical delegate in case of seal is broken or the value is not the one corresponding to the Bulletin.



7.1. Display workshop pages

EcuMaster display offers some pages so the mechanic can carry out a check list prior to start-up and also to warm-up with pressure and temperatures control.

Pressure / Temperature / w. speed / s. angle



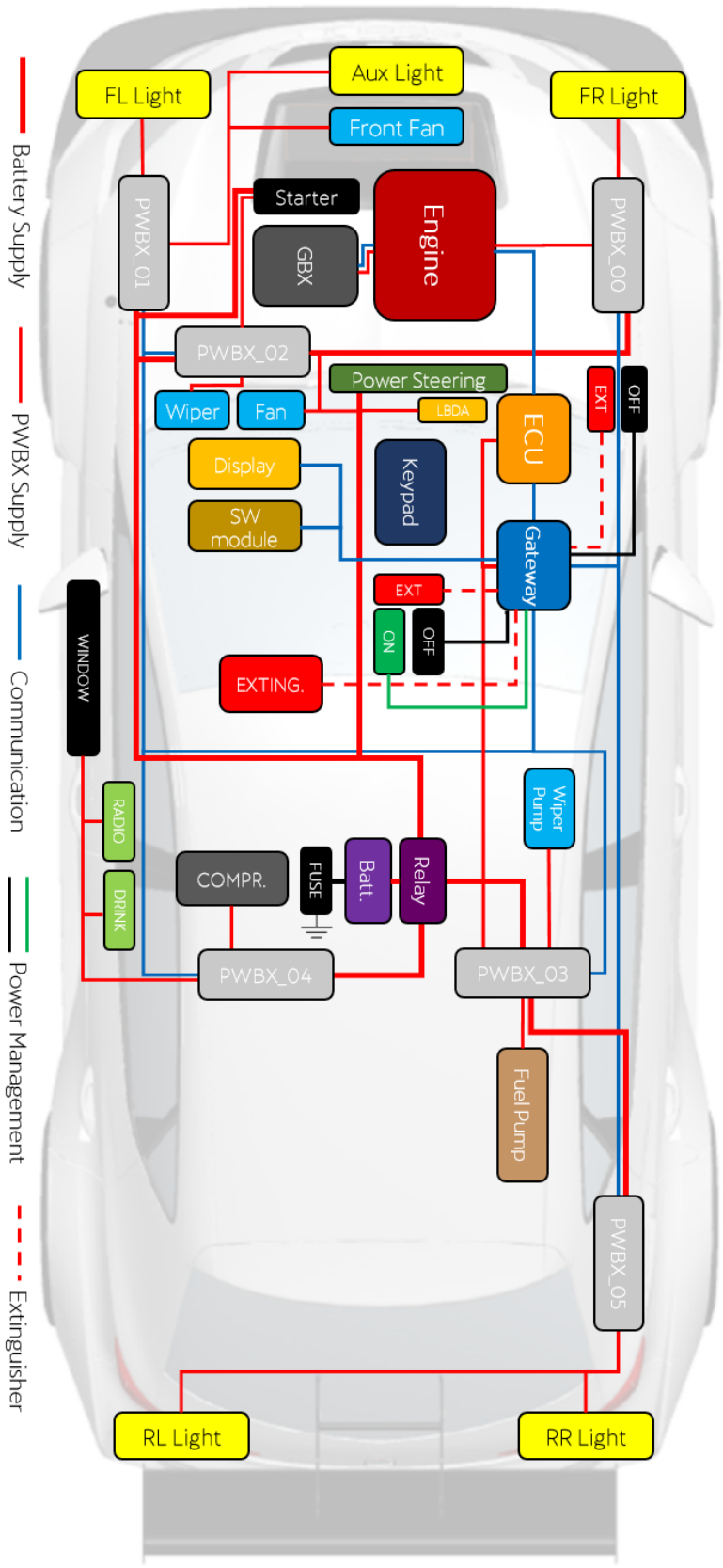
INTERNAL

- Power boxes and electric line check. Using this display page, check CAN-BUS and power boxes structure is working properly.

Power boxes and CAN-BUS lines OK

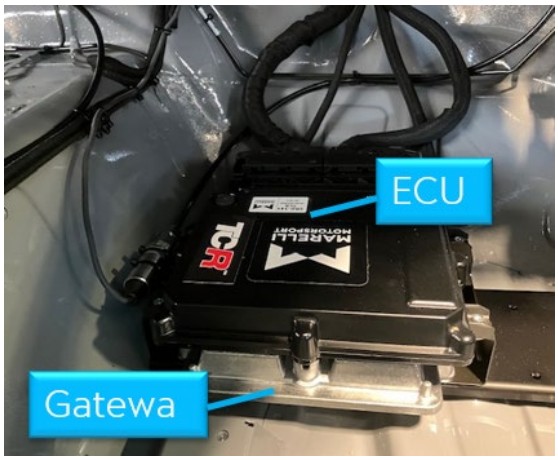
INTERNAL

7.2. Devices layout



INTERNAL

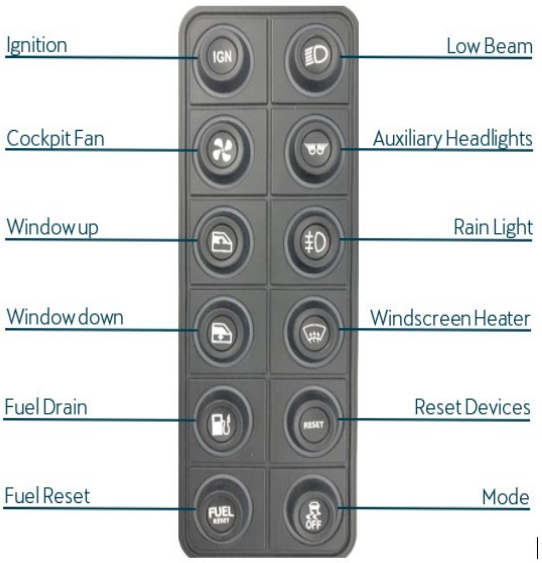
- ***Devices in position***

ECU & Gateway (certified)	***Powerboxes. 6 units per car (certified)***
	
Battery, 45 Ah, (certified)	***TCR BoP rotary, certified***
	

INTERNAL

7.1. Keypad & Steering wheel module

Use buttons GREEN to switch ON and BLUE to switch OFF the power supply.



See Car Electric manual for steering will module function details.

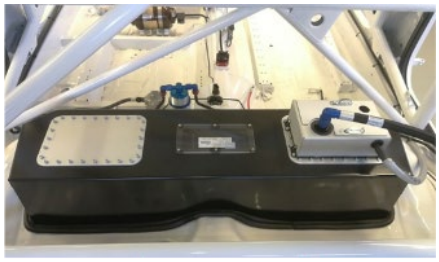
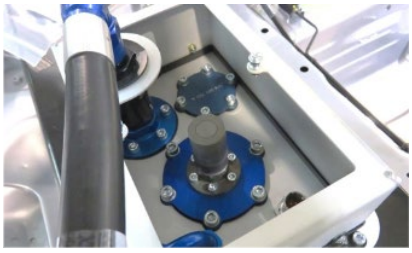
** Std circular steering wheel is also certified / Option

INTERNAL

8. Fuel tank

Two fuel tank brands are homologated: M.E.RIN and Premier. FIA certified.

- Capacity 100L (97 ±3 Liters certified)

Fuel tank assembly	Refilling Stäubli jig in position
	
FIA Draining Stäubli SPT 12/JKV in engine bay position	FIA Draining Stäubli SPT 08.7655/L/JKV
	Catalogue available. 
Fuel tank filters	External refueling kit Optional
  Flow Pre-filter	

Recommendation:

- Check data acquisition usually. If a downward slope is observed in the flow pressure in the long straights, it may indicate that the pre-filter is dirty. Substitute.
- The fuel bladder FIA homologated have a caducity of 5 years and an option to enlarge the +2 year after manufacturer re-certification.

INTERNAL

8.1. GASOLINE LEVEL SET UP

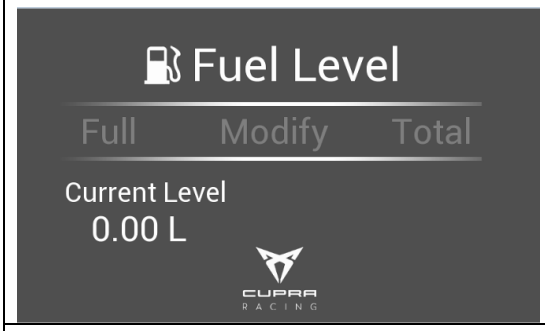
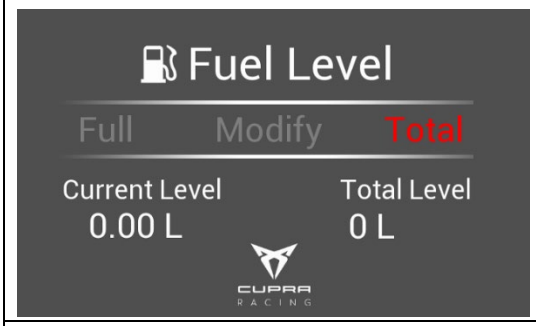
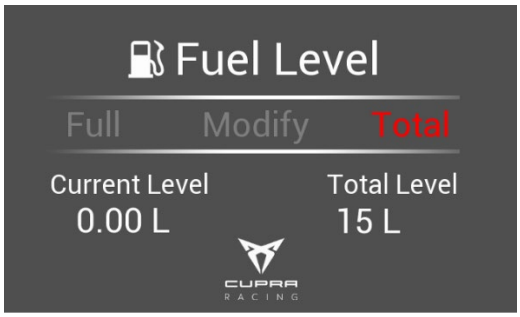
The fuel tank gasoline level must be entered to the display manually. The ECU counts down the engine consumption.

Process:

1. Drain the tank.
2. Measure the volume of fuel introduced.
3. Set up the display introducing the valuer manually.

To set up the fuel level in the display, there are three modes:

- **Full**. Set up the car to 100L.
- **Modify**. Add or subtract fuel to the current level of the fuel level.
- **Total**. Establish the total fuel available in the tank without considering the current value showed by the display.

To start the setup, with the engine stopped press Fuel button (bottom left).	
	
Select the fuel mode by pressing MODE as many time as needed.	
	
Finally choose the amount by pressing up/down buttons	
	

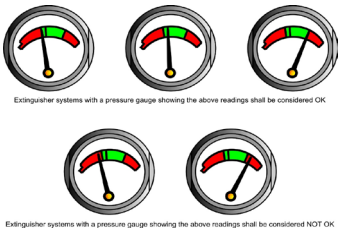
INTERNAL

9. SAFETY

PIECE	*REMARKS*	*CADUCITY*
BUCKET	SABELT GT- FR1 carbon seat	10 years
Homologation	FIA Standard 8862-2009	
Size	XL	
HARNESS	SABELT 6P HANS /CFCI CUPRA	5 years
Homologation	FIA 8853/16	
WINDOW NET	SABELT	5 years
FIRE EXTINGUISEHR	Lifeline - ZERO 275	5 years (+2 w. certificate)
Homologation	FIA 8865:2015	
Weight	2650 gr ± 250 g	
FUEL TANK	MERING & PREMIER	5 years (+2 w. certificate)
Homologation	FIA FT3	

9.1. Fire extinguisher maintenance

- Check the pressure gauges are in the green area of the scale. Some fluctuation can be observed in high and low temperatures, this is normal.



- **Electrical Test**
  1. Move the switch to test mode.
  2. Press one of the activation switches.
     a. LED amber 5 sec = system is correctly wired and 9v battery is OK
     b. LED amber flashes = there is an error in the system:
        i. 2 flashes = Low/Faulty Battery. The Battery must be replaced.
        ii. 3 flashes = Circuit Fault. Check that the wiring harness.
  3. Arm the system. Red LED will flash every 3 seconds. If the LED does not flash, there is a fault in the system and the system will not fire!

IMPORTANT:

1. Only use alkaline PP3 batteries 6LR61
2. Always have a spare 9v alkaline battery.
3. Fire extinguisher system is electronic so in linked to 12V battery power supply.

INTERNAL

9.2. Airjacks System

- 3 air jack pistons
- Powerless coupling process
- Lifter maximum pressure 40 bar. Do not exceed.
- Check eventually airjack fixation nuts are well tighten.
- Check eventually thre are no leakages on the pressure line connections.

Airjack (x3) max lifter pressure 40 bar	Quick connector
	
Car quick connector in position	Lance
	
Safety props	Car lifters option
	

IMPORTANT: Never, under any circumstances, get under the car without putting the locks SAFETY PROPS on.

INTERNAL

10. MILEAGE MAINTENANCE

The following maintenance chards are only estimation. Keep in mind the type of track or championship and the use you apply to the car to guide your own maintenance plan properly.

The mileage chart has been considered as follows:

Sprint event ≤ 300 km **Sprint season ≤ 2400 km**

Endurance event ≤ 3000 km **Endurance season ≤ 12000 km**

The mileage recommendations are not strict. Adapt them to your type of championship and use. In case of doubt CUPRA RACING recommends act in prevention and shorten the recommended mileage.

ENGINE	Sprint race service	Sprint race change (km)	Endurance service (km)	Endurance change (km)	Remarks
Engine	--	6.000		12.000	Check cylinder leakage in case of doubt
Turbo	--	6.000		12.000	
Spark plugs		2.000		4.000	
Engine oil	Inspect x event	600		4.000	Drain catc- tank
Oil filter	Inspect x event	600		4.000	
Air filter	once per event	300		4.000	Wash in deep to clean the cotton and add filter oil
Poly-V belt	Inspect x event	2.000		4.000	Change in case of cuts or incrusted stones, especially if car had a runaway exit.

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Engine care:

- The engine revision it is not contemplated.
- The **conditions because** it is recommended the substitution of the engine are:

Mileage	Sprint race use ≥ 6.000 km Endurance race use ≥ 12.000 km
Engine Water Overheating	≥ 120º C
Oil pressure in idle speed	< 1.2 bar
Oil pressure in engine load	< 2.0 bar (with full throttle)
Cylinder leakage	Up to 20% (warm conditions)
Engine catch tank	Up to 300cl of oil in the catch tank after 30´ running session means the piston rings are damaged.

IMPORTANT: An electronic calibrations process is needed in case of engine substitution. See the car electrical manual. (Turbo. Engine throttle, Foot throttle)

TRANSMISSION	Sprint race service	Sprint race change (km)	Endurance service (km)	Endurance change (km)	Remarks
Gearbox	600		once per event		Inspection
Gbx oil		300		once per event	
Gbx filter	once per event		once per event		
Diff. and ramps	600		once per event		
Drive shaft		3.500		8.000	Inspect boots periodically
Shift valves	2.400		once per event		
Compressor filter	1000				

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Accumulator filter	1000	once per event		
Shift pot drain	700	once per event		
Flywheel	2000	**once per event**		Depends on the use
Clutch wear	1.000	**once per event**		Depends on the use

FUEL TANK	**Sprint race service**	**Sprint race change (km)**	**Endurance service (km)**	**Endurance change (km)**	
Flow fuel pump		5000		5000	
HP fuel pump				After 24h event	
Pre-filter fuel pump	once per season		once per event		Green mesh
Flow filter	once per season	700	once per season		Original VAG

***Is recommended replace the fuel filters (inside fuel tank) and clean the bottom of the tank once per season.

***When fuel bag is new could drop a little bit of dirty and Pre-filter (green mesh) might need an early cleaning.

SUSPENSION	**Sprint race service/inspect**	**Sprint race change (km)**	**Endurance service (km)**	**Endurance change (km)**	**Remarks**
Front subframe	Once per event	12.000		12.000	
Front Upright	Once per event	12.000		12.000	
Front wishbone	Once per event	12.000		12.000	
Steering rods	Once per event			12.000	
Steering rack	Once per event	12.000		12.000	Seal electric socket when cleaning with Kärcher.
Wheel bearing	Once per event	8000	Once per event	12.000	
Front wishbone pivot ball join	Once per event	5.000		8.000	
Rear subframe	Once per event	5.000		12.000	Check cracks
Rear upright	Once per event	8.000		12.000	
Rear upright bolt (damper mount)	Once per event	2.500		4.000	Check if bolts are tight or bent
Longitudinal beam	Once per event			12.000	

INTERNAL

Rear longitudinal beam	Once per event			12.000	Inspect if it´s bent after crashes
Rear lateral beam	Once per event			12.000	
Rear camber beam	Once per event	3.500		8.000	Inspect if it´s bent after crashes
Toe rod rear	Once per event				
Dampers (Bilstein)	Once per event	once per season		12.000	
Brake discs	Once per event	1.000		2.500	** depends on the use / pads
Wheel nuts		once per season		once per season	

10.1. Fluids

FLUIDS	Type	Volume	Sprint race (km)	Endurance (km)	Remarks
Engine oil	5W-30 LL 507	4.7 L	600	3000	
Engine coolant	VAG G12-evo	8.0 L.			Customer care
Gearbox oil Sadev	75W / 140	1.8 L			Including cooler
Gearbox oil Hewland	75W / 140	2.5 L			Including cooler
Hydraulic unit Sadev	Dexron III	70 cl			
CV joint grease	GKN - HT1LF	120 gr.			Customer care
Tripod grease	GKN -GKY H-15	120 gr.			Customer care
Brake fluid	Castrol SRF		300	3000	
Clutch fluid	Castrol SRF		300	3000	

INTERNAL

11. CHANGE INDEX

Version	Date	Change / amendment	Page

INTERNAL