

BMW M2 CS RACING 2020. TECHNICAL CUSTOMER MANUAL.



M BMW Motorsport



El presente COMPLEMENTO queda
aprobado a efectos deportivos.

12-03-2024

Madrid,

A handwritten signature in black ink.

Fdo.: Paloma Izquierdo
Directora Deportiva



PREFACE.



This manual is intended to give you the safe operation of the racing vehicle and the opportunity to look up data, setting values and operating instructions for the vehicle and to facilitate the maintenance and repair of the vehicle.

The technical details given in this manual are subject to further technical developments and may differ between the description and the vehicle.

In particular, the two different technical versions of the vehicles for Motorsport and for Clubsport are to be observed.

BMW recommends that you familiarize yourself with the manual before setting up and using the vehicle.

For reasons of readability, the manual refrains from using gender-specific formulations. Insofar as personal names are given only in masculine form, they refer to male, female and diverse persons in the same way.

Information, Repair Manuals and Special Tools for the vehicle, which are not expressly mentioned in this manual, refers to the series production of your BMW M4 CS and can be obtained from your BMW dealer.

To avoid damage to components due to corrosion and electrical faults, it is recommended not to use high pressure washers or car wash sites.

We wish you many motorsport successes with your BMW M2 CS Racing.

CONTACT.

BMW M Motorsport
Customer Racing

Email: teaminfo@bmw-motorsport.com

DISCLAIMER.



Competition Vehicle BMW M2 CS Racing.

The vehicle has been specially developed and designed for participation in competitions supervised by sporting authorities (circuit races) on FIA-tested, permanent or temporary, closed tracks with solid surfaces (asphalt, concrete, etc.) and preparatory tests. It is therefore not recommended to operate the vehicle outside such tracks/events.

BMW M Motorsport assumes no responsibility for compliance with the respective valid motor racing regulations and sporting codes.

Illustrations, descriptions and diagrams are used solely to supplement the text. BMW M Motorsport assumes no liability for the completeness and conformity of the contents with the respective installations or vehicle states.

By continually optimizing our products, there are regular updates to this manual and technical information. Please note that only the current version of the manual is valid.

IMPORTANT NOTES.

Important Notes:

BMW M Motorsport Customer Racing Vehicles.

Your BMW M Motorsport Customer Racing Vehicle has been designed for motorsport use and therefore significantly differs from road legal production vehicles. These Important Notes provide you with essential information regarding the safety and security of your vehicle, recommended usage scenarios and vehicle characteristics.

Safety and security

Not for use on public roads

- The vehicle is not approved for use on public roads and does not comply with the locally applicable road approval regulations.
- The vehicle has been designed for specific motorsport usage scenarios only, please see below "Usage scenarios" for further details.

Driving characteristics and driver skills

- Driving characteristics of the vehicle significantly differ from road legal production vehicles. BMW recommends special race training, ideally a racing license, for drivers and continuous training and education during the whole holding and usage period of the vehicle. Otherwise the driver and third parties can be exposed to significant risks.
- BMW recommends to register with BMW M Motorsport (<https://specials.bmw-motorsport.com/kundensport/>) in order to receive vehicle specific safety-related information.

Observance of applicable law

- The operation of the vehicle, as well as all work on the vehicle, might be subject to special legal requirements, in particular concerning safety and security, under the (locally) applicable law.
- Such requirements may especially derive from guidelines and regulations of the local (traffic or sporting) authorities, health protection regulations, accident protection regulations and environmental protection regulations.
- The assessment and observance of such guidelines and regulations as well as any other applicable legal provisions is your exclusive responsibility.

Repair and maintenance instructions

- BMW recommends that all repair, maintenance and adjustment work is carried out by official BMW M Motorsport dealers or equally qualified professional mechanics. Any attempt to carry out repair, maintenance or adjustment work without appropriate training, tools and equipment may result in serious injuries (including death) to yourself or others. In addition, vehicle damage or malfunctions of the vehicle can occur.
- The (functional) safety and security of the vehicle is only ensured if the instructions in the manual are strictly followed. It is your responsibility to read and understand the information in the manual. If you have any questions about the content of the manual, please contact your BMW M Motorsport dealer or send an e-mail to: technical-support@bmw-motorsport.com.
- The vehicle design is geared towards lightweight construction. As a result the vehicle has a reduced durability compared to road legal production vehicles. For this reason, it is your responsibility to strictly follow the vehicle manual instructions regarding handling, service and maintenance intervals of the vehicle and running times of the components.

Safety equipment

- The vehicle is equipped with built-in safety equipment such as safety roll cage, fire extinguishing equipment, safety belts, safety tank and certified racing seat in order to protect the driver. Some of these safety devices have a limited durability and must be checked regularly and replaced if necessary (see user manual for further details).
- After an accident and/or potential damage to the installed safety equipment such as the safety roll cage, fire extinguishing equipment, safety belts, safety tank and certified racing seat, the vehicle must be checked for damage by a recognized technical scrutineer, a BMW M Motorsport dealer or an equally qualified professional mechanic and may only be reused after repair and release by the person performing the check and repair.
- In order for the safety equipment in the vehicle to be fully effective, BMW recommends that the driver also wears up-to-date (FIA) certified safety equipment, consisting of helmet, shoes, gloves, head and neck support (HANS) system and fireproof racing suit and underwear.
- In addition to the above mentioned safety equipment, there are various components of the vehicle (see user manual) which must be in fully functioning condition for safe operation of the vehicle. Components must be checked for damage after accidents and atypical driving manoeuvres and, if necessary, be serviced or replaced.

IMPORTANT NOTES.

Roll cage – special requirements

- The roll cage is firmly welded into the body. Any modifications to the roll cage will likely result in non-registration or disqualification of the vehicle.
- In the event of an accident, the roll cage must be inspected and approved by a technical scrutineer or an independent expert. A damaged roll cage will result in reduced occupant protection.
- BMW recommends replacing a damaged cage with a new one. Cage repairs should only be carried out by a certified cage manufacturer. Please pay particular attention to the cage certificate including instructions, which are enclosed with the vehicle.

Usage scenarios

The vehicle has been designed for certain racing and clubsport events, see below “Racing events” and “Clubsport events”. BMW does not recommend the operation of the vehicle outside the mentioned events. BMW especially does not recommend to use the vehicle for events listed below under “Events for which the vehicle has not been designed”.

• Racing events

The vehicle has been designed to be used at certain racing events that

- (i) are supervised by a sporting authority; and
- (ii) take place on a permanent or temporary closed circuit track with solid surfaces (asphalt, concrete, etc.) that complies with the standards of the FIA or equivalent standards of local motorsport authorities;

and for necessary preparatory tests for such events.

Such racing events / preparatory tests include:

- o Circuit racing
- o Slalom with more than 1000 m track length
- o Racing slalom
- o Performance test
- o Regularity / consistency test

• Clubsport events

The vehicle has been designed to be used at certain clubsport events that

- (i) require all participating vehicles to provide appropriate security features, especially safety equipment such as circuit breakers, fire extinguishers, safety roll cage and marked towing devices;
- (ii) take place on a permanent or temporary closed circuit track with solid surfaces (asphalt, concrete, etc.) that complies with the standards of the FIA or equivalent standards of local motorsport authorities.

Such Clubsport events include (characterization following the definition of the German motorsports authority “Deutscher Motor Sport Bund e.V.”):

- o Registered events
Approval by the supporting associations / other motor sport associations / other members of the national sporting authority. The registered events are carried out according to the regulations of the respective sponsoring association / member organization. The national sporting authority will establish minimum safety requirements for such events and, where necessary, develop guidelines for technical regulations.
- o Grassroot Racing
License-free grassroot racing events are governed by private operating agencies of the national sporting authority / other motorsport associations or other members.
- o Trackdays
Driving events organized by different organizers with different event regulations (rules) on closed race tracks where it is allowed to participate with non-road legal vehicles. Participants drive on their own, with an instructor or behind an instructor’s vehicle (guided laps) on the race track.

• Events for which the vehicle has not been designed

The vehicle has not been designed for other (racing) events such as:

- o Rally
- o Hill climb
- o Drift events
- o Drag racing / acceleration race
- o Rallycross / autocross

or similar events.

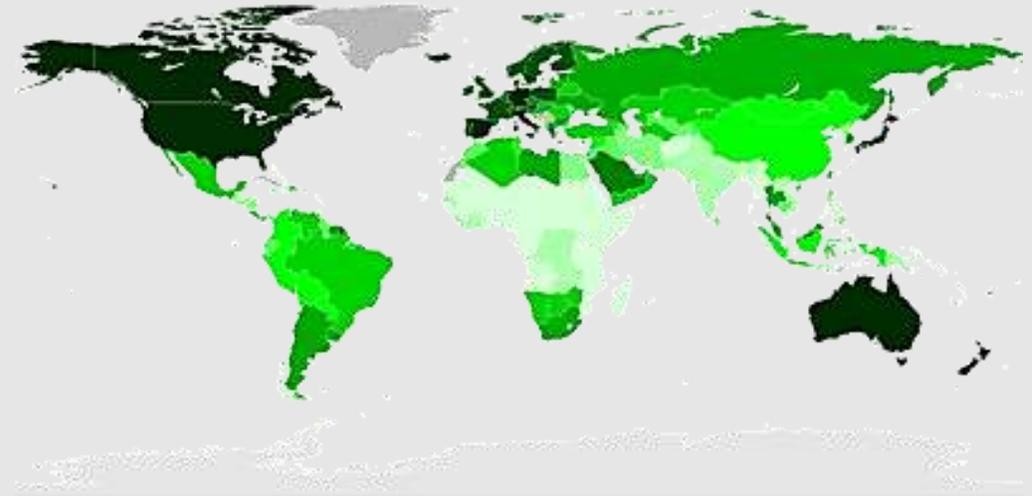
BMW does not recommend usage of the vehicle in such events.

IMPORTANT NOTES.

Vehicle characteristics

As described in the chapter “Safety and Security”, the vehicle deviates significantly from road legal production vehicles. The below described characteristics of the vehicle may occur due to the specific purpose of use of the vehicle and its corresponding design, but do not constitute a defect:

- **Corrosion**
To optimize performance and weight, corrosion protection measures are not fully applied. This can result in corrosion damage to body components, paintwork, chassis and drivetrain components. For this reason it is strongly recommended to store the vehicle in a dry place. Should moisture penetrate into the vehicle, it is recommended to remove the moisture immediately.
- **Brakes**
The brake system is one of the most heavily stressed components in motorsport vehicles. Explicit reference is made to the instructions in the vehicle manual for handling of the brake system, in particular the run-in instructions must be respected. Non-compliance can result in significantly increased wear and tear and/or damage to the brake system. Due to the performance design of the brake system, acoustic abnormalities, such as brake squeal, are not considered a defect.
- **Vehicle battery**
The specific electric motorsport components significantly increase the quiescent current level. If the vehicle is not used for a longer period of time, it is recommended to disconnect the vehicle from the power supply via the main battery switch. In case of shorter interruptions, it is recommended to charge the battery via an external power supply.
- **Vehicle glazing**
To optimize performance and weight, Makrolon® plastic car windows are used to some extent. These may show optical distortions due to their nature. They are also less scratch-resistant than conventional glass car windows.



WARNING- AND SAFETY NOTES.

Acc. ANSI Z535:

The warning notes and safety instructions are classified by the respective signal word (**Danger, Warning, Caution, Notice**) beside the warning symbol:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE indicates special attention which, if not respected, can lead to property damage.

For Health and Safety at Maintenance or Repair Work the safety instructions should be followed:



Protective clothing should be worn.

To prevent injury and adversely affecting the operational and road safety of the vehicle, or damage to the vehicle as a result of improper work, read these warnings and safety instructions carefully and observe them fully.

CHANGELOG.

The following chapters and pages have been modified from previous versions:

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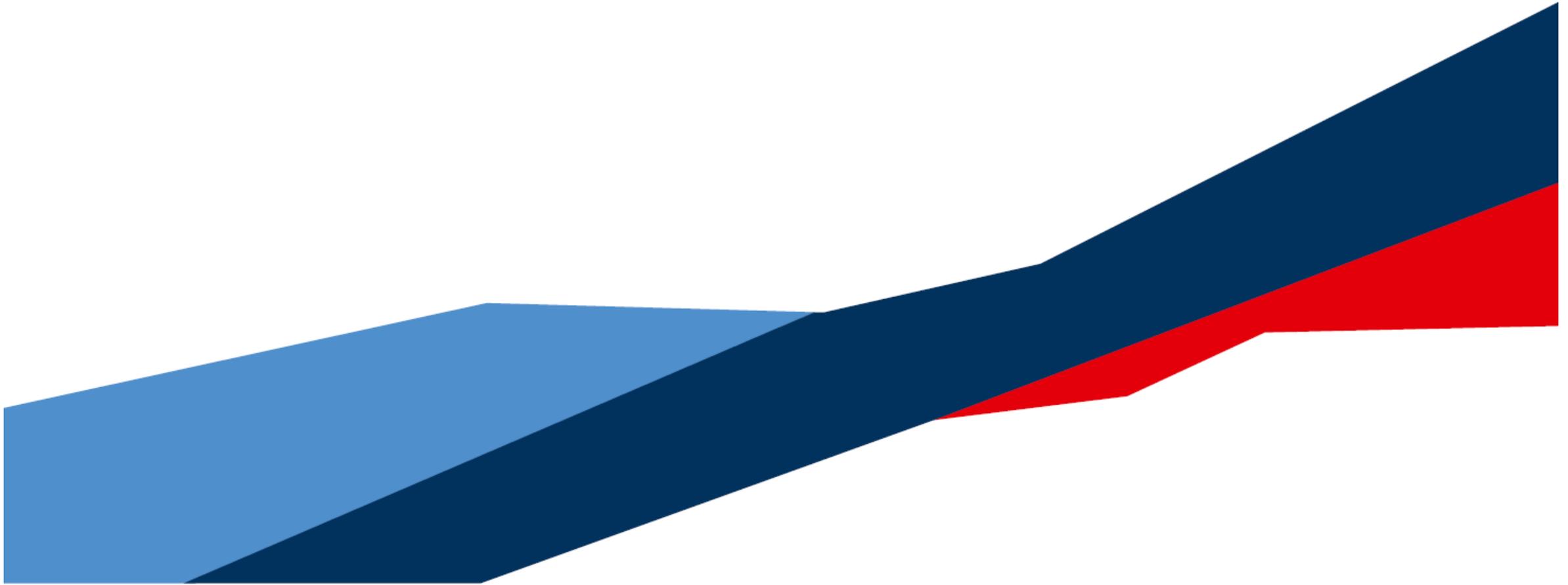
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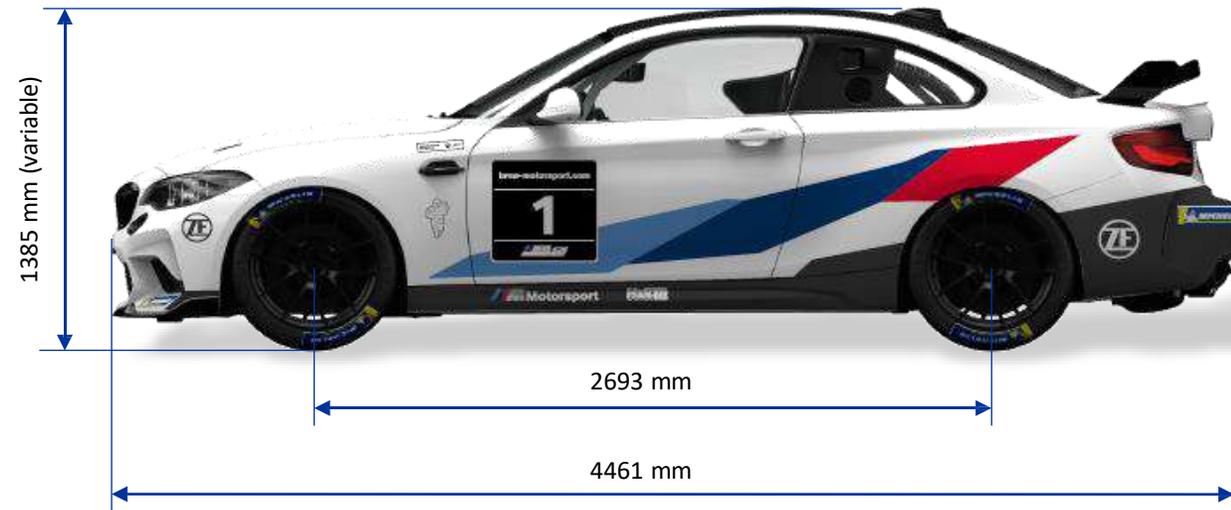
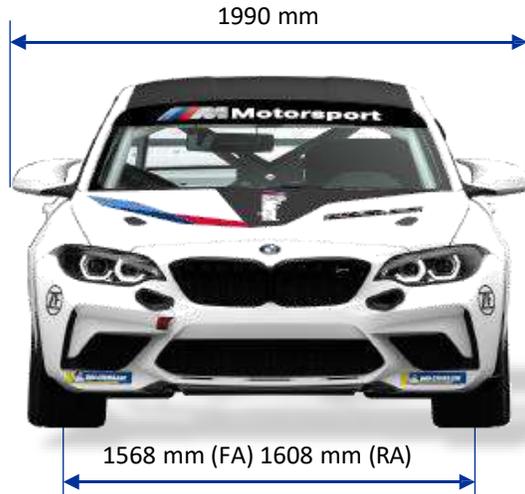
1. AT A GLANCE.



1. AT A GLANCE.

1.1. DIMENSIONS.

Dimensions: (Subject to changes!)



1. AT A GLANCE.

1.2. SPECIFICATIONS.

Version.	365 HP Version.	450 HP Version.
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Engine:

Type.	S55 B30 Inline 6-Cylinder, 4-Valves.	S55 B30 Inline 6-Cylinder, 4-Valves.
Technology.	M TwinPower Turbotechnology, Direct-Injection, Valvetronic.	M TwinPower Turbotechnology, Direct-Injection, Valvetronic.
Displacement.	2,979 ccm.	2,979 ccm.
Power.	Power level approx. 365 hp (270 kW). Powerstick system for power control.	Power level approx. 450 hp (330 kW). Powerstick system for power control.
ECU.	Production Engine ECU (DME) with adapted Motorsport electronics.	Production Engine ECU (DME) with adapted Motorsport electronics.
Exhaust-System.	Motorsport specific exhaust system with race catalyzers.	Motorsport specific exhaust system with race catalyzers.

Drivetrain:

Gear Box.	7-Speed double-clutch gear box with Motorsport-Software.	7-Speed double-clutch gear box with Motorsport-Software.
Differential.	Limited slip differential (Drexler), separate cooling.	Limited slip differential (Drexler), separate cooling.
Transmission.	Propshaft with damping elements. Motorracing driveshafts.	Propshaft with damping elements. Motorracing driveshafts.



1. AT A GLANCE.

1.2. SPECIFICATIONS.

Version.	365 HP Version.	450 HP Version.
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Suspension:

Suspension Joints.	Motorsport-specific.	Motorsport-specific.
Anti-Roll-Bar.	2-way adjustable Anti-Roll-Bar, front and rear axle.	2-way adjustable Anti-Roll-Bar, front and rear axle.
Shocks.	1-way Shockabsorber (ZF) front and rear axle.	1-way Shockabsorber (ZF) front and rear axle.
Springs.	Different Main Spring Rate choices for front- and rear axle available.	Different Main Spring Rate choices for front- and rear axle available.

Brakes:

Front.	6-Piston Caliper (Alcon). Diameter Brake Discs: 380 mm.	6-Piston Caliper (Alcon). Diameter Brake Discs: 390 mm.
Rear.	4-Piston Caliper (BMW). Diameter Brake Discs: 380 mm.	4-Piston Caliper (Alcon). Diameter Brake Discs: 355 mm.
Specification.	Brake discs and pads optionally sprint or long-distance package.	Brake discs and pads optionally sprint or long-distance package.

Wheels:

Dimensions.	10,5" x 18 Motorsport Rim with 27/65-18 Motorsport tyres.	10,5" x 18 Motorsport Rim with 27/65-18 Motorsport tyres.
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1. AT A GLANCE.

1.2. SPECIFICATIONS.

Version.	365 HP Version.	450 HP Version.
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Bodywork:

Dimensions.	According this manual.	According this manual.
Safety.	DMSB-certified Safety-Rollcage (acc. FIA rules). FIA Fire extinguisher system.	DMSB-certified Safety-Rollcage (acc. FIA rules). FIA Fire extinguisher system.
Material.	Steel body with aluminum- and CFK mounted parts.	Steel body with aluminum- and CFK mounted parts.
Jacking.	Air jack system.	Air jack system.
Aerodynamic.	Frontsplitter analogous M2 CS, Rear Wing.	Frontsplitter analogous M2 CS, Rear Wing.

Tank:

Type.	FT3-Safety Tank. Capacity: approx. 84 L (Option: 120 L for endurance racing).	FT3-Safety Tank. Capacity: approx. 84 L (Option: 120 L for endurance racing).
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Assistant Systems:

Stability Control.	BMW M Motorsport-specific configured (DSC/ABS).	BMW M Motorsport-specific configured (DSC/ABS).
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1. AT A GLANCE.

1.2. SPECIFICATIONS.

Version.	365 HP Version.	450 HP Version.
Cockpit:		
Comfort.	1-zone air condition.	1-zone air condition.
Seat.	Safety seat (SABELT) „FIA 8855-1999 approved“ with lateral head restraint, XL-version. Option: M- & L-version	Safety seat (Recaro) „FIA 8862-2009 approved“ with lateral head restraint, one size fits all version.
Pedals.	Series pedals with motorsport-specific footrest.	Series pedals with motorsport-specific footrest.
Steering.	Steering wheel (dimnable) with controls, adjustable in height and length. Quick release.	Steering wheel (dimnable) with controls, adjustable in height and length. Quick release.
Restraint-System.	Seat belt with six fixing points according FIA 8853-2016 (Schroth).	Seat belt with six fixing points according FIA 8853-2016 (Schroth).
Instruments.	AIM MXG 1.2 Motorsport Dash Logger with color display.	AIM MXG 1.2 Motorsport Dash Logger with color display.
Switches.	Illuminated Switchpanel (dimnable).	Illuminated Switchpanel (dimnable).
Car Loom.	Motorsport-Car-Loom with free connectors (e.g. Reglement-specific Datalogging).	Motorsport-Car-Loom with free connectors (e.g. Reglement-specific Datalogging).



1. ATA GLANCE.

1.3. OPERATING TEMPERATURES.

Temperatures:	Min	Max	Normal Operation	Alarm **	
				Step 1	Step 2
Engine Oil	60°C	137°C	∅ 120°C	140°C	145°C ***
Coolant	60°C	116°C	∅ 105°C	117°C	120°C ***
Gearbox Oil	20°C	129°C	∅ 115°C	130°C	135°C ***
Clutch*	20°C	139°C	--	140°C	160°C ***
Differential	20°C	144°C	∅120°C	--	145°C

*) The clutch temperature is monitored in the gearbox, gearbox temperature warning can refer to the sump or clutch temperature.

***) Observe temperatures on the dash and accordingly adjust the driving style to reduce the temperature (e.g. no slipstream and early upshift).

***) Torque reduction may happen.

1. ATA GLANCE.

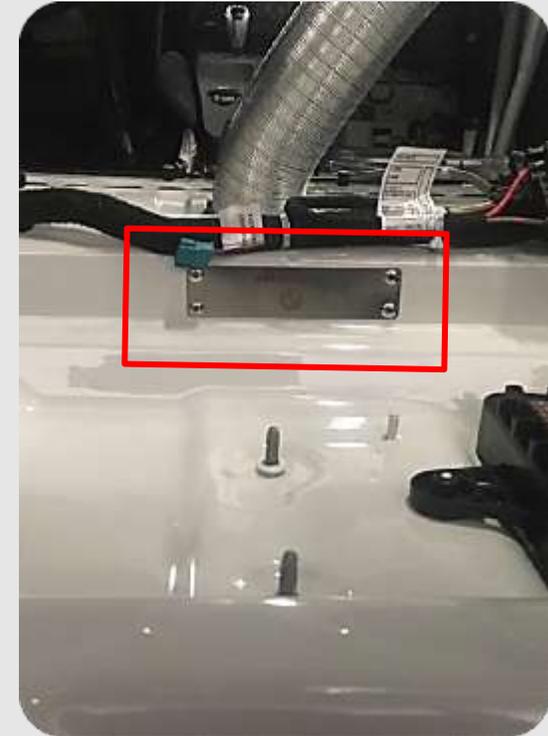
1.4. CHASSIS- / CAGE- / VIN NUMBER.



The Chassis-No. (e.g. 1901) is located at the B-Pillar on the driver side entry.



The Cage-No. (e.g. 16-31/67-S) and the Chassis-No. (e.g. 1901) are located on the driver side near the B-pillar on the cage tube.



The VIN-No. (7 digits) is located on the rear crossbar in the boot.

2. ENGINE.



2. ENGINE.

2.1. GENERAL.

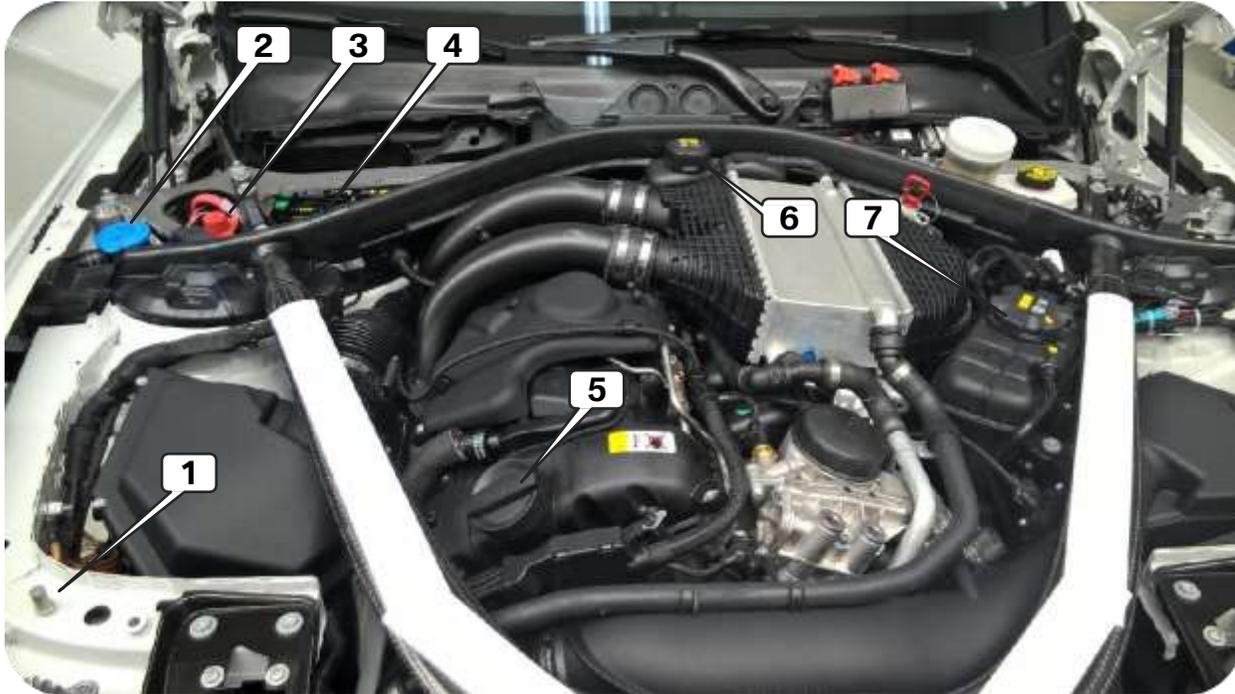


Specification:

Engine		S55B30
Type		Inline 6 M TwinPower Turbotechonology, Direct- Injection, Valvetronic.
Displacement	[cm ³]	2979
Bore/Stroke	[mm]	84 / 89.6
Max. Power	[kW]	270 / 330 (Version dependent)
Displacement Power	[kW/L]	87.3 / 110.8 (Version dependent)
Max. Torque at RPM	[Nm], [1/min]	550 / 1850-5500 (BOP dependent)
Compression Ratio	[ε]	10.25 : 1
Valves per Cylinder		4
Engine Weight	[kg]	205

2.1. GENERAL.

2.1.1. ENGINE COMPARTMENT.

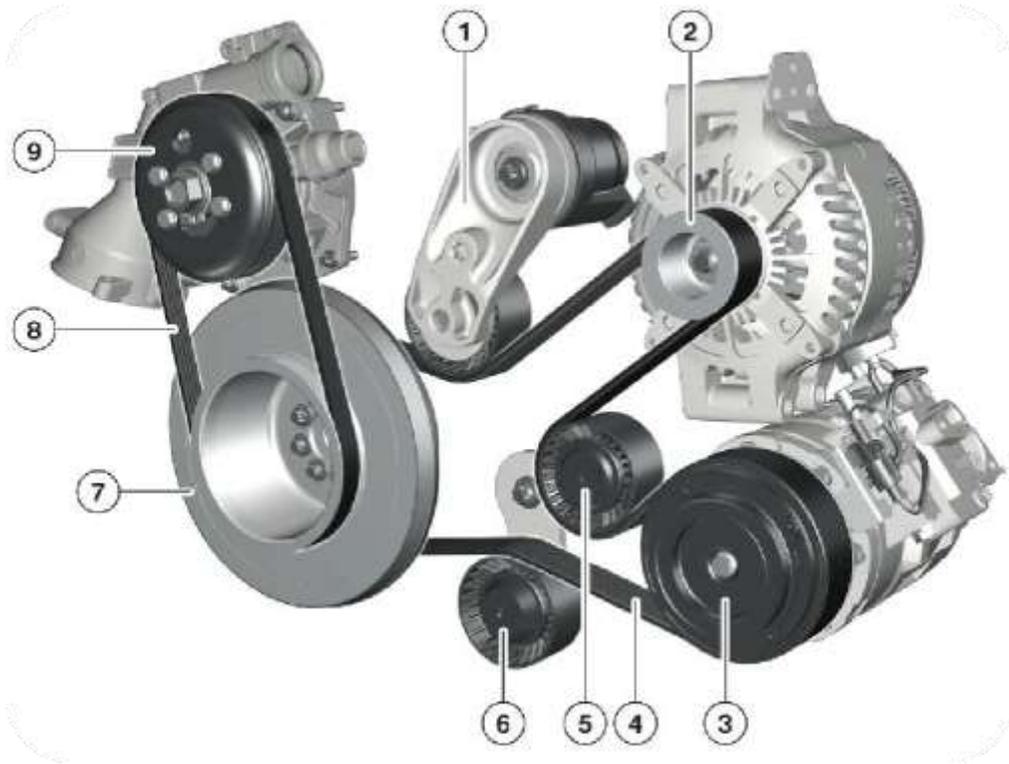


Important features in the engine compartment:

- 1 Jump start, negative battery terminal.
- 2 Washer fluid reservoir.
- 3 Jump start, positive battery terminal.
- 4 Engine compartment fuse box.
- 5 Oil filler neck.
- 6 Coolant reservoir for charge air cooling.
- 7 Coolant reservoir for engine cooling.

2.1. GENERAL.

2.1.2. BELT DRIVE.



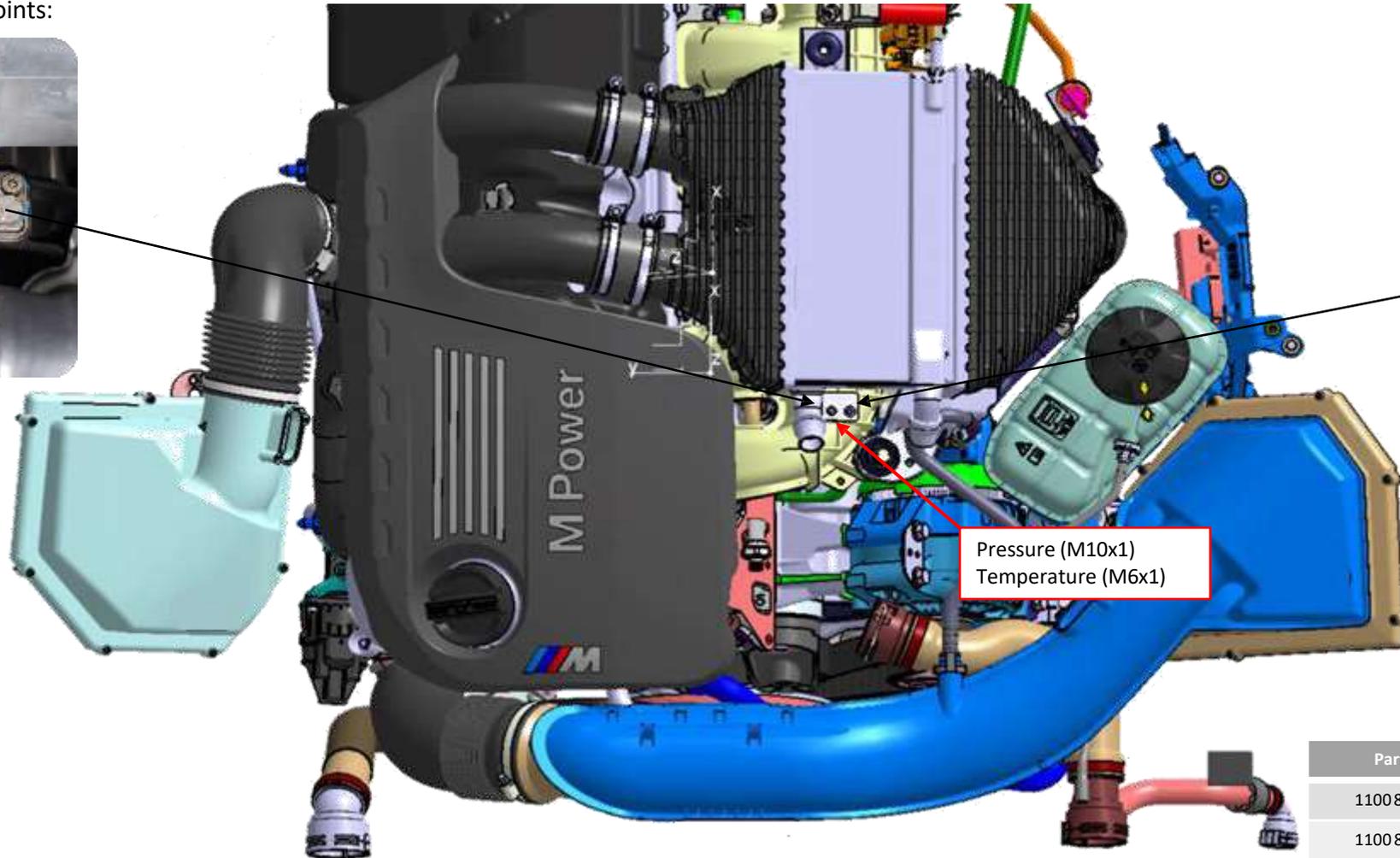
Belt Drive Components:

- 1 Belt Spanner.
- 2 Generator.
- 3 AirCon Compressor.
- 4 V-Belt.
- 5 Pulley.
- 6 Aux. Belt Spanner.
- 7 Oscillation Damper.
- 8 V-Belt.
- 9 Water Pump.

2.1. GENERAL.

2.1.3. MEASURING POINT MONITORING / SCRUTINEERING.

Schema Measuring Points:



Part-No.	Description
11008431813	Scrut.Leitung Luftfiltergeh.
11008431814	Scrut.Leitung Motorbruecke

2.1. GENERAL.

2.1.4. SEALING / SCRUTINEERING.



DME-Control Unit (2x Hologram)



Turbocharger Bank 1 + 2 (2x Cable Seal)



P/T-Sensor Intercooler (1x Hologram)



P/T-Sensor Intake (1x Hologram)

No.	Area	Type of Seal
1	DME-Control Unit	2x Hologram
2	Turbocharger Bank 1 + 2	1x Cable Seal
3	P/T-Sensor Intercooler	1x Hologram
4	P/T-Sensor Intake	1x Hologram

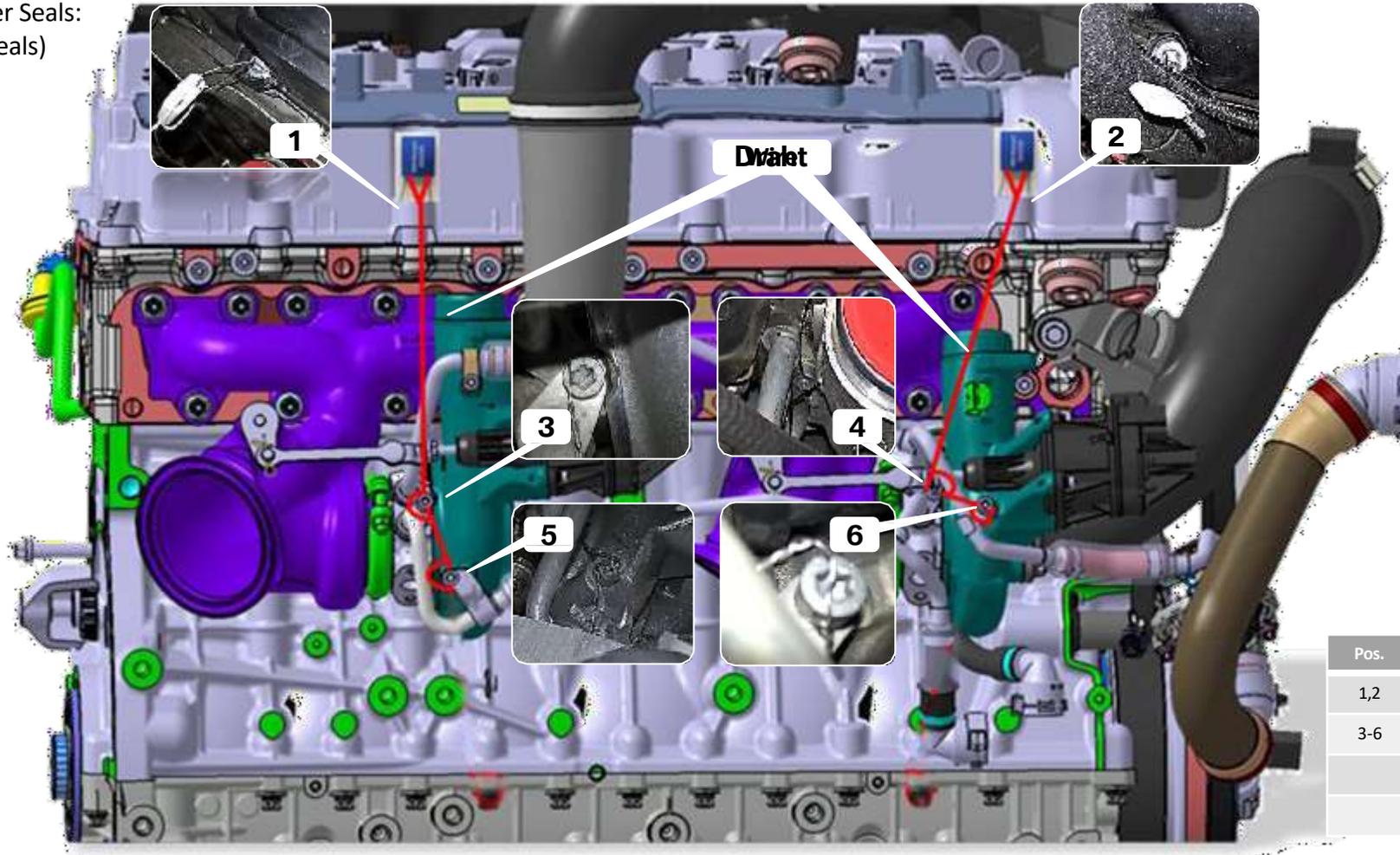
NOTICE

For a fair competition in the M2 CS Racing cup platforms, the drive train has been sealed by BMW M Motorsport and holograms were attached.

2.1. GENERAL.

2.1.4. SEALING/ SCRUTINEERING.

Organizer Seals:
(Cable Seals)



Tightening Torque:

Pos.	Tightening Torque
1, 2	9 Nm
3, 4, 5, 6	8 Nm

NOTICE

It is important to ensure that the wastegate linkage remains clear.
Shown is the right side of the engine.

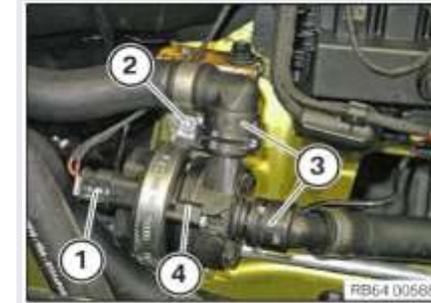
Pos.	Part-No.	Qty.	Description
1,2	1100 8436841	2	Collar screw cylinder head
3-6	1113 8433037	4	ISA Bolt M6x16
	1111 8416209	1	Sealing wire 0.62 mm x 50 m
	1100 8429426	2	Lead seal

2.1. GENERAL.

2.1.5. SENSOR / ACTUATOR POSITIONS.



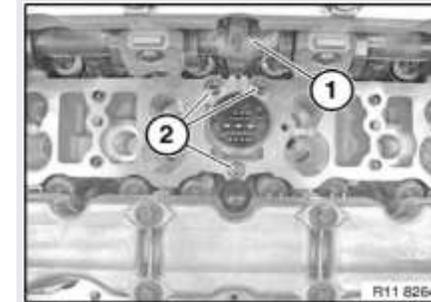
- Electric auxiliary coolant pump for heating.
- Actuator motor for eccentric shaft (VVT).
- Crankshaft sensor.
- Camshaft sensor intake.
- Camshaft sensor exhaust.
- Knock sensors.
- Pressure sensor before throttle valve (charge air cooler).
- Pressure and temp. sensor after throttle valve (intake manifold).
- Sensor high pressure pump.
- Oil pressure switch.
- Oil temperature sensor.
- Low pressure fuel sensor.
- High pressure fuel sensor.
- Coolant temperature sensor.
- Injectors.
- Air mass sensor left.
- Air mass sensor right.
- Electric coolant pump for charge air cooling.
- Electric coolant pump for turbo charger.



Electric auxiliary coolant pump for heating.

The charge air cooler and coolant expansion tank should be removed for installation and removal.

② 10 Nm



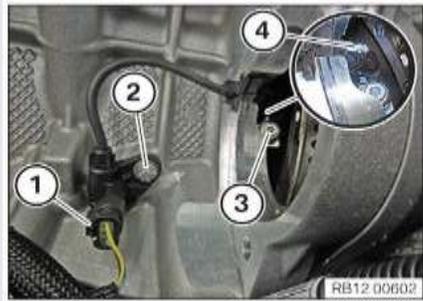
Actuator for eccentric shaft (VVT).

For installation and removal, the charge air cooler, charge air duct, the tension strut, the cylinder head cover and all injectors should be removed. Before removal, the eccentric shaft must be brought to full stroke via the hexagon socket of the actuator motor and supported with a flat wrench on the double flat shaft.

② M6x16 10 Nm

2.1. GENERAL.

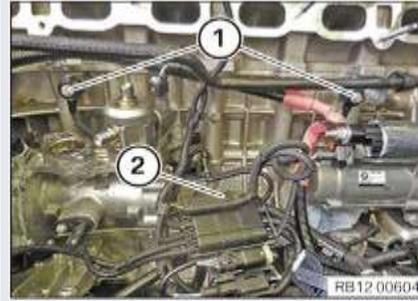
2.1.5. SENSOR / ACTUATOR POSITIONS.



Crankshaft sensor.

For installation and re-moval, the intake manifold with DME and the starter motor must be removed.

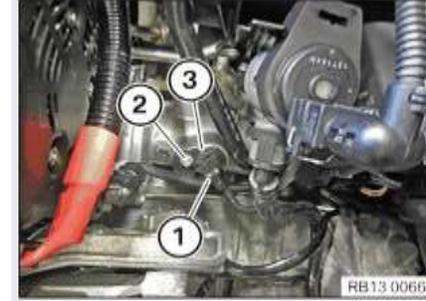
- ② M6x16 8 Nm
- ③ 4,6 Nm



Knock sensors.

The charge air cooler, intake air filter housing on the left, the intake manifold with DME and the front high-pressure pump should be removed for installation and removal.

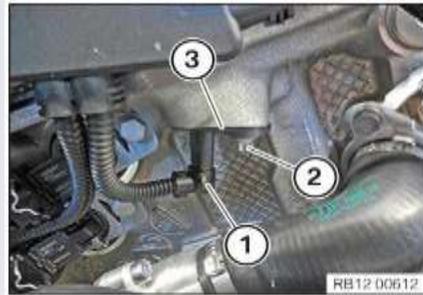
- ③ M6x16 8 Nm



Sensor high pressure pump.

For installation and removal, the intake air filter housing on the left should be removed and the coolant expansion tank loosened and put aside.

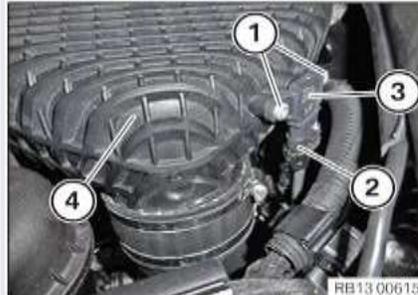
- ② 8 Nm



Camshaft sensor intake.

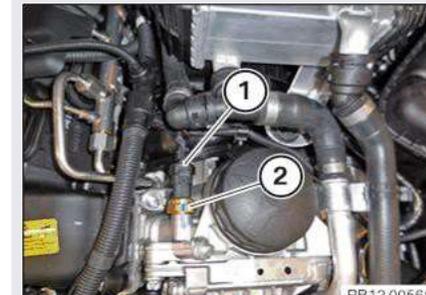
The intake air filter housing on the left side should be removed for installation and removal.

- ② M6x16 8 Nm



Pressure sensor before throttle valve (charge air cooler).

- ① 8 Nm



Oil pressure switch.

- ② M12x1,5 20 Nm + 16°



Camshaft sensor exhaust.

For installation and removal, the air duct on the right front, the intake filter housing on the right and the ventilation hose on the cylinder head cover should be removed.

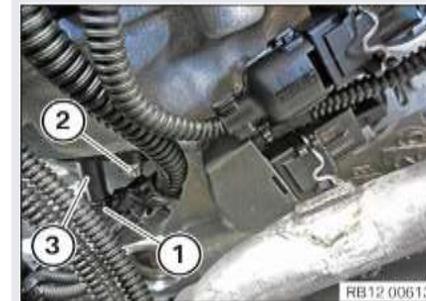
- ② M6x16 8 Nm



Pressure and temp. sensor intake manifold.

For installation and removal, the expansion tank of the charge air cooling must be loosened and set aside.

- ② M6x16 8 Nm



Oil temperature sensor.

For installation and removal, the intake air filter housing on the left, the charge air cooling and the throttle valve should be removed, the cable duct in front of the starter motor must be loosened.

- ② 13,5 +/- 2 Nm

2.1. GENERAL.

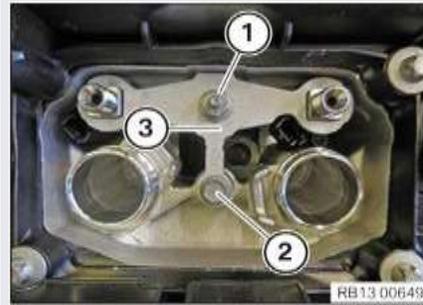
2.1.5. SENSOR / ACTUATOR POSITIONS.



Low pressure fuel sensor.

For installation and removal, the intake air filter housing on the left, the charge air cooling and the throttle valve should be removed, the cable duct in front of the starter motor must be loosened.

② M10 30 Nm

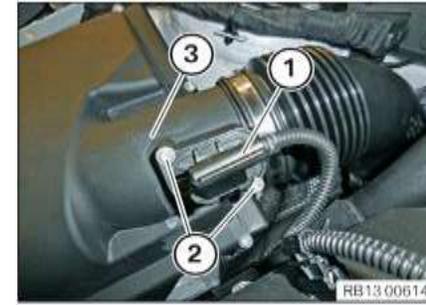


Injectors.

The air ducts and the high pressure rail must be removed for installation and removal. It is not necessary to upload the injector calibration to the DME at a value of 215. A special puller is required for stuck injectors.

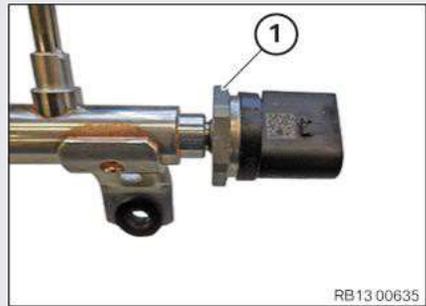
① M7x90 13+/-1 Nm
② M7x90 13+/-1 Nm

Note:
Pay attention to the completeness of the seals such as clamping and the Teflon ring.



Air mass sensor right.

① 2,5 Nm



High pressure fuel sensor.

The charge air cooler, ignition coils and the rail should be removed for installation and removal.

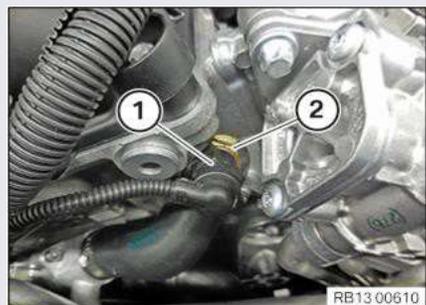
① M10 30 Nm



Electric coolant pump for charge air cooling.

Coolant should be drained for installation and removal.

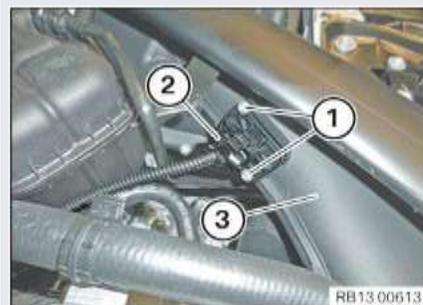
① 5,5 Nm
② 5,5 Nm



Coolant temperature sensor.

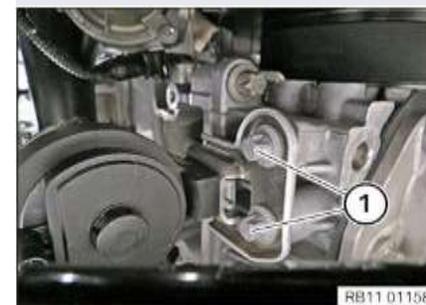
The charge air ducts and injector cover should be removed for installation and removal.

② 13,5 Nm



Air mass sensor left.

① 2,5 Nm



Electric coolant pump for turbo charger.

The intake air filter housing on the right and the thrust panel should be removed for installation and removal.

① 10 Nm

2.1. GENERAL.

2.1.6. BOP POWERSTICKS.

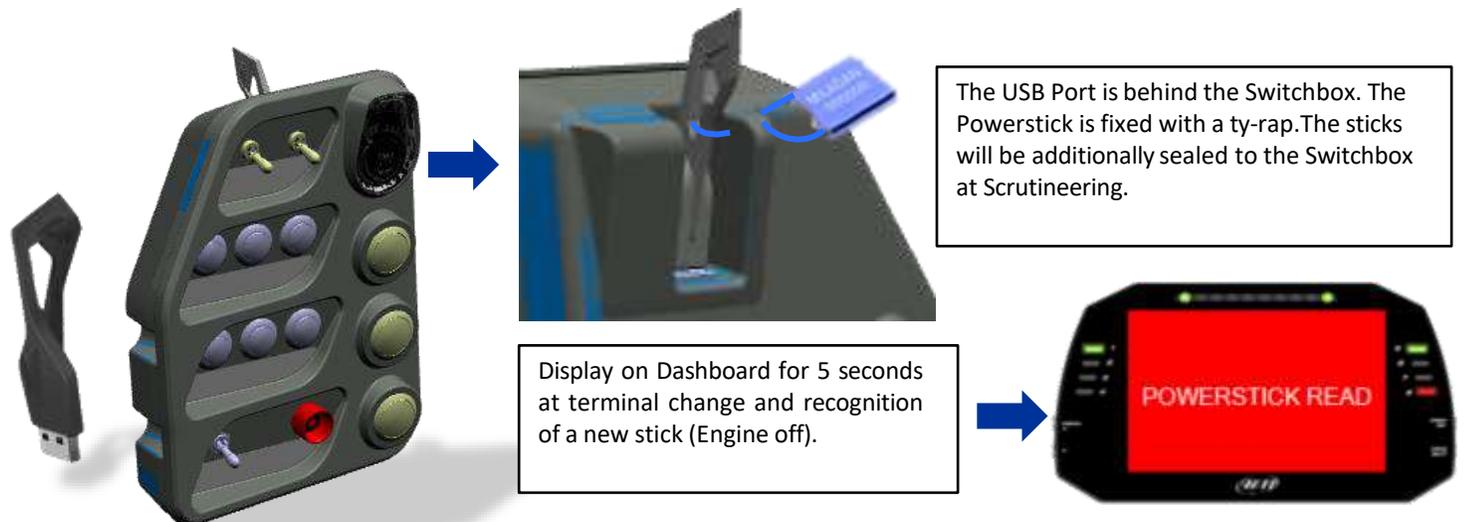
BOP (Balance of Performance) is the balancing of the performance of numerous production-based GT cars, which are originally adapted to different specifications and also use different engines, so that equal opportunities on a variety of racetracks can be achieved. The Power Sticks can be obtained from BMW Motorsport.

Powerstick Mapping for the 365 HP und 450 HP Version:

Powerstick		P/N	Icon 1 (on Dash)	Icon 2 (on Dash)	Power / Torque
365 HP	450 HP				
No Stick*	Black	6135 8324083	BLACK		Max. ↑ ↓ Min.
No Stick*	White	6135 8324082	WHITE		
No Stick*	No Stick*	--			
	Purple	6135 8324089	PURPLE		
	Red	6135 8324085		RED	
	Orange	6135 8324088		ORANGE	
	Yellow	6135 8324087		YELLOW	
	Blue	6135 8324084		BLUE	
	Green	6135 8324086	GREEN		
White	No Stick*	6135 8324082	WHITE		

*) Both variants have a maximum output of 365 hp without a power stick. The black one is required for the 450 HP version to activate the maximum output.

Connector-Position:



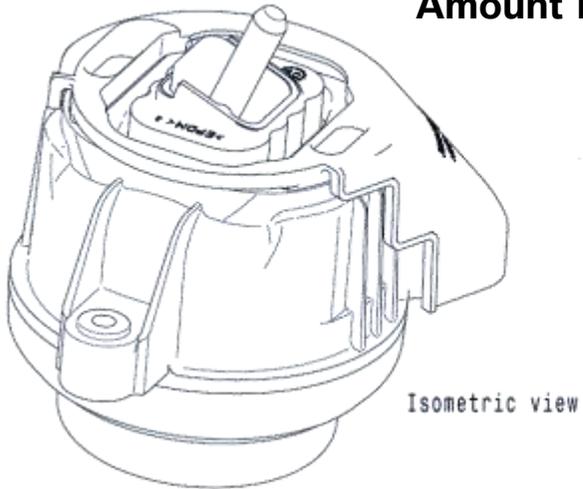
NOTICE

After switching on the ignition the recognized power map remains unchanged until a full power cycle.

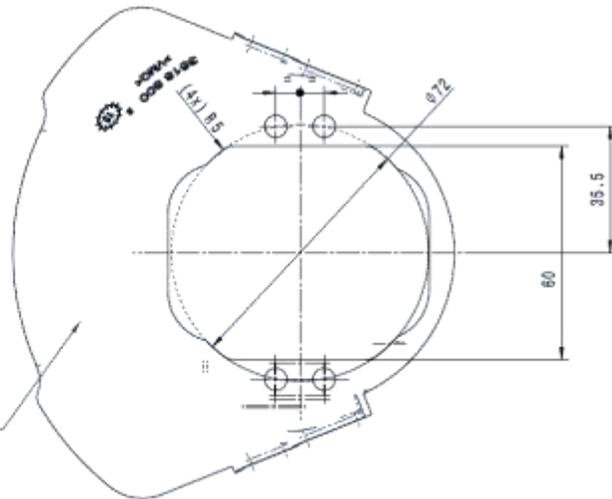
2.1. GENERAL.

2.1.7. ENGINE MOUNT.

Amount Trim Work Heat Isolation Cap Engine Mount RH. (at Replacement).



Trim Heat Isolation Cap



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
2211 8431708	NA Motorlager RE



Repair and maintenance work on the vehicle only with appropriate protective clothing.

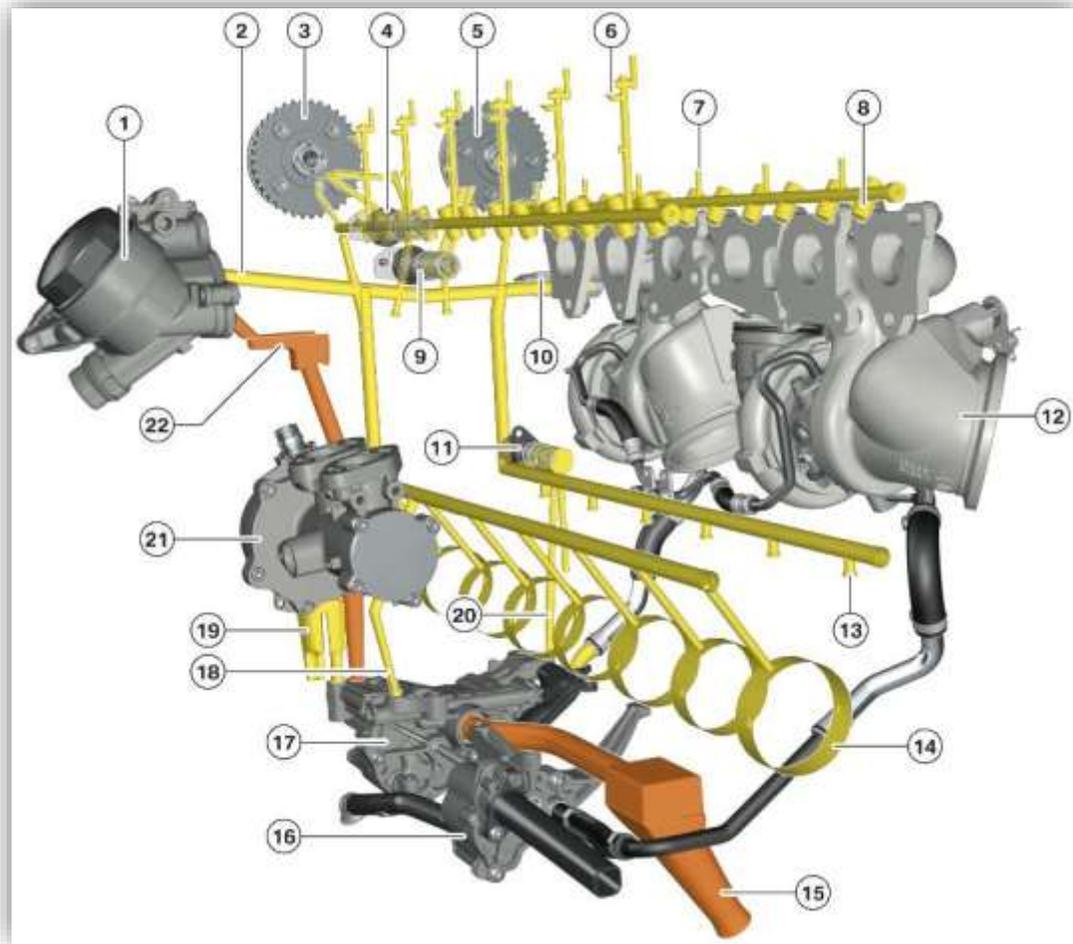
Engine Mount LH. (at Replacement).



Stop rubber is not required and must be removed before installation.

2.2. ENGINE OIL / -FILTER.

2.2.1. OILSYSTEM.



Components:

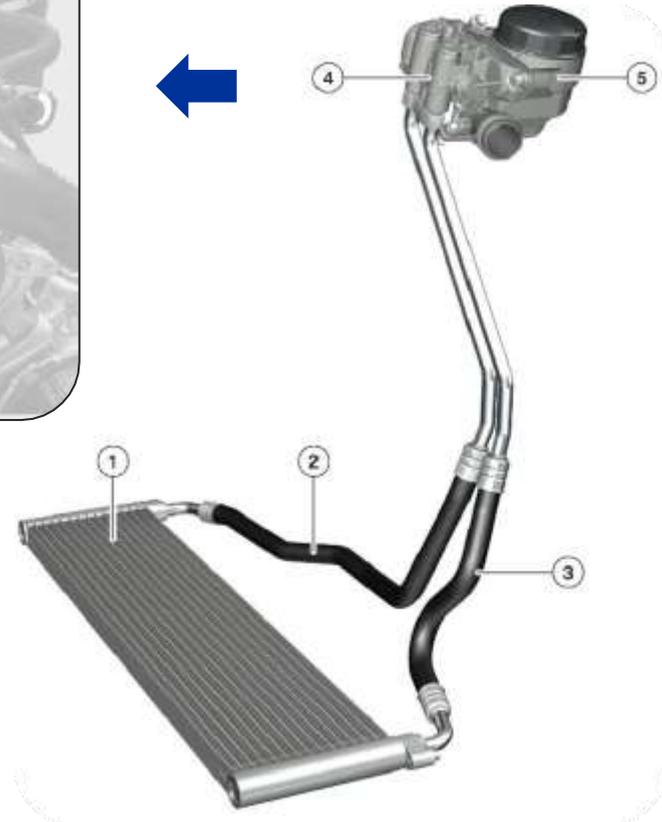
- | | | | |
|----|-------------------------------|----|--|
| 1 | Oilfilter. | 12 | Turbocharger. |
| 2 | Main oil passage (Clean oil). | 13 | Connection oil spray nozzles / Turbocharger. |
| 3 | VANOS Intake. | 14 | Crankshaft. |
| 4 | VANOS Intake Solenoid. | 15 | Suction pipe. |
| 5 | VANOS Exhaust. | 16 | Suction pump. |
| 6 | Intake camshaft. | 17 | Oil pump. |
| 7 | Exhaust camshaft. | 18 | Passage oil pressure regulation. |
| 8 | Hydraulic lifter. | 19 | Passage vacuum pump. |
| 9 | VANOS Exhaust Solenoid. | 20 | Passage oil pressure regulation. |
| 10 | Chain tensioner. | 21 | Vacuum pump. |
| 11 | Oil pressure valve. | 22 | Passage pan oil. |

NOTICE

The nominal engine oil pressure is dependent on rpm, the map for this is stored in the DME and is monitored by alarms.

2.2. ENGINE OIL / -FILTER.

2.2.2. OIL COOLING.



Components:

- 1 Engine oil cooler.
- 2 Return flow.
- 3 Forward flow.
- 4 Thermostat.
- 5 Oil-Filter.

2.2. ENGINE OIL / -FILTER.

2.2.3. MATERIALS.

List of approved oils and quantities:

Engine Oil.	BMW TwinPower Turbo LL-04 0W-30	Running Time: 5000 km	
Bulk (Sales).	BMW-P/N: 8321 2365929	1 L – Can.	
	BMW-P/N: 8321 2405099	209 L Barrel. 5 L – Can.	
Max. Quantity.	7.8 L without Filter.	8.4 L with Filter.	
Oil Filter Cartridge.	BMW-P/N: 1142 7854445	Running Time: 5000 km	
O-Ring.	BMW-P/N: 1142 8683168	Running Time: 5000 km	

List of approved third-party products (USA):

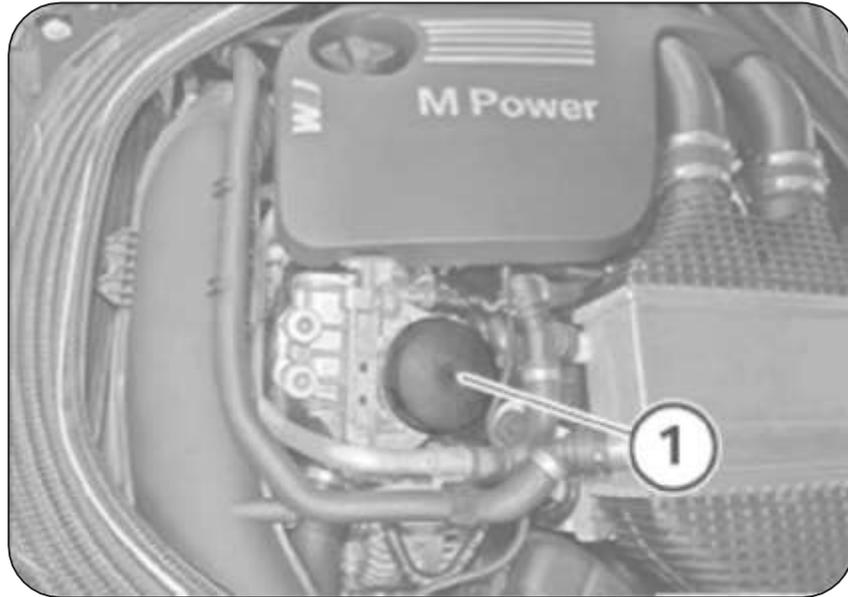
Trade Name	Producer / Supplier	Specification
Pennzoil P9 Pro LS	Shell International Petroleum Co. Ltd.	SAE 0W - 30
Shell Helix Ultra ECT	Shell International Petroleum Co. Ltd.	SAE 0W - 30

2.2. ENGINE OIL/ -FILTER.

2.2.4. OIL CHANGE.

General Information.

Drain the engine oil with a suitable collection container and dispose it. Observe country-specific and organizer disposal regulations.



1. Change oil only when engine is warm.

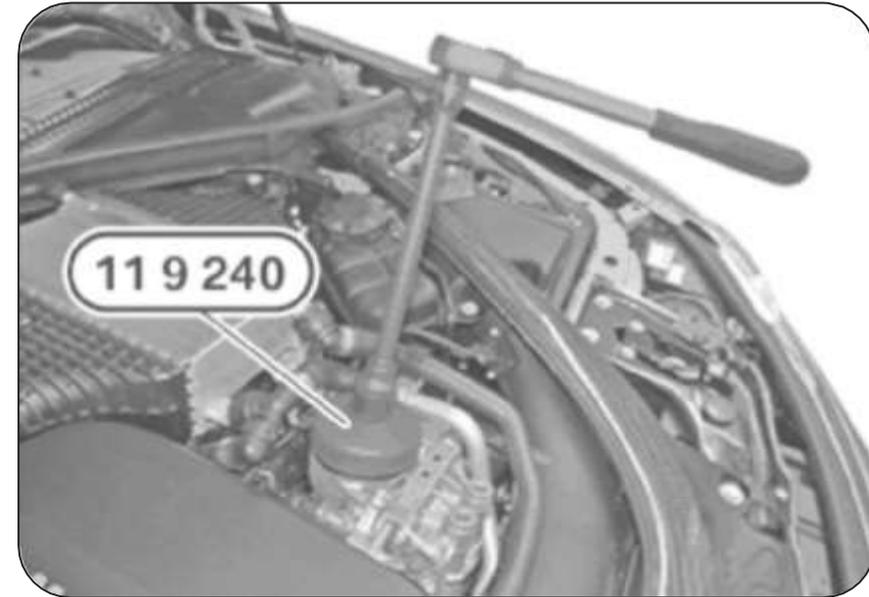
NOTICE

Risk of damage!
Protect belt drive against
dirt.
Cover it with suitable
means.



DANGER

Danger of Scalding!



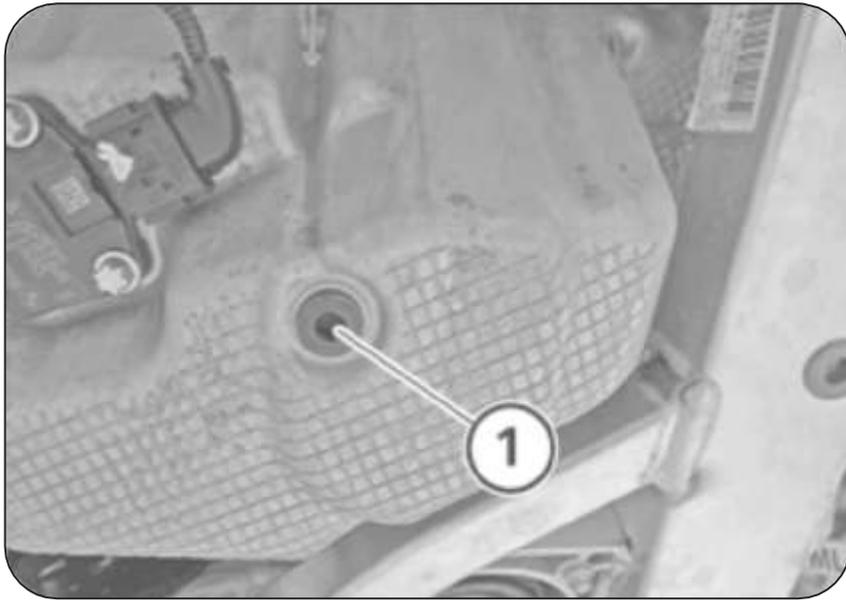
2. Remove oil filter cover (1) with special tool 11 9 240.
3. The engine oil flows from the oil filter housing back into the oil pan.

2.2. ENGINE OIL / -FILTER.

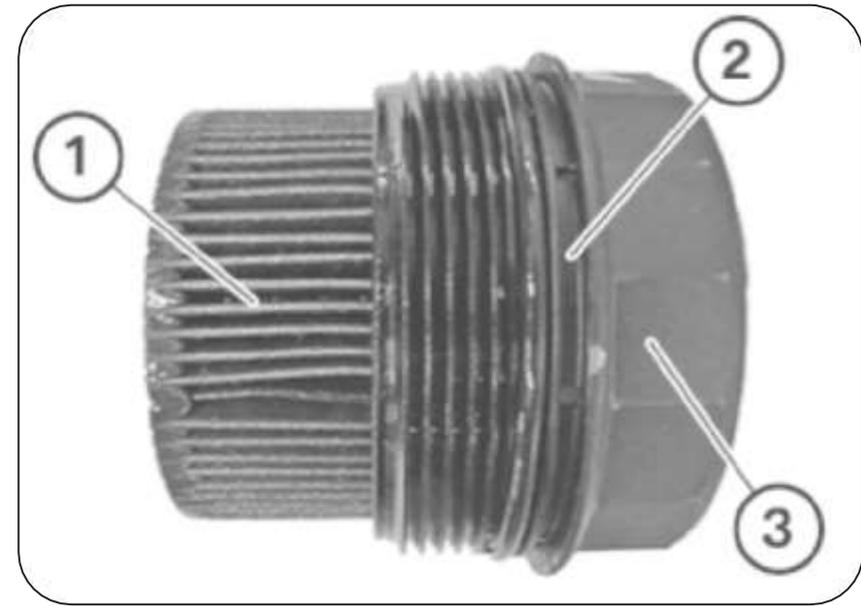
2.2.4. OIL CHANGE.

General Information.

Drain the engine oil with a suitable collection container and dispose it. Observe country-specific and organizer disposal regulations.



4. Loosen oil drain plug (1) at the oil pan. Drain engine oil.
5. Replace the seal ring of the oil drain plug (1).
6. Tightening torque: **25 Nm**.



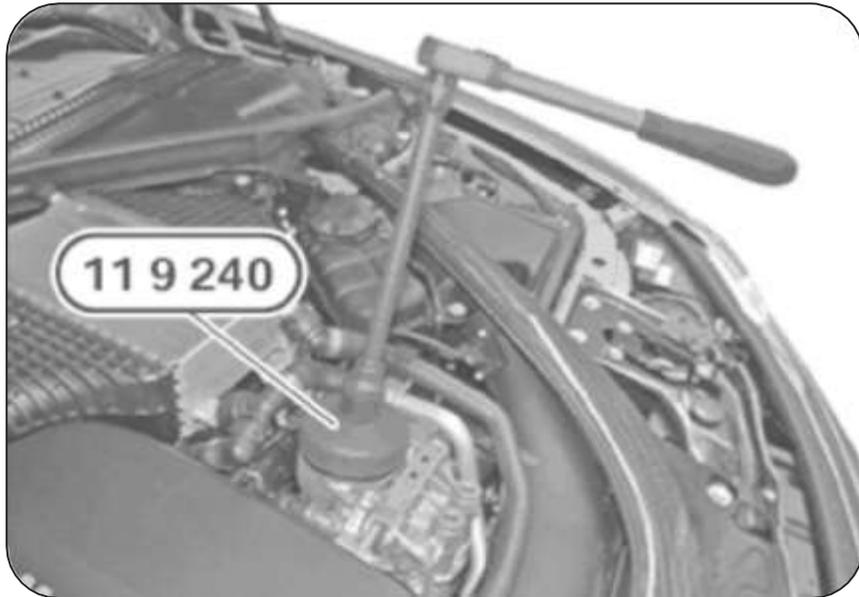
7. Replace filter cartridge (1) 1142 7854445 from housing (3).
8. Replace O-ring (2) 1142 8683168.
9. Wet O-ring (2) with engine oil.

2.2. ENGINE OIL / -FILTER.

2.2.4. OIL CHANGE.

General Information.

Drain the engine oil with a suitable collection container and dispose it. Observe country-specific and organizer disposal regulations.



10. Fasten oil filter cover with special tool 11 9 240.
11. Tightening torque: **25 Nm**.
12. Pour in engine oil.

Check oil filter cover and drain plug for leaking.

Check oil level mentioned in chapter 2.2.5.

The oil consumption should be observed and monitored by the team regularly, as a guideline the value is 0.5 to 1.0 liters per 1000 km (The value applies after the engine has been run in, may be higher at the beginning).

For long distance races, these monitored oil consumption values should be used to top up the engine oil during pit stops (engine off).

NOTICE

Risk of engine damage, if oil quantity is too high or too low!



Repair and maintenance work on the vehicle only with appropriate protective clothing.

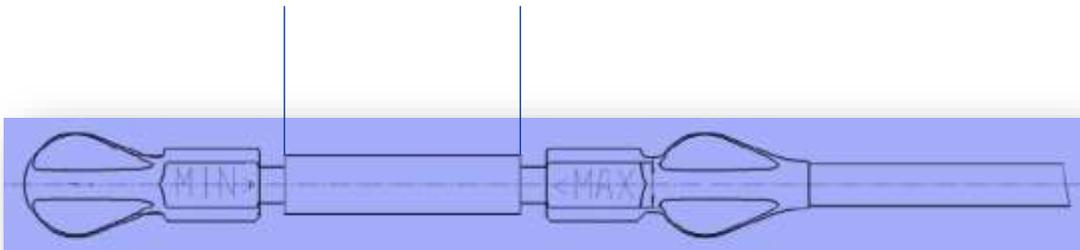
2.2. ENGINE OIL / -FILTER.

2.2.5. OIL LEVEL.

Position Dip Stick



Min: 6.8 L (with Filter) **Max:** 8.4 L (with Filter)



Check oil level with the dip stick while engine is off:

The filling quantity should be adjusted to MAX-level of the dipstick after a standing time of 2-3 hours on the cold engine, this corresponds to approx. **7.8 L without filter** and **8.4 L with filter**. The oil consumption can vary depending on the engine (see chapter 2.2.4. also).

NOTICE

Risk of engine damage, if oil quantity is too high or too low!

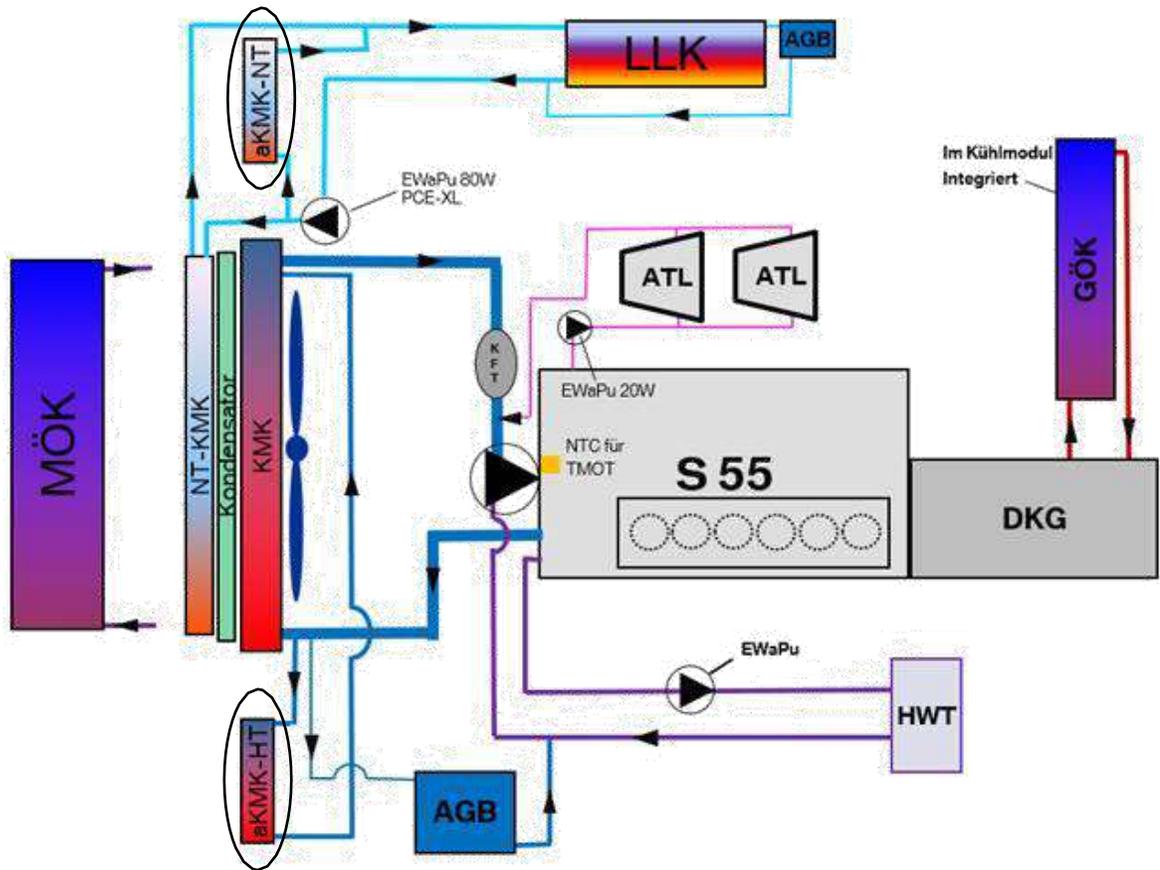


Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.3. ENGINE COOLING.

2.3.1. COOLING SYSTEM.

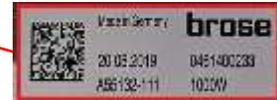
Schematic:



*) Different versions for the 365 HP and 450 HP variant.



365 HP: 850 W



450 HP: 1000 W

Abbreviations:

KMK:	Engine Cooling Centre Radiator.	NT:	Low Temperature.
MÖK:	Engine Oil Radiator.	ATL:	Exhaust Gas Turbocharger.
GÖK:	Heat Exchanger Gearbox Oil.	AGB:	Coolant Reservoir.
LLK:	Charge-Air Intercooler.	KFT:	Thermostat.
aKMK*:	Side Radiator.	EWaPu:	Electr. Waterpump.
HT:	High Temperature.	HWT:	Exchanger Heating System.

NOTICE

The cooling system has to be filled and vent with the Vacuum filling device (Part No. 8139 2152473). See chapter 2.3.3.

2.3. ENGINE COOLING.

2.3.2. COOLANT.

List of approved Anti-Freeze and quantities:

Anti-Freeze / Water.	Mixing Ratio: 50:50 with demineralized water.		 <p>FROSTOX HT-12</p>
Bulk (Sales).	Part-No.: 8319 5A42DF3	1.5 L – Can.	
	Part-No.: 8319 2466484	5,0 L – Can.	
	Part-No.: 8319 5A42DF4	60 L Barrel.	
	Part-No.: 8319 5A42DF5	205 L Barrel.	
Quantity (Cooling System).	13.9 L		

2.3. ENGINE COOLING.

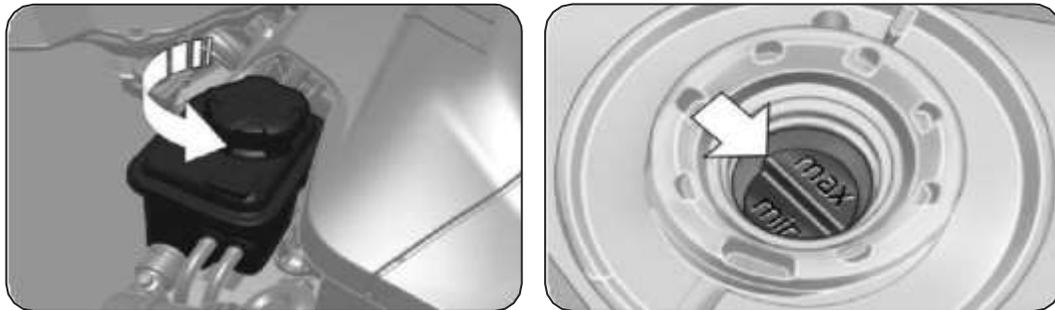
2.3.3. CHECK.

General information.

The vehicle has **two coolant reservoirs** that are located in the engine compartment.

To ensure the operational reliability of the vehicle, always check the coolant level of both coolant reservoirs.

Checking coolant level:



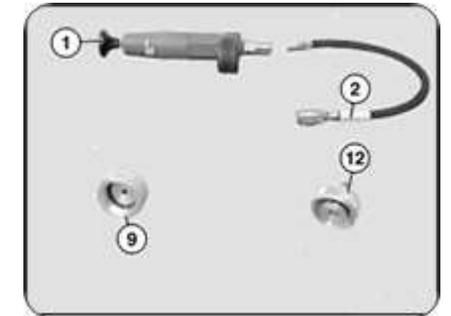
1. Let the engine cool down.
2. Turn the lid of the coolant reservoir slightly counterclockwise to allow any excess pressure to dissipate, then open it.
3. Open the coolant reservoir lid fully.
4. The coolant level is correct if it lies between the minimum and maximum marks in the filler neck.



WARNING

Scalding! Open the reservoir cap only when the engine has cool down.

Special Tools:



Part-No.	Description
8139 2152473	Vacuum filling unit
8330 0494417	Tester adapter
8330 0494426	Adapter small container
8330 0494642	Adapter large container

NOTICE

The special tools shown can be obtained from your BMW dealer.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.3. ENGINE COOLING.

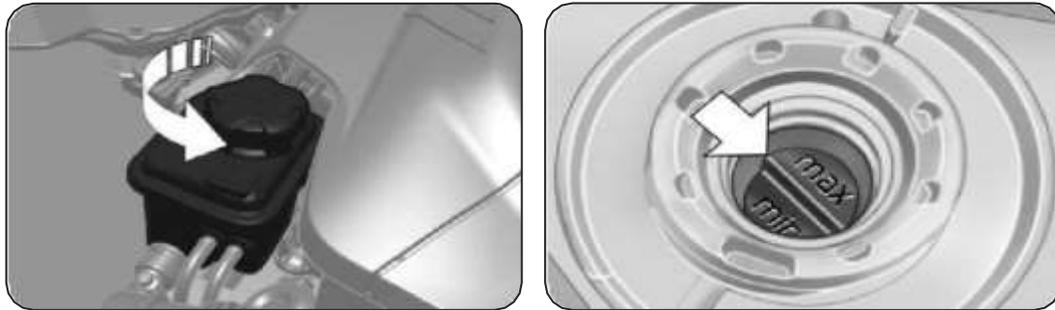
2.3.3. CHECK.

General information.

The vehicle has **two coolant reservoirs** that are located in the engine compartment.

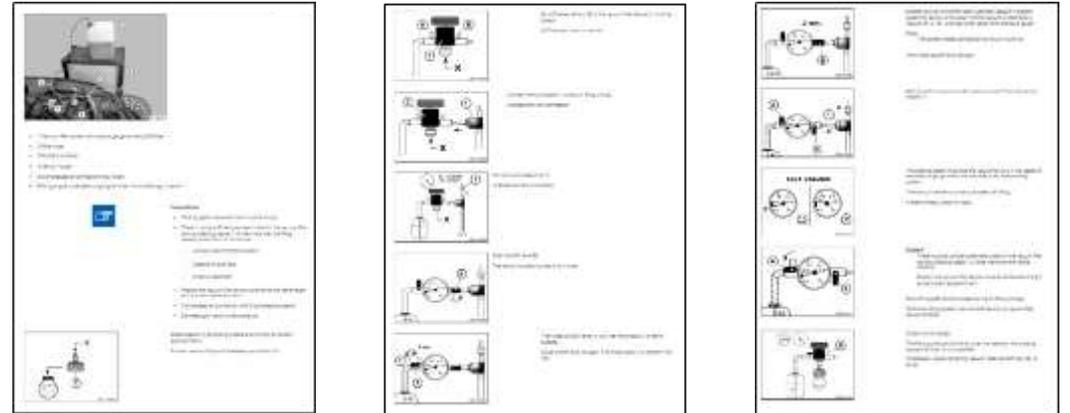
To ensure the operational reliability of the vehicle, always check the coolant level of both coolant reservoirs.

Adding coolant:



1. Let the engine cool down.
2. Turn the lid of the coolant reservoir slightly counterclockwise to allow any excess pressure to dissipate, then open it.
3. Open the coolant reservoir lid fully.
4. If the coolant is low, slowly add coolant up to the specified level; do not overfill.
5. Close the lid.
6. Have the cause of the coolant loss eliminated as soon as possible.

Cooling system (Engine, Intercooler) filling / bleeding:



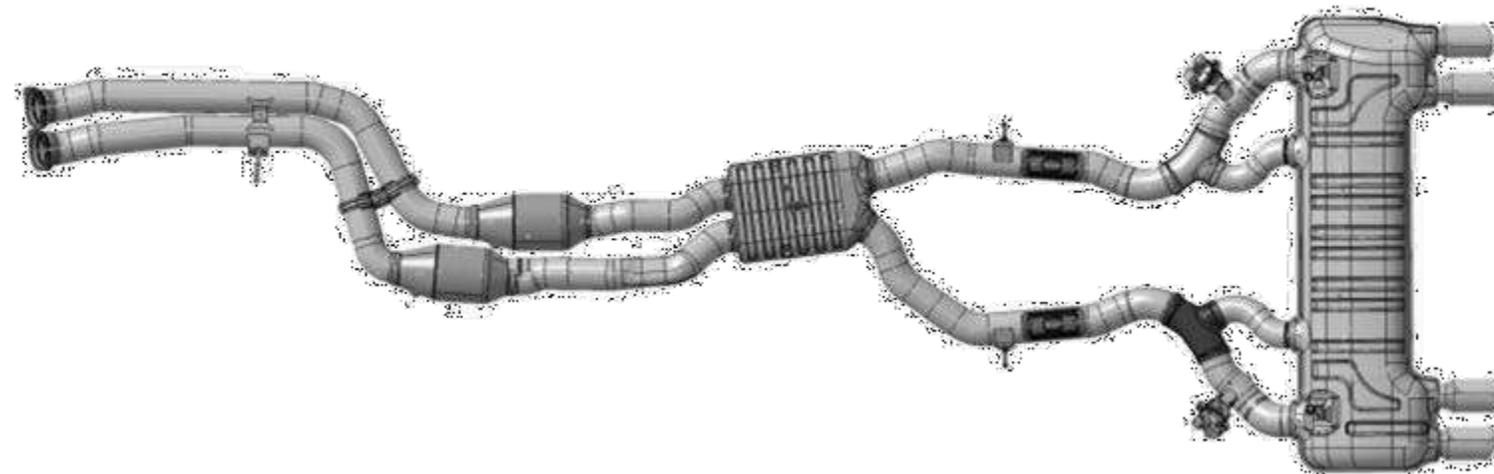
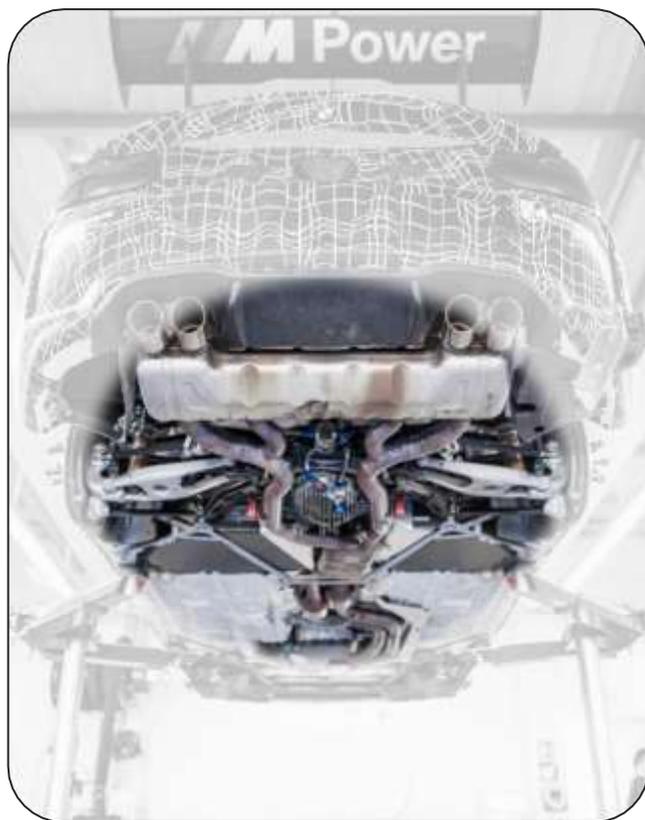
NOTICE

The instruction manuals can be download from the BMW M Motorsport Customer Portal.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.4. EXHAUST SYSTEM.



WARNING

Working on the hot exhaust can cause burns.

NOTICE

Motorsport variant with CS series back pot. However, please note the different part number for the back pot in the ETK for the BMW M2 CS Racing.



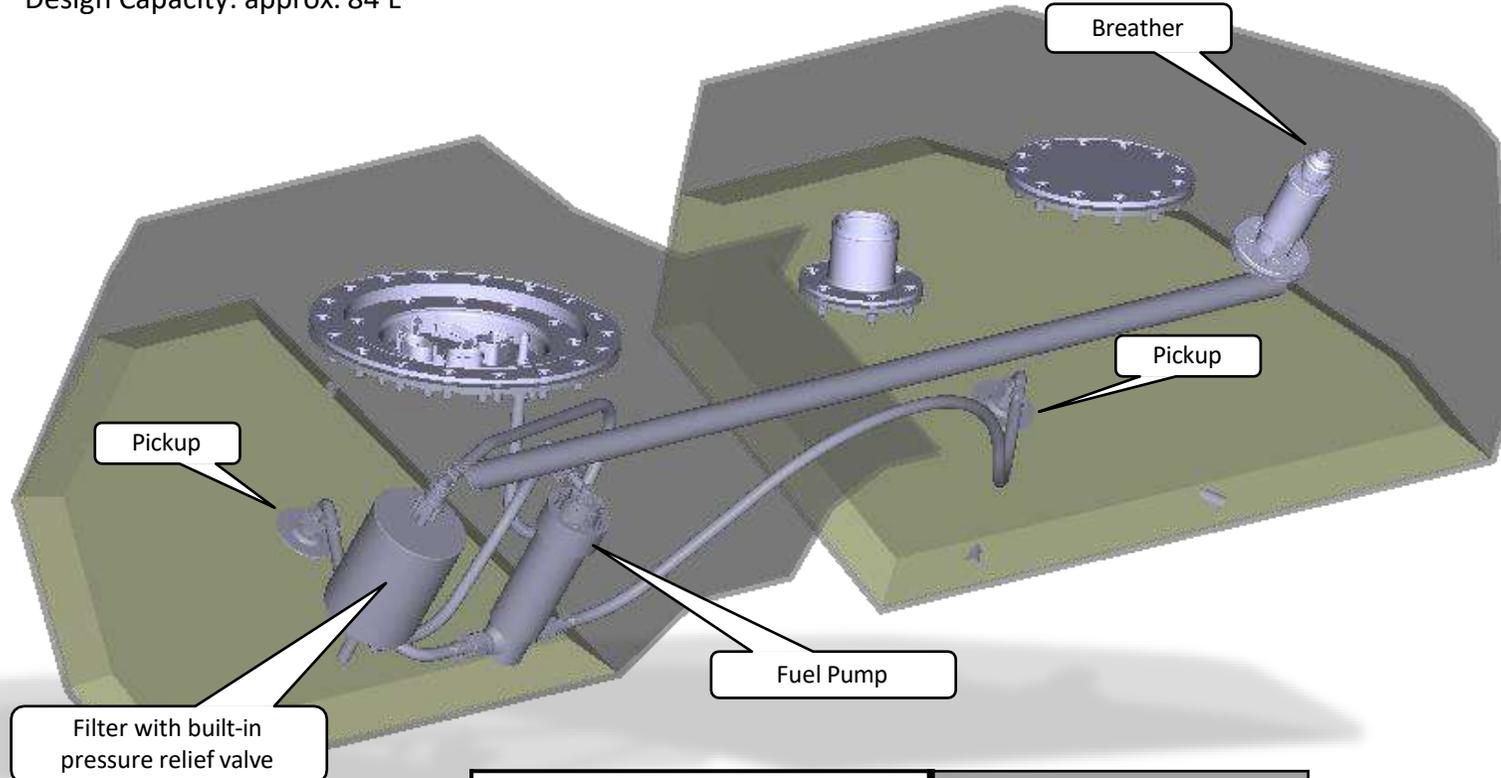
Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.5. FUEL SUPPLY.

2.5.1. FUEL TANK.

Merin FT3 Safety Tank.

Design Capacity: approx. 84 L



In order to adjust the tank capacity individually to the racing series regulations, the following **Tank Volume Balls** are used for this:

Tank Volume Balls	
Part-No.	Volume
1610 7767897	0.2 L
1610 7767898	0.5 L

DANGER

Risk of explosion!
 Keep open fire and sources of ignition away!
 Gasoline is highly flammable and its vapors form explosive mixtures.
 Fuel is toxic when inhaled, swallowed and when it comes into contact with the skin.
 Benzene contained in gasoline is carcinogenic.

NOTICE

Maximum tank capacities are defined by the respective racing series regulations and must be respected at any times.
 Please take notice of the tank certificate attached to the vehicle documents and the expiry date!
Never let the fuel pumps run dry!
 Always keep a certain amount of fuel in the tank when ignition is on.
 The map of the nominal fuel pressure is stored in the DME and is monitored by means of an alarm.

Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.5. FUEL SUPPLY.

2.5.2. FUEL COMPATIBILITY.

NOTICE

Most fuel system components are not resistant to all types of fuel. Pay attention to the given instructions below!

- Use unleaded petrol (recommended at least: 98 RON, AKI 93). Minimum fuel grade: 95 RON, AKI 91. According ISO 5164 and ISO 5163.
- It is essential before each event to identify the intended fuel or blend to use for the race weekend before purchasing it.
- Because of the engine's road car specification, it is recommended that the ethanol content of the fuel may not exceed 10% (E10). Ethanol should comply with the following quality standards: US: ASTM 4806, CAN: CGSB-3.511.
- Do not use fuel with a consistent of methanol, e.g. M5 – M100.
- Do not use fuel with any metallic additives, e.g. manganese or iron, as this can cause permanent damage to the catalytic converter and other components.
- If fuel with any ethanol content is used, the size/capacity of the fuel cell will change over time and has to be checked regularly and then the tank volume has to be corrected with the tank volume balls, mentioned in chapter 2.5.1.
- Also any fuel with an ethanol content should be pumped out after every race weekend, because if this fuel is left to stand, it can separate and give high concentration of volatile alcohols, which could damage the fuel cell.
- The fuel cell can withstand reasonable exposure to homogeneous blends up to 85% ethanol oxygenate (E85). Therefore, for high concentration of ethanol content, the fuel should be pumped out after every use.
- Be aware, that a high constituent of toluene (methylbenzene) can damage the fuel cell very quickly.
- Also, read carefully the Safety Information & Instructions for the fuel tank attached to the vehicle documents.

2.5. FUEL SUPPLY.

2.5.3. FUEL DRAIN / REFUELING.



Disconnect this plug if pumps need to be switched off, while ignition is on.

Description	Part-No.
Krontec Quick Release with wire (Dry Break)	1612 8431388
Drain Pipe	1612 8416984



Risk of fire or explosion! Avoid contact with hot parts or ignition sources. Collect flammable fumes.

Fuel drain:

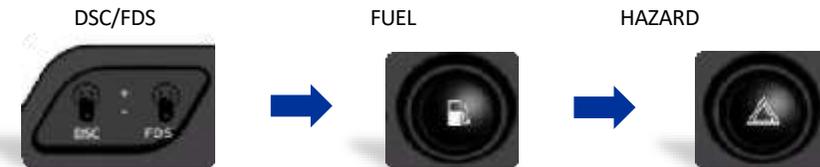
To drain the fuel tank, a drain valve in the engine compartment is installed near the bulkhead (see figure). To start the process, enter the **Service Mode (SEPP Mode)**:

This mode can only be activated when the engine is not running.

To enter the **SEPP Mode** push and hold the **DSC** and **FDS** switches at the switch panel simultaneously in the up position for 2 seconds until all buttons start flashing.

To start and stop draining, press the **Fuel** button accordingly on the switch panel to start and stop the fuel pumps.

To exit the **SEPP Mode** press the **HAZARD** button.



If possible, never run the fuel pumps dry! (Risk of damage to the fuel pumps!) The fuel must only be stored in suitable containers! **Always have the fire extinguisher ready when you drain the tank.**

After refilling (or when fuel run out), it may happen that there is no rail pressure and the engine goes directly into limp mode. There is no alarm message for this.

For this reason, it is recommended to do the following:

- After fuel drain or when fuel run out → stop the fuel pumps a.s.a.p.
- Refuel the car.
- Drain again until fuel comes out of the drain pipe → then disconnect the drain pipe.
- Start engine till engine runs fine → then stop the engine.
- Power cycle.
- Start engine again → do a multi turn.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.5. FUEL SUPPLY.

2.5.3. FUEL DRAIN / REFUELING.



Quick Release Filler Cap

Opening: Pull the latch handle towards you and remove the quick release filler cap.

Closing: Push back on the quick release filler cap and fold in the latch handle.



Risk of fire or explosion! Avoid contact with hot parts or ignition sources. Collect flammable fumes.

Refueling:

NOTICE

Before refueling, please refer to the correct fuel quality (Chapter 2.5.2).

After refueling with incorrect fuel quality, do not press the start / stop button. Drain the wrong fuel again.

Wrong fuels can damage the fuel system and the engine.

Avoid overfilling. If fuel comes into contact with painted surfaces, these surfaces can be damaged. The environment is harmed.

When refueling with a fuel pump nozzle, hang it into the filler hose. Lifting the nozzle while refueling leads to the following:

- Early shutdown.
- Reduced return of fuel vapors.

The fuel tank is full when the nozzle switches off for the first time.

Always have fire extinguishers ready when refueling.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.5. FUEL SUPPLY.

2.5.4. TANK CONVERSION.

General Information:

1. Tank conversion:

Extract fuel from fuel tank.

Fuel escapes when fuel lines are detached. Have a suitable collecting vessel ready.

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

Caution!

Ensure adequate ventilation in the workbay!

Avoid skin contact (wear gloves)!

After installation of fuel tank/prior to first engine start-up:

- Fill-up fuel tank with fuel after completing the conversion work and check the tank system for leaks before and after engine start-up.

2. Welding and grinding work:

1. Battery.

Explosion hazard in the vicinity of the battery during welding and grinding work. The battery must be removed.

2. Control units.

The following risks exist when the battery is connected:

- Damage to control units resulting from welding work on the body or a line short circuit.

Because of these risks the ground cable must be disconnected prior to all repair work.

Control units are designed for a temperature of 65 °C.

Protect control units against the influence of heat >65 °C.

2.3. Electrical wires and wiring harnesses.

Protect electrical wires and wiring harnesses against damage.

Protect electrical wiring and wiring harnesses against the influence of heat >65 °C .

Do not kink electrical wiring.

Adapter wiring harness 8417862 replaces 7744836.

Check whether fuses F143 and F144 are inserted (if necessary insert).

3. Amount of Parts:

Part-No.	Qty.	Description
1600 8342873	1	Tank 120 Ltr. Incl. Catch Tank
1600 8328161	1	Firewall Extra Volume
1600 8328162	1	Viton-Seal Firewall Extra Volume
6113 8372293	1	Grommet Main Harness
4100 8435913	15	Fillister Head Screw ISO7380-1 M5x12 10.9 ZNSW
4100 8427226	7	Washer M5 ISO7093 200HV A2
1100 2190416	13	Nut with washer HWM14-050 M5
1600 8342796	1	Cover Plate
4100 8427836	6	Cyl. Head Screw ISO4762 M8x20 10.9 ZNSW
4100 8427228	6	Washer M8 ISO7093 200HV A2
0714 7204294	1	Hex Screw with washer
6111 8417862	1	Adapter Wiring Harness

2.5. FUEL SUPPLY.

2.5.4. TANK CONVERSION.

Conversion / Fitting 120 L Tank:



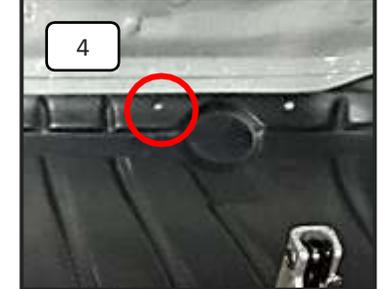
Tools required for installation / conversion.



Use the cover plate (P/N 8342796) as a template to set the drill holes only.

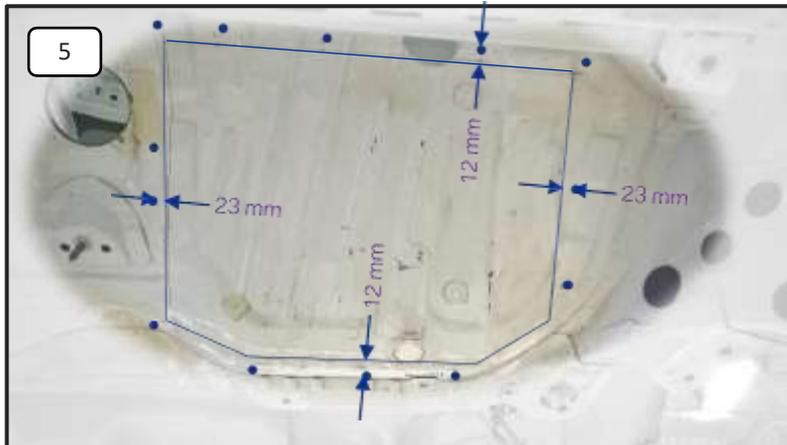


Align the template (cover plate) and fix it with a clamp.



Punch the marked hole, drill a 2.5 mm hole and fix with a screw. After pre-drill all holes with 2.5 mm bore.

Note: Do not use the cover plate to mark the required cutout.



Mark the inner cut-out parallel to the holes and with the gaps as shown. After, cut out the marked panel.



Adjust the cut-out with the firewall (P/N 8328161) and deburr the trim edges, so that the tank bladder cannot be damaged. Align the edges with the firewall radii. Then drill all holes to 5 mm bore.



Insert the fillister head screws M5x12 (P/N 8435913) from below through all holes and spot-weld them on as shown. Before doing this, sand down the contact surfaces and flatten the weld area. After, paint the sanded surfaces again and mask the screw heads with helitape.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

2.5. FUEL SUPPLY.

2.5.4. TANK CONVERSION.

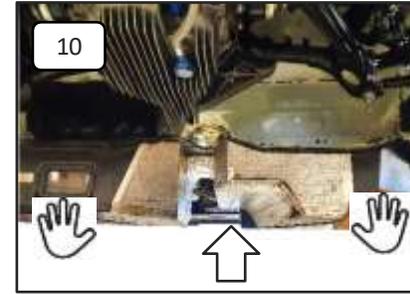
Conversion / Fitting 120 L Tank:



Prepare tank bladder with CFK firewall, tank protection (Sylomer) and tank pan. Sprinkle the tank tray with talcum powder beforehand.



Position CFK firewall from inside over the cutout.
Screw connection 13x Kaynut M5.
Tightening torque: 8 Nm



Position tank with 2 people from below into the intended position.



Screw the tank bladder to the firewall with a third person from above.
Tightening torque: 8 Nm



Screw the tank pan with 6x bolts M8x20 to the body.
Tightening torque: 21 Nm + Loctite 243



Apply fuel line to fuel tank mount (service cover) and attach service cap with plug to it and fasten. Screw the firewall including the seal back onto the floor panel.



Connect the vent as shown.



Fit fuel filler hose to tank with hose clamp. Fasten aluminum protective hose with clamp.

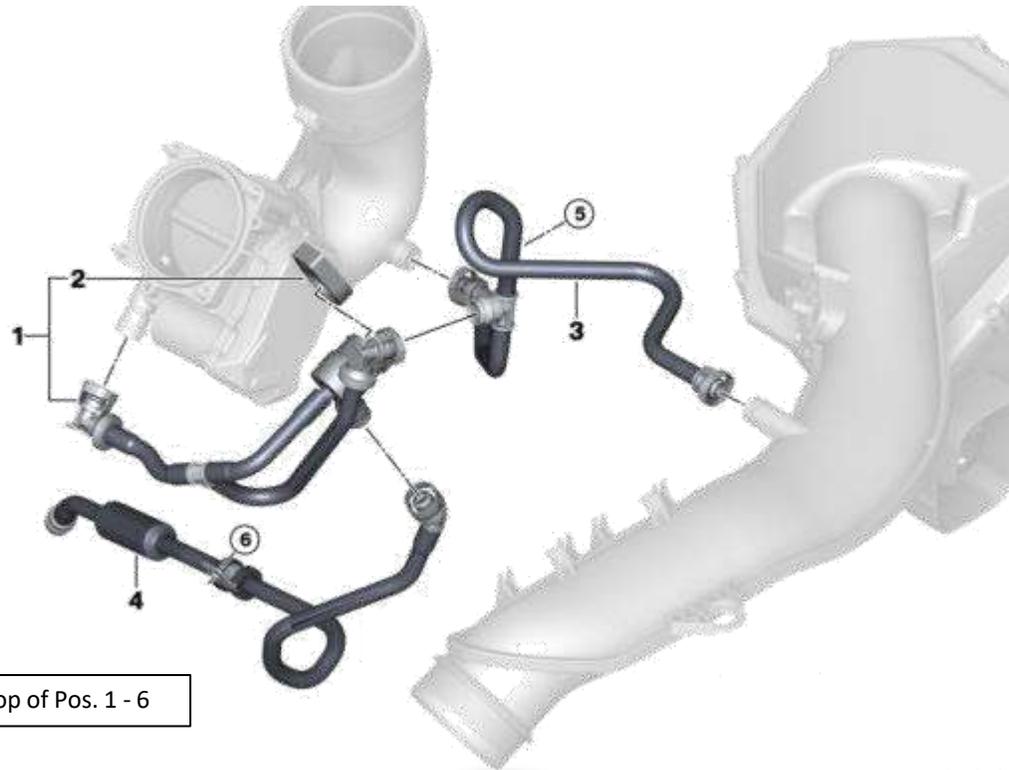


Attach fuel filler hose and aluminum protective hose analog to the tank filler neck.

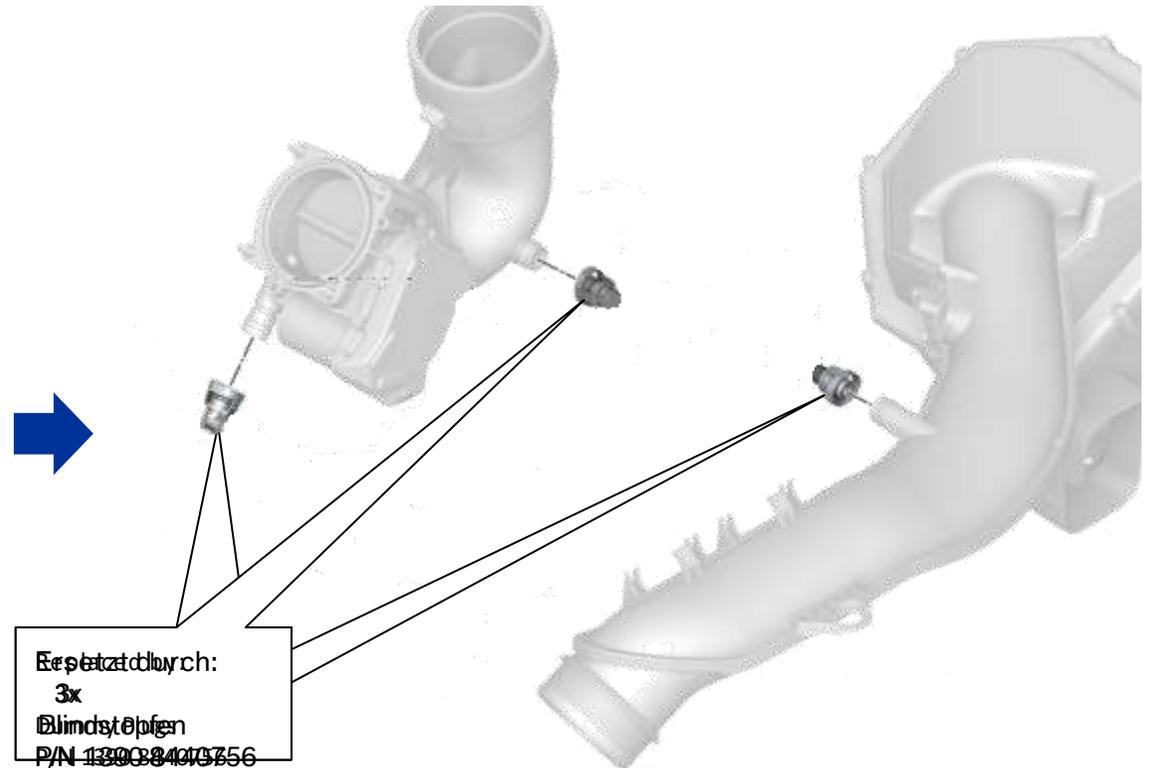
2.5. FUEL SUPPLY.

2.5.5. TANK VENT.

No tank ventilation pipes.
(at renewal)



Drop of Pos. 1 - 6



Ersetzt durch:
3x
Blindstopfen
P/N 1300840356



Repair and maintenance work on the vehicle only
with appropriate protective clothing.

2.6. RUNNINGTIMES.

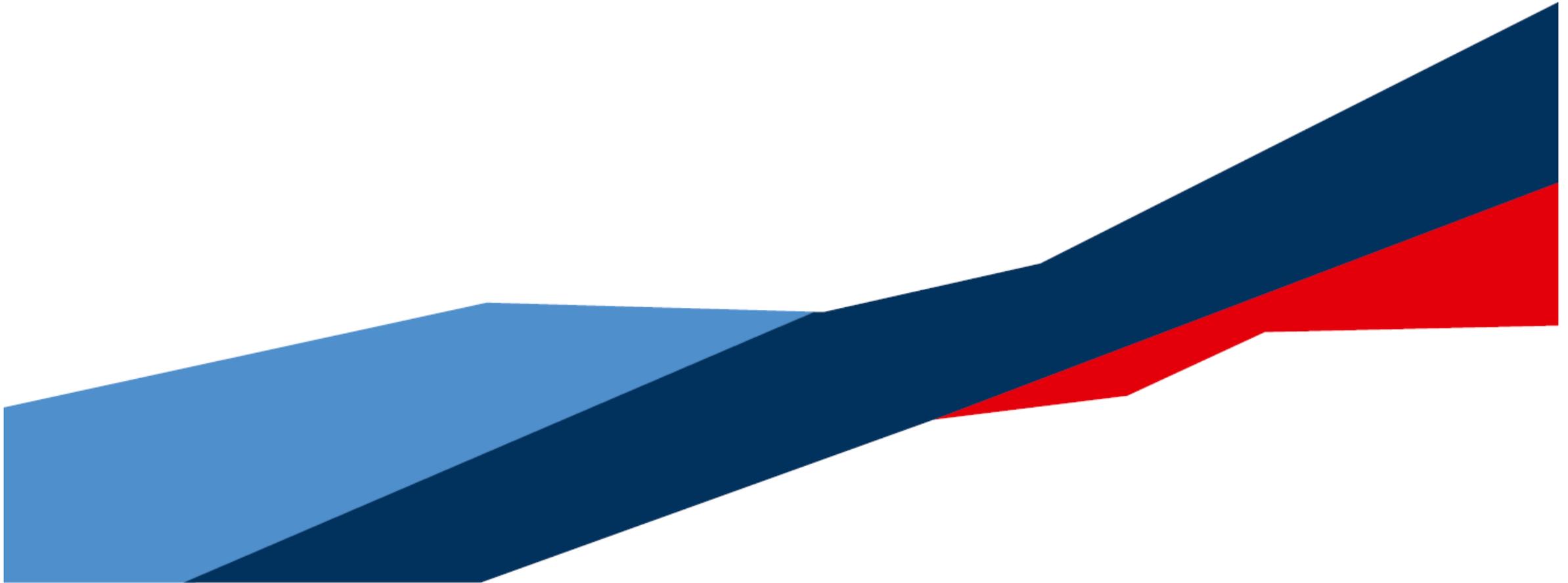


Major Components:

Component	Run Time	Remark
Engine.	30,000 km	Change.
V-Belt.	10,000 km	Change.
Spark Plugs.	5,000 km	Change.
Air Filter.	5,000 km (or earlier)	Change.
Oil Filter.	5,000 km	Change.
Engine Oil.	5,000 km	Change.

For run times of other engine parts, please refer to the list enclosed in the appendices.

3. DRIVE TRAIN.

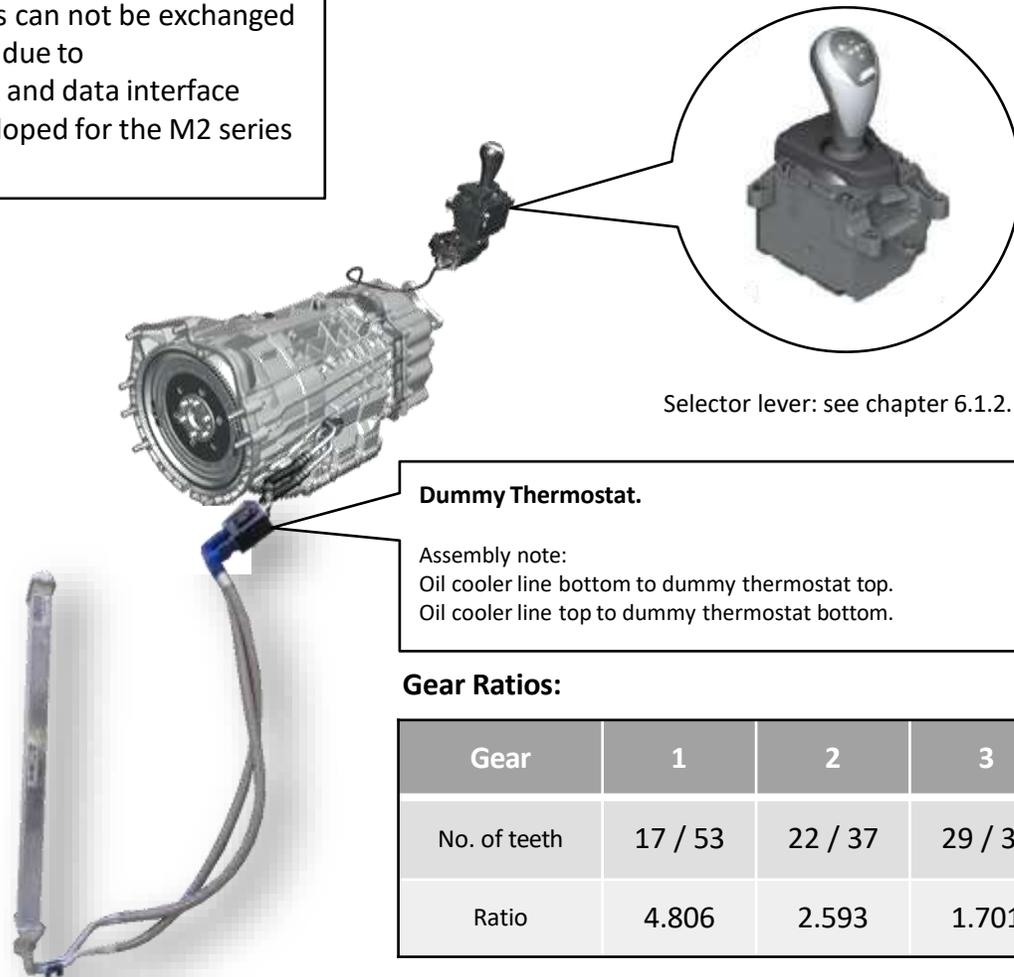


3. DRIVETRAIN.

3.1. DOUBLE CLUTCH TRANSMISSION (DKG).

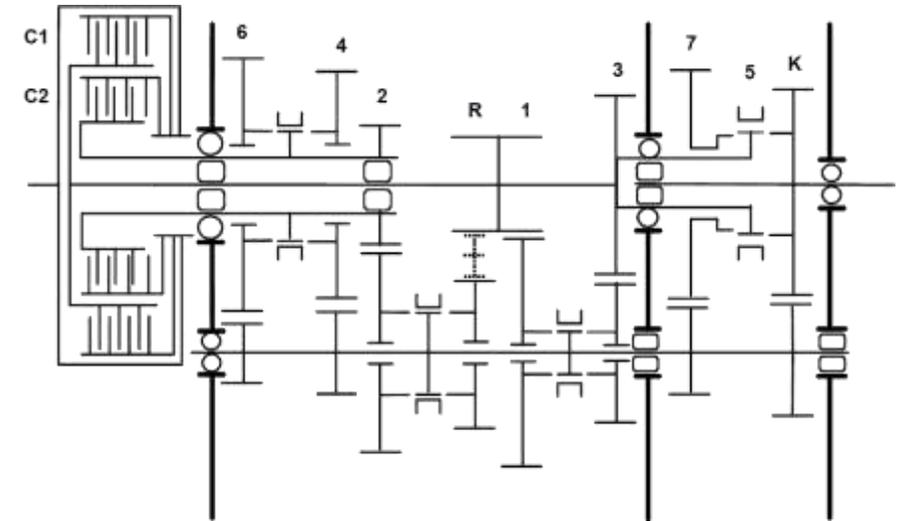
NOTICE

The gearboxes can not be exchanged between cars due to the electronic and data interface concept developed for the M2 series production.



Gear Ratios:

Gear	1	2	3	4	5	6	7	R	Drop Gear	iDiff.
No. of teeth	17 / 53	22 / 37	29 / 32	35 / 29	0 / 0	53 / 29	62 / 27	17 / 25 25 / 46	37 / 24	3.460
Ratio	4.806	2.593	1.701	1.277	1.000	0.844	0.671	4.172	1.542	



3.1. DOUBLE CLUTCH TRANSMISSION (DKG).

3.1.1. OIL SPECIFICATION.

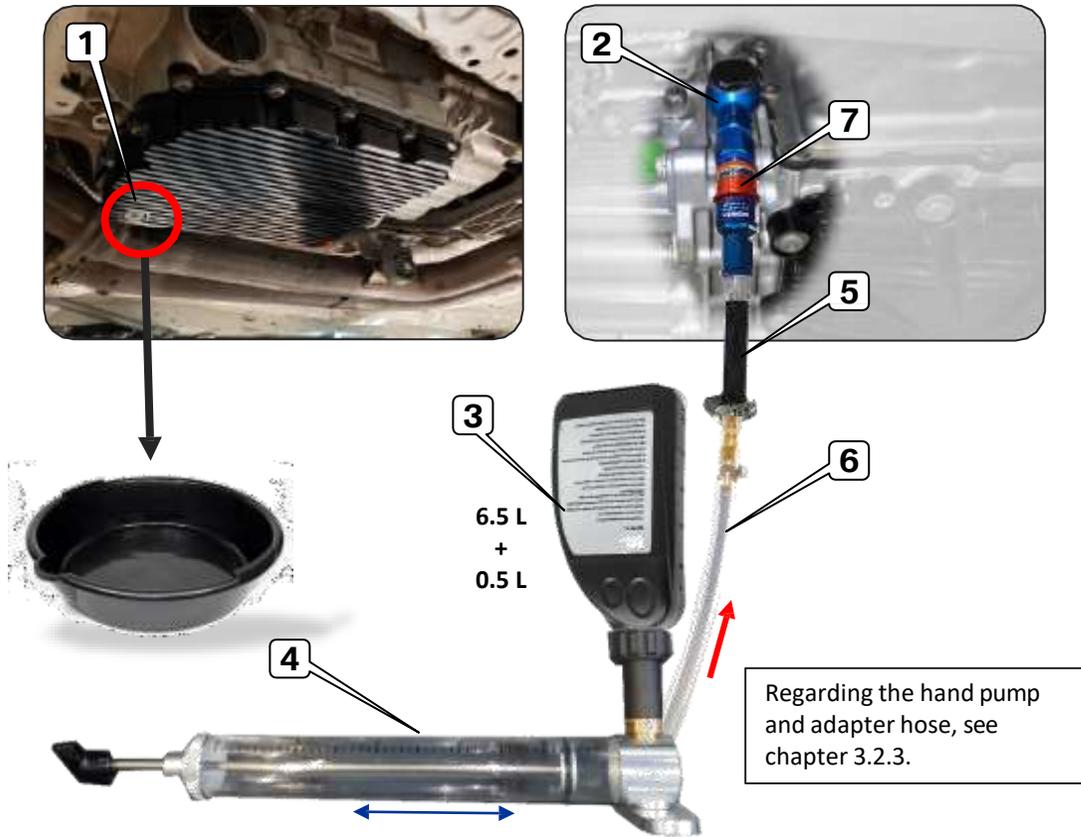
List of approved oils and quantities:

Oil.	BMW DCTF 1+	Running Time: 30000 km	
Bulk (Sales).	Part-No.: 8322 2446673	1 L – Can.	
	Part-No.: 8322 2148579	1 L – Can. (only US-Market)	
Quantity.	approx. 8.9 L	inkl. Radiator with filling set P/N: 7845077	

3.1. DOUBLE CLUTCH TRANSMISSION (DKG).

3.1.2. OIL CHANGE.

Oil drain / -fill up:




 Repair and maintenance work on the vehicle only with appropriate protective clothing.

- 1 Loosen the oil drain plug (1), drain the oil and collect it in a suitable container (approx. 6 L). Then re-fit the oil drain plug with a new sealing ring P/N 9963252.
- 2 Screw on a new oil can (3) to the hand pump as shown and pump in approx. 6.5 L gear oil (3) with the hand pump (4) and adapter hose (5) via the quick filler (2).
- 3 Then disconnect the Krontec coupling (7) and start the engine (in P) and while engine running warm up the gearbox to 30 - 40 ° C. Connect adapter hose (5) after warming up and let the the oil run out until it just drips.

Note: If no oil runs out, then fill in another 1 L of oil via the quick fill (2) with the pump. Then repeat the point 3.

Anziehmoment: **25 Nm +2**

- 4 When the gearbox temperature has reached approx. 30 - 40 ° C and the oil outlet breaks or it only drips, pump another 0.5 L of oil via the quick filler with the hand pump (4).
- 5 Then pull off the adapter hose (5) and check all components for leaks.



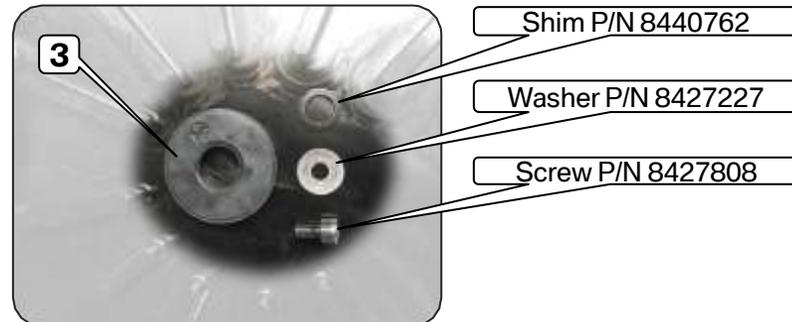
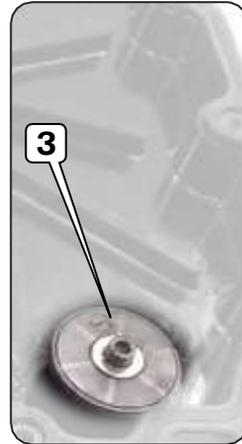
NOTICE

Due to the lack of the thermostat, it is recommended to only drive onto the race track with a transmission oil temperature of > 30 °C.

3.1. DOUBLE CLUTCH TRANSMISSION (DKG).

3.1.3. REMOVE / REFIT OIL SUMP.

Removal of oil pan:



- 1 Release oil drain plug (1), drain oil and collect with suitable measuring container (about 6 L).
- 2 Undo all screws and remove transmission oil pan (2).
- 3 Check that the magnet (3) is free and can be easily turned by hand.
- 4 If the magnet (3) is damaged, replace it and refit it with cylinder screw (8427808), washer (8427227) and below with the shim (8440762) and reinstall it into the oil pan.

Tightening Torque: **10 Nm +1 plus Loctite 270.**

After installation, check that the magnet is free and can be easily turned by hand.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

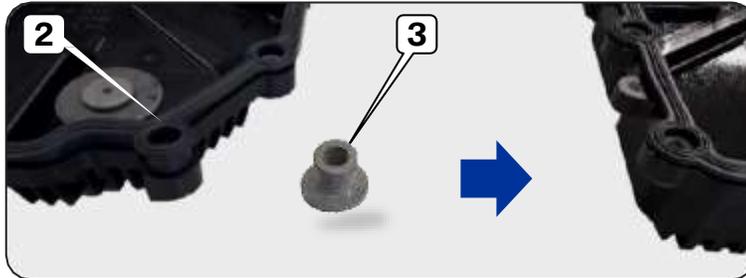
NOTICE

It is recommended to install a new oil sump gasket.

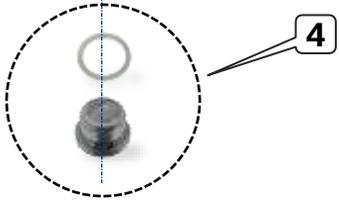
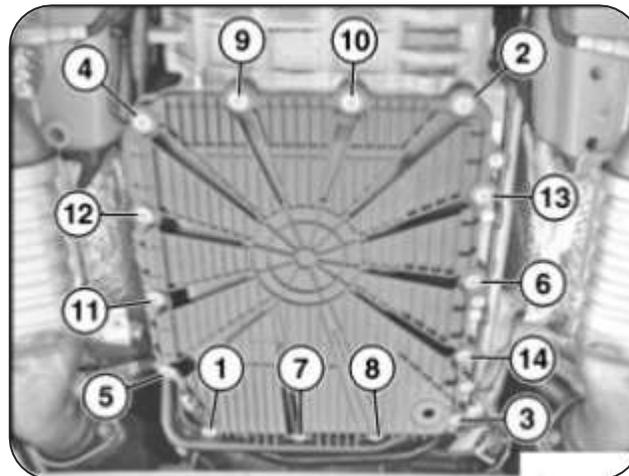
3.1. DOUBLE CLUTCH TRANSMISSION (DKG).

3.1.3. REMOVE / REFIT OIL SUMP.

Installation of new aluminum oil pan:



Screwing Order:



- 5 When changing, remove the gasket (2) and sleeves (3) from the old oil sump. Check gasket and replace if necessary. For it, please order oil pan (P/N 8070791) and take the new gasket from it.
- 6 Provide new oil sump (1) with gasket and sleeves and screw in screws up to screw head.
- 7 Tighten Oil pan (1) screws in specified order (1 – 14) with torque (see image).

Tightening torque: **10 +/- 1 Nm.**
- 8 Close oil sump (1) with oil drain plug (4) and new sealing ring (P/N 9963252).

Tightening torque: **25 Nm +2.**
- 9 For oil filling see chapter 3.1.2.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

NOTICE

It is recommended to install a new oil sump gasket.

3. DRIVETRAIN.

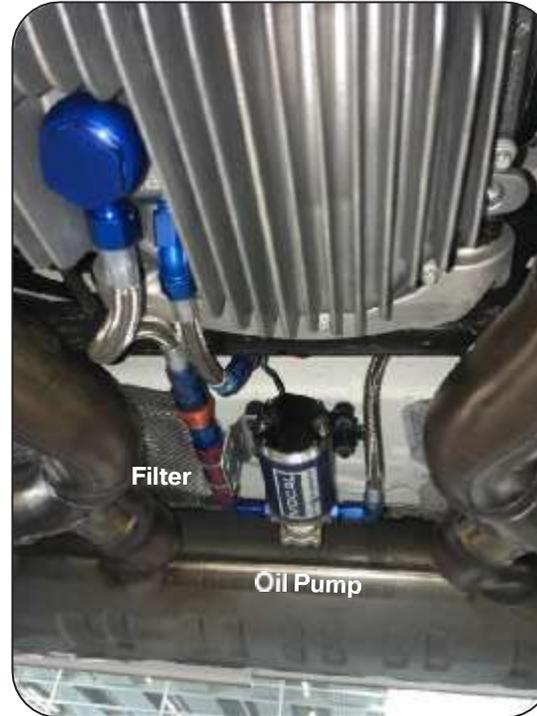
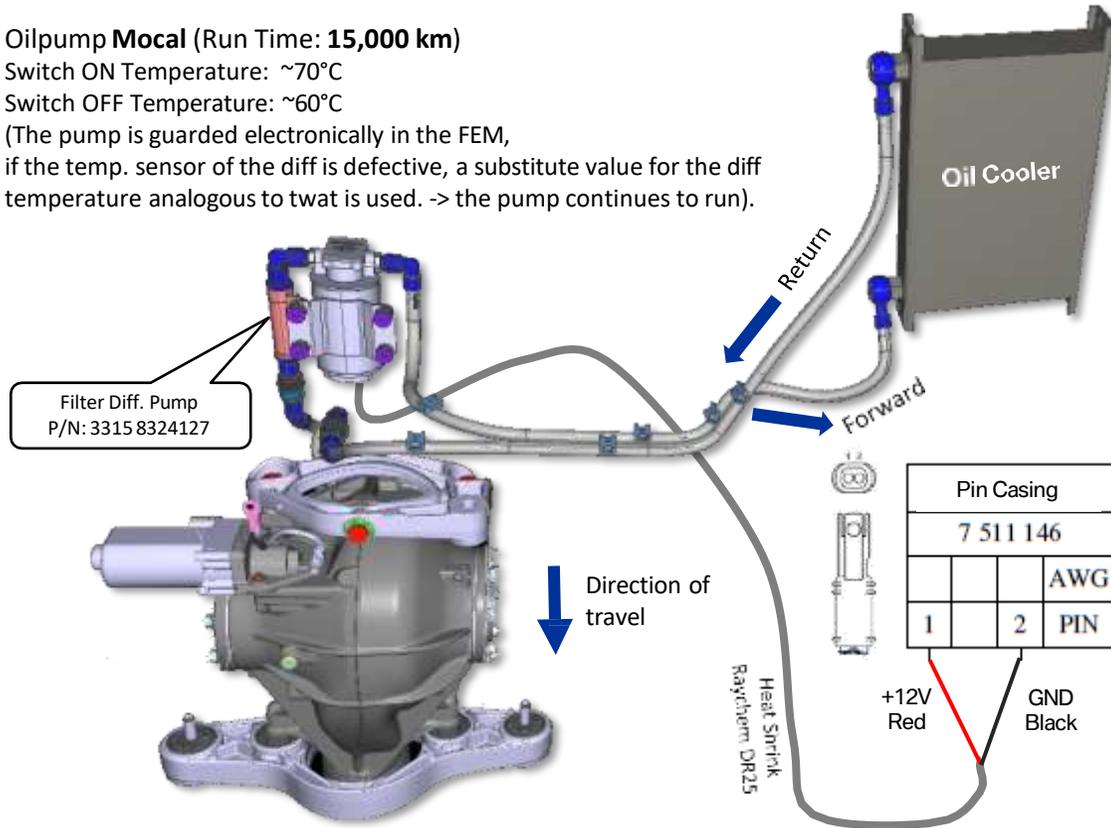
3.2. FINAL DRIVE.

Oilpump **Mocal** (Run Time: 15,000 km)

Switch ON Temperature: ~70°C

Switch OFF Temperature: ~60°C

(The pump is guarded electronically in the FEM, if the temp. sensor of the diff is defective, a substitute value for the diff temperature analogous to twat is used. -> the pump continues to run).



NOTICE

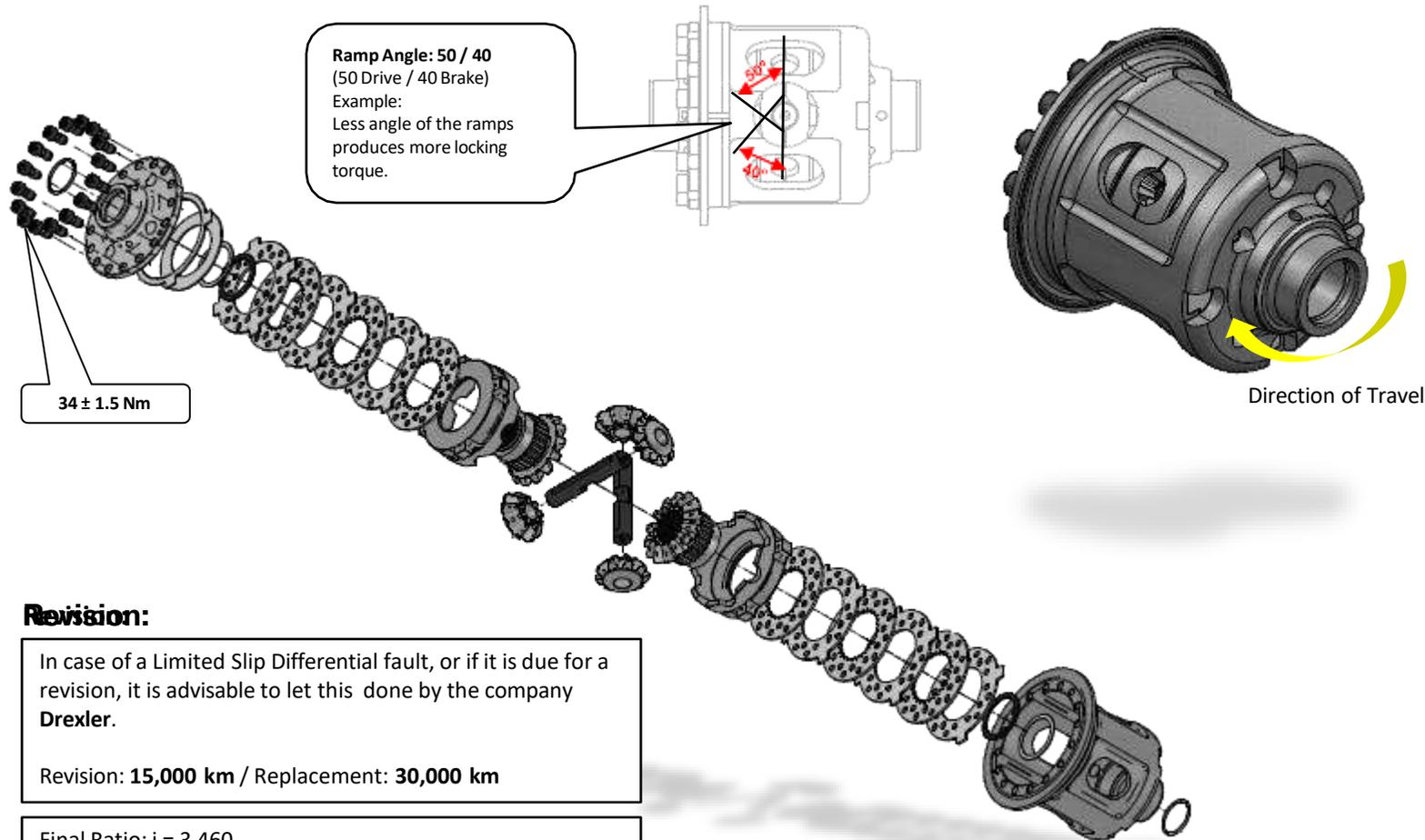
The Air Intake side of the Oil Cooler should be checked and cleaned regularly! To avoid any damage to the differential cooling pump / system, please note the following steps:

1. To achieve optimum results in cleaning the entire differential cooling system, please make sure the differential is warm enough before draining the used oil. Open and clean the filter system at the same time.
2. Before triggering the pump for bleeding purposes, make sure the fresh differential oil is pre-heated to at least 70°C / 158°F, even if the Clare's software allows the pump to be turned on when cold.
3. If the vehicle is operated at rear axle temperatures below the switch-on temperature of the differential pump, oil may be discharged via the breather.

3.2. FINAL DRIVE.

3.2.1. DIFFERENTIAL.

Limited Slip Differential (Drexler).



Revision:

In case of a Limited Slip Differential fault, or if it is due for a revision, it is advisable to let this done by the company **Drexler**.

Revision: **15,000 km** / Replacement: **30,000 km**

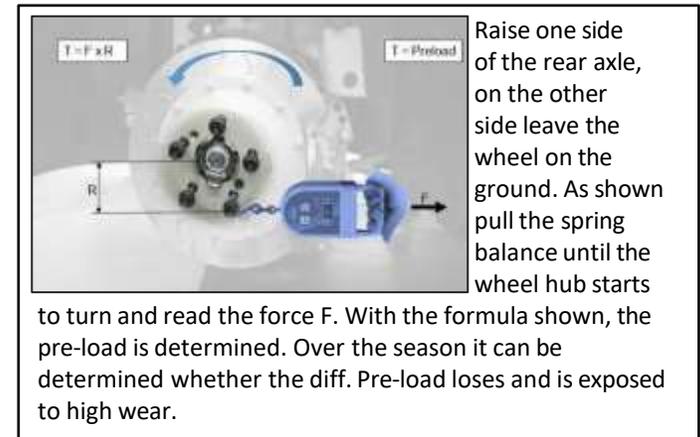
Final Ratio: $i = 3.460$

Pre-Load:

As the differential locking torque is improving the car handling on track, you should check the differential pre-load value at new condition and before every session.

When the pre-load changes too much during the season, this will reduce differential locking torque, which could provoke inner wheel spins and result in entry corner oversteer.

Preload (New condition): **50 – 70 Nm.**



3.2. FINAL DRIVE.

3.2.2. OIL SPECIFICATION.

List of approved oils and quantities:

Oil.	BMW Hypoid-Öl MSP/A Synthetik.	Running Time: 5000 km	
Bulk (Sales).	BMW-P/N: 8322 2365988	1 L – Can.	
Quantity.	1.0 L 0.9 – 1.0 L	Diff. Diff-cooler.	
Filter.	BMW-P/N: 3315 8324127		

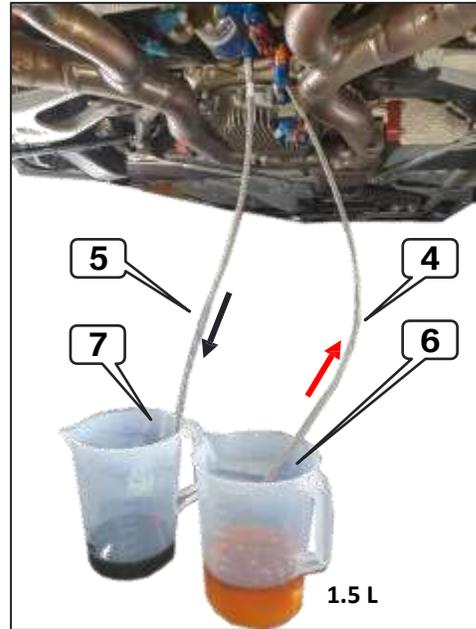
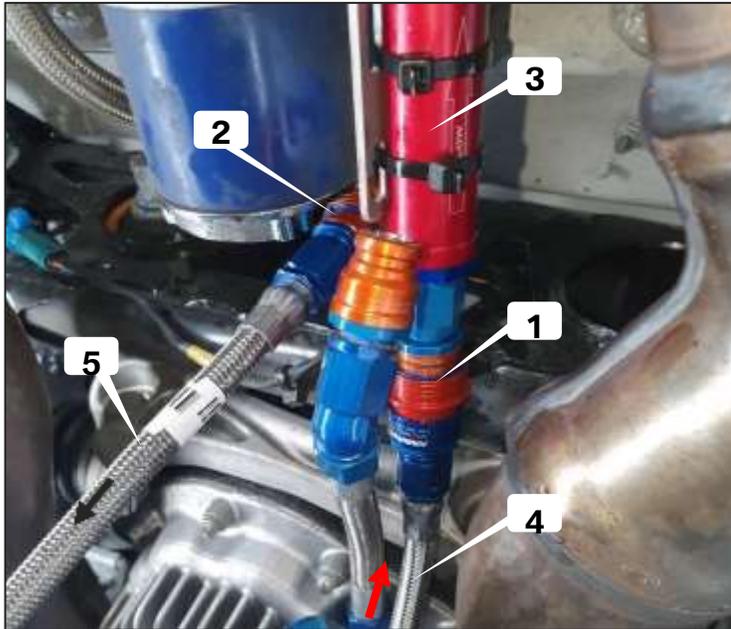
3.2. FINAL DRIVE.

3.2.3. OIL CHANGE.

General Notes.

Drain the differential oil with a suitable collection container and dispose it. Observe country-specific and organizer disposal regulations.

A. Diff. Cooler drain / -fill up:



Pos.	Part-No.	Qty.	Description
1	2314 8335851	1	High flow Coupling 06D Nipple
2	2314 8335852	1	High flow Coupling 06D Coupler
4+5	1612 8417143	2	Fuel drain pipe 06D



NOTICE

Use only approved transmission oil.
Failure to do so will result in serious damage to the final drive. Check Diff-Pump regularly at $T > 70^{\circ}\text{C}$.

1. Disconnect both quick-release couplings (cooler supply and return flow 1 + 2).
2. Remove the filter (3) and clean or replace it. Then reinstall the filter.
3. Cut the supply and return lines (4 + 5) to the required length and assemble with Krontec couplings (1 + 2).
4. Connect the prepared flow and return hoses (4 + 5) as shown in the picture - Flow = fresh oil (4), return = used oil (5).
5. Fill the measuring container (6) with 1.5 L fresh Diff. Oil (Min. Room Temp.).
6. Start the pump with the **MiDiS** diagnostic tool and the service function as shown (A). Alternatively, use an adapter cable and external battery.
7. Rinse the Diff. Cooler with fresh oil while the pump is running until approx. 1.5 L have run through. (Run Mocal pump not longer than 60 seconds in one go). Make sure that the pump never draws air.
8. Then stop the pump and immediately disconnect the couplings (1 + 2). The Diff.-Cooler is now rinsed and correctly filled.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

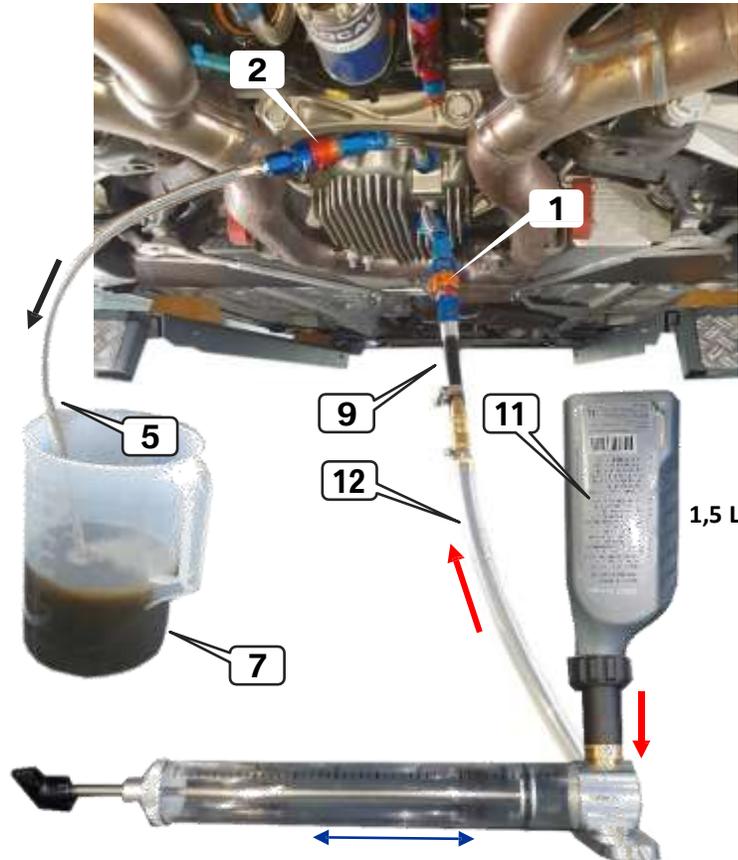
3.2. FINAL DRIVE.

3.2.3. OIL CHANGE.

General Notes.

Drain the differential oil with a suitable collection container and dispose it. Observe country-specific and organizer disposal regulations.

B. Diff.-Oil change:



NOTICE

Use only approved transmission oil.
Failure to do so will result in serious damage to the final drive. Check Diff-Pump regularly at $T > 70^{\circ}\text{C}$.

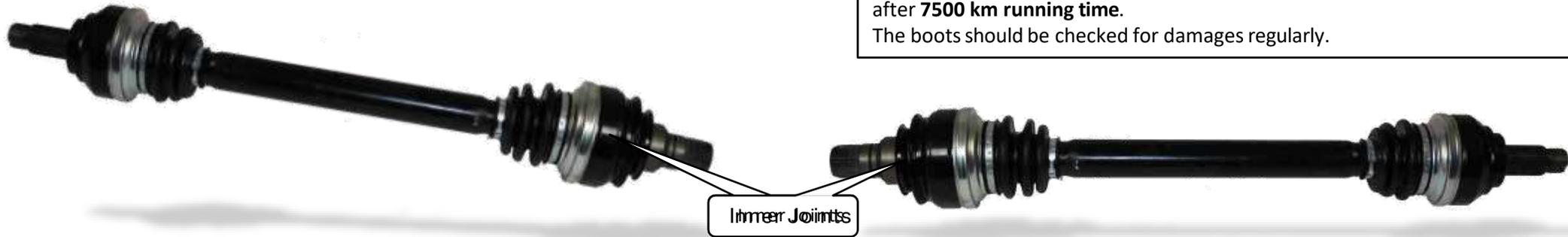
9. Open the banjo bolt (8) and drain oil from Differential. Oil should be as warm as possible.
10. Fit the banjo bolt (8) with new sealing rings after draining the oil. For tightening torque see Appendices F (Krontec).
11. Prepare the adapter pipe (9) as shown. Make the hose connection (arrow) out of pipe section (10).
12. Screw a new Diff.-Oil can (11) to the hand pump as shown.
13. Connect the adapter pipe (9) to the coupling (1). Connect hand pump hose (12) with adapter pipe (9).
14. Connect the return hose (5) to the coupling (2) and insert the end of the hose into the measuring container (7).
15. Pump with hand pump fresh oil (1.5 L) into the Diff. until oil exits at the return hose (5). Then allow the oil to drip off until no more oil comes out. Diff. is now correctly filled.
16. Then disconnect all flow and return hoses and reconnect couplings (1 + 2) with the original lines



Repair and maintenance work on the vehicle only with appropriate protective clothing.

3. DRIVETRAIN.

3.3. DRIVE SHAFTS.



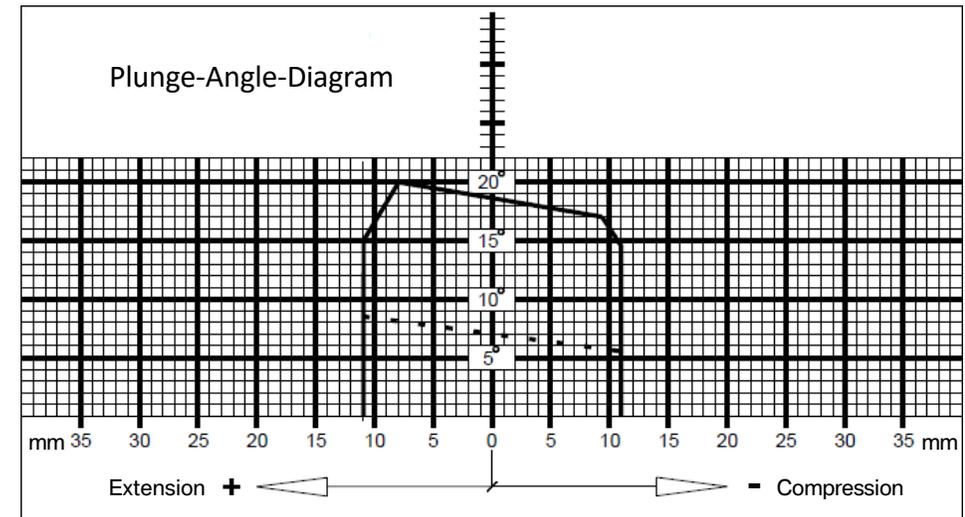
NOTICE

When installing new drive shafts, these should be bed in beforehand. Change after **7500 km running time**.
The boots should be checked for damages regularly.

Main Features: (compared to production level)

- Left inner joint on right output shaft. (Due to the Drexler Differential-Body).
- Changed production grease to **Krytox GPL217** (HT resistance).
- CV-Joints installed to low friction (durability).
- Boot ventilation inside and outside.

CV-Joints:



3. DRIVETRAIN.

3.3. DRIVE SHAFTS.

Driveshaft Tool 8442944

1. Coat all screws with copper paste.



2. Insert screws 8427181 in the tool and screw in as far as shown.



3. Attach the tool to the driveshaft as shown and screw together with 8427901 (20 Nm).



3. Turn the driveshafts until the screws 8427181 are aligned with the screws of the diff cover.



4. Tighten screws crosswise in 10 Nm steps with a torque wrench until driveshaft "pops out".



5. Please check the circlip groove for chips and remove them if necessary. Insert new safety clip.



6. Insert driveshaft again with a new safety clip and assemble in vice versa sequence.

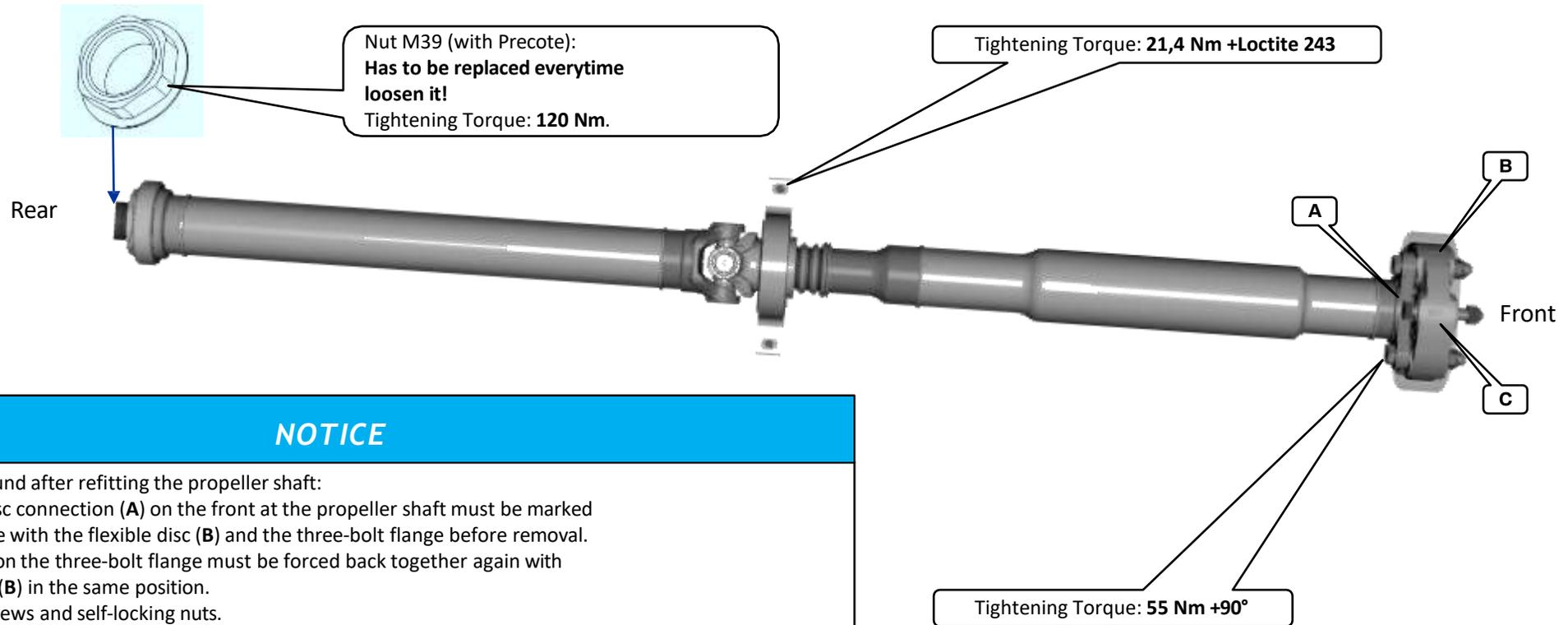


Repair and maintenance work on the vehicle only with appropriate protective clothing.

3. DRIVETRAIN.

3.4. PROP SHAFT.

Propshaft with reinforced center bearing for motorsport. Limitation of vibration loads by selected damping elements.

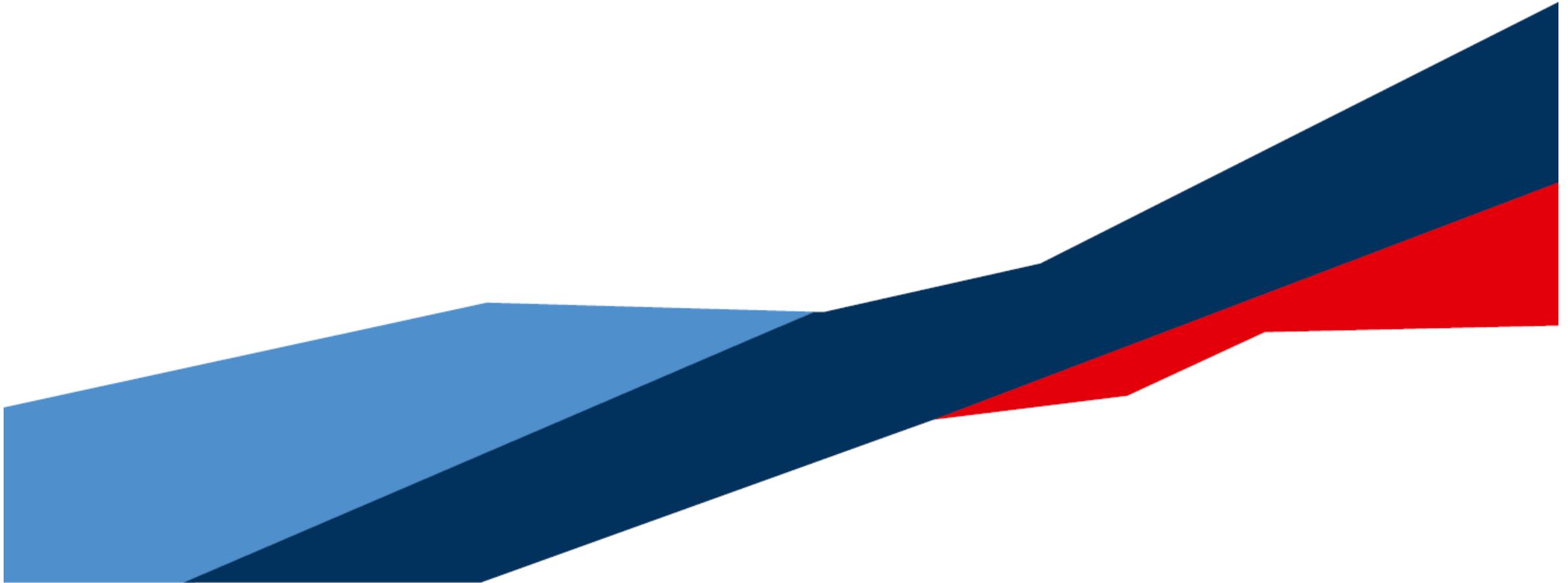


NOTICE

To avoid buzzing sound after refitting the propeller shaft:

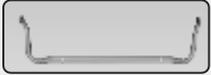
1. The flexible disc connection (A) on the front at the propeller shaft must be marked (C) in one plane with the flexible disc (B) and the three-bolt flange before removal.
2. During installation the three-bolt flange must be forced back together again with the flexible disc (B) in the same position.
3. Replace ZNS screws and self-locking nuts.
4. Incorrect assembly of the center bearing can lead to imbalance and damage to the drive shaft.
5. Running Time: 30,000 km.

4. SUSPENSION.



4.1. SPRINGS/ ANTI ROLL BAR.

4.1.1. SPECIFICATION.

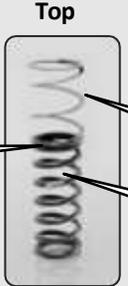
	Front		Rear	
	Part-No.	Code	Part-No.	Code
Main Spring Variants. 	3130 8416815 3133 7766685 3130 8431823	140-60-180 140-60-200 *(ZF-Nr. 001713000930) 140-60-220 *) at delivery	3350 8321018 3350 8321019 3350 8322138 3350 8342780 3350 8342781	170-60-170 170-60-180 170-60-190 * (ZF-Nr. 001713000936) 170-60-200 170-60-210 *) at delivery
Helper Spring. 	3130 8416816	ZF 080-005	3130 8416816	ZF 080-005
Anti Roll Bar. 	Ø 30 mm (dual adjustable)		Ø 26 mm (dual adjustable)	

Main Spring Code:

XXX – XX – XXX

- Non-compression length [mm]
- Inner - Ø [mm]
- Spring Rate [N/mm]

Mounting Position Front & Rear:



Support Platform

Helper

Main Spring

Helper Spring Code:

ZF XXX – XXX

- Spring Rate [N/mm]
- Non-compression length [mm]

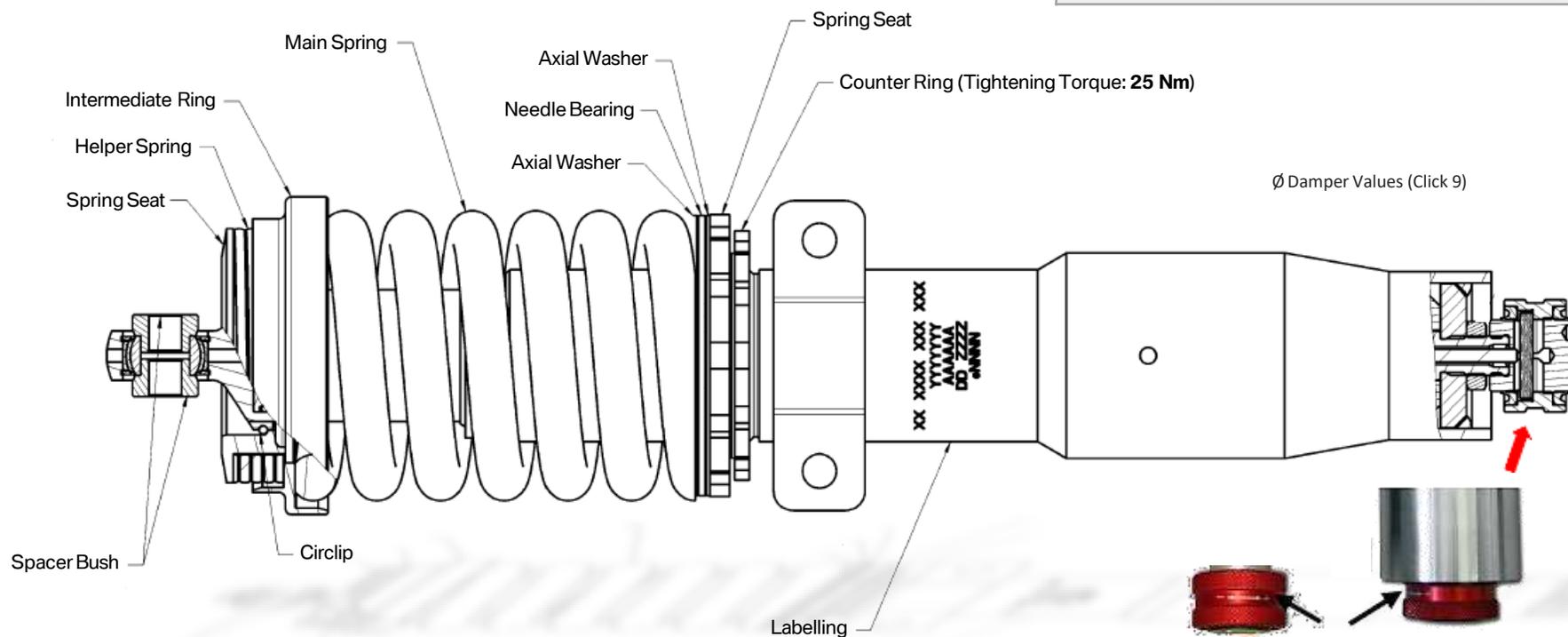
NOTICE

Please see chapter 4.2. too!

4.2. SHOCK ABSORBER.

4.2.1. FRONT DAMPER.

		Ø Damper Values (Click 9)							Units	
Zug	rebound	Measurement Velocity	0	0.026	0.052	0.131	0.262	0.393	0.524	m/s
		mid	0	-165	-300	-970	-2465	-3075	-3450	N
Druck	bump	Measurement Velocity	0	0.026	0.052	0.131	0.262	0.393	0.524	m/s
		mid	0	235	445	1370	2050	2450	2780	N



Mounting Position:



Adjustment for different settings and definition of counting mode:

1. Turn the adjusting wheel in clockwise direction "+" until it is no longer possible to turn it without increased effort!
 2. Further procedure: Turn the adjusting wheel carefully in the direction of "-" until the first click is felt.
-> this first noticeable engaged click defines the wording click 1!
 3. to adjust the damping forces and thus the desired setting, turn the adjusting wheel until you reach the desired setting in counterclockwise direction "-".
- Every noticeable click is added to click 1 described in step 2!

Adjustment: 20 Clicks.
Harder clockwise (+).
Softer counterclockwise (-).

The adjuster has min. defined 20 clicks:
Max. Pos. = click 1
Min. Pos. = click 20

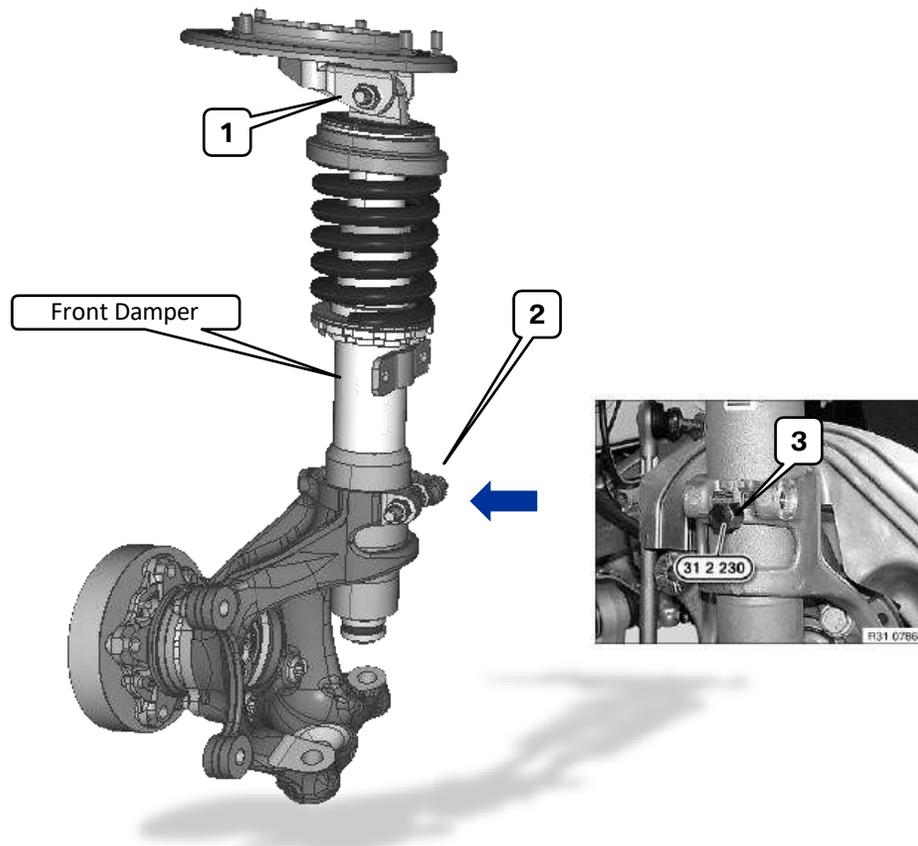
1-way adjustable.

Weight	6100 g
Max. Stroke	101 +/- 2 mm
Service	every 5000 km

4.2. SHOCK ABSORBER.

4.2.1. FRONT DAMPER.

Damper Fitting:



The shock absorbers of the front axle can be removed by loosening the screw-nut connections (1 - 2) as shown and spread swivel bearing with special tool (3), align it based with the gap on the rear side of the spring strut and push upwards.

Pos.	Description	Qty. (per Damper)	Tightening Torque
1	Hex Bolt M10 x 50	1	56 Nm
2	Hex Bolt M10 x 80	1	56 Nm
Special Tool			
3	Spreader*	1	T/N 8330 0494541

*) Use Spreader to prevent risk of wheel carrier cracking.



CAUTION

Follow safety instructions for lifting the car!

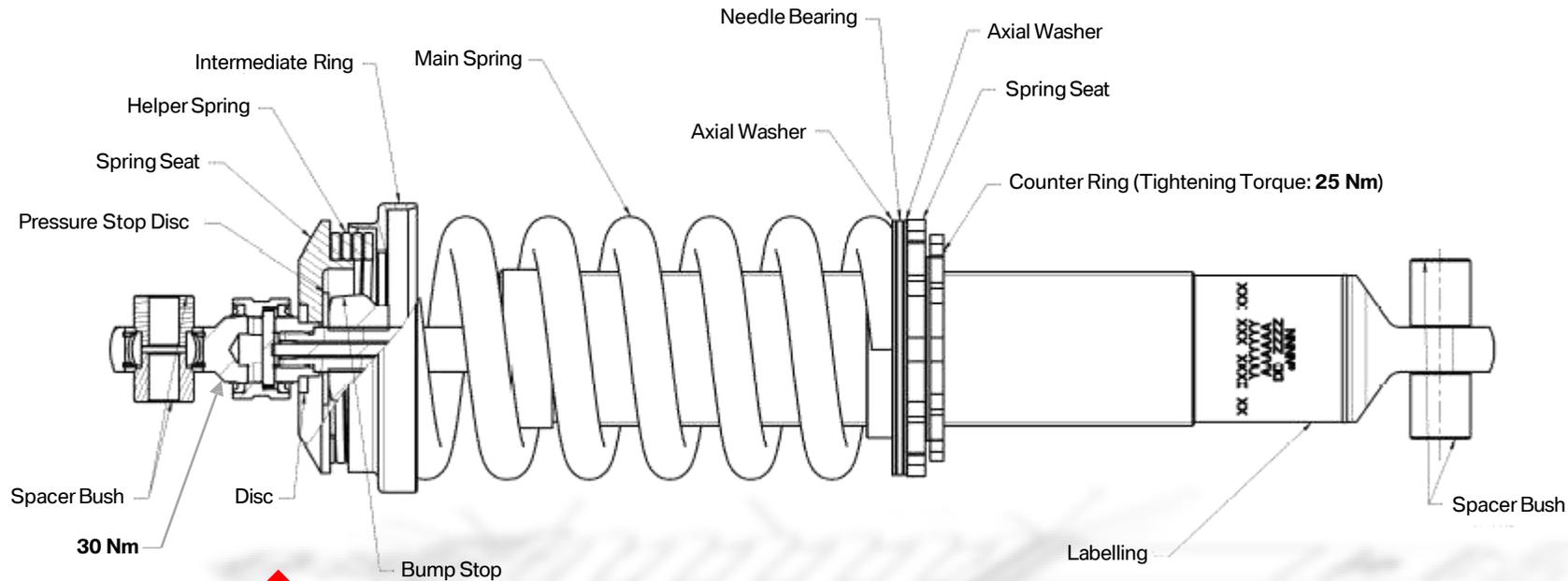
NOTICE

The dampers and fittings must be checked regularly.

4.2. SHOCK ABSORBER.

4.2.2. REAR DAMPER.

		Ø Damper Values (Click 9)							Units
Zug	Measurement Velocity	0	0.026	0.052	0.131	0.262	0.393	0.524	m/s
	mid	0	-170	-470	-890	-1145	-1355	-1550	N
Druck	Measurement Velocity	0	0.026	0.052	0.131	0.262	0.393	0.524	m/s
	mid	0	250	670	1135	1675	2080	2460	N



Mounting Position:



Adjustment: 20 Clicks.
Harder:
clockwise (+).
Softer: counterclockwise (-)

The adjuster has min. defined 20 clicks:
Max. Pos. = click 1
Min. Pos. = click 20



Adjustment for different settings and definition of counting mode:

1. Turn the adjusting wheel in clockwise direction "+" until it is no longer possible to turn it without increased effort!
2. Further procedure: Turn the adjusting wheel carefully in the direction of "-" until the first click is felt.
-> this first noticeable engaged click defines the wording click 1!
3. to adjust the damping forces and thus the desired setting, turn the adjusting wheel until you reach the desired setting in counterclockwise direction "-".
Every noticeable click is added to click 1 described in step 2!

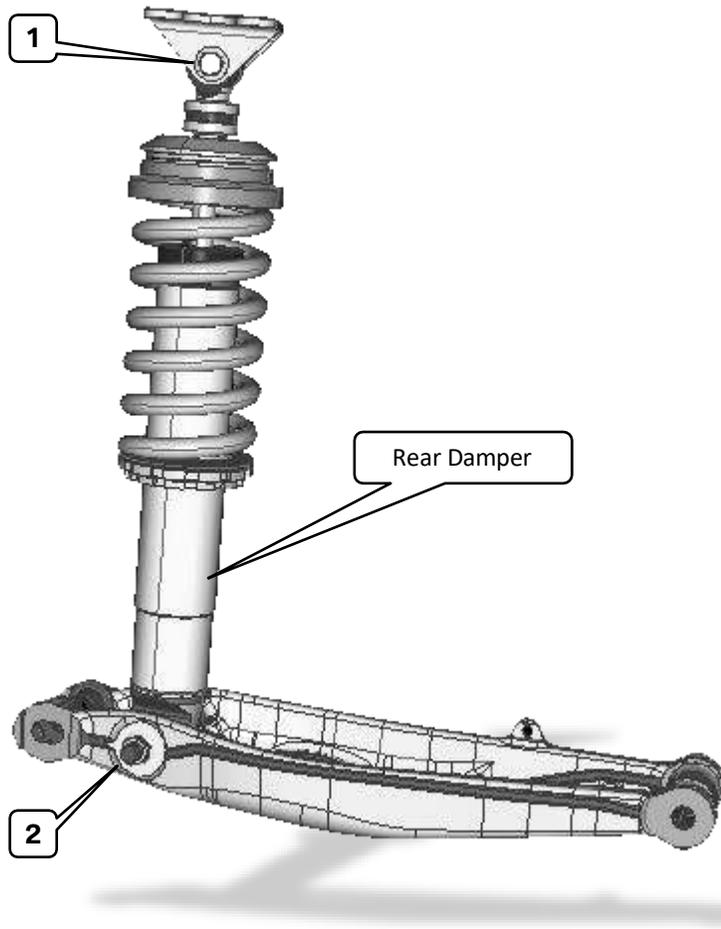
1-way adjustable.

Weight	5600 g
Max. Stroke	107 +/- 2 mm
Service	every 5000 km

4.2. SHOCK ABSORBER.

4.2.2. REAR DAMPER.

Damper Fitting:



The shock absorbers of the rear axle can be removed by loosening the screw-nut connections (1 - 2) as shown.

Pos.	Description	Qty. (per Damper)	Tightening Torque
1	Hex Bolt M10 x 70	1	56 Nm
2	D2 Schraube HA (Bolt)	1	80 Nm



CAUTION

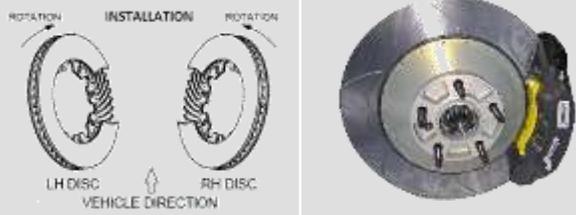
Follow safety instructions for lifting the car!

NOTICE

The dampers and fittings must be checked regularly.

4.3. BRAKES.

4.3.1. SPECIFICATION.

At delivery:	Front	Rear
Brake Caliper:	6-Piston Caliper (Alcon) Max. Temp.: 200°C (car on track) 365 HP: P/N: 3410 8438069/70 450 HP: P/N: 3410 8428733/34 	4-Piston Caliper Max. Temp.: 200°C (car on track) 365 HP: P/N: 3421 8091281/82 – BMW 450 HP: P/N 3420 8328259/60 - Alcon 
Tightening Torque:	Caliper on Caliper Bracket: 365 HP: P/N: 3410 8323912 + 3410 8328057; 110 Nm 450 HP: P/N: 3410 8323912; 110 Nm Caliper Bracket on Carrier:* 365 HP + 450 HP: P/N: 3410 6864424; 80 Nm + 55° - Loctite 243 	Caliper on Carrier:* 365 HP: P/N: 3420 6864424; 80 Nm + 55° - Loctite 243 Caliper on Caliper Bracket: 450 HP: P/N: 3420 8328318; 110 Nm Caliper Bracket on Carrier:* 450 HP: P/N: 3420 6864424; 80 Nm + 55° -Loctite 243 
Brake Discs:	Machine pre-bedded discs are recommended: 365 HP: Ø 380 x 35.6 mm 450 HP: Ø 390 x 35.6 mm Thickness new: 35.6 mm Thickness min: 34.6 mm (0.5 mm wear per side) 	365 HP: Ø 380 x 28 mm Thickness new: 28.0 mm Thickness min: 27.5 mm (0.25 mm wear per side) 450 HP: Ø 355 x 32 mm Thickness new: 32.0 mm Thickness min: 31.0 mm (0.5 mm wear per side) 
Brake Pads:	Sprint: P/N: 3410 8328281 (Pagid RSL-29) Endurance: P/N: 3410 8324148 (Endless ES99G) 450 PS: T/N: 3410 8328305 450 PS: T/N: 3410 8342783 (Endless)	Sprint: P/N: 3420 8328283 (Pagid RST-D1) Endurance: P/N: 3420 8328222 (Endless ES88G) 450 PS: T/N: 3420 8328320 450 PS: T/N: 3420 8328304 (Endless)
Brake Cooling Ducts:	Direct	Indirect (Air mouth)
Mastercylinder:	Series brake booster with master brake cylinder adapted for motorsport (i = 5) P/N 3420 8328141	
Brake Fluid:	Castrol SRF Racing (P/N: 3430 2483651)	

*) No Copper Paste

4.3. BRAKES.

4.3.2. REMARKS.

Brake bleeding:

1. Pressurize the brake pedal.
2. Open the outer bleed screw of a front and rear caliper (RR / FR) and slowly depress the pedal to avoid fluid aeration, using the full master cylinder stroke.
3. Close the bleed screws and let the pedal return fully to its original position to allow the master cylinder to recuperate fresh fluid from the reservoir. Repeat the procedure and ensure that there is always enough brake fluid in the reservoir. Do not allow the pedal to snap back, use a controlled rate of return. Rest for 5 seconds to allow the master cylinder to re-fill. Top up the reservoir as required. Repeat until no air is visible in the bleed tube.
4. Repeat sections 1 - 3 for the inner bleed screws of the front and rear caliper until no air is visible in the bleed tube.
5. Repeat sections 1 - 4 on the other side of the car (RL / FL).
6. When bleeding has been completed, the pistons must be re-set by pushing each piston back into the bore by a small amount. When the brakes are next applied, the pistons will move forward to contact the pads, which will energize the seals. When the brakes are released and pressure has decayed to zero, the seals will retract the pistons. Failure to create forward movement of the pistons may lead to off-brake drag.

Note: After each practice, it is recommended to bleed the system, and change the brake fluid after each race.

Pad changing:

1. Thoroughly clean the protruding pistons with brake cleaner before pushing the pistons back to fit new pads. Scotchbrite or similar abrasives should not be used.
2. Note the importance of cleaning pistons during a pad change, to prevent debris being deposited in the seal / piston interface as pistons are pushed back. Debris will reduce seal to piston friction, and have an adverse effect on piston retraction.



WARNING

Calipers must be regularly inspected for leaks and damage. Temperatures must be monitored at all times to prevent overheating.



CAUTION

New brake pads (front & rear) paired with already used brake discs must be driven in before! Risk of cracks!

4.3. BRAKES.

4.3.2. REMARKS.

Brake disc temperature:

In general discs should run at similar temperatures from left to right as dissimilar temperatures may lead to braking induced steering pull. Temperature balance can be checked as soon as the car stops in the pit lane using an infrared thermometer or a handheld thermocouple probe with digital readout. Significant left to right differences should be investigated. This measurement is not representative for the disc operating temperatures as high values decay rapidly with respect to time when the brakes are not applied. Circuit layout and/or pit lane length can significantly influence the measured temperature once the car has stopped, so should not be used as an indicator for correct operating temperature. Under racing conditions we recommend disc internal temperatures should normally be maintained in the range 400°C to 600°C. Disc rubbing face temperatures run significantly higher than internal and should not exceed the maximum recommended for a given friction material. An effective method of checking maximum disc operating temperature is by using temperature paints applied to the disc outer diameter or rim and across the cooling vane. Each disc has three paint colours applied, Green (changes to White at 450°C), Orange (changes to yellow at 550°C) and Red (changes to white at 630°C). When assessing brake temperatures it is important to complete several successive laps under race conditions to allow disc temperatures to stabilise at a representative level. Typically when running within the correct temperature range the Green paint will turn throughout, the Orange paint 50% to 100% throughout and the Red paint will turn on each disc cheek with a slight propagation in to the cooling vane region. If the Red paint blows throughout, this disc has run too hot and additional brake cooling should be applied. Over-cooling should be avoided as this can also affect disc durability. High surface and cheek temperature, represented by the red paint turning white for the full 'cheek' thickness, combined with an excessive amount of orange paint remaining on the cooling vane, will increase the internal stresses in the disc and result in reduced durability. In such an instances it is appropriate to reduce the effectiveness of cooling devices and/or aerodynamic brake cooling features and to a point where some red paint remains on the cooling vane post-adjustment.

Caliper temperature:

Operating temperatures should be kept below 180°C. If using Alcon caliper temperature stickers, this would mean not exceeding the 188°C / 370°F value (4th box). However, if the running temperatures are 180°C you should expect that 'heat soak' when coming to a stop in the pits, will lead to an increase in caliper temperature before temperatures begin to fall. This 'heat soak' may turn another box to black on the sticker and because it represents a short duration event, is acceptable. Caliper temperature stickers are 'single use', so once turned to 210°C / 410°F should be replaced at the earliest opportunity.



To achieve the optimum brake disc temperatures, the blanking of only the lower ducts should be done on the 365 BHP version due to caliper cooling by the upper ducts.



Green paint turns to white at: 450 °C
Orange paint turns to yellow at: 550 °C
Red paint turns to white at: 630 °C
(based on 10 min continuous exposure time)



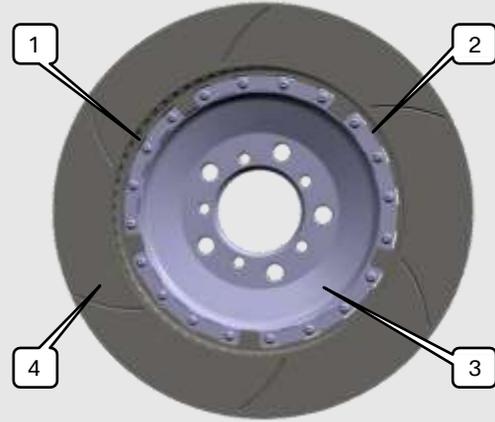
Temp. strip on caliper.

4.3. BRAKES.

4.3.2. REMARKS.

Brake Disc fitting:

- 1 20 x Fixing Bolt M5x0.8x12 (P/N 8323911).
Tightening Torque: **8-9 Nm**.
- 2 5 x Retaining Strap (P/N 8323913).
- 3 Brake Bell (P/N 8323914).
- 4 Brake Disc.



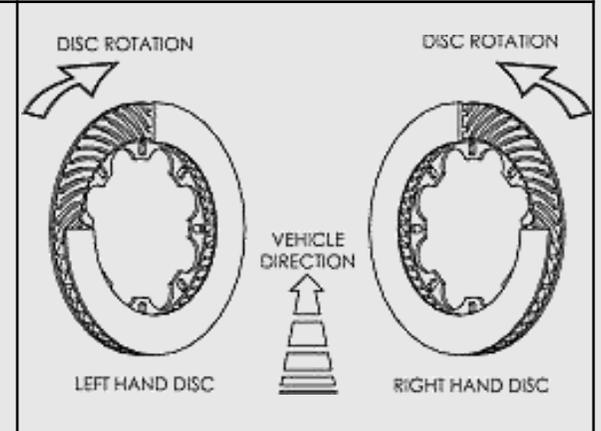
Tightening Sequence:

First, nip all bolts together with the straps to the bell.

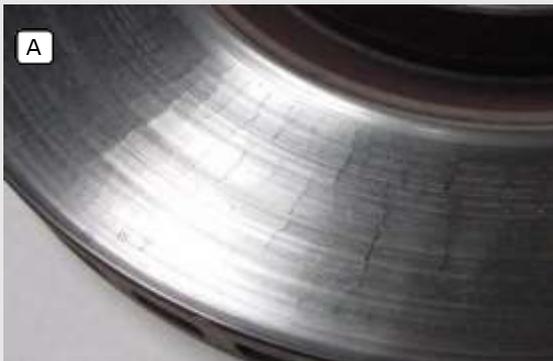
Then tight the inner 2 bolts per strap first, after the outer 2 bolts on each strap.

Tighten the straps crosswise.

Note: Make sure that the free movement of the brake disc is guaranteed at all times.



Brake Disc Lifespan:



It's not uncommon to see tiny heat cracks (**Fig. A**) after one day or even after a session on the track. They are a natural result of the iron expanding and contracting with the massive temperature swings experienced at the track under braking.



But, if you ever see any cracks (**Fig. B**) on the outer edge (OD) and/or inner edge (ID) where the disc attaches to the bell, then **you should immediately replace the discs**. If any cracks in the disc face appear to go the entire way through the disc face, the disc should be replaced immediately. Please also check the brake disc bells, it is especially important if there is a lot of braking with ABS.

4.3. BRAKES.

4.3.2. REMARKS.

Brake Disc – Spare Parts Overview:

BMW P/N	Description	Bedding suffix
365 HP Version		
(bedded with Pagid RSL29 8328281)		
3410 8328173	BRAKE DISC FRONT (LH – Pagid)	P9
3410 8328174	BRAKE DISC FRONT (RH – Pagid)	P9
(bedded with ENDLESSE599G 8324148)		
3410 8342921	BRAKE DISC FRONT (LH – Endless)	E10
3410 8342922	BRAKE DISC FRONT (RH – Endless)	E10
450 HP Version		
(Spare disc - bedded)		
(bedded with Pagid RSL29 8328305)		
3410 8328273	BRAKE DISC FRONT (LH – 450 HP – Pagid)	P9
3410 8328274	BRAKE DISC FRONT (RH – 450 HP – Pagid)	P9
(bedded with Endless ES99G 8342783)		
3410 8342869	BRAKE DISC FRONT (LH – 450 HP – Endless)	E10
3410 8342870	BRAKE DISC FRONT (LH – 450 HP – Endless)	E10
(bedded with Pagid RSL D1 8328320)		
3420 8328275	BRAKE DISC REAR (LH – 450 HP – Pagid)	P14
3420 8328276	BRAKE DISC REAR (RH – 450 HP – Pagid)	P14
(bedded with Endless ES88G 8328304)		
3420 8342871	BRAKE DISC REAR (LH – 450 HP – Endless)	E16
3420 8342872	BRAKE DISC REAR (LH – 450 HP – Endless)	E16



NOTICE

Only bedded brake pad- / brake disc combinations are to be used, as specified in the table beside.

4.4. RIMS & TYRES.

4.4.1. RIMS / WHEEL NUTS.

	Front Axle	Rear Axle	
Rims.	10.5J x 18 (Offset 46) P/N: 3610 8324178 9.5 kg Can only be used with the following wheel spacers: Front: 3120 8328080 Rear: 3340 8328081		
Remark: The rims for the front- and rear axle are equal!			
Wheel Nuts.	20 x Wheel nut coated. P/N: 3610 8431620 Tightening Torque: 120 Nm.		
Studs.	Front: 10x Studs P/N: 3600 8328085 Rear: 10x Studs P/N: 3600 8328079 Tightening Torque: 120 Nm + Loctite 648 + lock paint. Stud replacement: Degrease the thread on the studs and wheel hub with Loctite Cleaner and screw in the studs with a suitable stud driver, making sure the thread lock is evenly distributed.		

4.4. RIMS & TYRES.

4.4.2. TYRES.

	Make	Typ	Size	Diameter* [mm]	CIRC π D* [mm]
MOTORSPORT	Michelin	S7L (Slick)	27/65 - 18	648	1990
	Michelin	S8L (Slick)	27/65 - 18	648	1990
	Michelin	S9L (Slick)	27/65 - 18	648	1990
	Michelin	P2L (Regen)	27/65 - 18	652	2048

*) All manufacturer's specifications are subject to change without notice.

NOTICE

The participants are responsible for ensuring that the tires of their vehicles are used at all times during a racing event correspond with the sporting and technical regulations of the respective racing series. The obligation to provide proof of this rests solely with the participants.

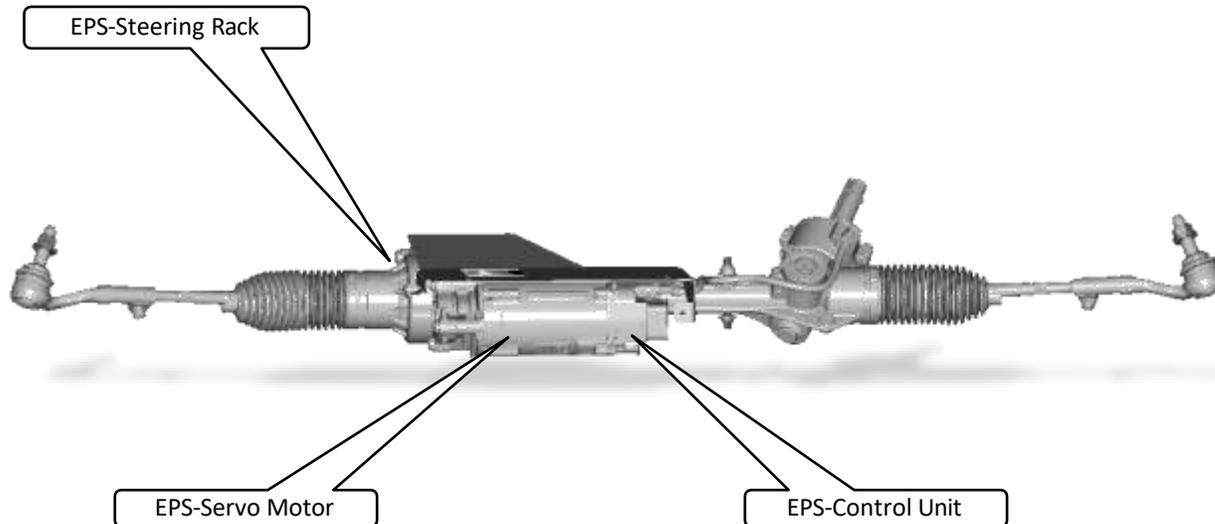
4.5. STEERING.

4.5.1. EPS.

The electromechanical power steering (EPS) supports the driver by means of an electric servomotor rather than by a hydraulic drive. The servomotor is only active when steered. As a result, the servo motor does not absorb any power during at straight line.

The EPS control unit is part of the EPS unit. The EPS unit also includes the servomotor. In the EPS control unit, several maps for the power steering, active steering wheel reset and the damping characteristics are stored. The values calculated from the input variables together with the respective maps provide the necessary steering support.

Remark: In case of a failure of the electromechanical power steering support, the pure mechanical steering of the vehicle remains unchanged!



WARNING

Steering re-adjustment:

At Battery Disconnect (**Main Switch Off**) and after replacing the steering, the end stops of the steering gear must be learned new. Incorrectly learned end stops can lead to DSC errors and a sudden loss of the steering support in the end stops. The following conditions must be met when learning the end stops:

1. Vehicle is on level surface. Front wheels are free for steering movements.
2. Main switch On. Brake pedal is not pressed and the parking lock is not applied.
3. No error memory entry in Dynamic Stability Control (DSC).
4. Steering wheel is in straight forward position.
5. Ignition must be on (1x Press on Start/Stop, brake pedal is not pressed).
6. Engine Start by pressing Start/Stop again (this time with pressed brake pedal).
7. To learn the end stops, the steering wheel must be turned 2x completely once left and right. The steering speed must be below 1 steering wheel rotation per second. At the end stops increase slowly the steering force until the steering wheel no longer rotates.
8. Then release the steering wheel into the center position.

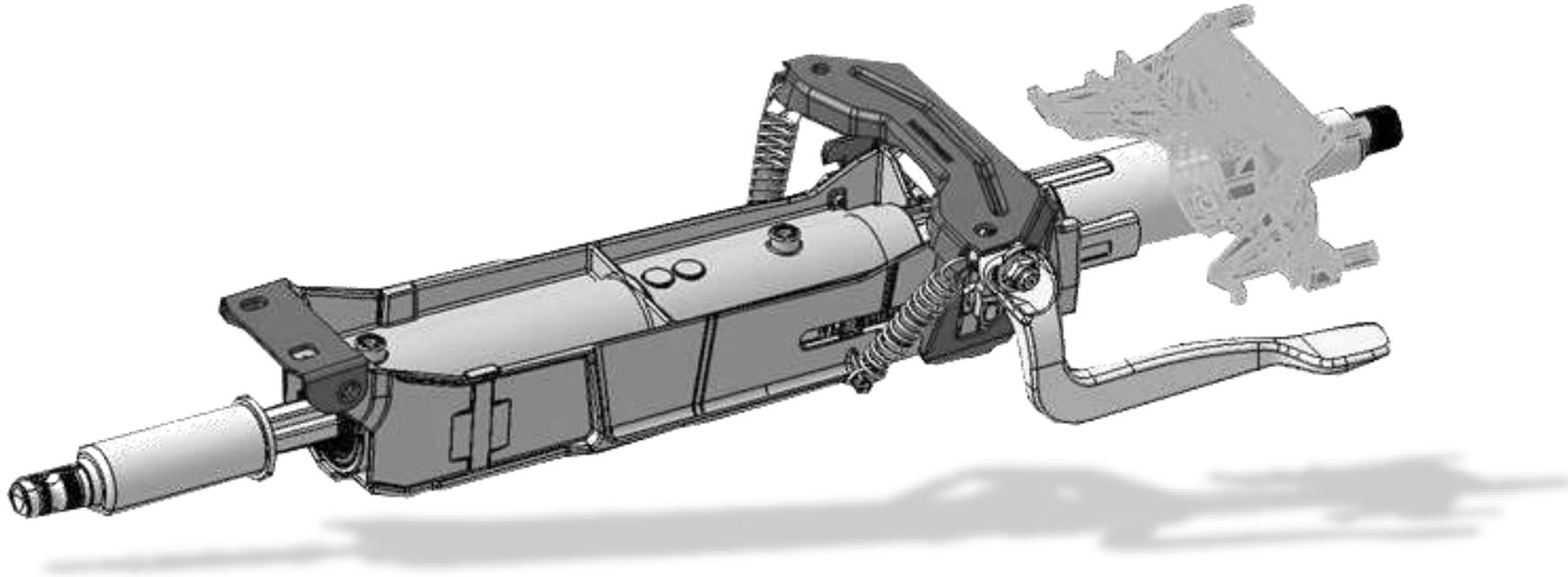
NOTICE

Regularly check the fixation bolts tightness of the steering rack to the sub-frame.
Tightening Torque: **56 Nm + 90°**.

4.5. STEERING.

4.5.2. STEERING COLUMN.

Amount Steering Column.
(at Replacement).

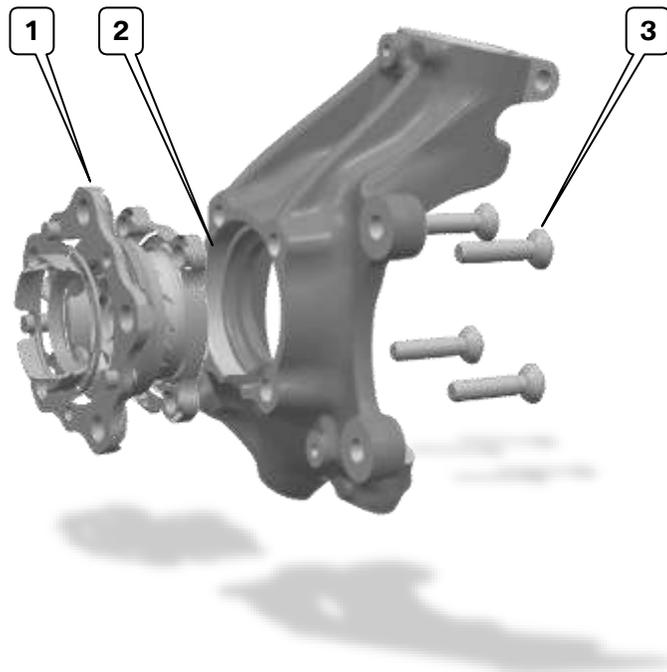


Repair and maintenance work on the vehicle only
with appropriate protective clothing.

Part-No.	Description
3230 6858559	ZB LENKSAEULE

4.6. FRONT & REAR AXLE.

4.6.1. FA WHEEL BEARING.



The wheel bearing unit is fitted separately to the wheel carrier by means of four bolts.

This bearing integration offers the advantage that the bearing replacement can be carried out more quickly and easily on the vehicle. In addition, the wheel bearing is less sensitive to temperature changes.

Wheel Bearing Change:

- Remove wheels.
- Remove brake disc and caliper.
- Check wheel sensors for damages.
- Remove the 4 bolts (3) from the wheel bearing unit (1) and remove the wheel bearing unit.
- Install the new wheel bearing unit (1) in the reverse order (use new bolts (3)).



CAUTION

Follow safety instructions for lifting the car!

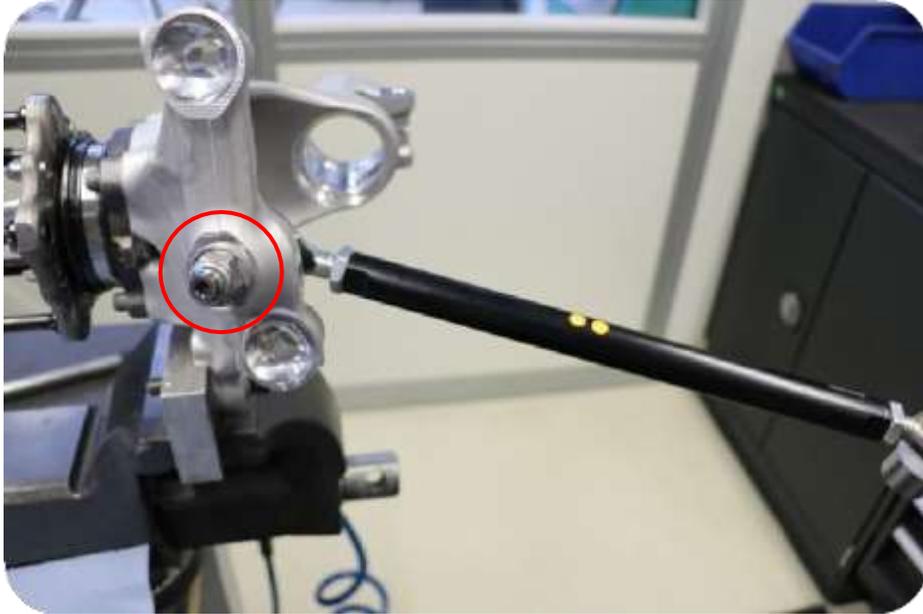
Pos.	Description	Part-No.	QTY. (*)	Tightening Torque / Runtime / Remarks
1	Wheel bearing unit	3120 7857506	1	Running Time: 7500 km.
2	Contact patch	-	1	Keep clean and grease free.
3	Bolt M12	3120 6872920	4	120 Nm + 90° + Loctite 270 + lock paint (Replace bolts always).

(*per wheel bearing)

4.6. FRONT & REAR AXLE.

4.6.2. FASUS.ARMS.

Fitting.



Screw the tension arm to the wheel carrier (middle position).

Note installation side!

Left: ● ●

Right: ●

Tightening Torque: **175 Nm + Loctite 243 + lock paint**



Screw the suspension arm to the wheel carrier (rear position).

Note installation side!

Left: ○ ○

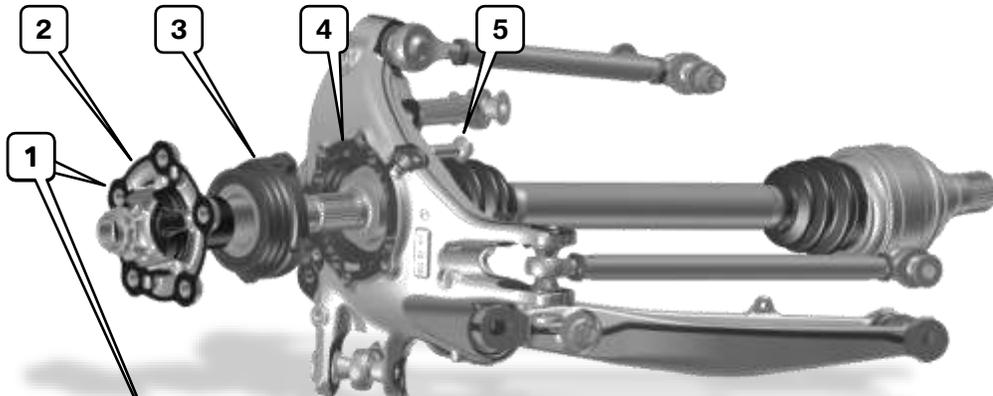
Right: ○

Tightening Torque: **175 Nm + Loctite 243 + lock paint**

4.6. FRONT & REAR AXLE.

4.6.3. RA WHEEL BEARING.

The wheel bearing unit is fitted separately to the wheel carrier by means of four bolts. This bearing integration offers the advantage that the bearing replacement can be carried out more quickly and easily on the vehicle. In addition, the wheel bearing is less sensitive to temperature changes.



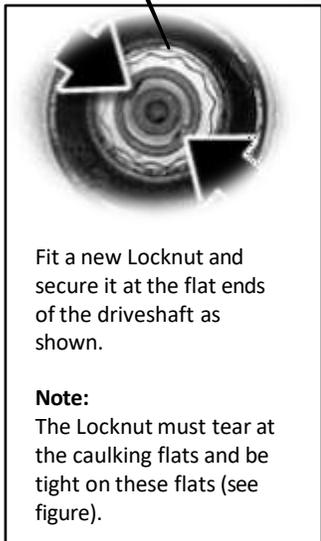
Wheel bearing replacement:

- Remove wheels.
- Before, just loosen the collar nut (1).
- Remove brake disc and caliper.
- Check wheel sensors for damages.
- Remove the 4 bolts (5) from the wheel bearing unit (3) and remove the wheel bearing unit.
- Check driveshaft journal teething.
- Press the wheel bearing unit (3) off the driving flange (2) using a commercially available press (7).
- Re-press the new wheel bearing unit (3) (do not use the removed wheel bearing again).
- Install the new wheel bearing unit (3) in the reverse order (use new bolts (5)).
- Tighten the new collar nut according to the instruction (1).



CAUTION

Follow safety instructions for lifting the car!



Fit a new Locknut and secure it at the flat ends of the driveshaft as shown.

Note:
The Locknut must tear at the caulking flats and be tight on these flats (see figure).



Before the wheel bearing including the hub can be dismantled, the driveshaft must be pressed out with a tool (P/N: 8164 2155744).

Pos.	Description	Part-No.	QTY. (*)	Tightening Torque / Runtime / Remarks
1	Collar Nut M27.	3341 1133785	1	300 Nm + Loctite 270 (Replace nut always).
2	Mitnehmerflanschnabe.	3340 2283220	1	
3	Wheel bearing unit (HT-Grease).	3340 8431635	1	Running Time: 5000 km.
4	Contact patch.	-	1	Keep clean and grease free.
5	Bolt M12x30	3340 2284592	4	80 Nm + 90° + Loctite 270 (Replace bolts always).
6	Multipol-Impulsring.	-	1	Do not damage. Has to show to vehicle centre line.
7	Press.	-	1	Commercial.
8	Press Tool	8164 2155744	1	

(*per bearing)

4.7. SETUP.

4.7.1. GENERAL.

Measurement Setup:



Car Dry Weight.	[kg]	measured
Dummy Driver Weight.	[kg]	80
Setup Fuel (incl. CatchTank).	[kg]	45
Setup Wheel Diameter, front/rear.	[inch]	18
Tyre Pressure	bar	2.0

Setup Procedure:

A basic measurement setup generally consists of the following components:

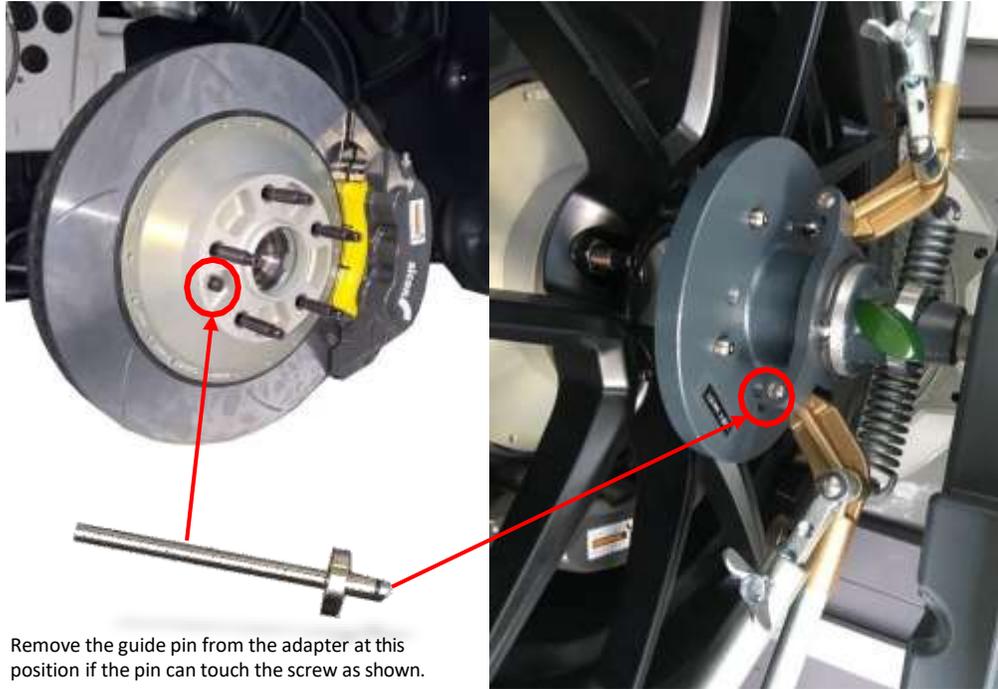
- Setup Table.
- Corner Weight Scales.
- Setup Wheels.
- Turn Tables.
- Toe- / Camber Equipment.

1. Ensure the car is always in the same conditions for setup and setdown.
2. Bodywork is either fully mounted or compensation weights are fitted.
3. Always the same people should bounce the car and measure.
4. Ensure the Steering Wheel is always straight.
5. Front and Rear Anti Roll Bars are disconnected.
6. Basically, chassis parts should always be tightened under 1G conditions (wheels on the ground).

4.7. SETUP.

4.7.1. GENERAL.

BMW Quick Clamping Device: P/N 8133 0433150:



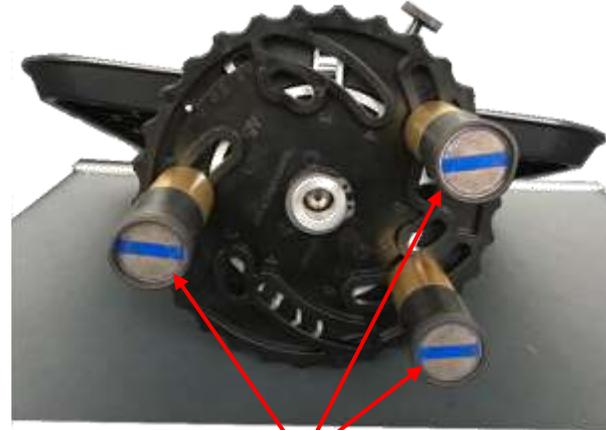
Remove the guide pin from the adapter at this position if the pin can touch the screw as shown.



NOTICE

When using the quick clamp device, profiled tires on the same rim size should preferably be used.

BMW KDS 3D Magnetic Holder:
(In Kit included)



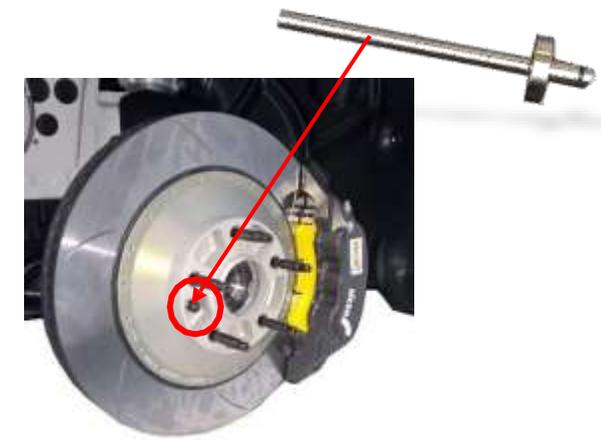
Magnets



BMW KDS II Hunter Quick Clamping:
(In Kit included)



Remove the guide pin from the adapter at this position if the pin can touch the screw as shown.

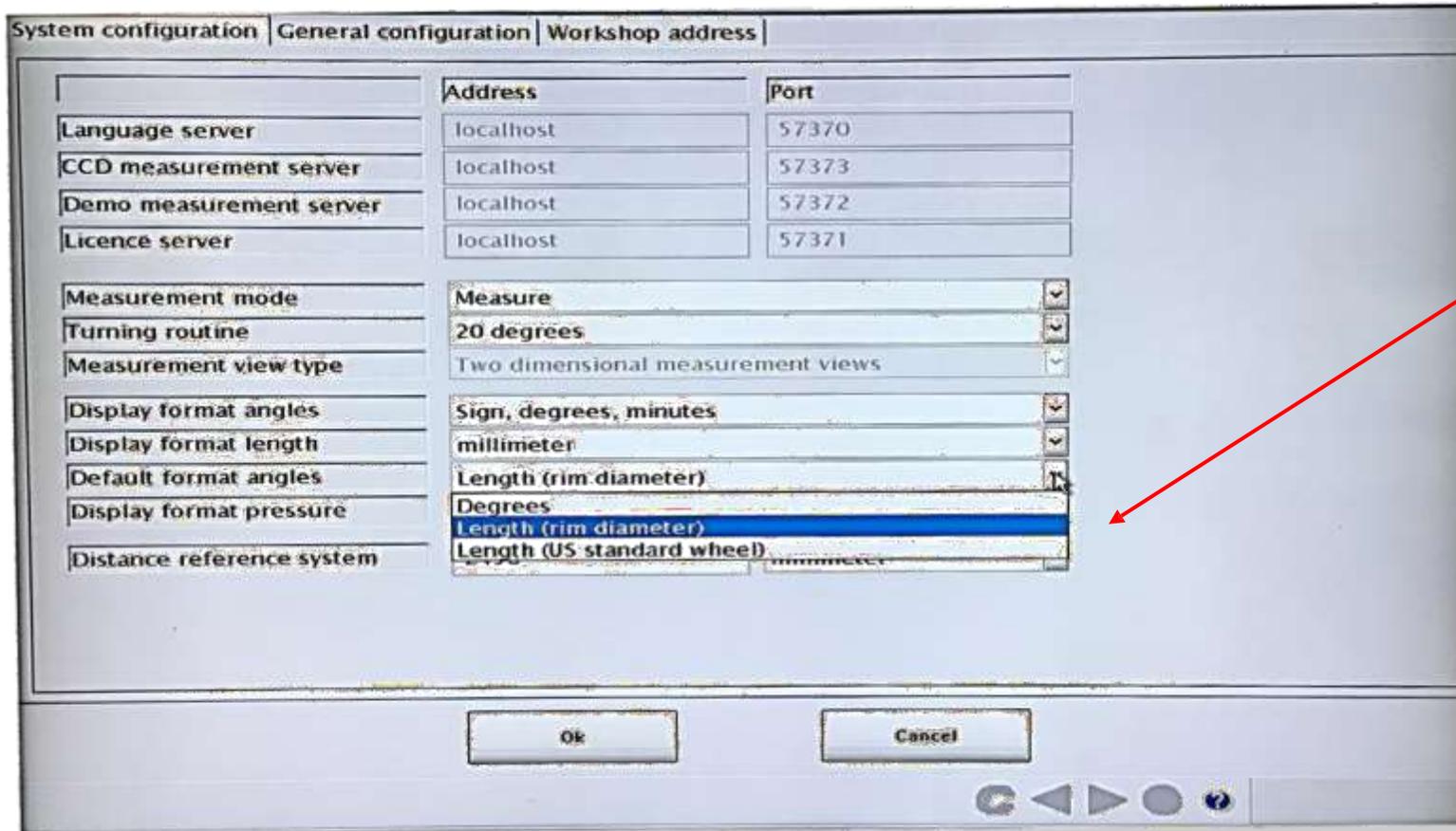


4.7. SETUP.

4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

1. Select wheel angles (e.g. toe) in mm.



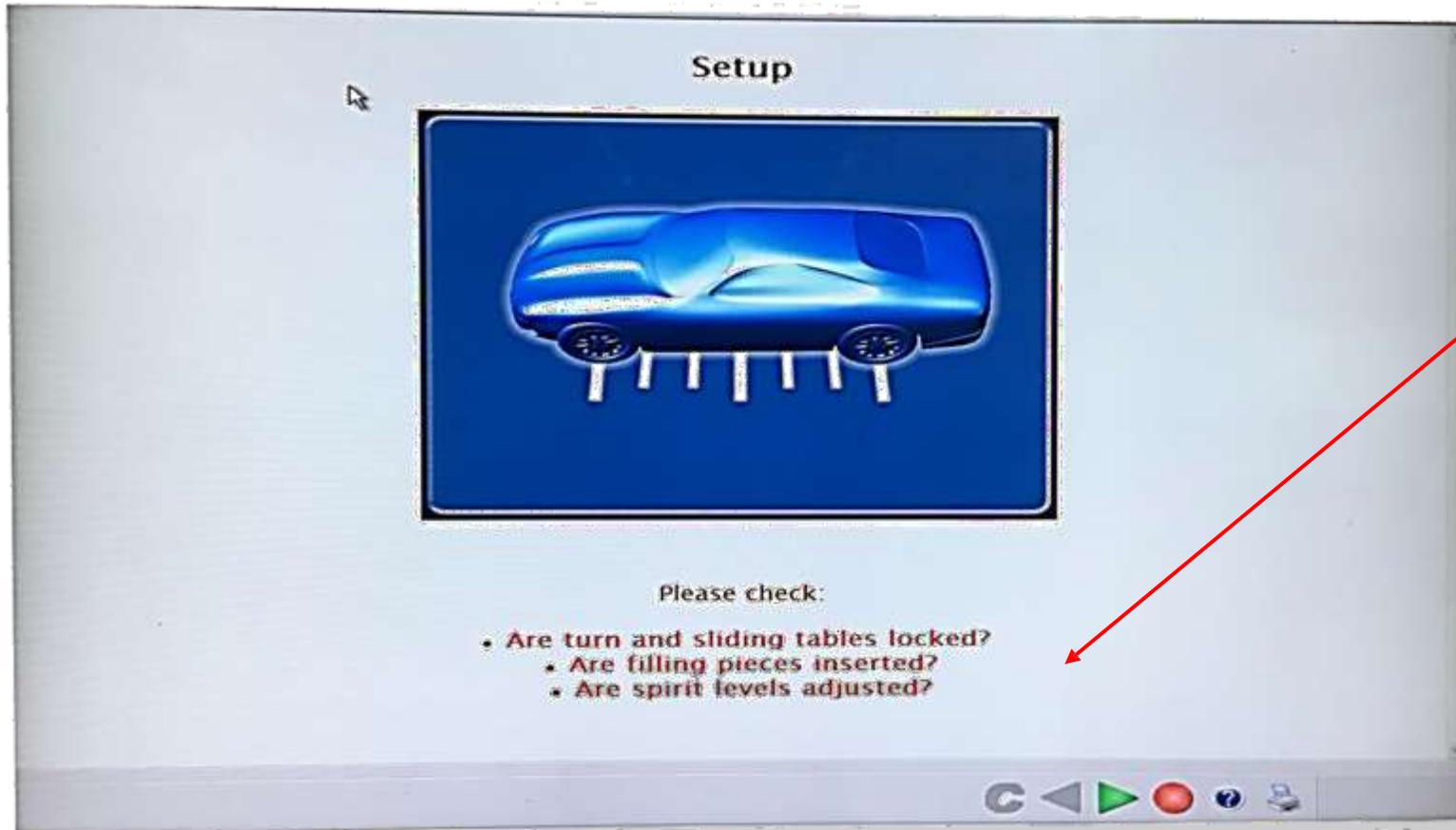
In System configuration change the default setting from Degrees to Length.

4.7. SETUP.

4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

2. Pre-Measurement checks.



Make sure, that these items are checked, before proceeding.

After, follow the On-Screen instructions.

4.7. SETUP.

4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

3. Runout compensation.



As On-Screen instructed, move der car forward and backward.

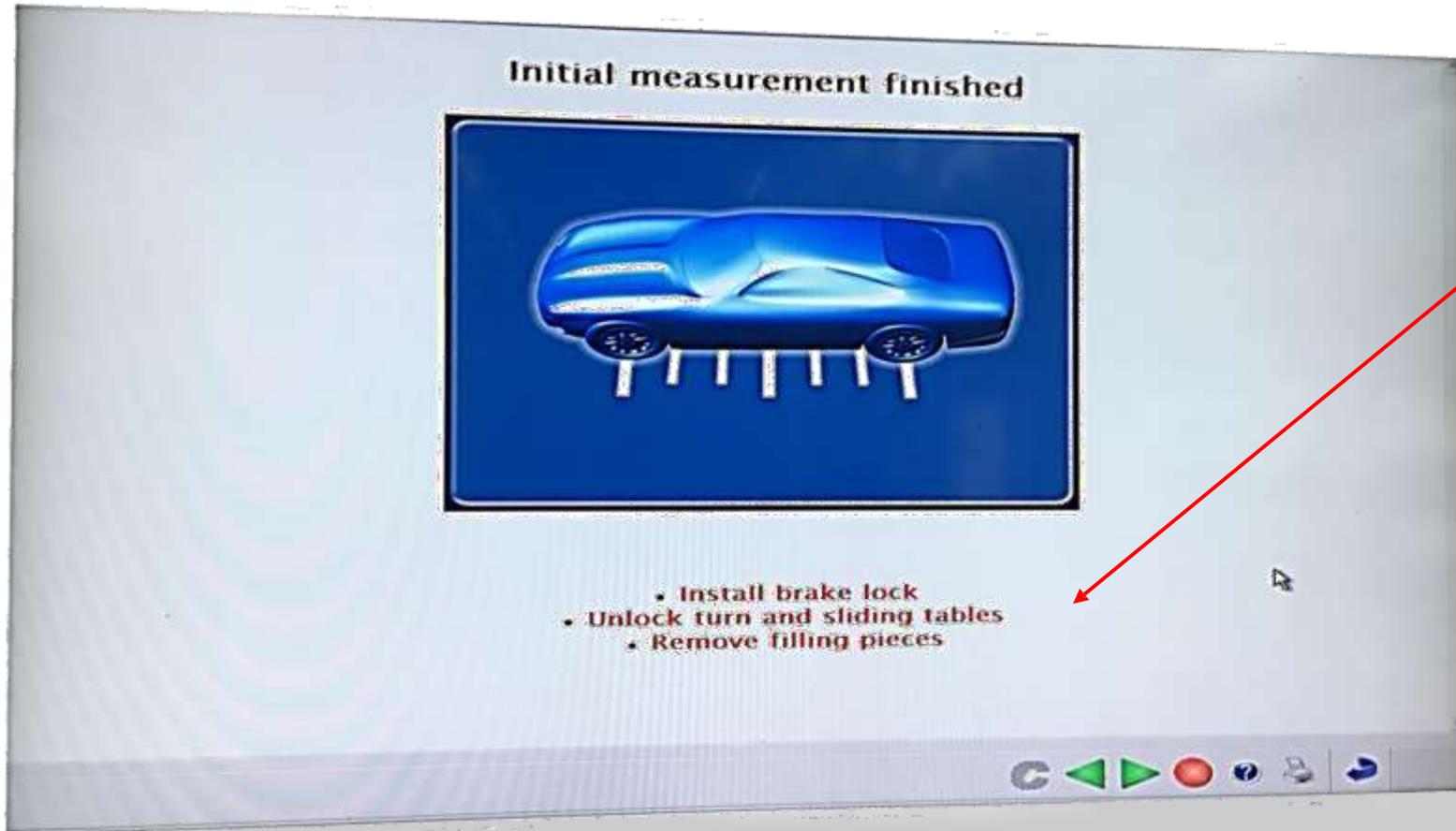


4.7. SETUP.

4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

4. Prepare for measurement.



Make sure, that these items are done, before proceeding.

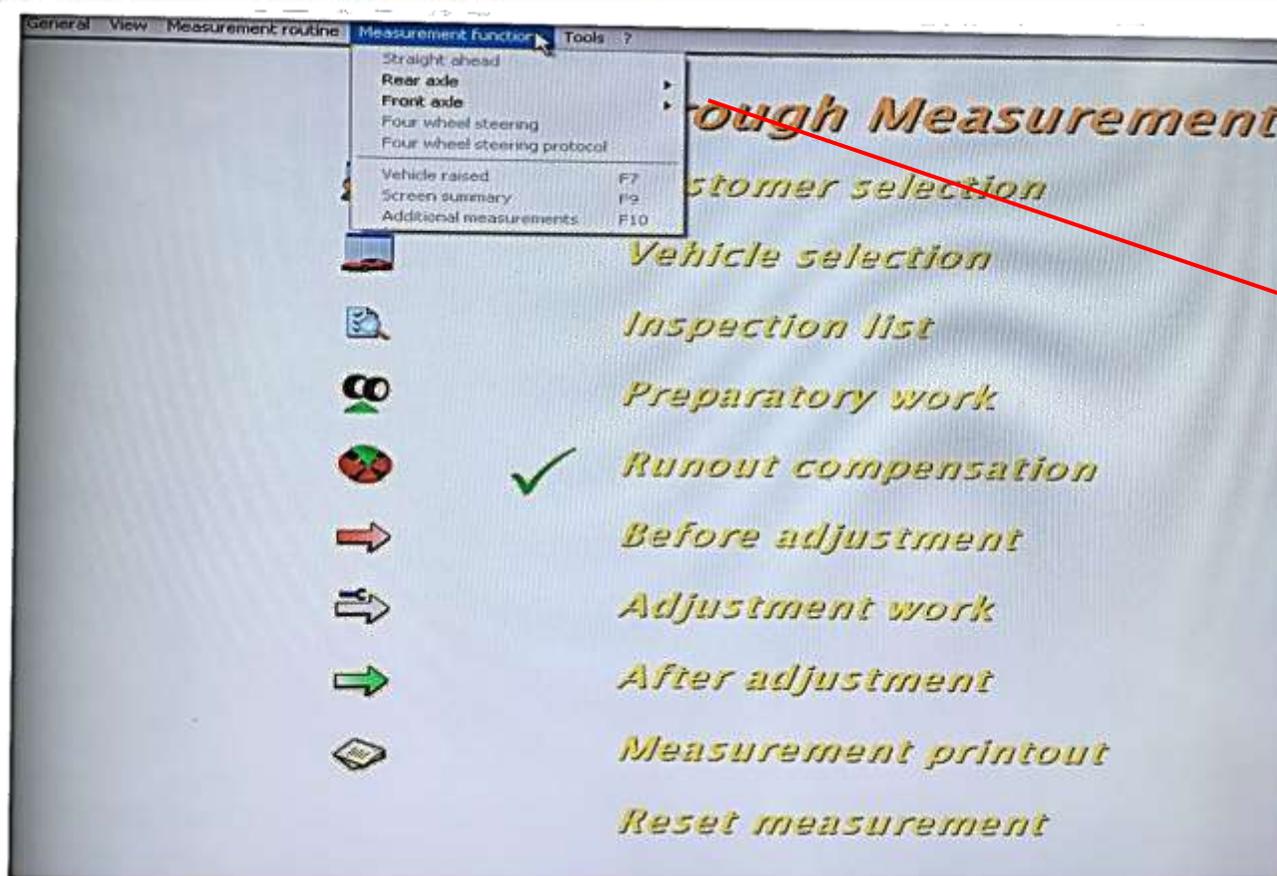


4.7. SETUP.

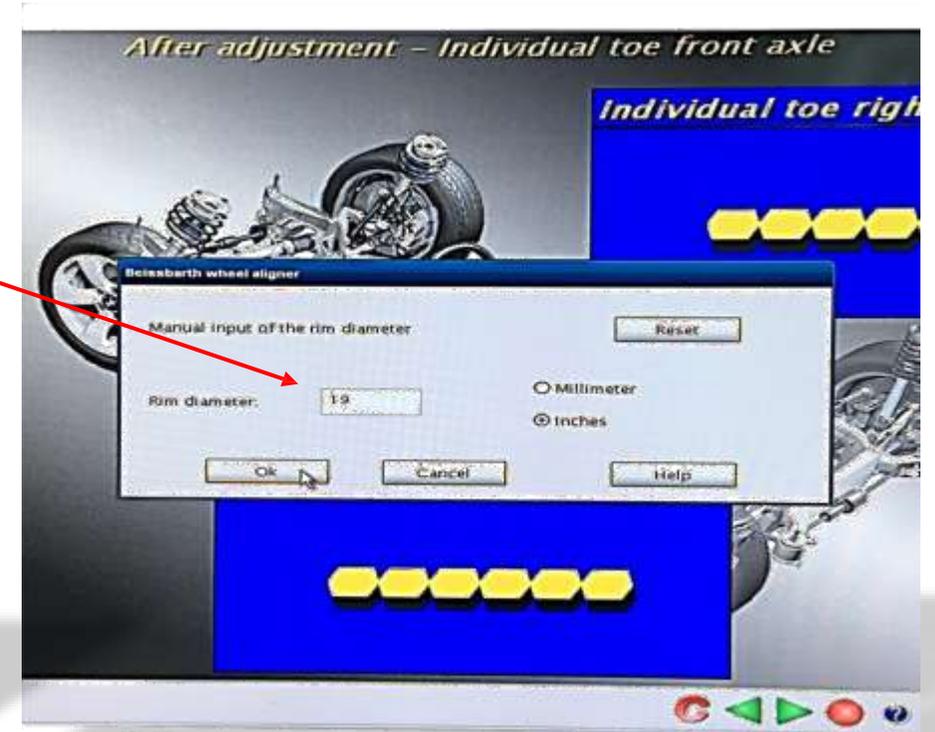
4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

5. Start Measurement.



Add the diameter of the rim:



4.7. SETUP.

4.7.1. GENERAL.

Principal measurement procedure based on the BMW KDS 3D system:

6. Get the results.



After adjustment, do not forget to put the steering wheel straight:



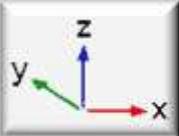
4.7. SETUP.

4.7.1. GENERAL.

Definitions & Setup Matrix:

Coordinate system:

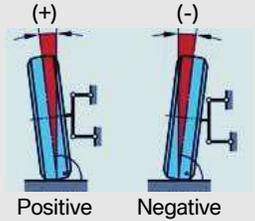
- x = 0** Front wheel centerline. (positive [+] is to the rear).
- y = 0** Car centerline. (positive [+] is to the right).
- z = 0** Reference plane. (positive [+] is up).



Reference plane (z = 0):  Bottom of chassis.

Note: Ride heights are relative to the reference plane.



Camber:  Positive Negative

Toe: Toe in is positive [+].
Toe out is negative [-].

Balance: Defined as % Front, applies to:

- Weight distribution.
- Aero Balance.
- Hydraulic / Mechanic distribution.

Data:

- Bump travel is negative [-].
- Droop travel is positive [+].
- Compression force is positive [+].
- Steering to the left is positive [+]:
 - Steering wheel angle.
 - Lateral acceleration.
 - Yaw rate.
 - Roll.
- Acceleration is positive [+].
- Braking is negative [-].

Setup Matrix:

	Unit	Setup Change	Balance Change *	Change in %
Spring Rate Front	N/mm	180 -> 200	-> US	9.5
Spring Rate Rear	N/mm	190 -> 200	-> OS	4.9
ARB Front	Position	1 -> 2	-> US	2.4
ARB Rear	Position	1 -> 2	-> OS	1.4
Ride Height Front (not Spring Platform)	mm	+ 5	-> US	3.8
Ride Height Rear (not Spring Platform)	mm	+ 5	-> OS	1.5

*) US = Understeer, OS = Oversteer

4.7. SETUP.

4.7.2. AT DELIVERY.

Basic Setup at vehicle delivery (Nordschleife):

Left Front		OK
Camber	-3.0 deg	
Shim	10 mm	
Toe (out)	-1.0 mm	
Spring Helper	5 N/mm	
Spring Main	200 N/mm	
Damper		OK
Type	8324125 (ZF)	
Bump / Rebound adjustment*	9 (+/-1)	

Left Rear		OK
Camber	-2.7 deg	
Toe (in)	+5.0 mm	
Spring Helper	5 N/mm	
Spring Main	190 N/mm	
Damper		OK
Type	8324126 (ZF)	
Bump / Rebound adjustment*	9 (+/-1)	

Mechanical (Michelin)



Right Front		OK
Camber	-3.0 deg	
Shim	10 mm	
Toe (out)	-1.0 mm	
Spring Helper	5 N/mm	
Spring Main	200 N/mm	
Damper		OK
Type	8324125 (ZF)	
Bump / Rebound adjustment*	9 (+/-1)	

Right Rear		OK
Camber	-2.7 deg	
Toe (in)	+5.0 mm	
Spring Helper	5 N/mm	
Spring Main	190 N/mm	
Damper		OK
Type	8324126 (ZF)	
Bump / Rebound adjustment*	9 (+/-1)	

*) See chapter 4.2.

4.7. SETUP.

4.7.2. AT DELIVERY.

Basic Setup at vehicle delivery (Nordschleife):

Front		OK
Bonnet Type	8323900	
Bootlid Type	8324122	
Splitter Type	8328240	

Front Ride Height (SRO) +/- 1.0 mm	
130.7 mm (LHS)	130.7 mm (RHS)

Front Ride Height (Wheelarch – 18" Rim) +/- 1.0 mm	
577.0 mm (LHS)	577.0 mm (RHS)

Front Anti-Roll Bar		OK
Type (30 mm)	8431269	
Setting L/R	1 / 1 (2 = Hard)	

Front	365 HP	450 HP	OK
Pad Type	8328281	8328305	
Disc Type	8438071 / 72	8328273 / 74	
Caliper Type (Alcon)	8438069 / 70	8428733 / 34	

Aerodynamic



Rear		OK
Rear Wing Type	8324118	
Rear Wing Setting	6.3 deg	
Gurney Type	8328299	
Gurney Height	10.0 mm	

Rear Ride Height (SRO) +/- 1.0 mm	
129.2 mm (LHS)	129.2 mm (RHS)

Rear Ride Height (Wheelarch – 18" Rim) +/- 1.0 mm	
580.0 mm (LHS)	580.0 mm (RHS)

Rear Anti-Roll-Bar		OK
Type (26 mm)	8431271	
Setting L/R	1 / 1 (2 = Hard)	

Rear	365 HP	450 HP	OK
Pad Type	8328283	8328320	
Disc Type	8072019 / 20	8328275 / 76	
Caliper Type	8091281 / 82	8328259 / 60	

Ride Height (Michelin Slick at 2.0 bar)

Anti Roll Bar

Brakes

NOTICE

Setup values can be changed due to transport requirements and should be checked and reset when the vehicle is received.

4.7. SETUP.

4.7.3. OPTION.

Optional Setup (e.g. Hockenheim, Bilster Berg):

Left Front		OK
Camber	-3.4 deg	
Shim	7.5 mm	
Toe (out)	-1.0 mm	
Spring Helper	5 N/mm	
Spring Main	200 N/mm	
Damper		OK
Type	8324125 (ZF)	
Bump/ Rebound adjustment*	9	

Left Rear		OK
Camber	-2.8 deg	
Toe (in)	+5.0 mm	
Spring Helper	5 N/mm	
Spring Main	190 N/mm	
Damper		OK
Type	8324126 (ZF)	
Bump / Rebound adjustment*	9	

Mechanical (Michelin)



Right Front		OK
Camber	-3.4 deg	
Shim	7.5 mm	
Toe (out)	-1.0 mm	
Spring Helper	5 N/mm	
Spring Main	200 N/mm	
Damper		OK
Type	8324125 (ZF)	
Bump / Rebound adjustment*	9	

Right Rear		OK
Camber	-2.8 deg	
Toe (in)	+5.0 mm	
Spring Helper	5 N/mm	
Spring Main	190 N/mm	
Damper		OK
Type	8324126 (ZF)	
Bump / Rebound adjustment*	9	

*) See chapter 4.2.

4.7. SETUP.

4.7.3. OPTION.

Optional Setup (e.g. Hockenheim, Bilster Berg):

Front		OK
Bonnet Type	8323900	
Bootlid Type	8324122	
Splitter Type	8328240	

Front Ride Height (SRO) +/- 1.0 mm	
125.0 mm (LHS)	125.0 mm (RHS)

Front Ride Height (Wheelarch – 18" Rim) +/- 1.0 mm	
570.0 mm (LHS)	570.0 mm (RHS)

Front Anti-Roll Bar		OK
Type (30 mm)	8431269	
Setting L/R	2 / 2 (2 = Hard)	

Front	365 HP	450 HP	OK
Pad Type	8328281	8328305	
Disc Type	8438071 / 72	8328273 / 74	
Caliper Type (Alcon)	8438069 / 70	8428733 / 34	

Aerodynamic



Rear		OK
Rear Wing Type	8324118	
Rear Wing Setting	6.3 deg	
Gurney Type	8328299	
Gurney Height	10.0 mm	

Rear Ride Height (SRO) +/- 1.0 mm	
120.0 mm (LHS)	120.0 mm (RHS)

Rear Ride Height (Wheelarch – 18" Rim) +/- 1.0 mm	
572.0 mm (LHS)	572.0 mm (RHS)

Rear Anti-Roll-Bar		OK
Type (26 mm)	8431271	
Setting L/R	1 / 1 (2 = Hard)	

Rear	365 HP	450 HP	OK
Pad Type	8328283	8328320	
Disc Type	8072019 / 20	8328275 / 76	
Caliper Type	8091281 / 82	8328259 / 60	

Ride Height (Michelin Slick at 1.8 bar)

Anti Roll Bar

Brakes

NOTICE

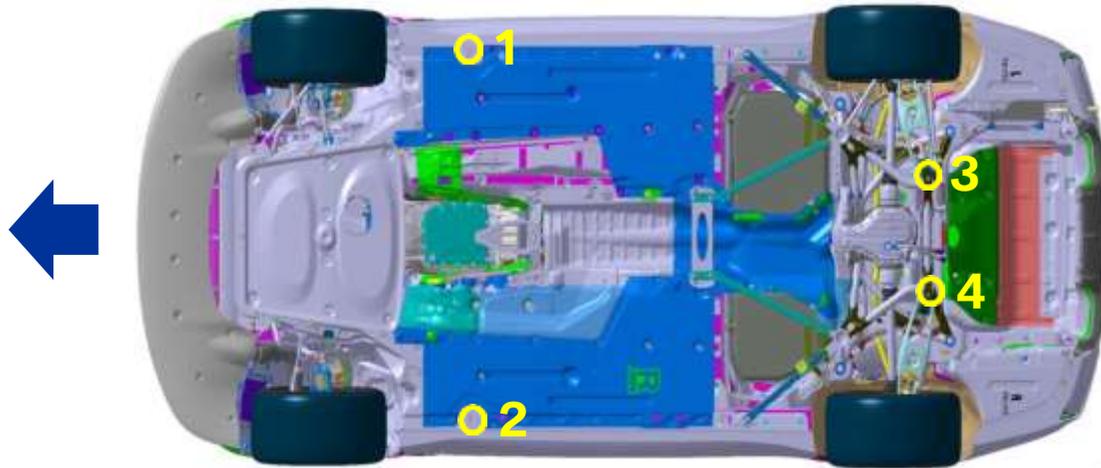
This setup does not suit for 'Nürburgring-Nordschleife'

4.7. SETUP.

4.7.4. RIDE HEIGHT.



Ride Height Measurement Points SRO (Flat Patch):



Ride Height Measurement Points with electronic measuring system:



NOTICE

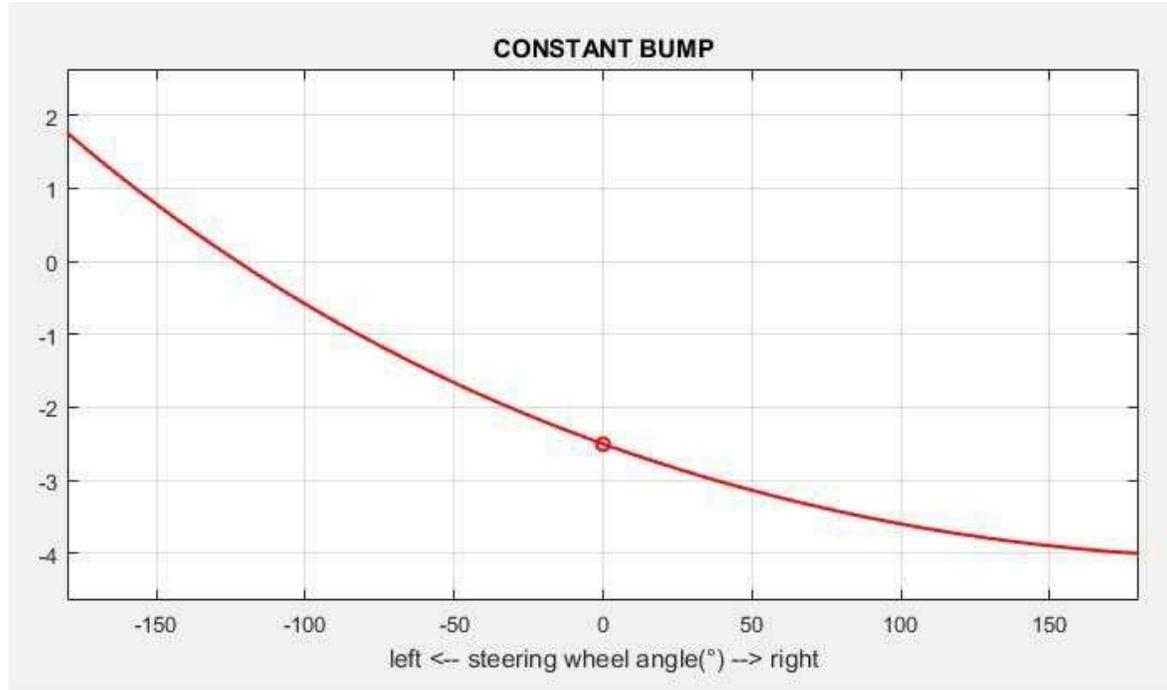
Minimum Ride Heights are defined by the respective racing series regulations and must be respected at any times!

Depending on the system and the tires, the set vehicle height may differ between the shown measurement methods.

4.7. SETUP.

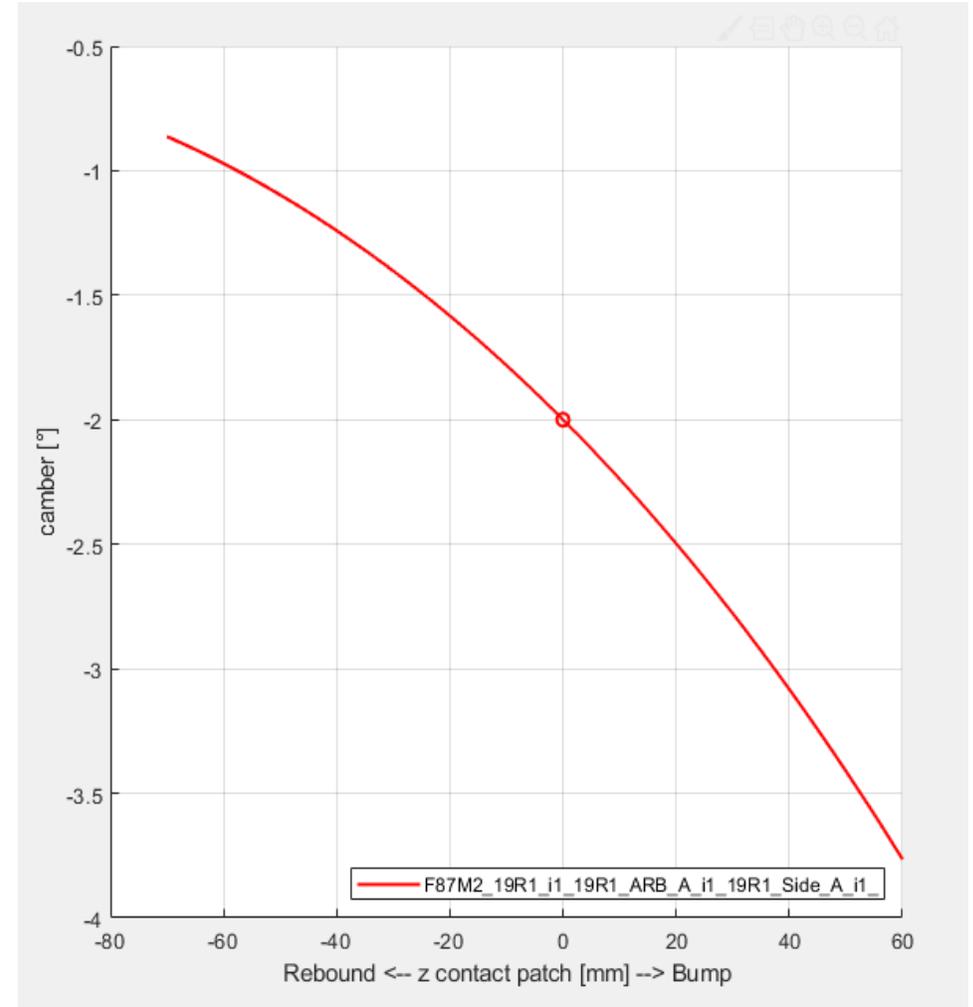
4.7.5. CAMBER.

Front Camber Change.



Part-No.	Position [mm]	Design
3130 8431254	0	
3130 8431255	2.5	
3130 8431256	5	
3130 8431257	7.5	
3130 8431258	10	
3130 8431259	12.5	

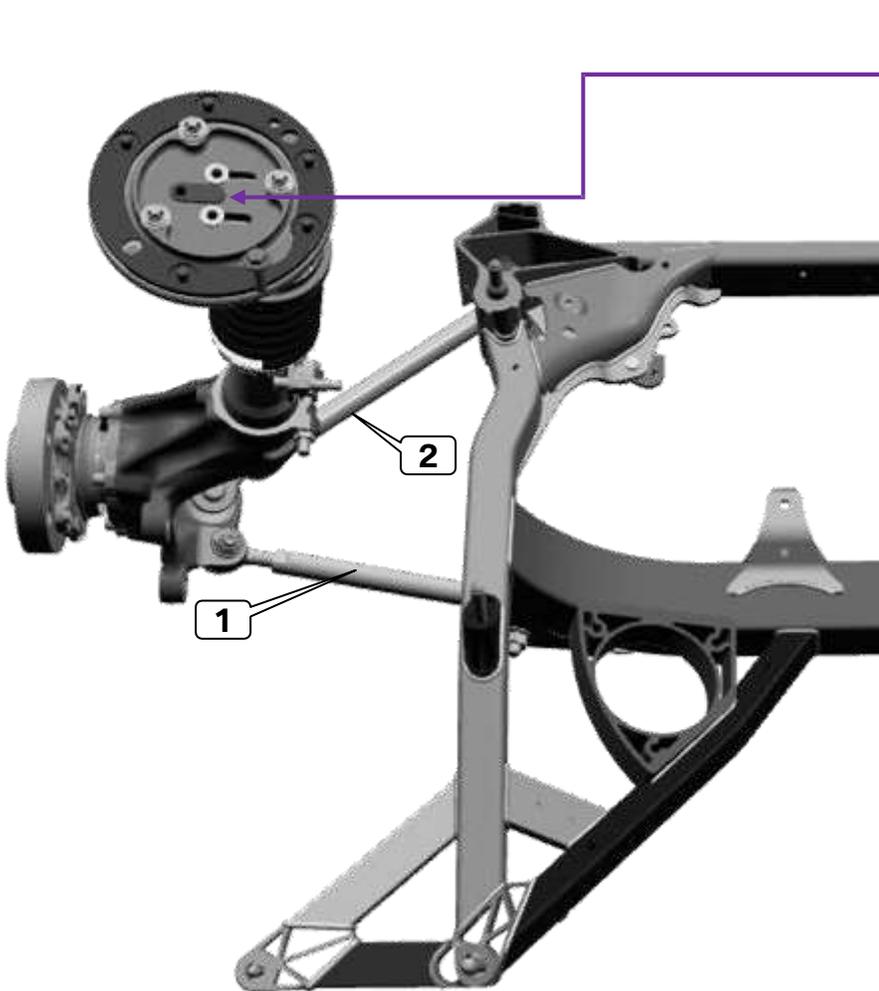
Rear Camber Change.



4.7. SETUP.

4.7.5. CAMBER.

Camber adjustment front axle:



Shims for camber adjustment.



Camber [°]	Shim [mm]
5.2	12.5 in
5.0	10 in
4.7	7.5 in
4.5	5 in
4.2	2.5 in
4.0	0
3.8	2.5 out
3.5	5 out
3.3	7.5 out
3.0	10 out
2.8	12.5 out

The camber is adjusted with shims on the upper spring support bearing (see figure on below left).

Tightening torque: **36 Nm**

The length [L] of the suspension arms must be checked with the specified dimension (see figures below).

Tightening torque: **45 Nm**

Basic adjustment of front axle suspension arms:

Sus. arm (1)

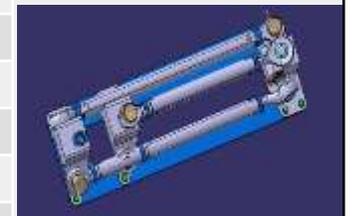


Tension arm (2)



For this purpose, a suspension strut adjustment gauge from BMW M Motorsport is offered:

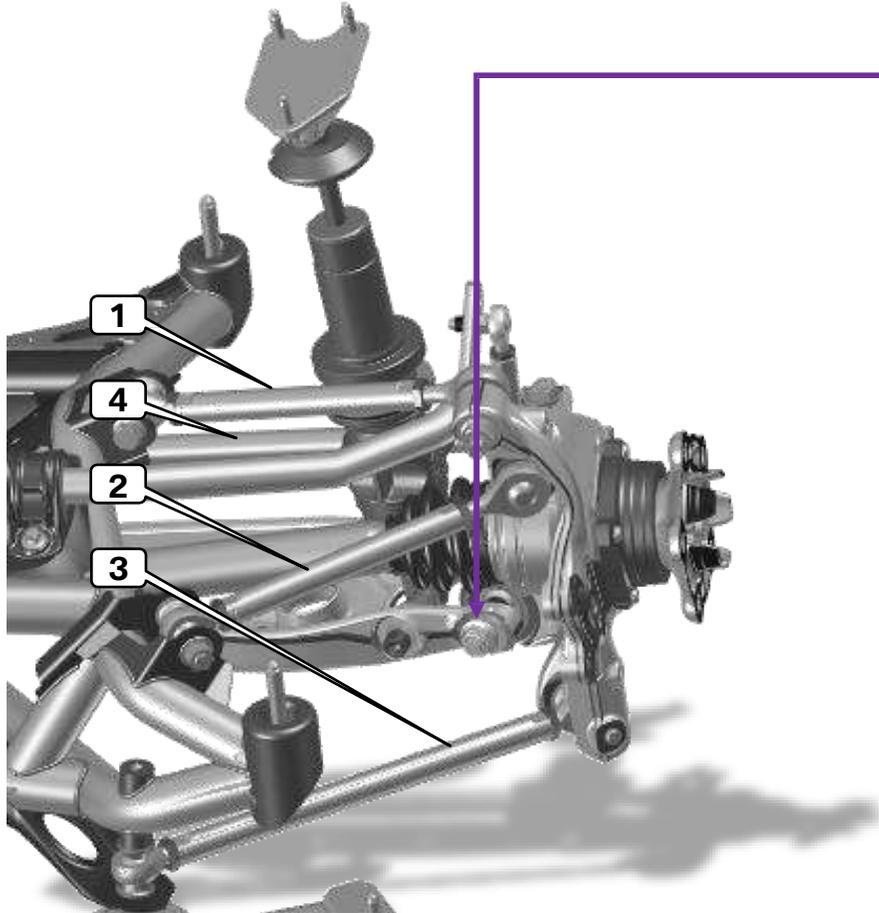
Part-No.	Qty.	Description
8331 8431893	1	Fixation strut wheel carrier side
8331 8431894	1	Fixation strut chassis side
8331 8417415	1	Fixation strut chassis right
8331 8431899	1	Bush insert short strut
8331 8431898	2	Gauge pin
8331 8431901	1	Gauge base plate



4.7. SETUP.

4.7.5. CAMBER.

Camber adjustment rear axle:



Camber eccentric

The camber is adjusted as shown on the eccentric of the camber arm (see figure on the left).
Tightening torque: **165 Nm + Loctite 243**

The length [L] of the suspension arms must be checked with the specified dimension (see figures below).
Tightening torque: **45 Nm**

Basic adjustment of rear axle suspension arms:

Sus. arm (1)



Sus. arm (2)



Sus. arm (3)



Note:

The rear lower suspension arm (4) has a basic setting of **L = 378,2 mm** and is used for setting the toe.

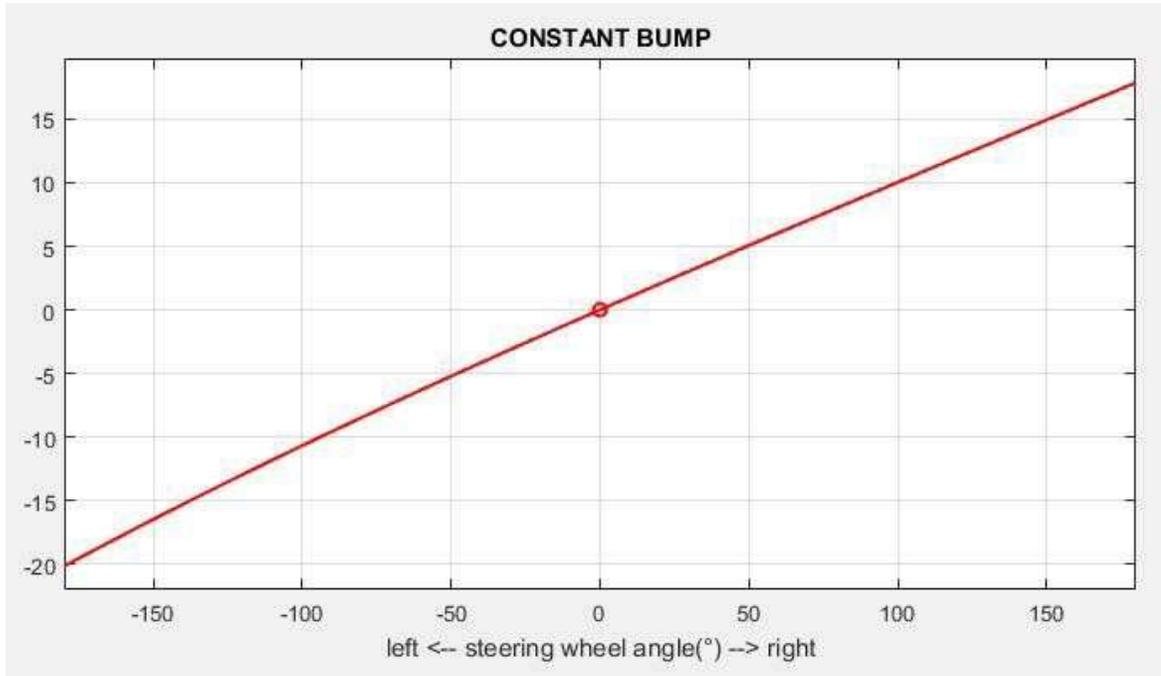
NOTICE

BMW M Motorsport offers a suspension strut adjustment gauge (see previous page + Appendices).

4.7. SETUP.

4.7.6. TOE.

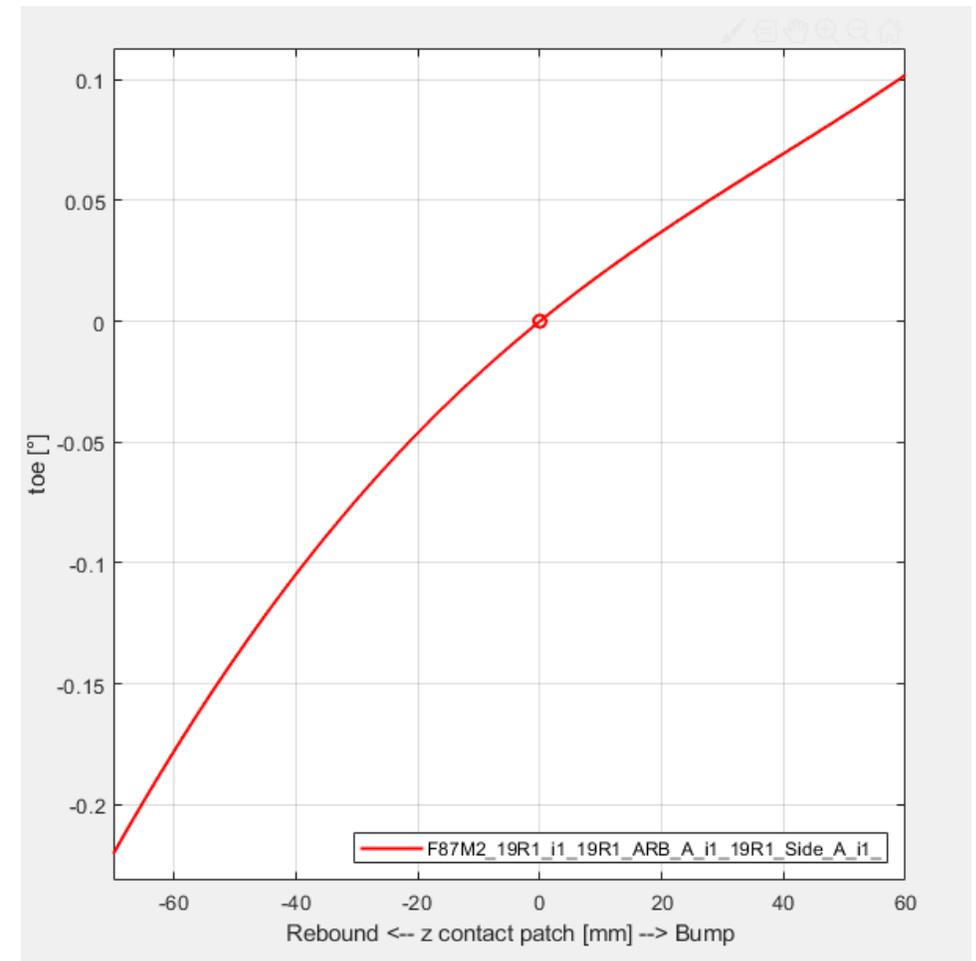
Front Toe Change.



Before setting up and checking the toe, the steering wheel must always be adjusted straight ahead.

In principle: If actual values are determined outside the tolerance, then damaged parts must be replaced and / or adjustment work carried out. In the case of incorrect values, the rear axle are always set before the front axle, because the toe of the rear axle influences the toe of the front axle.

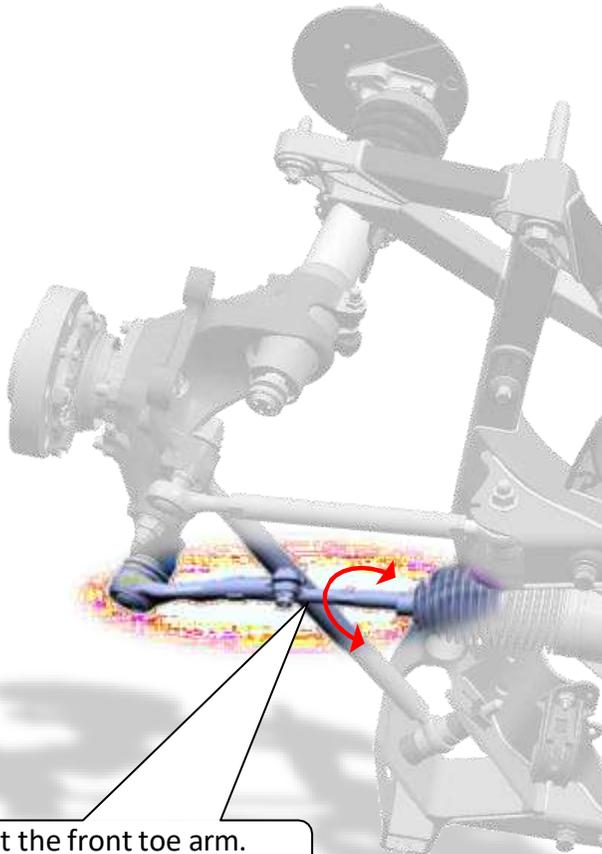
Rear Toe Change.



4.7. SETUP.

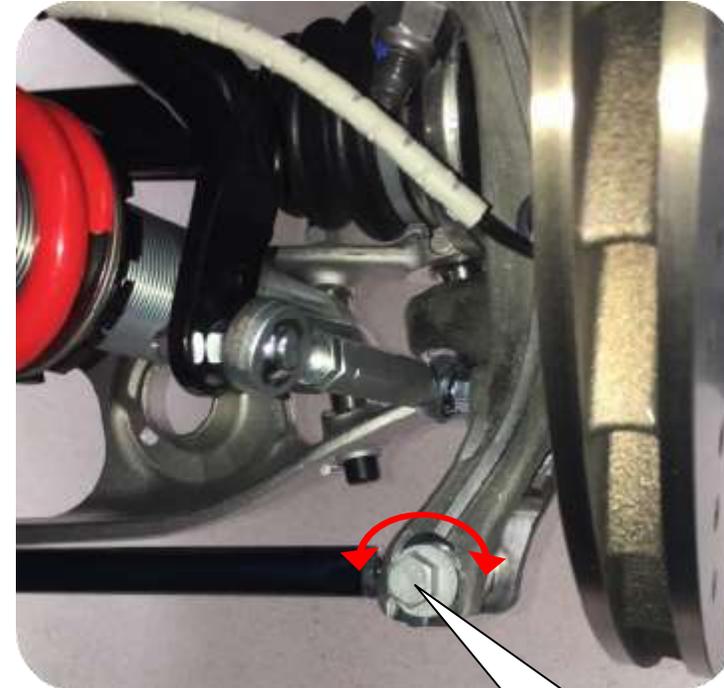
4.7.6. TOE.

Toe adjustment front axle:



Adjustment at the front toe arm.
Tightening torque: **32 Nm**

Toe adjustment rear axle:



Adjustment at the rear toe arm.
Tightening torque: **100 Nm + Loctite 243**

4.7. SETUP.

4.7.7. ANTI ROLL BARS.

General information.

Front and rear anti roll bars can be adjusted in 2 positions (soft / hard) on each side.

During adjustment work on the suspension (setup), the connecting rods of the anti roll bars must be unhooked and then installed under 1G on a flat surface without tension (the connecting rod length may need to be adjusted). The freedom of movement of all moving parts must be guaranteed.



Front ARB stiffness:

POS. 1 ➡ Soft
POS. 2 ➡ Hard



Rear ARB stiffness:

POS. 1 ➡ Soft
POS. 2 ➡ Hard

4.7. SETUP.

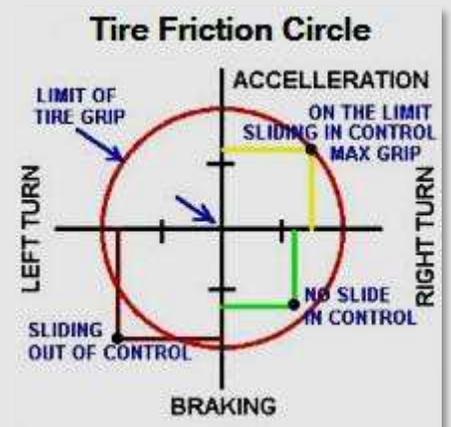
4.7.8. TYRES.

Tyre Pressures:

The tyre pressure in a tyre has a big effect on tyre traction. The correct tyre pressure, which first should be requested at a tyre brand engineer for the car, is in practice a narrow range of pressure, within about 3 psi. If the pressure is outside of this range, the contact patch is deformed and not fully in contact with the road surface. The Tyre Friction Circle represents a graphical illustration of the possible total force on a wheel in the lateral and longitudinal direction until the max. force is reached.

Setting Tyre Pressures:

- When the target pressure is e.g. 28 psi at hot conditions, then start with ~ 23 psi and run a stint of min. 10 laps. After, check the tyre pressures all around and adjust to the target value.
- Then take the adjusted tyre set off the car and let it cool down to ambient temperature for obtaining cold tyre pressure values.
- When the track gets ~10 deg warmer, bleed ~0,72 psi cold or ~1,16 psi warm air pressure from the tyre to avoid over pressures, which results in less grip.
- Too **HIGH** tyre pressures causes sliding at slightest provocation, wheel spin and responds to quickly.
- Too **LOW** tyre pressures makes the car feel unresponsive, rolls a lot and are slow to take a set corners.



4.7. SETUP.

4.7.8. TYRES.

Tyre Tempartures:

All racing and high performance road car tyres are designed to operate within an optimum temperature range when driving near or at the limits of a race car.

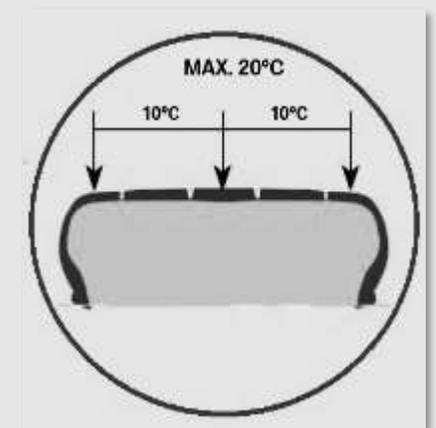
- **Tyre temperature is too low**, the coefficient of friction will be too low and maximum traction will not be achieved.
- **Tyre tread is too hot**, again traction will be lost and the tire will wear more quickly.

The optimum tyre temperature range for the specific car should be requested from the tyre supplier. The tyre temperature should be measured by a tyre pyrometer with a needle probe and checked as close as possible to the tyre steel construction. Measuring the temperature with a needle probe will be much more accurate, as the surface might cool down when entering into the pit lane at lower speeds.

Measuring Temperatures:

The tyre temperature range will be measured at the outside, middle and inside area of the tire patch:

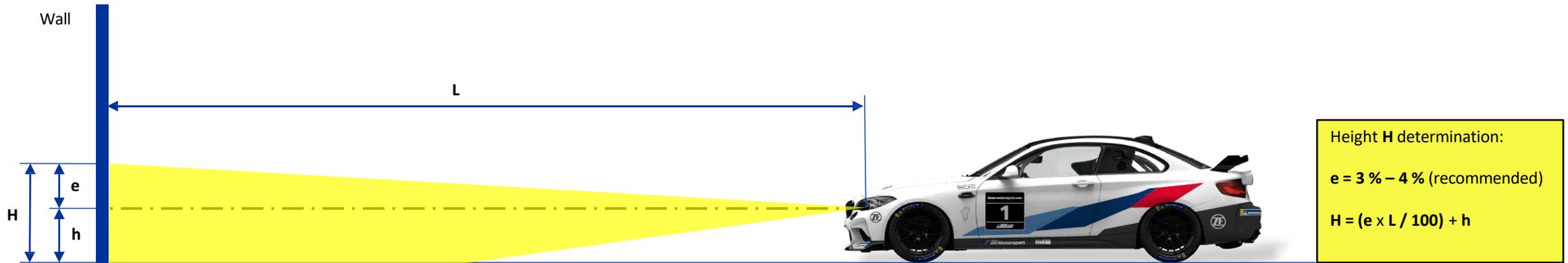
The difference between the spots should be ~10°C. (e.g. 60°C / 70°C / 80°C)



4.7. SETUP.

4.7.9. HEADLIGHTS.

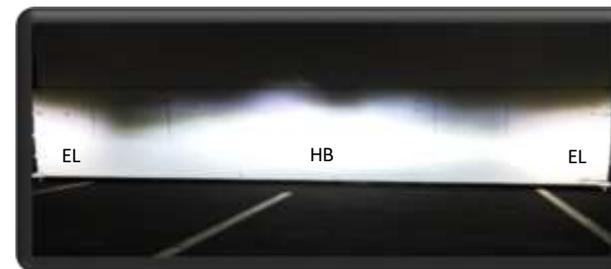
Low Beam basic adjustment (recommended):



A level surface should be selected for the headlight setting. It should be noted that when changing the vehicle ride height, the headlamp adjustment also changes. Determine the center axis of the headlight and mark it on the wall. Determine the height H and also mark these on the wall. Check whether the light / dark border limit matches the marking or, if necessary, correct the headlight setting. Cover one headlight at a time.

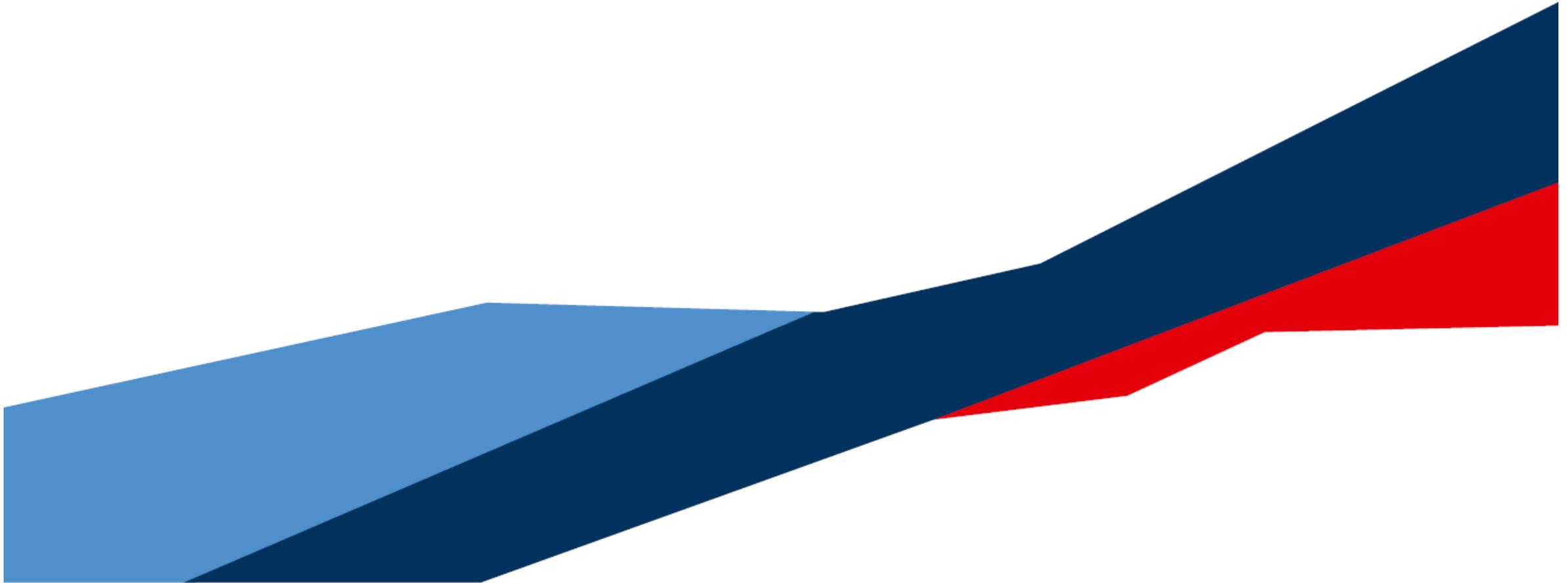
When additional endurance lights are used, these should be set to the same height as the high beam for the required distance and visibility of the driver and have only a minimal light / dark border to the high beam (see picture).

NOTICE The basic setting is only a recommendation and ultimately depends on the individual seating position and the driver (visibility) himself.



HB – High Beam.
 EL – Endurance Lights.

5. BODYWORK.



5. BODYWORK.

5.1. LIGHTWEIGHT MATERIALS.



For the BMW M2 CS Racing, light-weight materials were used for the following body parts:

Parts of light-weight materials:

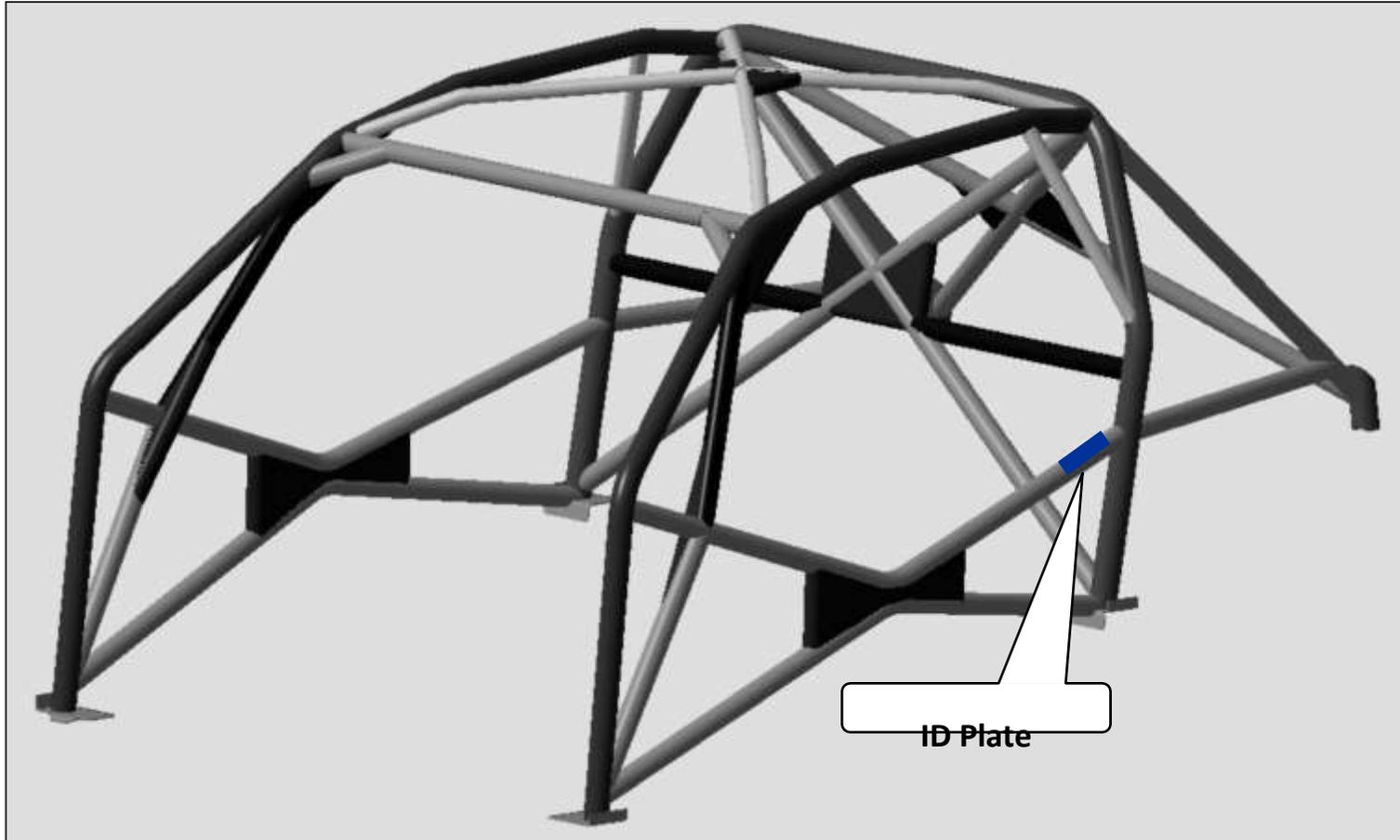
- Roof.
- Door Trim (Natural fiber).
- Rear wing.

Parts from Makrolon®:

- Rear side window.

5. BODYWORK.

5.2. ROLL OVER CAGE



WARNING

The rollover cage is firmly welded into the chassis. Any modifications to the rollover cage will lead to non-approval or disqualification of the vehicle. In the case of an accident, an inspection of the rollover cage and release of a technical official must be carried out.

A damaged safety cell is always with a diminished occupant protection. Therefore, the safety cell after an accident also has to be checked by an independent expert.

Please take notice of the cage certificate attached to the vehicle documents!

5.3. AERODYNAMIC.

5.3.1. FRONT SPLITTER.

The front splitter has been designed and specially developed for the BMW M2 CS Racing and tested. In conjunction with the rear wing, the front splitter provides a consistent aerodynamic balance for each race track.



A damage of the front splitter causes a changed driving behavior. Be sure to check the front splitter for damage before each drive.

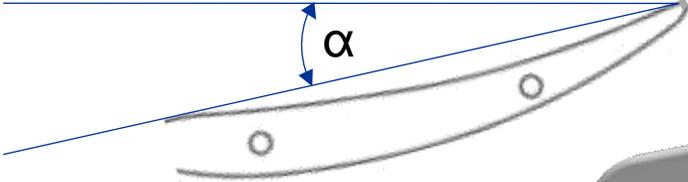
5.3. AERODYNAMIC.

5.3.2. REAR WING.

The rear wing has been specially developed for the BMW M2 CS Racing and optimized in BMW's own wind tunnel and can be adjusted 5 times and therefore in conjunction with front splitter and diffuser, the wing provides the optimum aerodynamic balance for each race track.

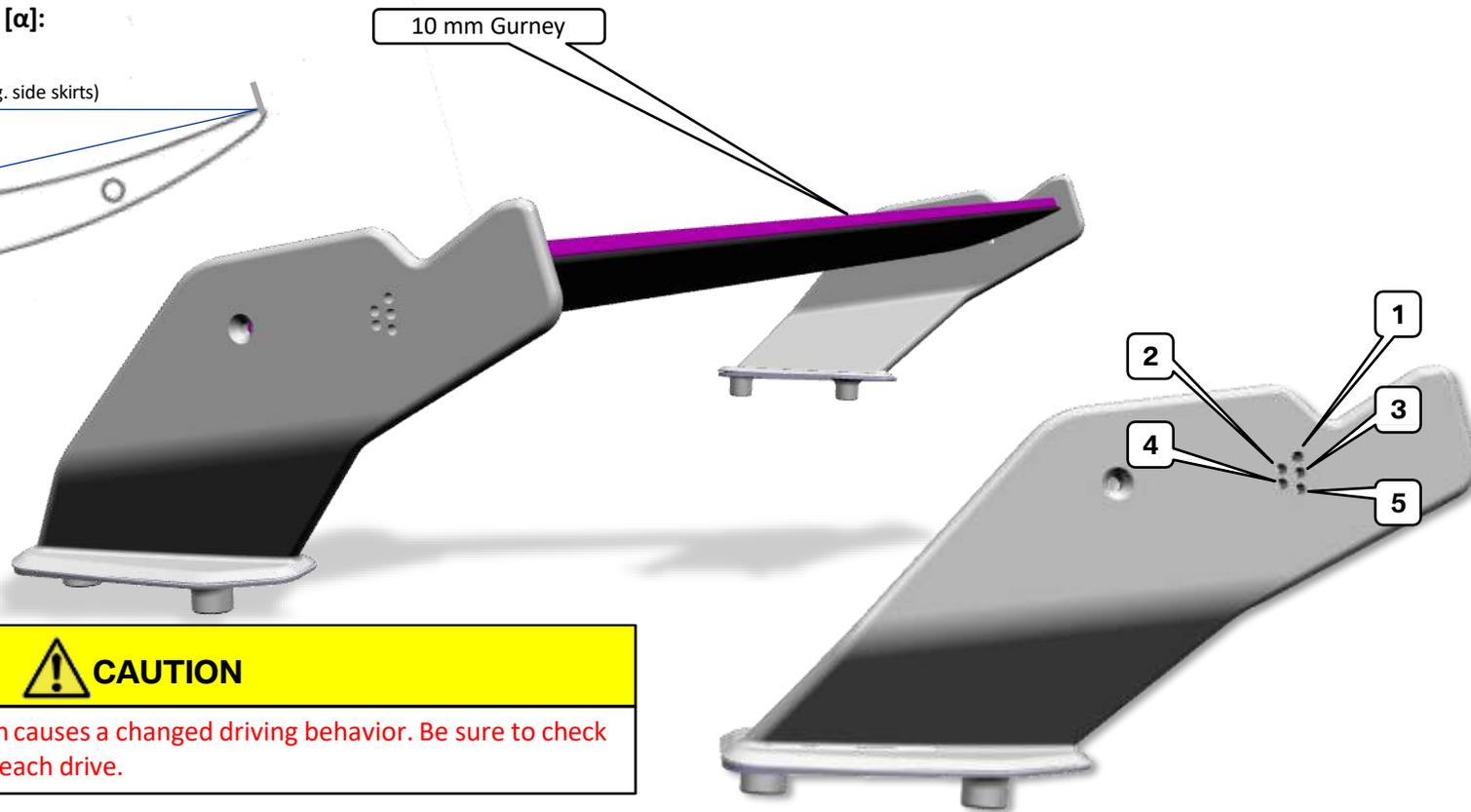
Determination of rear wing angle $[\alpha]$:

Reference line construction plane $[x]$ (zero-, e.g. side skirts)



For the rear wing adjustment, the assignment of the holes applies as shown in the pictures. Due to tolerances, any other positions should be avoided.

The rear wing angle $[\alpha]$ always refers to the construction plane $[x]$ of the vehicle, e.g. side skirts, underbody etc. and can due to tolerances be off by 0.5 deg.



Adjustment:

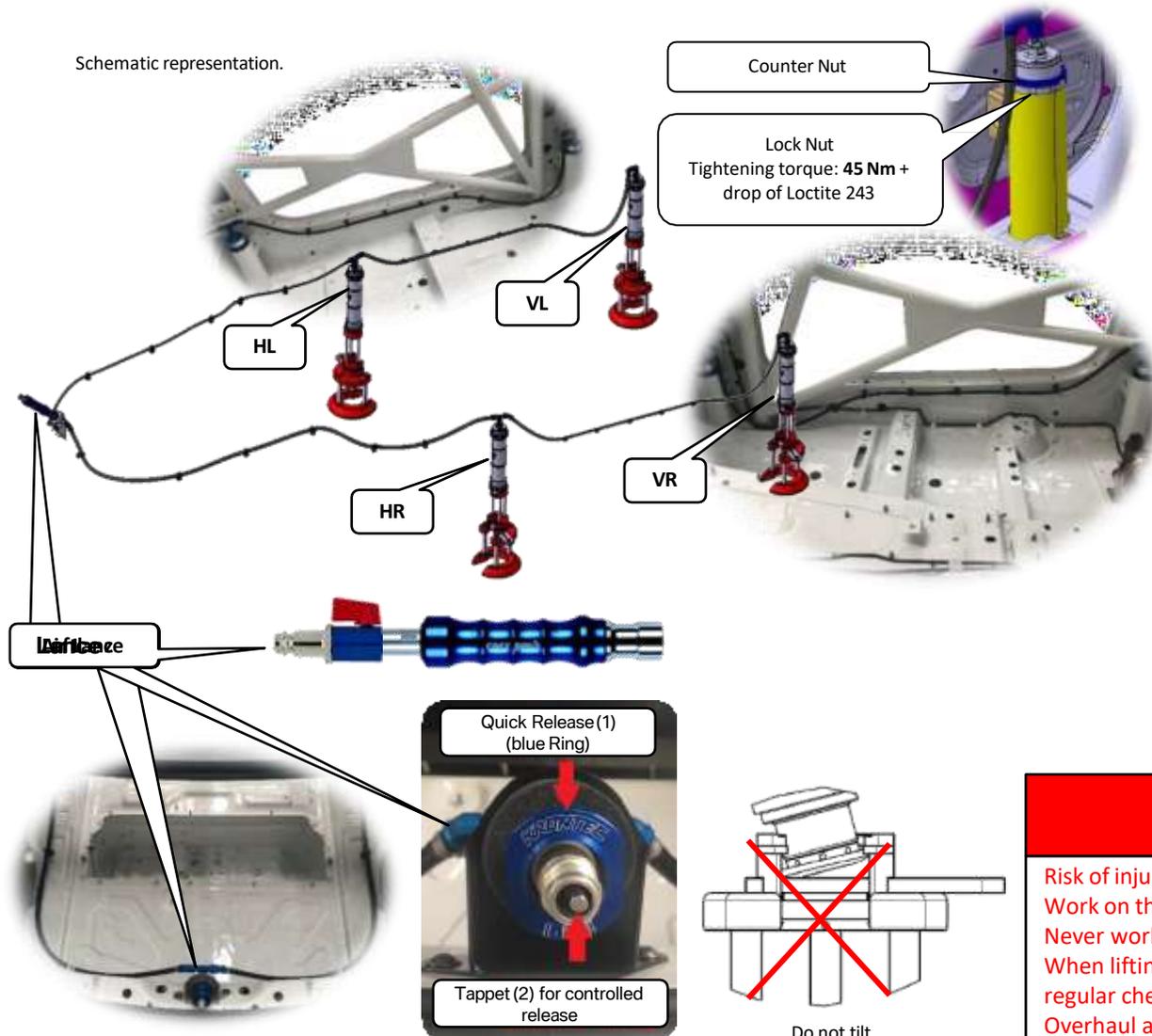
Pos.	Angle $[\alpha]$
1	6°
2	3,5°
3	1°
4	-1.5°
5	-4°



CAUTION

A change in the rear wing position causes a changed driving behavior. Be sure to check the rear wing for damage before each drive.

5.4. AIR JACK SYSTEM.



How to use:

The system may only be operated by trained personnel.
 Operating pressure: min. 15 to max. 40 bar.
 Maximum permissible operating temperature: approx. 80 °C / 176 °F
 Always use clean and dry compressed air.
 When lifting the vehicle, make sure that it is level.
 Before working on and under the raised vehicle, a prop (safety prop) must be used on every air jack. (see schematic drawing)
 Work on the vehicle may only be carried out when the system is depressurized.
 To avoid damage to the system, if possible, release the air by pressing on the tappet integrated in the air lifting valve before pulling the quick exhaust.
 Before starting the vehicle, make sure that all air lifters are completely retracted.
 Never use cleaning agents based on mineral oil. Use only silicone grease.
 It is expressly recommended to carry out a revision at the manufacturer (Krontec) after 2000 lifting cycles or after two years.

Lifting: Place the air lance on the vehicle air jack valve. Open the air lance valve slowly and raise the vehicle. Position the safety supports centrally under each air jack. Pull off the air lance and slowly lower the vehicle onto the safety supports by actuating the tappet (2).

Lowering: Place the air lance on the vehicle air jack valve. Open the air lance valve slowly and raise the vehicle. Remove safety supports from under each air jack. Pull off the air lance and slowly lower the vehicle onto the wheels by actuating the tappet (2).

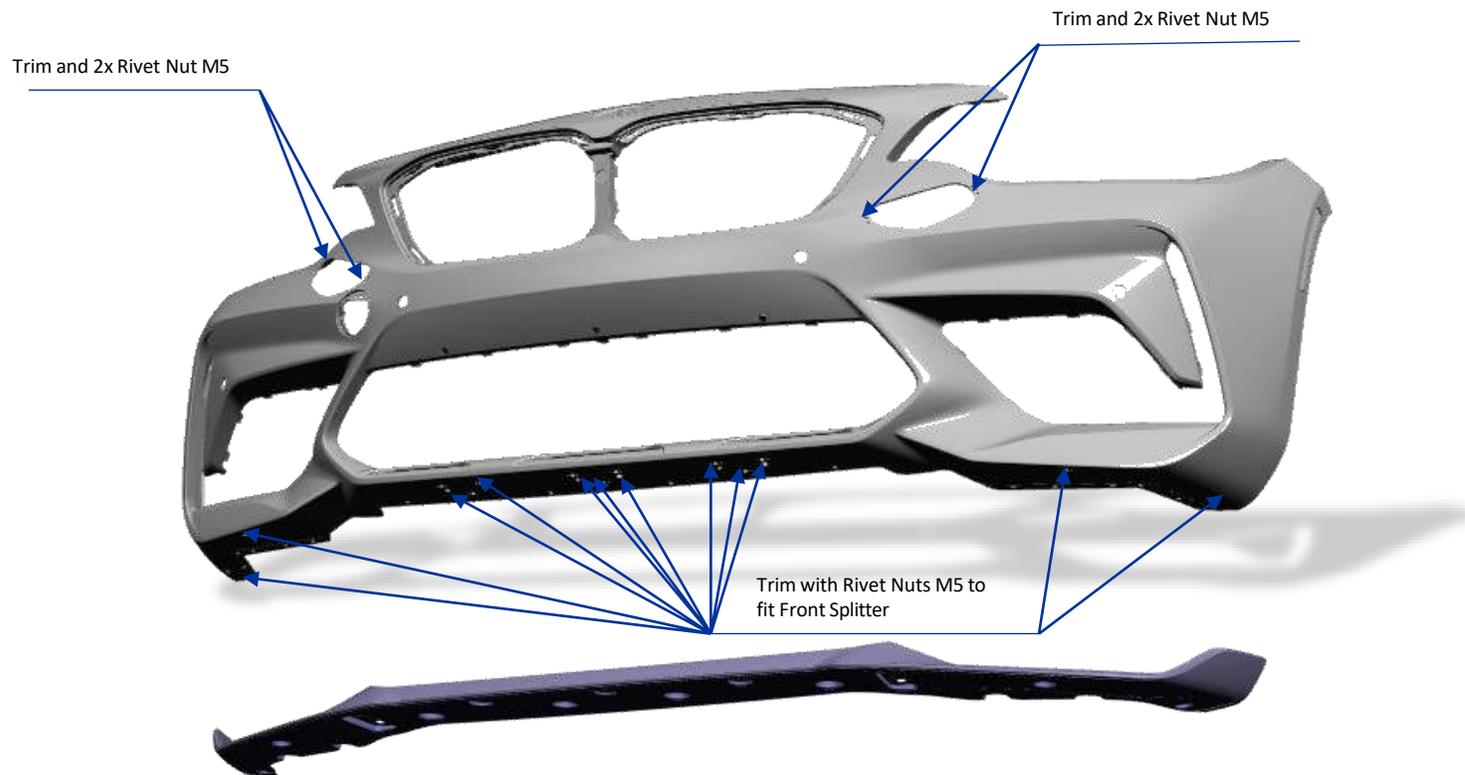
! DANGER

Risk of injury!
 Work on the vehicle / system may only be carried out when depressurized.
 Never work under the vehicle without supports (safety prop).
 When lifting the vehicle, make sure that you or other people's feet are at a sufficient distance from the air lift. A regular check of the air lifting system for damage / tightness is imperative.
 Overhaul and maintenance work may only be carried out by the manufacturer!

5.5. BODY PARTS.

5.5.1. FRONT BUMPER.

**Amount Trim Front Bumper.
(necessary for bumper replacement).**



NOTICE

The front bumper can be obtained ready-trimmed from BMW Motorsport.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

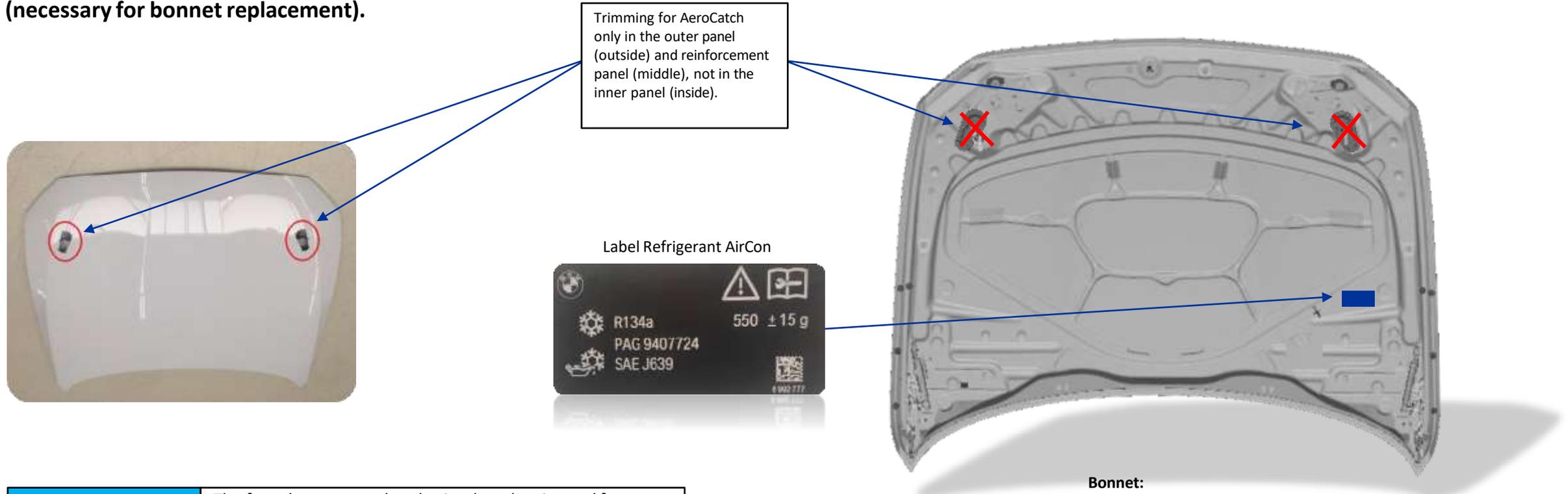
Front Bumper (trimmed):

Part-No.	Description
5111 8324172	NA Stossfaenger vorne

5.5. BODY PARTS.

5.5.2. BONNET.

**Amount Bonnet Trim.
(necessary for bonnet replacement).**



NOTICE The front bumper can be obtained ready-trimmed from BMW Motorsport.

Repair and maintenance work on the vehicle only with appropriate protective clothing.

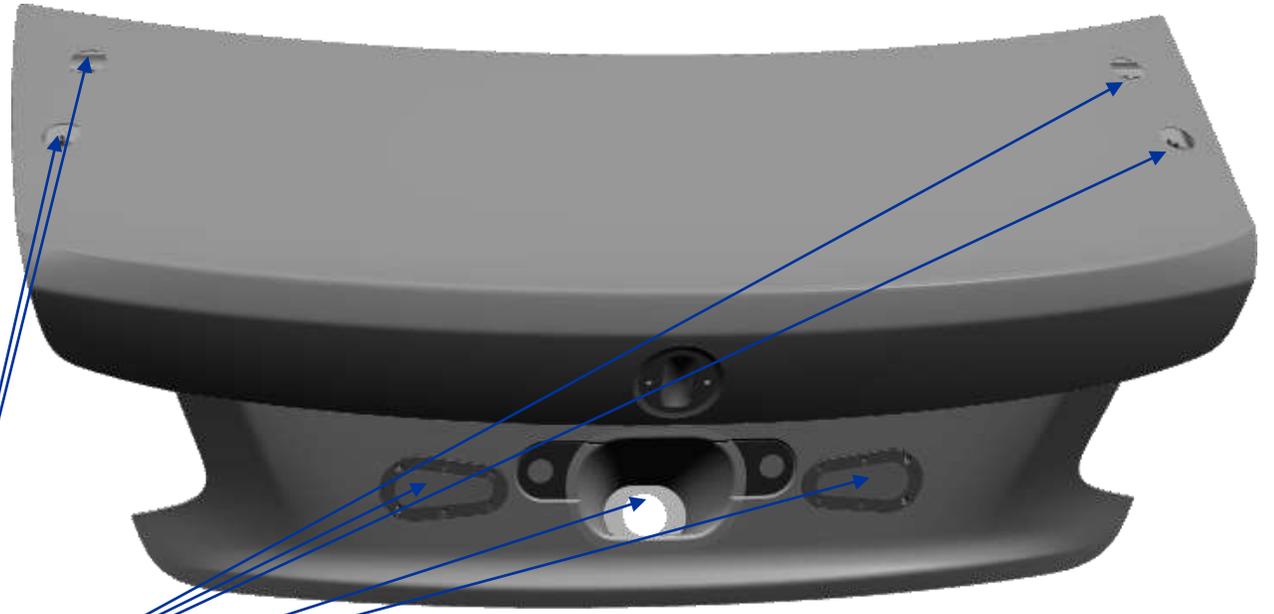
Bonnet:

Part-No.	Description
4161 8323900	NA FRONTKLAPPE KLPT
4100 7290942	ZB FRONTKLAPPE GRUNDIERT VERSIEGELT

5.5. BODY PARTS.

5.5.3. BOOT LID.

Amount Boot Lid Trim.
(necessary for boot lid replacement).



NOTICE The front bumper can be obtained ready-trimmed from BMW Motorsport.

 Repair and maintenance work on the vehicle only with appropriate protective clothing.

Boot Lid (trimmed):

Part-No.	Description
4162 8324122	NA Heckklappe (no paint)

5.5. BODY PARTS.

5.5.3. BOOT LID.

Boot Lid Replacement:



1
Roughen the marked adhesive surface with a grinding paper and then clean it.



2
Roughen the adhesive surface with the grinding paper and then clean it.



3
Position the template and position the funnel. Coat the adhesive surface with "2K adhesive 5min PU hard". Insert the funnel in the boot lid and fix it with adhesive tape.
NOTE: Note the curing time.



4
Insert the Aero-Catch in the boot lid and screw it tight.



5
Fit the rear spoiler and glue the M2 CS lettering.



6
Insert plastic grommets into the tailgate.



7
Insert the emblem into the boot lid.



8
Close license plate fitting holes with seal pads.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

NOTICE

The boot lid can be obtained ready-trimmed from BMW Motorsport.

5.5. BODY PARTS.

5.5.4. CFK ROOF.

CFK Roof Replacement (exemplary M4GT4):



Treat the adhesive surfaces on carbon roof and body with abrasive fleece and clean it with cleaner R1.



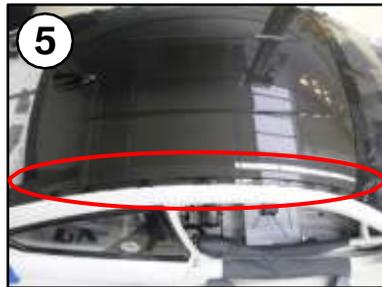
Put window adhesive front and rear of the roof bend inside the marked areas (red) on the body.



Put Würth Ultimate adhesive with a 2K dispensing gun to the marked roof flange of the body (green).



Insert, position and fix the CFK Roof carefully onto the body.
Curing time: 1h.



Fit 7x retaining clip roofing strip L / R (self-adhesive) on the marked areas (red) of the CFK Roof.
Clip the roof trim strip L / R onto it.



Put the roof antenna including GPS receiver into the CFK Roof from above.



Fix the roof antenna with 3x Kaynut M5 from inside.



Fix the cable harness (GPS) with ty-raps onto the roll cage (as shown in the figure).



Repair and maintenance work on the vehicle only with appropriate protective clothing.

NOTICE

A new body shell is always delivered without a built-in CFK roof.

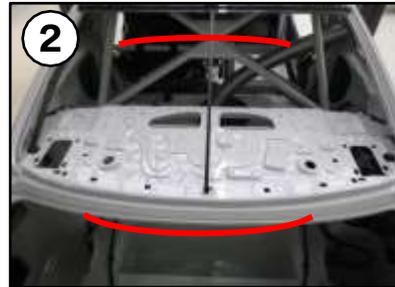
5.5. BODY PARTS.

5.5.5. WINDOWS.

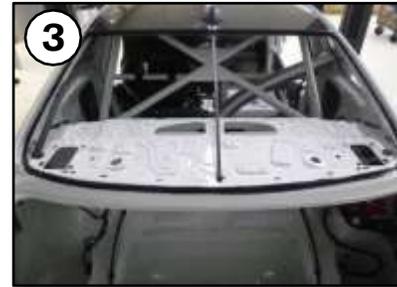
Window Replacement (exemplary M4GT4):



Material:
1x Würth Ultimate Set
1x abrasive Fleece (0402967)



Fit support strut rear window on rear body.
ATTENTION: If necessary, the strut must be trimmed (bent) to window contour.



Treat adhesive surfaces with abrasive fleece and Würth Varioprimer safe + easy. Add the Würth Ultimate adhesive around the window flange.



Insert, position and fix the rear window carefully onto the body.



Analog fit the front support struts, treat the adhesive surface and add the Würth Ultimate around the windscreen flange.



Insert, position and fix the windscreen carefully onto the body. Connect the front screen heating cable harness to the windscreen connector.



Lock windshield with 9x plastic hexagon quick-release fastener on windscreen.



Fit windshield with 2x plastic clips to body bracket (fender) L / R.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

NOTICE

Remove the old screen spacer completely and install new ones.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Mounting Radiator Top. (at Replacement).

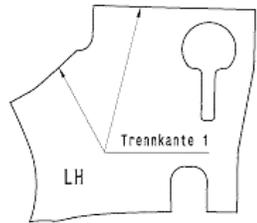
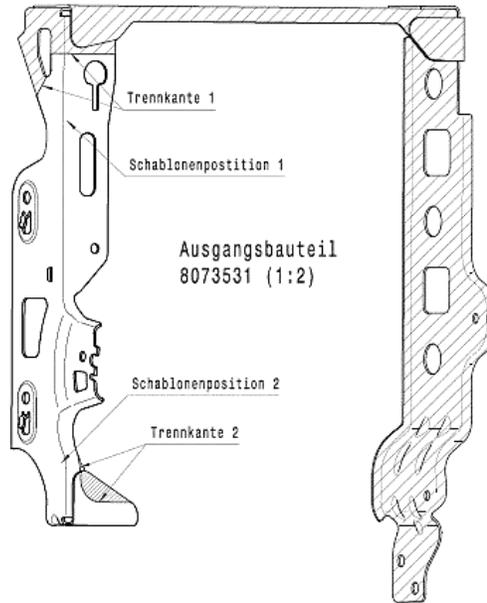


Linksteil (1:5)

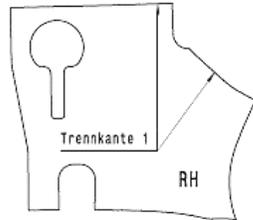


Rechtsteil (1:5)

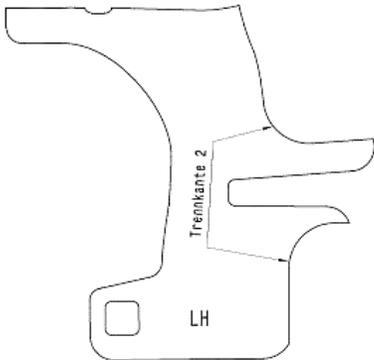
Beschnittschablonen wie dargestellt an Bauteil ansetzen
(s. Hinweis Ausgangsbau teil)



LH

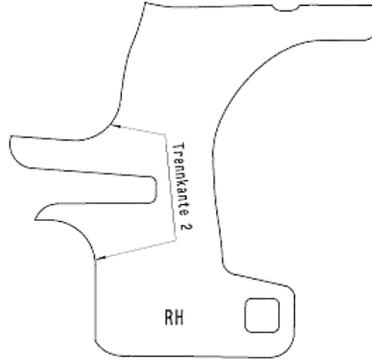


RH



Trennkante 2

LH



Trennkante 2

RH

NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342828	NA Aufnahme Kuehler oben

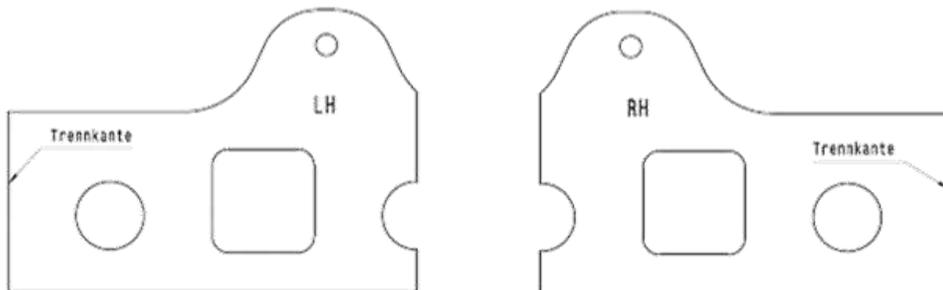
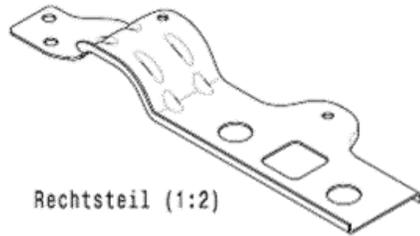
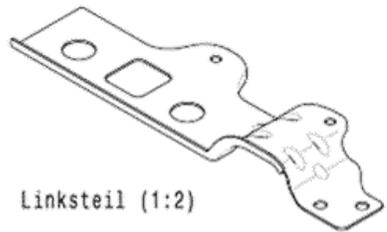


Repair and maintenance work on the vehicle only with appropriate protective clothing.

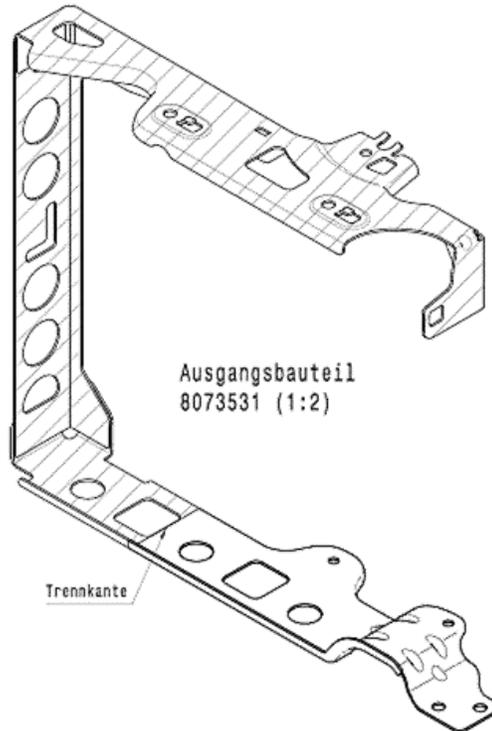
5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Mounting Radiator Bottom. (at Replacement).



Beschnittschablonen wie dargestellt an Bauteil ansetzen
(s. Hinweis Ausgangsbauteil)



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342829	NA Aufnahme Kuehler unten

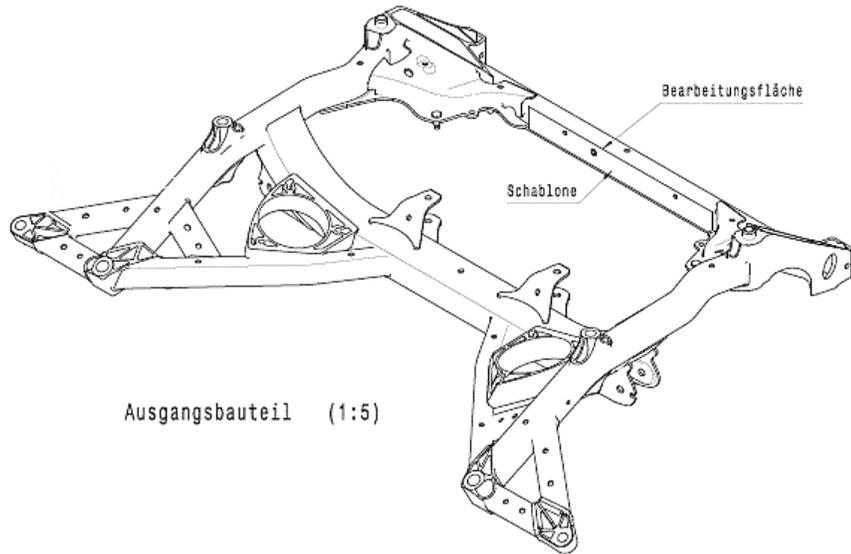


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Front Sub-Frame. (at Replacement).



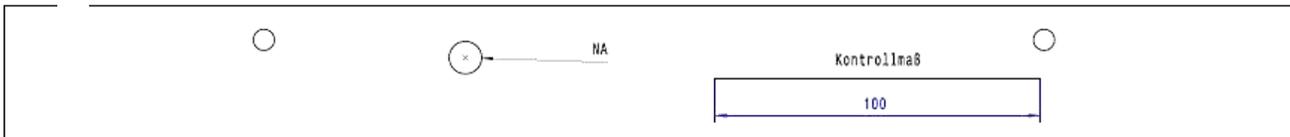
Beschnittschablonen wie dargestellt an Bauteil ansetzen
(s. Hinweis Ausgangsbauteil)

NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342830	NA Vorderachstraeger

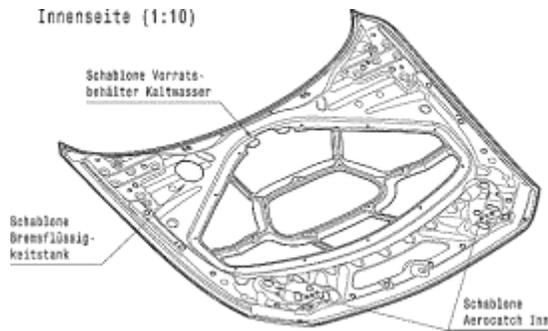
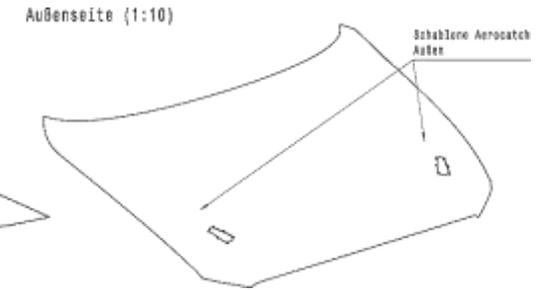
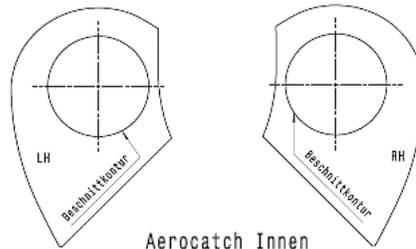
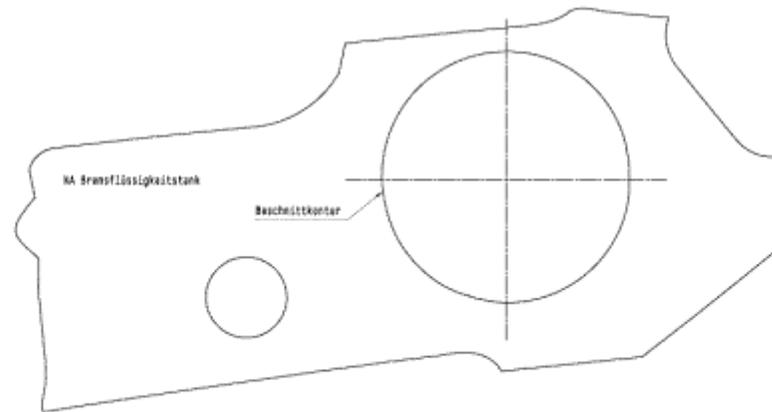
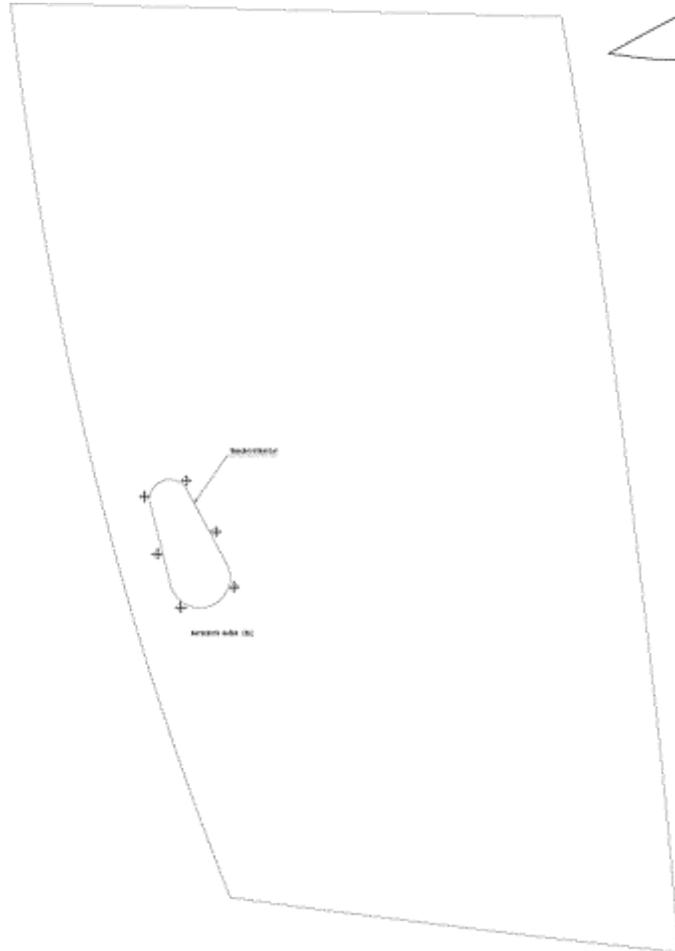


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Steel Bonnet. (at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

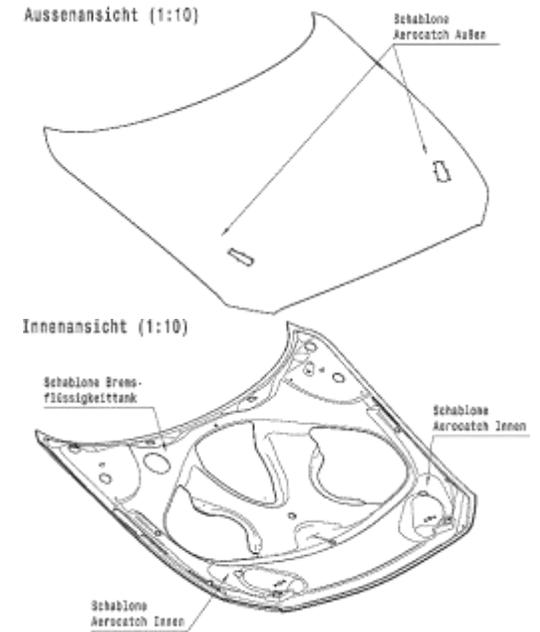
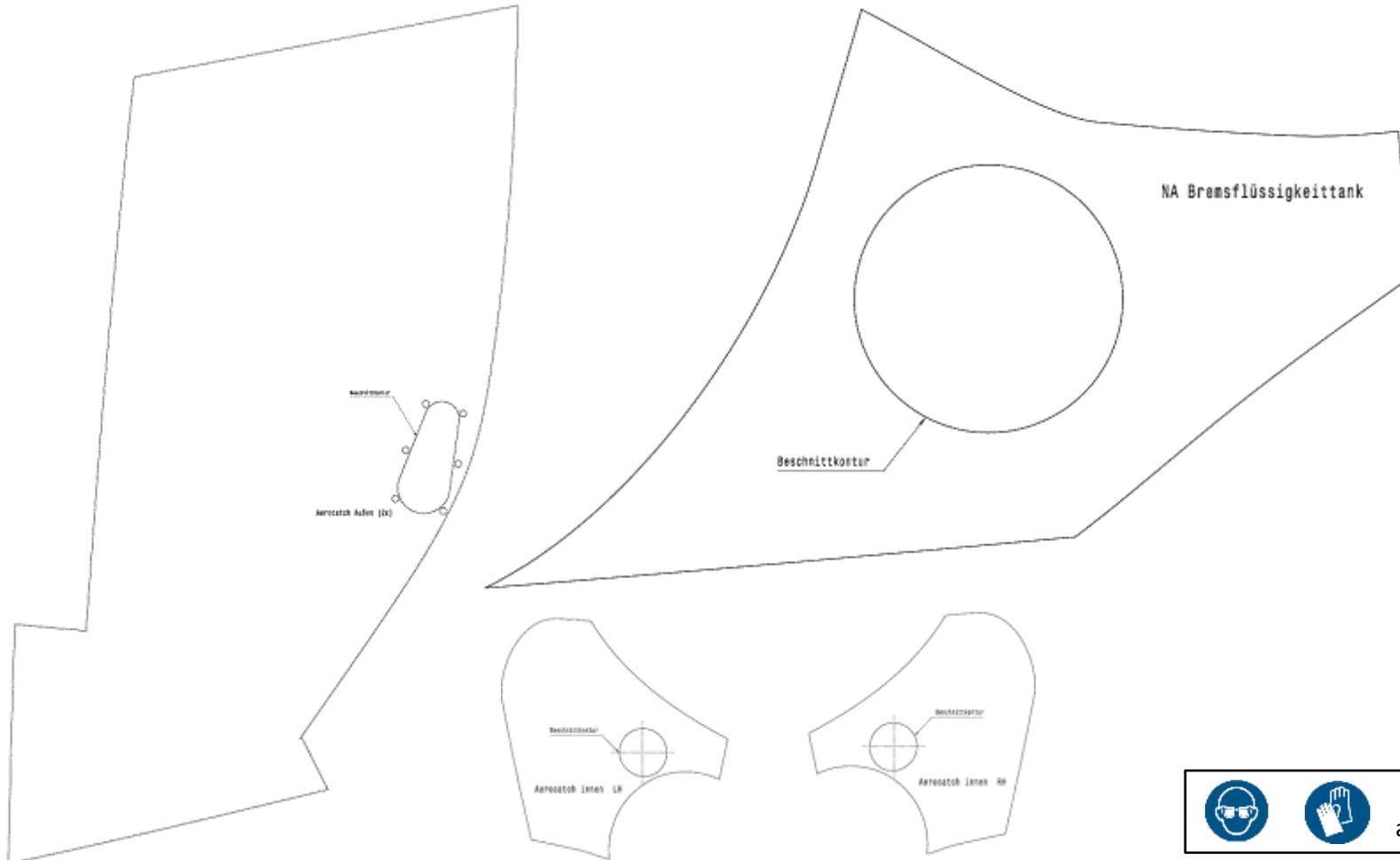
Part-No.	Description
8331 8342831	NA Frontklappe klpt

Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Carbon Bonnet.
(at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342832	NA ZSB Frontklappe Carbon

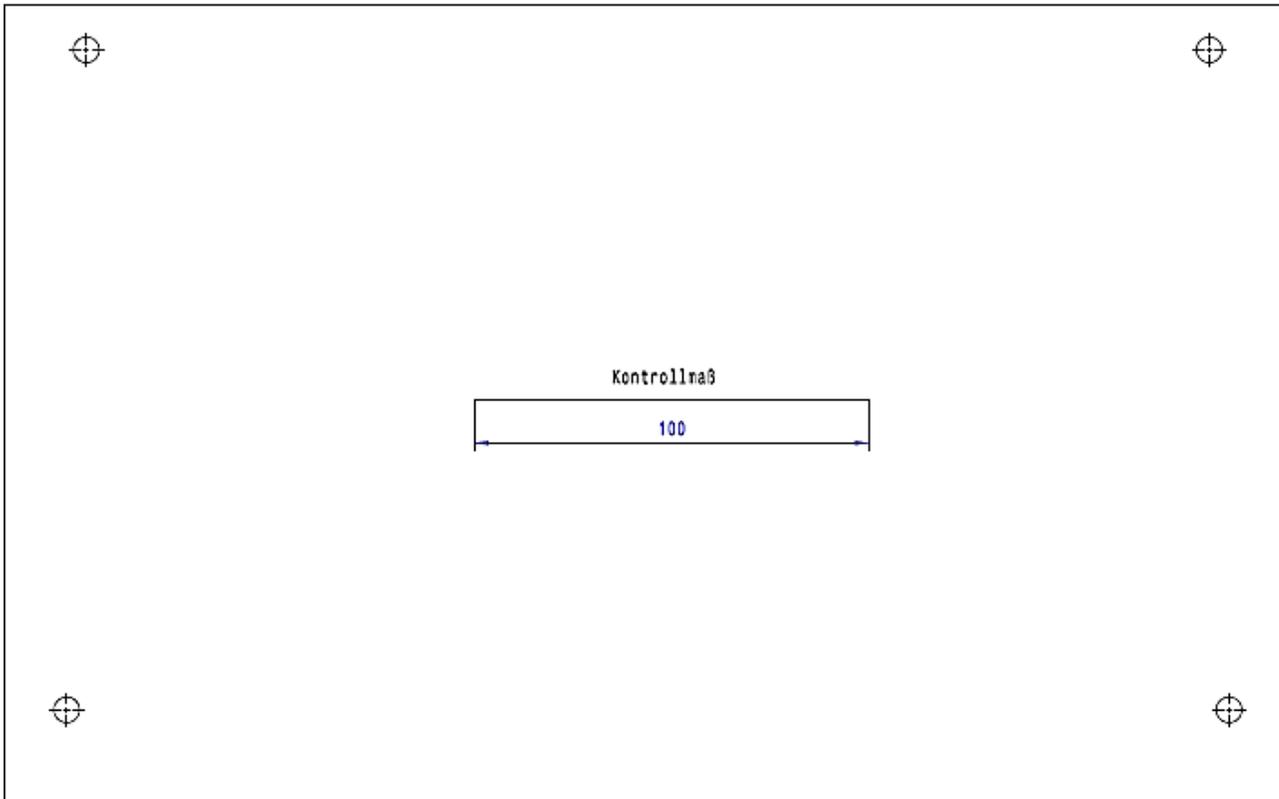
Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

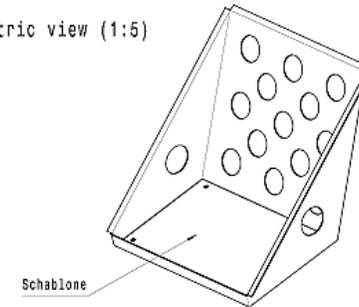
5.5.6. TEMPLATES.

Trim Work Foot Rest Passenger. (at Replacement).

Beschnittschablonen wie dargestellt an Bauteil ansetzen



Isometric view (1:5)



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342834	NA Fussstuetze BFS Alu

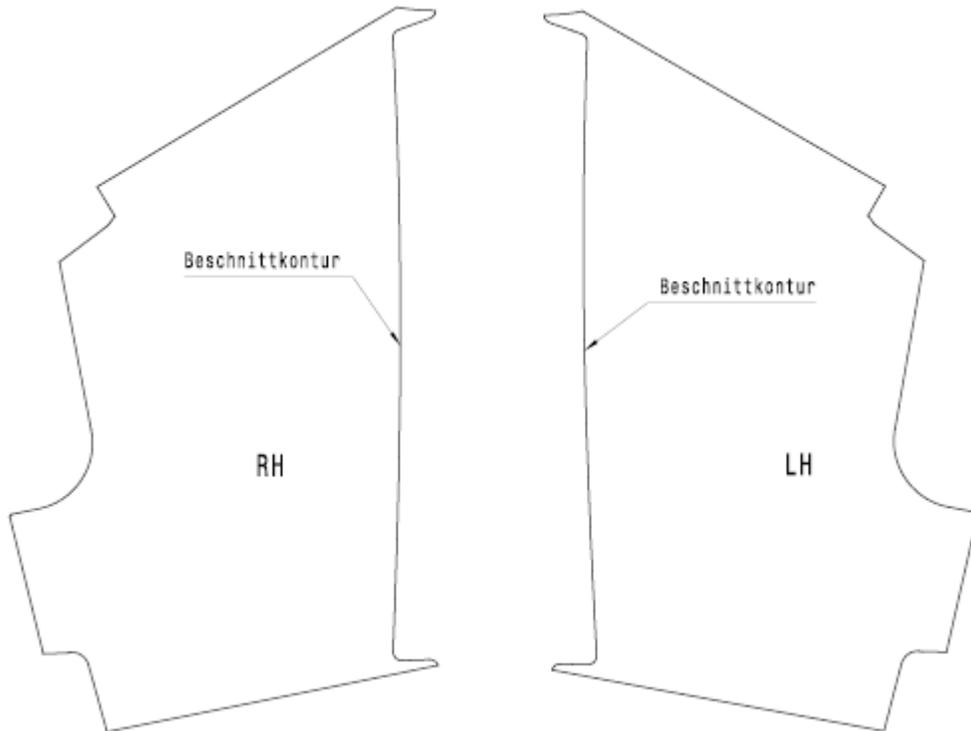


Repair and maintenance work on the vehicle only with appropriate protective clothing.

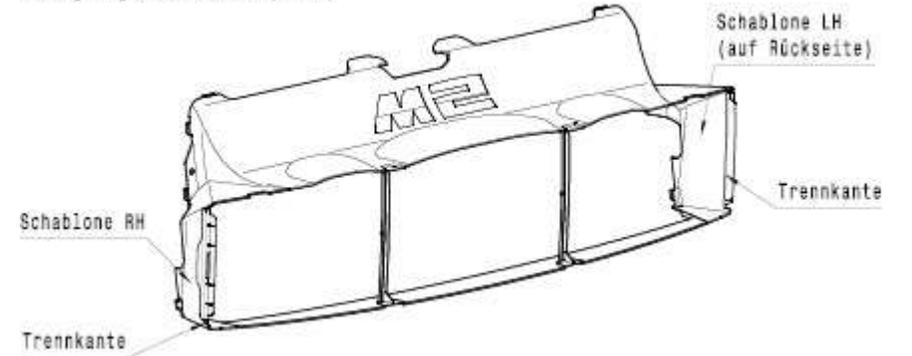
5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Air Guide Radiator Bottom. (at Replacement).



Ausgangsbauteil (1:5)



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342835	NA Luftführung Kuehl. unten

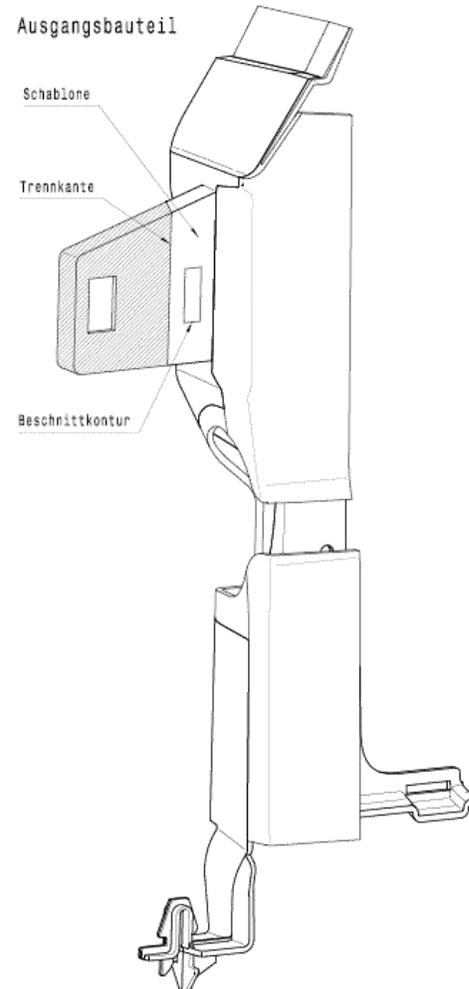
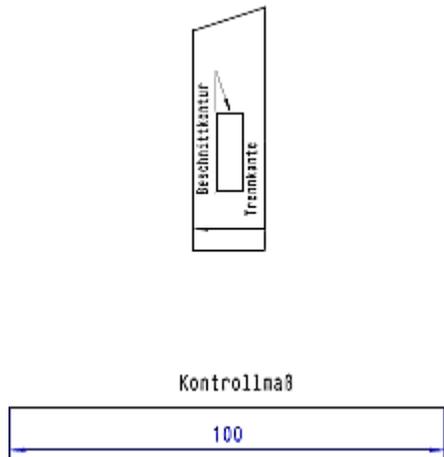


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Air Guide Radiator RHS. (at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342836	NA Re Luftführung Kuehler

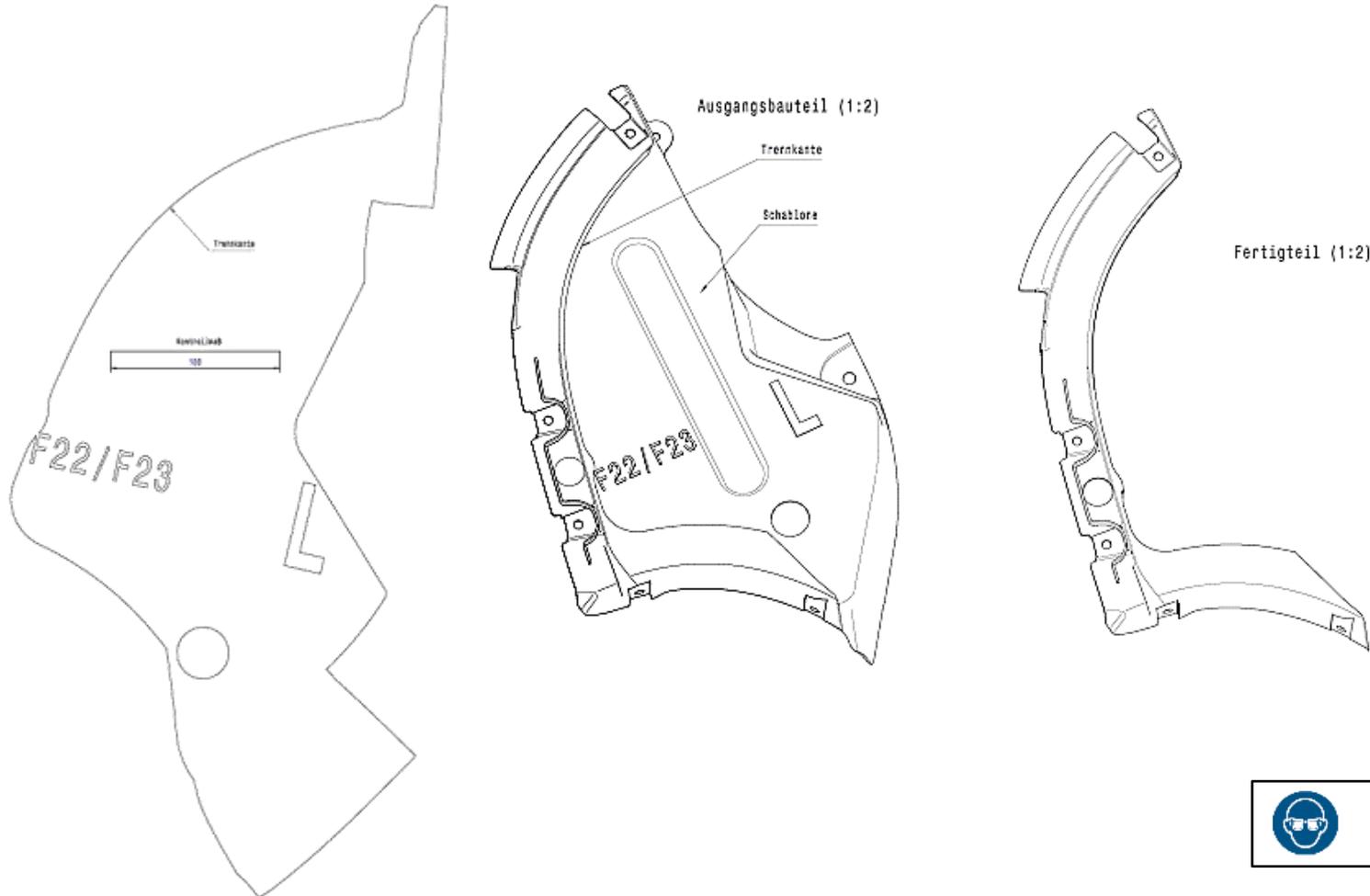


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Underride Protection. (at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342837	NA ZB Unterbodenver.



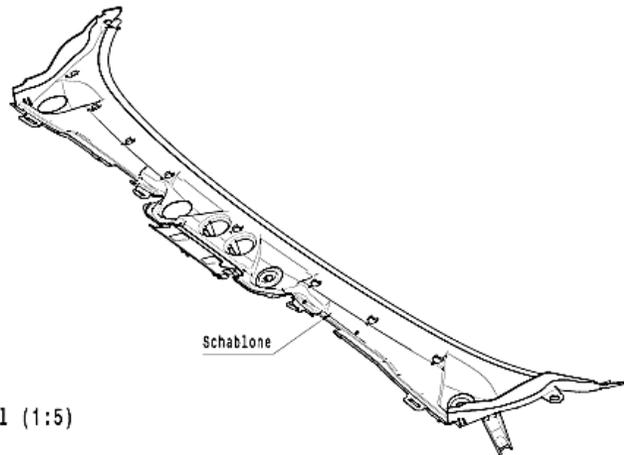
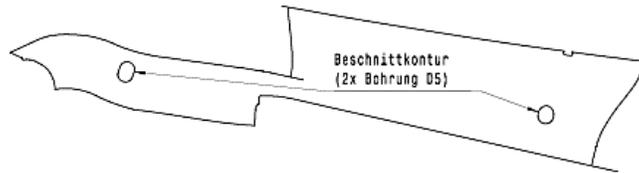
Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Cowl Cover. (at Replacement).

Beschnittschablonen wie dargestellt an Bauteil ansetzen
(s. Hinweis Ausgangsbau teil)



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342838	NA ZB Abdeckung Windlauf

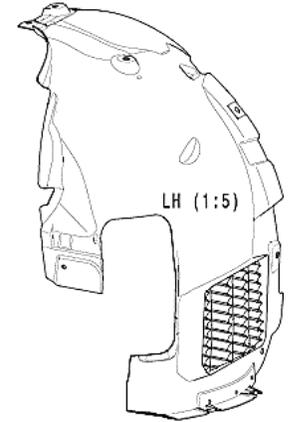
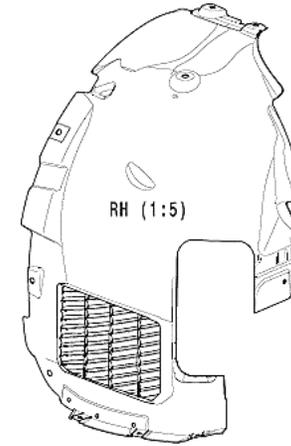
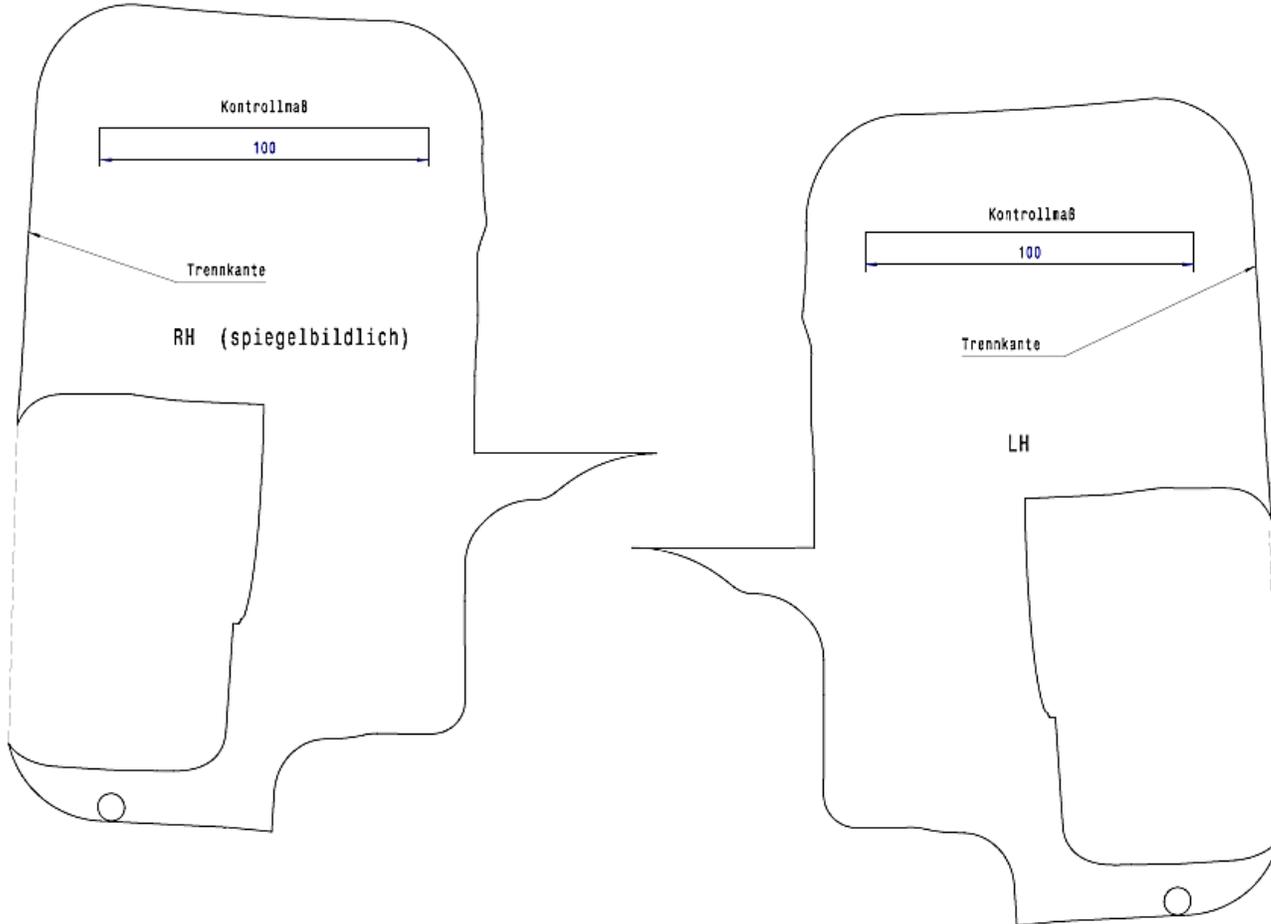


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work LHS Wheelarch Shell. (at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342839	NA Li. Radhausschale

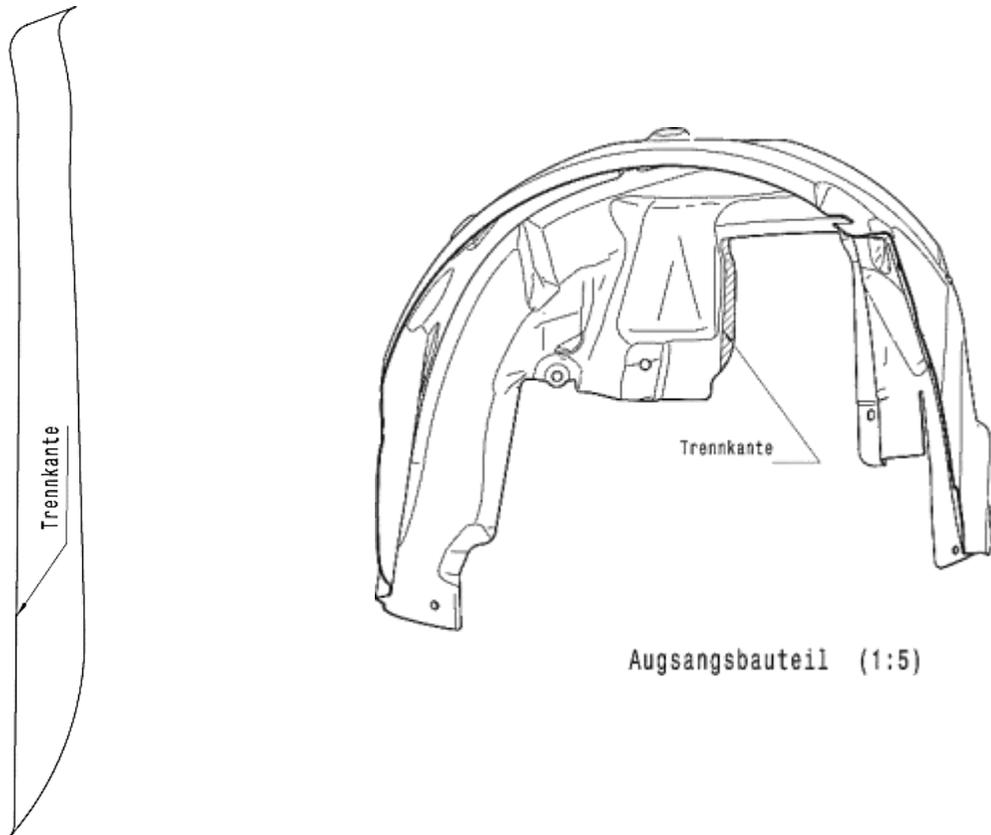


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work LHS Cover Wheelarch Shell.
(at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342840	Li NA Abdeckg. Radhausschale

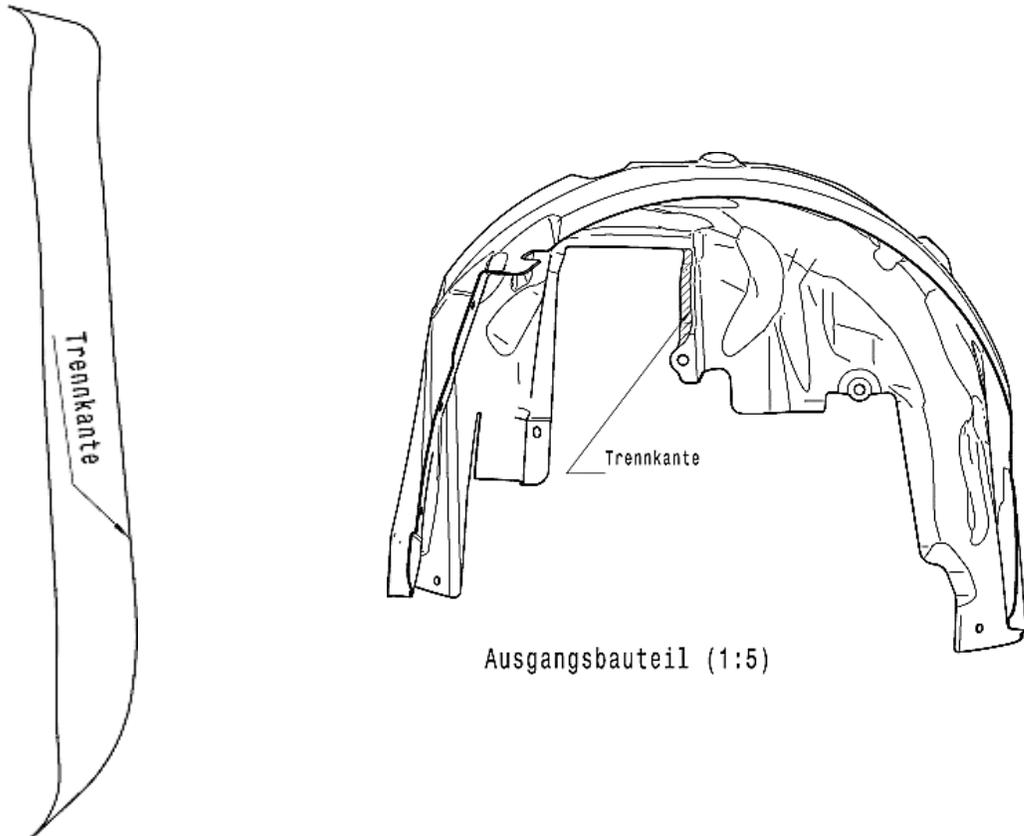


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work RHS Cover Wheelarch Shell.
(at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342841	Re NA Abdeckg. Radhausschale

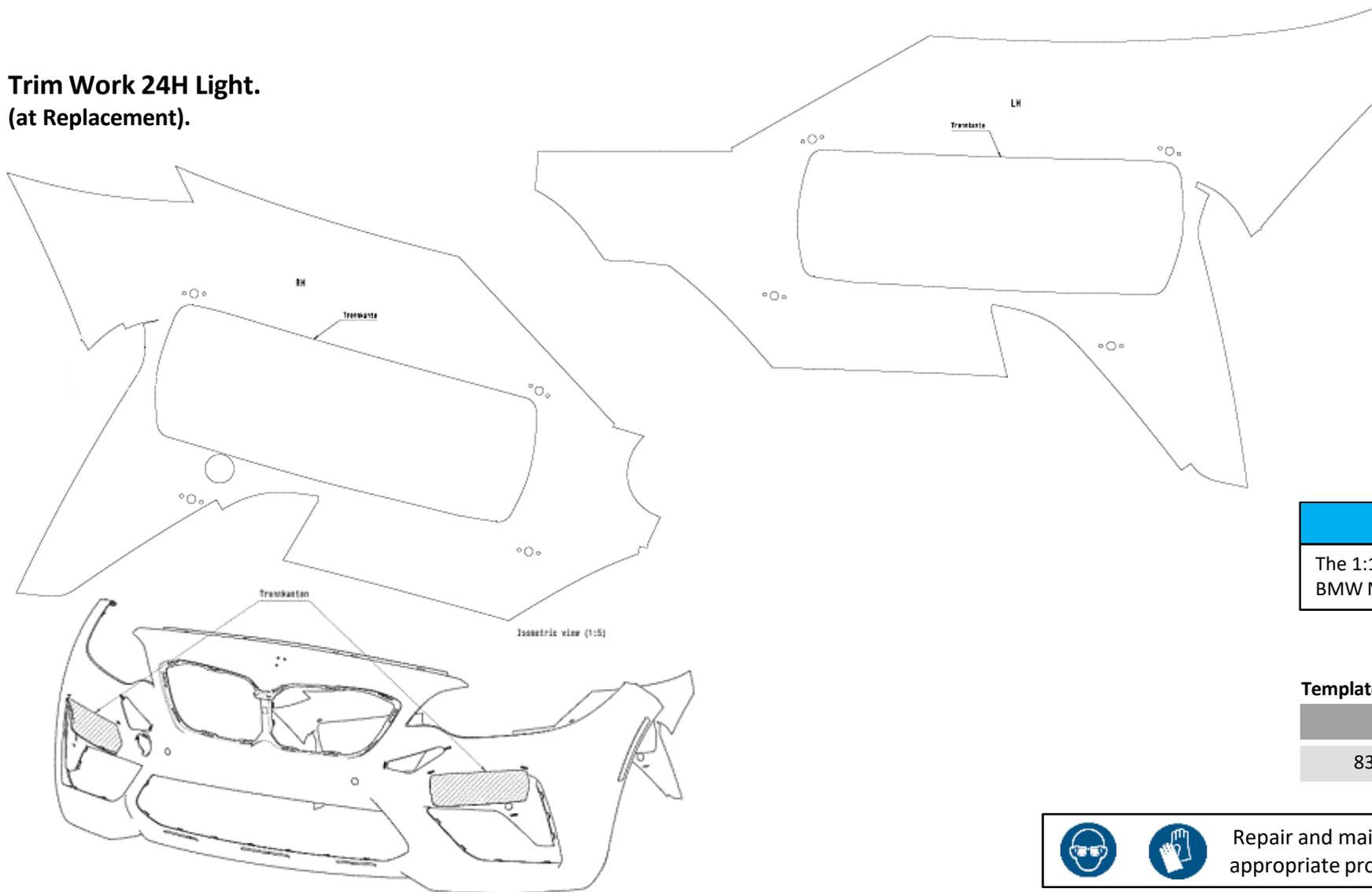


Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work 24H Light. (at Replacement).



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

Template:

Part-No.	Description
8331 8342842	NA 24H Light Verkl Stossf.



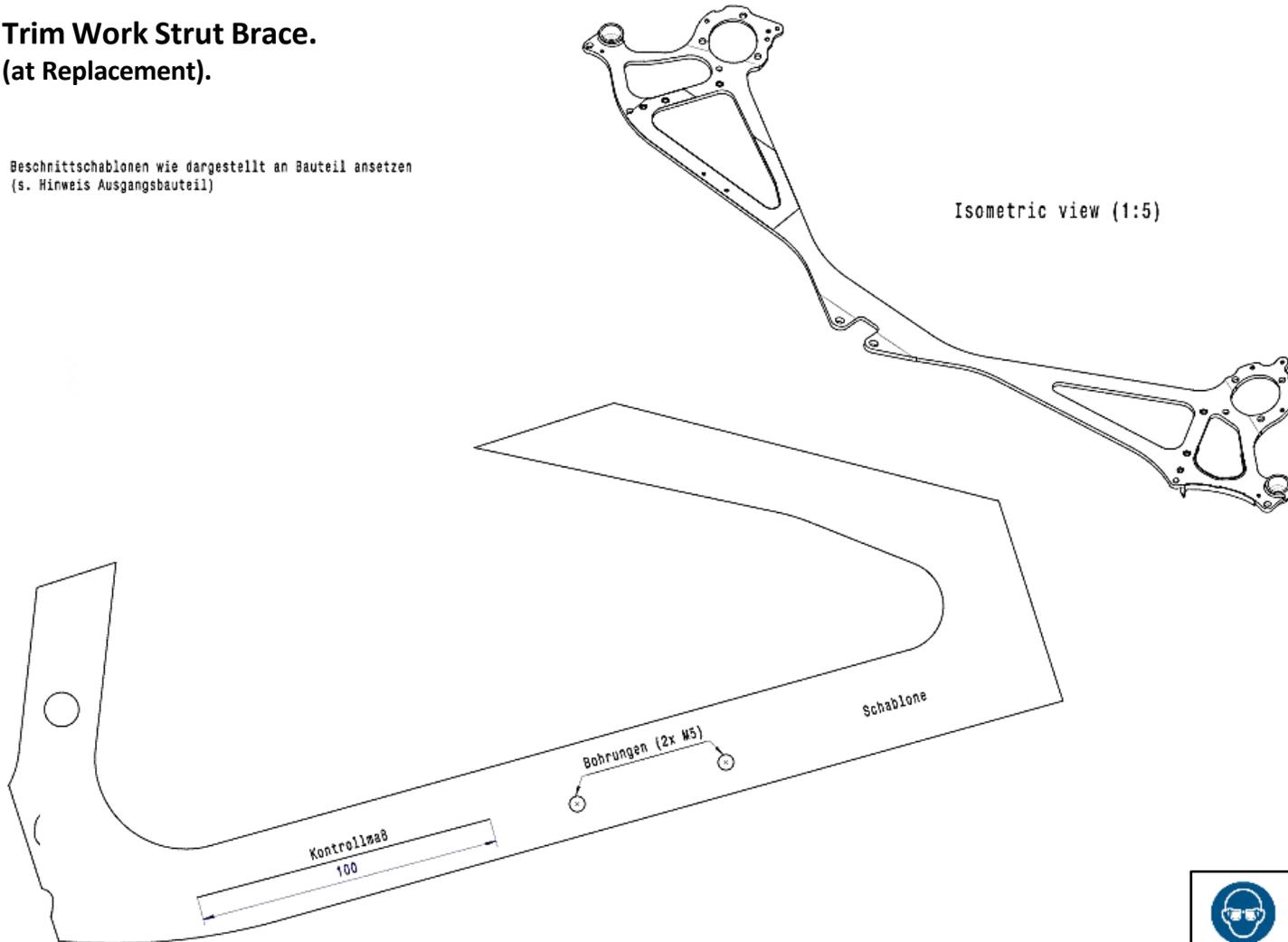
Repair and maintenance work on the vehicle only with appropriate protective clothing.

5.5. BODY PARTS.

5.5.6. TEMPLATES.

Trim Work Strut Brace. (at Replacement).

Beschnittschablonen wie dargestellt an Bauteil ansetzen
(s. Hinweis Ausgangsbauteil)



NOTICE

The 1:1 scale template drawing can be downloaded from the BMW Motorsport customer portal.

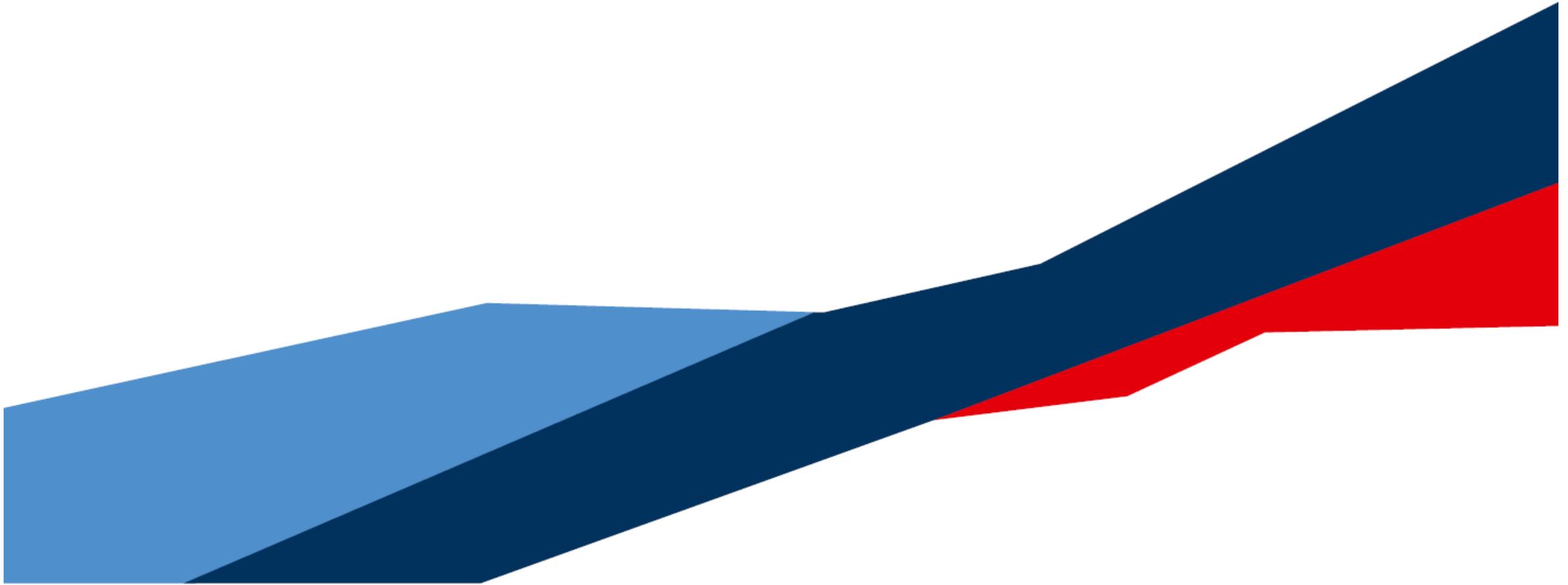
Template:

Part-No.	Description
8331 8342843	NA Alu Front Domstrebe LL



Repair and maintenance work on the vehicle only with appropriate protective clothing.

6. INTERIOR.



6.1. DRIVER CONTROL SYSTEMS.

6.1.1. STEERING WHEEL.



RADIO:	Transmission.	
	▪ Push to Talk.	
LEFT:	Indicator left.	
	▪ Press:	On/Off.
WIPER: (Button)	Wash / Wipe function.	
	▪ Press:	Windscreen washing + wiping.
WIPER: (Rotary switch)	Wiper function.	
	▪ Pos. 1:	Interval wiping.
	▪ Pos. 2:	Normal wiping.
	▪ Pos. 3:	Quick wiping.
DASH:	Display.	
	▪ Press:	Dash page change.
DIM:	Illuminated Switch Panel (Dimming).	
	▪ Pos. 1 – 5:	1-Bright, 5-Dark.
	▪ Pos. 6:	Illumination OFF.
HIGH:	Head Light.	
	▪ Short Press:	High beam flashing.
	▪ Long Press:	High beam On/Off.
RIGHT:	Indicator right.	
	▪ Press:	On/Off.
DRINK:	Triggers the drink bottle pump.	
PSL:	Pit Lane Speed Limiter.	
	▪ see below.	

PSL: Pressing PSL activates the Pit Speed limiter. The Limiter can be operated in any driving dynamics mode. The limiter target speed can be selected via the **SEPP mode** (see chapter 6.1.3). There are two different PSL limits that can be set in the SEPP mode via the **DSC switch** (Limit 1 - low) / **FDS switch** (Limit 2 - high). Push the selected switch up or down to increase/decrease the PSL limit. In the Dash, the respective limit is displayed in SEPP mode under **OIL (Limit 1)** and **WAT (Limit 2)**. Only the limiter is active, which is in the catch-speed limit, when the PSL button is pressed. For example: If limiter 1 is set to 60 km/h and Limiter 2 is set to 120 km/h, Limiter 1 is active at a speed up to 90 km/h. Limiter 2 is active from 90 km/h.

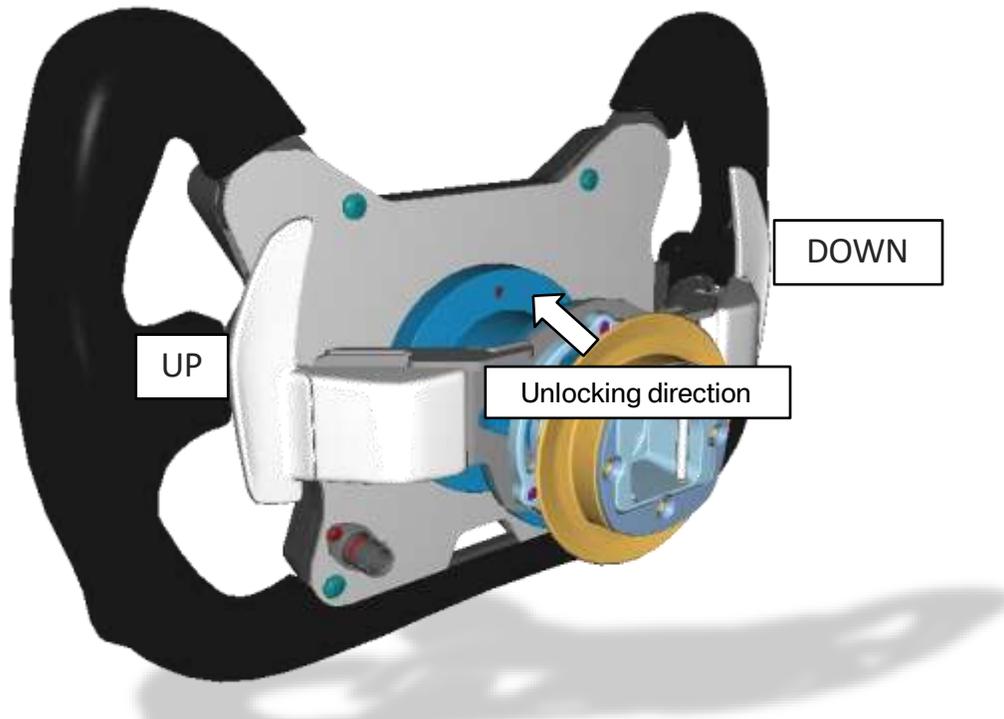
[Catch-Speed Limit Switch Point = ((PSL 2 - PSL 1) / 2) + Limit 1] Limit 1 active < Catch-Speed Limit Switch Point < Limit 2 active.

NOTICE

The **Pit Speed Limiter** only limits the engine torque and does not make any active brake interventions. At settling initial control or approaching the selected limit with large wheel slip on the rear axle or on a part of the track with a steep incline may cause a brief exceed of the selected limit.

6.1. DRIVER CONTROL SYSTEM.

6.1.1. STEERING WHEEL.



Steering wheel has a quick release and can be taken off.

PADDLE SHIFT:

UP: Pull flipper to trigger an up shift.

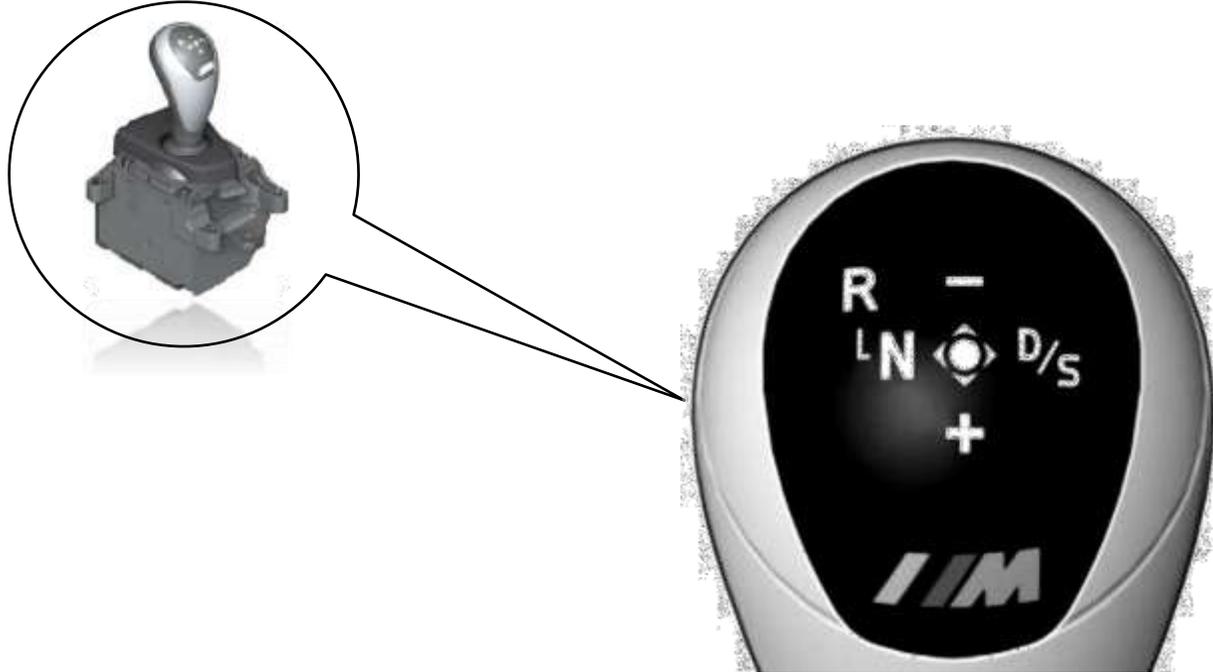
DOWN: Pull flipper to trigger a down shift.

A downshift memory function is applied. Up to three downshift activations can be triggered at the shift pedal immediately in a row, the request will be saved for 5s.

After, downshift(s) will be performed at the optimum shifting point and is done only if the rpm and vehicle speed are appropriate. For example, there is no downshifting if the engine speed is too high.

6.1. DRIVER CONTROL SYSTEM.

6.1.2. SELECTOR LEVER.



R: Reverse Gear.
▪ Engage only at vehicle stillstand.

N: Neutral, Idle.

Centre Position:

- + manual Up Shift.
- - manual Down Shift.

D/S: change between Drive Mode and sequential shift Mode.

Press the brake and move the selector lever to the the corresponding direction.
As soon as the selector lever is released, it returns back to the middle position. In position **R** the selector lever is locked at that position. If necessary, change parking lock release position and press the **P**-button (see chapter 6.1.3. too).
The selected lever position is displayed in the Dash-board and on the selector lever.



An unsecured vehicle can set itself independently and roll away. There is an accident risk. Before leaving the vehicle, secure it against rolling away.

6.1. DRIVER CONTROL SYSTEM.

6.1.3. PARKING LOCK / RECOVERY.



Unlocked – car can roll away.

Position in driving / track mode and when towing the vehicle.



Locked – car can not roll away.

Position when the vehicle is parked at slopes or work is done on the vehicle while the engine is running.

The gearbox parking lock should be unlocked by means of the gearbox unlocking lever in driving / track mode. This is the case if the red lever on the center tunnel is in the horizontal position, the rope is tensioned and the vehicle can be moved with the engine switched off. The **P** does not appear when the **P** key is pressed while the engine is running. The parking lock should only be used when the vehicle is parked on slopes etc., or when working at standstill with the engine running on wheels or brakes.

Towing is possible in drive mode **N** only.

The gearbox unlocking lever is located at the propshaft tunnel (see figure).

NOTICE

When the engine is running, the drag torque of the wet clutch can be transmitted to the wheels. If work has to be carried out on wheels or brakes while the engine is running, the parking brake must be inserted – gear position **N** is not sufficient. Move the red lever to the vertical position and press the **P** button - gear position **P** is indicated on the dash - do not start with the work before. Before you continue driving, unlock the parking brake.

6.1. DRIVER CONTROL SYSTEM.

6.1.4. SWITCH BOX / SWITCHES



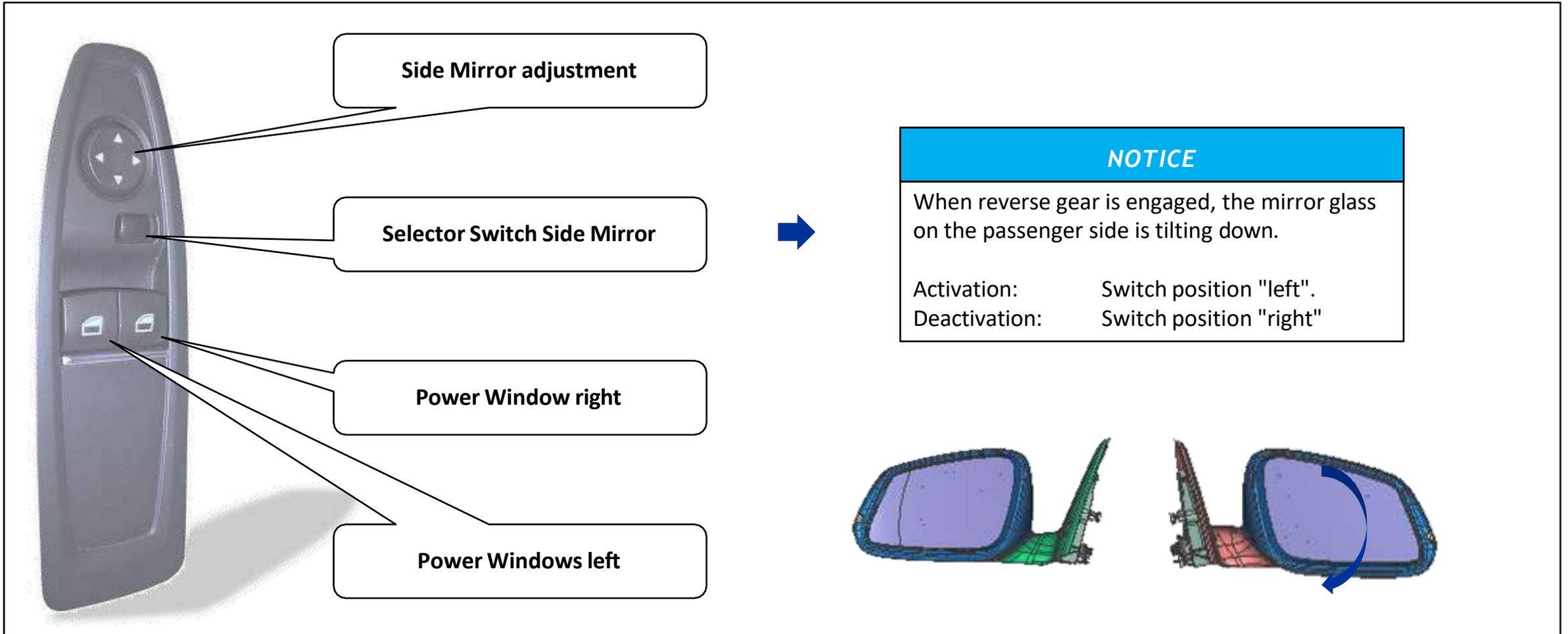
START:	Engine Start/Stop. <ul style="list-style-type: none"> See also chapter 6.1.4. 	RAIN:	Rear fog light. <ul style="list-style-type: none"> Works with lights on only.
P:	Gearbox “P”- Mode. <ul style="list-style-type: none"> Parking lock. See also chapter 6.1.12. 	FRONT:	Windscreen heater. <ul style="list-style-type: none"> Active with running engine only.
FUEL:	Fuel reset button. <ul style="list-style-type: none"> Resets fuel used on dash. 	REAR:	Rear window heater. <ul style="list-style-type: none"> Active with running engine only.
HAZARD:	Hazard flashing. <ul style="list-style-type: none"> Switches hazard flashing on. Fuel drain in SEPP-Mode. 	LIGHT:	Lighting system. <ul style="list-style-type: none"> Switches the lights on/off.
FIRE:	Fire Extinguisher. <ul style="list-style-type: none"> Activation of the fire extinguisher. 	AC:	Air condition. <ul style="list-style-type: none"> Aircon on/off.
DSC:	BMW DSC Mode. <ul style="list-style-type: none"> See chapter 6.1.5. 	FOG:	Front endurance lights (24H). <ul style="list-style-type: none"> Works with lights ON only.
FDS:	BMW FDS Mode. <ul style="list-style-type: none"> See chapter 6.1.5. or if you suspect a cable burn. 	MAIN:	Main switch:
NOTICE			
Disconnects the battery from the electrical system. Disconnect the power supply if you leave the race track unexpectedly			

Remark: All activated switches are illuminated in Blue.

A Service Mode **SEPP (Service Per Personal)** can be called (engine off): Hold the **DSC** and **FDS** switches of the control panel simultaneously in the upper position for 2 seconds until all buttons start to flash. The **SEPP mode** is switched off by the **HAZARD** button.

6.1. DRIVER CONTROL SYSTEM.

6.1.4. SWITCH BOX / SWITCHES



6.1. DRIVER CONTROL SYSTEM.

6.1.5. ENGINE START / STOP.

Important: Before starting the engine pay attention to chapter A of the appendices!



The ID transmitter (remote control) must be present for starting the engine in the vehicle. The position shown in the center console is provided for this purpose.



The main switch needs to switch ON to activate the car's power supply.



When the start / stop button is pressed and the brake is actuated at the same time, the engine starts in each terminal state. If only the Start / Stop button is pressed without the brakes, the ignition can be switched on or off.

NOTICE

If it is not possible to switch the ignition or start the engine via the Start / Stop button, this may indicate an empty key battery. In this case, a fault memory is entered in the FEM.

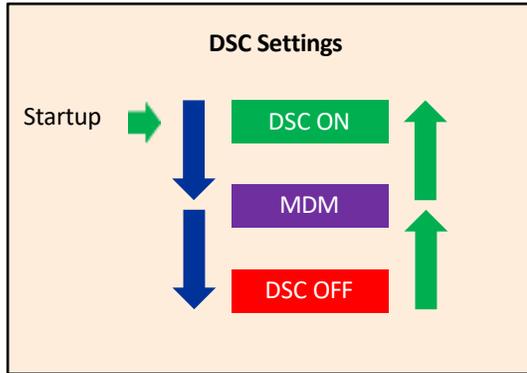
To start the engine or switch the ignition on, the key must be removed from the holder and, as shown in the picture, held on the emergency start coil (which is located under the carbon) with the key tip at the following position when the Start / Stop button is pressed:



6.1. DRIVER CONTROL SYSTEM.

6.1.6. DSC / FDS.

DSC modes and functions implemented in the vehicle :



Driving dynamics control: DSC ON, MDM, DSC OFF

DSC ON:

This mode is designed for maximum driving stability.

MDM: (M-Dynamic Mode / Performance Mode)

The MDM mode allows for more longitudinal / lateral dynamics and does not immediately prevent Under- / Oversteer. (Understeer / Oversteer is possible, if the driver reacts too slow or does not react at all).

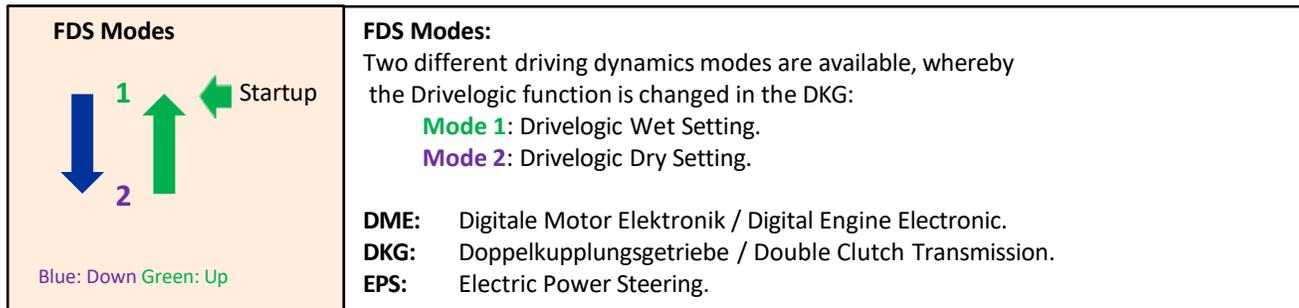
DSC OFF:

No vehicle dynamics control is active.

The driving dynamics can be changed by pressing the "DSC button" on the switch panel. After each engine start, the vehicle dynamics control is activated to its full extent (**DSC-ON**). By pressing the DSC button down, the modes are shown as shown in the diagram (**blue arrows**). Pressing the DSC button up (**green arrow**). The control request is set by the driver via the DSC switch on the switch panel and displayed in the DASH via the lettering (**DSC-ON / MDM / DSC-OFF**). From now on, the DSC LED (LED-4) in the DASH always indicates the current control state of the DSC, which describes the current state: **DSC-ON: green, MDM: blue, DSC-OFF: red.**

If the DSC LED turns **blue / green** again after a DSC alarm according to the setting by the driver's request, the control is active again.

FDS modes and functions implemented in the vehicle :



NOTICE

ABS control is always active regardless of the vehicle dynamics mode and can not be deactivated.

A **DSC Alarm** can occur with free-spinning rear wheels and standing front wheels (e.g., jacked up with the engine running and Shift Check). This alarm is not automatically cleared at > 42 km/h. If the AIM warning lamp lights up red and MDM or DSC-ON is selected, there is NO driving stability mode!

6.1. DRIVER CONTROL SYSTEM.

6.1.7. AIM DASHBOARD.



NOTICE

It is recommended that the BMW Motorsport installed firmware of the AIM MXG Dash Loggers do not change. On the BMW Customer Portal, the versions tested and released by BMW M Motorsport are available.

As inconsistent data / values may occur during configuration changes in the AIM Logger, the shared BMW Motorsport configuration must always be used if problems occur. Always make a backup before any change. BMW M Motorsport assumes no responsibility after a firmware or configuration change. For assistance in this case, contact AIM. The standard wiring diagram for the Dash Logger can be downloaded from the BMW Customer Portal.

AIM MXG DASH LOGGER.

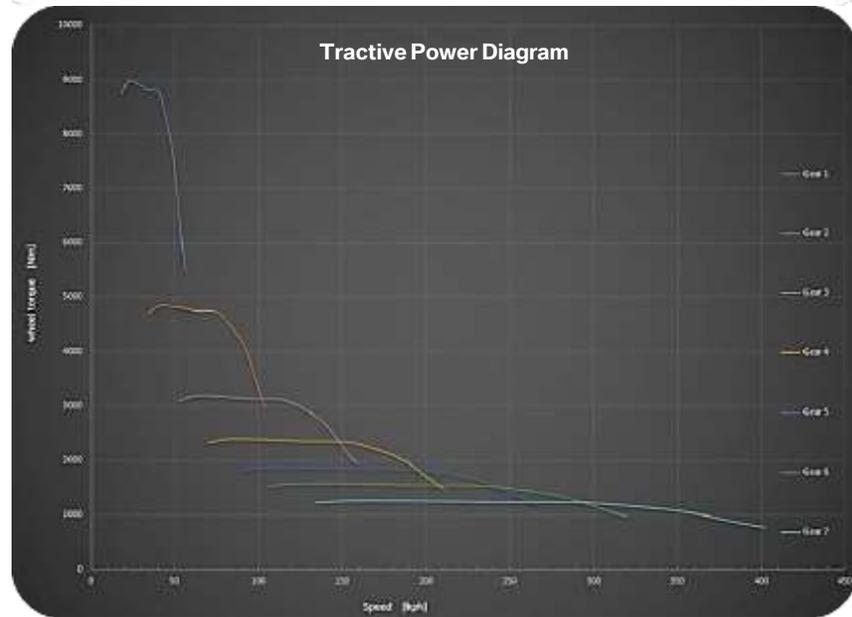
The AIM MXG Dashboard allows two different types of beacons. A conventional optical lap beacon or a GPS beacon.

Main Specifications:

7" TFT Display	
800 x 480 Pixel	
Alarm-LEDs:	8 RGB (fully configurable).
Shift Light LEDs:	10 RGB (fully configurable).
CAN connections:	3
Expansion Can connectors:	GPS, Channel expansion, Cam, Lambda Controller.
Digital Outputs:	2 (1 A, 12 V).
Digital Inputs:	4x Speed, 1x RPM.
Analog Inputs:	8 (fully configurable).
Motion Detection:	internal 5G-Sensor (3-axis), Gyro.
Memory:	4GB (internal).
Dimensions:	237 x 127.6 x 26 mm.
Weight:	950 g.
Waterproof:	IP65.

6.1. DRIVER CONTROL SYSTEM.

6.1.7. AIM DASHBOARD.



The tractive power diagram shows the loss of torque due to late shifting to the next higher gear.

The dashboard supports **10 Shift Lights**, **8 Indication LEDs** and configurable **Alarm texts** as shown in the dash picture.

The Shift Light pattern is gear dependent. The outer LEDs will be illuminated first until the inner LEDs “touch”. The driver should shift when he sees the Red Lights, but not predict the last light!



The 8 additional **LEDs** are used to show the state of the following functions:

LED	Color/Function	Color/Function	LED
←	Green: Left Indicator Yellow: Alarm active	Green: Right Indicator Yellow: Alarm active	→
FUEL	Red: Fuel Alarm Orange: Fuel Warning	Blue: High Beam Green: Headlights	LIGHTS
PSL	Yellow: PSL active	Red: DSC Off	ABS
DSC	Green: DSC On Blue: MDM Red: DSC Off	Green: FDS 1 Blue: FDS 2	FDS

Please note the following engine speed for optimized torque in all gears. Please note that the shift lights are preconfigured to the indicated engine speed and are the shift point, on which you pull the upshift pedal "+".

Gear	1-2	2-3	3-4	4-5	5-6	6-7
RPM	7100	7000	6800	6700	6500	

The use of the 7th gear for maximum speed is not recommended. As an added benefit, this lowers your powertrain temperatures.

6.1. DRIVER CONTROL SYSTEM.

6.1.8. AIM TABLE OF ALARMS (DISPLAY).

ALARM	Specification	Action	ALARM	Specification	Action
LOW BATTERY	Car battery is low.	Charge battery. Check AC charging.	ENGINE FAN FAILURE	Radiator fan failure.	Cool down before entering pit lane.
DSC FAILURE	DSC/ABS system failure.	DSC/ABS deactivated.	CLUTCH TEMPERATURE	Clutch temp. high.	Reduce pace.
DSC FAILURE INITIALIZATION	DSC calibration loss.	DSC/ABS deactivated until recalibration.	GENERATOR FAILURE	Generator/Power supply failure.	Turn off all electrical consumers.
STEERING FAILURE	Power steering failure.	Power steering can be lost.	GBX FAILURE	Gearbox failure.	Reduce pace. Shift time is reduced automatically.
DSC/STEERING FAILURE	DSC/Power steering failure.	DSC/ABS + Power steering can be lost.	DIFF FAILURE	Differential failure.	Reduce pace.
COOLANT LEVEL LOW	Coolant level low.	Pits, coolant leakage.	ABS FAILURE	ABS failure.	ABS is deactivated.
ENGINE TEMPERATURE	Engine oil temp. above threshold.	Monitor oil temp., switch to page 1 or 2, power reduction at 140°C, cool down if oil temp. is > 145°C.	ENGINE TEMPERATURE HIGH	Engine oil temp. above critical threshold.	Pits, reduce pace, reduce G-levels, power reduction.
ENGINE OIL PRESSURE	Engine oil pressure below threshold.	Communicate to pits.	OIL PRESSURE LOW	Engine oil pressure is below critical threshold.	Stop and switch off to safe engine.
			GBX TEMPERATURE HIGH	Gearbox temp. is high.	Pits, reduce pace, reduce G-levels, GBX Emergency mode.

NOTICE

All **Red highlighted** alarms are a risk for hardware damage. The alarms are shown on the AIM display at the top LEDs flashing yellow (LED1 / LED5) plus an alarm text. All alarms must be reported to the pits immediately.

6.1. DRIVER CONTROL SYSTEM.

6.1.8. AIM TABLE OF ALARMS (LOGGING).

ALARM	Spezification	Alarm-ID	ALARM	Spezification	Alarm-ID
LOW KEY BATTERY	Shows Alarm when Key Battery voltage exceeds threshold	63	COOLANT LEVEL LOW	Coolant level low	42
LOW BATTERY	Shows Alarm when Battery voltage exceeds threshold	62	ENGINE TEMPERATURE	Coolant or engine oil high	41
DSC FAILURE	Group message DSC failure	61	ENGINE OIL PRESSURE	Oil system error - oil pressure too high or too low	40
DSC FAILURE	Group message Alive failure and brake electronics without function	60	ENGINE FAN FAILURE	Error in the e-fan	39
DSC FAILURE - INITIALIZATION IN PROGRESS	Undervoltage or steering angle adjustment has been lost and must be re-learned	59	tbd	Low fuel pressure system too low	38
DSC FAILURE	DSC stabilization failed	58	tbd	High fuel pressure system too low	37
DSC FAILURE	DSC stabilization failed	57	CLUTCH TEMPERATURE	Heat input clutch too high	36
DSC FAILURE	DSC stabilization failed	56	CLUTCH TEMPERATURE	Heat input clutch too high	35
DSC FAILURE	DSC stabilization failed	55	GENERATOR FAILURE	Failure of the 12V generator	34
STEERING FAILURE	Group message Steering defective / failed	54	GBX FAILURE	Mechanical emergency gearbox	33
STEERING FAILURE	Steering ECU or peripheral fault or alive failure	53	GBX FAILURE	Electric emergency gearbox, communication problem	32
STEERING FAILURE	Failure or Alive Fail AFS / HSR	52	GBX FAILURE	Electric emergency gearbox	31
STEERING FAILURE	AFS / HSR disturbed (temporary)	51	DIFF FAILURE	Shutdown gHAS	30
STEERING FAILURE	Steering failed	50	DIFF FAILURE	Overload or failure	29
STEERING FAILURE	Steering failed	49	ABS FAILURE	Brake electronics without function	28
STEERING FAILURE	Steering failed due to HW failure or degradation of steering assistance	48	ENGINE TEMPERATURE HIGH	Coolant or engine oil too high	27
STEERING FAILURE	Steering system disturbed (temporarily)	47	OIL PRESSURE LOW	Engine oil pressure too low	26
DSC / STEERING FAILURE	Group message DSC stabilization and steering failed	46	GBX TEMPERATURE HIGH	Transmission temperature too high (Thermophase red)	24
DSC / STEERING FAILURE	Group message DSC stabilization and steering failed	45	GBX TEMPERATURE HIGH	Transmission temperature too high (Thermophase black)	23
DSC / STEERING FAILURE	Group message DSC stabilization and steering failed	44			
DSC / STEERING FAILURE	Group message DSC stabilization and steering failed	43			

NOTICE

All Red highlighted alarms are a risk for hardware damage. The alarms are shown on the AIM display at the top LEDs flashing yellow (LED1 / LED5) plus an alarm text. All alarms must be reported to the pits immediately.

6.1. DRIVER CONTROL SYSTEM.

6.1.8.1. AIM LOGGING TABLE.

M2CSR_V6_XXX

Channel Name	Description	Additional Information	Unit
STW_Radio	Radio Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_IndicatorLef	Left Indicator Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_Wiper	Wiper Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_Dash	Dash Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_High	High Beam Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_IndicatorRig	Right Indicator Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_PSL	Pit Speed Limiter Button on Steering Wheel	0=unacutaded 1=pressed	#
STW_Drink	Drink Button on Steering Wheel	0=unacutaded 1=pressed	#
VStwPaddle	Shift paddle voltage	Development reasons (no function)	mV
NDscSwitch	DSC mode	1=DSC ON 2=MDM 3=DSC OFF	#
NFdsSwitch	FDS mode	1=DriveLogic WET 2=DriveLogic DRY	#
BIndicatorL	Left turn indicator	0= not blinking 1=blinking	#
NGearAscii	Gear postion in ascii	78=N 80=P 82=R 1=1. 2=2. 3=3. 4=4. 5=5. 6=6. 7=7.	gear
BIndicatorR	Right turn indicator	0= not blinking 1=blinking	#
NDscStatus	Status DSC	DSC occurances	#
pAmbStat	Ambient pressure	Ambient pressure linearized	bar
TDiffOil	Differential oil temperature		°C
Vbattery	Battery voltage	Voltage from IBS	Mv
OIL	Engine oil temperature		°C
WAT	Engine water temperature		°C
QFuelUsed	Fuel consumption	Fuel consumption in liters. Calculated with injector needle lifting, rail pressure and injections per cylinder.	l
TCockpit	Cockpit air temperature		°C
Miko_AcSwitch	AC Button on dash panel	0= not active 1= activated	#
BAcComp	Air condition compressor clutch	always 0=open (no meaning)	#
BPsl	Pit speed limiter	0= not active 1= activated	#
Miko_ParkSwitch	Park switch Button on dash panel	0= not active 1= activated	#
Miko_FuelSwitch	Fuel switch Button on dash panel	0= unactuaded 1=pressed (Qfuelused channel set to zero)	#
Miko_WBL_Switch	Hazard light	0= off 1= pressed	#

6.1. DRIVER CONTROL SYSTEM.

6.1.8.1. AIM LOGGING TABLE.

M2CSR_V6_XXX

Channel Name	Description	Additional Information	Unit
Miko_DSCPSwitch		0= not actuated 1=DSC switch pressed upwards	#
Miko_DSCMSwitch		0= not actuated 1=DSC switch pressed down	#
Miko_MDMPSwitch		0= not actuated 1= FDS switch pressed upwards	#
Miko_MDMMSwitch		0= not actuated 1=FDS switch pressed down	#
Miko_RainSwitch	Rain light	0= off 1=on	#
Miko_ScreenSwitc	Screen heating	0= off 1=on	#
Miko_LightsSwitc	Low beam	0= off 1=on	#
Miko_SpotsSwitch	24h light	0= off 1=on	#
rBrakeBalance	Brake balance	Calculated	%
pBrakeF	Brake pressure front		bar
pBrakeR	Brake pressure rear		bar
aSteer	Steering angle	Calculated steeringwheel angle	deg
ALAXX_XxxXxxxx	Alarm message	0= alarm not active 1=active // For a detailed explanation please take a look at the technical costumer manual	#
BUT_MENU	Menu button in the AIM dash while in SEPP mode	RADIO button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_FWD	Forward button in the AIM dash while in SEPP mode	LEFT button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_OK	OK button in the AIM dash while in SEPP mode	HIGH button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_QUIT	Quit button in the AIM dash while in SEPP mode	RIGHT button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_BACKLIGHT		DASH button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_RES_ODO		DRINK button on the steering wheel while in SEPP mode 0=not activated 1=pressed	#
BUT_RES_ALA	Reset Alarm	DASH button on steering wheel long pressed 0=not ativated 1=long pressed (reset alarms)	#
BUT_PAGE	Change page in the dash	DASH button on steering wheel 0=not activated 1=pressed (change page)	#
PwrClassChange	Powerstick change	1= Powerstick drawn or plugged during ignition on	#
NPowerClass	Indicate which power stick is inserted	1=without 2=Red 3=Silver 4=Gold 5= Blue 9-15= Black	#
pEngOil	Engine oil pressure		bar
PPsi	Air pressure in the intake manifold	Sensor in the manifold, after throttle body (this sensor measured also Tans)	bar
PBoost	Air pressure in the intercooler	Sensor in the intercooler, before throttle body	bar
ZW_Ist	Ignition Angle		deg
Lambda 0	Lambda cylinder 1-3		λ

6.1. DRIVER CONTROL SYSTEM.

6.1.8.1. AIM LOGGING TABLE.

M2CSR_V6_XXX

Channel Name	Description	Additional Information	Unit
Lambda1	Lambda cylinder 4-6		λ
Tans	Air intake temperature	Measure in the intake manifold, same sensor as Ppsi.	°C
Vsa_spri	Exhaust camshaft adjustment	Complete open exhaust valves before TDC	deg
Vse_spri	Intake camshaft adjustment	Complete open intake valves after TDC	deg
MEng	Engine torque calculated	Engine torque calculated	Nm
pTyreFl	Tyre pressure front left		bar
pTyreFr	Tyre pressure front right		bar
pTyreRl	Tyre pressure rear left		bar
pTyreRr	Tyre pressure rear right		bar
TTyreSensorFl	Tyre temperature sensor front left		°C
TTyreSensorFr	Tyre temperature sensor front right		°C
TTyreSensorRl	Tyre temperature sensor rear left		°C
TTyreSensorRr	Tyre temperature sensor rear right		°C
MBrakeTotal	Total calculated wheel torque of power train		Nm
nEng	Engine RPM		rpm
MEngDME	Engine torque calculated	Gearbox corrected	Nm
rPedal	Throttle pedal position		%
nGear	Gear position	1=N 2=R 4=P 5=1. 6=2. 7=3. 8=4. 9=5. 10=6. 11=7.	#
rVehiclecondition	Status car	7= Engine on, vehicle not coasting 8=Driving 13=Start engine, vehicle coasting	#
rKlemmen	Status terminal control	Development reasons	#
NAbs	Status ABS	ABS occurrences	#
NAsc	Status Asc	ASC occurrences	#
NFdr	Status Fdr	FDR occurrences	#
NGearGWS	Selector lever switch	1=R 2=N 3=D 4=- 5=+ (Display in live logging N wrong, shows R)	#
gLon	Longitudinal G	Provided by ICM	G
gLat	Lateral G	Provided by ICM	G
nYaw	Yaw rate	Provided by ICM	deg
vCar	Car speed	Calculated from the DSC (wheel speeds) with vehicle emphasis	km/h

6.1. DRIVER CONTROL SYSTEM.

6.1.8.1. AIM LOGGING TABLE.

M2CSR_V6_XXX

Channel Name	Description	Additional Information	Unit
BIndicators	Status turn indicators	0=off 1=left 2=right 3=both	#
NPaddle	Status shift paddle	0= unactuated 1= downshift 2= upshift 5= downshift debounced 6 upshift debounced 3= Failure paddle	#
BBrakelight	Status Brakelight	0= Brakelight off 1= Brakelight on	#
BRainlight	Status Rainlight	0= Rainlight off 1=Rainlight on	#
BFoglights	Status 24h light	0= 24h light off 1= 24h light on	#
BParkinglights	Status parking light	0= Parking light off 1= Parking light on	#
BHighbeam	Status high beam	0= High beam off 1= High beam on	#
BFrontlight	Status head lights	0= Headlights off 1= Headlights on	#
BSreenheating	Status windscreen heating	0= Heating off 1= Heating on	#
nWheelFl	Wheelspeed front left		deg/s
nWheelFr	Wheelspeed front right		deg/s
nWheelRl	Wheelspeed rear left		deg/s
nWheelRr	Wheelspeed rear right		deg/s
VLim	Pit speed limit	30= PSL not active 0-250=Shows current pit speed limit during BPs1 1	km/h
TAmbient	Ambient temperature		°C
TFuel		Channel not occupied	°C
aWheel		Steering angle	deg
IFuelPump	Output power EKPM		A
nFuelPump	Fuel pump speed		rpm
GBX	Temperature gearbox oil		°C
rEngineIdle	Status engine idle	0=Engine idle 1=Engine not idle	#
rEngineStatus	Engine status	0=engine off 1=engine start 2=engine run	#
NVvt2	Status VVT	0= ok 1= VVT failure (lowering breakaway speed)	#
pAmbDyn	Ambient pressure	Ambient pressure dynamic	bar
NVt1	Status VVT	0= ok 1= VVT failure (lowering breakaway speed)	#
NGearboxMode		2=M	#
nGearEGS	Gear position		gear

6.1. DRIVER CONTROL SYSTEM.

6.1.9. ALARM RESET / REMOTE.

Alarm Reset:

Once an alarm has been triggered, it can be reset by pressing the Dash button on the steering wheel for 1 second.

The alarm will stay active even if the condition is not present anymore. All alarms are defined by the production electronics (CCM alarms), the alarm configuration cannot be changed.

Alarms can be displayed in the bottom info-line or as a full screen display.



Side Buttons



Side Buttons

Display Remote:

The side-buttons of the display cannot be accessed once the dash is fitted to the car. If they need to be used this can be done by entering the SEPP mode (see Chapter 6.1.3.) and using the steering wheel button **RADIO**, **HIGH**, **LEFT**, and **RIGHT**.

See table for assignment between steering wheel and dash button:

Steering Wheel Button	Function
RADIO	MENU / PREV
LEFT (Indicator)	NEXT
HIGH (Beam)	MEM / OK
RIGHT (Indicator)	VIEW / QUIT

6.1. DRIVER CONTROL SYSTEM.

6.1.10. ODOMETER / BACKLIGHT.

A. Odometer:

While in SEPP Mode:
 Press "MENU" (Radio Button), scroll to "Counters" icon using "next" and "prev" buttons: press "ENTER".

- Five odometers shows up all set "Active" by default: one labelled "System" and four labelled "Usr" from 1 to 4.
- "System" odometer can only be activated/stopped, while the four "Usr" ones can be: activated / stopped and reset.



To reset the odometer scroll to "Clear" option to one of the labelled "Usr" and press "ENTER", the odometer resets for that "Usr".

Steering Wheel Button	Function
RADIO	MENU / PREV
LEFT (Indicator)	NEXT
HIGH (Beam)	MEM / OK
RIGHT (Indicator)	VIEW / QUIT

6.1. DRIVER CONTROL SYSTEM.

6.1.10. ODOMETER / BACKLIGHT.

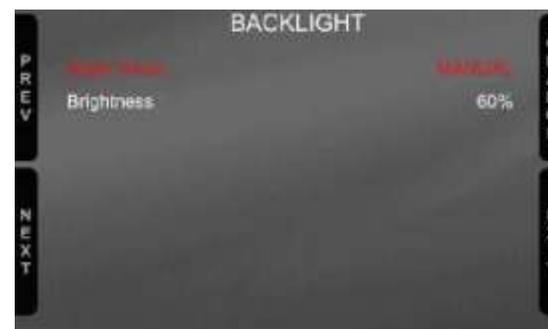
B. Backlight:

While in SEPP Mode:

Press "MENU" (Radio Button), scroll to "Backlight" icon using "next" and "prev" buttons: press "ENTER".



- **AUTOMATIC:** in case ambient light is higher than a defined threshold, the brightness is reduced; you can set day and night brightness level as well as the brightness threshold value that switches from day to night mode (left image below).
- **MANUAL:** you may define the brightness of the display and LEDs choosing among some values: 20%, 40%, 60%, 80%, 100% (right image below).



Steering Wheel Button	Function
RADIO	MENU / PREV
LEFT (Indicator)	NEXT
HIGH (Beam)	MEM / OK
RIGHT (Indicator)	VIEW / QUIT

6.1. DRIVER CONTROL SYSTEM.

6.1.11. DASH PAGE DRIVER.

With TPMS (Main page):



Driver Page

nEng:	Unfiltered Engine-RPM.
GEAR:	Engaged Gear display. ▪ P R N 1 2 3 4 5 6 7
pTyreXX:	Tyre Pressure XX (bar).
TTyreXxx	Tyre Temperature (°C)
OIL:	Engine Oil Temperature (°C).
WAT:	Engine Water Temperature (°C).
DIFF:	Differential Oil Temperature (°C).
GBX:	Gear Box Oil Temperature (°C).
vCar:	Vehicle Speed (km/h).
FUEL:	Fuel used – since last reset (L).
Icon 1:	Colour Powerstick (Power Class 6-9)
Icon 2:	Colour Powerstick (Power Class 2-5)

NOTICE

Vehicle / Dash does not have a fuel gauge like in the production vehicle! Therefore, drain or fill up full with fuel before each use and carry out a fuel reset by pressing the "FUEL" button in the switch box in order to reset the fuel consumption shown in the dashboard to zero and then read off the current consumption afterwards.

6.1. DRIVER CONTROL SYSTEM.

6.1.11. DASH PAGE DRIVER.

Without TPMS (Main page):



Driver Page

nEng:	Unfiltered Engine-RPM.
GEAR:	Engaged Gear display. ▪ P R N 1 2 3 4 5 6 7
TAmbient:	Ambient Temperature (°C).
gLon:	Longitudinal Force (g).
gLat:	Lateral Force (g).
NPowerCl:	Power Class (Powerstick-#)
DSC/FDS:	DSC/FDS Switch Position.
Battery:	Battery Voltage (V).
OIL:	Engine Oil Temperature (°C).
WAT:	Engine Water Temperature (°C).
DIFF:	Differential Oil Temperature (°C).
GBX:	Gear Box Oil Temperature (°C).
vCar:	Vehicle Speed (km/h).
FUEL:	Fuel used – since last reset (L).
Icon 1:	Colour Powerstick (Power Class 6-9)
Icon 2:	Colour Powerstick (Power Class 2-5)

NOTICE

Vehicle / Dash does not have a fuel gauge like in the production vehicle! Therefore, drain or fill up full with fuel before each use and carry out a fuel reset by pressing the "FUEL" button in the switch box in order to reset the fuel consumption shown in the dashboard to zero and then read off the current consumption afterwards.

6.1. DRIVER CONTROL SYSTEM.

6.1.12. DASH PAGE MECHANIC.

With and without TPMS (Info page):



Mechanic Page

nEng:	Unfiltered Engine-RPM.
GEAR:	Engaged Gear display. P R N 1 2 3 4 5 6 7
BATTERY:	Battery Voltage (V).
rPedal:	Throttle Pedal Position (%).
pBrakeF:	Brake Pressure Front (bar).
MEng:	Engine Torque (Nm).
nWheelXX:	Wheel Speed (deg/s).
Pboost:	Engine Boost Pressure (bar).
aSteer:	Steering Angle (deg).
Tans:	Intake Temperature (°C).
IFuelPump:	Fuel Pump Ampere (A).
nFuelPump:	Fuel Pump Revolution (rpm).
pEngOil:	Engine Oil pressure (bar).
Lambda1:	Lambda Bank 1.
Lambda0:	Lambda Bank 0.
Icon 1:	Colour Powerstick (Power Class 6-9)
Icon 2:	Colour Powerstick (Power Class 2-5)

NOTICE

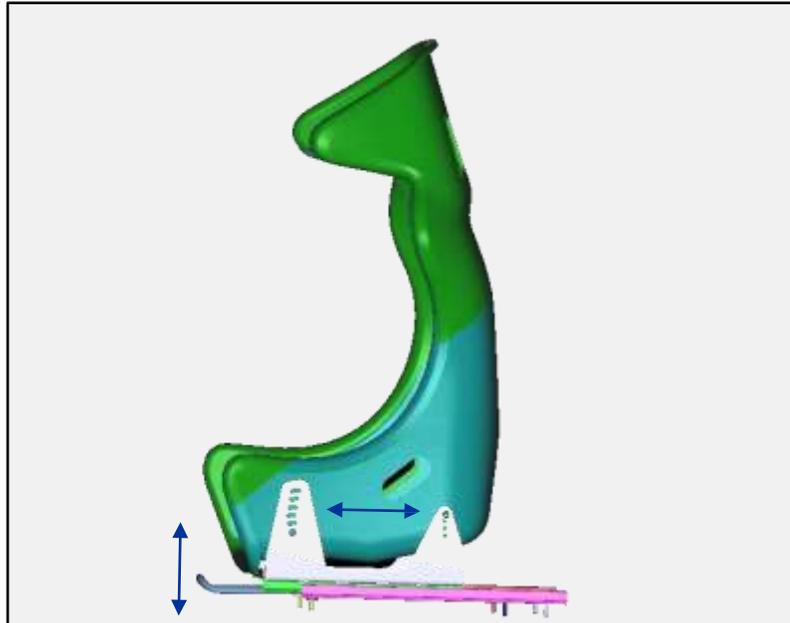
Vehicle / Dash does not have a fuel gauge like in the production vehicle! Therefore, drain or fill up full with fuel before each use and carry out a fuel reset by pressing the "FUEL" button in the switch box in order to reset the fuel consumption shown in the dashboard to zero and then read off the current consumption afterwards.

6.1. DRIVER CONTROL SYSTEM.

6.1.13. ADJUSTMENT DRIVER POSITION.

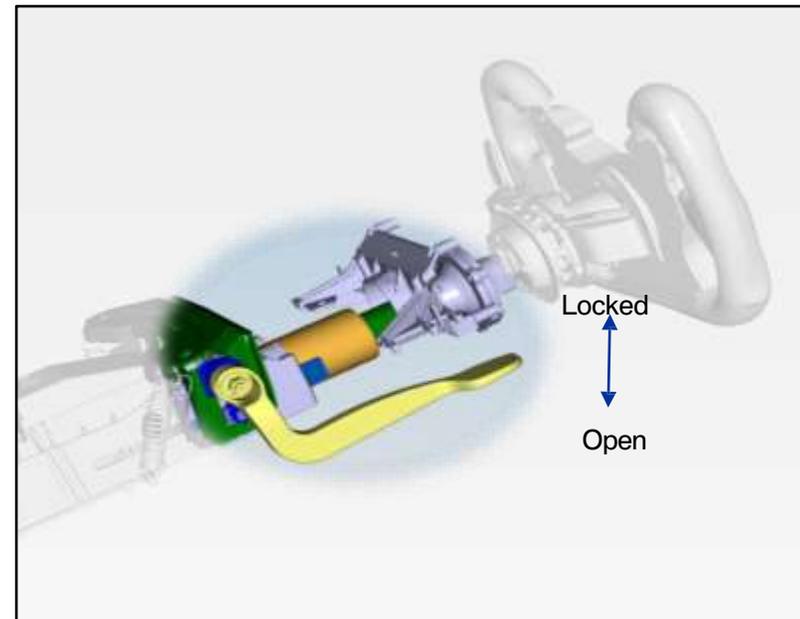
The seat position can be adapted individually and with the following adjustment possibilities to the respective driver:

Seat adjustment:



The pedal box can be manually adjusted when the lever is pulled as shown in the figure. Likewise, the seat can be adjusted in height and inclination by means of 4x screw connections.

Adjustment Steering column:



The steering column can be manually adjusted by operating the lever as shown in the figure.

6.2. FIRE EXTINGUISHER.

6.2.1. OPERATION.



Figure 1



Figure 2

Switch Position:

1	TEST.	System is disarmed! System Check!
2	ARM.	System is armed!

DANGER

Leave vehicle after the fire-system has been triggered immediately.

Unconsciousness can occur in under 1 minute. In case of unconsciousness in an extinguishing gas atmosphere, death occurs as a result of asphyxiation.

If possible, trigger system when vehicle is unmanned.

Before each racing event, check the extinguishing nozzles, check connections, and check all components of the system.

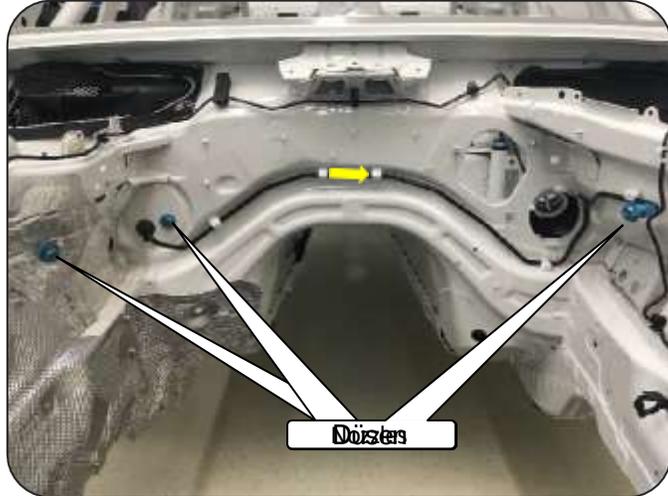
The fire extinguishing system works with a liquid fire extinguishing agent. It consists of a two-chamber container which stores the extinguishing agent in liquid form and transfers it into the gaseous aggregate state upon exiting. Thus, a residue-free erasure can take place. Two gas cartridges, which are activated via a control unit, are used as the propulsion unit for the extinguishing agent transport. The contents of the extinguishing tank have a mass of ~3 kg, which helps to keep the overall weight of the vehicle low. The extinguishing system nozzles are in the cockpit and are in the engine compartment. The system can be activated from the outside (Figure 1) and from the center console (Figure 2) by a switch. The switches can be checked for its function (Pos.1 -> System Test). The system is operated with a **Hi-Power 9 volt** block battery (when replacing, always use a new, fresh, heavy duty battery).

Please pay attention to the fire extinguisher expiry date!

6.2. FIRE EXTINGUISHER.

6.2.2. LAYOUT.

 **DANGER** See warnings in chapter 6.2.1.



  Repair and maintenance work on the vehicle only with appropriate protective clothing.

6.3. DRIVER SEAT.

The BMW M2 CS Racing Racing Seat offers the driver a high degree of safety and individual comfort. Compared to standard safety seats, this combination of adjustable seat and adjustable steering column provides the best possible driving position for the most diverse drivers in both size and weight. This seat comes in 4 different versions.



Seat Dimensions [mm]	Taurus M	Taurus L	Taurus XL	Recaro***
Headrest Width	341*	357*	394*	--
Shoulder Width	486*	501*	512*	630**
Side Bolster Width	345*	362*	393*	520**
Hip Width	300*	318*	326*	385*
Leg Width	348*	364*	393*	409*
Overall Height	925**	979**	980**	873**
Base Seating Length	290*	290*	290*	--
Seat Bottom to Mid Shoulder	685**	717**	716**	630**
Weight [kg]	10,5	11,2	11,4	11,4

*) Inside **) Outside ***) Delivery with Pad Kit Size M

Part-No.	Qty	Description
5200 8323882	1	Seat Sabelt Taurus M – M2 Racing
5200 8323883	1	Seat Sabelt Taurus L – M2 Racing
5200 8323884	1	Seat Sabelt Taurus XL – M2 Racing
5200 8342844	1	Seat Recaro P1300 GT

NOTICE

Seat and seat bracket are each to be installed with the same homologation number.



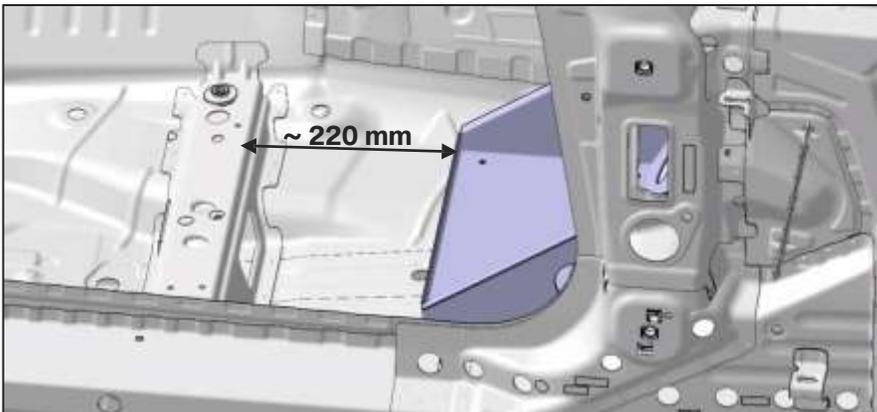
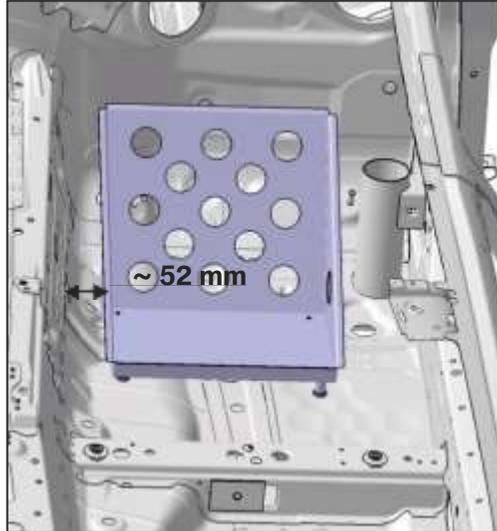
WARNING

In the case of an accident, an inspection of the seat or release by a Technical Commissioner (TK) must be mandatory or, if necessary, be exchanged.

6.4. PASSENGER SEAT.



For the BMW M2 CS Racing, a passenger seat, including foot rest / mounting kit, can be obtained from BMW Motorsport:



NOTICE

The passenger seat is only to be used for test drives!
Use in a race is not permitted. Use in any other operating mode is not secured and released. The front passenger seat can only be used with all available safety devices as a complete package, analogous to the driver's side.

Part-No.	Qty.	Description
5200 8323884	1	SEAT SABELT TAURUS XL – M2RACING
5200 8323971	2	SEAT RAIL PASSENGER SEAT
5200 8324110	4	WASHER 10.5 x 24 x 3 300HV-A4
0714 7146686	4	FILLISTER HEAD SCREW SELF-LOCKING WITH PIN
0711 9904164	4	WASHER 8-200 HV-ZNS3
3311 2283346	4	HEX SREW M8 x 25 – 10.9 ZNS3
5171 8431698	1	FOOT REST BFS ALU (Trim Work see chapter 5.5.6.)
5171 8431694	1	ADAPTER SOCKET FOOT REST 1
5171 8431695	1	ADAPTER SOCKET FOOT REST 2
5171 8431696	1	ADAPTER SOCKET FOOT REST 3
5171 8431697	1	ADAPTER SOCKET FOOT REST 4
4100 8435935	2	FILLISTER HEAD SCREW ISO7380-1 M6x30 10.9 ZNSW
7211 8328082	1	SEATBELT
7211 8429700	3	CAGE PADS
1251 7736328	20	CABLE TIES
7211 8324011	3	CAGE PADS
4100 8435939	2	FILLISTER HEAD SREW ISO7380-1 M6x50 10.9 ZNSW

6.5. SAFETY NET.

6.5.1. TRIANGLE NET.

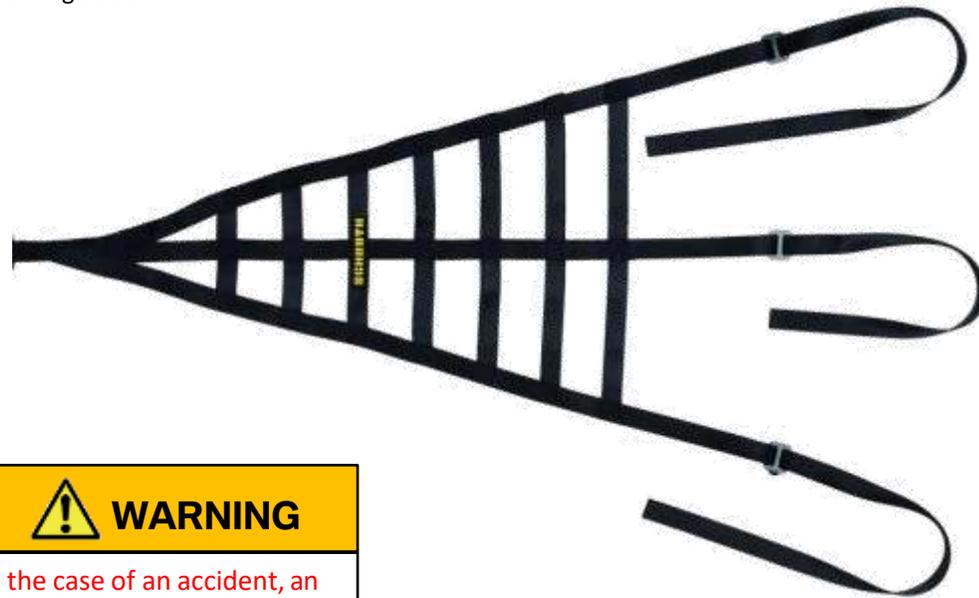
NOTICE The installation of the triangle net is defined by the regulations of the respective racing series and must be observed at all times.



Fixation A-Pillar front

Passenger Side:
For use in USA

Befestigung Öse mittig vorne



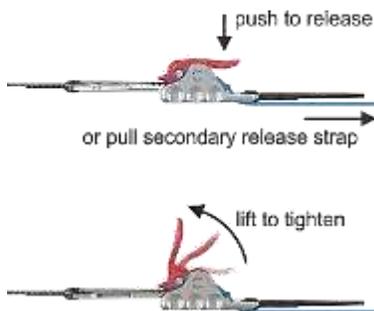
Fixation upper diagonal bar B-Pillar



Fixation diagonal bar rear



Fixation lower diagonal bar



WARNING

In the case of an accident, an inspection of the net or release by a Technical Commissioner (TK) must be mandatory or, if necessary, be exchanged.

Part-No.	Description
7211 8424776	FAHRER DREIECKNETZSCHROTH RACING *

*) Recommended! Better side view than window net!

6.5. SAFETY NET.

6.5.2. WINDOW NET.

NOTICE The installation of the window net is defined by the regulations of the respective racing series and must be observed at all times.



Fixation roof bar front



Fixation roof bar rear



Fixation cross bar front



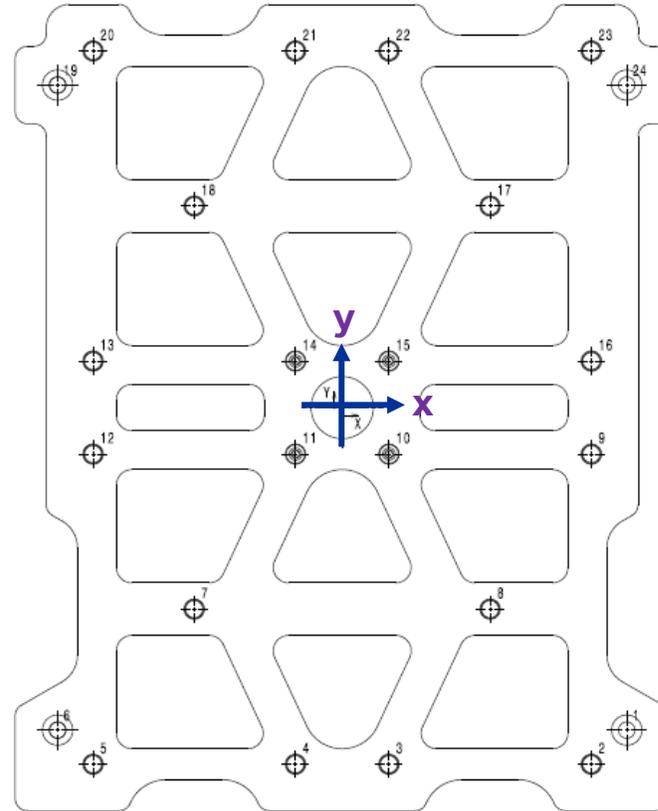
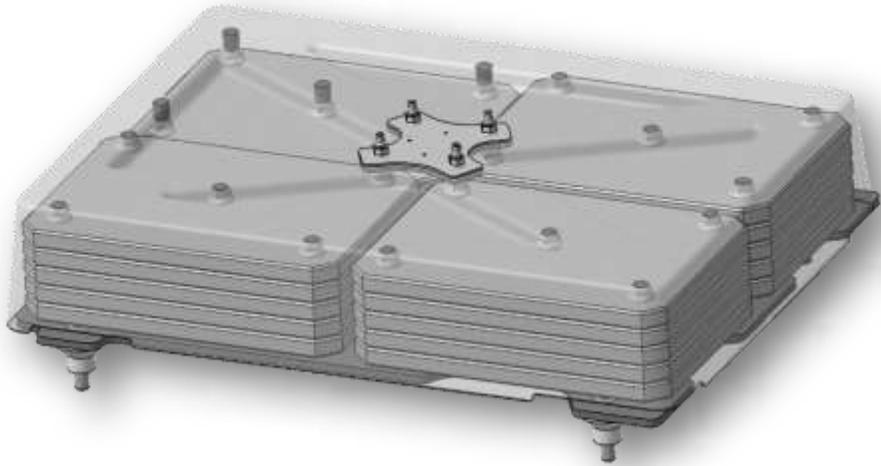
Fixation B-Pillar bottom

WARNING

In the case of an accident, an inspection of the net or release by a Technical Commissioner (TK) must be mandatory or, if necessary, be exchanged.

Part-No.	Description
72118417060	LU FENSTERNETZ M. KAEFIGBEFESTIGUNGSSET
72118417049	SATZ BEFESTIGUNGSET FENSTERNETZ

6.6. BALLAST BOX.



NOTICE

The ballast box on the passenger side serves to accommodate additional ballast according to the BOP regulations. Ballast weights for this are individually determined by the teams according shown dimension table.

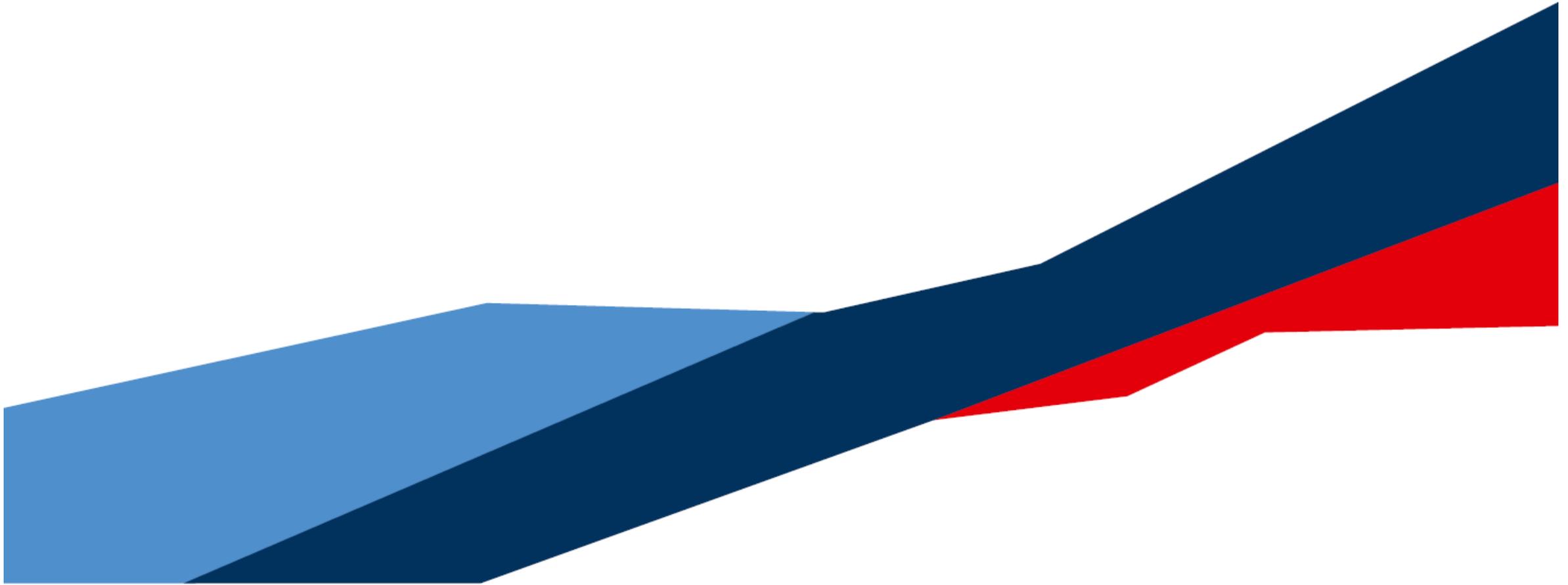
WARNING

Risk of injury! It must be ensured at all times that the additional weights are adequately fastened and secured.

Dimension Table:

POS.	X	Y	DIAMETER
1	182.75	-208	10.5
2	160	-230	13
3	30	-230	13
4	-30	-230	13
5	-160	-230	13
6	-182,75	-208	10.5
7	-95	-130	13
8	95	-130	13
9	160	-30	13
10	30	-30	13
11	-30	-30	13
12	-160	-30	13
13	-160	30	13
14	-30	30	13
15	30	30	13
16	160	30	13
17	95	130	13
18	-95	130	13
19	-182.75	208	10.5
20	-160	230	13
21	-30	230	13
22	30	230	13
23	160	230	13
24	182.75	208	10.5

7. ELECTRIC.



7. ELECTRIC.

7.1. BATTERY.

AGM-Battery



WARNING

Do not charge the AGM battery with > 14.8 V. Do not use rapid-charging programs!

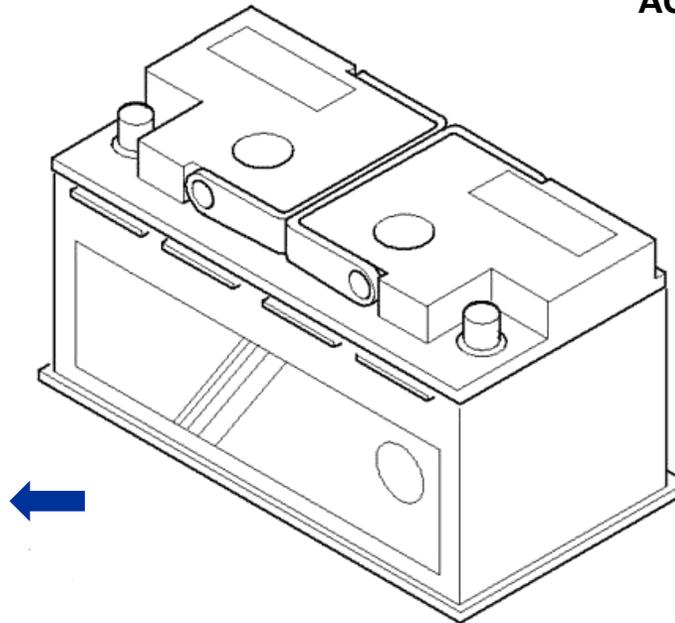
When charging removed batteries (so-called stand-alone batteries), do not exceed the maximum charging voltage of 14.8 V at room temperature. Also, for charging via the external start connection point, the maximum charging voltage of 14.8 V at room temperature must not be exceeded. The battery can be damaged even if the AGM battery is only briefly charged with a charging voltage higher than 14.8 V. A charging voltage of more than 14.8 V is usually used in quick-charging routines.



Connection Battery Charger



11 24



AGM stands for **Absorbent Glass Mat**, i.e. absorbent chopped strand mat.

Jump starting:

The vehicle can be jump started same as vehicles with a lead-acid battery.

Attention! Do not open AGM batteries.

On no account may AGM batteries be opened, as the ingress of oxygen from the atmosphere would cause the battery to lose its chemical balance, rendering it unserviceable.

Description	Value
Maximum charging voltage	14.8 V
Recommended temperature for charging	15 bis 25 °C

The AGM battery is sufficiently charged when the charge current drops below 2.5 amperes.

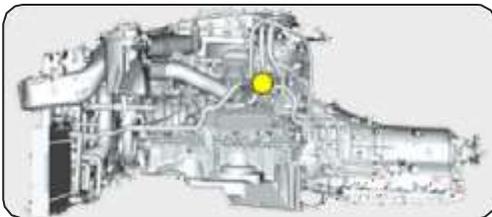
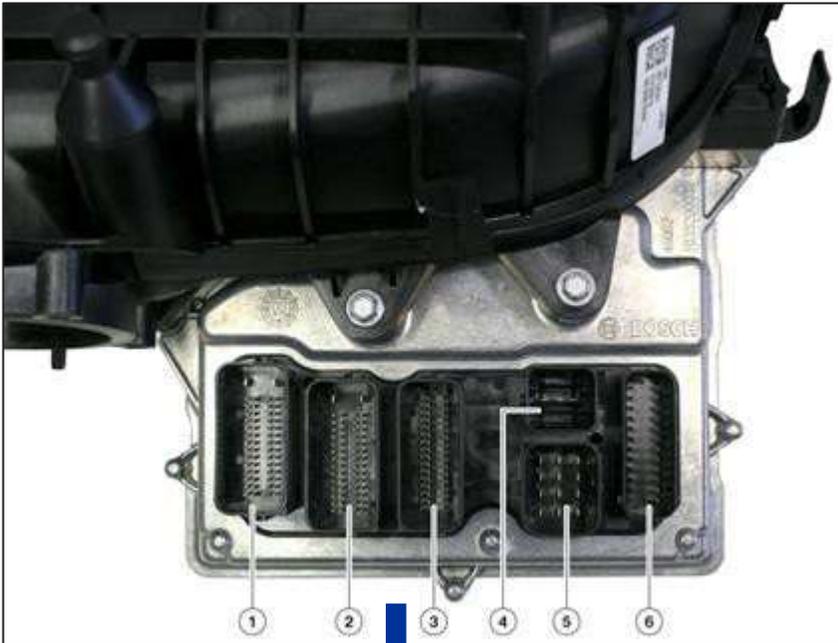
7.2. CONTROL UNITS.

7.2.1. DME.

NOTICE

The control units installed in the BMW M2 CS Racing are production-based components and must be recoded on replacement. A simple module exchange is not possible! The actual PDX-Database is stored on **MiDIS**.

DME = Digitale Motor Elektronik (Engine-ECU)



Pos.	Description	Explanation
1	Module 100	Sensor group 2
2	Module 200	Sensor group 1
3	Module 300	Chassis harness connection
4	Module 400	Valvetronic
5	Module 500	Power supply module
6	Module 600	Ignition and Injection

Major Functions:

- Engine-Management.
- Separation of the engine harness into individual modules.
- Supply of all electrical components on the engine directly via DME.
- The DME is cooled via the air intake.

7.2. CONTROL UNITS.

7.2.2. REM / FEM.

NOTICE

The REM, which is installed in the BMW M2 CS Racing, is a series component and has to be re-coded on replacement. **The FEM is specifically designed for the vehicle (Immobilizer) and must not be exchanged.** The actual PDX-Database is stored on **MiDiS**.

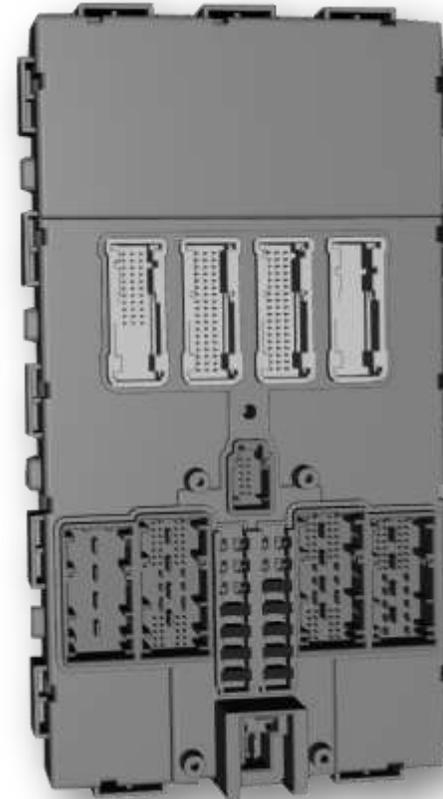
REM = Rear Electronic Module.

FEM = Front Electronic Module.



Hauptfunktionen:

- Light functions rear.
- Windscreen heater.



Major Functions:

- Engine start.
- Immobilizer.
- Electrical system control.
- Light functions front.
- Gateway CAN-Bussystems.



7.2. CONTROL UNITS.

7.2.3. DSC/ICM.

NOTICE

These control units installed in the BMW M2 CS Racing are production-based components and must be recoded on replacement. A simple module exchange is not possible! The actual PDX-Database is stored on **MiDiS**.

DSC = Dynamic Stability Control



Major Functions:

- Dynamic stability control.
- ABS.

ICM = Integrated Chassis Management.



Major Functions:

- Lateral- / Longitudinal Control.
- Error / Fault output.
- The airbag labeling stands for the airbag sensor system of the series component, but is not relevant in the BMW M2 CS Racing.



7.2. CONTROL UNITS.

7.2.4. IHKA/ EKPM.

NOTICE

These control units installed in the BMW M2 CS Racing are production-based components and must be recoded on replacement. A simple module exchange is not possible!
The actual PDX-Database is stored on [MiDiS](#).

IHKA = Integrierte Heiz- und Klimaautomatik.
(Integrated Heating- and Climate control.)

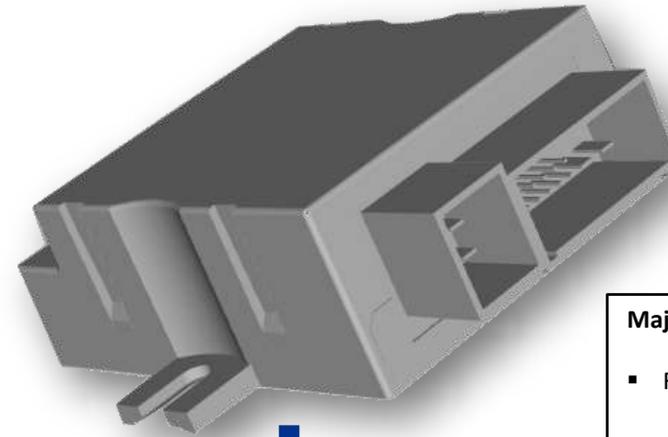


Major Function:

- Control of the AirCon system.



EKPM = Elektronisches Kraftstoffpumpen Modul.
(Electronic fuel pump module.)



Major Function:

- Fuel pump control.



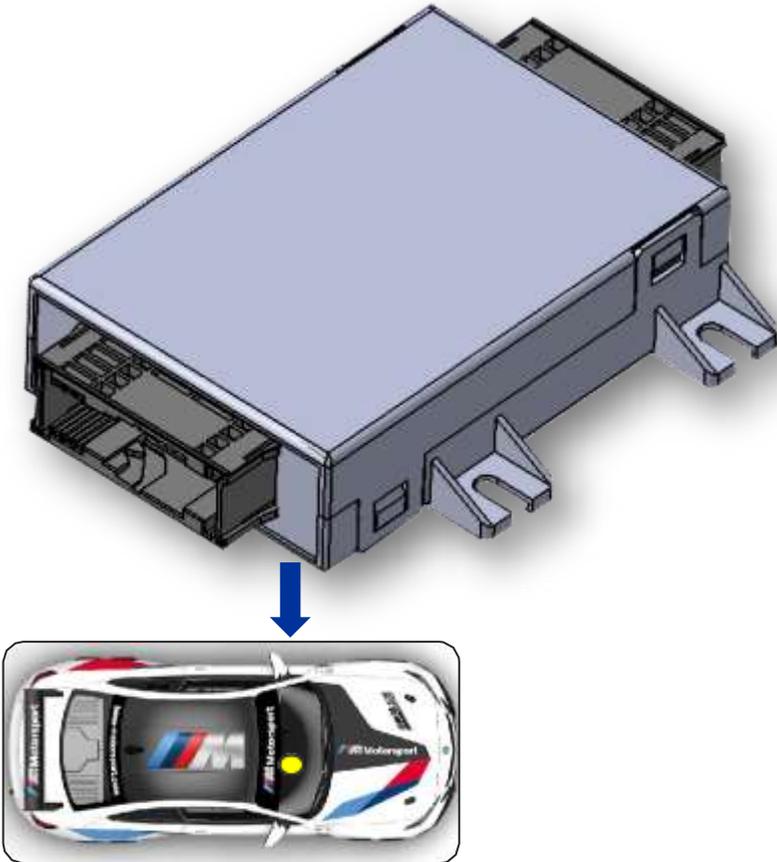
7.2. CONTROL UNITS.

7.2.5. CLARE.

NOTICE

This control unit installed in the BMW M2 CS Racing, must be **flashed** with the actual software on replacement. A simple module exchange is not possible!
The actual Database is stored on **MiDiS**.

CLARE = CanLin and Restbus Emulation.



Major Funktion:

CLARE simulates all discontinued series components from the vehicle and ensures a corresponding rest bus simulation in order to maintain the vehicle operation. The module is the gateway between the motorsport components (dash, steering wheel, switchbox, scruteneering logger, TPMS, powerstick ...) and the production based components (FEM, DME, ICM ..):

- Calculations fuel consumption, brake balance.
- Reading in temperature sensors.
- Read all buttons from the switch panel.
- Connection Motorsport Steering Wheel / Dash / Switchpanel.
- Pit Lane-Speed Limiter.

7.3. PIN OUT.

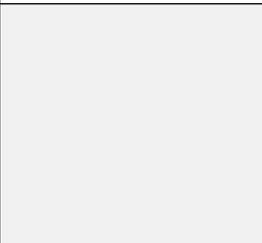
7.3.1. GENERAL.

Location		Gross Sign	Description	Plug (Loom)	Pinning		Remark
	Fan Radiator RH	X252*1B	STVB. Separation Point Frontend Ambient Temp. Sensor	2 360 043	-	-	- In the case of a defect at connection A-Temp Sensor Loom, replace this from this point by 8 345 010
	Engine Compartment Strut tower -Wheelarch left PDM	X13*3S	Separation Point Engine	8 373 583	-	-	At engine replacement this separation point must be disconnected and after, must be plugged together again. No engine start possible.
	Front Wheelarch RH	X2136*2B	STVB. Separation Point Headlights RH	1 387 132	3 4	NSW_R 31L	<ul style="list-style-type: none"> - Possibility of connection for additional headlights on PIN 3, load max. 10A - Connection possibility for detection lamps on PIN 2, load max. 2A - Adapter for additional lights 8 345 034 - If headlight adapter-loom is defective replace this from this point by 8 344 957
	Front Wheelarch LH	X2137*2B	STVB. Separation Point Headlights LH	1 387 132	3 4	NSW_L 31L	
					2	IB_4	<ul style="list-style-type: none"> - Possibility of connection for 24 H Light Pack on PIN 3, load max. 10A - Connection possibility for aux. lamps (e.g. LED) on PIN 2, load max. 2A Adapter for additional lights 8 345 034 - If headlight adapter-loom is defective replace this from this point by 8 344 957

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location		Gross Sign	Description	Plug (Loom)	Pinning		Remark
	Front Fusebox RH	X2130*1B <i>(Take notice at the end of the chapter)</i>	STVB. Separation Point Loom to Wheelarch FR	6 909 008	-	-	- In the case of a defect at the wheelarch loom replace this from this point by 8 344 961
	Front Fusebox RH	-	12V Plug KL30B Engine Compartment RH	1 378 108	1	30B_F68_vBF	- Pin KI 30B, fuse protection see chapter fuseboxl - required mating connector: 1 378 106
	Front Fusebox RH	X2170*1B	STVB. Separation Point RDC Trigger FR	2 359 992	-	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 973
	Front Fusebox RH	X2173*1B	STVB. Separation Point RDC Front Antenna	2 359 992	-	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 972
	Brake Fluid Reservoir	X2169*1B	STVB. Separation Point RDC Trigger FL	2 359 992	-	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 973
	Brake Fluid Reservoir	-	12V Plug KL30B Engine Compartment LH	1 378 108	1	30B_F68_vBF	- Pin KL 30B, fuse protection see chapter fusebox - required mating connector: 1 378 106
	Brake Fluid Reservoir	X2131*1B <i>(Take notice at the end of the chapter)</i>	STVB. Separation Point Loom to Wheelarch FL	6 909 008	-	-	- In the case of a defect at the wheel housing loom replace this from this point by 8 344 961
	Brake Fluid Reservoir	X1784*1B	STVB. Separation Point Kill Switch	6 909 008	-	-	-If defective kill switch, replace switch from this position by 8 327 272
	A-Pillar RH	X2127*1B	STVB. Position 1	1 378 134	1	15N_F46_vBF	- Connection possibility for a 12V consumer (e.g. display panel placement, identification light) - Protection for KL. 15N & KL. 30B; see chapter fusebox - Driver-controlled connection (IB_5), Load max. 2A - required mating connector 8 352 311
					2	30B_F29_vBF	
					3	31L	
					4	IB_5	

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location	Gross Sign	Description	Plug (Loom)	Pinning	Remark
	Gear box Tunnel PS	A391*1B	Data System ASN	AS 0 10-98SN	1 30B_F65_vBF 2 31L 3 FA-CAN_L 4 FA-CAN_H 5 CLARE_CAN1_L 6 CLARE_CAN1_H - Measurement connection ASN - required mating connector: AS 6 10-98PN - Protection for KL. 30B; see chapter fusebox
	Gear box Tunnel PS	A392*1B	Data System Team	AS 0 10-98SN	1 30B_F65_vBF 2 31L 3 FA-CAN_L 4 FA-CAN_H 5 CLARE_CAN1_L 6 CLARE_CAN1_H - Measurement connection Team - required mating connector: AS 6 10-98PN - Protection for KL. 30B; see chapter fusebox
	Gear box Tunnel PS	A393*1B	Data System BMW	AS 0 10-98SN	1 30B_F66_vBF 2 31L 3 FA-CAN_L 4 FA-CAN_H 5 CLARE_CAN1_L 6 CLARE_CAN1_H - Measurement connection BMW - required mating connector: AS 6 10-98PN - Protection for KL. 30B; see chapter fusebox
	Gear box Tunnel PS	X2117*1B	Data System Spare	AS 0 10-98SN	1 30B_F65_vBF 2 31L 3 FA-CAN_L 4 FA-CAN_H 5 CLARE_CAN1_L 6 CLARE_CAN1_H - Measurement connection Spare - required mating connector: AS 6 10-98PN - Protection for KL. 30B; see chapter fusebox
	Front Propshaft Tunnel PS	A221*1B	Radio Unit	1 378 134	1 30B_F69_vBF 2 31L 3 Radio_COM 4 Radio_GND - Connection for radio - the required mating connector: 8 352 311 - Protection for KL. 30B; see chapter fusebox
	Front Propshaft Tunnel PS	M393*1B	Pump Drink Bottle	1 378 108	1 Pwr_DrinkPump 2 31L - Connection for drinking pump - required mating connector: 1 378 106 - load max. 5A
	Front Propshaft Tunnel PS	X104*1B	12V Plug KL. 30B Passenger Footwell	1 378 108	1 30B_F67_vBF 2 31L - Pin KL 30B, fuse protection see chapter fusebox - required mating connector: 1 378 106
	Front Propshaft Tunnel PS	X105*1B	12V Plug KL.30B Passenger Footwell	1 378 108	1 30B_F67_vBF 2 31L - Pin KL 30B, fuse protection see chapter fusebox - required mating connector: 1 378 106

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location		Gross Sign	Description	Plug (Loom)	Pinning		Remark
	Driver Door	-	KL58G Plug	2 360 043	1	58G	<ul style="list-style-type: none"> - Relevant to SA start number lighting - Driving light-controlled connection; Load max.3A - Connection point for 8 344 954
					2	31L	
	Passenger Door	-	KL58G Plug	2 360 043	1	58G	<ul style="list-style-type: none"> - Relevant to SA start number lighting - Driving light-controlled connection; Load max.3A - Connection point for 8 344 954
					2	31L	
	B-Pillar PS	X6*1B	OBD-II Diagnostic	6 931 948	-	-	<ul style="list-style-type: none"> - Production Vehicle OBD-II Diagnostic Interface - Interfaces Accessories: 8 417 550
	B-Pillar PS	X6*2B	OBD-II Racing Diagnostic	AS 0 12-355N	7	CLARE_CAN1_L	<ul style="list-style-type: none"> - OBD-II Racing Diagnostic Interface for CLARE, RDC and AIM MXG - required mating connector: AS 6 12-35PN - Interfaces Accessories: 8 345 027, 8 323 314
					8	CLARE_CAN1_H	
					9	RDC_RS232_TX	
					10	RDC_RS232_RX	
					11	RDC_RS232_KL31	
					12	MessTest_USB_Pwr	
					13	MessStd_USB_D-	
	14	MessStd_USB_D+					
					15	MessStd_USB_GND	
	B-Pillar PS	X483*1S	STVB. KAR-Roof	8 352 923	2	IB_5	<ul style="list-style-type: none"> - connection point for: <ul style="list-style-type: none"> > Cockpit temperature sensor, > GPS Mouse, > LapTrigger > A load with supply from the driving light "ON" (e.g. interior light or start number-lighting roof) - Driver-controlled connection (58_Amb1_2), Load max. 2A - required mating connector: included in part-no. 8
					3	58_Amb1_2	
					4	31L	
					5	31L	
					10	T_Cockpit_GND	
11					T_Cockpit_Sig		
14					Mess_Std_EXP_UBN		
15					Mess_Std_EXP_Vbext		
16					Mess_Std_EXP_GND		
17					Mess_Std_EXP_CAN_L		
18	Mess_Std_EXP_CAN_H						
19	Mess_Std_LapTrigger_U-BN	<ul style="list-style-type: none"> On delivery, the GPS antenna is connected to the display at this point. Instead the GPS antenna at this point, e.g., first a AIM hub can be connected and then again the GPS antenna, a Smarty CAMetc. 					
20	Mess_Std_LapTrigger_GND						
21	Mess_Std_LapTrigger_Sig						

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location		Gross Sign	Description	Plug (Loom)	Pinning		Remark
	B-Pillar PS	X1786*1B	STVB. SeparationPoint Fuel Tank	-	1	15N_F143_HR	<p>- ATTENTION! If the fuel tank is empty! Before switching on the KL. 15, disconnect this connector to protect the fuel pumps.</p> <p>Test of Lift Pumps: LP 1 + 2 > Pin 1 > 15N_F143_HR LP 3 + 4 > Pin 2 > 15N_F144_HR</p> <p>Earth 31L to vehicle for Lift Pumps with Pin 6 und Pin 7. In the case of an electrical fault at the fuel tank disconnect at this point the vehicle wiring harness and replace it with 8 344 959.</p>
					2	15N_F144_HR	
					3	15N_F145_HR	
					4	15N_F146_HR	
					6	31L	
					7	31L	
	Side Panel Font Passenger RH	A66*1B	RDC Control Unit	-	-	-	<p>- Relevant to SA tire pressure system</p> <p>- Connection point for RDC control unit</p>
	Parcel Shelf RH	X2128*1B	STVB. Position 2	6 909 008	1+2	30B_F136_HR	<p>- Connection possibility for a 12V consumer (e.g. display panel placement, detecting light)</p> <p>- Protection for KL.15N see chapter fuse box</p> <p>- Connection KL. 30B, load max.10A</p> <p>- Driver-controlled connection (58_Amb1_1), Load max. 2A</p>
					3+4	15N_F154_HR	
					5	58_Amb1_1	
					6+7	31L	
	Parcel Shelf LH	X2129*1B	STVB. Position 3	6 909 008	1+2	30B_F137_HR	<p>- Connection possibility for a 12V consumer (e.g. display panel placement, identification light)</p> <p>- Protection for KL. 15N see chapter fusebox</p> <p>- Connection KL. 30B, load max. 10A</p> <p>- Headlight-controlled connection (OVT), Load max. 2A</p>
					3+4	15N_F154_HR	
					5	OVT	
					6+7	31L	

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location	Gross Sign	Description	Plug (Loom)	Pinning		Remark	
	Center Boot	X1233*1B	STVB. Separation Point RDC Rear Antenna	2 359 992	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 972	
	Left Boot	X2171*1B	STVB. Separation Point RDC Trigger RL	2 359 992	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 973	
	Right Boot	X2172*1B	STVB. Separation Point RDC Trigger RR	2 359 992	-	- Relevant to TPMS tire pressure system (RDC) - Connection point for 8 344 973	
	Rear Wheelarch RH	-	12V Plug KL. 30B Boot RH	1 378 108	1	30B_F140_HR	- Pin KL. 30B, fuse protection see chapter fusebox - required mating connector: 1 378 106
	Boot RH	X2132*1B	STVB. Separation Point Loom to Wheelarch RR	-	2	31L	- In the case of a defect at the wheelarch loom replace it from this point by 8 344 963

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.1. GENERAL.

Location		Gross Sign	Description	Plug (Loom)	Pinning		Remark
	Rear Wheelarch LH	-	12V Plug KL. 30B Boot LH	1 378 108	1	30B_F141_HR	- Pin KL. 30B, fuse protection see chapter fusebox - required mating connector: 1 378 106
	Boot LH	X2133*1B	STVB. Separation Point Loom to Wheelarch RL	6 909 008	2	31L	
	Fuel Filler Cap		12V- Charging Plug				- Open filler cap

NOTICE

The following connectors must be regularly checked for corrosion and if necessary cleaned or replaced:

X2130*1B (Wheelarch front right):



For the upcoming work the disassembly of the strut bars is recommended!

X2131*1B (Wheelarch front left):



Open plug connection and check both sides (male / female) for corrosion.



If corrosion is present, then clean and dry the plug as best as possible using suitable means (e.g. contact spray).

After cleaning or renewal if necessary, connect the plugs until they click into place.

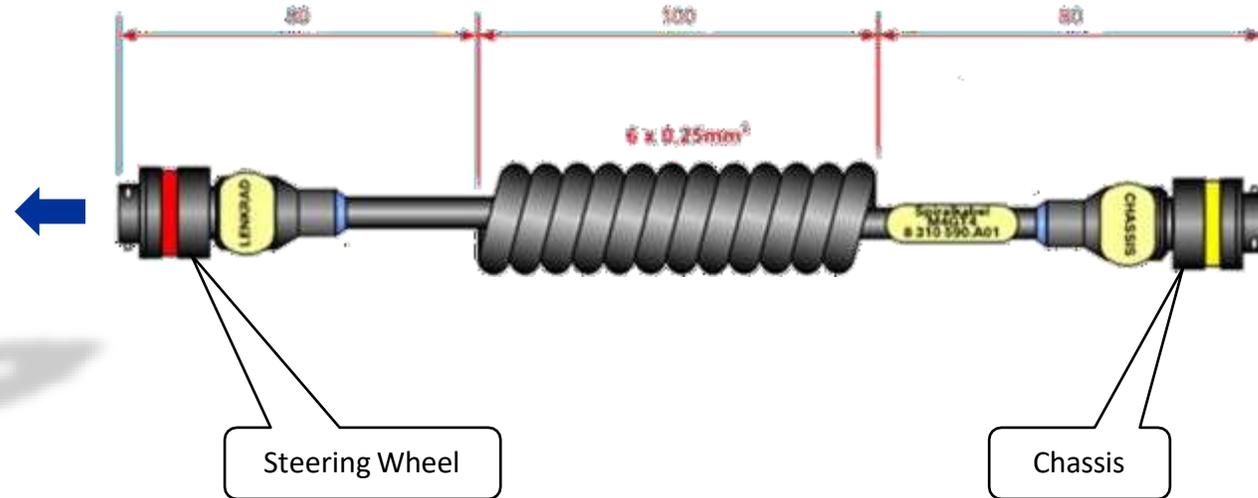


For further protection of the connector a heat shrink can be attached.

Please regularly check all connections, especially those in the "water-penetrating" area - especially when driving longer distances under wet conditions.

7.3. PIN OUT.

7.3.2. STEERING WHEEL CABLE.

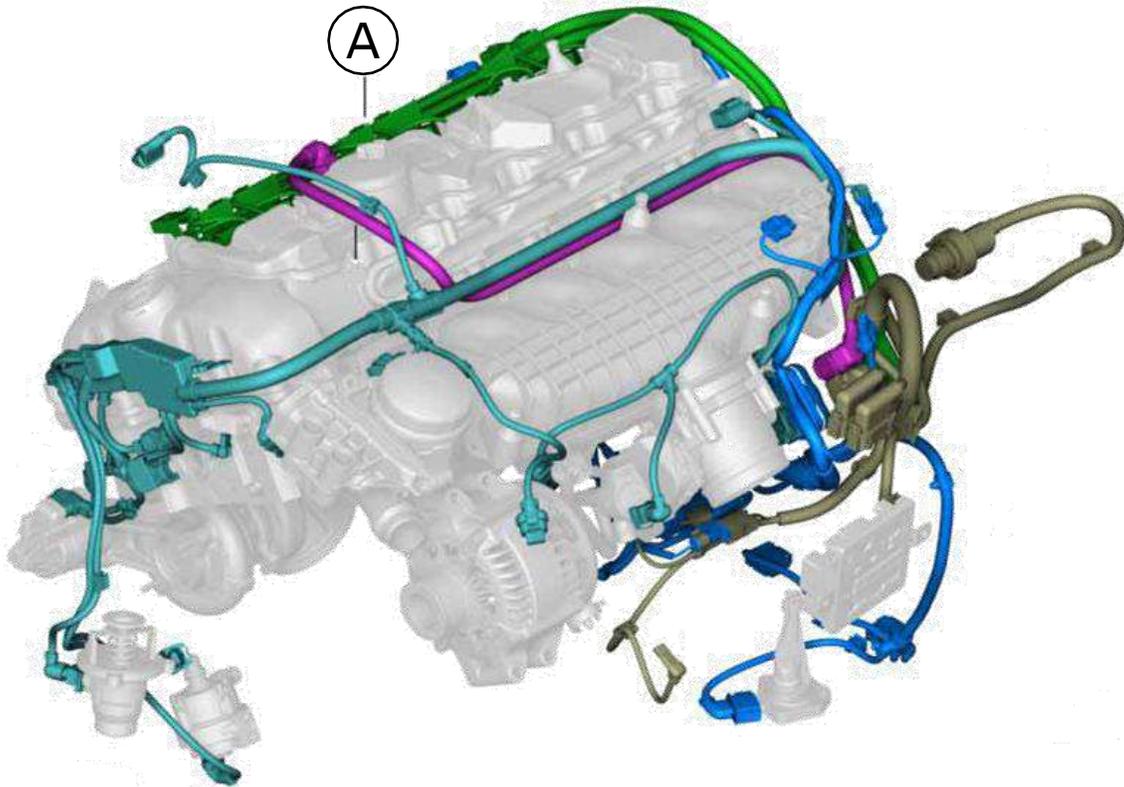


AS 608-35PA Chassis						
PIN	1	2	3	4	5	6
mm ²	0,25	0,25	0,25	0,25	0,25	0,25
	Batt +	GND	CAN L	CAN H	LED -	V Batt
mm ²	0,25	0,25	0,25	0,25	0,25	0,25
PIN	1	2	3	4	5	6
AS 608-35SN Steering Wheel						

7.3. PIN OUT.

7.3.3. RETROFIT ENGINE LOOM.

Reworking engine wiring harness (A) when renewing.



WARNING

A replacement engine / -engine wiring harness does not have an emergency stop. If this is built into an M2 CS Racing, the engine continues to run even if the emergency stop button is pressed.

- If the engine is running and the alternator control is active, it continues to supply the vehicle electrical system with 12V. The engine must stop so that the on-board electrical power supply is no longer working.

Engine wiring harness (A) to be processed:

Part – No.	Qty.	Description
1251 7850995	1	WIRING HARNESS INJECTION VALVE/IGNITION

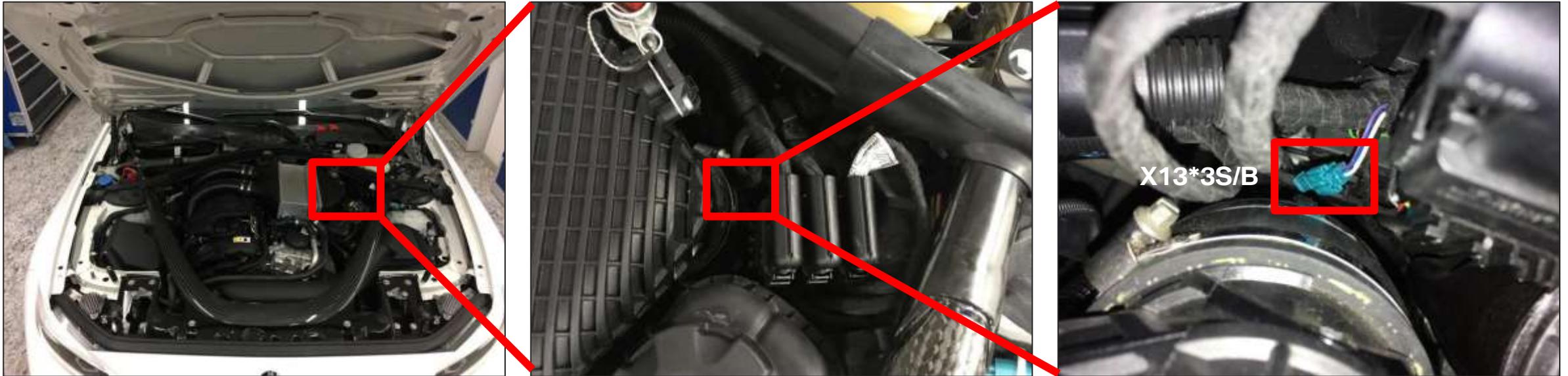
Connector engine / chassis as spare part:

Teile – Nr.	Menge	Beschreibung
6113 8373583	1	PLUG 2-POL.KOD.Z WATERBLUE
1252 1427613	1	PIN SLK2,8 0,50-0,75 AG ELA
1252 1748973	1	ELA5,2 BLUE 1,6-2,1 (DGB0,75-1,0)
6113 8721062	2	PIN MQS AG 0,5-0,75QMM
6113 1393723	2	PIN MQS SN 0,5-0,75QMM
--	-	CONSUMABLES CABLE 0.5 SQM

7.3. PIN OUT.

7.3.3. RETROFIT ENGINE LOOM.

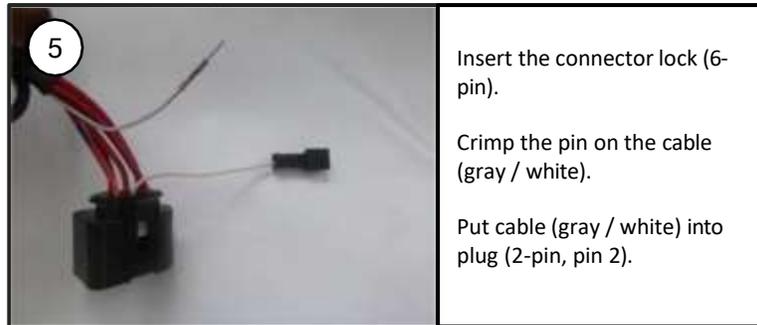
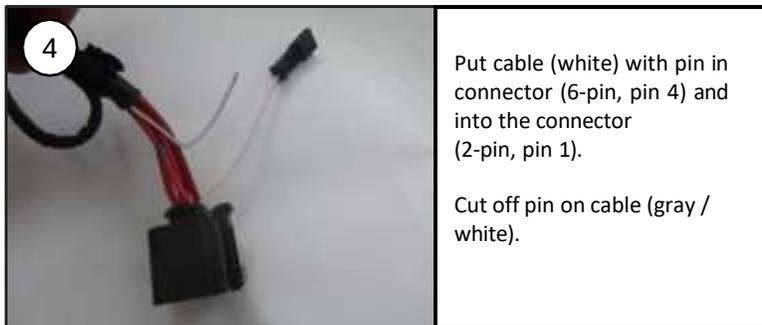
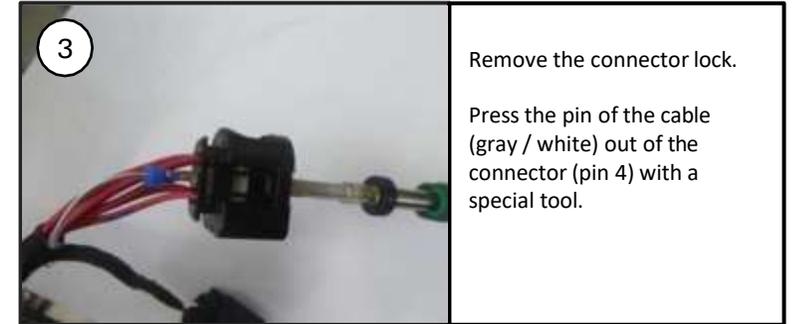
Location Separation Point X13*3S/B.



7.3. PIN OUT.

7.3.3. RETROFIT ENGINE LOOM.

Retrofit Engine Wiring Harness.



NOTICE

After installing the engine wiring harness and / or engine, an emergency switch test must be carried out:
1.) Starting the engine without a battery charger 2.) Wait until the battery voltage is > 13.5 V. 3.) Press the emergency stop switch.

7.4. FUSE ASSIGNMENT.

7.4.1. FUSEBOX FRONT.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
- (Plug 11)	1	F502	MIDI	Kl.30	B+ Battery	100	-
61.13 9 227 714 (Plug 01)	1	F42	MINI	Kl. 15 N	-	10	-
	1a						
	2	F43	MINI	Kl. 15 N	DigiTyreLite_TPMS	10	-
	2a						
	3	F44	MINI	Kl. 15 N	-	20	-
	3a						
	4	F45	MINI	Kl. 15 N	-	20	-
	4a						
61.13 9 227 714 (Plug 05)	5	F46	MINI	Kl. 15 N	Position_1	20	-
	5a						
	6	F47	MINI	Kl. 15 N	Reserve	5	-
	6a						
	1	F48	MINI	Kl. 15 N	Reserve	10	Plug is not available
	1a	F49					
3	F50	MINI	Kl. 30	Reserve	10		
3a	F51						
5	F52	MINI	Kl. 30 B	Reserve	7,5		
5a							
6	F53	MINI	Kl. 30 B	Reserve	20		
6a							

7.4. FUSE ASSIGNMENT.

7.4.1. FUSEBOX FRONT.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
61.13 9 227 714 (Plug 03)	1	F54	MINI	Kl. 30 B	-	7,5	GWS: Gears shift lever
	1a						
	2	F55	MINI	Kl. 15 N	-	5	-
	2a						
	3	F56	MINI	Kl. 15 N	-	5	-
	3a						
4	U-Tab		Kl. 15 N	-	-	-	
4a							
5	U-Tab		Kl. 31	-	-	-	
5a							
6	U-Tab		Kl. 30 B	-	-	-	
6a							
61.13 9 227 714 (Plug 06)	1	F23	MINI	Kl. 30 B	-	10	-
	1a						
	2	F22	MINI	Kl. 30 B	-	7,5	ASP: Side Mirrors Driver/Passenger
	2a						
	3	F21	MINI	Kl. 30 B	-	15	WaPu: Water Pump
	3a						
4	F20	MINI	Kl. 30	-	5	-	
4a							
6	F18	MINI	Kl. 30	-	15	-	
6a							

7.4. FUSE ASSIGNMENT.

7.4.1. FUSEBOX FRONT.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing			
		No.	Type		Description	I _{Nenn} / A	Remark	
61.13 9 227 714 (Plug 04)	1	F35	MINI	Kl. 30 B	Display_AIM-MXG	10	-	
	1a				-			
	2	F34	MINI	Kl. 30 B	CLARE_1	20	-	
	2a				-			
	3	F33	MINI	Kl. 30 B	CLARE_2	10	-	
	3a				-			
4	F32	MINI	Kl. 30 B	CLARE_Mess_ANA3&ANA4	5	-		
4a				-				
		F31						
		F30						
61.13 9 227 714 (Plug 02)	1	F29	MINI	Kl. 30 B	Position_1	20	-	
	1a				-			
	2	F28	MINI	Kl. 30 B	Steering Wheel (Load)	5	-	
	2a				Steering Wheel (Bel.)			
	3	F27	MINI	Kl. 30 B	-	20	-	
	3a				-			
4	F26	MINI	Kl. 30 B	DSC (Logic)	5	-		
4a				E-Fan Relais				
5	F25	MINI	Kl. 30 B	-	5	-		
5a				ICM-Q/-L				
6	F24	MINI	Kl. 30 B	EGS, (DKG F80)	10	-		
6a				-				
- (Plug 08)	1	F57	ATO	Kl. 30	Supply FEM (Redundanz)	40	-	
	2	F58	ATO	Kl. 30	DSC Valves (Load)	30	-	
	3	F59	ATO	Kl. 30	LED Headlights LH	15	-	
			F60					
			F61					
	6	F62	ATO	Kl. 30	Reserve	30	-	
	7	F63	ATO	Kl. 30	-	20	-	

7.4. FUSE ASSIGNMENT.

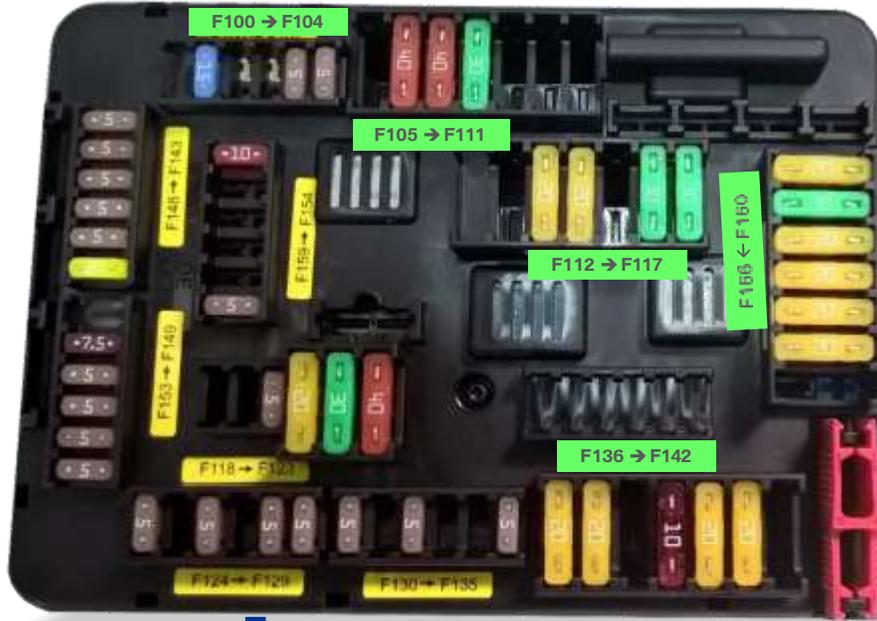
7.4.1. FUSEBOX FRONT.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
-	1	F70	ATO	Kl. 30 B	Positionlight L/R	15	-
	2	F69	ATO	Kl. 30 B	Radio	20	-
	3	F68	ATO	Kl. 30 B	Plug_KL30B_1.1 / Plug_KL30B_1.2	20	-
	4	F67	ATO	Kl. 30 B	Plug_KL30B_2.1 / Plug_KL30B_2.2	20	-
	5	F66	ATO	Kl. 30 B	DataSystem_BMW	5	-
	6	F65	ATO	Kl. 30 B	DataSystem_Team, ASN, Spare	20	-
	7	F64	ATO	Kl. 30 B	OBD Plug Racing	20	-
61.13 9 228 356.9 (Plug 10)	2	F41					Plug is not available
		F40	MINI	Kl. 30	Reserve	15	
		F39					
		F38					
		F37					
		F36					

7.4. FUSE ASSIGNMENT.

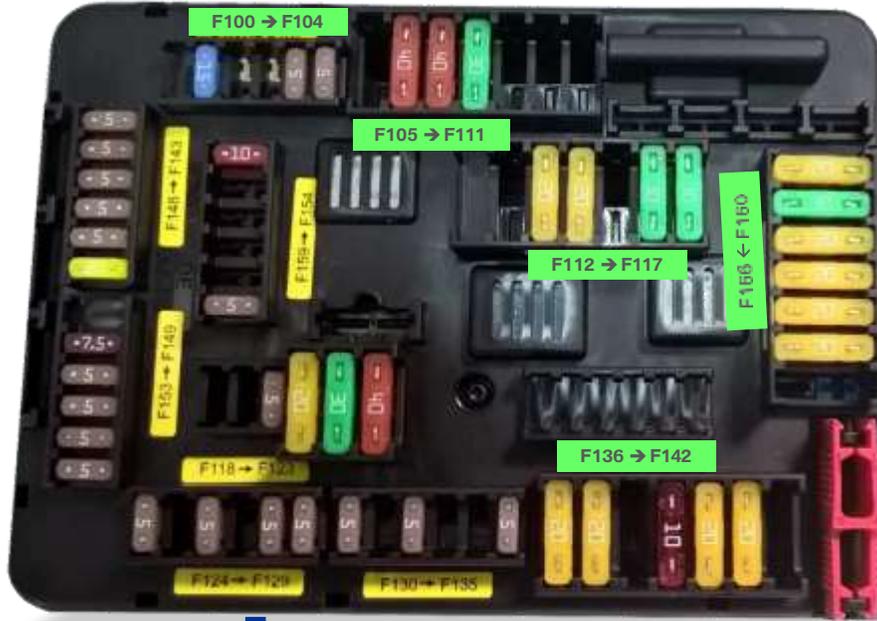
7.4.2. FUSEBOX REAR.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
- (Plug 14)	1	F501	MIDI	Kl. 30	B+ Battery	100	-
61.13 9 227 714 (Plug 01)	1	F130	MINI	Kl. 30 B	Reserve	5	Plug is not available
	1a						
	3	F132	MINI	Kl. 30 B	Reserve	5	
	3a						
	6	F135	MINI	Kl. 30 B	Reserve	5	
6a							
61.13 9 227 714 (Plug 02)	1	F124	MINI	Kl. 30 B	Reserve	5	Plug is not available
	1a						
	2	F125	MINI	Kl. 30 B	Reserve	20	
	2a						
	3	F126	MINI	Kl. 30 B	Reserve	5	
	3a						
	5	F127	MINI	Kl. 30 B	Reserve	5	
	5a						
6	F128	MINI	Kl. 30 B	Reserve	5		
6a							
		F129	MINI	Kl. 30 B	Reserve	5	

7.4. FUSE ASSIGNMENT.

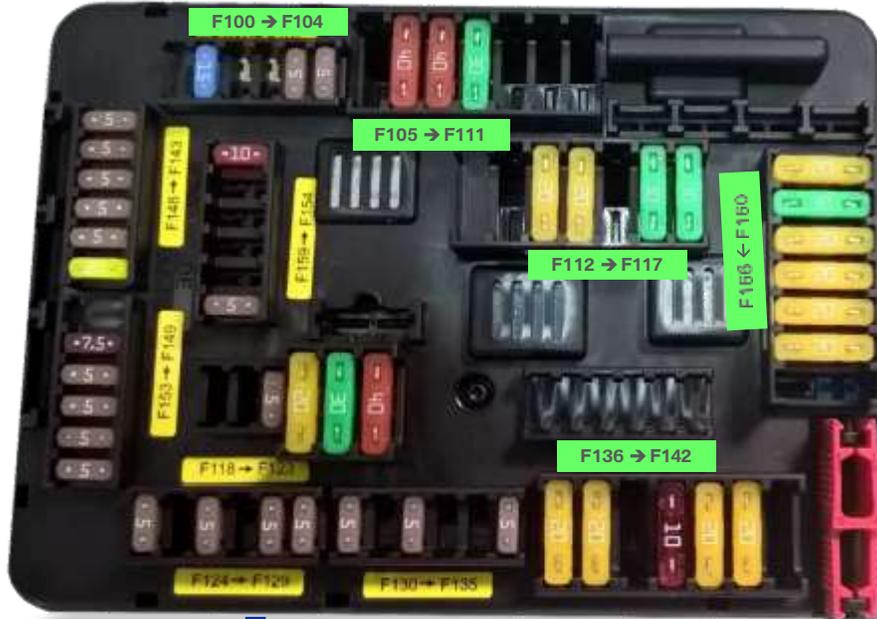
7.4.2. FUSEBOX REAR.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
61.13 9 227 714 (Plug 03)	1			Kl. 15 N	(Relais 1: Monostabil, 15N_2) Reserve (not usable)	-	-
	1a		U-Tab				
	2			Kl. 30 F	TMS3	7,5	-
	2a	F149	MINI				
	3			Kl. 30 F	Reserve	5	-
	3a	F150	MINI				
	4			Kl. 30 B	Reserve	5	-
	4a	F151	MINI				
5			Kl. 30 B	Reserve	5	-	
5a	F152	MINI					
6			Kl. 30 B	Reserve	5	-	
6a	F153	MINI					
61.13 9 227 714 (Plug 06)	1			Kl. 30 B	Reserve	5	-
	1a	F159	MINI				
		F158					
		F157					
		F156 F155					
6			Kl. 15 N	Position_2 Position_3	10	-	
6a	F154	MINI					
61.13 9 227 714 (Plug 05)	1			Kl. 30	FBD II Antenna	5	-
	1a	F104	MINI				
	2						
	2			Kl. 30	Reserve	5	-
	2a	F103	MINI				
		F102 F101					
5			Kl. 30	LED SW RH	15	-	
5a	F100	MINI					
6			Kl. 31 L	31L (Earth) Reserve (not usable)	-	-	
6a		U-Tab					

7.4. FUSE ASSIGNMENT.

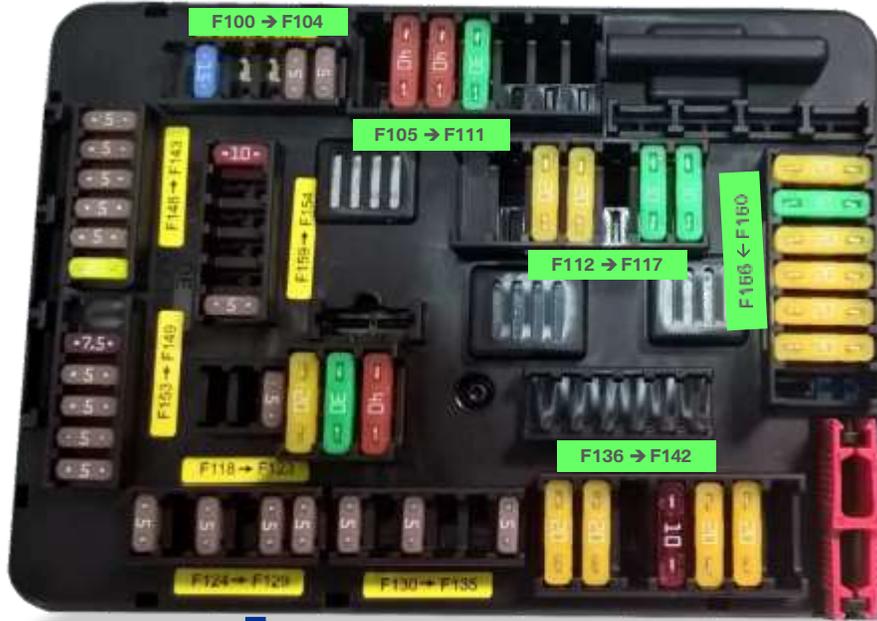
7.4.2. FUSEBOX REAR.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	I _{Nenn} / A	Remark
61.13 9 227 714 (Plug 04)	1	F143	MINI	Kl. 15 N	InTank Pump 1 + 2	5	-
	1a						
	2	F144	MINI	Kl. 15 N	InTank Pump 3 + 4	5	-
	2a						
	3	F145	MINI	Kl. 15 N	-	5	-
	3a						
4	F146	MINI	Kl. 15 N	-	5	-	
4a							
5	F147	MINI	Kl. 15 N	-	5	-	
5a							
6	F148	MINI	Kl. 15 N	-	20	-	
6a							
61.13 9 227 714 (Plug 08)	1		U- Tab	Kl. 30 F	DC/DCMSA (Relais 3: Bistabil, 30F_AUS) Reserve (not usable)	-	MSA: Engine Start/Stop automatic
	1a						
	3		U- Tab	Kl. 30 F	DC/DCMSA (Relais 3: Bistabil, 30F_EIN) Reserve (not usable)	-	MSA: Engine Start/Stop automatic
3a							
5		U- Tab	Kl. 30 B	DC/DCMSA (Relais 2: Monostabil, 30B_2) Reserve (not usable)	-	MSA: Engine Start/Stop automatic	
5a							
- (Plug 09)	1	F136	ATO	Kl. 30 B	Position_2	20	max. Load 10A
	2	F137	ATO	Kl. 30 B	Position_3	20	max. Load 10A
		F138					
	4	F139	ATO	Kl. 30 B	Plug_KL30B_3.1	10	-
	5	F140	ATO	Kl. 30 B	Plug_KL30B_4.1	20	-
	6	F141	ATO	Kl. 30 B	Plug_KL30B_4.2	20	-
		F142					

7.4. FUSE ASSIGNMENT.

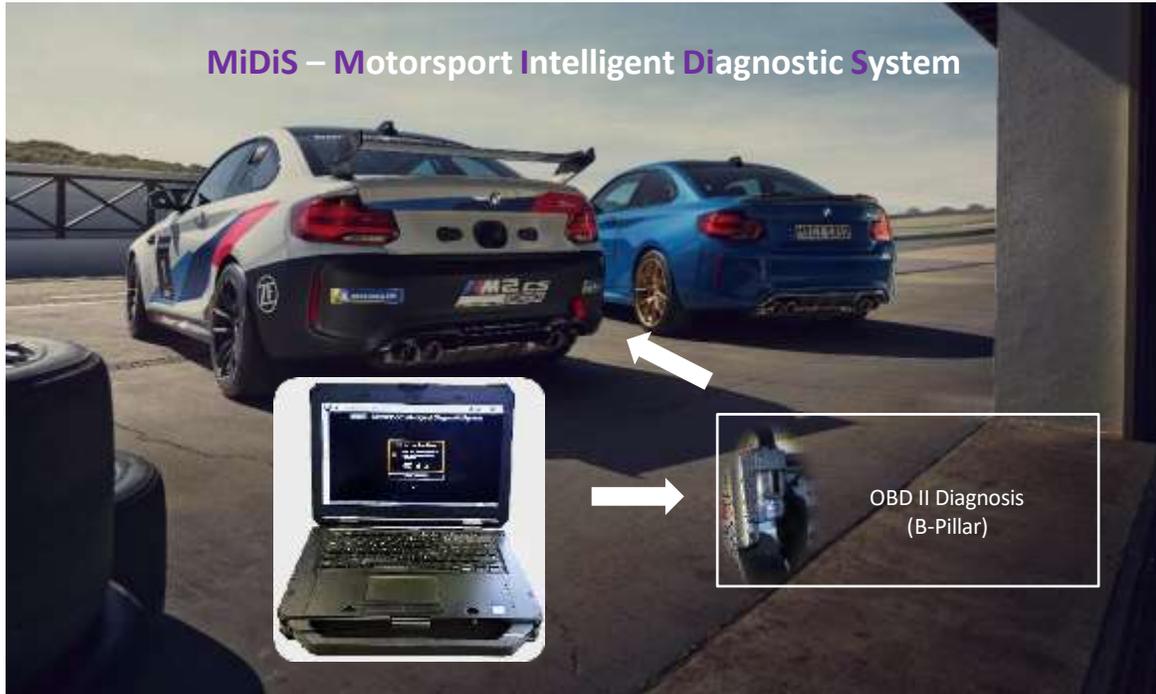
7.4.2. FUSEBOX REAR.



BMW Part-No. Harness-Connector	Pin	Fuse-		Terminal	BMW AG Motorsport M2 CS Racing		
		No.	Type		Description	Inenn / A	Remark
-	(Plug 10)	F111					Plug is not available
		F110					
		F109	ATO	Kl. 30	Reserve	30	
		F108	ATO	Kl. 30	Reserve	30	
		F107	ATO	Kl. 30	Reserve	40	
		F106	ATO	Kl. 30	Reserve	40	
-	(Plug 11)	F166					
		F165	ATO	Kl. 30 B	EKP; unadjusted Fuel-Pump (EKP Relais)	20	
		F164	ATO	Kl. 30 B	Reserve	20	
		F163	ATO	Kl. 30 B	-	20	
		F162	ATO	Kl. 30 B	-	5	
		F161	ATO	Kl. 30	-	30	
		F160	ATO	Kl. 30	REM (Redundanz for Load)	20	
-	(Plug 13)	F117	ATO	Kl. 30	Reserve	30	Plug is not available
		F116	ATO	Kl. 30	Reserve	30	
		F115	ATO	Kl. 30			
		F114	ATO	Kl. 30 F	Reserve	20	
		F113	ATO	Kl. 30 F	Reserve	20	
		F112	ATO	Kl. 30 F			
			U-Tab	Kl. 30 B	DC/DC	-	
61.13 9 228 356.9 (Plug 07)		F118					Plug is not available
		F119					
		F120	MINI	Kl. 30 F	Reserve	5	
		F121	ATO	Kl. 30 B	Reserve	20	
		F122	ATO	Kl. 30 B	Reserve	30	
		F123	ATO	Kl. 30	Reserve	40	

7. ELECTRIC.

7.6. FAULT DIAGNOSIS.



The vehicle electronics, with the exception of necessary motor racing adaptations, largely correspond to the software level as it is used in series production and can be diagnosed by your BMW dealer.

In addition, a **MiDiS** (**M**otorsport **I**ntelligent **D**iagnostic **S**ystem) device (Part-No. 6112 8417551) can be purchased from BMW Motorsport for the electronic fault diagnosis of your BMW M2 CS Racing.

MiDiS is a diagnosis and programming system in the BMW Motorsport environment.

The diagnosis is used to read fault memories and to delete them. **MiDiS** can also be used to open fault code descriptions from the fault memory. These are intended to make it easier to analyze and correct errors.

Installation and locations of control units and software information can be viewed in the control unit overview (SG overview).

With the programming, control units can be programmed to a new or existing software version. It is important to program and code exchanged control units in the vehicle. This is possible with **MiDiS** in the exchange section within the programming. Here the exchanged control units are selected and the exchange is completed by starting the update.

For example, **MiDiS** can be used to program control units, such as for the steering system.

Motorsport-specific circuit diagrams and user manuals can be found under Documents.

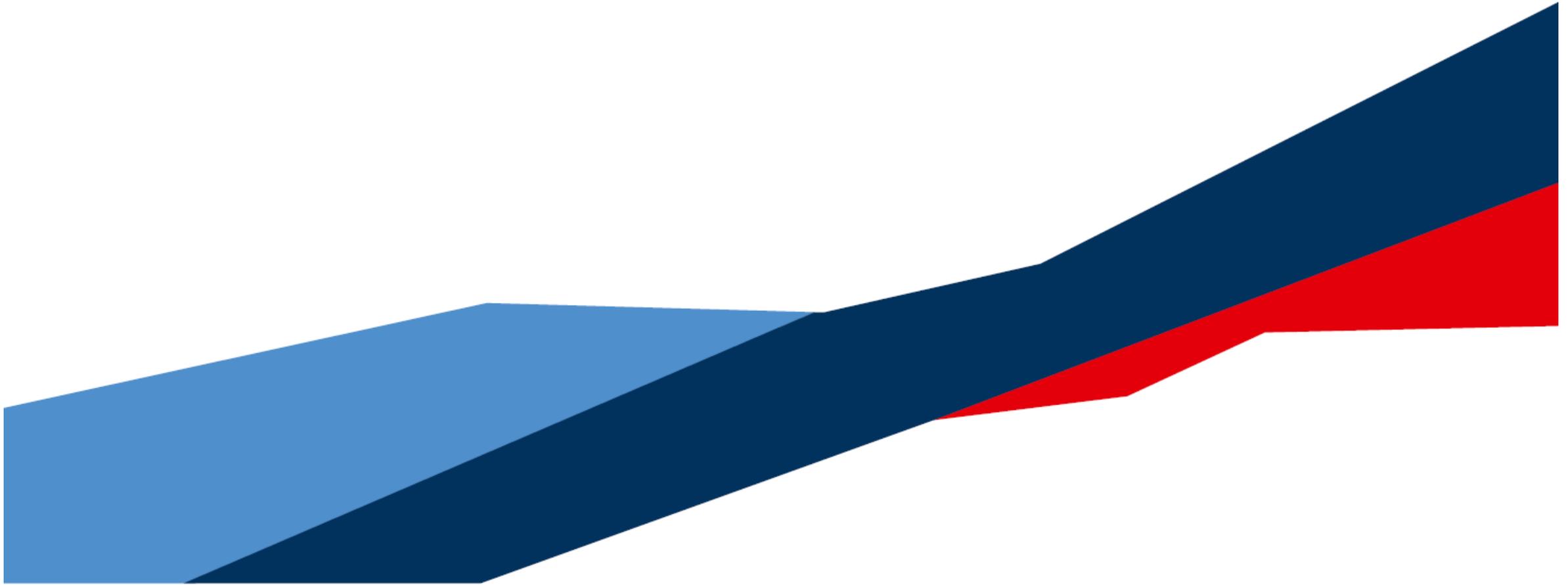
Remote support from BMW Motorsport, Customer Racing, is provided for an existing internet connection for the laptop, as well as up to the vehicle with **MiDiS**.

There is a separate tutorial for this, which can be called up separately on the **MiDiS** device.

For selected racing events, BMW Motorsport provides additional trained support engineers.

For further information please contact BMW Motorsport, Customer Racing.

8. SOFTWARE APPLICATIONS.



8.1. AIM.

8.1.1. BEACON.

NOTICE

The actual Race Studio Software and Documentation can be downloaded from the BMW Customer Portal.

Select the beacon:

The AIM MXG Dashboard allows two different types of beacons. A conventional optical lap beacon or a GPS beacon.

In the dash configuration the beacon type can be selected together with different settings typed in.

Math Channels	Parameters	Shift Lights and Alarms	Display	SmartyCam Stream	CAN Expansions	CAN Output
---------------	-------------------	-------------------------	---------	------------------	----------------	------------

Lap Detection

Hold lap time for sec ?

GPS Beacon

Track Width m ?

Optical Beacon

Ignore additional lap signal for sec ?

8.1. AIM.

8.1.2. TRACKMANAGER.

NOTICE

The actual Race Studio Software and Documentation can be downloaded from the BMW Customer Portal.

Select a map:

AIM has his own Trackmanager where the most of the tracks around the world can be selected. The correct GPS coordinates will be set for the Lap Beacon automatically.



The screenshot displays the AIM Track Manager software interface. On the left, there is a sidebar with navigation options: All Tracks, Nations (listing Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Canada), Smart Collections, Manual Collections, and Connected Devices. The main area shows a list of tracks under the 'Argentina' category. The selected track is 'Kartodromo Ciudad de Zarate', which is 1,1 km long and paved. The interface also shows a map of the track and a list of other tracks in the same category.

Track Name	Location	Type	Length
Autodromo de Buenos Aires	Buenos Aires, Argentina	Kart Track Paved	1,1 km
Automotoclub Lezama	Lezama (Buenos Ayres), Argentina	Kart Track Dirt	643 m
Kartodromo Ciudad de Zarate	Zarate (Buenos Aires), Argentina	Kart Track Paved	1,0 km
Kartodromo Ciudad de Zarate	Zarate (Buenos Aires), Argentina	Kart Track Paved	1,1 km

If it is necessary, the user of the AIM MXG has the opportunity to generate individual Start/Finish Lines for creating laps via GPS. Furthermore different split time sections can be created as well.

8.1. AIM.

8.1.2. TRACKMANAGER.

NOTICE

The actual Race Studio Software and Documentation can be downloaded from the BMW Customer Portal.

Create a new map:

Select “New”. Every detail of a circuit can be typed in. For the Start/Finish Line use the GPS coordinates with decimal values. With (+) or (-) a split can be added or removed.



After that the track has to be send to the Dash. A set of tracks can be selected and transmitted to the Dash while the device is connected via USB or WiFi.

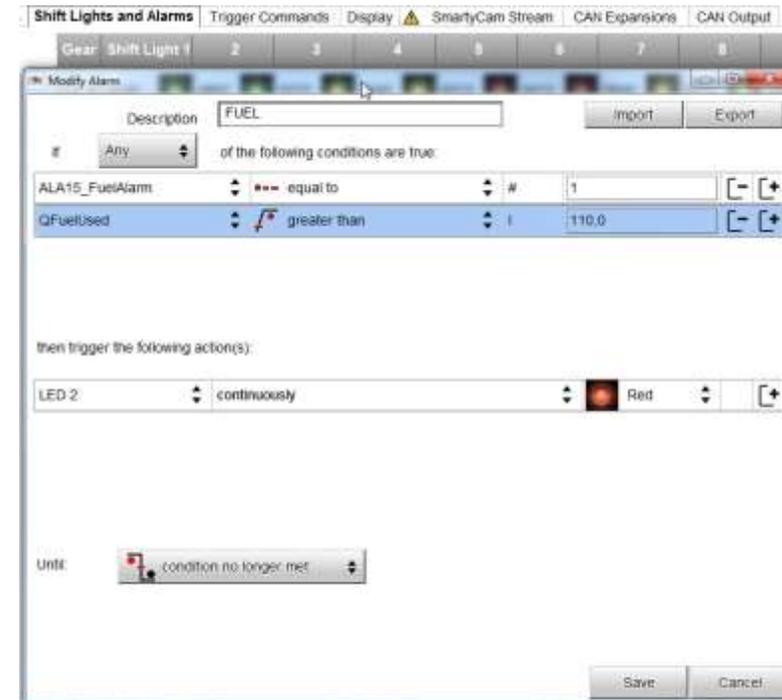
8.1. AIM.

8.1.3. CONFIGURATION FUEL ALARM.

NOTICE

The actual Race Studio Software and Documentation can be downloaded from the BMW Customer Portal.

It is possible to configure a FUEL alarm in the same way as the amount of fuel consumed. To do this, the configuration must be opened in the RaceStudio. In the "Shift Lights and Alarms" tab, the "FUEL" parameter can be used to configure the QFuelUsed quantity at which an alarm is triggered. For this purpose, the used fuel quantity (fuel) is always used as the value.



8.1. AIM.

8.1.4. FIRMWARE & CONFIG.

The actual AIM RaceStudio3 (Vx.xx.xx) and the upgrade firmware (MXG_update_vxx.xx.xx.zip) are stored in the BMW customer portal.

The image shows two screenshots of the RaceStudio3 software interface. The top screenshot shows the 'Firmware' tab selected in the 'MXG ID 4201369' window, with a red box around the 'Firmware' button (2). The bottom screenshot shows a file explorer window with a red box around the file 'MXG_update_v01.30.06.zip' (3). A 'NOTICE' box is also present.

NOTICE

Live updates for RaceStudio3 and firmware must be deactivated.

If the old AIM config is still needed, please save it in advance!

AIM Firmware flashen:

1. Install the "RaceStudio3" software on the PC / laptop beforehand. Then connect the PC / laptop to the vehicle using a data cable (see picture) and call up RaceStudio3.
2. Establish connection (1) with the AIM Dash.
3. Select the firmware (3) previously downloaded from the customer portal using the button (2).

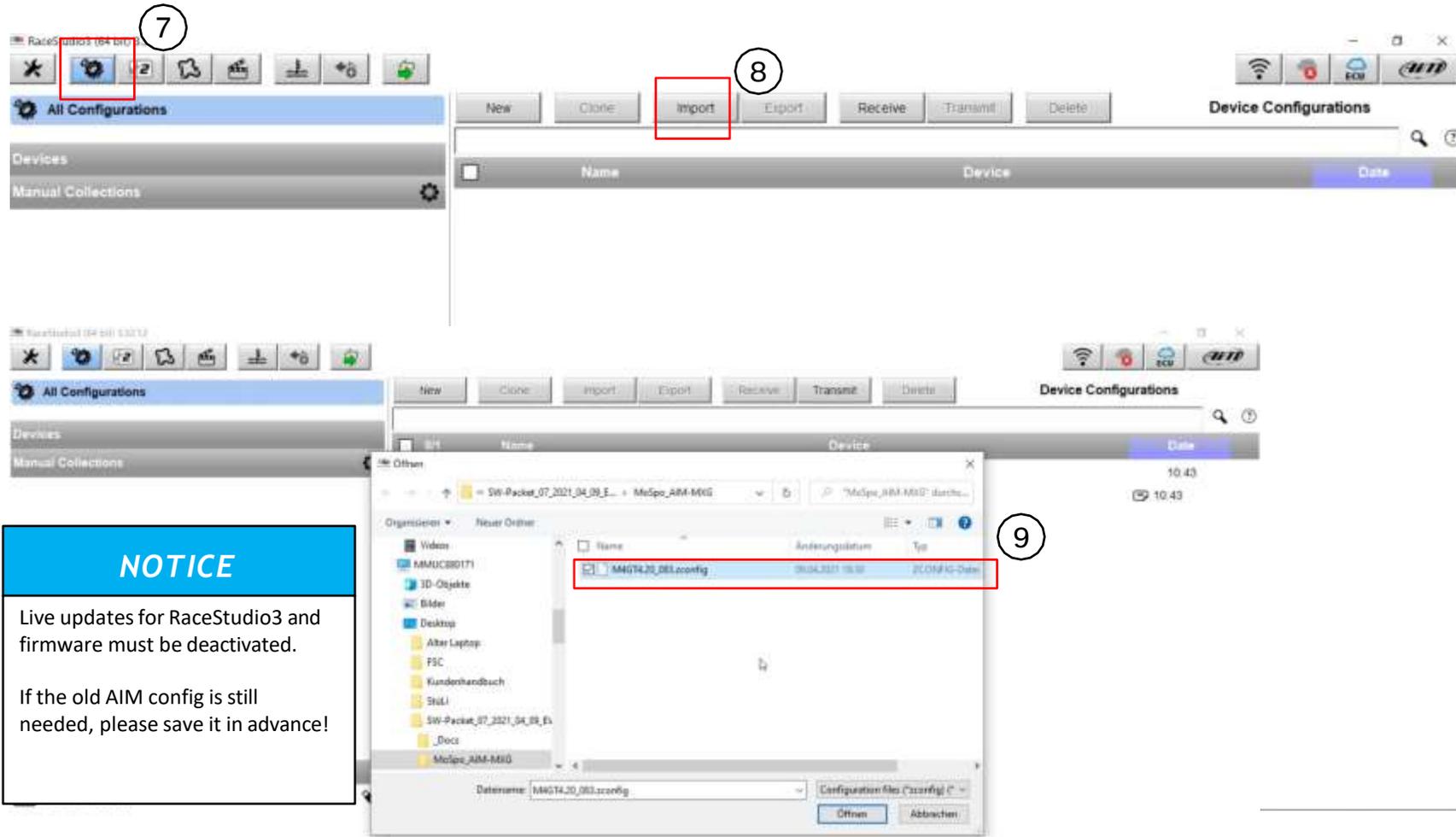
Data cable (see customer manual, chapter 7.5.):



8.1. AIM.

8.1.4. FIRMWARE & CONFIG.

The actual AIM configuration (`xxx.zconfig`) is stored in the BMW customer portal.



Update AIM configuration:

7. Select Configurations (7).
8. Import new configuration (8).
9. Select the configuration (9) previously downloaded from the customer portal.

NOTICE

Live updates for RaceStudio3 and firmware must be deactivated.

If the old AIM config is still needed, please save it in advance!

Data cable (see customer manual, chapter 7.5.):



8.1. AIM.

8.1.4. FIRMWARE & CONFIG.

The actual AIM configuration ([xxx.zconfig](#)) is stored in the BMW customer portal.

The screenshot shows the RaceStudio3 interface. A table of configurations is visible with the following data:

1/2	Name	Device	Date
<input checked="" type="checkbox"/>	M4GT4.20_083 Clare_011	MXG	10.43
<input checked="" type="checkbox"/>	M4GT4.17_071 FW/MY	MXG	10.43

Annotations on the screenshot:

- 10: Points to the selected configuration row in the table.
- 11: Points to the 'Save' button.
- 12: Points to the 'Close' button.
- 13: Points to the 'Transmit' button in the top toolbar.

Below the table, there are tabs for 'Channels', 'ECU Stream', 'CAN2 Stream', 'CAN Expansions', 'Math Channels', 'Status Variables', 'Parameters', and 'Shift Lights and Alarms'. The 'Channels' tab is active, showing a table of channels:

ID	<input checked="" type="checkbox"/>	Name	Function
RPM	<input type="checkbox"/>	RPM	Engine RPM
Spd1	<input type="checkbox"/>	Speed1	Vehicle Spd
Spd2	<input type="checkbox"/>	Speed2	Vehicle Spd
Spd3	<input type="checkbox"/>	Speed3	Vehicle Spd
Spd4	<input type="checkbox"/>	Speed4	Vehicle Spd

Update AIM configuration:

10. Choose new AIM Dash configuration (10).
11. Open config with doubleclick.
12. Save the config (11).
13. Close and go back to the overview (12).
14. Start update process (13).

Data cable (see customer manual, chapter 7.5.):



HINWEIS

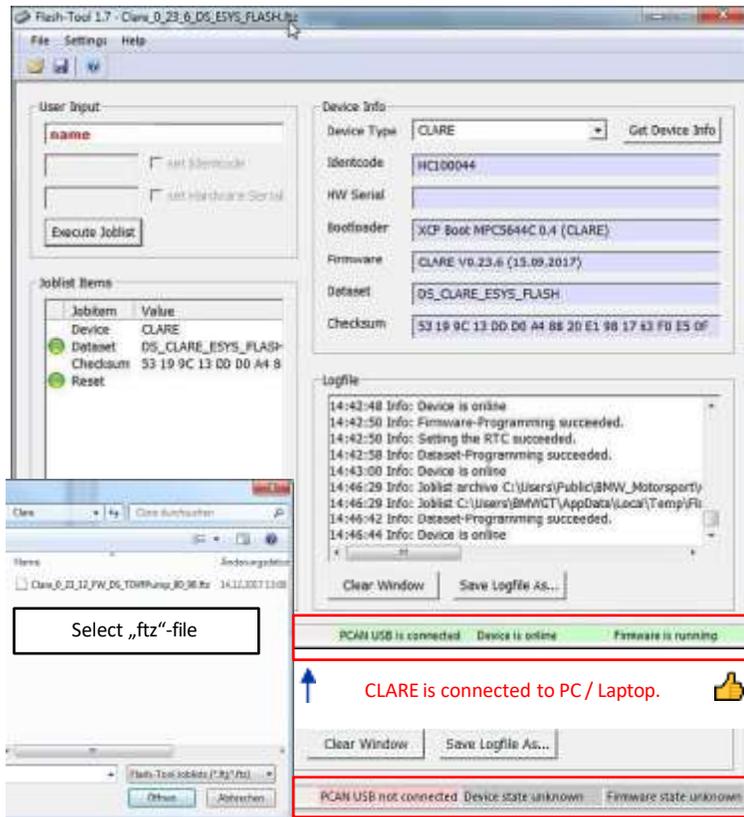
Live updates for RaceStudio3 and firmware must be deactivated.

If the old AIM config is still needed, please save it in advance!

8.2. CLARE FLASH TOOL.

8.2.1. FLASHING.

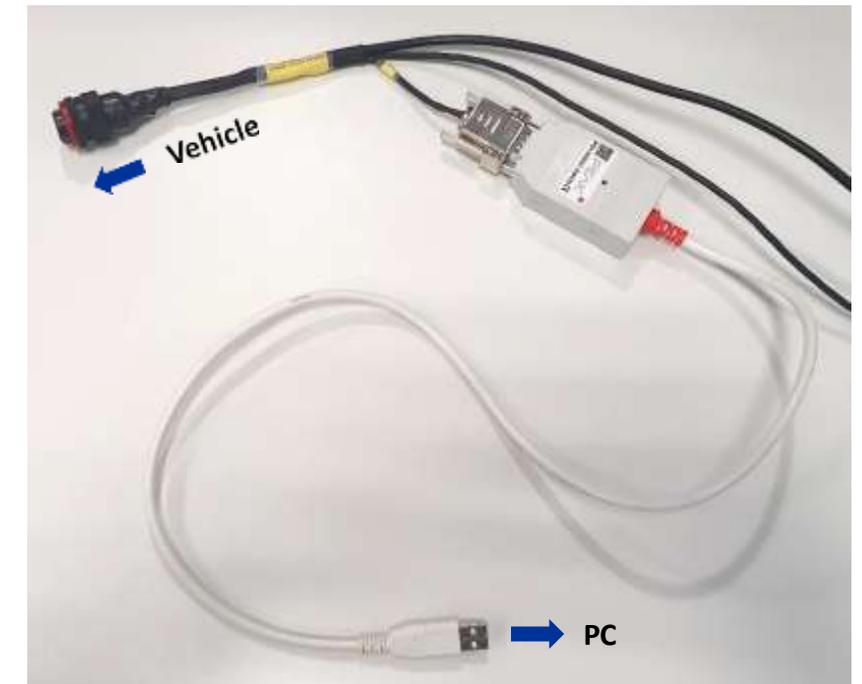
The current CLARE data status / Joblist ([Clare_XX_XX_XXXXX.ftz](#)) and the current Flashtool ([Flash-Tool_xxx.msi](#)) are stored in the BMW customer portal.



Flashing the CLARE ECU:

1. Install the "PEAK" drivers on the PC / Laptop before-hand.
The drivers can be downloaded from the PEAK website:
<https://www.peak-system.com/Drivers.523.0.html?&L=1#>
2. Connect the PC / laptop to the vehicle with the connection cable (as shown on the right).
3. The CLARE can be programmed with use of the **Flashtool** Software.
4. The Clare Data Set / Joblist (ftz) can be selected via **File / Open**.
5. **User Type** is to fill with your **name**.
6. **Select Device Type** with **CLARE**.
7. Press **Execute Joblist** button.

Interface: PEAK-CAN adapter (8323314) on SUB-D "CAN" vehicle diagnostic cable (8345027) connected (see chapter 7.5. also):



NOTICE

When flashing the CLARE, the low beam light and wiper are activated during the update.

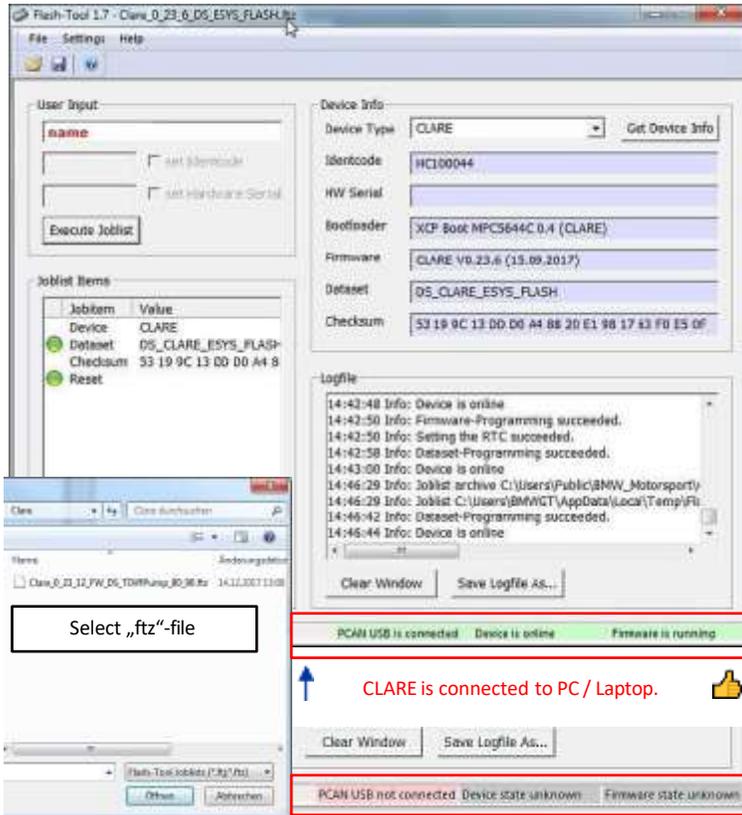


Repair and maintenance work on the vehicle only with appropriate protective clothing.

8.2. CLARE FLASH TOOL.

8.2.2. TRANSPORT-MODE (VMAX 30 KM/H).

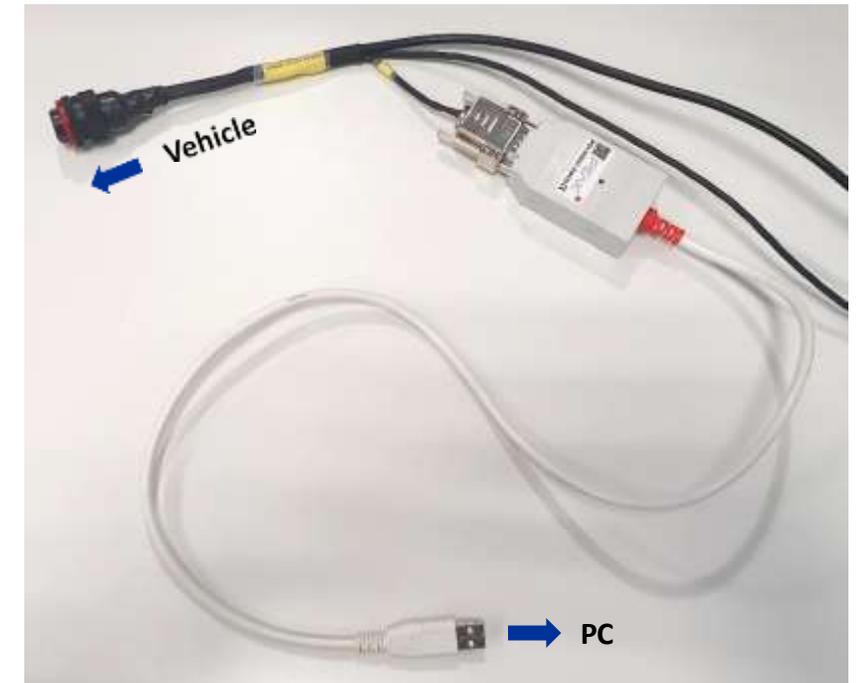
If the Transport-Mode is still active, please remove it with the data set / job list (Clare_M2_1_03_07_FW_DS_Def.ftz) and the current flash tool (Flash-Tool_xxx.msi) by flashing the CLARE control unit. This data set is stored in the BMW Customer Portal.



Flashing the CLARE ECU:

1. Install the "PEAK" drivers on the PC / Laptop before-hand.
The drivers can be downloaded from the PEAK website:
<https://www.peak-system.com/Drivers.523.0.html?&L=1#>
2. Connect the PC / laptop to the vehicle with the connection cable (as shown on the right).
3. The CLARE can be programmed with use of the **Flashtool** Software.
4. The Clare Data Set / Joblist (ftz) can be selected via **File / Open**.
5. **User Type** is to fill with your **name**.
6. Select **Device Type** with **CLARE**.
7. Press **Execute Joblist** button.

Interface: PEAK-CAN adapter (8323314) on SUB-D "CAN" vehicle diagnostic cable (8345027) connected (see chapter 7.5. also):



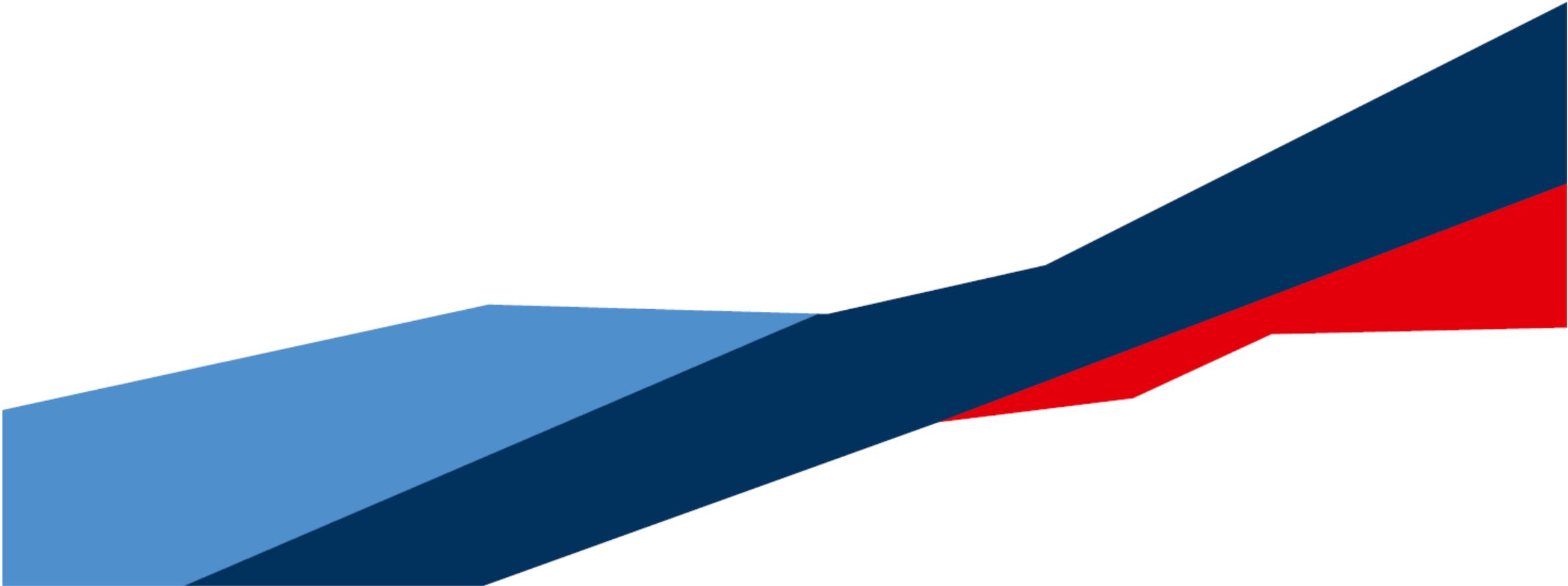
NOTICE

When flashing the CLARE, the low beam light and wiper are activated during the update.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.



APPENDICES.

A. HANDOVER CHECKLIST.

Auftrags-Nr. / Order-No.:	
Kunde / Customer / Team:	
Km Stand / Mileage:	
Fahrgestell-Nr. / VIN:	
Chassis-Nr. / Chassis-No.:	

Arbeiten die vor dem ersten Betrieb durchzuführen sind / Jobs which has to be done before the first run:

Nr. No.		OK	not OK	Bemerkung / Comment
Fahrzeug auf dem Boden / Car on the ground				
1	Prüfen auf offene Team Infos und ggf. abarbeiten. Check for open Team Infos and process if necessary.			
2	Softwarestände auf Aktualität prüfen und ggf. updaten. Check the software status for up-to-dateness and update if necessary.			
3	Fehlerspeicher lesen und ggf. abarbeiten / löschen. Read fault memory and process / delete if necessary.			
4	Transportmodus deaktivieren (siehe Dokumentation). Deactivate transport mode (see documentation).			
5	Sichtprüfung Karosserie auf Beschädigungen. Visual inspection of the body for damages.			
6	Radmuttern nachziehen (120Nm). Retighten the wheel nuts (120Nm).			
7	Funktionsprüfung Lufthebeanlage. Function test of air jack system.			
8	Funktionsprüfung Beleuchtung. Function test of lighting system.			
9	Entfernen von Aufklebern / Barcodes etc. Removing stickers / barcodes etc.			
10	Batterie über Schneeladestecker (hinter Tankdeckel) laden. Charge the battery using the charging plug (behind the fuel cap).			

Nr. No.		OK	not OK	Bemerkung / Comment
Innenraum / Interior				
11	Sichtprüfung Innenraum auf Beschädigungen / lose Bauteile / Steckverbindungen. Visual inspection of the interior for damages / loose components / plug connections.			
12	Kiste auf Ballastbox demontieren (Kunden übergeben), Deckel Ballastbox wieder befestigen. Remove the box on the ballast box (hand over to the customer), reattach the ballast box cover.			
13	Fußraumwanne entfernen. Remove the footwell pan.			
14	Funktionsprüfung Schalter/Schalterbeleuchtung. Function test switch / switch lighting.			
15	Prüfung Ablaufdatum und Druck Feuerlöscher. Check expiration date and pressure fire extinguisher.			
16	Fahrernetz rechts (Dreieck) stecken und mit Sitz spannen. Plug in the driver's net on the right (triangle) and tension it with the seat.			
17	Fahrernetz links (Viereck) stecken. Plug in the driver's net (square) on the left.			
Motorraum / Engine compartment				
18	Sichtprüfung Motorraum auf lose Leitungen / Bauteile / Steckverbindungen. Visual inspection of loose cables / components / plug connections in the engine compartment.			
19	Flüssigkeitsstände kontrollieren und ggf. auffüllen. Check all fluid levels and top up if necessary.			
20	Waschwasser auffüllen. Fill up windscreen washer liquid.			
Fahrzeug angehoben / Car lifted				
21	Entfernen Travel-Spacer VA/HA. Remove travel spacer front & rear.			
22	Luftdruck Räder prüfen (Reifenfülldruck von 3 bar Transport-Fülldruck auf 2 bar korrigieren). Check the tire air pressure (correct the tire inflation pressure from 3 bar transport inflation pressure to 2 bar).			
23	Sichtprüfung Unterboden auf Beschädigungen/ lose Bauteile / Steckverbindungen. Visual inspection of the underbody for damage / loose components / plug connections.			

APPENDICES.

B. MAINTENANCE RECORD.

The BMW M Motorsport maintenance and runtime system ensures reliable and with the least effort for the operational safety of your vehicle.

When calculating the maintenance intervals, please take into account the running times we have specified as well as the individual operating conditions of your vehicle and your personal driving style. The distances traveled are usually calculated. Because a closed circuit operation (many starts, starting at high engine speeds) will stress your vehicle in a different way than a long-distance operation (engine with constant operating temperature).

However, if you drive very little (well below 10,000 km per year), you should do a service every year. Have the engine oil and brake fluid changed, because oil also ages regardless of the usage. Depending on the operating conditions, you should also have the body, chassis and wheels checked for damages regularly.

Make sure that all maintenance work (change of brake fluid and coolant, oil service, change of filters and body- and chassis control) and the change of ownership to be entered into the service booklet* attached to each vehicle. The documentation of the regular maintenance work serves the operational safety of your vehicle.

*) The service booklet is included with every vehicle upon delivery!

APPENDICES.

B. MAINTENANCE RECORD.

The image displays three identical maintenance record forms arranged horizontally. Each form is enclosed in a rounded rectangular border and contains the following fields:

- VIN / Cage-No.:** A text input field.
- Mileage:** A text input field.
- Name / Team:** A text input field.
- Address:** A large, rounded rectangular text area.
- Date, Stamp, Signature:** A horizontal line at the bottom right for recording the date, stamp, and signature.

A large, diagonal watermark with the word "EXAMPLE" in red capital letters is overlaid across the middle form.

APPENDICES.

B. MAINTENANCE RECORD.

VIN / Cage-No.

Handover Check

carried out according factory specification

Date, Stamp, Signature _____

VIN / Cage-No.

carried out after run in new vehicle

yes no	yes no	Mileage
<input type="radio"/> <input type="radio"/> Engine Oil	<input type="radio"/> <input type="radio"/>	<input type="text"/>
<input type="radio"/> <input type="radio"/> Filter Engine Oil	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Diff. Oil	<input type="radio"/> <input type="radio"/>	yes no
<input type="radio"/> <input type="radio"/> Filter Diff.	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> Vehicle in original condition
<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	

Datum, Stamp, Signature _____

VIN / Cage-No.

carried out according running times

yes no	yes no	Mileage
<input type="radio"/> <input type="radio"/> Engine Oil	<input type="radio"/> <input type="radio"/> Fuel System Check	<input type="text"/>
<input type="radio"/> <input type="radio"/> Filter Engine Oil	<input type="radio"/> <input type="radio"/> Revision Diff. (after 15000 km)	yes no
<input type="radio"/> <input type="radio"/> Air Filter	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> Vehicle in original condition
<input type="radio"/> <input type="radio"/> Spark Plugs	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Suspension Check	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Brake Check	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Check Body Work	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Wheel Check	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> System Check Fire Extinguisher	<input type="radio"/> <input type="radio"/>	
<input type="radio"/> <input type="radio"/> Seat Belt Check	<input type="radio"/> <input type="radio"/>	

Datum, Stamp, Signature _____

APPENDICES.

B. MAINTENANCE RECORD.

carried out according running times

VIN / Cage-No.

Mileage

yes no	<input type="radio"/> <input type="radio"/> Engine Oil	yes no	<input type="radio"/> <input type="radio"/> Fuel System Check	yes no	<input type="radio"/> <input type="radio"/> Vehicle in original condition
	<input type="radio"/> <input type="radio"/> Filter Engine Oil		<input type="radio"/> <input type="radio"/> Revision Diff. (after 15000 km)		
	<input type="radio"/> <input type="radio"/> Air Filter		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Spark Plugs		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Suspension Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Brake Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Check Body Work		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Wheel Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> System Check Fire Extinguisher		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Seat Belt Check		<input type="radio"/> <input type="radio"/>		

Datum, Stamp, Signature _____

carried out according running times

VIN / Cage-No.

Mileage

yes no	<input type="radio"/> <input type="radio"/> Engine Oil	yes no	<input type="radio"/> <input type="radio"/> Fuel System Check	yes no	<input type="radio"/> <input type="radio"/> Vehicle in original condition
	<input type="radio"/> <input type="radio"/> Filter Engine Oil		<input type="radio"/> <input type="radio"/> Revision Diff. (after 15000 km)		
	<input type="radio"/> <input type="radio"/> Air Filter		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Spark Plugs		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Suspension Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Brake Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Check Body Work		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Wheel Check		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> System Check Fire Extinguisher		<input type="radio"/> <input type="radio"/>		
	<input type="radio"/> <input type="radio"/> Seat Belt Check		<input type="radio"/> <input type="radio"/>		

Datum, Stamp, Signature _____

EXAMPLE

APPENDICES.

C. START / WARM UP PROCEDURE.

Type of check	Check ID	AM	WU	Sequence
Pre-Checks	1	x	x	Possibly connect car battery.
	2	x	x	Connect charger or jump battery at the jump start connector in the fuel filler cap.
	3	x	x	Check engine oil level at the dip stick (min. 2 hours no engine running before).
	4	x	x	Check coolant level in both reservoirs (Engine and Intercooler).
	5	x	x	Check brake fluid level in both reservoirs.
	6	x	x	Jack up the car with air jacks.
	7	x	x	For a safety stand use "Safetys"!!!
	8	x	x	Check car for fluid leakage.
	9	x	x	Visual check of all suspension components for cracks and damages.
	10	x	x	Remove "Safetys" !!!
	11	x	x	Put back the car on ground with air jacks.
	12	x		Switch Main Switch on Switchbox to „ON“.
	13	x		Do not touch brake pedal !!!
	14	x		Push start button once to >>> Ignition ON.
	15	x		Read error codes memory and delete.
Warm Up	16		x	Gearbox unlocking lever in „Park“ position.
	17		x	Press „P“-button on Switchbox >>> Check AIM-Display.
	18		x	Push brake pedal !!!
	19		x	Press Start button >>> Engine cranks and starts.
	20		x	Keep engine idle until engine water temperature reaches 40°C.
	21		x	Rev up to constant 2500 - 3000 rpm until engine water temperature reaches 80°C.
	22		x	Initiate steering angle sensor >>> Turn steering wheel lock to lock.
	23		x	Push Start/Stop button on Switchbox >>> Engine stops.
	24		x	Read error codes memory and delete.

APPENDICES.

C. START / WARM UP PROCEDURE.

Type of check	Check ID	AM	WU	Sequence
System checks	25	x	x	Switch fire extinguisher to „Test“.
	26	x	x	Check fire extinguisher outside button near the windscreen.
	27	x	x	Check fire extinguisher button inside on the Switchbox.
	28	x		Install Radio and connct.
	29	x	x	Check Radio button on the steering wheel.
	30	x	x	Check lights by switching lights on.
	31	x	x	Check high beam at the button on the steering wheel.
	32	x	x	Lift wiper blades and spray windscreen with foam cleaner !!!
	33	x	x	Check wiper function with push button on steering wheel.
	34	x	x	Check "Emergency Stop" - Check inside / outside> 1 min.

Remarks:

The start-up / warm-up procedure ensures correct and reproducible conditioning of the vehicle before and during a racing event. Furthermore, the data engineers are able to carry out comprehensive system tests before the car is sent to the track. The columns **AM / WU** show system tests at the start in the morning (**AM**) or the warm up (**WU**) later between the sessions.

APPENDICES.

D. RUN IN INSTRUCTIONS.

At Vehicle Delivery:

1. 300** km with a half-load acceleration up to 170 km/h, in-between speeds of 60, 120 and 170 km/h respectively constant for a duration of 1-3 minutes or 3 km, gear change under 5500 rpm and brake pressure max 15 bar.
2. Then do brake bedding according to the instruction as below (when not using pre-bedded brake discs*):

To achieve optimal brake pad performance, please follow the instructions below:

Wherever possible, drive in new brake pads on used disks and new disks with used brake pads.

To reduce thermal shock during bedding, the brake ventilation can be taped by 50%.

Apply the brakes a few times with little pressure at low speed to ensure correct installation of the brake system.

Gradually increase to 70% of the racing speed and 50% of the brake pressure and then brake about with 35 brake applications (see *).

Cool down a lap before returning to the pits. The full surface should be bedded, and after any masking tape can be removed at this point. At the return to the racetrack increase the racing speed and the brake pressure progressively.

***) The number of brake operations required depends on the severity of brake application. A heavy duty brake application can take more than 35 stops.**



A brake disc may crack prematurely due to an unequal distribution of thermal stresses around the disc. To get knowledge about the disc temperature, you can apply brake temperature paint on the brake discs. The three colors change at different temperatures and thereby give an indication of the actual disc temperature and even the temperature distribution within the disc.



Green paint turns to white at: 450 °C
Orange paint turns to yellow at: 550 °C
Red paint turns to white at: 630 °C
(based on 10 min continuous exposure time)

NOTICE

When replacing renewed / revised engines, gearboxes and rear axles, these components have to be run in again and afterwards the oil including the filter has to be changed of these components, too.

Brake operation temperatures:



To avoid damage of the components, monitoring these temperatures while driving will help you to bring your brake system into the correct temperature window. At all times, on all race tracks, the brake discs will require a gentle warming up to reach their operation temperature window (between 400-600°C). Significant left to right differences should be investigated. To assist the monitoring, temperature balance can be checked as soon as the car stops in the pit lane using a infrared thermometer or a handheld thermocouple probe with digital readout.

Therefore we have the option of blanking the brake cooling ducts. (For more detail instructions, please refer to chapter 4.3.).

Important:

Blanking only the lower ducts should be done on the 365 HP version due to caliper cooling by the upper ducts.

3. Afterwards 100 km** with 20-30 partial load accelerations up to 250 km/h, again gear changes under 5500 rpm, and keep the final speed for some time constant.
4. Finally change the engine oil (incl. filter) and the rear axle final drive oil (incl. filter).

*) Preferable are machine pre-bedded brake discs!

***) The vehicle does not have an odometer in the dashboard. The mentioned distances are therefore to be converted by the teams.

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Interval [km]
Engine					
1100	2433194	Short Engine S55B30A	30000	Replace	Not specified
1100	7847203	Vacuum pump	30000	Replace	Not specified
1364	7639994	RP Injector (only together with compression ring 1353 7577649)	15000	Replace	Not specified
1351	7847204	High-pressure pump	30000	Replace	Not specified
1212	0039664	Spark plug, High Power NGK SILZKBR8D8S	5000		Not specified
1128	7848605	RIBBED V-BELT	10000	Replace	Not specified
1128	7848606	RIBBED V-BELT	10000	Replace	Not specified
1128	8604266	Belt tensioner	10000	Replace	Not specified
1128	7589361	Deflection pulley	10000	Replace	Not specified
1128	7848607	Deflection pulley	10000	Replace	Not specified
8321	2365929	Engine Oil	5000		
1142	7854445	Set oil-filter element	5000		Not specified
1372	7843284	Air filter element for Cylinder bank 1	5000		
1372	7843283	Air filter element for Cylinder bank 2	5000		
Cooling					
1711	7639024	COVER LID	15000	Replace	Not specified
1711	7639021	RADIATOR CAP	15000	Replace	Not specified
Tank					
1600	8324141	ZB TANK	0	Every 5 years	
1600	8328160	ZB TANK 120 LITRE	0	Every 5 years	
Exhaust system					
		Exhaust system complete	30000	Visual Check	5000

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
Engine mount					
2211	8416823	Reinforcement ring	10000		
2211	8431709	Reinforcement ring	10000		
2211	8431708	NA Engine Mount RE (WAERMESCHUTZKAPPE)	10000		
2211	2284818	RE Engine Mount S55	10000		
Gear box					
2800	7853551	Dual-clutch transmission	30000	Replace	Not specified
2300	8423754	Bowden cable control	30000	Replace	30000
		Quick Fill	30000	Visual Check	5000
Rear differential					
3310	8440743	ZB HAG 215M I=3,46 GESCHM. DREX. 50-40	0		15000
3312	7607158	Repair kit ELM M39 L20	15000	Replace	15000
Air jack					
7112	8283834	Lifting Jack LL-24	0	Revision	10000

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
711	9963132	SEAL RING A12X16-CU	15000	Replace	0
711	9963041	SEAL RING A8X11,5-AL	30000	Check for leakage	10000
711	9963300	SEAL RING A18X22-AL	0	Visual Check	5000
711	9963300	SEAL RING A18X22-AL	0	Visual Check	5000
711	9963300	SEAL RING A18X22-AL	0	Visual Check	5000
1100	7735140	O-RING 42X3 80SH V1500	30000	Replace	30000
1100	2190452	O-RING 4,47X1,78 FKM 80SH V1500	30000	Check for leakage	10000
1100	8431813	SCRUTINEERINGPIPE AIRFILTER LH	30000		
1100	8431814	SCRUTINEERINGPIPE ENGINE	30000		
1100	2194181	O-RING 8X1,5 FKM 80SH V1500	30000	Check for leakage	10000
1142	7854445	SET M - SEAL. FILTER ALU F.OELP.	5000		
1142	8683168	O-RING 80X3,5 AEM70 FUER OELFILTERDECKEL	5000		
1143	8423403	PLUG ALU 806-10X1,0	30000	Check for leakage	10000
1151	8284521	LOCK SCREW M6X8,5	30000	Check for leakage	10000
1161	8416401	LOCK SCREW M6X8,5 F. O-RING	30000	Check for leakage	10000
1251	1742867	TY-RAP –TEMPERATURE RESISTANCE -	30000	Replace	30000
1353	8299667	PIN ISA BEST.NR. 6439-0	30000	Replace	30000
1353	7577649	DECOUPLING ELEMENT N55	15000		
1371	8429438	NA AGD F. MEASURING POINT (AUS 7 846 268)	30000	Check for leakage	10000
1372	7843284	AIRFILTER INSERT ZYL. 1-4	5000		
1372	7843283	AIRFILTER INSERT ZYL. 5-8	5000		
1600	8323989	ZB TANK DD-ZI-097	0	Every 5 years	
1600	8417159	FUEL PIPE FLEXAFIT DI=50 L=980	0	Visual Check	5000
1612	8323879	FUEL PIPE TANK TO GBX TUNNEL	0	Visual Check	5000

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
1612	8324063	FUEL PIPE TUNNEL	0	Visual Check	5000
2211	8416823	REINFORCEMENT RING ENGINE MOUNT SERIES	10000		
2211	8431709	REINFORCEMENT RING ENGINE MOUNT RH	10000		
2211	8431708	NA ENGINE MOUNT RH (CAP HEAT PROTECTION)	10000		
2211	2284818	RH ENGINE MOUNT S55	10000		
2314	8335851	HIGH FLOW COUPLING 06D ALU-NIPPLE BF750	0	Visual Check	5000
2314	8335852	HIGH FLOW COUPLING 06D ALU-COUPLER BF750	0		
3110	8431219	WIISHBONE FRONT	10000	Visual Crack Inspection	5000
3110	8431956	SPHERICAL BEARING FRONT MK3	10000	Visual Crack Inspection	5000
3110	8431217	SPHERICAL BEARING GAXSW14X1.5 MS LH	10000	Visual Crack Inspection	5000
3110	8431362	SPACER U3 FRONT	10000	Visual Crack Inspection	5000
3110	8431218	TENSION STRUT FRONT	10000	Visual Crack Inspection	5000
3110	8431361	SPACER U1 FRONT	10000	Visual Crack Inspection	5000
3110	8324096	SPACER U3 FRONT	10000	Crack Inspection	5000
3110	8324097	SPACER U1 FRONT	10000	Crack Inspection	5000
3110	8431216	SPHERICAL BEARING GAXSW14X1.5 MS	10000	Visual Crack Inspection	5000
3120	7857506	WHEEL BEARING	7500		
3120	8328350	WHEEL BEARING HT-GREASE FRONT	7500		
3121	2284001	LH STRUT M3	10000	Visual Crack Inspection	5000
3121	2284002	RH STRUT M3	10000	Visual Crack Inspection	5000
3130	8431790	NA FRONT SUB FRAME	10000	Visual Check	
3130	8324125	ZB DAMPER FRONT ZF	10000	Service	5000/ 1x per Year

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
3130	8431752	STRUT SUPPORT LOWER FRONT MK2	10000	Visual Crack Inspection	5000
3130	8431471	ZB STRUT SUPPORT UPPER FRONT LH	10000	Visual Crack Inspection	5000
3130	8431472	ZB STRUT SUPPORT UPPER FRONT RH	10000	Visual Crack Inspection	5000
3135	8431268	ANTI ROLL BAR KIT FRONT 30MM	10000	Crack Inspection	5000
3135	8431560	DROP LINK FRONT	10000	Crack Inspection	5000
3135	8431700	BALL JOINT BEM10-20-501	10000	Crack Inspection	5000
3135	8431494	BALL JOINT BEM10-20-502 M. M10	10000	Crack Inspection	5000
3135	8431783	LINKAGE GST10-150-0236-0-5	10000	Crack Inspection	5000
3135	8431703	HEX NUT 10-00-936-1	10000	Crack Inspection	5000
3135	8431704	HEX NUT 10-00-936-2	10000	Crack Inspection	5000
3135	8431539	CON. DROP LINK FRONT WHEEL CARRIER 15MM	10000	Crack Inspection	5000
3210	8099561	ZB EPS STEERING RACK LL F8X	15000		
3210	6799960	ZB TOE ROD LH RWD	10000	Crack Inspection	2500
3210	6799965	ZB TOE ROD RH RWD	10000	Crack Inspection	2500
3230	8431556	ADAPTER STEERING COLUMN	0	Crack Inspection	5000
3230	8431513	QUICK RELEASE STEERING WHEEL QR-33 FASE	10000		
3230	8321787	STEERING WHEEL SPACER 10MM	0	Crack Inspection	5000
3230	8321700	STEERING WHEEL SPACER 20MM	0	Crack Inspection	5000
3230	6858559	ZB STEERING COLUMN LK O. ELV TOPFK.	0	Crack Inspection	5000
3230	2284757	ZB STEERING SPINDLE	0	Crack Inspection	5000
3300	8328143	FLANGE HUB	10000	Visual Crack Inspection	2500

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
3310	8433799	ZB DIPSTICK CARRIER POSITION 2 M4GT4	30000	Replace	30000
3310	8433829	LU DIPSTICK ACC. 4709096	30000	Replace	30000
3310	7767353	BANJO BOLT	0	Visual Check	5000
3315	8345082	ZB OIL PUMP, FA MOCAL, ST.2POLMCON, L250MM	15000		
3317	6757314	DIFF-RUBBER MOUNT FRONT	10000		
3317	7852495	DIFF-RUBBER MOUNT REAR	10000		
3320	8431719	DRIVESHAFT LH MK1	7500		
3320	8431720	DRIVESHAFT RH MK1	7500		
3330	8431221	UPPER SUS. STRUT REAR	10000	Visual Crack Inspection	5000
3330	8431957	SPHERICAL BEARING REAR MK3	10000	Visual Crack Inspection	5000
3330	8431363	SPACER FOR 48MM JOINT REAR	10000	Visual Crack Inspection	5000
3330	8431220	LOWER SUS. STRUT REAR	10000	Visual Crack Inspection	5000
3330	8431364	SPACER FOR 40MM JOINT REAR	10000	Visual Crack Inspection	5000
3330	8431237	NA SUB FRAME REAR	20000		
3330	8431233	SPACER U3 REAR	10000	Visual Crack Inspection	5000
3331	2283019	DIFF-RUBBER MOUNT FRONT	10000		
3332	2284533	CAMBER STRUT	10000	Visual Crack Inspection	5000
3340	8431235	ZB WHEEL CARRIER REAR LH	10000	Visual Crack Inspection	2500
3340	8431236	ZB WHEEL CARRIER REAR RH	10000	Visual Crack Inspection	2500
3340	8328241	NA FLANGE HUB	10000	Visual Crack Inspection	2500
3340	8328351	WHEEL BEARING HT-GREASE	5000		
3350	8324126	ZB DAMPER REAR ZF	10000	Service	5000 / 1x per Year
3350	8431286	DAMPER MOUNT REAR	10000	Service	5000

APPENDICES.

E. RUNNINGTIMES.

Figures corresponds to the running time currently released from the test program. The running times are continuously adjusted as the test program progresses.

HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
3355	8431271	ANTI ROLL BAR KIT REAR 26MM	10000	Crack Inspection	5000
3355	8431563	DROP LINK REAR	10000	Crack Inspection	5000
3355	8431706	LINKAGE GST10-150-0071-0-5	10000	Crack Inspection	5000
3355	8431537	CON. DROP LINK REAR WHEEL CARRIER	10000	Crack Inspection	5000
3400	8328318	ISK BOLT M12X1.75X60	10000	Crack Inspection	5000
3410	8438069	LH BRAKE CALIPER	10000	Seal change, Revision	5000
3410	8438070	RH BRAKE CALIPER	10000	Seal change, Revision	5000
3410	8438075	ADAPTER WHEEL CARRIER	10000	Crack Inspection	5000
3410	8323912	FIXING BOLT M12X1.75X65MM	10000	Crack Inspection	5000
3410	8431633	BOLT D12K2 M12X1K5X40	10000	Crack Inspection	5000
3410	8323914	BRAKE BELL	10000	Crack Inspection	5000
3410	8323911	FIXING BOLT M5X0.8X12MM	0	Bell Visual Check	2500
3410	8323913	RETAINING STRAP	0	Bell Visual Check	2500
3410	8328173	LH BRAKE DISC FRONT - BEDDED	0	Bell Visual Check	2500
3410	8328174	RH BRAKE DISC FRONT - BEDDED	0	Bell Visual Check	2500
3410	8428733	BRAKE CALIPERL ALCON FRONT LH	10000	Seal change, Revision	5000
3410	8428734	BRAKE CALIPERL ALCON FRONT RH	10000	Seal change, Revision	5000
3410	8328316	RING FRONT BRAKE DISC/BELL	0	Bell Visual Check	2500
3411	8072019	LH BRAKE DISC 380X28 COMPOUND	0	Bell Visual Check	2500
3411	8072020	RH BRAKE DISC 380X28 COMPOUND	0	Bell Visual Check	2500
3420	8328317	RING REAR BRAKE DISC/BELL	0	Bell Visual Check	2500

APPENDICES.

E. RUNNINGTIMES.

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HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
3421	9504135	DS ZB LH BRAKE CALIPER M4.28-380-28 BEL	5000	Visual Check	2500
3421	9504136	DS ZB RH BRAKE CALIPER M4.28-380-28 BEL	5000	Visual Check	2500
3610	8324178	RIM 10.5JX18 ET46 STY 513M	10000		
4100	8427482	SEAL RING DIN7603 FORM A 10X13,5X1 AL	30000	Check for leakage	10000
4100	8438004	SEAT BEAM LH FRONT	0	Crack Inspection	1000
4100	8438005	SEAT BEAM LH REAR	0	Crack Inspection	1000
5171	8324128	BALLASTBOX BASE PLATE MK2	10000		
5200	8417355	RAIL KULA WITH GRIP SABELT	7500		
5200	8324115	ADAPTER SABELT TAURUS M-L	15000		
5200	8324116	ADAPTER SABELT TAURUS XL	15000		
5200	8323894	FLEX-ADAPTER RECARO P1300GT	7500		
5200	8324142	SEAT ADAPTER P1300 GT FRONT	15000		
5200	8324143	SEAT ADAPTER P1300 GT REAR	15000		
5200	8324144	SEAT ADAPTER P1300 GT- S FRONT	15000		
5200	8324145	SEAT ADAPTER P1300 GT - S REAR	15000		
5200	8328242	SEAT ADAPTER P1300GT S FRONT Z PLUS 50	15000		
5200	8328246	SEAT ADAPTER P1300GT S REAR Z PLUS 50	15000		
5200	8324146	SEAT ADAPTER P1300 GT - L FRONT	15000		
5200	8324147	SEAT ADAPTER P1300 GT - L REAR	15000		

APPENDICES.

E. RUNNINGTIMES.

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HG	Part-No.	Description	Mileage [km]	Service	Service Intervall [km]
5200	8323971	SEAT RAIL PASSENGER SEAT	15000		
7211	8328082	SEAT BELT PROFI 2X2 PULL-DOWN BLACK	0	Expiry Date	
8130	4670304	ADAPTER M8X1 DASH 4 AL	30000	Check for leakage	10000
8130	4670396	CAP D4 AL	30000	Check for leakage	10000
8130	4670302	ADAPTER M10X1 DASH 4 AL	30000	Check for leakage	10000

Remark:

- Regular visual inspection of all fuel-carrying components.
- Regular visual inspection of the complete radiator/cooling package.
- Regular visual inspection of all chassis components.

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
711	9904670	HEX NUT M10-10-ZNS3	A	56 Nm
711	9908497	HEX BOLT M14X1,5X105-LG 20-PC-10.9-ZNS3	A	120 Nm - Loctite 243
711	9905418	HEX BOLT M10X80-U1-10.9-ZNS3		56 Nm - Loctite 243
711	9906292	HEX BOLT M12X1,5X80-U1-10.9-ZNS3		100 Nm - Loctite 243
711	9906489	HEX BOLT M12X1,5X67-U-SW18-10.9-ZNS3		100 Nm - Loctite 243
711	9907352	HEX BOLT M10X70-10.9-ZNS3		56 Nm - Loctite 243
711	9907125	HEX BOLT BM8X20-PC-10.9-ZNS3	A	28 Nm + Loctite 243
712	9905867	ISA-SCREW M6X12-8.8-ZNNIV SI		9 Nm
714	7204294	HEX NUT WITH WASHER		25 Nm - Loctite 243
714	7698893	FILLISTER HEAD SCREW	B	1,8
1100	8436841	COLLAR SREW		9 Nm
1100	2190416	KAYNUT W. WASHER HWM14-050 M5 6KT		5 Nm
1100	2190413	KAYNUT HM14-080 M8 6KT		36 Nm
1100	2190418	KAYNUT W. WASHER HWM14-080 M8 6KT		30 Nm
1100	2190420	KAYNUT W. WASHER HWM14-100 M10 6KT		45 Nm
1100	2190417	KAYNUT W. WASHER HWM14-060 M6 6KT		8 Nm
1100	1313172	KAYLOCK-NUT HM-14-080-M8		19 Nm
1100	2190413	KAYNUT HM14-080 M8 6KT		19 Nm

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
1100	2190420	KAYNUT W. WASHER HWM14-100M10 6KT (Battery fixation)		25 Nm
1115	7767267	COUPLING 90 06MALE-FEMALE		20 Nm - Loctite 542
1151	8284521	PLUG SCREW M6X8,5		9 Nm
1161	8440739	CYL. SCREW DIN 7984 M5X14 V2A	2	6 Nm
1161	8416401	PLUG SCREW M6X8,5 F. O-RING		9 Nm
1212	0039664	SPARK PLUG HIGH POWER NGK SILZKBR8D8S		23 Nm +/-3
1331	1714453	HOLDER		20 Nm - Loctite 542
1371	7547064	RUBBER BLOCK W. 2 THREADED RODS M6		Hand tight - Loctite 270
1612	8324063	FUEL FORWARD TUNNEL		20 Nm - Loctite 542
1612	8431548	PIPE FORWARD T-PIECE TO ENGINE		20 Nm - Loctite 542
1612	7749602	T-PIECE W. NUT		20 Nm - Loctite 542
1612	8431359	DRAIN PIPE T-PIECE TO QC		20 Nm - Loctite 542
1612	7769955	T-PIECE FEMALE06D-MALE06D M10X1		20 Nm - Loctite 542
1613	8431611	TANK VENT PIPE		45 Nm - Loctite 542
1722	2204799	NUT D6		20 Nm - Loctite 542
2314	8335852	HIGH FLOW COUPLING 06D ALU-COUPLER BF750		Loctite 542
2314	8335851	HIGH FLOW COUPLING 06D ALU-NIPPEL BF750		20 Nm - Loctite 542
2611	7527475	HEX-SCREW M12X1.5X71 ZNS3		55 Nm + 90° - Loctite 243
2612	7536563	HEX.-NUT M12X1,5		55 Nm + 90° - Loctite 243
3110	6793894	BOLT ASA M12X1,5X45-10.9-PC ZNS3	A	120 Nm - Loctite 243
3110	2284536	BOLT ASA M12X1,5X145-10.9-PC ZNS3	A	108 Nm - Loctite 243

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
3110	6862545	ASA-SCREW M10X40-U-PC-10.9-ZNS3	A	56 Nm + 90° - Loctite 243
3110	6885777	HEX BOLT M12X1.5X136-TC-10.9-ZNS3	A	100 Nm + 90° - Loctite 243
3110	6767496	LOCK NUT M12X1,5-10 ZNS3	A	100 Nm + 90° - Loctite 243
3110	6797237	HEX BOLT M12X1,5X85-10.9 ZNS3	A	100 Nm + 90° - Loctite 243
3110	6859809	SCREW ASA M8X30-10.9 ZNS3		28 Nm
3110	6769907	SCREW M12X1,5X90-10.9-PC ZNS3		120 Nm
3110	6768886	HEX NUT HCN M14X1,5-10 ZNS3		165 Nm - Loctite 243
3110	6786144	SCREW M14X1,5X120-10.9-MK ZNS3		165 Nm - Loctite 243
3120	6872920	BALL HEAD SCREW M12		120 Nm + 90° - Loctite 270
3120	1133785	DOUBLE HEX NUT WAXED M27X1,5 ZN		300 Nm
3130	8431839	HEX SCREW DIN6921 M10X50 10.9 ZN		56 Nm - Loctite 243
3135	8431703	HEX SCREW 10-00-936-1		25 Nm
3135	8431704	HEX NUT 10-00-936-2		25 Nm
3210	6773068	ASA-SCREW M10X70-10.9		56 Nm +90°
3210	6799960	TOE ARM LEFT RWD		105 Nm
3210	6799965	TOE ARM RIGHT RWD		105 Nm
3230	2635621	HEX SCREW M14X1,5 M. SPERRVERZ.KARIP		62 Nm
3310	7767353	HOLLOW SCREW		45 Nm - Loctite 542
3312	7607158	REPAIR SET ELM M39 L20		120 Nm
3315	7768507	ADAPTER M22X1.5-06D		45 Nm - Loctite 542
3315	7749395	HOLLOW SCREW 775-22X1,5		45 Nm - Loctite 542
3315	8323903	OIL PIPE HAG ZU QC		20 Nm - Loctite 542
3315	8323905	OIL PIPE PUMP TO COOLER		20 Nm - Loctite 542
3315	8323906	OIL PIPE COOLER TO QC		20 Nm - Loctite 542
3315	8323907	OIL PIPE QC TO INTAKE-HAG		20 Nm - Loctite 542

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
3315	7750605	ADAPTER UNF-JIC 919-3/8-24-03 SS KRONTEC		15 Nm - Loctite 542
3317	7852488	KOMBI-SCHRAUBE M14X1.5X125-10.9 ZNS3		210 Nm
3330	6787062	KOMBIMUTTER M14X1,5-10 ZNNIV SI	A	175 Nm - Loctite 243
3330	6787062	KOMBIMUTTER M14X1,5-10 ZNNIV SI (Diff. Fixation)		210 Nm - Loctite 243
3330	8431363	DISTANZBUCHSE FUER 48MM GABELKOPF HA		60 Nm
3330	6784802	EXZENTERSCHRAUBE M12X1,5X85-10.9 ZNS3		100 Nm - Loctite 243
3330	2284642	SCHRAUBE ASA M12X1,5X60-10.9-PC ZNS3		108 Nm - Loctite 243
3330	6861221	LINSENSCHRAUBE M12 ISA 60 10.9		42 Nm
3332	6768354	KOMBI-SCHRAUBE M10X33-10.9-PC ZNS3	A	56 Nm + 90° - Loctite 243
3332	6768884	SECHSKANTBUNDMUTTER HCN M10-10 ZNS3		56 Nm - Loctite 243
3332	6760380	SCHEIBENBUNDMUTTER M14X1,5-10 ZNS3		210 Nm
3332	6760668	SECHSKANTFLANSCHMUTTER M12X1,5-10-ZNS3		100 Nm - Loctite 243
3332	6779785	EXZENTERSCHRAUBE M14X1,5X105-10.9 ZNS3		165 Nm - Loctite 243
3332	2284543	SCHRAUBE-M12X1.5X106M10X1.5X20-10.9-ZNS3		100 Nm - Loctite 243
3332	6768884	SECHSKANTBUNDMUTTER HCN M10-10 ZNS3 (Steering Rack)		56 Nm + 90°
3332	6760668	SECHSKANTFLANSCHMUTTER M12X1,5-10-ZNS3 (Damper Fixation)	A	80 Nm - Loctite 243
3340	8431234	LAGERBUCHSE U2 HA		Loctite 648
3340	2284592	KUGELBUND-SCHRAUBE M12X1.5X30-10.9 ZNS3	A	80 Nm, 90° + Loctite 270
3350	8431475	D2 SCHRAUBE HA	A	80 Nm - Loctite 243
3355	8431537	ANBINDUNG KOPPELSTANGE HA RADTRAEGER		45 Nm + Loctite 243
3410	8328059	BLEED SCREW 3/8UNF		14 Nm hot max 18 Nm cold max
3410	8323911	FIXING BOLT M5X0.8X12MM		8-9 Nm

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
3410	8304631	BRAKE PIPE FA		15 Nm - Loctite 542
3430	8438083	BRAKE PIPE INSIDE RA LH		17 Nm
3430	8438084	BRAKE PIPE INSIDE RA RH		17 Nm
3430	8438085	BRAKE PIPE ABS TO FRONT WALL RA LH		17 Nm
3430	8438086	BRAKE PIPE ABS TO FRONT WALL RA RH		17 Nm
3430	8324169	BRAKE PIPE ABS TO FRONT WALL RA LH		17 Nm
3430	8324170	BRAKE PIPE ABS TO FRONT WALL RA RH		17 Nm
3430	2284889	PIPE FROM RA TO FRONT LEFT		17 Nm
3430	8323889	BRAKE PIPE BG Z. T-PIECE		15 Nm - Loctite 542
3430	8323890	T-PIECE M12X1/M10X1/D06		15 Nm - Loctite 542
3430	8323891	ADAPTER M12X1/D06		15 Nm - Loctite 542
3430	8431355	BRAKE PIPE FA		15 Nm - Loctite 542
3432	2284891	PIPE FROM RA TO FRONT RIGHT		17 Nm
3432	6799823	PIPE V. BG Z. HE KR. -V-		17 Nm
3432	6872652	PIPE V. BG Z. HE KR. -H-		17 Nm
3450	6859776	HEX NUT M6-8-SC-ZNNIVSI	B	12 Nm
3450	6859776	HEX NUT M6-8-SC-ZNNIVSI (Fixation EKPM)	B	3 Nm
3450	6859776	HEX NUT M6-8-SC-ZNNIVSI (Parking Lock)	B	8 Nm
3600	8328085	WHEEL STUD FA		120 Nm + Loctite 648
3600	8328079	WHEEL STUD RA		120 Nm + Loctite 648
3610	8431287	ALLIGATOR VALVE 512573		5 Nm
3610	8431620	WHEEL NUT COATED		120 Nm

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
4100	8427836	SCREW ISO4762 M8X20 10.9 ZNSW (Tank)		21 Nm - Loctite 243
4100	8436096	SCREW ISO10642 M5X18 10.9 ZNSW		5 Nm
4100	8427673	CLAMP ABA ORIGINAL STAINLESS44MM-56MM		5 Nm
4100	8427702	CLAMP 5MM DIN3017 W4 85MM-100M		5 Nm
4100	8436021	FILLISTER HEAD SCREW ISO7380-2 M6X16 10.9 ZNSW (Door)		8 Nm - Loctite 542
4100	8436007	FILLISTER HEAD SCREW ISO7380-2 M5X12 10.9 ZNSW		8 Nm - Loctite 542
4100	8436011	FILLISTER HEAD SCREW ISO7380-2 M5X20 10.9 ZNSW		15 Nm
4100	8436006	FILLISTER HEAD SCREW ISO7380-2 M5X10 10.9 ZNSW	B	5 Nm
4100	8427808	SCREW ISO4762 M6X10 10.9 ZNSW		13 Nm+1
4100	8427442	NUT LOW DIN439 M14X1,5 A2	A	45 Nm
4100	8427443	NUT LOW DIN439 M14X1,5-LH A2	A	45 Nm
4100	8427836	SCREW ISO4762 M8X20 10.9 ZNSW		36 Nm - Loctite 243
4100	8427839	SCREW ISO4762 M8X30 10.9 ZNSW		36 Nm
4100	8427839	SCREW ISO4762 M8X30 10.9 ZNSW (Seat Recaro P1300GT)		30 Nm – Loctite 243
4100	8427839	SCREW ISO4762 M8X30 10.9 ZNSW (Triangle Net)		20 Nm – Loctite 243
4100	8436020	FILLISTER HEAD SCREW ISO7380-2 M6X14 10.9 ZNSW		15 Nm - Loctite 243
4100	8427787	SCREW ISO4762 M5X16 10.9 ZNSW		10 Nm - Loctite 243
4100	8427791	SCREW ISO4762 M5X25 10.9 ZNSW		10 Nm - Loctite 243
4100	8427793	SCREW ISO4762 M5X35 10.9 ZNSW		10 Nm - Loctite 243
4100	8436020	FILLISTER HEAD SCREW ISO7380-2 M6X14 10.9 ZNSW	B	15 Nm
4100	8427838	SCREW ISO4762 M8X25 10.9 ZNSW		36 Nm - Loctite 243
4100	8436006	FILLISTER HEAD SCREW ISO7380-2 M5X10 10.9 ZNSW (CLARE)		7 Nm
4100	8436015	FILLISTER HEAD SCREW ISO7380-2 M5X35 10.9 ZNSW		7 Nm
4100	8436021	FILLISTER HEAD SCREW ISO7380-2 M6X16 10.9 ZNSW	B	8 Nm

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
4100	8436076	SCREW ISO10642 M4X12 10.9 ZNSW	B	3,6 Nm
4100	8436144	SCREW ISO10642 M8X20 10.9 ZNSW		15 Nm - Loctite 243
4100	8436023	FILLISTER HEAD SCREW ISO7380-2 M6X20 10.9 ZNSW		30 Nm - Loctite 243
4100	8436166	SCREW ISO10642 M10X50 10.9 ZNSW		65 Nm - Loctite 243
4100	8427796	SCREW ISO4762 M5X50 10.9 ZNSW		8 Nm
4100	8428008	SCREW ISO7380-1 M4X6 10.9 ZNSW		4 Nm
4100	8436034	FILLISTER HEAD SCREW ISO7380-2 M8X20 10.9 ZNSW		15 Nm - Loctite 243
4100	8427871	SCREW ISO4762 M10X75 10.9 ZNSW		35 Nm
4161	8417421	BONNET LOCK XTREME		S M4=4 Nm, M M4=4 Nm, M M10 = 25 Nm- Loctite 243
5116	8341222	INT. MIRROR (ISA RACING 6663.0)		15 Nm (S+M)
5116	8431369	INT. MIRROR BRACKET (ISA RACING 6663.2)		8 Nm (M5x25)
5145	8436321	SCREW DIN912 M14X1.5X60 12.9ZNSW		Loctite 243
5171	8436318	KAYNUT HM14-120 M12X1.75 6KT		100 Nm
5200	8328075	SCREW M8X30 TORX		20-28 Nm
5200	8328073	SCREW M8X25 TORX		18-22 Nm
5200	8342758	SCREW M8X30		20-24 Nm
6210	8314872	PRESS. SENSOR 160BAR VARIOHM M10X1 25MVPB		15 Nm - Loctite 542
6214	8431948	AIM MXG 1.2 DASH LOGGER MEMOTEC GT4		25 Nm
7112	8283834	AIR JACK LL-24		45 Nm (Mutter)
7112	8283091	COUNTER NUT F. AIR JACK LL-21/LL-22 60X1.5		45 Nm
7112	8283451	VALVE AIR JACK LANCE KRO LL-16PLUS		45 Nm - Loctite 243

APPENDICES.

F. TIGHTENING TORQUE.

HG	Part-No.	Description	Bolting-Category	Tightening Torque
7112	8431347	AIR PIPE VALVE TO REAR		20 Nm - Loctite 542
7211	8328167	CLAMP . RING DEVIDED D=40 ALUMINIUM		10 Nm
8130	4670304	ADAPTER M8X1 DASH 4 AL		8 Nm
8130	4670396	PLUG D4 AL		11 Nm
8130	4671068	ANGLE PIECE 90GR 2 X UEWM 990-D6		20 Nm - Loctite 542
8130	4670300	ADAPTER 919/M10X1/03D SS		15 Nm - Loctite 542
8130	4670326	T-PIECE W. NUT DASH 6		20 Nm - Loctite 542

Important: When checking bolts used with Loctite at spanner check - do not tighten, otherwise the Loctite effect will be lost. Instead, renew them.

APPENDICES.

F. TIGHTENING TORQUE.

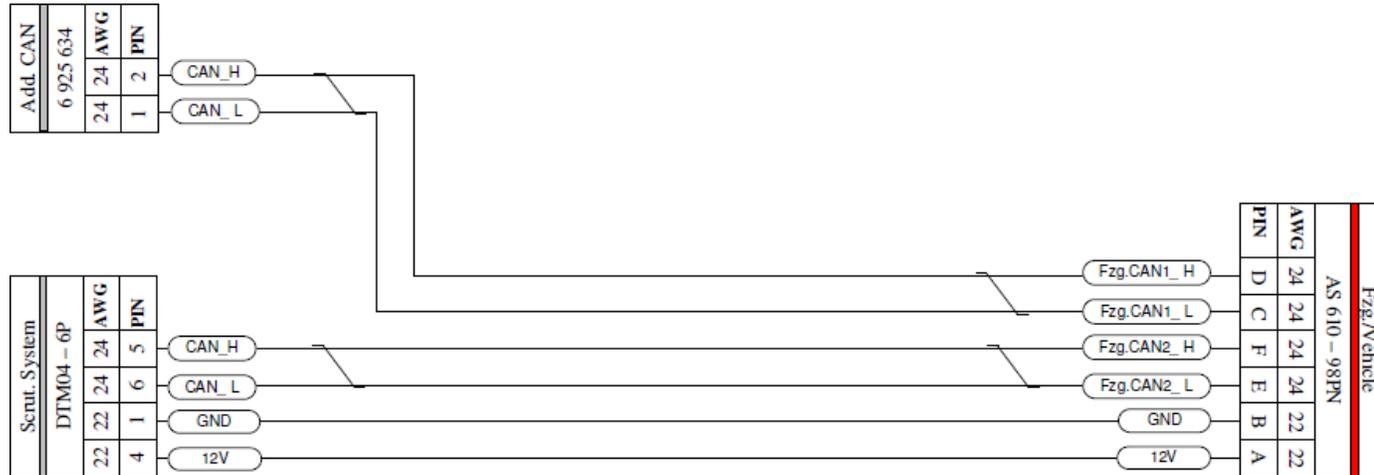
KRONTEC (Nm).

Fitting Größe / JIC Size	Gewinde / Thread	Edelstahl / Stainless Steel Titan / Titanium (Min)	Edelstahl / Stainless Steel Titan / Titanium (Max)	Aluminum (Min)	Aluminum (Max)
Metrisch / Metric					
• 3	M 10 x1	11	16	8	12
• 4	M12 x 1.5	15	21	11	16
• 6	M14 x 1.5	24	32	17	22
• 8	M18 x 1.5	53	62	31	39
• 10	M22 x 1.5	70	84	41	48
• 12	M26 x 1.5	97	119	52	62
• 16	M30 x 1.5	129	155	79	95
Imperial					
• 3	3/8-24-UNF	11	16	8	12
• 4	7/16-20-UNF	15	21	11	16
• 5	7/16-20-UNF	19	27	15	20
• 6	7/16-18-UNF	24	32	17	22
• 8	3/4-16-UNF	53	62	31	39
• 10	7/8-14-UNF	70	84	41	48
• 12	1-1/16-12-UNF	97	119	52	62
• 16	1-5/16-12-UNF	129	155	79	95

APPENDICES.

G. DATA LOGGER ADAPTER.

Adapter Cable: SRO, PWC



NOTICE

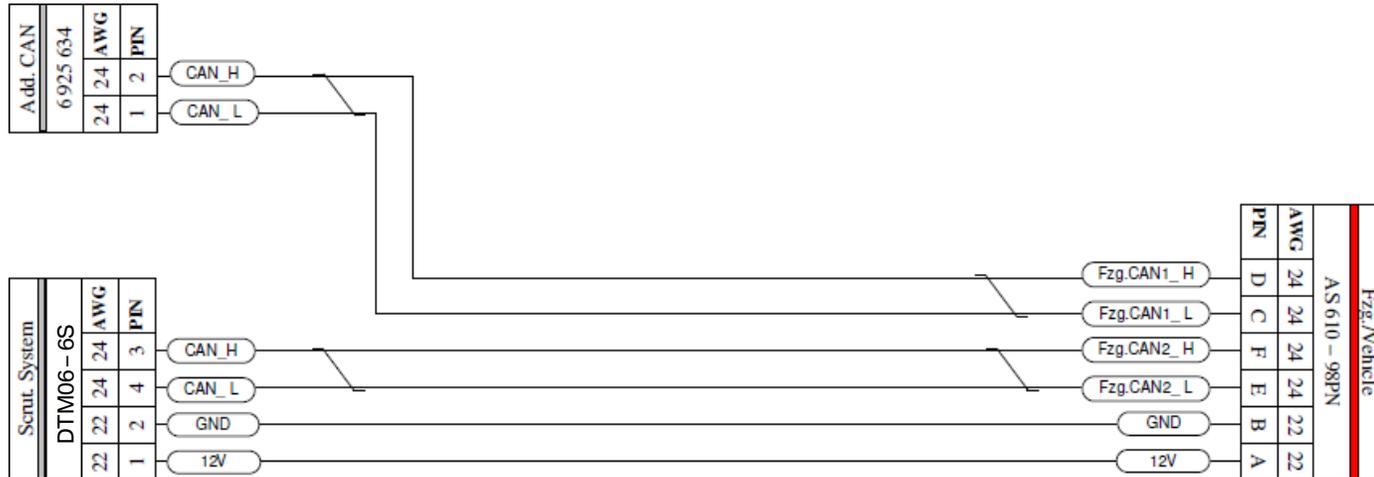
The cable is used to transfer CAN data to the Scrutineering Logger. The cable has to be provided by the teams.

Part-No.	Description
8130 8345069	ADAP CAN AS610 ZU DTM04-6P

APPENDICES.

G. DATA LOGGER ADAPTER.

Adapter Cable: VLN, 24H NBR, Creventic



NOTICE

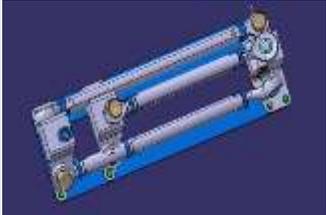
The cable is used to transfer CAN data to the Scrutineering Logger. The cable has to be provided by the teams.

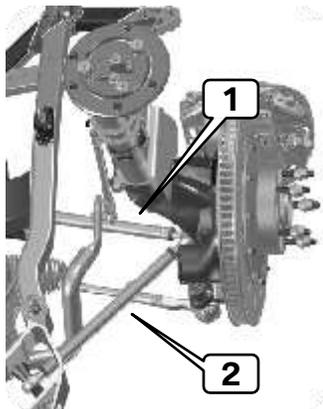
Part-No.	Description
8130 8345070	ADAP CAN AS610 ZU DTM06-6S

APPENDICES.

H. SUSPENSION STRUT ADJUSTMENT GAUGE (OPTION).

The gauge consists of the following components:

A suspension strut adjustment gauge from BMW M Motorsport is offered:			
Part-No.	Qty.	Description	
83318431893	1	Fixation strut wheel carrier side	
83318431894	1	Fixation strut chassis side	
83318417415	1	Fixation strut chassis right	
83318431899	1	Bush insert short strut	
83318431898	2	Gauge pin	
83318431901	1	Gauge base plate	



NOTICE

Indicated are design dimensions. Due to tolerances, these dimensions may differ in the gauge.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

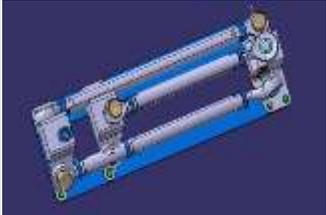
Front Axle (FA) :

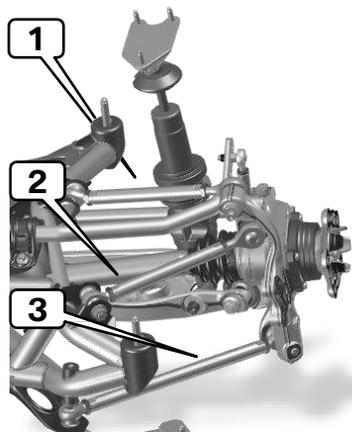
Description	Strut	Position in Gauge
Suspension Arm FA Pos. 1	<p>Pos. 1</p>  <p>L=283,5 mm</p>	 
Tension Strut FA Pos. 2	<p>Pos. 2</p>  <p>L=369,4 mm</p>	 

APPENDICES.

H. SUSPENSION STRUT ADJUSTMENT GAUGE (OPTION).

The gauge consists of the following components:

A suspension strut adjustment gauge from BMW M Motorsport is offered:			
Part-No.	Qty.	Description	
83318431893	1	Fixation strut wheel carrier side	
83318431894	1	Fixation strut chassis side	
83318417415	1	Fixation strut chassis right	
83318431899	1	Bush insert short strut	
83318431898	2	Gauge pin	
83318431901	1	Gauge base plate	



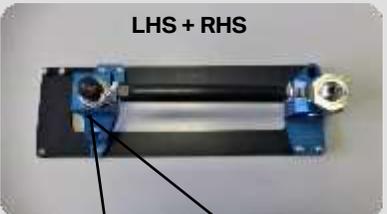
NOTICE

Indicated are design dimensions. Due to tolerances, these dimensions may differ in the gauge.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

Rear Axle (RA) :

Description	Strut	Position in Gauge
Suspension Arm RA Pos. 1	<p>Pos. 1</p>  <p>L=270,1 mm</p>	<p>LHS + RHS</p> 
Suspension Arm RA Pos. 2	<p>Pos. 2</p>  <p>L=270,5 mm</p>	<p>Pos. 1</p>  <p>Pos. 2</p> 
Suspension Arm RA Pos. 3	<p>Pos. 3</p>  <p>L=373,3 mm</p>	<p>LHS + RHS</p> 

APPENDICES.

I. TPMS (OPTION).

As an option, a **TPMS (Tyre Pressure Monitoring System)**, developed for the BMW M2 CS Racing can be ordered from BMW Motorsport.

RDC = Reifendruck Control (Kontrolle).



Operating Temperatures

- ECU – -40°C – +85°C
- Wheel Sensor – 0°C – +150°C
- Trigger Antenna – -40°C – +105°C

Supply Voltage

- ECU – 12V switched ignition
- Current – <300mA

Wheel Sensor

25mbar/bit Sensor

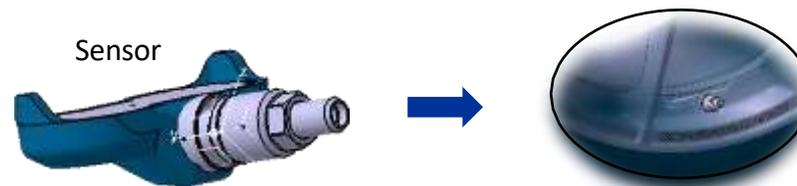
- Pressure Range – 0 – 5.375bar gauge
- Pressure Resolution – 25mbar/bit
- Accuracy – ±25.0mbar

14.7mbar/bit Sensor

- Pressure Range – 0 – 3.631bar gauge
- Pressure Resolution – 14.7mbar/bit
- Accuracy – ±29.4mbar
- Temperature Range – 0°C – 150°C
- Temperature Resolution – 1°C/bit
- Accuracy – ±1°C
- Transmit Rate (moving) – 1Hz
- Mass – 30g

Brand: bf1systems
Software: DigiTyre
Cable: Serial RS232 (+ USB to serial adaption)
Connector: 'TPMS' Sub D9 @ bottom RHS door

4 x Tyre Pressure Sensors
+
4x LF Trigger in the Wheelarch



2 x LF-Antennas

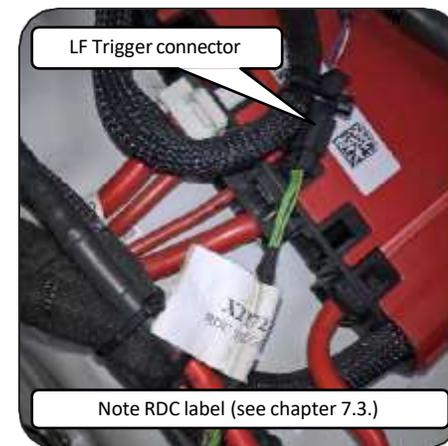
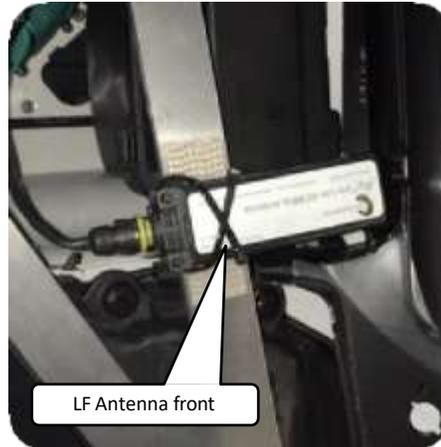


APPENDICES.

I. TPMS (OPTION).

As an option, a **TPMS** (Tyre Pressure Monitoring System), developed for the BMW M2 CS Racing can be ordered from BMW M Motorsport.

(For connector locations, please refer to chapter 7.3.):



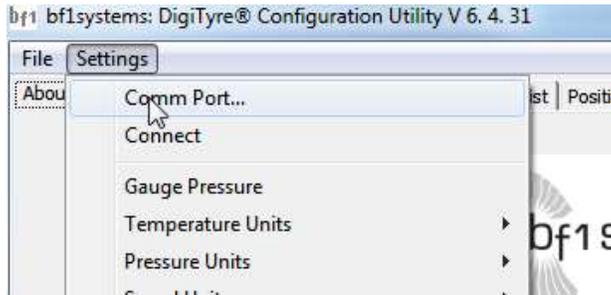
APPENDICES.

I. TPMS (OPTION).

The DigiTyre Software (DigiTyre xxx.exe) can be downloaded from the BMW Customer Portal.

1. Install the DigiTyre Software on your PC.

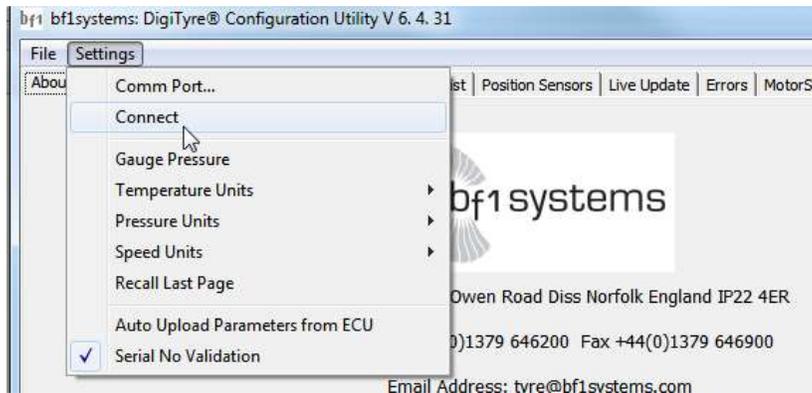
2. After the Computer is connected via RS-232 (Serial Port) to the bf1 ECU goto Settings and set the relevant Comm Port:



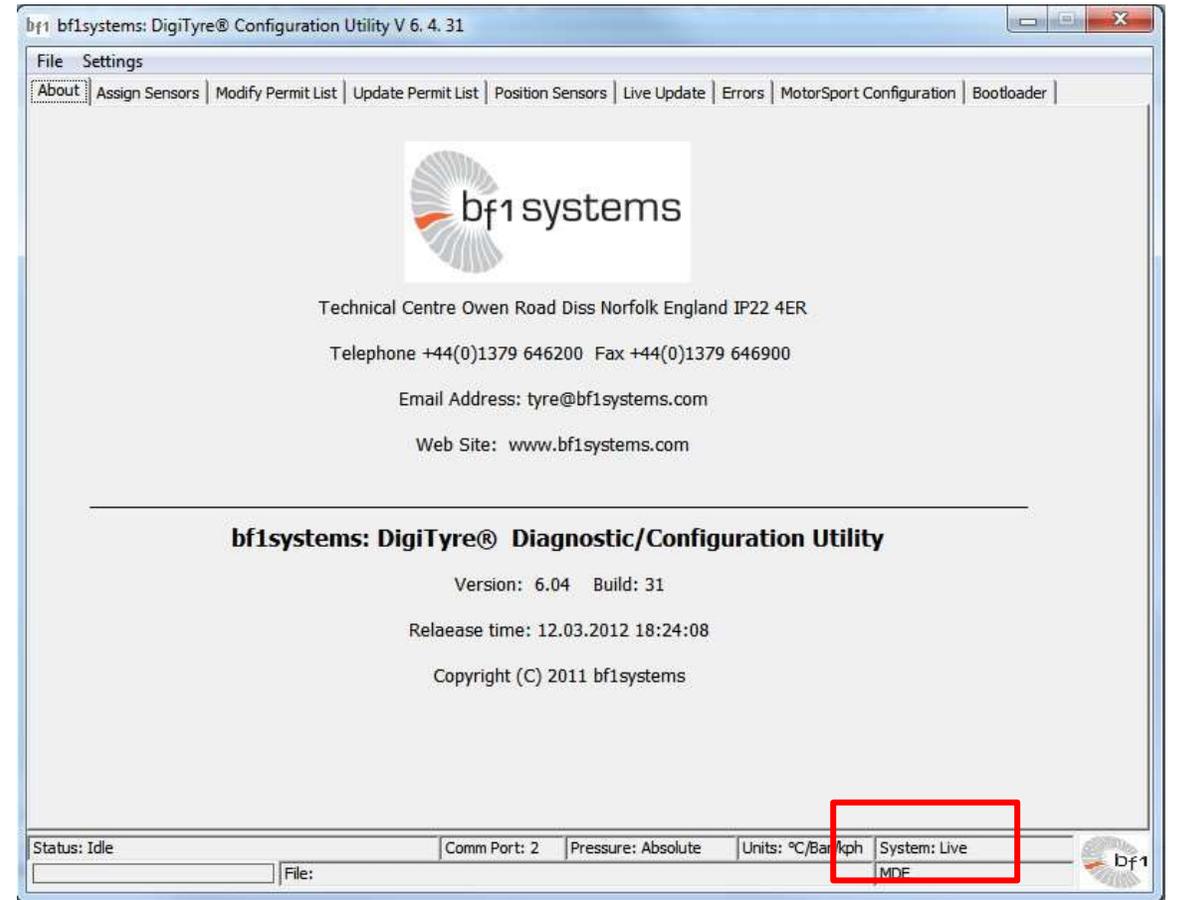
NOTICE

Please inform yourself, how to set the Comm Port in your PC's Operating System (e.g. Windows). Use the same Comm Port in the DigiTyre Software. If your PC doesn't have a Serial Port, please purchase a USB/Serial Port adapter instead.

3. Now connect to Device via Settings -> Connect



4. If the connection is established successfully, the System Status appears as System: Live

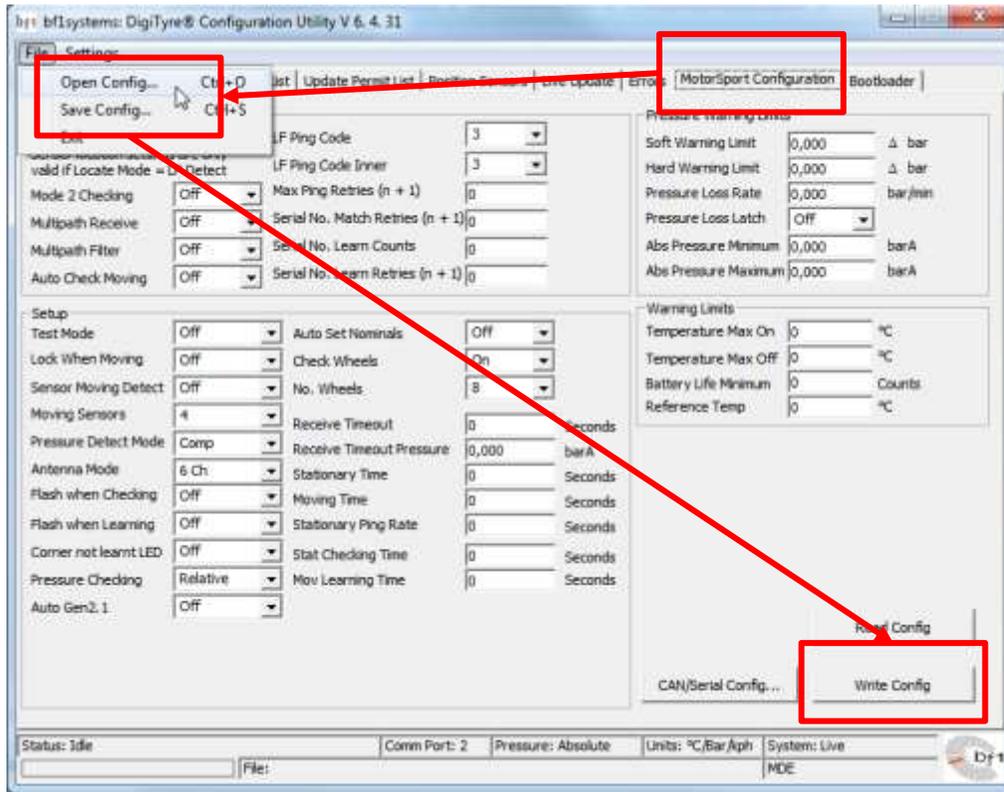


APPENDICES.

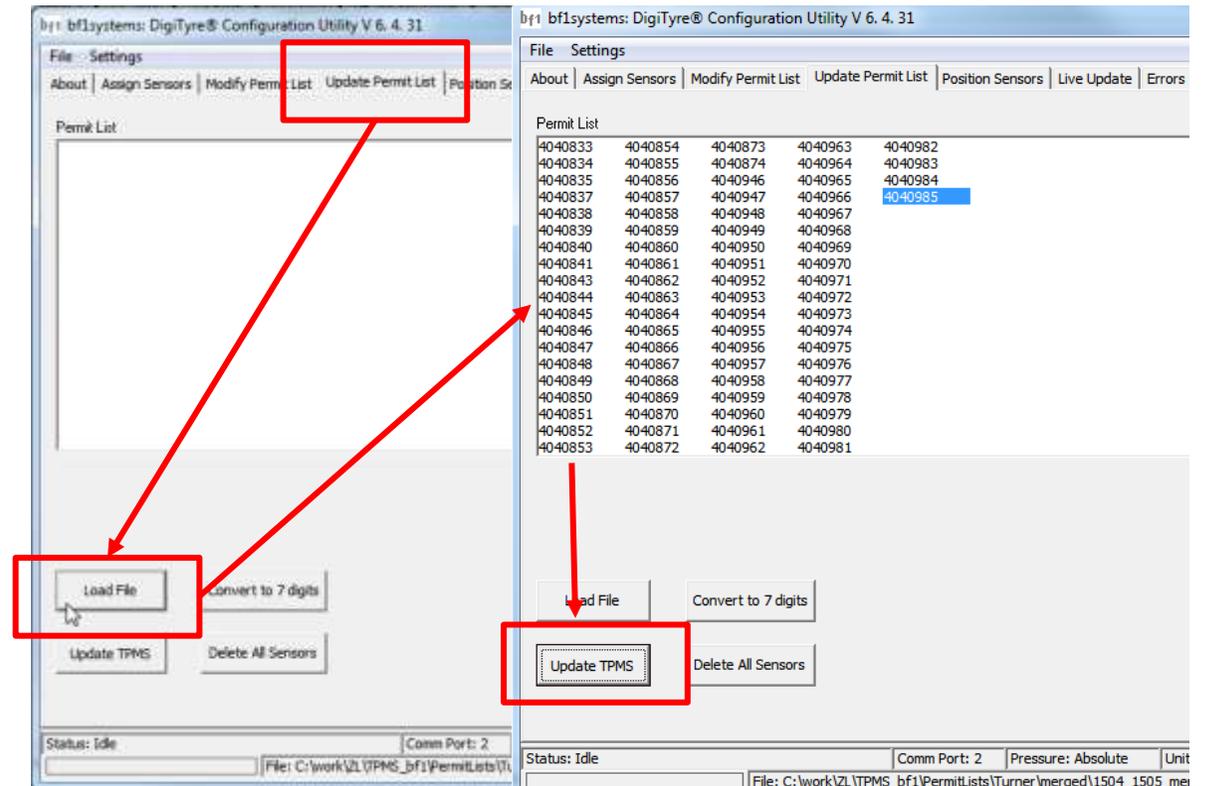
I. TPMS (OPTION).

The BMW Motorsport CAN Config File (M2CSRxx_TPMS_ECU_Config_xxx.cfg) together with the Sensor **Permit List** can be downloaded from the BMW Customer Portal.

5. If it's a new device the BMW CAN Configuration needs to be loaded.
Therefore go to Tab Motor Sport Configuration.
Afterwards open a Config File via File Menu.
When the configuration is loaded press Write Config Button.



6. The bf1-System just accepts sensors that are assigned to it.
Therefore go to Tab Update **Permit List** and load the list, before downloaded from the BMW Customer Portal, into the System.
After the file is loaded the available sensors are displayed.
With pressing the Button Update TPMS the sensor list is written into the device.

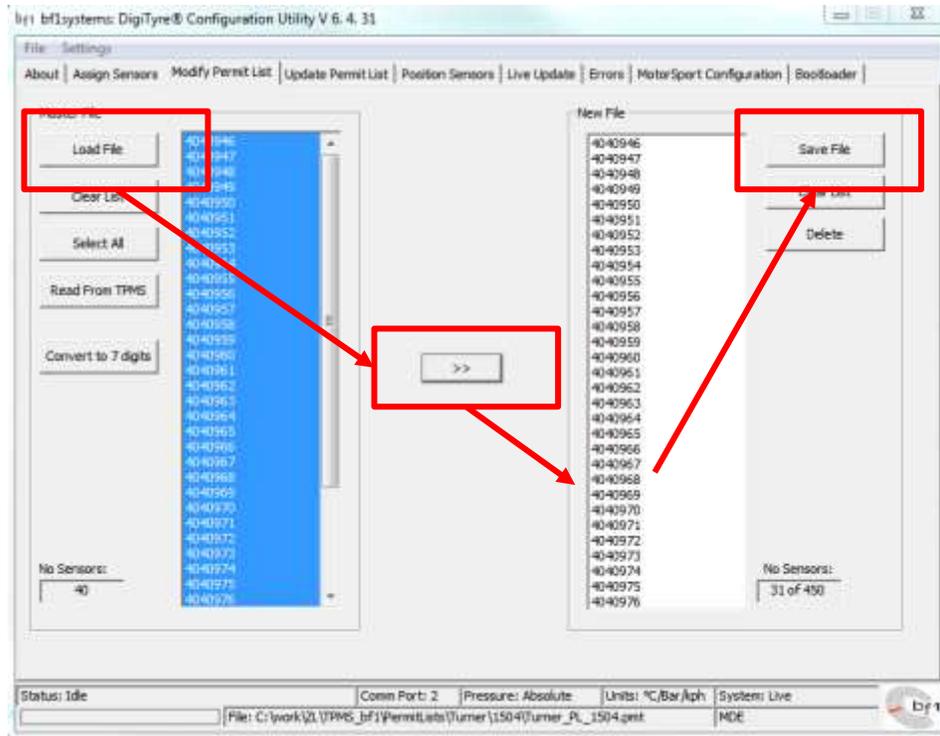


APPENDICES.

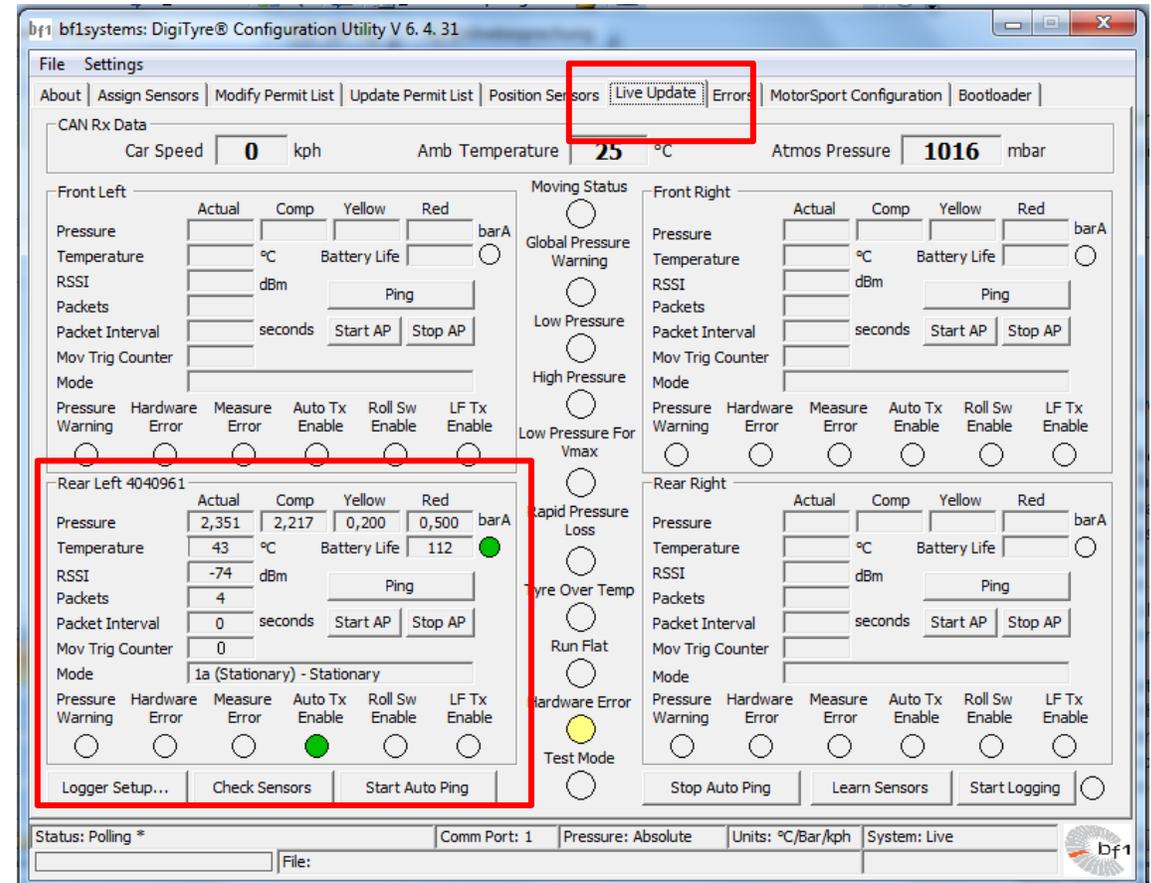
I. TPMS (OPTION).

The Permit List of the sensors, included in the kit, should be downloaded from the BMW Customer Portal.

- In order to update an existing Permit List go to Tab Modify Permit List.
Load all available (also the already known Permit Lists) one after each other.
After a Permit List is loaded press the >> Button.
Load the next Permit List.
When all Permit Lists are loaded, press the Save File Button and load the new Permit List in to the device as described before.
Note: max. 450 Sensors are allowed.



- To check the status of the current system, go to Tab Live Update. The picture below shows the rear left sensor with its values.



APPENDICES.

I. TPMS (OPTION).

For further informations please refer to the provided bf1-systems documentation (User Manual) on the CD.

9. If an error occurs go to Error Tab and read the Min/Max values.
Make a Screenshot in order to document potential Errors/Issues.

bf1systems: DigiTyre® Configuration Utility V 6. 4. 31

File Settings

About Assign Sensors Modify Permit List Update Permit List Position Sensors Live Update Errors MotorSport Configuration Bootloader

Live Errors

Code	Error Name	Pos	Time
164	Antenna not communicating	FL	00:00:01
164	Antenna not communicating	FR	00:00:01
164	Antenna not communicating	RL	00:00:01
164	Antenna not communicating	RR	00:00:01
101	Sensor cannot be LF triggered	RR	00:00:15
101	Sensor cannot be LF triggered	RL	00:00:23
101	Sensor cannot be LF triggered	FR	00:00:32
101	Sensor cannot be LF triggered	FL	00:00:41

Logged Errors

Code	Error Name	Pos	Time
101	Sensor cannot be LF triggered	RR	00:35:21
101	Sensor cannot be LF triggered	RL	00:35:30
101	Sensor cannot be LF triggered	FR	00:35:39
101	Sensor cannot be LF triggered	FL	00:35:48
164	Antenna not communicating	RL	00:35:54
164	Antenna not communicating	FL	00:35:54
164	Antenna not communicating	FR	00:35:54
164	Antenna not communicating	RR	00:35:54
208	LIN and Antenna voltage low	ECU	35:34:49
105	Sensor learning failed	RR	172:29:56
105	Sensor learning failed	FL	172:33:20
105	Sensor learning failed	RL	172:33:33
146	Sensor not transmitting	FL	172:33:57
146	Sensor not transmitting	FR	172:33:57
146	Sensor not transmitting	RL	172:33:57
146	Sensor not transmitting	RR	172:33:57

Voltages

	Actual	Min	Max	
Battery	11,975	9,000	18,000	v
Reference	5,008	4,500	5,200	v
Vdd	5,008	4,500	5,200	v
LIN	11,929	11,500	17,000	v

Temperatures

	Actual	Max	
PSU	46	100	°C
PCB	46	100	°C

Clear Errors

Read Min/Max

Write Min/Max

Status: Polling **

Comm Port: 2 Pressure: Absolute Units: °C/Bar/kph System: Live

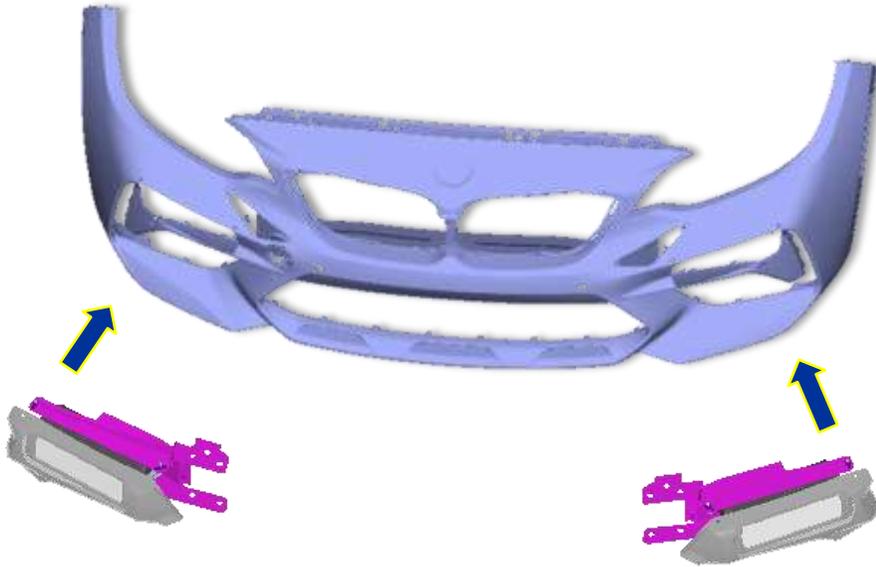
File: C:\work\ZL\TPMS_bf1\PermitLists\Turner\1504\Turner_PL_1504.pmt MDE

APPENDICES.

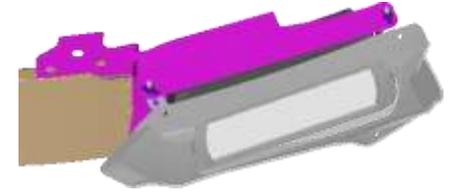
J. LIGHT PACK 24H (OPTION).

As an option, an Endurance Light Pack (24H Light) and a Start Number Lighting can be ordered for the BMW M2 CS Racing.

Endurance Light:



View of attachment:



Part-No.	Qty.	Description
6317 8323990	2	LED HEADLIGHTS-R 750 ELITE 3
6111 8345034	2	ADAPTER WIRE
6317 8342785	1	FRAME HEADLIGHT LEFT
6317 8342786	1	FRAME HEADLIGHT RIGHT
6317 8342774	2	BRACKET EXTERIOR
6317 8342773	2	BRACKET INNER
4100 8436323	8	HEXAGON-HEAD BOLT M6x16
5162 8431781	1	MOUNT BUMPER FRONT
4100 8427811	4	SCREW BLACK M6x16
4100 8427200	4	WASHER M6
6317 8323987	1	COVER LEFT
6317 8323988	1	COVER RIGHT
4100 7748510	12	RIVET NUT M5
4100 8436284	24	BLIND RIVET
4100 8436008	8	FILLISTER HEAD SCREW M5x14
6317 8431808	2	LAMP LENS KIT 15



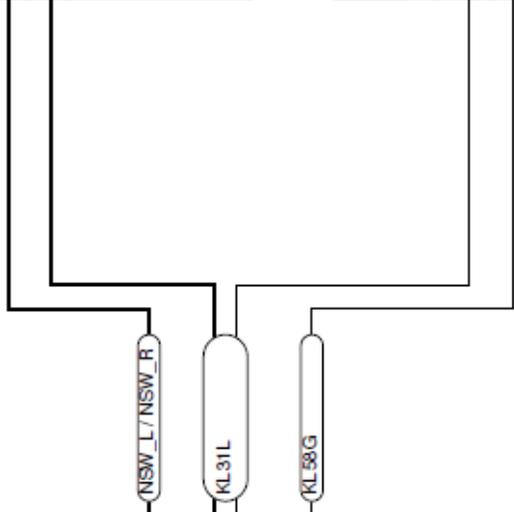
Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

J. LIGHT PACK 24H (OPTION).

Part-No. 8 344 980			
Endurance Lights (Lazer)			
AWG	16	16	
A	1.5	1.5	
PIN	2	1	

Part-No. 6 925 634			
Free Connector			
AWG	20	20	
A	0.75	0.75	
PIN	2	1	



PIN	3	4	2
A	1.5	1.5 & 0.75	0.75
AWG	16	16 & 20	20
X2136*2B / X2137*2B			
Part-No.1 387 132			

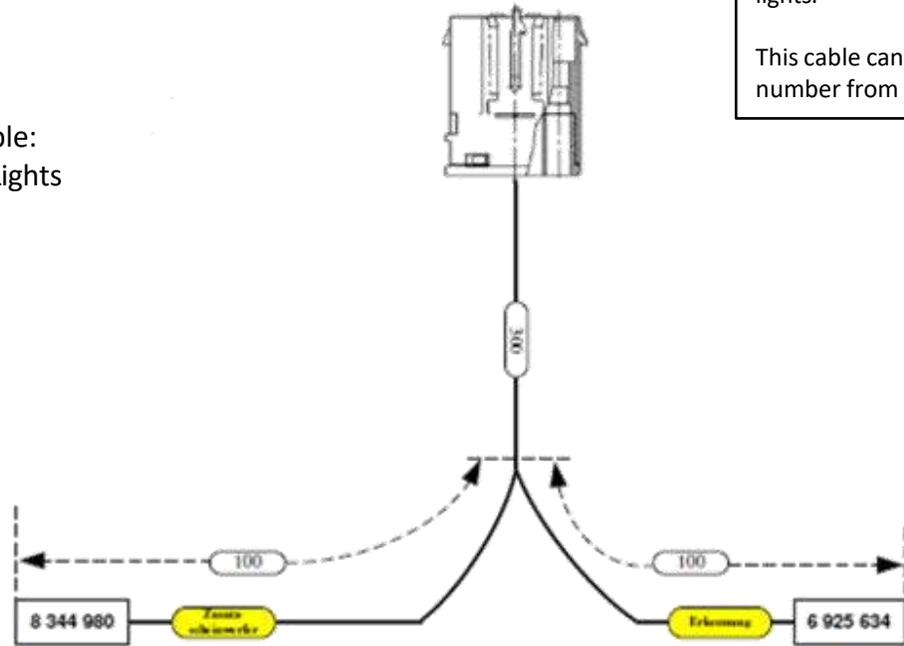
Connector Light Pack:
24 H Light

Adapter-Cable:
Endurance Lights

Connector Vehicle Loom (see chapter 7.3.)

X2136*2B / X2137*2B

The cable is used to connect the endurance lights.
This cable can be ordered with below part number from BMW M Motorsport.



Free Connector:
e.g. adding a LED

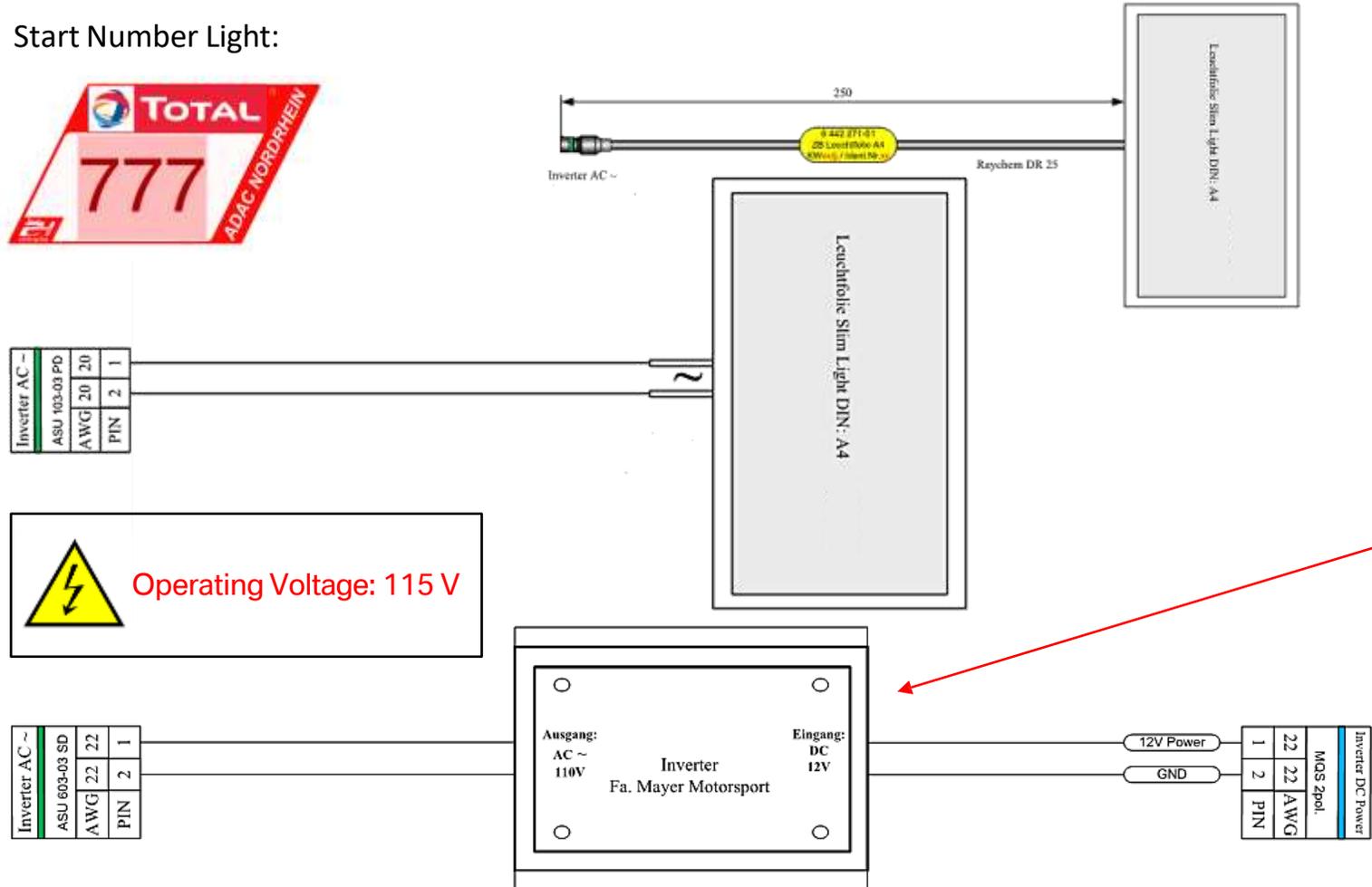
Part-No.	Qty.	Description
6111 8345034	2	ZB ADAP. 2.5MMSYS AUF SUPERSEAL 2POLIG

APPENDICES.

J. LIGHT PACK 24H (OPTION).

As an option, an Endurance Light Pack (24H Light) and a Start Number Lighting can be ordered for the BMW M2 CS Racing.

Start Number Light:



Part-No.	Qty.	Description
8442272	2	ZB INVERTER LIGHT FOIL M2-RACE
8373583	2	ST.GEH.2-POL.KOD.Z LIGHT BLUE
1393723	4	ST.KONTAKT MQS SN 0,5-0,75QMM
7736095	2	STICKER HV-COMPONENTS
8442271	2	ZB LIGHT FOIL A4 MIT ASU PLUG
8323080	2	LIGHT FOIL SLIMLIGHT 200 X 320
7762905	2	CON. ULTRALITE ASU 1 03-03 PD HE
8442273	2	ZB LIGHT FOIL A3 MIT ASU PLUG
7777780	2	LIGHT FOIL SLIMLIGHT A3 WHITE/WHITE

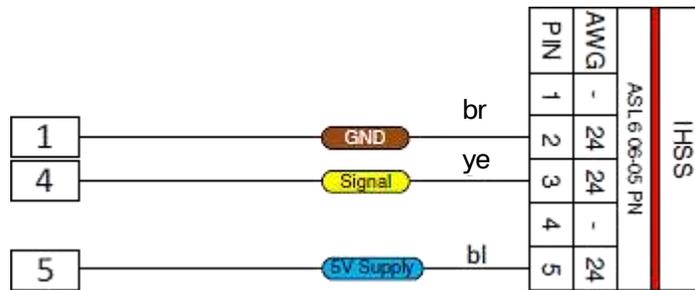
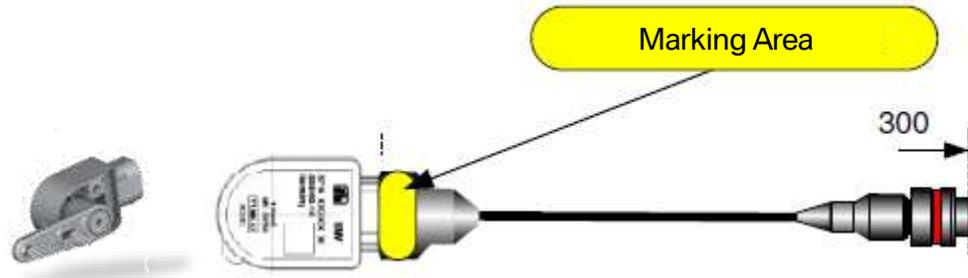


WARNING

Make a visual inspection before each outing. If the parts are damaged, they must be replaced. Before replacing parts, make sure that the vehicle is disconnected from the power and wait 5 minutes before carrying out the parts exchange.

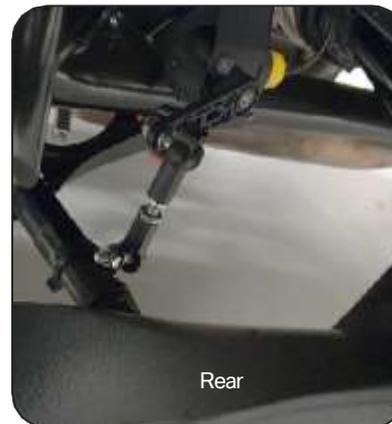
APPENDICES.

K. SUS. TRAVEL SENSOR (OPTION).



NOTICE

The suspension travel sensors are option and can be ordered with below part number from BMW M Motorsport.
The AIM configuration can be downloaded from the BMW Customer Portal.



Part-No.	Qty.	Description
6210 6870000	4	LEVEL SENSOR
6210 7744449	2	LOOM FRONT AXLE
6210 7744450	2	LOOM REAR AXLE
6210 8328130	4	BRACKET
6210 8328131	2	SUPPORT LEVEL SENSOR FA
6210 8328168	2	STABILIZER LINK FA
4100 8427604	8	BLIND RIVET
4100 8427924	20	SCREW
4100 8427459	8	NUT
0750 8323237	8	CABLE TIE
6210 8328133	1	LEFT SUPPORT REAR AXLE
6210 8328134	1	RIGHT SUPPORT REAR AXLE
6210 8324135	2	STABILIZER LINK RA
4100 8427599	4	RIVET NUT
6210 8324102	4	TWIST PROTECTION
6210 8342811	4	SPACER BUSH

APPENDICES.

L. BRAKE CALIPER SERVICE.

Alcon – Motorsport Caliper Service Instruction.

As brake calipers are a safety critical part of the braking system, Alcon recommends that they are inspected and serviced regularly to ensure consistent performance. The main service item within the caliper assembly is the caliper pressure seal, although the pistons and their coating should also be inspected during a service.

Stage 1 – Condition Seals.

Soak new caliper pressure seals in brake fluid for a minimum of 60 minutes prior to build or if an assembly lubricant is provided, smear on seals and pistons.

Stage 2 – Exterior Clean.

The exterior of the brake caliper should be clean before attempting the removal of the caliper pistons. The exterior can be cleaned using warm soapy water, and the caliper should be dried off prior to disassembly. Performing an exterior clean will reduce the risk of dirt and other contaminants entering the hydraulic system. It is acceptable to omit this process if a post strip down wash of all components is going to be performed prior to rebuild.

Stage 3 – Piston Removal.

To ease removal of the caliper pistons, a self-centring block can be used. Alcon recommend using a suitably sized block between the pistons which centres itself within the caliper using the disc pathway (see image below). An ideal width for this block would be the nominal disc thickness plus the thickness of both pad back plates. So if you have a nominal disc width of 32 mm and your pad back plates are 5 mm thick, a block 42 mm wide would be ideal.

With the block inserted, the caliper pistons can be moved forward under pressure (hydraulic or air).

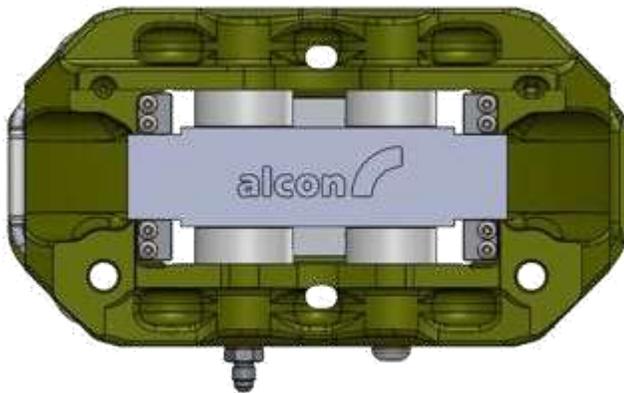


Fig 1 – Caliper pistons moved forward to facilitate removal.

WARNING

Hands and other body parts must be kept well clear of the caliper pistons to avoid injury. In the case of using air pressure to drive the pistons forward, hands and other body parts should be kept away from escaping air.

APPENDICES.

L. BRAKE CALIPER SERVICE.

Once pistons are protruding from the caliper bores, a piston removal tool can be used to remove the pistons from the caliper (see images below).

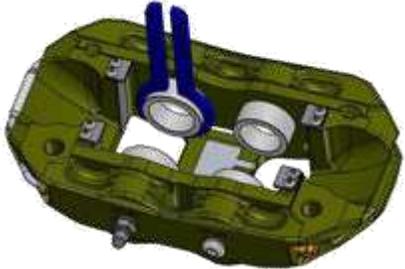


Fig 2 – Removing piston with removal tool.

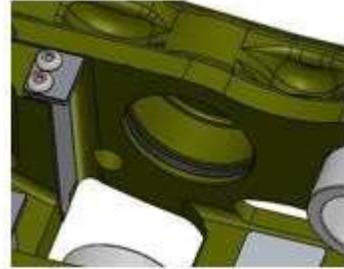


Fig 3 – Piston removed from bore.

Stage 4 - Seal removal.

Carefully remove old pressure seals from the groove using a thin, blunt edged tool to prise the seal from the groove.

Stage 5 – Internal Clean.

The caliper bores, seal grooves and pistons should all be cleaned prior to re-assembly. Alcohol based cleaning agents may be used.

DO NOT USE ANY MINERAL OIL BASED CLEANING AGENTS.

Ensure that bores, seal grooves and pistons are completely clean and free from contamination and moisture.

Care should be taken when cleaning the caliper pistons so that no damage is caused to the piston coating. If the piston coating appears to be excessively worn, then the pistons should be replaced with new or reconditioned pistons.

Stage 6 – Rebuild.

Fit replacement caliper pressure seals into grooves ensuring that they are correctly seated. Seals should sit smoothly in the grooves and have no kinks or twists visible.

Apply a small amount of brake fluid to the corner radius of the piston at the base, as this will help with re-assembly. Carefully engage the piston in its bore and apply even pressure to guide it through the pressure seal. Once fully engaged with the seal, the piston should be pushed to the bottom of its bore.

DO NOT USE EXCESSIVE FORCE TO INSERT THE PISTON THROUGH THE PRESSURE SEAL. If piston does not slide through the seal, remove the piston and check seal is correctly seated, re-apply lubrication (brake fluid) to both the seal and piston corner radius and re-insert.

Where possible, calipers should be pressure tested prior to use on the car.

APPENDICES.

M. DAMPER SERVICE INFORMATION.

Service intervals.

We recommend a damper service check at least once per year or appr. after 5 000 km on the race track. Parts to be serviced can be shipped directly to ZF Race Engineering or to their authorized service partners.

ZF Contact details.

For Europe:

ZF Race Engineering GmbH
Ernst-Sachs-Straße62
97424 Schweinfurt
Germany

Phone +49 9721 983258
Fax +49 9721 984299
service.sre@zf.com

For North America:

ZF Race Engineering NRT, NA
15811 Centennial Drive
Northville, MI 48168

NRT-Sales-ZRNA@zf.com

Servicepartner	Address	Zip Code / Place	Country	Contact Person	Phone no.	E-Mail	Website
Dullinger Fahrwerkst	Kasten 3	4091 Vichtenstein	AT	Günther Dullinger	+43 (0) 6766/850371	office@dullinger.co.at	www.dullinger.co.at
Triple Eight Race Engineering Australia Pty Ltd.	Depot Street 40	4014 Banyo	AU	Andrew Simpson	+61 (0) 7363/57008	CustomerSupport@tripleeight.com.au	tripleeight.com.au
rene's race engineer	Nassauer Ring 2	56422 Wirges	DE	Rene Jungnickel	+49 (0) 2602/9187408	info.rre@t-online.de	http://www.r-r-e.de
Nadal Technologies	C/. Estornell n°6 - baixos	08186 LLICÀ D'AMUNT BARCELONA	ES	Marc Nadal	+34 (0) 9384/16098	marc@nadaltech.com	www.nadaltech.com
BG Motorsport Ltd.	47-48 Silverstone Circuit	NN12 8GZ Silverstone Northants	GB	Ben Fricker	+44 (0) 13278/55200	dampers@bgmotorsports.co.uk	www.bgmotorsport.co.uk
Enable Inc. Outsourcing-Central, Inc.	Kariya-shi, Ootsuzaki Ogakie-cho 1-36	448-0813 Aichi-ken	JP	Yasumasa Matsuda	+81 (0) 5666/28505	yasumasa.matsuda@enable-apg.jp	www.enable-apg.jp
ZF Race Engineering NA	15811 Centennial Drive	48168 Northville, Michigan.	USA		+1 (734) 737-8839	NRT-Sales-ZRNA@zf.com	https://www.zf.com/

APPENDICES.

M. DAMPER SERVICE INFORMATION.

Service orderform.

In case of a service request, please use the ZF damper service form and put it into the damper shipment, or send it per mail in advance.

You can download the form at: https://www.zf.com/products/media/en/zf_race_engineering/motorsports/services/repair_service/serviceauftrag_d_mpfer_zf.pdf

ZF Race Engineering GmbH
Ernst-Sachs-Str. 42
97424 Schweinfurt
Germany
Phone: +49 9721 88-8430
Fax: +49 9721 88-803-8433
E-Mail: technicalservice.zf@zf.com

**Service order
for damper systems**

Please send us a copy of the service order by mail or fax in advance.
Also add a signed copy of this order form to the shipment of goods.

Dampers have to be cleaned and delivered without springs, pistons, bump stops and top mounts.
Euro 50.00 will be charged for cleaning and dismounting of the attachments.
We reserve the right to invoice a charge of Euro 40.00 if no service was carried out.

Please note that the parts cannot be serviced if the order form is not completely filled out!

RETURN ADDRESS Customer no.: _____
Company: _____ Contact person: _____
Street: _____ Phone: _____
ZIP code: _____ City: _____ Fax: _____
Country: _____ VAT: _____ E-Mail: _____

DELIVERY ADDRESS Forwarders account no. (incl. tax, only): _____
Company: _____ Contact person: _____
Street: _____ Phone: _____
ZIP code: _____ City: _____ Fax: _____
Country: _____ VAT: _____ E-Mail: _____

Contact person (ZfE): _____ Date of contact: _____
Purchase data (ZfE or delivery note): _____

Chassis	Article No.	Serial No.	Description	Type of service
				<input type="checkbox"/> Measurement of performance
				<input type="checkbox"/> Change of oiling
				<input type="checkbox"/> Revision

Reason for repair: _____
Attachments, documents, etc.: _____

Requested date of delivery: _____ (Please note: approx. lead time 3 weeks)
In case of service refusal please: send back parts scrap parts
Payment handling for new customers: prepayment cash on delivery
Please find more information under: <http://www.zf.com/technicalproducts>

Place, date: _____ Signature: _____

Service workload.

A standard service workload incl. the following work packages:

- Incoming dyno test, compare to tolerance spread band.
- In case the graph is out of range, -> offer a damper service (there is no constraint to the teams to do so).
- Standard Service work load:
 - Open the damper.
 - Replace shims, oil, piston seal and piston rod guide.
 - Close the damper + dyno check.
 - Damaged piston rods, damper bodies, uniballs etc. will be charged extra.
- It's also very common to have just a dyno check, in order to pair left and right damper to each other (within the tolerance) – requested by some professional teams. No service requested.
- technical scrutineering will be provided to BMW **free of charge**.

APPENDICES.

M. DAMPER SERVICE INFORMATION.

Sales and cost's.

ZF has defined the cost's for their standard service to each damper type, these cost's will be revised by ZF each year.

The standard service of the BMW M2 CS Motorsport front and rear damper will be charged by ZF per damper.

There is a charge for a dyno check per damper, in case there is no further service to be done.

The spare parts, which are not included in the standard service (e.g. a nut, or piston, bump stop) will be invoiced by ZF separately.

Service and Support during Race Events.

ZF offers free of charge for all BMW teams the measurement of damping performances and function check at all race tracks where the service trucks will be available.

If the ZF service trucks are requested for further events, this event service will be charged at extra costs, like:

- Day Rate for the engineer.
- Day Rate for the mechanic.
- Day Rate for the service vehicle.
- Travel expenses.

APPENDICES.

N. PARTNER CONTACTS.

EUROPE.

ZF Race Engineering GmbH

Ernst-Sachs-Straße 62
97424 Schweinfurt
Germany
service.sre@zf.com
Tel.: +49 9721 983258
Fax: +49 9721 984299

Drexler Automotive GmbH

Postgasse 12c
94121 Salzweg
Germany
sales.automotive@drexler-automotive.com
www.drexler-automotive.com
Tel.: +49 (0)851 / 851 63 63 – 0

Alcon Components Limited

Apollo
Lichfield Road Industrial Estate
Tamworth
Staffordshire
B79 7TN, United Kingdom
info@alcon.co.uk
Tel: +44 (0)1827 723 700
Fax: +44 (0)1827 723 701

Merin

Loc. Monte Le Mole 15
00060 – Capena
Roma
Italia
info@merin.it
Tel. +39 06 9074 553
Fax +39 06 9032 191

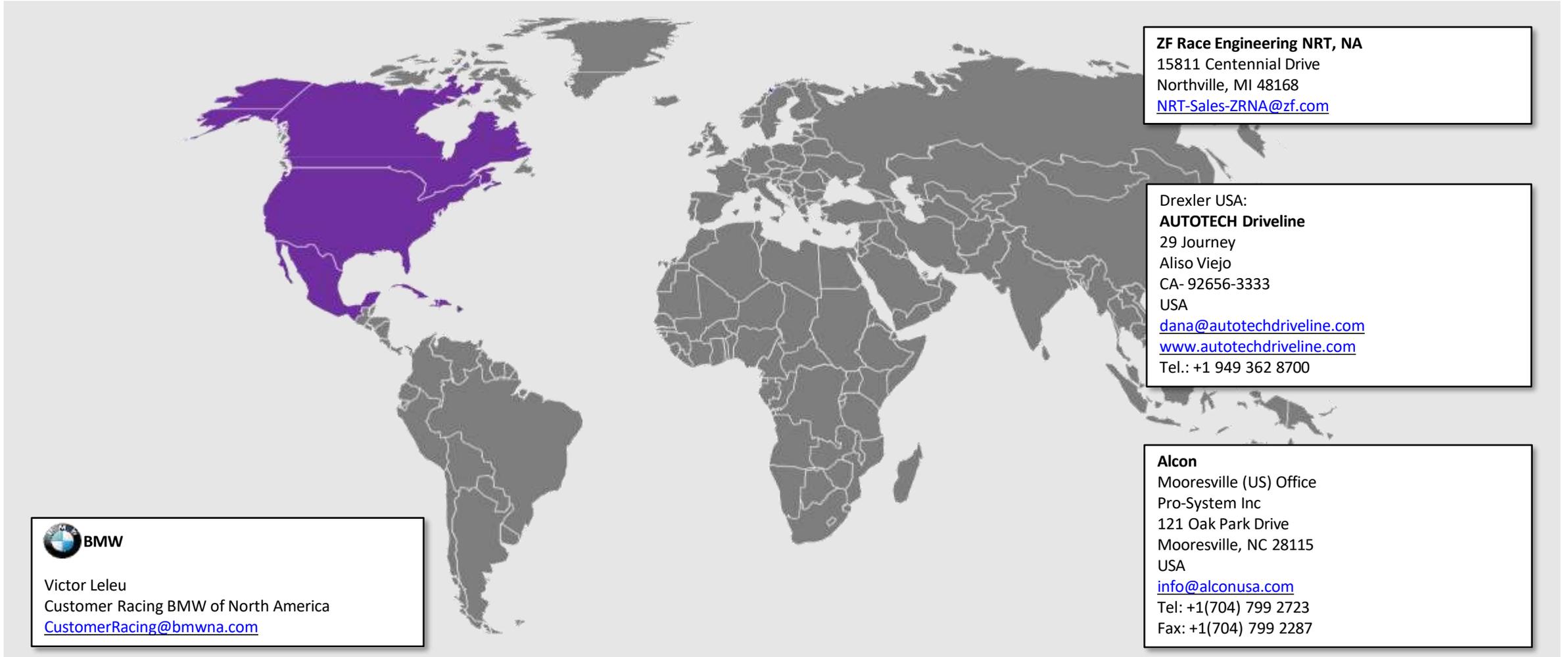


Nico Amende
Germany
M2CSRacing@bmw-motorsport.com

APPENDICES.

N. PARTNER CONTACTS.

AMERICA.



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Northville, MI 48168
NRT-Sales-ZRNA@zf.com

Drexler USA:
AUTOTECH Driveline
29 Journey
Aliso Viejo
CA- 92656-3333
USA
dana@autotechdriveline.com
www.autotechdriveline.com
Tel.: +1 949 362 8700

Alcon
 Mooresville (US) Office
Pro-System Inc
121 Oak Park Drive
Mooresville, NC 28115
USA
info@alconusa.com
Tel: +1(704) 799 2723
Fax: +1(704) 799 2287

 **BMW**
Victor Leleu
Customer Racing BMW of North America
CustomerRacing@bmwna.com

APPENDICES.

N. PARTNER CONTACTS.

ASIA.

ZF

Enable Inc. Outsourcing-Central Inc.
Kariya-shi, Ootsuzaki Ogakie-cho 1-36
448-0813 Aichi-ken
Japan
yasumasa.matsuda@enable-apg.jp
www.enable-apg.jp
Kontakt: Yasumasa Matsuda
Tel.: +81 903334 6556

Drexler Japan:

ENABLE / OSCN 1-36

Technical centre

Ootsuzaki Ogakie-cho Kariya-shi
448-0813 Aichi
Japan
yasumasa.matsuda@enable-apg.jp
www.enable-apg.jp
Kontakt: Yasumasa Matsuda
Tel.: +81 903334 6556



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M2CSRacing@bmw-motorsport.com

APPENDICES.

N. PARTNER CONTACTS.

AUSTRALIA.

ZF

Triple Eight Race Engineering Australia Pty Ltd.
Depot Street 40
4014 Banyo
Australia
customersupport@tripleeight.com.au
www.tripleeight.com.au
Contact: Andrew Simpson
Tel.: +61736357008

Drexler Motorsport Australia

Unit D 39 College St Gladesville NSW
Australia
erik@drexler-motorsport.com.au
www.Drexler-motorsport.com.au
Kontakt: Erik Gattermeier
Tel.: +61 2 9879 4839



Nico Amende
Germany
M2CSRacing@bmw-motorsport.com

APPENDICES.

O. SPECIAL TOOLS.

Main Group	Part-No.	Qty.	Description
Special Tool for clamping front damper			
8330	0494541	1	NUT
Special Tool for mounting rear damper-eye			
8331	8328248	1	KLEMMBACKEN D11 D15 D18
8331	8328249	1	MONTAGEVORRICHTUNG DAEMPFERAUGE
Adpater Suspension Setup			
8331	8342769	20	BOLT MONTAGE ACHSVERMESSUNG
8331	8342770	20	NUT MONTAGE ACHSVERMESSUNG
Travel Spacer			
8331	8342791	2	TRAVELSPACER VA
8331	8342792	2	TRAVELSPACER HA
Car Cover			
8331	8342805	1	CAR COVER M2 CSR

APPENDICES.

O. SPECIAL TOOLS.

Main Group	Part-No.	Qty.	Description
Bridge Thermostat Gear Box Oil Cooler			
8331	8417329	1	SPUELWERKZEUG GETRIEBETHERMOSTAT
1161	7836178	1	O-RING 20X2,5-N-FPM
Jack Up Tools			
7112	7768885	1	LUFTLANZE EASY PUSH LL-03 KRONTEC
Special Tools Rear Axle			
8330	0494978	1	SCHEIBE
8330	0494929	1	WERKZEUG
8330	0494981	1	SPINDEL
8330	0494982	1	MUTTER
8330	2361896	1	HUELSE

APPENDICES.

O. SPECIAL TOOLS.

Main Group	Part-No.	Qty.	Description
Special Tool Rear Axle			
8330	2361891	1	GEGENHALTER
8330	0496552	1	SPINDEL
8330	2360786	1	ABZIEHER
8330	2240469	1	SCHEIBE AUSZIEHSCHEIBE
8330	0494417	1	PRUEFGERAET
Press Tools Rear Axle Sub Frame			
8330	0496553	1	SPINDEL
8330	2360786	1	ABZIEHER
8330	0496555	1	MUTTER
8330	0496554	1	MUTTER
Press Tools Uniball 8416802			
8330	0496553	1	SPINDEL
8330	0494978	1	SCHEIBE
8330	0494982	1	MUTTER

APPENDICES.

O. SPECIAL TOOLS.

Main Group	Part-No.	Qty.	Description
General Special Tools			
8331	8424781	1	RINGSCHLUESSEL FUER AXIALGELENK
8330	0493936	1	OELFILTERSCHLUESSEL
8330	0496268	1	STIFT
8330	0495554	1	VERLAENGERUNG
8330	2348293	1	GABELSCHLUESSEL SW50, F8X
8139	2152473	1	BEFUELLGERAET
8330	0494417	1	PRUEFGERAET ADAPTER
8164	2155745	1	WERKZEUGSATZ SET IM KOFFER
8164	2155746	1	WERKZEUGSATZ SET IM KOFFER
8164	2155744	1	WERKZEUGSATZ SET IM KOFFER
8122	2219012	1	HYDRAULIKHEBER UNIVERSAL HEBER
8130	0495851	1	VORRICHTUNG
8122	2184136	1	MOBILER AGGREGATEHUBTISCH
8330	0494541	1	SPREADER

APPENDICES.

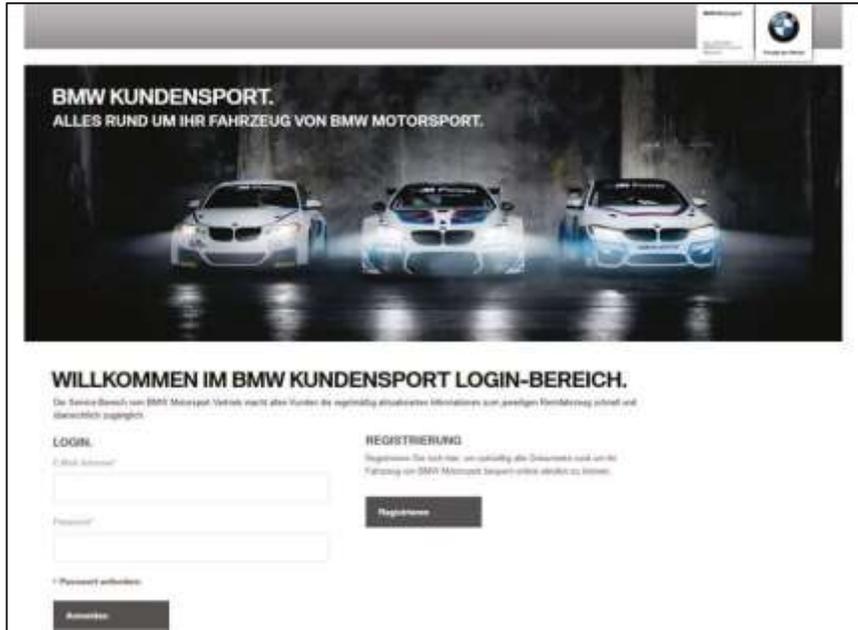
P. REGISTRATION CUSTOMER PORTAL.

Enter the following link into your browser:

<https://specials.bmw-motorsport.com/kundensport/>

Push „Registrieren“ at the Login area right hand.

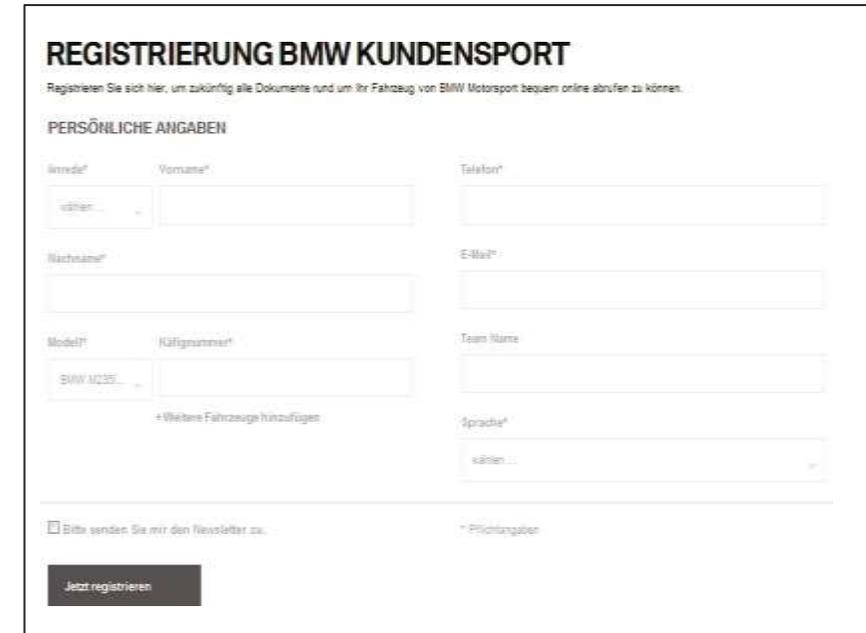
You are automatically forwarded to the registration area.



The screenshot shows the BMW Kundensport website. At the top, it says "BMW KUNDENSORT. ALLES RUND UM IHR FAHRZEUG VON BMW MOTORSPORT." Below this is a banner image of three BMW race cars. Underneath the banner, it says "WILLKOMMEN IM BMW KUNDENSORT LOGIN-BEREICH." There are two main sections: "LOGIN" on the left and "REGISTRIERUNG" on the right. The "LOGIN" section has fields for "E-Mail-Adresse*" and "Passwort*" and a "Anmelden" button. The "REGISTRIERUNG" section has a "Registrieren" button. At the bottom left, there is a "Passwort vergessen" link.

Enter your Email Adress and password if you are already registrated.

Complete the following boxes as required by BMW Kundensport.



The screenshot shows the "REGISTRIERUNG BMW KUNDENSORT" form. It has a title "REGISTRIERUNG BMW KUNDENSORT" and a subtitle "Registrieren Sie sich hier, um zukünftig alle Dokumente rund um Ihr Fahrzeug von BMW Motorsport bequem online abrufen zu können." The form is divided into "PERSÖNLICHE ANGABEN" and has several fields: "Vorname*", "Nachname*", "Geburtsdatum*", "Geburtsort*", "Telefon*", "E-Mail*", "Modell*", "Käfignummer*", "Team Name", and "Sprache*". There is a checkbox for "Bitte senden Sie mir den Newsletter zu..." and a "Jetzt registrieren" button at the bottom.

Set your Modell and your Team name. After that push „Registrierung abschließen“ to succeed the registration.

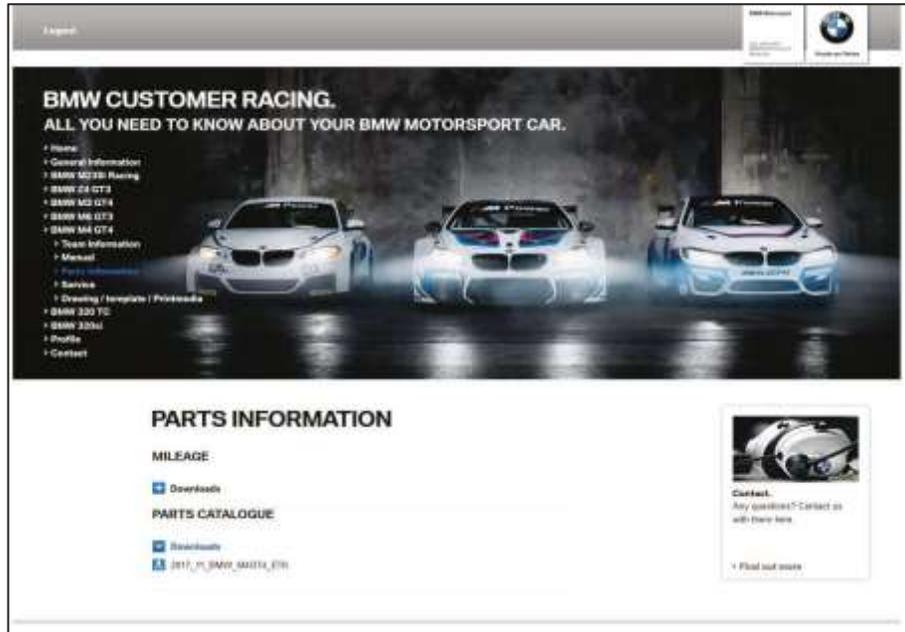
Note: Only vehicle owner with Cage number get access to the „Kundensport“ area.

This is a measure to stay competitive.

APPENDICES.

P. REGISTRATION CUSTOMER PORTAL.

When the registration was successful, you find all vehicle informations with the dropdown on the left hand.



**Note: It's only the car's owner, who is allowed to join the Portal.
The registration process can last some days.**

APPENDICES.

Q. SPARE PARTS CATALOGUE (ETK).

Access to BMW ETK (electronic parts catalogue):

Since 1.1.2020 the BMW ETK (online spare parts catalogue) in the BMW Aftersales Assistance Portal (ASAP) has been switched off. In 2020 a new version will be released for end customer with mandatory registration of your car VIN for getting access. Meanwhile for BMW end customer there's just the possibility to use

www.partslink24.com. Because of **partslink24** is updated regularly, we highly recommend you to use this ETK access.

MODEL	TECH INFO	RE STRUC CODE 1	RE STRUC CODE 2
1	BMW Motorrad	100011-1	Classic
2			M2CS Racing
3			M4 GTR
4			M8 GTR
5			
6			
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APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Important information

BMW M2 CS Racing - Upgrade package 450 HP

The BMW M2 CS Racing Upgrade Package 450hp ("Package") is a combination of software and hardware components for upgrading the 365hp version of the BMW M2 CS Racing to the 450hp version. It consists of a new engine data package ("Engine Data Package") and the hardware components listed in the Appendix ("Hardware"; Engine Data Package and Hardware together "Components"), which are optimally matched to each other.

For safe installation and operation of the Package respectively the vehicle equipped with the Package, the following instructions must be followed:

- Safe operation can only be guaranteed if the Package is installed in its entirety (all Components). Neither only individual Components of the Package may be installed nor may individual Components of the Package be modified. In particular, the Engine Data Package may not be installed or used on its own (without the Hardware).
- A retrofit must always be carried out in its entirety (all Components).
- The installation of the Hardware must be carried out professionally by an appropriately qualified mechanic according to the instructions enclosed with the Package. It is recommended to have the installation carried out by an authorised BMW dealer or an authorised BMW service workshop.
- **Only an authorised BMW dealer or authorised BMW service workshop can install the Engine Data Package.** Before installing the Engine Data Package, this Important Information must be signed by the purchaser and the dealer or the workshop must contact BMW M Customer Racing Technical Support (e-mail to: technical-support@bmw-motorsport.com).
- The instructions and notes in the "M2CSRacing_Technical_Customer_Manual" must always be observed. Further information is available at <https://specials.bmw-motorsport.com/kundensport/>.

Failure to observe the above points can lead to defects and malfunctions of the vehicle and a reduction in the safety and protection standard of the vehicle. In such cases, there is a risk to the life and limb of the vehicle occupants and persons in the vicinity of the vehicle. In particular, the installation of only individual Components can lead to defects in the braking system, malfunctions of the stability control system (DSC) and the anti-lock braking system (ABS) as well as insufficient cooling capacity and consequential damage to the drive. Serious injuries (in particular fractures, burns, internal injuries) up to fatal injuries of the vehicle occupants and persons in the vicinity of the vehicle can be the result.

With his signature, the purchaser confirms that the Package has been or will be installed in accordance with the above-mentioned requirements and agrees to observe the other points mentioned above and to make this Important Information and all other package-related information received from BMW M Customer Racing available to each user and, in the event of resale, to the subsequent owner of the vehicle equipped with the Package.

In the event of resale, it is recommended that the new owner registers with BMW M Customer Racing (<https://specials.bmw-motorsport.com/kundensport/>) in order to receive vehicle-specific safety-related information. Should any questions arise, BMW M Customer Racing will be happy to provide detailed information.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Amount of Parts:

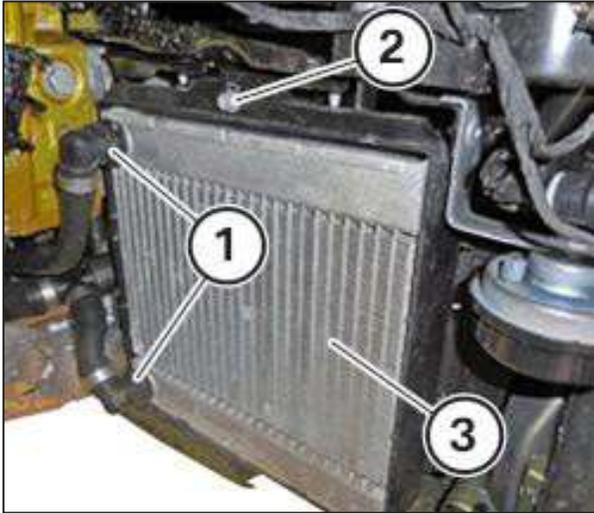
Part-No.	Qty.	Description
Supplementary Coolant Radiator		
1710	8342846	1 WELDING ASSEMBLY aKMK LH
1710	8328139	1 WELDING ASSEMBLY aKMK RH
1710	8328135	1 LH UPPER RADIATOR BRACKET
1710	8328136	1 RH UPPER RADIATOR BRACKET
1710	8328137	1 LH LOWER RADIATOR BRACKET
1710	8328138	1 RH LOWER RADIATOR BRACKET
1710	8436008	2 FILLISTER HEAD SCREW ISO7380-2 M5X14 10.9 ZNSW
1710	8427226	2 WASHER M5 ISO7093 200HV A2
Radiator Fan		
1710	8417424	1 FAN 1000W MOTORSPORT
Front Brake		
3410	8428733	1 CALIPER ALCON FL
3410	8428734	1 CALIPER ALCON FR
8130	4670300	2 ADAPTER 919/M10X1/03D SS
3432	8321499	2 CU-SEAL RING 10X14X2
3410	8328261	2 ADAPTER CALIPER FRONT HIGH
3410	8323912	4 FIXING BOLT M12X1.75X65MM
3410	6864424	4 BOLT ASA M12X1.5X43-10.9 ZNS3
3410	8328273	1 LH BRAKE DISC FRONT HIGH BEDDED
3410	8328274	1 RH BRAKE DISC FRONT HIGH BEDDED
3410	8328267	2 BRAKE DISC CHAMBER FRONT HIGH
3410	8323911	40 FIXING BOLT M5X0.8X12MM
3410	8328316	10 RETAINING RING FRONT BRAKE DISC
3410	8328305	1 SET BRAKE PADS FRONT PAGID RSL29
5174	8328297	1 LH BRAKE AIR GUIDE RADS. HIGH
5174	8328298	1 RH BRAKE AIR GUIDE RADS. HIGH
3411	6868785	6 HEX BOLT M6X12-10.9-MK
5174	8328301	1 LH SHIELD PLATE FRONT BRAKE
5174	8328302	1 RH SHIELD PLATE FRONT BRAKE
4100	8435912	6 FILLISTER HEADSCREW ISO7380-1 M5X10 10.9 ZNSW
Rear Brake		
3420	8328259	1 LH CALIPER REAR HIGH
3420	8328260	1 RH CALIPER REAR HIGH

Part-No.	Qty.	Description
8130	4670300	2 ADAPTER 919/M10X1/03D SS
3432	8321499	2 CU-SEAL RING 10X14X2
3420	8328309	1 LH ADAPTER CALIPER REAR HIGH
3420	8328310	1 RH ADAPTER CALIPER REAR HIGH
3420	8328318	4 ISK BOLT M12X1.75X60
3420	6864424	4 BOLT ASA M12X1.5X43-10.9 ZNS3
3420	8328275	1 LH BRAKE DISC REAR HIGH BEDDED
3420	8328276	1 RH BRAKE DISC REAR HIGH BEDDED
3420	8328268	2 BRAKE DISC CHAMBER REAR HIGH
3410	8323911	40 FIXING BOLT M5X0.8X12MM
3410	8328317	10 RETAINING RING REAR BRAKE DISC
3420	8328320	1 SET BRAKE PADS REAR PAGID RSL D1
Driver Seat		
5200	8342844	1 SEAT RECARO P1300 GT M2CSR
5200	8342845	1 FLEX-ADAPTER RECARO P1300GT M2CSR
5200	8324142	1 SEAT ADAPTER P1300 GT FRONT
5200	8324143	1 SEAT ADAPTER P1300 GT REAR
5200	8427839	8 CYL. HEADSCREW ISO4762 M8X30 10.9 ZNSW
5200	8427201	8 WASHER M8 ISO7089 200HV A2
5200	8427862	4 CYL. HEADSCREW ISO4762 M10X30 10.9 ZNSW
5200	8427202	4 WASHER M10 ISO7089 200HV A2
Optional		
5145	8324111	1 COVER EYE CUT I-PANEL
5145	8436345	1 CYL. HEADSCREW DIN912 M14X1,5X60 10.9ZNSW
5145	8328171	1 SLEEVE COVER EYE CUT
5145	8427220	1 WASHER M14 ISO7092 200HV A2
Powerstick		
6131	8324083	1 POWER STICK M2 BLACK
Consumables		
1100	8328053	10 DOUBLE HEAD CABLE TIES 4.7 x 395
3430	2483651	2 CASTROL SRF RACING 1LTR

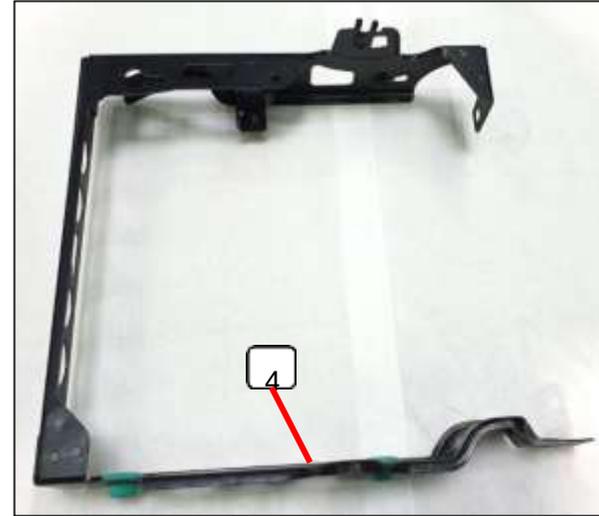
APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion of supplementary coolant radiator (left and right):



1. Remove front wheel arch cover.
2. If you have not already done so, drain the coolant.
3. Loosen coolant hoses (1).
4. Loosen screw (2).
5. Lift the additional coolant cooler (3) upwards out of the rubber mounts.



6. Remove the radiator bracket (4).

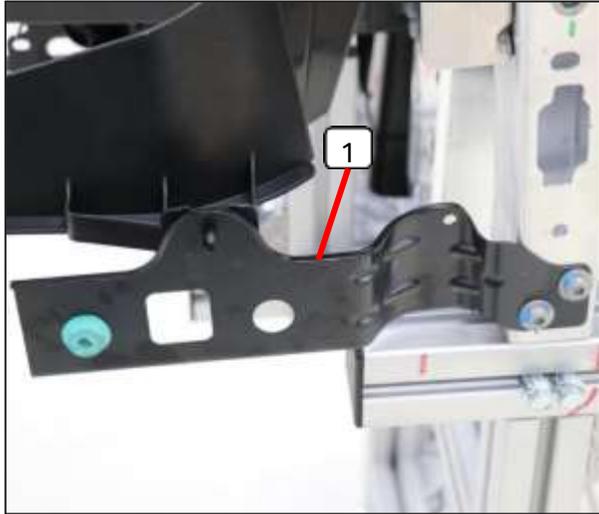


Repair and maintenance work on the vehicle only
with appropriate protective clothing.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion of supplementary coolant radiator (left and right):

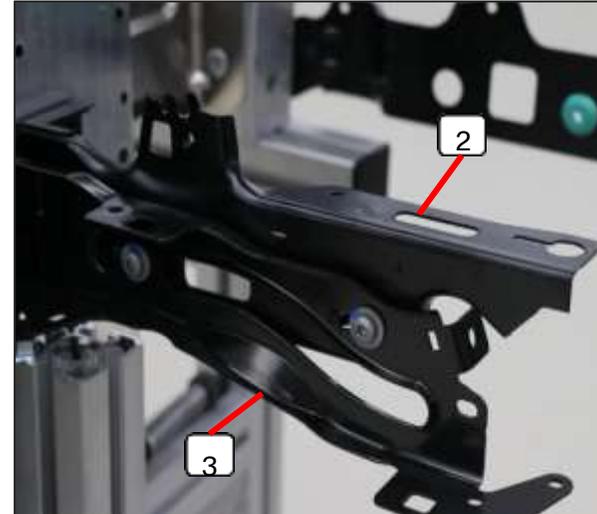


7. Fit the new modified radiator lower bracket (1) as shown.

Note:

Only one rubber mount is installed.

Tightening torque: **12 Nm + Loctite 243.**



8. Fit the radiator upper bracket (2) and bolt together with the headlight bracket (3) as shown.

Tightening torque: **12 Nm + Loctite 243.**



Repair and maintenance work on the vehicle only
with appropriate protective clothing.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion of supplementary coolant radiator (left and right):



9. Insert the new coolant radiator (1) into the rubber mount (2) and secure it with the screw M5 + washer as shown.

Tightening torque: **5 Nm + Loctite 243.**

10. Screw the coolant radiator to the upper mount (3) as shown.

Tightening torque: **8 Nm + Loctite 243.**

11. Reconnect the coolant hoses as shown.
12. Mount the front wheel arch liner.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

NOTICE

The cooling system has then according to Chapter 2.3. to be filled with the recommended coolant and vented with the vacuum filling device.

BMW M Motorsport recommends that the cooling system to be filled and vented by your BMW dealer or an equally qualified professional mechanic.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Preparation for changing the cooling fan:



1. Dismantle the underbody – stiffening plate (1).

Tightening torque: **56 Nm + 90° + Loctite 243**

2. Loosen the screws from the engine oil cooler (2) and secure it against falling down.

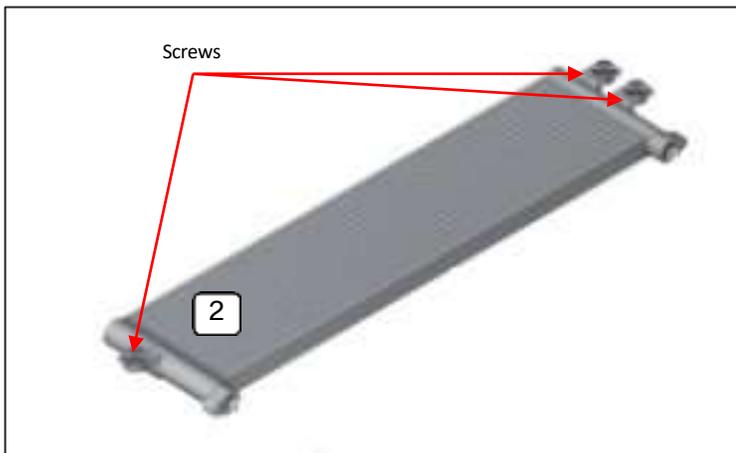
Tightening torque: **19 Nm + Loctite 243**

3. Remove the plastic sleeves (3) as shown.

4. Dismantle the LH air filter box and the CFK strut (4) completely.

Tightening torque: **28 Nm + Loctite 243**

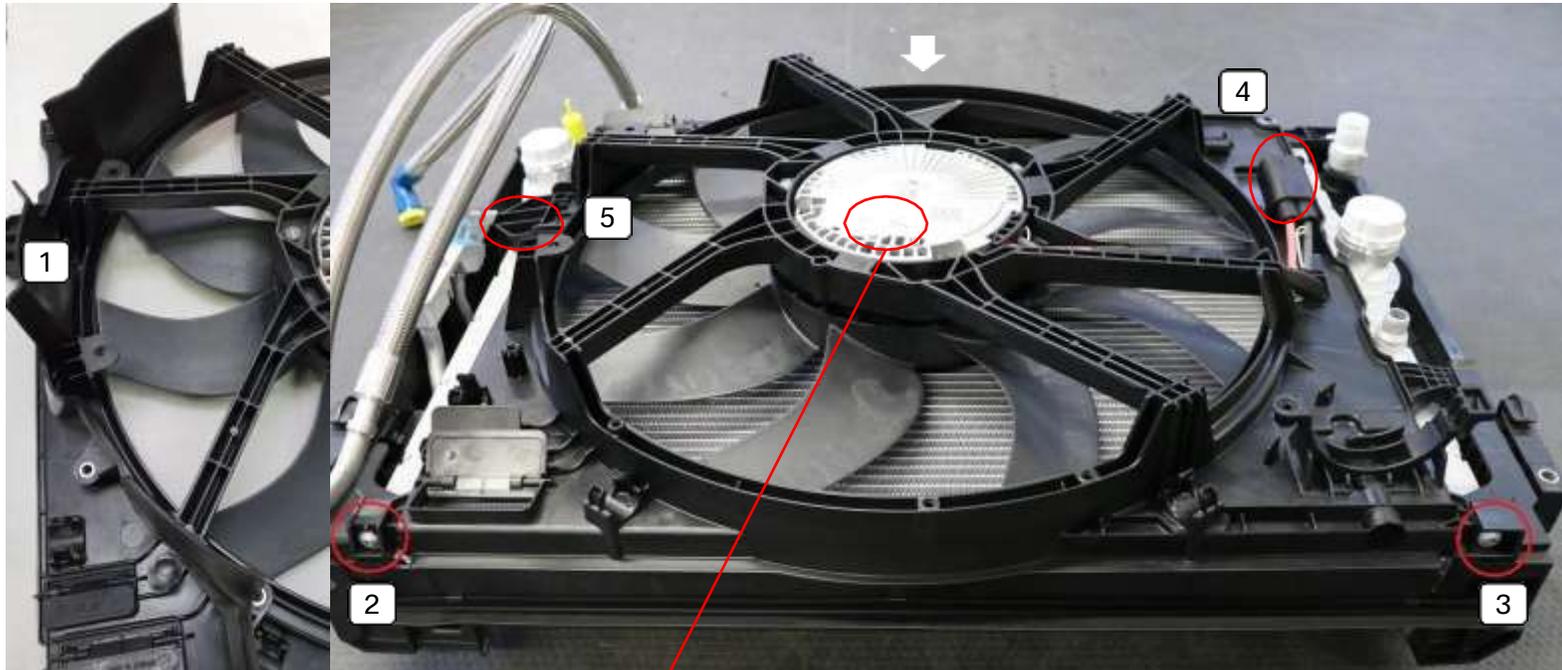
5. Drain the coolant and disconnect the coolant hoses (5) from the cooling module.



APPENDICES.

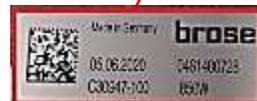
R. CONVERSION 450 HP UPGRADE PACKAGE.

Change of Cooling Fan:

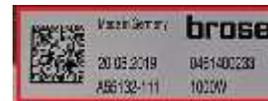


6. Remove the flap for the fan cowl (1).
7. Loosen screws (2 + 3) from below.

Tightening torque: **5 Nm.**
8. Disconnect the plug (4).
9. Remove the catch (5).
10. Pull the fan out downwards in the direction of the arrow.
11. Install the new fan (1000 W) in reverse order.



365 HP: 850 W



450 HP: 1000 W



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with appropriate protective clothing.

NOTICE

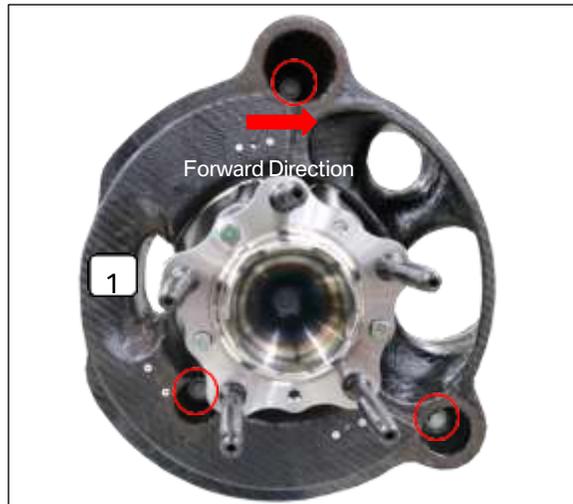
The cooling system has then according to Chapter 2.3. to be filled with the recommended coolant and vented with the vacuum filling device.

BMW M Motorsport recommends that the cooling system to be filled and vented by your BMW dealer or an equally qualified professional mechanic.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change front brake system:



1. Remove the brake discs, brake air duct and brake calipers from the 365 HP brake system.
2. Fit the new brake air duct as shown.

Tightening torque: **8 Nm.**

Note:
Please use new screws (3411 6868785).



3. Fit the brake air duct cover disc as shown.

Tightening torque: **5 Nm.**

Note:
Please use new screws (4100 8435912).



4. After, fit the brake air hoses. Note that the brake air hose of the brake caliper cooling (365 HP) is inserted on the opening (1) in the new brake air duct. Regarding laying and, if necessary, length compensation, it is recommended to slide the brake hose a little forward into the cooling module and to be reattached with double head cable ties.

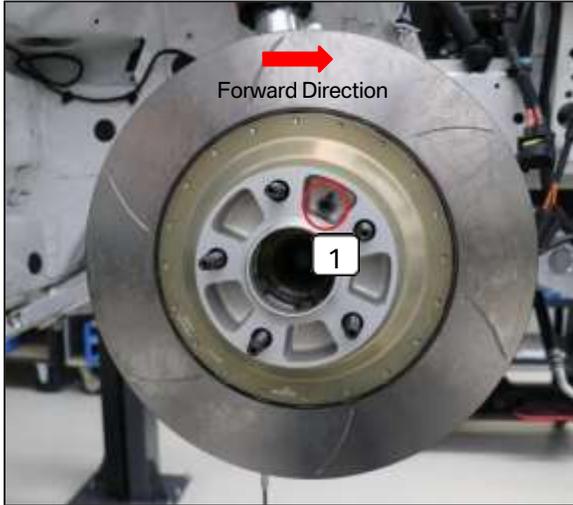


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APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change front brake system:



5. Assemble new brake disc (390 x 35.6 mm) with brake disc chamber according to chapter 4.3.4.
6. Place the brake disc / -chamber on the flange and **do not** secure it with a screw.
7. Mount the spacer and secure it with the screw (1).

Tightening torque: **36 Nm + Loctite 243.**



8. Fit brake caliper adapter to wheel carrier as shown. Observe the note below.

Tightening torque: **80 Nm + 55° + Loctite 243.**

Note on brake caliper adapter:

The designation "**Disc Side**" indicates the side facing the brake disc.

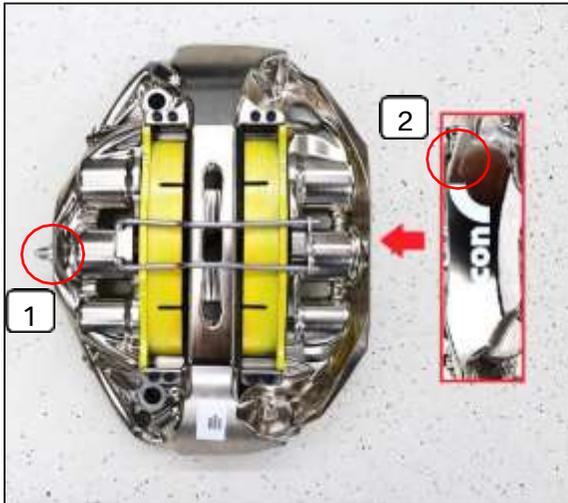


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APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change front brake system:



9. Prepare brake caliper with pads as shown. Observe the notes below.

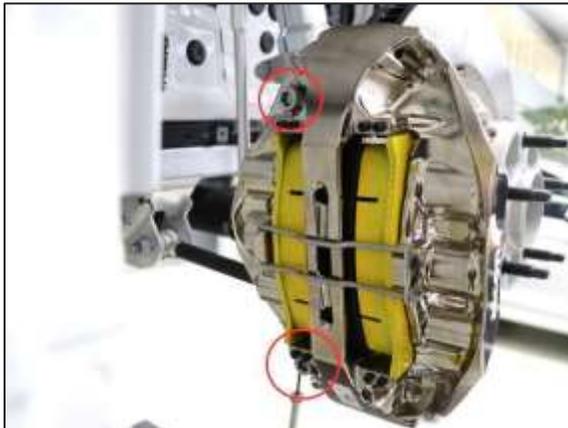
10. Fit brake line connection (1) with sealing ring.

Tightening torque: **15 Nm + Loctite 542.**

Notes on brake caliper:

The "alcon" logo marks the outside of the caliper.

The arrow (2) indicates the direction of rotation of the brake disc in the direction of travel and thus the left and right side of the brake caliper.



11. Mount the caliper on the adapter as shown. The screw connection is made **without** a washer.

Tightening torque: **110 Nm.**



12. Connect brake line as shown with an angle of approx. 45 ° and fasten it with double head cable ties.

Tightening torque: **15 Nm + Loctite 542.**

NOTICE

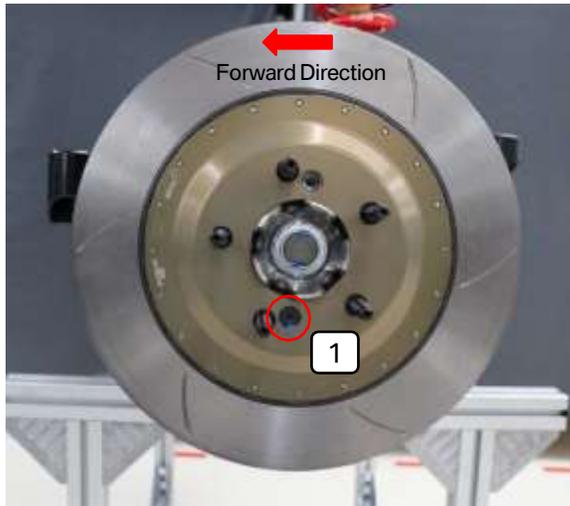
After completing work on the brake system, bleed the entire brake system including the DSC.

BMW M Motorsport recommends that the brake system be vented by your BMW dealer or an equally qualified professional mechanic.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change rear brake system:

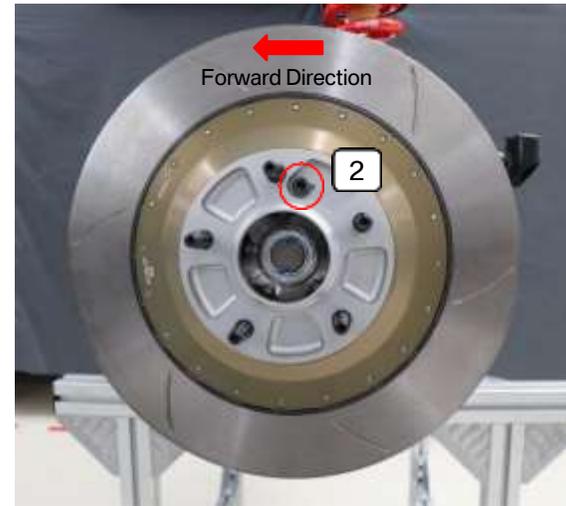


1. Remove the brake discs and brake calipers from the 365 HP brake system.
2. Assemble new brake disc (355 x 32 mm) with brake disc chamber according to chapter 4.3.4.
3. Place the brake disc / -chamber on the flange and secure it with the screw (1).

Tightening torque: **16 Nm + Loctite 243.**

Note:

Pay attention to position of screw hole in disc chamber as shown!



4. Mount the spacer and secure it with the screw (2).

Tightening torque: **36 Nm + Loctite 243.**

Note:

Pay attention to position of screw hole in the spacer as shown!



Repair and maintenance work on the vehicle only
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APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change rear brake system:



5. Fit brake caliper adapter to wheel carrier as shown. Observe the notes below.

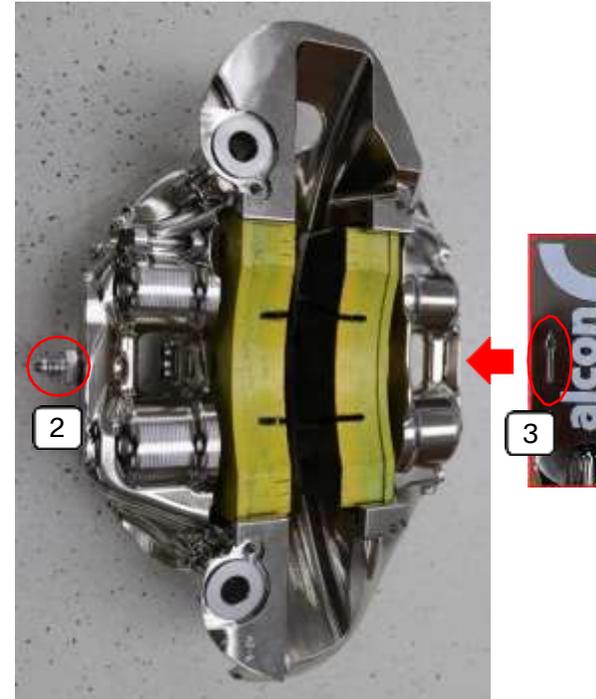
Tightening torque: **80 Nm + 55 ° + Loctite 243.**



Notes on brake caliper adapter:

L + R (1) mark the left and right side.

The designation "**Disc Side**" indicates the side facing the brake disc.



6. Prepare brake caliper with pads as shown. Observe the notes below.

7. Fit brake line connection (2) with sealing ring.

Tightening torque: **18 Nm + Loctite 542.**

Notes on brake caliper:

The "**alcon**" logo marks the outside of the caliper.

The arrow (3) indicates the direction of rotation of the brake disc in the direction of travel and thus the left and right side of the brake caliper.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Change rear brake system:



8. Mount the caliper on the adapter as shown. The screw connection is made **without** a washer.

Tightening torque: **110 Nm**.



9. Connect the brake line as shown and secure with a double-headed cable tie.

Tightening torque: **15 Nm + Loctite 542**.



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NOTICE

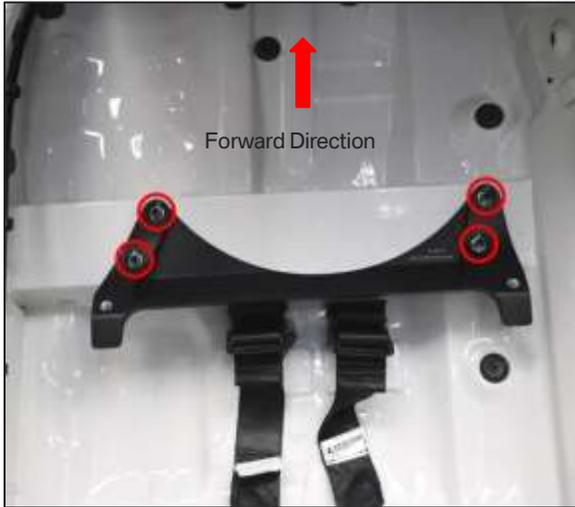
After completing work on the brake system, bleed the entire brake system including the DSC.

BMW M Motorsport recommends that the brake system be vented by your BMW dealer or an equally qualified professional mechanic.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion driver seat (Recaro):



1. Remove the old seat (Sabelt), -support and -console.
2. Mount the seat adapter at the front as shown with bolt and washer.

Tightening torque: **30 Nm + Loctite 243.**



3. Mount the seat adapter at the rear as shown with bolt and washer.

Tightening torque: **30 Nm + Loctite 243.**

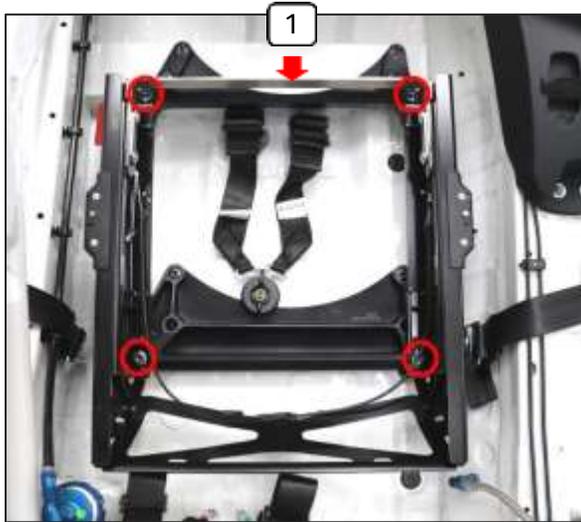


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APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion driver seat (Recaro):



4. Mount the seat console on the seat adapter as shown with bolt and washer. Do not remove the transport bracket (1) yet.

Tightening torque: **45 Nm + Loctite 243.**



5. Only then remove the transport lock. The remaining screws should be kept at later for fitting the seat to the console.

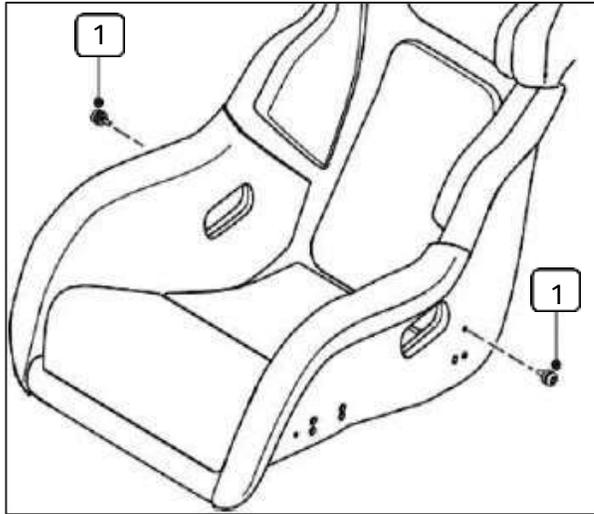


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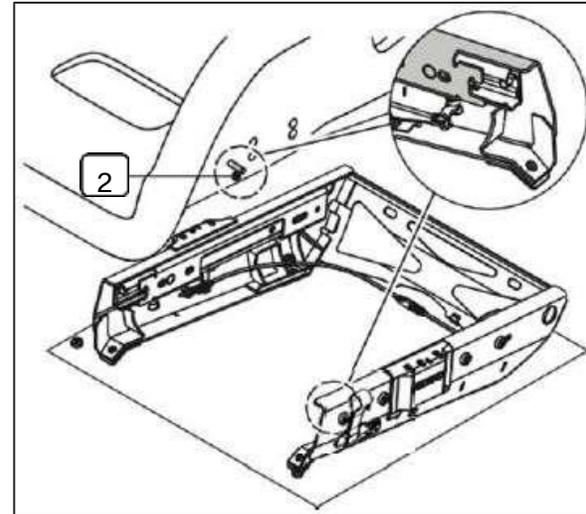
APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion driver seat (Recaro):



6. Before fitting the seat, please insert the provided mounting rollers (1) into the seat shell as shown. Remove these mounting rollers before tightening the seat fixation screws.



7. When fitting the seat, make sure that the seat pin (2) engages into the console guide as shown.



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with appropriate protective clothing.

APPENDICES.

R. CONVERSION 450 HP UPGRADE PACKAGE.

Conversion driver seat (Recaro):



- Carefully place the driver's seat with the mounting rollers on the seat console and snap in the seat pin at the front as described in point 6.



- Screw the driver's seat to the seat console by opening the upholstery tabs as shown. It is essential to ensure that the screws do not tilt.

Tightening torque: **23 Nm.**



Repair and maintenance work on the vehicle only
with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

1. Preparation:

- Drain the entire fuel from inside the fuel tank.
- Dismount and remove the entire fuel tank from the car.
- Put the empty and removed fuel tank on a work bench or table, where you are able to work on it.



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DANGER

Risk of explosion!

Keep open fire and sources of ignition away!

Gasoline is highly flammable and its vapors form explosive mixtures.

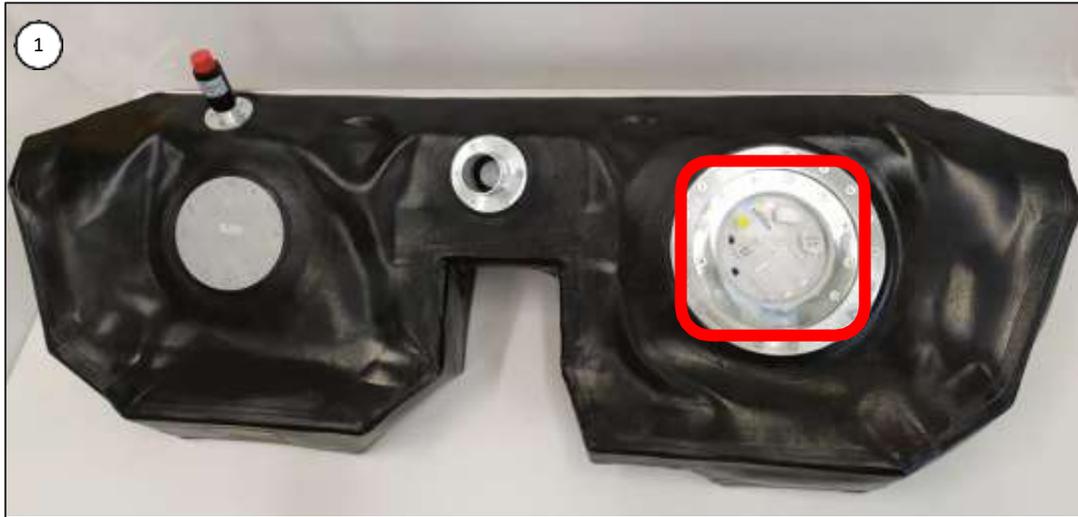
Fuel is toxic when inhaled, swallowed and when it comes into contact with the skin.

Benzene contained in gasoline is carcinogenic.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

2. Disassembling of components:



Place the fuel tank in horizontal position, as shown on the picture above and start to remove the screws on top of the big round metal plate, on the right side of the tank (see red square).



Remove the inner 12 screws, carefully from the internal metal ring of the fuel pump and **put them aside for later.**



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

2. Disassembling of components:



Soon after removing the metallic flange (left picture), raise the plastic plate (right picture) and follow the corrugated hose until to the connection with the UFI filter. Then disconnect the hose from the filter, using the SAE quick connector's push-button and remove the green O-ring (see picture far right).



Disconnect this hose from the filter.



Green O-ring removed.

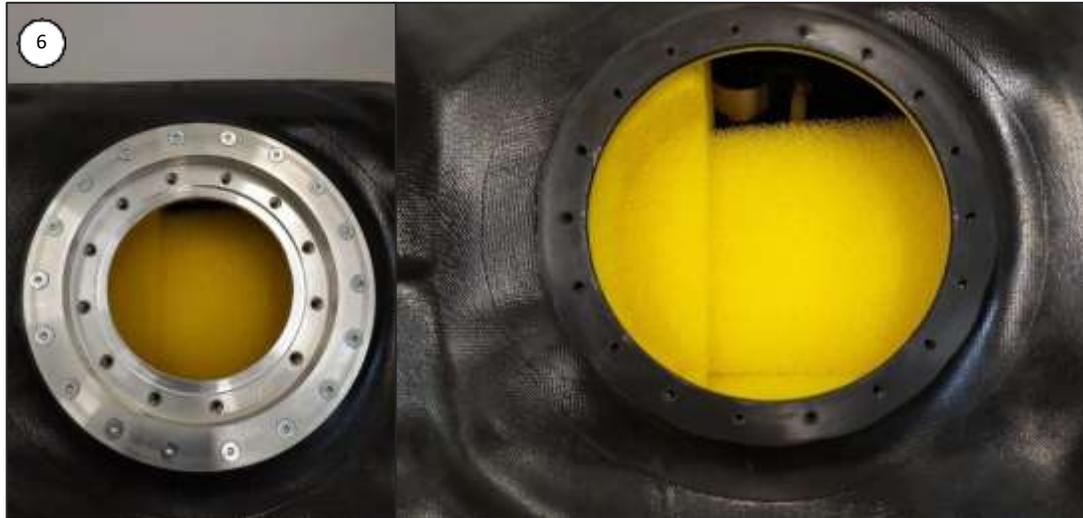


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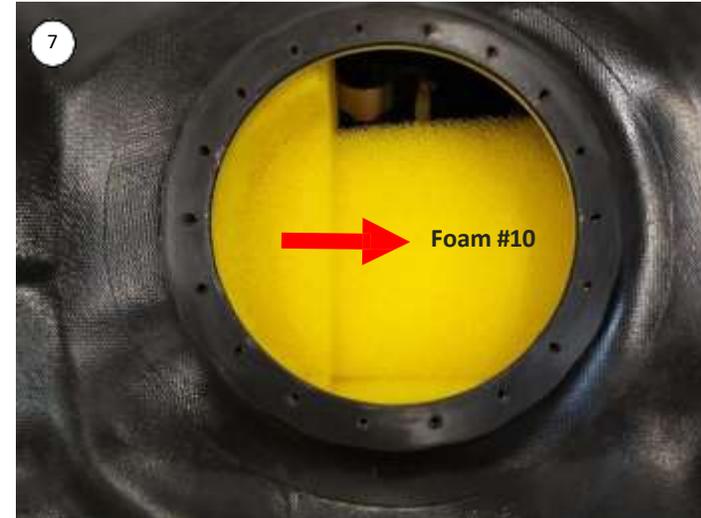
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

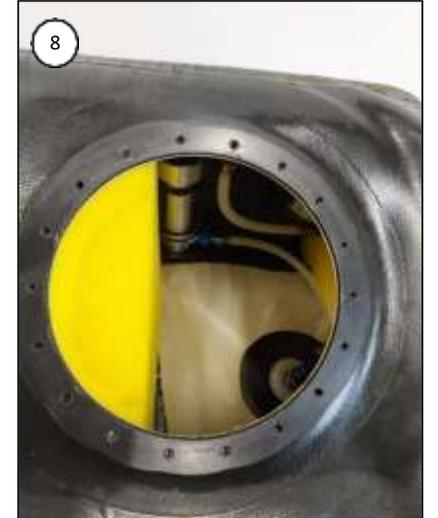
2. Disassembling of components:



Remove the 18 outside screws above. Then remove the flange and put it aside for later.



Remove the piece of foam #10 above.



Foam #10 removed.

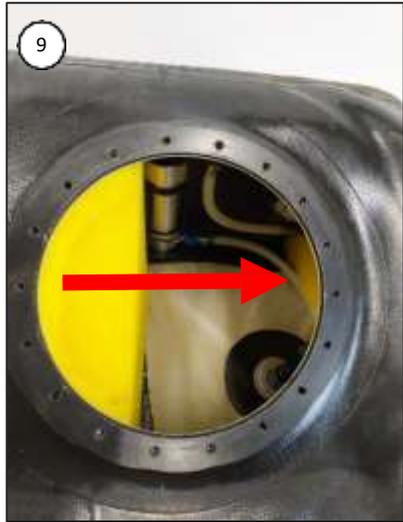


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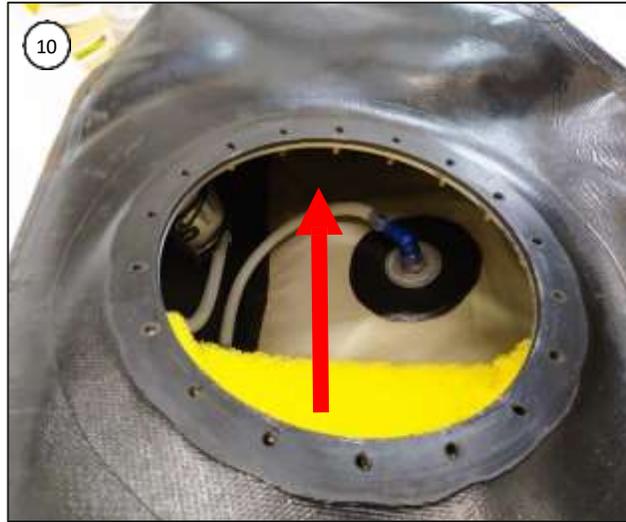
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

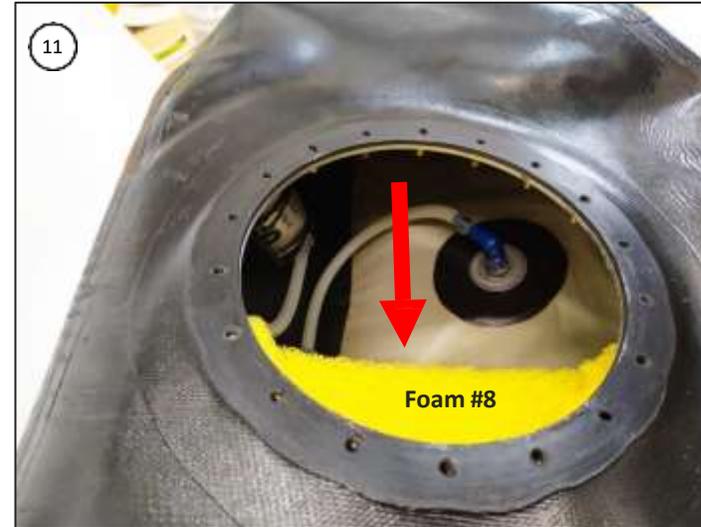
2. Disassembling of components:



Remove the piece of foam #9 on the far right inside.



Foam #9 removed.



Remove the piece of foam #8 above.

Note: Put the foam #8 and #9 to the side for later.



Foam #8 removed.



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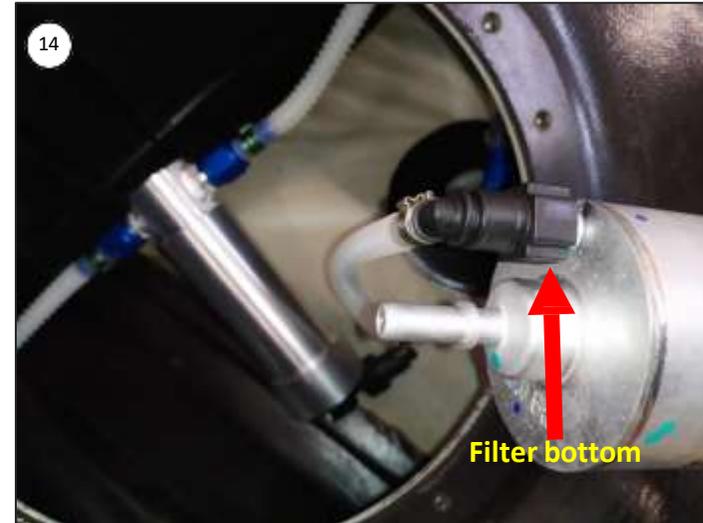
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

2. Disassembling of components:



By the use of a cutter, remove the cable ties, that hold these two parts (5 pieces in total, two on the pump, and 3 on the filter – two big and a little one on the bottom).



Now, holding the filter in one hand, disconnect the SAE quick connector from the filter bottom and the one on top of the HP fuel pump.



Repair and maintenance work on the vehicle only
with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

2. Disassembling of components:



Now, unscrew the two blue connectors, screwed on the fuel pump support (D06) on the bottom. Then leave the hoses inside the tank.



After, disconnect the hoses from the pick-up points and put them away.



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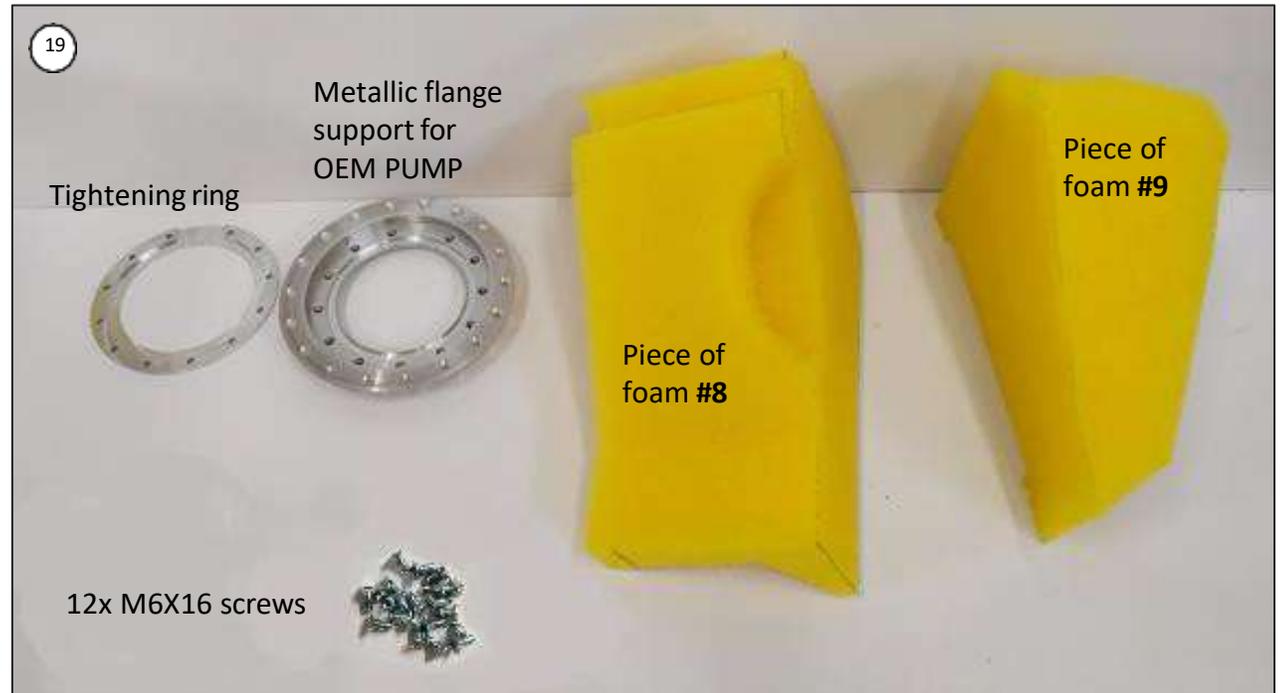
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

2. Disassembling of components:



The removing phase has ended. You should have removed all the following components above.



Prepare all the below shown parts, that you kept aside during the disassembling of the fuel tank, to be used again now with the installation of the new fuel pumps retrofitting kit.

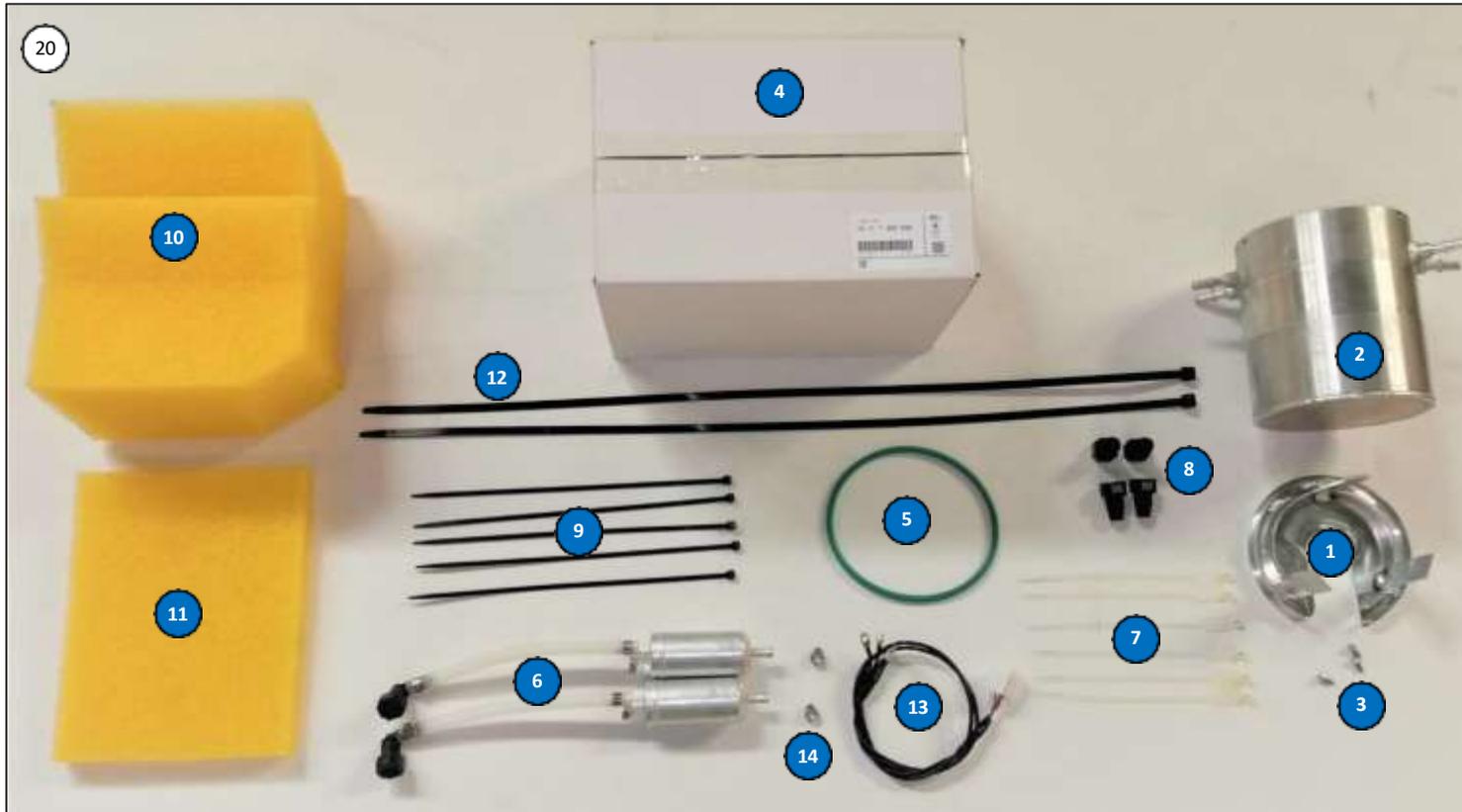


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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

3. Preparation of new components:



Parts list:

1. 1x Catch tank cap.
2. 1x Catch tank body.
3. 3x Hex socket flat counterbore head screws.
4. 1x BMW original fuel pump (OEM).
5. 1x Green O-ring (D130).
6. 2x Lift pumps Assy (Protec PN 11880 plus hoses, SAE Quick connectors and clamps).
7. Cable ties, ty rap (2x TY46MD and 2x TY46M).
8. 4x SAE J2044 Blind Quick Connect.
9. 5x Short ty-raps for lift pumps (4,8x280mm).
10. Block foam #10 adapted to Catch Tank.
11. Block foam #11 between Catch Tank and Net.
12. 2x Long ty-raps for catch tank (7,8x750mm).
13. Electrical Loom (electrical wiring + connector for LLP).
14. 2x One ear clamp 9,8-11,8 (WUERTH).



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with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

3. Preparation of new components:



Important note: You will receive the lift pumps with already connected hoses on both sides of the lift pumps and not like shown on the simple overview picture #20, which shows the hoses only on one side.



Repair and maintenance work on the vehicle only
with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

4. OEM Pump pre-assembly:



Open the BMW fuel pump box.



Above you can see the needed parts to start assembling the OEM-Pump and its supporting metallic flange.



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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

4. OEM Pump pre-assembly:



Place the O-ring inside it's seat (left picture) and close it with the inner flange on top (right picture).



Then tight all screws with 6-8 Nm, as seen on the picture above.

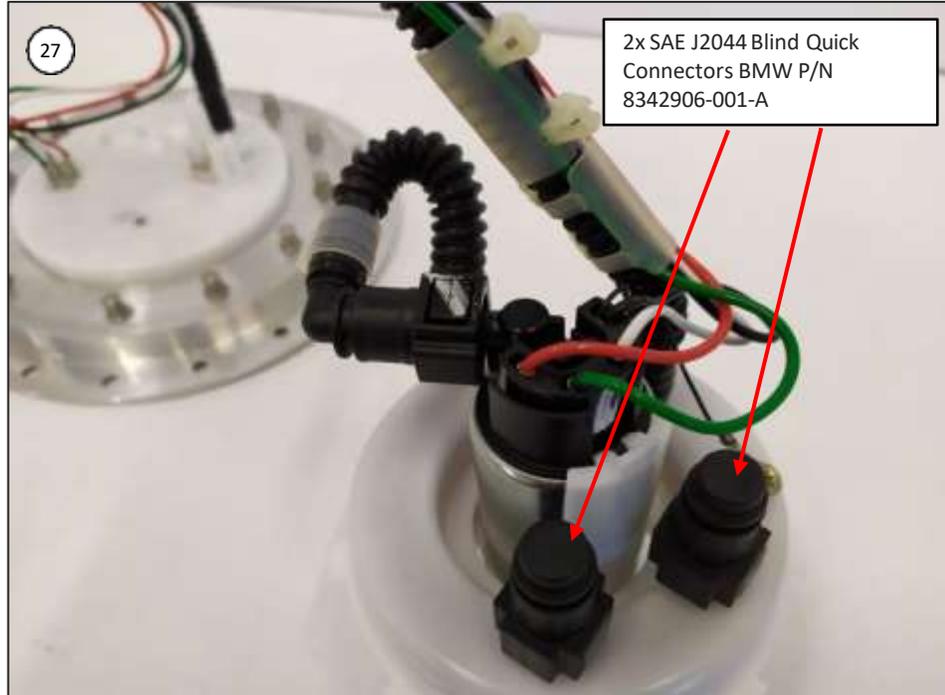


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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

5. OEM Pump installation:



Take two of 4 SAE quick connectors and close the two openings on top of the OEM fuel pump.



Take the pump body and insert it inside the catch tank pushing it down until it is perfectly matching with the metal ring inside. Pay attention to the catch tank orientation. Catch tank, pump and hex screws orientation must be as shown on the below picture.

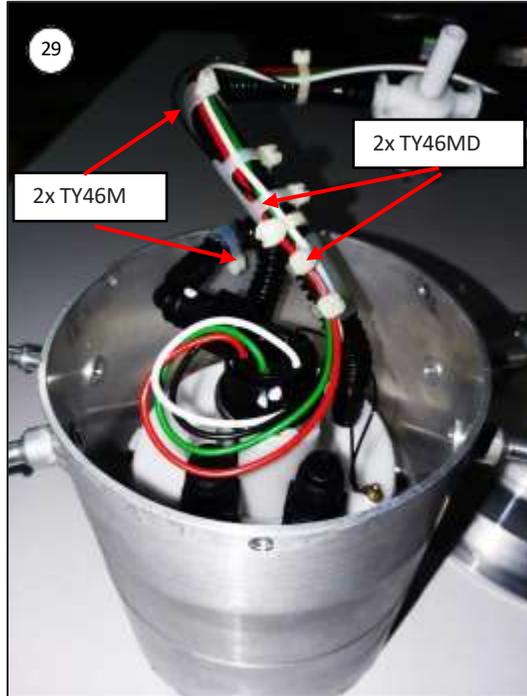


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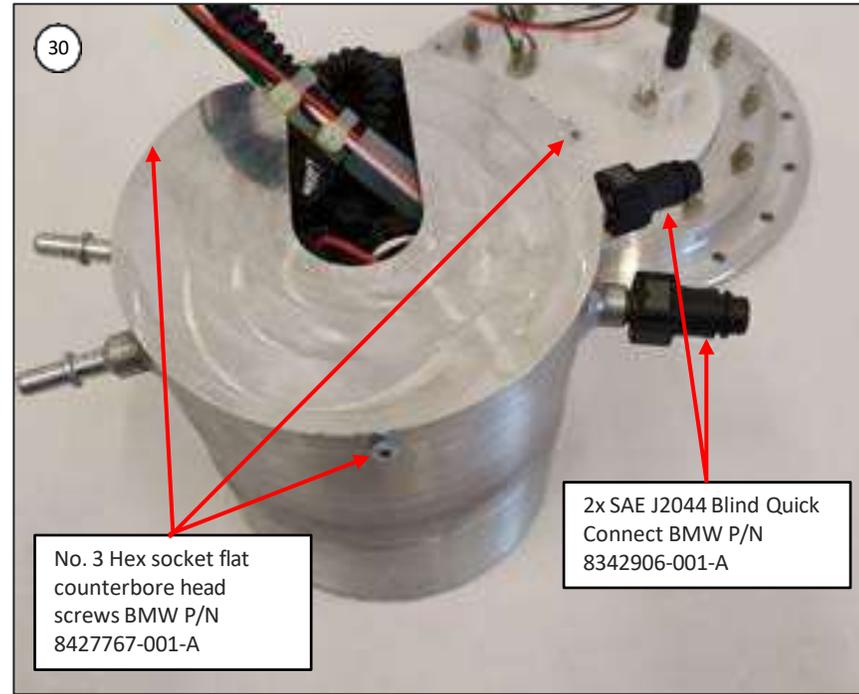
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

5. OEM Pump installation:



Now, before closing the catch tank, we have to protect the high pressure hoses from direct contact with sharp edges. So take the four cable ties (2x TY46MD and 2x TY46M), and place them as shown in the above picture.



Then, proceed by closing the catch tank with the three screws (2-3Nm) and apply the remaining two SAE quick connectors on the RH hose holders.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

6. Lift Pump installation:



Take the two lift pumps (picture above) and the 4 cable ties (4,8x280mm) PN 8342900-001-A (Item #9 on picture #20).



Connect the two lift pumps with the D06 connector to the pickup points.



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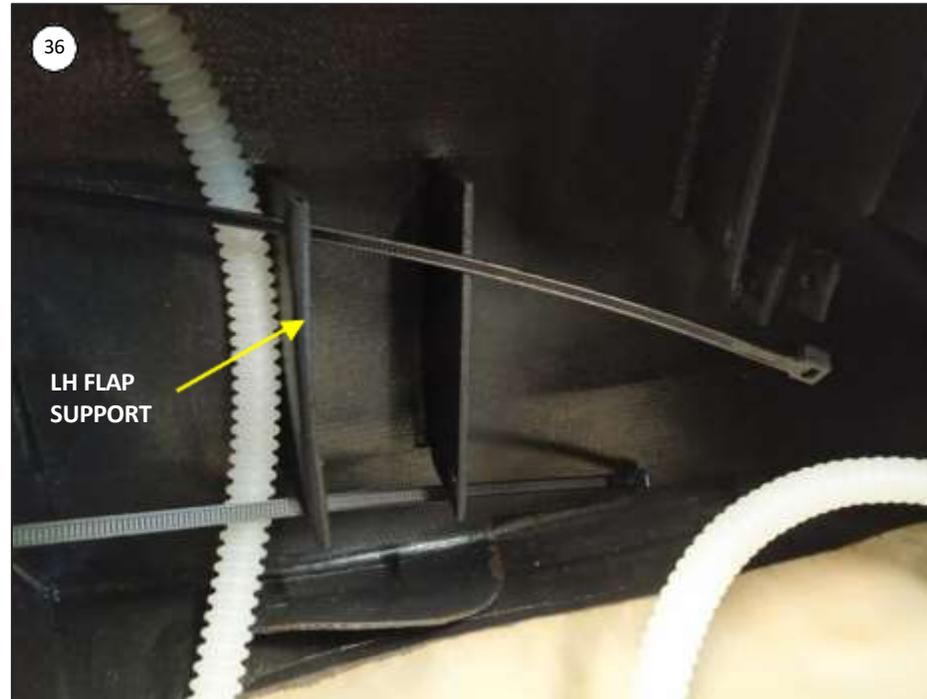
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

6. Lift Pump installation:



Then, take the electrical loom received with the KIT, see picture #20 (item #13), and install it, see picture above.



Lift pumps have to be tightened to the tank wall using the supports of rubberized textile and two small ty-raps (4,8x280mm). Insert the two ty-raps inside the LH flap support holes, as showed on the picture above.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

6. Lift Pump installation:



Tight the ty-rap and cut the rest away, see above picture.



Then, do exactly the same procedure for the second lift pump, on the RH side. See above picture.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

7. Prep. Work before Catchtank installation:



On the above picture, you can see the original position of the pick-up hose.



Slightly unscrew the Goodridge fitting and turn it of about 90° together with the hose. Then tight it again with 22-26 Nm.

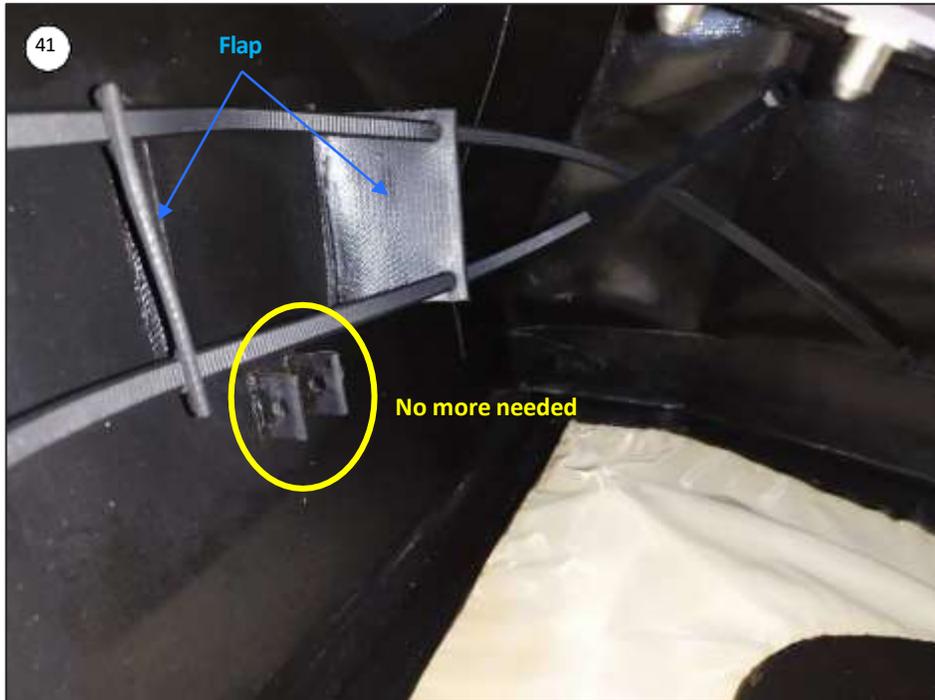


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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

7. Prep. Work before Catchtank installation:



Insert the two long ty-raps into the original holes, previously expected for the UFI filter, the lower little flaps are not involved in the Retrofit KIT configuration.



Then, place the piece of foam #11 (see picture #20) as shown on the picture above.

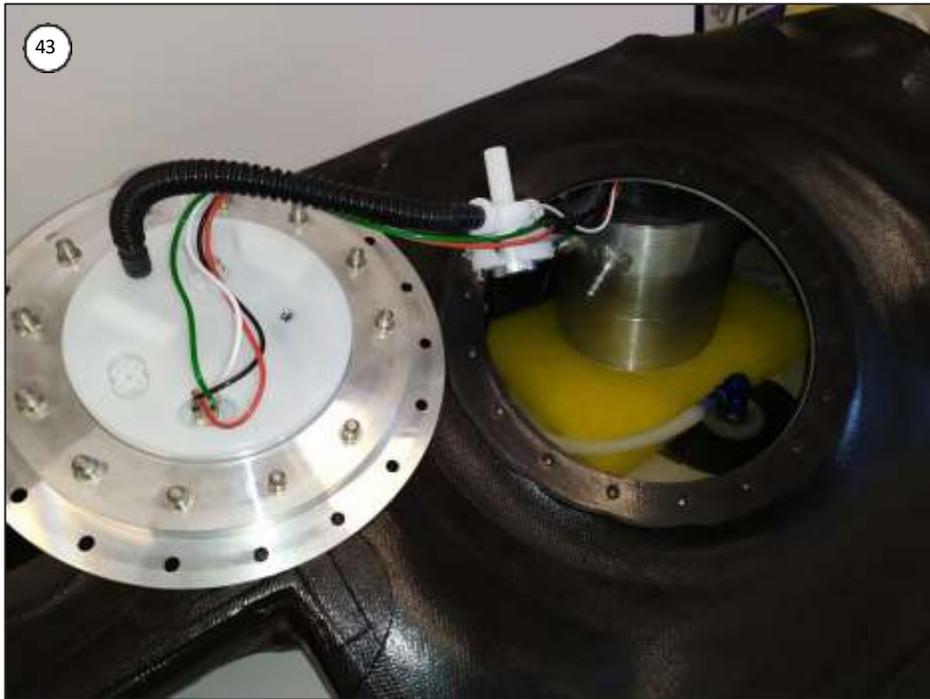


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APPENDICES.

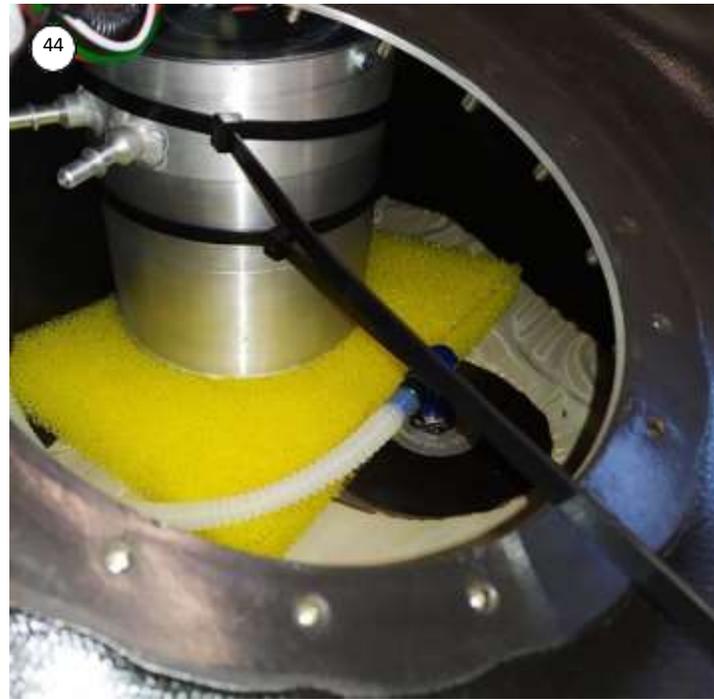
S. RETROFIT OF NEW FUEL PUMPS.

8. Catchtank installation:



Take the assembled catch tank and place it into its place, just upon the foam and in the middle of the two flaps with prepared ty-raps.

NOTE: Do not forget about the right position/orientation of the catch tank before tightening the ty-rap's.



Soon after you have checked the catch tank proper positioning, proceed by tightening the ty-raps. Then cut each ty-rap end off. See picture above.

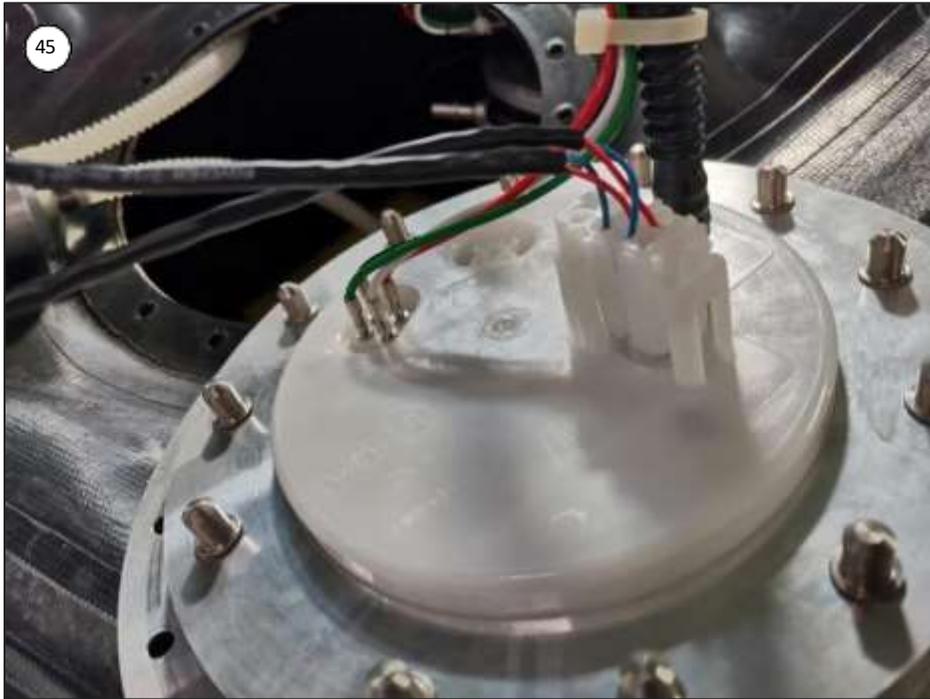


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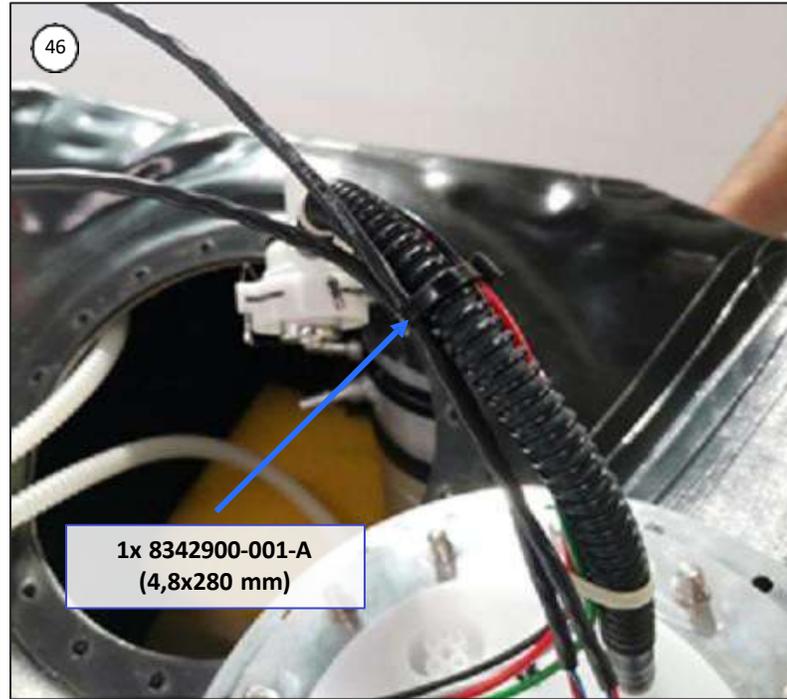
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

9. Making the electrical connection:



Insert the electrical connector into the connector on top of the plastic flange, like on the picture above.



Use a cable tie (BMW PN: 8342900-001-A) to secure the electrical wires on the high pressure hose.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

10. Making the SAE connection:



The free SAE connectors at the end of each lift pump hose, must be now connected to the catch tank hose holders.



You can see the hose holders, highlighted inside the yellow circle on the above picture.



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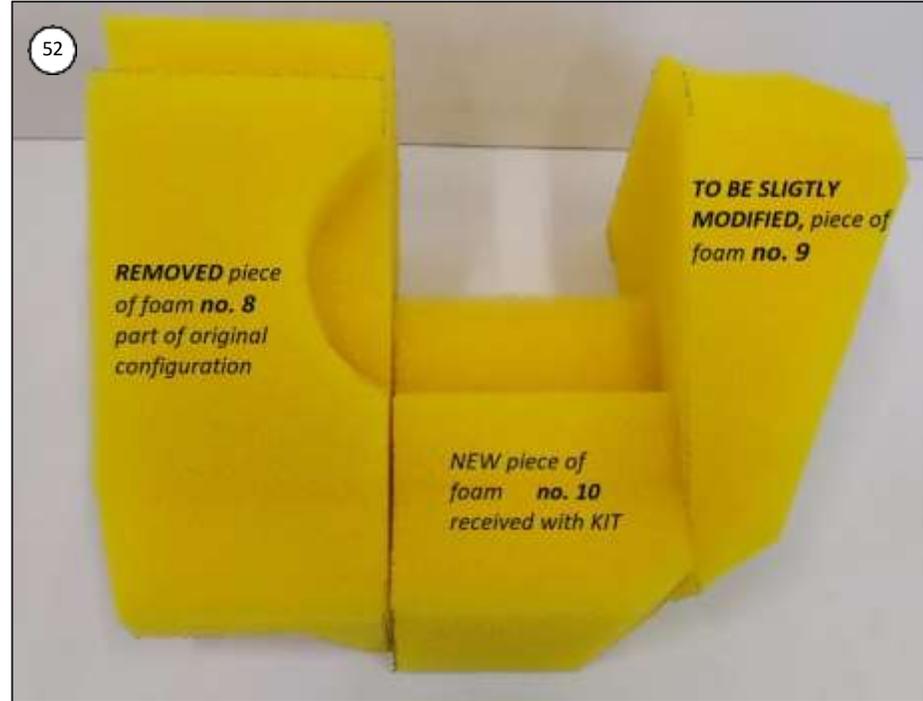
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

11. Installing the foam pieces:



Take foam #8, that you left aside during the dismantling phase (Picture #19) and place it through the opening inside the tank on the very far left side.



On the picture above, you can see the overall configuration of the foam pieces, as it has to be installed inside the right side of the fuel tank.

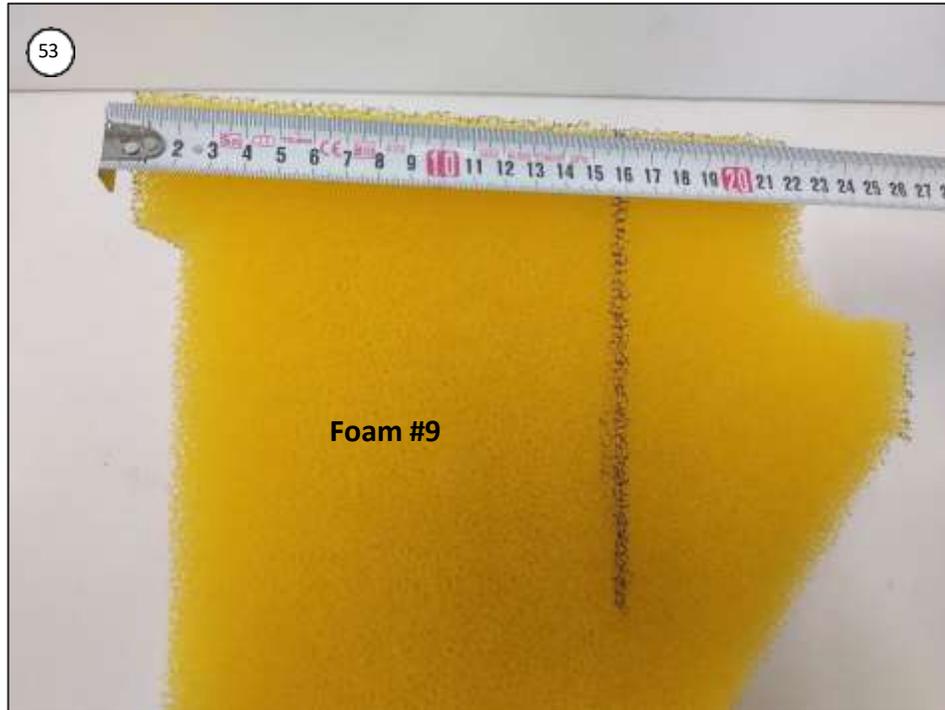


Repair and maintenance work on the vehicle only
with appropriate protective clothing.

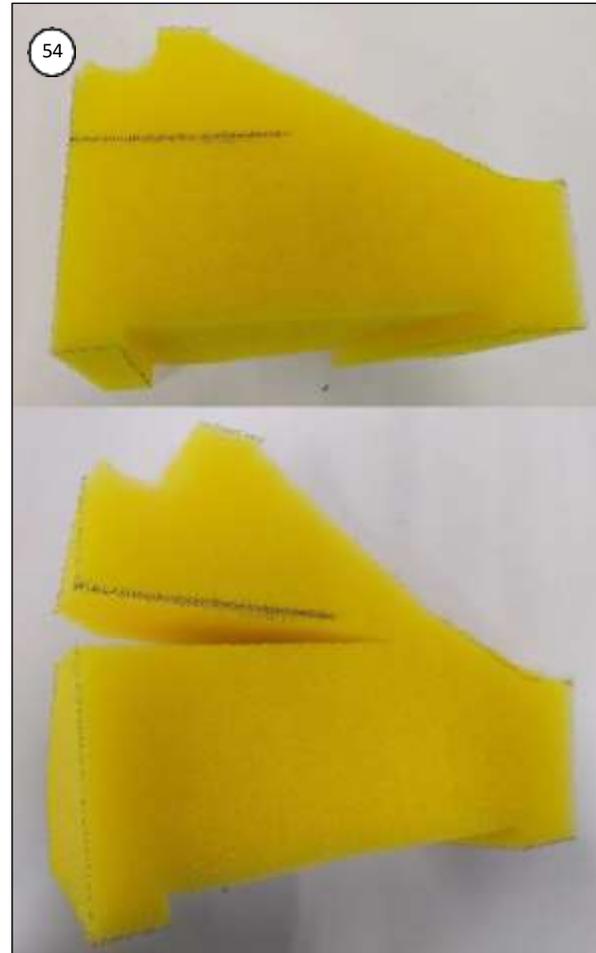
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

11. Installing the foam pieces:



Take foam #9, place it on a table and cut it at the 16 cm mark (along the whole depth and the maximum length of 18-20 cm) as showed on the above picture and the right ones.

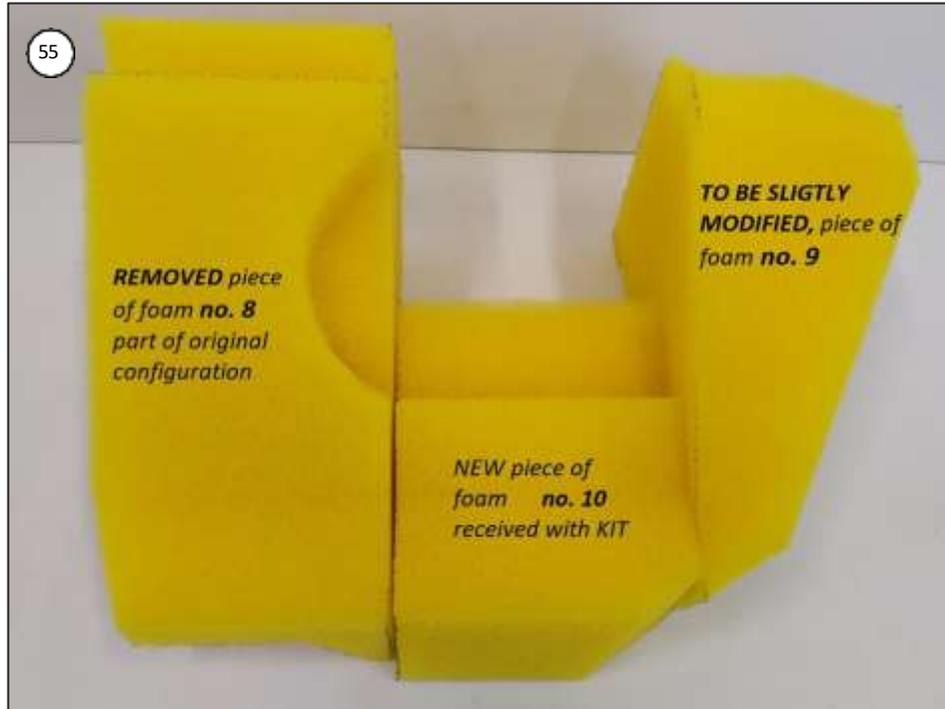


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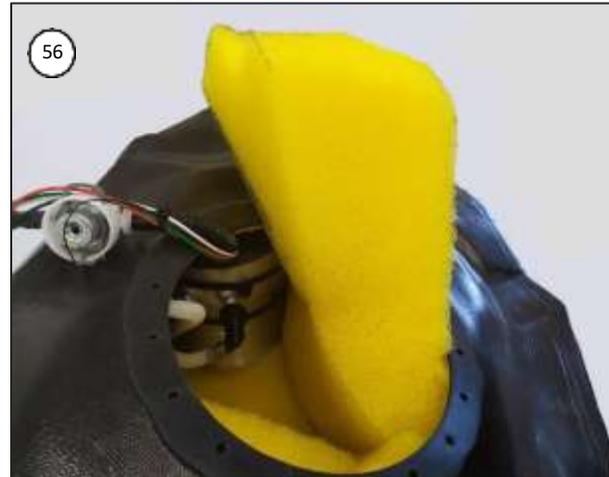
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

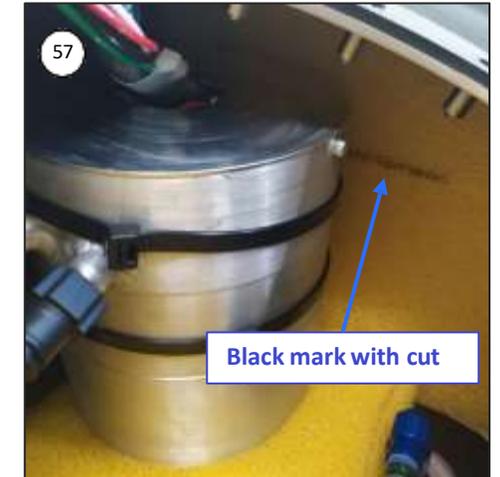
11. Installing the foam pieces:



Above again the overview of the entire foam configuration. Make sure, to place the piece of foam #9 inside the very far right side of the tank.



In order to insert the modified piece of foam #9 properly, start from the lower part of it and then insert the upper part of the foam in the end (see picture above).



The foam cut must offer a proper fit with the blind SAE quick-release couplings, so these must match the black marking and thus the cut surface.

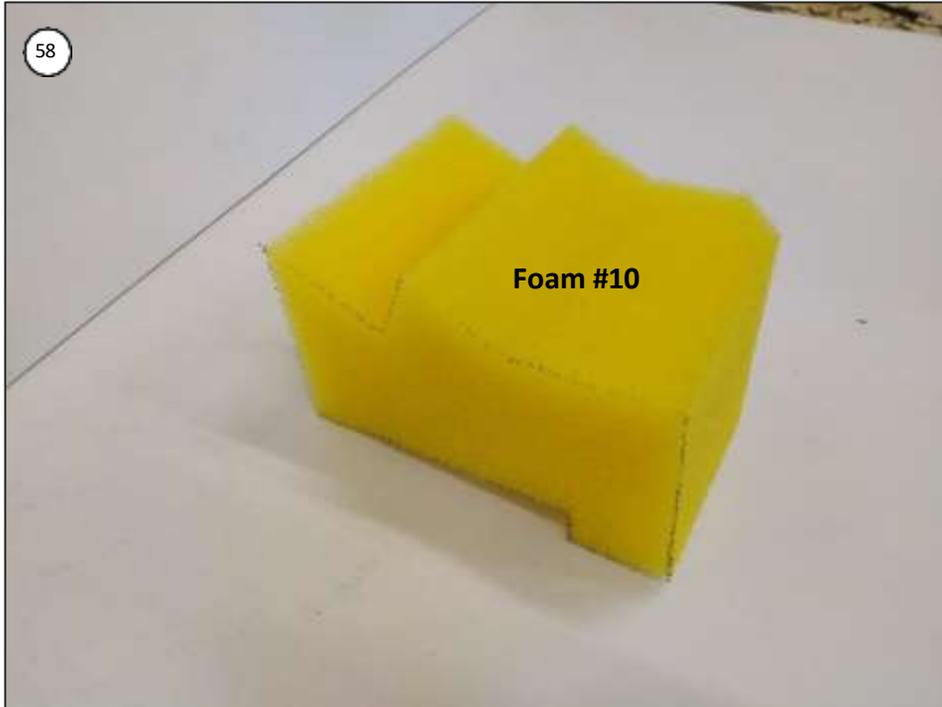


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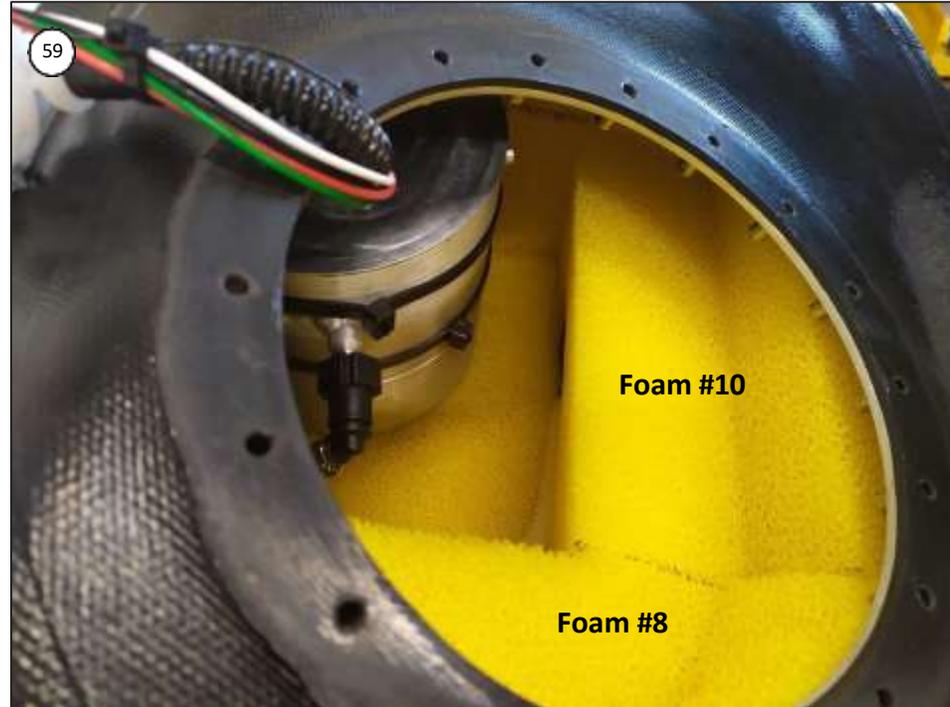
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

11. Installing the foam pieces:



Take the piece of foam #10 received with the KIT.



Insert the foam #10 exactly in the front of the catch tank, the lower part must be close to the catch tank body.

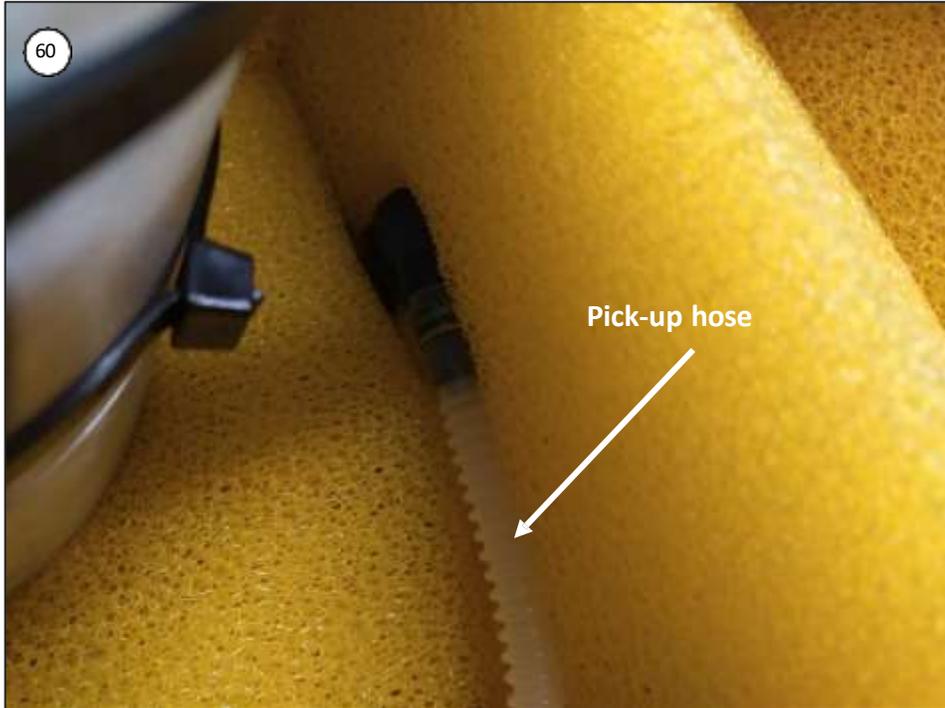


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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

12. Visual inspection of components:



Verify that the pick-up hose is in front of the catch tank. The correct position is shown on the picture above.



The fuel return has not to be into the catch tank, neither upon it. See picture above.



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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

13. Installing the top plate:



Arrange/route the HP hose with the cables to pass between the piece of foam #8 and #10. See picture above.



Close the flange opening with the already assembled closure plate and tight the remaining 18 screws with 6-8 Nm. See picture above.



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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:

- Reinstall the entire fuel tank back into the car.
- Continue to install the additional fuel pump harness into the car, like described on the next pages.



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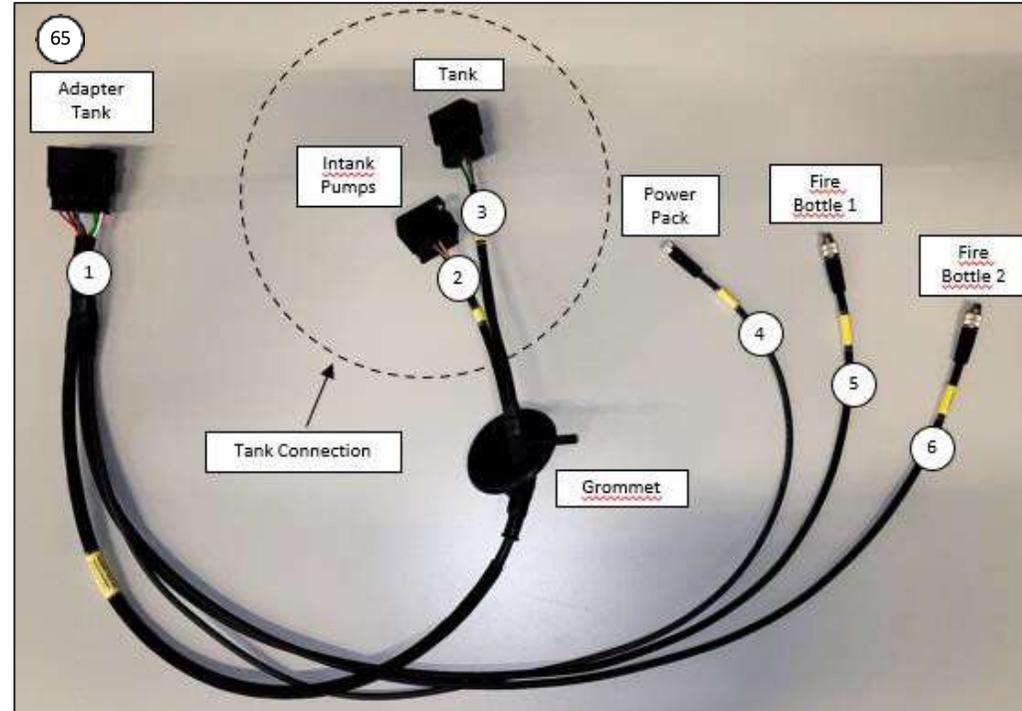
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:



Verify that you received the right parts by part number and check the harness including the pins for any damage.



Above is an overview of the harness including the connector description.



Repair and maintenance work on the vehicle only with appropriate protective clothing.

APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:



First remove the five plastic nuts (red triangles) from the carbon fuel pump cover and remove the cover.

Disconnect the two connectors from the fuel pump and remove the connectors including the rubber grommet, through the middle hole of the carbon cover.



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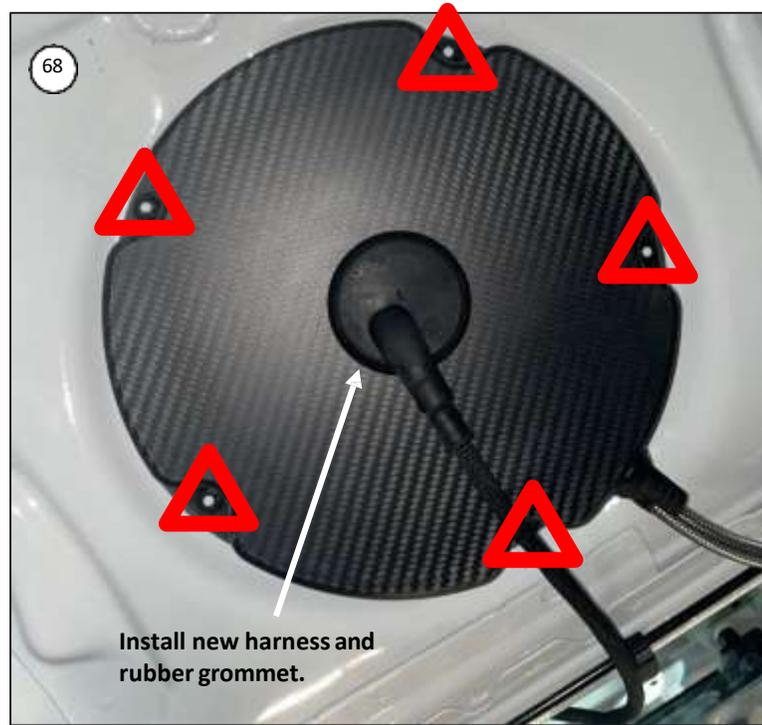
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:



Route the two connectors (2+3) from the new harness including the rubber grommet, through the middle hole of the carbon cover and connect the connectors to the fuel pump. Make sure the rubber grommet fits correctly.



Install the carbon cover back onto the fuel pump and tighten the five plastic nuts (red triangles).

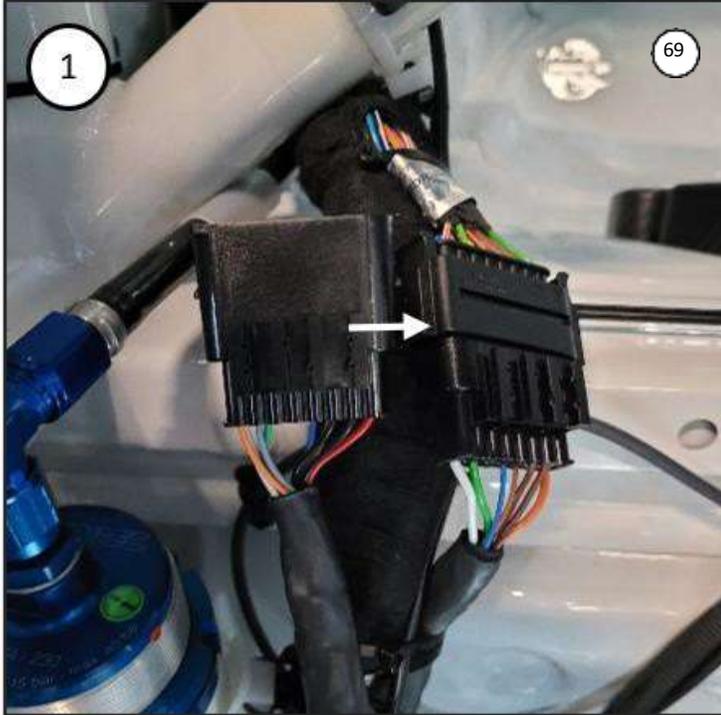


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APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:



1
69

Disconnect the old fuel pump main connector and connect it with the adapter tank connector (#1, picture #65). The old fuel pump harness can be removed.



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The location of the adapter tank connector to the main harness is shown above.

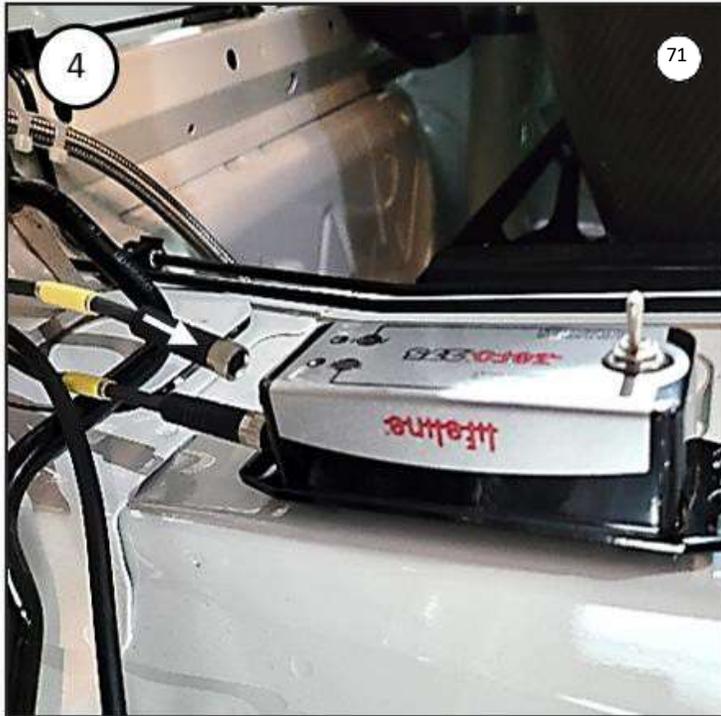


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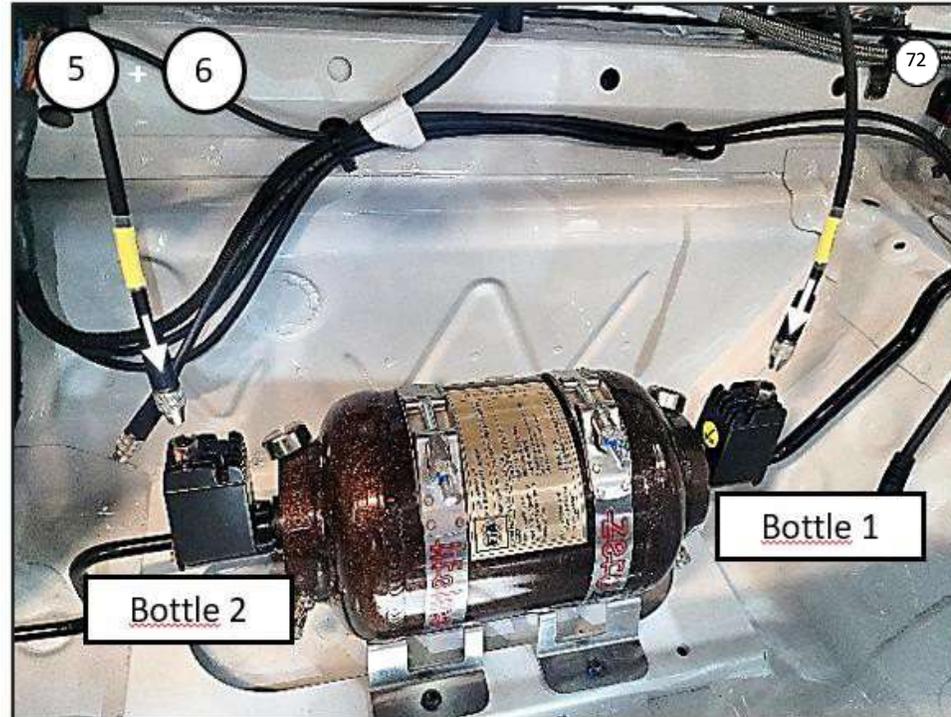
APPENDICES.

S. RETROFIT OF NEW FUEL PUMPS.

14. Installing the additional harness:



Connect the fire extinguisher power pack connector (#4, picture #65) to the power pack.



Connect the fire bottle 1 and the fire bottle 2 connector (#5+6, picture #65) to the fire extinguisher bottle.

Final:

1. Route and attach the new harness with cable ties to the same spots, where the old harness was attached.
2. Refill the tank with fuel to the maximum level and check for any leaks.
3. Perform a fuel pump function test, following an engine start and verify a correct running system.



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