

Welcome to The 488 GTB Workshop Manual at Ferrari

Publication Date: 16/05/2018

Disclaimer: Whilst every effort has been made to ensure the accuracy of this Workshop Manual, the Manufacturer Ferrari shall not in any circumstances be held responsible for any inaccuracy or the consequences thereof. The manufacturer Ferrari reserves the right to vary specifications without notice in accordance with its policy of continual product improvement.



WORKSHOP MANUAL

488 GTB



01.01 Consultation

Consulting the manual

The manual is divided into sections, with each section identified by a different letter.

Each section is divided into chapters, identified by the letter indicating the relative section followed by a sequential number.

Each chapter is, in turn, divided into paragraphs, identified by the letter indicating the relative section, the chapter number and a sequential number, separated from the former by a point.

This format is used for all references to chapters or paragraphs in other sections.

The chapter or paragraph containing the notes relative to a certain topic may be identified by consulting the table of contents at the beginning of each section.

To illustrate the topic more clearly, the text is supplemented by illustrations in which the elements described are highlighted and/or identified with numerical references.

01.02 Updates

Updates

The manual will be updated periodically to reflect modifications made to the vehicle and the production of new versions.

ALWAYS read the Technical Notes as they may introduce more recently updated regulations and methods than those in this manual.

01.03 Symbols

The safety symbols illustrated below are used to draw the attention of the operator to injury hazards, to indicate operations which may entail a risk of damage to the vehicle, or to provide useful information for a specific operation.



IMPORTANT

Failure to observe the instructions in this note may be dangerous and result in serious injury to the operator and/or to persons in the vicinity.



IMPORTANT

Failure to observe the instructions in this note may result in irreparable damage to the vehicle and/or its parts.



ENVIRONMENTAL SAFETY

This symbol indicates recommendations for environmental safety.



NOTE

Indicates a note of a generic nature providing the operator with useful information concerning the operation being performed.



REFERENCE

Refers to the paragraph or chapter in which the relative operation is described.

01.04 Glossary

N₂

Nitrogen

CO

Carbon Monoxide

CO₂

Carbon Dioxide

NO_x

Nitrogen Oxide

HC

Hydrocarbons

Standard

Indicates reference value

Service limit

Indicates the limit value beyond which a part or coupling must be serviced to bring it back within the prescribed tolerance range

Right hand and/or left hand

The terms right hand and/or left hand indicate the right hand and/or left-hand side of the vehicle with respect to the front of the vehicle

ABS

Anti Blockier System

ABS prevents wheel lock-up under braking to maintain directional control over the vehicle.

A.C.

Air conditioning

ASR

Antriebs Schlupf Regelung

Wheelspin control under acceleration.

AVH

Automatic Vehicle Holding

Supplementary function of the electric parking brake (EPB): releases the brake shoes and brake pads at different times. The result is optimised brake release behaviour, assisting the driver.

CAN

Controller Area Network

Communication line between ECUs.

CST

Control Stability Traction

Stability and traction control

DCT

Dual Clutch Transmission

Dual clutch transmission. Each of the two clutches is associated to a different part of the gearbox, with one part engaging even gears and the other engaging odd gears.

E-DIFF

Electronic Differential

Electronically controlled differential integrated with the EF1-Trac traction control system.

EBD

Electronic Brake Force Distribution

Electronic brake force distribution system.

ECU

Electronic Control Unit

Electronic control unit

EF1-TRAC

Traction control integrated with Hy-Kers system.

Excess torque produced by the engine is used by the Hy-Kers system to charge the high voltage battery. The system is self-adaptive and calculates the maximum grip available by constantly monitoring the relative speeds of the wheels.

EPB

Electric Parking Brake

Electric parking brake, with an electric motor actuating the rear brake shoes controlled by an electronic control unit.

ESC

Electronic Stability Control

The ESC function is implemented by the two systems: VDC and EF1-Trac

F1-Trac

Traction control system based on race technology.

The system is self-adaptive and calculates the maximum grip available by constantly monitoring the relative speeds of the wheels. F1-Trac correlates real data against a vehicle dynamics model stored in the control system and optimises the behaviour of the vehicle by controlling engine torque delivery.

FPB

Ferrari Brake Prefill

A system that eliminates the gap between the brake pads and discs by applying slight pressure to the brake system as soon as the accelerator pedal is released when imminent braking is expected. The result is improved brake response.

HV

High Voltage

High voltage electrical system.

HVB

High Voltage Battery

480 Volt high voltage battery situated under the passenger compartment, which accumulates the energy necessary to power the Hy-Kers hybrid system.

HPU

Hybrid Power Unit

Power unit of the Hy-Kers hybrid system, consisting of a DC-DC inverter and converter.

LC

Launch Control

Performance start strategy.

LV

Low Voltage

Low voltage electrical system.

PTU

Power Transfer Unit

Transmission power unit.

RHT

Retractable Hard Top

Retractable hard top.

TPMS

Tyre Pressure Monitoring System

System monitoring the pressure and temperature of the vehicle's tyres. An ECU receives data transmitted by special sensors installed on the interior of the wheel rims near the valves. Tyre pressure and temperature information and the relative messages are displayed on the instrument panel.

VDC

Vehicle Dynamic Control

Vehicle dynamics control using the brake system and engine torque.

4WD

4 Wheel Drive

4 wheel drive system.

02.01 Manual user

Manual user

This publication was produced by the FERRARI Technical Service Department as an informative support tool to assist the operator in performing work on FERRARI cars.

This manual is intended for expert operators with sufficient knowledge and skill to carry out all maintenance and repair operations for FERRARI cars correctly and safely.

Carrying out the aforementioned operations without the necessary knowledge and skills will cause damage to the vehicle and may expose the operator and the user of the vehicle to danger.

02.02 Operating procedures

Operating procedures

Regular maintenance and repairs on vehicles with Hy-Kers hybrid technology may only be performed by centres with at least one TÜV-certified F-HVT technician (Ferrari-High Voltage Technician) and with all the specific equipment required.

All other centres with no F-HVT technician may only perform regular maintenance procedures.

Booking in and redelivery of vehicles with Hy-Kers hybrid technology may only be performed by F-HVT technicians.

Regular maintenance and repair procedures on vehicles with Hy-Kers hybrid technology may only be delegated to other personnel by an F-HVT technician.

Any person tasked with performing regular maintenance and repair procedures on vehicles with Hy-Kers hybrid technology must be in possession of valid accrediting certification.

The operator must observe the instructions and warnings given in the manual precisely and must not implement inappropriate methods or tools, as this may constitute a risk to personal safety and compromise the reliability of the vehicle.

In addition to the guided diagnostic procedure implementable with the FERRARI SD-3 or DEIS tester, each section of the manual contains diagnostic procedures to identify malfunctions of the different components in the vehicle.

Evaluating the impressions of the user is of vital importance, formulating appropriate questions to clearly identify the symptoms of the problem.

Once the cause has been identified, plan the job by consulting the relative informative notes concerning the tools necessary, the reference data for servicing and disassembly and reassembly procedures given in the manual.

Following the methods described in this manual precisely for each job ensures the safety of the user and the quality of the vehicle.

02.03 Using tools and spare parts

Using tools and original spare parts

FERRARI supplies workshops authorised to repair its vehicles with specific tools to ensure that repair work is carried out correctly and safely.

Carrying out any work without using specific FERRARI tools, or using alternative tools, may cause damage to relative component and/or system, voiding the warranty.

Always use original FERRARI spare parts, consulting the relative spare parts catalogue.

In addition to voiding the warranty, using non original components may damage the vehicle and expose the user to danger.

02.04 **Warranty**

FERRARI guarantees its vehicles for 3 years from the date of delivery.

The warranty may be extended if required. For details, see the specific documents "Power brochure" and "Power warranty handbook". For more information, contact the Ferrari Technical Service Department.

Carrying out any work without using specific FERRARI tools, or using alternative tools, may cause damage to relative component and/or system, voiding the warranty. Always use original FERRARI spare parts, consulting the relative spare parts catalogue. In addition to voiding the warranty, using non original components may damage the vehicle and expose the user to danger.

During this period, the appropriate form must be filled out and the S.T. Schedule, which indicates the time specified by FERRARI for the operation, must be consulted for any work on the vehicle.

02.05 Tightening torques

For the fastening of main vehicle components, Ferrari has defined three tolerance classes relative to the rated torque value: The tolerance class is shown in the summary paragraphs concerning tightening torques, at the beginning of each section and/or at the beginning of each paragraph.

Class

A	$\pm 5 \%$
B	$\pm 10 \%$
C	$\pm 20 \%$

03.01 Personal protection

When performing regular maintenance or repairs on the vehicle, the operator must take all precautions necessary to prevent injury and wear the appropriate personal protective equipment.
The personal protective equipment used must comply with applicable safety legislation and must be in excellent condition.

Footwear



Wear safety footwear at all times.

Gloves



Wear safety gloves when working with or near sharp or hot objects and when handling liquids that are harmful to the skin.

Eyewear



Wear safety eyewear when working underneath the vehicle and when handling liquids that are harmful for the eyes.

Ear plugs



Use safety ear plugs when working with the engine running.

03.02 Hazards

Exhaust system and engine	
Danger	Precautions
As the vehicle is used, the components of the exhaust system and the engine itself reach very high temperatures and remain hot long after the engine is switched off.	Always wear insulating gloves when handling these components, or wait as long as necessary for the components to cool.

Electric cooling fans	
Danger	Precautions
After the vehicle is stopped with a warm engine, the electric cooling system fans may activate without warning.	Use particular caution when working near these components.

Petrol	
Danger	Precautions
The petrol contained in the fuel tank and the entire fuel system is highly flammable and, in certain conditions, potentially explosive.	Smoking, sparks and naked flame must not be allowed in the work area or the immediate vicinity. Keep out of reach of children! Always work in a well ventilated area. Never dispose of petrol into the environment!

Used oil	
Danger	Precautions
Prolonged skin contact with used oil may cause severe skin disease.	Keep out of reach of children! To prevent risks, always wear protective gloves and/or wash any areas that have come into contact with used oil thoroughly with soap and water. Never dispose of used oil into the environment!

Hydraulic fluid	
Danger	Precautions
The fluid contained in the brake, clutch and power steering systems is corrosive to plastic, rubber and paintwork and is extremely harmful in the event of contact with the eyes and skin.	In the event of contact, wash the affected area with plenty of running water. To prevent risks, always wear protective eyewear and gloves. Keep out of reach of children! Never dispose of used hydraulic fluid into the environment!

Coolant	
Danger	Precautions
The cooling circuit contains fluid at high temperature and pressure: contact with hot coolant may cause severe burns. Coolant may cause irritation in the event of skin contact and is poisonous if swallowed.	Keep out of reach of children! Never dispose of coolant into the environment!

03.03 Dangerous emissions

Exhaust gas	
Danger	Precautions
The engine must be kept running for certain maintenance procedures. Exhaust gases contain carbon monoxide, a highly toxic gas which may even cause death in the event of prolonged inhalation.	Never run the engine in a closed space; preferably work outdoors or use exhaust extraction systems.
The emissions control devices installed were necessary in order for the vehicle to obtain type approval allowing the vehicle to be driven legally on public roads in compliance with emissions and noise legislation. Removing or tampering with these devices is prohibited by law.	Never puncture the exhaust silencers or remove any of their internal elements. Never use the vehicle with any of these devices removed.
Each of these devices bears a marking or label indicating the type approval number obtained.	Never replace any of the original devices with devices without type approval. These devices must also be kept in proper working order, carrying out all the procedures indicated in the maintenance schedule.

Battery	
Danger	Precautions
As the battery is charged, gases are released which are potentially explosive in the event of contact with sparks or naked flame.	Always charge the battery in a well ventilated area.
The battery also contains sulphuric acid as an electrolyte, which may cause irritation in the event of skin contact.	Always wear appropriate protective garments and a face mask when handling electrolyte.

04.01 Identification numbers

Engine type and number



Located on crankcase.

Gearbox type and number



Located on right hand side of gearbox.

Chassis number



Located on left hand side of windscreen.

Assembly number



Located under engine compartment cross member.

04.02 Identification plates and labels

Low beam type approval



Located on inner side of luggage compartment lid.

Quick release terminal disconnected warning (for vehicles with HELE)



Located behind passenger side footrest mat.

EEC type approval



Located on inner side of luggage compartment lid.

Vehicle identification



Located on rear passenger side pilaster strip.

Passenger airbag hazard warning



Located on passenger side sun visor.

Unleaded fuel



Located on inner side of fuel filler flap.

Radiator containing antifreeze



Located on right hand engine compartment cosmetic shield.

Stop&Start system warning (for vehicles with HELE)



Located on left hand engine compartment cosmetic shield.

Engine and gearbox oil identification



Located on left hand engine compartment cosmetic shield.

Tyre specifications label



Located on inner side of driver door.

TPMS system installed warning



Located on inner side of driver door.

Original paint



Located on inner side of luggage compartment lid.

Max. speed with winter tyres label



Located on rear driver side pilaster strip.

'Do not install child seat facing backwards' warning label



Situated on passenger side lateral dashboard panel.

AC system specifications label

05.01 Performance and consumption

Performance

	0 to 100 Km/h	0 to 200 Km/h	Top speed
DCT gearbox	3.0 seconds	8.7 seconds	> 325 Km/h

Consumption and CO₂ emissions

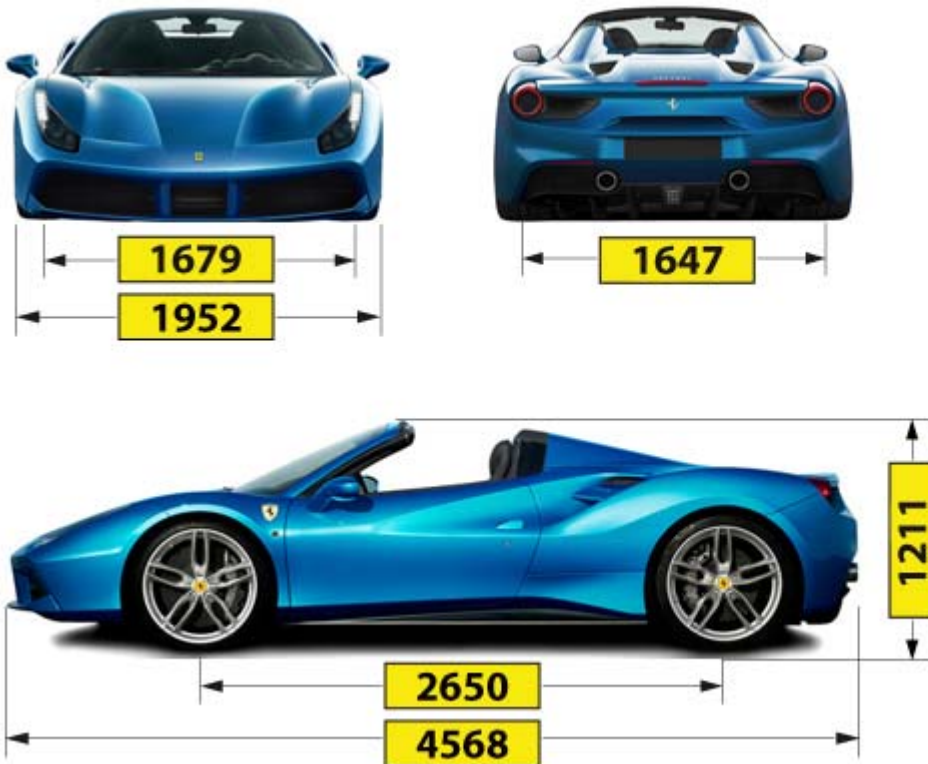
Urban cycle	18.4 l/100 Km 419 g/Km
Extraurban cycle	8.6 l/100 Km 196 g/Km
Combined cycle	12.1 l/100 Km 277 g/Km

Consumption and CO₂ emissions (vehicles with HELE)

Urban cycle	16.6 l/100 Km 377 g/Km
Extraurban cycle	8.4 l/100 Km 193 g/Km
Combined cycle	11.4 l/100 Km 260 g/Km

05.02 Dimensions and weight

Dimensions and weights



Max. length	4568 mm
Max. width	1952 mm
Max. height	1211 mm
Front track	1679 mm
Rear track	1647 mm
Wheelbase	2650 mm
Kerb weight (DCT)	1525 kg (with most commonly chosen combination of options installed)

A1.01 Fluid properties

Engine cooling system (1)	
Protective fluid with antifreeze action for monoethylene glycol-based cooling systems.	50 %
Water	50 %
Windscreen washer/headlight washer system	
Mixture of water and denatured isopropyl alcohol	50 %
Glass cleaner	2 phial



Fluids and lubricants table

Model
<i>488 GTB</i>

- Fluids and lubricants table

[\[Download\]](#)



Scheduled maintenance

Model
<i>488 GTB</i>

- Pre-Delivery Inspection - PDI	[Download]
- Scheduled maintenance plan - Annual	[Download]
- Scheduled maintenance plan - 20,000 km (12,500 miles)	[Download]
- Scheduled maintenance plan - 40,000 km (25,000 miles)	[Download]
- Scheduled maintenance plan - 60,000 km (37,500 miles)	[Download]
- Scheduled maintenance plan - 80,000 km (50,000 miles)	[Download]
- Scheduled maintenance plan - 100,000 km (62,500 miles)	[Download]
- Scheduled maintenance plan - 120,000 km (75,000 miles)	[Download]

A3.01 Checking engine oil level and changing engine oil and engine lubrication system filters

Checking engine lubrication oil level



When checking the engine oil level, the vehicle must be on a level surface and the engine must be warm.

➤ Open the engine compartment lid (E5.11).

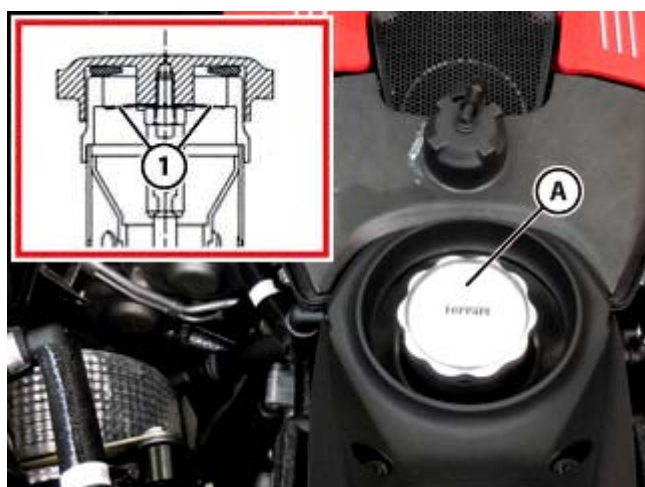
- Start the engine (E5.08).
- Switch off the AC system compressor by pressing the relative button on the AC system control panel.
- Wait for the engine oil temperature to reach **90 °C**.

 Do not use the engine coolant system temperature as reference.

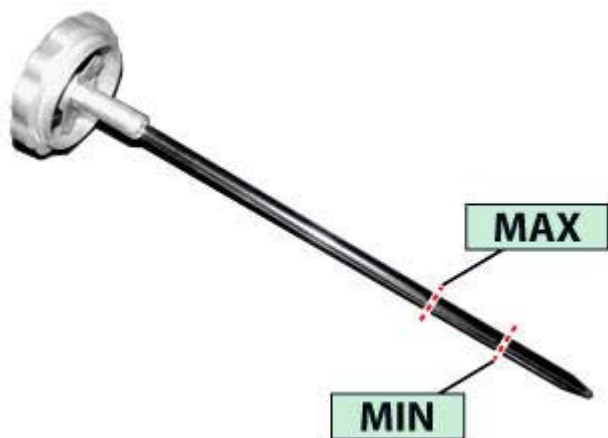
- Leave the engine running at idle speed for **2 minutes**.
- Keep the engine running while checking the engine oil level.



- Undo and remove the cap **(A)**.



- Wipe the engine oil dipstick on the cap **(A)**.
- Fit the cap **(A)** on the tank filler pipe, ensuring that the cap springs **(1)** are seated correctly.
- Undo and remove the cap **(A)**.



- Check that the engine oil level is between the **MIN** and **MAX** limits indicated on the dipstick.

i The **MIN** and **MAX** limits are indicated on the dipstick.

i The gap between the **MIN** and **MAX** limits corresponds to approximately 1.5 litres of oil.



If the level is too low, identify the cause of excessive oil consumption before proceeding.



Top up the engine oil using only new oil of the type specified in the fluids and lubricants table.

- If the engine oil level is near or below the **MIN** limit, switch off the engine and top the system up to between the **MIN** and **MAX** limits with new engine oil of the specified type.

- Fit and tighten the cap **(A)** securely.



- Repeat the entire procedure after topping up.

➤ Close the engine compartment lid (🔧 E5.11).

Draining the engine lubrication system



Pour the oil drained from the system into a container and seal it. DO NOT dispose of used oil in the environment.

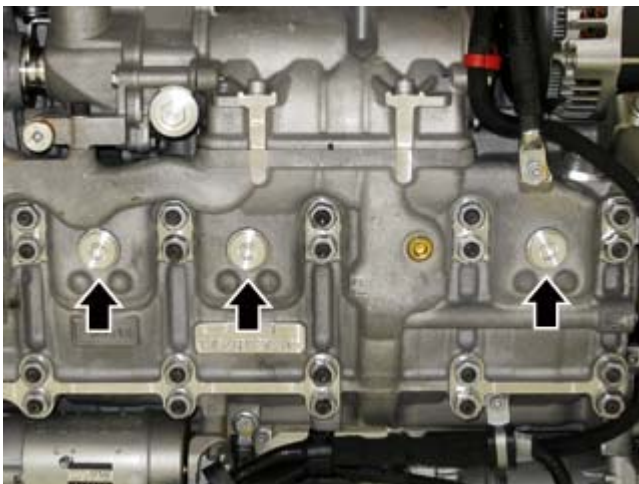
➤ Remove the flat undertray sections (🔧 E3.12).



Remove the rear flat undertray section.



- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.
- Wait for the oil to drain completely.



- Place a container for collecting oil under the indicated plugs.
- Undo the indicated plugs.
- Wait for the oil to drain completely.

Replacing the engine lubrication system oil filter

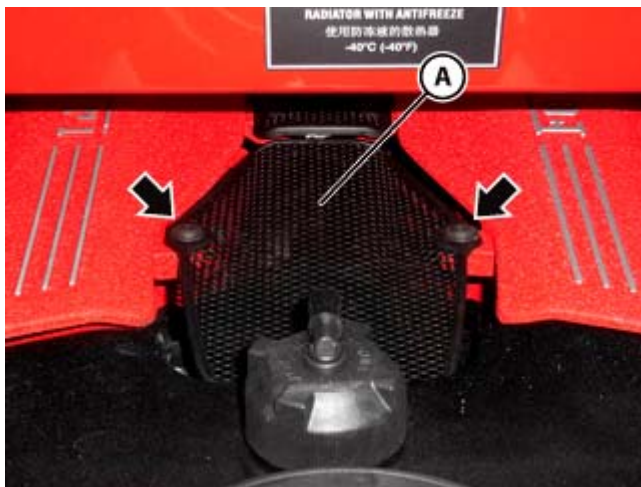
			
Tightening torque		Nm	Class
Fastening the engine lubrication system oil filter	Engine oil filter cartridge	25^{+0}_{-5} Nm	A
Fastening intake manifold cosmetic grille	Screw	8 Nm	B



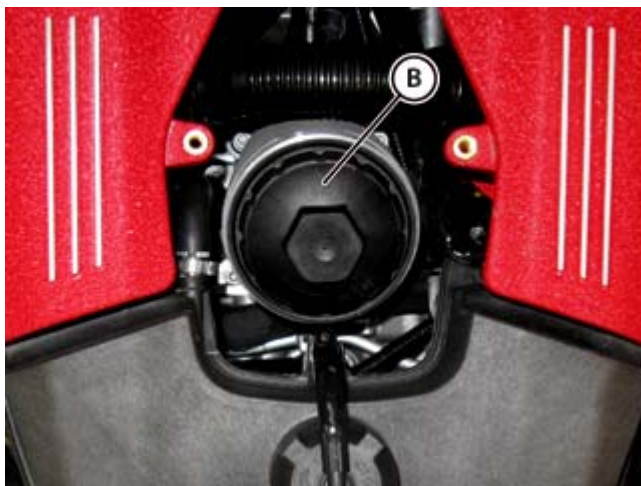
Replace damaged parts or parts that have been dropped, even if there is no visual damage.

The engine oil filter must be replaced after every engine oil change.

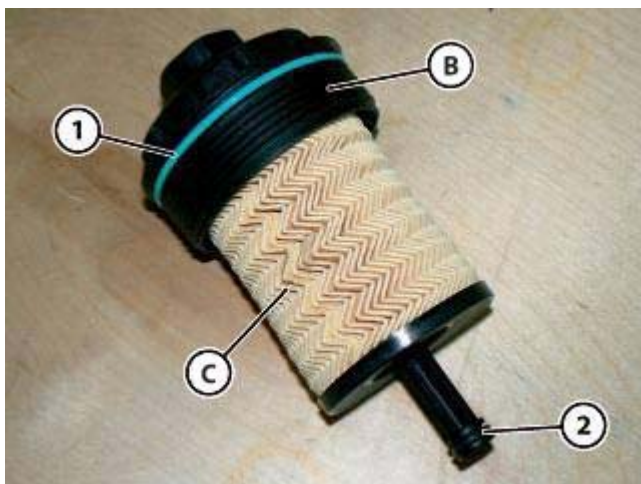
- Drain the engine lubrication system ( A3.01).
- Open the engine compartment lid ( E5.11).



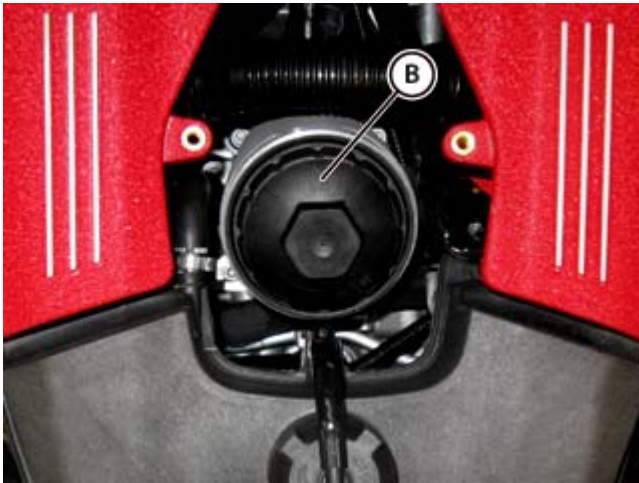
- Undo the screws indicated.
- Remove the cosmetic grille **(A)**.



- Undo the cap **(B)**.
- Protect the area surrounding the cap **(B)** with absorbent cloths.
- Remove the cap **(B)**, complete with engine oil filter.

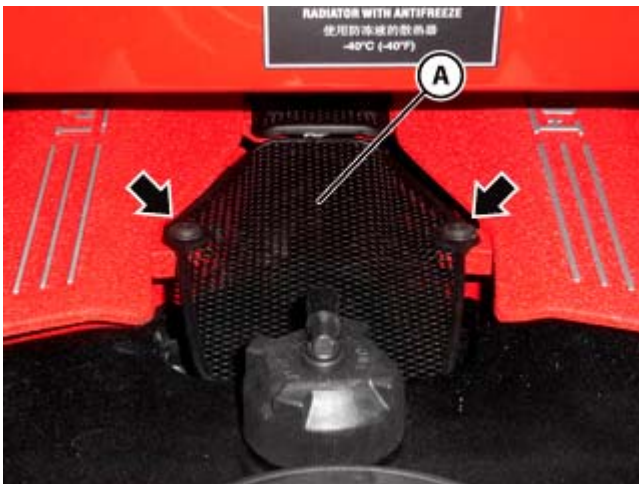


- Detach the cap **(B)** from the filter **(C)**.
- 
 Replace damaged parts or parts that have been dropped, even if there is no visual damage.
- Replace the seal **(1)**, refitting in the correct position and taking care not to damage the respective seat.
- 
 DO NOT assemble the filter element if the drain pipe O-ring is missing.
- Replace the filter **(C)**, ensuring that the seal **(1)** is fitted correctly on the drain pipe.
- Fasten the filter **(C)** to the cap **(B)**.
- Lubricate the gasket **(1)** with the specified engine oil.



- Fit the cap **(B)** correctly, complete with filter.
- Tighten the cap **(B)**.

		
Tightening torque	Nm	Class
Engine oil filter cartridge	25^{+0}_{-5} Nm	A



- Fit the cosmetic grille **(A)**.
- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Fill the engine lubrication system ( A3.01).
- Check the engine lubrication oil level ( A3.01).
- Close the engine compartment lid ( E5.11).

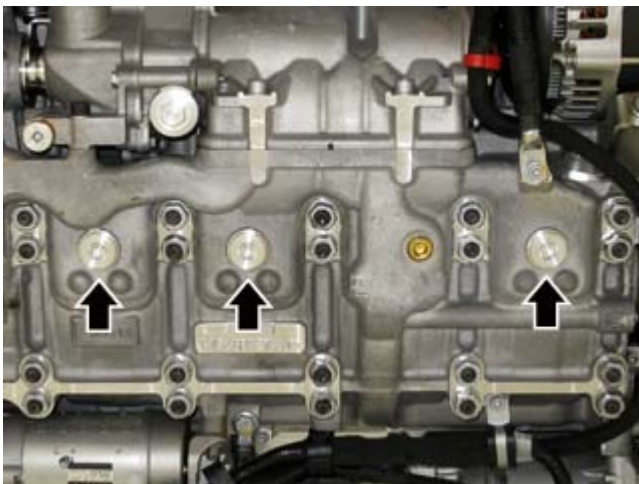
Filling the engine lubrication system

			
Tightening torque		Nm	Class
Fastening the engine lubrication system drain plugs	Plug	50 Nm	B
	Plug	40 Nm	B



- Clean the indicated plug thoroughly with a suitable degreaser that does not leave residue.
- Definitively tighten the indicated plug, replacing the respective gasket.

		
Tightening torque	Nm	Class
Plug	50 Nm	B



- Clean the indicated plugs thoroughly with a suitable degreaser that does not leave residue.
- Replace the respective seals and fit and tighten the indicated plugs.

		
Tightening torque	Nm	Class
Plug	40 Nm	B

- Lower the vehicle.



- Undo and remove the cap **(A)**.
 Fill the engine lubrication system using only new oil of the type specified in the fluids and lubricants table.
- Gradually add new oil of the specified type to the tank.
- Due to inevitable pooling within the lubrication system, the actual quantity of oil added may vary from vehicle to vehicle.
- Check the engine lubrication oil level ( [A3.01](#)).
- Fit and tighten the cap **(A)** securely.

- Check that there are no leaks from the drain plugs.
- Refit the flat undertray sections ( [E3.12](#)).

A3.02 Inspecting oil level and replacing Shell Transaxle 75W-90 GL5 gear oil

Checking the Shell Transaxle 75W-90 GL5 gear oil level

			
Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B



The following procedures must be carried out exactly as described to ensure that the hydraulics are properly lubricated and function correctly.



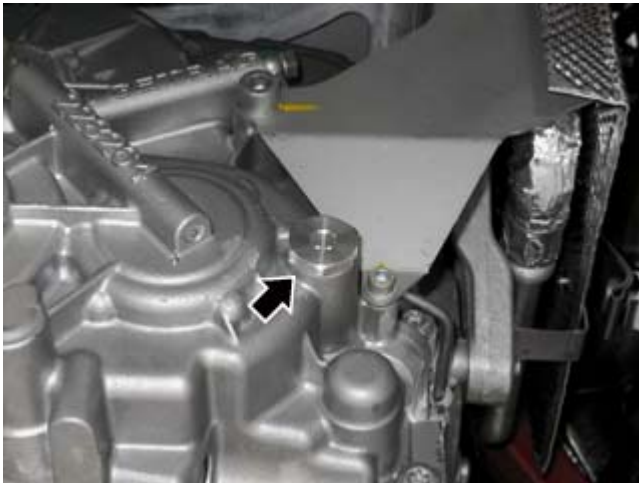
To check the gear oil level correctly, carry out the following procedures precisely as described.

- Remove the flat undertray sections ( E3.12).
-  Remove the rear flat undertray diffuser.

- Ensure that the vehicle is NOT on a gradient.
- Start the engine ( E5.08).
- Keep the engine running at idle speed.
- Select reverse **R** and hold the brake pedal.
- Check that the clutch system ATF fluid temperature DOES NOT exceed **40 °C**.
- Check that the engine coolant temperature is between **40** and **50 °C**.



- Select element **01** of the pump (**AV 8174**).



- Place a container for collecting oil under the indicated plug.



CAUTION

HOT OIL may be released: use adequate protection.

- Unscrew the indicated plug.



If the level is too low, identify the cause of excessive oil consumption.

- Using element **01** of the pump (**AV 8174**), add oil of the specified type through the level inspection orifice until oil overflows from the orifice itself.
- Wait for all the excess oil to drain.



- Replace the plug, fitting and tightening the new component.

		
Tightening torque	Nm	Class
Plug	25 Nm	B

- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray diffuser.

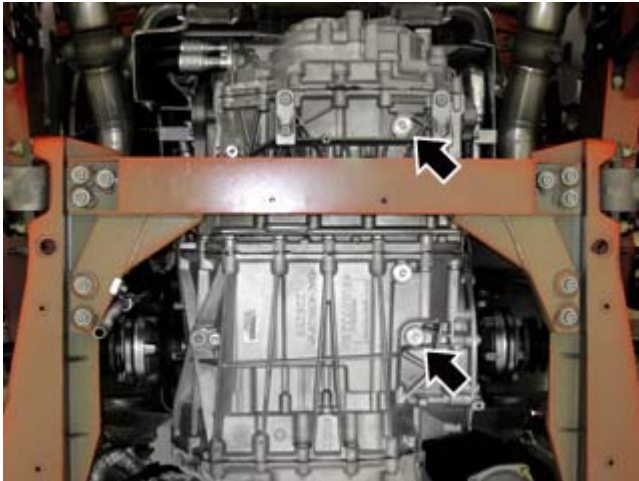
Draining the Shell Transaxle 75W-90 GL5 gear oil



ALWAYS dispose of liquids correctly in accordance with applicable legislation.
Collect all liquids drained from the vehicle systems in appropriate airtight containers, then close the containers.

The gear oil must be changed at the intervals specified in the MAINTENANCE SCHEDULE.

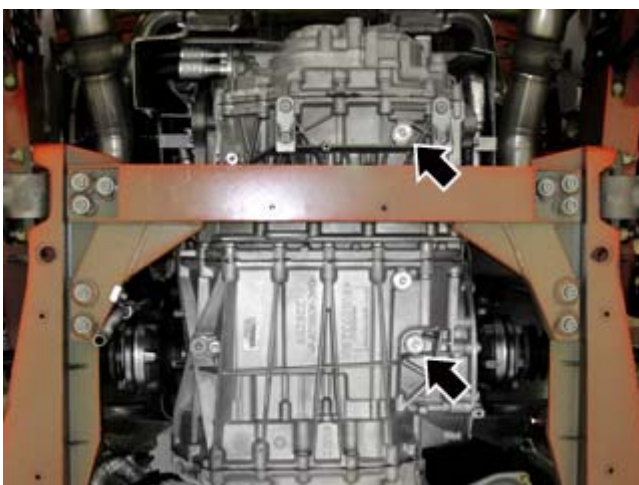
- Remove the flat undertray sections ( E3.12).
-  Remove the rear diffuser and the rear flat undertray section.



- Place a container for collecting oil under the indicated plugs.
- Undo the indicated plugs.
- Wait for the oil to drain completely.

Filling the system with Shell Transaxle 75W-90 GL5 gear oil

			
Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B



- Replace the indicated plugs, fitting and tightening the new components.

		
Tightening torque	Nm	Class
Plug	25 Nm	B



- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.



- Select element **01** of the pump (**AV 8174**).



- Using element **01** of the pump (**AV 8174**), gradually add oil of the specified type through the level inspection orifice until oil overflows from the orifice itself.
- Waiting a few minutes between attempts, repeat the previous step as necessary until oil overflows immediately when added.
- *i* The actual oil necessary may vary from the total fill value specified for an empty system due to inevitable pooling in the system itself.
- Check the Shell Transaxle 75W-90 GL5 gear oil level ( **A3.02**).



- Replace the plug, fitting and tightening the new component.



Tightening torque	Nm	Class
Plug	25 Nm	B

- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray section and the rear diffuser.

A3.03 Checking Shell DCT F-3 hydraulic clutch system fluid level

Checking Shell DCT F-3 hydraulic clutch system fluid level

			
Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B



The following procedures must be carried out exactly as described to ensure that the hydraulics are proper lubricated and function correctly.



To check the hydraulic clutch system fluid level correctly, carry out the following procedures precisely as described.

➤ Remove the flat undertray sections ( E3.12).

 Remove the rear flat undertray section.

- Ensure that the vehicle is NOT on a gradient.
- Start the engine ( E5.08).
- Keep the engine running at idle speed.
- Select neutral **N**.

 Alternatively, select reverse **R**.

- Wait for the ATF fluid temperature to reach approximately **60 °C**.
-  Check that the ATF fluid temperature does NOT exceed **80 °C** at any point during the operation.
- Check that the engine coolant temperature is between **40** and **50 °C**.



- Select element **02** of the pump ( **8174**).



- Place a container for collecting oil under the indicated plug.



CAUTION

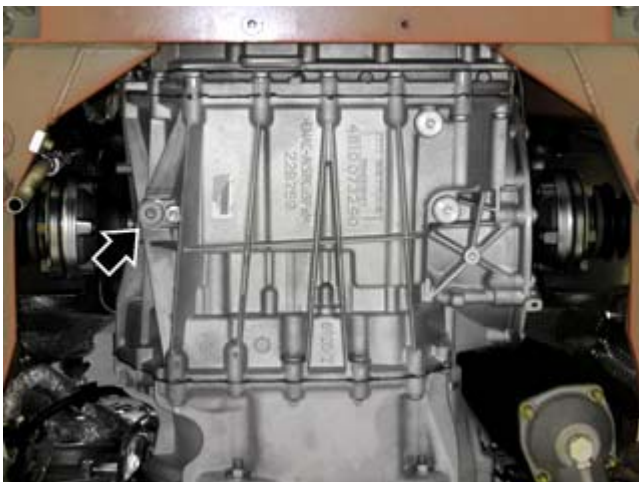
HOT OIL may be released: use adequate protection.

- Unscrew the indicated plug.



If the level is too low, identify the possible causes for excessive consumption before refilling.

- Using element **02** of the pump (**AV 8174**), top up the level by gradually adding oil of the specified type through the level inspection orifice until oil overflows from the orifice itself.
- Wait for all the excess oil to drain.



- Replace the plug, fitting and tightening the new component.

		
Tightening torque	Nm	Class
Plug	25 Nm	B

- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray section.

A3.04 Checking the windscreen and headlight washer fluid level

Checking the windscreen and headlight washer fluid level

➤ Open the luggage compartment lid (📖 E5.11).



- Prise open the cap **(A)**.
- Check that the level of the windscreen/headlight washer fluid level is visible in the filler neck.
- If the level of the windscreen/headlight washer fluid level is not visible in the filler neck, top up with the specified fluid until the level is visible in the filler neck.
- Close the cap **(A)**.

- A level sensor mounted on the reservoir detects when the windscreen/headlight washer fluid level is too low and causes the relative warning light on the control panel to light.

➤ Close the luggage compartment lid (📖 E5.11).

A3.05 Checking brake system fluid level

Checking brake fluid reservoir level

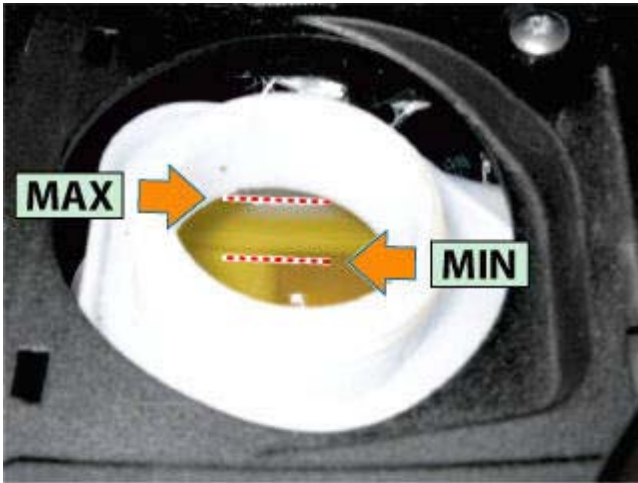


 The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.

- Detach and remove the cover **(A)**, prising off in the position indicated.



- Undo and remove the cap **(B)**.



Hydraulic brake fluid is corrosive.

Contact with brake fluid may cause severe injury or damage to painted parts of the vehicle.

In the event of skin contact with fluid, wash the respective part of the body immediately with plenty of water.

In the event of contact between the fluid and painted parts of the vehicle, wash and dry the respective areas immediately.

- Visually check that the brake fluid level in the reservoir is near the **MAX** limit.



- Levels approaching the **MIN** limit may be indicative of excessive brake fluid consumption.

- If the level is near the **MIN** limit, top the system up with brake fluid as follows.



Always use fresh oil of the recommended type and in the quantity indicated, taken from sealed containers.



The circuit is filled with synthetic oil.

Using mineral oil may cause irreparable damage to the rubber seals in the system.

- Add new brake fluid of the type specified to reach the **MAX** level.

- Fit and tighten the cap **(B)** securely.





The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.

- Fit the cover **(B)** and fasten by pressing in the position indicated.

A3.06 Checking power steering system fluid level

Checking the power steering system fluid level



The power steering fluid level must be checked with the system warm, after driving for at least 15 Km. If checked cold, the level may appear to be excessively low even with the correct amount of fluid in the system.

➤ Open the engine compartment lid (🔧 E5.11).



- Undo and open the cap **(A)**.



- Use the dipstick on the cap **(A)** to check that the power steering fluid level is between the **MIN** and **MAX** levels.

i There are MIN and MAX limits indicated on both sides of the dipstick. Refer to the limits on the side of the dipstick indicating a temperature of **90°C**.



Always use fresh oil of the recommended type and in the quantity indicated, taken from sealed containers.



The circuit is filled with synthetic oil. Using mineral oil may cause irreparable damage to the rubber seals in the system.

- If the level is near the **MIN** level, top up with power steering fluid to reach the **MAX** level.

i Levels approaching the **MIN** limit may be indicative of excessive power steering fluid consumption.



- Close and tighten the cap **(A)** securely.

A3.07 Checking engine coolant level and topping up

Checking the cooling system fluid level



CAUTION

The fluid in the engine coolant system may be very hot.
Hot engine coolant may cause severe burns.

ALWAYS WAIT FOR THE SYSTEM TO COOL BEFORE STARTING ANY WORK.

➤ Open the engine compartment lid (📄 E5.11).



- Undo and open the cap (A).



- Check via the filler neck that engine coolant is visible in the reservoir.
- If the fluid is not visible, top up with the specified coolant until the level can be seen.



- Fit and tighten the cap **(A)**.

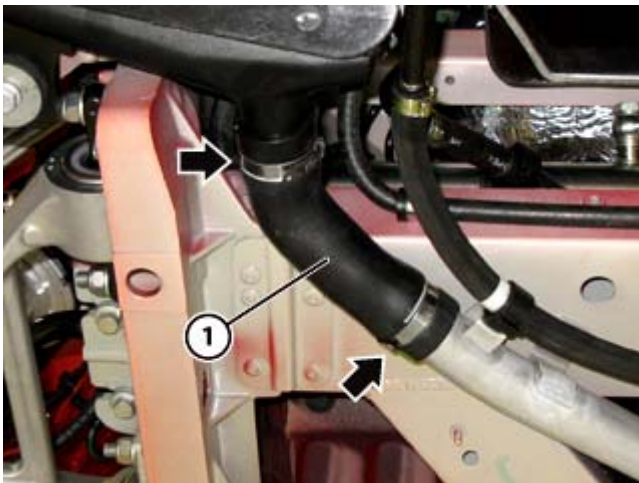
➤ Close the engine compartment lid (🔧 E5.11).

Filling and bleeding the coolant system

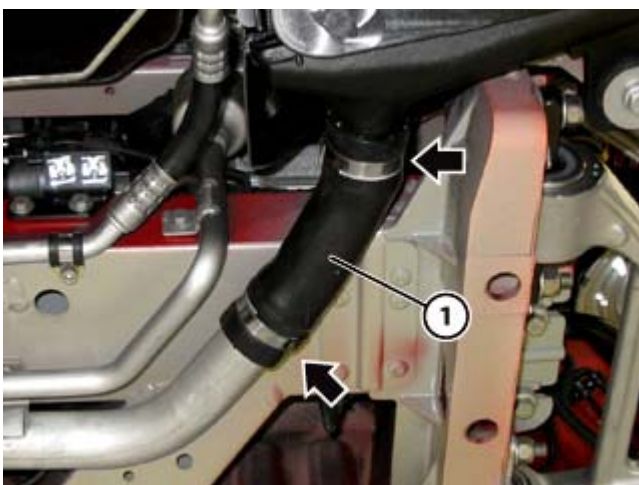


After loosening or removal, the Caillau Visa hose clamps must be replaced with Mikalor worm drive hose clamps, following the instructions given in Technical Information 2054 of December 2012.

➤ Open the engine compartment lid (🔧 E5.11).



- Fit and fasten the connector hose **(1)**.
- Fit and tighten the indicated collars.



- Fit and fasten the connector hose **(1)**.
- Fit and tighten the indicated collars.

Static filling (engine off)



- Undo and open the cap **(A)**.



- Add coolant of the specified oil to the tank gradually to reach the **MAX** level.



- Close and tighten the cap **(A)** securely.

Dynamic filling (engine on)

- Check that the heater is off.
- Start the engine ( E5.08).
- Let the engine **idle** for **5 minutes**.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **30 seconds**.
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **30 seconds**.
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **2 minutes**, or until the electric radiator fans are activated.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 2,000 rpm** for **1 minute**.
- Let the engine **idle** for **30 seconds**.
- Turn on the heater by setting the maximum temperature on the air conditioning and heating system for both passenger compartment zones.
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Allow the engine to return to **idle speed** and leave to idle for **2 minutes**.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Turn off the heater.
- Stop the engine ( E5.08).
- Wait for the engine coolant temperature to reach **40 - 45 °C**.
- Check the cooling system fluid level ( A3.07).

➤ Refit the flat undertray sections ( E3.12).

 Refit the front flat undertray sections.

➤ Close the engine compartment lid ( E5.11).

A3.08 Replacing the active carbon filter

Removing the active carbon filter

- Preparation in progress

Refitting the active carbon filter

- Preparation in progress

A3.09 Replacing the oxygen sensors

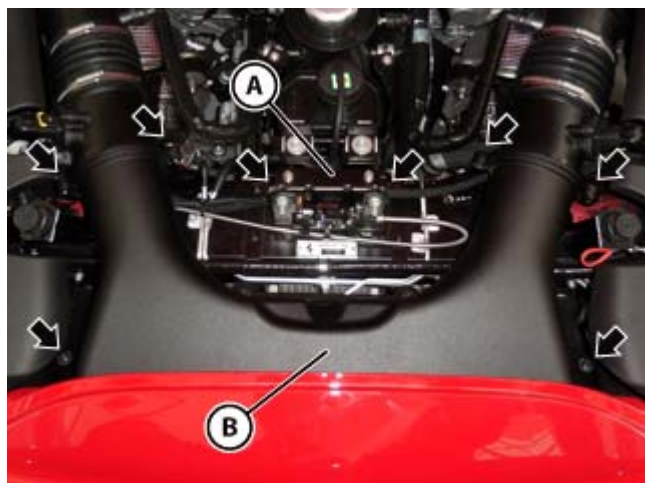
Replacing the oxygen sensors

- Preparation in progress

A3.10 Replacing the engine air filter

Replacing the engine air intake system filter

- Remove the engine compartment cosmetic shields (🔧 E3.13).
- Remove the central cosmetic engine compartment shield.



- Mark the position of the bracket **(A)**.
- Undo the indicated screws fastening the bracket **(A)**.
- Remove the bracket **(A)** complete with engine compartment lid lock.
- Undo the screws indicated fastening the air filter box cover **(B)**.



WARNING: take care not to damage the bodywork during air filter box cover handling.

- Prise out and move the air filter box cover **(A)** forward out of its seat.
- Remove and replace the filter.
- Fit the new filter.



WARNING: take care not to damage the bodywork during air filter box cover handling.

- Fit and move back the air filter box cover **(A)** by pushing it into its seat.
- Tighten the indicated screws fastening the cover **(B)**.
- Fit the bracket **(A)** in the marked position complete with engine compartment lid lock.
- Tighten the indicated screws fastening the bracket **(A)**.

- Refit the engine compartment cosmetic shields (🔧 E3.13).
- Refit the central cosmetic engine compartment shield.

A3.11 Replacing the air conditioning and heating system filter

Replacing the air conditioning and heating system filter

- Preparation in progress

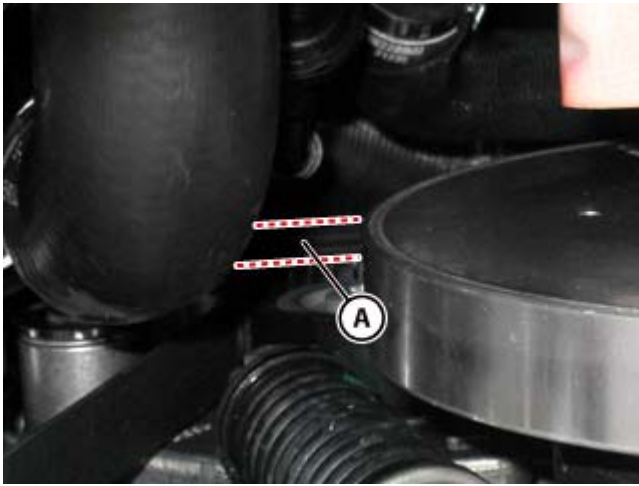
A3.12 Checking tension and replacement of auxiliary utilities belts

Checking tension of the engine ancillaries drive belt



Check the belt tension with a cold engine.

- Start the engine.
- Let the engine idle for a few seconds.
- Switch off the engine.
- Remove the flat undertray sections (E3.12).
- Remove the rear flat undertray section.



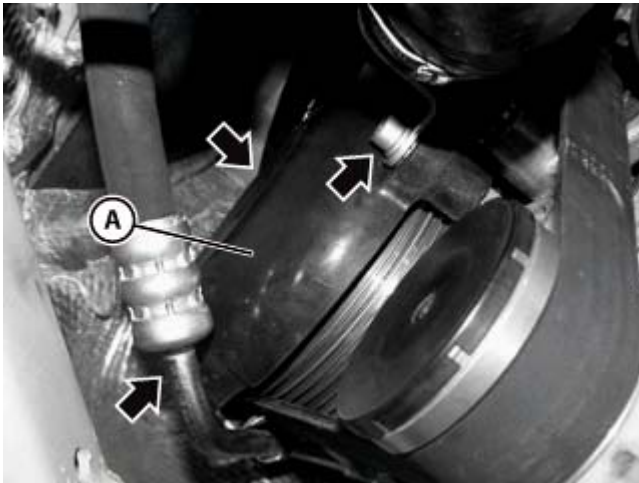
- Place the frequency probe of the tension meter (95978151) near the section of belt indicated by dotted lines (A), but without touching the belt itself.
- Tap the belt with a suitable tool near the tension probe and check that the value read by the meter is as specified.

- Replace the belt if the frequency measured is lower than the specified value.
- Replace the engine ancillaries drive belt tensioner (A3.12).
- Perform if the frequency measured is still lower than the specified value after replacing the belt.

- Refit the flat undertray sections (E3.12).

Removing the engine ancillaries drive belt

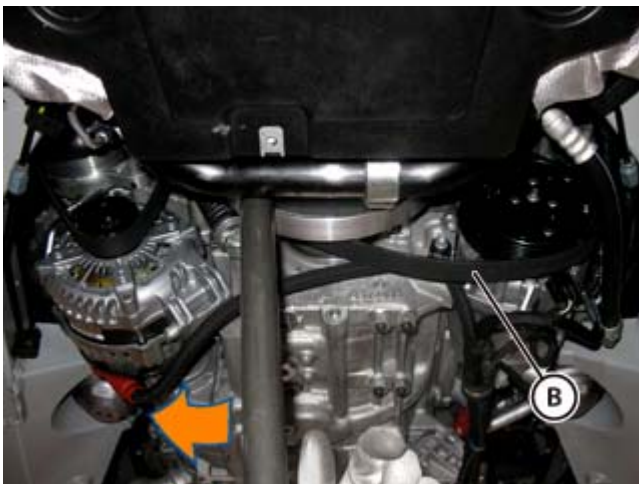
- Remove the flat undertray sections (E3.12).
- Remove the rear flat undertray section.



- Undo the screws indicated.
- Remove the soundproofing cover **(A)**.



- Turn the tool **(AV 8827)** with the groove facing the dumper and insert in the square hole on the belt tensioner arm.
- Connect a wrench fitted with an extension to tool **(AV 8827)**.



Do not apply a force greater than 60 Nm when loosening the belt tensioner.

- Using the tools connected to tool **(AV 8827)**, loosen the tension of the belt tensioner by turning **clockwise**.
- Detach the belt **(B)** from the belt tensioner pulley.
- Remove tool **(AV 8827)**.
- Detach and remove the belt **(B)** from the lower pulleys and upper pulleys.

Refitting the engine ancillaries drive belt

			
Tightening torque		Nm	Class



Tightening torque

Fastening soundproofing cover on power steering pump

Screw

Nm

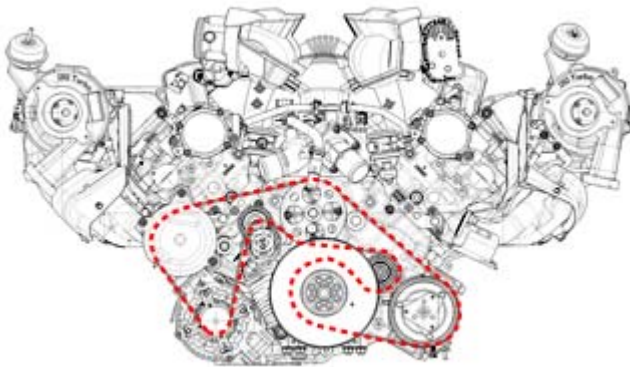
10 Nm

Class

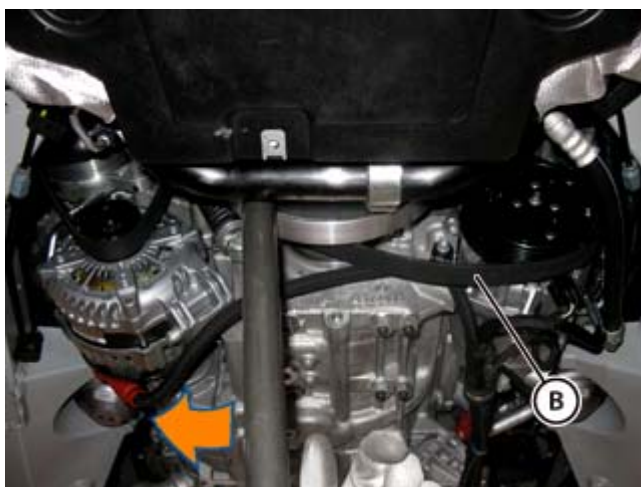
B

- Lift the vehicle ( E3.12).

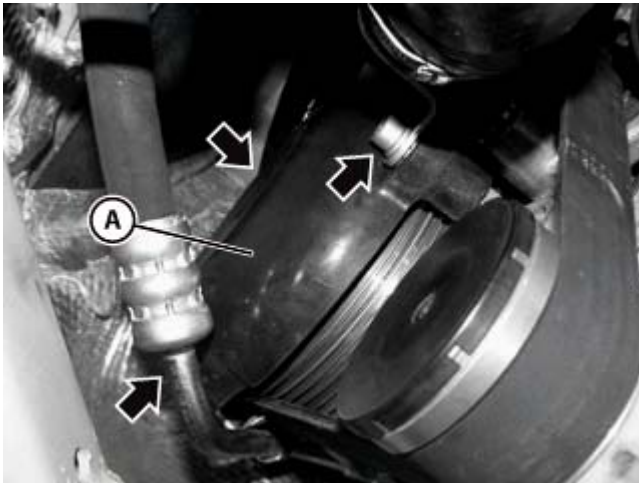
- Fit and seat the belt onto the upper and lower pulleys, following the correct path shown.



- Turn the tool (**AV 8827**) with the groove facing the dumper and insert in the square hole on the belt tensioner arm.
- Connect a wrench fitted with an extension to tool (**AV 8827**).



- Using the tools connected to tool (**AV 8827**), loosen the tension of the belt tensioner by turning **clockwise**.
- Fit the belt onto the belt tensioner pulley.
- Remove tool (**AV 8827**).



- Fit the soundproofing cover **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B

- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray section.

Replacing the engine ancillaries drive belt tensioner

			
Tightening torque		Nm	Class
Fastening belt tensioner	Screw	55 Nm	B

- Remove the engine ancillaries drive belt ( A3.12).



- Undo the indicated screw.



- Undo the indicated screw.
- Remove the belt tensioner **(A)** and replace.
- Fit the new belt tensioner **(A)**.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	55 Nm	B



- Tighten the indicated screw.

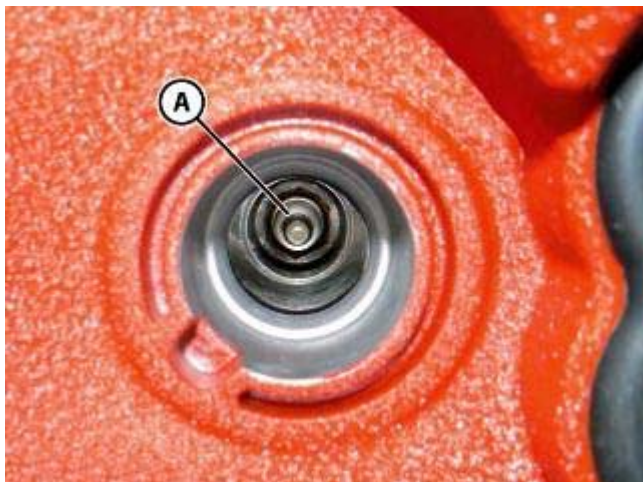
		
Tightening torque	Nm	Class
Screw	55 Nm	B

➤ Refit the engine ancillaries drive belt (🔧 A3.12).

A3.13 Checking and replacing spark plugs

Removing the spark plugs

- Disconnect the battery ( F2.01).
- Remove the ignition coils ( F3.02).



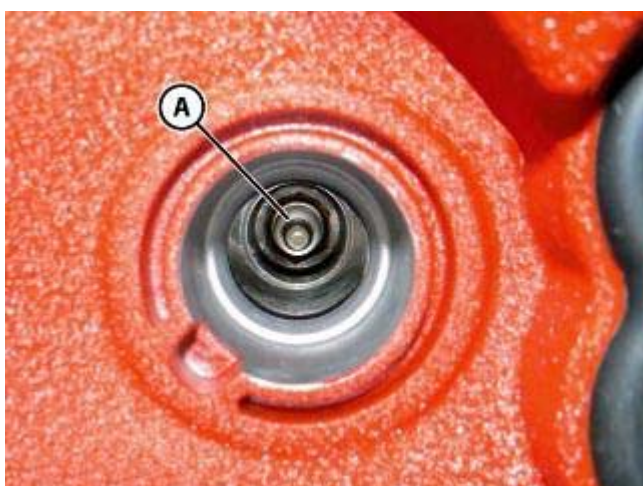
- Using a universal articulated wrench, undo and remove the spark plugs **(A)**.

Refitting the spark plugs

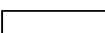


Tightening torque		Nm	Class
Fastening spark plug	Spark plug	11 Nm	A

- Check that the spark plugs are in good condition and replace if necessary.
- Check that the spark plug electrode gap is between 0.6 and 0.7 mm. Oil the threaded part of the spark plug with very little oil.



- When refitting the original spark plugs **(A)**, clean with compressed air to remove any dirt.
- Fit the spark plugs **(A)** in the relevant holes in the cylinder head.
- Use an articulated wrench **(A)** to snug the spark plugs and bring the gasket into contact with the mating surface on the head.
- Unscrew the spark plugs **(A)** slightly.
- Definitively tighten the spark plugs **(A)**.

		
Tightening torque	Nm	Class
Spark plug	11 Nm	A

- Refit the ignition coils ( F3.02).
- Connect the battery ( F2.01).

A3.14 Checking Blow-by system pipes and connections

Checking Blow-by system pipes and connections

- Remove the engine compartment cosmetic shields (E3.13).
- Remove central cosmetic shield.



- Check the condition of the indicated unions of the respective pipes.
- Check for leaks or seepage and replace any pipes necessary.

A3.15 Checking cooling system pipes and connections

Checking cooling system pipes and connections



After loosening or removal, the Caillau Visa hose clamps must be replaced with Mikalor worm drive hose clamps, following the instructions given in Technical Information 2054 of December 2012.

➤ Remove the flat undertray sections ( E3.12).

- Check that the pipes and pipe unions on the water pump, the radiators and the expansion tank are undamaged.
- Replace any worn pipe unions or loose clamps.

A3.16 Checking injection and ignition system pipes and connections

Checking injection and ignition system pipes and connections

- Remove the engine compartment cosmetic shields ( E3.13).
- Check the state of the connection pipes between the fuel tank and the high pressure pump, and of the fuel rail on the intake manifold.
- In the event of leakage, replace the pipe and check the system.
- Remove the rear wheelhouses ( E3.05).
- Check the state of the cables and connectors for the Motronic ECUs and the coils. If the outer casing or the connector locks are damaged, replace the cable.
- In the event of malfunction, check the spark plugs. Replace the spark plugs at the intervals indicated in the MAINTENANCE SCHEDULE.

A3.17 Checking exhaust system connections

Checking exhaust system connections

- Remove the flat undertray sections ( E3.12).
 - Remove the rear flat undertray diffuser.
- Remove the rear wheelhouses ( E3.05).
- Remove the engine compartment cosmetic shields ( E3.13).
- Check the state of the system components, the connections between the manifolds and the catalytic converters, and the connections between the catalytic converters and the silencers, then check the fasteners.

A3.18 Checking exhaust emissions

Exhaust gas analysis

Test Drive (details of procedure)

- Preferably test drive the vehicle after it has been left unused overnight. The difference between the engine temperature and ambient temperature on starting must be between 3°C and 37.5°C, and the fuel level must be between 15% and 85%.
- Self-adaptive parameters must be reset (simply cancel errors to reset).
- **TEST DRIVE procedure:**
- With the engine cold, start the engine and leave to idle for 4 minutes without accelerating.
- Drive the vehicle normally for approximately 6 Km at constant speed, in 3rd or 4th gear with an engine speed between 2,000 and 2,500 rpm, and without accelerating suddenly or changing gear too frequently.
- Accelerate gradually to 6,000 rpm, then slow to an engine speed of 2,000 rpm. Repeat eight times.
- Stop the vehicle, leave the engine idling for 5 minutes, then switch off the engine.
- Wait at least 15 minutes.
- Start the engine and drive the vehicle normally for at least 20 minutes with accelerating suddenly or changing gear too frequently.

Exhaust gas analysis (details of procedure)

- Remove the engine compartment cosmetic shields (🔧 E3.13).
- Connect the DEIS diagnostic tester to the diagnostic socket (🔧 F2.08).
- Perform the cycle "**170 NCM Exhaust gas test**" with the DEIS Diagnostic Tester.



- Perform test at the outlet ports of the cylinder head in the following conditions: engine temperature above 90°C, engine at idle speed and A/C system ON.
- Check CO, HC CO2 and O2 levels by connecting the tester to the unions on the catalytic converters, after removing the two nuts (1).
- If the values are not within the specified limits, see the most recent Technical Information relative to the "Engine Fault Check List".
- After completing the procedure, tighten the two nuts (1).

➤ Refit the engine compartment cosmetic shields (🔧 E3.13).

A3.19 Checking service brakes for wear

Checking service brakes for wear

- At the intervals indicated in the Maintenance Schedule, check the state of wear of the brake pads and discs.
- Remove the wheels ( D2.01).
- The front brake pads are fitted with a wear indicator connected to the brake failure warning light on the instrument panel. Should this warning light illuminate, check the thickness of the pads and the state of the braking surfaces on the discs.
- In the event of excessive wear, even of just one pad, replace all the pads on the axle.

Checking and inspecting the brake discs

The brake discs must be perfectly clean, free of any oil, grease or rust, and must not be excessively scored.

In the event of poor braking performance not attributable to the state of the brake pads and callipers, carry out a series of dimensional checks on the discs.

- Using a dial gauge, measure the planarity with the disc fitted on the wheel hub.
 - Using a micrometer, measure the parallelism between the contact surfaces and the pads at different points on the braking surface.
 - Using the special tool, check the roughness of the pad contact surface.
- The rear discs differ from the front discs in that they have two additional holes to enable access to the brake shoe adjustment pin without removing the disc.
- They also have a large friction surface on the inner side for the parking brake.

Checking CCM brake disc wear

- This operation includes:
 - visually inspecting for alterations in the brake disc friction surface;
 - checking the minimum brake disc thickness (maximum permitted wear **0.5 mm**);
 - checking the brake disc edges for damage (damage caused by improper use).
-
- The brake discs must be replaced if:
 - there are significant alterations in the friction surface;
 - the brake discs are worn beyond the minimum required thickness (material abraded).
-
- Normally, both forms of brake disc wear occur simultaneously. Only rarely, following prolonged stress on the race track with large temperature variations on the friction surface, surface alteration may become so pronounced as to necessitate earlier replacement of the brake discs.



Always replace the CCM brake discs on both sides of the same axle.

- Front and rear CCM disc wear is calculated by the instrument panel operating software, which uses an algorithm to determine when to switch on the relative indicator to warn the driver.



The bedding-in procedure must always be performed after replacing the brake discs or the brake pads.

- Disc replacement is necessary when the wear limit is reached, as indicated by the relative warning on the TFT display, or if visual inspection reveals any surface damage.

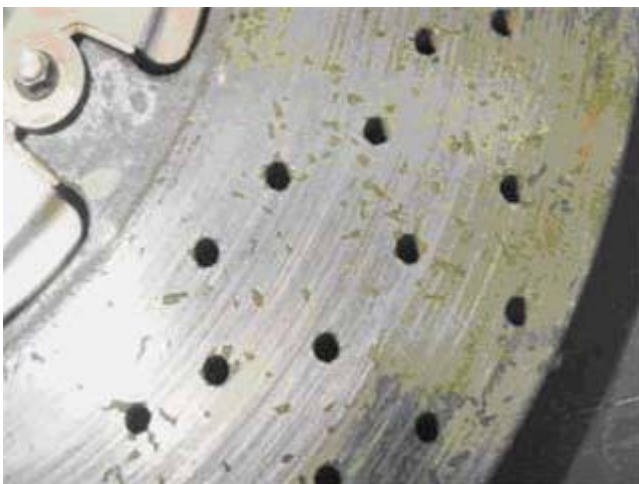
- **Visual inspection of the disc friction surface**

- The alterations in the friction surface are caused by the material oxidising as a result of extremely high thermal stress. The high temperatures reached by the brake discs, especially in race track conditions, cause the material to oxidise progressively.
- Surface alteration is detrimental to braking comfort, reduces brake disc resistance and increases pad wear, requiring the replacement of components earlier than scheduled.

- Understanding the signs of brake disc wear and consequent operations necessary:



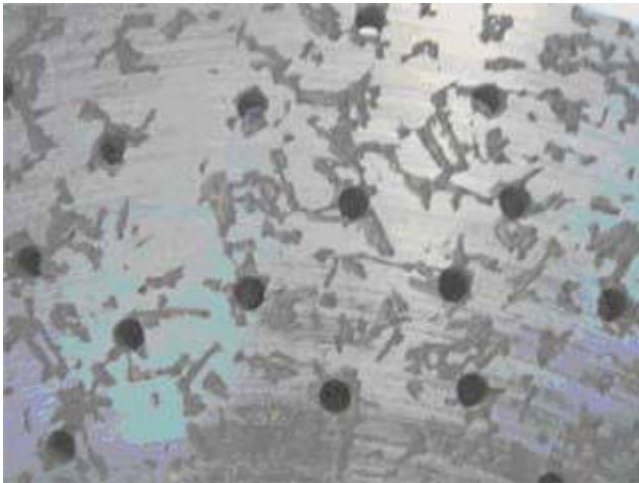
- The figure aside shows the friction surface after normal brake usage in road conditions; disc replacement is not necessary in this case.



- The figure aside shows the friction surface after a long journey, with only one intense brake application; here too, disc replacement is not necessary.



- The figure aside shows the friction surface after an appropriate mileage or following maximum stress in track conditions; disc replacement is necessary in this case.



- The figure aside shows the friction surface after an appropriate mileage or following maximum stress in track conditions; disc replacement is necessary in this case.

- **Checking minimum disc thickness**

- The minimum thickness of cross-drilled discs must always be measured at the base of the inner or outer friction surface track. Use a suitable micrometrical screw or a brake disc template.
- Maximum permissible wear is **0.5 mm**

- **Checking disc edges for damage**



Regardless of the overall state of wear, the disc must be replaced if it shows signs of damage around the edge.



Any unauthorised mechanical work on the holes in the surface of the disc may damage the brake disc itself.

If necessary, clean the holes in the disc brake and the friction surface of the rotor with a pressure cleaner.

Do not perform any mechanical work on the holes in the disc.

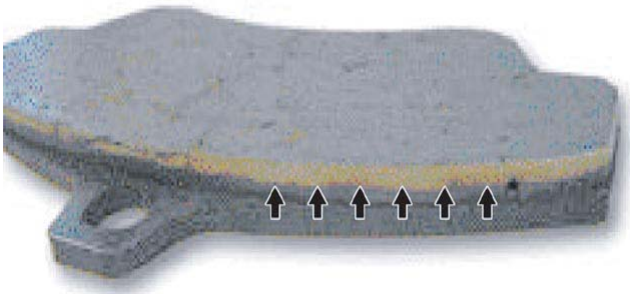


CAUTION

When using pressure cleaners to clean discs, use adequate face protection.

- When assessing damage to the disc edges, apply the following criteria:
- maximum permissible width/depth **2 mm**;
- maximum permissible length (**10 mm**);
- no more than **3** damaged areas are permissible.

Check CCM brake pad wear



After particularly intense use on the track, check the appearance of the pads as well as checking normally for wear. If there is a distinct white discolouration on the edges of the pads, which extends almost as far as the metal backing plate, the pads must be replaced to ensure that the brake system continues to perform correctly.

CCM brake disc wear

As the discs wear, their mass reduces. This is due to two simultaneous effects - a thermal effect, which burns the carbon fibres, and a mechanical abrasion effect between the disc and pad.

The instrument panel operating software uses an algorithm to calculate, in relation to effective vehicle usage (e.g.: deceleration caused by braking), separate wear indices for the front **P(a)** and rear **P(p)** carbon brake discs, expressed as a percentage (%) of wear.

These indices are periodically compared against a threshold value (**100%**). Upon reaching this threshold, an amber warning signal (possible danger of disc failure) is shown on the TFT display, warning the user that disc replacement is necessary.

The user is warned of this condition by the appearance of the message: “**CCM disc brake wear**” on the display, together with the specific amber symbol. At the end of the display cycle, or when the MODE button is pressed (with “**Escape**” function), the symbol is reduced to icon form.



An RLI for “Number of brake disc replacements” is also generated, identifying the number of times that the discs have been replaced.

Once the brake discs have been replaced, the wear index may be reset on the instrument panel.



The wear index indicated on the instrument panel may only be reset when the discs are replaced, once the wear index exceeds 100%.

To maintain a record of the latest brake wear index reset, three values are stored in the statistics memory for the front and rear brakes, which are updated upon reset (with the possibility of storing the last seven resets):

- Number of brake disc changes counter: ----- (dimensionless number)
- Kilometres at first disc brake change: ----- Km
- Wear percentage at first disc brake change: ----- %

At each service, submit the following data (printing out the parameters from the instrument panel):

- vehicle serial number;

- vehicle mileage ("Odometer" parameter);
- "Disc Wear Index" value.

There are essentially 5 different scenarios possible:

- 1 - Replacing all carbon discs due to vehicle usage;
- 2 - Replacing one carbon disc (or two discs on same axle) due to failure;
- 3 - Replacing a working instrument panel (dialogue with diagnostic instrument possible);
- 4 - Replacing of a malfunctioning instrument panel (dialogue with diagnostic instrument not possible);
- 5 - Replacing the carbon discs before reaching wear threshold ("Disc Wear Index" parameter < 100%).

1 - Replacing the carbon discs due to vehicle usage

- In this situation, the amber warning signal on the TFT display is lit.
- Use the diagnostic instrument to verify from the instrument panel that the disc wear index has exceeded 100%.
- Replace the carbon discs.
- Reset the carbon disc wear index on the instrument panel with the diagnostic instrument.

2 - Replacing one carbon disc (or two discs on same axle) due to failure

- In this situation, only one disc (or two discs on the same axle) are replaced, without modifying the parameters on the instrument panel.
- In other terms, the "Disc Wear Index" parameter is left at the value for the discs not being replaced (partially worn).

3 - Replacing a working instrument panel (dialogue with diagnostic instrument possible)

Order a replacement instrument panel following the instructions given in **TI 2009** issued **May 2012**.

4 - Replacing a malfunctioning instrument panel (dialogue with diagnostic instrument not possible)

Order a replacement instrument panel following the instructions given in **TI 2009** issued **May 2012**, specifying:

- the serial number of the vehicle;
- estimated vehicle mileage.

SAT will verify the estimated vehicle mileage.

Using a table correlating vehicle usage time with increase in disc wear % compiled by the engineering division, SAT will determine the % disc wear value to be entered in the new instrument panel in relation to the mileage recorded at the last service.

Upon approval from SAT (which will verify the data supplied by the dealership), the Spare Parts Department will confirm the order and supply a spare instrument panel (with the estimated values from the replaced unit).

5 - Replacing the carbon discs before reaching wear threshold ("Disc Wear Index" parameter < 100%)

This is a non-standard procedure and may only be performed by authorised personnel. Contact the Ferrari SAT service.

A3.20 Checking service brake/parking brake function

Checking service brake/parking brake function

- Check the brake pedal travel and **STOP** light switch function.
- Road test the vehicle to check braking performance.

A3.21 Checking suspension components

Checking suspension components

- Road test the vehicle to check shock absorber performance and to check for suspension noise.
- Remove the wheels ( D2.01).
-  Remove all.
- Check tightness of suspension components.
- Check that all protective gaiters are in good order and that the ball joints on the stub axle and on the rear hub holder have sufficient play.
- Check that the silentblock bushings at the arm and shock absorber mounting points on the chassis have sufficient play.
- Check that the arms are not deformed and exhibit no signs of failure.
- Check the state of the upper rebound stop bushes on the shock absorbers.
- Check front and rear stabiliser bar alignment and the state of the rubber mounts and tie rod ball joints.



Vehicle Setup Parameter Check Form

Model
<i>488 SPIDER</i>

- Vehicle Setup Parameter Check Form

[\[Download\]](#)

A3.23 Checking proper installation and function of seats and seat belts

Checking proper installation and function of seats and seat belts

- With the seat adjustment controls, check that the electrical seats move through their entire adjustment travel without impediment.
- Check that the seat guides are securely fastened to the floor mounts.
- Lubricate the guide connections and sliding surfaces with waterproof lithium grease.
- Check that the seat belt anchor screws are properly tightened.

A3.24 Checking and recharging battery

Checking battery state of charge

Use a digital multimeter to measure the battery state of charge.

- Clean the battery poles and clamps adequately.
- Connect the terminals of the digital multimeter to the battery poles.
- Read the battery voltage value from the display of the digital multimeter.
-  If the battery voltage measured is **greater than 12.70 V**, the state of charge is **100%**.
-  If the battery voltage measured is **between 12.45 V and 12.70 V**, the state of charge is **75% to 100%**.
-  If the battery voltage measured is **between 12.36 V and 12.45 V**, the state of charge is **50% to 75%**.
-  If the battery voltage measured is **less than 12.36 V**, the state of charge is **0% to 50%**.
- Recharge the battery ( A3.24).
-  Perform only if the battery voltage measured is **less than 12.5 V**.

Recharging the battery

Three charging methods are possible for "AGM" (gas recombination) batteries: FAST, SLOW and DEEP charging.

FAST charging is used for a partially or completely discharged battery

SLOW charging is used for a partially or completely discharged battery

DEEP charging is used for batteries that have discharged as a result of prolonged inactivity (over 2 weeks).

- Clean the battery poles and clamps adequately.
- Connect a stabilised battery charger to the battery.

FAST charging

-  While the battery is charging, check that the internal battery temperature never exceeds 45°C. If the temperature exceeds 45°C, interrupt charging and wait a few hours before completing.
-  If the vehicle is equipped with a Ferrari battery charger socket (optional), no work on the battery is necessary.
- Charge at a constant voltage of **14.4 V to 14.8 V**, at ambient temperature and with **limited initial charge current**.
-  For **L3 12V 70Ah 760A EN** batteries, the maximum initial charge current must be between **18 A** and **30 A**.
-  Charge cycle duration: **min. 4 hours, max. 6 hours**.

SLOW charging



While the battery is charging, check that the internal battery temperature never exceeds 45°C. If the temperature exceeds 45°C, interrupt charging and wait a few hours before completing.



If the vehicle is equipped with a Ferrari battery charger socket (optional), no work on the battery is necessary.

- Charge at a constant voltage of **14.4 V to 14.8 V**, at ambient temperature and with **limited initial charge current**.



For **L3 12V 70Ah 760A EN** batteries, the maximum initial charge current must be between **7 A** and **14 A**.



Charge cycle duration: **min. 12 hours, max. 24 hours**.

DEEP charging



While the battery is charging, check that the internal battery temperature never exceeds 45°C. If the temperature exceeds 45°C, interrupt charging and wait a few hours before completing.



If the vehicle is equipped with a Ferrari battery charger socket (optional), no work on the battery is necessary.



If the vehicle is not used for extended periods, remove the battery from the vehicle and recharge at least once every 3 months.

If you intend to leave the battery connected to the electrical system, to keep certain connected devices operating (car radio channel memory, alarm system, etc.), recharge at least once a month.

- If the battery voltage is below 9 - 10 V, charge without **voltage limiting**.



The maximum initial charge current must be between **1 A** and **2 A**.



Charge cycle duration: **min. 12 hours, max. 24 hours**.

Battery conditioner



Ferrari vehicles are equipped with a battery conditioner with switched, pulse maintenance, buffer charging and analysis modes, representing the state of the art in battery care.

Ferrari battery conditioners are suitable for charging all types of 12V lead acid batteries: including liquid acid, MF, AGM, VRLA and the majority of gel batteries.

Technical specifications

Model: 1049

AC voltage: 220–240 V AC, 50–60Hz

Current absorption*: < 1mA

Nominal charging voltage: 12V

Fluctuation**: < 4%

Charging current: max 5A

Ambient temperature: -20 to +50°C, with automatic current reduction at higher temperatures.

Cooling: natural convection.

Charging cycle: Ferrari battery conditioners use a completely automatic charging cycle consisting of multiple stages

Battery types: all 12V lead acid batteries (liquid, Ca/Ca, MF, AGM and gel).

Battery capacity: from 14–160Ah

Dimensions: 168x65x38mm (L x W x H)

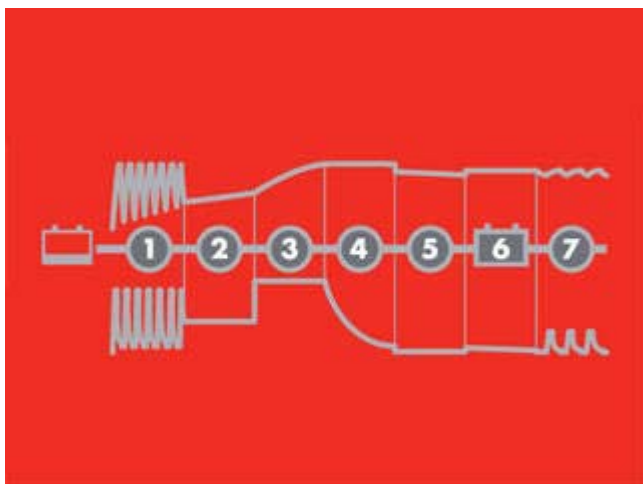
Insulation rating: IP65

Weight: 0.5 Kg

*) Return current absorption refers to the residual current in the battery when the battery conditioner is connected to the battery without connecting the mains power cable.

**) The stability of the current and voltage delivered is very important. High fluctuation values will result in battery overheating and cause accelerated deterioration of the positive electrode. High fluctuation values may also be harmful to the devices connected to the battery. The Ferrari battery conditioner delivers stable current with a very low degree of fluctuation.

Charging process stages



Ferrari battery conditioners use a completely automatic charging cycle consisting of multiple stages

Stage 1 - DESULPHATION: The battery conditioner determines if the battery is sulphated and, if necessary, delivers specific voltage and current pulses to eliminate the sulphates deposited on the lead plates of the battery and restore battery capacity.

Stage 2 - SOFT START: The battery conditioner determines if the battery is capable of being charged, to prevent attempting to charge a faulty battery.

Stage 3 - BULK: The battery conditioner charges with a current up to a maximum of 80% of battery capacity.

Stage 4 - ABSORPTION: The battery conditioner charges with decreasing current starting from 100% of battery capacity.

Stage 5 - ANALYSE: The battery conditioner tests if the battery is capable of maintaining charge. If not, it may be necessary to replace the battery.

Stage 6 - FLOAT: The battery conditioner maintains maximum battery voltage with a constant charging voltage.

Phase 7 - PULSE: The battery conditioner keeps the battery at 95–100% of capacity by monitoring the battery voltage and delivering a charge pulse when necessary to keep the battery fully charged.

Charging



- Connect the magnetic connector of the battery conditioner to the indicated socket on the luggage compartment lid.
- Connect the battery conditioner plug to the mains socket (the power lamp illuminates).

- Follow the progress of the 7 stages indicated on the display during the charging cycle.

The error warning lamp lights if the battery terminals are incorrectly connected.

The polarity inversion protection function prevents damage to the battery or battery conditioner in the event of incorrect connection.

When stage 4 is indicated, the battery is ready to start the engine.

When stage 6 is indicated, the battery is fully charged.

The charging cycle may be interrupted at any time by disconnecting the power cable from the mains socket.

Error modes

The battery conditioner enters error mode in the following conditions:

- Inverted polarity
- If the analyse function of the battery conditioner interrupts the charging process.
- If the terminals of the battery conditioner short-circuit when the charging cycle starts.
- If the battery conditioner remains in Start mode for more than 4 hours.

Press the RESET button to acknowledge/reset error mode.

Safety

The battery conditioner is designed to charge lead acid batteries with capacities from 14–160Ah. Do not use for any other purpose.

Ensure that the cables are not pinched and do not come into contact with hot surfaces or sharp edges.

The battery may release explosive gases during the charging cycle: do not allow sparks or naked flame near the battery.

The area must be adequately ventilated during the charging cycle.

Do not cover the battery conditioner.

Ensure that the mains socket is not exposed to water.

Never recharge a frozen battery.

Never recharge a damaged battery.

Never place the battery conditioner on the battery during the charging cycle.

Connections to mains electricity must comply with national law concerning high voltages.

Check the cables of the battery conditioner before use. Ensure that there are no cracks or splits in the cable insulation. Never use a battery conditioner with damaged cables.

Always ensure that the battery conditioner enters maintenance charging mode correctly before leaving unattended and in operation for prolonged periods of time. If the battery conditioner does not switch to maintenance charging mode within 72 hours, this means that a fault has occurred. Should this occur, disconnect the battery conditioner manually.

Eventually, all batteries wear out. If a battery fault is detected during charging, the battery is reconditioned by the advanced functions of the battery conditioner. Some faults, however, may not be correctable by the battery conditioner. Never leave the battery charger unattended and operating for prolonged periods of time.

Place on a flat surface only.

This device must not be operated by children or persons who cannot read and understand the indications of this manual unless supervised by an adult ensuring that the battery conditioner is used safely. Store and use the battery conditioner out of the reach of children; never let children play with the battery conditioner.

Overheating protection

The Ferrari battery conditioner has an overheat protection function.

Output power is reduced in the event of increased ambient temperature.

Maintenance

The Ferrari battery conditioner requires no maintenance.

Never dismantle the battery conditioner. Any dismantling or tampering will void the warranty.

Take the battery charger to the dealer for repair if the power cable is damaged.

The cover of the battery conditioner may be cleaned with a soft, dampened cloth and neutral detergent.

Always disconnect the Ferrari battery conditioner from the mains before cleaning.

A3.25 Checking the state of the chassis and box elements

Checking the state of the chassis and box elements



The vehicle chassis elements, box sections and outer components are made of aluminium: all repairs and/or replacements of chassis parts or bodywork components must be performed by skilled personnel using suitable tooling and equipment.

- Check that the chassis structures, box elements and outer skins are in perfect condition. Repair if any deformation or failure is noted.
- Check tightness of chassis fittings.

A3.26 Checking wheels and tyres

Checking wheels and tyres



CAUTION

Tyre replacement is recommend after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.

- Remove the wheels from the vehicle, then check the state of the wheel rims and tyres.
- Check that the tyre pressure matches the value specified
- Check the location and fastening of the balancer weights on the inside of the wheel rims.
- In case of excessive tyre wear, check the wheel alignment data and perform static and dynamic wheel balancing

A3.27 Inspecting the air conditioning and heating system

Inspecting the air conditioning and heating system

- Remove the flat undertray sections ( E3.12).
- Remove the luggage compartment trim panels ( E4.06).
- Check the unions on the pipes leading to the condenser, the dehydrator filter, the evaporator and compressor for gas leakage.
- Check that there is no gas leakage from the system hoses.
- Check that there is no refrigerant leakage from the recirculation pump and the evaporator.

A3.28 Inspecting the brake system

Inspecting the brake system

- Remove the wheels ( D2.01).
 - Remove the luggage compartment trim panels ( E4.06).
 -  Remove the lateral underwindscreen cosmetic shields.
-
- Check the connection pipes leading to the callipers and to the unions on the rigid lines.
 - Check that there is no leakage near the brake master cylinder unions or on the electrohydraulic unit.
 - Check that the unions are properly tightened.
 - Check that the instrument panel warning lights function correctly.
 - If any leakage is found, replace the defective unions or pipes.
 - Fill and bleed the brake system ( D3.10).

A3.29 Tightening bolts, unions and clamps

Tightening bolts, unions and clamps

- At the intervals given in the Maintenance Schedule, check the tightness of the major mechanical fittings.
- Refer to the tightening torque tables given at the beginning of each section.
- Also check that all hydraulic hose fittings and clamps are correctly tightened.
- Replace only with the clamp types specified.

A3.30 Checking and lubricating hinges and adjusters

Checking and lubricating hinges and adjusters

- Check that the door hinges and the engine and luggage compartment lid hinges are correctly fastened and that they open and close without free play or noise.
- Check that the door locks and the engine and luggage compartment lid release mechanisms function correctly.
- Check the state of the engine compartment lid release cable and of the fuel filler flap, luggage compartment lid and engine compartment lid emergency release cables.
- Check that the luggage and engine compartment lid gas struts function correctly.
- Lubricate all surfaces subject to friction with waterproof lithium grease.

A3.31 Treating interior trim in leather - Alcantara

Treating interior leather upholstery

- Proper and regular treatment (at least once a year) will preserve the natural qualities and softness of Ferrari leather trim.
- For this precise purpose, a range of specific leather care products (Cleaner and Cream), developed and tested by Ferrari, is also available. These products may be ordered through the Ferrari Spare Parts Department, either individually or as part of the "Care Kit", which includes a complete set of car cleaning products.
- For the instructions on how to use the products contained in the "Care Kit", see the "User's Manual, Carrozzeria Scaglietti Programme" and the instructions included with the Kit.
- Never use acidic detergents, turpentine, liquid stain removers, petrol, solvents or domestic cleaning products to clean leather as these will damage the natural material.

Treating interior trim in Alcantara

Alcantara® is the registered trade mark of a new generation material produced exclusively by Alcantara S.p.A.

Both elegant and practical, Alcantara® combines softness, sophistication, rich colours and outstanding resilience with remarkably easy maintenance.

The material is ideally suited to innovative and exclusive applications in interior decor, automotive interiors, fashion clothing and fashion accessories.

Regular care



Avoid rubbing with too much force and do not use equipment with vapour.

- Regular cleaning is recommended to maintain the beauty of Alcantara® over time.

Daily cleaning

- Simply dust Alcantara® with a soft brush or dry cloth, or clean with a vacuum cleaner.

Weekly cleaning



Avoid the use of rags/blotting paper because they could leave ink on the material.

- After dusting Alcantara®, wipe with a slightly moistened white cotton cloth.

Yearly cleaning

- With removable upholstery, machine wash using the following procedure (general guidelines for washing).
- With non-removable upholstery, use specific products for cleaning Alcantara®.
- If no specific products are available, dust the material thoroughly.



Be very careful not to wet Alcantara® in depth.

- Moisten a soft cloth or sponge with water, squeeze out thoroughly and wipe all surfaces in Alcantara®.
- Wipe again with a cloth moistened with clean water and leave to dry completely (overnight).
- Once dry, brush delicately with a soft bristled brush to restore the nap.

General guidelines for washing

- If removable upholstery needs to be cleaned completely due to large stains, observe the washing instructions given aside precisely:



In case of dry-cleaning do not use trichloroethylene and avoid direct contact with equipment that uses steam.



Alcantara® must not be treated with chlorine-based bleaches.



Never use a centrifuge.

- With removable upholstery, Alcantara® may be safely machine washed at approximately 30°C, using a neutral detergent.
- If Velcro is applied to the upholstery hems, protect the Velcro with counter-velcro before washing to prevent damage to the upholstery.
- After washing, allow the upholstery to air-dry and brush gently with a soft-bristled brush.



The bottom of the iron must be at a temperature lower than 110°C.

- If necessary, Alcantara® may be ironed, placing a white cloth between the iron and the material.
- Spray extraction cleaning machines may only be used at low temperatures.
- For non-removable upholstery, follow the procedure give for yearly cleaning.

General guidelines for stain removal

- With localised stains, if no specific products for cleaning Alcantara® are available, immediately wipe off (**within 30 minutes**) and minimise the stain, working from the edge of the stain toward the middle to stop it from spreading.
- Before wiping off the stain, remove the spilt substance from the upholstery: use a spoon or plastic spatula for dense substances (yoghurt, jam etc.), use unprinted absorbent paper or a sponge with liquids.



Do not pour the product being used for cleaning directly on Alcantara®.



Avoid rubbing to keep the stain from spreading or penetrating in depth.

- Use a moistened and thoroughly squeezed white cloth or sponge to remove stains.
-  When using a sponge, rinse in clean water and squeeze thoroughly between applications.

Water-soluble stains

- Preferably use specific products for cleaning Alcantara®.
- If no specific products are available, use water, lemon juice or pure ethyl alcohol (spirits), depending on the case.
- Fruit juice, jam, jelly, ketchup: use lukewarm water; rinse by patting with clean water.
- Blood, egg: use cold water; do not use hot water as it coagulates proteins; rinse by patting with clean water.
- Liqueur, wine, beer, cola and tea: use lukewarm water; if a coloured stain remains, use lemon juice then rinse well.
- Copying pencil, cocoa, chocolate, custard or chocolate confectionary, ice cream, mustard: use lukewarm water; rinse by patting with clean water.
- Vinegar, hair gel, tomato sauce, sweet coffee: use lemon juice, then wipe with lukewarm water; rinse by patting with clean water.

Non-water-soluble stains

- Preferably use specific products for cleaning Alcantara®.
 - If no specific products are available, use water, lemon juice or pure ethyl alcohol (spirits), depending on the case.
 - Lipstick, foundation, mascara, eye shadow, perfume, shoe polish, oil and grease in general, grass stains and marker pen (including indelible markers): pat with ethyl alcohol then pat with water and rinse.
-  With difficult to remove grass and marker pen stains, especially if light in colour, clean as soon as possible before the stain dries excessively.
- Chewing gum and wax: fill a plastic bag with ice; when the substance has hardened, break it off in pieces, then treat with ethyl alcohol.

Stubborn stains

- Repeat the treatments described several times.
-  Often, even non-water-soluble stains require treatment with water after initial cleaning.

A3.32 Checking radiators for fouling

Checking radiators for fouling

Detritus from the road may enter the vehicle front air intake and foul the radiators; over time, this may compromise the functionality of the cooling systems so that they are no longer capable of providing sufficient cooling.

It is therefore VITAL that the radiator cores are checked for fouling at each scheduled service and cleaned, if necessary, using the following procedure.

- Check the radiator cores for fouling.
- In the event of fouling, clean with a pressurised water jet or equivalent method.
-  Check for any dirt accumulated between the water radiator and the AC condenser.
-  Remove the front bumper ONLY in the event of very heavy fouling.
- ONLY in the event of very stubborn dirt, which may be possible with particularly high mileage vehicles, remove the radiator assembly and remove the dirt by blowing air from the rear of the radiators.

Checking condition of radiators

- Periodically check the condition of the radiator core. Clean the fins to remove any leaves, insects or foreign matter which could obstruct the air flow and cause the fluid to overheat. Straighten any bent fins, taking care not to damage the radiator core.
- Replace the radiator if excessively damaged.
- Periodically check the condition of the connector hoses.

A3.33 Cleaning and maintaining matt paints (if applicable)

Cleaning and maintaining matt paints (optional)



NEVER polish the paintwork with any product.



DO NOT lean on the vehicle, especially if wearing garments with buttons, belts, rings, necklaces etc., as you may cause irreparable damage to the bodywork.



For information on the correct products to be used, contact the Ferrari Service Network.

Proper care by the owner is essential for keeping (optional) matte paintwork in good condition.

The following is a list of the main precautions necessary:

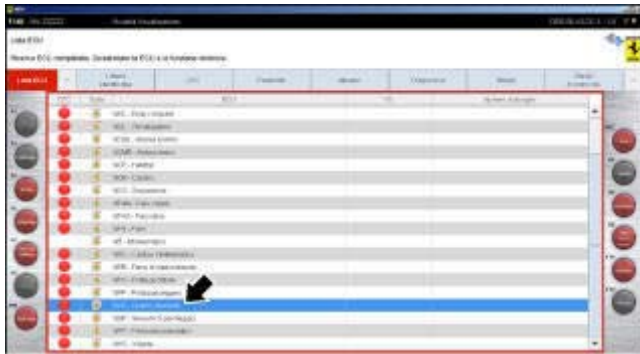
- Wash the car only with **Steam cleaner**, and rinse with demineralised water only.
- The paintwork may only be dried with an automatic blower or with compressed air. The paintwork may ONLY be dried by hand using a clean **Yellow 3M microfibre cloth (Ferrari p/n 571.400.022)** cloth, moistened with demineralised water, and using **Glass cleaning solution** in areas with limescale residue. The cloth must be kept in a specific sealed, clean container.
- To remove grease or oil stains, a clean **Yellow 3M microfibre cloth (Ferrari p/n 571.400.022)** cloth may be used, moistened with **R107/S solvent (heptane)**. The cloth must be new, or one that has not previously been moistened with demineralised water or **Glass cleaning solution**.
- Do not wash the vehicle in direct sunlight or if the bodywork is still hot.
- Never apply adhesive materials to the bodywork.
- Cracks in the paint or areas with exposed base material due to stone chips, scratches, parking damage etc. must be treated immediately by the Ferrari Service Network.

A3.34 Service counter reset

Service counter reset

➤ Connect the DEIS tester to the diagnostic socket.

- Switch on the DEIS tester.
- Click the DEIS button.



- Select "**NQS - Instrument panel**".



- Click "**Diagnostics**"
- Select "**SET SERVICE**"

A3.35 Cylinder compression test

Cylinder compression test

- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
 - ❧ Perform the cycle "**160 NCM Compression mode management**" with the DEIS diagnostic tester after disabling engine firing.
- Remove the spark plugs ( A3.13).
 - ❧ Remove all.
- Screw the instrument into the spark plug seat, then press the engine start button to rotate the crankshaft by a number of turns while reading the pressure within the combustion chamber.
- Repeat the procedure for each cylinder.
- Refit the spark plugs ( A3.13).
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
 - ❧ Perform the cycle "**160 NCM Compression mode management**" with the DEIS diagnostic tester, re-enabling engine firing.

A3.36 Cleaning the intercoolers

Cleaning the intercoolers

			
Tightening torque		Nm	Class
Fastening the intercooler mounting bracket	Nut	9 Nm	B
Fastening the intercooler moulding bracket	Screw	9 Nm	B

Periodically check the condition of the intercooler cores. If the front and/or rear sides of the intercoolers are fouled, perform the procedure described as follows to clean them correctly.

The following procedure is for the left hand intercooler; The procedure for the right hand part is identical.

- Remove the wheels ( D2.01).
- Remove the rear wheelhouses ( E3.05).
-  Remove the front element.

Rear side



- Clean the rear side of the intercooler **(A)** with a high pressure water cleaner or an equivalent alternative.

Front side



- Remove the flat undertray sections (E3.12).
- Remove the rear flat undertray section.
- Undo the indicated screws and remove the moulding (1).



- Undo the indicated screw.
- Undo the two nuts indicated.
- Separate the intercooler (A) from the air duct as far as possible.
- Clean out the dirt via the space created between the intercooler (A) and the air duct.
- Fit the intercooler (A) in its seat then tighten the two nuts indicated.

		
Tightening torque	Nm	Class
Nut	9 Nm	B

- Tighten the indicated screw.



- Fit the moulding in its seat and tighten the indicated screws.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Refit the flat undertray sections (E3.12).
- Refit the rear wheelhouses (E3.05).
- Refit the wheels (D2.01).

B1.01 Technical specifications



Engine specifications

The engine is a 90° V8 turbo unit with dry sump lubrication.

The low weight and friction of the titanium twin scroll turbines with ball bearing mounted shafts make them less susceptible to inertia and friction, reducing response times. Twin scroll technology also reduces interference between the pressure pulse streams of different cylinders, maximising the pressure pulse reaching the turbocharger.

Flat plane crankshaft for a more compact engine, less mass and optimised fluid dynamics.

Exhaust manifolds with equal length and diameter headers, for a potent sound with the signature frequencies of a Ferrari engine.

The special configuration of the hi-tumble intake ducts improves the flow of the air entering the combustion chamber for optimum cylinder fill even at higher engine speeds.

Two stage oil pump, which reduces hydraulic power demand by up to 30% compared with a conventional pump, and roller finger cam followers, which reduce cylinder head power absorption at low speeds by 10%, by reducing friction between the valve stem and the tappet.

Cylinder firing sequence

1.8.3.6.4.5.2.7

Main engine specifications

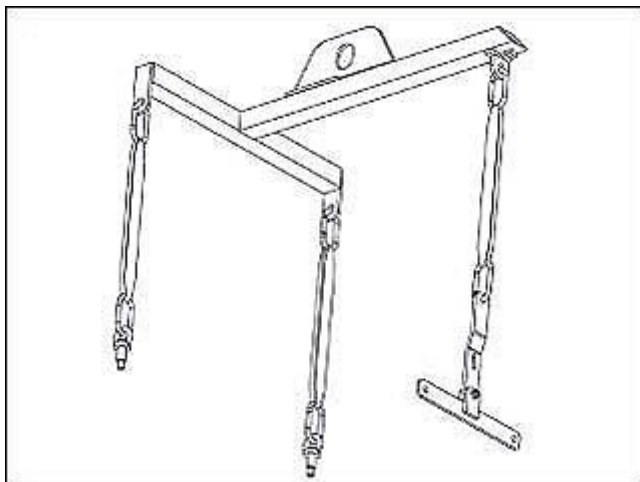
Type	F154CB
Number of cylinders	90° V8

Cylinder bore	86.5 mm
Piston stroke	83 mm
Total displacement	3902 cm ³
Compression ratio	9.4 : 1
Max. engine speed (at rev limiter)	8000 rpm
Maximum power	670 HP
Corresponding rpm	8000 rpm
Maximum torque	760 Nm
Corresponding rpm	3000 rpm

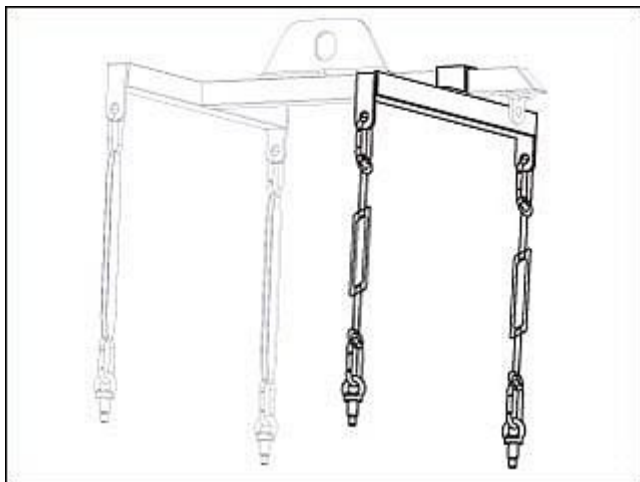
B1.02 Specific tooling and equipment



- Tensiometer (95978151)
Seem DIAPAZ.



- Hook 95973432 (AV 3432)
for hoisting engine.



- Hook (AV 3979)
for hoisting engine.



- Torque wrench 95978172 (AV 8172)
(Replaces torque wrench USAG 815F)



- Pins for lifting engine-gearbox assembly
95978253 (AV 8253)
for lifting engine/gearbox assembly off rear
removable subframe after removal of
subframe from vehicle.



- Wrench 95978827 (AV 8827)
loosening belt tensioner.



- Hook 95977564 (AS 107564) for lifting the gearbox.

B1.03 Tightening torques



Tightening torque		Nm	Class
Fastening belt tensioner	Screw	55 Nm	B
Fastening spark plug	Spark plug	11 Nm	A
Fastening the engine lubrication system oil filter	Engine oil filter cartridge	25^{+0}_{-5} Nm	A
Fastening the engine lubrication system drain plugs	Plug	50 Nm	B
	Plug	40 Nm	B
Fastening the engine lubrication system tank	Screw	10 Nm	B
Fastening the exhaust silencer	Nut	10 Nm	B
	Nut (Clamp)	54.2 Nm	B
Fastening the catalytic converters	Screw	25 Nm	B
	Screw (V-Clamp collar)	13 Nm	B
	Nut (V-Clamp collar)	13 Nm	B
Fastening the turbochargers	Screw (V-Clamp collar)	8 Nm	B
	Nut (V-Clamp collar)	8 Nm	B
Fastening the turbocharger air inlet/outlet pipes	Screw	10 Nm	B
Fastening the turbocharger lubrication pipes	Screw	10 Nm	B
	Filler neck	20 Nm	B
Fastening the turbocharger cooling pipes	Screw	10 Nm	B
	Filler neck	25 Nm	B
	Threaded union	25 Nm	B

B2.01 Removing the complete engine

Removing the engine

- Preparation in progress

B2.02 Refitting the complete engine

Refitting the engine

- Preparation in progress

B2.03 Engine overhaul - Disassembly

- Preparation in progress



B2.04 Engine overhaul - Inspections

- Preparation in progress



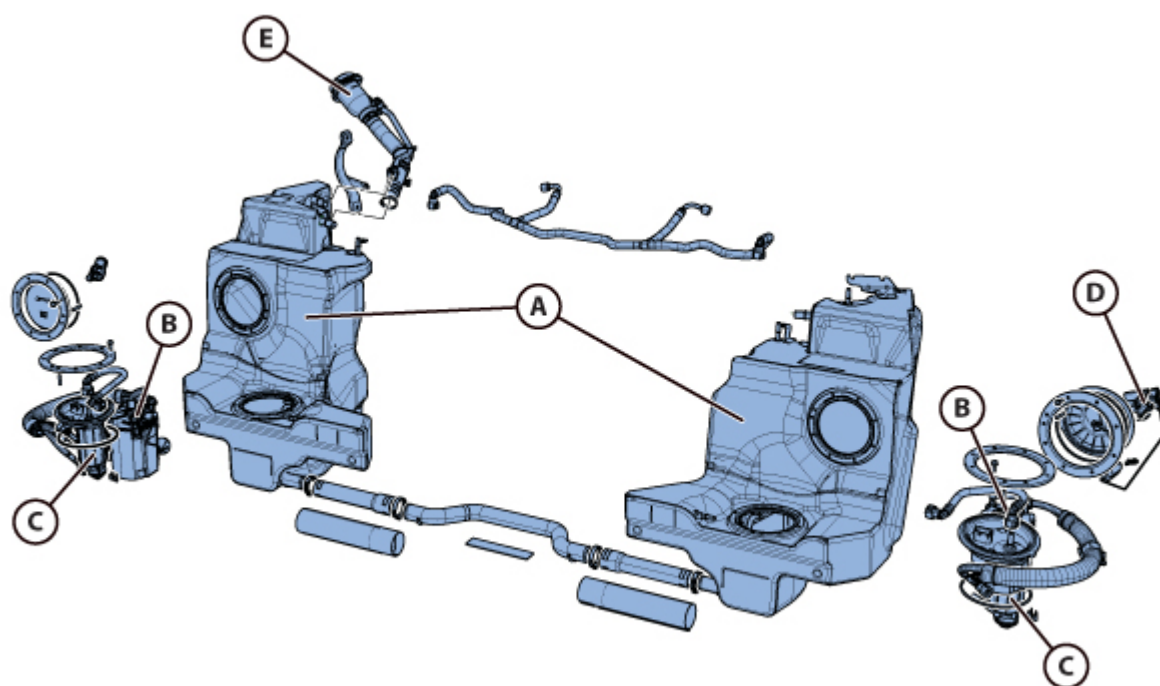
B2.05 Engine overhaul - Rebuild

- Preparation in progress



B3.01 Engine fuel system layout

Fuel system layout



- A - Fuel tanks
- B - Fuel pumps
- C - Fuel pump filters
- D - Fuel level sensor
- E - Fuel filler neck

B3.02 Fuel tanks

Removing the fuel tanks

- Preparation in progress

Refitting the fuel tanks

- Preparation in progress

B3.03 Fuel pump assembly

Removing the fuel pump filters

- Preparation in progress

Refitting the fuel pump filter

- Preparation in progress

Replacing the fuel pumps

- Preparation in progress

B3.04 Fuel level sensor

Replacing the fuel level sensor

- Preparation in progress

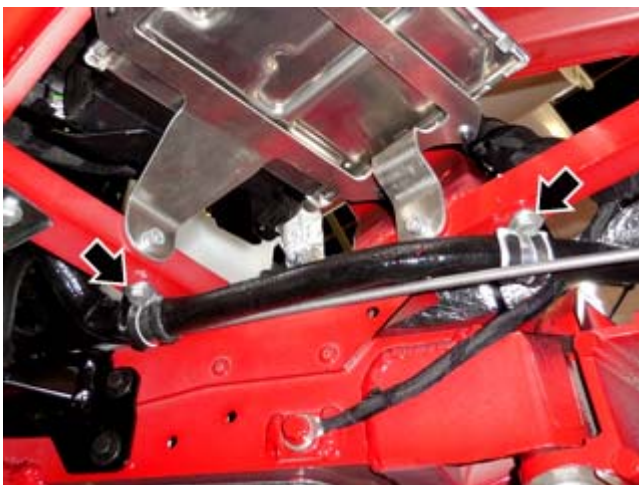
B3.05 Fuel vapour separator

Removing the fuel vapour separator

- Remove the engine compartment cosmetic shields (E3.13).
- Remove the rear wheelhouses (E3.05).
- Remove the rear left hand wheelhouse.



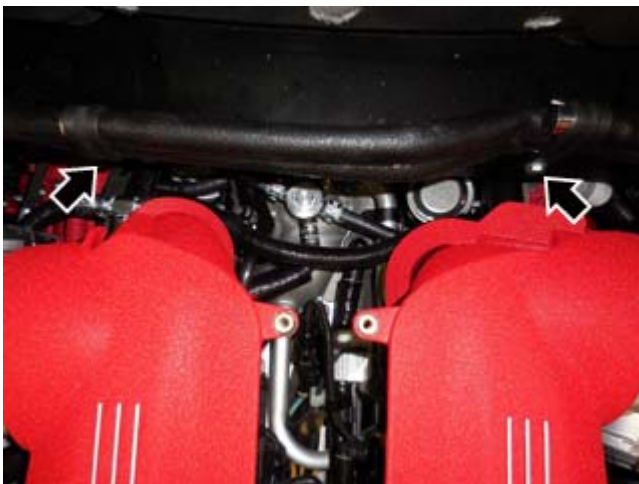
- Disconnect the pipe (1), releasing the indicated quick release coupling.



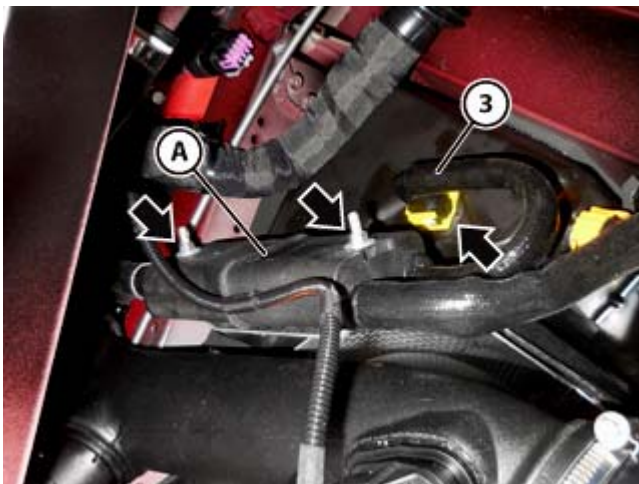
- Undo the screws indicated.



- Disconnect the pipe **(2)**, detaching the "double-lock" union indicated.



- Undo the screws indicated.



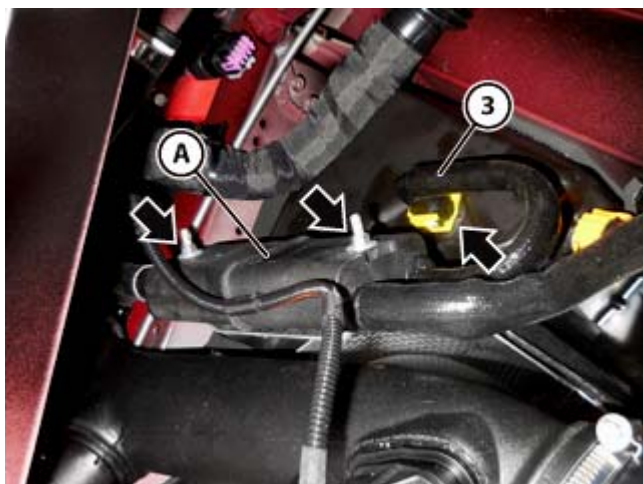
- Disconnect the pipe **(3)**, detaching the "double-lock" union indicated.
- Undo the nuts indicated.
- Remove the fuel vapour separator **(A)**, complete with the respective pipes.

Refitting the fuel vapour separator

			
Tightening torque		Nm	Class



Tightening torque		Nm	Class
Fastening fuel vapour separator	Nut	9 Nm	B
Fastening the evaporative emissions control system pipes	Screw	8 Nm	B

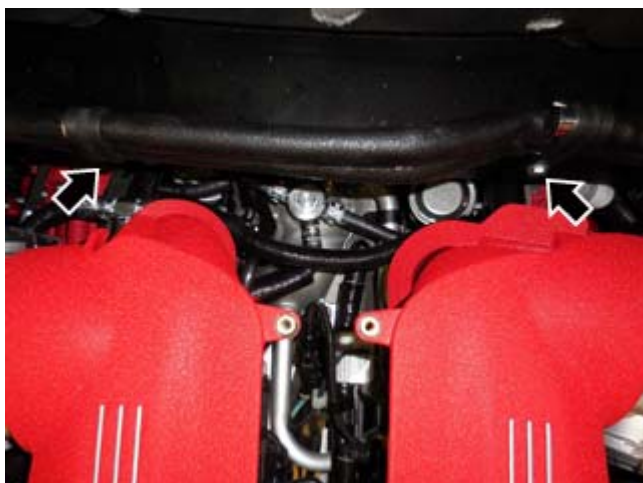


- Fit the fuel vapour separator **(A)**, complete with the respective pipes.
- Tighten the nuts indicated.



Tightening torque	Nm	Class
Nut	9 Nm	B

- Connect the pipe **(3)**, fastening the "double-lock" union indicated.



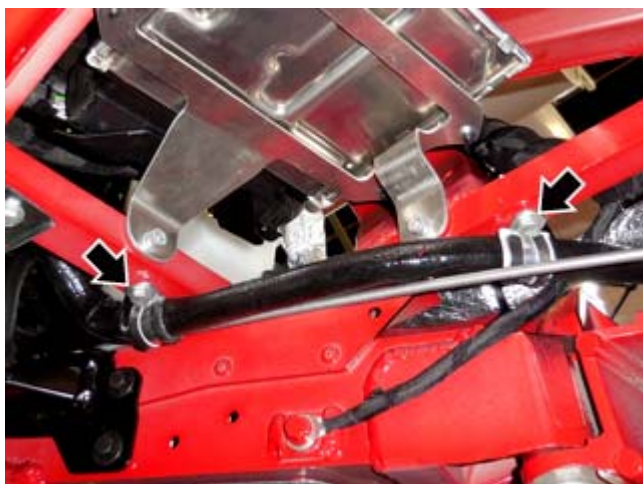
- Tighten the indicated screws, fitting the respective rubber lined brackets.



Tightening torque	Nm	Class
Screw	8 Nm	B



- Connect the pipe **(2)**, fastening the "double-lock" union indicated.



- Tighten the indicated screws, fitting the respective rubber lined brackets.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



- Connect the pipe **(1)**, fastening the respective quick release coupling.

- Refit the rear wheelhouses (🔧 E3.05).
- Refit the rear left hand wheelhouse.
- Refit the engine compartment cosmetic shields (🔧 E3.13).

B3.06 Fuel filler neck

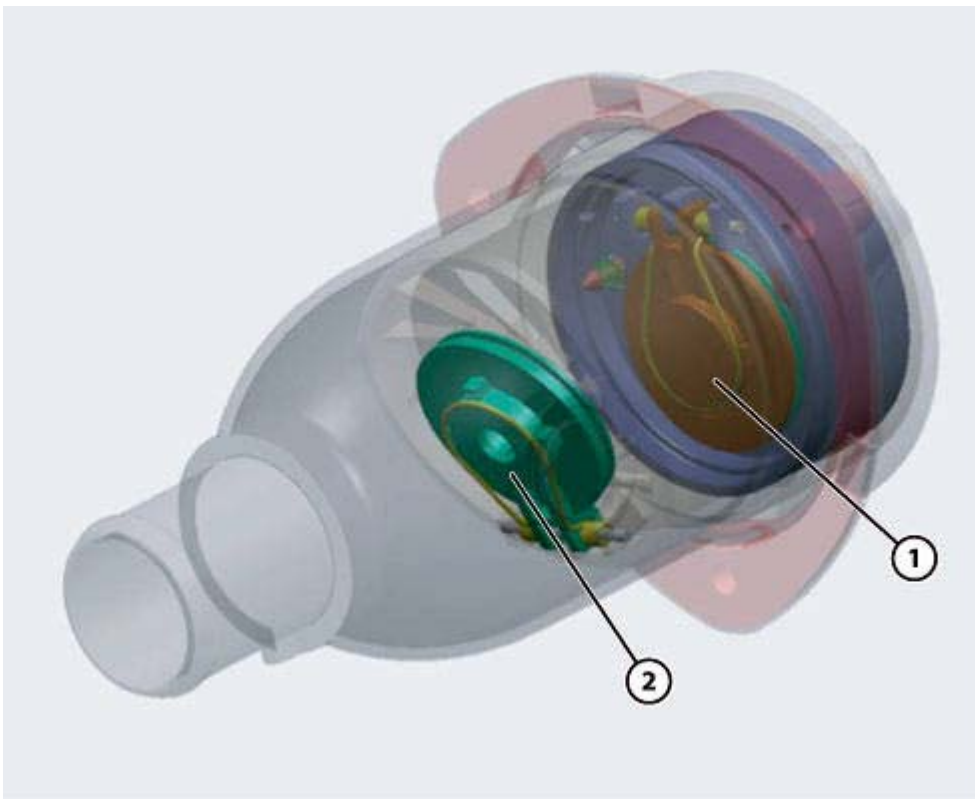
Using the Capless fuel filler system



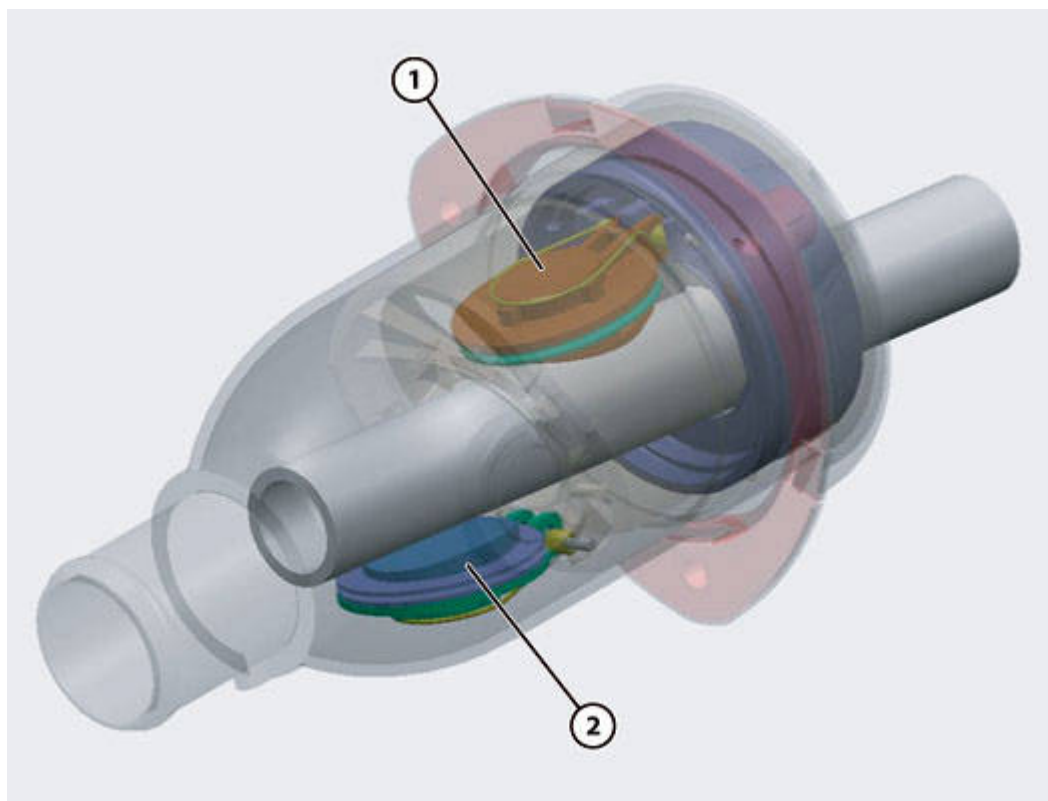
The 'capless' filler system is a filler neck with no manual cap.

The advantages of a capless system during refuelling are:

- no need to physically unscrew the cap (which may be particularly difficult in certain temperature conditions);
- no need to hang the cap near the filler neck itself while refuelling;
- no risk of accidentally trapping the cap lanyard under the cap itself when closing, which may cause fuel leakage.



The cap is functionally substituted by two tandem flaps, **(1)** and **(2)**, both of which fitted with an airtight seal and a pressure relief safety valve calibrated at **120 mbar**.



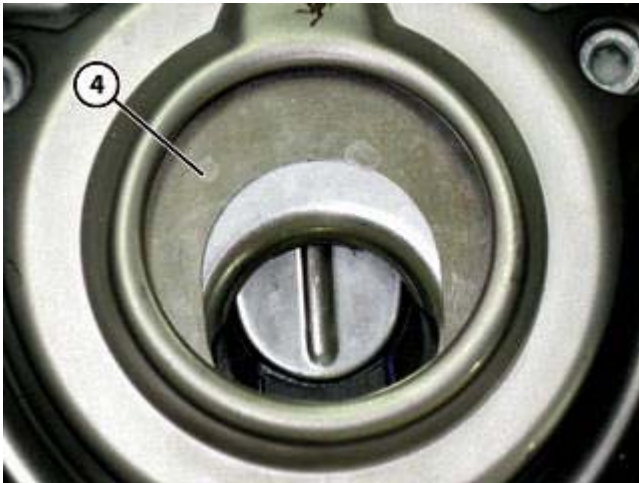
The above image shows the capless filler neck with the fuel pump nozzle inserted and the flaps **(1)** and **(2)** open.



For safety reasons, the outer wall features a number of 'teeth' **(3)** that lock the outer flap: the only way to open this flap is to insert the nozzle of a fuel station pump.



Do not force the outer flap by pushing with the fingers or attempt to open with inappropriate tools (e.g. screwdriver): this may damage the outer flap mechanism and compromise seal integrity.

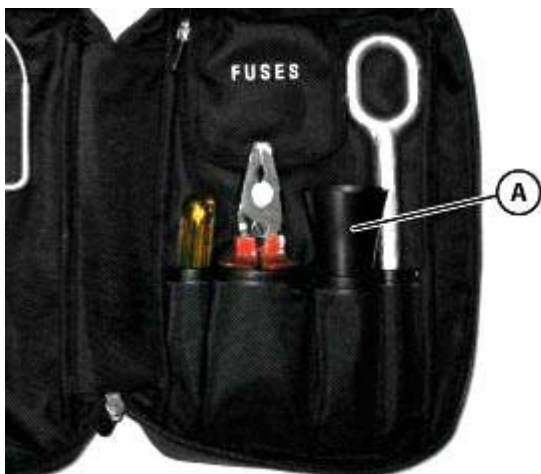


The capless system is more reliable than a conventional filler cap system, as instead of an external cap, the system is sealed by elements within the filler neck itself. Furthermore, the pump nozzle is guided more positively into the filler neck during insertion than with a conventional filler system.



Insert the nozzle carefully into the filler neck to prevent damage to the mechanism seal. After refuelling, wait approximately 5 seconds, then slowly remove the nozzle from the filler neck: this is to allow any residual fuel in the nozzle to drain into the tank, preventing spillage onto the bodywork.

The pump nozzle is inserted into the filler neck until it comes into contact with the outer flange (4). More of the pump nozzle remains outside the filler neck than with a conventional system; this is not a problem, as the capless system has been specifically engineered to function correctly with the nozzle in this position. Like a conventional filler neck, the capless system also has a retainer tongue for locking the pump nozzle (EU and USA). By twisting the nozzle by 30° in either direction after insertion, the nozzle itself is held in place during refuelling.

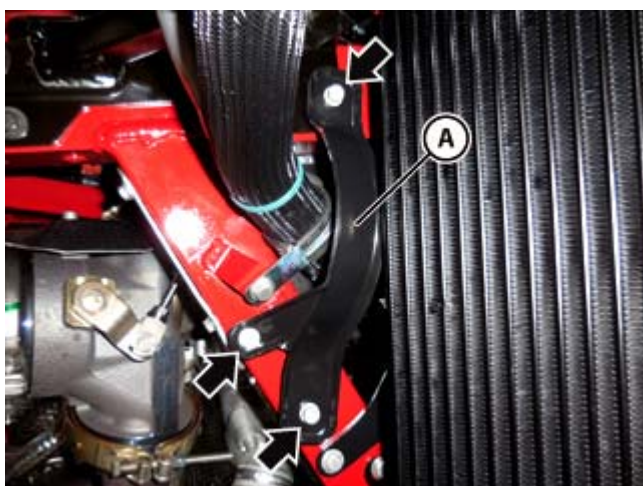


Do not attempt to insert funnels or portable jerry can spouts into the filler neck. Should it be necessary to use a portable fuel container, only use the funnel included in the vehicle tool kit, which is designed to activate the automatic release system.

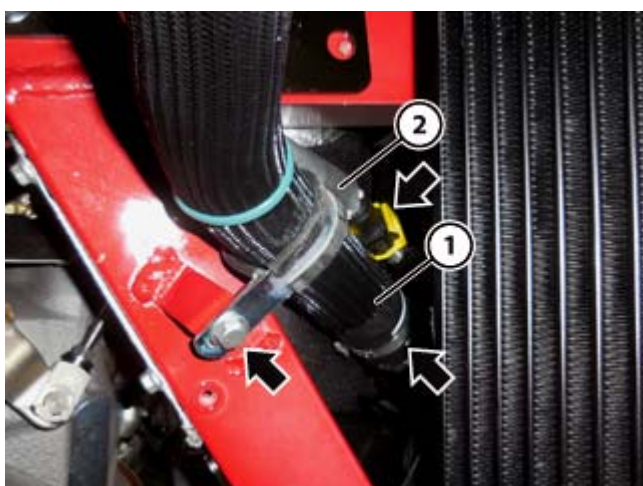
Should it be necessary to refuel without access to a fuel station, a special funnel (A), shaped like the nozzle of a petrol pump, is included in the tool kit. The funnel (A) releases the capless automatic sealing system.

Removing the fuel filler neck complete with pipes

- Disconnect the battery (🔧 F2.01).
- Drain the fuel system (🔧 B3.07).
- Remove the rear wheelhouses (🔧 E3.05).
- Remove the front element of the rear right hand wheelhouse.



- Undo the screws indicated.
- Remove the bracket **(A)**.



- Undo the indicated screw.

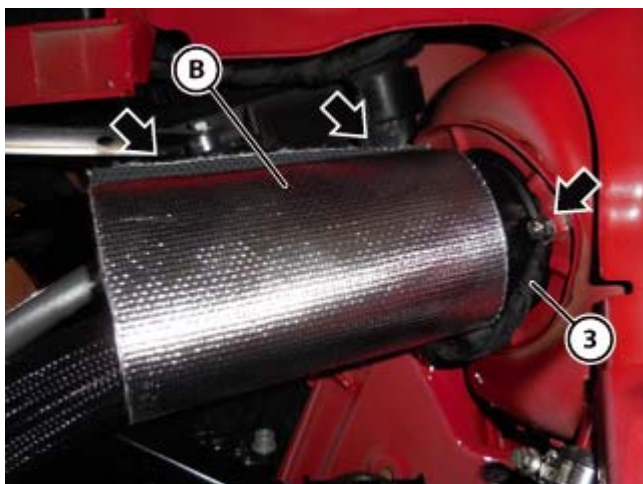


CAUTION

When connecting a fuel system pipe, bear in mind that the line may be pressurised. Proceed therefore with caution and keep away any type of flame as there is a risk of fuel spraying onto the operator.

Always plug the disconnected fuel pipes to prevent residual fuel from leaking.

- Disconnect the pipe **(1)**, removing the indicated collar.
- Plug the pipe and the relative connection on the tank.
- Disconnect the pipe **(2)**, releasing the double-lock quick release coupling indicated.
- Plug the pipe and the relative connection on the tank.



- Remove the heat shield **(B)**, releasing the indicated clips.
- Disconnect the ground cable **(3)** by undoing the indicated nut.



- Undo the screws indicated.
- Remove the fuel filler neck **(C)**, complete with pipes.

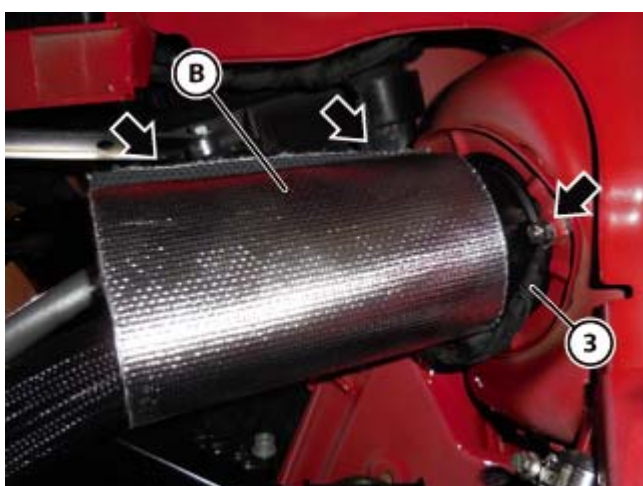
Refitting the fuel filler neck complete with pipes

			
Tightening torque		Nm	Class
Fastening fuel filler neck	Screw	5 Nm	B
	Screw	9 Nm	B
Fastening the fuel filler neck ground lug terminal	Nut	3 Nm	B
Fastening fuel filler neck guard bracket	Screw	9 Nm	B



- Install the fuel filler neck **(C)**, complete with pipes.
- Tighten the screws indicated.

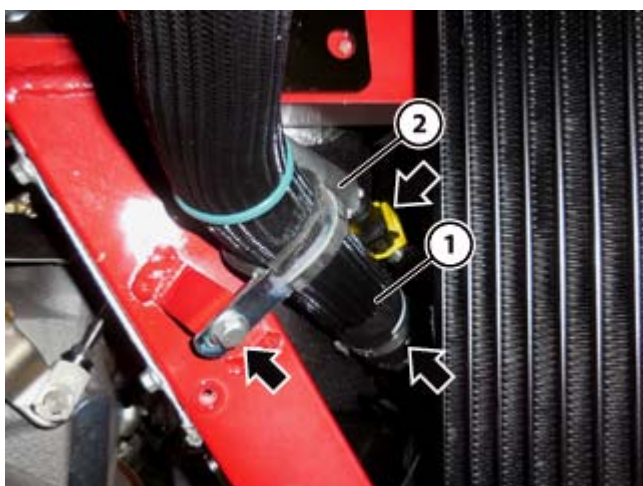
		
Tightening torque	Nm	Class
Screw	5 Nm	B



- Connect the ground cable **(3)**, tightening the indicated nut.

		
Tightening torque	Nm	Class
Nut	3 Nm	B

- Fit and fasten the heat shield **(B)**, fastening the indicated clips.



- Connect the pipe **(2)**, fastening the respective double-lock quick release coupling indicated.

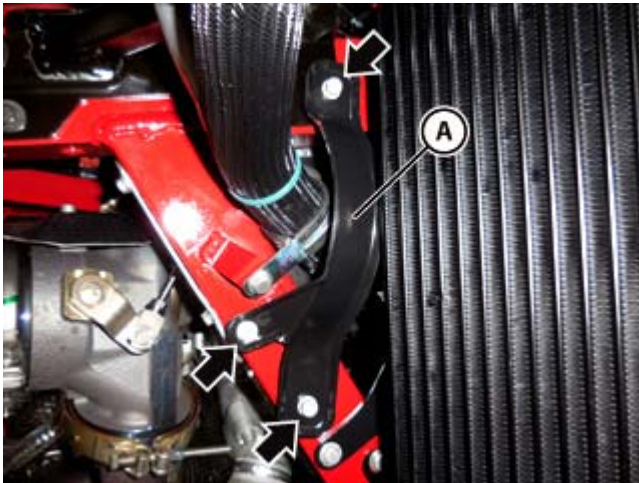
CAUTION

When connecting a fuel system pipe, bear in mind that the line may be pressurised. Proceed therefore with caution and keep away any type of flame as there is a risk of fuel spraying onto the operator.

Always plug the disconnected fuel pipes to prevent residual fuel from leaking.

- Connect the pipe **(1)** fitting and tightening the new collar as indicated.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	9 Nm	B



- Fit the bracket **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Refit the rear wheelhouses (🔧 E3.05).
- Refit the front element of the rear right hand wheelhouse.
- Connect the battery (🔧 F2.01).
- Perform the respective cycle with the DEIS diagnostic tester.. Connect the DEIS diagnostic tester to the diagnostic socket (🔧 F2.08).

B3.07 Draining the engine fuel system

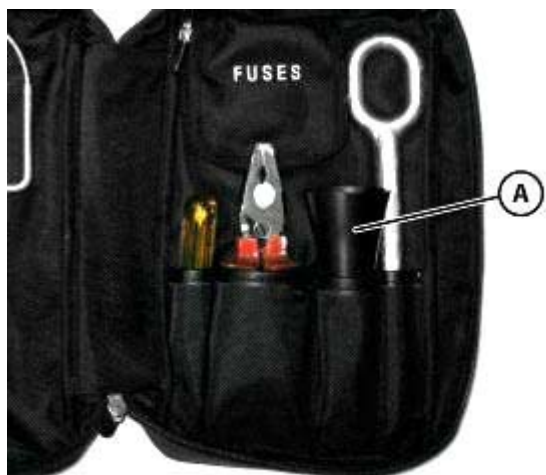
Draining the fuel system



CAUTION

Fuel is highly flammable.
NEVER WORK ON A HOT ENGINE.

- This procedure requires the use of an aspirator pump compliant with **EEC standards**.
- Connect a suitable pipe at least **2.5 metres** in length, with a maximum diameter of **10 mm**, to the aspirator pump.



Only use the funnel included, which releases the Capless automatic locking system correctly.

- Select the funnel **(A)** from the vehicle tool kit and insert in the relative seat in the filler neck.
- i* The funnel releases the capless automatic filler neck closure system.

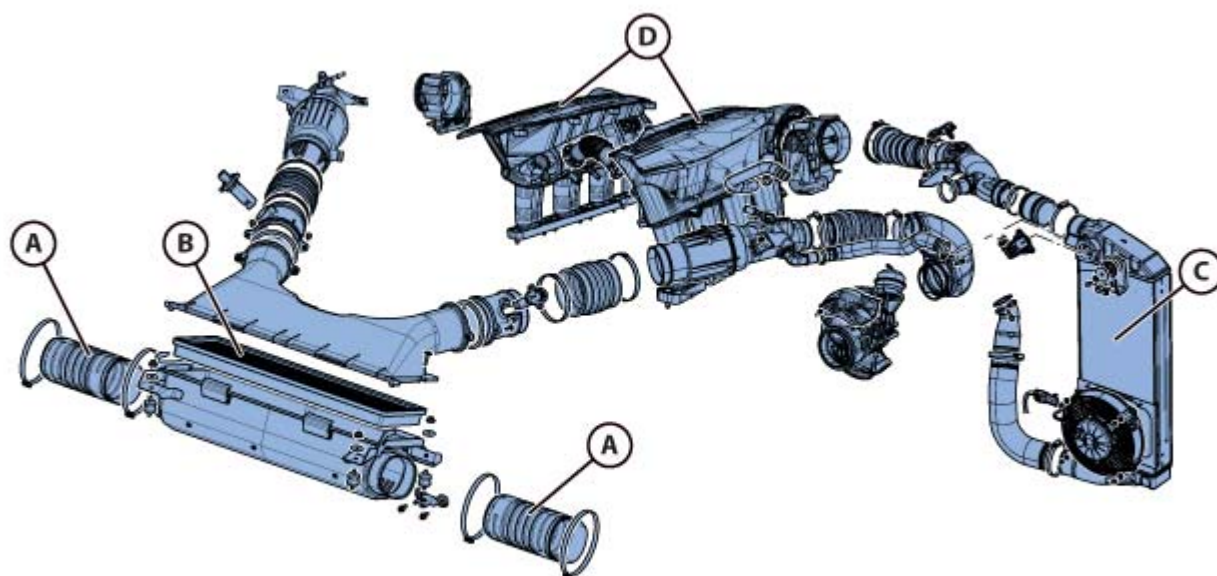


CAUTION

Collect the fuel in a suitable container.

- Feed the pipe into the filler neck until it reaches the right hand fuel tank, then aspirate all the fuel out of the tank.
- i* The two tanks are connected by a pipe at the bottom, so the fuel level will drop in both tanks simultaneously.
- Check the quantity of fuel remaining in the tanks from the instrument panel. If necessary, repeat the previous procedure to aspirate as much of the fuel as possible out of the tanks.

B4.01 Engine air intake system layout



- A - Engine air duct
- B - Engine air filters
- C - Intercooler
- D - Engine intake manifolds

B4.02 Engine air intake system filter box

Replacing the engine air intake system filter

- Remove the engine compartment cosmetic shields (🔧 E3.13).
- Remove the central cosmetic engine compartment shield.



- Mark the position of the bracket **(A)**.
- Undo the indicated screws fastening the bracket **(A)**.
- Remove the bracket **(A)** complete with engine compartment lid lock.
- Undo the screws indicated fastening the air filter box cover **(B)**.



WARNING: take care not to damage the bodywork during air filter box cover handling.

- Prise out and move the air filter box cover **(A)** forward out of its seat.
- Remove and replace the filter.
- Fit the new filter.



WARNING: take care not to damage the bodywork during air filter box cover handling.

- Fit and move back the air filter box cover **(A)** by pushing it into its seat.
- Tighten the indicated screws fastening the cover **(B)**.
- Fit the bracket **(A)** in the marked position complete with engine compartment lid lock.
- Tighten the indicated screws fastening the bracket **(A)**.

- Refit the engine compartment cosmetic shields (🔧 E3.13).
- Refit the central cosmetic engine compartment shield.

Removing the engine air filter box

- Preparation in progress

Refitting the engine air filter box

- Preparation in progress

B4.03 Engine air intake system manifold

Removing the engine intake manifolds

- Preparation in progress

Refitting the engine intake manifolds

- Preparation in progress

B5.01 Engine lubrication system layout

Engine lubrication system layout



- A** - Engine oil tank
- B** - Engine oil pump
- C** - Water/engine oil heat exchanger
- D** - Engine oil filter

B5.02 Engine lubrication system pump

Removing the engine lubrication system pump

- Preparation in progress

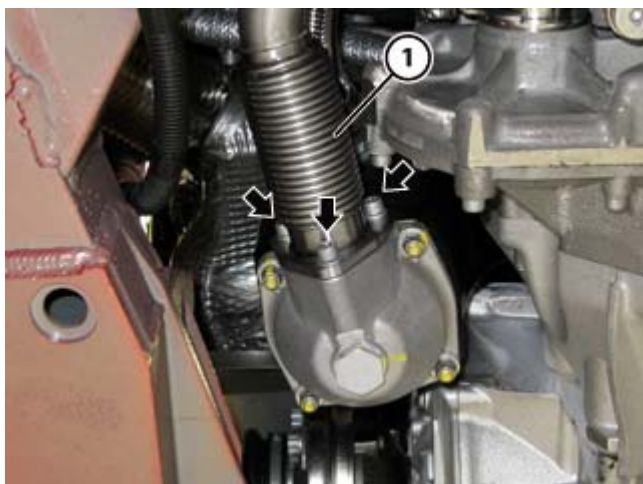
Refitting the engine lubrication system pump

- Preparation in progress

B5.03 Engine lubrication system tank

Removing the engine lubrication system tank

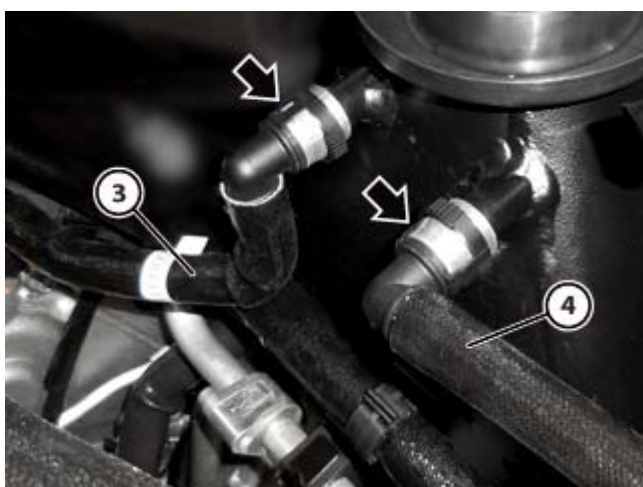
- Drain the engine lubrication system (🔧 A3.01).
- Remove the engine cooling system tank (🔧 B6.02).



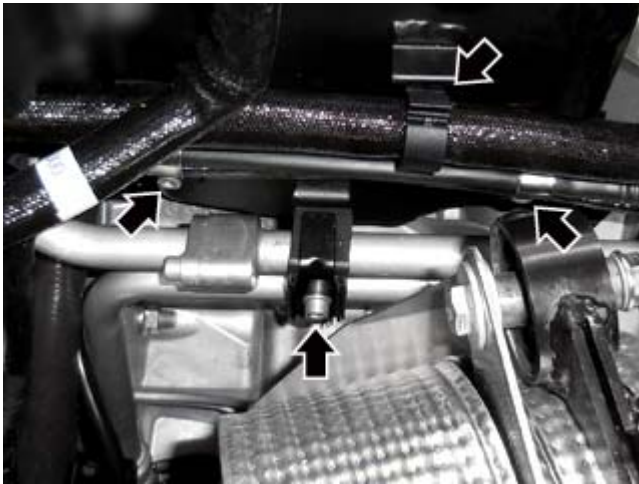
- Undo the screws indicated.
- Disconnect the pipe (1).



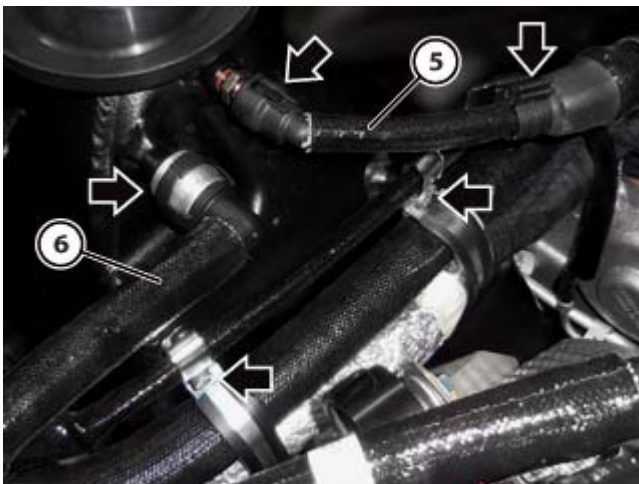
- Undo the screws indicated.
- Disconnect the pipe (2).



- Disconnect the pipe (3), detaching the respective quick release coupling indicated.
- Disconnect the pipe (4), detaching the respective quick release coupling indicated.



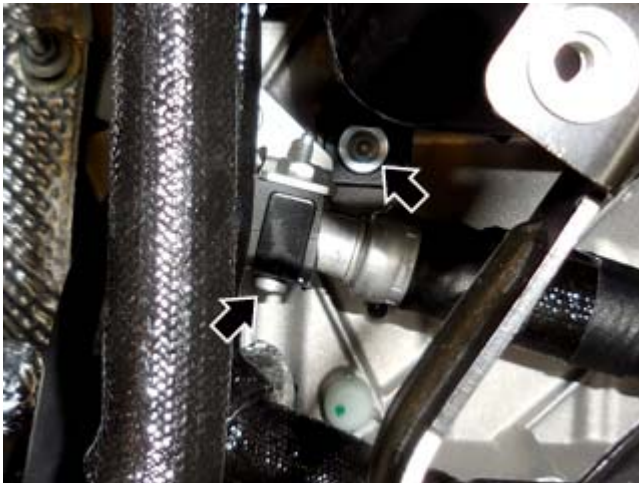
- Release and open the indicated clip.
- Undo the screws indicated.



- Release and open the indicated clip.
- Disconnect the pipe **(5)**, detaching the respective quick release coupling indicated.
- Disconnect the pipe **(6)**, detaching the respective quick release coupling indicated.
- Undo the screws indicated.



- Undo the screws indicated.



- Undo the screws indicated.



- Undo the indicated screw.

- Lift and remove the engine lubrication system tank.

Refitting the engine lubrication system tank

			
Tightening torque		Nm	Class
Fastening the engine lubrication system tank	Screw	10 Nm	B

- Fit the engine lubrication system tank.



- Tighten the indicated screw fastening the engine lubrication system tank.



Tightening torque	Nm	Class
Screw	10 Nm	B



- Tighten the indicated screw fastening the engine lubrication system tank.



Tightening torque	Nm	Class
Screw	10 Nm	B

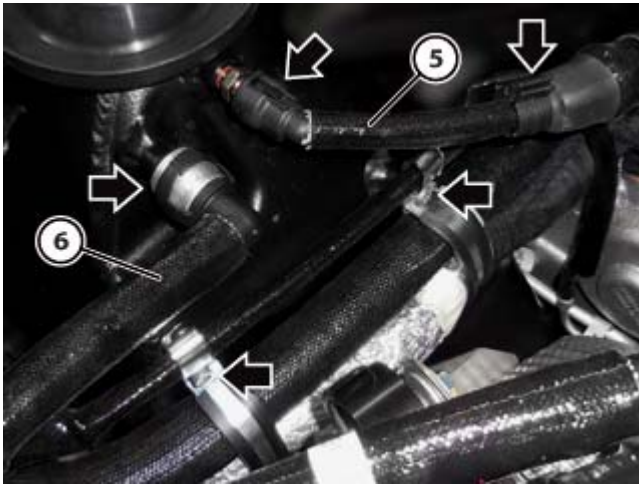
- Tighten the indicated screw fastening the retainer block.



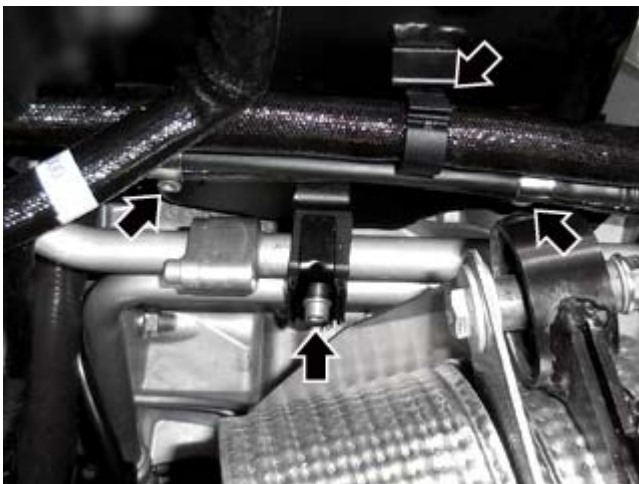
- Tighten the indicated screws fastening the engine lubrication system tank.



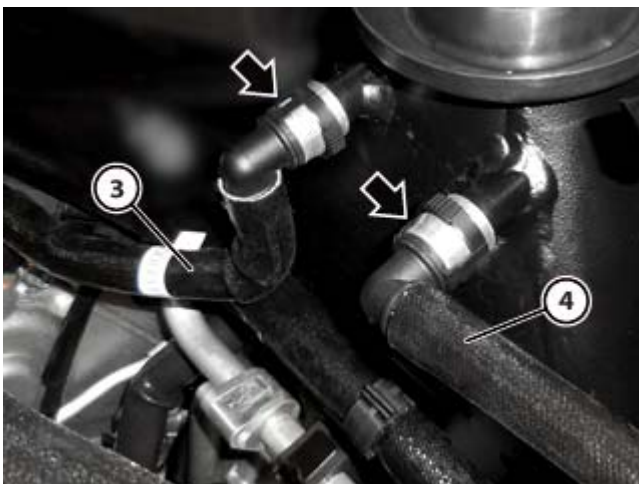
Tightening torque	Nm	Class
Screw	10 Nm	B



- Tighten the screws indicated.
- Connect the pipe **(6)**, connecting the respective quick release coupling indicated.
- Connect the pipe **(5)**, connecting the respective quick release coupling indicated.
- Close and fasten the indicated clip.



- Tighten the screws indicated.
- Close and fasten the indicated clip.

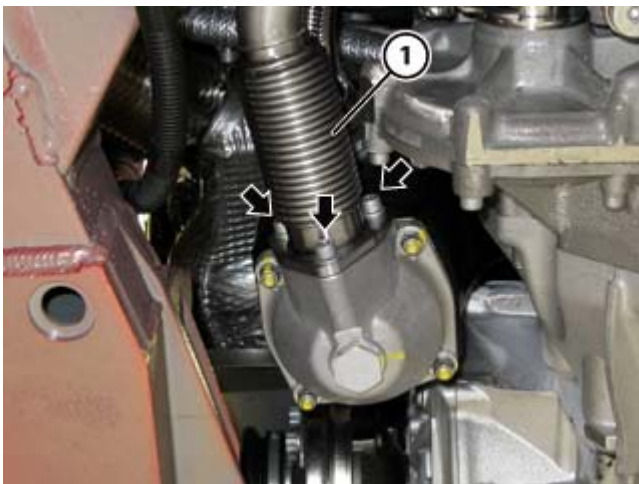


- Connect the pipe **(4)**, connecting the respective quick release coupling indicated.
- Connect the pipe **(3)**, connecting the respective quick release coupling indicated.



- Replace the O-rings of the pipe **(2)**, lubricating before installation.
- Connect the pipe **(2)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Replace the O-ring of the pipe **(1)**, lubricating the new part.
- Connect pipe **(1)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B

- Refit the engine cooling system tank ( B6.02).
- Fill the engine lubrication system ( A3.01).

B5.04 Engine lubrication system-engine cooling system heat exchanger

Removing the engine lubrication system-engine cooling system heat exchanger

- Preparation in progress

Refitting the engine lubrication system-engine cooling system heat exchanger

- Preparation in progress

B5.05 Draining and filling the engine lubrication system

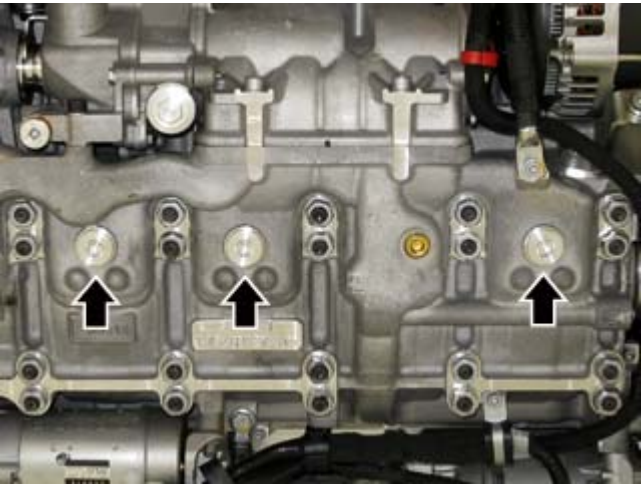
Draining the engine lubrication system

 Pour the oil drained from the system into a container and seal it. DO NOT dispose of used oil in the environment.

- Remove the flat undertray sections ( E3.12).
-  Remove the rear flat undertray section.



- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.
- Wait for the oil to drain completely.



- Place a container for collecting oil under the indicated plugs.
- Undo the indicated plugs.
- Wait for the oil to drain completely.

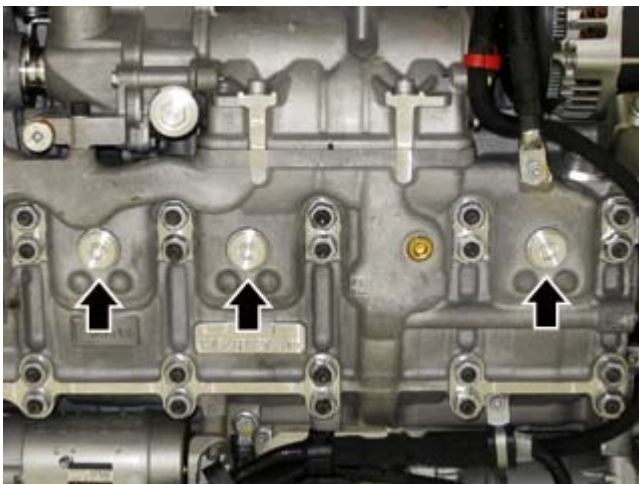
Filling the engine lubrication system

			
Tightening torque		Nm	Class
Fastening the engine lubrication system drain plugs	Plug	50 Nm	B
	Plug	40 Nm	B



- Clean the indicated plug thoroughly with a suitable degreaser that does not leave residue.
- Definitively tighten the indicated plug, replacing the respective gasket.

		
Tightening torque	Nm	Class
Plug	50 Nm	B



- Clean the indicated plugs thoroughly with a suitable degreaser that does not leave residue.
- Replace the respective seals and fit and tighten the indicated plugs.

		
Tightening torque	Nm	Class
Plug	40 Nm	B

- Lower the vehicle.

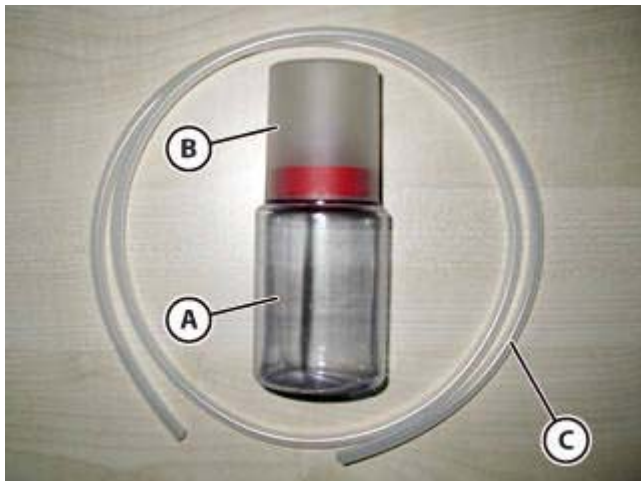


- Undo and remove the cap **(A)**.
 Fill the engine lubrication system using only new oil of the type specified in the fluids and lubricants table.
- Gradually add new oil of the specified type to the tank.
- Due to inevitable pooling within the lubrication system, the actual quantity of oil added may vary from vehicle to vehicle.
- Check the engine lubrication oil level ( [A3.01](#)).
- Fit and tighten the cap **(A)** securely.

- Check that there are no leaks from the drain plugs.
- Refit the flat undertray sections ( [E3.12](#)).

Taking engine oil samples

➤ Open the engine compartment lid (📄 E5.11).



The bottle contains a vacuum (-950 mbar depression).

DO NOT remove the outer cap or turn the valve before use.

The following sampling procedure must be performed with the engine warm: run the engine to reach normal operating temperature.

- To take an engine oil sample, use the **"Vacuum bottle with tube" KIT, Part No. 070001988**, consisting of:

- Bottle (A);
- Outer cap (B);
- Tube (C).



- Remove the outer cap from the bottle.
- Undo and remove the cap (D) from the engine oil tank.
- Insert one end of the pipe in the engine oil tank to immerse it in oil being sampled.
- Only insert the length of tube necessary to immerse the end in the oil.

- Connect the bottle to the end of the tube.
- Turn the valve by 90°.
- Once the bottle is filled, close the valve by turning back 90°.
- Disconnect the bottle from the tube and refit the outer cap.
- Fit the engine oil tank cap (D) and tighten securely.
- Print out the specific label (annexed with Technical Information) on adhesive paper, compile the label with the information requested and apply to the bottle.

➤ Close the engine compartment lid (📄 E5.11).

B6.01 Engine cooling system layout



- A** - Expansion tank
- B** - Radiators
- C** - Pressure switch/thermostat
- D** - Pump
- E** - Electric fans

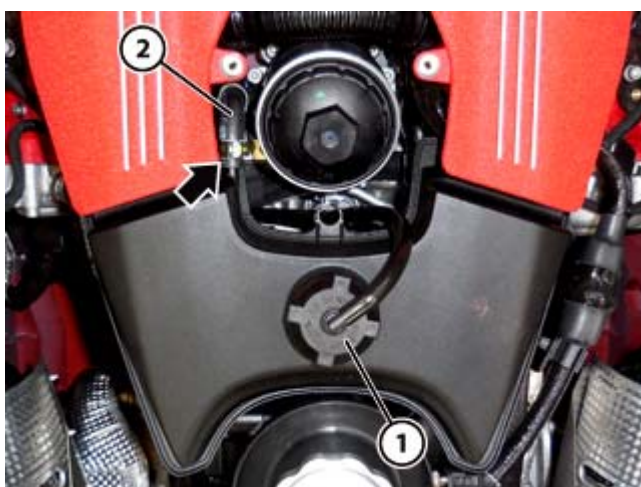
B6.02 Engine cooling system tank

Removing the engine cooling system tank

- Disconnect the battery (🔧 F2.01).
- Remove the engine compartment cosmetic shields (🔧 E3.13).
- Remove the central engine compartment cosmetic shield.



- Undo the screws indicated.
- Remove the cosmetic grille (A).



- Undo the cap (1).
- Empty the tank, aspirating coolant via the filler neck.
- Disconnect the pipe (2), removing the respective collar indicated.



- Undo the indicated nut.
- Disconnect the pipe **(3)**, loosening the respective screw collar indicated.



- Undo the indicated nut.



- Lift the engine cooling system tank.
- Disconnect the pipe **(4)**, releasing the indicated quick release coupling.

- Remove the engine cooling system tank.

Refitting the engine cooling system tank



Tightening torque

Fastening intake manifold cosmetic grille

Screw

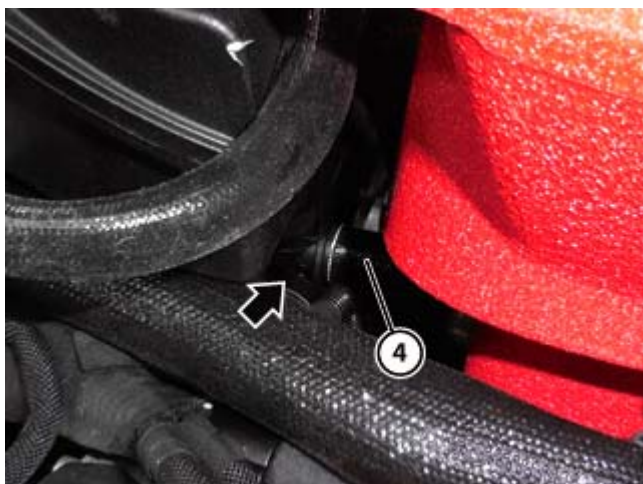
Nm

8 Nm

Class

B

- Fit the engine cooling system tank.



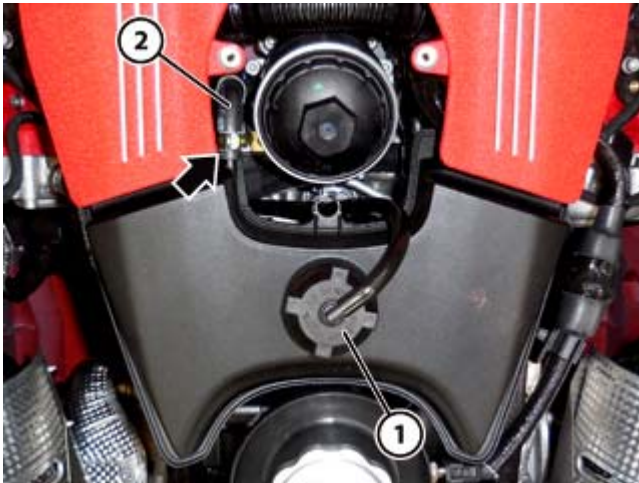
- Connect the pipe **(4)**, fastening the respective quick release coupling.
- Push the engine cooling system tank down into position.



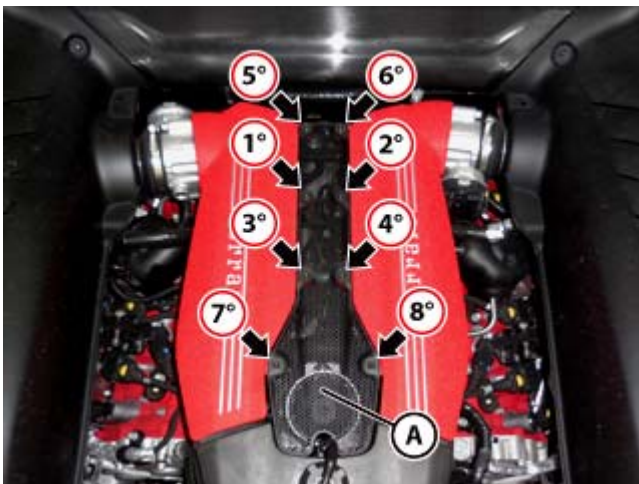
- Tighten the indicated nut.



- Connect the pipe **(3)**, fitting and tightening the respective screw collar indicated.
- Tighten the indicated nut.



- Connect the pipe **(2)** fitting and tightening the respective collar indicated.
- Tighten the cap **(1)**.



- Fit the cosmetic grille **(A)**.
- Tighten the indicated screws in the sequence given.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Refit the engine compartment cosmetic shields (🔧 E3.13).
 - Refit central cosmetic shield.
- Connect the battery (🔧 F2.01).
- Fill and bleed the coolant system (🔧 A3.07).

B6.03 Engine cooling system pump

Removing the engine cooling system pump

- Preparation in progress

Refitting the engine cooling system pump

- Preparation in progress

B6.04 Engine cooling system pressure switch/thermostat

Replacing the engine cooling system pressure switch/thermostat

- Preparation in progress

B6.05 Engine cooling system radiators

Removing the engine cooling system radiators

- Preparation in progress

Refitting the engine cooling system radiators

- Preparation in progress

B6.06 Engine cooling system electric fans

Removing the electric radiator fans

- Preparation in progress

Refitting the electric radiator fans

- Preparation in progress

B6.07 Draining and filling the engine cooling system

Draining the cooling system



Pour the fluid drained from the system into a container and seal it. DO NOT DISPOSE OF USED FLUID IN THE ENVIRONMENT.



CAUTION

The fluid in the engine coolant system may be very hot.

Hot engine coolant may cause severe burns.

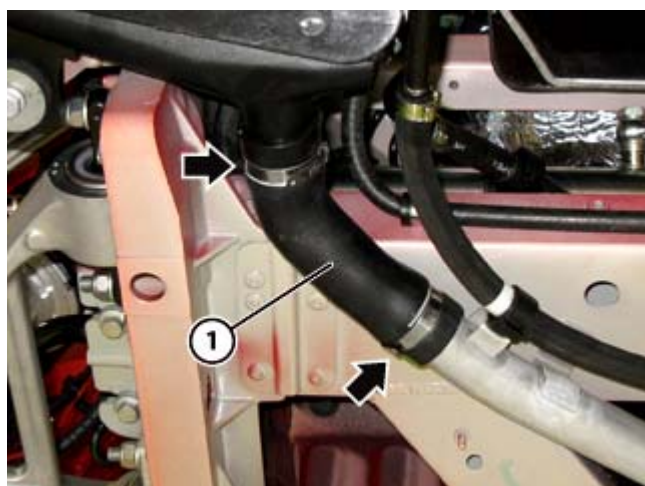
ALWAYS WAIT FOR THE SYSTEM TO COOL BEFORE STARTING ANY WORK.



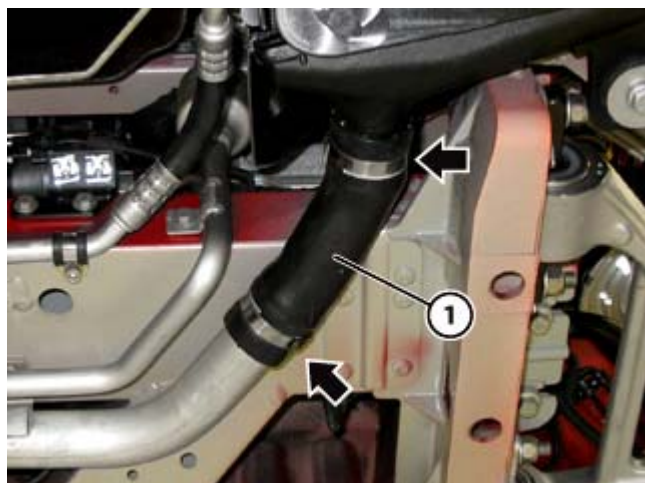
After loosening or removal, the Caillau Visa hose clamps must be replaced with Mikalor worm drive hose clamps, following the instructions given in Technical Information 2054 of December 2012.

➤ Remove the flat undertray sections ( E3.12).

➤ Remove the front flat undertray sections



- Place a container for collecting engine coolant under the connector hose **(1)**.
- Remove the indicated collars.
- Detach and remove the connector hose **(1)**.
- Wait for all the fluid to drain.



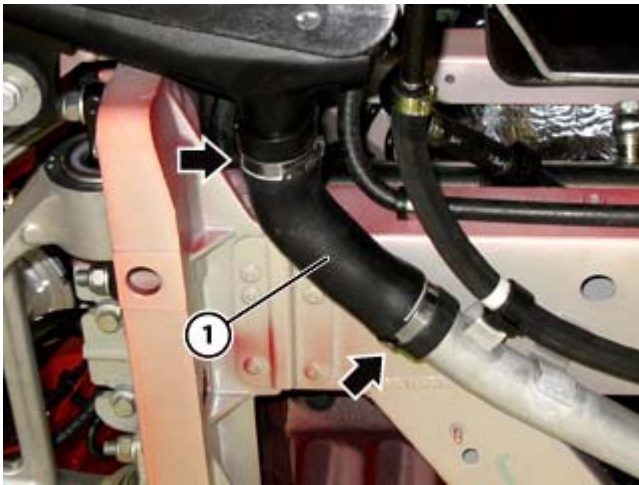
- Place a container for collecting engine coolant under the connector hose **(1)**.
- Remove the indicated collars.
- Detach and remove the connector hose **(1)**.
- Wait for all the fluid to drain.

Filling and bleeding the coolant system

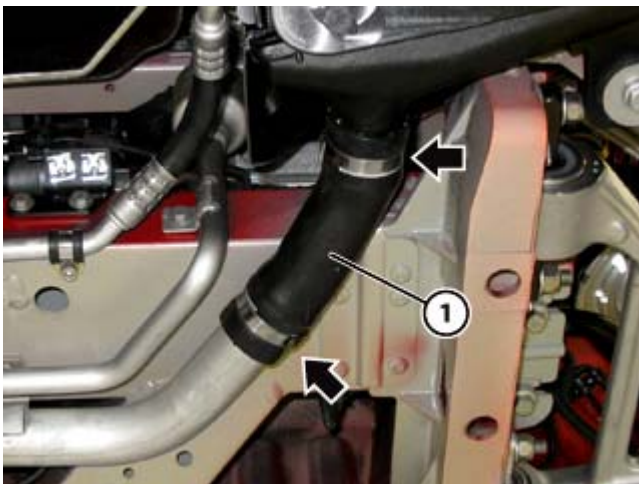


After loosening or removal, the Caillau Visa hose clamps must be replaced with Mikalor worm drive hose clamps, following the instructions given in Technical Information 2054 of December 2012.

➤ Open the engine compartment lid (🔧 E5.11).



- Fit and fasten the connector hose **(1)**.
- Fit and tighten the indicated collars.



- Fit and fasten the connector hose **(1)**.
- Fit and tighten the indicated collars.

Static filling (engine off)



- Undo and open the cap **(A)**.



- Add coolant of the specified oil to the tank gradually to reach the **MAX** level.



- Close and tighten the cap **(A)** securely.

Dynamic filling (engine on)

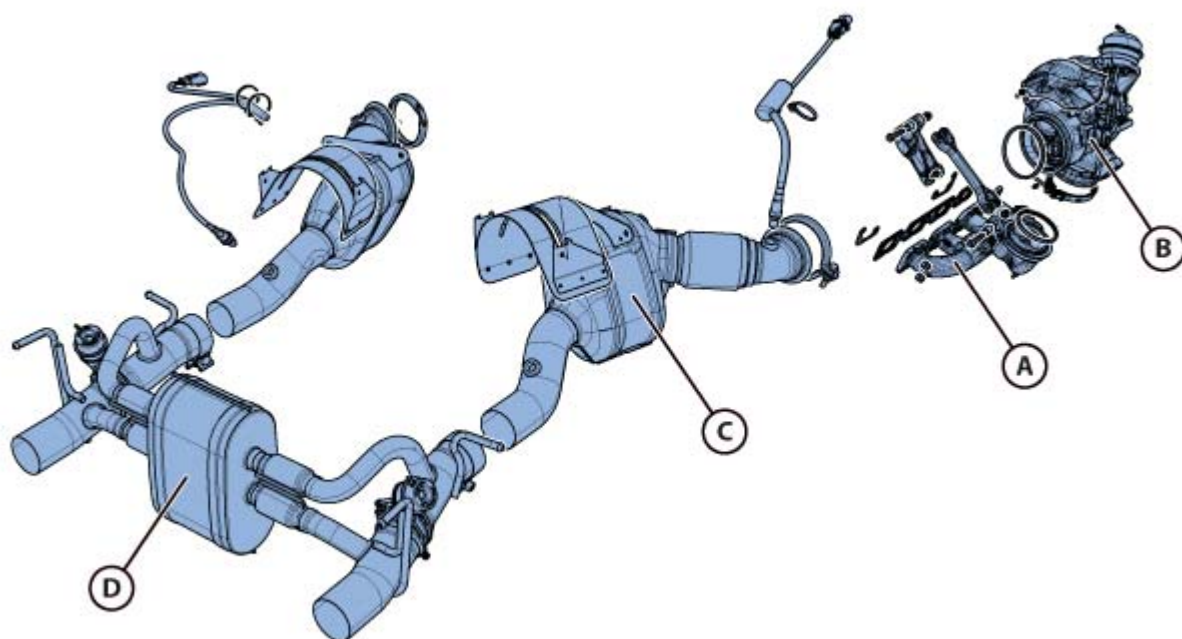
- Check that the heater is off.
- Start the engine ( E5.08).
- Let the engine **idle** for **5 minutes**.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **30 seconds**.
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **30 seconds**.
- Run the **engine at 2,000 rpm** for **30 seconds**.
- Let the engine **idle** for **2 minutes**, or until the electric radiator fans are activated.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 2,000 rpm** for **1 minute**.
- Let the engine **idle** for **30 seconds**.
- Turn on the heater by setting the maximum temperature on the air conditioning and heating system for both passenger compartment zones.
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Allow the engine to return to **idle speed** and leave to idle for **2 minutes**.
- Check the cooling system fluid level ( A3.07).
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Run the **engine at 3,000 rpm** for **1 minute**.
- Let the engine **idle** for **1 minute**.
- Turn off the heater.
- Stop the engine ( E5.08).
- Wait for the engine coolant temperature to reach **40 - 45 °C**.
- Check the cooling system fluid level ( A3.07).

➤ Refit the flat undertray sections ( E3.12).

 Refit the front flat undertray sections.

➤ Close the engine compartment lid ( E5.11).

B7.01 Exhaust system layout



- A - Manifolds
- B - Turbochargers
- C - Catalytic converters
- D - Silencer

B7.02 Exhaust system manifolds

Removing the exhaust system manifolds

- Preparation in progress

Refitting the exhaust system manifolds

- Preparation in progress

B7.03 Exhaust system catalytic converters

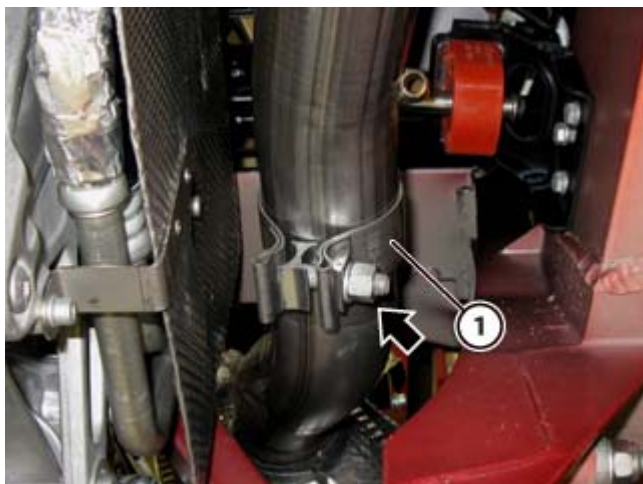
Removing the exhaust system catalytic converters

- Remove the air flow meters (🔧 F3.07).
- Remove the rear bumper (🔧 E3.04).
- Remove the rear wheelhouses (🔧 E3.05).
- Remove the front sections of the rear wheelhouses.

Right hand exhaust catalytic converter



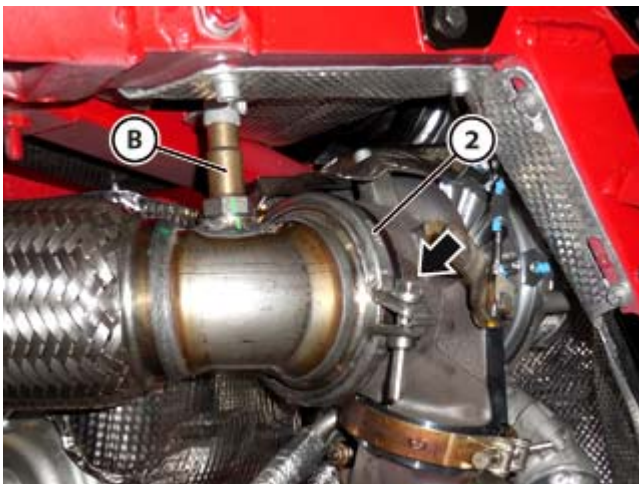
- Unscrew the oxygen sensor **(A)**.



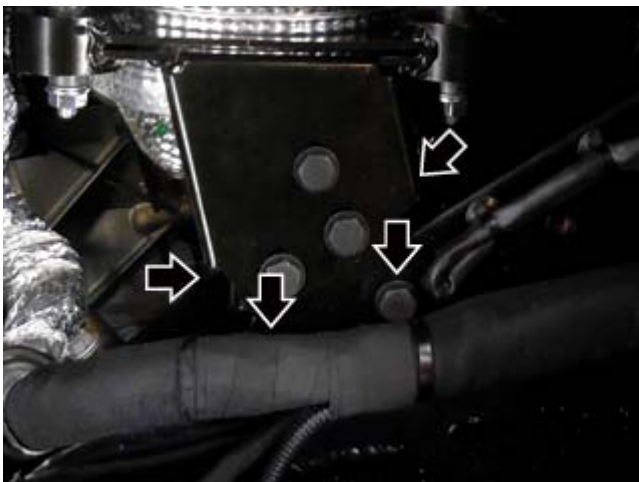
- Loosen the clamp **(1)**, undoing the indicated nut.



- Undo the indicated nut.



- Unscrew the oxygen sensor **(B)**.
- Loosen the clamp **(2)**, undoing the indicated screw.



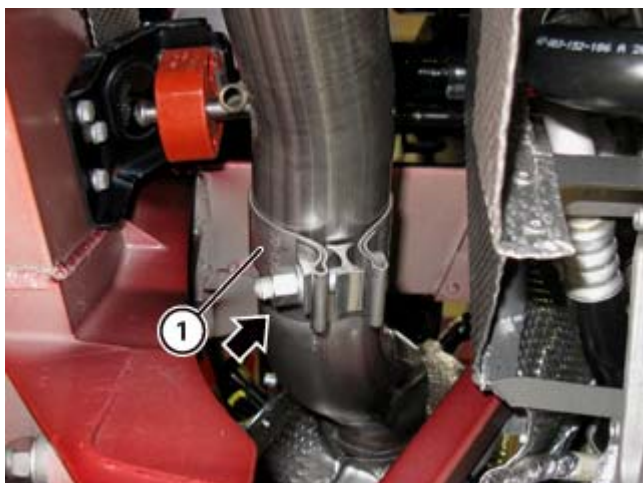
- Undo the screws indicated.

- Disconnect the catalytic converter from the turbocharger and from the silencer, and remove via the wheelhouse.

Left hand exhaust catalytic converter



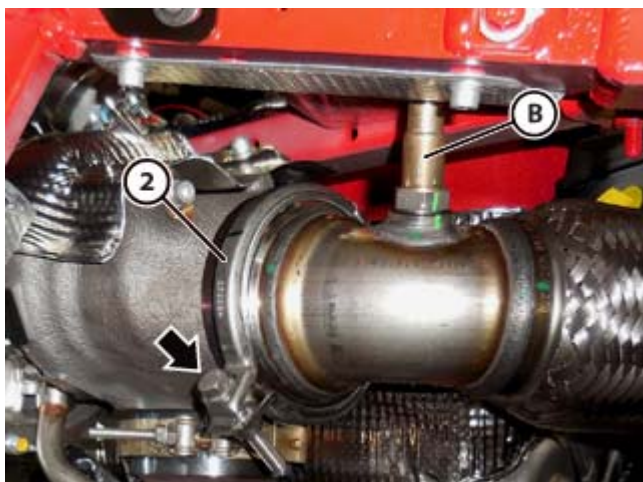
- Unscrew the oxygen sensor **(A)**.



- Loosen the clamp **(1)**, undoing the indicated nut.



- Undo the indicated nut.



- Unscrew the oxygen sensor **(B)**.
- Loosen the clamp **(2)**, undoing the indicated screw.



- Undo the screws indicated.

- Disconnect the catalytic converter from the turbocharger and from the silencer, and remove via the wheelhouse.

Refitting the exhaust system catalytic converters

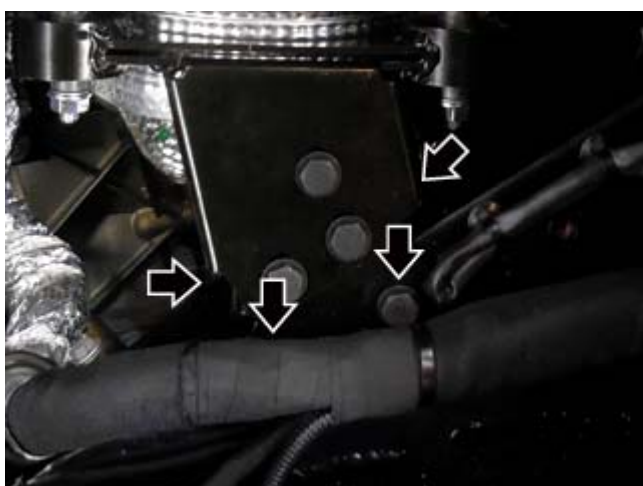
			
Tightening torque		Nm	Class
Fastening the catalytic converters	Screw	25 Nm	B
	Screw (V-Clamp collar)	13 Nm	B
	Nut (V-Clamp collar)	13 Nm	B
Fastening oxygen sensors	Oxygen sensor	50 Nm	B
Fastening the exhaust silencer	Nut	10 Nm	B
	Nut (Clamp)	54.2 Nm	B

Right hand exhaust catalytic converter



Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.
Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

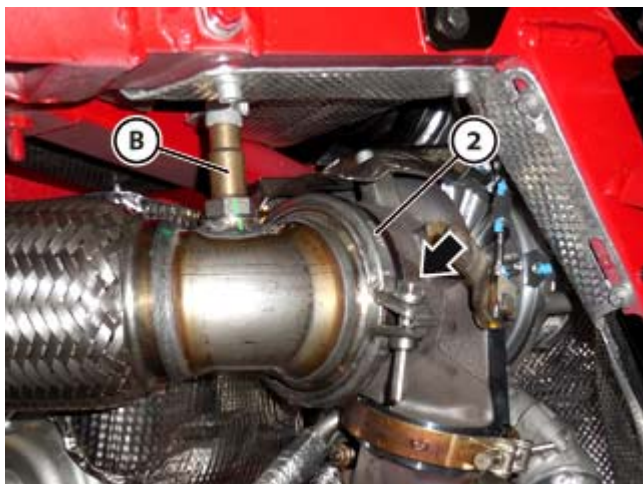
- Replace the joint seal between the catalytic converter and the turbocharger.
- Fit the catalytic converter, connecting it to the silencer.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	25 Nm	B



Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.

Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

- Replace the clamp (2).
- Carefully mate the catalytic converter inlet flange and the turbocharger outlet flange.
- If necessary, hold the catalytic converter up to support its weight until it is aligned correctly.
- While keeping the flanges correctly aligned, fit and fasten the clamp (2), tightening the indicated screw.

		
Tightening torque	Nm	Class
Screw (V-Clamp collar)	13 Nm	B

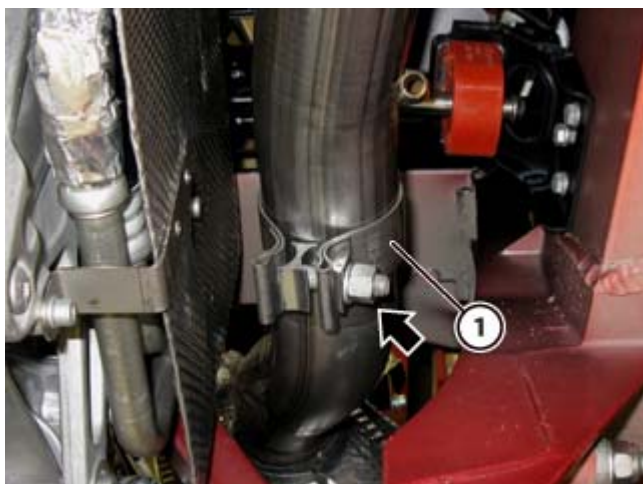
- Tighten the oxygen sensor (B).

		
Tightening torque	Nm	Class
Oxygen sensor	50 Nm	B



- While holding the screw with a suitable wrench to prevent it from turning, tighten the indicated check nut.
- The indicated screw MUST be prevented from turning while tightening the nut. If not, the screw will loosen.

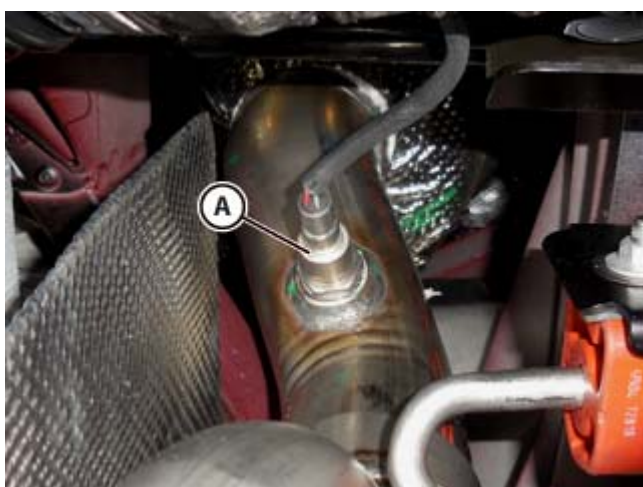
		
Tightening torque	Nm	Class
Nut (V-Clamp collar)	13 Nm	B



- Tighten the clamp, tightening the indicated nut.



Tightening torque	Nm	Class
Nut (Clamp)	54.2 Nm	B



- Screw on the oxygen sensor (A).



Tightening torque	Nm	Class
Oxygen sensor	50 Nm	B

Left hand exhaust catalytic converter



Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components. Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

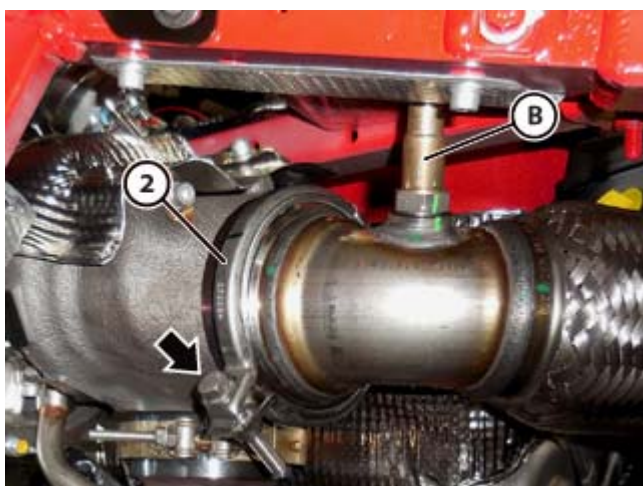
- Replace the joint seal between the catalytic converter and the turbocharger.
- Fit the catalytic converter, connecting it to the silencer.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	25 Nm	B



Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.

Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

- Replace the clamp **(2)**.
- Carefully mate the catalytic converter inlet flange and the turbocharger outlet flange.
- If necessary, hold the catalytic converter up to support its weight until it is aligned correctly.
- While keeping the flanges correctly aligned, fit and fasten the clamp **(2)**, tightening the indicated screw.



Tightening torque	Nm	Class
Screw (V-Clamp collar)	13 Nm	B

- Tighten the oxygen sensor **(B)**.

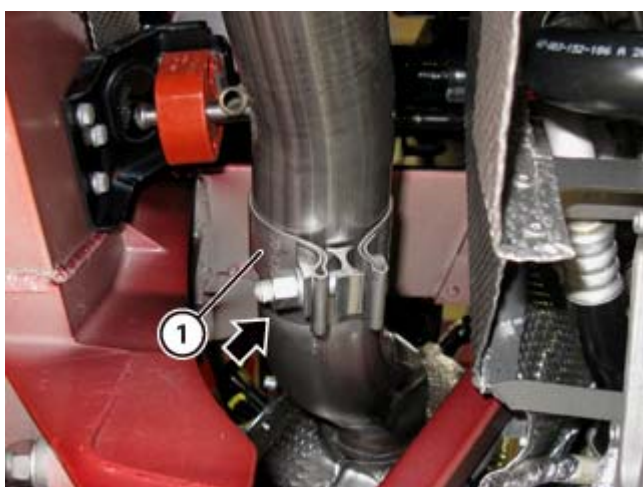


Tightening torque	Nm	Class
Oxygen sensor	50 Nm	B



- While holding the screw with a suitable wrench to prevent it from turning, tighten the indicated check nut.
- The indicated screw **MUST** be prevented from turning while tightening the nut. If not, the screw will loosen.

		
Tightening torque	Nm	Class
Nut (V-Clamp collar)	13 Nm	B



- Tighten the clamp **(1)**, tightening the indicated nut.

		
Tightening torque	Nm	Class
Nut (Clamp)	54.2 Nm	B



- Screw on the oxygen sensor **(A)**.

		
Tightening torque	Nm	Class
Oxygen sensor	50 Nm	B

- Refit the air flow meters (🔧 F3.07).
- Refit the rear bumper (🔧 E3.04).
- Refit the rear wheelhouses (🔧 E3.05).

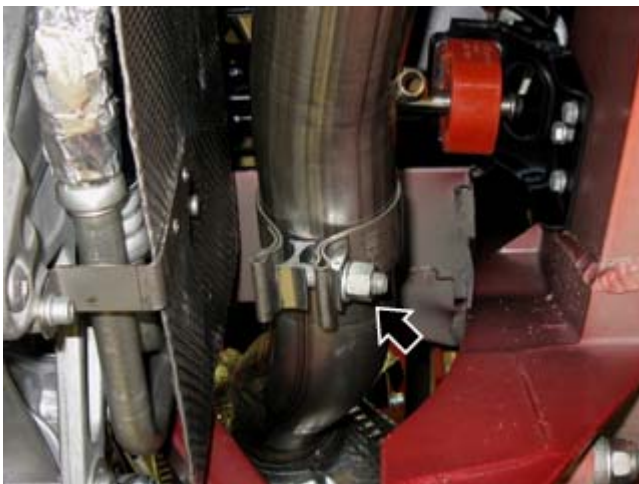
B7.04 Exhaust system silencer

Removing the exhaust system silencer

➤ Remove the rear bumper (🔧 E3.04).



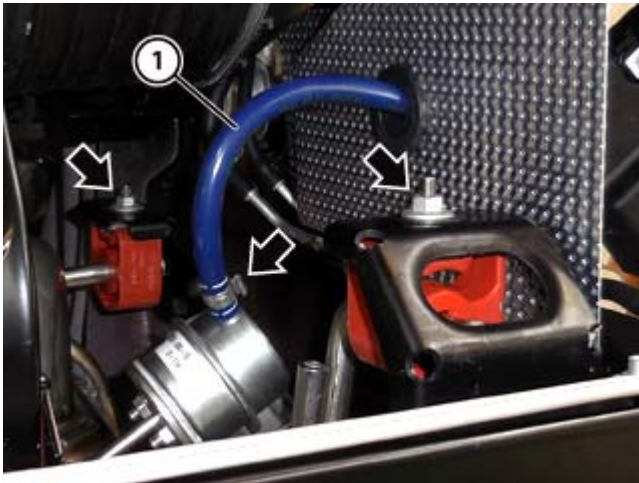
- Loosen the indicated nut.



- Loosen the indicated nut.



- Disconnect the pipe (1), removing the indicated collar.
- Undo the nuts indicated.



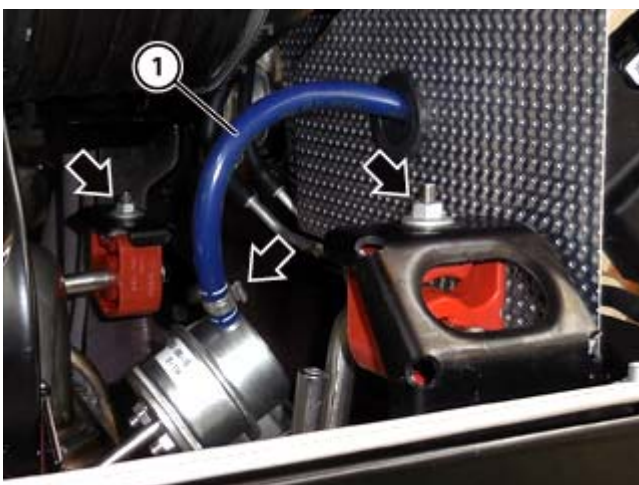
- Disconnect the pipe **(1)**, removing the indicated collar.
- Undo the nuts indicated.

- Disconnect the exhaust silencer from the catalytic converters and remove.

Refitting the exhaust system silencer

			
Tightening torque		Nm	Class
Fastening the exhaust silencer	Nut	10 Nm	B
	Nut (Clamp)	54.2 Nm	B

- Fit the exhaust silencer and connect to the catalytic converters.



- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut	10 Nm	B

- Connect the pipe **(1)** fitting and tightening the new collar as indicated.

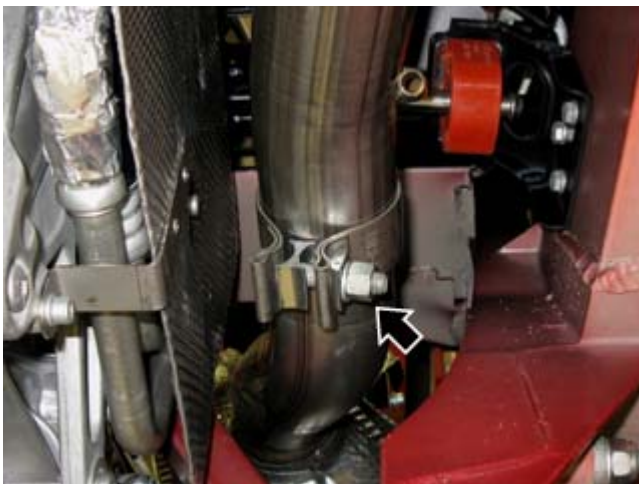


- Tighten the nuts indicated.



Tightening torque	Nm	Class
Nut	10 Nm	B

- Connect the pipe (1) fitting and tightening the new collar as indicated.



- Tighten the indicated nut.



Tightening torque	Nm	Class
Nut (Clamp)	54.2 Nm	B



- Tighten the indicated nut.



Tightening torque	Nm	Class
Nut (Clamp)	54.2 Nm	B

➤ Refit the rear bumper (🔧 E3.04).

B8.01 Turbocharging system turbochargers

Removing the turbochargers

- Remove the engine compartment cosmetic shields (E3.13).
 - i Remove the lateral cosmetic engine compartment shields.
- Remove the rear wheelhouses (E3.05).
 - i Remove the front sections of the rear wheelhouses.

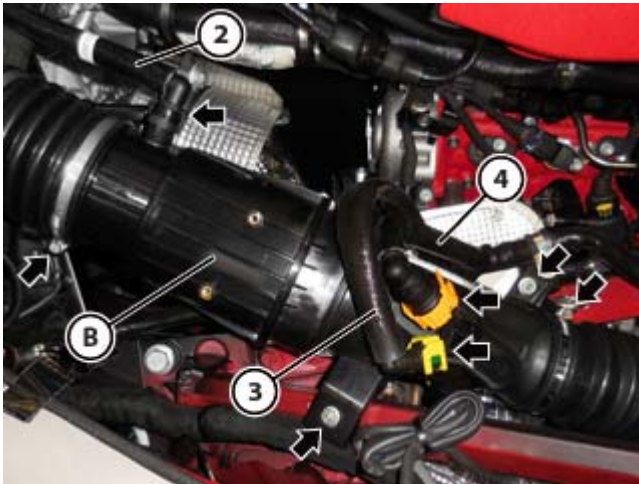
RH turbocharger



- Loosen the screw collar indicated.
- Disconnect the pipe (1).
- Release and open the indicated clip.



- Loosen the indicated collar.
- Undo the screws indicated.
- Disconnect and remove the duct (A).



- Disconnect the pipe **(2)**, detaching the respective quick release coupling.
- Disconnect the pipe **(3)**, detaching the respective quick coupling "double lock" connector.
- Disconnect the pipe **(4)**, detaching the respective quick coupling "double lock" connector.
- Loosen the indicated screw collars.
- Undo the nuts indicated.
- Disconnect and remove the duct **(B)**.



- Disconnect the connector **(5)**.
- Disconnect the pipe **(6)**, detaching the respective quick coupling "double lock" connector.
- Loosen the indicated screw collars.
- Undo the indicated nut.
- Disconnect and remove the duct **(C)**.



- Undo the screws indicated.



- Undo the screws indicated.



- Undo the screws indicated.

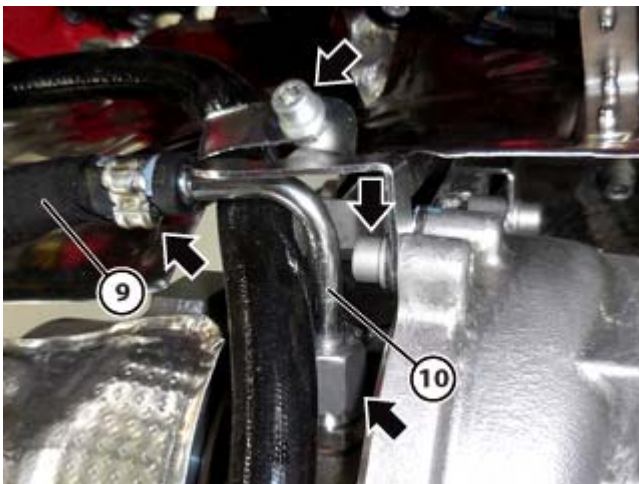
- Remove the RH internal diagonal brace of the chassis.



- Disconnect the pipe (7).



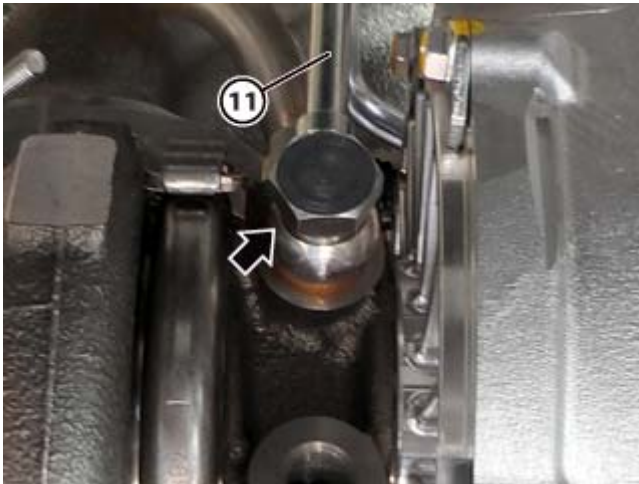
- Disconnect the pipe **(8)** undoing the indicated pipe union.



- Disconnect the pipe **(9)**, removing the respective collar indicated.
- Undo the screws indicated.
- Disconnect the pipe **(10)** undoing the respective union indicated.



- Undo the indicated screw.



- Disconnect the pipe **(11)** undoing the indicated pipe union.



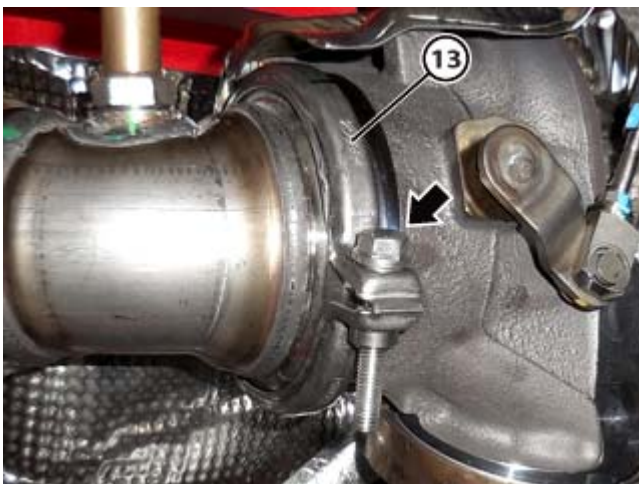
- Undo the indicated screw.



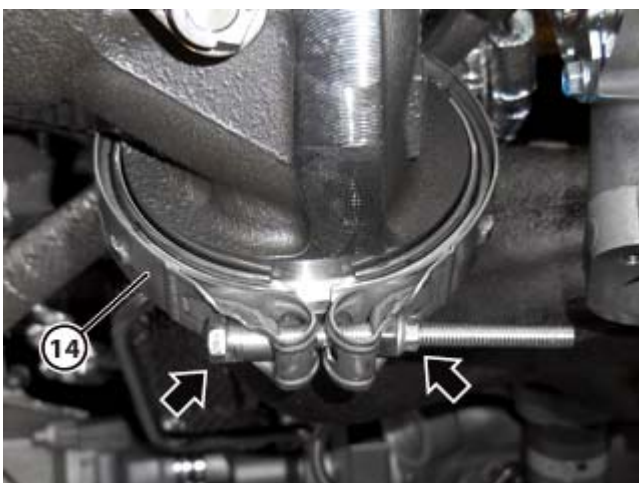
- Undo the indicated screw.
- Disconnect the pipe **(12)**.



- Undo the screws indicated.
- Disconnect the pipe **(D)**.



- Loosen the indicated screw.
- Move the clamp **(13)** on the catalytic converter.



- Loosen the indicated check nut and screw.
- Move the clamp **(14)** on the exhaust manifold

- Move the cooling and lubrication pipes of the turbocharger making sure you do not bend them.
- Remove the turbocharger by taking it out of the engine compartment.



- Remove the clamp **(14)**.
- Remove the seal **(15)**.
- Protect the exhaust system ducts and the cooling and lubrication pipes of the turbocharger.

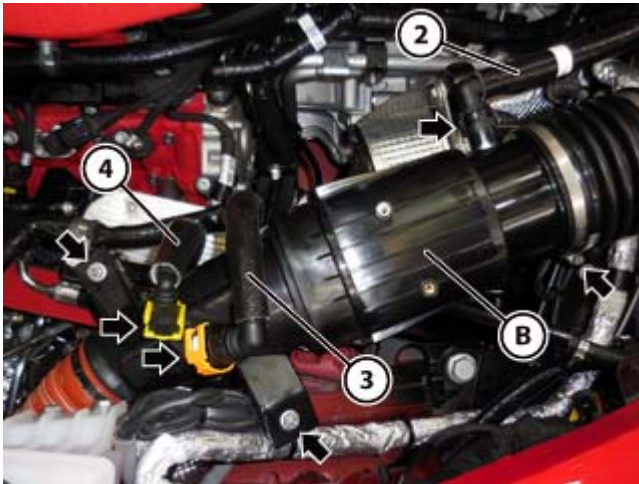
LH turbocharger



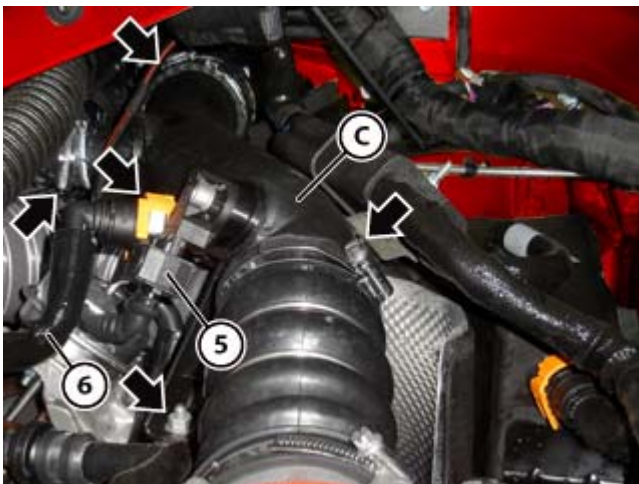
- Loosen the screw collar indicated.
- Disconnect the pipe **(1)**.
- Release and open the indicated clip.



- Loosen the indicated collar.
- Undo the screws indicated.
- Disconnect and remove the duct **(A)**.



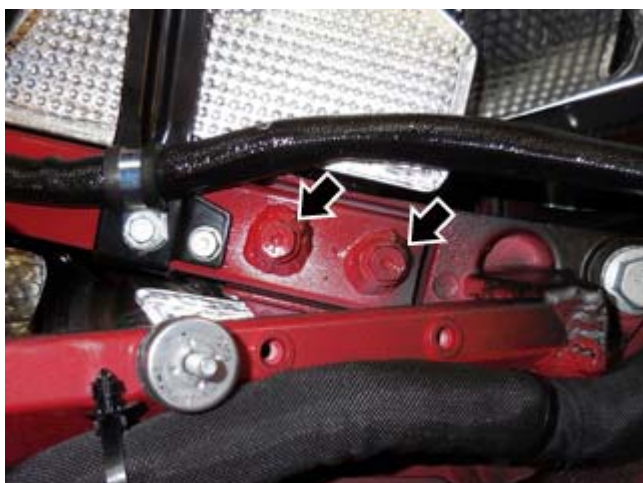
- Disconnect the pipe **(2)**, detaching the respective quick release coupling.
- Disconnect the pipe **(3)**, detaching the respective quick coupling "double lock" connector.
- Disconnect the pipe **(4)**, detaching the respective quick coupling "double lock" connector.
- Loosen the indicated screw collars.
- Undo the nuts indicated.
- Disconnect and remove the duct **(B)**.



- Disconnect the connector **(5)**.
- Disconnect the pipe **(6)**, detaching the respective quick coupling "double lock" connector.
- Loosen the indicated screw collars.
- Undo the indicated nut.
- Disconnect and remove the duct **(C)**.



- Undo the screws indicated.



- Undo the screws indicated.

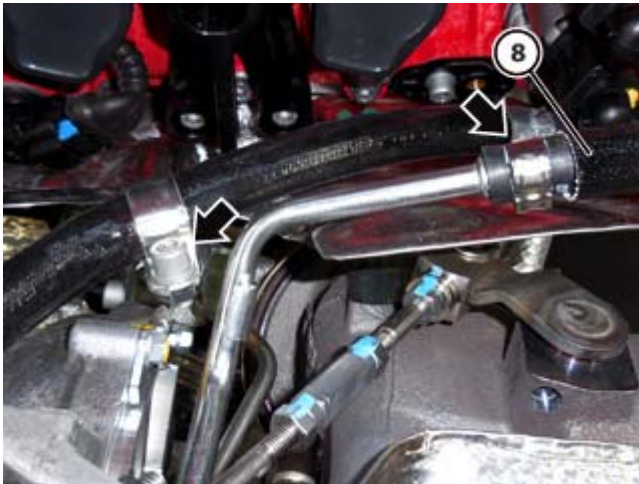


- Undo the screws indicated.

- Remove the LH internal diagonal brace of the chassis.



- Disconnect the pipe (7).



- Disconnect the pipe **(8)**, removing the respective collar indicated.
- Undo the indicated screw.



- Undo the indicated screw.



- Disconnect the pipe **(9)** undoing the indicated pipe union.



- Disconnect the pipe **(10)** undoing the indicated pipe union.



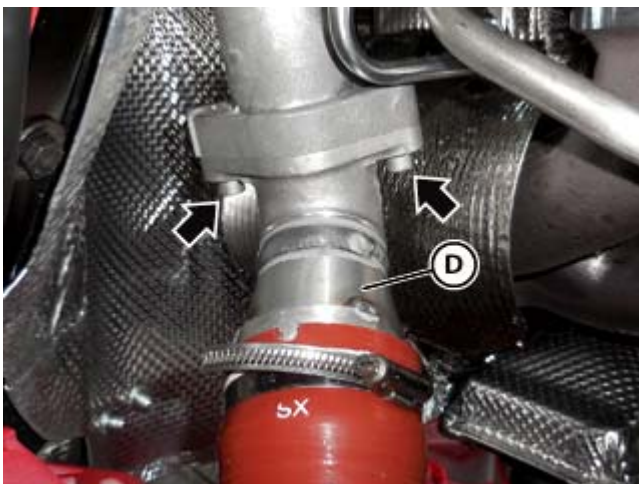
- Undo the indicated screw.



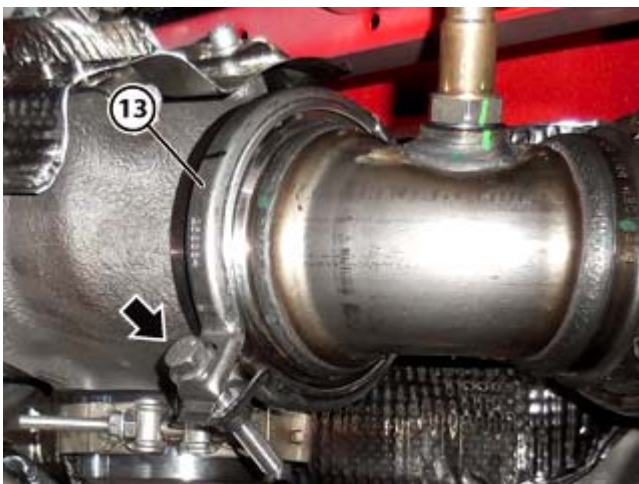
- Disconnect the pipe **(11)** undoing the indicated pipe union.



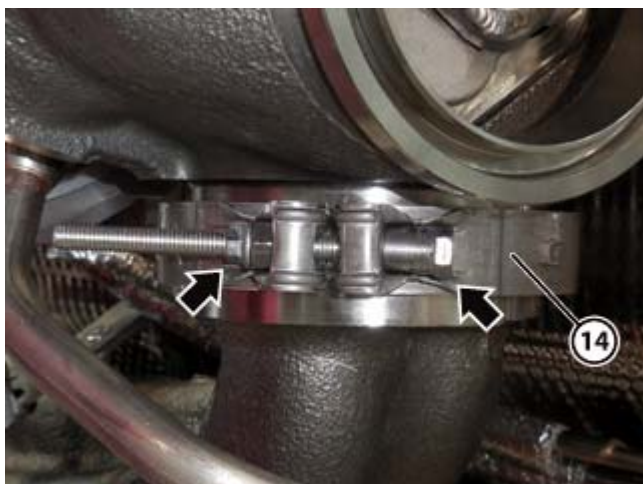
- Undo the screws indicated.
- Disconnect the pipe **(12)**.



- Undo the screws indicated.
- Disconnect the pipe **(D)**.



- Loosen the indicated screw.
- Move the clamp **(13)** on the catalytic converter.



- Loosen the indicated check nut and screw.
- Move the clamp **(14)** on the exhaust manifold

- Move the cooling and lubrication pipes of the turbocharger making sure you do not bend them.
- Remove the turbocharger by taking it out of the engine compartment.



- Remove the clamp **(14)**.
- Remove the seal **(15)**.
- Protect the exhaust system ducts and the cooling and lubrication pipes of the turbocharger.

Refitting the turbochargers

			
Tightening torque		Nm	Class
Fastening the turbochargers	Screw (V-Clamp collar)	8 Nm	B
	Nut (V-Clamp collar)	8 Nm	B
Fastening the catalytic converters	Screw	25 Nm	B
	Screw (V-Clamp collar)	13 Nm	B
	Nut (V-Clamp collar)	13 Nm	B
Fastening the turbocharger air inlet/outlet pipes	Screw	10 Nm	B
Fastening the turbocharger lubrication pipes	Screw	10 Nm	B
	Filler neck	20 Nm	B
Fastening the turbocharger cooling pipes	Screw	10 Nm	B
	Filler neck	25 Nm	B



Tightening torque		Nm	Class
	Threaded union	25 Nm	B
Fastening the internal engine compartment diagonal braces	Screw	24 Nm	B
Fastening the engine air ducts from the intercooler to throttle bodies	Screw collar	4 Nm	B
	Nut	6 Nm	B
Fastening the engine air ducts from the air flow meters to the turbochargers	Screw collar	4 Nm	B
	Nut	6 Nm	B

RH turbocharger



- Remove the shields from the exhaust system ducts and the cooling and lubrication pipes of the turbocharger.

- Thoroughly clean the mating surfaces between the turbocharger and the exhaust manifold.



Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.

Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

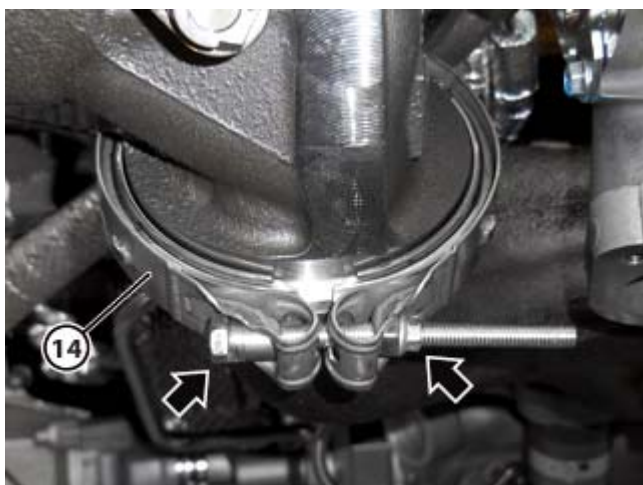
- Replace and thoroughly clean the seal **(15)** in the groove on the exhaust manifold outlet flange.
- Replace the clamp **(14)**, fitting the new clamp on the exhaust manifold.

- Move the cooling and lubrication pipes of the turbocharger aside, taking care not to bend them.

- From the engine compartment, fit the turbocharger onto the exhaust manifold and carefully mate the respective flanges.

 A key on the turbocharger inlet flange and a groove on the exhaust manifold outlet flange ensure that the turbocharger and exhaust manifold flanges are mated correctly.

- Fit the cooling and lubrication pipes of the turbocharger in the correct positions, taking care not to bend them.

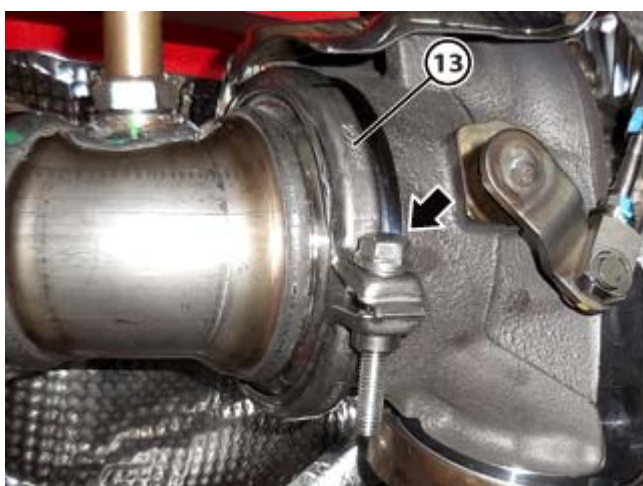


- Fit the new clamp **(14)**, orienting correctly as shown.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw (V-Clamp collar)	8 Nm	B

- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut (V-Clamp collar)	8 Nm	B



-  Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.
 Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

- Replace the joint seal between the catalytic converter and the turbocharger.
- Carefully mate the catalytic converter inlet flange and the turbocharger outlet flange.
- Fit a new clamp **(13)**, orienting correctly as shown.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw (V-Clamp collar)	13 Nm	B



- Replace the gasket of pipe **(D)**.
- Connect the pipe **(D)**.
- Tighten the screws indicated.

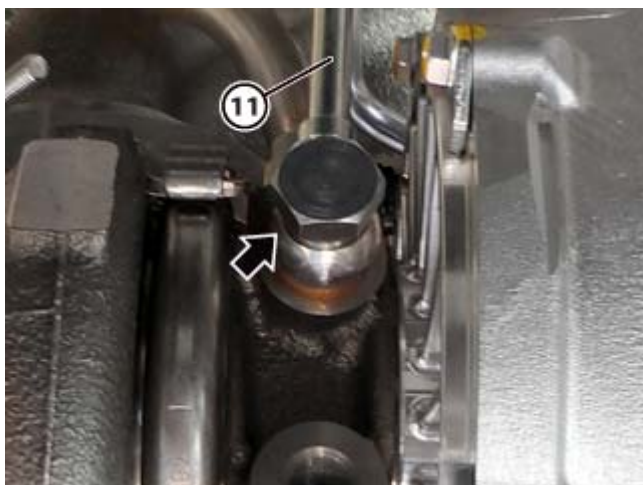
		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Connect the pipe **(12)**.
- Tighten the indicated screw.



- Tighten the indicated screw.



- Replace the gaskets of pipe **(11)**.
- Connect the pipe **(11)** tightening the indicated pipe union.



- Tighten the indicated screw.



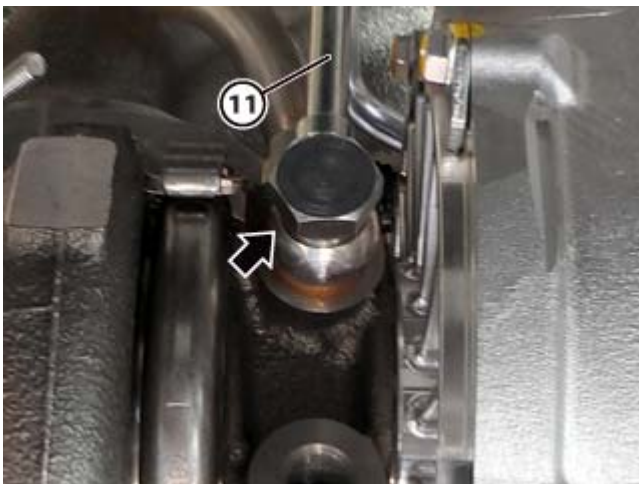
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



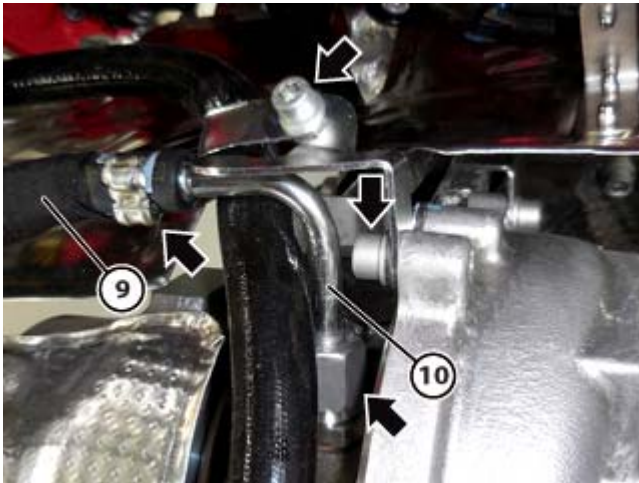
- Tighten the indicated pipe union.

		
Tightening torque	Nm	Class
Filler neck	25 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Replace the gaskets of pipe (10).
- Connect the pipe (10), tightening the respective union indicated.



Tightening torque	Nm	Class
Threaded union	25 Nm	B

- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the pipe (9) fitting and tightening the respective collar indicated.



- Replace the gaskets of pipe (8).
- Disconnect pipe (8) tightening the indicated pipe union.



Tightening torque	Nm	Class
Filler neck	20 Nm	B



- Connect the pipe (7).

- Fit the RH internal diagonal brace of the chassis.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	24 Nm	B



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	24 Nm	B



- Tighten the screws indicated.



- Fit and connect the duct **(C)**.
- Tighten the indicated screw collars.



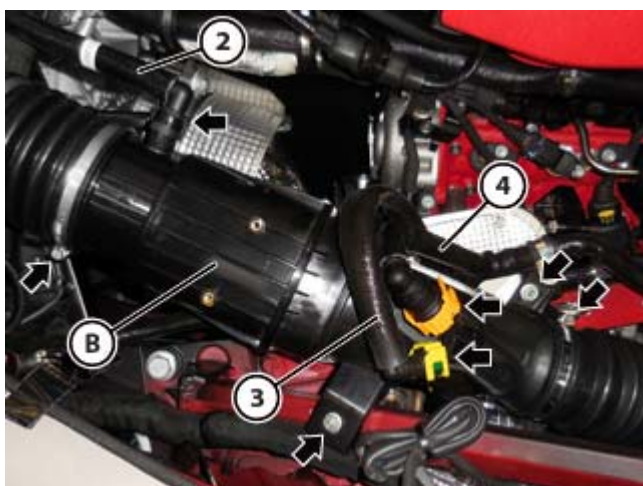
Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Tighten the indicated nut.



Tightening torque	Nm	Class
Nut	6 Nm	B

- Connect the pipe **(6)**, fastening the respective quick coupling "double lock" connector.
- Connect the connector **(5)**.



- Fit and connect the duct **(B)**.
- Tighten the indicated screw collars.



Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Tighten the nuts indicated.



Tightening torque	Nm	Class
Nut	6 Nm	B

- Connect the pipe **(4)**, fastening the respective quick coupling "double lock" connector.
- Connect the pipe **(3)**, fastening the respective quick coupling "double lock" connector.
- Connect the pipe **(2)**, fastening the respective quick release coupling.



- Fit and connect the duct **(A)**.
- Tighten the screws indicated.
- Tighten the indicated collar clamp.



- Connect pipe **(1)**.
- Tighten the indicated screw collar.



Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Close and fasten the indicated clip.

LH turbocharger



- Remove the shields from the exhaust system ducts and the cooling and lubrication pipes of the turbocharger.

- Thoroughly clean the mating surfaces between the turbocharger and the exhaust manifold.

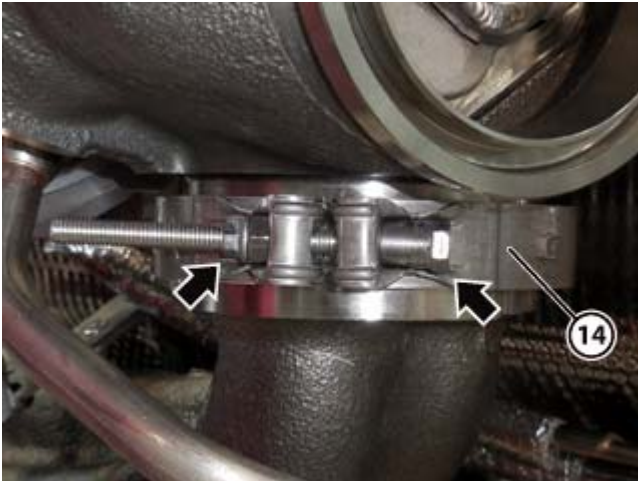


Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.

Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

- Replace and thoroughly clean the seal **(15)** in the groove on the exhaust manifold outlet flange.
- Replace the clamp **(14)**, fitting the new clamp on the exhaust manifold.

- Move the cooling and lubrication pipes of the turbocharger aside, taking care not to bend them.
- From the engine compartment, fit the turbocharger onto the exhaust manifold and carefully mate the respective flanges.
- A key on the turbocharger inlet flange and a groove on the exhaust manifold outlet flange ensure that the turbocharger and exhaust manifold flanges are mated correctly.
- Fit the cooling and lubrication pipes of the turbocharger in the correct positions, taking care not to bend them.

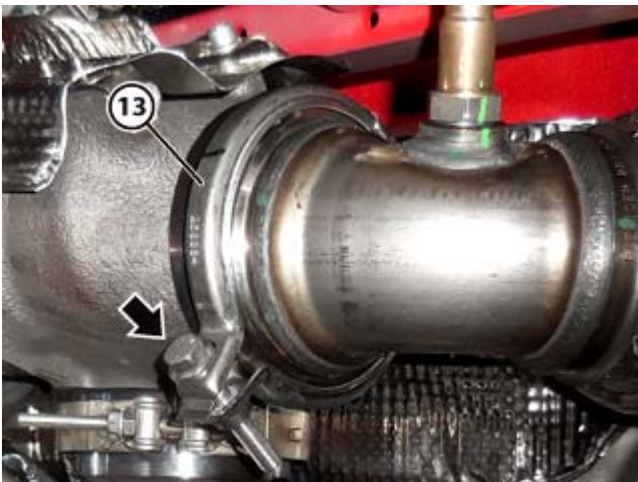


- Fit the new clamp **(14)**, orienting correctly as shown.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw (V-Clamp collar)	8 Nm	B

- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut (V-Clamp collar)	8 Nm	B

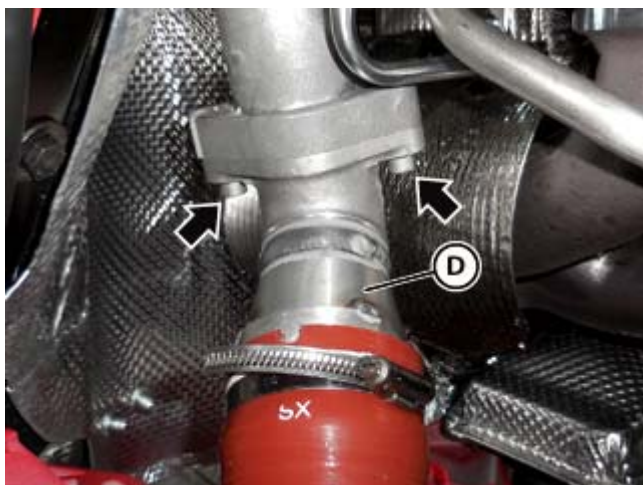


Never reuse exhaust system clamps and gaskets that have been subjected to operating temperature. Always replace with new components.

Only new exhaust system clamps and gaskets may be removed and refitted for adjustment purposes during initial installation.

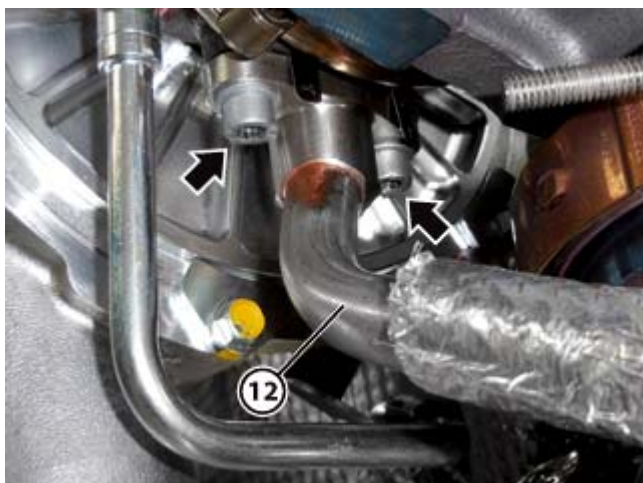
- Replace the joint seal between the catalytic converter and the turbocharger.
- Carefully mate the catalytic converter inlet flange and the turbocharger outlet flange.
- Fit a new clamp **(13)**, orienting correctly as shown.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw (V-Clamp collar)	13 Nm	B



- Replace the gasket of pipe **(D)**.
- Connect the pipe **(D)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Connect the pipe **(12)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Replace the gaskets of pipe **(11)**.
- Connect the pipe **(11)** tightening the indicated pipe union.



- Tighten the indicated screw.



- Tighten the indicated pipe union.

		
Tightening torque	Nm	Class
Filler neck	25 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	10 Nm	B



- Replace the gaskets of pipe **(10)**.
- Connect the pipe **(10)** tightening the indicated pipe union.



- Tighten the indicated screw.



- Tighten the indicated pipe union.

		
Tightening torque	Nm	Class
Filler neck	20 Nm	B



- Undo the indicated screw.



- Replace the gaskets of pipe **(9)**.
- Connect the pipe **(9)** tightening the indicated pipe union.



- Tighten the indicated screw.



- Tighten the indicated pipe union.



Tightening torque	Nm	Class
Filler neck	25 Nm	B



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	10 Nm	B



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the pipe (8) fitting and tightening the respective collar indicated.



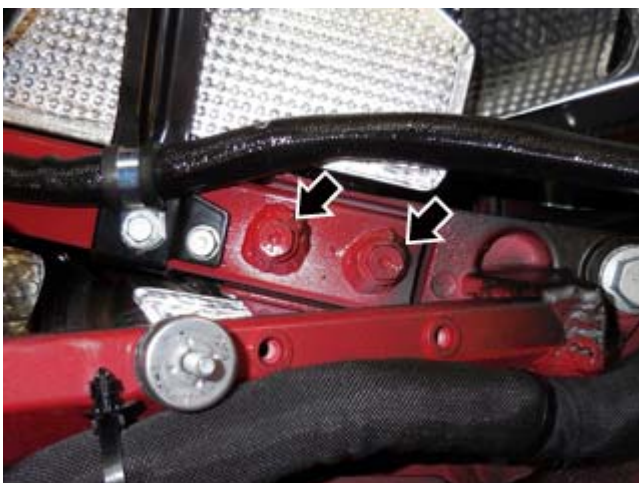
- Connect the pipe (7).

- Fit the LH internal diagonal brace of the chassis.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	24 Nm	B

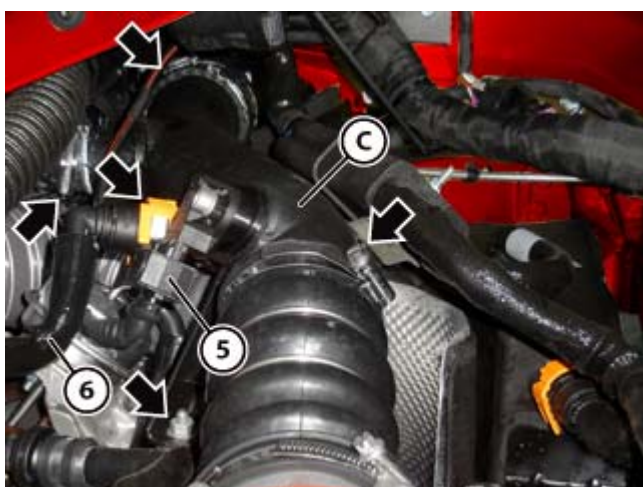


- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	24 Nm	B



- Tighten the screws indicated.



- Fit and connect the duct **(C)**.
- Tighten the indicated screw collars.



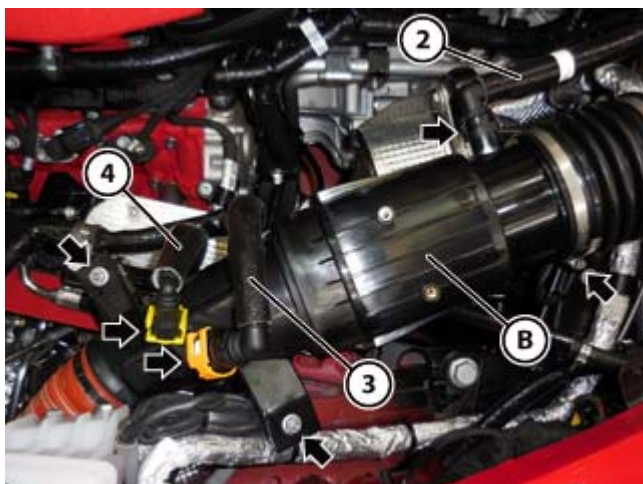
Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Tighten the indicated nut.



Tightening torque	Nm	Class
Nut	6 Nm	B

- Connect the pipe **(6)**, fastening the respective quick coupling "double lock" connector.
- Connect the connector **(5)**.



- Fit and connect the duct **(B)**.
- Tighten the indicated screw collars.

		
Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut	6 Nm	B

- Connect the pipe **(4)**, fastening the respective quick coupling "double lock" connector.
- Connect the pipe **(3)**, fastening the respective quick coupling "double lock" connector.
- Connect the pipe **(2)**, fastening the respective quick release coupling.



- Fit and connect the duct **(A)**.
- Tighten the screws indicated.
- Tighten the indicated collar clamp.



- Connect pipe **(1)**.
- Tighten the indicated screw collar.

		
Tightening torque	Nm	Class
Screw collar	4 Nm	B

- Refit the rear wheelhouses ( E3.05).
 -  Refit the front sections of the rear wheelhouses.
- Refit the engine compartment cosmetic shields ( E3.13).
 -  Refit the lateral cosmetic shields.
- Fill and bleed the coolant system ( A3.07).

B8.02 Turbocharging system sensors

Replacing turbocharging system pressure and temperature sensors



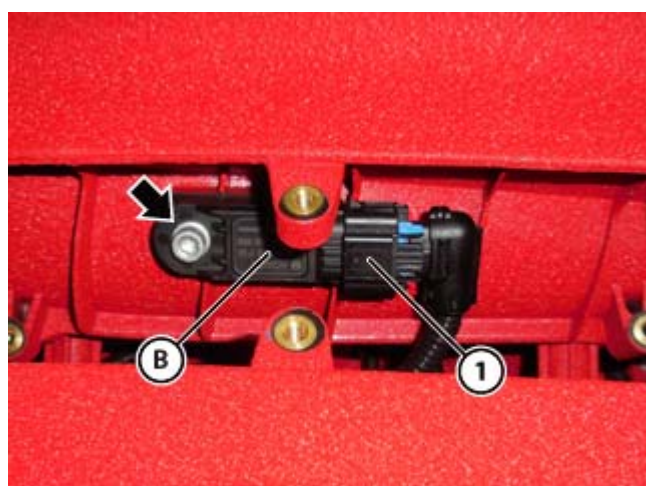
Tightening torque		Nm	Class
Fastening engine air pressure sensor	Screw	10 Nm	B
Fastening intake manifold cosmetic grille	Screw	8 Nm	B
Fastening engine air pressure and temperature sensor	Screw	4 Nm	B
Products to use: Loctite 278			

➤ Disconnect the battery (🔌 F2.01).

Pressure sensor on left hand intake manifold



- Undo the screws indicated.
- Remove the cosmetic grille (A).



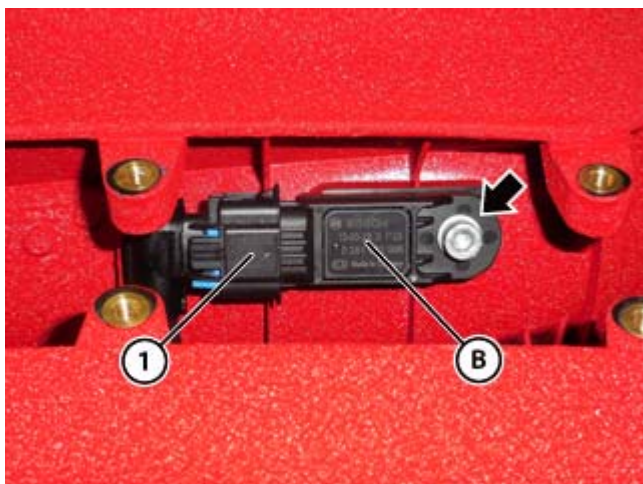
Pressure sensor on right hand intake manifold

- Disconnect the connector (1).
- Undo the indicated screw.
- Remove the sensor (B) and replace.
- Fit the new sensor (B).
- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the connector (1).



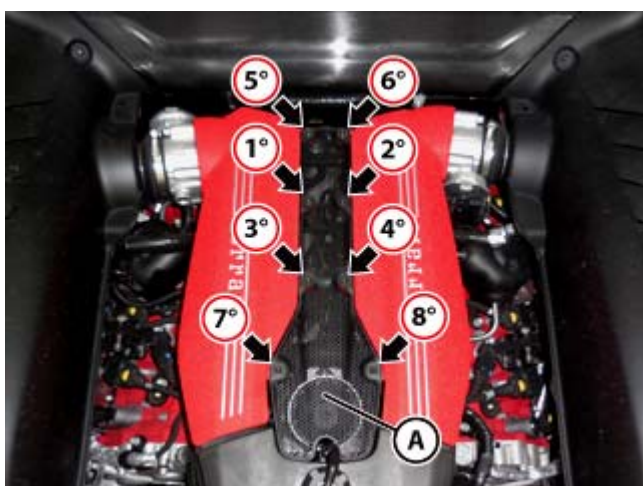
Pressure sensor on left hand intake manifold

- Disconnect the connector **(1)**.
- Undo the indicated screw.
- Remove the sensor **(B)** and replace.
- Fit the new sensor **(B)**.
- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the connector **(1)**.



- Fit the cosmetic grille **(A)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B

Temperature and pressure sensors on intake ducts

- Remove the engine compartment cosmetic shields (E3.13).
- Remove the lateral cosmetic engine compartment shields.



Temperature and pressure sensor on right hand intake duct

- Disconnect the connector **(1)**.
- Undo the indicated screw.
- Remove the sensor **(A)** and replace.
- Fit the new sensor **(A)**.
- Tighten the indicated screw, applying **Loctite 278** to the thread.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.



Temperature and pressure sensor on left hand intake duct

- Disconnect the connector **(1)**.
- Undo the indicated screw.
- Remove the sensor **(A)** and replace.
- Fit the new sensor **(A)**.
- Tighten the indicated screw, applying **Loctite 278** to the thread.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.

- Refit the engine compartment cosmetic shields ( E3.13).
-  Refit the lateral cosmetic engine compartment shields.

- Connect the battery ( F2.01).

B8.03 Turbocharging system solenoid valves

Replacing the turbocharging system modulator solenoid valves

- Preparation in progress

B8.04 Turbocharging system intercooler

Removing the turbocharging system intercooler

- Preparation in progress

Refitting the turbocharging system intercooler

- Preparation in progress

C1.01 Technical specifications

DCT gearbox

Dual clutch transmission, 7 forward gears + reverse, electrohydraulic system controlled automatically or in semi-automatic mode from the steering wheel shift paddles.

Each of the two clutches is associated to a different part of the gearbox, with one part engaging even gears and the other engaging odd gears.

Each time the driver selects a gear, the system already preselects the next gear.

As the correct engine speed is reached, one clutch opens while the other closes simultaneously, so that the shift is performed with no interruption in power delivery.

Electronic control systems

E-Diff 3: active electronic differential on rear axle, which continuously varies the degree of differential lock-up between the two axle shafts.

Transmission drive ratios

	1st	2nd	3rd	4th	5th	6th	7th	R
Gearbox gear ratios	3.334	2.285	1.626	1.728	1.369	0.875	0.642	2.979
Differential/bevel gear pair ratio			4.375					

C1.02 Specific tooling and equipment



- Trolley 95977565 (AS 107565)
removing the engine / gearbox / subframe assembly.



- Trolley 95977572 (AS 107572)
to be used together with trolley AS 107565 for
removing/refitting gearbox from and into
vehicle.



- Torque wrench 95978172 (AV 8172)
(Replaces torque wrench USAG 815F)



- Hook 95977564 (AS 107564) for lifting the gearbox.



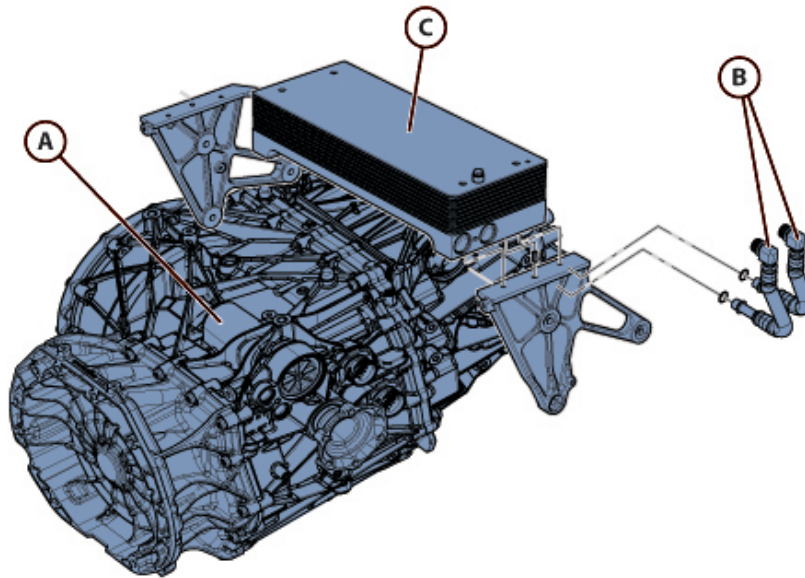
- Pump 95978174 (AV 8174) topping up gearbox and clutch oil.

C1.03 Tightening torques

			
Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B
Fastening single oil heat exchanger	Screw	9 Nm	B
Fastening single oil heat exchanger brackets	Screw	30 Nm	B
Fastening starter motor to gearbox	Screw	25 Nm	A
Fastening gearbox to engine	Nut	60 Nm	A
Fastening DCT gearbox bush mount	Screw	100 Nm	A
	Screw (pretightening)	40 Nm	0
Fastening GL and ATF oil pipe forks to gearbox	Screw	20 Nm	A
Fastening axle shaft to wheel hub	Nut	275 Nm	A
Fastening DCT gearbox mounting bush	Nut	100 Nm	B
Fastening GL and ATF oil pipe forks to single oil heat exchanger	Screw	9 Nm	A
Fastening gear oil and clutch oil radiator to chassis	Nut	9 Nm	B
Fastening flywheel to crankshaft	Pretightening torque for screw	45 Nm	A
	Screw	91 Nm	A
Fastening single oil heat exchanger pipe heat shields	Screw	9 Nm	B
	Nut	9 Nm	B
Fastening heat shield brackets	Screw	20 Nm	B
	Screw	9 Nm	B
Fastening bush mounting bracket to gearbox	Screw	100 Nm	A

C2.01 DCT gearbox gear oil system layout

Gear oil system layout



A - DCT gearbox (gear oil tank and gear oil pump)

B - Gear oil pipes

C - Water/gear oil radiator

C2.02 Removing the DCT gearbox

Removing the DCT gearbox

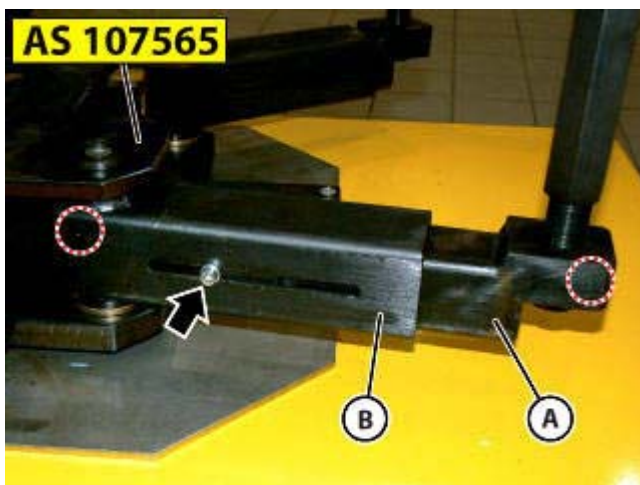


CAUTION

For safety reasons, the VEHICLE MAY ONLY BE LIFTED WITH THE ANTI-TIPPING SAFETY RETAINERS INSTALLED.

- Lift the vehicle using anti-tipping safety retainers (E3.12).
- Remove the flat undertray sections (E3.12).
 - i Remove the rear flat undertray section.
- Remove the rear bumper (E3.04).
- Remove the engine lubrication system tank (B5.03).
- Remove the exhaust system silencer (B7.04).
 - i Loosen the fasteners of the exhaust silencer and move the silencer as far back as possible without removing it from the vehicle.
- Remove the axle shafts (C4.01).
 - i Disconnect the axle shafts from the gearbox flanges.

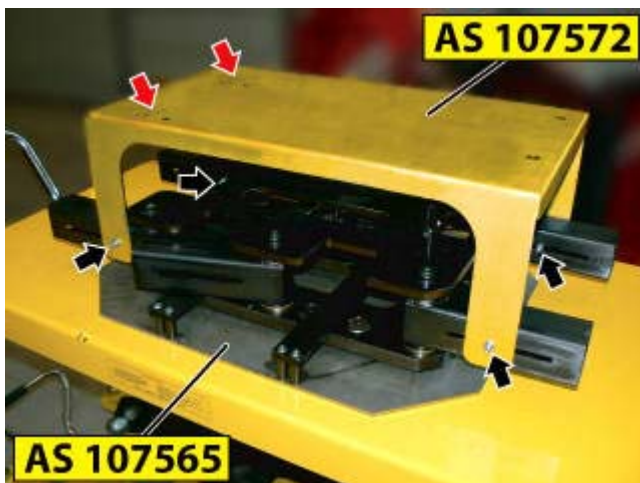
- The trolley (AS 107565) and the trolley (AS 107572) are necessary for the removal of the DCT gearbox.



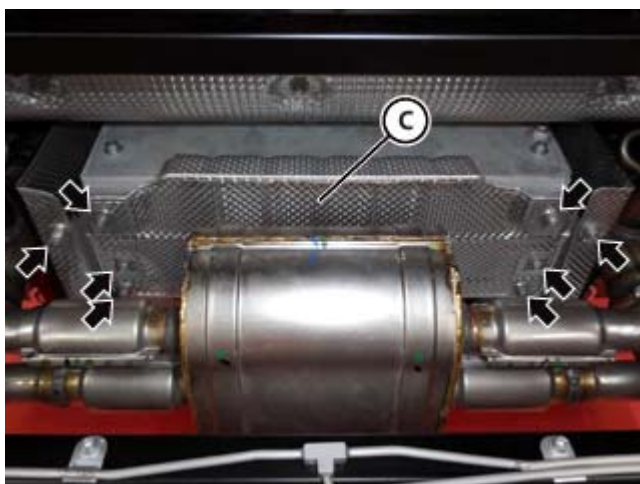
- (AS 107565) Undo the indicated screws fastening the telescoping arm (A) to the relative mounting (B) on all the arms on the trolley.
- Pull out and remove all the telescoping arms (A) from the respective mounts (B).
- i The telescoping arms (A) and the mounts (B) are numbered for identification and matching correctly.



- Position the mountings (B) on the trolley (AS 107565) as shown in the photo aside.



- Place the trolley (AS 107572) on the mountings of the trolley (AS 107565), orienting with the pairs of holes indicated by the red arrows towards the rear of the vehicle, as shown in the photo aside.
- Fasten the trolley (AS 107572) onto the mountings, in as centred a position as possible, tightening the four screws indicated.



- Undo the screws indicated.
- Remove the heat shield (C).



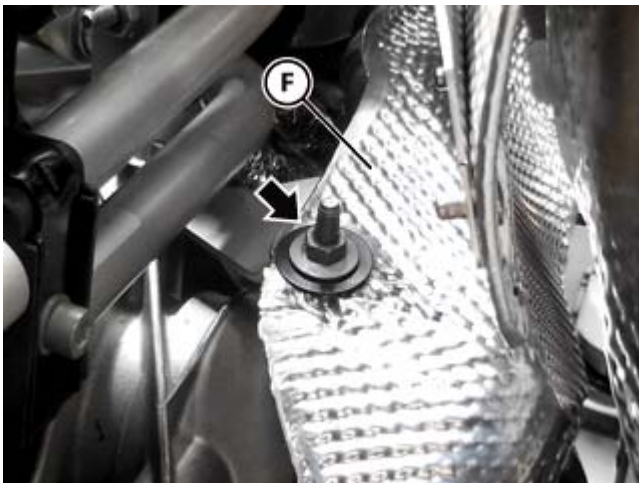
- Undo the screws indicated.
- Remove the heat shield **(D)**.



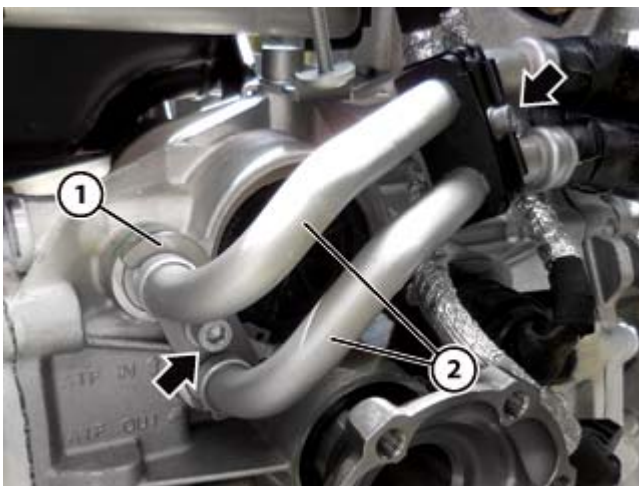
- Undo the screws indicated.



- Undo the screws indicated.
- Remove the heat shield **(E)**.



- Undo the indicated nut.
- Remove the heat shield **(F)**.



- Using a suitable degreaser that does not leave residue, thoroughly clean the area surrounding the clutch hydraulic system oil pipe connections.
- Place a suitable container for collecting the clutch hydraulic system oil under the pipes.
- Undo the indicated screw fastening the retainer block.
- Undo the indicated screw fastening the fork **(1)**.
- Remove the fork **(1)**.



Pour the oil drained from the system into a container and seal it. DO NOT dispose of used oil in the environment.

- Disconnect the pipes **(2)** and plug the ends immediately.
- Taking care not to bend them, move the pipes **(2)** aside so that they do not hinder the subsequent operations.



- Using a degreaser that does not leave residue, thoroughly clean the area around the gearbox gear oil pipe connections.
- Place a suitable container for collecting the gearbox gear oil under the pipes.
- Undo the indicated screw.
- Remove the fork **(3)**.

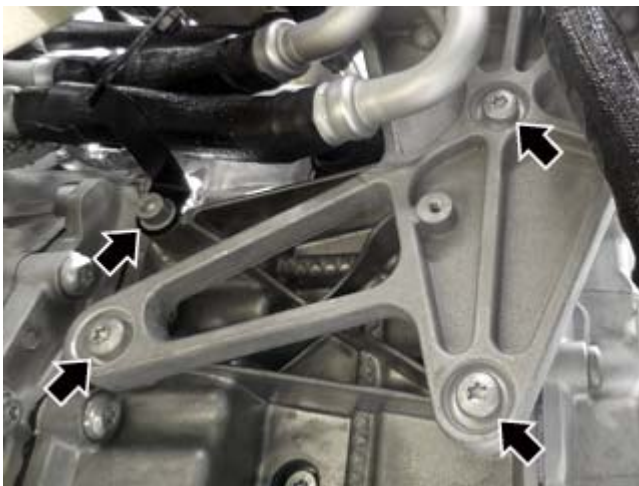


Pour the oil drained from the system into a container and seal it. DO NOT dispose of used oil in the environment.

- Disconnect the pipes **(4)** and plug the ends immediately.
- Taking care not to bend them, move the pipes **(4)** aside so that they do not hinder the subsequent operations.



- Undo the indicated screw fastening the retainer block.
- Undo the indicated screws fastening the mounting bracket of the single oil heat exchanger.

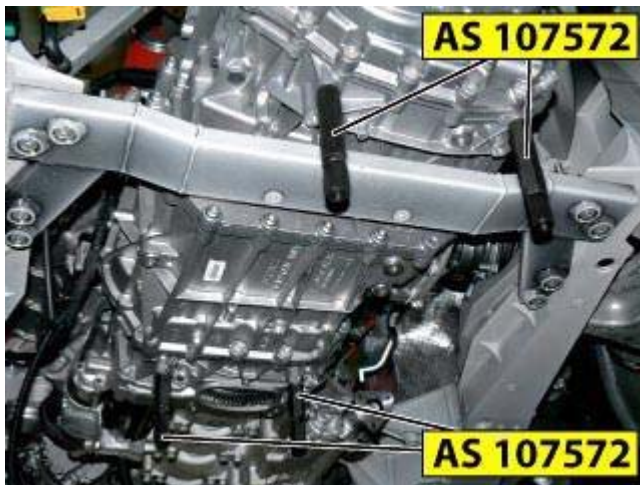


- Undo the indicated screw fastening the mounting bracket of the heat shields.
- Undo the indicated screws fastening the mounting bracket of the single oil heat exchanger.

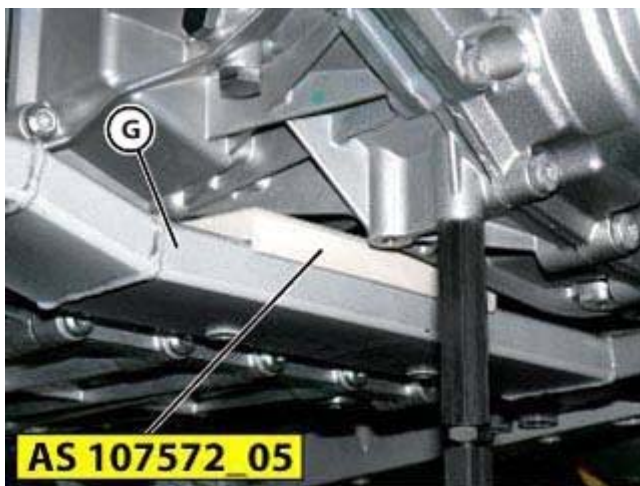
- Lift the single oil heat exchanger, complete with mounting brackets, and secure to the engine air intake filter box.



- Disconnect the connectors (5).
- Move the DCT gearbox wiring harness out of the way so that it does not hinder the following operations.



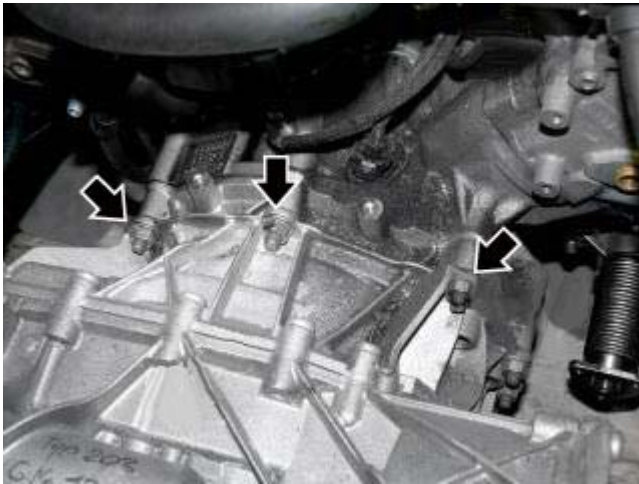
- Tighten the adjuster pins of the tool (**AS 107572**) into the relative holes, and set all the pins to the same position.
- The shorter adjuster pins must be installed in the front holes.
- The longer adjuster pins must be installed in the rear holes.



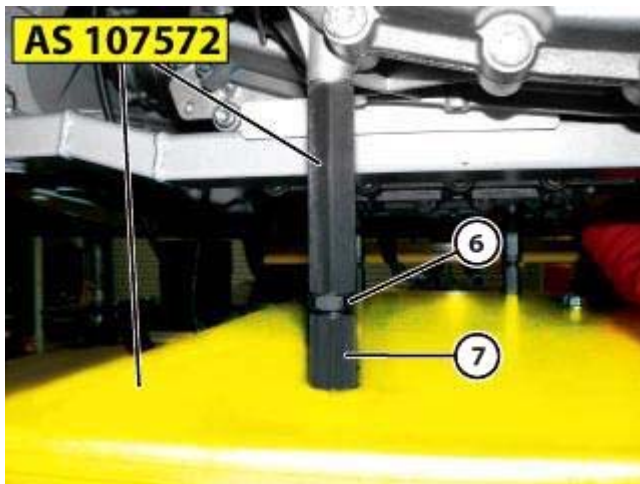
- Insert the support spacer (element **05**) of tool (**AS 107572**) between the lower gearbox mounting cross member (**G**) and the DCT gearbox.



- Place a hydraulic jack underneath the DCT gearbox and raise slightly to load it with the weight of the gearbox.
- Undo the indicated nut and remove the DCT gearbox mounting pin, retrieving the respective washers.
- Lower the hydraulic jack until the DCT gearbox rests on the support spacer (element **05**) of the tool (**AS 107572**), fit previously on the DCT gearbox mounting cross member.



- Undo the nuts indicated.



- Position the trolley (**AS 107565**) under the vehicle and lift the platform to approximately **10 mm** from the adjuster pins.
- Loosen the nut (**6**) and undo the pin (**7**) of tool (**AS 107572**), to bring it into contact with the trolley (**AS 107572**).
- Repeat this procedure for all the adjuster pins.



- Tighten the indicated screws fastening the four adjuster pins onto the trolley (**AS 107572**).



- Ensure that the upper and lower parts of the pin are correctly fastened to the gearbox and trolley (**AS 107572**) respectively, then tighten the nut (6).
- Repeat this procedure for all the adjuster pins.
- Use the pedal on the trolley (**AS 107565**) to lift the gearbox by a few millimetres to support its weight.

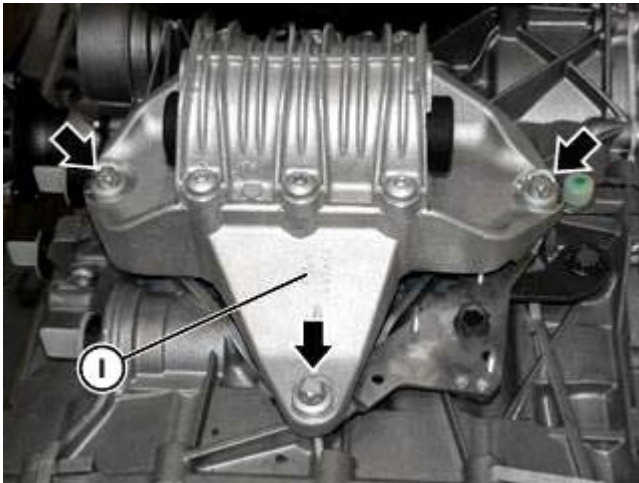


- Undo the indicated nuts on both sides of the DCT gearbox.

- Remove the DCT gearbox mounting cross member ( E2.02).



- Loosen the two lock handles of the trolley platform (**AS 107565**).
- Move the trolley back (**AS 107572**) to separate the DCT gearbox (H) from the engine.
- Lock the two lock handles of the trolley platform (**AS 107565**).



- Undo the screws indicated.
- Remove the bracket (I).



- Install the tool (AS 107564), tightening the eye bolts in the relative holes on the gearbox.
- Attach the tool (AS 107564) to a mobile hydraulic jack.
- Adjust the hydraulic jack to place the tie rods of the tool (AS 107564) under slight, uniform tension, lift the DCT gearbox from the trolley (AS 107572) and set down in a suitable place.

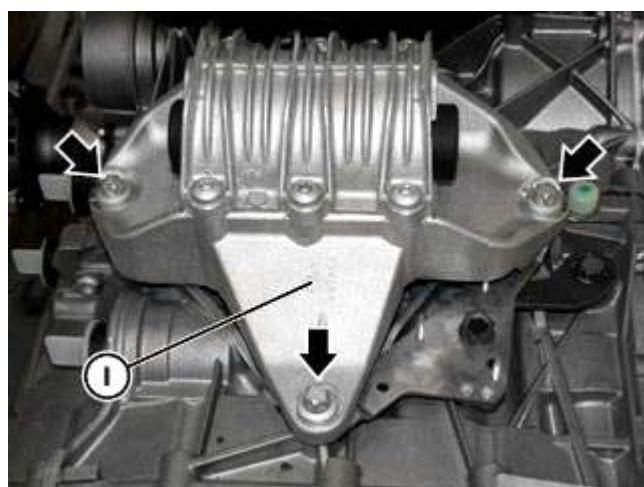
C2.03 Refitting the DCT gearbox

Refitting the DCT gearbox

			
Tightening torque		Nm	Class
Fastening DCT gearbox bush mount	Screw	100 Nm	A
	Screw (pretightening)	40 Nm	0
Fastening gearbox to engine	Nut	60 Nm	A
Fastening DCT gearbox mounting bush	Nut	100 Nm	B
Fastening single oil heat exchanger brackets	Screw	30 Nm	B
Fastening heat shield brackets	Screw	20 Nm	B
	Screw	9 Nm	B
Fastening GL oil and ATF oil pipe retainer blocks	Screw	8 Nm	B
Fastening GL and ATF oil pipe forks to gearbox	Screw	20 Nm	A
Fastening single oil heat exchanger pipe heat shields	Screw	9 Nm	B
	Nut	9 Nm	B



- Install the tool (**AS 107564**), tightening the eye bolts in the relative holes on the gearbox.
- Attach the tool (**AS 107564**) to a mobile hydraulic jack.
- Adjust the hydraulic jack to place the tie rods of the tool (**AS 107564**) under slight, uniform tension, lift the gearbox and place correctly on the trolley (**AS 107572**).
- Remove the tool (**AS 107564**), undoing the relative eye bolts from the gearbox.



- Fit the bracket (**N**).
- Pre-tighten the indicated screws.

		
Tightening torque	Nm	Class
Screw (pretightening)	40 Nm	0

- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	100 Nm	A

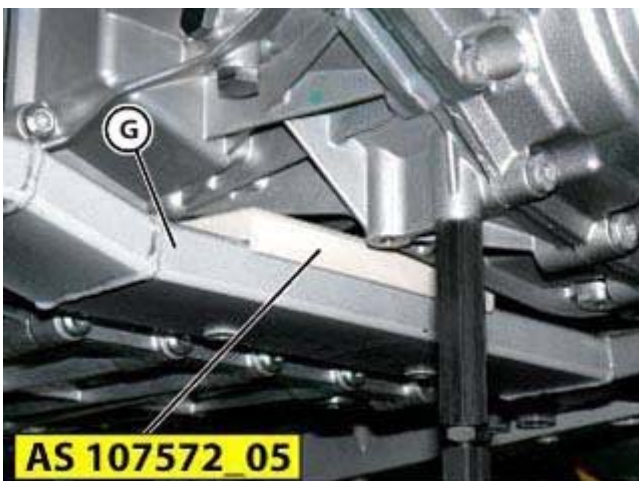


- Apply a layer of copper grease **ROLOIL Copper Grease - copper based grease for high temperatures** on the splined shaft of the gearbox.



- Using the lift trolley (**AS 107565**) and the trolley (**AS 107572**), position the DCT gearbox (**M**) under the vehicle.
- Loosen the two lock handles of the trolley platform (**AS 107565**).
- Move the trolley (**AS 107572**) forwards to mate the DCT gearbox (**M**) with the engine, engaging the stud bolts correctly.

- Refit the DCT gearbox mounting cross member ( **E2.02**).



- Insert the support spacer (element **05**) of tool (**AS 107572**) between the lower gearbox mounting cross member (**L**) and the DCT gearbox.



- Tighten the indicated nuts on both sides of the DCT gearbox.

		
Tightening torque	Nm	Class
Nut	60 Nm	A

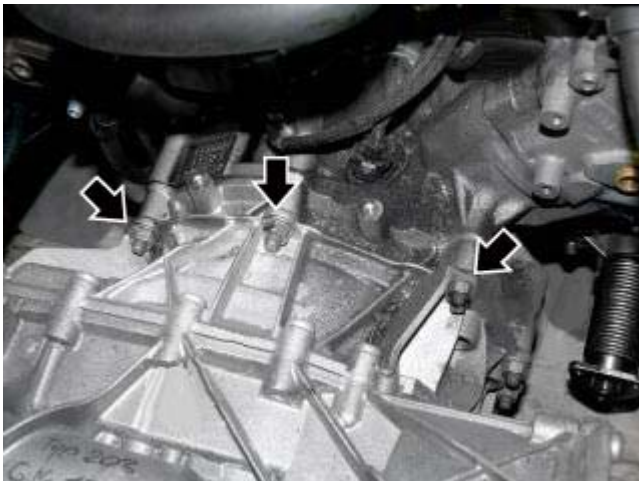


- Undo the indicated screws fastening the adjuster pins onto the trolley (**AS 107572**).
- Slowly lower the trolley (**AS 107572**) by a few centimetres, resting the DCT gearbox on the support spacer (element **05**) of tool (**AS 107572**).

- Remove all the lifting tools (**AS 107572**) and (**AS 107565**).



- Place a hydraulic jack underneath the gearbox and raise slightly to load it with the weight of the gearbox.
- Fit the DCT gearbox mounting pin, installing the respective washers, and tighten the indicated nut.



- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut	60 Nm	A



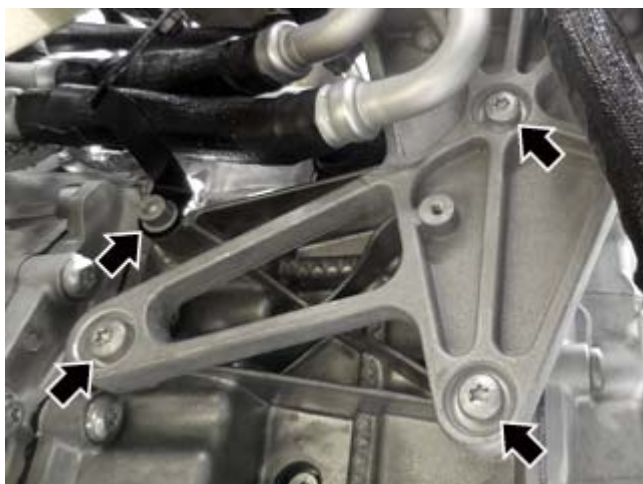
- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	100 Nm	B



- Connect the connectors (5).

- Free the single oil heat exchanger, complete with mounting brackets, and fit on the DCT gearbox.

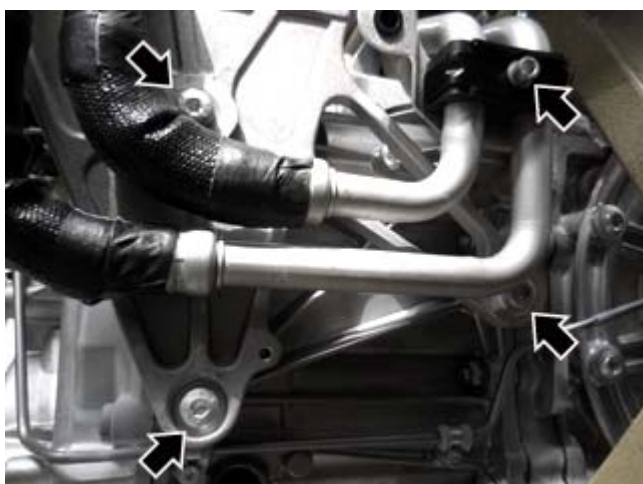


- Tighten the indicated screws fastening the mounting bracket of the single oil heat exchanger.

		
Tightening torque	Nm	Class
Screw	30 Nm	B

- Tighten the indicated screw fastening the mounting bracket of the heat shields.

		
Tightening torque	Nm	Class
Screw	20 Nm	B

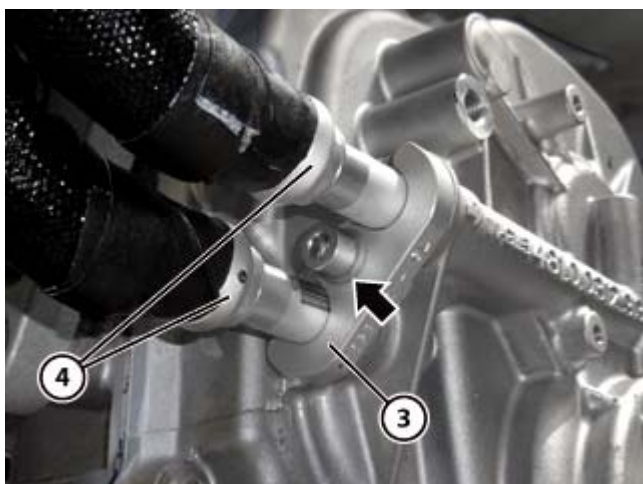


- Tighten the indicated screws fastening the mounting bracket of the single oil heat exchanger.

		
Tightening torque	Nm	Class
Screw	30 Nm	B

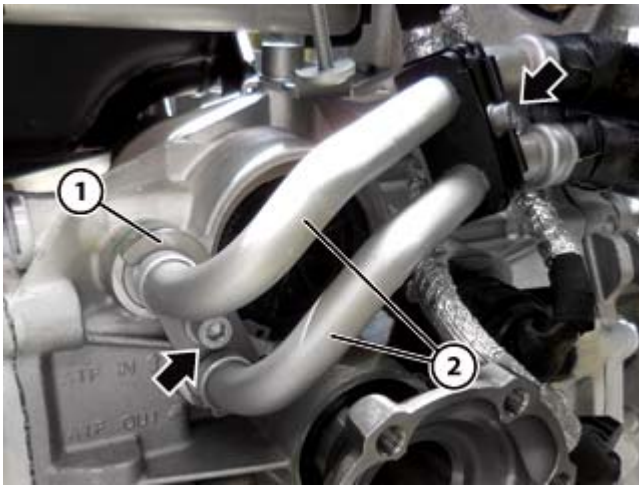
- Tighten the indicated screw fastening the retainer block.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



- Remove the plugs positioned previously.
- Using a suitable degreaser that does not leave residue, clean the area around the pipe connections **(4)** thoroughly.
- Replace the O-rings on the pipes **(4)**, lubricating with the specified gearbox gear oil.
- Connect the pipes **(4)**.
- Fit the fork **(3)**.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	20 Nm	A

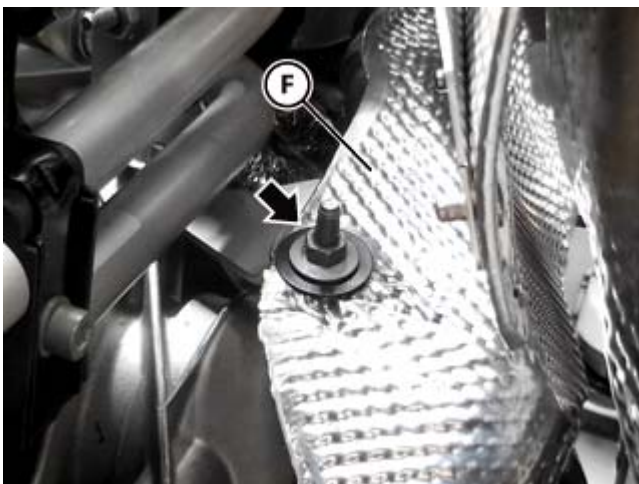


- Remove the plugs positioned previously.
- Using a suitable degreaser that does not leave residue, clean the area around the pipe connections **(2)** thoroughly.
- Replace the O-rings on the pipes **(2)**, lubricating with the specified clutch system oil.
- Connect the pipes **(2)**.
- Fit the fork **(1)**.
- Tighten the indicated screw fastening the fork **(1)**.
- Tighten the indicated screw fastening the retainer block.
- Tighten the indicated screw fastening the fork **(1)**.

		
Tightening torque	Nm	Class
Screw	20 Nm	A

- Tighten the indicated screw fastening the retainer block.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



- Remove the heat shield **(F)**.
- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	9 Nm	B



- Fit the heat shield **(E)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	9 Nm	B



- Tighten the screws indicated.



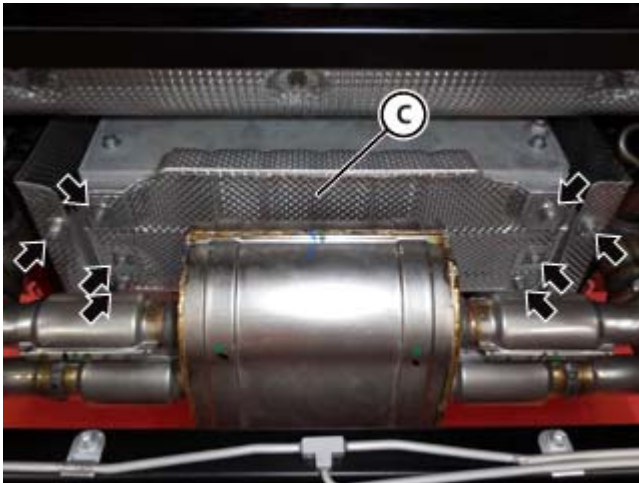
Tightening torque	Nm	Class
Screw	9 Nm	B



- Fit the heat shields **(D)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	9 Nm	B



- Fit the heat shield **(C)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Refit the axle shafts ( C4.01).
- Refit the exhaust silencer ( B7.04).
- Refit the rear bumper ( E3.04).
- Refit the engine lubrication system tank ( B5.03).
- Inspect the hydraulic clutch system oil level Shell DCT F-3 ( A3.03).
- Check the Shell Transaxle 75W-90 GL5 gear oil level ( A3.02).
- Lower the vehicle using anti-tipping safety retainers ( E3.12).
- Refit the flat undertray sections ( E3.12).

C2.04 DCT gearbox gear oil system single heat exchanger

Removing the DCT gearbox gear/clutch oil system single heat exchanger

- Preparation in progress

Refitting the DCT gearbox gear/clutch oil system single heat exchanger

- Preparation in progress

C2.05 Draining and filling with Shell Transaxle 75W-90 GL5 gear oil

Draining the Shell Transaxle 75W-90 GL5 gear oil



ALWAYS dispose of liquids correctly in accordance with applicable legislation.

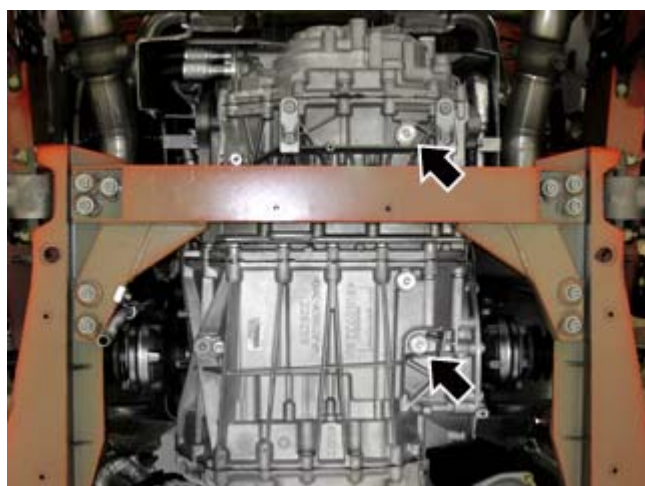
Collect all liquids drained from the vehicle systems in appropriate airtight containers, then close the containers.

The gear oil must be changed at the intervals specified in the MAINTENANCE SCHEDULE.

➤ Remove the flat undertray sections ( E3.12).



Remove the rear diffuser and the rear flat undertray section.

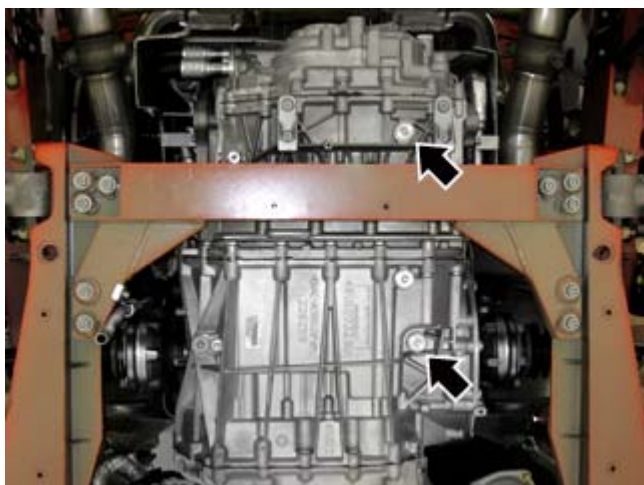


- Place a container for collecting oil under the indicated plugs.
- Undo the indicated plugs.
- Wait for the oil to drain completely.

Filling the system with Shell Transaxle 75W-90 GL5 gear oil



Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B



- Replace the indicated plugs, fitting and tightening the new components.



Tightening torque	Nm	Class
Plug	25 Nm	B



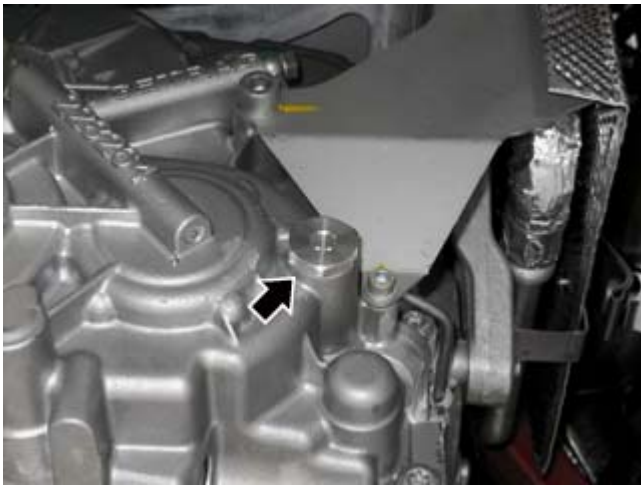
- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.



- Select element **01** of the pump (**AV 8174**).



- Using element **01** of the pump (**AV 8174**), gradually add oil of the specified type through the level inspection orifice until oil overflows from the orifice itself.
- Waiting a few minutes between attempts, repeat the previous step as necessary until oil overflows immediately when added.
- The actual oil necessary may vary from the total fill value specified for an empty system due to inevitable pooling in the system itself.
- Check the Shell Transaxle 75W-90 GL5 gear oil level (**CF A3.02**).



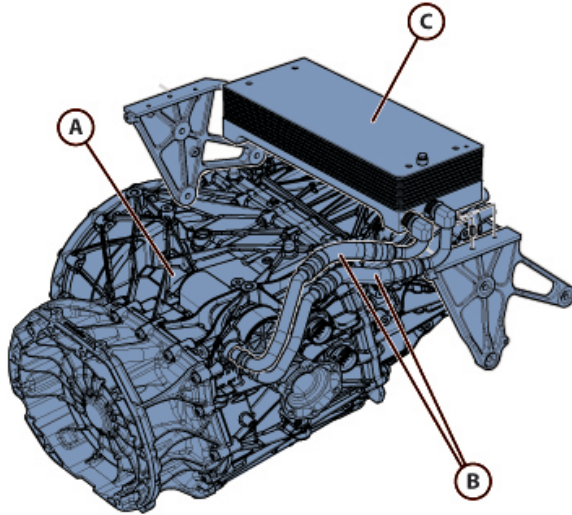
- Replace the plug, fitting and tightening the new component.

		
Tightening torque	Nm	Class
Plug	25 Nm	B

- Refit the flat undertray sections (**CF E3.12**).
- Refit the rear flat undertray section and the rear diffuser.

C3.01 DCT gearbox clutch hydraulic oil system layout

Hydraulic clutch oil system layout



- A - DCT gearbox (clutch oil tank and clutch oil pump)
- B - Clutch oil pipes
- C - Single clutch oil heat exchanger

C3.02 DCT gearbox clutch hydraulic oil system single heat exchanger

Removing the DCT gearbox gear/clutch oil system single heat exchanger

- Preparation in progress

Refitting the DCT gearbox gear/clutch oil system single heat exchanger

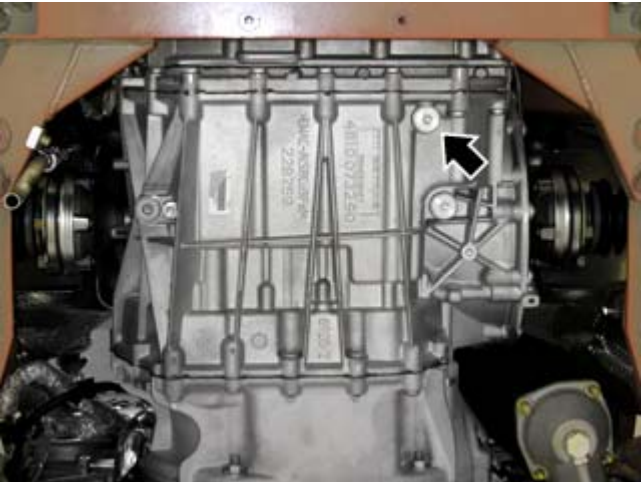
- Preparation in progress

C3.03 Draining clutch hydraulic system and filling with Shell DCT F-3 fluid

Draining Shell DCT F-3 hydraulic clutch system oil

 ALWAYS dispose of liquids correctly in accordance with applicable legislation. Collect all liquids drained from the vehicle systems in appropriate airtight containers, then close the containers.

- Remove the flat undertray sections ( E3.12).
-  Remove the rear flat undertray section.



- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.
- Wait for the oil to drain completely.

Filling with Shell DCT F-3 hydraulic clutch system oil

			
Tightening torque		Nm	Class
Fastening gearbox oil filler/drain plug and clutch hydraulic fluid filler/drain plug	Plug	25 Nm	B



- Replace the plug, fitting and tightening the new component.

		
Tightening torque	Nm	Class
Plug	25 Nm	B



- Place a container for collecting oil under the indicated plug.
- Unscrew the indicated plug.



- Select element **02** of the pump (**AV 8174**).



If the level is too low, identify the possible causes for excessive consumption before refilling.

- Using element **02** of the pump (**AV 8174**), gradually add oil of the specified type through the level inspection orifice until oil overflows from the orifice itself.
- Waiting a few minutes between attempts, repeat the previous step as necessary until oil overflows immediately when added.
- The actual oil necessary may vary from the total fill value specified for an empty system due to inevitable pooling in the system itself.
- Inspect the hydraulic clutch system oil level Shell DCT F-3 (**EF A3.03**).



- Replace the plug, fitting and tightening the new component.

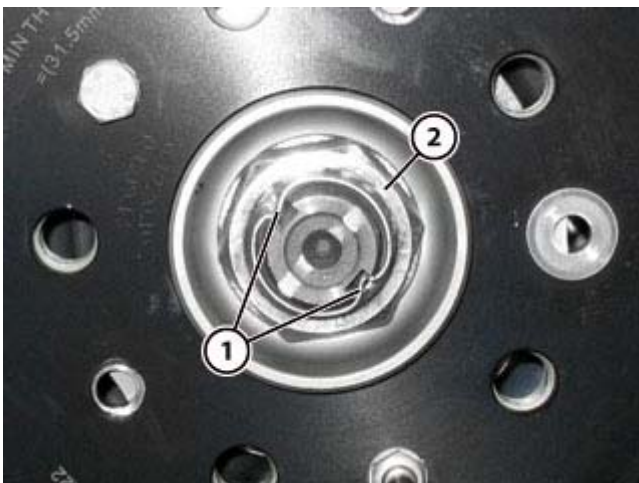
		
Tightening torque	Nm	Class
Plug	25 Nm	B

- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray section.

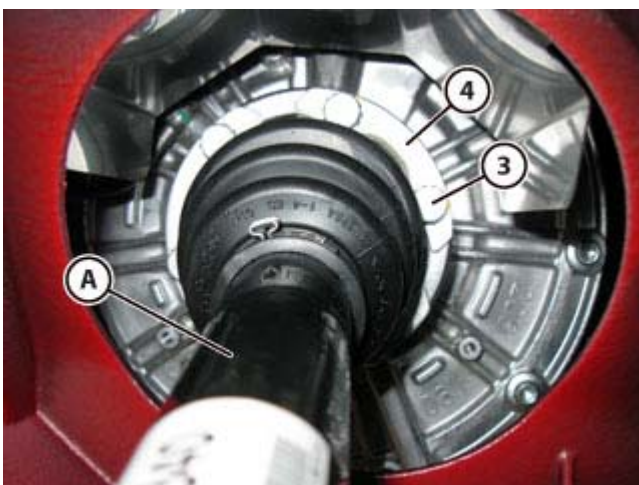
C4.01 Axle shafts

Removing the axle shafts

- Remove the wheels (🔧 D2.01).
- Remove the rear wheels.



- Use a punch and mallet to remove the caulking (1) from the ring nut (2).
- Undo the ring nut (2).



- Undo the six screws (3) fastening the axle shaft (A) to the differential flange, recovering the three shims (4).

- Support the weight of the suspension adequately.



- Undo the indicated screw and nut.



- Undo the indicated screw and nut.

- Tilt the hub carrier outward to detach the axle shaft from the differential flange.
- Using a suitable punch and mallet, detach the axle shaft from the hub carrier bearing and remove it.

Refitting the axle shafts

			
Tightening torque		Nm	Class
Fastening toe-in tie-rod to hub carrier	Nut	80 Nm	A
Fastening upper arm to hub carrier	Nut	90 Nm	A
Fastening axle shaft to differential flange	Screw	78 Nm	A
Fastening axle shaft to wheel hub	Nut	275 Nm	A

- Remove any residue of **AREXONS SYSTEM 56A01 - HIGH STRENGTH RETAINING COMPOUND** from the splining on the axle shaft.
- Remove any residue of **AREXONS SYSTEM 56A01 - HIGH STRENGTH RETAINING COMPOUND** from the splining on the hub carrier bearing.
- Check that the surface of the differential flange is completely clean.



- Apply three even and regularly spaced circular beads of **AREXONS SYSTEM 56A01 - HIGH STRENGTH RETAINING COMPOUND** to the splining on the axle shaft.

- Fit the axle shaft in the hub carrier bearing.
- Tilt the hub carrier inward to bring the axle shaft and the differential flange together.



- Tighten the indicated screw and nut.

		
Tightening torque	Nm	Class
Nut	80 Nm	A



- Tighten the indicated screw and nut.

		
Tightening torque	Nm	Class
Nut	90 Nm	A



- Tighten the six screws **(3)** fastening the axle shaft **(A)** to the differential flange, fitting the three shims **(4)**.

		
Tightening torque	Nm	Class
Screw	78 Nm	A



- Tighten the ring **(2)**.

		
Tightening torque	Nm	Class
Nut	275 Nm	A

- Loosen the ring nut **(2)** and retighten.

		
Tightening torque	Nm	Class
Nut	275 Nm	A

- Use a punch and mallet to caulk **(1)** the ring nut **(2)**.

- Refit the wheels ( D2.01).
- Refit the rear wheels.

C4.02 Flywheel

Removing the flywheel

- Preparation in progress

Refitting the flywheel

- Preparation in progress

D1.01 Technical specifications

Wheels

Front

Wheel rim size

Light alloy 9 " J x 20 "

Spare wheel 4.5 " J x 20 " optional

Tyre size

245/35 ZR20 Michelin Pilot Super Sport

245/35 ZR20 Bridgestone Potenza S007 optional

245/35 ZR20 Pirelli PZero optional

Winter 235/35 W20 Pirelli Winter Sottozero optional

Spare wheel 145/60 R20 Vredestein optional

Rear

Wheel rim size

Light alloy 11 " J x 20 "

Spare wheel 4.5 " J x 20 " optional

Tyre size

305/30 ZR20 Michelin Pilot Super Sport

305/30 ZR20 Bridgestone Potenza S007 optional

305/30 ZR20 Pirelli PZero optional

Winter 285/35 W20 Pirelli Winter Sottozero optional

Spare wheel 145/60 R20 Vredestein optional

Inflation pressure (cold)

	Front	Rear
Michelin Pilot Super Sport	2.1 bar	2 bar
Bridgestone Potenza S007	2.1 bar	2.1 bar
Pirelli P Zero	2.1 bar	2 bar
Pirelli Winter Sottozero	2.1 bar	2 bar
Vredestein (Spare wheel)	4.2 bar	4.2 bar

Brake system

CCM discs

Front: 398 x 223 x 36 mm

Rear: 360 x 233 x 32 mm

Callipers

Front: 4 pistons

Rear: 4 pistons

Electronic control systems

ABS (Anti Blockier System): system preventing wheel lock-up under braking.

EBD (Electronic Brake Force Distribution): a system optimising brake force distribution between the wheels.

VDC (Vehicle Dynamic Control): a system which uses the brakes to control vehicle dynamics.

FBP (Ferrari Brake Prefill): a system which eliminates the air gap between the calliper and disc by applying slight pressure to the brake system as soon as the accelerator is released.

SSC (Side Slip Angle Control): innovative, exclusive software which analyses a number of vehicle parameters (such as longitudinal and lateral acceleration) and the estimated tyre grip to help the driver control skidding in the Race or CT OFF manettino settings, for increased longitudinal acceleration when exiting a bend.

Suspension

Arms

Front: double wishbones

Rear: Multilink

Shock absorbers

Adjustable damping control (MagneRide)

Electronic control systems

SCM-E (Magnetorheological Control System): magnetorheological suspension control system (MagneRide), with frequency analysis system and dual solenoids.

D1.02 Specific tooling and equipment



- Support 95973206 (AV 3206) for complete hub.



- Torque wrench 95978172 (AV 8172) (Replaces torque wrench USAG 815F)

D1.03 Tightening torques

			
Tightening torque		Nm	Class
Fastening wheels	Stud bolt (pretightening)	25 ÷ 45 Nm	0
	Stud bolt	100 Nm	A

D2.01 Complete wheels

Removing the wheels



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.



Use tools very carefully in order to prevent damaging the painted surfaces of the wheel rim. Tyres that have been fitted for over 3 years must be checked to verify they are still suitable for use.



CAUTION

Tyre replacement is recommend after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.



- Loosen the indicated stud bolts.
- Lift the vehicle.
- Remove the indicated stud bolts.
- Remove the complete wheel **(A)**.

Checking complete wheels



CAUTION

Tyre replacement is recommend after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.

- Check the state of wear of the tyre and the state of the wheel rim.
- When replacing a tyre or rim, the wheel must be statically and dynamically balanced.
- Check that the mating surfaces on the rim and brake disc are perfectly clean.
- Replace any stud bolts with damage to the thread or cone.
- Clean the stud bolts thoroughly before refitting.
- Never lubricate the mating surfaces between the stud bolt and rim and between the rim and the brake disc.
- Do not clean the wheel cones with solvents or aggressive products as they may remove the anti-seizing coating.

Refitting the wheels

			
Tightening torque		Nm	Class
Fastening wheels	Stud bolt (pretightening)	25 ÷ 45 Nm	0
	Stud bolt	100 Nm	A



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.



Use tools very carefully in order to prevent damaging the painted surfaces of the wheel rim.
Tyres that have been fitted for over 3 years must be checked to verify they are still suitable for use.



CAUTION

Tyre replacement is recommend after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.



- Fit the complete wheel, inserting the locator pin in the seat on the wheel rim.
- Hand-tighten the stud bolt opposite the locator pin first, then the other indicated stud bolts.
- Pre-tighten the indicated stud bolts in a cross pattern.

		
Tightening torque	Nm	Class
Stud bolt (pretightening)	25 ÷ 45 Nm	0

- Lower the vehicle to the ground.
- Tighten the indicated stud bolts.

		
Tightening torque	Nm	Class
Stud bolt	100 Nm	A

D2.02 Tyres and rims

Checking the state of the tyres



Tyre replacement is recommended after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.

Check the state of the tyres during the scheduled maintenance.



CAUTION

Pressure increases with increasing tyre temperature. Never reduce the tyre pressure if measured when the tyres are hot.

Tyre overheating due to underinflation may seriously compromise handling and tyre integrity.

Do not inflate the tyres to a pressure other than the specified value, as this would render the tyre pressure monitoring system useless.

After replacing one or more tyres, always calibrate the tyre pressure monitoring system by pressing the button on the passenger compartment dome light panel.

- Check the inflation pressure: pressure must be measured with cold tyres and must match the values specified.



CAUTION

Always inspect any tyre damage very carefully to assess severity: damage may greatly reduce tyre life and cause accidents.

- Check the tyres to ensure that there are no signs of damage such as abrasion, cuts, cracks, bubbles etc.
- Violent knocks against kerbs, holes or other obstacles and driving on poor road surfaces for extended periods may cause tyre damage. This damage may not always be visible. Any foreign objects penetrating the tyre in these conditions may cause structural damage that is only identifiable after removing the tyre from the wheel.



CAUTION

If the same tyres have been fitted on the vehicle for over 3 years, check frequently and carefully for signs of deterioration.

Do not monitor the pressure of a damaged tyre.

- Tyres will deteriorate even if the vehicle is used rarely or kept stationary. Cracks in the rubber on the tread and sidewalls, at times accompanied by blisters, are an indication of tyre deterioration.



CAUTION

Never fit a tyre with tread depth under the specified limit, even if only in a single localised area.

- Check the tread depth: the minimum permissible value is **1.7 mm**. This depth is identified by the tyre wear indicators.
- Check the wear over the entire tread; in the event of uneven tread wear, perform static and dynamic wheel balancing.



Note that once Run Flat tyres have been fitted, the instrument panel must be reprogrammed when refitting conventional tyres to prevent a warning message from being shown on the TFT display.

- Replace any tyres that have been punctured and/or been inflated with the tyre inflation bottle included with vehicle toolkit. For safety reasons, we do not recommend attempting to repair punctured tyres.

Preparation for tyre removal

The tyre pressure monitoring sensor is installed on the wheel rims, near the inflation valve.



Removing the tyre without using the correct tools and taking the necessary precautions may damage the sensor.



To avoid this problem, we are showing the entire procedure for removal and refitting of the tyres from the wheel rim, using a **CORGHI** tool, model **Artiglio A2019 RC** (shown in the photo) or **Artiglio A2020 TI**, recommended by Ferrari.

To prevent damage to the wheel rim, all parts of the tool that may come into contact with the rim are rubber coated.



Only use rubberised tools.
Wear gloves and protective eyewear.

Removing the tyres



Ensure that tyres are not kept in stock for more than 4 years. Tyres may be kept in stock for a maximum of 4 years, provided that they are kept out of direct sunlight, protected from the weather and humidity and stored in low oxygen conditions. If necessary, the Ferrari Service Network will verify whether old tyres are suitable for use. In all cases, tyres mounted on a vehicle for over 3 years must be inspected by an authorised Ferrari Service Centre.



Tyre replacement is recommended after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.



When removing and refitting tyres, **DO NOT** use tyre levers which could damage the rim and compromise its protective layer. Use levers coated in protective material.

The photos shown here were taken using a rim from the 575M Maranello.

To more clearly identify the correct mounting positions for the tools relative to the wheel, the vertical column of the tyre demounting machine is used as the starting point (12 o'clock).



- Undo the core of the valve (**A**) to completely deflate the tyre.



- Place the wheel on the machine table and break the bead on both the inner and outer sides.
- Lubricate the bead (**1**) with the lubricant spray provided.

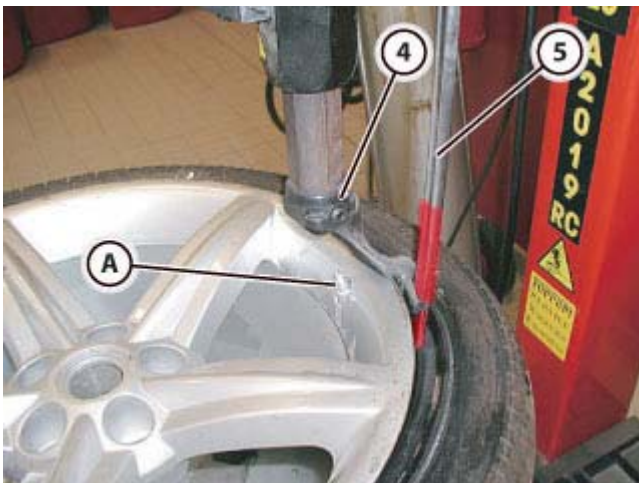


- Place the wheel on the self-centring clamp and use the bead breaker to ensure that the wheel is gripped correctly by the clamps (**2**) on the table.
- *i* If the machine is not equipped with a bead breaker, clamp the wheel from the inside.
- Clamp the wheel.

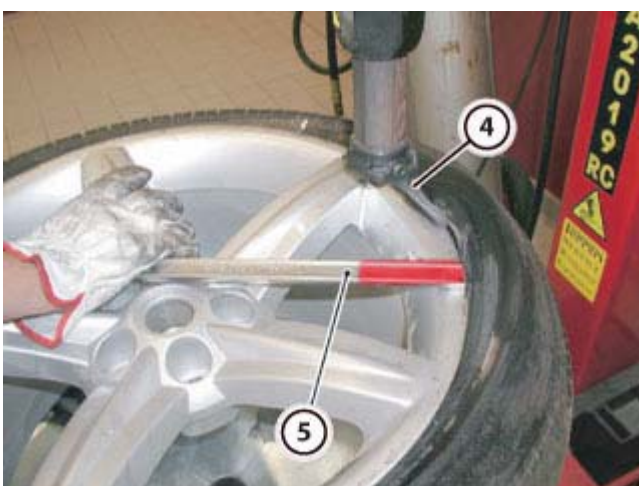


Observe the correct positions for bead breaking shown as follows.

- Position the inflation valve **(A)** at **12 o'clock**.
- Position the bead breaker disc **(3)**.
- Push the bead into the rim channel using the bead breaker disc while simultaneously turning the tyre counterclockwise, until the inflation valve **(A)** is at **3 o'clock**.
- Lubricate the bead while turning.
- To facilitate tyre removal, if necessary, insert a bead breaker lever at **180°** relative to the sensor.
- If the bead is not completely broken, repeat this stage in a clockwise direction, moving the inflation valve from **3 o'clock** to **12 o'clock**. Perform this stage repeatedly, clockwise and anticlockwise, until the bead is completely broken.



- Fit tool **(4)**: after clamping, the tool automatically moves upwards and outwards.
- Position the inflation valve **(A)** at **11 o'clock**.
- Mount the lever **(5)** on tool **(4)**, using the bead breaker disc to facilitate the operation if necessary.
- Remove the bead breaker disc.



- Position the tyre bead on the tool **(4)** using the lever **(5)**.
- Remove the lever.

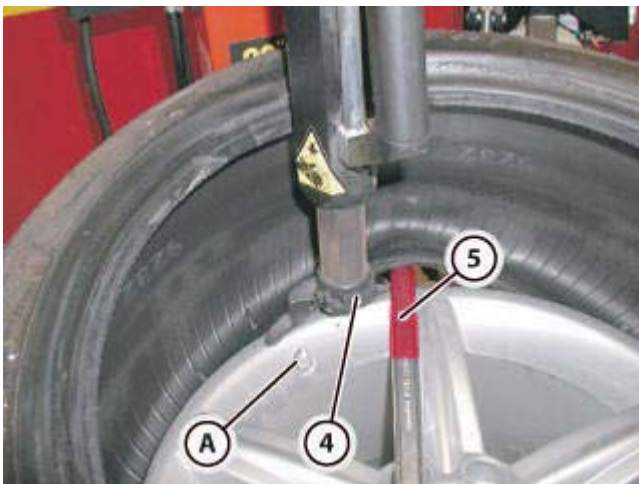


- Ensure that the entire edge of the bead is outside the rim and completely visible. If this is not the case, the bead may be damaged.



If the bead does not slide easily into the groove, lubricate the contact area.

- Turn the wheel clockwise.



- Position the inflation valve **(A)** at **12 o'clock**.
- Fit the lever **(5)** on the tool **(4)**.
- Lift the tyre.



Take care not to damage the sensor when inserting the tyre lever (5).

- Position the lower bead of the tyre on the tool **(4)**, using the lever **(5)**.
- Turn the wheel clockwise.

- Remove the rim from the machine and put carefully in a safe place.
- If the tyre is not to be refitted immediately, refit the valve core and cap.

- Remove the tyre pressure sensors (🔧 D2.03).

Proceed as follows if removal is necessary.

Checking wheels

- Also check the condition of the wheels during scheduled services or when replacing a tyre.
- Visually inspect the outer and inner surfaces of the wheel; if any cracks or deep gouges or found, replace the wheel.
- In the case of scratches, small dents or surface scuffing, the relative area or, if necessary, the entire wheel may be repainted. The painting process is the same as for any normal aluminium surface, restoring the silver base coat and then, once this has formed a matte film, applying the clear coat finish. Dry the painted wheel in a paintwork oven to cure all the layers of treatment applied.
- Protect the valve hole and centre badge when repainting the wheel, to prevent the risk of excess overcoating impeding reassembly and compromising the efficacy of the corrosion protection used.
- Inspect the brake disc mating surface with particular care: this area is not painted like the rest of the wheel, and is treated only with single cathodolysis coating.
- This treatment has a limited lifespan and tends to wear away due to fretting between the surfaces. This area cannot be repainted, and a wheel on which this treatment has worn away must be replaced.
- Before refitting a wheel, always check that the mating surfaces on the wheel and brake disc are perfectly clean.



Using inappropriate tools for removing and refitting the tyre may damage the wheel rim and compromise the protective layer.

- Measure the wheel balance the wheel with no tyre, and with the pressure sensor and inflation valve installed. If the static imbalance of the wheel (including radial and lateral run-out), after removing the balancer weights, exceeds **36 grams**, the wheel must be replaced.

Refitting the tyres



Ensure that tyres are not kept in stock for more than 4 years. Tyres may be kept in stock for a maximum of 4 years, provided that they are kept out of direct sunlight, protected from the weather and humidity and stored in low oxygen conditions. If necessary, the Ferrari Service Network will verify whether old tyres are suitable for use. In all cases, tyres mounted on a vehicle for over 3 years must be inspected by an authorised Ferrari Service Centre.



Tyre replacement is recommend after 4 years of normal use. Frequent use in maximum load conditions and at high temperatures may lead to premature deterioration.



When removing and refitting tyres, DO NOT use tyre levers which could damage the rim and compromise its protective layer. Use levers coated in protective material.

➤ Refit the tyre pressure sensor (🔧 D2.03).

➤ Proceed as follows if the component has already been removed.



- After installing the pressure sensor (A), mount the clean rim on the self-centring clamp, ensuring that the wheel is gripped correctly by the clamps (2) on the table.
- Lubricate the wheel.



- Pick up the tyre and ensure that the direction of rotation is correct.
- Lubricate both beads.



- Fit the inflation valve **(A)** at **6 o'clock**.
- Place the tyre on the rim and tip the tool arm **(4)** forwards.
- Fit the lower bead under the right hand part of the tool **(4)**.
- Turn the wheel clockwise.
- Mount the bead on the rim, applying constant pressure.
- Rotate the wheel to bring the inflation valve **(A)** into the **1 - 2 o'clock position**.

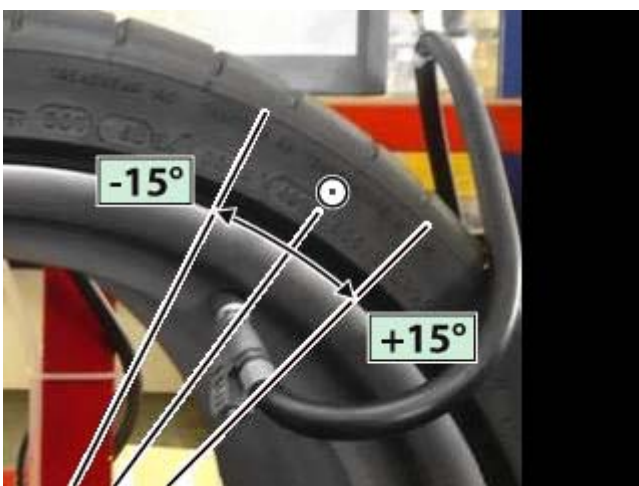


 The bead breaker disc must never reach the valve-sensor assembly position.

- Fit the inflation valve **(A)** at **4-5 o'clock**.
- Place the tyre on the rim, matching the lighter parts of the rim, marked with an embossed letter **"G"**, with the yellow dots on the tyre.
- Insert the lever **(5)** at **2-3 o'clock**, using the bead breaker disc **(3)** to push the bead in.
- i* If available, use tyre pliers instead of the lever **(5)**, with the appropriate adapter fitted.

i If necessary, insert a second set of tyre pliers, with the correct adapter fitted.

- Turn the wheel clockwise until the upper bead is completely mounted.
- If used, remove the tyre lever with the bead breaker disc.



- When mounting the tyre, the white dot must always be aligned with the valve.
- i* The dot may be misaligned by up to $\pm 15^\circ$ relative to the valve.



- Release the wheel from the clamps **(2)** on the table.



- Refit the core of the valve **(A)**.



- To ensure that the beads seat correctly, inflate the tyre immediately with a pressure of **4.20 bar** while the beads themselves are still lubricated.
- *i* The tyre must be inflated to **activate** the tyre pressure monitoring system sensor. Inflate the tyre to a pressure greater than **0.6 bar** and **keep inflated at this pressure for a few minutes**.
- If the maximum permissible inflation pressure is not sufficient to seat the beads, lubricate again.



- Place the bead breaker disc of the tyre changer on the outer side of the tyre, next to the rim of the wheel.
- Rotate the wheel by six complete turns while keeping the bead breaker disc pressed against the outer side of the tyre.



- Place the bead breaker disc of the tyre changer on the inner side of the tyre, next to the rim of the wheel.
- Rotate the wheel by six complete turns while keeping the bead breaker disc pressed against the inner side of the tyre.

➤ Balance the wheel (🛠️ D2.02).

Balancing the wheel



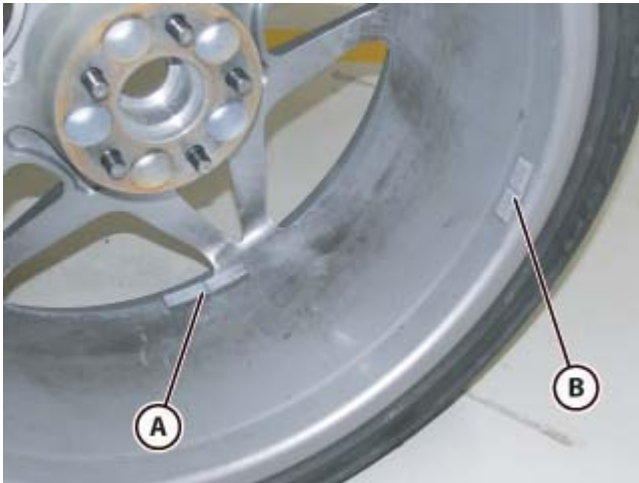
Only use self-adhesive counterweights. In addition to damaging the wheel rim, other types of counterweights can interfere with parts of the suspension or detach while driving.



Do not touch the adhesive surface of the counterweight before applying to the rim and never reuse counterweights or use weights with no protective paper, as these may detach while driving.

After replacing a tyre, wheel, or both, the assembled wheel must be balanced statically and dynamically on a wheel balancer machine, using the specific balancer weights.

Manufacturers indicate the heaviest part of a wheel or tyre with a reference marking. When refitting a tyre on a wheel, these markings must diametrically opposed to each other to minimise the quantity of balancer weights which will be needed for balancing.



- The balancer weights must be applied **(A)** on the inner edge of the wheel, in position **(B)**, or, if necessary, in both locations.
- Clean the surface of the wheel where the balancer weight will be applied thoroughly with heptane.
- Remove the protective backing and fix the balancer weight to the wheel, applying uniform pressure to ensure correct adhesion.

D2.03 TPMS tyre pressure and temperature monitoring system (optional)

Operating the TPMS tyre pressure and temperature monitoring system



The system must be calibrated from the relative menu option on the left hand TFT display after replacing or inflating any of the tyres.

The TPMS system may be calibrated from the specific Menu option on the left hand TFT display.

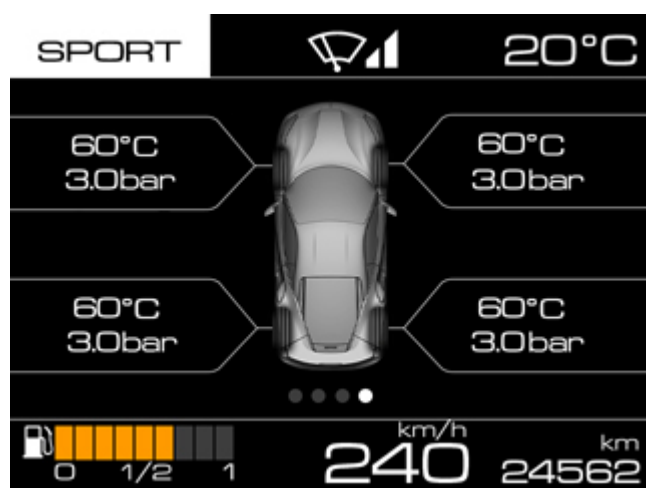
The sensors fixed to the interior of the wheel rims, next to the inflation valve, detect the pressure and temperature of the tyres.

These sensors transmit a signal received by the triggers fixed to the bodyshell behind the gravel guard, which are in turn connected to the ECU.

The ECU processes the data received from the triggers and transmits the processed data to the instrument panel.

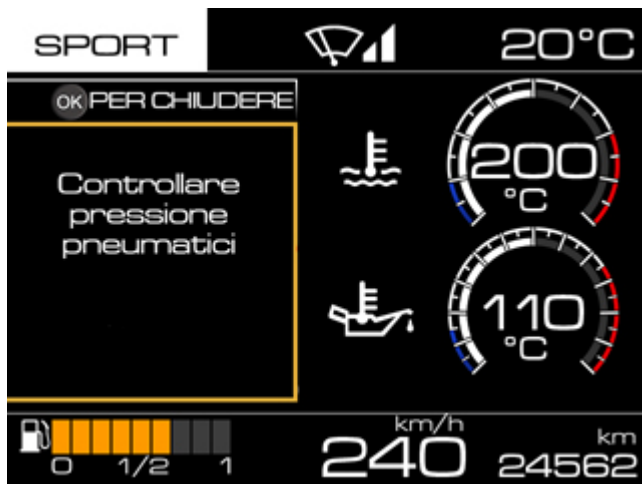
The data transmitted to ECU activates the respective indications on the left hand TFT display.

Visualisation on TFT display



TYRES screen: use the relative controls on the left hand TFT display to access the informative screen displaying the pressure and temperature values for each tyre.

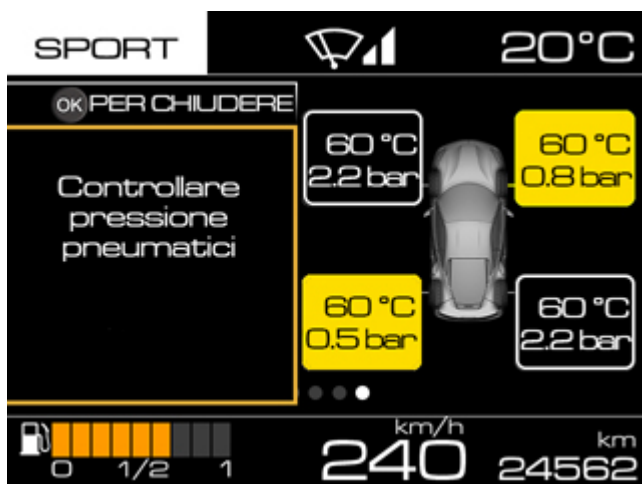
- Insufficient pressure of one or more tyres



With any currently active screen, when the instrument panel receives the signal from the electronic control unit indicating that the pressure of one or more tyres is below the warning threshold, but the system cannot recognise which wheel is generating the fault signal, the TFT display displays the specific message “**Check tyre pressure**” without the vehicle symbol.



With any currently active screen, when the instrument panel receives the signal from the electronic control unit indicating that the pressure of a tyre is below the warning threshold, the TFT display displays the specific message “**Check tyre pressure**” together with the vehicle symbol indicating tyre pressures. The background of the box indicating the pressure and relative unit of measurement for the faulty tyre turns amber.



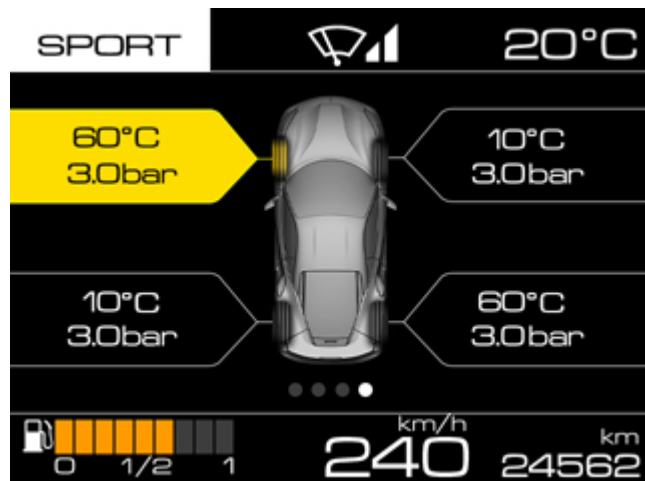
With any currently active screen, when the instrument panel receives the signal from the electronic control unit indicating that the pressure of more than one tyre is below the warning threshold, the TFT display displays the specific message **"Check tyre pressure"** together with the vehicle symbol indicating tyre pressures.

The background of the box indicating the pressure and relative unit of measurement for the faulty tyre turns amber.

The display cycle is 20 seconds, after which time the specific screen disappears.

At key-off, no information is displayed but the function continues to monitor tyre pressure while the vehicle is parked.

If the fault persists at the subsequent key-on, the specific screen is shown again on the display.



TYRES screen: the driver may recall the screen by using the controls on the left hand TFT display, enabling identification of tyres with insufficient pressure at any time. When the system cannot recognise which wheel is generating the fault signal, as the respective values cannot be displayed by the TYRES screen, the screen is not recallable by the driver.

- TPMS not calibrated



When the TPMS system has not been calibrated or a tyre has been replaced, the TFT display displays the specific message **"TPMS not calibrated"** together with the message **"Execute calibration"**.

The vehicle symbol is not displayed. Therefore, if the fault occurs while the TYRES screen is active, the default screen is shown automatically.

Simultaneously, the specific indicator light starts flashing and continues to flash for a maximum period of 90

seconds (determined by NTP), after which the indicator light remains lit continuously until the system is calibrated.

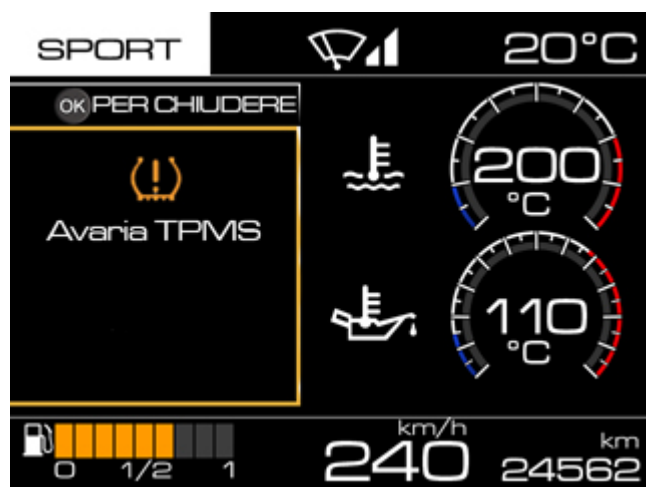
The system may be calibrated via the specific option in the menu, in key-on state with the engine off.



Upon selection of the menu option and subsequent successful calibration, the TFT display displays the specific message "**Calibration activated**" for 5 seconds.

In "Calibration activated" state, the TYRES screen is recallable, but the pressure and temperature values are replaced by dashes.

- TPMS failure



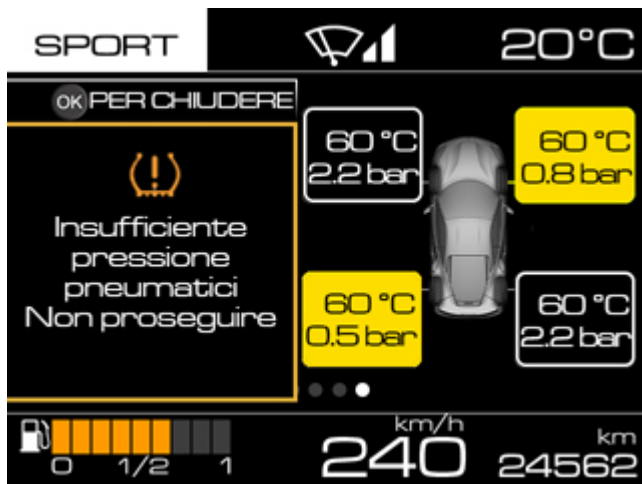
In the event of a fault in the circuit and/or wiring harness leading to the ECU, or in the event of a TPMS ECU fault, or in the event of no signal reception from one or more sensors due to fault, breakage or flat battery, the TFT display displays the specific message "**TPMS failure**".

The vehicle symbol is not displayed. Therefore, if the fault occurs while the TYRES screen is active, the default screen is shown automatically.

Simultaneously, the specific indicator light starts flashing and continues to flash for a maximum period of 90 seconds (determined by NTP), after which the indicator light remains lit continuously until normal operating conditions are restored.

The TYRES screen is not recallable by the driver.

- Punctured tyre



When the instrument panel receives the signal from the electronic control unit indicating that the pressure of one or more normal tyres is below the alarm threshold, but the system cannot recognise which wheel is generating the fault signal, the TFT display displays the specific message “**Low tyre pressure**” together with the message “**Do not proceed**”, without the vehicle symbol.

If the vehicle is driven for more than 100 Km (62 mi) in “punctured tyre” state, the specific screen is displayed.



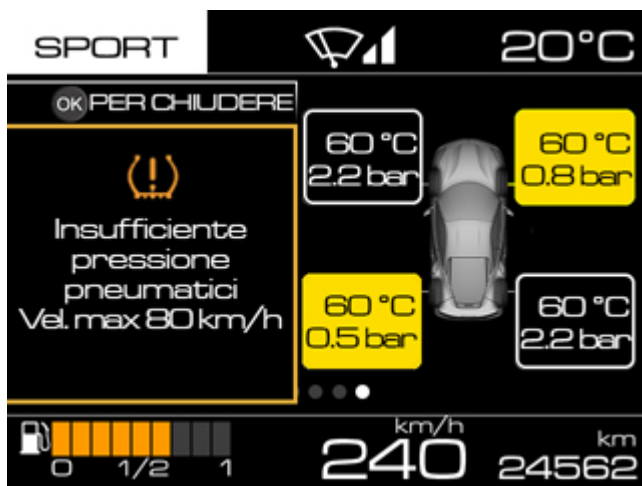
When the instrument panel receives the signal from the electronic control unit indicating that the pressure of one or more normal tyres is below the alarm threshold, the TFT display displays the specific message “**Low tyre pressure**” together with the message “**Do not proceed**” and the vehicle symbol indicating tyre pressures.

If the vehicle is driven for more than 100 Km (62 mi) in “punctured tyre” state, the specific screen is displayed. The background of the box indicating the pressure and relative unit of measurement for the faulty tyre turns amber.



When the instrument panel receives the signal from the electronic control unit indicating that the pressure of one or more RUN FLAT tyres is below the alarm threshold, but the system cannot recognise which wheel is generating the fault signal, the TFT display displays the specific message "**Low tyre pressure**" together with the message "**Max speed 80 Km/h**" without the vehicle symbol.

The system warns the driver and displays the specific screen if the vehicle speed exceeds 80 Km/h (50 mph) while in "punctured tyre" state.



When the instrument panel receives the signal from the electronic control unit indicating that the pressure of one or more RUN FLAT tyres is below the alarm threshold, the TFT display displays the specific message "**Low tyre pressure**" together with the message "**Max speed 80 Km/h**" and the vehicle symbol indicating tyre pressures.

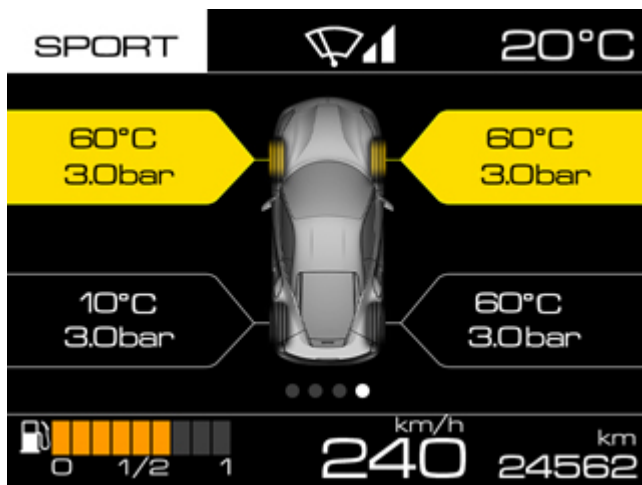
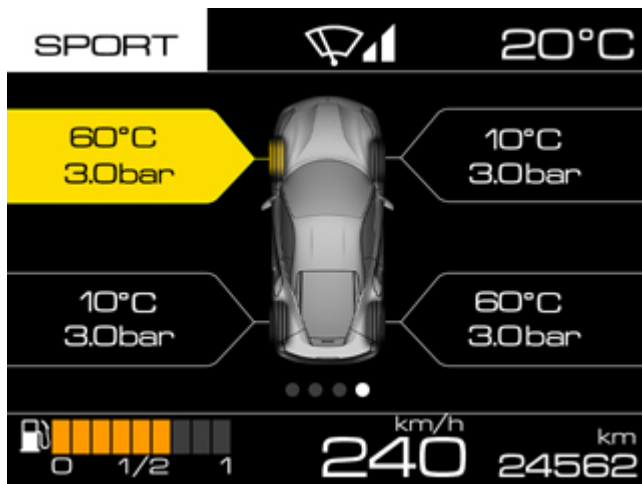
The system warns the driver and displays the specific screen if the vehicle speed exceeds 80 Km/h (50 mph) while in "punctured tyre" state.

The instrument panel also calculates (but does not display) the remaining range in Km (or mi) and repeats the warning after 50 Km (31 mi).

In the event of a puncture to another tyre, the instrument calculates (but does not display) the updated remaining range in Km (mi), in relation to the distance driven since the previous puncture event.

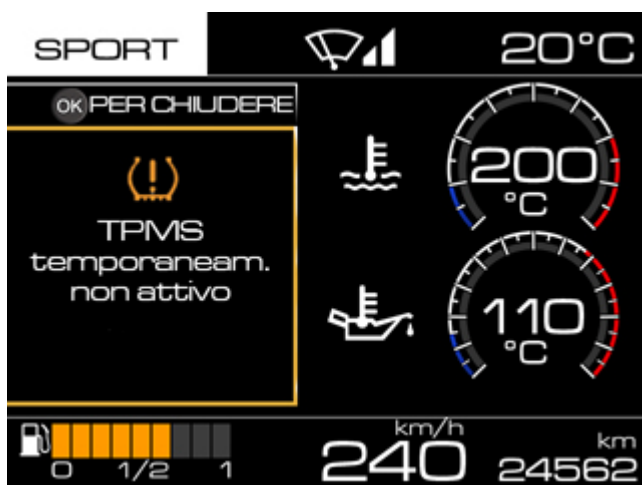
After the display cycle for the screen is complete, the screen disappears, but the relative indicator light remains lit continuously.

Pressing the "Escape" function key during the display of faults with priority 0 (standard type tyre puncture) or priority 1/ 2 (RUN FLAT tyre puncture, with speed limit not exceeded and with tyres still in usable condition) cancels the screen while leaving the relative warning light lit.



TYRES screen: the screen may be recalled using the controls on the left hand TFT display, enabling the driver to identify punctured tyres at any time. When the system cannot recognise which wheel is generating the fault signal, as the respective values cannot be displayed by the TYRES screen, the screen is not recallable by the driver.

- TPMS temporarily inactive



In the event of antenna reception disturbance caused by an RF source transmitting in the same frequency

range as the sensors, or in the event of sensor overheating, or during calibration, or if the ECU does not recognise the sensor identifiers, the TFT display displays the specific message "**TPMS temporarily inactive**".

Simultaneously, the specific indicator light starts flashing and continues to flash for a maximum period of 90 seconds (determined by NTP), after which the indicator light remains lit continuously until normal operating conditions are restored.

Subsequently (or if the "Escape" function key is pressed during the display cycle), the screen disappears but the warning light remains lit.

The TYRES screen is not recallable by the driver.

- "TPMS inactive"



When the system has been disabled via the diagnostic tester, the TFT display displays the specific message "**TPMS inactive**".

Simultaneously, the specific indicator light starts flashing and continues to flash for a maximum period of 90 seconds (determined by NTP), after which the indicator light remains lit continuously until normal operating conditions are restored.

Subsequently (or if the "Escape" function key is pressed during the display cycle), the screen disappears but the warning light remains lit.

The TYRES screen is not recallable by the driver.

Tyre pressure sensor

The sensors are fastened to the wheel via the inflation valve.

The sensor and valve must be fastened together perfectly for the system to function correctly.



ALWAYS replace with new components when REMOVING the TPMS sensor, complete with valve, from the rim.

Replace the entire sensor-valve assembly even if only one of the components is damaged.

Detaching the tyre from the rim without due caution may cause irreparable damage to the sensor.

Removing the tyre pressure sensors



ALWAYS replace with new components when REMOVING the TPMS sensor, complete with valve, from the rim.

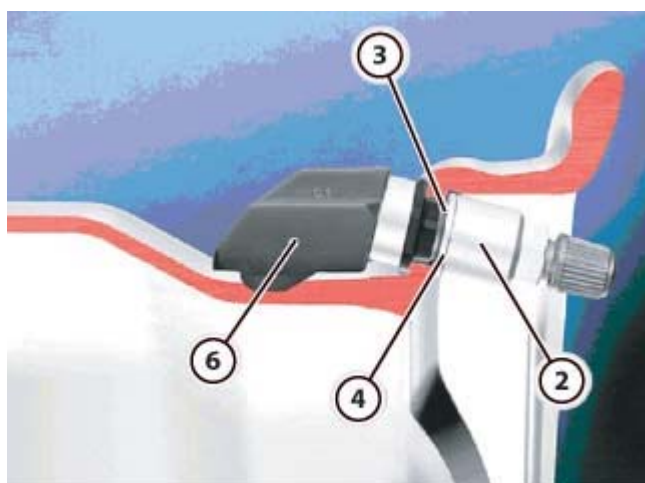
The sealant liquid contained in puncture repair aerosols may damage the sensor. Always replace the sensor if a tyre has been repaired with a puncture repair aerosol.

Replace the entire sensor-valve assembly even if only one of the components is damaged.

➤ Remove the tyres (🔧 D2.02).



- Insert the pin **(1)** included in the kit into the hole on the sensor side to prevent the inflation valve from turning.



- Undo the nut **(2)** fastening the inflation valve and retrieve the insulator washer **(3)**.
- Remove the sensor **(6)** with the valve **(4)** from the wheel rim and replace.

Refitting the tyre pressure sensor

			
Tightening torque		Nm	Class
Fastening tyre inflation valve	Nut	4 Nm	A
Fastening tyre pressure sensor	Screw	4 Nm	A



When replacing the tyre pressure sensors, carry out the new ECU sensor acquisition procedure with the DEIS tester.



Always finish all the components in the batch opened previously before starting a new sensor batch, as the sensors are equipped with a battery with a limited lifespan.

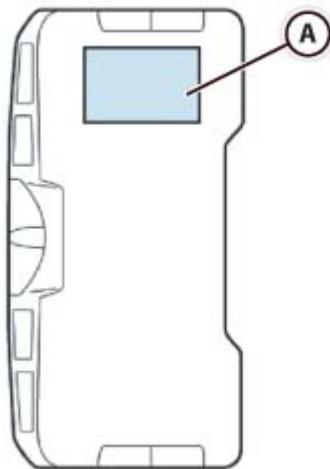
Once the sensor has been activated, the internal battery has a lifespan of approximately 10 years.



ALWAYS replace with new components when REMOVING the TPMS sensor, complete with valve, from the rim.

The sealant liquid contained in puncture repair aerosols may damage the sensor. Always replace the sensor if a tyre has been repaired with a puncture repair aerosol.

Replace the entire sensor-valve assembly even if only one of the components is damaged.



The sensor must not be treated with detergents, solvents or other harsh products.

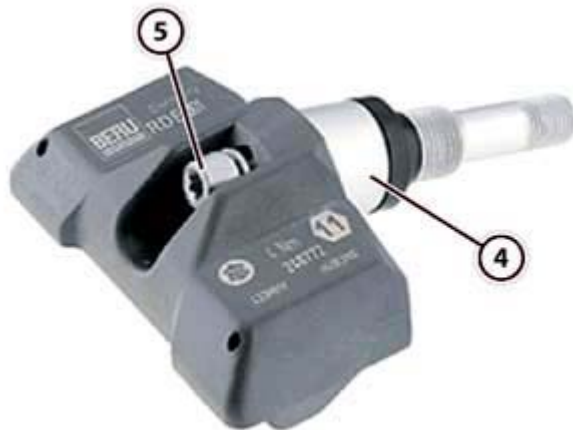
Do not clean with compressed air or pressurised liquids (e.g. pulivapor).

Take particular care not to tear the surface of the filter interface (A) on the inner side of the sensor. Always replace the sensor if the interface surface is dirty or torn.

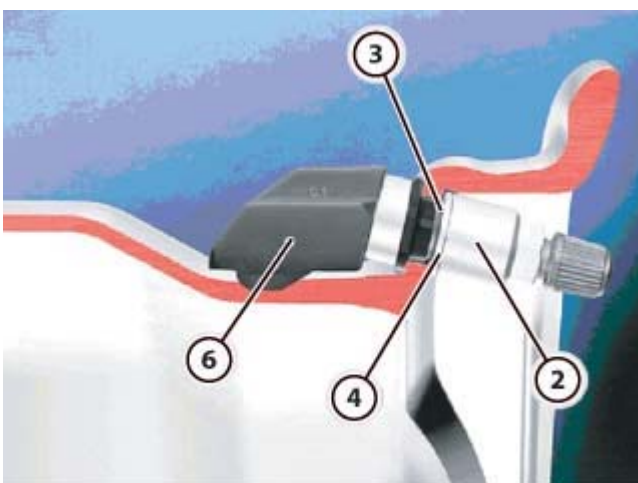
Store all the components of the sensor-valve assembly in a clean, dry place.

- Select a new TPMS valve-sensor assembly.

- Clean the sensor mating area on the wheel rim.
- Check that the sensor frequency matches the system frequency: **433 MHz** for the **STANDARD** version, white label on sensor; **315 MHz** for the **JAPAN** version, blue label on sensor.



- Fit the self-locking screw (5) in the hole on the sensor and tighten the valve (4) by two or three turns.



- Fit the valve (4) with sensor (6) already assembled, in the hole on the wheel rim.



Ensure that the insulating washer is fitted onto the outside of the rim and is perpendicular to the valve.

- Fit the insulating washer (3) and tighten the nut (2) fully.



Use a rod to ensure that the hole on the valve is kept outside the rim.

- Fit the rod (1) in the radial hole of the valve and tighten the nut (2).
- ALWAYS use a torque wrench, using only certified and calibrated tools to ensure that the correct tightening torque is achieved.



Tightening torque	Nm	Class
Nut	4 Nm	A

- Remove the rod (1).



For the sensor to function correctly, there must be contact between the rim and the mounting points of the sensor itself. The system may not function correctly if the sensor is not installed exactly as instructed.

- Push the sensor gently onto the rim to ensure contact between the rim and the mating surface of the sensor itself.
- Tighten the self-locking screw (5).
- ALWAYS use a torque wrench, using only certified and calibrated tools to ensure that the correct tightening torque is achieved.



Tightening torque	Nm	Class
Screw	4 Nm	A

➤ Refit the tyres (D2.02).

Tyre pressure sensor wake-up



Always finish all the components in the batch opened previously before starting a new sensor batch, as the sensors are equipped with a battery with a limited lifespan. Once the sensor has been activated, the internal battery has a lifespan of approximately 10 years.

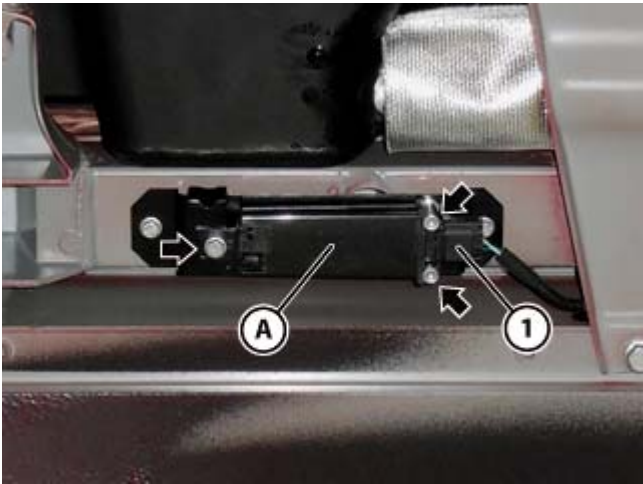
When manufactured, the tyre pressure sensor is set in sleep mode to preserve battery life during storage.

To wake the sensor up, it is subjected to a certain pressure value as described as follows.

- Refit the tyre pressure sensor (🔧 D2.03).
- Refit the tyres (🔧 D2.02).
- Inflate the tyre to a pressure above **0.6 bar (8.7 psi)** and keep at this pressure **for a few minutes**. This wakes up the sensor.
- Inflate the tyre to the specified pressure.
- Refit the wheels (🔧 D2.01).

Replacing the TPMS antenna

- Disconnect the battery (🔧 F2.01).
- Remove the flat undertray sections (🔧 E3.12).
- Remove the rear flat undertray section.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the antenna **(A)** and replace.
- Fit the new antenna **(A)**.
- Tighten the screws indicated.
- Connect the connector **(1)**.

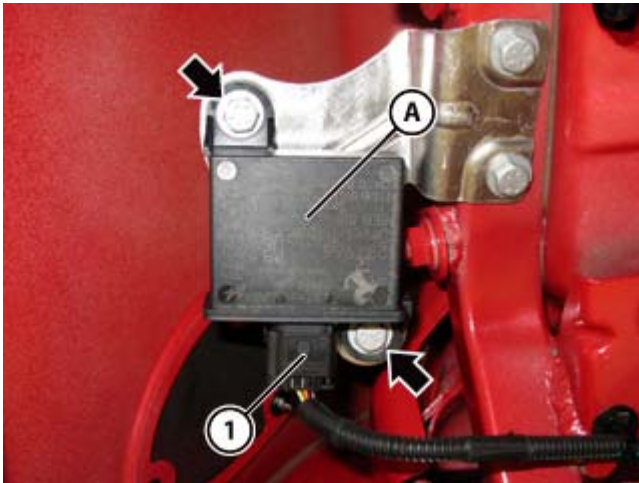
- Refit the flat undertray sections (🔧 E3.12).
- Connect the battery (🔧 F2.01).

Replacing the TPMS triggers

			
Tightening torque		Nm	Class
Fastening TPMS triggers	Screw	4 Nm	B

- Disconnect the battery (🔧 F2.01).

Front TPMS triggers

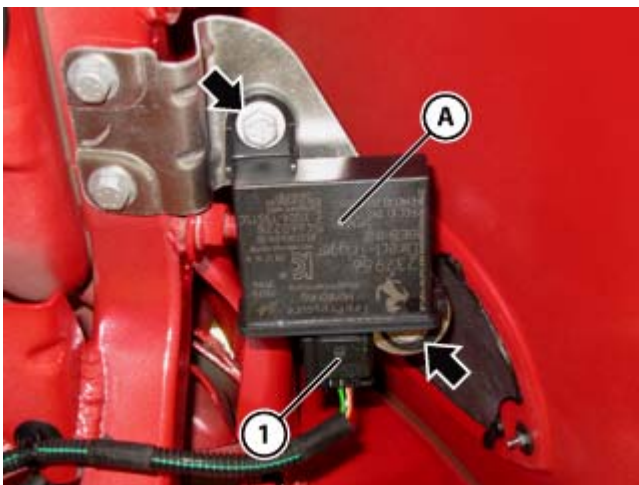


RH front TPMS trigger

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the trigger **(A)** and replace.
- Fit the new trigger **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.



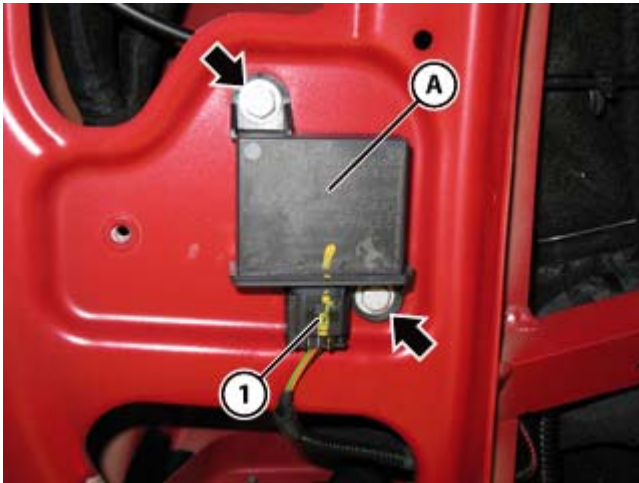
LH front TPMS trigger

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the trigger **(A)** and replace.
- Fit the new trigger **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.

Rear TPMS triggers

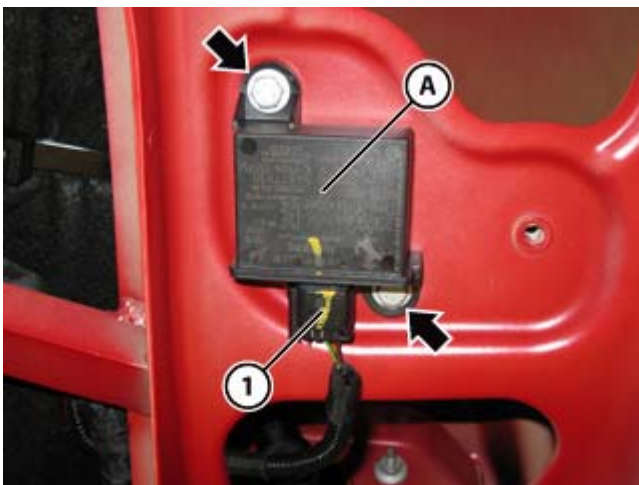


RH rear TPMS trigger

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the trigger **(A)** and replace.
- Fit the new trigger **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.



LH rear TPMS trigger

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the trigger **(A)** and replace.
- Fit the new trigger **(A)**.
- Tighten the screws indicated.

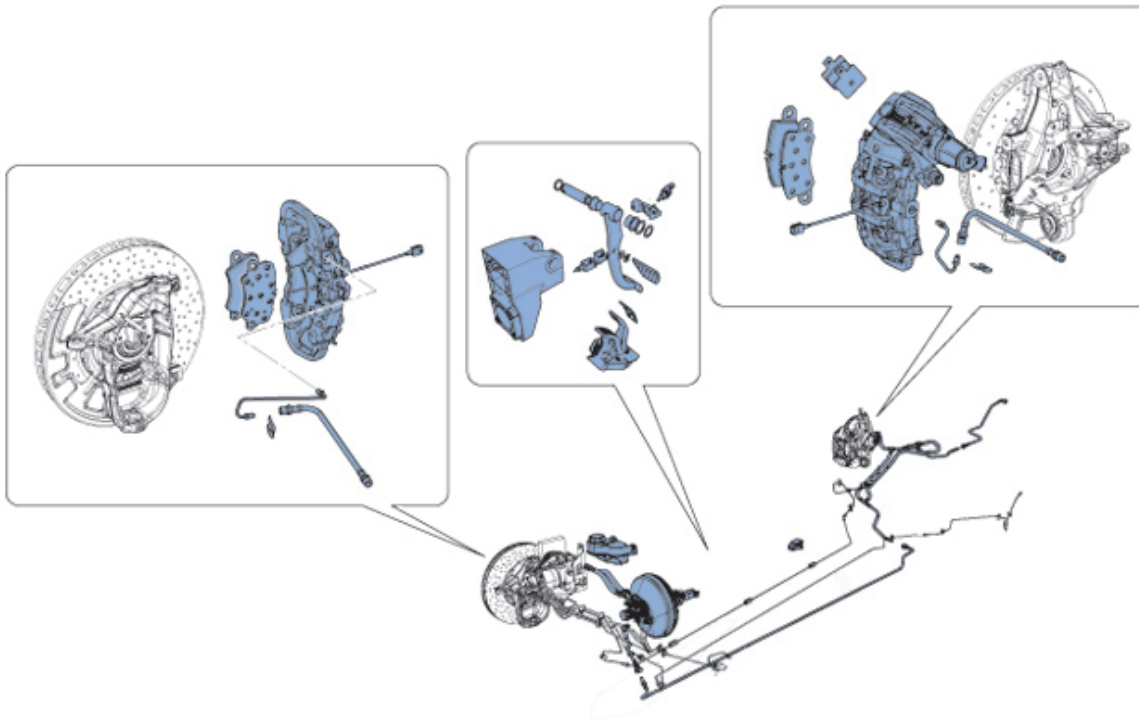
		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.

- Refit the front wheelhouses ( E3.05).
- Connect the battery ( F2.01).

D3.01 Brake system layout

Brake system layout



- A - Brake fluid tank
- B - Master brake cylinder
- C - Brake servo
- D - ABS/ESC electrohydraulic unit
- E - Brake callipers
- F - Brake pads
- G - Brake discs
- H - Yaw sensor
- I - Pedal board

D3.02 Brake fluid tank

Removing the hydraulic brake system fluid tank

- Preparation in progress

Refitting the brake fluid tank

- Preparation in progress

D3.03 Brake discs

Removing the brake discs

- Remove the wheels (🔧 D2.01).
- Remove the rear brake callipers (🔧 D3.05).
 - 🔴 Applicable only for removing the rear discs. DO NOT disconnect the calliper fluid pipe and take particular care not to damage the pipe when handling the calliper.
- Remove the front brake callipers (🔧 D3.05).
 - 🔴 Applicable only for removing the front discs.



- Undo the wheel locator pin indicated.
- Undo the screw indicated fastening the disc.
- Remove the disc, easing it off the wheel bearing.

Refitting the brake discs

			
Tightening torque		Nm	Class
Fastening brake disc - bearing	Screw	15.5 Nm	B
	Pin	15.5 Nm	B

- Check that the disc is in proper working condition and inspect the disc contact surface, even if new.
- If any dirt, stains or greasy/oily patches are noted on the disc surface, clean thoroughly with a regular solvent, degreaser and/or soap and water.



- Fit the disc on the wheel bearing.
- To centre the disc on the wheel bearing, hand tighten the wheel fastener stud bolts into their seats.
- Tighten the screw indicated fastening the disc.

		
Tightening torque	Nm	Class
Screw	15.5 Nm	B

- Tighten the wheel locator pin indicated.

		
Tightening torque	Nm	Class
Pin	15.5 Nm	B

- Remove the stud bolts fitted previously for aligning the disc.

- Refit the front brake callipers ( D3.05).
- Refit the rear brake callipers ( D3.05).
- Fill and bleed the brake system ( D3.10).
- Carry out this operation only if the oil pipe unions have been disconnected.

- Refit the wheels ( D2.01).
- Only in the case of replacing the discs. Bed-in the CCM brake pads ( D3.04).

Cleaning CCM brake discs



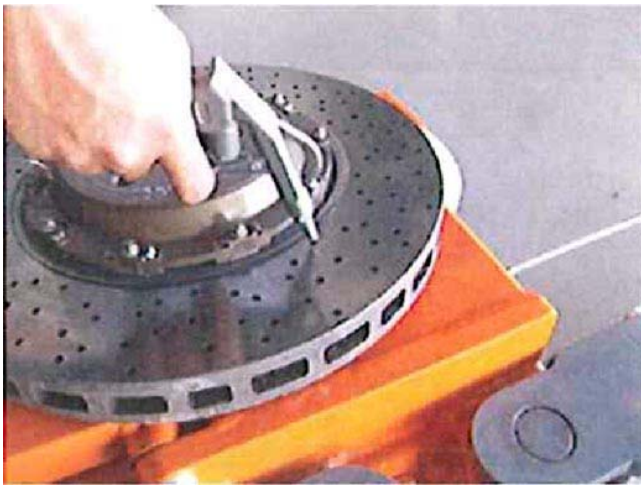
Always use standard dust and dirt protection measures, such as safety eyewear, face masks and an extractor system, when performing any cleaning work on the discs.
Wear plastic gloves when handling discs.

- Remove the brake discs ( D3.03).
- Remove dirt from the brake hat and the braking surface of the rotor with a clean cloth and acetone (C3 H6 O) or alcohol (DO NOT wash).



DO NOT use a drill to remove stubborn material from the holes.
DO NOT countersink the holes.
DO NOT grind the discs.
DO NOT widen the holes with a drill.

- Remove any material from the cross-drilled ventilation holes in the disc with a metal pin or a screwdriver no larger than **5 mm** in diameter.



- Blow compressed air into the ventilation holes.

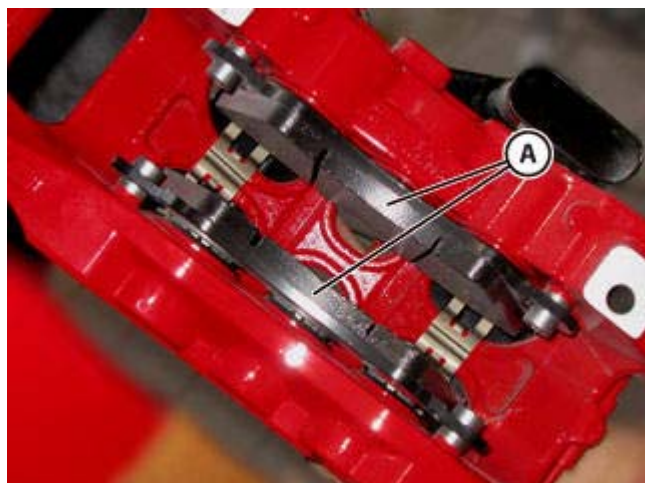
- If evident signs of moisture are found on the discs, place the discs in an oven at a constant temperature of **120 to 150°C** for **2 hours**.

D3.04 Brake pads

Replacing the front brake pads

➤ Remove the front brake callipers (🔧 D3.05).

❗ Remove the brake callipers, disconnecting the hydraulic line mounting brackets without disconnecting the hydraulic lines themselves.



- Detach and remove the pads **(A)** and the respective springs from the calliper.
- Replace the pads **(A)** and the respective springs.



The surface of the friction which will be in contact with the disc must not be contaminated with the paste. In case of contamination, remove the paste with a cloth or paper.

- Before fitting new pads, apply **MOLYKOTE® Cu7439** high temperature copper based paste to the rear of the pads (the side in contact with the calliper pistons) using a brush. The paste must be applied as evenly as possible, in a layer thick enough so that the colour of the underlying pad surface is no longer visible.



When fitting the pads, take care not to contaminate the friction surfaces with paste.

- Fit and fasten the pads **(A)** and the respective springs in the calliper.

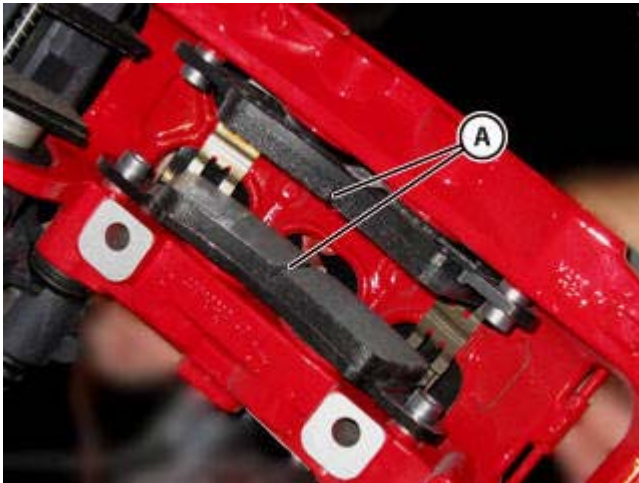
➤ Refit the front brake callipers (🔧 D3.05).

❗ Refit the hydraulic line mounting brackets.

Replacing the rear brake pads

➤ Remove the rear brake callipers (🔧 D3.05).

❗ Remove the brake callipers, disconnecting the hydraulic line mounting brackets without disconnecting the hydraulic lines themselves.



- Detach and remove the pads **(A)** and the respective springs from the calliper.
- Replace the pads **(A)** and the respective springs.
- Fit and fasten the pads **(A)** and the respective springs in the calliper.

- Refit the rear brake callipers (🛠️ D3.05).
- Refit the hydraulic line mounting brackets.

Bedding-in CCM brake pads

The following procedure is applicable for both CCM1 and CCM2 brake systems and must be performed **EACH TIME** the CCM brake pads and/or CCM brake discs are replaced.

For vehicles intended for ROAD use

- Brake **4 times** from **80 Km/h** to **30 Km/h** with constant pressure on the brake pedal and without activating the ABS system.
- Allow the brake system to cool by driving at **80 Km/h** for approximately **180 seconds**.
- Brake **6 times** from **130 Km/h** to **30 Km/h** with constant pressure on the brake pedal and without activating the ABS system.
- Allow the brake system to cool by driving at **80 Km/h** for **180 seconds**.
- Brake **15 times** from **130 Km/h** to **30 Km/h** with constant pressure on the brake pedal and without activating the ABS system.
- Allow the brake system to cool by driving at **80 Km/h** for **180 seconds**.
- 🚫 Allow the brake system to cool completely before using the vehicle again after the bedding-in procedure to ensure maximum braking efficacy.
- As soon as you notice an increase in brake pedal travel, stop the car and wait for the brake system to cool completely.

For vehicles intended for TRACK use

- Brake **9 times** from **130 Km/h** to **30 Km/h** with constant pressure on the brake pedal and without activating the ABS system.
- Allow the brake system to cool by driving at **80 Km/h** for approximately **240 seconds**.
- Brake **3 times** from **200 Km/h** to **30 Km/h** with constant pressure on the brake pedal and without activating the ABS system.
- Allow the brake system to cool by driving at **80 Km/h** for **300 seconds**.



Allow the brake system to cool completely before using the vehicle again after the bedding-in procedure to ensure maximum braking efficacy.

- As soon as you notice an increase in brake pedal travel, stop the car and wait for the brake system to cool completely.

D3.05 Brake callipers

Removing the front brake callipers



Hydraulic brake fluid is corrosive.

Contact with brake fluid may cause severe injury or damage to painted parts of the vehicle.

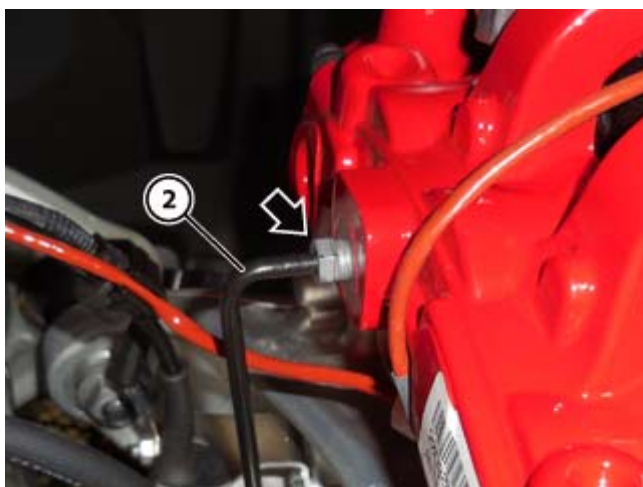
In the event of skin contact with fluid, wash the respective part of the body immediately with plenty of water.

In the event of contact between the fluid and painted parts of the vehicle, wash and dry the respective areas immediately.

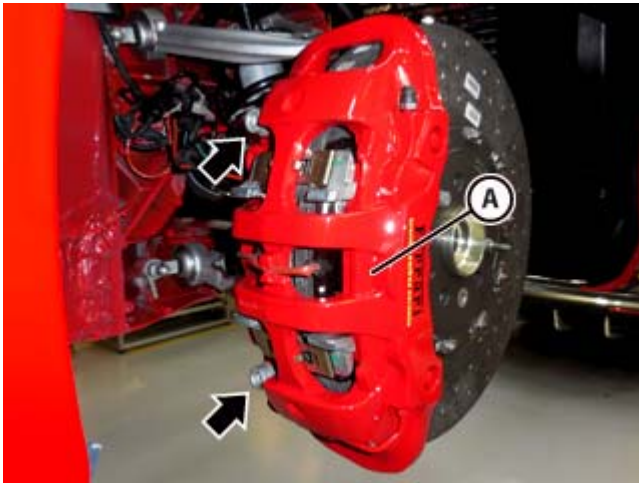
➤ Remove the wheels ( D2.01).



- Detach and disconnect the connector **(1)**, releasing the respective cable.



- Disconnect the pipe **(2)** undoing the indicated union.



- Undo the screws indicated.
- Remove the calliper **(A)**.

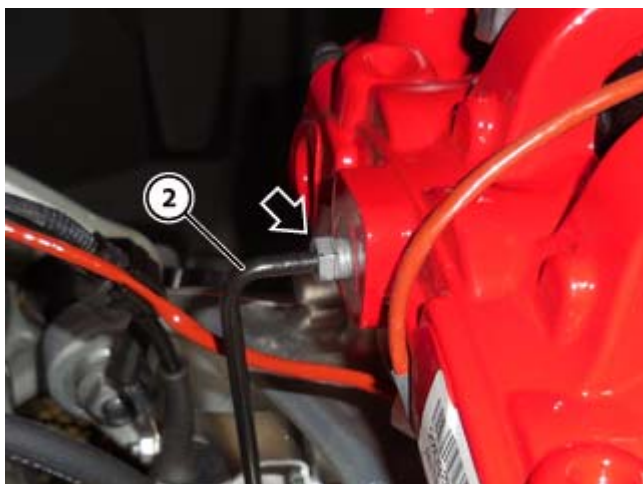
Refitting the front brake callipers

			
Tightening torque		Nm	Class
Fastening brake callipers	Screw	95 ÷ 105 Nm	A
Fastening brake fluid pipes to brake callipers	Union	14 ÷ 17 Nm	A



- Check that the mating surfaces between the calliper and the stub axle are clean.
- Fit the calliper **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	95 ÷ 105 Nm	A



- Connect the pipe **(2)**, tightening the indicated union.

		
Tightening torque	Nm	Class
Union	14 ÷ 17 Nm	A



- Connect and fasten the connector **(1)**, securing the respective cable.

- Fill and bleed the brake system ( D3.10).
- Refit the wheels ( D2.01).

Removing the rear brake callipers



Hydraulic brake fluid is corrosive.

Contact with brake fluid may cause severe injury or damage to painted parts of the vehicle.

In the event of skin contact with fluid, wash the respective part of the body immediately with plenty of water.

In the event of contact between the fluid and painted parts of the vehicle, wash and dry the respective areas immediately.

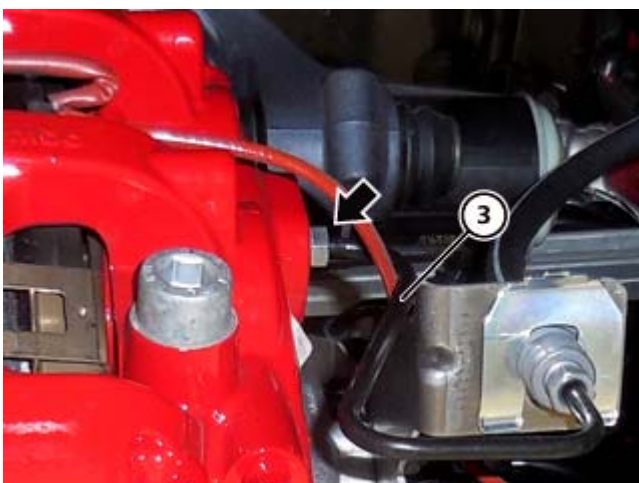
- Disable the EPB electric parking brake Autohold function ( D3.07).
- Remove the wheels ( D2.01).



- Detach and disconnect the connector **(1)**, releasing the respective cable.



- Disconnect the connector **(2)**.



- Disconnect the pipe **(3)** undoing the indicated union.



- Undo the screws indicated.
- Remove the calliper **(A)**.

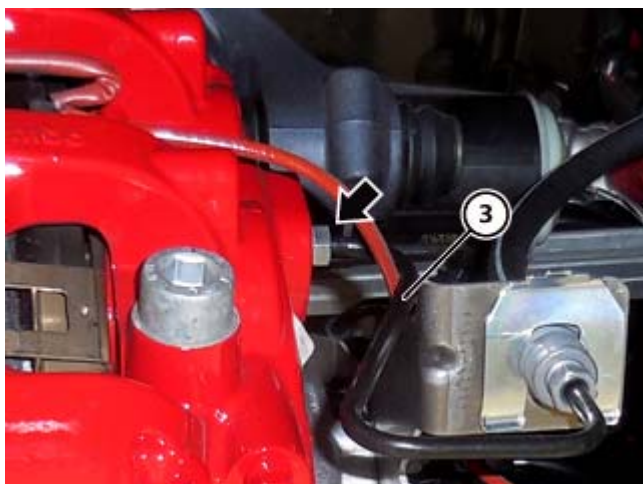
Refitting the rear brake callipers

			
Tightening torque		Nm	Class
Fastening brake callipers	Screw	95 ÷ 105 Nm	A
Fastening brake fluid pipes to brake callipers	Union	14 ÷ 17 Nm	A



- Check that the mating surfaces between the calliper and the hub carrier are clean.
- Fit the calliper **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	95 ÷ 105 Nm	A



- Connect the pipe **(3)**, tightening the indicated union.



Tightening torque	Nm	Class
Union	14 ÷ 17 Nm	A



- Connect the connector **(2)**.



- Connect and fasten the connector **(1)**, securing the respective cable.

- Fill and bleed the brake system ( D3.10).
- Refit the wheels ( D2.01).

D3.06 ABS electrohydraulic unit

Replacing the ABS/ASR electrohydraulic unit

- Preparation in progress

D3.07 EPB electric parking brake

Disabling the EPB electric parking brake Autohold function

The EPB electric parking brake is engaged automatically at each Key-off, as the Autohold function is always enabled by default.

The following procedure disables the Autohold function to impede automatic engagement of the EPB electric parking brake at Key-off: no maintenance is possible on the components of the EPB system while the EPB electric parking brake is engaged, as a result, this procedure is necessary before carrying out any work involving the components of the EPB electric parking brake.

The Autohold function will resume normal operation at the next Key-on, and the EPB electric parking brake will therefore be automatically engaged at the next Key-off.

- Open the driver side door.
- Depress and hold the brake pedal.
- Turn the ignition switch **ON**.



- Pull the EPB electric parking brake control lever (A).



- Wait until the respective indicator light on the instrument panel extinguishes.



- Press the AUTO PARK button **(B)**.



- Wait for the specific message **"Parking Brake not engaged"** to appear on the TFT display.

- Turn the ignition switch **OFF**.

Emergency mechanical EPB electric parking brake deactivation procedure



CAUTION

When the electric parking brake is deactivated manually, the vehicle may move unexpectedly! The vehicle is held in position only by the Park Lock safety device, if engaged. To hold the vehicle, the Park Lock safety system must be engaged: ensure that the letter "P" is shown on the gearbox display.

Should it not be possible to deactivate the electric parking brake electronically from the respective lever in the event of a flat battery or an electrical system malfunction, the parking brake must be deactivated mechanically as described as follows.

- Replace the fuses and relays on the dashboard (Body computer) (🔧 F2.06).
- Disconnect fuses F-33 and F-34 situated on the dashboard ECU.



- Loosen the indicated screws on both EPB callipers.

- Remove the rear brake callipers (🔧 D3.05).

🔧 Replace the complete rear callipers.

- Refit the rear brake callipers (🔧 D3.05).

🔧 After assembling the new complete rear callipers, contact the Ferrari Help Desk.

- Replace the fuses and relays on the dashboard (Body computer) (🔧 F2.06).

🔧 Connect fuses F-33 and F-34 situated on the dashboard ECU.

D3.08 Brake servo

Removing the brake servo

- Preparation in progress

Refitting the brake servo

- Preparation in progress

D3.09 Pedal board

Removing the pedal board

- Preparation in progress

Refitting the pedal board

- Preparation in progress

D3.10 Filling and bleeding the brake system

Filling and bleeding the brake system

- Remove the wheels (🔧 D2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket (🔧 F2.08).

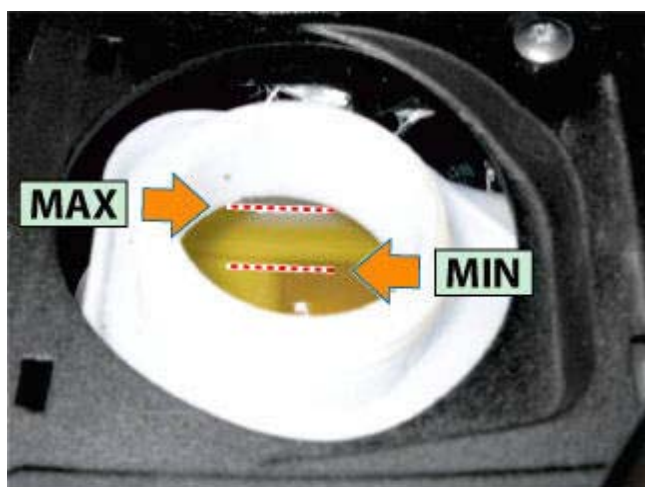


 The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.

- Detach and remove the cover (A), prising off in the position indicated.



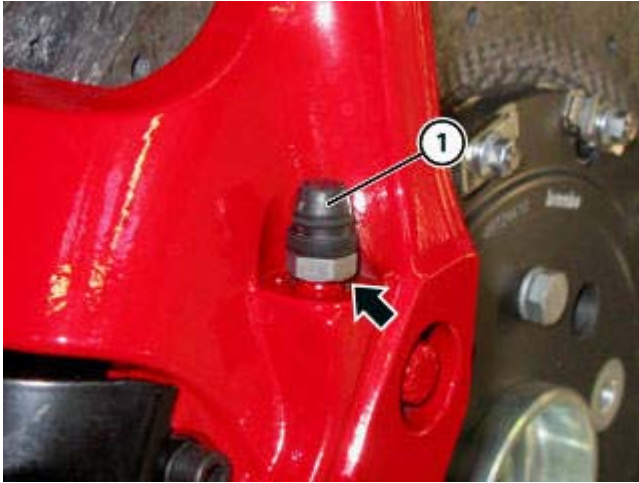
- Undo and remove the cap (B).



 Always use fresh oil of the recommended type and in the quantity indicated, taken from sealed containers.

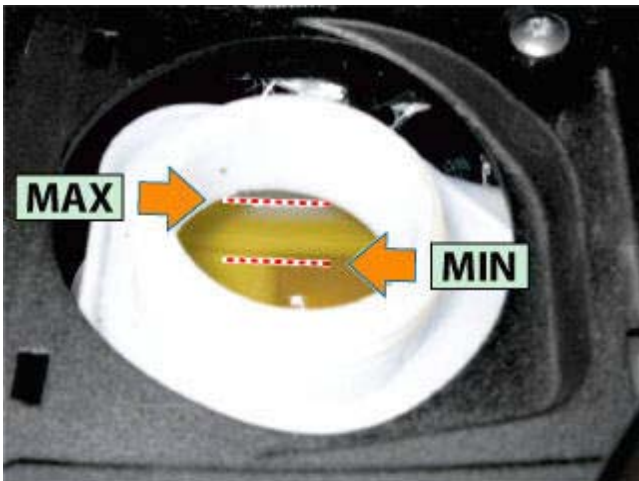
 The circuit is filled with synthetic oil. Using mineral oil may cause irreparable damage to the rubber seals in the system.

- Fill the reservoir gradually with the specified hydraulic brake fluid up to the **MAX** level.



The procedure for bleeding the brake system must be performed on each calliper, bleeding from the inner calliper bleed unions first and then from the outer calliper bleed unions.

- Prise off the cap **(1)**.
- Connect a suitable transparent tube to the indicated bleed union.
- Place a container for collecting brake fluid near the calliper.
- Insert the end of the tube in the container.
- Perform the **20 - NFR Bleeding** cycle with the DEIS diagnostic tester, pressing the brake pedal when the ESP pump activates to pressurise the circuit.
- During the brake system bleeding procedure, the brake fluid level in the reservoir must not be allowed to drop below the **MIN** level. Check the brake fluid level in the reservoir continuously and top up whenever necessary.
- Disconnect the transparent tube from the indicated bleed union.
- Remove the container.
- Tighten the indicated bleed union.
- Fit the cap **(1)**.



Always use fresh oil of the recommended type and in the quantity indicated, taken from sealed containers.



The circuit is filled with synthetic oil. Using mineral oil may cause irreparable damage to the rubber seals in the system.

- Fill the reservoir gradually with the specified hydraulic brake fluid up to the **MAX** level.



- Fit the cap **(B)** and tighten securely.



The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.

- Fit the cover **(A)** and fasten by pressing in the position indicated.

- After the procedure, there must be no sponginess notable in the brake pedal and the braking action must be progressive, starting immediately after a short free play.
- Refit the wheels ( D2.01).



CCM Brake Disc Wear Form

Model
All Models

- CCM Brake Disc Wear Form

[\[Download\]](#)

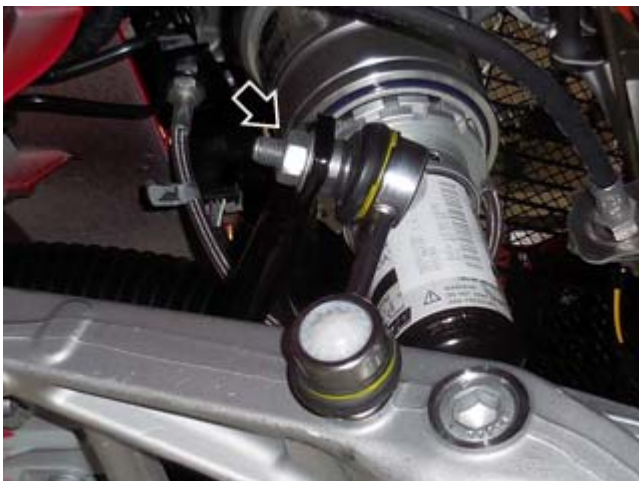
D4.01 Complete suspension

Removing complete front suspension

- Disconnect the battery (🔌 F2.01).
- Remove the front wheelhouses (🔌 E3.05).



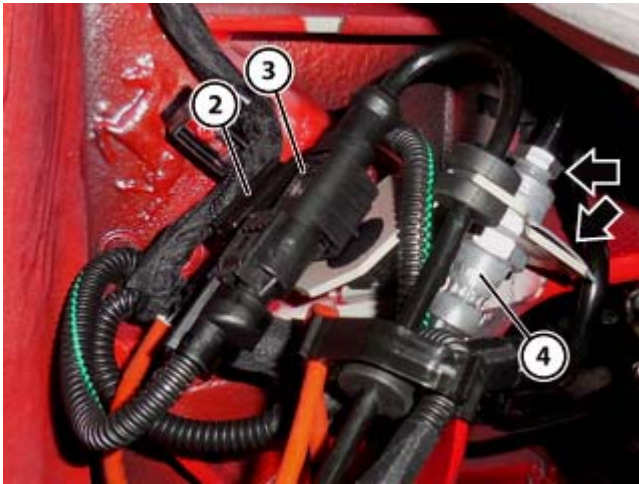
- Undo the indicated nut.
- Disconnect the steering box tie-rod from the hub carrier.



- Undo the indicated nut.
- Disconnect the spherical tie-rod from the stabiliser bar.



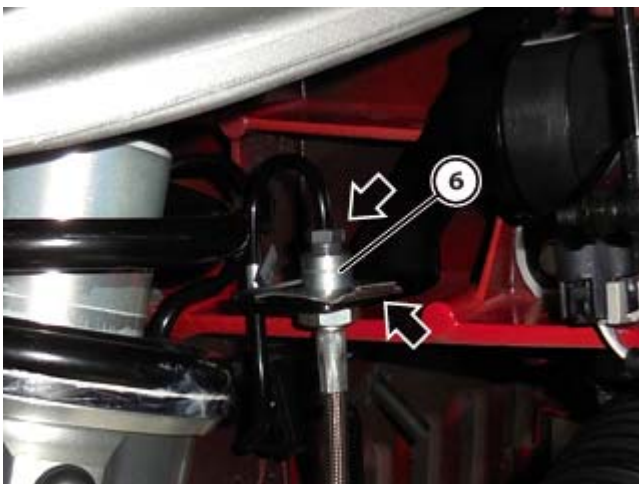
- Disconnect the connector (1).



- Detach and disconnect the connector **(2)** for the ABS sensor.
- Detach and disconnect the connector **(3)** for the brake pad wear sensor.
- Undo the indicated union.
- Remove the indicated clip.
- Disconnect the pipe **(4)**.

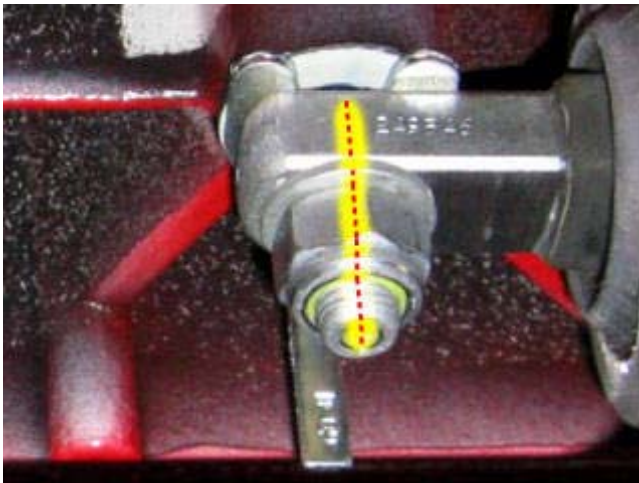


- Undo the indicated nut.
- Disconnect the ground cable **(5)**.

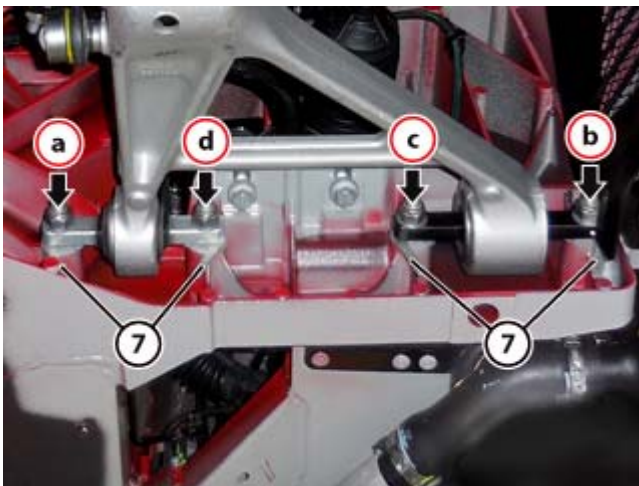


For vehicles with "Front Lift" system

- Undo the indicated union.
- Remove the indicated clip.
- Disconnect the pipe **(6)**.

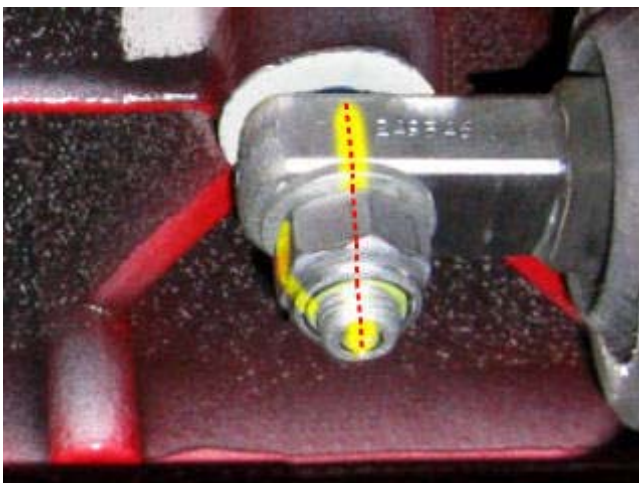


- Using a delible yellow marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the lower arm.



 DO NOT use lubricants or electric/pneumatic drivers.

- Partially loosen the indicated nuts, retrieving the shims (7), in the following order: (a), (b), (c), (d).



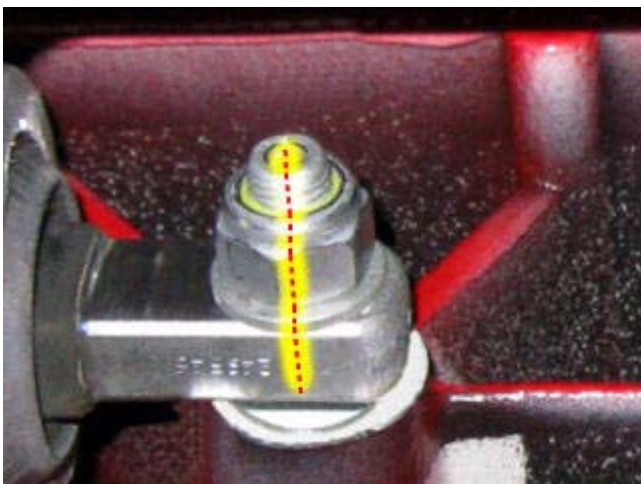
- Check that the yellow reference markings are correctly aligned: the marking on the threaded rods and the marking on the Flanbloc eyebolts must be aligned.
-  Only the nut must turn, the threaded rod must remain in its original position.
- If the markings on the threaded rods and eyebolts are not correctly aligned after loosening the arm fastener nuts (even if only on one threaded rod), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the threaded rods and eyebolts are correctly aligned after loosening the arm fastener nuts, completely undo and remove the four arm fastener nuts in the order given for the previous operation.



- Check again that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.



- Support the weight of the suspension adequately.
 DO NOT use lubricants or electric/pneumatic drivers.
- Undo the screws indicated.



- Using a delible yellow marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



- Detach the tie-rod **(8)**.



DO NOT use lubricants or electric/pneumatic drivers.

- Partially loosen the indicated nuts in the following sequence: **(a)**, **(b)**, **(c)**, **(d)**.
- Move the shock absorber aside to facilitate the operation.



- Check that the yellow reference markings are correctly aligned: the marking on the threaded rods and the marking on the Flanbloc eyebolts must be aligned.
- If the markings on the threaded rods and eyebolts are not correctly aligned after loosening the arm fastener nuts (even if only on one threaded rod), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the threaded rods and eyebolts are correctly aligned after loosening the arm fastener nuts, completely undo and remove the four arm fastener nuts in the order given for the previous operation.
- Move the shock absorber aside to facilitate the operation.



- Check again that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.

- Remove the complete suspension from its seat, retrieving the four washers of upper lever stud bolts.

Refitting complete front suspension

			
Tightening torque		Nm	Class
Fastening upper arm to chassis	Nut (pretightening)	9 Nm	A
	Nut	60 Nm	A
Fastening shock absorber to chassis	Screw (pretightening)	20 Nm	A
	Screw	110 Nm	A
Fastening lower arm to chassis	Nut (pretightening)	9 Nm	A
	Nut	60 Nm	A
Fastening vehicle lift system unions	Union	16 Nm	B
Fastening brake pad sensor ground cable	Nut	6 Nm	B
Fastening brake pipe union or connection	M10 union	16 Nm	B
Fastening front stabiliser bar to tie-rod	Nut	50 Nm	B
Fastening steering box tie-rod to hub carrier	Nut	40 Nm	B

- Position the four washers onto upper arm stud bolts, and position the complete suspension inside its seat, supporting its weight adequately.



- Clean the mating surfaces with a degreasing product (heptane).
 DO NOT use lubricants or electric/pneumatic drivers.
-  ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.
- Tighten the nuts in the following tightening order: **(a), (b), (c), (d)**.
 Move the shock absorber aside to facilitate the operation.

		
Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	A
Nut	60 Nm	A

- Attach the tie-rod **(8)**.



- Check that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.

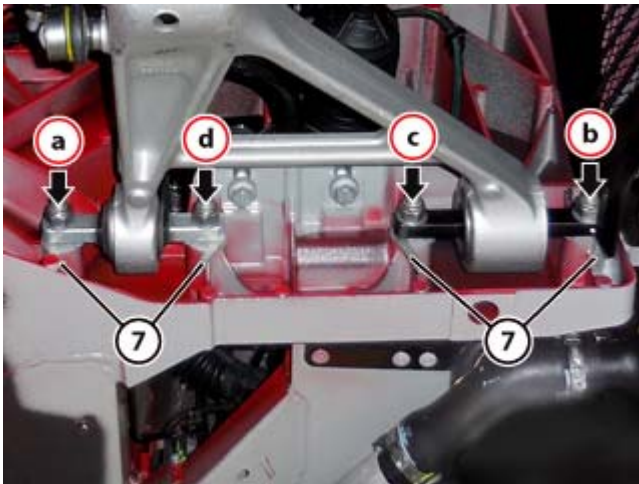


- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	110 Nm	A



- Fit the shims **(7)** in the relative seats, pushing down completely onto the threaded rods and ensuring that they are perfectly perpendicular to the horizontal axis of the Flanblocs.
- Clean the mating surfaces with a degreasing product (heptane).



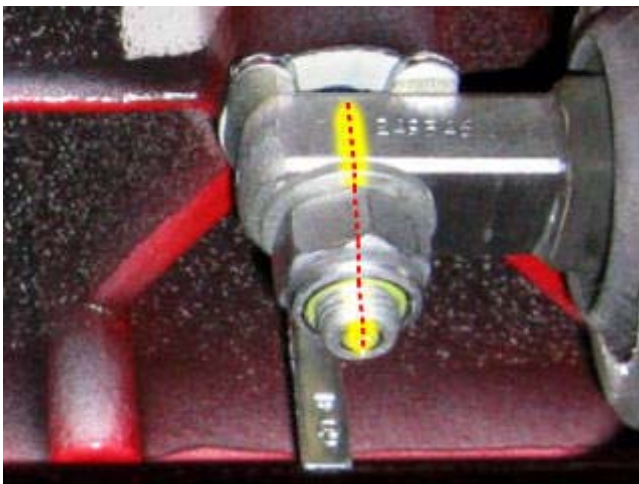
DO NOT use lubricants or electric/pneumatic drivers.



ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.

- Tighten the nuts in the following tightening order: **(a), (b), (c), (d)**.

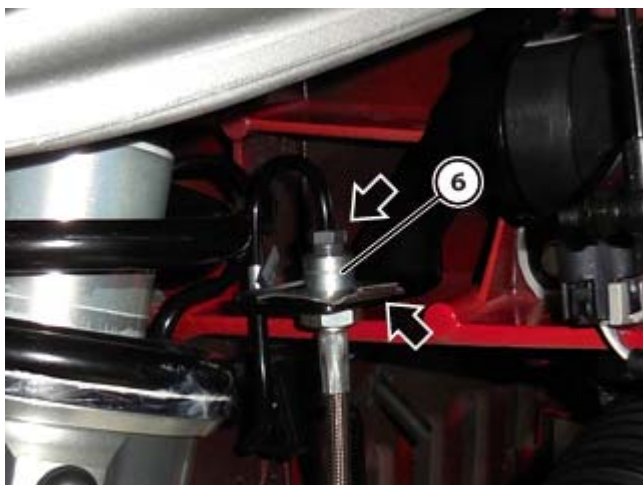
		
Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	A
Nut	60 Nm	A



- Check that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.



- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the lower arm.



Only for vehicles with "Front Lift" system

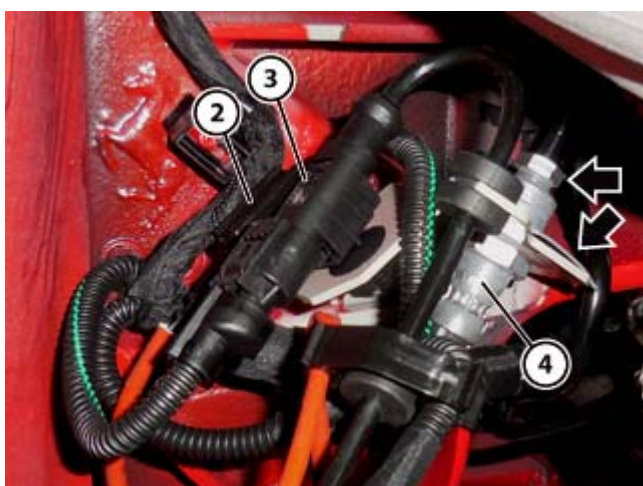
- Connect pipe (6).
- Refit the indicated clip.
- Tighten the indicated union.

		
Tightening torque	Nm	Class
Union	16 Nm	B



- Connect the ground cable (5).
- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	6 Nm	B



- Connect pipe (4).
- Refit the indicated clip.
- Tighten the indicated union.

		
Tightening torque	Nm	Class
M10 union	16 Nm	B

- Fit and fasten the brake pad wear sensor connector (3), fastening the respective cable.
- Connect and fasten the connector (2) for the ABS sensor, fastening the respective cable.



- Connect the connector **(1)**.



- Connect the tie-rod to the stabiliser bar.
- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	50 Nm	B



- Pre-tighten the indicated nut fastening the steering box tie-rod.

		
Tightening torque	Nm	Class
Nut	40 Nm	B

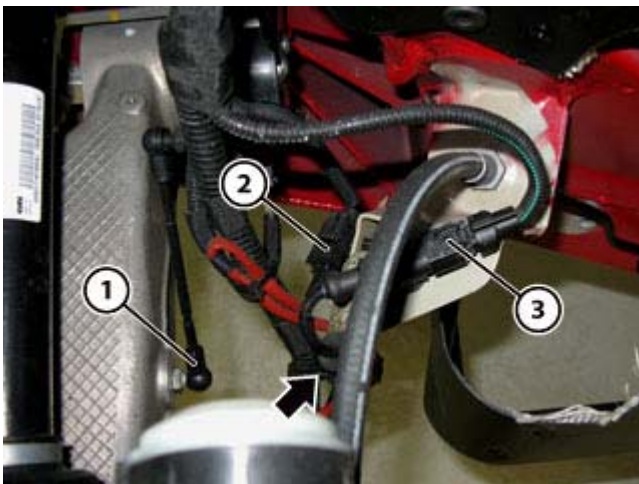
- Loosen and retighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	40 Nm	B

- Refit the front wheelhouses ( E3.05).
- Connect the battery ( F2.01).
- Fill and bleed the brake system ( D3.10).
- Only for vehicles with "Front Lift" system. Fill and bleed the "Front Lift" system ( D4.08).
- Check the vehicle set-up ( D4.07).

Removing complete rear suspension

- Disable the EPB electric parking brake Autohold function (🔧 D3.07).
- Disconnect the battery (🔧 F2.01).
- Remove the flat undertray sections (🔧 E3.12).
 - Remove the rear flat undertray section.
- Remove the wheels (🔧 D2.01).
 - Remove the rear wheels.



- Detach the linkage **(1)** of the NRRPS movement sensor.
- Disconnect the connector **(2)** for the brake pad wear sensor.
- Disconnect the connector **(3)** for the ABS sensor.
- Detach the indicated cable grommet from the relative mounting bracket.



- Undo the indicated nut.
- Disconnect the ground cable **(4)**.



- Remove and retrieve the indicated clip.
- Undo the indicated union.
- Disconnect the brake oil hose (5).



- Undo the six screws indicated (6), retrieving the three shims (7).



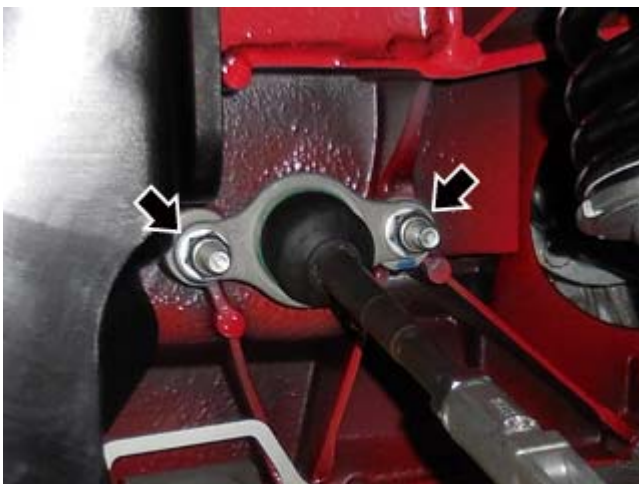
- Release and disconnect connector (9).
- Support the weight of the complete suspension adequately.
- Undo the screws indicated.



- Disconnect the connector **(10)**.



- Using a delible yellow marker pen or paint, make reference markings on the threaded bolts and relative nuts and the eyebolts fastening the toe-in tie-rod.



 **DO NOT** use lubricants or electric/pneumatic drivers.

- Partially loosen the indicated nuts.



- Check that the yellow reference markings are correctly aligned: the marking on the threaded rods and the marking on the eyebolts must be aligned.
- Only the nut must turn, the threaded rod must remain in its original position.

- If the markings on the threaded rods and eyebolts are not correctly aligned after loosening the toe-in tie rod fastener nuts (even if only on one threaded rod), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the threaded rods and eyebolts are correctly aligned after loosening the toe-in tie-rod fastener nuts, completely undo and remove the two toe-in tie-rod fastener nuts in the order given for the previous operation.
- Check again that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the eyebolts must be aligned.

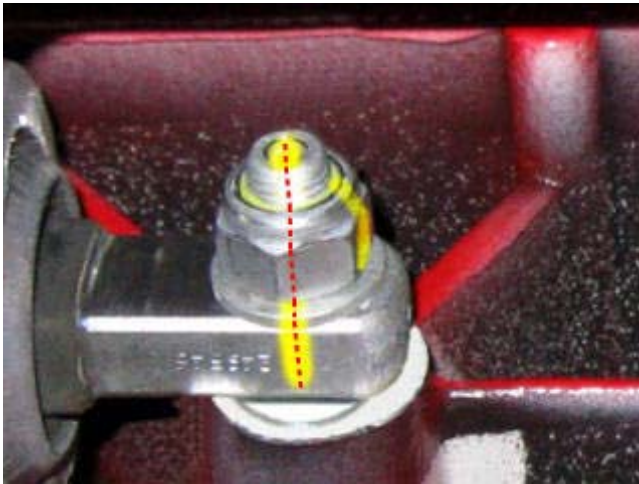


- Using a delible yellow marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



 DO NOT use lubricants or electric/pneumatic drivers.

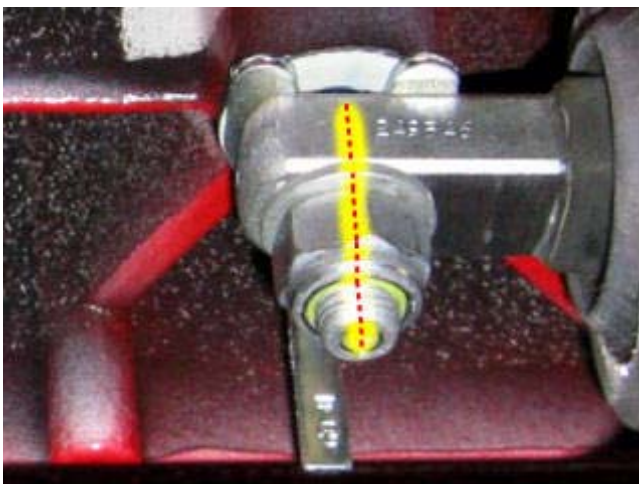
- Partially loosen the indicated nuts.



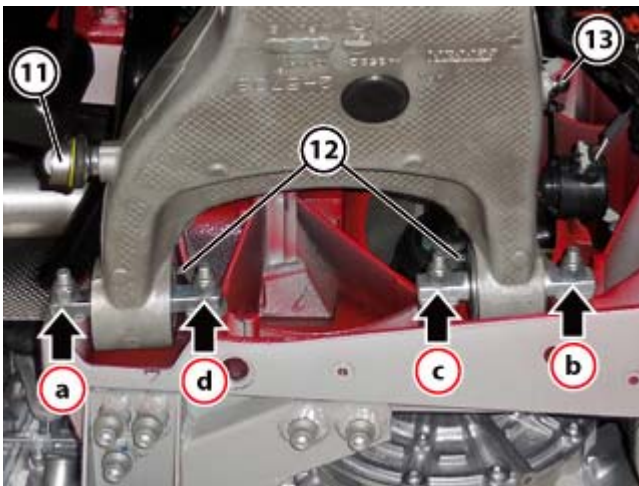
- Check that the yellow reference markings are correctly aligned: the marking on the threaded rods and the marking on the Flanbloc eyebolts must be aligned.
- If the markings on the threaded rods and Flanbloc eyebolts are not correctly aligned after loosening the arm fastener nuts (even if only on one threaded rod), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the threaded rods and Flanbloc eyebolts are correctly aligned after loosening the arm fastener nuts, completely undo and remove the two arm fastener nuts in the order given for the previous operation.



- Check again that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.



- Using a delible yellow marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the lower arm.



- Undo the ball-joint **(11)** of the stabiliser bar.
-  **DO NOT** use lubricants or electric/pneumatic drivers.
- Partially loosen the indicated nuts, retrieving the shims **(12)** in the following order: **(a)**, **(b)**, **(c)**, **(d)**.
- Detach the linkage **(12)** of the NRRPS movement sensor.



- Check that the yellow reference markings are correctly aligned: the marking on the threaded rods and the marking on the Flanbloc eyebolts must be aligned.
-  Only the nut must turn, the threaded rod must remain in its original position.
- If the markings on the threaded rods and Flanbloc eyebolts are not correctly aligned after loosening the arm fastener nuts (even if only on one threaded rod), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the threaded rods and Flanbloc eyebolts are correctly aligned after loosening the arm fastener nuts, completely undo and remove the four arm fastener nuts in the order given for the previous operation.



- Check again that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.

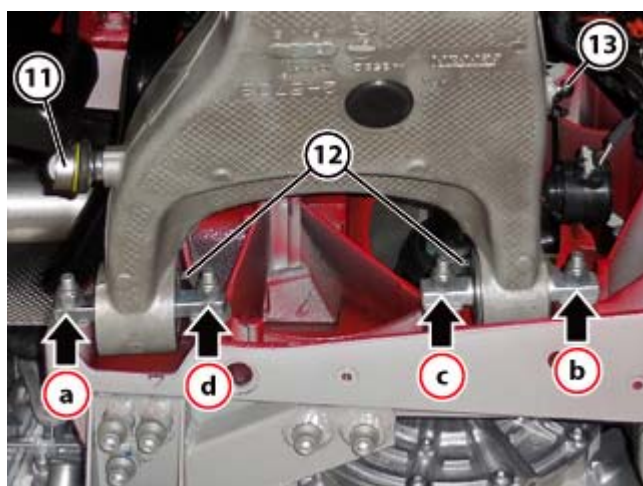
- Remove the complete rear suspension from the vehicle, retrieving the two washers of upper lever stud bolts.

Refitting complete rear suspension



Tightening torque		Nm	Class
Fastening lower arm to chassis	Nut (pretightening)	9 Nm	B
	Nut	60 Nm	A
Fastening spherical tie-rod - lower arm	Spherical tie-rod	50 Nm	B
Fastening upper arm to chassis	Nut (pretightening)	9 Nm	B
	Nut	60 Nm	A
Fastening toe-in tie-rod to chassis	Nut (pretightening)	9 Nm	B
	Nut	60 Nm	A
Fastening shock absorber to chassis	Screw	110 Nm	A
Fastening axle shaft to differential flange	Screw	78 Nm	A
Fastening brake pipe union or connection	M10 union	16 Nm	B
Fastening brake pad sensor ground cable	Nut	6 Nm	B

- Position the two washers onto upper lever stud bolts, and then position the rear suspension inside the relative seat, supporting its weight adequately.



- Attach the linkage **(13)** of the NRRPS movement sensor.
- Fit the shims **(12)** in the relative seats, pushing down completely onto the threaded rods and ensuring that they are perfectly perpendicular to the horizontal axis of the Flanblocs.
- Clean the mating surfaces with a degreasing product (heptane).



DO NOT use lubricants or electric/pneumatic drivers.



ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.

- Tighten the indicated nuts to the chassis in the following order: **(a)**, **(b)**, **(c)**, **(d)**.



Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	B
Nut	60 Nm	A

- Tighten the ball-joint **(11)** of the stabiliser bar tie-rod.



Tightening torque	Nm	Class
Spherical tie-rod	50 Nm	B



- Check that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.



- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the lower arm.



- Clean the mating surfaces with a degreasing product (heptane).
 DO NOT use lubricants or electric/pneumatic drivers.
-  ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.

- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	B
Nut	60 Nm	A



- Check that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the Flanbloc eyebolts must be aligned.



- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the threaded rods and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



- Clean the mating surfaces with a degreasing product (heptane).
 DO NOT use lubricants or electric/pneumatic drivers.
-  ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.

- Tighten the nuts.



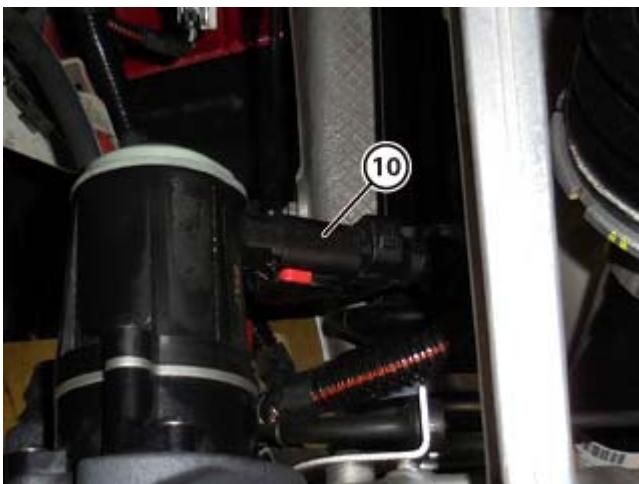
Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	B
Nut	60 Nm	A



- Check that the yellow reference markings are correctly aligned: the markings on the threaded rods and the markings on the eyebolts must be aligned.



- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the threaded rods and the relative nuts and eyebolts fastening the toe-in tie-rod.



- Connect the connector **(10)**.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	110 Nm	A

- Connect and fasten the connector (9).



- Fit the three shims (8) and tighten the six screws (7).

		
Tightening torque	Nm	Class
Screw	78 Nm	A



- Connect the brake oil hose (5).
- Tighten the indicated union.

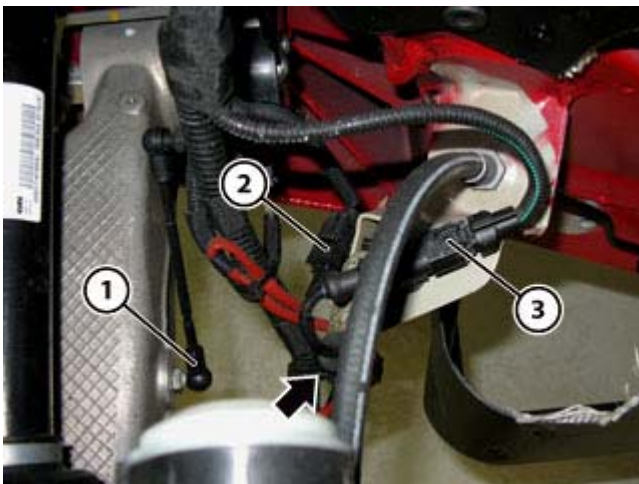
		
Tightening torque	Nm	Class
M10 union	16 Nm	B

- Refit the clip (5).



- Connect the ground cable **(4)**.
- Tighten the indicated nut.

		
Tightening torque	Nm	Class
Nut	6 Nm	B



- Attach the cable grommet indicated to the relative mounting bracket.
- Connect the connector **(2)** for the brake pad wear sensor.
- Connect the connector **(3)** for the ABS sensor.
- Attach the tie-rod **(1)** for the NRRPS motion sensor onto the lower arm.

➤ Refit the wheels (🔧 D2.01).

➤ Refit the rear wheels.

➤ Refit the flat undertray sections (🔧 E3.12).

➤ Refit the rear flat undertray section.

➤ Connect the battery (🔧 F2.01).

➤ Fill and bleed the brake system (🔧 D3.10).

➤ Check the vehicle set-up (🔧 D4.07).

D4.02 Arms

Removing front suspension upper arms

- Preparation in progress

Refitting front suspension upper arms

- Preparation in progress

D4.03 Hub carriers

Removing the front suspension hub carriers

- Preparation in progress

Refitting the front suspension hub carriers

- Preparation in progress

D4.04 Shock absorbers

Removing the front shock absorbers

- Disconnect the battery (🔌 F2.01).
- Remove the front wheelhouses (🔌 E3.05).



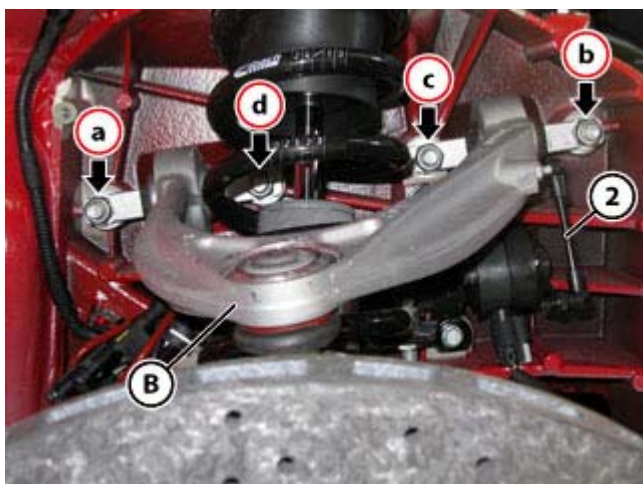
- Disconnect the connector **(1)**.



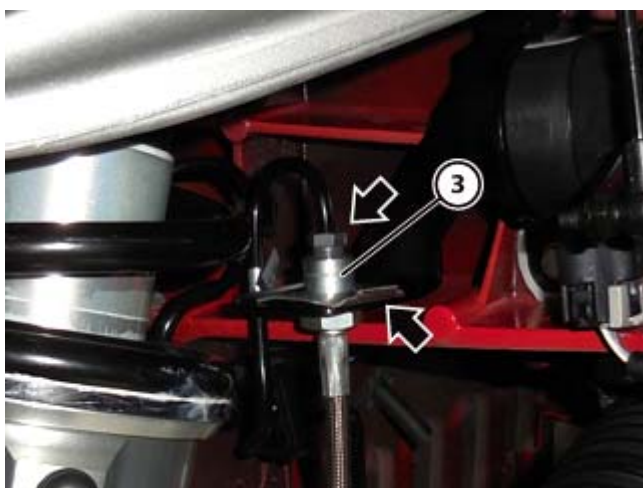
- Undo the screws indicated.



- Using a delible yellow marker pen or paint, make reference markings on the stud bolts and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



- Detach the tie-rod for the NRRPS movement sensor **(2)** from the upper arm **(B)**.
 DO NOT use lubricants or electric/pneumatic drivers.
- Partially loosen the four nuts indicated fastening the upper arm **(B)** in the following order: **(a)**, **(b)**, **(c)**, **(d)**.
-  Move the shock absorber aside to facilitate the operation.



For vehicles with "Front Lift" system

- Undo the indicated union.
- Remove the indicated clip.
- Disconnect the pipe **(3)**.



- Check that the yellow reference markings are correctly aligned: the marking on the stud bolts and the marking on the Flanbloc eyebolts must be aligned.
- If the markings on the stud bolts and eyebolts are not correctly aligned after loosening the arm fastener nuts (even if only on one stud bolt), a ROL (Red On Line) must be opened, attaching adequate photographic documentation, and contact the Ferrari Help Desk.
- If the markings on the stud bolts and eyebolts are correctly aligned after loosening the arm fastener nuts, completely undo and remove the four arm fastener nuts in the order given for the previous operation.
-  Move the shock absorber aside to facilitate the operation.



- Check again that the yellow reference markings are correctly aligned: the markings on the stud bolts and the markings on the Flanbloc eyebolts must be aligned.



- Undo the indicated screw.

- Remove upper arm from the relative stud bolts, retrieving the four washers, and slightly turn it toward the front of the vehicle.
- Remove the shock absorber from the relative seat.

Refitting the front shock absorbers

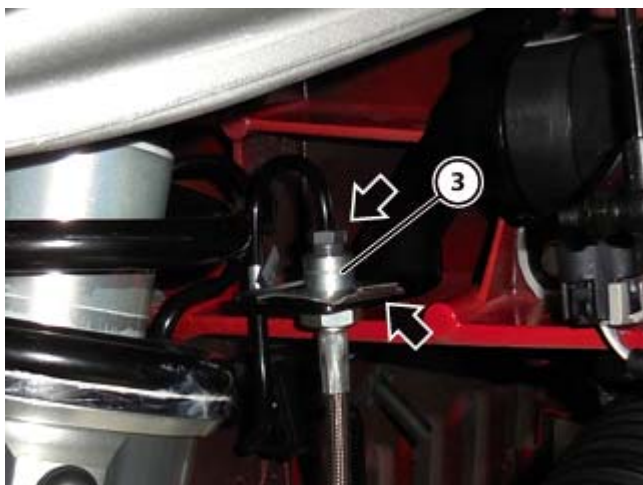
			
Tightening torque		Nm	Class
Fastening shock absorber to lower arm	Screw	80 Nm	A
Fastening vehicle lift system unions	Union	16 Nm	B
Fastening upper arm to chassis	Nut (pretightening)	9 Nm	A
	Nut	60 Nm	A
Fastening shock absorber to chassis	Screw (pretightening)	20 Nm	A
	Screw	110 Nm	A

- Fit the shock absorber in the relevant seat.
- Position the four washers and upper arm, turning it toward the rear of the vehicle, onto the relative stud bolts.



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	80 Nm	A



For vehicles with "Front Lift" system

- Connect pipe **(3)**.
- Refit the indicated clip.
- Tighten the indicated union.

		
Tightening torque	Nm	Class
Union	16 Nm	B



- Clean the mating surfaces with a degreasing product (heptane).
 DO NOT use lubricants or electric/pneumatic drivers.
-  ALWAYS replace the suspension arm fastener nuts, complete with relative washers, each time they are removed. Replacement is NOT necessary if the nuts are loosened only.
- Tighten the four nuts indicated fastening the upper arm (**B**) in the following tightening order: (**a**), (**b**), (**c**), (**d**).
-  Move the shock absorber aside to facilitate the operation.

		
Tightening torque	Nm	Class
Nut (pretightening)	9 Nm	A
Nut	60 Nm	A

- Attach the tie-rod for the NRRPS movement sensor (**2**) to the upper arm (**B**).



		
Tightening torque	Nm	Class
Screw (pretightening)	20 Nm	A
Screw	110 Nm	A

- Tighten the screws indicated.



- Check that the yellow reference markings are correctly aligned: the markings on the stud bolts and the markings on the Flanbloc eyebolts must be aligned.



- Remove the yellow reference markings made during removal.
- Using an indelible red marker pen or paint, make reference markings on the stud bolts and relative nuts and the eyebolts of the Flanblocs fastening the upper arm.



- Connect the connector **(1)**.

- Connect the battery (🔧 F2.01).
- Refit the front wheelhouses (🔧 E3.05).
- For vehicles with "Front Lift" system. Fill and bleed the "Front Lift" system (🔧 D4.08).
- Check the vehicle set-up (🔧 D4.07).

Removing the rear shock absorbers

- Disconnect the battery (🔧 F2.01).

- Remove the wheels (🛞 D2.01).
➤ Remove the rear wheels.



- Disconnect and release the connector **(1)**.
- Undo the screws indicated.



- Prise out and remove the indicated plug.



- Prise out and remove the indicated plug.



- Undo the indicated screw and nut.

- Remove the rear shock absorber.

Refitting the rear shock absorbers

			
Tightening torque		Nm	Class
Fastening shock absorber to lower arm	Screw	80 Nm	A
Fastening shock absorber to chassis	Screw (pretightening)	20 Nm	A
	Screw	110 Nm	A

- Fit the rear shock absorber.



- Tighten the indicated screw and nut.

		
Tightening torque	Nm	Class
Screw	80 Nm	A



- Fit the indicated cap.



- Fit the indicated cap.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw (pretightening)	20 Nm	A
Screw	110 Nm	A

- Connect and fasten the connector **(1)**.

- Refit the wheels (🔧 D2.01).
- Refit the rear wheels.

- Connect the battery (🔧 F2.01).
- Check the vehicle set-up (🔧 D4.07).

Adjusting shock absorber length

- Preparation in progress

D4.05 Stabiliser bars

Removing the front stabiliser bar

- Preparation in progress

Refitting the front stabiliser bar

- Preparation in progress

Removing the rear stabiliser bar

- Preparation in progress

Refitting the rear stabiliser bar

- Preparation in progress

D4.06 Suspension damping control system

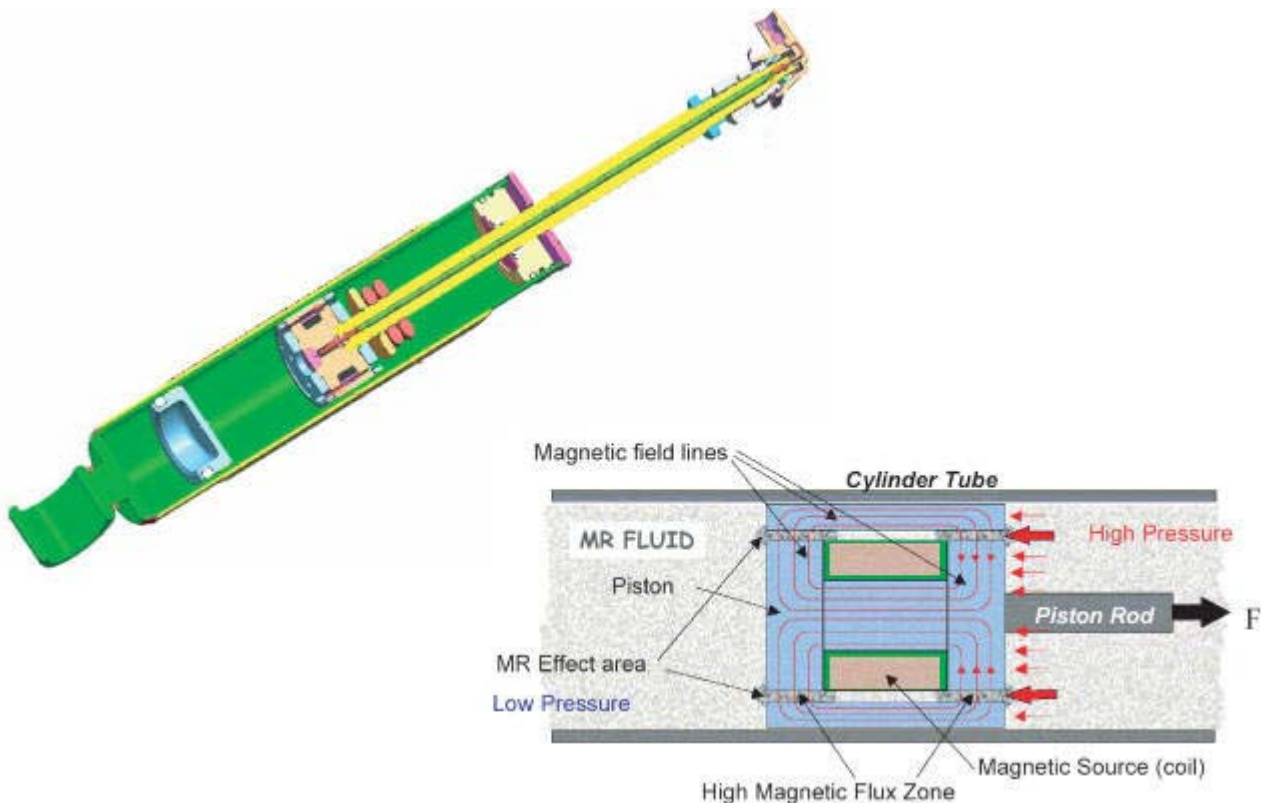
System function

This vehicle is equipped with the latest generation MagneRide™ magnetorheologically controlled suspension, a system that continuously and automatically controls suspension damping developed by Delphi and honed by Ferrari.

By processing data received from the vehicle dynamics sensors measuring the movements of the bodyshell, the ECU determines the road surface conditions and instantaneously adapts the response of the suspension accordingly, by varying the control current for each shock absorber.

These sensors allow the ECU to calculate vehicle speed, vertical and lateral acceleration, steering angle and instantaneous brake system pressure, and therefore control suspension damping in relation to these parameters.

Damping at each wheel is adjusted by a magnetorheological fluid which changes in density in relation to a magnetic field applied to the suspension.



The magnetorheological (MR) fluid is an oil containing a suspension of spherical ferromagnetic particles measuring a few microns in diameter.

Using an electric current to apply a magnetic field to the oil, the viscosity of the oil may be varied.

By varying the magnetic field applied to the MR fluid flowing in a duct, its pressure and flow rate characteristics may be adjusted in real time without the use of any external mechanical moving parts or actuators.

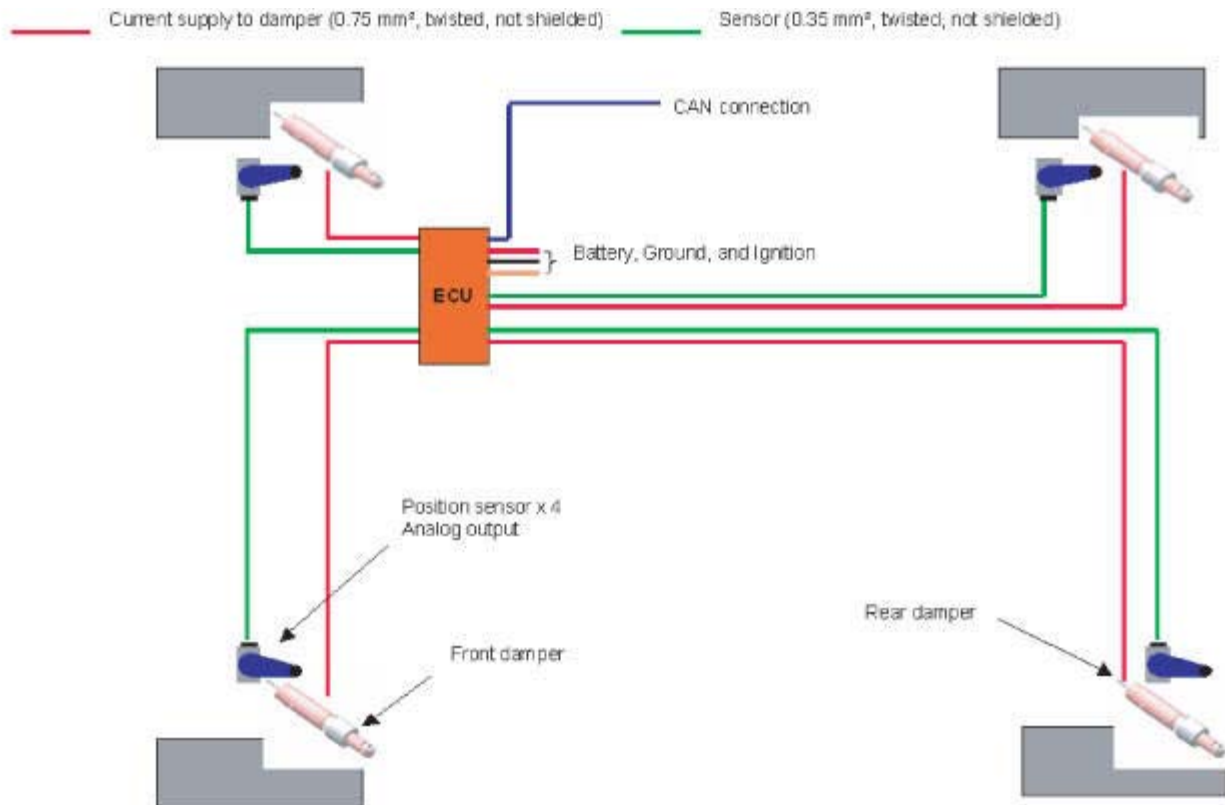
As well as ensuring the perfect balance between handling and comfort at all times, through specific calibrations selectable from the Manettino driving mode selector, this system can also shift the bias slightly towards one or the other of these two aspects.

Three different calibration levels are used on this vehicle:

- Level 1 (COMFORT): a slightly softer calibration optimised to absorb bumps better and to offer improved grip in wet conditions ("Low Grip" Manettino setting).

- Level 2 (SPORT): a slightly stiffer calibration optimised for sports and high speed use (in medium to high grip conditions) without drastically compromising comfort (SPORT and ESC OFF Manettino settings).
- Level 3 (RACE): an even stiffer calibration optimised for track use (RACE, CT OFF and CST OFF Manettino settings).

System layout



The system consists of:

- **4 NRRPS** (Non-Contacting Ratiometer Rotational Position Sensor) sensors installed on the suspension of each wheel, in which the fixed part of the potentiometer is mounted on the chassis (sprung mass) while the rotating part of the potentiometer moves together with the suspension. The sensors transmit a linear signal to the NCS ECU proportional to the angle of movement.
- **NCS ECU**, installed under the hatch cover in the passenger side footrest mat which, in relation to the signals received from the four NRRPS sensors, the data provided by the ECUs connected to the NCS and the Manettino setting, controls the damping function of the shock absorbers.
- **4 magnetorheological shock absorbers**, with one for each wheel suspension, controlled by the NCS ECU in relation to the signals received by the latter.

Replacing the front NRRPS motion sensors

- Preparation in progress

Replacing the rear NRRPS motion sensors

- Preparation in progress

D4.07 Vehicle set-up

Checking vehicle set-up

- Check tightness of wheel fasteners.
- Check that the tyre pressure is correct.
- Check that the steering box functions correctly.
- Check that the suspension components function correctly.
- Place the vehicle on a wheel alignment lift, **filled with all fluids as necessary** and with the electric parking brake engaged.

 **For this procedure**, the fuel tank must be full and all fluids must be filled to the correct levels.

- Check that the vehicle setup parameters comply with the specifications given in the "Vehicle Setup Parameter Check Form".

 The vehicle parameters specified in the "Vehicle Setup Parameter Check Form" are given in chapter **A3.22**.

- If the vehicle setup parameters measures for the vehicle do not comply with the specifications of the "Vehicle Setup Parameter Check Form", adjust the vehicle setup accordingly.

Adjusting the vehicle suspension/wheel alignment



Tightening torque		Nm	Class
Fastening toe-in tie-rods	Nut	60 Nm	B

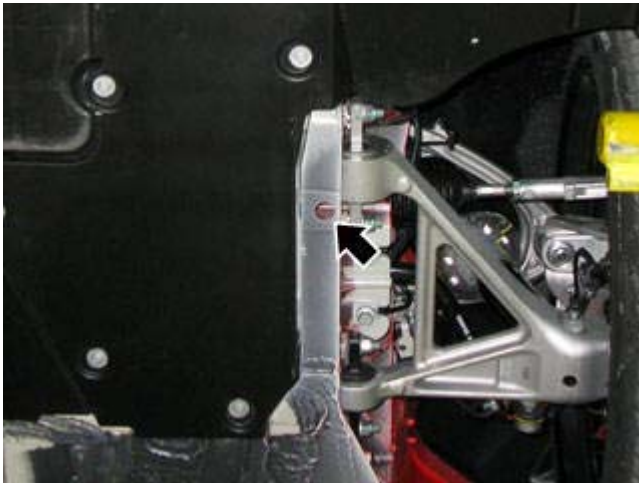
- Check the vehicle set-up ( **D4.07**).

 The vehicle parameters specified in the "Vehicle Setup Parameter Check Form" are given in chapter **A3.22**.

- Remove the flat undertray sections ( **E3.12**).

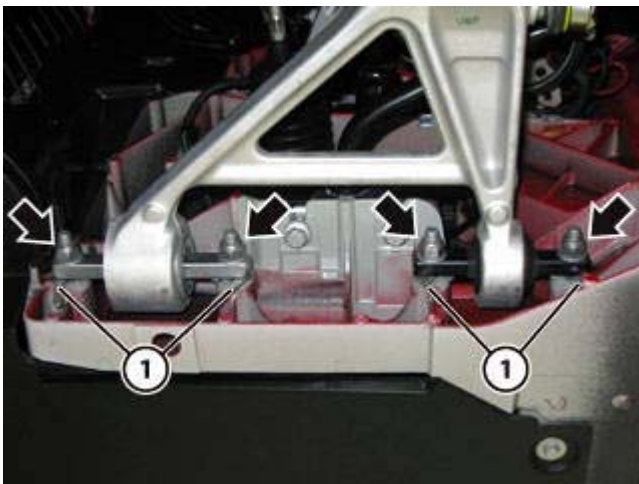
 Remove the rear flat undertray section.

Front



Ground clearance of vehicle at master point

- Check that the distance between the spot-facing of the masterpoint indicated and the ground is as specified.
- If the ground clearance of the vehicle at the masterpoint is not as specified, adjust the shock absorber length as described in chapter **D4.04**.



Camber

- Check that the wheel camber value is as specified.
- If the wheel camber value is not as specified, loosen the indicated nuts as described in chapter **D4.02** and add or remove shims as necessary **(1)** to bring the wheel camber value within the specified range.
- Tighten the indicated nuts as described in chapter **D4.02**.



Toe-in

- Check that the toe value is as specified.
- If the toe value is not as specified, ensure that the steering box is centred and that the steering wheel is perfectly straight, placing a tool with a spirit level on the steering wheel itself.
- Loosen the nut **(2)** and turn the tie-rod **(3)** to bring the toe value within the correct range.
- Tighten the nut **(2)**.

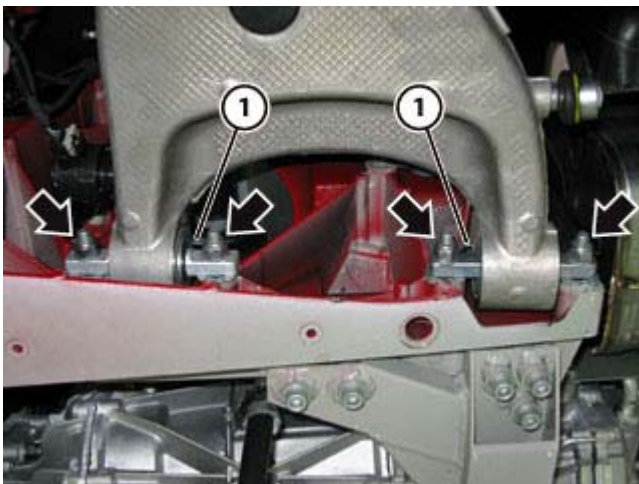
		
Tightening torque	Nm	Class
Nut	60 Nm	B

Rear



Ground clearance of vehicle at master point

- Check that the distance of the masterpoint indicated from the ground is as specified.
- If the ground clearance of the vehicle at the masterpoint is not as specified, adjust the shock absorber length as described in chapter **D4.04**.



Camber

- Check that the wheel camber value is as specified.
- If the wheel camber value is not as specified, loosen the indicated nuts as described in chapter **D4.02** and add or remove shims as necessary **(1)** to bring the wheel camber value within the specified range.
- Tighten the indicated nuts as described in chapter **D4.02**.



Toe-in

- Check that the toe value is as specified.
- If the toe value is not as specified, loosen the nut **(2)** and turn the tie-rod **(3)** to bring the toe value within the correct range.
- Tighten the nut **(2)**.

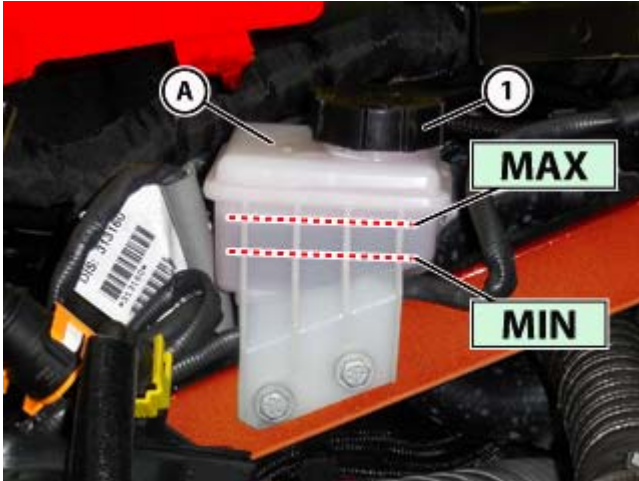


Tightening torque	Nm	Class
Nut	60 Nm	B

D4.08 “Front Lift” ramp clearing front suspension lift (optional)

Checking the fluid level in the "Front Lift" hydraulic system

- Remove the engine compartment cosmetic shields (E3.13).
- Remove the left hand cosmetic engine compartment shield.

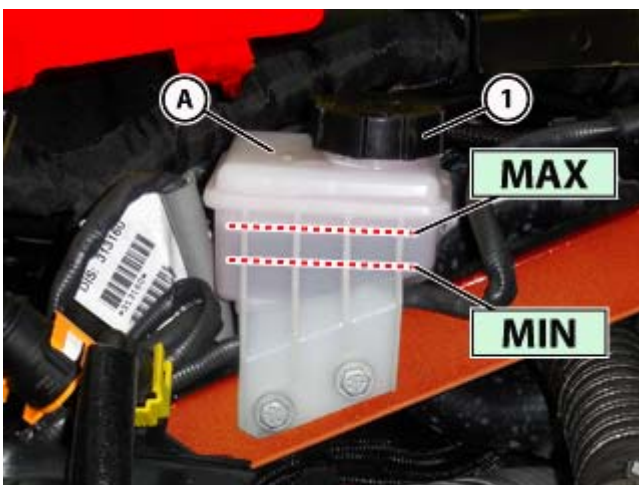


- Check that the fluid level in the reservoir (A) is near the **MAX** limit.
- If the level is near the **MIN** limit, top the system up with fluid as follows.
- Undo the cap (1).
- Fill the brake fluid reservoir to the **MAX** level.
- Screw the cap (1) back on tightly.

- Refit the engine compartment cosmetic shields (E3.13).
- Refit the left hand cosmetic engine compartment shield.

Filling and bleeding the "Front Lift" system

- The vehicle must be on a level, horizontal surface.
- Remove the engine compartment cosmetic shields (E3.13).
- Remove the left hand cosmetic engine compartment shield.



- Undo the cap (1).
- Fill the reservoir (A), bearing in mind that the level in the reservoir must never drop below the **MIN** limit when bleeding the system.

- Turn the ignition switch to **Key-ON**.
- Start the engine.
- Wait at least **10 seconds**.
- Connect the DEIS diagnostic tester to the diagnostic socket (🔧 F2.08).
- Using the DEIS diagnostic tester perform the "**NSV vehicle lift test**" cycle **5 consecutive times**.
- Check the fluid level in the "Front Lift" hydraulic system (🔧 D4.08).
- Using the DEIS diagnostic tester perform the "**NSV vehicle lift test**" cycle **5 consecutive times**.
- Check the fluid level in the "Front Lift" hydraulic system (🔧 D4.08).



The following procedures must always be repeated on each individual shock absorber.

- Prise off and remove the indicated protective cap.
- Connect a suitable transparent rubber tube to the indicated bleed union.
- Place the other end of the transparent rubber pipe in a suitable container for collecting the fluid.
- With the DEIS diagnostic tester, activate the "**NSV bleeding**" cycle.
- Wait for the electric pump to activate fully.
- Loosen the indicated bleed union.



DO NOT bleed more than 100 ml of fluid from each shock absorber.

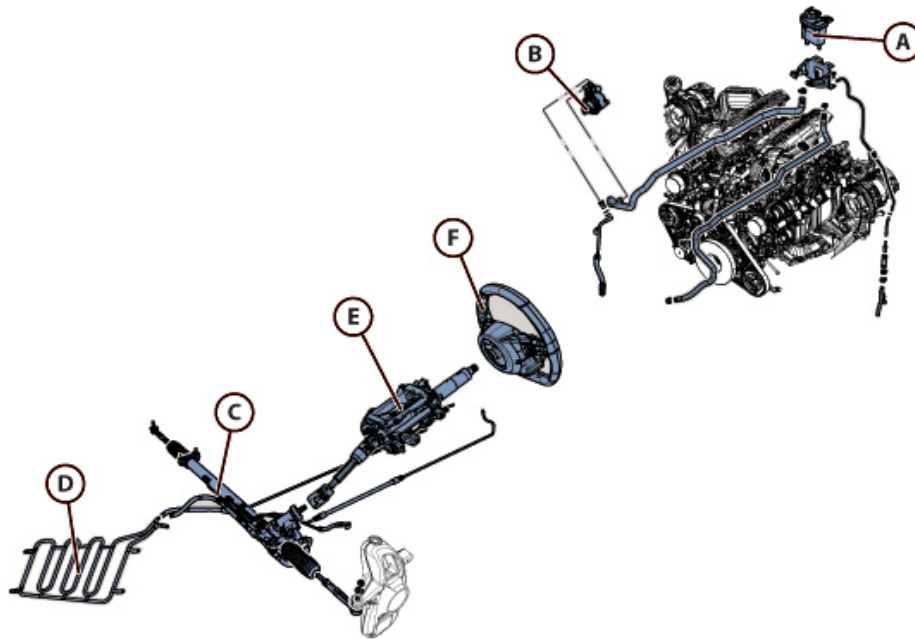
As the lift system tank only has a small capacity, draining excessive fluid from the system would cause air to be aspirated into the system and damage the electric pump.

- Repeat the bleed cycle as many times as necessary until the fluid draining from the transparent rubber pipe contains no air bubbles.
- Tighten the indicated bleed union.
- Disconnect the rubber transparent tube from the indicated bleed union.
- Fit the indicated protective cap.
- With the DEIS diagnostic tester, deactivate the "**NSV bleeding**" cycle.

- Check the fluid level in the "Front Lift" hydraulic system (🔧 D4.08).
- Refit the engine compartment cosmetic shields (🔧 E3.13).
- Refit the left hand cosmetic engine compartment shield.

D5.01 Steering system layout

Steering system layout



- A - Power steering fluid tank
- B - Power steering fluid pump
- C - Steering box
- D - Power steering fluid radiator
- E - Steering column
- F - Steering wheel

D5.02 Power steering system tank

Removing the power steering system tank

- Preparation in progress

Refitting the power steering tank

- Preparation in progress

D5.03 Power steering system pump

Removing the power steering system pump

- Preparation in progress

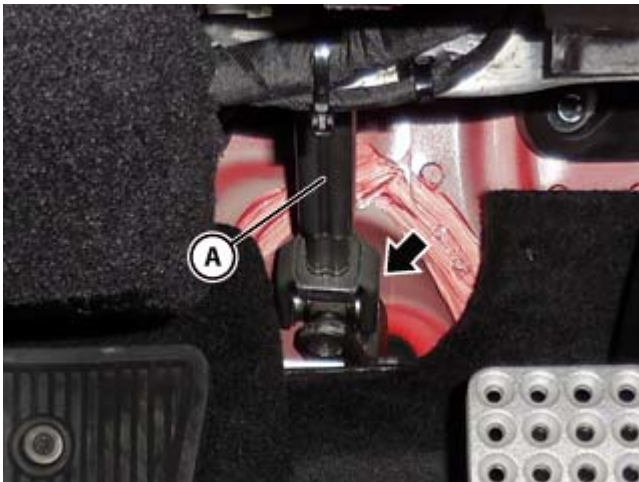
Refitting the power steering system pump

- Preparation in progress

D5.04 Steering box

Removing the steering box

- Disconnect the battery (🔧 F2.01).
- Remove the wheels (🔧 D2.01).
 - ❗ Remove the front wheels.
- Remove the luggage compartment trim panels (🔧 E4.06).
 - ❗ Remove the luggage compartment tray.
- Drain the power steering system (🔧 D5.08).



- Undo the indicated screw.
- Disconnect the steering column from the steering box.



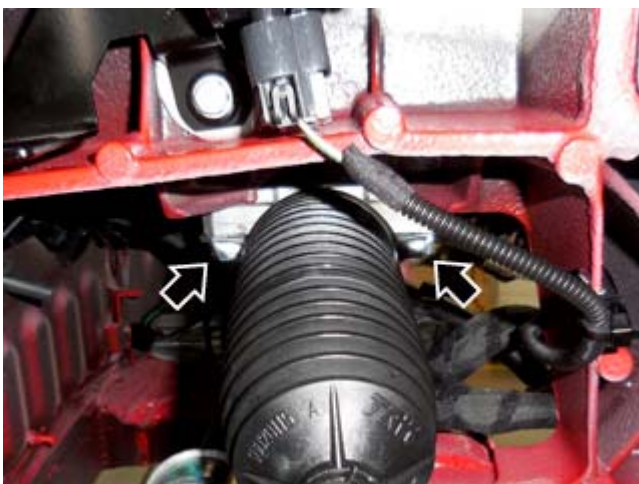
- Undo the indicated nut.
 - ❗ There is a recess on the ball stud to facilitate loosening the nut.
- Disconnect the steering box tie-rod from the hub carrier.



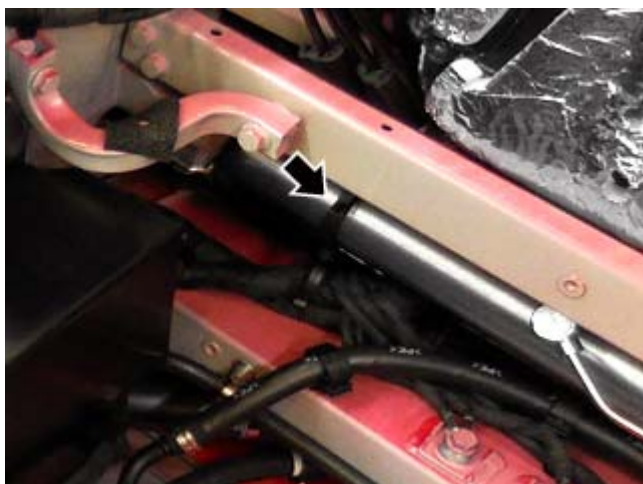
- Undo the indicated nut.
- There is a recess on the ball stud to facilitate loosening the nut.
- Disconnect the steering box tie-rod from the hub carrier.



- Disconnect the connector (1).
- Undo the screws indicated.



- Undo the indicated screws, retrieving the mount and the respective spacer.



- Detach the indicated clamp.

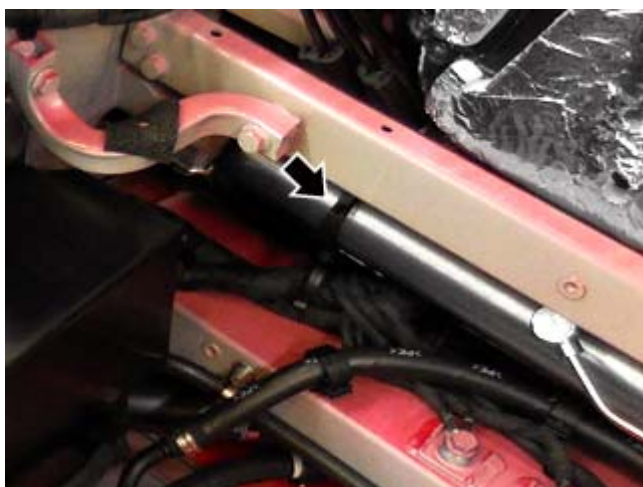
- Remove the steering box via the left hand front wheel bay.

Refitting the steering box

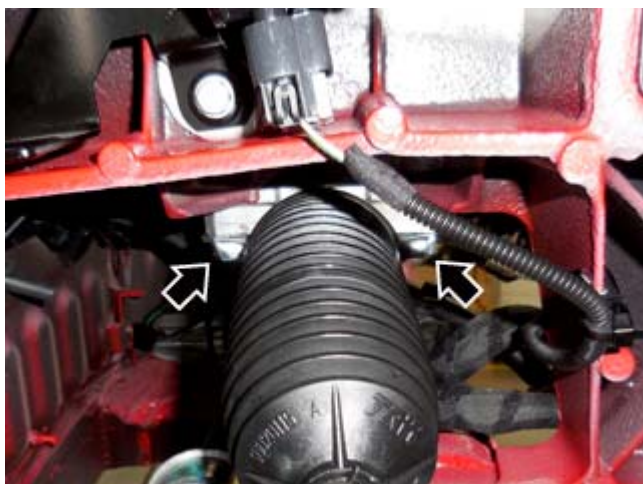


Tightening torque		Nm	Class
Fastening steering box to chassis	Nut (pretightening)	25 Nm	B
	Screw	60 Nm	A
Fastening steering box tie-rod to front hub carrier	Nut	40 Nm	A
Fastening steering column to steering box	Screw	30 Nm	B

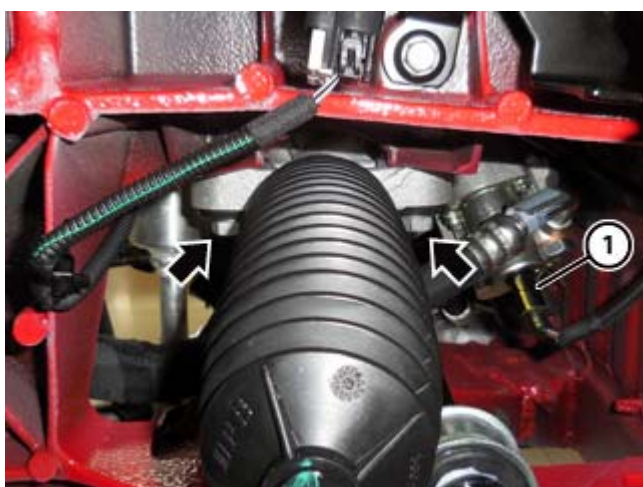
- Fit the steering box, installing via the front left hand wheel bay.



- Attach the indicated clamp.



- Tighten the indicated screws, fitting the mount and the respective spacer.



- Tighten the screws indicated.
- Connect the connector **(1)**.

- Pre-tighten and definitively tighten the steering box fastener screws in a cross pattern.

		
Tightening torque	Nm	Class
Nut (pretightening)	25 Nm	B
Screw	60 Nm	A



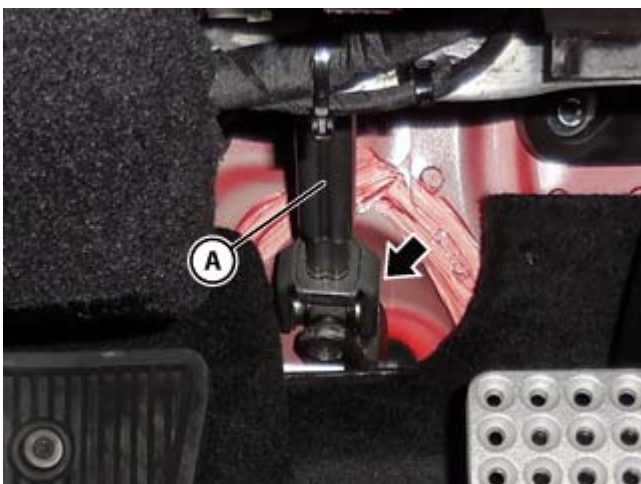
- Connect the steering box tie-rod to the hub carrier.
- Pre-tighten the indicated nut, then loosen and tighten fully.
- There is a recess on the ball stud to facilitate tightening the nut.

		
Tightening torque	Nm	Class
Nut	40 Nm	A



- Connect the steering box tie-rod to the hub carrier.
- Pre-tighten the indicated nut, then loosen and tighten fully.
- There is a recess on the ball stud to facilitate tightening the nut.

		
Tightening torque	Nm	Class
Nut	40 Nm	A



- Connect the steering column **(A)** to the steering box.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	30 Nm	B

➤ Refit the wheels (🔧 D2.01).

• Refit the front wheels.

➤ Refit the luggage compartment trim panels (🔧 E4.06).

• Refit the luggage compartment tray.

➤ Connect the battery (🔧 F2.01).

➤ Fill the power steering system (🔧 D5.08).

D5.05 Power steering system fluid coil

Removing the power steering system fluid coil

- Preparation in progress

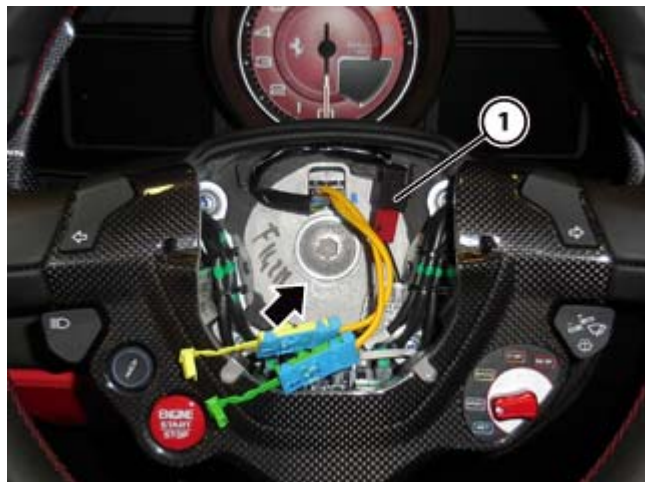
Refitting the power steering system fluid coil

- Preparation in progress

D5.06 Steering wheel

Removing the steering wheel

- Disconnect the battery (F2.01).
- Remove the driver side airbag module (F4.02).



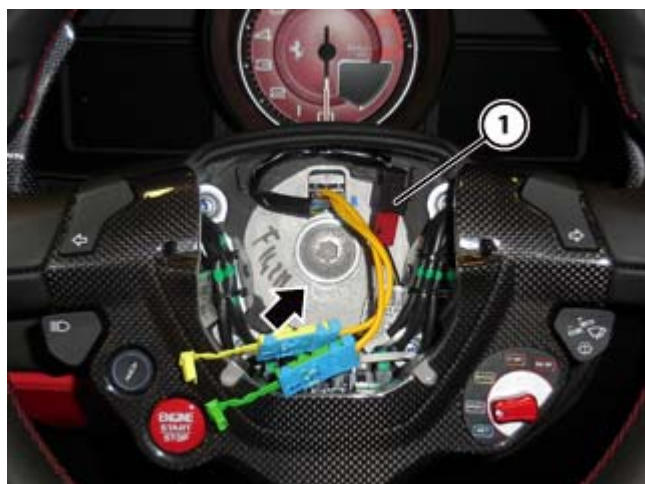
- Disconnect the connector (1).
- Undo the indicated screw.

- Remove the steering wheel and secure the clock spring connector in place by fitting and tightening a cable tie.

Refitting the steering wheel

			
Tightening torque		Nm	Class
Fastening steering wheel	Nut	80 Nm	B

- Release the clock spring connector and fit the steering wheel.



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Nut	80 Nm	B

- Connect the connector (1).

- Refit the driver side airbag module (F4.02).
- Connect the battery (F2.01).

D5.07 Steering column

Removing the steering column

- Preparation in progress

Refitting the steering column

- Preparation in progress

D5.08 Emptying and filling the power steering system

Draining the power steering system

- Remove the flat undertray sections ( E3.12).
-  Remove the front left hand element of the flat undertray.



- Undo and open the cap (A).



-  Pour the oil drained from the system into a container and seal it. DO NOT dispose of used oil in the environment.

- Protect the connector.
- Place a container for collecting hydraulic power steering fluid under the indicated unions.
- Loosen the indicated unions.
- Wait for the oil to drain completely.

Filling the power steering system

			
Tightening torque		Nm	Class
Fastening delivery and return pipes on steering box	M14 pipe union	35 Nm	B
	M16 pipe union	38 Nm	B



- Replace the respective seals and tighten the indicated unions.

		
Tightening torque	Nm	Class
M14 pipe union	35 Nm	B
M16 pipe union	38 Nm	B

- Remove the power steering system tank (🔧 D5.02).
- Clean the interior of the power steering fluid reservoir thoroughly using a small quantity of new power steering fluid of the specified type.
- Allow the power steering fluid used to clean the power steering fluid reservoir to drain completely into a suitable container.
- Use a suitable syringe to aspirate any residue of the power steering fluid used for cleaning from the power steering fluid reservoir.
- Connect a suitable additional pipe to the power steering fluid reservoir return pipe.
- Place the other end of the pipe into a container for collecting the power steering fluid.



CAUTION

The oil contained in the hydraulic steering system is harmful to the eyes and skin and may also damage the vehicle bodywork.

- Adequately protect the areas surrounding the power steering tank pipes.



DO NOT apply any more turning force to the steering wheel once full lock is reached.

- Steer fully to the left and right a few times until power steering fluid starts to flow from the tank return pipe.
- Connect a suitable funnel to the power steering fluid reservoir delivery pipe.
- Place an **80 micron** mesh filter in the funnel.
- Pour new power steering fluid into the funnel while simultaneously steering to the left and right a few times until at least **3 litres** of power steering fluid has been collected from the power steering fluid reservoir return pipe.



Do not let the funnel empty during this procedure.

- Disconnect and remove the funnel from the power steering fluid reservoir delivery pipe.
- Disconnect and remove the additional pipe from the power steering fluid reservoir return pipe.
- Refit the power steering system tank (🔧 D5.02).



- Undo and open the cap **(A)**.



- ⚠ Always use fresh oil of the recommended type and in the quantity indicated, taken from sealed containers.
- ⚠ The circuit is filled with synthetic oil. Using mineral oil may cause irreparable damage to the rubber seals in the system.
- ⚠ DO NOT apply any more turning force to the steering wheel once full lock is reached.

- Fill the power steering fluid reservoir to the **MAX** limit on the cap dipstick **(A)** while simultaneously steering fully to the right and left repeatedly until the power steering fluid level stabilises and the fluid contains no bubbles.

i There are MIN and MAX levels indicated on both sides of the dipstick. Use the levels on the side indicating the temperature **20°C**.

- Start the engine (🛞 E5.08).

i Perform twice.

- Stop the engine (🛞 E5.08).

i Perform twice.

- Check that the fluid level is stable and that the fluid is not emulsified with air.
- If the power steering fluid level drops, top the power steering fluid reservoir up to the **MAX** limit on the cap dipstick **(A)** while simultaneously steering fully to the right and left repeatedly until the power steering fluid level stabilises and the fluid contains no bubbles.

i There are MIN and MAX levels indicated on both sides of the dipstick. Use the levels on the side indicating the temperature **20°C**.

- Lift the vehicle with a vehicle lift so that the wheels are not in contact with the ground.
- Start the engine ( E5.08).
-  Perform twice.

- Let the engine idle for **1 minute**.



DO NOT apply any more turning force to the steering wheel once full lock is reached.

- Check the power steering system fluid level ( A3.06).

 Simultaneously, steer fully 10 times.

- Lower the vehicle to bring the wheels into contact with the ground.
- Wait for the engine coolant temperature to reach **90°C**.



DO NOT apply any more turning force to the steering wheel once full lock is reached.

- Check the power steering system fluid level ( A3.06).

 Simultaneously, steer fully 10 times.

 Repeat this procedure another three times.

- Check the power steering system fluid level ( A3.06).
- Refit the flat undertray sections ( E3.12).

 Refit the front left hand element of the flat undertray.

E1.01 Tightening torques

			
Tightening torque		Nm	Class
Fastening wheelhouse	Screw	7 Nm	B
Fastening luggage compartment tub	Screw	8.5 Nm	B
Fastening luggage compartment trim panels	Screw	4.5 Nm	B
	Collar screw	8 Nm	B
Fastening flat undertray sections	Screw	8 Nm	B
Fastening rear bumper	Screw	8 Nm	B
Fastening front bumper	Screw	7 Nm	B
	Screw	6 Nm	B
Fastening engine compartment cosmetic shields	Screw	4 Nm	B
Fastening passenger compartment trim panels	Screw	4 Nm	B
	Screw	5 Nm	B
	Nut	4 Nm	B
Fastening roof trim panels	Screw	7 Nm	B
	Screw	5 Nm	B
	Nut	4 Nm	B
	Screw	3 Nm	B

E1.02 Specific tooling and equipment



- Trolley 95977565 (AS 107565) removing the engine / gearbox / subframe assembly.



- Safety extensions 95977513 (AS 107573) for trolley AS 107565, for removing/refitting rear removable subframe.



- Torque wrench 95978172 (AV 8172) (Replaces torque wrench USAG 815F)



- Safety retainers 95978183 (AV 8183) vehicle anti-tipping retention.



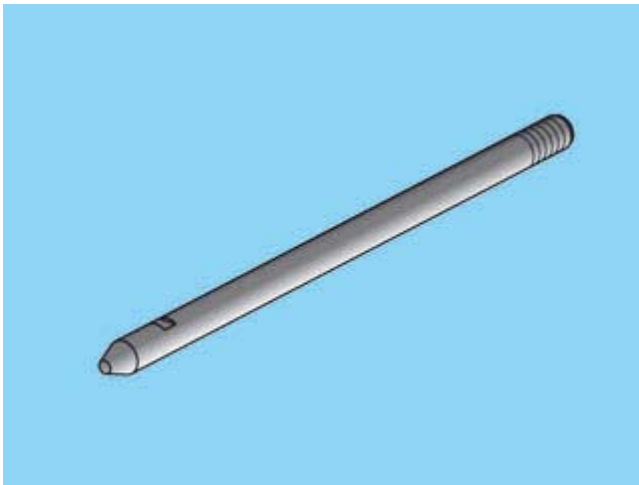
- Fastening brackets for safety retainers 95978184 (AV 8184) raised vehicle anti-tipping retention for runway type car lifts.



- Mounting bracket for vehicle safety retainers for lifting 95978251 (AV 8251) lifting vehicle on vehicle lift.



- Spacers 95978255 (AV 8255)
for trolley AS 107565, for removing/refitting rear
removable subframe.



- Pins 95978351 (AV 8351)
alignment for installation of front/rear removable
subframes.

E2.01 General

Features of the chassis

A "Space-frame" architecture has been adopted for the aluminium chassis, meaning less weight, for improved performance and safety, and greater torsional stiffness, for superior dynamic qualities.

Using a modular chassis also introduces the following advantages:

- greater service efficiency and shorter service times;
- easier maintenance from a Client perspective;
- reduced replacement times for damaged parts;
- reduced running costs.

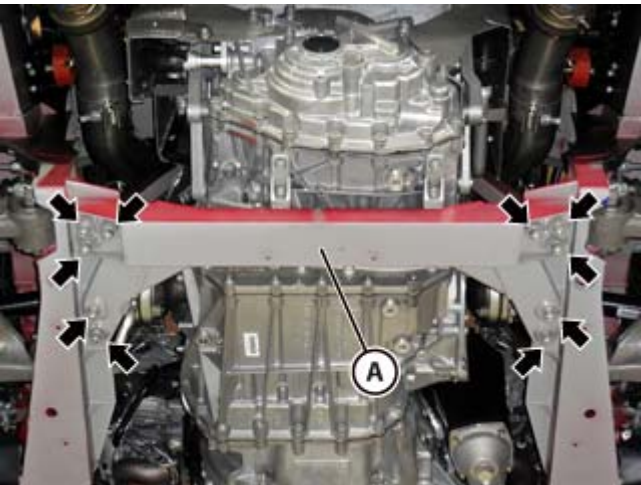
E2.02 Rear removable engine-gearbox assembly mounting subframe

Removing DCT gearbox mounting cross member

- Remove the flat undertray sections (🔧 E3.12).
- Remove the rear diffuser and the rear flat undertray section.



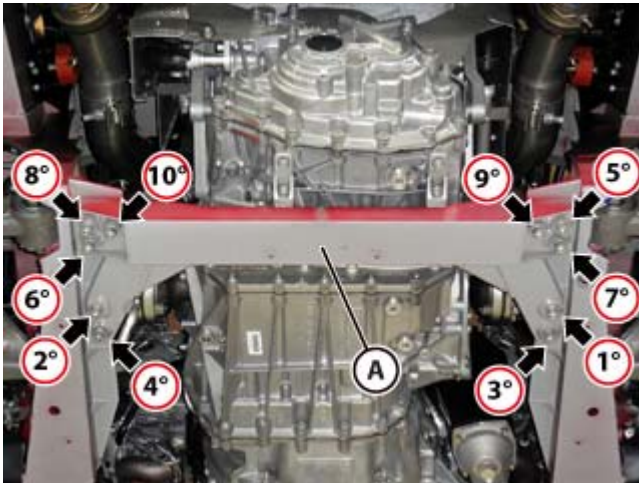
- Undo the indicated screw.



- Undo the screws indicated.
- Remove the DCT gearbox mounting cross member (A).

Refitting the DCT gearbox mounting cross member

			
Tightening torque		Nm	Class
Fastening lower gearbox mounting cross member to chassis	Screw	60 Nm	A



- Fit the DCT gearbox mounting cross member **(A)**.
- Definitively tighten the indicated screws in the sequence given.

		
Tightening torque	Nm	Class
Screw	60 Nm	A



- Tighten the indicated screw, fitting the drain pipe correctly.

- Refit the flat undertray sections ( E3.12).
- Refit the rear diffuser and the rear flat undertray section.

Removing the rear removable subframe

- Preparation in progress

Refitting the rear removable subframe

- Preparation in progress

E3.01 Engine compartment lid

Removing the engine compartment lid

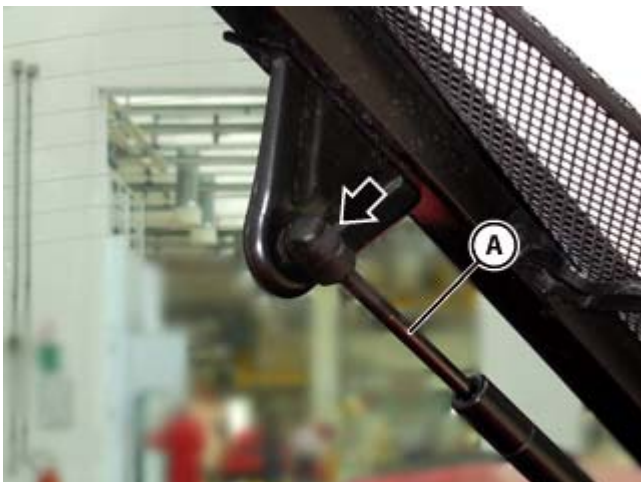
- Disconnect the battery (🔧 F2.01).
- Open the engine compartment lid (🔧 E5.11).
- Remove the engine compartment cosmetic shields (🔧 E3.13).
 - Remove the right hand lateral engine compartment cosmetic shield.



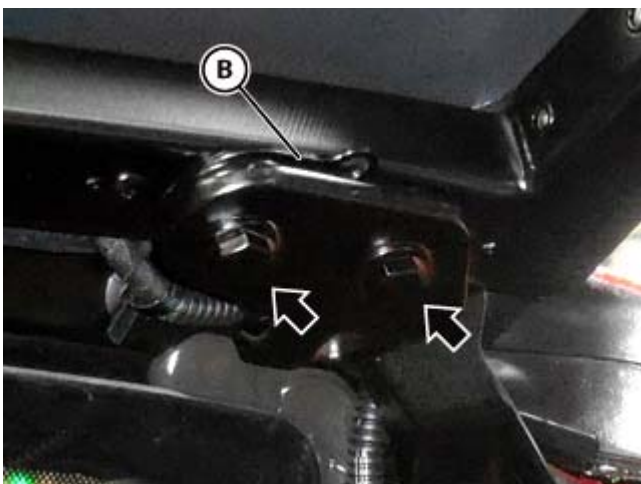
- Release and disconnect connector **(1)**.



- Prise off the indicated clip.
- Detach the top end of the gas strut **(A)**.



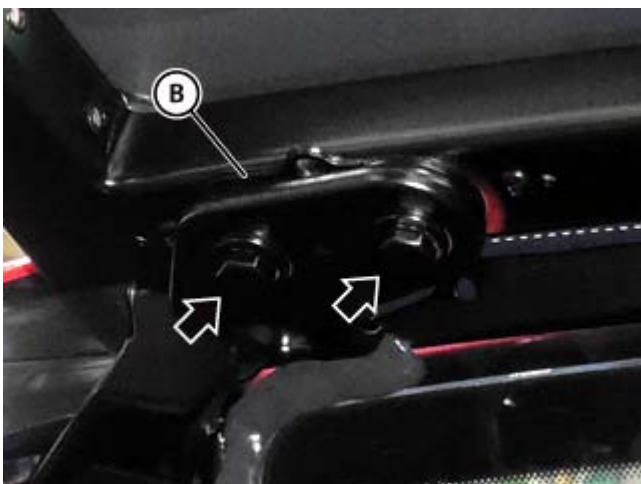
- Prise off the indicated clip.
- Detach the top end of the gas strut **(A)**.



CAUTION

Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

- Undo the screws indicated.
- Retrieve the shim **(B)**.



CAUTION

Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

- Undo the screws indicated.
- Retrieve the shim **(B)**.



CAUTION

Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

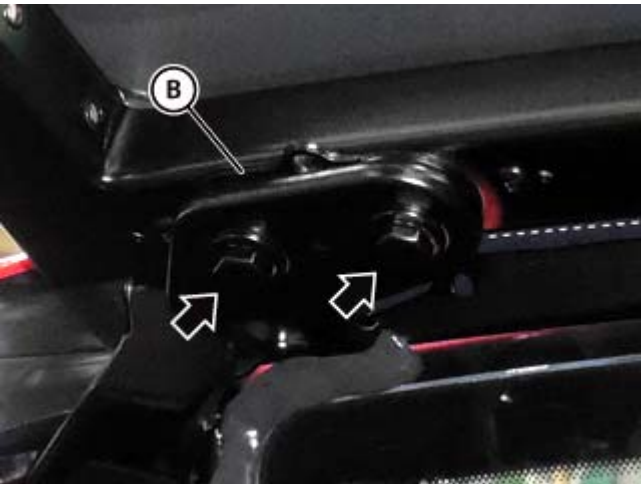
- Remove the engine compartment lid.

Refitting the engine compartment lid

			
Tightening torque		Nm	Class
Fastening the engine compartment lid	Screw	25 Nm	B

 **CAUTION**
Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

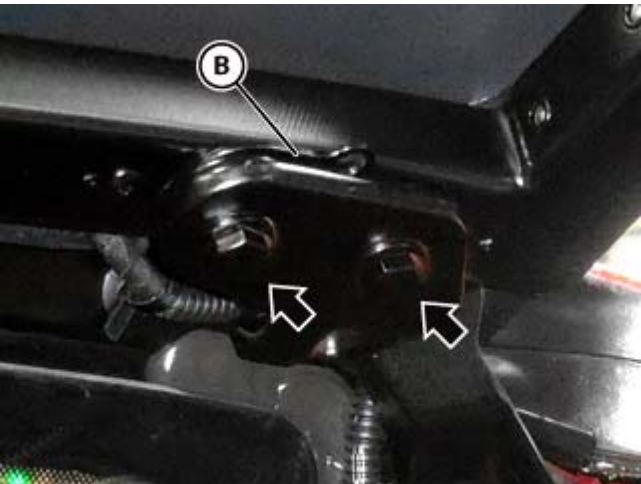
- Fit the lid.



 **CAUTION**
Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

- Fit the shim **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	25 Nm	B



 **CAUTION**
Adequately support the weight of the engine compartment lid.
This operation requires at least two operators.

- Fit the shim **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	25 Nm	B



- Attach the top end of the gas strut **(A)**.
- Fasten the indicated clip.



- Attach the top end of the gas strut **(A)**.
- Fasten the indicated clip.



- Connect and fasten the connector **(1)**.



- Check that the engine compartment lid opens and closes correctly.
 - i* If the lid does not open and/or close correctly, adjust the engine compartment lid.
- Check that the entire perimeter of the engine compartment lid is correctly aligned with the adjacent bodywork.
 - i* If the alignment is incorrect, adjust the engine compartment lid.

- Refit the engine compartment cosmetic shields (🔧 E3.13).
 - i* Refit the right hand lateral engine compartment cosmetic shield.
- Close the engine compartment lid (🔧 E5.11).
- Connect the battery (🔧 F2.01).

E3.02 Luggage compartment lid

Removing the luggage compartment lid

➤ Open the luggage compartment lid (🔧 E5.11).



- Mark the position of the hinge on the lid.
- Disconnect the pipe **(1)** from the three-way union.
- Release and open the indicated clips.
- Detach the indicated pipe grommet.
- Remove the pipe **(1)** from the lid.



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Undo the nuts indicated.



- Mark the position of the hinge on the lid.



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Undo the nuts indicated.



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Remove the lid.

Refitting the luggage compartment lid



Tightening torque		Nm	Class
Fastening luggage compartment lid	Nut	25 Nm	B



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Fit the lid, using the markings made previously as reference.



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Tighten the nuts indicated.



Tightening torque	Nm	Class
Nut	25 Nm	B



CAUTION

Adequately support the weight of luggage compartment lid.
This operation requires at least two operators.

- Tighten the nuts indicated.



Tightening torque	Nm	Class
Nut	25 Nm	B

- Connect the pipe (1) to the three-way union.
- Fit the indicated pipe grommet in the relative hole.
- Close and fasten the indicated clips.



- Check that the luggage compartment lid opens and closes correctly.



If the lid does not open and/or close correctly, adjust the luggage compartment lid.

- Check that the entire perimeter of the luggage compartment lid sits flush with the adjacent bodywork.



If the alignment is incorrect, adjust the luggage compartment lid.

E3.03 Front bumper

Removing the front bumper

- Disconnect the battery (🔌 F2.01).
- Remove the luggage compartment trim panels (🔧 E4.06).
 - ❗ Remove the lateral luggage compartment trim panels.
- Remove the front wheelhouses (🔧 E3.05).
- Remove the flat undertray sections (🔧 E3.12).
 - ❗ Remove the fasteners shared with the front bumper.



- Undo the screws indicated.



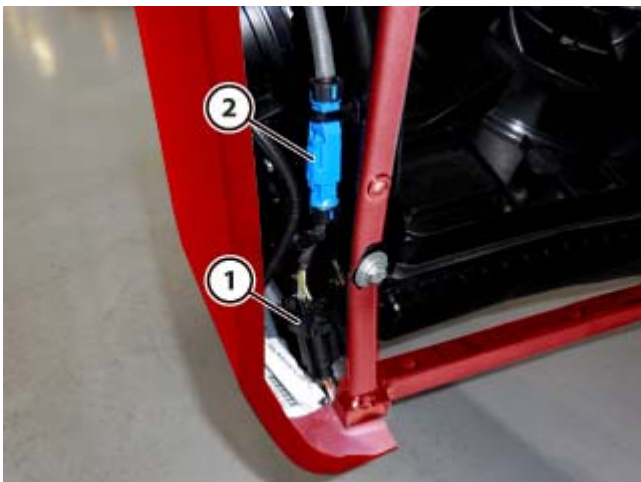
- Undo the screws indicated.



- Undo the screws indicated.



- Undo the screws indicated.



- Release and disconnect connector **(1)**.
- For vehicles with parking camera: release and disconnect the connector **(2)**.

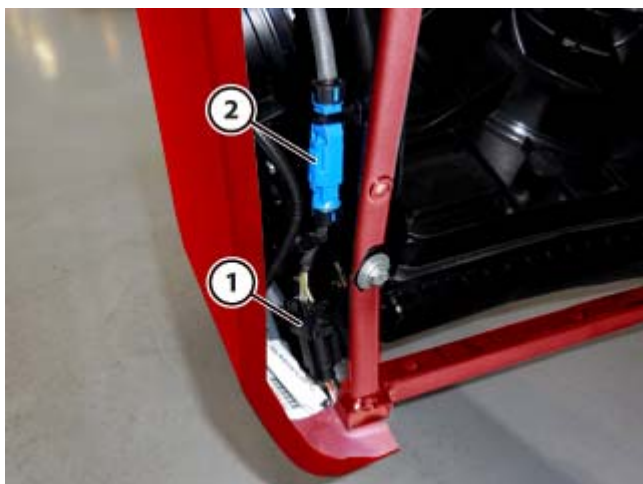
- Detach and remove the front bumper, disconnecting the headlamp washer system pipe.

Refitting the front bumper



Tightening torque		Nm	Class
Fastening front bumper	Screw	7 Nm	B
	Screw	6 Nm	B

- Fit and fasten the front bumper, connecting the headlamp washer system pipe.



- For vehicles with front parking camera: connect the connector **(2)**.
- Connect and fasten the connector **(1)**.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	7 Nm	B



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	6 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	6 Nm	B



- Check that the bumper is correctly aligned and if necessary, install the specific split washers between the bumper and chassis on the respective fastener screws indicated.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	7 Nm	B

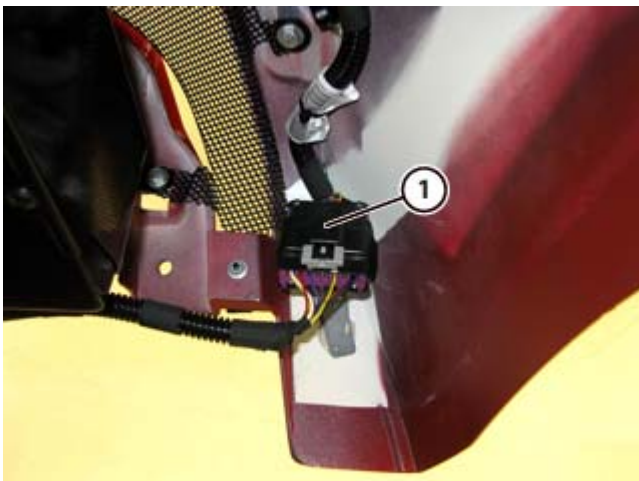
- Refit the flat undertray sections ( E3.12).
- Tighten the fasteners shared with the bumper.

- Refit the front wheelhouses ( E3.05).
- Refit the luggage compartment trim panels ( E4.06).
- Connect the battery ( F2.01).

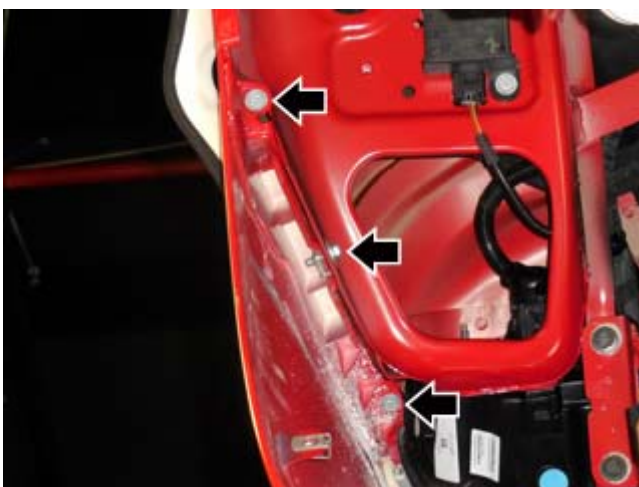
E3.04 Rear bumper

Removing the rear bumper

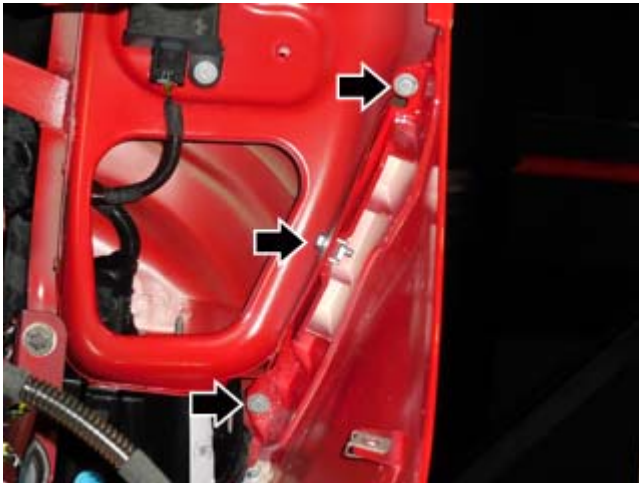
- Disconnect the battery (🔌 F2.01).
- Remove the flat undertray sections (🔌 E3.12).
 - ❗ Remove the rear diffuser.
- Remove the rear wheelhouses (🔌 E3.05).
 - ❗ Remove the rear elements of the rear wheelhouses.



- Release and disconnect connector (1).



- Undo the screws indicated.



- Undo the screws indicated.



- Undo the screws indicated.

- Detach and remove the bumper.

Refitting the rear bumper

			
Tightening torque		Nm	Class
Fastening rear bumper	Screw	8 Nm	B

- Fit and fasten the rear bumper.



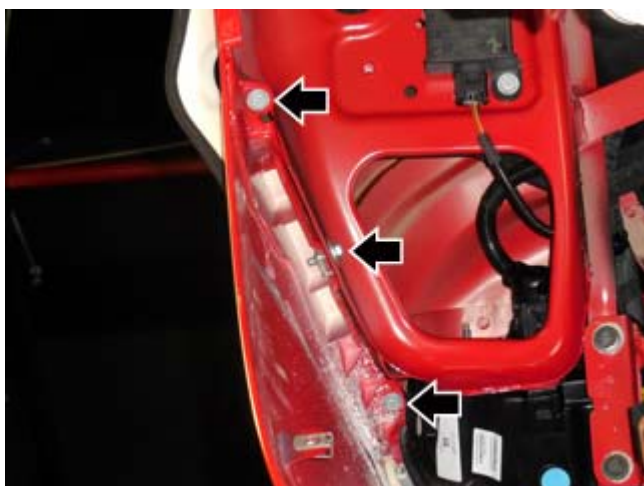
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



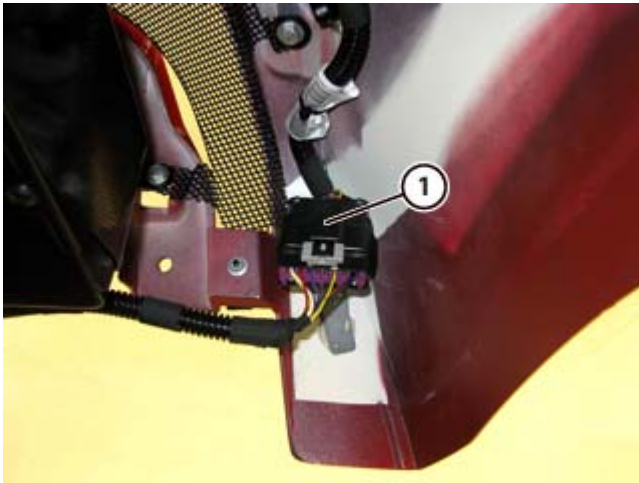
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



- Connect and fasten the connector **(1)**.

- Refit the rear wheelhouses ( E3.05).
 -  Refit the rear sections of the rear wheelhouses.
- Refit the flat undertray sections ( E3.12).
 -  Refit the rear diffuser.
- Connect the battery ( F2.01).

E3.05 Wheelhouse

Removing the front wheelhouses

- Remove the wheels (🔧 D2.01).
- Remove the front wheels.

Front element



- Undo the screws indicated.
- Remove the front element **(A)** of the front wheelhouse.

Rear element



- Undo the screws indicated.
- Remove the rear element **(B)** of the front wheelhouse.

Refitting the front wheelhouses

			
Tightening torque		Nm	Class

			
Tightening torque		Nm	Class
Fastening wheelhouse	Screw	7 Nm	B

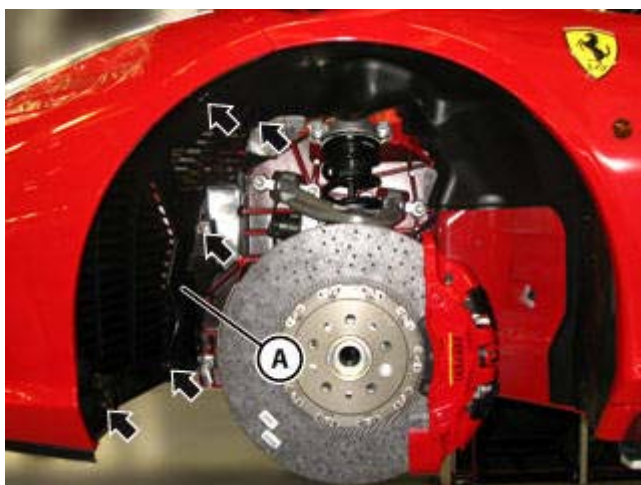
Rear element



- Fit the rear element **(B)** of the front wheelhouse.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	7 Nm	B

Front element



- Fit the front element **(A)** of the front wheelhouse.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	7 Nm	B

- Refit the wheels ( D2.01).
-  Refit the front wheels.

Removing the rear wheelhouses

- Remove the wheels ( D2.01).
-  Remove the rear wheels.

Rear element



- Undo the screws indicated.
- Remove the rear element **(A)** of the rear wheelhouse.

Front element



- Undo the screws indicated.
- Remove the front element **(B)** of the rear wheelhouse.

Refitting the rear wheelhouses

			
Tightening torque		Nm	Class
Fastening wheelhouse	Screw	7 Nm	B

Front element



Check conformity of the heat shield fitted on the inner side of the front section of the rear wheelhouse.

If the heat shield is damaged and/or not securely fastened, replace the front section of the rear wheelhouse.

- Fit the front element **(B)** of the rear wheelhouse.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	7 Nm	B

Rear element



- Fit the rear element **(A)** of the rear wheelhouse.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	7 Nm	B

➤ Refit the wheels (🛠️ D2.01).

➤ Refit the rear wheels.

E3.06 Windscreen

Replacing the windscreen

- Preparation in progress

E3.07 Rear screen and quarterlights

Replacing the rear screen

- Preparation in progress

Replacing the quarterlights

- Preparation in progress

E3.08 Doors

Removing the complete doors

➤ Disconnect the battery (🔌 F2.01).



Driver side door

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the complete door.



Passenger side door

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the complete door.

Refitting the complete doors

			
Tightening torque		Nm	Class
Fastening doors	Screw	18 Nm	B
	Screw	23 Nm	B



Driver side door

- Fit the complete door.
- Tighten the indicated screws fastening the door.

		
Tightening torque	Nm	Class
Screw	18 Nm	B

- Tighten the screw indicated fastening the tie-rod.

		
Tightening torque	Nm	Class
Screw	23 Nm	B

- Connect the connector **(1)**.



Passenger side door

- Fit the complete door.
- Tighten the indicated screws fastening the door.

		
Tightening torque	Nm	Class
Screw	18 Nm	B

- Tighten the screw indicated fastening the tie-rod.

		
Tightening torque	Nm	Class
Screw	23 Nm	B

- Connect the connector **(1)**.

➤ Connect the battery ( F2.01).

Removing door trim

➤ Disconnect the battery ( F2.01).

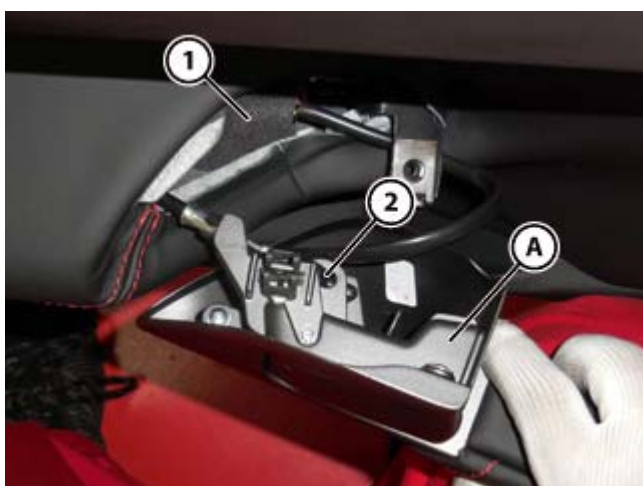
Driver side door panel



- Undo the indicated screw.



- Undo the indicated screw.
- Detach the handle **(A)**.



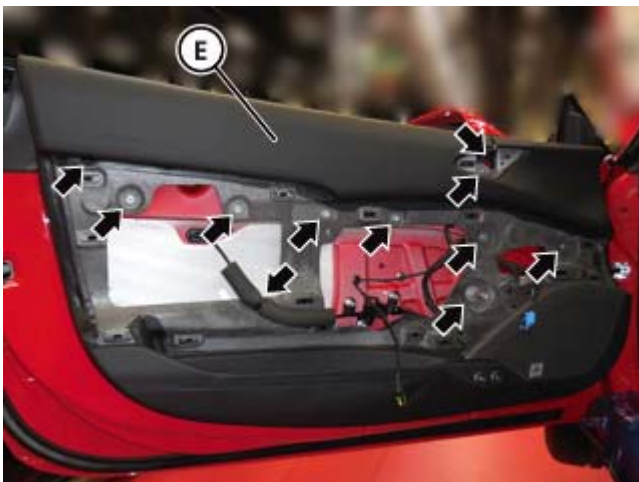
- Disconnect the connector **(1)**.
- Disconnect the Bowden cable **(2)**.
- Remove the handle **(A)**.



- Detach and remove the panel **(B)**, disconnecting the exterior rear view mirror control connector.
- Detach and remove the grille **(C)**.
- Detach and remove the cover **(D)**.

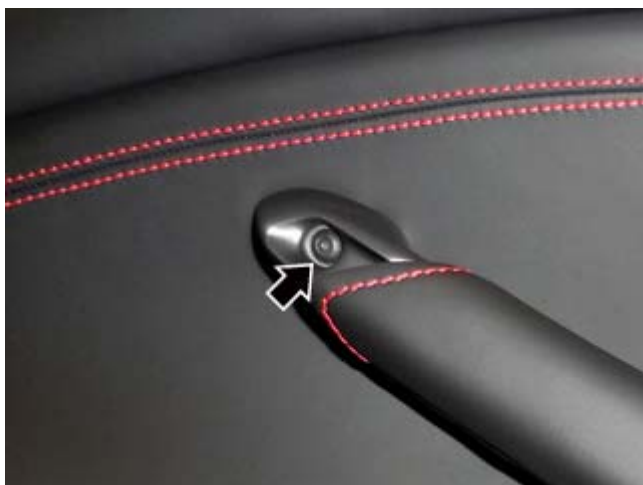


- Undo the screws indicated.



- Undo the screws indicated.
- Undo the indicated stud.
- Detach the indicated clamp.
- Detach and remove the panel **(E)**, disconnecting the connector of the luggage compartment and fuel flap release buttons and the connector of the lower light unit.

Passenger side door panel



- Undo the indicated screw.



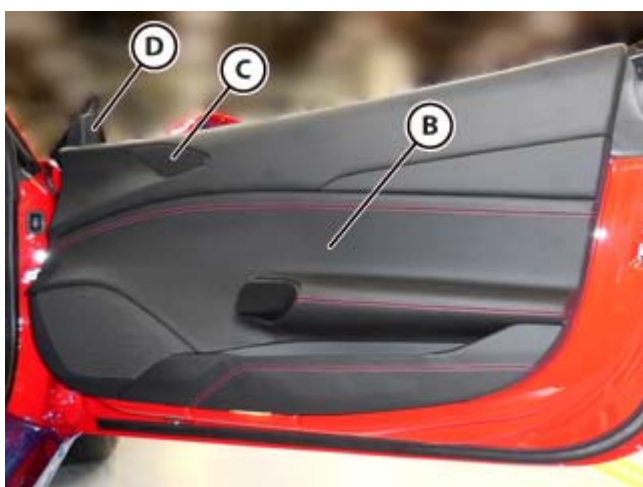
- Undo the indicated screw.
- Detach the handle **(A)**.



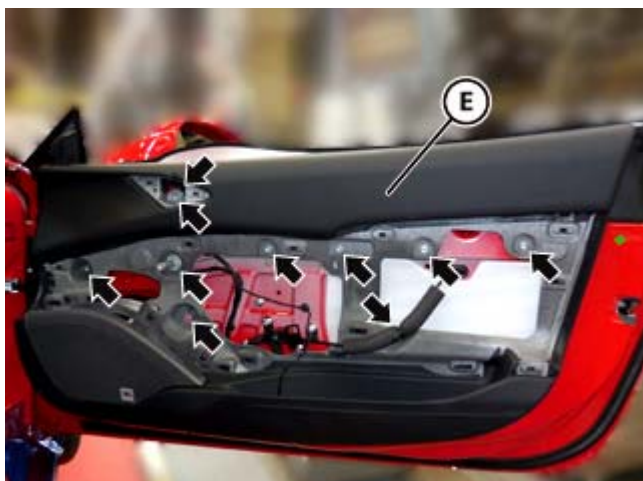
- Disconnect the connector **(1)**.
- Disconnect the Bowden cable **(2)**.
- Remove the handle **(A)**.



- Detach and remove the panel **(B)**.
- Detach and remove the grille **(C)**.
- Detach and remove the cover **(D)**.



- Undo the screws indicated.

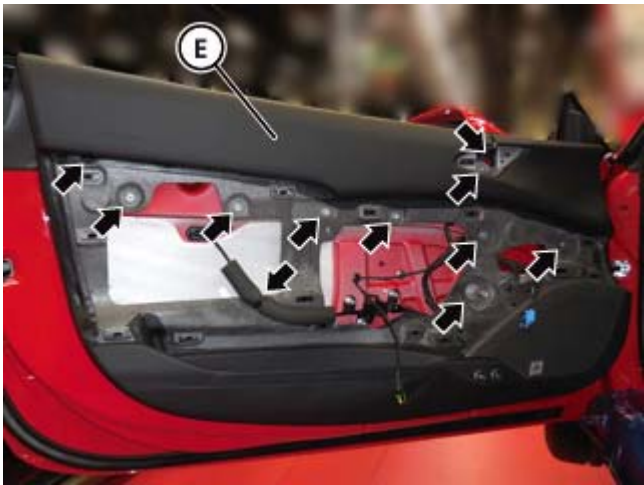


- Undo the screws indicated.
- Undo the indicated stud.
- Detach the indicated clamp.
- Detach and remove the panel **(E)**, disconnecting the connector of the lower light unit.

Refitting door trim

			
Tightening torque		Nm	Class
Fastening door trim	Screw	4 Nm	B
	Stud bolt	9.5 Nm	A
	Screw	8 Nm	B
	Screw	5 Nm	B
	Screw	9 Nm	C

Driver side door panel



- Connecting the connector of the luggage compartment and fuel flap release buttons and the connector of the lower light unit, fit and fasten the panel **(E)**, pressing manually into place.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Definitively tighten the indicated stud bolt.

		
Tightening torque	Nm	Class
Stud bolt	9.5 Nm	A

- Attach the indicated clamp.

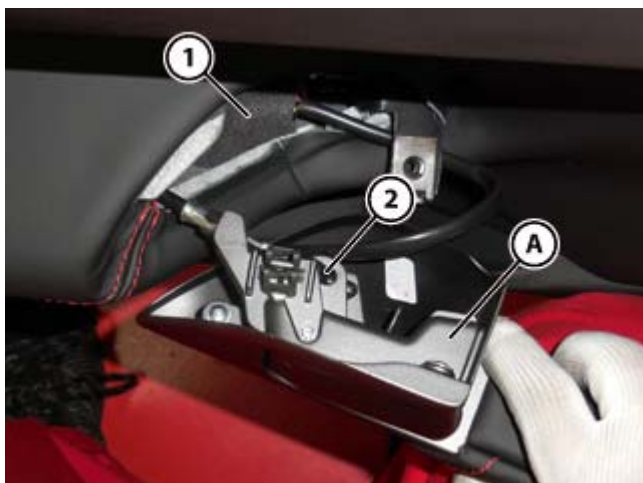
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B





- Fit and fasten the trim **(D)**, pressing manually into place.
- Fit and fasten the grille **(C)**, pressing manually into place.
- Connecting the exterior rear view mirror control connector, fit and fasten the panel **(B)** pressing manually into place.



- Fit the handle **(A)**.
- Connect the Bowden cable **(2)**.
- Connect the connector **(1)**.



- Fit the handle **(A)**.
- Tighten the indicated screw.

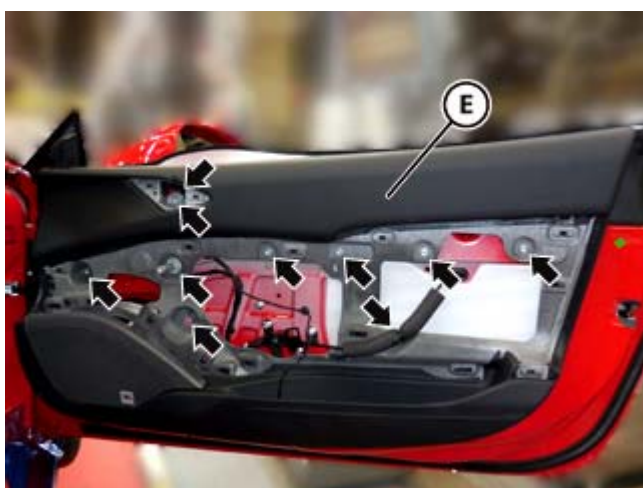
		
Tightening torque	Nm	Class
Screw	5 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	9 Nm	C

Passenger side door panel



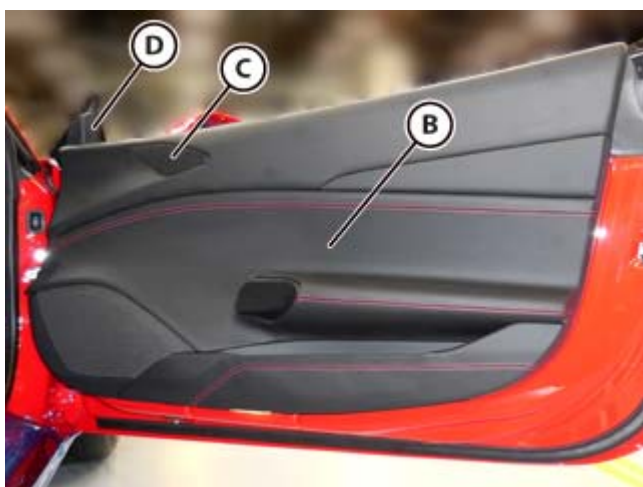
- Connecting the lower light unit connector, fit and fasten the panel **(E)** pressing manually into place.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Definitively tighten the indicated stud bolt.

		
Tightening torque	Nm	Class
Stud bolt	9.5 Nm	A

- Attach the indicated clamp.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



- Fit and fasten the trim **(D)**, pressing manually into place.
- Fit and fasten the grille **(C)**, pressing manually into place.
- Fit and fasten the panel **(B)**, pressing manually into place.

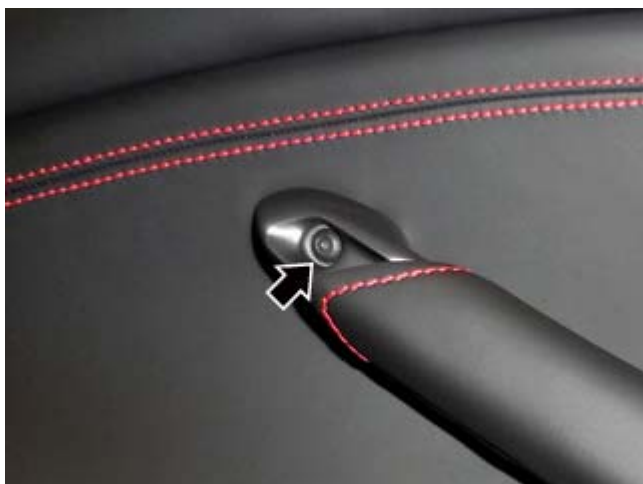


- Fit the handle **(A)**.
- Connect the Bowden cable **(2)**.
- Connect the connector **(1)**.



- Fit the handle **(A)**.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	5 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	9 Nm	C

➤ Connect the battery (🔋 F2.01).

E3.09 Windscreen wiper

Removing the windscreen wiper arms

- Mark the position of the blades on the windscreen to ensure that the arms are installed in the correct positions during reassembly.



- Prise out and remove the indicated plugs.



- Undo the nuts indicated.
- Undo the indicated screw.
- Remove the arms **(A)**.

Refitting the windscreen wiper arms

			
Tightening torque		Nm	Class
Fastening windscreen wiper arms	Nut	25 Nm	B



- Fit the arms **(A)**, aligning the reference markings on the windscreen.
- Replace the indicated nuts, fitting and tightening the new components.

		
Tightening torque	Nm	Class
Nut	25 Nm	B

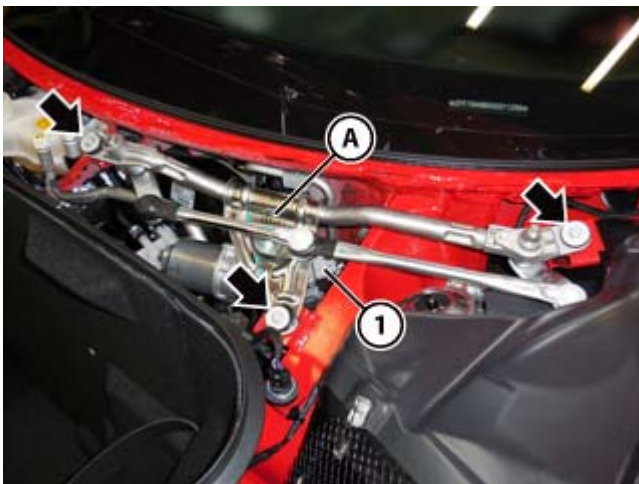
- Tighten the indicated screw.



- Fit the indicated caps.

Removing the windscreen wiper unit

- Disconnect the battery ( F2.01).
- Remove the engine compartment cosmetic shields ( E3.13).
- Remove the left hand underwindscreen shield.

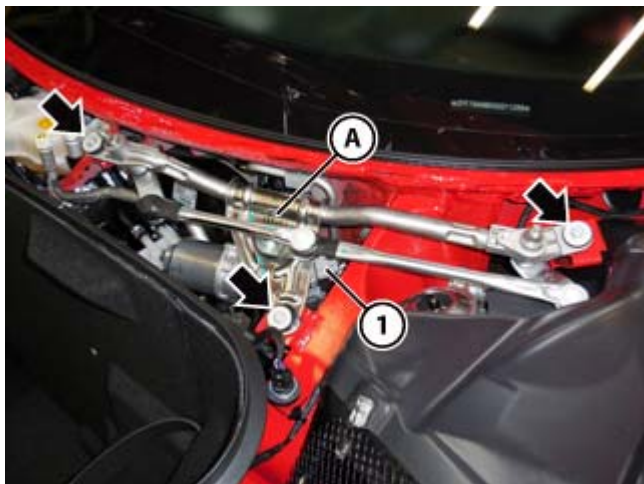


- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the windscreen wiper unit **(A)**.

Refitting the windscreen wiper unit



Tightening torque		Nm	Class
Fastening the windscreen wiper unit	Screw	8 Nm	B



- Fit the windscreen wiper unit **(A)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the connector **(1)**.

- Refit the engine compartment cosmetic shields (🔧 E3.13).
- Refit the left hand cosmetic underwindscreen shield.

- Connect the battery (🔧 F2.01).

E3.10 Windscreen washer and headlight washer

Removing windscreen and headlight washer fluid reservoir

- Preparation in progress

Refitting windscreen and headlight washer fluid reservoir

- Preparation in progress

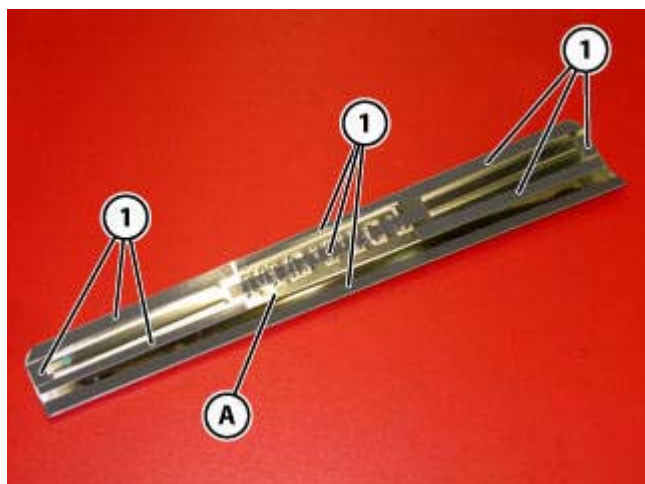
E3.11 Door perimeter trim panels

Removing the kickplate trim panels



- Using a suitable tool, detach and remove the kickplate **(A)**.

Refitting the kickplate trim panels



- If necessary, remove the old strips **(1)** of dual sided adhesive tape.
- Ensure that the inner surface of the kickplate **(A)** is clean. If necessary, clean with a degreasing product.
- Apply new strips of dual sided adhesive tape **(1)** in the original positions.



- Ensure that the surface of the seat for the kickplate **(A)** is clean. If necessary, clean with a degreasing product.
- Fit the kickplate **(A)** correctly in the relative seat, pressing over its entire outer surface to fix evenly.

Removing the sill trim panels

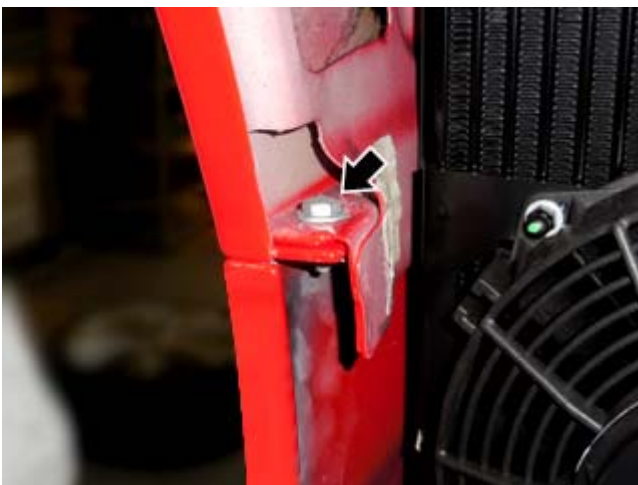
- Remove the kickplate trim panels ( E3.11).
- Remove the rear wheelhouses ( E3.05).
 -  Remove the front sections of the rear wheelhouses.
- Remove the front wheelhouses ( E3.05).
 -  Remove the rear sections of the front wheelhouses.



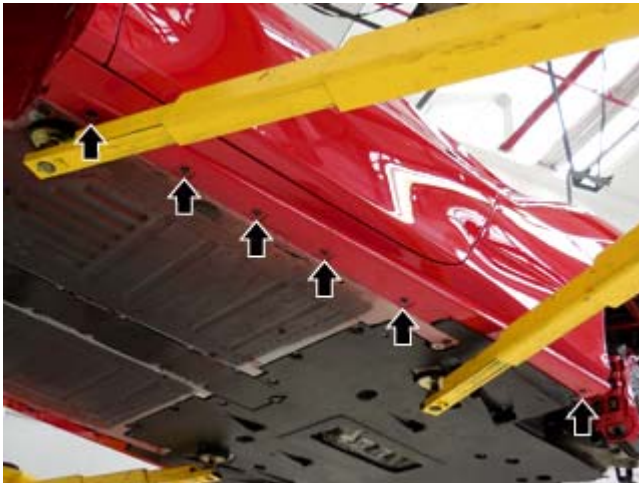
- Undo the indicated screw.



- Undo the screws indicated.



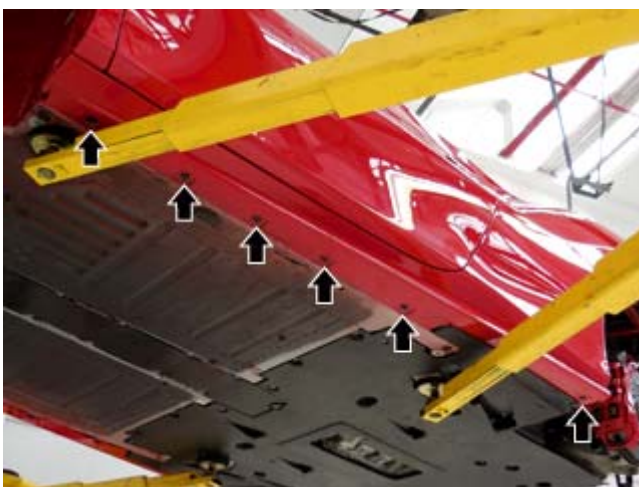
- Undo the indicated screw.



- Undo the screws indicated.
- Detach and remove the sill trim panel **(A)**.

Refitting the sill trim panels

			
Tightening torque		Nm	Class
Fastening sill trim	Screw	7.5 Nm	B
	Screw	5 Nm	B



- Fit the door sill trim panel **(A)** in the relative seat.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	7.5 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	5 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	7.5 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Refit the front wheelhouses ( E3.05).
- Refit the rear sections of the front wheelhouses.
- Refit the rear wheelhouses ( E3.05).
- Refit the front sections of the rear wheelhouses.
- Refit the kickplate trim panels ( E3.11).

E3.12 Flat undertray sections and vehicle lifting

Lifting the vehicle



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.



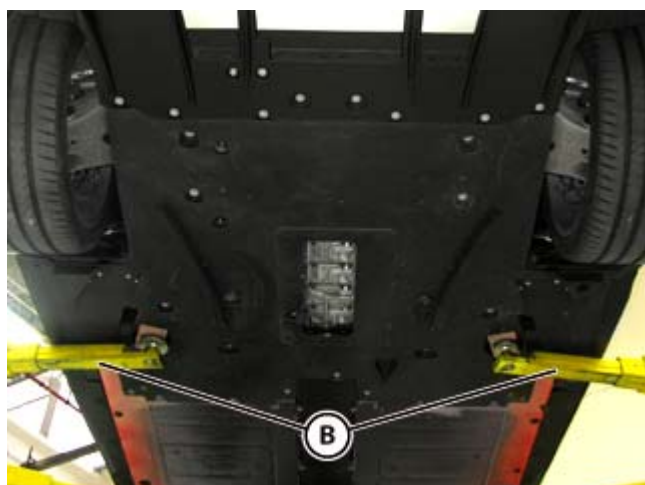
CAUTION

Failure to observe the operations below may pose a serious risk to the persons working or standing in the vicinity of the vehicle.

Two post vehicle lift



- Fit the two front bushings **(A)** in the position indicated.



- Fit the two rear bushes **(B)** in the positions indicated, in the relevant recesses in the rear flat undertray section.

- Lift the vehicle.

Runway type vehicle lift



- Fit the front pads **(A)** in the position indicated.



- Fit the rear bushes **(B)** in the positions indicated, in the relevant recesses in the rear flat undertray section.
- i* To prevent damage to the rear flat undertray section, cylindrical bushes that fit into specific recesses in the rear flat undertray section itself must be used

- Lift the vehicle.

Lifting the vehicle with anti-tipping safety retainers



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.



CAUTION

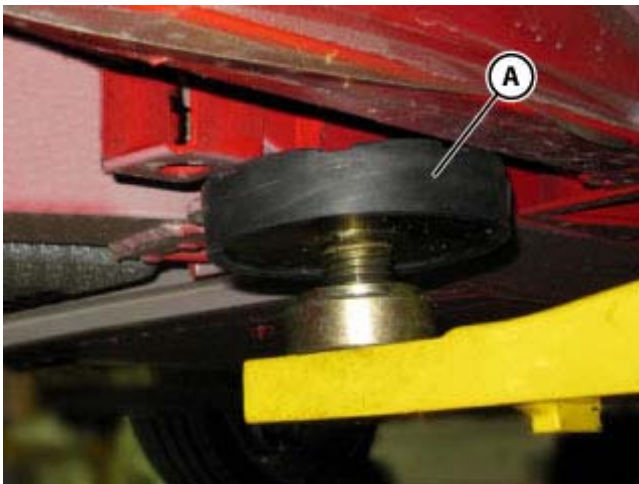
Failure to observe the operations below may pose a serious risk to the persons working or standing in the vicinity of the vehicle.

The following procedure is for fitting the brackets (**AV 8251**), fitting the vehicle anti-tipping safety retainers (**AV 8183**) to a two post vehicle lift and fitting the brackets (**AV 8184**) to a runway type car lift, and subsequently lifting the vehicle.

The anti-tipping safety retainers must always be used when removing the engine, gearbox and the rear removable subframe.

Two post vehicle lift

- Remove the flat undertray sections ( E3.12).
- Remove the rear flat undertray section.



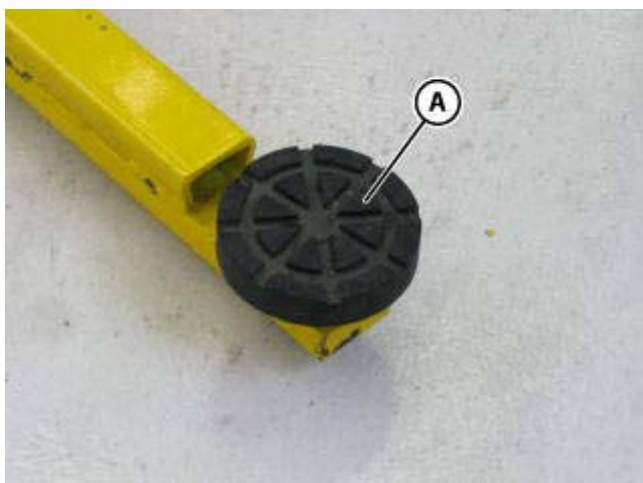
- Place the pads (**A**) in the positions indicated.

- Lift the vehicle.



- Fit the brackets (**AV 8251**) in the relative seats.
- Tighten the indicated screws fastening the brackets (**AV 8251**) to the subframe.

- Lower the vehicle to the ground.

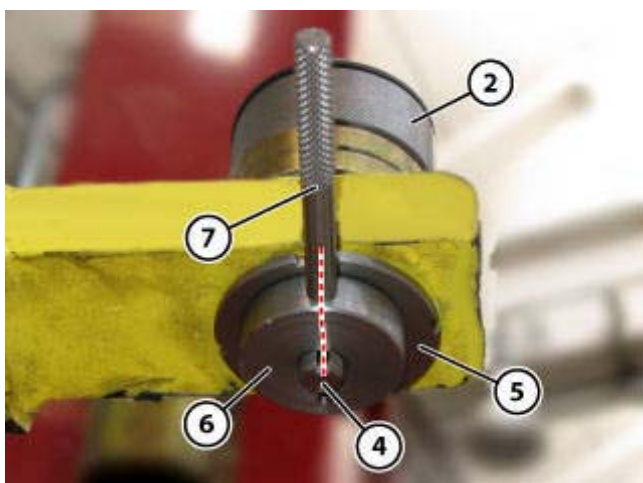


- Remove the rear pads **(A)** on the vehicle lift.

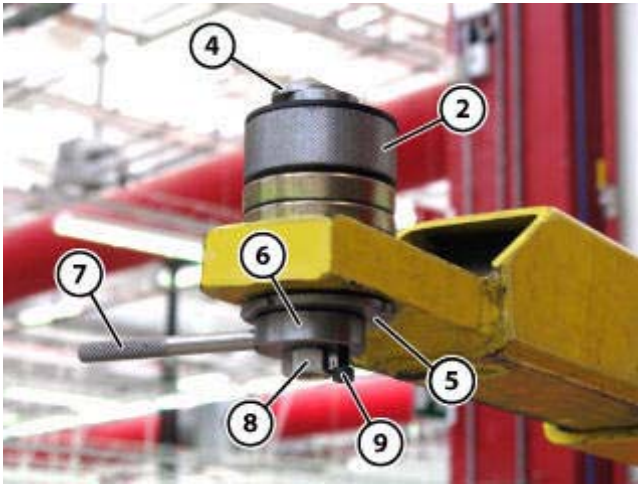
- Hold the anti-tipping safety retainers **(AV 8183)**.



- Fit the spacers **(1)** for preventing the vehicle lift arms from coming into contact with the sill trim panel during manoeuvring in the holes previously used for the rubber blocks.
- The spacers **(1)** are supplied in different sizes.
- Fit the sleeves **(2)** on the shims **(1)**.
- Fit the washers **(3)** on the sleeves **(2)**.
- Fit the eccentric pins **(4)** on the sleeves **(2)**, inserting in the relative holes.



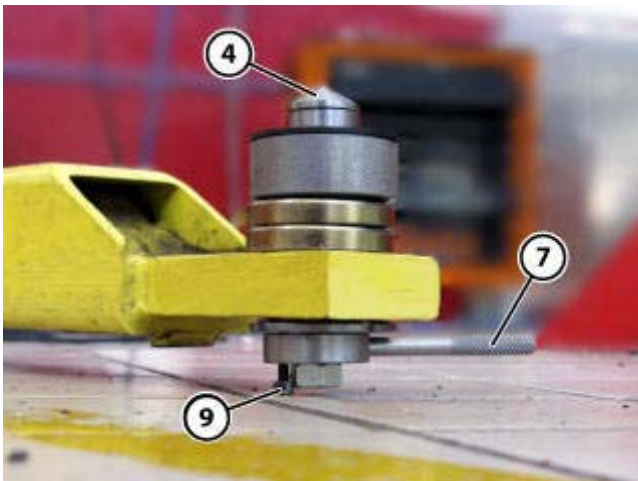
- Fit the ring nuts **(5)** under the vehicle lift arms over the centres of the holes previously used for the rubber blocks, tightening to the bushings **(2)**.
- Preventing the ring nuts from turning **(5)**, hand tighten the sleeves **(2)**.
- Tighten the bushings **(6)** to the eccentric pins **(4)**.
- Tighten the positioning levers **(7)** into the relative holes on the bushings **(6)**, which must be aligned with the groove on the eccentric pins **(4)**.



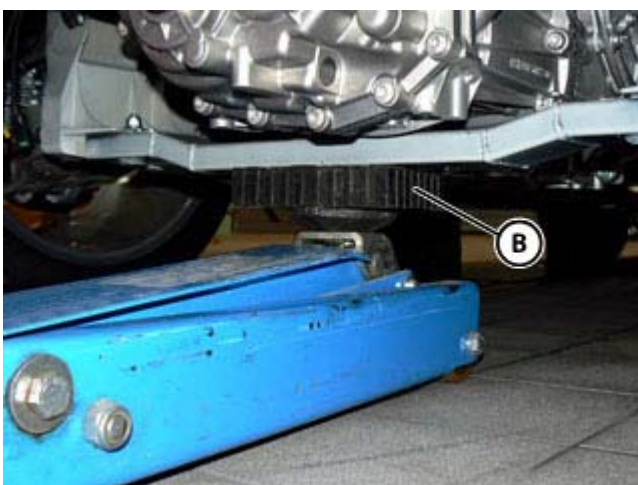
- Holding the positioning levers to prevent them from turning (7), tighten the nuts (8).
- Partially tighten the screws (9) fastening the positioning levers (7) onto the bushings (6).
- Holding the sleeves (2) to prevent them from turning, rotate and unscrew the ring nuts (5), together with the positioning levers (7), until the head of the eccentric pins (4) protrudes in the correct position for attaching to the vehicle.

i Note that the rear right hand fastener slot is parallel to the longitudinal axis of the vehicle, the front right hand fastener slot is perpendicular to the longitudinal axis of the vehicle, the rear left hand fastener slot is perpendicular to the longitudinal axis of the vehicle and the front left hand fastener slot is parallel to the longitudinal axis of the vehicle.

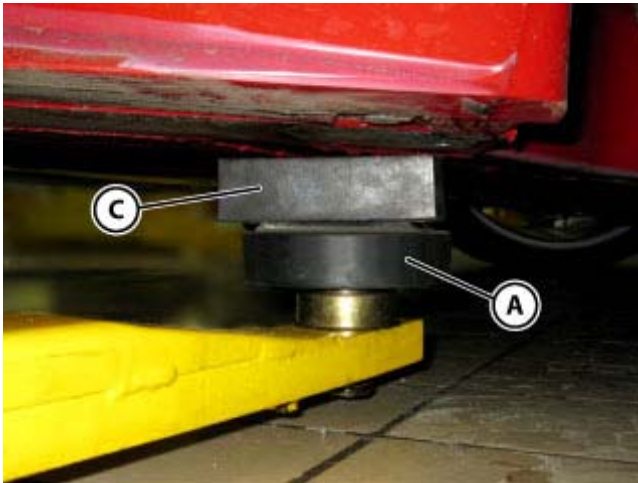
- Preventing the ring nuts from turning (5), hand tighten the sleeves (2).



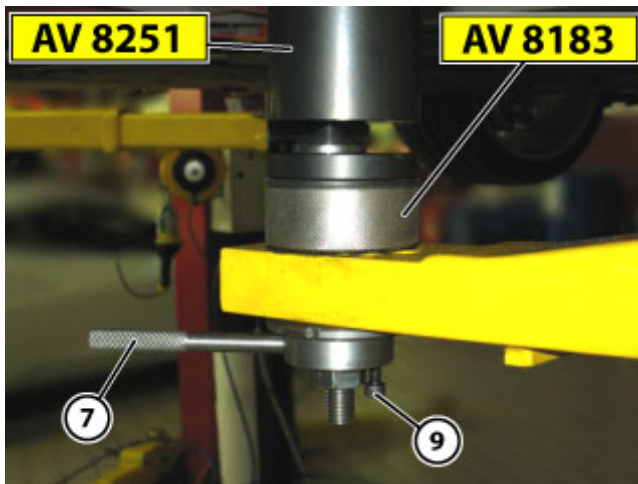
- Turn the positioning levers (7) until the eccentric pin head (4) retracts into the correct position to allow the insertion of the anti-tipping safety retainers into the relative fastener slots.
- Completely tighten the screws (9) fastening the positioning levers (7).
- Lower the arms of the car lift completely, ensuring that the anti-tipping safety retainers do not touch the floor, as this may damage them.



- Position a hydraulic jack under the rear gearbox mounting cross member, installing a pad (B) between the jack and the cross member.



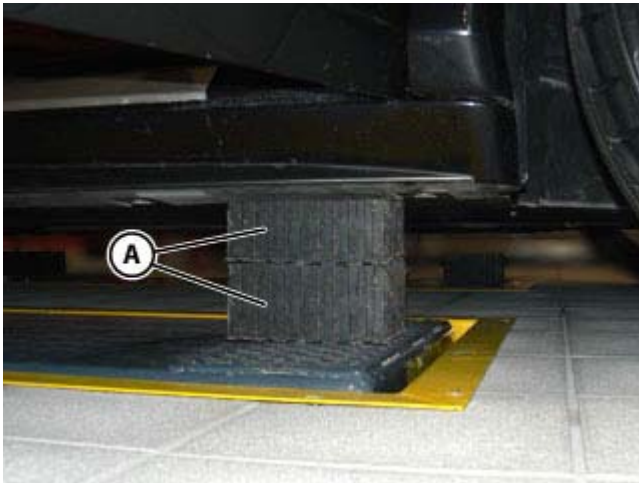
- Lift the rear of the vehicle with the jack until it is possible to increase the height of the front pads (A) on the vehicle lift or place an additional pad (C) on top of the front pads (A) of the vehicle lift.
- The total height of the front pads (A) of the vehicle lift, measuring it from the lift arm to the pad top surface, must be **145 mm**.



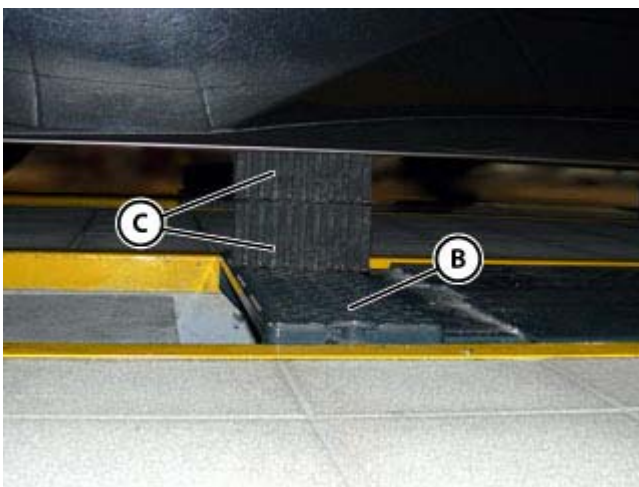
- Moving the rear vehicle lift arms (AV 8183) manually align the anti-tipping safety retainers (AV 8251) with the relative fastener brackets on the vehicle to ensure correct engagement when lifting.
- Ensuring that the anti-tipping safety retainers are correctly aligned with the respective fastener brackets, carefully lower the rear of the vehicle with the hydraulic jack until the anti-tipping safety retainers engage with the respective fastener brackets.
- Loosen the screws (9) fastening the positioning levers (7).
- Turn the positioning levers (7) by 180°.
- Unscrew and remove the positioning levers (7).
- Tighten the screws (9) fastening the positioning levers (7).
- Lift the vehicle lift arms until the car is the desired height from the ground.

Runway type vehicle lift

- Remove the flat undertray sections (E3.12).
- Remove the rear flat undertray section.



- Place two pads **(A)**, stacked one on top of the other, at the front vehicle lift points.



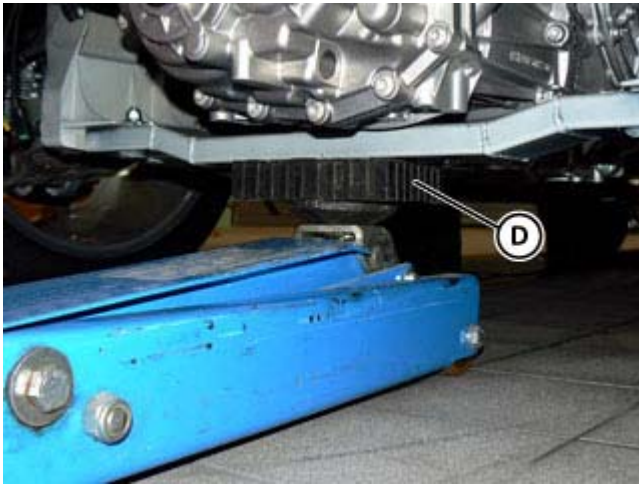
- Remove the safety extensions **(B)** from the car lift runways.
- Place two pads **(C)**, stacked one on top of the other, at the rear vehicle lift points on the safety extensions **(B)**.
- i* The pads **(C)** must be the same size as the pads placed previously at the front vehicle lift points.

- Lift the vehicle.

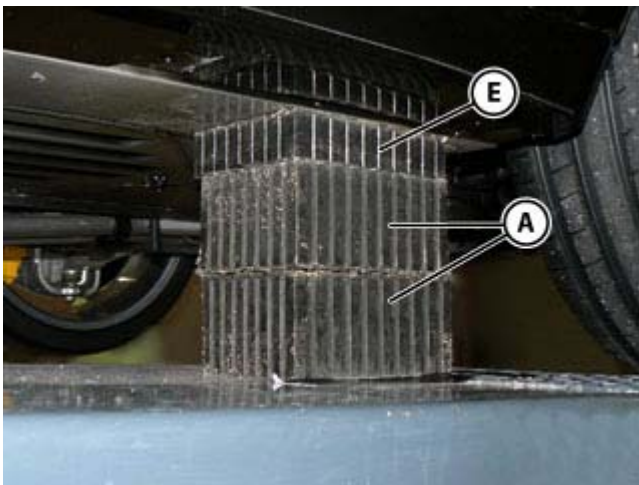


- Fit the brackets **(AV 8251)** in the relative seats.
- Tighten the indicated screws fastening the brackets **(AV 8251)** to the subframe.

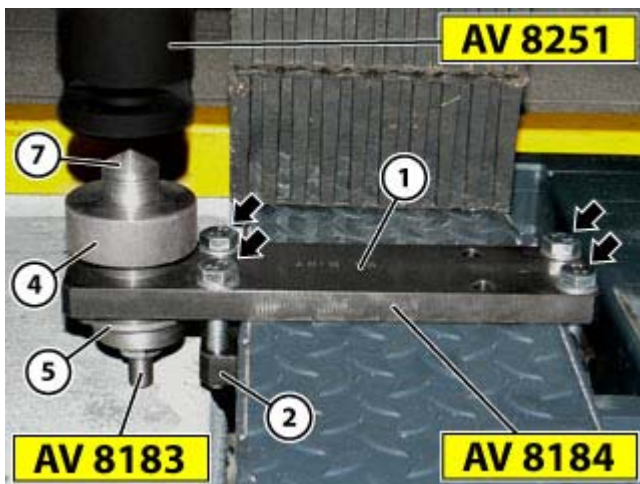
- Lower the vehicle to the ground.



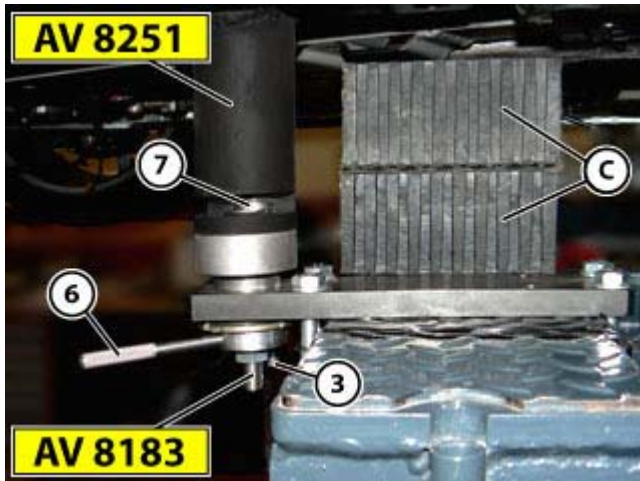
- Position a hydraulic jack under the rear gearbox mounting cross member, installing a pad **(D)** between the jack and the cross member.



- Raise the rear of the vehicle with the hydraulic jack until it is possible to add a pad **(E)** on top of the pads **(A)** placed previously at the front vehicle lift points.
- The total height of the pads installed at the front vehicle lift point must be **180 mm**.



- Fit the upper plates (1) of the brackets (AV 8184) fastening the anti-tipping safety retainers (AV 8183) over the safety extensions on the car lift runways.
- Fit the lower plates (2) of the brackets fastening the anti-tipping safety retainers on the safety extensions under the car lift runways.
- Tighten the indicated screws fastening the upper (1) and lower plates (2) to the safety extensions on the car lift runways.
- Loosen the screws fastening the positioning levers.
- Holding the sleeves (4) to prevent them from turning, rotate and unscrew the ring nuts (5), together with the positioning levers, until the head of the eccentric pin (7) protrudes in the correct position for attaching to the vehicle.
- Preventing the ring nuts from turning (5), hand tighten the sleeves (4).
- Turn the positioning levers until the eccentric pin head (7) retracts into the correct position to allow the insertion of the anti-tipping safety retainers into the relative fastener brackets.
- Tighten the screws fastening the positioning levers.
- Visually check that the eccentric pins (7) and brackets fastening the anti-tipping safety retainers to the safety extensions on the vehicle lift runways are positioned correctly, to ensure correct insertion of the anti-tipping safety retainers into the relative brackets (AV 8251) for attaching to the vehicle.



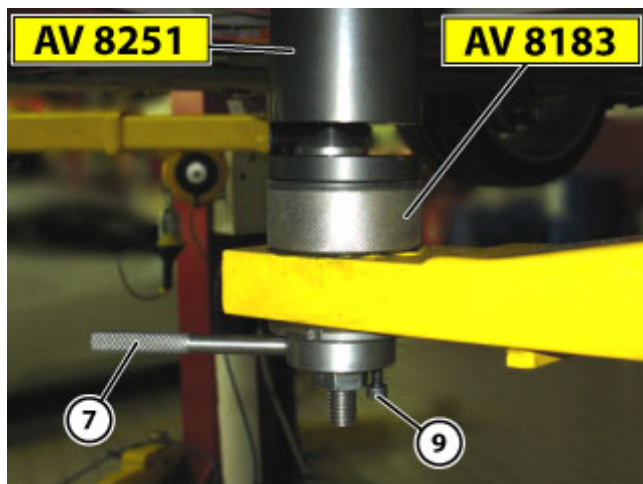
- Proceeding with due care and ensuring that the anti-tipping safety retainers (AV 8183) are correctly aligned with the respective brackets (AV 8251) for fastening to the vehicle, lower the rear of the vehicle with the hydraulic jack until the anti-tipping safety retainers engage with the respective fastener brackets.
- Remove the pads (C) from the safety extensions on the vehicle lift runways.
- Lift the vehicle slightly off the ground and check that it is stable.
- Loosen the screws (3) fastening the positioning levers (6).
- Turn the positioning levers (6) by 180°.
- Unscrew and remove the positioning levers (6).
- Tighten the screws (3) fastening the positioning levers (6).
- Raise the vehicle lift runways until the car is the desired height from the ground.

Lowering the vehicle with anti-tipping safety retainers

The following procedure is for lowering the vehicle, removing the brackets (AV 8251), removing the vehicle anti-tipping safety retainers (AV 8183) from a two post vehicle lift and removing the anti-tipping safety

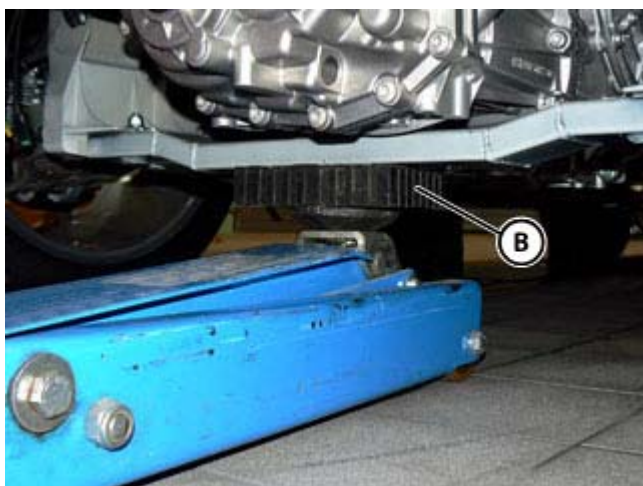
retainer fastener brackets (**AV 8184**) from a runway type car lift.

Two post vehicle lift



- Lower the vehicle lift arms until the car is the desired height from the ground.
- Loosen the screws (9) fastening the positioning levers (7).
- Tighten the positioning levers (7).
- Turn the positioning levers (7) by 180°.
- Tighten the screws (9) fastening the positioning levers (7).

- Lower the vehicle to the ground.

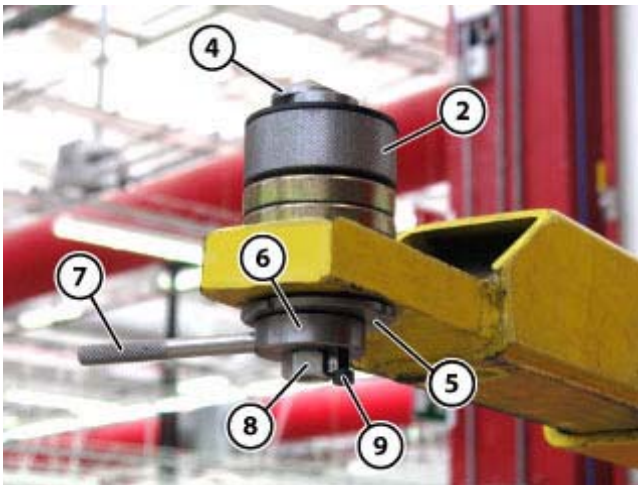


- Position a hydraulic jack under the rear gearbox mounting cross member, installing a pad (B) between the jack and the cross member.

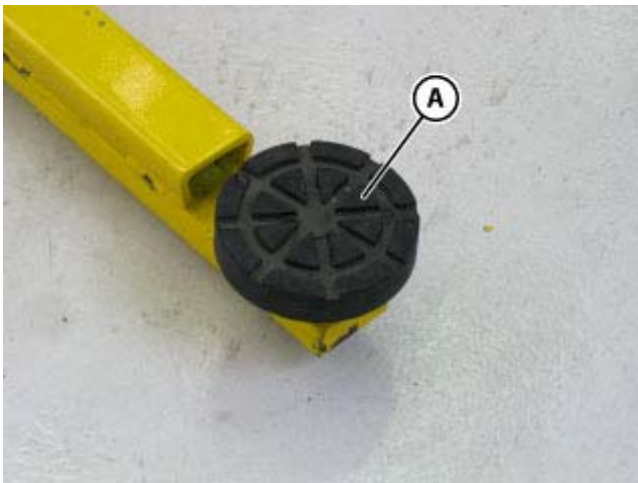


- Proceeding with due care and ensuring that the anti-tipping safety retainers withdraw correctly and without impediment from the respective brackets for attaching to the vehicle, raise the rear of the vehicle with the hydraulic jack until it is possible to reduce the height of the front pads (A) on the vehicle lift or remove the pad (C) from the front pads (A) on the vehicle lift.

- Remove the vehicle lift arms from underneath the vehicle and lower the hydraulic jack positioned under the lower gearbox mounting cross member.



- Undo and remove the screws (9) fastening the positioning levers (7) onto the bushings (6).
- Holding the positioning levers to prevent them from turning (7), undo the nuts (8).
- Unscrew the positioning levers (7) from the bushings (6).
- Undo the bushings (6) from the eccentric pins (4).
- Remove the eccentric pins (4) from the relative seats.
- Preventing the ring nuts from turning (5), manually unscrew the sleeves (2) and remove both components, together with relative shims, from the car lift arms.



- Refit the rear pads (A) on the vehicle lift.

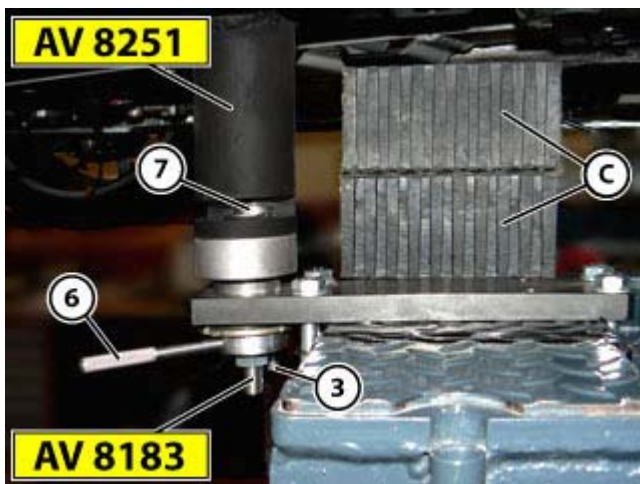
- Lift the vehicle.



- Undo the indicated screws fastening the brackets (AV 8251) to the subframe.
- Remove the brackets (AV 8251) from the relative seats.

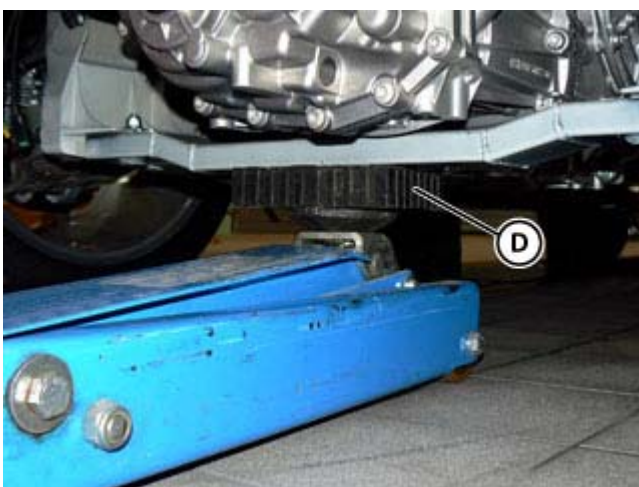
- Refit the flat undertray sections ( E3.12).
-  Refit the rear flat undertray section.

Runway type vehicle lift

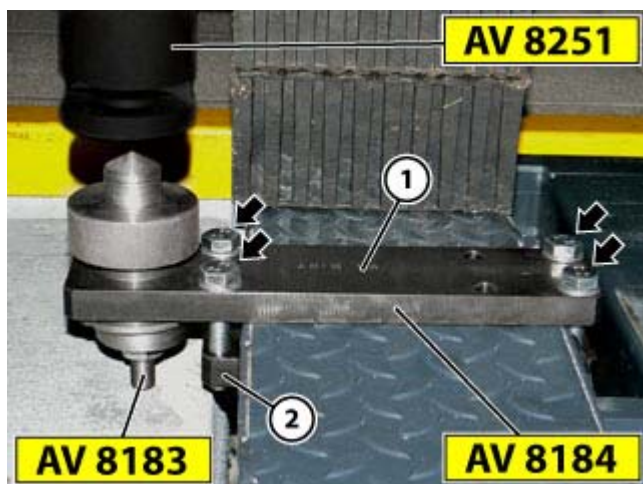


- Lower the vehicle lift runways until the car is the desired height from the ground.
- Place the pads (C) at the rear vehicle lift points on the runway safety extensions.
- Loosen the screws (3) fastening the positioning levers (6).
- Tighten the positioning levers (6).
- Turn the positioning levers (6) by 180°.
- Visually check that the eccentric pins (7) are positioned correctly to ensure that the anti-tipping safety retainers (AV 8183) withdraw correctly from the relative brackets (AV 8251) for attaching to the vehicle
- Tighten the screws (3) fastening the positioning levers (6).

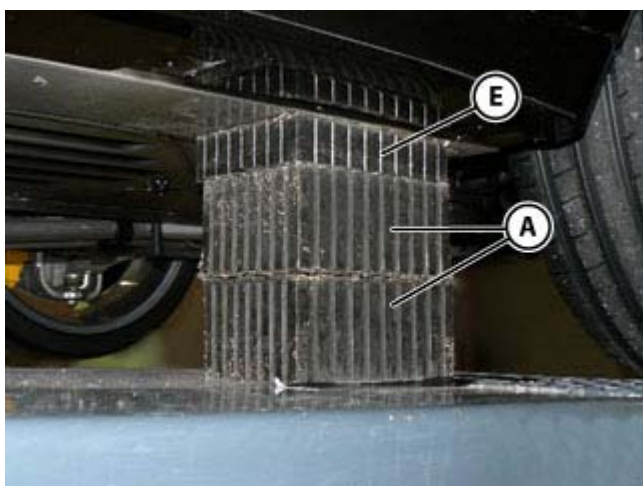
- Lower the vehicle to the ground.



- Position a hydraulic jack under the rear gearbox mounting cross member, installing a pad (D) between the jack and the cross member.



- Raise the rear of the vehicle with the hydraulic jack carefully to ensure that no resistance is encountered, until the anti-tipping safety retainers (AV 8183) withdraw from the relative brackets (AV 8251) for attaching to the vehicle.
- Undo the indicated screws fastening the upper plates (1) and lower plates (2) of the brackets (AV 8184) fastening anti-tipping safety retainers.
- Remove the lower plates (2) fastening the anti-tipping safety retainers from the safety extensions on the car lift runways.
- Remove the upper plates (1) fastening the anti-tipping safety retainers from the safety extensions on the car lift runways.



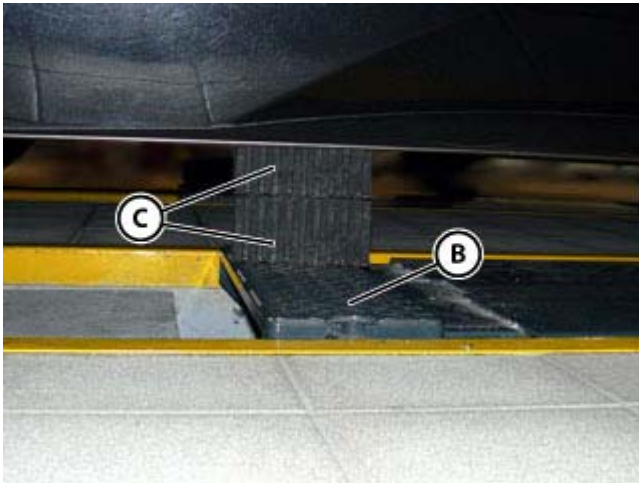
- Remove the pad (E) from the pads (A) placed previously at the front lift points, then lower the rear of the vehicle.

- Lift the vehicle.

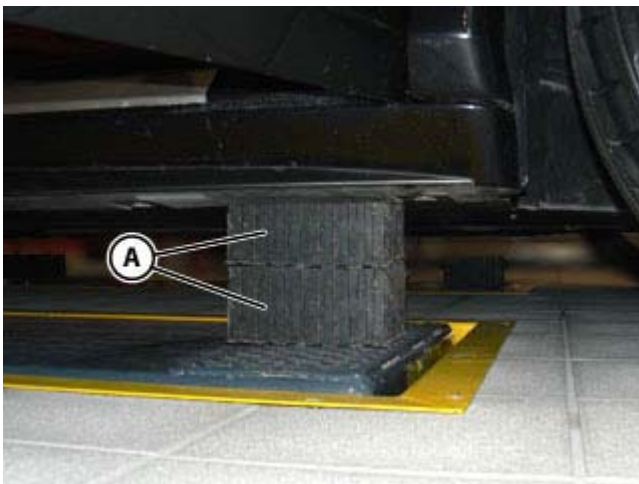


- Undo the indicated screws fastening the brackets (AV 8251) to the subframe.
- Remove the brackets (AV 8251) from the relative seats.

- Lower the vehicle to the ground.



- From the safety extensions **(B)** remove the two pads **(C)** from the rear vehicle lift points.
- Fit the runway safety extensions **(B)**.



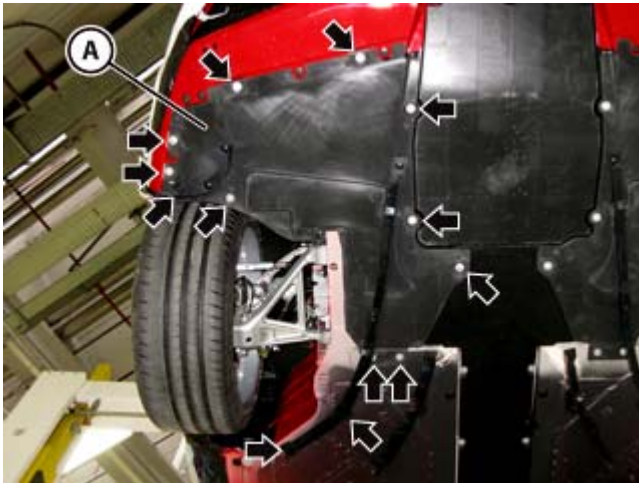
- Remove the two pads **(A)** from the front vehicle lift points.

- Refit the flat undertray sections (🛠️ E3.12).
- Refit the rear flat undertray section.

Removing the flat undertray sections

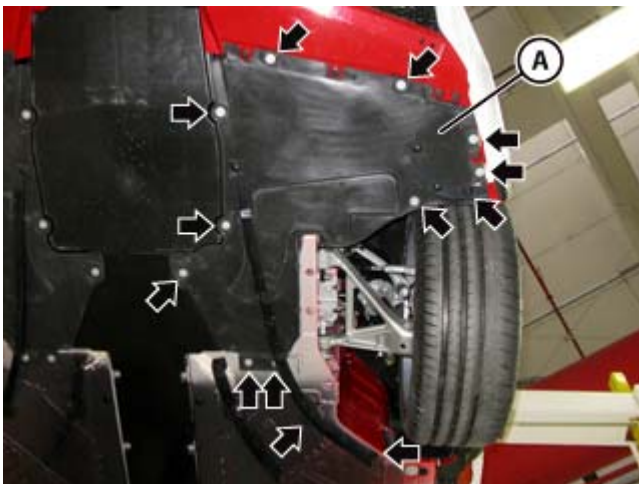
- Lift the vehicle (🛠️ E3.12).

Front flat undertray sections



Front right hand section

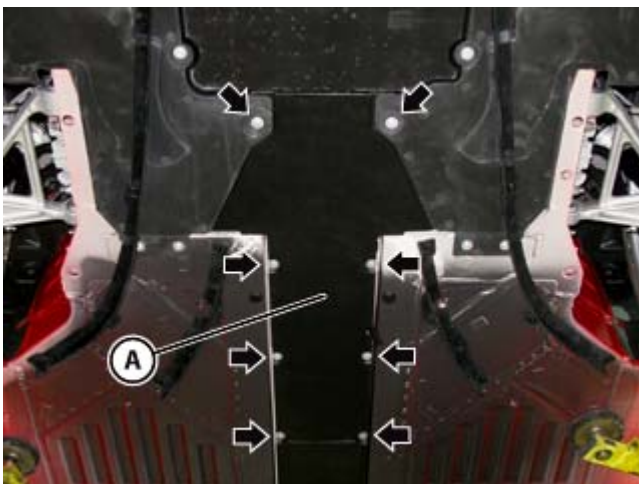
- Undo the indicated screws.
- Detach and remove the front right hand section **(A)** of the flat undertray.



Front left hand section

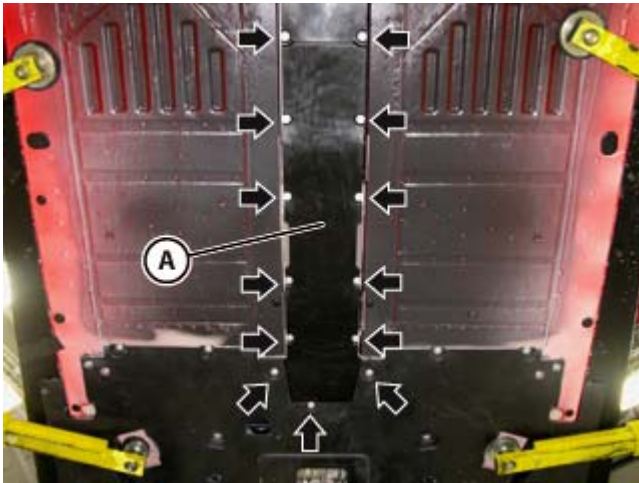
- Undo the indicated screws.
- Detach and remove the front left hand section **(A)** of the flat undertray.

Central flat undertray sections



Front central section

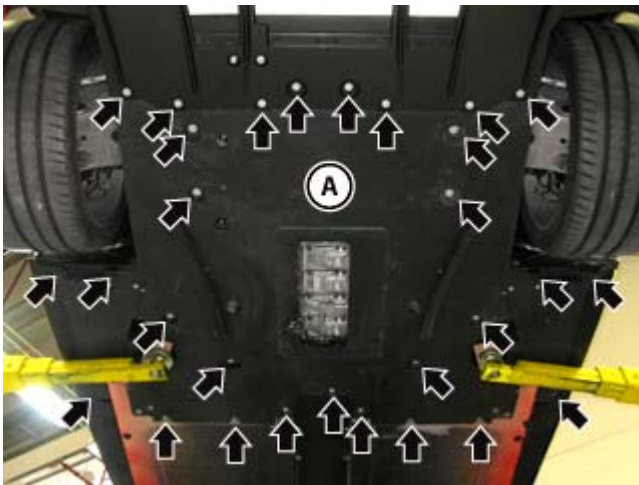
- Undo the indicated screws.
- Detach and remove the front central section **(A)** of the flat undertray.



Rear central section

- Undo the indicated screws.
- Detach and remove the rear central section **(A)** of the flat undertray.

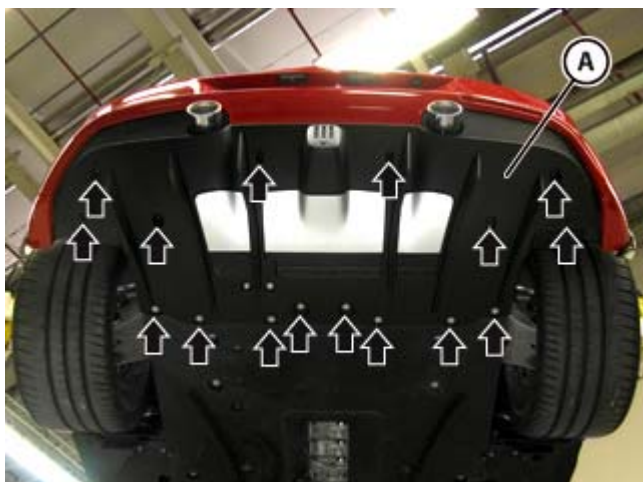
Rear flat undertray section



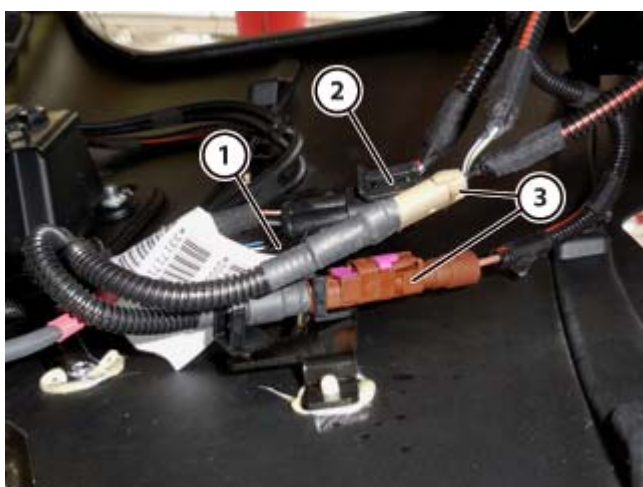
- Undo the screws indicated.
- Lower the vehicle sufficiently in order to be able to place a pad approximately 80 mm high under the centre of the rear element **(A)** of the flat undertray.
- Lower the vehicle until it rests on its wheels on the ground.
- Remove the pads on the rear lift arms from the relative holes in the rear element **(A)** of the flat undertray.
- Fit the pads on the rear lift arms correctly in the relative lift holes on the vehicle.
- Disconnect the pipes of the rear calliper air ducts from the rear element **(A)** of the flat undertray.
- Lift the vehicle off the ground and remove the rear element **(A)** of the flat undertray.

Flat undertray diffuser

- Disconnect the battery ( F2.01).



- Undo the indicated screws fastening the rear diffuser **(A)** of the flat undertray.
- Lower the rear diffuser **(A)**.



- Disconnect the connector **(1)** and the connector **(2)**.
- For vehicles with TV tuner, disconnect the connectors **(3)**.

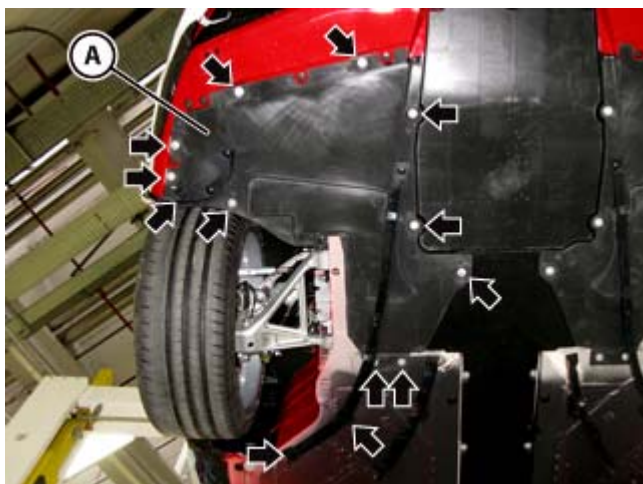
- Remove the rear diffuser.

Refitting the flat undertray sections

			
Tightening torque		Nm	Class
Fastening flat undertray sections	Screw	8 Nm	B

➤ Lift the vehicle ( E3.12).

Front flat undertray section

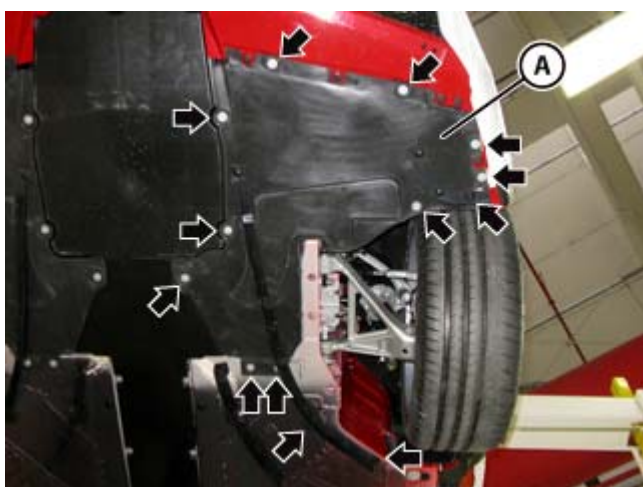


Front right hand section

- Fit and fasten the front right hand section **(A)** of the flat undertray.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B



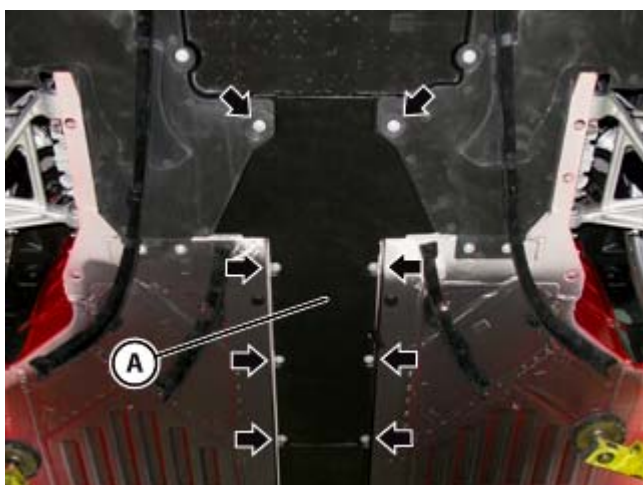
Front left hand section

- Fit and fasten the front left hand section **(A)** of the flat undertray.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B

Central flat undertray section

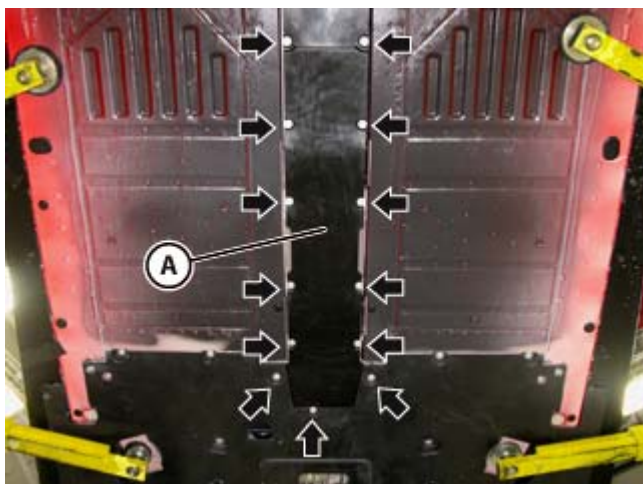


Front central section

- Inserting the air conditioner condensate drain pipe correctly in the relative hole, fit and fasten the central front section **(A)** of the flat undertray.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B

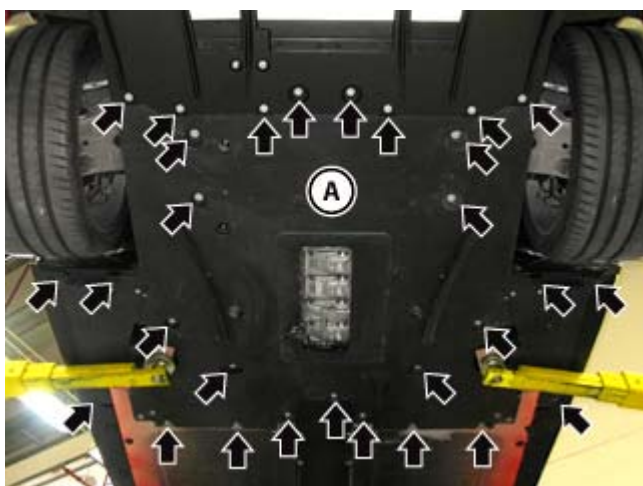


Rear central section

- Fit and fasten the central rear section **(A)** of the flat undertray.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

Rear flat undertray section

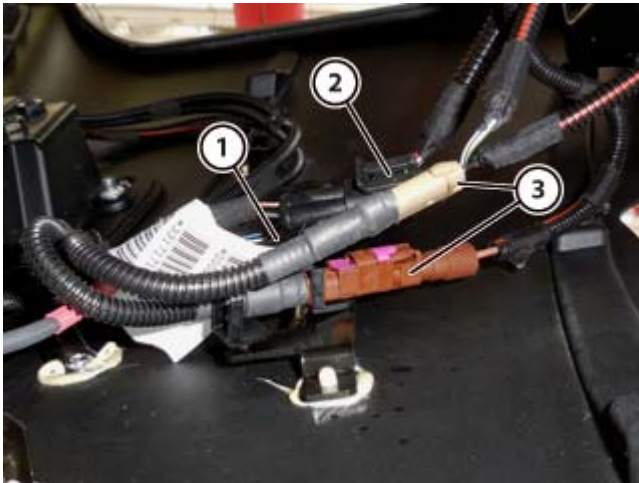


- Lift the vehicle sufficiently in order to be able to fit the rear element **(A)** of the flat undertray in the correct position under the rear of the vehicle.
- Fit a pad approximately 80 mm high under the centre of the rear element **(A)** of the flat undertray.
- Lower the vehicle until it rests on its wheels on the ground.
- Inserting through the relative holes in the rear element **(A)** of the flat undertray, fit the pads on the rear lift arms correctly in the relative lift holes on the vehicle.
- Connect the pipes of the rear calliper air ducts to the rear element **(A)** of the flat undertray.
- Lift the vehicle.
- Inserting the power steering fluid reservoir breather pipe and the fuel drain pipe correctly through the relative holes, fit the central rear section **(A)** of the flat undertray.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

Flat undertray diffuser

- Lift the rear diffuser.



- Connect the connector **(1)** and the connector **(2)**.
- For vehicles with TV tuner, connect the connectors **(3)**.



- Fit the rear diffuser **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the battery ( F2.01).

E3.13 Engine compartment cosmetic shields

Removing engine compartment cosmetic shields



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.

➤ Open the engine compartment lid (🔧 E5.11).

Centre cosmetic shield



- Undo the screws indicated.
- Remove the cosmetic shield **(A)**.

Lateral cosmetic shields



Left hand lateral cosmetic shield

- Undo the screws indicated.
- Remove the cosmetic shield **(B)**.



Right hand lateral cosmetic shield

- Undo the screws indicated.
- Remove the cosmetic shield **(B)**.



Front cosmetic shield

- Remove lateral cosmetic shields.
- Undo the screws indicated.
- Remove the cosmetic shield **(C)**.

Refitting engine compartment cosmetic shields

			
Tightening torque		Nm	Class
Fastening engine compartment cosmetic shields	Screw	4 Nm	B

Front cosmetic shield



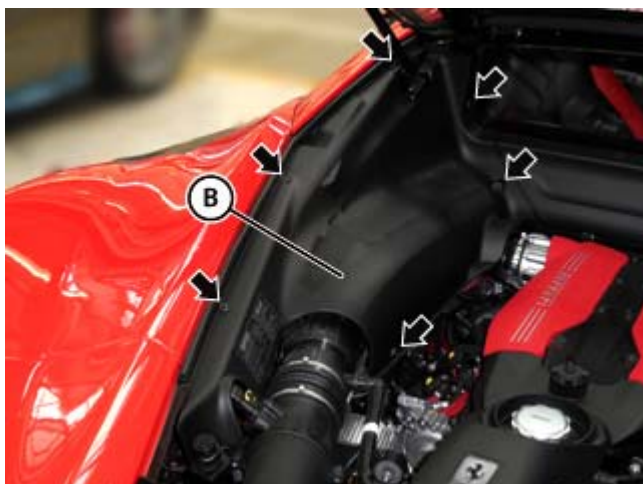
- Fit the cosmetic shield **(C)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	4 Nm	B

- Refit the lateral cosmetic shields.

Lateral cosmetic shields



Left hand lateral cosmetic shield

- Fit the cosmetic shield **(B)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	4 Nm	B



Right hand lateral cosmetic shield

- Fit the cosmetic shield **(B)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	4 Nm	B

Centre cosmetic shield



- Fit the cosmetic shield **(A)**.
- Tighten the screws indicated.

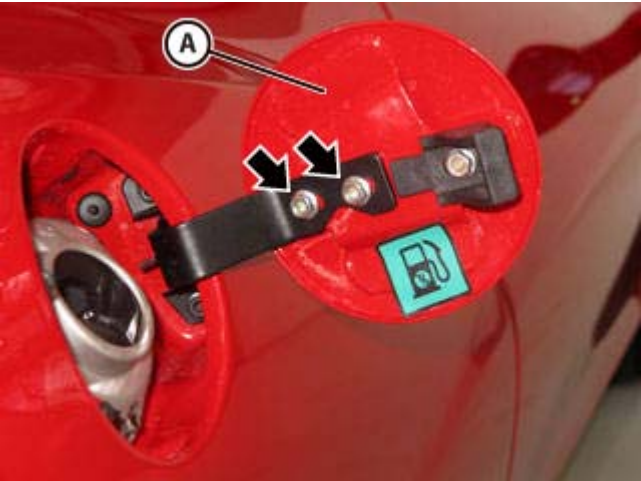
		
Tightening torque	Nm	Class
Screw	4 Nm	B

➤ Close the engine compartment lid ( E5.11).

E3.14 Fuel filler flap

Replacing fuel filler flap

			
Tightening torque		Nm	Class
Fastening fuel filler flap	Nut	4 Nm	B



- Open the fuel filler flap **(A)**.
- Undo the nuts indicated.
- Replace the fuel filler flap **(A)**.
- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut	4 Nm	B



- Close the fuel filler flap **(A)** and check that it sits flush with the bodywork.

E3.15 Active aerodynamics

The active aerodynamics system alters the configuration of the vehicle to provide maximum downforce in bends and minimise drag when driving on a straight.

At the front of the vehicle are three passive elements - two vertical flaps and a horizontal flap in the undertray. At relatively low speeds, all three flaps are closed and air feeds the radiators to provide the necessary cooling action for the engine.

At speeds above 170 km/h, the two vertical hatches open, modifying the air flow to reduce the volume fed to the radiators and reduce drag.

Above 220 km/h, the horizontal flap lowers to reduce front downforce.

This shifts the total downforce balance towards the rear axle.

The rear flaps have two configurations:

- high downforce - the flaps are raised and the air flow adheres to the diffuser.
- minimum drag - the system uses two sensors and a specific algorithm to lower the flaps by up to 17°, stalling the diffuser and reducing drag as a consequence.

E3.16 Tow hook

Tow hook



CAUTION

Always comply with road safety legislation when towing the vehicle.

Do not connect tow lines to suspension arms, suspension components or wheels. Connect only to the specific tow hook, after fitting the tow hook in its relative mounting.

Remember that the power steering and brake servo do not function with the engine off.



- Select the tow hook **(A)** from the tool bag in the luggage compartment.



- Tighten the toe eye completely into the indicated seat.
- Do not use any anchor points for towing other than the tow eye fitted correctly in the indicated seat.

- Release the **Park Lock** carrying out the CAR WASH procedure, if possible, or carrying out the emergency Park Lock release procedure.
- Deactivate the **Parking Brake**, using the relative lever if possible, or carrying out the emergency electric parking brake release procedure.
- Keep the ignition key turned to **II** to enable the lights to work and to prevent the steering wheel from locking if turned, to keep the Park Lock deactivated (when using the CAR WASH procedure) and to prevent electric parking brake activation (if the AUTO PARK function is enabled).

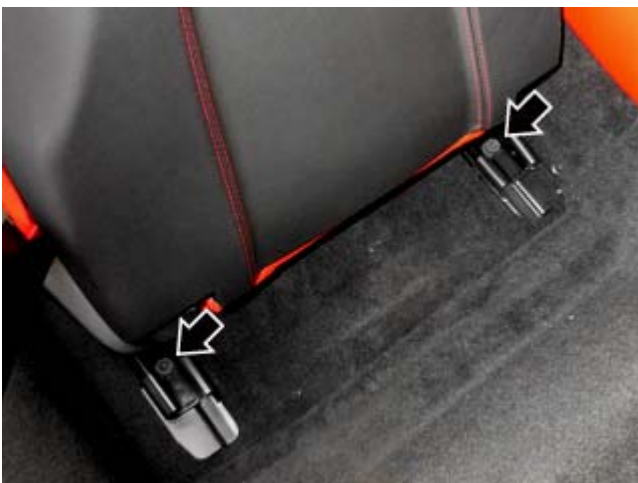
E4.01 Seats

Removing the seats

Driver seat

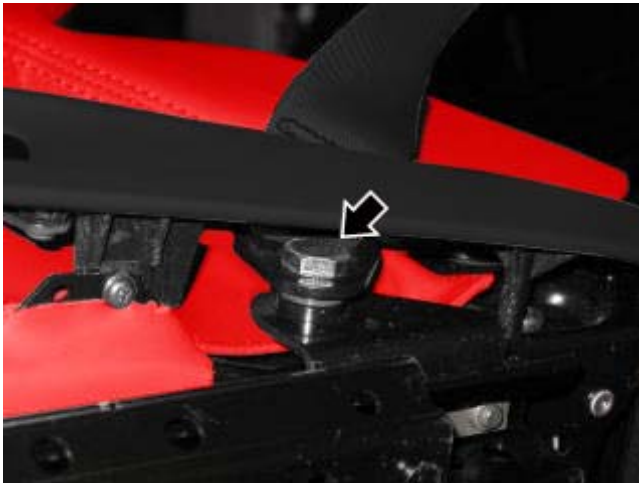


- Move the seat all the way back.
- Undo the screws indicated.



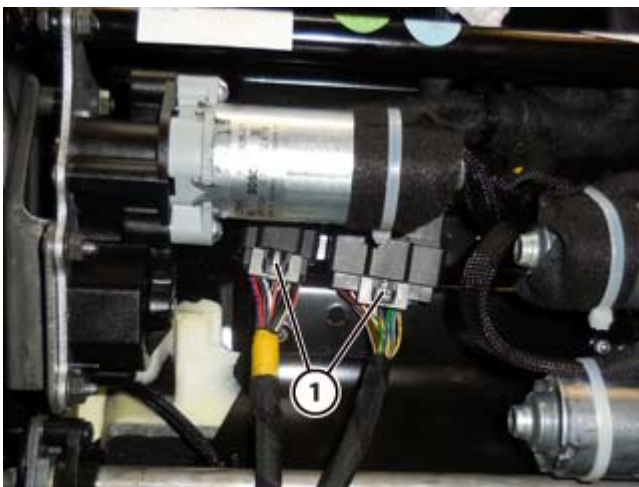
- Move the seat all the way forwards.
- Undo the screws indicated.

- Lift the seat and tilt towards the interior of the vehicle.



- Undo the indicated screw fastening the seat belt.

- Disconnect the battery (🔌 F2.01).



- Disconnect the connectors **(1)**.

- Remove the seat.

Passenger seat



- Move the seat all the way back.
- Undo the screws indicated.



- Move the seat all the way forwards.
- Undo the screws indicated.

- Lift the seat and tilt towards the interior of the vehicle.



- Undo the indicated screw fastening the seat belt.

- Disconnect the battery (🔋 F2.01).



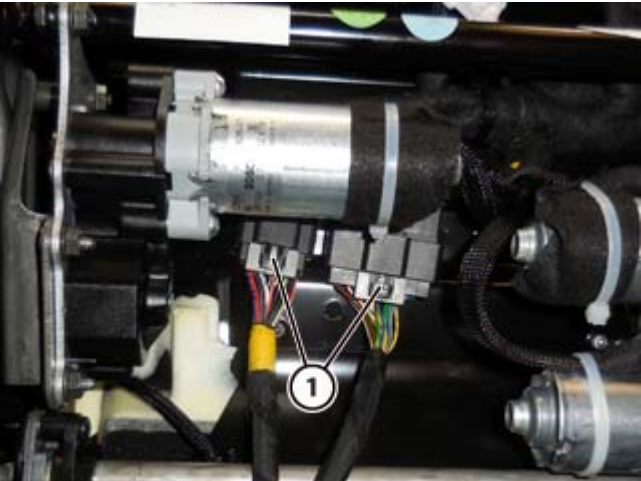
- Disconnect the connector **(1)**.

- Remove the seat.

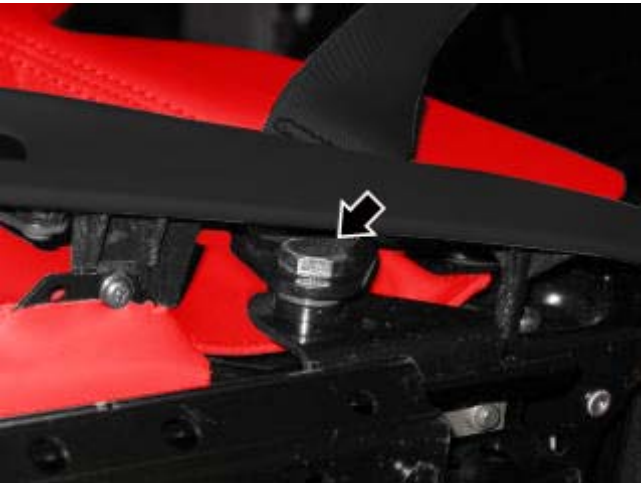
Refitting the seats

			
Tightening torque		Nm	Class
Fastening seat belts	Screw	40 Nm	B
Fastening seat	Screw	40 Nm	B

Driver seat

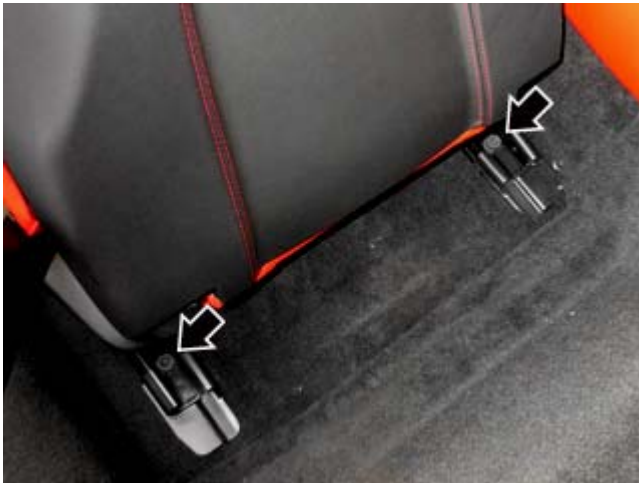


- Connect the connectors **(1)**.
- Connect the battery ( F2.01).



- Tighten the indicated screw fastening the seat belt.

		
Tightening torque	Nm	Class
Screw	40 Nm	B



- Move the seat all the way forwards.
- Tip the backrest forwards.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B



- Move the seat all the way back.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B

Passenger seat



- Connect the connectors (1).
- Connect the battery ( F2.01).



- Tighten the indicated screw fastening the seat belt.

		
Tightening torque	Nm	Class
Screw	40 Nm	B



- Move the seat all the way forwards.
- Tip the backrest forwards.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B



- Move the seat all the way back.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B

E4.02 Dashboard

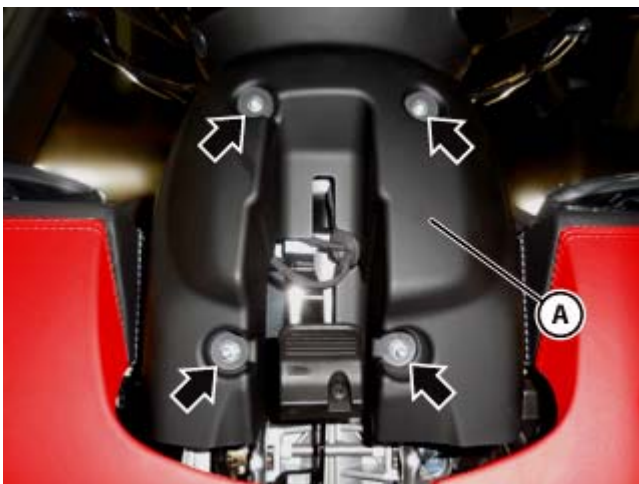
Removing the dashboard trim panels

Instrument panel trim



- Undo the screws indicated.
- Detach and remove the trim panel **(A)**.

Steering column trim



For vehicles with mechanically adjustable steering column

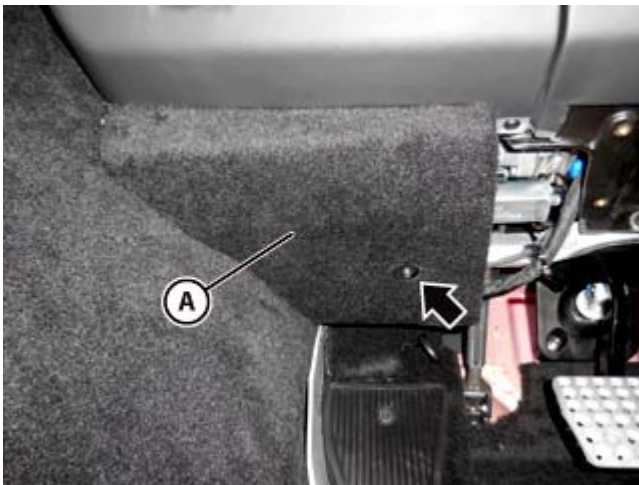
- Undo the screws and nuts indicated.
- Detach the lower trim panel **(A)**, separating it from the upper trim panel.



For vehicles with electrically adjustable steering column

- Disconnect the battery (🔌 F2.01).
- Undo the screws and nuts indicated.
- Detach the lower trim panel (A), separating it from the upper trim panel and disconnecting the steering column adjustment control connector.

Underdashboard trim panels



Driver side underdashboard trim panel

- Undo the indicated screw.
- Remove the trim (A).



Passenger side underdashboard trim panel

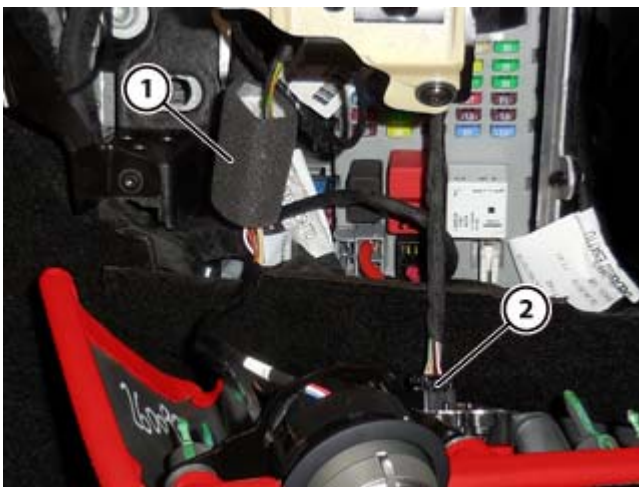
- Remove the passenger compartment mats (🔌 E4.05).
- Fold down the passenger side footrest mat.
- Undo the screws indicated.
- Remove the trim (A).

Lower left hand trim panel

- Disconnect the battery (🔌 F2.01).



- Undo the indicated screw.
- Remove the trim **(A)**.

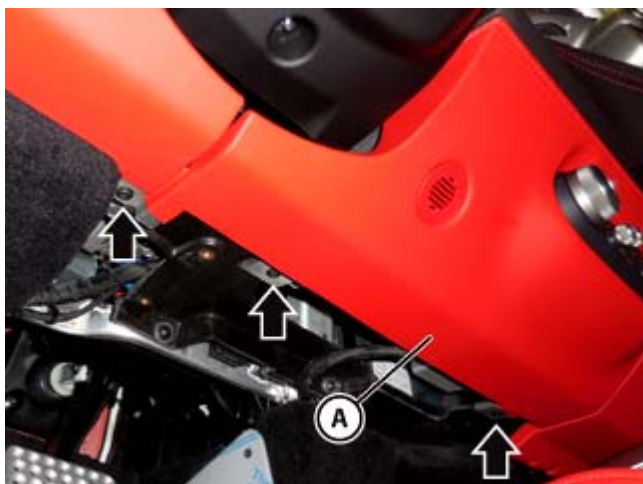


- Disconnect the connector **(1)**.
- Disconnect the connector **(2)**.

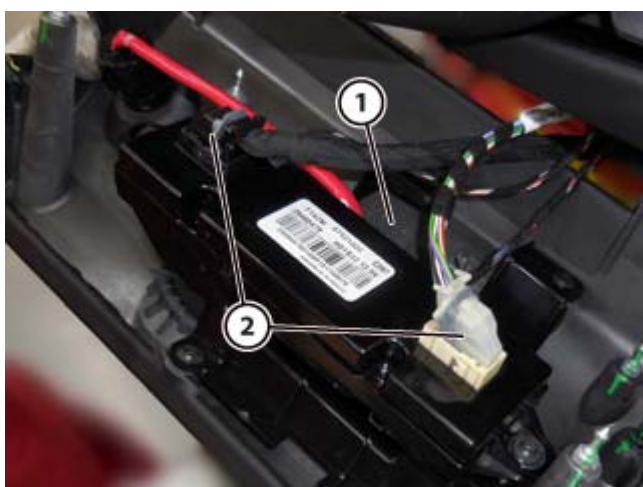
- Remove the lower left hand trim.

Lower centre trim panel

- Disconnect the battery (🔌 F2.01).



- Undo the screws indicated.
- Remove the trim **(A)**.



- Disconnect the connector **(1)**.
- Disconnect the connectors **(2)**.

- Remove the lower central trim panel.

Passenger side lateral trim panel



- Detach and remove the trim panel **(A)**.

Removing the passenger side cosmetic trim

- Remove the passenger side lateral trim panel
- Remove the lower central trim.



- Undo the indicated screw.



- Undo the screws indicated.
- Remove the cosmetic trim **(A)**, disconnecting the glove compartment light connector and the air vent control connector.

Removing the glove compartment

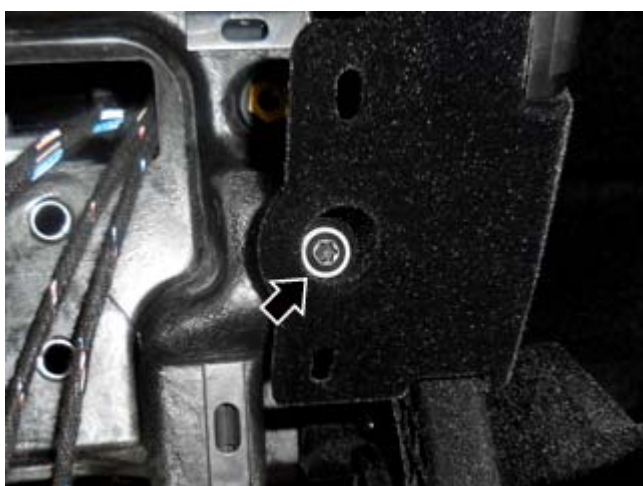
- Remove the passenger side cosmetic trim.
- Remove the passenger side underdashboard trim panel.



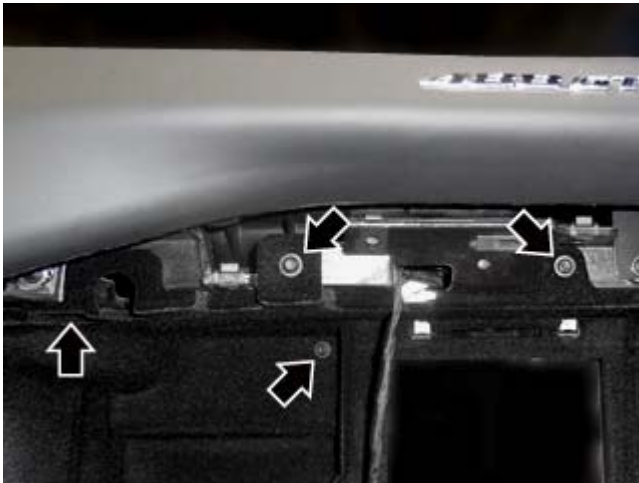
- Undo the screws indicated.



- Undo the indicated screw.



- Undo the indicated screw.



- Undo the screws indicated.



- Disconnect the connector **(1)**.

Passenger side upper trim panel

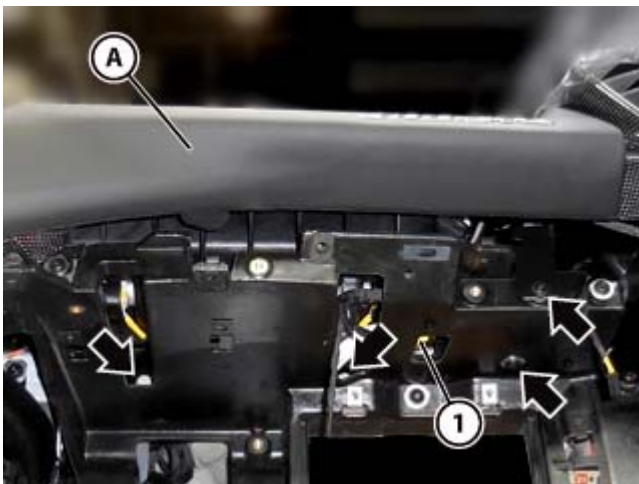
- Remove the glove compartment.



- Undo the screws indicated.



- Undo the indicated nut.



- Undo the screws indicated.
- Detach and remove the trim panel **(A)**, disconnecting the connector **(1)**.

Driver side upper LH trim

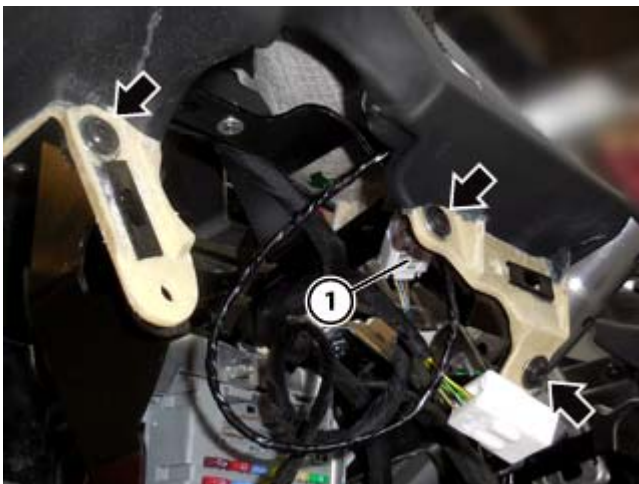
- Remove the instrument panel ([E5.02](#)).
- Remove the lower left hand trim.



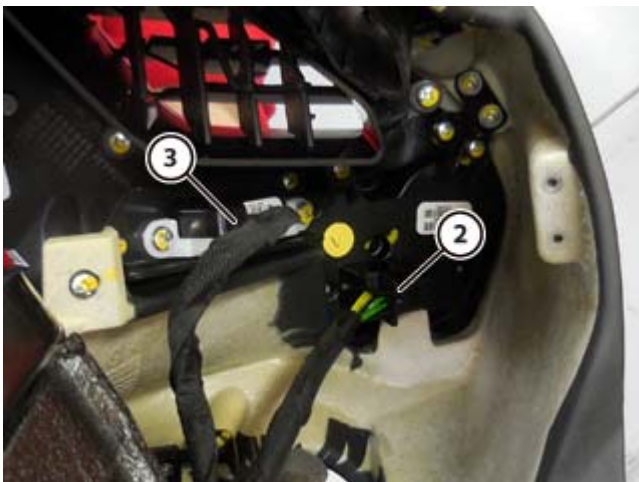
- Undo the screws indicated.



- Undo the screws indicated.



- Release and disconnect connector **(1)**.
- Undo the screws indicated.
- Detach the left hand upper trim panel.



- Disconnect the connector **(2)**.
- Disconnect the connector **(3)**.

- Remove the left hand upper trim panel.

Driver side upper RH trim

- Remove the instrument panel (🔧 E5.02).
- Remove the passenger side upper trim panel.



- Undo the screws indicated.



- Undo the screws indicated.



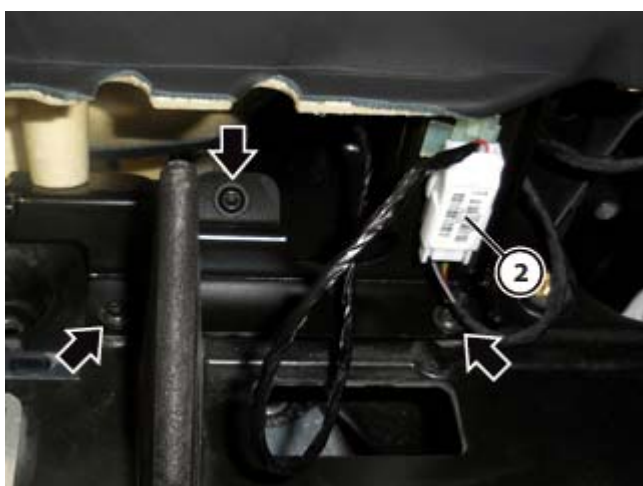
- Undo the screws indicated.



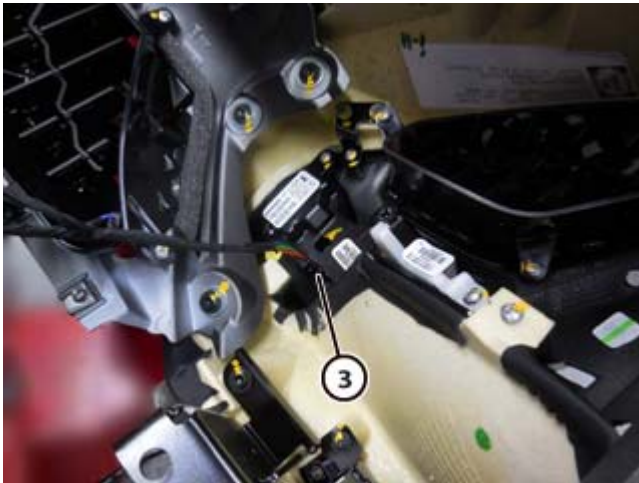
- Undo the screws indicated.
- Disconnect the connector **(1)**.



- Undo the indicated screw.



- Undo the screws indicated.
- Release and disconnect connector **(2)**.



- Detach the right hand upper trim panel, disconnecting the air vent connectors and the connector **(3)**.

- Remove the left hand upper trim panel.

Upper cosmetic grille

- Remove the driver side and passenger side upper trim panels.



- Undo the indicated screw.



- Undo the screws indicated.



- Undo the indicated screw.

- Detach and remove the upper cosmetic trim panel, disconnecting the sunlight sensor connector.

Refitting the dashboard trim panels

			
Tightening torque		Nm	Class
Fastening the dashboard trim panels	Screw	5 Nm	B
	Screw	3.5 Nm	B
	Screw	8.5 Nm	B
	Nut	3.5 Nm	B
	Screw	2.6 Nm	B

Upper cosmetic grille

- Detach and remove the upper cosmetic trim panel, disconnecting the sunlight sensor connector.



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



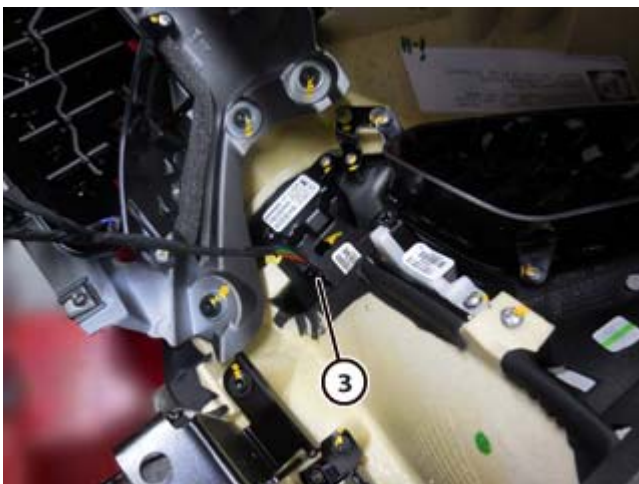
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

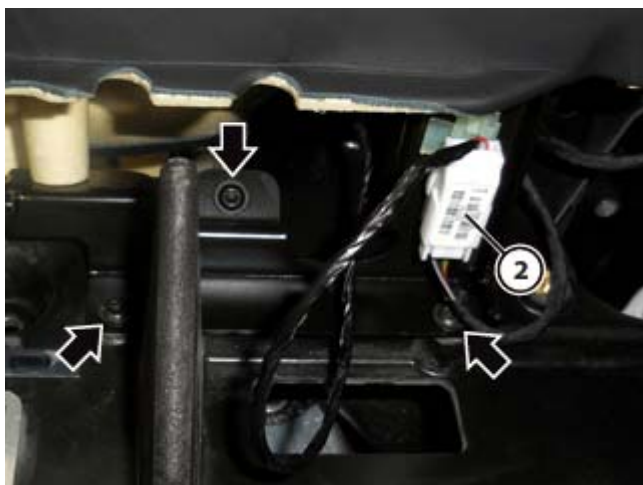
- Refit the driver side and passenger side upper trim panels.

Driver side upper RH trim

- Fit the left hand upper trim panel.



- Connect the air vent connectors and the connector **(3)** and fit and fasten the right hand upper trim panel.



- Connect and fasten the connector **(2)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



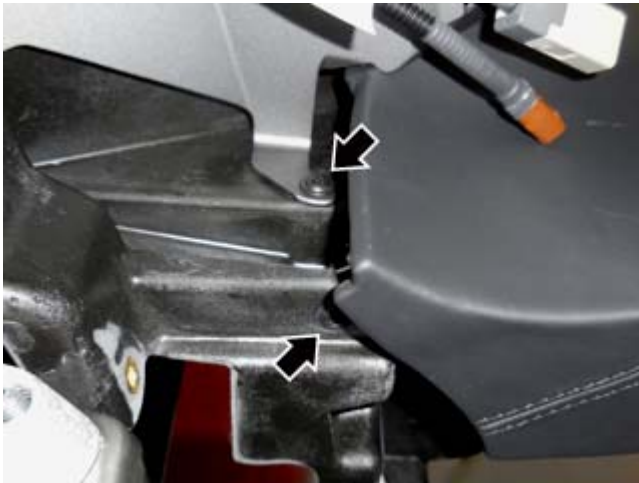
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Connect the connector **(1)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



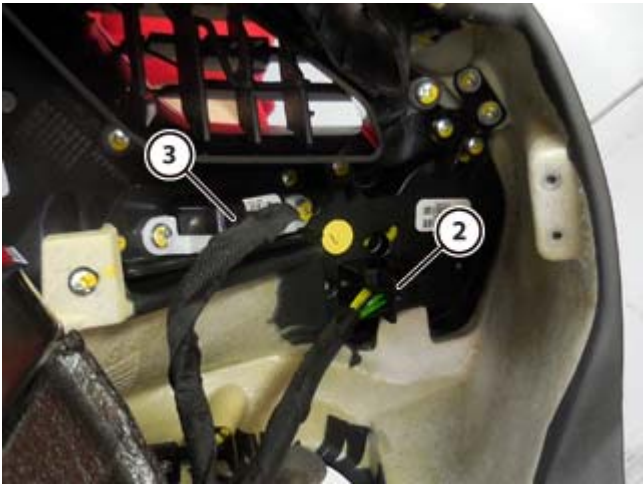
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

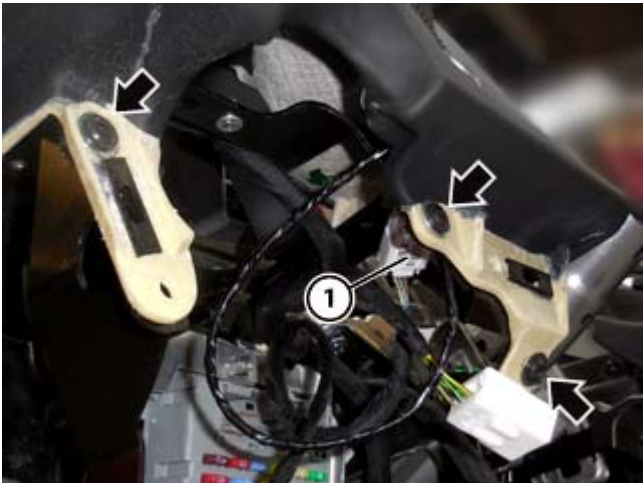
- Refit the instrument panel ( E5.02).
- Refit the passenger side upper trim panel.

Driver side upper LH trim

- Fit the left hand upper trim panel.



- Connect the connector (3).
- Connect the connector (2).



- Fit and fasten the left hand upper trim panel.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

- Connect and fasten the connector (1).



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



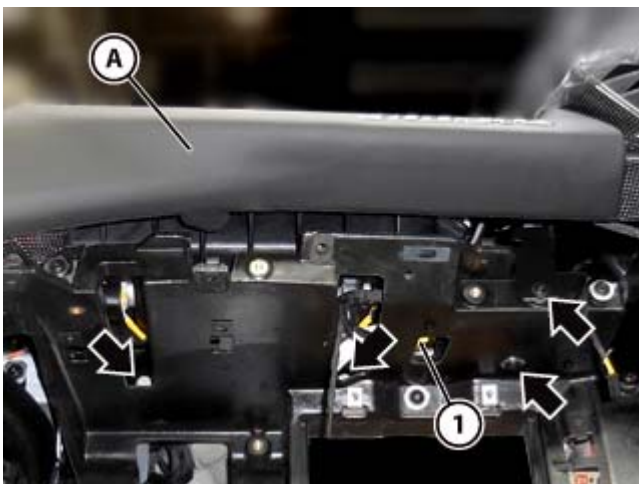
- Refit the instrument panel (🔧 E5.02).
- Refit the lower left hand trim.

- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	2.6 Nm	B

Passenger side upper trim panel



- Fit and fasten the trim panel **(A)**, connecting the connector **(1)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	3.5 Nm	B
Screw	8.5 Nm	B



- Tighten the indicated nut.



Tightening torque	Nm	Class
Nut	3.5 Nm	B



- Tighten the screws indicated.

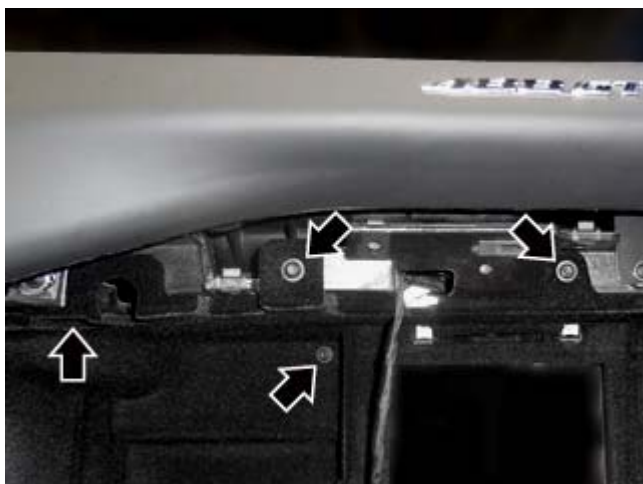
		
Tightening torque	Nm	Class
Screw	3.5 Nm	B

- Refit the glove compartment.
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
-  Perform the airbag ECU cycle with the DEIS diagnostic tester.

Removing the glove compartment

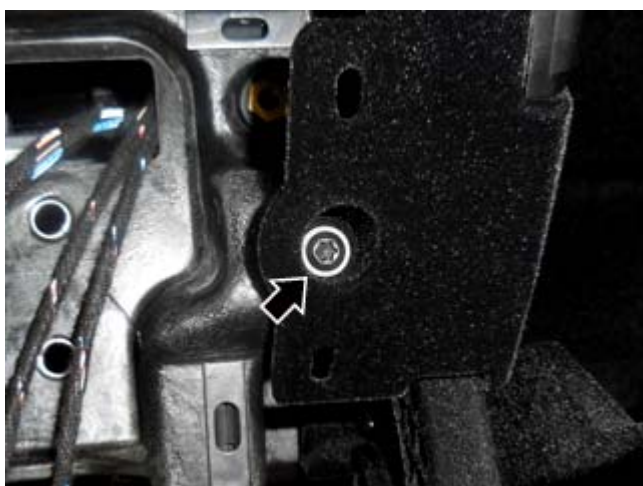


- Connect the connector **(1)**.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Refit the passenger side underdashboard trim panel.
- Refit the passenger side cosmetic trim.

Removing the passenger side cosmetic trim



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

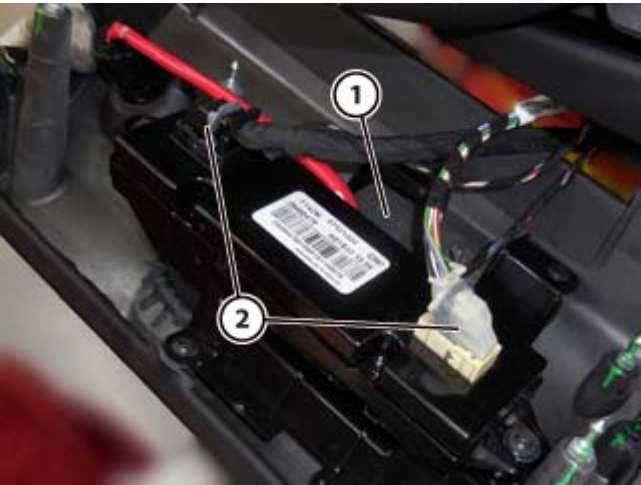
- Fit the cosmetic trim **(A)**, connecting the glove compartment light connector and the air vent control connector.
- Tighten the screws indicated.



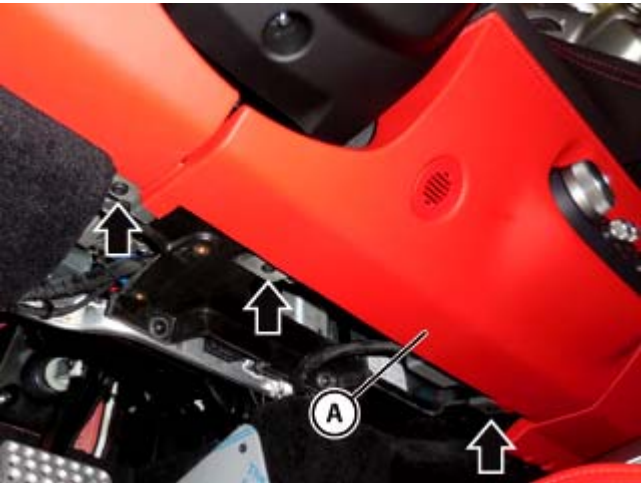
- Tighten the indicated screw.

- Refit the lower central trim.
- Refit the passenger side lateral trim panel

Lower centre trim panel



- Connect the connectors **(2)**.
- Connect the connector **(1)**.



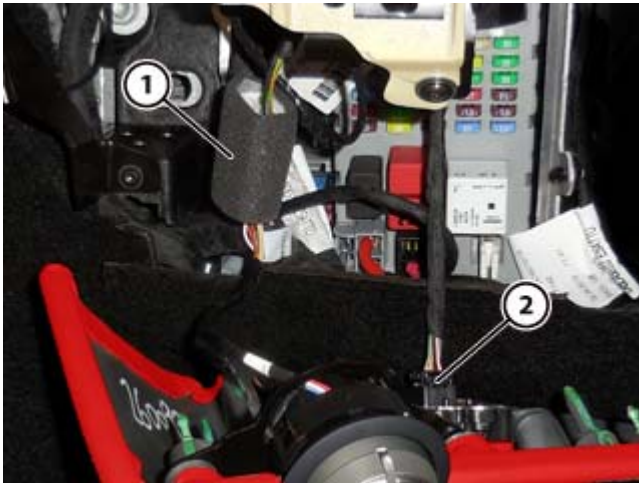
- Fit and fasten the trim panel **(A)**, pressing manually into place.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Connect the battery ( F2.01).
- Remove the lower central trim panel.

Lower left hand trim panel

- Fit the lower left hand trim panel.



- Connect the connector **(2)**.
- Connect the connector **(1)**.

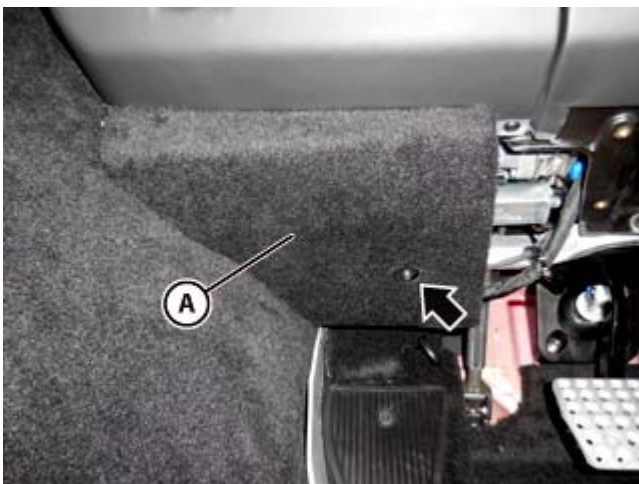


- Fit the trim panel **(A)** and fasten by pressing manually into place.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Disconnect the battery ( F2.01).

Underdashboard trim panels



Driver side underdashboard trim panel

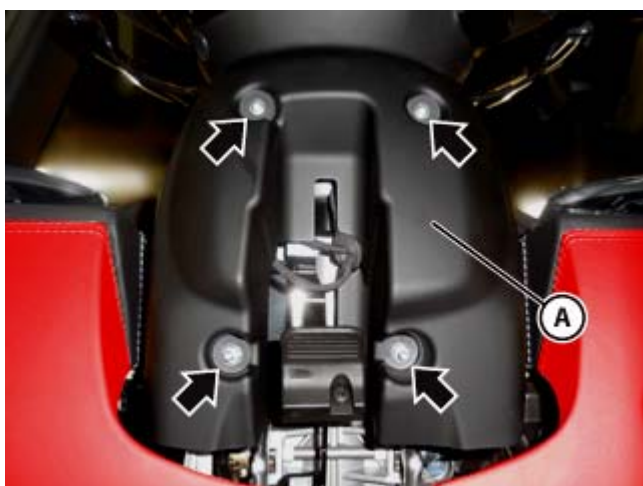
- Fit the trim **(A)**.
- Tighten the indicated screw.



Passenger side underdashboard trim panel

- Fit the trim (A).
- Tighten the screws indicated.
- Refit the passenger compartment mats (🔧 E4.05).
- Refit the passenger side footrest mat.

Steering column trim



For vehicles with mechanically adjustable steering column

- Fit and fasten the lower trim panel (A), fastening it to the upper trim panel.
- Tighten the screws and nuts indicated.

		
Tightening torque	Nm	Class
Nut	3.5 Nm	B
Screw	2.6 Nm	B



For vehicles with electrically adjustable steering column

- Fit and fasten the lower trim panel (A), fastening it to the upper trim panel and connecting the steering column adjustment control connector.
- Tighten the screws and the nut indicated.

		
Tightening torque	Nm	Class
Nut	3.5 Nm	B
Screw	2.6 Nm	B

- Connect the battery (🔧 F2.01).

Instrument panel trim



- Fit and fasten the trim panel (A).
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

Removing the dashboard

- Preparation in progress

Refitting the dashboard

- Preparation in progress

E4.03 Centre tunnel console trim

Removing the centre tunnel console trim

➤ Disconnect the battery (🔌 F2.01).



- Detach and remove the trim elements **(A)**.



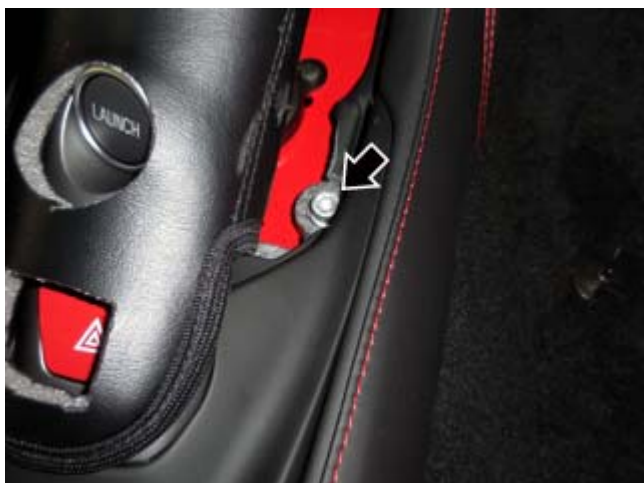
- Undo the screws indicated.



- Detach and remove the cover **(B)**.



- Undo the indicated screw.



- Undo the indicated screw.



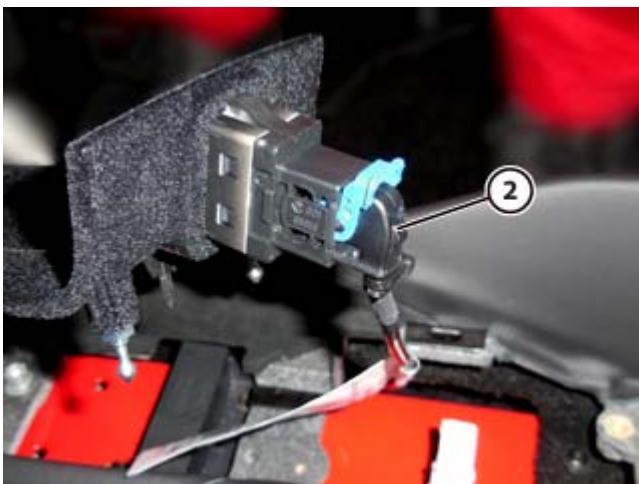
- Detach the trim **(C)**.



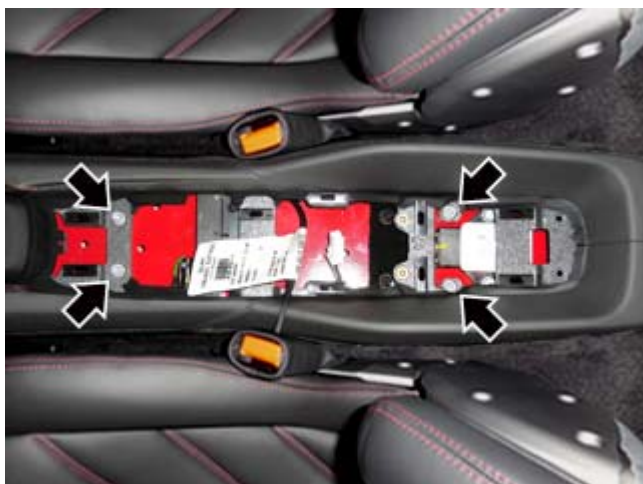
- Disconnect the connector **(1)**.



- Detach the trim **(D)**.



- Disconnect the connector **(2)**.



- Undo the screws indicated.

- Lift the centre tunnel console trim.



- Disconnect the connectors **(3)**.



- Disconnect the connector **(4)**.

- Remove the centre tunnel console trim.

Refitting the centre tunnel trim



Tightening torque		Nm	Class
Fastening centre tunnel trim panel	Screw	8 Nm	B

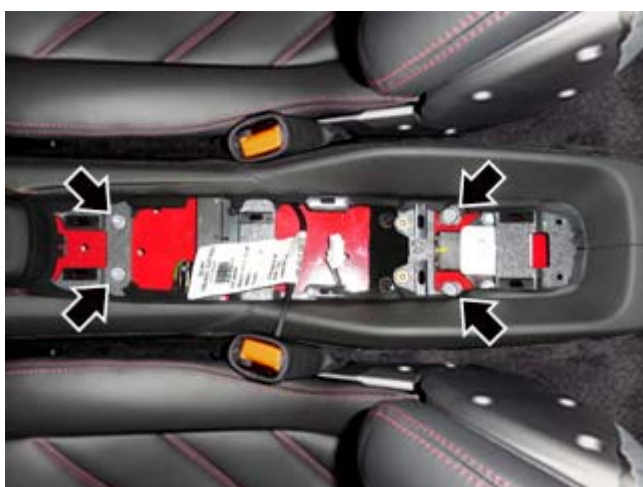


- Connect the connector **(4)**.



- Connect the connectors **(3)**.

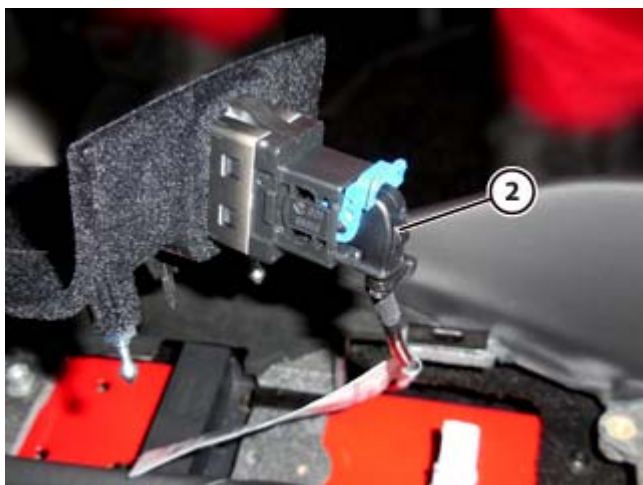
- Fit the centre tunnel console trim.



- Tighten the screws indicated.



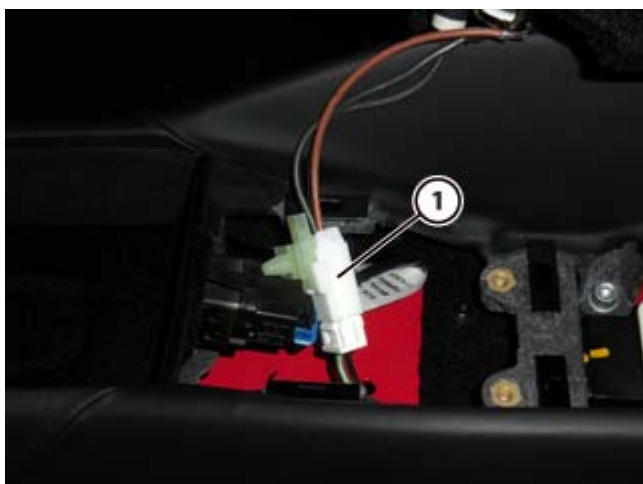
Tightening torque	Nm	Class
Screw	8 Nm	B



- Connect the connector **(2)**.



- Fit and fasten the trim **(D)**, pressing manually into place.



- Connect the connector **(1)**.



- Fit and fasten the trim **(C)**, pressing manually into place.



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	8 Nm	B



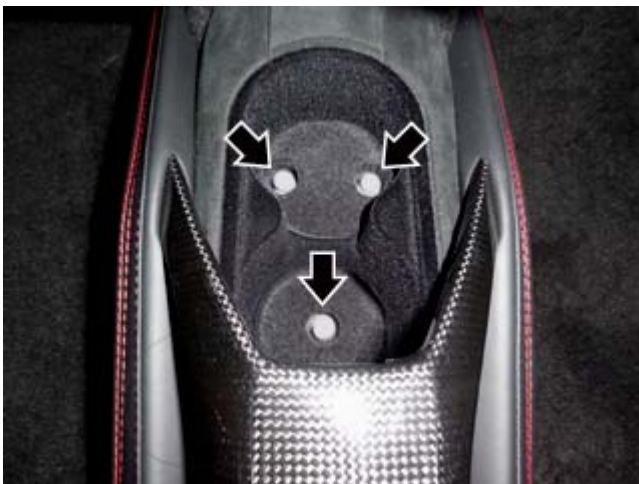
- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	8 Nm	B



- Fit and fasten the trim **(B)**, pressing manually into place.



- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B



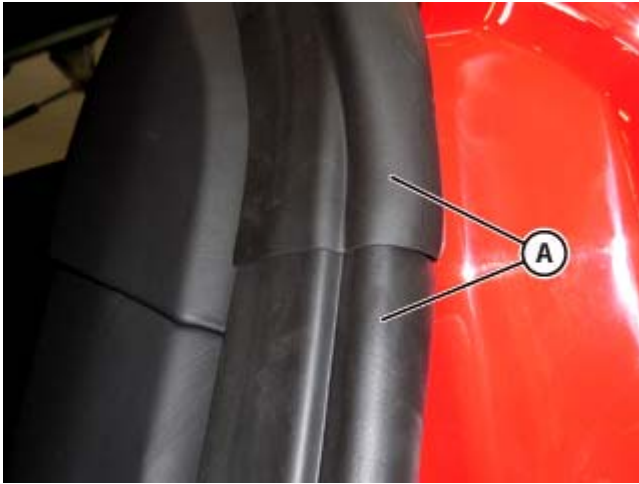
- Fit and fasten the trim elements **(A)**.

➤ Connect the battery ( F2.01).

E4.04 Passenger compartment and roof trim panels

Removing the passenger compartment trim panels

Left hand upper lateral trim panel



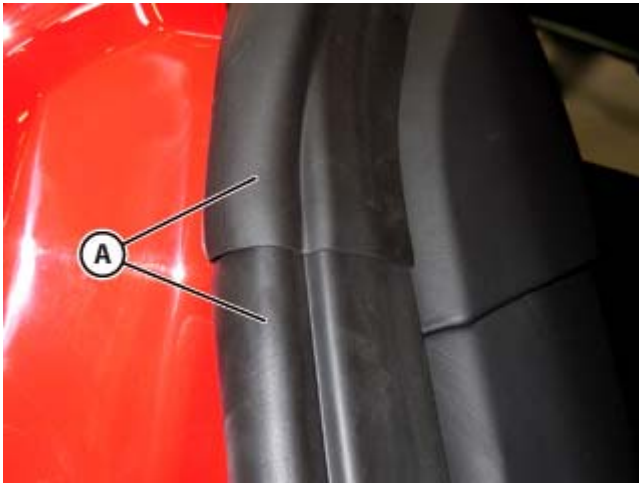
- Detach the upper and lower portions of the door perimeter seal **(A)**.



- Undo the indicated screw.

- Detach and remove the upper lateral trim panel, pulling out the seat belt.

Right hand upper lateral trim panel



- Detach the upper and lower portions of the door perimeter seal **(A)**.



- Undo the indicated screw.

- Detach and remove the upper lateral trim panel, pulling out the seat belt.

Left hand lower lateral trim panel

- Disconnect the battery ( F2.01).
- Remove the left hand upper lateral trim panel.



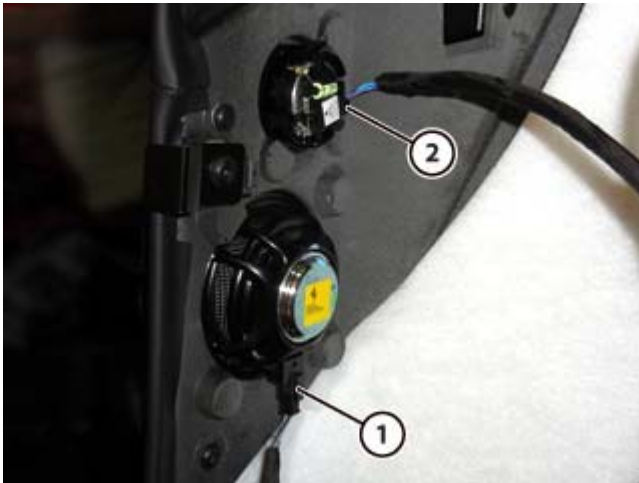
- Undo the indicated screw.



- Undo the indicated screw.



- Undo the indicated screw.



- Disconnect the connector **(1)**.
- Disconnect the connector **(2)**.

- Remove the lower lateral trim panel.

Right hand lower lateral trim panel

- Disconnect the battery (🔋 F2.01).
- Remove the right hand upper lateral trim panel.



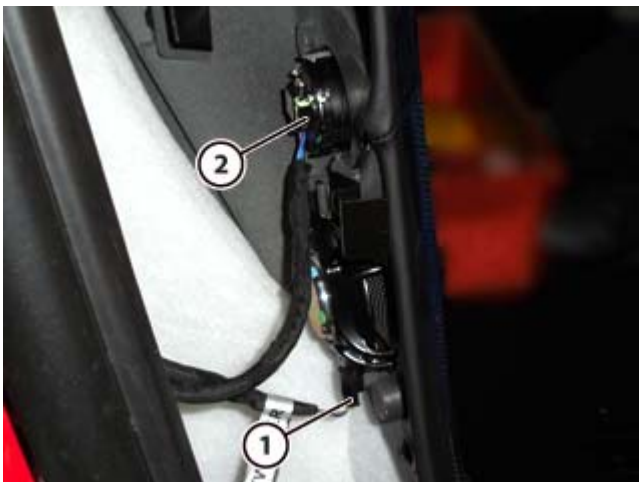
- Undo the indicated screw.



- Undo the indicated screw.



- Undo the indicated screw.



- Disconnect the connector **(1)**.
- Disconnect the connector **(2)**.

- Remove the lower lateral trim panel.

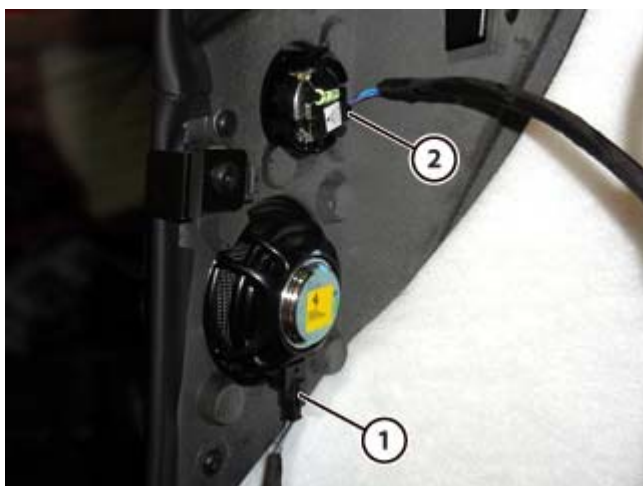
Refitting the passenger compartment trim panels



Tightening torque		Nm	Class
Fastening passenger compartment trim panels	Screw	4 Nm	B
	Screw	5 Nm	B
	Nut	4 Nm	B

Left hand lower lateral trim panel

- Fit the lower lateral trim panel.



- Connect the connector (2).
- Connect the connector (1).



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	4 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



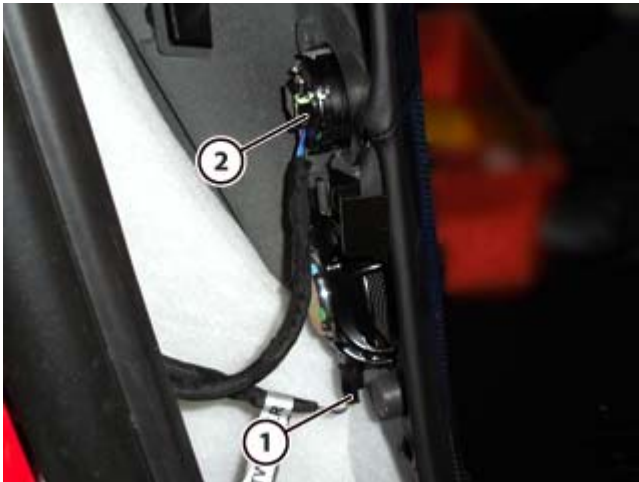
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Refit the left hand upper lateral trim panel.
- Connect the battery ( F2.01).

Right hand lower lateral trim panel

- Fit the lower lateral trim panel.



- Connect the connector **(2)**.
- Connect the connector **(1)**.



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	4 Nm	B



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	4 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Refit the right hand upper lateral trim panel.
- Connect the battery ( F2.01).

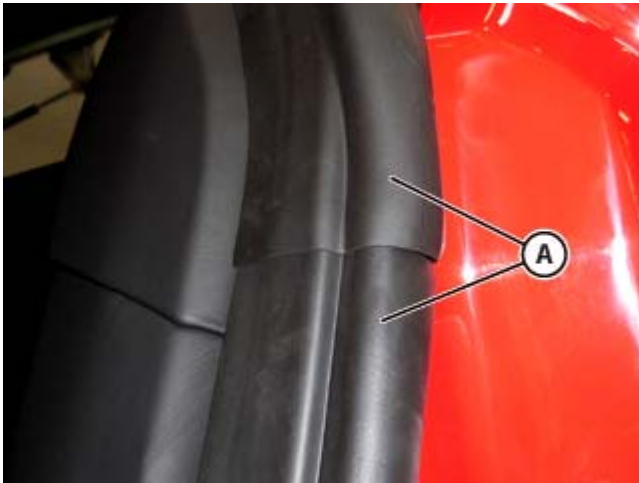
Left hand upper lateral trim panel

- Fit and fasten the upper lateral trim panel, inserting the seat belt.



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



- Fit the upper and lower portions of the door perimeter seal **(A)**.

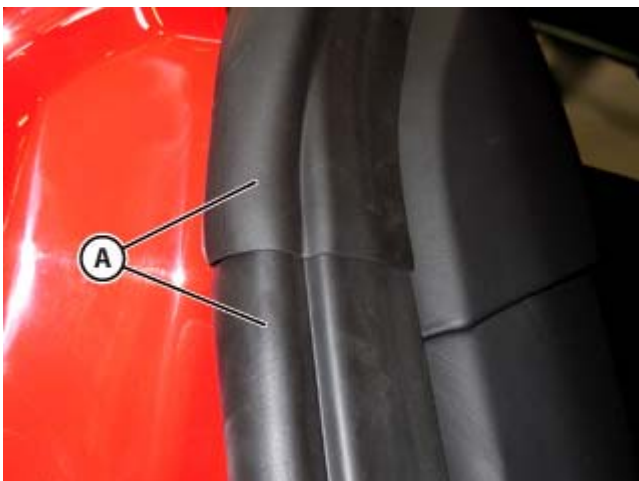
Right hand upper lateral trim panel

- Fit and fasten the upper lateral trim panel, inserting the seat belt.



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



- Fit the upper and lower portions of the door perimeter seal **(A)**.

Removing the roof trim panels

Sun visors



Driver side sun visor

- Undo the screws indicated.
- Remove the sun visor **(A)**, complete with the relative mounts and spacers.



Passenger side sun visor

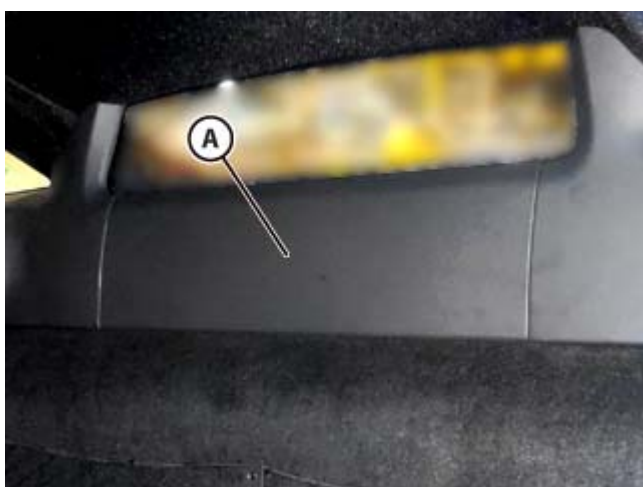
- Undo the screws indicated.
- Remove the sun visor **(A)**, complete with the relative mounts and spacers.

Centre rear screen trim panel

- Remove the engine compartment cosmetic shields (E3.13).
- Remove the front cosmetic engine compartment shield.



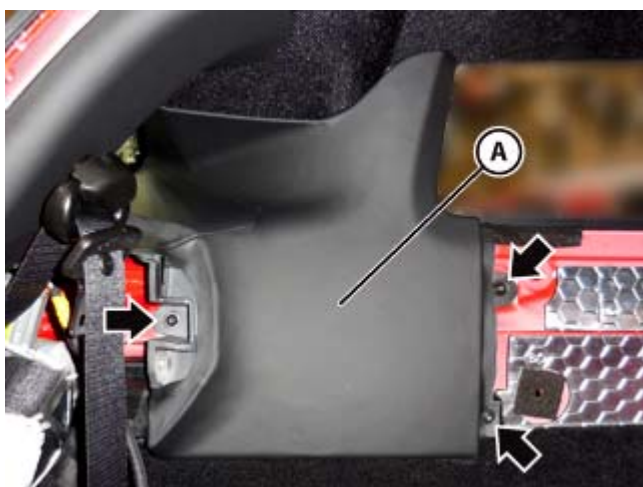
- Undo the nuts indicated.



- Detach and remove the trim panel **(A)**.

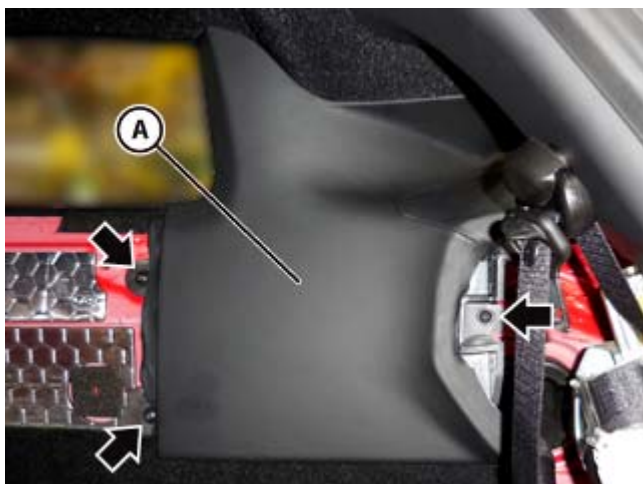
Rear screen lateral trim panels

- Remove the centre rear screen trim.



Right hand lateral rear screen trim panel

- Remove the passenger compartment trim panels ( E4.04).
- Remove the lower right hand lateral trim panel.
- Undo the screws indicated.
- Remove the trim **(A)**.



Left hand lateral rear screen trim panel

- Remove the passenger compartment trim panels (E4.04).
- Remove the lower left hand lateral trim panel.
- Undo the screws indicated.
- Remove the trim (A).

Upper B-pillar trim panels



Right hand B-pillar trim panel

- Remove the passenger compartment trim panels (E4.04).
- Remove the lower right hand lateral trim panel.
- Undo the screws indicated.
- Detach and remove the trim panel (A).



Left hand B-pillar trim panel

- Remove the passenger compartment trim panels (E4.04).
- Remove the lower left hand lateral trim panel.
- Undo the screws indicated.
- Detach and remove the trim panel (A).

Refitting the roof trim panels

			
Tightening torque		Nm	Class
Fastening seat belts	Screw	40 Nm	B
Fastening roof trim panels	Screw	7 Nm	B
	Screw	5 Nm	B
	Nut	4 Nm	B
	Screw	3 Nm	B

Upper B-pillar trim panels



Right hand B-pillar trim panel

- Fit and fasten the trim panel **(A)**.
- Tighten the screws indicated.
- Tighten the indicated screw fastening the seat belt turning loop.

		
Tightening torque	Nm	Class
Screw	40 Nm	B

- Tighten the indicated screw fastening the trim **(A)**.

		
Tightening torque	Nm	Class
Screw	7 Nm	B

- Refit the passenger compartment trim panels (E4.04).
- Refit the lower right hand lateral trim panel.



Left hand B-pillar trim panel

- Fit and fasten the trim panel (A).
- Tighten the screws indicated.
- Tighten the indicated screw fastening the seat belt turning loop.



Tightening torque	Nm	Class
Screw	40 Nm	B

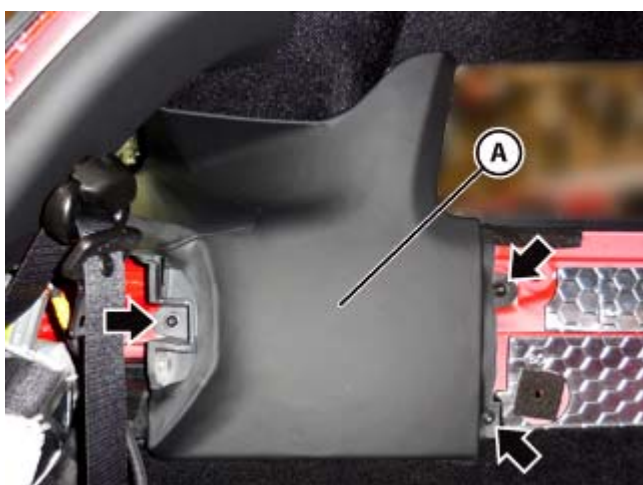
- Tighten the indicated screw fastening the trim (A).



Tightening torque	Nm	Class
Screw	7 Nm	B

- Refit the passenger compartment trim panels (E4.04).
- Refit the lower left hand lateral trim panel.

Rear screen lateral trim panels



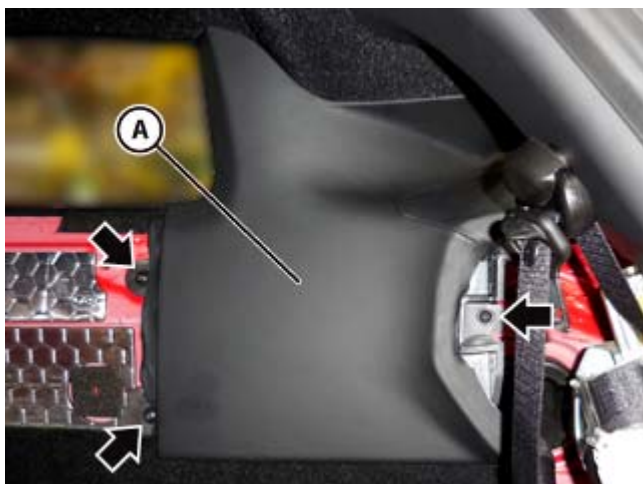
Right hand lateral rear screen trim panel

- Fit the trim (A).
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	5 Nm	B

- Refit the passenger compartment trim panels (E4.04).
- Refit the lower right hand lateral trim panel.



Left hand lateral rear screen trim panel

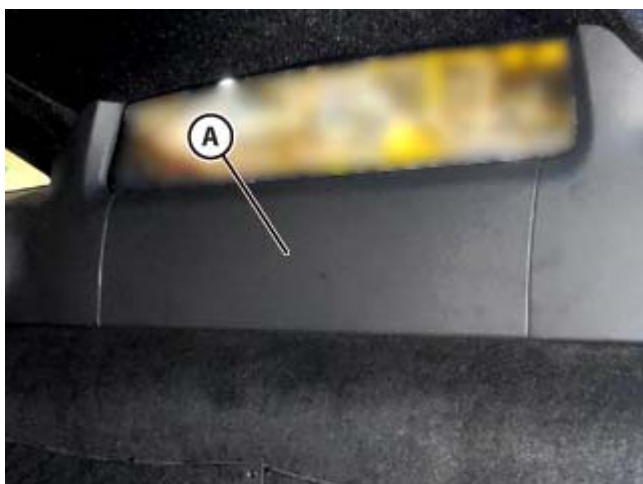
- Fit the trim (A).
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Refit the passenger compartment trim panels (E4.04).
- Refit the lower right hand lateral trim panel.

- Refit the centre rear screen trim.

Centre rear screen trim panel



- Fit the trim panel (A) and fasten by pressing manually into place.



- Tighten the nuts indicated.

		
Tightening torque	Nm	Class
Nut	4 Nm	B

- Remove the engine compartment cosmetic shields (🔧 E3.13).
- 🔧 Refit the front cosmetic engine compartment shield.

Sun visors



Driver side sun visor

- Refit the sun visor (A), complete with the relative mounts and spacers.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	3 Nm	B



Passenger side sun visor

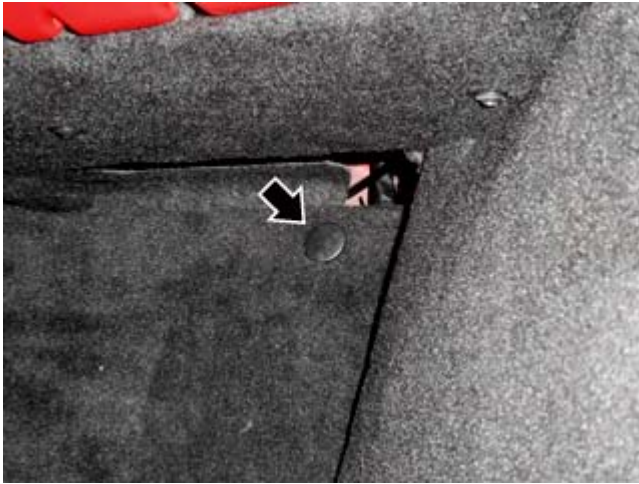
- Remove the sun visor (A), complete with the relative mounts and spacers.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	3 Nm	B

E4.05 Mats

Removing the passenger compartment mats

Passenger side footrest mat

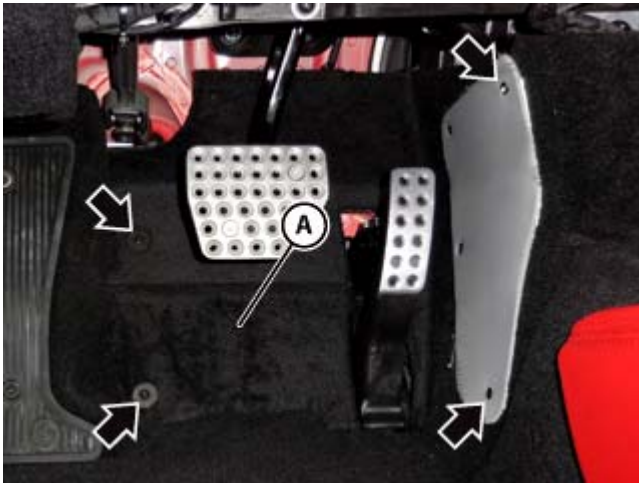


- Undo the indicated pin.



- Fold down the mat **(A)**.
- Undo the screws indicated.
- Remove the mat **(A)**.

Pedal mat



- Undo the screws indicated.
- Remove the mat **(A)**.

Centre console mats

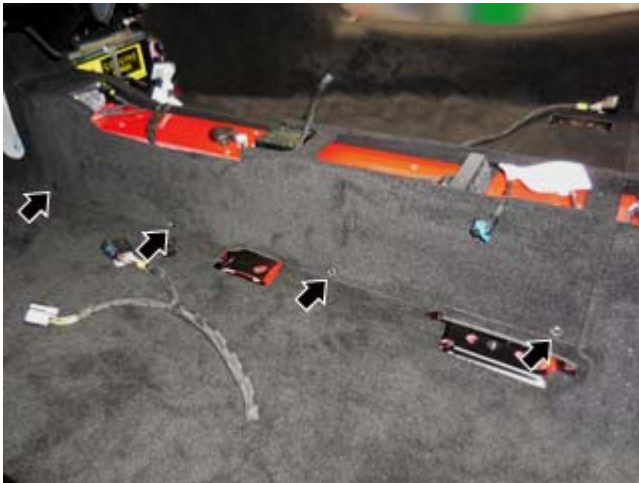


Rear tunnel mat

- Undo the screws indicated.



- Undo the screws indicated.



- Undo the screws indicated.
- Remove the rear tunnel mat.



Front tunnel mat

- Undo the screws indicated.

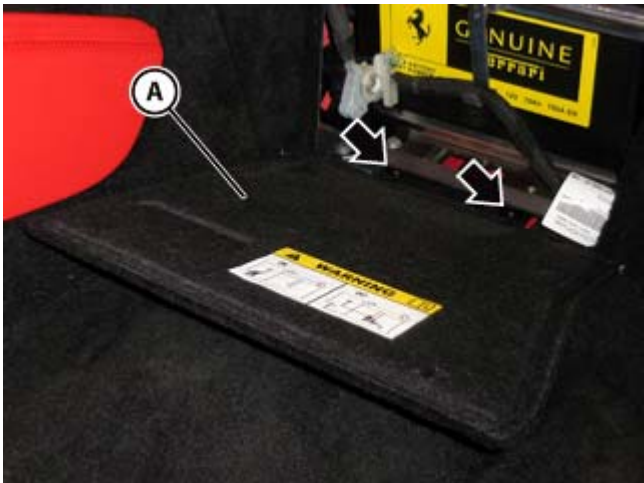


- Undo the screws indicated.
- Remove the front tunnel mat **(A)**.

Refitting the passenger compartment mats

			
Tightening torque		Nm	Class
Fastening mats	Screw	4 Nm	B
	Screw	9 Nm	B

Passenger side footrest mat



- Fit the mat **(A)**.
- Hand tighten the screws indicated.

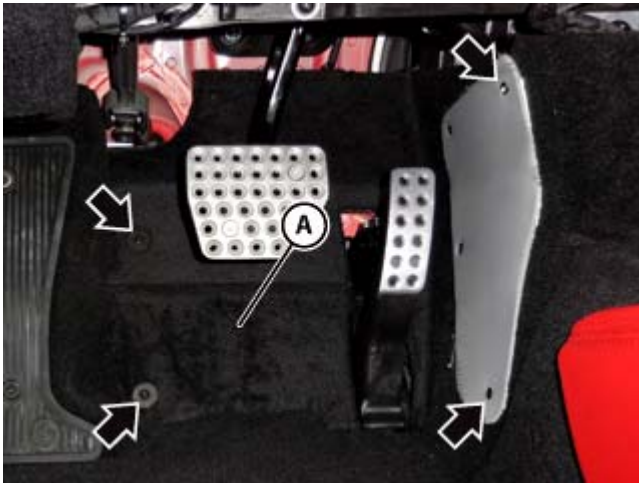
		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Lift the mat **(A)**.



- Tighten the indicated pin.

Pedal mat



- Fit the mat **(A)**.
- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

Centre console mats



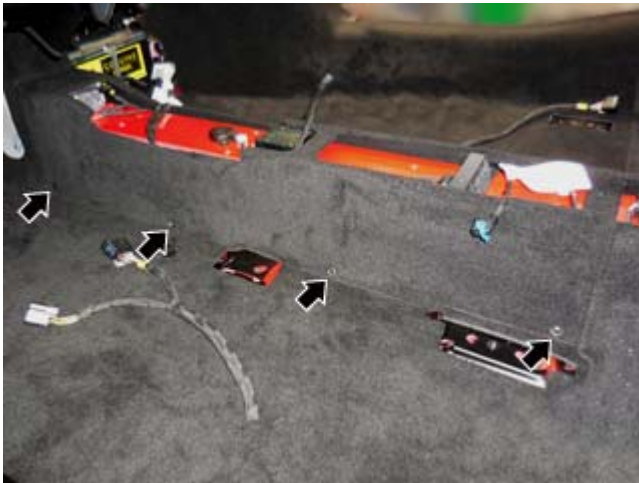
Front tunnel mat

- Fit the front tunnel mat **(A)**.
- Hand tighten the screws indicated.



- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



Rear tunnel mat

- Fit the rear tunnel mat.
- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B



- Hand tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

E4.06 Luggage compartment cosmetic trim and guards

Removing the luggage compartment trim panels

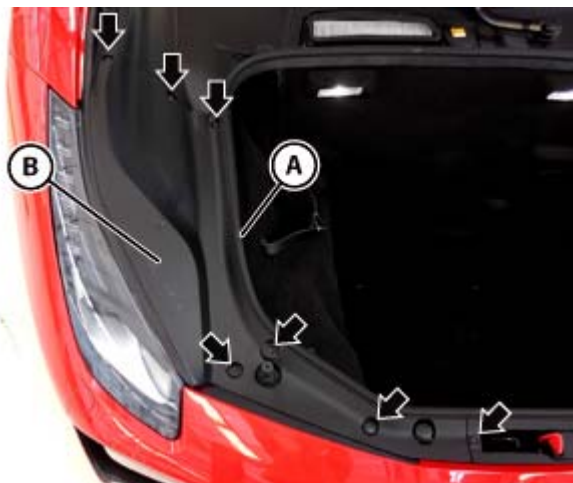
➤ Open the luggage compartment lid (🔧 E5.11).

Lateral trim panels



Left hand lateral trim

- Detach the section of seal **(A)** adjacent to the lateral trim **(B)**.
- Undo the screws indicated.
- Detach and remove the lateral trim panel **(B)**.



Left hand lateral trim

- Detach the section of seal **(A)** adjacent to the lateral trim **(B)**.
- Undo the screws indicated.
- Detach and remove the lateral trim panel **(B)**.

Underwindscreen trim



LH underwindscreen trim

- Remove the windscreen wiper arms ( E3.09).
- Remove the left hand lateral trim panel.
- Detach the section of seal **(A)** adjacent to the underwindscreen shield **(B)**.
- Undo the screws indicated.
- Detach and remove the underwindscreen shield **(B)**.



Right hand underwindscreen trim

- Remove the right hand lateral trim.
- Detach the section of seal **(A)** adjacent to the underwindscreen shield **(B)**.
- Undo the screws indicated.
- Detach and remove the underwindscreen shield **(B)**.

Luggage compartment tub

- Disconnect the battery ( F2.01).
- Remove the lateral trim panels.
- Remove the underwindscreen trim.



- Disconnect the connector **(1)**.



- Undo the screws indicated.



- Undo the screws indicated.

- Remove the luggage compartment tub by pulling it up.

Refitting the luggage compartment trim panels

			
Tightening torque		Nm	Class
Fastening luggage compartment tub	Screw	8.5 Nm	B
Fastening flat undertray sections	Screw	8 Nm	B
Fastening luggage compartment trim panels	Screw	4.5 Nm	B
	Collar screw	8 Nm	B

Luggage compartment tub

- Fit the luggage compartment tub.



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8.5 Nm	B



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	8 Nm	B



- Connect the connector **(1)**.

- Connect the battery ( F2.01).
- Refit the underwindscreen trim.
- Refit the lateral trim panels.

Underwindscreen trim



LH underwindscreen trim

- Fit and fasten the underwindscreen shield **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4.5 Nm	B

- Fit the section of seal **(A)** adjacent to the underwindscreen shield **(B)**.
- Refit the left hand lateral trim panel.
- Refit the windscreen wiper arms ( E3.09).



Right hand underwindscreen trim

- Fit and fasten the underwindscreen shield **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4.5 Nm	B

- Fit the section of seal **(A)** adjacent to the underwindscreen shield **(B)**.
- Refit the left hand lateral trim panel.

Lateral trim panels

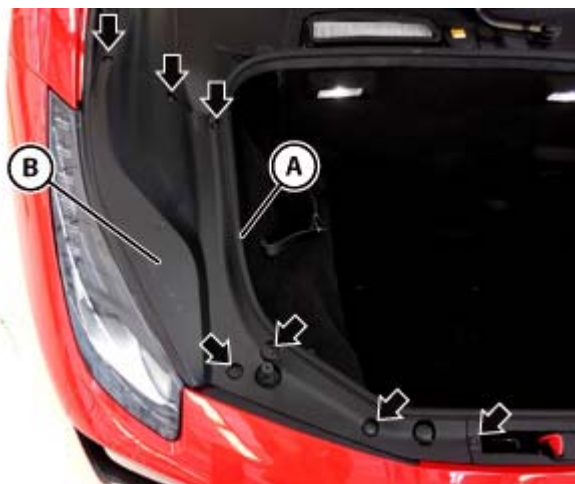


Left hand lateral trim

- Fit and fasten the lateral trim panel **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4.5 Nm	B
Collar screw	8 Nm	B

- Fit the section of seal **(A)** adjacent to the lateral trim **(B)**.



Right hand lateral trim panel

- Fit and fasten the lateral trim panel **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4.5 Nm	B
Collar screw	8 Nm	B

- Fit the section of seal **(A)** adjacent to the lateral trim **(B)**.

E5.01 Location of controls in vehicle

Instruments and controls on roof panel



- A - Door lock - unlock
- B - Disable anti-lift protection
- C - Driver side light on / Centre light on (vehicles with HELE)
- D - Centre light on / Stop&Start system on-off (vehicles with HELE)
- E - Passenger side light on / Centre light on (vehicles with HELE)
- F - Cabin light
- G - Rear view mirror
- H - Activating / deactivating electrochromic mirror
- L - Enable/disable front parking sensors (optional)

Instruments and controls on the dashboard



- A - Left hand TFT display controls
- B - EPB electric parking brake controls
- C - Lights selector
- D - Instrument cluster
- E - A.C. control panel
- F - Right hand TFT display controls
- G - Passenger display (optional)

Instruments and controls on steering wheel



- A - Horn button
- B - Turn indicator buttons
- C - High beam light switch
- D - Windscreen wiper controls
- E - Suspension decoupling button
- F - Manettino
- G - Engine start button
- H - Shift paddles

Instruments and controls on centre console



A - DCT gearbox control buttons

B - Hazard warning light button

C - Door window controls

E5.02 Instrument panel



- A - Left hand TFT display
- B - Electronic analogue tachometer
- C - Right hand TFT display
- D - DCT gearbox display
- E - Warning lights

Left hand TFT display

This display is set in the instrument panel and has the following functions:

- displaying control parameters;
- displaying general information while driving;
- indicating any faults.

To interact with the system, selecting the desired configuration and setting parameters, use the controls on the dashboard, on the left-hand side of the steering wheel.

MAIN screen

Press the MAIN button to open the MAIN screen, from which the menu screens STATUS, TRIP, VDA, TURBO and SETTINGS may be accessed.



Select **STATUS** to view the following screens:

- SPORT screen
- SPORT 2 screen
- TYRES screen



Select **TRIP** to view the following screens:

- TRIP A screen
- TRIP B screen



Select **VDA** to view the following screens:

- VEHICLE STATE screen
- MANETTINO STATUS screen
- CHRONOMETER screen



Select **TURBO** to view the following screens:

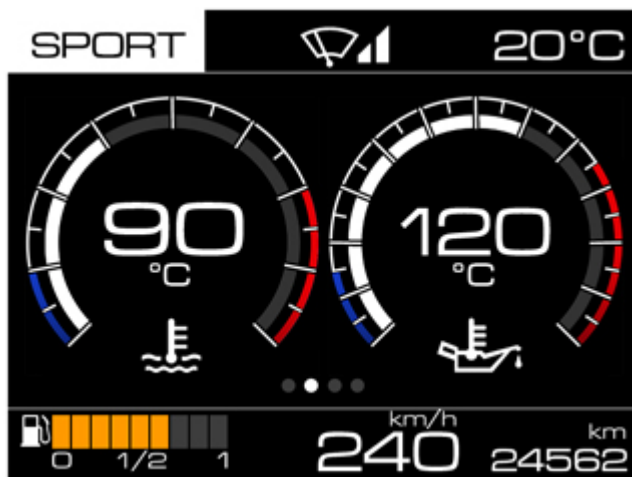
- TURBO PRESSURE screen
- TURBO RESPONSE screen
- TURBO EFFICIENCY screen



Select **SETTINGS** to view the following screens:

- MENU screen

SPORT screen

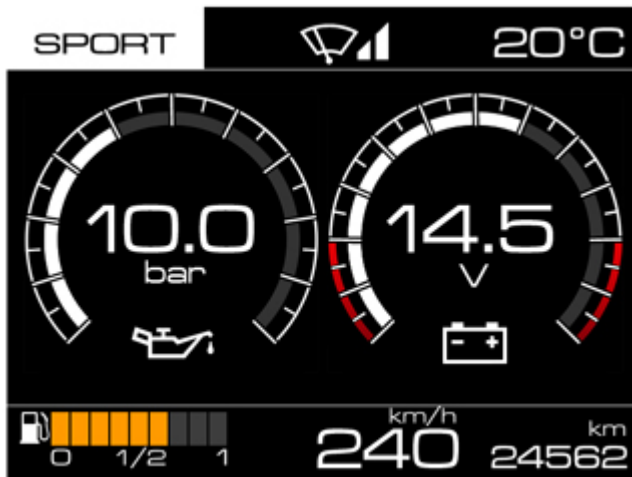


The SPORT screen contains the following virtual gauges:

- Engine coolant temperature;
- Engine oil temperature.

If any event occurs necessitating the visualisation of a specific symbol and/or message while the SPORT screen is active, the virtual indicators are displayed in minimised format.

SPORT 2 screen

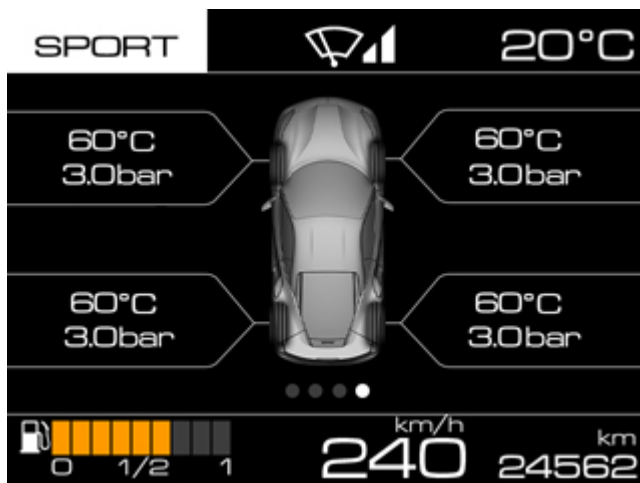


The SPORT 2 screen contains the following virtual gauges:

- Engine oil pressure;
- Voltmeter.

If any event occurs necessitating the visualisation of a specific symbol and/or message while the SPORT 2 screen is active, the virtual indicators are displayed in minimised format.

TYRES screen



The TYRES screen, which is available on vehicles with equipped with the TPMS tyre pressure and temperature monitoring system, displays a symbol of the vehicle together with the pressure and temperature values for each tyre.

If any event occurs necessitating the visualisation of a specific symbol and/or message while the TYRES screen is active, the screen is displayed in minimised format.

TRIP A and TRIP B screens



The TRIP A and TRIP B screens display the following information:

- Maximum speed;
- Average speed;
- Travel distance;
- Travel time;
- Range.

If any event occurs necessitating the visualisation of a specific symbol and/or message while the TRIP A or TRIP B screens are active, the screen is displayed in minimised format.

VDA screen (Vehicle Dynamic Assistance)

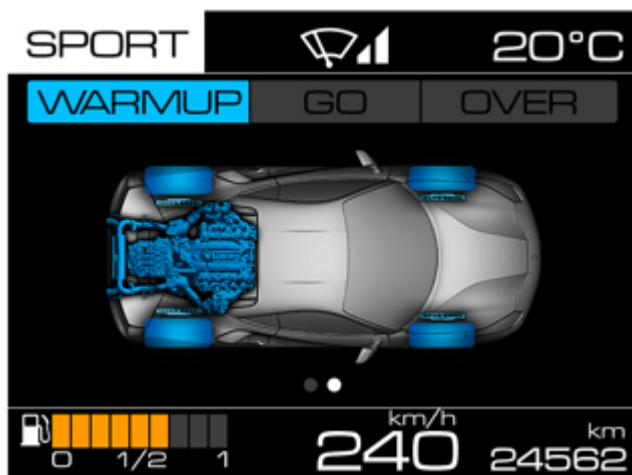
In addition to the chronometer function, the Vehicle Dynamic Assistance (VDA) group of screens acts as a valuable tool for ascertaining the status of the vehicle during use on the track, allowing the driver to intuitively determine the optimum conditions for making full use of the vehicle's performance.

The functions of the "Vehicle status" screen are only available with the Manettino driving mode selector set to RACE, CT OFF or CST OFF mode, which have been specifically developed for track use.

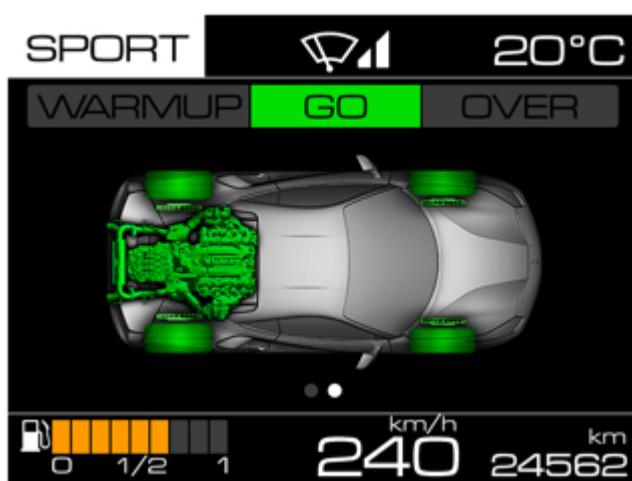
The "VEHICLE STATUS" screen, which may be recalled directly by pressing VDA, or by pressing LEFT with the MAIN screen active, helps the driver keep the vehicle in optimum conditions for maximum performance when driving on high grip surfaces.

This is done by using an algorithm that estimates the temperature status of the vehicle's main subsystems (tyres, brakes, engine) in relation to a number of dynamic parameters (lateral acceleration, speed etc.).

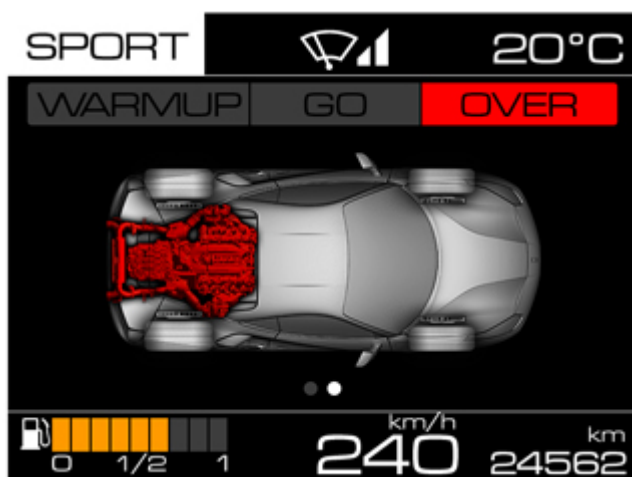
Three different colours - green, light blue and red - are used to visualise the current vehicle status in an immediately legible form.



WARM UP: component warm-up and control system self-acquisition stage, during which careful driving intended to bring the vehicle into optimum operating conditions is recommended.



GO: the vehicle has completed the warm-up stage and all vehicle subsystems have reached optimum conditions for performance driving.

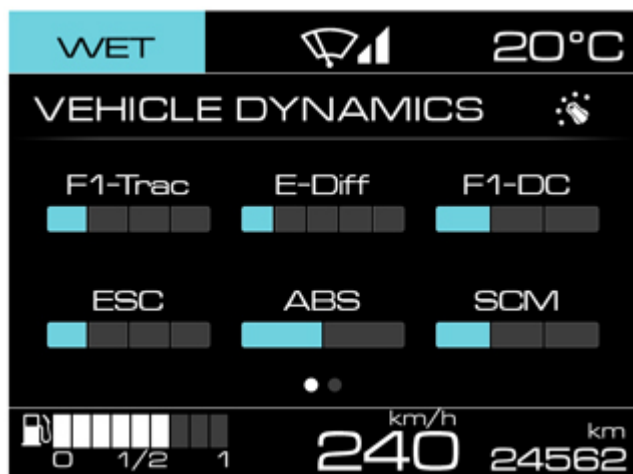


OVER: one or more systems overheated, creating conditions which may compromise vehicle dynamics - slowing down is recommended in order to restore optimum operating conditions for the systems involved.

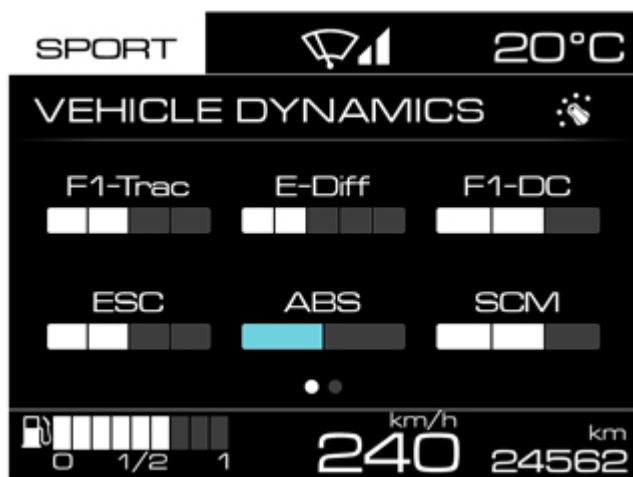
The "MANETTINO STATUS" screen displays a list of the parameters configurable using the Manettino driving mode selector, indicating the respective configuration for each parameter in each of the driving modes.

The systems involved are as follows:

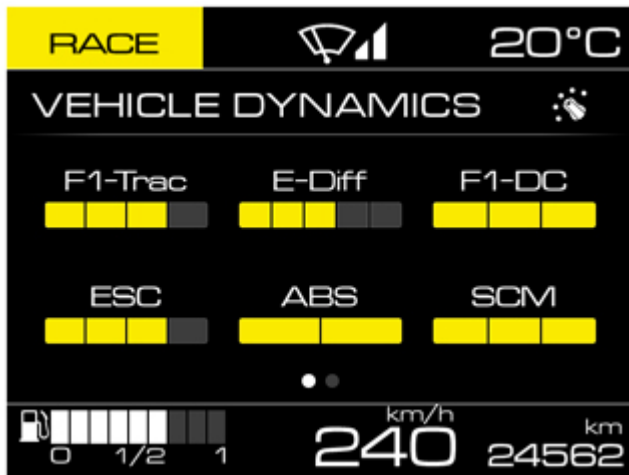
- **F1-Trac**: traction control;
- **E-Diff**: electronic differential;
- **F1-DC**: dual clutch F1 gearbox;
- **CST**: stability and traction control;
- **ABS**: anti-lock brake system;
- **SCM**: magnetorheologically controlled suspension.



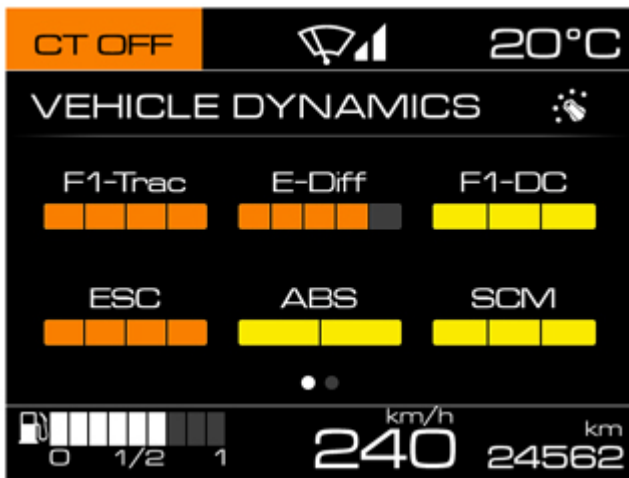
WET MANETTINO STATUS screen



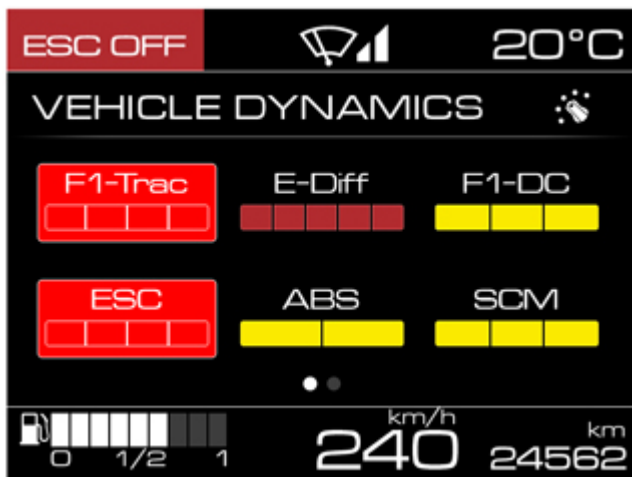
SPORT MANETTINO STATUS screen



RACE MANETTINO STATUS screen



CT OFF MANETTINO STATUS screen



ESC OFF MANETTINO STATUS screen



The “**CHRONOMETER**” screen may be used to record and save lap times during track use.

The screen displays the following information:

- **Current Lap**: time elapsed since chronometer was started;
- **LAP TIME / Best**: best lap time;
- **LAP TIME / Last**: last lap time;
- **TOP SPEED / Best**: highest speed reached;
- **TOP SPEED / Last**: top speed reached during last lap.

If any event occurs necessitating the visualisation of a specific symbol and/or message while the “Chronometer” screen is active, the screen is displayed in minimised format.

The chronometer continues to run while the event/fault is displayed.

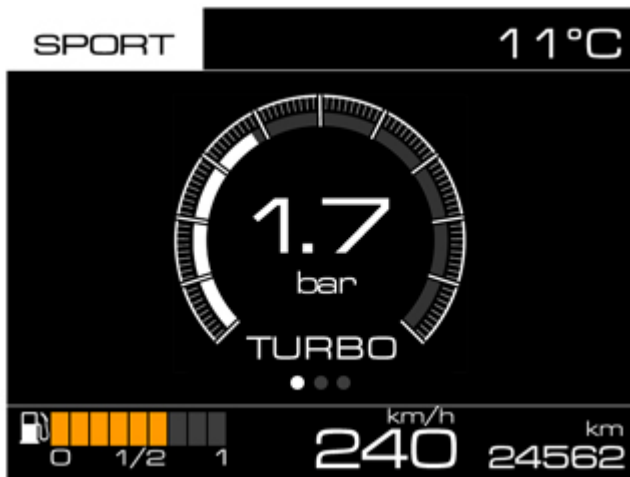
The chronometer is reset at each Key-on, while the most recent valid Best Lap and Last Lap values recorded remain in memory.

The chronometer function is controlled using the OK, UP and DOWN buttons as follows:

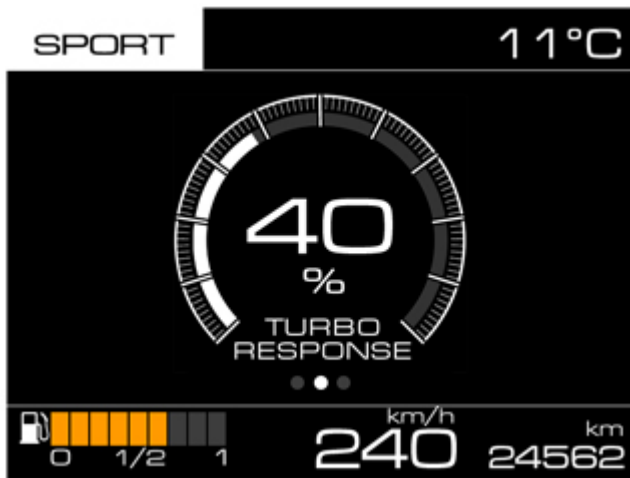
- pressing OK briefly with the chronometer stopped starts the Current Lap chronometer;
- pressing OK briefly with the chronometer running resets and restarts the Current Lap chronometer and updates information relevant to the previous laps (lap end/start of next lap);
- pressing UP or DOWN briefly with the chronometer stopped recalls the display brightness setting screen;
- pressing UP or DOWN briefly with the chronometer running stops the chronometer and updates information relevant to previous laps;
- pressing and holding UP or DOWN with the chronometer stopped or running resets the chronometer and the information relevant to previous laps.

During the display cycle of an active event/fault, pressing OK briefly cancels the event/fault display cycle (“ESCAPE” function) without affecting the chronometer function.

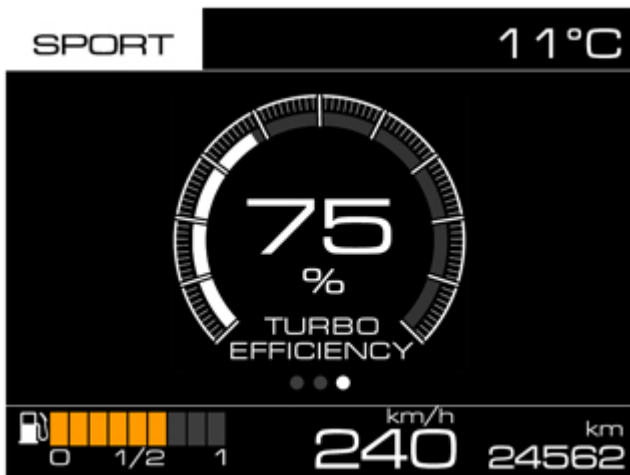
TURBO screen



The **TURBO PRESSURE** screen displays the operating pressure of the turbocharger.

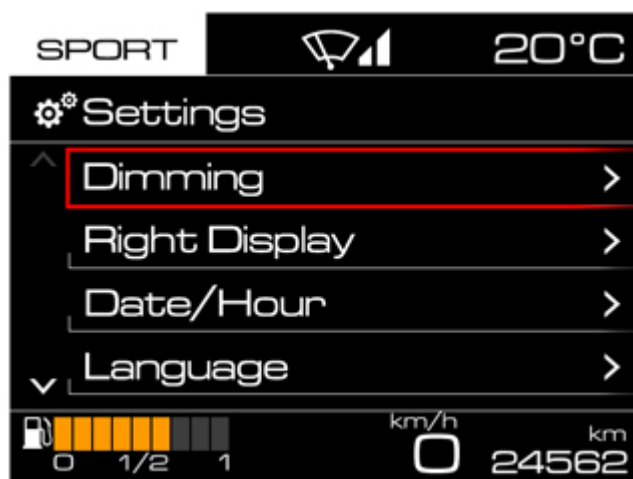


The **TURBO RESPONSE** screen indicates the current percentage of maximum engine response in relation to engine speed.



The **TURBO EFFICIENCY** screen indicates the current percentage of maximum engine efficiency (maximum torque deliverable by engine for a given fuel consumption value or quantity of fuel used) in relation to engine speed.

MENU screen



The display settings may be adjusted and vehicle parameters configured from the MENU screen (the only screen in the SETUP group). The MENU screen may be recalled directly when the MAIN screen is active. Navigation in the menu is organised into different levels:

The first level contains a list of options for setting the following parameters and displaying the following information:

- **Dimming**: adjust display illumination;
- **Display setup.**: configure display;
- **Date/Hour**: set date and time;
- **Language/M.U.**: set language and units of measurement;
- **Car setup**: configure vehicle parameters;
- **Calibr. TPMS**: calibrate TPMS (only on vehicles with TPMS);
- **Service**: scheduled maintenance information.

These options are the main functions of the menu.

Press UP or DOWN to scroll through the list of options.

Press and release the OK or RIGHT button quickly to select the required function.

After selecting the function, the relative subfunctions or modifiable parameters are displayed.

Always press UP or DOWN to select, while pressing and releasing the OK (or RIGHT) button quickly accesses any additional subfunctions or enables the parameter selected.

Press and hold OK or LEFT, or select the BACK option (included in most subfunctions) to go back to the previous level.

If no input is received for 10 seconds, the display returns to the first menu level.

Electronic analogue tachometer



The electronic rev counter is set in the centre of the instrument panel.

The numbers on the dial represent engine speed in rpm/1000.

Engine speed is indicated as main numbers at intervals of 1000 rpm, with intermediate markings at secondary intervals of 200 rpm.



If the rev counter has a white or yellow background, the backlighting is not enabled during the daytime - i.e. with the parking lights off, or with the parking lights on, but with the twilight sensor detecting daytime light conditions - so as to allow instrument better visibility.

Right hand TFT display

This display is set in the instrument panel and has the following functions:

- vehicle speed display;
- NIT information display (Infotainment Node);
- "Rear Parking Camera" display (if applicable).

To interact with the system, selecting the desired configuration and setting parameters, use the controls on the dashboard, on the right-hand side of the steering wheel.

Vehicle speed display

The vehicle speed may be displayed on the right hand TFT display in either "SPEEDOMETER" or "DIGITAL SPEED" mode.

The desired display mode is selectable with the specific option in the MENU screen on the left hand TFT display.



The **SPEEDOMETER** screen displays the vehicle speed with a virtual analogue speedometer.



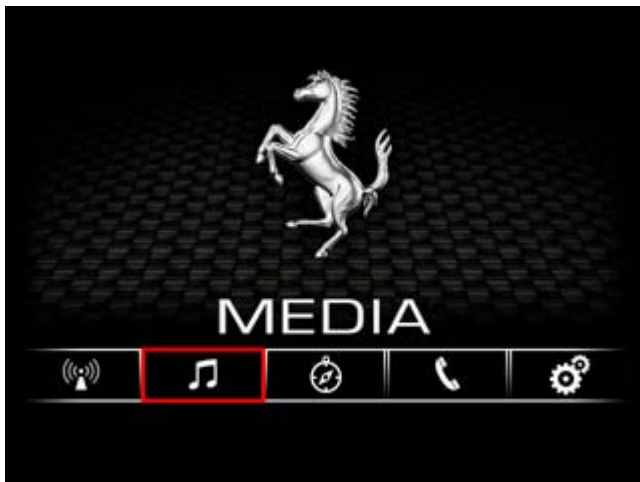
The **DIGITAL SPEED** screen displays the vehicles speed in digital format.

MAIN screen (Infotainment System)

Press the MAIN button to open the MAIN screen, from which the menu screens RADIO, MEDIA, NAVI, PHONE and SETTINGS may be accessed.



Select **RADIO** to view radio functions.



Select **MEDIA** to view multimedia functions and content.



Select **NAVI** to view the functions and content of the satellite navigation system.



Select **PHONE** to view phone functions and content.

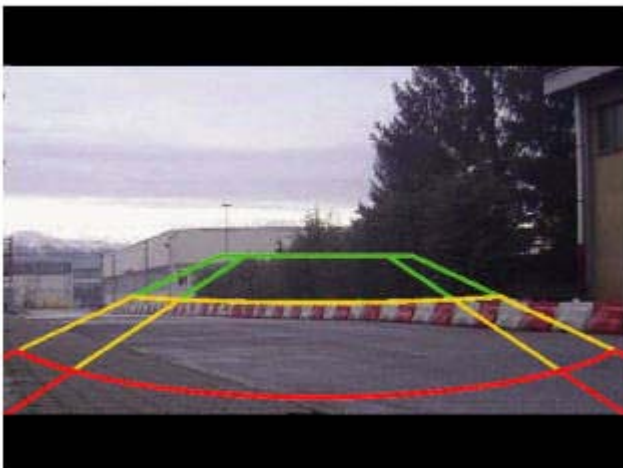


Select **SETTINGS** to access and configure the settings of the infotainment system.



On vehicles with the telemetry system, the **TELEMETRY** screen is also accessible from the MAIN screen.

"Rear parking camera" screen (optional)



On vehicles equipped with the (optional) rear parking camera, the "Rear Parking Camera" is displayed automatically on the right hand TFT when reverse is selected.

This screen, which remains active for as long as reverse is engaged, displays images from the camera

installed in the rear bumper to assist the driver when parking.

The image is overlaid by a static grid of green, yellow and red lines, which indicate the distance between the vehicle and any obstacles in the field of vision of camera. The red zone indicates the area between approximately 0 and 60 cm from the vehicle, the yellow zone indicates the area between 60 and 130 cm, and the green zone indicates the area between 130 and 190 cm from the vehicle.

"Dual view camera" screen (optional)



On vehicles equipped with the "Dual View Camera" (consisting of an additional camera installed in the front bumper) as well as the rear parking camera, the following screens are available on the right hand TFT display:

- wide angle central front view;
- lateral front corner view.

With reverse selected:

- rear view with grid ("Rear Parking Camera");
- wide angle rear view.



Press button **(C)** on the dashboard to select between views: if the speedometer reading is shown on the right hand TFT display, press button **(C)** briefly to display the central front view.

Pressing the button again toggles between the two front views available.

The display of images from the front camera is disabled at speeds above 12 Km/h

The "Rear Parking Camera" screen is shown automatically on the right hand TFT display when reverse is selected.

With reverse selected, pressing button **(C)** toggles between the two rear views available.

To recall the vehicle speed display, press and hold button **(C)** or shift out of reverse.

Storing the "Start of vehicle life"

When the vehicle is delivered, the start date of vehicle life must be stored, from which the counter begins for the expiry date for the first "Scheduled Maintenance" service.

The parameter is entered using the DEIS diagnostic tester.

"Scheduled Maintenance" reset

At every scheduled service date, the 'maintenance complete' procedure must be performed using the relevant function on the DEIS diagnostic tester.

The instrument panel must store the following data:

- service No. performed;
- service date;
- total mileage at service date.

This data must be readable via the DEIS diagnostic tester.

At each service, before resetting the "Scheduled Maintenance" parameter, the instrument panel verifies that the date on the CAN network is later than the "start of vehicle life" date or that of the previous service. If these conditions are not met, the panel will not accept the reset operation.

Gearbox display

It displays the following information:

- Engaged gear (DCT gearbox);
- "Auto" gearbox mode (DCT gearbox);
- "Auto easy exit" gearbox mode (DCT gearbox);
- "Parking" mode;
- "Launch Control" enabled;
- "AVH" system enabled.

Information concerning the gearbox is always displayed in all operating conditions.

Engaged gear (DCT gearbox)



When gears are selected with the two shift paddles on the steering wheel with the DCT gearbox in MANUAL mode (F1), the number corresponding to the currently engaged gear is shown on the gearbox display as follows: **1, 2, 3, 4, 5, 6, 7.**



When the DCT gearbox is used in AUTOMATIC mode, the relative gear engaged is shown on the gearbox display as follows: **D** (Drive), **N** (Neutral), **R** (Reverse).

At Key-off, if the panel receives the Neutral value, the gearbox display will read N. If the panel receives a gear engaged value for any gear other than Neutral, the display will show the gear engaged.

"Auto" gearbox mode (DCT gearbox);



When the DCT gearbox is in AUTOMATIC mode, the gearbox display reads “**AUTO**” along with the letter indicating the gear currently engaged.

"Auto easy exit" gearbox mode (DCT gearbox)



At every Key-on, “Auto easy exit” gearbox mode is activated by the gearbox. A small “arrow” symbol is shown continuously at the bottom left of the gearbox display.

“Parking” mode



When the gearbox Park Lock system is activated, the gearbox display shows the letter “P” at the centre.

"Launch Control"



When the system receives the signal indicating that launch control is available, the gearbox display will show the message “**LAUNCH**” until key-off or until the function is enabled.

AVH system enabled



When the AVH function is activated, the message “**HOLD**” is shown on the gearbox display.

Removing instrument panel

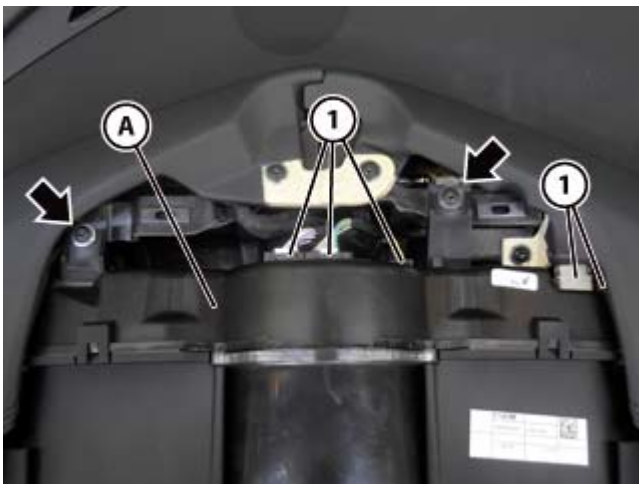
- Disconnect the battery (📄 F2.01).
- Remove the dashboard trim panels (📄 E4.02).
- Remove the steering column trim panel and the instrument panel trim.



- Undo the indicated screw.



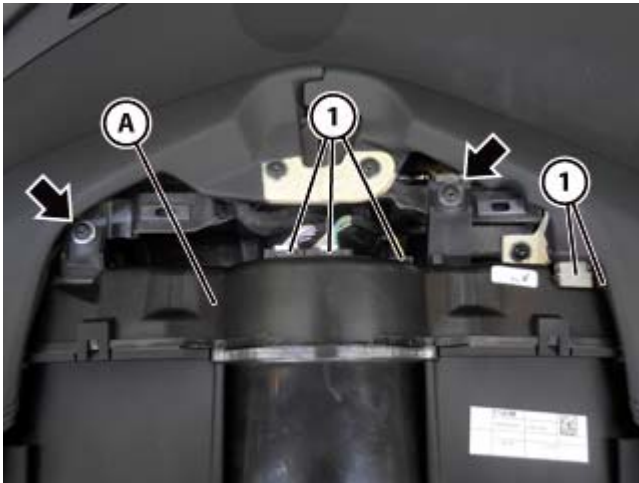
- Undo the indicated screw.



- Undo the screws indicated.
- Remove the instrument panel **(A)** and disconnect the connectors **(1)**.

Refitting instrument panel

			
Tightening torque		Nm	Class
Fastening instrument panel	Screw	2.6 Nm	B



- Fit the instrument panel **(A)** and connect the connectors **(1)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B



- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	2.6 Nm	B

- Refit the dashboard trim panels ( E4.02).
-  Refit the steering column trim panel and the instrument panel trim.
- Connect the battery ( F2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
-  Perform the respective cycle with the DEIS diagnostic tester.

E5.03 Warning lights

Engine diagnostic system (EOBD)



Engine diagnostic system (EOBD) failure.

Fuel



Low or reserve fuel level.

Fuel gauge failure.

Engine oil



Engine oil temperature too high.



Insufficient engine oil pressure.

Engine oil pressure sensor failure (flashing).

Coolant



Coolant temperature too high.

Dual Clutch gearbox



Dual Clutch gearbox failure.

Brake system



EBD system failure, together with ABS warning light.

Insufficient brake fluid level.

Excessive brake pad wear.

EPB electric parking brake failure, together with EPB electric parking brake warning light.

Parking brake system service required, together with brake system warning light.

EPB electric parking brake



EPB electric parking brake engaged (lit continuously or flashing).

EPB electric parking brake failure, together with brake system warning light (lit continuously or flashing).

ABS system



ABS system failure.

ESC system



Indicates deactivation of ESC system.



Indicates ESC system failure.
Indicates intervention of ESC system (flashing)

Lift system



Indicates that the system is active.
Indicates that the system is active in Key-off state.
Indicates activation and deactivation of the system (flashing).

TPMS system



One or more standard type tyres punctured.
Vehicle has been driven for more than 100 Km (62 mi), or at a speed exceeding 80 Km/h (50 mph), following a puncture to one or more RUN FLAT tyres.
One or more RUN FLAT type tyres punctured.
TPMS system failure.
TPMS system temporarily not active.
TPMS system not active.
TPMS system not calibrated.

Electrical system



Alternator failure and insufficient or excessive battery charge.

External lights



Running lights or low beam lights on.

During key-off, parking lights on.



High beam lights on.



Left hand turn indicators on.



Right hand turn indicators on.



Rear fog lights on.



Adaptive Light Control failure (flashing).

Airbag



Airbag system failure.

Seat belts



Driver side seat belt not buckled.

Passenger side seat belt not buckled.

Vehicle alarm system



Vehicle alarm system failure (lit continuously or flashing).

System not programmed (lit continuously or flashing).

System failure and system not programmed (lit continuously or flashing).

Cruise Control



Cruise Control enabled.

E5.04 Indications on the TFT display

The driver is notified of a fault by the instrument panel via the following events:

- relative fault warning lamp (if available) illuminated on specific panel;
- icon (if available) corresponding to fault displayed with relevant specific message (if available) on TFT display;

The icon and the warning lamp (if available) are activated simultaneously.

All information contained in the display area reserved for messages is replaced by information concerning the failure.

Faults are displayed according to the priority attributed to the faults themselves:

- Priority 0 (very serious)
- Priority 1 (serious)
- Priority 2 (not serious)

In the event of multiple simultaneous faults, the faults are displayed in order, with priority 0 faults first, priority 1 faults next and priority 2 faults last.

The information relative to the faults is displayed for 5 seconds for each fault in "rolling" order, with the screens displayed sequentially in order of priority or occurrence of the relative fault event.

If, during the display cycle for a fault, another priority 1 or 2 fault occurs, this will replace the message currently displayed only once the latter has been displayed for 2 seconds. The messages then continue to be displayed in "rolling" order.

If, during the display cycle for a fault, a priority 0 fault occurs, this will replace the fault currently displayed immediately, without the 2 second delay time. The messages then continue to be displayed in "rolling" order.

During the display of multiple faults in rolling order, if any of the faults is interrupted by a new failure/check event before its full display period has elapsed, the last event will be displayed nonetheless for 5 seconds, even if a shorter period would suffice to complete its display cycle.

During the display of priority 0, 1 and 2 faults, the set-up MENU functions, which are normally accessible via the specific buttons, are disabled.

During the display of priority 0, 1 and 2 faults, the display of other main screens normally accessible with the specific DISP button is disabled.

The faults remain displayed for 20 seconds.

In the event of faults with no physical warning light on the instrument panel, at the end of the display cycle, the relative symbol will be shown in icon form in area C1 of the display and will remain displayed until the malfunction generating the fault has been rectified.

In the event of faults with a physical warning light on the instrument panel, at the end of the display cycle, the relative symbol will not be shown in icon form in area C1 of the display.

Additionally, the screen displayed before the fault event will be shown again.

The fault is displayed for the period specified above at each key-on (until the malfunction generating the fault has been rectified).

If the fault is rectified before the end of the display cycle, the message will continue to be displayed and the relative warning light (if available) will remain lit for at least 2 seconds, to prevent undesirable "flashing" effects.

The warning light (if available) extinguishes and the message disappears from the display simultaneously.

Fault display may be interrupted in two different ways:

- by eliminating the malfunction generating the fault;
- by pressing the MODE button to escape.

Schedule maintenance



Indicates next scheduled service interval.

The TFT display displays the specific message "**Service Stop within:**" followed by the value in "kilometres" (or "miles") or "days" remaining until the next vehicle service interval.

At the end of the display cycle, the TFT display displays the minimised icon in the specific area. In this case, as there is no physical indicator light, the symbol is displayed in icon form in the specific area C1 until the malfunction generating the fault has been rectified. Additionally, the screen displayed before the fault event will be shown again.

Engine diagnostic system (EOBD)



Priority 0

Emission control system failure.

Indicates an ignition/injection system failure.

The TFT display displays the specific message "**Engine control system failure**" together with the message "**Go to dealer**".

Limp Home

Limited engine performance.

The TFT display displays the specific message "**Warning limited performance of the engine**" together with the message "**Restart the engine**".

Fuel



Priority 0

Inertia switch triggered.

The TFT display displays the specific message "**Inertia switch triggered**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 2

Indicates low fuel level.

The TFT display displays the specific message "**Fuel level low**" together with information concerning the remaining range in Km (or mi).

In low remaining range conditions, the remaining range information in Km (or mi) is replaced by the

message "**Limited range**".

The relevant message display cycle is repeated every 8 Km (5 mi).

Engine oil



Priority 0

Insufficient engine oil pressure.

The TFT display displays the specific message "**Low engine oil pressure**" together with the message "**Stop and turn off engine**".



Priority 0

Engine oil temperature too high.

The TFT display displays the specific message "**Engine oil Too Hot**" together with the message "**Slow down**".

Coolant



Priority 0

Engine coolant temperature too high.

The TFT display displays the specific message "**Engine coolant Too Hot**".

Catalytic converters



Priority 0

Catalytic converter temperature too high.

The TFT display displays the specific message "**Catalytic conv. temp. Excess.**" together with the message "**Engine performance limited**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 0

Catalytic converter temperature sensor failure.

The TFT display displays the specific message "**Catalytic conv. temperature not plausible**" together with the message "**Go to dealer slowly**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 1

Catalytic converter temperature too high.

The TFT display displays the specific message "**Catalytic conv. temperature high**" together with the message "**Slow down**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

DCT gearbox



Priority 1

Transmission failure.

The TFT display displays the specific message "**Transmission failure**" together with the message "**Go to dealer**".

E-Diff system



Priority 1

Electronic differential failure.

The TFT display shows the specific message "**Recovery**", depending on the signal it receives.

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 1

The TFT display displays the specific message "**E-DIFF system failure**" together with the message "**Go to dealer**", if necessary for the particular signal received.

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Power steering



Priority 2

Power steering system failure.

The TFT display displays the specific message "**Powersteering malfunction**".
At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Brake system



Priority 0

EBD system failure.

The TFT display displays the specific message "**EBD system failure**" together with the message "**Go to dealer slowly**".

Priority 0

Low brake fluid level.

The TFT display displays the specific message "**Brake fluid level low**" together with the message "**Go to dealer slowly**".



Priority 2

Excessive brake pad wear.

The TFT display displays the specific message "**Brake Pads Worn**" together with the message "**Go to dealer**".



Priority 2

Carbon ceramic brake discs worn.

The TFT display displays the specific message "**CCM disc brakes wear**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

EPB electric parking brake



Priority 0

EPB electric parking brake failure.

The TFT display displays the specific message "**EPB failure**".

Priority 0

Parking brake system service required.

The TFT display displays the specific message "**Parking Brake system revision**" together with the message "**Go to dealer**".

ABS system



Priority 1

ABS system failure.

The TFT display displays the specific message "**ABS system failure**" together with the message "**Go to dealer**".

ESC system



Priority 1

ESC system disengaged.

The TFT display displays the specific message "**ESC OFF**".



Priority 1

ESC system failure.

The TFT display displays the specific message "**ESC system failure**" together with the message "**Go to dealer**".

Suspension



Priority 2

Suspension control system failure.

The TFT display displays the specific message "**Suspension control system failure**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Lift system



Priority 1

Front lift system failure.

The TFT display displays the specific message "**Lift system failure**" together with the message "**Go to**

dealer".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

TPMS system

Priority 2

The TFT display displays the specific message "**Check tyre pressure**" in the event of low tyre pressure.



Priority 0

One or more tyres punctured.

The TFT display displays the specific message "**Low tyre pressure**" together with the message "**Do not proceed**", in the event of puncture if the vehicle is fitted with normal tyres.

Priority 2

The TFT display displays the specific message "**Low tyre pressure**" together with the message "**Max speed 80 Km/h**", in the event of puncture if the vehicle is fitted with Run Flat tyres.

Priority 2

TPMS system failure.

The TFT display displays the specific message "**TPMS failure**".

Priority 2

TPMS system temporarily inactive.

The TFT display displays the specific message "**TPMS temporarily inactive**".

Priority 2

TPMS system not active.

The TFT display displays the specific message "**TPMS inactive**".

Priority 2

TPMS system not calibrated.

The TFT display displays the specific message "**TPMS not calibrated**" together with the message "**Execute calibration**".



TPMS system calibration launched.

The TFT display displays the specific message "**Calibration activated**".

Active aerodynamics



Priority 1

Active aerodynamics system failure.

The TFT display displays the specific message "**Ali mobili system failure**" together with the message "**Go to dealer**".

Electronic system



Priority 2

Electronic system failure.

The TFT display displays the specific message "**Electrical system failure**" together with the message "**Go to dealer**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Battery



Priority 0

When the instrument panel is on, indicates an active connection with the battery conditioner.

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 1

Charging system fault, with insufficient or excessive battery charge voltage

The TFT display displays the icon and the specific message "**Alternator failure**".

Priority 2

The TFT display displays the icon and the specific message "**LOGISTIC MODE ON**".

Stop&Start system



Stop&Start function enabled.

The TFT display displays the specific message "**S&S active**".

Stop&Start function active.

The TFT display displays the specific message "**S&S ON**".



Stop&Start function disabled.
The TFT display displays the specific message "**S&S OFF**".



Priority 1
Stop&Start system failure.
The TFT display displays the specific message "**S&S failure**".



Priority 0
Stop&Start system failure.
The TFT display displays the icon and the specific message "**Stop&Start failure**" together with the message "**Go to dealer**".

External lights



Priority 2
Light system malfunction or blown running light lamp.
The TFT display displays an image of the vehicle with the areas corresponding to the malfunctioning running lights highlighted in red, together with the specific message "**Lamp Failure**".
At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 2
Light system malfunction or blown turn indicator lamp.
The TFT display displays an image of the vehicle with the areas corresponding to the malfunctioning turn indicators highlighted in red, together with the specific message "**Direction Indic. Failure**".
At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 2
Light system malfunction or blown rear fog light lamp.
The TFT display displays the specific message "**Foglamp Failure**".
At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 2
Light system malfunction or blown brake light lamp.

The TFT display displays the specific message "**Stop Lamp failure**".
At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 2

Light system malfunction or blown license plate light lamp.

The TFT display displays the specific message "**Numberplate Lamp Failure**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Twilight sensor



Priority 2

Ambient light sensor failure.

The TFT display displays the specific message "**Twilight sensor failure**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Parking sensor system



Priority 2

Parking sensor system failure.

The TFT display displays the specific message "**Parking sensor failure**" together with the message "**Warning! Possible obstacles**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Vehicle alarm system



Priority 1

Anti-theft system failure.

The TFT display displays the specific message "**Immobilizer Malfunction**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 1

Anti-theft system failure.

The TFT display displays the specific message "**Immobilizer Malfunction Immobilizer not programmed**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 2

Anti-theft system failure.

The TFT display displays the specific message "**Immobilizer not programmed**".

Priority 2

Anti-theft system failure.

The TFT display displays the specific message "**Alarm system failure**".

Priority 2

Attempted break in.

The TFT display displays the specific message "**Break-in attempted**".

Passive Start System (Keyless)



Indicates a passive start system (keyless) failure.

The TFT display displays the specific message "**Get passive start system checked**".

Doors/luggage compartment lid/engine compartment lid open



One or more doors/lids open or not closed correctly.

The TFT display displays the vehicle with the zones representing the open doors, luggage compartment lid and engine compartment lid "highlighted" in red and the specific message "**Door open**", "**Doors open**", "**Trunk open**", "**Boot open**" or "**Boot and bonnet open**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Airbag system



Priority 0

Airbag system failure.

The TFT display displays the specific message "**Airbag system failure**" together with the message "**Go to dealer**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Priority 0

Airbag test cycle not completed correctly.

The TFT display displays the specific message "**Airbag test not performed**".



Priority 2

Airbag warning lamp failure.

The TFT display displays the specific message "**Airbag warning light fault**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Seat belts



Priority 0

Passenger seat belt not fastened.

The TFT display displays the specific message "**Fasten passenger seat belt**".

Speed limit



Priority 2

Max. speed limit set by driver exceeded.

The TFT display displays the specific message "**Speed limit exceeded**".

The number indicates the speed limit set by the driver.

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Manettino



Priority 1

Manettino failure.

The TFT display displays the specific message "**Manettino failure**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Rain sensor



Priority 2

Rain sensor failure.

The TFT display displays the specific message "**Rain sensor failure**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Ice hazard



Possible ice on road.

The TFT display displays the specific message "**Warning: danger of ice**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

Windscreen washer



Priority 2

Low windscreen/headlamp washer fluid level.

The TFT display displays the specific message "**Low windshield washer fluid level**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.



Priority 2

Windscreen wiper motor failure.

The TFT display displays the specific message "**Windshield wiper motor failure**" together with the message "**Go to dealer**".

At the end of the display cycle, the TFT display displays the minimised icon in the specific area.

E5.05 Switches and buttons

Horn button



Press the buttons **(A)** to sound the horn.

Turn indicator buttons



Press the buttons **(B)** to switch the corresponding turn indicators on and off.

High beam light switch



With the low beam headlights on, press the switch **(C)** to turn on the high beam lights.

To switch the high beam lights off again, pull or push the switch **(C)**.

With the low beam lights off, pull the switch **(C)** to flash the high beam lights.

The high beam lights may be flashed with the low beam light off only with the ignition switch in position II.

If the high beam light switch is turned on, the high beams will come on each time the headlights switch on automatically. Preferably turn the high beam switch off once the twilight sensor switches off the lights.

With the ignition key turned to **0** or removed, push the switch **(C)** within **3 minutes** from switching off the engine (or within **30 seconds** if the driver side door is opened) to activate the **“Follow me home”** function, which illuminates the area surrounding the vehicle to allow the occupants to walk safely in dark conditions. Each time the switch **(C)** is pushed again increases the time that the low beam lights remain on in increments of **30 seconds**, up to a maximum of **210 seconds**.

Windscreen wiper, windscreen washer and headlight washer control



Push and pull the switch **(D)** to activate and deactivate the windscreen wiper and washer.

The windscreen wiper and washer will only work with the ignition switch in position II.

The windscreen wipers have four speed settings:

- OFF: windscreen wiper off;
- AUTO: the rain sensor regulates the windscreen wiper frequency in relation to rain intensity;
- 1: continuous slow operation;
- 2: continuous fast operation.

With the windscreen wiper OFF, push and release the switch **(D)** quickly to set the windscreen wipers to AUTO mode.

With the windscreen wipers OFF, pull and release the switch **(D)** quickly to make the windscreen wipers perform a few, rapid wipes (instant screen clear function).

With the windscreen wipers on, push and release the switch **(D)** quickly to increase the windscreen wiper speed setting in steps (from AUTO to 1 and from 1 to 2).

With the windscreen wipers on, pull and release the switch **(D)** quickly to reduce the windscreen wiper speed setting in steps (from 2 to 1, from 1 to AUTO and from AUTO to OFF).

With the windscreen wipers in AUTO mode or OFF, press and hold the switch **(D)** to set the maximum speed (2).

With the windscreen wipers set to 1 or 2, press and hold the switch **(D)** to turn off the windscreen wipers.

Pull and hold the switch **(D)** to activate the windscreen washer. The windscreen wiper resumes operation at the previous speed setting when the switch **(D)** is released.

The windscreen wiper will remain functional even in the event of electronic system malfunction.

In the event of malfunction, push the switch **(D)** to turn the windscreen wipers on and pull to turn off.

In the event of very severe malfunction, windscreen wiper operation may not be sustained automatically: in this case, keep the windscreen wipers operating by pressing and holding the switch **(D)**.

The headlight washers are activated automatically when the windscreen washer is operated with the low beam headlights on. The headlight washer uses the same reservoir as the windscreen washer. A low fluid level is indicated by the relative symbol on the left hand TFT display.

Suspension decoupling button



Press the button **(E)** to render the rear suspension setting independent of the Manettino control logic.

Irrespective of the current Manettino position, the suspension setting is set to Level 1 (COMFORT).

If the Manettino setting is altered after pressing the button **(E)**, the suspension setting is determined by the Manettino control logic.

After stopping and restarting the vehicle, the suspension setting will be determined by the Manettino position.

Manettino

The driving mode selector (Manettino) **(F)** on the steering wheel allows the driver to make full use of the potential of the vehicle quickly and intuitively.

There are five different driving modes available, ordered in relation to ascending grip levels (from low to high grip) offering progressively less driver assistance (from high to none).

Turn the Manettino **(F)** to select one of the five driving modes listed as follows:



- **WET** mode: driving mode offering maximum safety;
- **SPORT** mode: ideal mode for using the vehicle on an everyday basis;
- **RACE** mode: driving mode offering performance and stability in high grip conditions;
- **CT OFF** mode: F1-Trac traction control system is deactivated, whereas stability control remains active;
- **ESC OFF** mode: all electronic control systems are deactivated except for the E-Diff.



In the event of a fault of any of the onboard systems, as indicated by the relative symbol on the left hand TFT display, the Manettino enters "recovery" mode, allowing the vehicle to be driven.



CAUTION

Do not deactivate the CST system in medium or low grip conditions (wet road, ice, sand etc.).



CAUTION

With any gear higher than second gear engaged, the system automatically downshifts by one gear when the driver switches from "Low Grip" mode to "SPORT" mode, or from "SPORT" mode to "RACE" mode. Do not switch from "Low Grip" mode to "SPORT" mode, or from "SPORT" mode to "RACE" mode while in the middle of a bend.

The system will not downshift automatically if doing so will cause engine speed to exceed a value or if a downshift is already in progress due to excessively low engine speed.

Engine start button



Press the ENGINE START/STOP button **(G)** to start/stop the engine.



Do not keep the ENGINE START button pressed for prolonged periods.

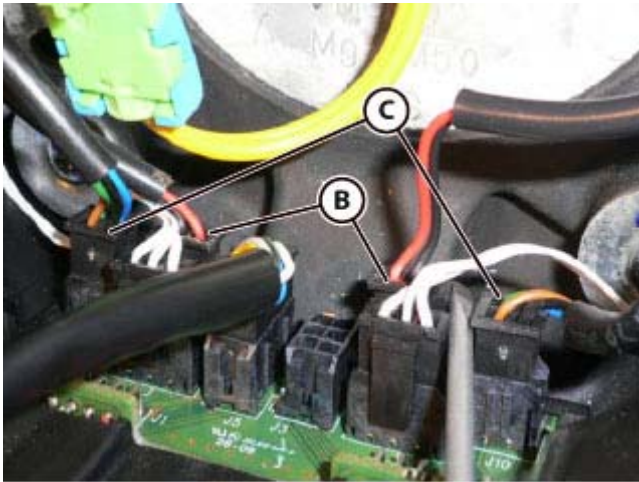
Release the ENGINE START/STOP button **(G)** as soon as the engine has started.

Replacing the steering wheel control panel

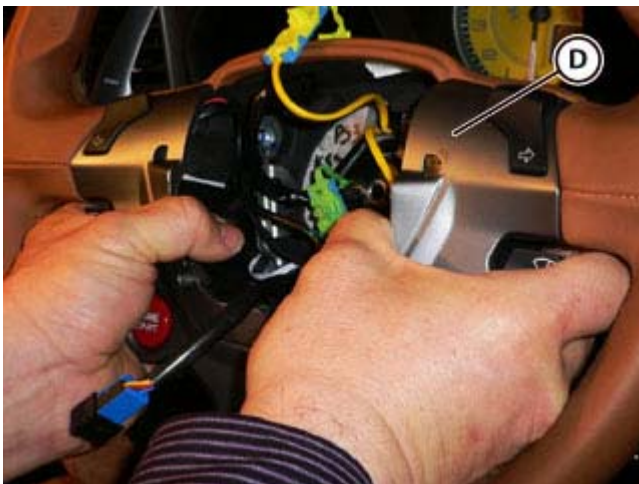
- Disconnect the battery (🔌 F2.01).
- Remove the driver side airbag module (🔌 F4.02).



- Disconnect the connector **(A)**.



- Disconnect the connectors **(B)** and **(C)**.
- The connectors **(B)** have a secondary lock on the outer side (use a suitable tool, such as a flat headed screwdriver, to release)
- The connectors **(C)** have a secondary lock at the rear (press to release).
- **DO NOT** disconnect the 2 connectors with grey wires.



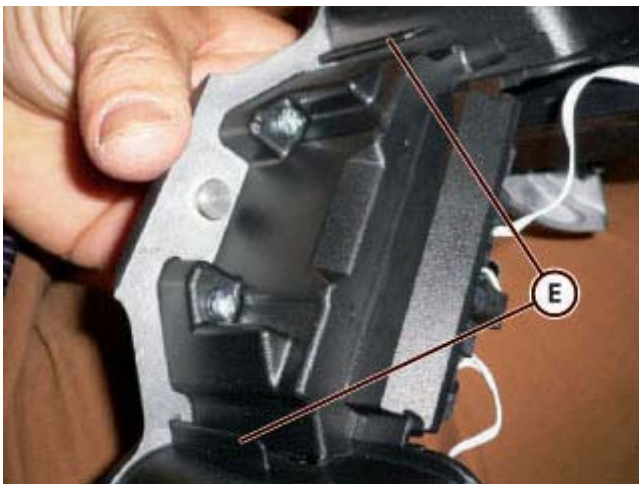
- Remove the steering wheel mounted control panel **(D)**.



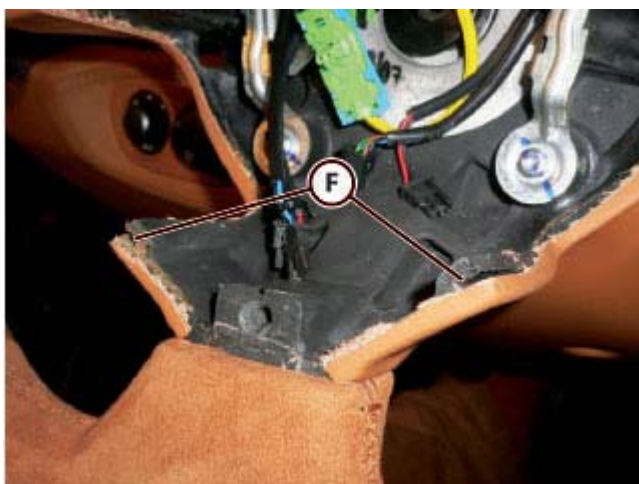
- On the right hand side, refit the connector wires in the indicated slit.



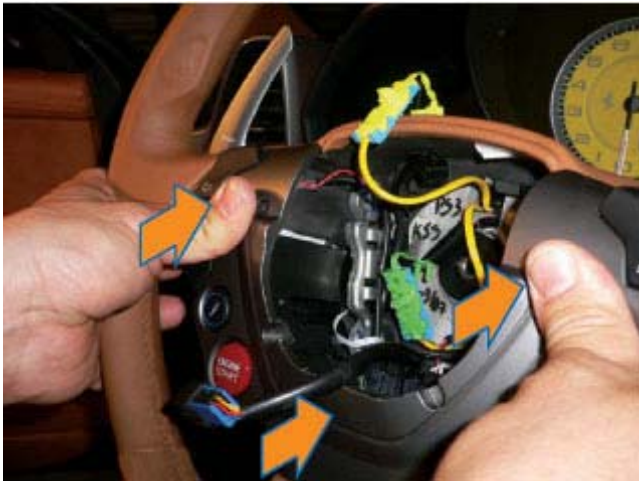
- On the left hand side, refit the connector wires in the indicated slit.



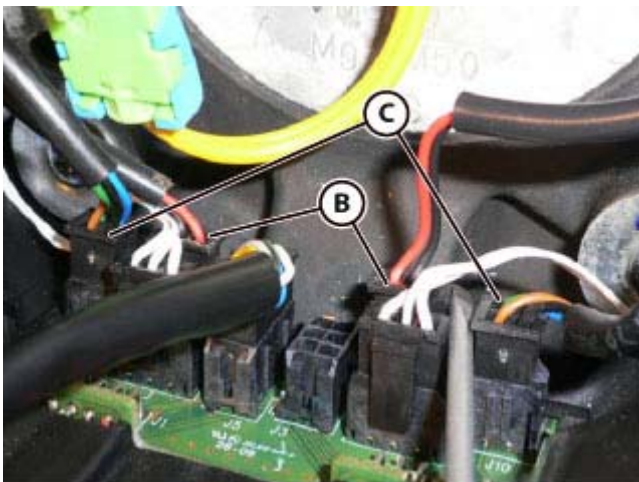
- Locate the tabs **(E)** on the new steering wheel mounted control panel.



- When fitting the new steering wheel mounted control panel, ensure that the tabs described previously fit correctly in the relative seats **(F)** on the steering wheel.



- Press repeatedly in the positions indicated to fasten the new steering wheel mounted control panel correctly into place.



- Connect the connectors **(B)** and **(C)**.



- Connect the connector **(A)**.

- Refit the driver side airbag module (📄 F4.02).
- Connect the battery (📄 F2.01).
- Perform a "complete test cycle" for the airbag system with the DEIS tester.

Replacing components of steering wheel control panel



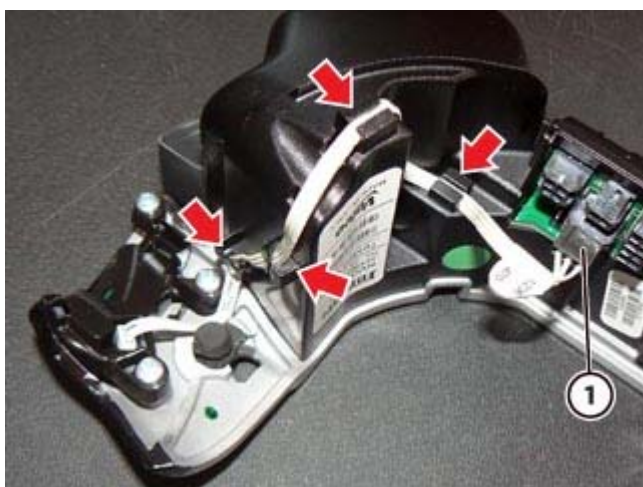
Tightening torque		Nm	Class
Fastening turn indicator switch	Screw	0.75 Nm	0
Fastening main shell	Screw	1.08 Nm	0
Fastening NVO circuit board	Screw	0.32 Nm	0
Fastening Manettino toggle	Dowel	0.74 Nm	0
Fastening Manettino selector dial	Screw	0.32 Nm	0
Fastening Manettino selector dial screw ring	Ring nut	1.48 Nm	0
Fastening main base	Screw	0.27 Nm	0
Fastening high beam - windscreen wiper switch	Screw	0.27 Nm	0



When working, stand on an earthed anti-static mat and wear an earthed anti-static wristband or gloves.

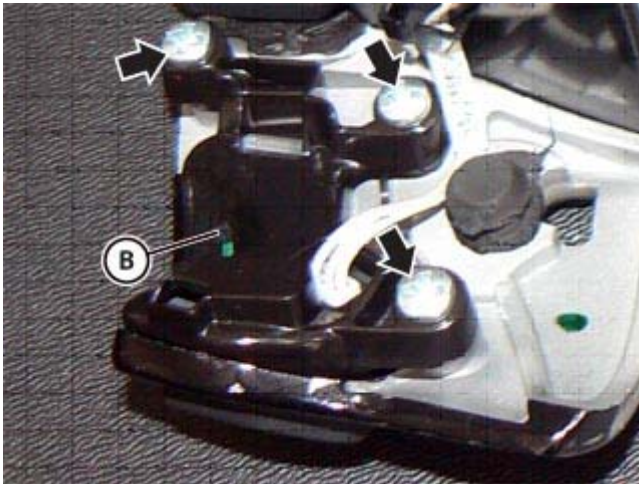
Lateral turn indicators

- Disconnect the battery ( F2.01).
- Replace the steering wheel mounted control panel ( E5.05).
-  Perform removal sequence.
-  Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.



LH button

- Disconnect the connector (**1**).
- Release the left hand turn indicator switch cable from the retainers indicated by the red arrows.
-  Take care not to damage the wiring harness



- Undo the indicated screws then remove the left hand turn indicator switch **(B)**.



RH button

- Disconnect the connector **(2)**.
- Release the right hand turn indicator switch cable from the retainers indicated by the red arrows.
- Take care not to damage the wiring harness.



- Undo the indicated screws then remove the right hand turn indicator switch **(B)**.



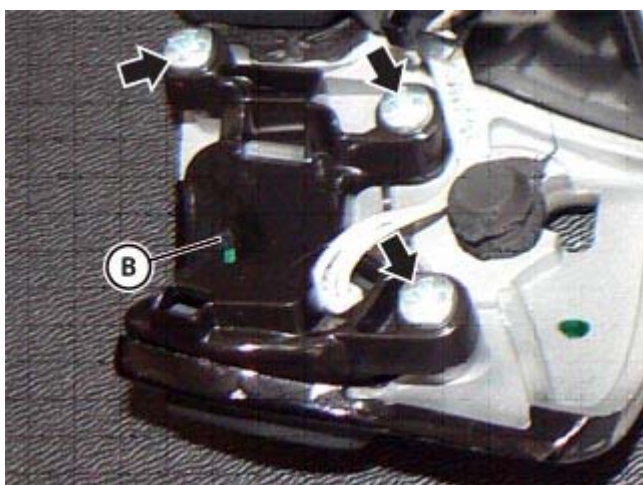
RH button

- Fit and fasten the new right hand turn indicator switch **(A)** to the button panel, tightening the indicated screws.

		
Tightening torque	Nm	Class
Screw	0.75 Nm	0



- Fasten the right hand turn indicator switch cable to the retainers indicated by the red arrows.
 Take care not to damage the wiring harness.
- Connect the connector **(2)**.



LH button

- Fit and fasten the new left hand turn indicator switch **(B)** to the button panel, tightening the indicated screws.

		
Tightening torque	Nm	Class
Screw	0.75 Nm	0

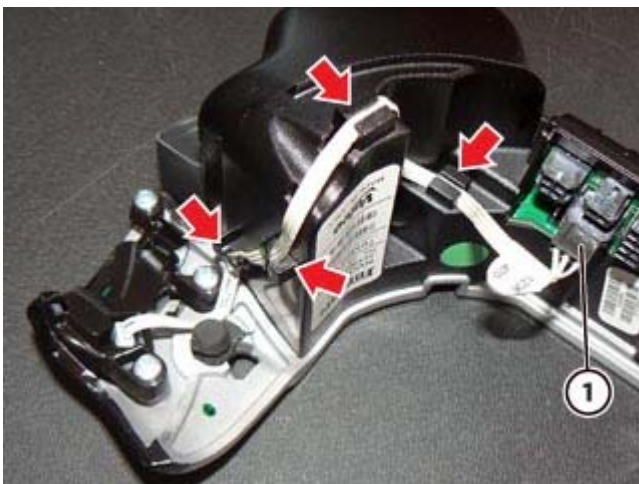


- Fasten the left hand turn indicator switch cable to the retainers indicated by the red arrows.
- Take care not to damage the wiring harness.
- Connect the connector **(1)**.

- Replace the steering wheel mounted control panel (E5.05).
- Perform refitting sequence.
- Connect the battery (F2.01).

Main shell

- Disconnect the battery (F2.01).
- Replace the steering wheel mounted control panel (E5.05).
- Perform removal sequence.
- Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.



- Disconnect the connector **(1)**.
- Release the left hand turn indicator switch cable from the retainers indicated by the red arrows.
- Take care not to damage the wiring harness

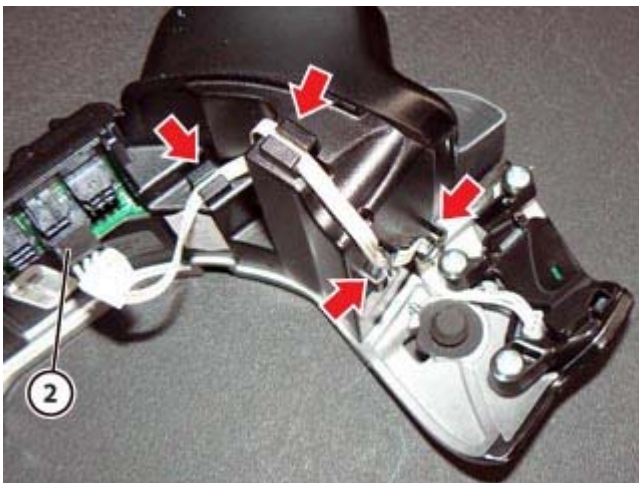


- Disconnect the connector **(2)**.
- Release the right hand turn indicator switch cable from the retainers indicated by the red arrows.
- Take care not to damage the wiring harness.



- Undo the indicated screws then remove the main shell **(A)**.
- Fit the main shell **(A)** and fasten by tightening the indicated screws.

		
Tightening torque	Nm	Class
Screw	1.08 Nm	0



- Fasten the right hand turn indicator switch cable to the retainers indicated by the red arrows.
- Take care not to damage the wiring harness.
- Connect the connector **(2)**.

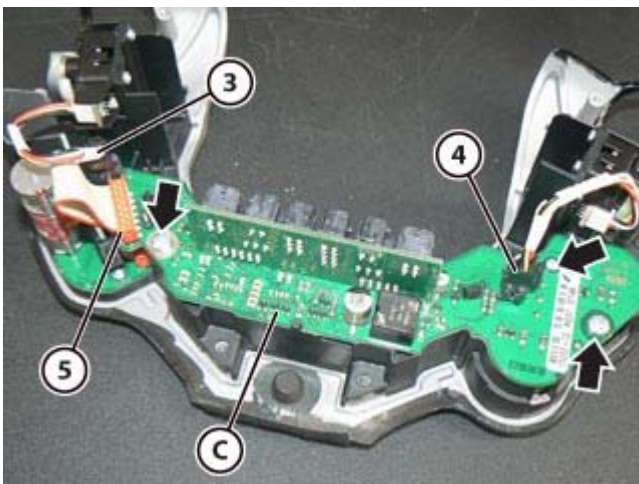


- Fasten the left hand turn indicator switch cable to the retainers indicated by the red arrows.
- Take care not to damage the wiring harness.
- Connect the connector **(1)**.

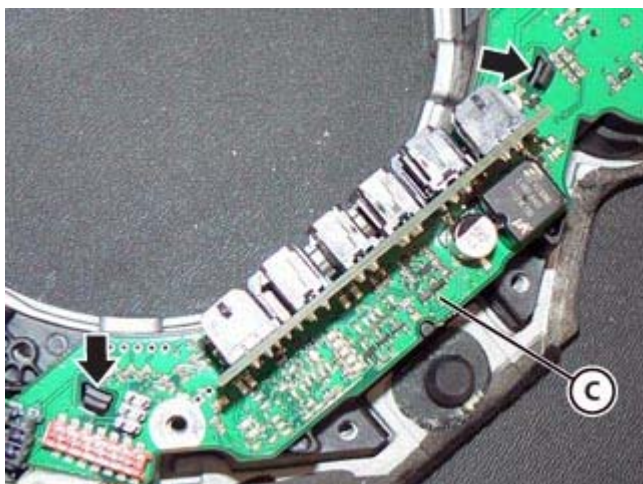
- Replace the steering wheel mounted control panel (E5.05).
- Perform refitting sequence.
- Connect the battery (F2.01).

NVO circuit board

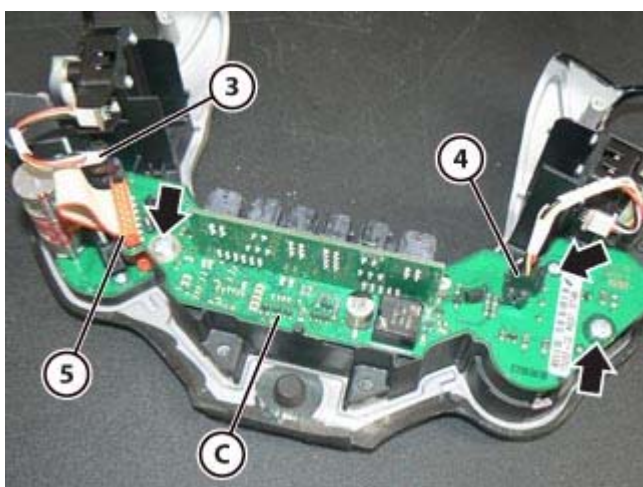
- Disconnect the battery (F2.01).
- Replace the steering wheel mounted control panel (E5.05).
- Perform removal sequence.
- Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.
- Remove the main shell.



- Gently disconnect the windscreen wiper switch connector **(3)** from the NVO circuit board.
- Gently disconnect the high beam switch connector **(4)** from the NVO circuit board.
- Gently disconnect the connector **(5)** from the Manettino selector dial.
- Undo the three screws indicated fastening the NVO circuit board **(C)**.



- Releasing the two retainers indicated, remove the NVO circuit board **(C)**.
- Fit the NVO circuit board **(C)** in the relative seat, and fasten with the two retainers indicated.



- Tighten the three screws indicated fastening the NVO circuit board **(C)**.

		
Tightening torque	Nm	Class
Screw	0.32 Nm	0

- Gently connect the windscreen wiper switch connector **(3)** to the NVO circuit board.
- Gently connect the high beam switch connector **(4)** to the NVO circuit board.
- Gently connect the connector **(5)** to the Manettino selector dial.

- Refit the main shell.
- Replace the steering wheel mounted control panel ( E5.05).
- Perform refitting sequence.

- Connect the battery ( F2.01).
- If the NVO circuit board has been replaced, a Proxy alignment procedure must be performed after reassembly.

Manettino toggle



- Undo the indicated grub screw and remove the Manettino toggle (7).



- Rotate the Manettino selector dial spindle (11) so that the flat surface is at **180°** relative to the **CT OFF** Manettino setting position, as shown in the photo aside.



- Fit the Manettino toggle (7) and fasten by tightening the indicated grub screw.

		
Tightening torque	Nm	Class
Dowel	0.74 Nm	0

Manettino dial face



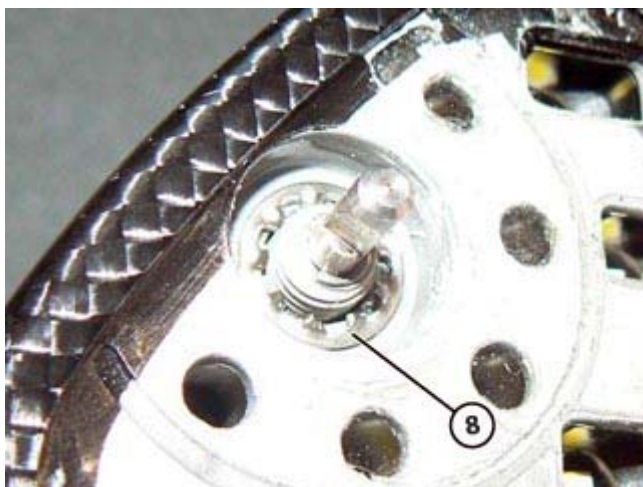
- Using a pointed implement and taking care not to damage the trim, detach the dial face (**J**) from the control panel.
- Always replace the dial face after removal.
- Fix the new dial face (**J**) in the relative seat, aligning the edges correctly.

Manettino selector dial

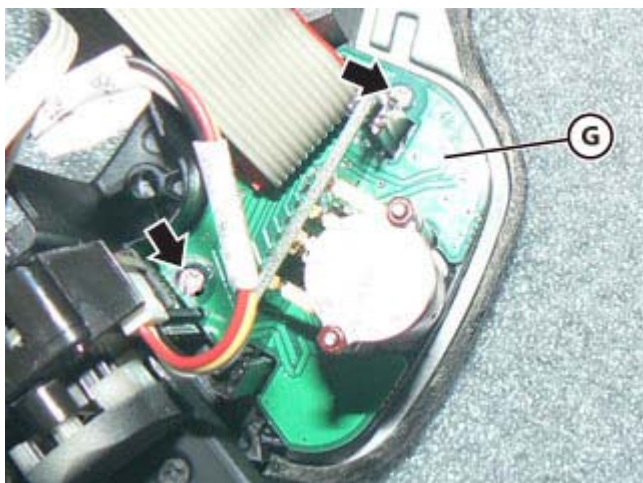
- Disconnect the battery (🔌 F2.01).
- Replace the steering wheel mounted control panel (🔌 E5.05).
- Perform removal sequence.
- Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.
- Remove the main shell.
- Remove the NVO circuit board.
- Remove the Manettino toggle.
- Remove the Manettino dial face.



- Using a long socket wrench, undo the indicated screw ring fastening the Manettino selector dial.



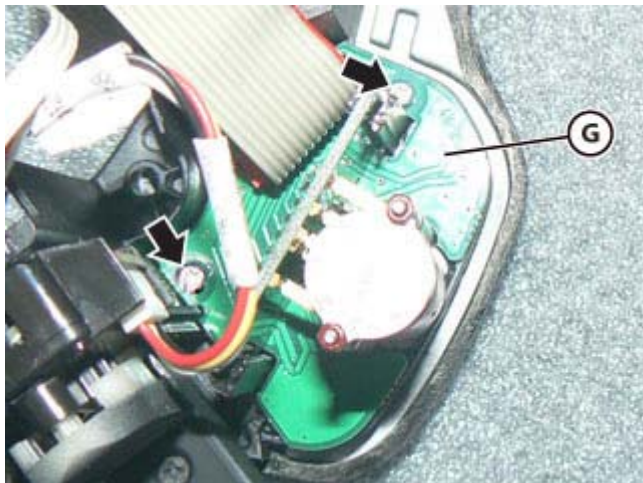
- Remove the washer **(8)** and replace.



- Undo the indicated screws fastening the Manettino selector dial **(G)**, then disconnect the cable.



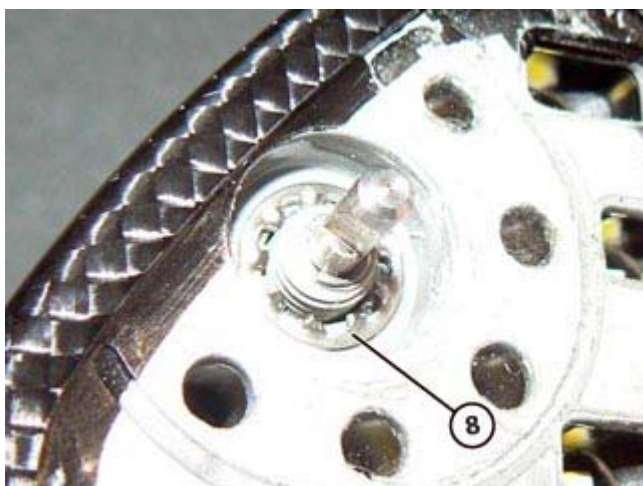
- Remove the Manettino selector dial **(G)**.
- Fit the Manettino selector dial **(G)** on the main base, aligning the indicated lugs.



- Tighten the indicated screws fastening the Manettino selector dial **(G)**, then connect the cable.



Tightening torque	Nm	Class
Screw	0.32 Nm	0



- Fit the new washer **(8)**.
- Always replace the washer with a new component after removal.



- Using a long socket wrench, tighten the indicated screw ring fastening the Manettino selector dial.



Tightening torque	Nm	Class
Ring nut	1.48 Nm	0

- Thoroughly clean the surface where the new dial face will be applied.

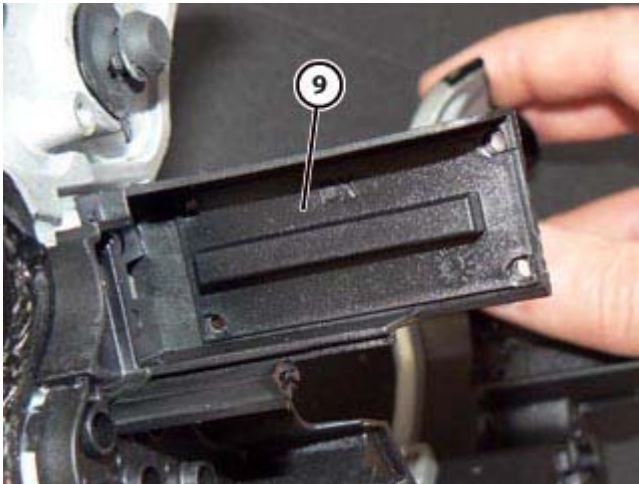
- Refit the Manettino dial face.
- Refit the Manettino toggle.
- Refit the NVO circuit board.
- Refit the main shell.
- Replace the steering wheel mounted control panel (🔧 E5.05).
-  Perform refitting sequence.
- Connect the battery (🔧 F2.01).
- If the Manettino selector dial has been replaced, a Proxy alignment procedure must be performed after reassembly.

Main base

- Disconnect the battery (🔧 F2.01).
- Replace the steering wheel mounted control panel (🔧 E5.05).
-  Perform removal sequence.
-  Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.
- Remove the main shell.
- Remove the NVO circuit board.
- Remove the Manettino selector dial.



- Undo the indicated screws then remove the windscreen wiper switch (E).

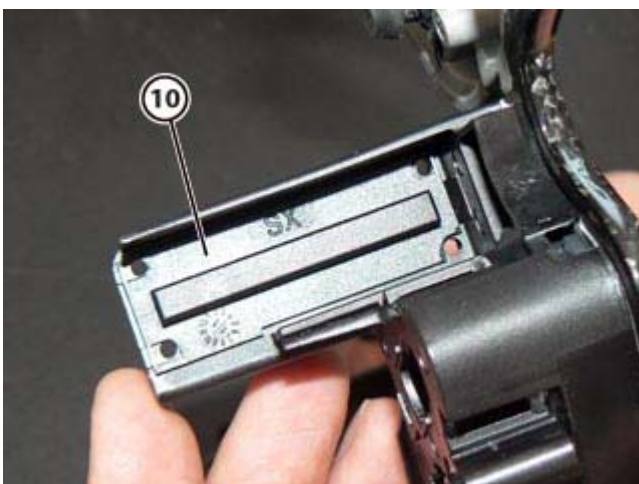


For control panels in Carbon and Alutex only

- Retrieve the shim (9) underneath the windscreen wiper switch.

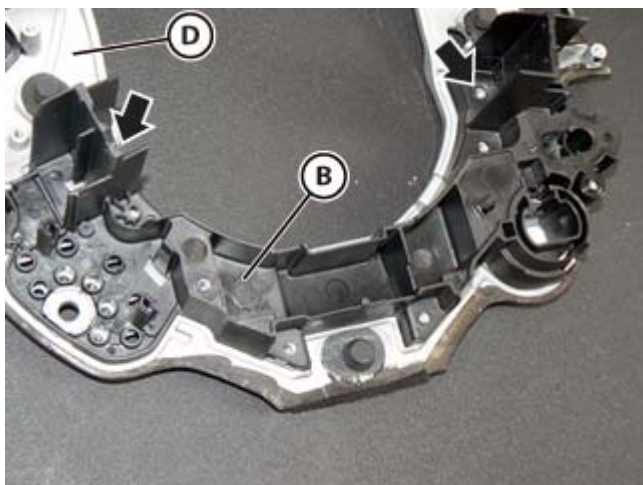


- Undo the indicated screws then remove the high beam switch (F).



For control panels in Carbon and Alutex only

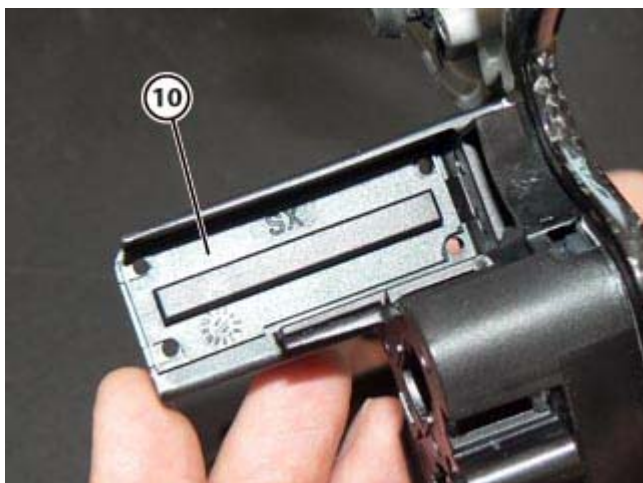
- Retrieve the shim (10) underneath the high beam switch.



- Undo the two screws indicated then remove the main base **(B)** from the cosmetic panel **(D)**.
- Fit the main base **(B)** on the panel **(D)** and tighten the two screws indicated.

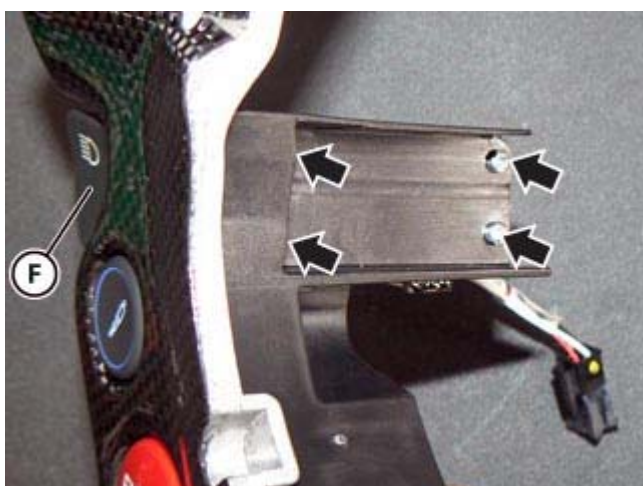


Tightening torque	Nm	Class
Screw	0.27 Nm	0



For control panels in Carbon and Alutex only

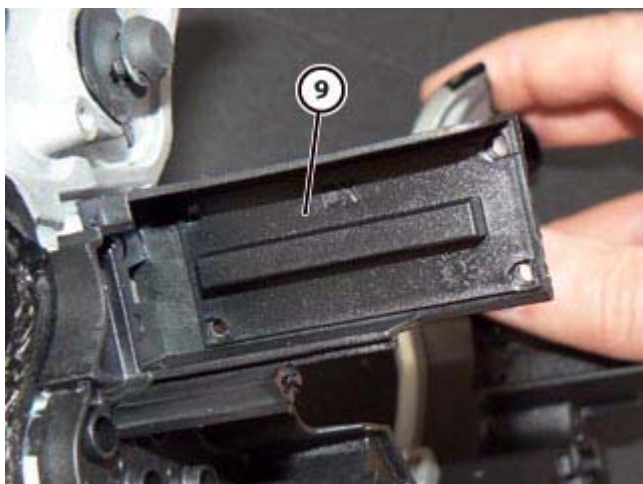
- Fit the shim **(10)** in the seat for the high beam light switch on the main base, with the letters SX at the top.



- Fit the high beam light switch **(F)** in the relative seat then fasten by tightening the indicated screws.



Tightening torque	Nm	Class
Screw	0.27 Nm	0



For control panels in Carbon and Alutex only

- Fit the shim **(9)** in the seat for the windscreen wiper switch on the main base, with the letters DX at the top.



- Fit the windscreen wiper switch **(E)** in the relative seat then fasten by tightening the indicated screws.

		
Tightening torque	Nm	Class
Screw	0.27 Nm	0

- Refit the Manettino selector dial.
- Refit the NVO circuit board.
- Refit the main shell.
- Replace the steering wheel mounted control panel ( E5.05).
-  Perform refitting sequence.
- Connect the battery ( F2.01).

"ENGINE START" and "Shock Absorber Height" buttons

- Disconnect the battery (🔌 F2.01).
- Replace the steering wheel mounted control panel (🔌 E5.05).
- Perform removal sequence.

• Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.

- Remove the main shell.
- Remove the NVO circuit board.
- Remove the Manettino selector dial.
- Remove the main base.

• In order to replace the “ENGINE START” and “Shock Absorber Height” buttons, the main base must be removed but it is not necessary to remove the windscreen wiper and lights switches.



- Push the three indicated tabs inward and remove the “ENGINE START” button (**H**).
- If necessary, apply a thin film of Vaseline around the outer circumference of the button (**H**) in contact with the relative seat to facilitate installation.
- Fit the new “ENGINE START” button (**H**) in the guides in the relative seat, orienting as shown in the photo aside and ensuring that the three tabs indicated are correctly locked.



- Push the three indicated tabs inward and remove the “Shock Absorber Height” button (**I**).
- If necessary, apply a thin film of Vaseline around the outer circumference of the button (**I**) in contact with the relative seat to facilitate installation.
- Fit the new “Shock Absorber Height” button (**H**) in the relative seat, orienting as shown in the photo aside and ensuring that the three tabs indicated are correctly locked.

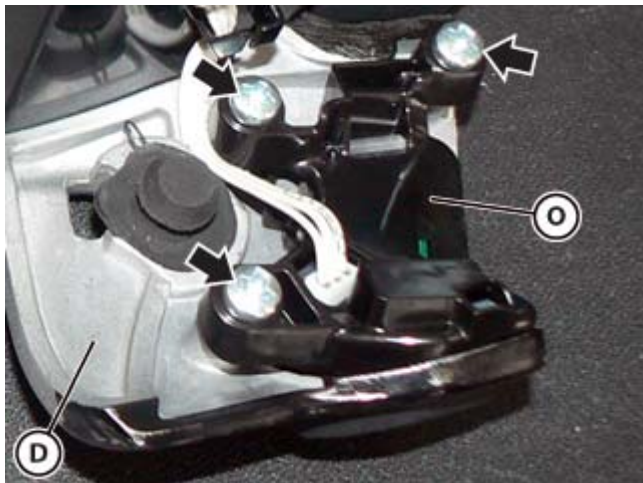
- Refit the main base.
- Refit the Manettino selector dial.
- Refit the NVO circuit board.
- Refit the main shell.
- Replace the steering wheel mounted control panel (🔧 E5.05).
- Perform refitting sequence.
- Connect the battery (🔧 F2.01).

Panel

- Disconnect the battery (🔧 F2.01).
- Replace the steering wheel mounted control panel (🔧 E5.05).
- Perform removal sequence.
- Place the steering wheel control panel on protective material on a flat surface to prevent damage to the components.
- Remove the main shell.
- Remove the NVO circuit board.
- Remove the Manettino selector dial.
- Remove the main base.



- Remove the left hand turn indicator switch (**N**) from the panel (**D**), undoing the indicated screws.



- Remove the right hand turn indicator switch **(O)** from the panel **(D)**, undoing the indicated screws.



- Fasten the right hand turn indicator switch **(O)** onto the panel **(D)**, tightening the indicated screws.



Tightening torque	Nm	Class
Screw	0.75 Nm	0



- Fasten the left hand turn indicator switch **(N)** onto the panel **(D)**, tightening the indicated screws.



Tightening torque	Nm	Class
Screw	0.75 Nm	0

- Refit the main base.
- Refit the Manettino selector dial.
- Refit the NVO circuit board.
- Refit the main shell.
- Replace the steering wheel mounted control panel (📖 E5.05).
- Perform refitting sequence.
- Connect the battery (📖 F2.01).

External light switch



The external lights will only function in Key-ON state.

Turn the external light selector clockwise or anticlockwise to select between the following external light modes:

- Turn to position **(A)** to switch on the parking lights.
- Turn to position **(B)** to set the lights to automatic mode, controlled by the twilight sensor.
- Turn to position **(C)** to switch the lights off.
- Turn to position **(D)** to switch on the low beam headlights.
- Press the button **(E)** to switch the rear fog lights on and off. The rear fog lights can only be switched on and off if the low or high beam headlights are on.

The rear fog lights may be switched on manually once the external lights have switched on in automatic mode.

When the external lights switch off automatically, the rear fog lights are also switched off automatically (if on), and will have to be switched on again manually, if required, the next time that the external lights switch on automatically.



With the parking lights on, press the high beam light switch **(F)** down to activate the running lights on the left hand side, and press upward to activate the running lights on the right hand side.

Left hand TFT display control buttons



The TURBO button **(A)** scrolls through the TURBO screens in sequence.

The VDA **(B)** button scrolls through the VDA screens in sequence.

The BACK button **(C)** returns to the previously active screen.

The OK button **(D)** and the UP/DOWN/LEFT/RIGHT buttons **(E)** are used for selecting and setting vehicle configuration parameters.

Right hand TFT display control buttons



The MAIN **(A)** button recalls the MAIN screen.

The OPTIONS VIEW button **(B)** recalls specific MENU screens.

The BACK button **(C)** returns to the previously active screen.

The dial **(D)** is used for selecting and confirming screens and options in the specific MENU screens.

The dial **(E)** switches the infotainment system on and off and adjusts the infotainment system volume.

EPB electric parking brake control buttons



CAUTION

When the Park Lock safety device is deactivated manually, the vehicle may move unexpectedly!

The vehicle is held in position only by the electric parking brake, if engaged.

The lever **(A)** engages and releases the EPB electric parking brake (by operating the brake shoes) in the following conditions:

- engine off;
- Key-ON
- brake pedal depressed.

The parking brake may be used as an emergency brake while the vehicle is in motion. In this case, the system continues to apply the brakes to all four wheels until the lever **(A)** is released, dialoguing with the

ESP stability control system, which prevents wheel lockup.

Autohold function

After deactivating the EPB electric parking brake as described previously, and in Key-ON state, pressing the AUTO PARK button **(B)** activates or deactivates the Autohold function, which automatically engages the EPB electric parking brake when the ignition is switched to Key-OFF.



CAUTION

When the Autohold function is deactivated, when parking the vehicle, always remember to manually engage the electric parking brake with the relative lever before switching off the engine.

When the button **(B)** is pressed, the message "**Parking brake on**" is displayed for **5 seconds** on the left hand TFT display. The next time the button **(B)** is pressed, the message "**Parking brake off**" is displayed for **5 seconds** on the left hand TFT display.

AVH "Automatic Vehicle Holding" function

The electric parking brake ensures optimised brake release dynamics for hill starts with the Automatic Vehicle Holding function: when certain conditions are met, the system keeps the vehicle braked by releasing the brake shoes and callipers at different times, allowing the driver enough time to move the foot from the brake to the accelerator without the vehicle rolling backwards.

Steering wheel adjustment control



The steering wheel reach and rake are adjustable electrically (only at Key-ON), by pushing the control **(A)** in the intended direction of adjustment for the steering wheel.

The steering wheel position is memorised, together with the external rear view mirror position, when the driver seat position is memorised (only on vehicles with memory seats).

DCT gearbox control buttons



Press **R (A)** to select reverse.

Release the **R** button (**A**) immediately once the relative gear selected is shown on the display. Holding the button for a prolonged period will cause the gearbox fault warning indicator to light, accompanied by a warning sound.

An audible safety signal sounds intermittently for as long as reverse is engaged.

If the system automatically engages 2nd gear when attempting to shift from "R" to 1st, this indicates that crashing was encountered in 1st gear.

If crashing is encountered when attempting to shift from 1st to "R", the system automatically engages "N".

Press **AUTO (B)** to select "Automatic" mode for the DCT gearbox.

The message "auto" is shown on the display when "Automatic" mode is enabled.

When in "Automatic" mode, the system automatically upshifts and downshifts in relation to vehicle speed, engine speed and the torque/power requested by the driver.

When in "Automatic" mode, the driver may still shift manually using the UP and DOWN shift paddles.

After a manual shift, the system remains in "Automatic" mode, as indicated by the message "auto", which continues to be shown on the display and flashes when the driver shifts manually with the paddles.

When the vehicle is stationary, requesting "N" from 1st or "R" will not cause the gearbox to switch from "Automatic" to "Manual" mode.

Press and hold **AUTO (B)** until the message "auto" is no longer shown on the gearbox display to exit the DCT gearbox "Automatic" mode.

The default mode for the DCT gearbox is "Automatic".

At each engine start, the DCT gearbox will be in "Auto easy exit" unless the vehicle was last switched off with the DCT gearbox in "Automatic" mode.

To exit "Auto easy exit" mode, simply press the **AUTO** button (**B**) on the centre console.

Press **LAUNCH (C)** button to activate the Launch Control performance start function.

Activating this function ensures the fastest acceleration possible for the vehicle from a standing start.

The function, which cannot be selected with the Manettino set to "Low Grip" mode, transmits the optimum amount of torque to the road surface to prevent wheelspin under acceleration.

Use the following procedure to activate Launch Control:

- vehicle stationary;
- brake pedal depressed;
- gearbox in manual mode;
- select first gear;
- disable traction control by setting the Manettino to CST OFF;
- press **LAUNCH (C)** on the centre console panel, an audible signal warns that the function is active and the message "launch" is shown on the gearbox display;
- press the accelerator pedal and release the brake pedal.

In the event of malfunction of the "UP" and "DOWN" shift paddles, the message "Depress brake pedal and press LAUNCH to engage gear" is shown on the left hand TFT display. The gear may then be engaged by

pressing **LAUNCH (C)** on the centre console while depressing the brake pedal.

In this case, the “Launch Control” function is not available.

If the gear selected previously was R, the **LAUNCH** button **(C)** must be pressed twice to engage 1st gear.

Power window buttons



CAUTION

Improper use of the power windows may be dangerous.

Always ensure that all persons and objects are at a safe distance before operating.

Use particular caution when operating the driver side window in automatic mode.

The power windows may only be operated with the ignition switch in position II.

Press or lift the button **(A)** up or down briefly and release to raise or lower the driver side door window manually (partial open/close).

Press and hold or lift and hold (for more than 0.3 seconds) the button **(A)** to lower or raise the driver side door window fully automatically. The window stops only once it has completed its travel or if the button is pressed again.

Press or lift the button **(B)** briefly to raise or lower the passenger side door window manually (partial open/close).

Press and hold or lift and hold the button **(B)** (longer than 0.3 seconds) to lower the passenger side door window fully automatically or raise manually.

On/off button for “Front Lift” ramp clearing front suspension lift (optional)



Press the button **(A)** to activate the “Front Lift” ramp clearing front suspension lift with the engine running and at speeds below 40 Km/h.

The “Front Lift” ramp clearing front suspension lift is disabled at speeds above 40 km/h. If vehicle speed exceeds 40 km/h while the system is active, it is automatically deactivated.

Press the button **(A)** to deactivate the “Front Lift” ramp clearing front suspension lift.

If the engine is switched off with the “Front Lift” ramp clearing front suspension lift active, it is advisable to turn the ignition key back to II (Key-on) and press the button **(A)** to deactivate the system.

If the system is not deactivated manually by pressing the button **(A)**, the “Front Lift” ramp clearing front suspension lift will be deactivated automatically 15 seconds after engine off.

In the event of engine fault, the “Front Lift” ramp clearing front suspension lift may still be activated by pressing and holding the button **(A)** for 10 seconds.

E5.06 Internal lighting

Removing the cabin light

- Preparation in progress

Refitting the cabin light

- Preparation in progress

E5.07 Door controls



CAUTION

Always check that the doors are closed correctly to prevent them from opening accidentally with the vehicle in motion.

Opening from the outside



Deactivate the alarm and unlock the centralised locking with the remote control or by turning the key in the relative lock.

Pull the handle **(A)** until the lock clicks open to open the door.

Opening from inside the vehicle



Pull the handle **(A)** until the lock clicks open to open the door.

When the door handle **(A)** is pulled without opening the door, the window drops to the "**target position**". If the door is then not opened within two seconds, the window returns to the "**upper limit**".

To open the door, release the handle and pull again.

Pulling the door handle **(A)** unlocks both doors

Door lock



Press the **"LOCK / UNLOCK" (A)** button to lock and unlock both doors from inside the passenger compartment.

The rolling lock function, which automatically locks the doors when the vehicle speed reaches 20 Km/h, may be enabled from the "Car setup" screen viewable on the left hand TFT display on the instrument panel.

E5.08 Passive Start System (Keyless)

Functions of Passive Start system (Keyless)



The Passive Start system is a convenient electronic start enable system - all the driver has to do is have the electronic key with him in the passenger compartment, in his jacket pocket, for example, to start the engine.

Activating Key-ON state



- Ensure that the electronic key of the vehicle is inside the passenger compartment.
- i* If the electronic key of the vehicle is not inside the passenger compartment, the left hand TFT display shows the specific message "**Electronic key not detected**".



- If the electronic system of the vehicle is in Key-OFF state, press the **ENGINE START/STOP** button and release as soon as the electronic system of the vehicle switches to **Key-ON** state.
- When the driver is inside the passenger compartment and the vehicle doors are closed, if the vehicle key is removed from the passenger compartment for any reason, the left hand TFT display shows the specific message "**Key not in vehicle**".

- If the message "**Remote key battery drained**" is shown on the left hand TFT display, the following procedure is required to activate Key-ON state.



- Detach and remove the cover (A).



- Hold the vehicle key vertically over the KIN emergency button.



- Press the **ENGINE START/STOP** button and release as soon as the electronic system of the vehicle switches to **Key-ON** state.

Activating Key-OFF state



- If the electronic system of the vehicle is in Key-ON state, press the **ENGINE START/STOP** button and release as soon as the electronic system of the vehicle switches to **Key-OFF** state.
-  If the electronic system is in Key-ON state with the engine off, the electronic system of the vehicle automatically switches to **Key-OFF** state after **240 minutes**.

Starting the engine

- Ensure that the anti-theft system and any major current consumers are switched off.
- Ensure that the EPB electric parking brake is activated.
- Ensure that all doors and lids are closed correctly.
- Activate Key-ON state ( E5.08).
- Wait for the initial instrument cluster indicator lamp check cycle to complete.



- Keep the brake pedal depressed.
-  Do not keep the ENGINE START button pressed for prolonged periods.
-  DO NOT depress the accelerator while the engine is starting.
- Press the **ENGINE START/STOP** button and release as soon as the engine has started.
-  If the vehicle key is removed from the passenger compartment for any reason while the engine is running with the driver inside the passenger compartment and the vehicle doors closed, the left hand TFT display shows the specific message "**Key not in vehicle**" repeatedly whenever the vehicle is moving until the engine is switched off. If the key is not in the passenger compartment, it will not be possible to start the engine again after switching it off.

Stopping the engine



- With the vehicle at a standstill and parked, press the **ENGINE START/STOP** button and release as soon as the engine stops.
-  If the key is not in the passenger compartment, it will not be possible to start the engine again after switching it off.
- If it is necessary to stop the engine while the vehicle is moving, press and hold the **ENGINE START/STOP** button for at least **2 seconds**, or press the **ENGINE START/STOP** button **3 times in rapid succession** within 6 seconds.

Emergency engine stop

The following procedure may only be used if the engine fails to stop after performing the normal engine stop procedure with the ENGINE START/STOP button.



- Detach and remove the cover **(A)**.



- Press the KIN emergency button **(B)** and release as soon as the engine stops.
- *i* The KIN emergency button **(B)** can only be used to switch the system off, and cannot be used to turn the system on.
- If it is necessary to stop the engine while the vehicle is moving, press and hold the **(KIN)** button for at least **2 seconds**, or press the **(KIN)** button **3 times in rapid succession** within 6 seconds.

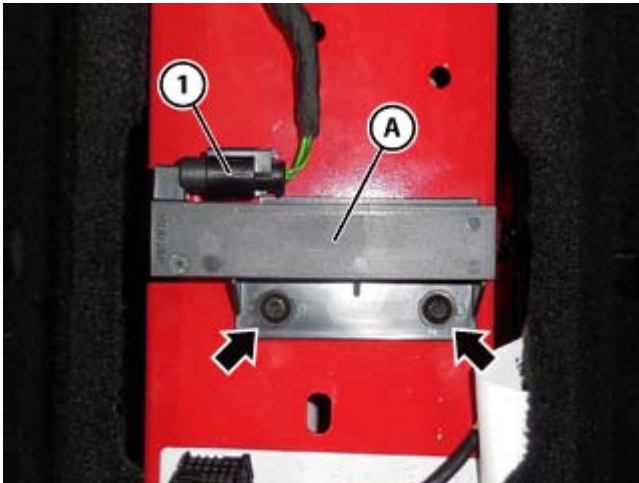
Replacing the passive start system antennas

			
Tightening torque		Nm	Class
Fastening passive start antennas	Screw	4 Nm	B

- Disconnect the battery ( F2.01).

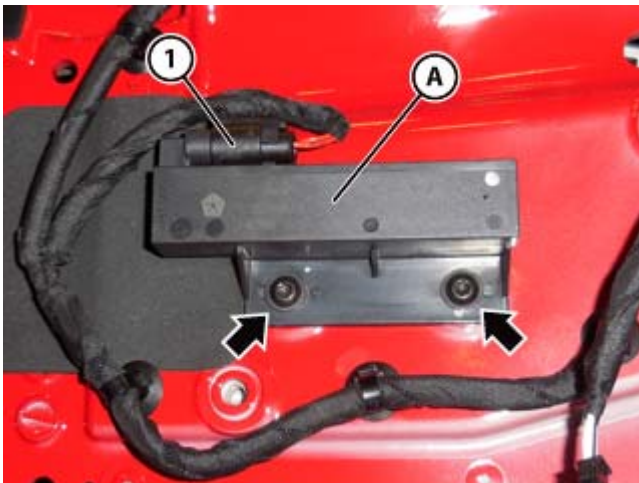
Centre antenna

- Remove the centre tunnel console trim ( E4.03).



- Refit the centre tunnel console trim (🔧 E4.03).

Lateral antennas



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the antenna **(A)** and replace.
- Fit the new antenna **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

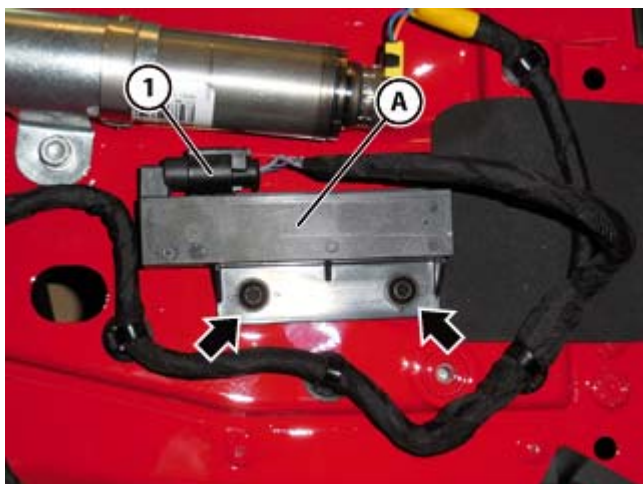
- Connect the connector **(1)**.

Right hand lateral antenna

- Remove the door trim (🔧 E3.08).
- Remove the right hand door panel.
- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the antenna **(A)** and replace.
- Fit the new antenna **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector **(1)**.
- Refit the door trim (🔧 E3.08).
- Refit the right hand door panel.



Left hand lateral antenna

- Remove the door trim (E3.08).
- Remove the left hand door panel.
- Disconnect the connector (1).
- Undo the screws indicated.
- Remove the antenna (A) and replace.
- Fit the new antenna (A).
- Tighten the screws indicated.

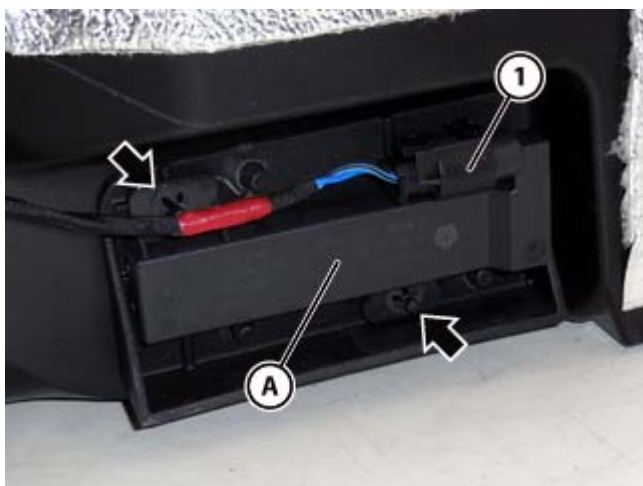


Tightening torque	Nm	Class
Screw	4 Nm	B

- Connect the connector (1).
- Refit the door trim (E3.08).
- Refit the left hand door panel.

Front antenna

- Remove the luggage compartment trim panels (E4.06).
- Remove the luggage compartment tray.



- Disconnect the connector (1).
- Detach the indicated clips.
- Remove the antenna (A) and replace.
- Fit the new antenna (A).
- Fasten the indicated clips.
- Connect the connector (1).

- Refit the luggage compartment trim panels (E4.06).
- Refit the luggage compartment tray.

- Connect the battery (F2.01).

E5.09 Rear view mirrors

Adjusting the interior rear view mirror



Do not adjust the rear view mirrors while the vehicle is in motion.



- Grip the internal rear view mirror **(A)** and move manually into the desired position.
- Press button **(1)** to enable or disable electrochromic dimming mode.
- The green LED indicated lights to indicate when electrochromic dimming mode is enabled. The green LED is off when electrochromic dimming mode is disabled.

Adjusting the external rear view mirrors

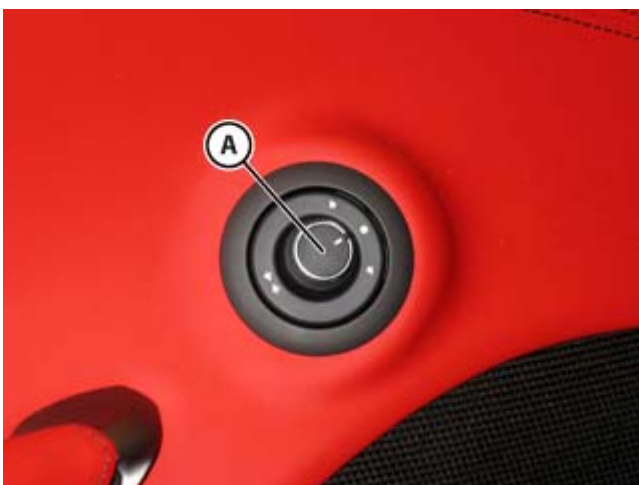


Do not adjust the rear view mirrors while the vehicle is in motion.

The mirrors can fold forward or backward in the event of collision: if necessary, the mirrors may be pushed forwards or backwards.

When reverse is engaged, the driver may adjust the passenger side rear view mirror into a different position than the one used in normal driving to facilitate parking manoeuvres. This position may be memorised by pressing the driving position memory buttons (E5.14, "Driving positions").

If a personalised reverse position for the rear view mirror has not been memorised, when reverse gear is engaged, the external rear view mirror will still move slightly downwards and inwards (relative to the normal driving position).



- To adjust the driver side external rear view mirror, turn the knob **(A)** 45° to the left.
- To adjust the passenger side external rear view mirror, turn the knob **(A)** 45° to the right.
- Push the knob **(A)** in the corresponding direction to adjust the field of view of the external rear view mirror as desired.
- After adjusting, turn the knob back **(A)** by 45° to the centre position to prevent unintentionally altering the rear view mirror setting.
- Rotate the knob **(A)** by 180° to fold both external rear view mirrors inwards.

E5.10 F1 shift paddles

Gearshift paddles



The driver can select the gears by means of two shift paddles located behind the steering wheel.

- Pull the left shift paddle **DOWN** to downshift.
- Pull the right shift paddle **UP** to upshift.
- Pull both shift paddles to select **neutral (N)**.

In the event of a malfunction of the **UP** and **DOWN** shift paddles, the message “**Depress brake pedal and press LAUNCH to engage gear**” is shown on the left hand TFT display. To engage the gear, press the **LAUNCH** button on the centre tunnel console while depressing the brake pedal.

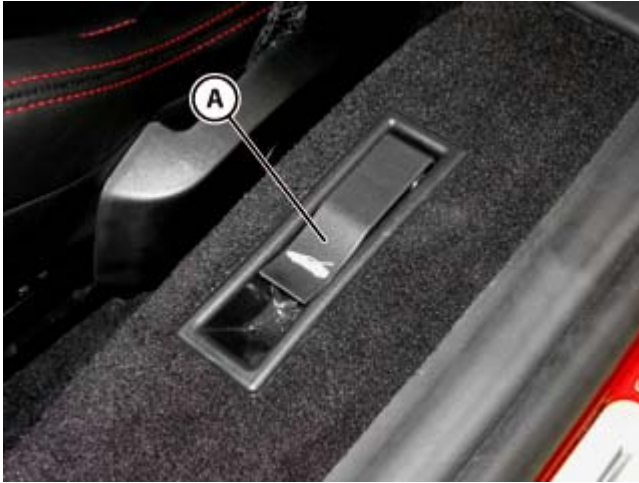
In the event of a malfunction of the **UP** and **DOWN** shift paddles with **R** engaged, press the **LAUNCH** button twice to select **1st gear**.

In this case, the “**Launch Control**” function is not available.

E5.11 Lid and fuel filler flap release mechanisms

Opening the engine compartment lid

➤ Open the driver side door.



- Pull the lever **(A)** until the lock audibly releases.



- Lift the engine compartment lid until the gas struts take up the weight.

Closing the engine compartment lid



CAUTION

Always check that the engine compartment lid is closed correctly to prevent it from opening accidentally with the vehicle in motion.

- Lower the engine compartment lid to close and press down on the lock area until it locks audibly.

Opening the luggage compartment lid

➤ Open the driver side door.



- Press the button **(A)**.



- The luggage compartment may also be opened by pressing the button **(B)** on the vehicle key.



- Keep the lever **(C)** pressed upward and lift the luggage compartment lid until the gas struts take the weight of the lid itself.

Opening the luggage compartment lid in an emergency

If the luggage compartment lid cannot be opened with the relative release button, the lid may be opened using the emergency release cable located under the dashboard on the driver side.



- Pull the emergency release cable **(D)** until the lock audibly clicks open.



- Keep the lever **(C)** pressed upward and lift the luggage compartment lid until the two gas struts take the weight of the lid itself.

Closing the luggage compartment lid



- Lower the luggage compartment lid to bring it into contact with the lock.



CAUTION

Always check that the luggage compartment lid is closed correctly to prevent it from opening accidentally with the vehicle in motion.

- Pressing onto the area over the lock, push the luggage compartment lid down gently until it locks audibly.

Opening the fuel filler flap



- Press the button **(A)** on the driver side door panel.



- The fuel filler flap opens automatically.

Opening the fuel filler flap in an emergency

If the fuel filler flap cannot be opened with the relative release button, it may be opened by using the emergency release cable located on the right-hand side of the engine compartment.

➤ Open the engine compartment lid (📖 E5.11).



- Pull the emergency release cable **(A)** until the fuel filler flap audibly opens.



- The fuel filler flap opens automatically.

Opening the fuel filler flap in an emergency

If the fuel filler flap cannot be opened with the relative release button, it may be opened by using the emergency release cable located on the right-hand side of the engine compartment.

➤ Open the engine compartment lid (📖 E5.11).



- Pull the emergency release cable **(A)** until the fuel filler flap audibly opens.

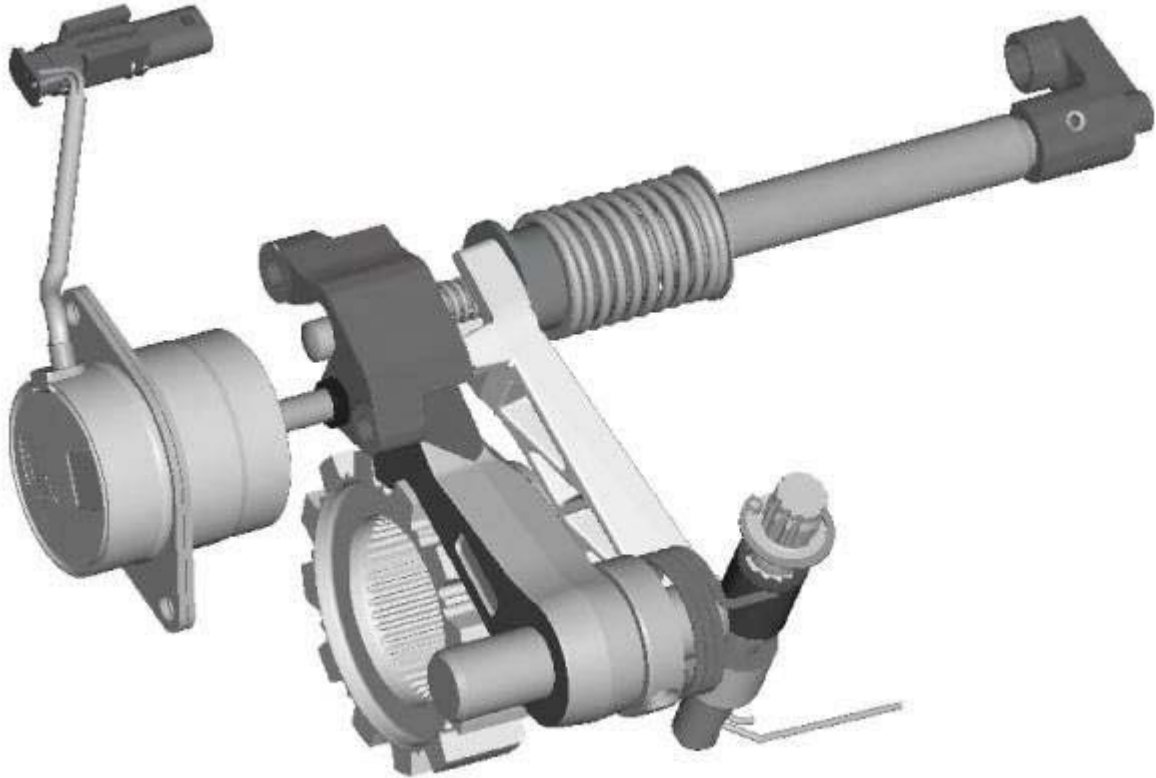


- The fuel filler flap opens automatically.

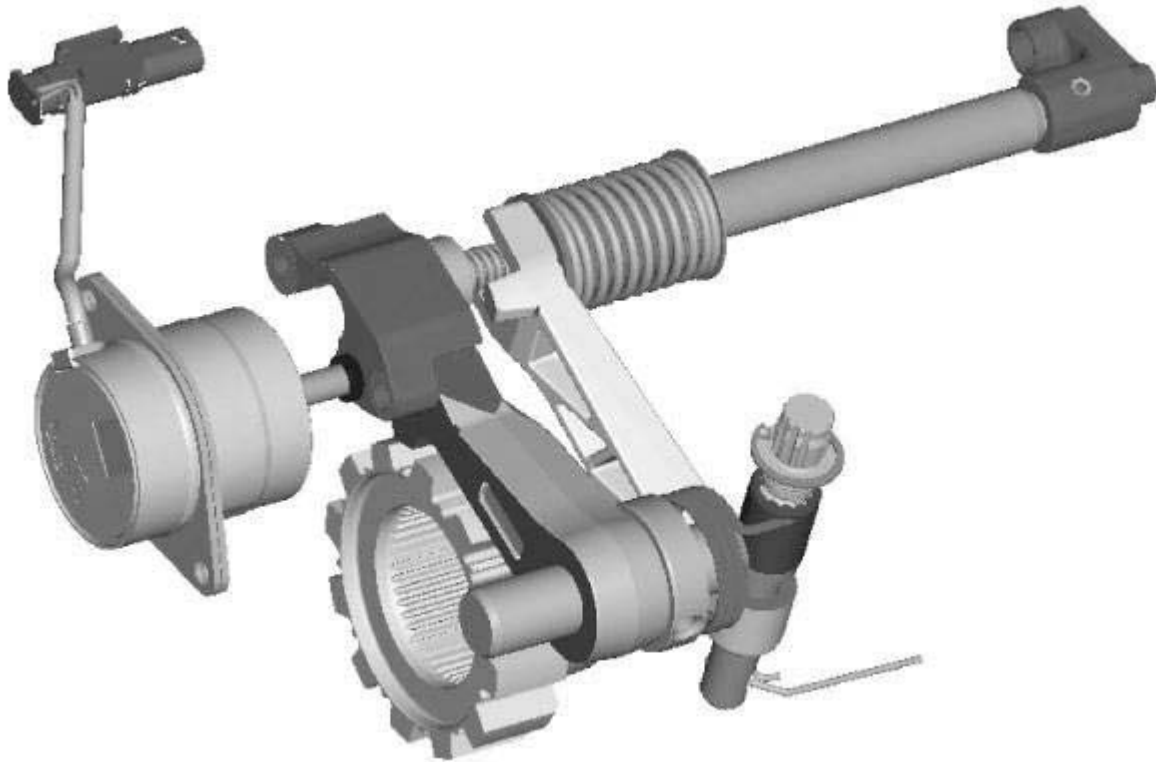
E5.12 Park Lock

The Park Lock device is integrated in the gearbox and immobilises the vehicle to prevent involuntary movement when the multiplate clutches are open, specifically, when the engine is off and/or with no hydraulic pressure in the gearbox.

This device is activated automatically at every "Key-OFF".



Park Lock engaged



Park Lock disengaged

The mechanism consists of a retainer wheel located on the output shaft, onto which a cable-controlled ratchet engages.

When the ratchet is over one of the teeth of the retainer wheel, the compression spring is loaded; as soon as the vehicle begins to move, the ratchet drops between two teeth, the spring relaxes, the carriage moves and the system locks.

When exiting park mode, carriage returns to its starting position and the compression spring retracts the ratchet from the gap between the retainer wheel teeth.

The vehicle is equipped with a manual system for releasing the Park Lock, situated on the gearbox housing, for use in the event of an emergency (e.g. vehicle breakdown or when transporting the vehicle with the battery disconnected).

Deactivating Park Lock electronically (CAR WASH mode)



When the Park Lock safety system is deactivated electronically (CAR WASH procedure), the vehicle may move unexpectedly!

The vehicle is held in position only by the electric parking brake, if engaged.

At each Key-OFF, the Park Lock system engages automatically to prevent the vehicle from moving.

Provided that the vehicle electrical system is functioning correctly, the Park Lock system may be deactivated electronically as described as follows.

In the case of a vehicle electrical system malfunction, the Park Lock system must be released with the "Emergency mechanical release procedure for Park Lock".

- Start the engine.
- Select **1st** gear.
- Select neutral (**N**).
- Switch off the engine.
- Turn the ignition switch **ON** within no more than **3 seconds**.



- Check that the letter "**N**" is shown on the DCT gearbox display.
- i* The Park Lock system is now temporarily **DEACTIVATED** and the vehicle is held in position only by the electric parking brake, if engaged.
- i* The Park Lock system will only remain in the **DEACTIVATED** state as long as the vehicle is in **Key-ON** state.

- The Park Lock system will only remain in the **DEACTIVATED** state as long as the vehicle is in **Key-ON** state.
- After the ignition switch is turned **OFF**, the Park Lock system is normally **ACTIVE**.

Mechanically deactivating the Park Lock



CAUTION

When the Park Lock safety device is deactivated manually, the vehicle may move unexpectedly! The vehicle is held in position only by the electric parking brake, if engaged.



CAUTION

If the vehicle is NOT on a level surface, suitable chocks must be placed in front of or behind the wheels.

Should it not be possible to deactivate the Park Lock electronically, the system may be released manually from the engine compartment. If the vehicle is NOT on a level surface, before releasing the system, place suitable chocks behind or in front of the wheels to prevent the vehicle from moving unexpectedly.



- Select the elements of the hex head wrench, Part No. **313812**, from the tool kit bag supplied with the vehicle.



- Assemble the elements of the hex head wrench, Part No. **313812**.



- Open the engine compartment lid.
- Fit the hex head wrench Part No. **313812** in the seat indicated on the Park Lock release mechanism.
- *i* To engage the hex head wrench, Part No. **313812**, correctly with the socket on the Park Lock release mechanism, ensure that the groove on the tip of the hex head wrench is aligned with the retainer tooth on the socket on the Park Lock release mechanism.
- Turn the hex head wrench, Part No. **313812** **ANTICLOCKWISE** by a quarter of a turn, without straining, until the Park Lock audibly **RELEASES**.



- If the electrical system is functioning, turn the ignition switch **ON** and check that the letter "**N**" is shown on the gearbox display.

- After moving the vehicle, the Park Lock must be activated again using the procedure described as follows.



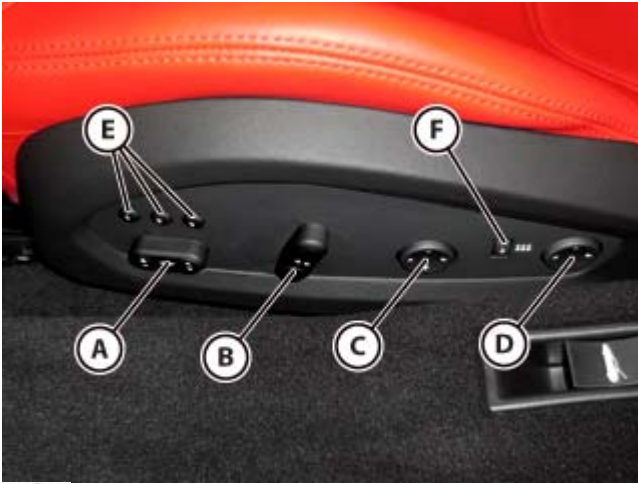
- Fit the hex head wrench Part No. **313812** in the seat indicated on the Park Lock release mechanism.
- *i* To engage the hex head wrench, Part No. **313812**, correctly with the socket on the Park Lock release mechanism, ensure that the groove on the tip of the hex head wrench is aligned with the retainer tooth on the socket on the Park Lock release mechanism.
- Turn the hex head wrench, Part No. **313812** **CLOCKWISE** by a quarter of a turn, without straining, until the Park Lock audibly **ENGAGES**.



- If the electrical system is functioning, turn the ignition switch **ON** and check that the letter "**P**" is shown on the gearbox display.

E5.13 Seat controls

Seat adjustment controls



CAUTION

Never adjust the seat position while driving, as this may cause loss of control of the vehicle.

With 2+2 version seats and optional Full Electric seats only, the seats may only be adjusted for a limited time (approx. 15 seconds) if the door is opened in key-off state. The seat alone may be adjusted again for a brief period each time that one of the doors is opened or both of the doors are closed in key-off state.

Adjusting the backward/forward position, height and tilt angle of the seat cushion

Push the control **(A)** forwards or backwards, as indicated by the arrows on the control itself, to adjust the forward/backward position of the seat.

Push the control **(A)** downwards or upwards, as indicated by the arrows on the control itself, to adjust the height or tilt angle of the seat.

Adjusting seat backrest inclination

Turn the control **(B)** forwards or backwards, as indicated by the arrows on the control itself, to adjust the inclination of the seat backrest.

Lumbar support adjustment (optional Full Electric)

Push the control **(C)** forwards, backwards, upwards or downwards, as indicated by the arrows on the control itself, to adjust the backrest lumbar support.

Pneumatic adjustment of the side of the seats (optional Full Electric)

Push the control **(D)** as indicated by the arrows on the control itself, to adjust the width of the lateral backrest and cushion sides.

Driving positions (optional Full Electric, driver seat only)

Use the three buttons **(E)** as described as follows to memorise or recall up to three different driving positions (function only enabled in key-on state):

- to memorise a driving position setting, adjust the seat, steering wheel and external rear view mirrors as desired using the respective controls, then press and hold any one of the three buttons **(E)** (each button corresponds to one memorisable position) for at least three seconds, until a double beep is emitted confirming that the setting has been saved. Adding a new driving position setting to the memory automatically replaces the setting assigned previously with the same button.
- to recall a memorised driving position, press the relative button **(E)** and release within three seconds.

Driving position selection may not be recalled while the vehicle is in motion.

The movements begin once one of the buttons **(E)** is released.

After releasing one of the buttons **(E)**, if the vehicle starts to move before the seat, steering wheel and external rear view mirrors have reached their respective memory positions, they will continue moving until the selected positions are reached.

If the memorised longitudinal position for the passenger seat is less than 50 mm from the rear travel limit, the seat will stop at approximately 50 mm from the rear travel limit when the memorised seat position is recalled. The seat may then be moved beyond this point using the forward/backward adjustment control.

Pressing any of the seat adjustment control buttons or memory buttons immediately arrests the automatic function in progress (e.g. memory recall and driver or rear seat easy entry/exit function UP TO Assembly No. 106216).

Heating (optional Full Electric)

Turn the dial **(F)** to switch on the heated seat function and set the temperature.

Turning the dial to "0" switches the seat heating function off.

Tipping the backrest



Lift the handle **(G)** to tip the backrest forwards.

E5.14 Infotainment system

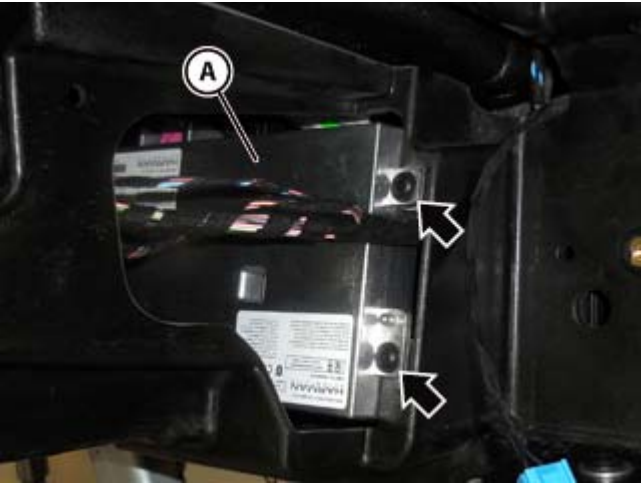
Removing the NIT

 Whenever an NIT or other component supplied by Becker is replaced, the replaced component must be placed in the original packaging (use the packaging containing the new replacement unit) and returned, to avoid the possibility of rejected warranty claims for faults which could otherwise be suspected as being the result of impact damage.

- Disconnect the battery ( F2.01).
- Remove the dashboard trim panels ( E4.02).
-  Remove the glove compartment.



- Undo the screws indicated.



- Undo the screws indicated.
- Remove the NIT **(A)**, disconnecting the connectors.
- Remove the NIT **(A)**, complete with the respective mounting bracket.

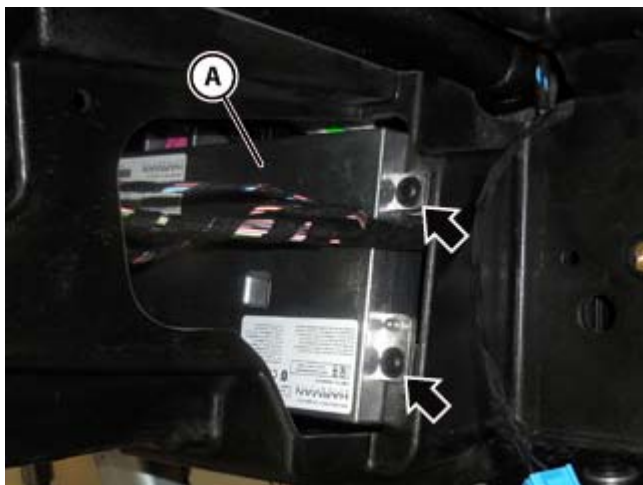
Refitting the NIT

			
Tightening torque		Nm	Class
Fastening the NIT	Screw	4 Nm	B



Tightening torque

	Nm	Class
Screw	8.5 Nm	B



- Fit the NIT **(A)**, complete with the respective mounting bracket.
- Install the NIT **(A)**, connecting the connectors.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	4 Nm	B



- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	4 Nm	B
Screw	8.5 Nm	B

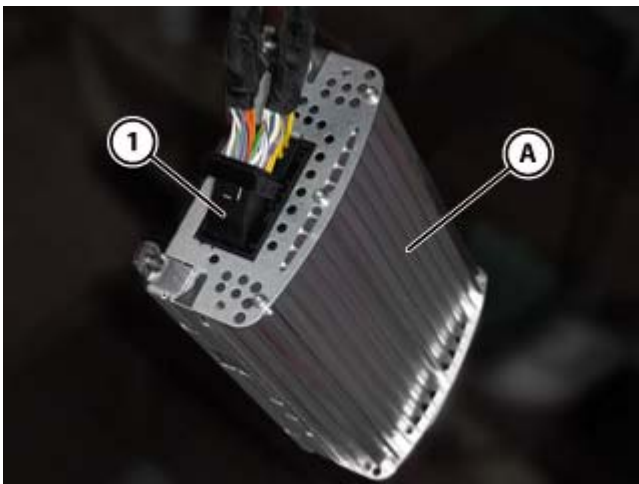
- Refit the dashboard trim panels (E4.02).
- Refit the passenger side central trim panel.
- Connect the battery (F2.01).

Removing the Hi-Fi system amplifier

- Disconnect the battery (F2.01).
- Remove the dashboard trim panels (E4.02).
- Remove the lower central trim panel.



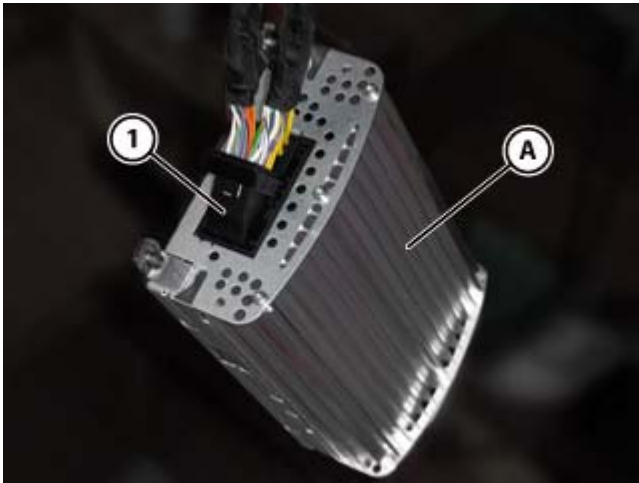
- Undo the screws indicated.
- Remove the amplifier from below.



- Disconnect the connector **(1)**.
- Remove the amplifier **(A)**.

Refitting the Hi-Fi system amplifier

			
Tightening torque		Nm	Class
Fastening the Hi-Fi system amplifier	Screw	5 Nm	B



- Fit the amplifier **(A)**.
- Connect the connector **(1)**.



- Fit the amplifier from below.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Refit the dashboard trim panels ( E4.02).
- Refit the lower central trim.
- Connect the battery ( F2.01).

E5.15 Telemetry

Replacing telemetry system cameras

- Preparation in progress

E6.01 Sanding and cleaning

	Pre-Cleaning Steel. Remove rust by sandblasting, wire brush or coarse sanding paper (P16 to P80) to achieve a bare substrate. For rust through areas tinning is recommended. In case of larger damaged areas it might be necessary to weld in a new sheet or to replace the whole part. Remove any remains like scale from welding, tinning or any parting compounds and fluxing agents thoroughly.																								
	Cleaning Clean any old paint (OE finish) thoroughly with water first to remove any water soluble dirt. Clean with a suitable pre-cleaner, e.g. D837 DX330 Spirit Wipe or D845 DX310 High Strength Degreaser. If there is any VOC legislation in force, use D842 DX380 low VOC Cleaner or D8401 Waterborne low VOC Cleaner. If using D842, rinse the surface with T494 Envirobace thinner immediately after degreasing, then dry the panel surface.																								
	Dry Sanding (rotary-orbital machine) Use the following paper grades depending on the substrate. Start with the coarsest grade and carry on down to the finest grade. Fleeces and pads are especially recommended for edges and borders. Use a guide coat for best results: <table border="0"> <tbody> <tr> <td>TM</td><td>™ red pad, 3M Soft Pad ultrafine</td></tr> <tr> <td>TM</td><td>™ grey pad, 3M Soft Pad ultrafine</td></tr> <tr> <td>Tinned Steel</td><td>P80-P220</td></tr> <tr> <td>TM</td><td>™ red pad, 3M Soft Pad ultrafine</td></tr> <tr> <td>E-Coat (spare parts)</td><td>P280 - P400, 3M Scotch-Brite™ grey pad, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)</td></tr> <tr> <td>OE Finish / Repair Coatings</td><td>P240 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine</td></tr> <tr> <td>Putty / Filler</td><td>Coarse sanding: P80 - P150, fine sanding: P240 - P320</td></tr> <tr> <td>Spray Polyester</td><td>Coarse sanding: P150, fine sanding: P240 - P320</td></tr> <tr> <td>Primer</td><td>P320 - P400, 3M Soft Pad ultrafine</td></tr> <tr> <td>Surfacer</td><td>P320 - P400, 3M Soft Pad ultrafine</td></tr> <tr> <td>Topcoat (blending areas)</td><td>P800 - P1500, 3M Soft Pad ultrafine, 3M Scotch-Brite™ pad superfine</td></tr> <tr> <td>Clearcoat (blending areas)</td><td>P800 - P1500, 3M Soft Pad ultrafine, 3M Scotch-Brite™ pad superfine</td></tr> </tbody> </table>	TM	™ red pad, 3M Soft Pad ultrafine	TM	™ grey pad, 3M Soft Pad ultrafine	Tinned Steel	P80-P220	TM	™ red pad, 3M Soft Pad ultrafine	E-Coat (spare parts)	P280 - P400, 3M Scotch-Brite™ grey pad, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)	OE Finish / Repair Coatings	P240 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine	Putty / Filler	Coarse sanding: P80 - P150, fine sanding: P240 - P320	Spray Polyester	Coarse sanding: P150, fine sanding: P240 - P320	Primer	P320 - P400, 3M Soft Pad ultrafine	Surfacer	P320 - P400, 3M Soft Pad ultrafine	Topcoat (blending areas)	P800 - P1500, 3M Soft Pad ultrafine, 3M Scotch-Brite™ pad superfine	Clearcoat (blending areas)	P800 - P1500, 3M Soft Pad ultrafine, 3M Scotch-Brite™ pad superfine
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Topcoat (blending areas)	P800 - P1500, 3M Soft Pad ultrafine, 3M Scotch-Brite™ pad superfine																								
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Surfacer	P320 - P400, 3M Soft Pad ultrafine																								
Topcoat (blending areas)	P320 - P400, 3M Soft Pad ultrafine																								

	Clearcoat (blending areas)	P1000 - P1200, 3M Soft Pad ultrafine
	Cleaning Clean any old paint (OE finish) thoroughly with water first to remove any water soluble dirt. Clean with a suitable pre-cleaner, e.g. D837 DX330 Spirit Wipe or D845 DX310 High Strength Degreaser . If there is any VOC legislation in force, use D842 DX380 low VOC Cleaner or D8401 Waterborne low VOC Cleaner . If using D842 , rinse the surface with T494 Envirobase thinner immediately after degreasing, then dry the panel surface.	

E6.02 Use of hardeners and diluents

The following tables show which hardeners and thinners have to be used together with the corresponding PPG products depending on the ambient temperature.

Deltron D821 – 2K HS Chip Resistant Primer				
Temperature	HS Hardeners		MS Hardeners	
	HS-Hardener	Thinner	MS-Hardener	Thinner
Up to 18°C	D884 / D897	D808	D841	D808
18 – 25°C	D884 / D897	D866 / D807	D841	D866 / D807
25 – 35°C	D884 / D897	D812	D861	D812
Above 35°C	D884 / D897	D869	D861	D869
N.B.: When using Deltron D821 primer as non-sand surfacers, it is recommended that the same hardener is used in subsequently applied direct gloss colour or clearcoat. Consult the appropriate technical datasheet(s) to identify a suitable common hardener.				

Deltron BC – Solventborne Basecoat	
Temperature	Thinner
Up to 18°C	D808
18 – 25°C	D807
25 – 35°C	D812
Above 35°C	D869
Spot Repair	D851 / for detailed information see technical datasheet "02 – Deltron BC"
	For optimum durability and adhesion it is recommended to mix Deltron BC 10 : 1 with D841 MS Hardener, and then thin 1 : 1 with GRS Thinner prior to application. Potlife of the activated basecoat is in excess of 48 hours. Application and drying properties are unchanged.

Deltron D8109 – UHS low VOC Clearcoat		
Temperature	HS Hardeners	
	HS-Hardener	Thinner
Up to 18°C	D897	D808
18 – 25°C	D897	D807
25 – 35°C	D897	D812
Above 35°C	D897	D869
	D8208	D808
Spot Repair	D868 / for detailed information see technical datasheet "171 – Deltron D8109"	
Enhanced	D865 / for detailed information see technical datasheet "171 – Deltron D8109"	
Extended	D886 / for detailed information see technical datasheet "171 – Deltron D8109"	

Deltron D8105 – CeramiClear™		
Temperature	HS Hardeners	
	HS-Hardener	Thinner
Up to 18°C	D8215	-
18 – 25°C	D8215	-
25 – 35°C	D8215	-

Above 35°C	D8215	-
Spot Repair	D8215	-
Extended	D886 / for detailed information see technical datasheet "171 – Deltron D8105"	

E6.03 Preparing and painting the aluminium sheets

CeramiClear™ warranty repair system, conventional with sanding, for Aluminium substrates, total or partly respray, for stonechipping areas and tintable surfacer.

	Substrates
	Aluminium / Magnesium
Cleaning / Sanding	see below
Primer	Universal D831
Surfacer (if polyester filler is necessary)	Deltron D821
Putty / Filler (If necessary)	Galvaplant 77
Surfacer	Deltron D821
Basecoat(s)	Deltron BC
Clearcoat(s)	Deltron D8105, Deltron D8109

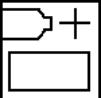
Substrate Preparation and Cleaning									
	for detailed information see chapter / section "Sanding and Cleaning".								
	Cleaning Clean any old paint (OE finish) thoroughly with water first to remove any water soluble dirt. Clean with a suitable pre-cleaner, e.g. D837 (DX330) Spirit Wipe or D845 (DX310) High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner.								
	Dry Sanding (rotary-orbital machine) Use the following paper grades depending on the substrate. Use a guide coat for best results: <table border="0" style="margin-left: 40px;"> <tr> <td>Aluminium /</td><td>P150 - P220, 3M Scotch-Brite™ red pad,</td></tr> <tr> <td>Magnesium</td><td>3M Soft Pad superfine</td></tr> <tr> <td>OE Finish / Repair</td><td>P240 - P400, 3M Scotch-Brite™ red pad,</td></tr> <tr> <td>Coatings</td><td>3M Soft Pad superfine</td></tr> </table>	Aluminium /	P150 - P220, 3M Scotch-Brite™ red pad,	Magnesium	3M Soft Pad superfine	OE Finish / Repair	P240 - P400, 3M Scotch-Brite™ red pad,	Coatings	3M Soft Pad superfine
Aluminium /	P150 - P220, 3M Scotch-Brite™ red pad,								
Magnesium	3M Soft Pad superfine								
OE Finish / Repair	P240 - P400, 3M Scotch-Brite™ red pad,								
Coatings	3M Soft Pad superfine								
	Wet Sanding (manual) Do not wet sand								
	Cleaning Clean with a suitable pre-cleaner, e.g. D837 DX330 Spirit Wipe or D845 DX310 High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner. Overcoat any exposed Aluminium within 4 hours.								

Deltron D831 – Universel	
	For detailed information see technical datasheet "10 – Universel D831"
 	For detailed information see chapter / section "Sanding and Cleaning"

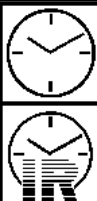
	Mixing Ratio D831 1 vol D832 / D833 * 1 vol
	* For exceptional conditions of temperature and humidity (> 35°C / > 70%) and for large areas use Slow Reactive Thinner D833
	Number of coats: 2-3
	Flash-off between coats at 20°C: 5 minutes
	Drying times: Dustfree 5 minutes Dry to sand at 20°C 30 - 45 minutes (D832) Dry to sand at 35°C 30 - 45 minutes (D833)
	Total dry film build: 15 - 20 µm
	Repair / Recoating: with P400 (dry), if necessary Overcoat / Re-coat time at at 20°C (airdrying): 30 – 40 minutes

Deltron D821 – 2K HS Chip Resistant Primer [Primer Surfer]	
	For detailed information see technical datasheet "104 – Deltron D821"
	For detailed information see chapter / section "Sanding and Cleaning"
	Hardener and thinner selection: for detailed information see chapter / section "Hardeners and Thinners"
	Mixing Ratio Untinted D821 5 vol D821 3 vol HS-Hardener 1 vol MS-Hardener 1 vol Thinner 1 vol Thinner 1 vol Tinted D821 3 vol D821 3 vol DG 1 vol DG 1 vol HS-Hardener 1 vol MS-Hardener 1,5 vol Thinner 1 vol Thinner 1 vol
	Number of coats: 2-3
	Flash-off between coats at 20°C: 10 – 15 minutes Flash-off before stoving at 20°C: 10 – 15 minutes
	Drying times: Dustfree at 20°C 35 minutes Touch dry at 20°C 1,5 - 2 hours (tinted: 2 – 2.5 hours) Through dry at 20°C Overnight Through dry at 60°C 20 – 25 minutes tinted: 30 minutes (metal temperature) Through dry (IR) 10 - 15 min

	Total dry film build: 70 – 110 µm (tinted: 60 – 90 µm)
 	Sand with P400 (dry) or P800 (wet)

Galvaplant 77											
	For detailed information see technical datasheet "76 - Fillers"										
 	For detailed information see chapter / section "Sanding and Cleaning"										
	Addition of hardeners (A665, A666, A667) <table> <tr> <td>from □°C to 10°C</td><td>2,5 % - 3,0 %</td></tr> <tr> <td>from 10 °C to 20 °C</td><td>from □,0°C to 2,5°C</td></tr> <tr> <td>from □°C to 30°C</td><td>from □,5°C to 2,0°C</td></tr> </table> (by weight)	from □°C to 10°C	2,5 % - 3,0 %	from 10 °C to 20 °C	from □,0°C to 2,5°C	from □°C to 30°C	from □,5°C to 2,0°C				
from □°C to 10°C	2,5 % - 3,0 %										
from 10 °C to 20 °C	from □,0°C to 2,5°C										
from □°C to 30°C	from □,5°C to 2,0°C										
	Application: use a suitable knife or spreader. Apply one or more coats as necessary, allowing 5 – 10 minutes at 20°C between coats. Galvaplant 77 can be used directly on the bare metal.										
 	Dry to sand: <table> <tr> <td>from □°C to 10°C</td><td>25 – 35 minutes</td></tr> <tr> <td>from 10 °C to 20 °C</td><td>20 – 30 minutes</td></tr> <tr> <td>from □°C to 30°C</td><td>15 – 20 minutes</td></tr> <tr> <td>IR medium</td><td>5 – 6 minutes</td></tr> <tr> <td>IR short</td><td>4 – 5 minutes</td></tr> </table>	from □°C to 10°C	25 – 35 minutes	from 10 °C to 20 °C	20 – 30 minutes	from □°C to 30°C	15 – 20 minutes	IR medium	5 – 6 minutes	IR short	4 – 5 minutes
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from □°C to 30°C	15 – 20 minutes										
IR medium	5 – 6 minutes										
IR short	4 – 5 minutes										
	Dry sanding paper grades: P80 - P120 - P240 Overcoating at 20° C: 30 minutes										

Primer Deltron D821 – 2K HS Chip Resistant [low VOC Primer Surfacer]																				
		D104 /For detailed information see technical datasheet "104 – Deltron D821"																		
 		For detailed information see chapter / section “Sanding and Cleaning”																		
		Hardener and thinner selection: for detailed information see chapter / section “Hardeners and Thinners”																		
		Mixing Ratio Untinted <table><tr><td>D821</td><td>5 vol</td><td>D821</td><td>3 vol</td></tr><tr><td>HS-Hardener</td><td>1 vol</td><td>MS-Hardener</td><td>1 vol</td></tr><tr><td>Thinner</td><td>1 vol</td><td>Thinner</td><td>1 vol</td></tr></table> Tinted <table><tr><td>D821</td><td>3 vol</td><td>D821</td><td>3 vol</td></tr></table>			D821	5 vol	D821	3 vol	HS-Hardener	1 vol	MS-Hardener	1 vol	Thinner	1 vol	Thinner	1 vol	D821	3 vol	D821	3 vol
D821	5 vol	D821	3 vol																	
HS-Hardener	1 vol	MS-Hardener	1 vol																	
Thinner	1 vol	Thinner	1 vol																	
D821	3 vol	D821	3 vol																	

	DG	1 vol	DG	1 vol										
	HS-Hardener	1 vol	MS-Hardener	1,5 vol										
	Thinner	1 vol	Thinner	1 vol										
	Number of coats: 2-3													
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	Drying times: <table><tr><td>Dustfree at 20°C</td><td>35 minutes</td></tr><tr><td>Touch dry at 20°C</td><td>1,5 - 2 hours (tinted: 2 – 2.5 hours)</td></tr><tr><td>Through dry at 20°C</td><td>Overnight</td></tr><tr><td>Through dry at 60°C</td><td>20 – 25 minutes; tinted: 30 minutes (metal temperature)</td></tr><tr><td>Through dry (IR)</td><td>10 - 15 min</td></tr></table> Total dry film build: 70 – 110 µm (tinted: 60 – 90 µm)				Dustfree at 20°C	35 minutes	Touch dry at 20°C	1,5 - 2 hours (tinted: 2 – 2.5 hours)	Through dry at 20°C	Overnight	Through dry at 60°C	20 – 25 minutes; tinted: 30 minutes (metal temperature)	Through dry (IR)	10 - 15 min
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Through dry (IR)	10 - 15 min													
	Sand with P400 (dry) or P800 (wet)													
														

Approved Topcoats to be used with this Repair System	
Deltron BC	see technical datasheet "02 – Deltron BC"
Deltron D8105	see technical datasheet "170 – Deltron D8105"
Deltron BC	see technical datasheet "02 – Deltron BC"
Deltron D8109	see technical datasheet "171 – Deltron D8109"

Notes:

CeramiClear™ warranty repair system, conventional with sanding, for Aluminium substrates, total or partly respray, for stonechipping areas and tintable surfacer.

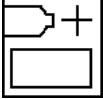
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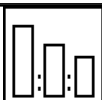
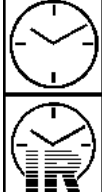
Deltron D831 – Universel							
	for detailed information see chapter / section “Sanding and Cleaning”.						
 VOC	For detailed information see technical datasheet "10 – Universel D831"						
	For detailed information see chapter / section “Sanding and Cleaning”						
	<table><tr><td>Mixing Ratio</td><td>D831</td><td>1 vol</td></tr><tr><td></td><td>D832 / D833 *</td><td>1 vol</td></tr></table> * For exceptional conditions of temperature and humidity (> 35°C / > 70%) and for large areas use Slow Reactive Thinner D833	Mixing Ratio	D831	1 vol		D832 / D833 *	1 vol
Mixing Ratio	D831	1 vol					
	D832 / D833 *	1 vol					
	Number of coats: 2-3						
	Flash-off between coats at 20°C: 5 minutes						
	Drying times: <table><tr><td>Dustfree</td><td>5 minutes</td></tr><tr><td>Dry to sand at 20°C</td><td>30 - 45 minutes (D832)</td></tr><tr><td>Dry to sand at 35°C</td><td>30 - 45 minutes (D833)</td></tr></table> Total dry film build: 15 - 20 µm	Dustfree	5 minutes	Dry to sand at 20°C	30 - 45 minutes (D832)	Dry to sand at 35°C	30 - 45 minutes (D833)
Dustfree	5 minutes						
Dry to sand at 20°C	30 - 45 minutes (D832)						
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	Repair / Recoating:	with P400 (dry), if necessary Overcoat / Re-coat time at at 20°C (airdrying): 30 – 40 minutes
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Primer Deltron D821 – 2K HS Chip Resistant [low VOC Primer Surfacers]																																
D104 /For detailed information see technical datasheet "104 – Deltron D821"																																
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Galvoplast 77	
	For detailed information see technical datasheet "76 - Fillers"
	For detailed information see chapter / section "Sanding and Cleaning"

											
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 	Dry to sand: <table> <tr> <td>from □°C to 10°C</td><td>25 – 35 minutes</td></tr> <tr> <td>from 10 °C to 20 °C</td><td>20 – 30 minutes</td></tr> <tr> <td>from □°C to 30°C</td><td>15 – 20 minutes</td></tr> <tr> <td>IR medium</td><td>5 – 6 minutes</td></tr> <tr> <td>IR short</td><td>4□ minutes</td></tr> </table>	from □°C to 10°C	25 – 35 minutes	from 10 °C to 20 °C	20 – 30 minutes	from □°C to 30°C	15 – 20 minutes	IR medium	5 – 6 minutes	IR short	4□ minutes
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Primer Deltron D821 – 2K HS Chip Resistant [low VOC Primer Surfacers]																															
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Sand with P400 (dry) or P800 (wet)

Approved Topcoats to be used with this Repair System

 VOC	Envirobase Deltron D8105	see technical datasheet "125 – Envirobase" see technical datasheet "170 – Deltron D8105"
 VOC	Envirobase Deltron D8105	see technical datasheet "125 – Envirobase" see technical datasheet "171 – Deltron D8109"

Notes:

- D8105 can be replaced by D8109 if the Fade-out technique is required .
- The following system is required if on the car the Colour Code label indicates “WATERBORNE TECHNOLOGY”.
- If a damaged part has to be repaired without replacing it, it is absolutely necessary to sand the OE Clear thoroughly. Superficial sanding can result in adhesion problems.
- Panel repair - also of adjacent parts – is recommended for optimum scratch resistance!

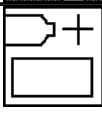
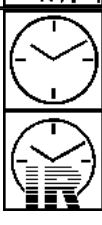
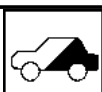
E6.04 Preparing and painting the steel sheets

CeramiClear™ warranty repair system, conventional with sanding, for Steel substrates, total or partly respray, for stonechipping areas and tintable surfacer.

	Substrates			
	Bare Steel	Galvanized Steel	E-Coat (spare parts)	OE Finish
Cleaning / Sanding	see below	see below	see below	see below
Putty / Filler	Galvaplant 77	Galvaplant 77		
Primer	Universal 831	Universal 831		
Surfacer	Deltron D821 MS / HS	Deltron D821 MS / HS	Deltron D821 MS / HS	
Basecoat(s)	Deltron BC	Deltron BC	Deltron BC	Deltron BC
Clearcoat(s)	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109

Substrate Preparation and Cleaning													
	for detailed information see chapter / section "Sanding and Cleaning".												
	Cleaning Clean any old paint (OE finish) thoroughly with water first to remove any water soluble dirt. Clean with a suitable pre-cleaner, e.g. D837 (DX330) Spirit Wipe or D845 (DX310) High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner.												
	Dry Sanding (rotary-orbital machine) Use the following paper grades depending on the substrate. Use a guide coat for best results: <table> <tr> <td>Steel</td><td>P80 - P220, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine</td></tr> <tr> <td>Galvanized Steel</td><td>P320 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine</td></tr> <tr> <td>Tinned Steel</td><td>P80-P220</td></tr> <tr> <td>Aluminium / Magnesium</td><td>P150 - P220, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine</td></tr> <tr> <td>E-Coat (spare parts)</td><td>P280 - P400, 3M Scotch-Brite™ grey pad, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)</td></tr> <tr> <td>OE Finish / Repair Coatings</td><td>P240 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine</td></tr> </table>	Steel	P80 - P220, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine	Galvanized Steel	P320 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine	Tinned Steel	P80-P220	Aluminium / Magnesium	P150 - P220, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine	E-Coat (spare parts)	P280 - P400, 3M Scotch-Brite™ grey pad, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)	OE Finish / Repair Coatings	P240 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine
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	Wet Sanding (manual) Use the following paper grades depending on the substrate <table> <tr> <td>E-Coat (spare parts)</td><td>P600 - P800, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)</td></tr> <tr> <td>OE Finish / Repair Coatings</td><td>P600 - P800, 3M Soft Pad ultrafine</td></tr> </table>	E-Coat (spare parts)	P600 - P800, 3M Soft Pad ultrafine (faultless E-Coat requires only cleaning)	OE Finish / Repair Coatings	P600 - P800, 3M Soft Pad ultrafine								
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OE Finish / Repair Coatings	P600 - P800, 3M Soft Pad ultrafine												
	Cleaning After wet sanding rinse thoroughly with clear water. Clean with a suitable pre-cleaner, e.g. D837 DX330 Spirit Wipe or D845 DX310 High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner. Overcoat any exposed Aluminium within 4												

hours.

Galvoplast 77			
		For detailed information see technical datasheet "76 - Fillers"	
	For detailed information see chapter / section "Sanding and Cleaning"		
	Addition of hardeners (A665, A666, A667)	from □°C to 10°C from 10 °C to 20 °C from □°C to 30°C	2,5 % - 3,0 % from □,0°C to 2,5°C from □,5°C to 2,0°C (by weight)
	Application: use a suitable knife or spreader. Apply one or more coats as necessary, allowing 5 – 10 minutes at 20°C between coats. Galvoplast 77 can be used directly on the bare metal.		
	Dry to sand:	from □°C to 10°C from 10 °C to 20 °C from □°C to 30°C IR medium IR short	25 – 35 minutes 20 – 30 minutes 15 – 20 minutes 5 – 6 minutes 4 – 5 minutes
	Dry sanding paper grades: Overcoating at 20° C:	P80 - P120 - P240 30 minutes	

Deltron D831 – Universel		
 VOC	For detailed information see technical datasheet "10 – Universel D831"	
 	For detailed information see chapter / section "Sanding and Cleaning"	
	Mixing Ratio	D831 1 vol D832 / D833 * 1 vol
	* For exceptional conditions of temperature and humidity (> 35°C / > 70%) and for large areas use Slow Reactive Thinner D833	
	Number of coats: 2-3	
	Flash-off between coats at 20°C: 5 minutes	
	Drying times: Dustfree 5 minutes	

	Dry to sand at 20°C Dry to sand at 35°C	30 - 45 minutes (D832) 30 - 45 minutes (D833)
	Total dry film build: 15 - 20 µm	
	Repair / Recoating:	with P400 (dry), if necessary Overcoat / Re-coat time at at 20°C (airdrying): 30 – 40 minutes

Deltron D821 – 2K HS Chip Resistant Primer [Primer Surfacers]		
	D104 / For detailed information see technical datasheet "104 – Deltron D821"	
	For detailed information see chapter / section "Sanding and Cleaning"	
	Hardener and thinner selection: for detailed information see chapter / section "Hardeners and Thinners"	
	Mixing Ratio Untinted D821 5 vol D821 3 vol HS-Hardener 1 vol MS-Hardener 1 vol Thinner 1 vol Thinner 1 vol Tinted D821 3 vol D821 3 vol DG 1 vol DG 1 vol HS-Hardener 1 vol MS-Hardener 1,5 vol Thinner 1 vol Thinner 1 vol	
	Number of coats: 2-3	
	Flash-off between coats at 20°C: 10 – 15 minutes Flash-off before stoving at 20°C: 10 – 15 minutes	
	Drying times: Dustfree at 20°C 35 minutes Touch dry at 20°C 1,5 - 2 hours (tinted: 2 – 2.5 hours) Through dry at 20°C Overnight Through dry at 60°C 20 – 25 minutes; tinted: 30 minutes (metal temperature) Through dry (IR) 10 - 15 min Total dry film build: 70 – 110 µm (tinted: 60 – 90 µm)	
	Sand with P400 (dry) or P800 (wet)	

Approved Topcoats to be used with this Repair System	
Deltron BC	see technical datasheet "02 – Deltron BC"

Deltron D8105	see technical datasheet "170 – Deltron D8105"
Deltron BC	see technical datasheet "02 – Deltron BC"
Deltron D8109	see technical datasheet "171 – Deltron D8109"

Notes:

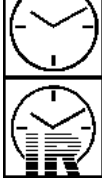
- D8105 can be replaced by D8109 if the Fade-out technique is required .
- The following system is required if on the car the Colour Code label indicates "WATERBORNE TECHNOLOGY".
- If a damaged part has to be repaired without replacing it, it is absolutely necessary to sand the OE Clear thoroughly. Superficial sanding can result in adhesion problems.
- Panel repair - also of adjacent parts – is recommended for optimum scratch resistance!

CeramiClear™ warranty repair system, compliant (low VOC, european legislation) with sanding, for Steel substrates, total or partly respray, for stonechipping areas and tintable surfacer.

	Substrates			
	Bare Steel	Galvanized Steel	E-Coat (spare parts)	OE Finish
Cleaning / Sanding	see below	see below	see below	see below
Putty / Filler	Galvoplast 77	Galvoplast 77		
Primer	Universal 831	Universal 831		
Surfacer	Deltron D821 HS	Deltron D821 HS	Deltron D821 HS	
Basecoat(s)	Envirobase	Envirobase	Envirobase	Envirobase
Clearcoat(s)	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109	Deltron D8105 Deltron D8109

Substrate Preparation and Cleaning	
	for detailed information see chapter / section "Sanding and Cleaning".
	Cleaning Clean any old paint (OE finish) thoroughly with water first to remove any water soluble dirt. Clean with a suitable pre-cleaner, e.g. D837 (DX330) Spirit Wipe o D845 (DX310) High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner.
	Dry Sanding (rotary-orbital machine) Use the following paper grades depending on the substrate. Use a guide coat for best results: Aluminium / Magnesium OE Finish / Repair Coatings P150 - P220, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine P240 - P400, 3M Scotch-Brite™ red pad, 3M Soft Pad superfine
	Wet Sanding (manual) Do not wet sand
	Cleaning Clean with a suitable pre-cleaner, e.g. D837 DX330 Spirit Wipe o D845 DX310 High Strength Degreaser. If there is any VOC legislation in force, use D8401 Waterborne low VOC Cleaner. Overcoat any exposed Aluminium within 4 hours.

Galvoplast 77	

Primer Deltron D821 – 2K HS Chip Resistant [low VOC Primer Surfacer]																													
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	Sand with P400 (dry) or P800 (wet)																												

Approved Topcoats to be used with this Repair System		
	Envirobase Deltron D8105	see technical datasheet "125 – Envirobase" see technical datasheet "170 – Deltron D8105"
	Envirobase Deltron D8105	see technical datasheet "125 – Envirobase" see technical datasheet "171 – Deltron D8109"

Notes:

- D8105 can be replaced by D8109 if the Fade-out technique is required .
- The following system is required if on the car the Colour Code label indicates "WATERBORNE TECHNOLOGY".
- If a damaged part has to be repaired without replacing it, it is absolutely necessary to sand the OE Clear thoroughly. Superficial sanding can result in adhesion problems.
- Panel repair - also of adjacent parts – is recommended for optimum scratch resistance!

E6.05 Restoring the cataphoresis coating

Restoring the cataphoresis coating

Whenever the cataphoresis coating layer is damaged, it is imperative that protective treatment is applied correctly to the damaged area as described in the following procedure.



Only mix the amount necessary to restore the coating, as once mixed, the product must be used within 1 hour.

- Prepare the product by mixing the two components in equal volumes - specifically, **50%** epoxy primer **PPG Universel D831** and **50%** catalyst **PPG Universel D832**.
- Clean the application area thoroughly with a clean cloth moistened with **R107/S**.
- The repair treatment may be applied with a spray gun or with a normal paint brush:

Application with spray gun



Protect the surrounding areas and nearby components against heat.

- Apply 2 or 3 coats of the treatment product, waiting **5 minutes** between coats.
- The total dry film thickness at the end of the application cycle must be between 15 μ and 20 μ .
- Allow to dry until dust free for **5 minutes**, or dry with a bodywork hot air gun, set to full power and held at a distance of 20 cm from the surface, for **10 minutes**.

Application with paint brush



Protect the surrounding areas and nearby components against heat.

- Apply a thin coat of product over all exposed metalwork surfaces.
- Allow to dry until dust free for **5 minutes**, or dry with a bodywork hot air gun, set to full power and held at a distance of 20 cm from the surface, for **10 minutes**.

Applying filler base coat

- Due to the characteristics of epoxy resin based products, a surfacer primer must also be applied over the epoxy primer **PPG Universel D831**, which also offers scratch protection.
- Apply **PPG UHS Greymatic D8018 (White)**, **PPG UHS Greymatic D8019 (Black)**, **PPG UHS Greymatic D8024 (Grey)** or **PPG Deltron D821** base coat.

The three surfacer primers differ in colour only and offer the same performance. The different colours are for use under different coloured top coats.

For instructions regarding preparation, application and drying, see the PPG technical product sheets.

F1.01 Tightening torques

			
Tightening torque		Nm	Class
Fastening throttle bodies	Screw	10 Nm	B
Fastening oxygen sensors	Oxygen sensor	50 Nm	B
Fastening the air flow meters	Screw	5 Nm	B
Fastening windscreen wiper arms	Nut	25 Nm	B
Fastening headlamps	Screw	7.5 Nm	B
Fastening the windscreen wiper unit	Screw	8 Nm	B
Fastening the engine ECU (NCM)	Screw	9 Nm	B
Fastening the ELDOR ionizing ECU (ION)	Screw	9 Nm	B
Fastening DCT gearbox ECU (NCR)	Screw	9 Nm	B
Fastening EPB electric parking brake ECU (NPB)	Screw	9 Nm	B

F1.02 List of light bulbs

Bulb application	Type	Power (12V)
High / Low beams	Gas discharge (Xenon) lamp	Das
Front running lights	Led	
Front turn indicators	Led	
Side turn indicators	Incandescent	T4W
Rear fog lights	Led	
Rear turn indicators	Led	
Reverse lights	Led	
Stop lights	Led	
Rear turn indicators	Led	
Number plate lights	Led	
Third stop light	Led	
Cabin light	Incandescent	8W
Spot light	Incandescent	5W
Document compartment light	Incandescent	5W
Underdoor courtesy light	Incandescent	5W
Luggage compartment light	Led	

F2.01 Battery, disconnecting / reconnecting

Specifications

The battery is located in the passenger compartment, behind the passenger side footrest.



Brand: **FIAMM**

Type: **VRLA - L3 AGM - 12V - 70Ah - 760A EN**

The battery is a sealed, maintenance-free unit.

The advantages of this type of battery are very low electrolyte consumption, self-discharge current and gas release during charging.

This battery has more than ample capacity to cater for the current consumption of the electrical systems originally installed on the vehicle.

This location ensures optimum operating conditions for the battery and extends battery life.

Installing additional electrical devices (telephone, etc.), increases absorption and necessitates special maintenance to ensure that the battery is charged correctly at the specified intervals.

Note that the battery has a self-discharge current of approximately **7 mA**. As a result, in the event of particularly prolonged periods with the vehicle not in use, recharge the battery at least once every months.

Disconnecting the battery



Each time the battery is disconnected from the electrical system of the vehicle, all the self-acquisition parameters are cancelled from the injection ECU.

These parameters must be reacquired before reusing the vehicle.



Never disconnect the battery from the electrical system while the engine is running.

Disconnect the battery when working on current consumers or in the event of prolonged periods with the vehicle not in use.

- Open the passenger side door.
- Use the power window controls to lower the door windows by 2-3 centimetres.
- Activate Key-OFF state (🚗 E5.08).
- Close the driver side door.
- Wait for the network to switch off. This should take approximately 5 to 15 minutes.
- During this period, do not open the doors or activate any vehicle device or system.



- Undo the indicated pin.
- Fold down the passenger side footrest mat.



- Release the quick release clamp on the negative pole of the battery using the lever (A).
- Disconnect the quick release clamp from the negative battery pole.



For vehicles with HELE

- Release the quick release clamp on the false negative pole of the battery using the lever (A).
- Disconnect the quick release clamp from the false negative battery pole.

Connecting the battery



Each time the battery is connected to the electrical system of the vehicle, WAIT 1 MINUTE before inserting the key in the ignition switch and do not switch on any current consumers during this period.

After inserting the ignition key, turn to "II" and WAIT AT LEAST 1 MINUTE before starting the engine. This procedure ensures that the ECUs in the vehicle are powered up and synchronised correctly, that all motorised valve aperture and closure travel parameters are self-acquired correctly and that AC ECU self-acquisition is performed correctly.

These self-acquisition procedures are initiated each time the battery is connected to the vehicle.



- Connect the quick release clamp to the negative battery pole.
- Fasten the quick release clamp on the negative pole of the battery using the lever **(A)**.



For vehicles with HELE

- Connect the quick release clamp to the false negative battery pole.
- Fasten the quick release clamp on the false negative pole of the battery using the lever **(A)**.



- Lift the passenger side footrest mat.
- Tighten the indicated pin.

➤ Carry out the following operations before starting the engine: close the doors, the engine compartment lid and the luggage compartment lid, unlock and lock the doors with the remote control, set the date and time on the instrument panel, close the doors, raise the door windows to the upper limit and check that the windows drop to the target position when the doors are opened.

i If this procedure is not followed correctly, the buttons in the passenger compartment for opening the luggage compartment lid, locking/unlocking the doors and releasing the fuel filler flap will be disabled.

➤ Restore the self-adaptive parameters (🔧 F2.01).

Restoring the self-adaptive parameters

Each time the battery is disconnected from the electrical system of the vehicle, all the self-acquisition parameters are cancelled from the ignition/injection ECU.

These parameters must be restored before the vehicle is used again, proceeding as follows.

The self-acquisition function of the Motronic ECUs will only be performed correctly at intake air temperatures above 5 °C. Ensure that the ambient air temperature is not below this value.

- Start the engine (🔧 E5.08).
- Leave the engine stationary for approximately **10 minutes** in the following conditions:
 - engine at idle speed;
 - water temperature stabilised;
 - current consumers switched off (lights, windscreen wipers etc.);
 - air conditioner off.
- These preparations allow the ECU to optimise the self-adaptive parameters quickly by preventing irregular engine operation.

Removing the battery

- Preparation in progress

Refitting the battery

- Preparation in progress

F2.02 Alternator

Removing the alternator

- Preparation in progress

Refitting the alternator

- Preparation in progress

F2.03 Starter motor

Removing the starter motor

- Preparation in progress

Refitting the starter motor

- Preparation in progress

F2.04 Lamps

Replacing Xenon high/low beam lamps

- Preparation in progress

F2.05 Lights

Diagnosing condensation in headlamps

Guide for headlamp moisture diagnosis

Visual check

- 1) Check that the lamps inspection cap is present and properly fitted to the ledge in its seat
(check cap position during checking operations)

lamps inspection cap

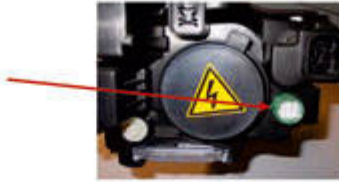


- 2) Check the absence of damages/cracks of the headlamp near both the headlamp body and the lens all along the perimeter (especially fixing brackets)



- 3) Check that the connector of opposite element is properly linked to the headlamp and that it is fitted to the ledge of the headlamp body (no free plays)

headlamp connector with opposite component



- 4) Check if the "cybar" cap and washer, that cover the front and rear ventilation, are present and properly mounted



ventilation cybar

ventilation washer



- 5) Check that all the carters are present and correctly assembled as per design specifications.

Test to be performed

- 1) Perform a dynamic test in order to eliminate the moisture following the further steps
 - a) engine on for 20 min
 - b) simultaneously switch on the headlamps (running light, low and high beams all on)
 - c) drive 30 km, speed 70 km/h
 - d) moisture must not be present at the end of test drive

Whenever condensation is found in a headlamp, please perform the checks and tests indicated above before starting any work.

Removing the headlamps

- Disconnect the battery (🔧 F2.01).
- Remove the luggage compartment trim panels (🔧 E4.06).
 - Remove the lateral luggage compartment trim panels.
- Remove the front bumper (🔧 E3.03).

Left hand headlamp



- Disconnect the connector **(1)**.



- Undo the screws indicated.
- Remove the taillight **(A)**.

Right hand headlamp



- Disconnect the connector **(1)**.



- Undo the screws indicated.
- Remove the taillight **(A)**.

Refitting the headlamps

			
Tightening torque		Nm	Class
Fastening headlamps	Screw	7.5 Nm	B

Left hand headlamp



- Fit the headlamp **(A)**.
- Tighten the screws indicated.



- Connect the connector **(1)**.



- Close the luggage compartment lid.
- Check that the light, the engine compartment lid and the fender are correctly aligned.
- Open the luggage compartment lid.
- If the alignment is incorrect, adjust the headlamp adjuster screws accordingly to obtain correct alignment.
- If the alignment is correct, tighten the light unit fastener screws.

		
Tightening torque	Nm	Class
Screw	7.5 Nm	B

Right hand headlamp



- Fit the headlamp **(A)**.
- Tighten the screws indicated.



- Connect the connector **(1)**.



- Close the luggage compartment lid.
- Check that the light, the engine compartment lid and the fender are correctly aligned.
- Open the luggage compartment lid.
- If the alignment is incorrect, adjust the headlamp adjuster screws accordingly to obtain correct alignment.
- If the alignment is correct, tighten the light unit fastener screws.

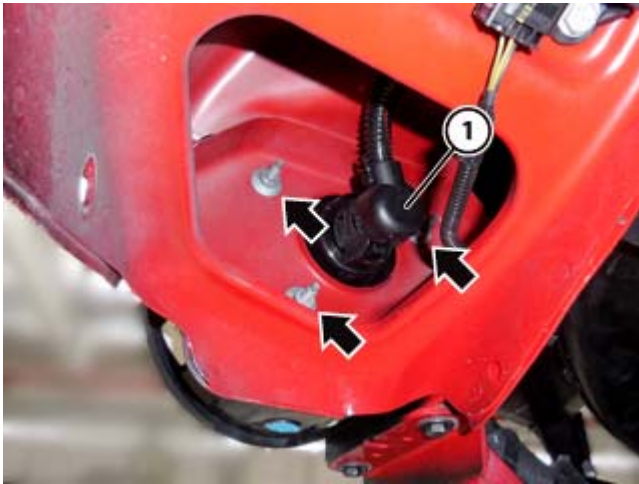
		
Tightening torque	Nm	Class
Screw	7.5 Nm	B

- Refit the front bumper (🔧 E3.03).
- Refit the luggage compartment trim panels (🔧 E4.06).
- Refit the lateral luggage compartment trim panels.
- Connect the battery (🔧 F2.01).

Removing the taillights

- Disconnect the battery (🔌 F2.01).
- Remove the rear bumper (🔌 E3.04).

RH taillight



- Disconnect the connector **(1)**.
- Undo the nuts indicated.



- Remove the taillight **(A)**.

LH taillight



- Disconnect the connector **(1)**.
- Undo the nuts indicated.



- Remove the taillight **(A)**.

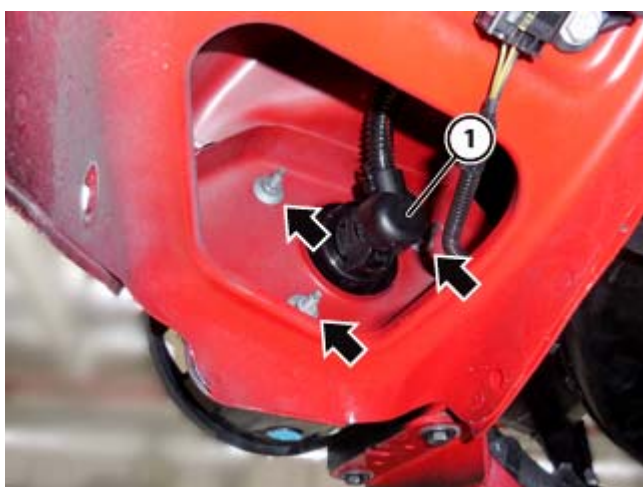
Refitting the taillights

			
Tightening torque		Nm	Class
Fastening taillights	Nut	4 Nm	B

RH taillight



- Fit the light unit **(A)**.



- Tighten the nuts indicated.
- Connect the connector **(1)**.



- Fit the rear bumper.
- Check that the light, the bumper and the fender are correctly aligned.
- If the alignment is incorrect, make the necessary adjustments to correct the alignment.
- If the alignment is correct, tighten the light unit fastener nuts.

		
Tightening torque	Nm	Class
Nut	4 Nm	B

LH taillight



- Fit the light unit **(A)**.



- Tighten the nuts indicated.
- Connect the connector **(1)**.



- Fit the rear bumper.
- Check that the light, the bumper and the fender are correctly aligned.
- If the alignment is incorrect, make the necessary adjustments to correct the alignment.
- If the alignment is correct, tighten the light unit fastener nuts.

		
Tightening torque	Nm	Class
Nut	4 Nm	B

- Refit the rear bumper (🔧 E3.04).
- Connect the battery (🔧 F2.01).

Replacing the third stop light



Tightening torque

Fastening third stop light

Nut

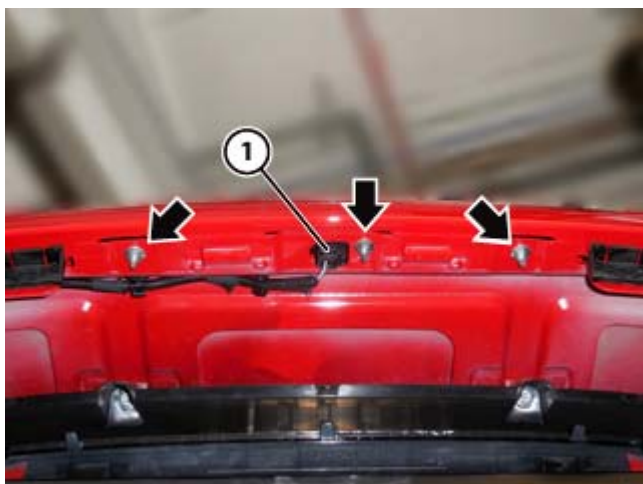
Nm

3 Nm

Class

B

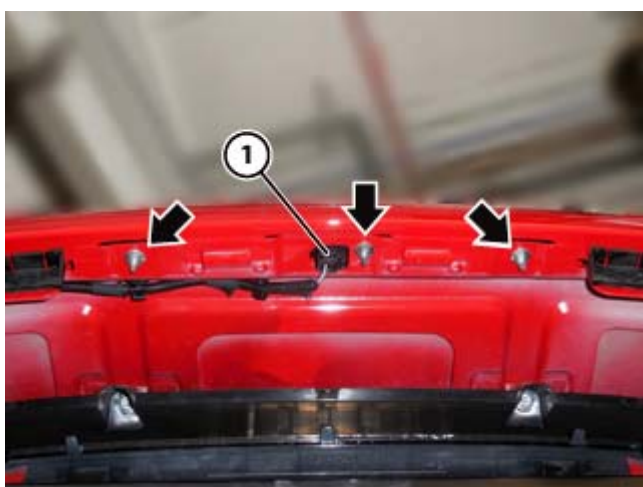
- Disconnect the battery (🔧 F2.01).
- Remove the rear bumper (🔧 E3.04).



- Disconnect the connector **(1)**.
- Undo the nuts indicated.



- Remove the third stop light **(A)** and replace.
- Fit the new third stop light **(A)**.
- Check that the third stop light **(A)** is correctly aligned with the rear spoiler.
- If the alignment is incorrect, adjust until correct with the fastener nuts.



- Tighten the nuts indicated.
- Carefully tighten the fastener nuts to avoid damaging the third stop light.



Tightening torque

Nut

Nm

3 Nm

Class

B

- Connect the connector **(1)**.

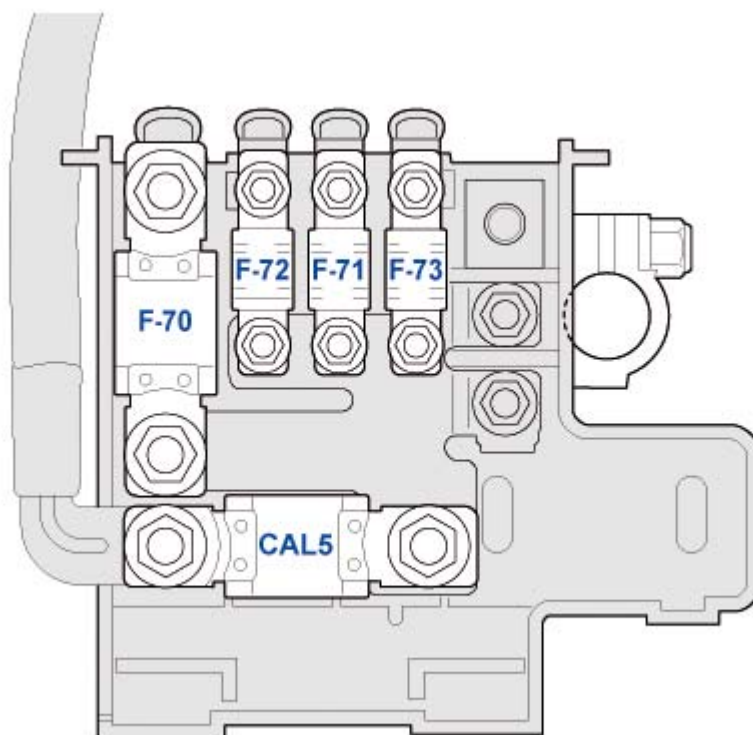
- Refit the rear bumper ( E3.04).
- Connect the battery ( F2.01).

F2.06 Fuses and relays

Replacing fuses on battery

- Preparation in progress

Fuses on battery

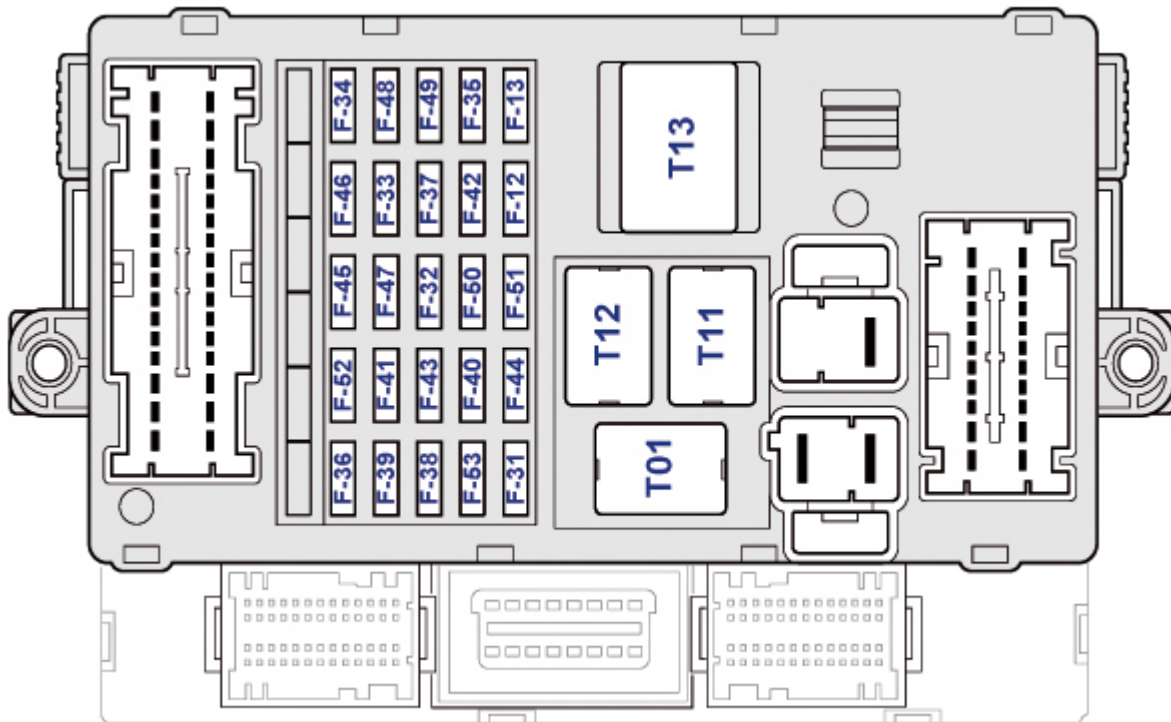


Ref	Amp.	Use
CAL5	CAL5	Starter motor
F-70	150	SCM
F-71	70	CPL1
F-72	50	Lift system
F-73	100	Centre console fuse protection

Replacing fuses and relays on dashboard (Body computer)

- Preparation in progress

Fuses and relays on dashboard (Body computer)



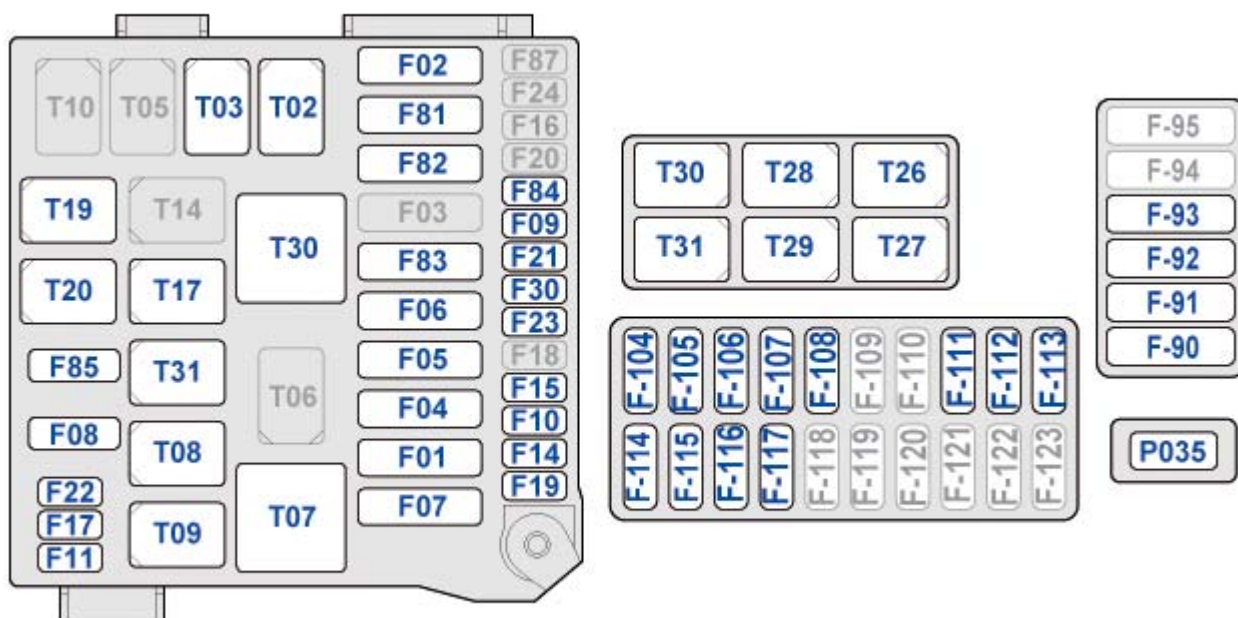
Ref	Amp.	Use
F-12	15	Right hand low beam light
F-13	15	Left hand low beam light
F-31	7.5	INT/A for dashboard ECU relay coils and Body computer node
F-32	10	Puddle lights
F-33	30	Left hand Brembo EPB motor
F-34	30	Right hand Brembo EPB motor
F-35	7.5	Key for power steering, headlights, adaptive headlights, stabiliser
F-36	10	Parking sensors, fuel filler flap relay
F-37	10	+15 Stop light control, Instrument Panel Node, Suspension Control Node
F-38	15	Luggage compartment lock actuator, parking camera
F-39	15	Dashboard ECU devices (NBC interconnections)
F-40	30	Heated rear screen
F-42	7.5	USB charging relay
F-43	30	Windscreen washer/wiper relay power
F-44	20	Passenger seat heating
F-46	20	For future vehicle developments
F-47	30	Driver side door, driver side power window
F-48	30	Passenger side door, passenger side power window
F-49	7.5	Key for CPOD, front lift, rear-view mirrors, active aerodynamics, parking sensors, rain sensor, electric seats
F-50	7.5	Airbag node, weight sensor

Ref	Amp.	Use
F-51	7.5	Key for functions on CVB relay T21
F-52	15	Driver seat heating
F-53	-	Not used
T01	20	Low beam relay
T11	30	Heated rear screen relay
T12	50	Services 1 relay (dependent on INT/A ignition switch)
T13	50	Bridge (services 2 power)

Replacing fuses and relays in passenger side of passenger compartment

- Preparation in progress

Fuses and relays in passenger side of passenger compartment



Ref	Amp.	Use	Specifications
F-01	40	+30 RH fan	
F-02	40	+30 ESP9 (Pump)	
F-03	-	Not used	
F-04	40	+30 WSP9 (hydraulic)	
F-05	40	+30 AC	
F-06	40	+30 LH fan	
F-07	20	+30 Horns	
F-08	7.5	AC compressor	

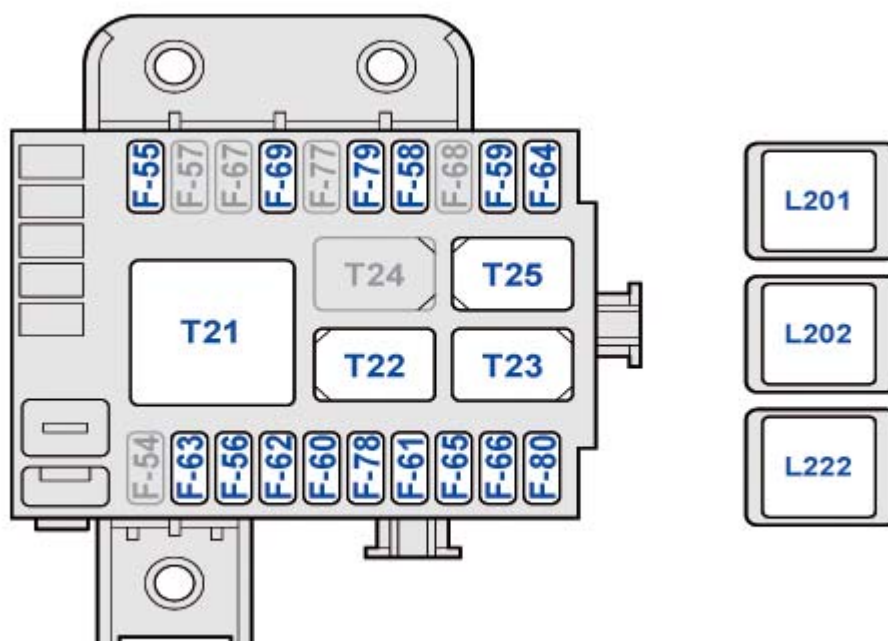
Ref	Amp.	Use	Specifications
F-09	7.5	+30 third stop light + luggage compartment dome light	
F-10	15	+30 NTP	
F-11	25	Lamba probe + various EI loads	
F-14	10	High beams	
F-15	7.5	+30 T-19 CLA	
F-16	-	Not used	
F-17	25	Injection from T-09	
F-18	-	Not used	
F-19	7.5	+30 Injection	
F-20	-	Not used	
F-21	30	+30 Wrench	
F-22	15	Ignition coils	
F-23	25	RH/LH turbine cooling fan	
F-24	-	Not used	
F-30	30	+30 Aerodynamics	
F-81	50	+30 Fuel pump ECU	
F-82	70	+30 Body Computer power supply	
F-83	50	+30 Air pump	
F-84	15	+30 Side Marker	
F-85	25	Headlight washer pump	
F-87	-	Not used	
F-90	30	+30 Converter 2	
F-91	-	Not used	
F-92	40	+30 Hi-Fi amplifier	
F-93	30	+30 Suspension control ECU	
F-94	-	Not used	
F-95	-	Not used	
F-104	15	Fuse for NIT + clock spring + ICP + CANBOX + CD charger	
F-105	7.5	Fuse for telemetry system, Inode and Parking Camera	
F-106	10	Instrument	
F-107	7.5	+30 Button lighting relay	
F-108	7.5	Central front dome	
F-109	-	Not used	
F-110	-	Not used	
F-111	7.5	Fuse for ionising ECUs	
F-112	15	Fuse for injection system sensors	
F-113	10	Turbine pump fuse	
F-114	7.5	Fuse for front LH and rear RH side markers	
F-115	7.5	Fuse for front RH and rear LH side markers	
F-116	10	+30 fuse for NPE and KIN key	
F-117	7.5	+30 fuse for start-up button key	
F-118	-	Not used	
F-119	-	Not used	
F-120	-	Not used	
F-121	-	Not used	
F-122	-	Not used	
F-123	-	Not used	

Ref	Amp.	Use	Specifications
T02	30	High beams	
T03	30	+15 button lighting stabiliser	
T05	-	Not used	
T06	-	Not used	
T07	50	Horns	
T08	30	AC compressor	
T09	30	Main injection relay	
T10	-	Not used	
T14	-	Not used	
T17	10/20	Loads excluded at start-up	
T19	30	Stop light control (CLA)	
T20	30	LH/RH turbine cooling fan	
T26	10/20	Windscreen wiper first speed	
T27	10/20	Windscreen wiper second speed	
T28	30	LC pump	
T29	30	Side marker	
T30	50	Air pump	
T31	30	Headlight washer pump	
P035	10	Battery state of charge sensor	For vehicles with Stop&Start system

Replacing fuses and relays in driver side of passenger compartment

- Preparation in progress

Fuses and relays in driver side of passenger compartment



Ref	Amp.	Use	Specifications
F-54	-	Not used	
F-55	10	+15 injection ECU, engine ionising ECU, fuel pump ECU	
F-56	30	NAG	
F-57	-	Not used	
F-58	7.5	Start-up	
F-59	7.5	Reverse lights	
F-60	30	NAP	
F-61	7.5	NAG, lift system	
F-62	7.5	NAP	
F-63	20	+30 NCR relay	
F-64	7.5	Fuel filler flap	
F-65	20	+30 lock NPG-NPP	
F-66	7.5	+30 NCR	
F-67	-	Not used	
F-68	-	Not used	
F-69	20	+15 Cigarette lighter	
F-77	-	Not used	
F-78	30	+30 Battery charger	
F-79	7.5	+15 NCR	
F-80	30	+30 start-up	
T21	50	+15 for utilities on rear cable	
T22	30	Reverse lights	
T23	30	Fuel filler flap	
T24	-	Not used	
T25	30	NCR	
L202	-	Starter relay 2	

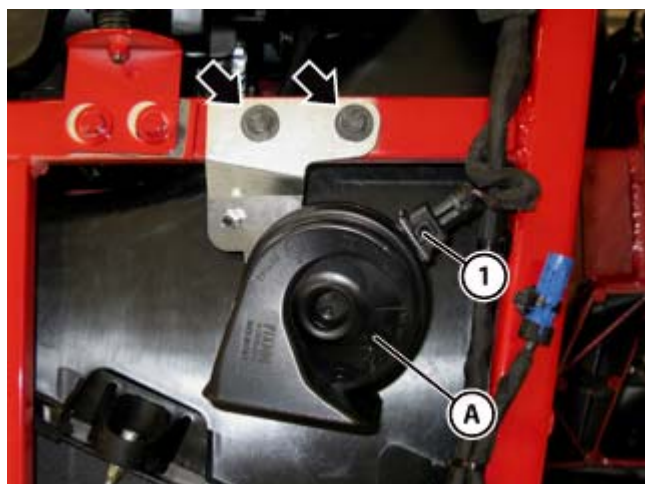
Ref	Amp.	Use	Specifications
L201	-	Starter relay 3	For vehicles with lift system
L222	30	Lift pump relay	

F2.07 Horn

Replacing the horns

			
Tightening torque		Nm	Class
Fastening horn	Screw	5 Nm	B

- Disconnect the battery ( F2.01).
- Remove the front bumper ( E3.03).

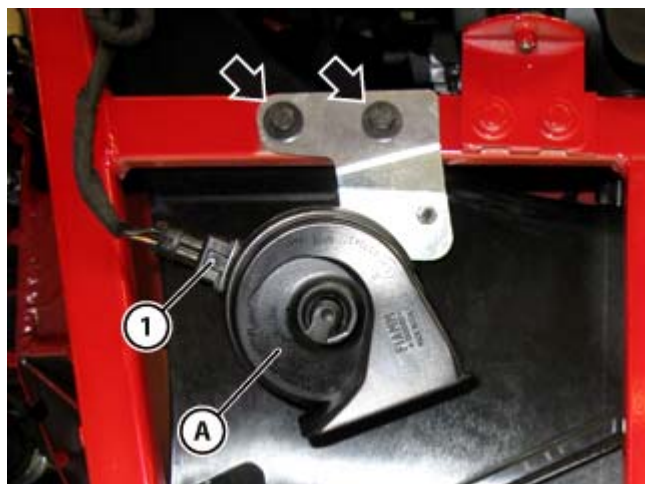


Left hand horn

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the horn **(A)**, complete with mounting bracket, and replace.
- Fit the new horn **(A)**, complete with mounting bracket.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Connect the connector **(1)**.



Right hand horn

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the horn **(A)**, complete with mounting bracket, and replace.
- Fit the new horn **(A)**, complete with mounting bracket.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Connect the connector **(1)**.

- Refit the front bumper ( E3.03).
- Connect the battery ( F2.01).

F2.08 Diagnostic socket

Connecting the DEIS diagnostic tester



- There is a socket **(A)** underneath the steering column for connecting the DEIS diagnostic tester to the vehicle.



- There is another socket **(B)** on the Body computer, behind the relative trim panel.

- Once connected to either of these specific sockets via the connector harness supplied, the DEIS diagnostic tester can interface with and diagnose all the systems in the vehicle.

➤ Activate Key-ON state ( E5.08).

F2.09 ECUs

Removing the engine ECU (NCM)

- Disconnect the battery (🔌 F2.01).
- Remove the rear wheelhouses (🔧 E3.05).
- Remove the front element of the rear right hand wheelhouse.



- Undo the screws indicated.
- Disconnect the connectors (1).
- Remove the ECU (A) complete with mounting bracket.
- Remove the ECU (A) from the mounting bracket.

Refitting the engine control ECUs (NCM)



Tightening torque		Nm	Class
Fastening the engine ECU (NCM)	Screw	9 Nm	B



- Fit the ECU (A) in the mounting bracket.
- Connect the connectors (1).
- Fit the ECU (A) complete with mounting bracket.
- Tighten the screws indicated.

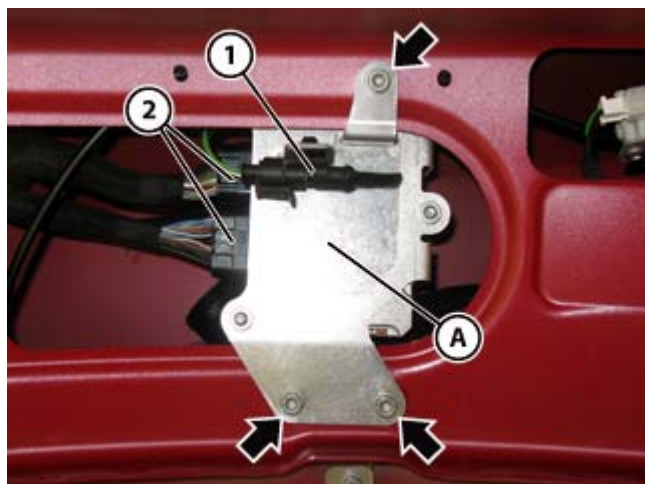


Tightening torque	Nm	Class
Screw	9 Nm	B

- Refit the rear wheelhouses (🔧 E3.05).
- Refit the front section of the front right hand wheelhouse
- Connect the battery (🔌 F2.01).

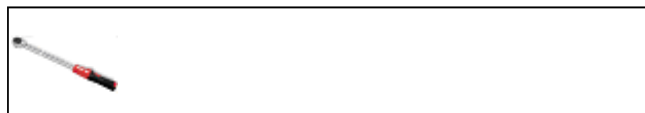
Removing the ionising system ECU (ION)

- Disconnect the battery (🔌 F2.01).
- Remove the rear wheelhouses (🔌 E3.05).
- Remove the front element of the rear right hand wheelhouse.

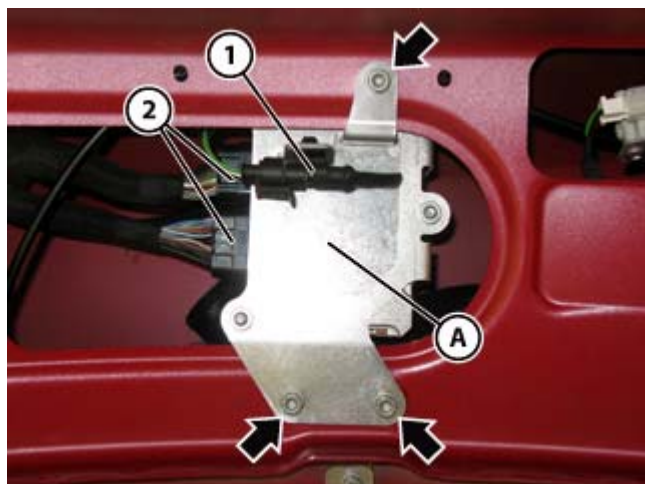


- Detach the connector (1).
- Undo the screws indicated.
- Disconnect the connectors (2).
- Remove the ECU (A) complete with mounting bracket.
- Remove the ECU (A) from the mounting bracket by unscrewing the fastener screws.

Refitting the ionising system ECU (ION)



Tightening torque		Nm	Class
Fastening the ELDOR ionizing ECU (ION)	Screw	9 Nm	B



- Fit and fasten the ECU (A) to the mounting bracket by tightening the fastener screws.

Tightening torque		Nm	Class
Screw		9 Nm	B

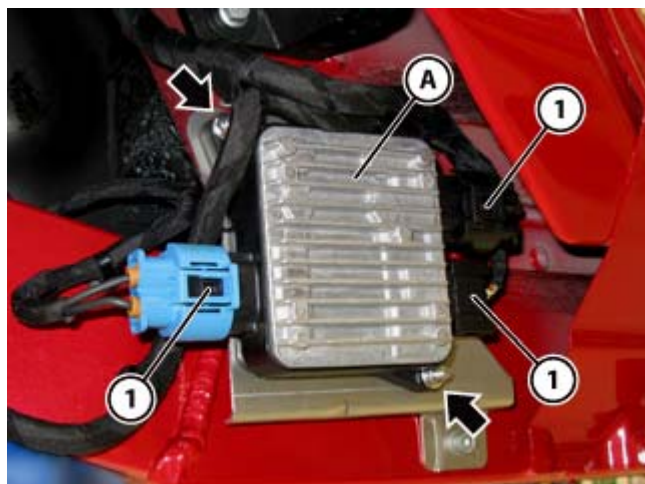
- Connect the connectors (1).
- Fit the ECU (A) complete with mounting bracket.
- Tighten the screws indicated.

Tightening torque		Nm	Class
Screw		9 Nm	B

- Refit the rear wheelhouses (🔌 E3.05).
- Refit the front section of the front right hand wheelhouse
- Connect the battery (🔌 F2.01).

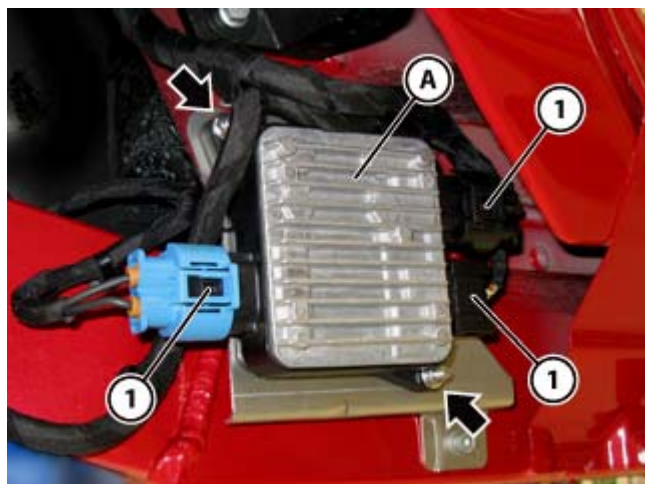
Removing the fuel pump control ECU (for vehicles with HELE)

- Disconnect the battery (🔌 F2.01).
- Remove the sill trim panels (🔧 E3.11).
- Remove the right hand sill trim.



- Disconnect the connectors (1).
- Undo the nuts indicated.
- Remove the ECU (A).

Refitting the fuel pump control ECU (for vehicles with HELE)



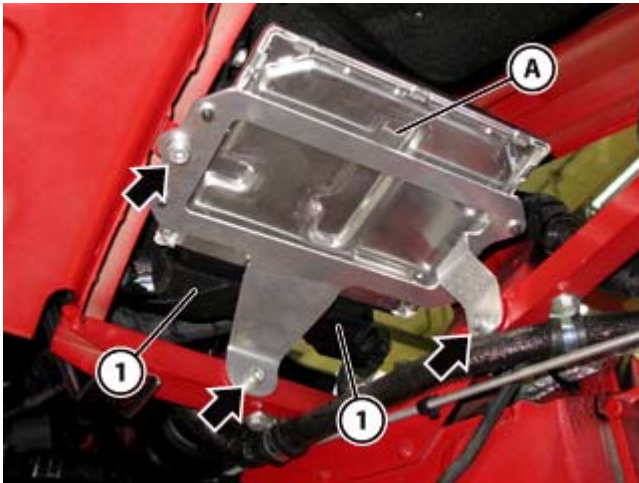
- Fit the ECU (A).
- Tighten the nuts indicated.
- Connect the connectors (1).

- Refit the sill trim panels (🔧 E3.11).
- Refit the RH sill trim.

- Connect the battery (🔌 F2.01).

Removing the DCT gearbox ECU (NCR)

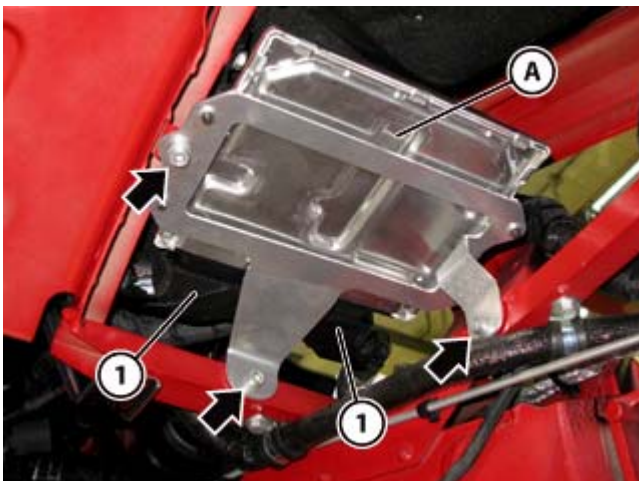
- Disconnect the battery (🔌 F2.01).
- Remove the rear wheelhouses (🔧 E3.05).
- Remove the front element of the rear left hand wheelhouse.



- Undo the screws indicated.
- Disconnect the connectors (1).
- Remove the ECU (A) complete with mounting bracket.
- Remove the ECU (A) from the mounting bracket by unscrewing the fastener screws.

Refitting the DCT gearbox ECU (NCR)

			
Tightening torque		Nm	Class
Fastening DCT gearbox ECU (NCR)	Screw	9 Nm	B



- Fit and fasten the ECU (A) to the mounting bracket by tightening the fastener screws.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Connect the connectors (1).
- Fit the ECU (A) complete with mounting bracket.
- Tighten the screws indicated.

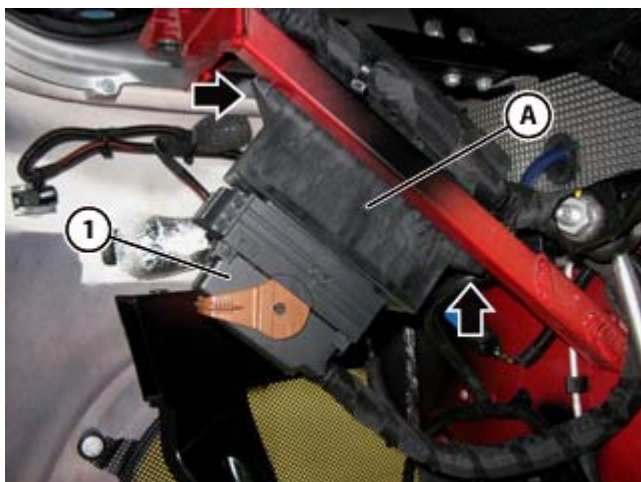
		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Connect the battery ( F2.01).
- Refit the rear wheelhouses ( E3.05).
- Refit the front element of the rear left hand wheelhouse.

Removing the EPB electric parking brake ECU (NPB)

- Disconnect the battery ( F2.01).
- Remove the rear wheelhouses ( E3.05).

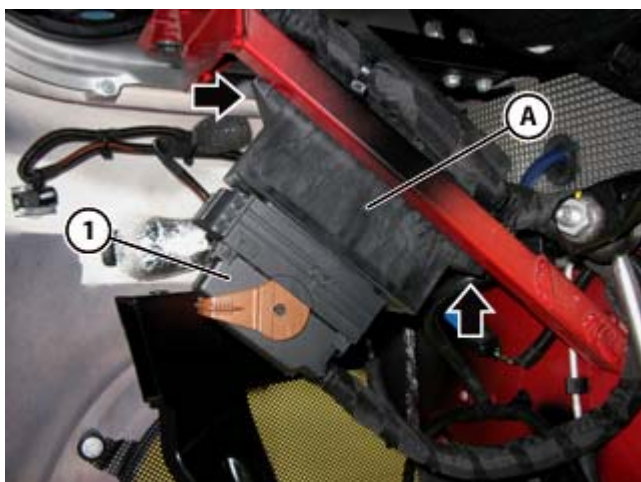
- Remove the rear element of the rear RH wheelhouse.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the ECU **(A)**.

Refitting the EPB electric parking brake ECU (NPB)

			
Tightening torque		Nm	Class
Fastening EPB electric parking brake ECU (NPB)	Screw	9 Nm	B



- Fit the ECU **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

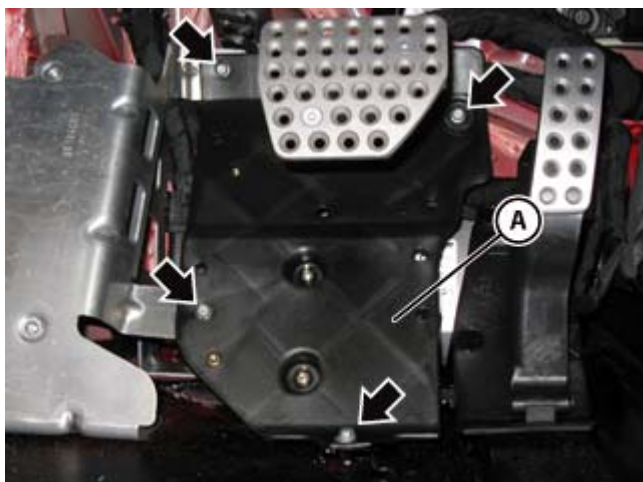
- Connect the connector **(1)**.

- Refit the rear wheelhouses ( E3.05).
- Refit the rear element of the rear RH wheelhouse.

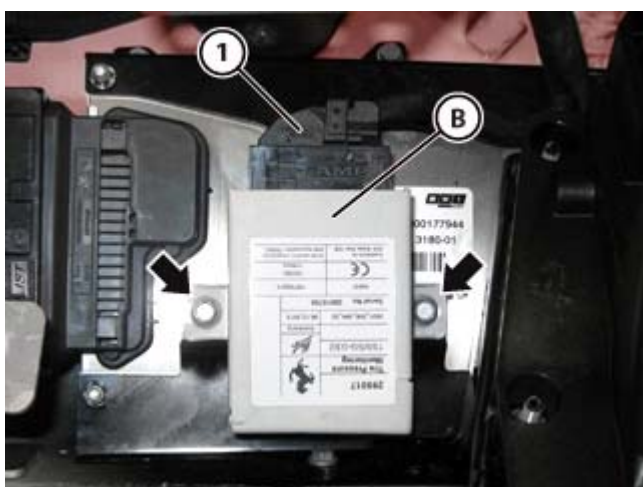
- Disconnect the battery ( F2.01).

Removing the TPMS system ECU (NTP)

- Disconnect the battery ( F2.01).
- Remove the passenger compartment mats ( E4.05).
- Remove the pedal mat.



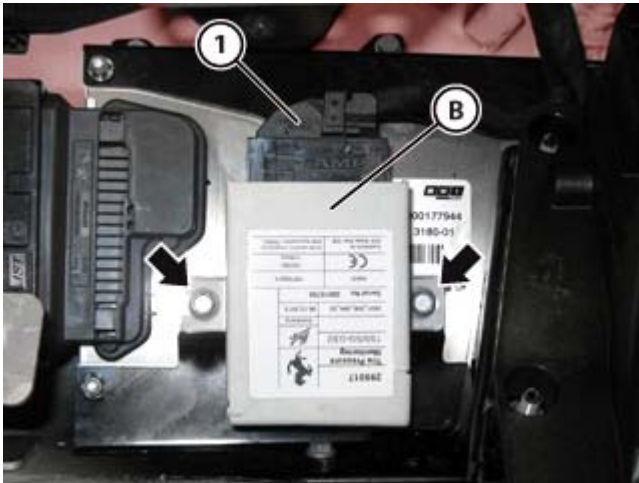
- Undo the screws indicated.
- Move the reinforcement plate **(A)** aside.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the ECU **(B)**.

Refitting the TPMS ECU (NTP)

			
Tightening torque		Nm	Class
Fastening the TPMS ECU (NTP)	Screw	2.6 Nm	B
Fastening fuel pump control ECU	Nut	5 Nm	B

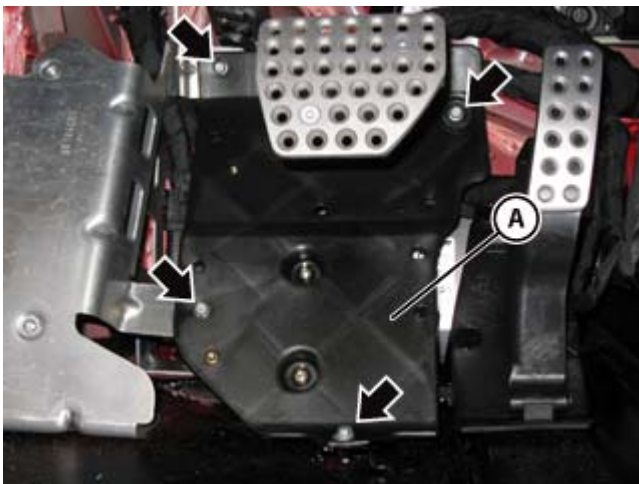


- Fit the ECU **(B)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Screw	2.6 Nm	B

- Connect the connector **(1)**.



- Refit the reinforcement plate **(A)**.
- Tighten the screws indicated.



Tightening torque	Nm	Class
Nut	5 Nm	B

- Refit the passenger compartment mats (E4.05).
- Connect the battery (F2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket (F2.08).
- ⚠ Perform the TPMS ECU cycle with the DEIS diagnostic tester.

Removing the adaptive headlight ECU (NFA)

- Disconnect the battery (F2.01).
- Remove the luggage compartment trim panels (E4.06).
- ⚠ Remove the right hand lateral cosmetic shield in the luggage compartment.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the ECU **(A)**.

Refitting the adaptive headlight ECU (NFA)

			
Tightening torque		Nm	Class
Fastening adaptive headlight ECU (NFA)	Screw	9 Nm	B



- Fit the new ECU **(A)**.
- Tighten the screws indicated.

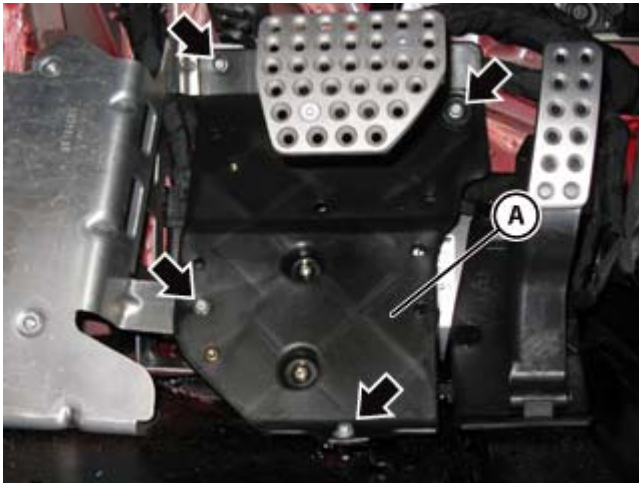
			
Tightening torque		Nm	Class
Screw		9 Nm	B

- Connect the connector **(1)**.

- Refit the luggage compartment trim panels ( E4.06).
- Connect the battery ( F2.01).

Removing the power steering ECU (NSV)

- Disconnect the battery ( F2.01).
- Remove the passenger compartment mats ( E4.05).
- Remove the pedal mat.



- Undo the screws indicated.
- Remove the reinforcement plate **(A)**, disconnecting the power steering ECU connector.



- Undo the screws indicated.
- Remove the ECU **(B)**.

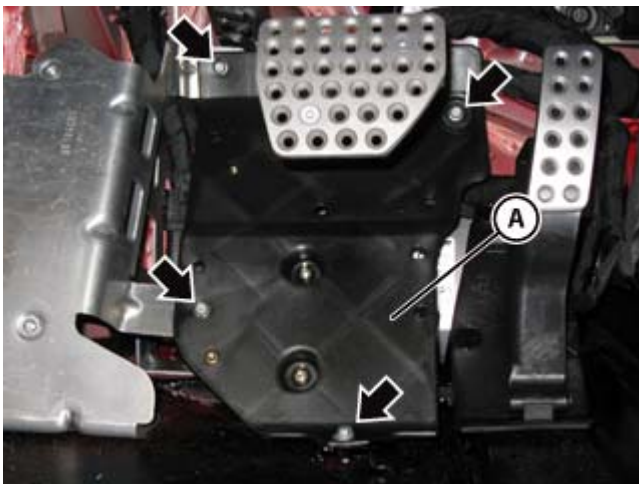
Refitting the power steering ECU (NSV)

			
Tightening torque		Nm	Class
Fastening power steering ECU (NSV)	Screw	5 Nm	B



- Fit the ECU **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

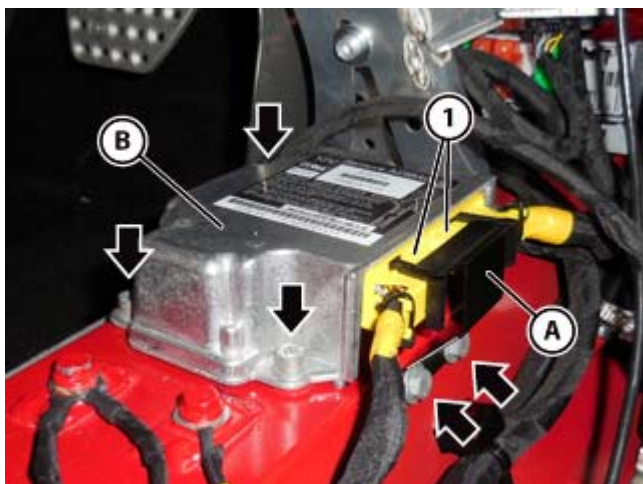


- Fit the reinforcement plate **(A)**, connecting the power steering ECU connector.
- Undo the screws indicated.

- Refit the passenger compartment mats ( E4.05).
-  Refit the pedal mat.
- Connect the battery ( F2.01).

Removing the airbag ECU (NAB)

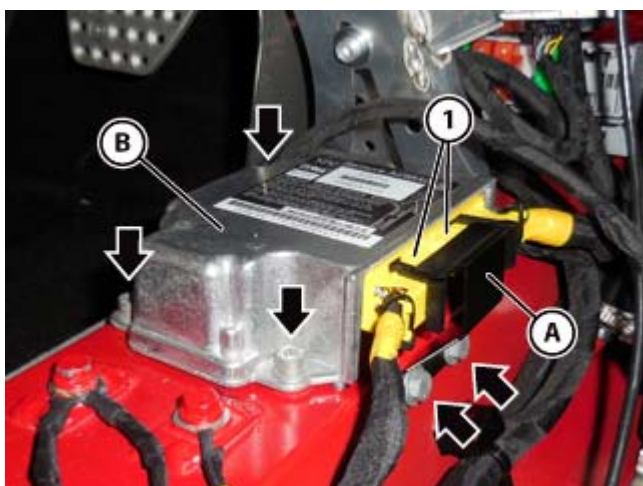
- Disconnect the battery ( F2.01).
- Remove the passenger compartment mats ( E4.05).
-  Remove the front tunnel mat.



- Remove the bracket **(B)**, undoing the respective fastener screws indicated.
- Disconnect the connectors **(1)**.
- Remove the airbag ECU **(A)**, undoing the respective fastener screws indicated.

Refitting the airbag ECU (NAB)

			
Tightening torque		Nm	Class
Fastening the airbag ECU (NAB)	Screw	10 Nm	B
	Screw	9 Nm	B



- Fit and fasten the new ECU **(B)**, tightening the respective fastener screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the connectors **(1)**.
- Fit and fasten the bracket **(A)**, tightening the respective fastener screws indicated.

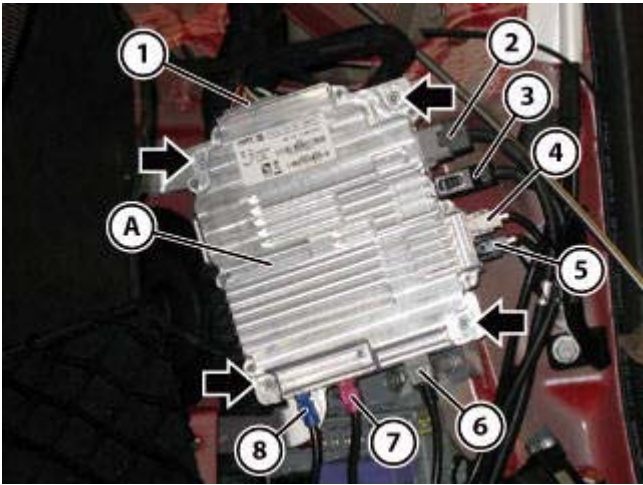
		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Refit the passenger compartment mats ( E4.05).
- Refit the front tunnel mat.

- Connect the battery ( F2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
- Perform the system test procedure with the DEIS diagnostic tester.

Removing the telemetry ECU (NTM)

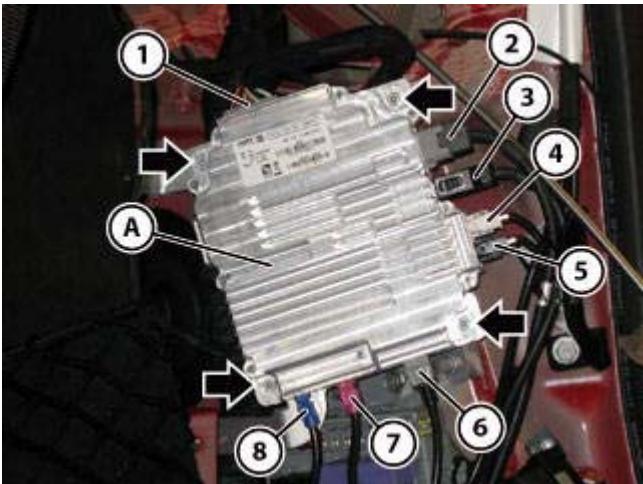
- Disconnect the battery (🔌 F2.01).
- Remove the passenger compartment trim panels (🔌 E4.04).
- Remove the left hand lateral trim panel.



- Disconnect the connector (1), the connector (2), the connector (3), the connector (4), the connector (5), the connector (6), the connector (7) and the connector (8).
- Undo the screws indicated.
- Remove the telemetry ECU (A).

Refitting the telemetry ECU (NTM)

			
Tightening torque		Nm	Class
Fastening telemetry ECU (NTM)	Screw	5 Nm	B



- Fit the new telemetry ECU (A).
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Connect the connector (1), the connector (2), the connector (3), the connector (4), the connector (5), the connector (6), the connector (7) and the connector (8).

- Refit the passenger compartment trim panels (🔌 E4.04).
- Refit the left hand lateral trim panel.

- Connect the battery (🔌 F2.01).

Removing the AC system ECU (NCL)

- Disconnect the battery (🔌 F2.01).

- Remove the dashboard trim panels (🔧 E4.02).
- ❗ Remove the lower central dashboard trim panel.



- Undo the screws indicated.
- Remove the ECU (A).

Refitting the AC system ECU (NCL)

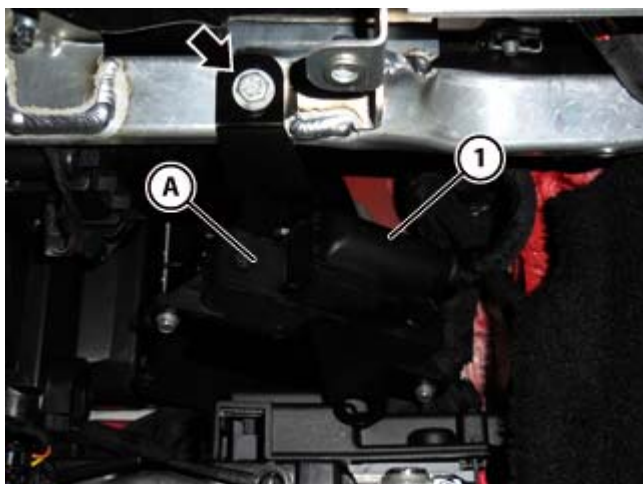


- Fit the ECU (A).
- Tighten the screws indicated.

- Refit the dashboard trim panels (🔧 E4.02).
- ❗ Refit the lower central dashboard trim panel.
- Connect the battery (🔧 F2.01).

Removing voltage stabilizer

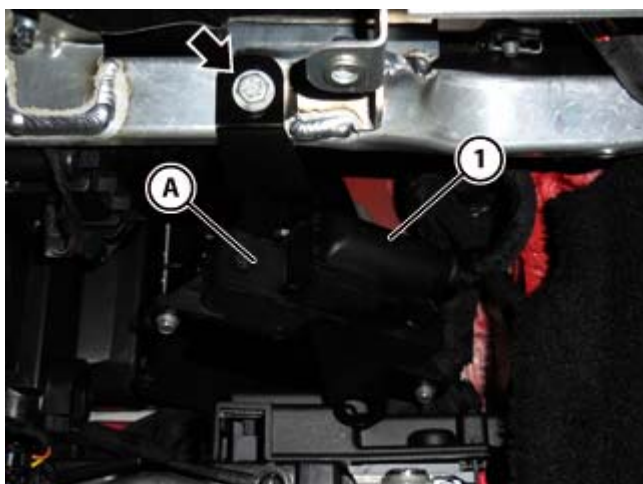
- Disconnect the battery (🔧 F2.01).
- Remove the passenger compartment mats (🔧 E4.05).
- ❗ Remove the passenger side footrest mat.
- Remove the dashboard trim panels (🔧 E4.02).
- ❗ Remove the passenger side underdashboard trim panel.



- Disconnect the connector **(1)**.
- Undo the indicated screw.
- Remove the voltage stabilizer **(A)** complete with the relative mounting bracket.

Refitting the voltage stabilizer

			
Tightening torque		Nm	Class
Fastening voltage stabilizer	Screw	8 Nm	B



- Fit the voltage stabilizer **(A)** complete with the relative mounting bracket.
- Tighten the indicated screw.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the connector **(1)**.

- Refit the dashboard trim panels ( E4.02).
 - Refit the passenger side underdashboard trim panel.
- Refit the passenger compartment mats ( E4.05).
 - Refit the passenger side footrest mat.
- Connect the battery ( F2.01).

F2.10 Rain/twilight sensor

Checking rain sensor operation

Perform on vehicle fitted with battery.

- Using the relative control on the steering wheel, turn the windscreen wiper from off to "AUTO".
 - Check that the windscreen wiper functions automatically, commanded by the rain sensor (with a dry screen, the system will still perform a wash cycle approximately every 5 seconds).
 - Wet the windscreen slightly in the area over the sensor (with a spray bottle or sponge) and check that the windscreen wiper activates and then stops when the area over the sensor is dry again.
-  A rain sensor fault is indicated by a specific indicator light on the instrument panel.

Checking twilight sensor operation

Perform on vehicle fitted with battery.

- Place the vehicle in a brightly lit area (for example, with a halogen lamp shining directly onto the windscreen in the area over the twilight sensor).
- Turn the dial to "AUTO" and check that the lights remain off.
- Cover the sensor with a black screen and check that the lights switch on with no noticeable delay.
- Remove the black screen from the sensor and check that the lights switch off after a delay of a few seconds.

 A twilight sensor fault is indicated by a specific indicator light on the instrument panel.

Removing the rain/twilight sensor

- Preparation in progress

Refitting the rain/twilight sensor

- Preparation in progress

F2.11 Engine services cable

Removing the engine services cable

- Preparation in progress

Refitting the engine services cable

- Preparation in progress

F2.12 Electrical system absorption test

Measuring no-load current absorption

The current absorbed by the vehicle system may be measured with a digital multimeter or with an amperometric clamp meter.

Use only amperometric clamp meters with mA scales.

The unit of measurement used for testing must be Amperes (A).

- Remove the passenger compartment mats (🔧 E4.05).
- Fold down the passenger footrest.

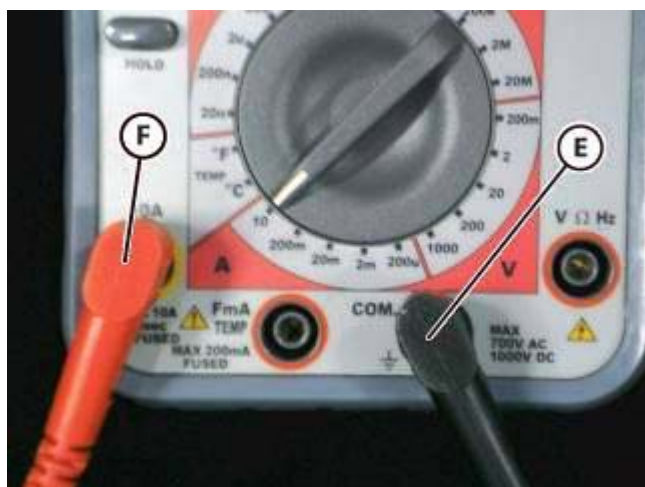
- Ensure that all lids and doors are closed correctly.



- If necessary, open the passenger side door to allow easier access for battery measurements.
- Open the passenger door and lock the relative lock (B).
- At the end of the test, unlock the lock by opening the door handle.

PROCEDURE WITH DIGITAL MULTIMETER

- Disconnect the battery (🔧 F2.01).



🚫 If possible, use cables with terminal clamps for the following procedures.

- Connect the wire (E) to the tester socket marked Ground.
- Connect the wire (F) (usually red) to the tester socket marked A (Amperes).



- Attach the lead clamp **(D)** onto the terminal clamp connected to ground on the chassis.



For vehicles without Stop&Start system



Do not start the engine or turn the ignition key-on, as this may blow the instrument fuse.

- Attach the black lead clamp **(C)** (common ground) onto the negative battery pole.



For vehicles with Stop&Start system



Do not start the engine or turn the ignition key-on, as this may blow the instrument fuse.

- Attach the black lead clamp **(C)** (common ground) onto the false pole connected to the negative battery pole.

- To prevent the reading from being affected by devices that are still active, wait at least **15 minutes** for the network to enter "**Sleep Mode**".
- Read the absorption values measured.
- The values read for zero-load current absorption must be close to **19 - 22 mA** and **MUST NOT** exceed **35 mA**.

- Remove the clamps.
- Connect the battery (🔧 F2.01).

PROCEDURE WITH AMPEROMETRIC CLAMP METER

- Disable the EPB electric parking brake Autohold function (🔧 D3.07).
- Close the driver side door ensuring that it closes correctly.



The instrument used must have a current scale precision in mA.

- Place the clamp meter unit around the ground cable leading from the negative battery pole.
- The direction of the current measured is indicated on the clamp.
- As in this case the current originates from the battery and discharges on the chassis, the arrow indicates a direction leading away from the battery toward the grounding point on the chassis.
- To prevent the reading from being affected by devices that are still active, wait at least **6 minutes** for the network to enter "**Sleep Mode**".
- The values read for zero-load current absorption must be close to **19 - 22 mA** and **MUST NOT** exceed **35 mA**.

- Refit the passenger compartment mats (🔧 E4.05).
- Close the passenger footrest.

Possible causes of excessive absorption

- If the value read in the vehicle is higher than in the specifications, the battery will tend to discharge rapidly.
- The cause of this is probably one or more devices failing to switch off.
- To identify the cause of excessive absorption, disconnect the networked ECUs one by one while observing the absorption value. This will drop when the active ECU is disconnected.
- Another possible cause for excessive current absorption may be a short circuit to ground at some point in the wiring harness.

F2.13 Stop&Start system (for vehicles with HELE)

Stop&Start system function



CAUTION

Before performing any maintenance on vehicles with the Stop&Start system, turn the ignition key to 0 (Key-OFF).

Before performing any maintenance procedures requiring the ignition key to be in position II on vehicles with the Stop&Start system, deactivate the Stop&Start system with the relative button, ensuring that the specific icon and the message "Stop&Start OFF" are shown on the TFT display, and that the LED on the on/off button itself is off.

Failure to do so may result in serious injury to persons working on the vehicle and in the vicinity of the vehicle in the event of the engine unexpectedly starting.

Vehicles with the optional HELE (High Emotion Low Emissions) packages are equipped with a Stop&Start system, which automatically switches off the engine when the vehicle is stationary and automatically restarts the engine when the driver intends to continue driving.

The purpose of Stop&Start is to increase the efficiency of the vehicle and reduce CO2 emissions, especially in urban use.

The automatic engine shut-off and restart functions are implemented with a series of sensors and control strategies devised to minimise the perceptible effects of the system on drivability and driving comfort and to keep all safety systems fully functional and maintain the desired climate comfort with the engine off.

When enabled, the Stop&Start system automatically stops and restarts the engine in relation to driving conditions, on board climate comfort and vehicle status.

The logic of the system does not require the driver to make any changes to the way he or she drives the vehicle.

Each time the ignition switch is turned to II (Key-on), the Stop&Start system will be in the same state it was when the ignition switch was turned to 0 (Key-off).

Therefore, if the function was active at the last Key-off, it will also be active at the next Key-on.

If the engine continues running with the vehicle stationary and the brake pedal depressed even though Stop&Start is enabled, this means that the system has inhibited automatic engine shut-off. In this situation, non specific indication is displayed on the instrument panel: this is normal.

If automatic restart is permanently disabled, the vehicle behaves in exactly the same way as a car without Stop&Start: the engine must therefore be restarted manually, pressing the ENGINE START buttons and using the shift paddles behind the steering wheel as required.

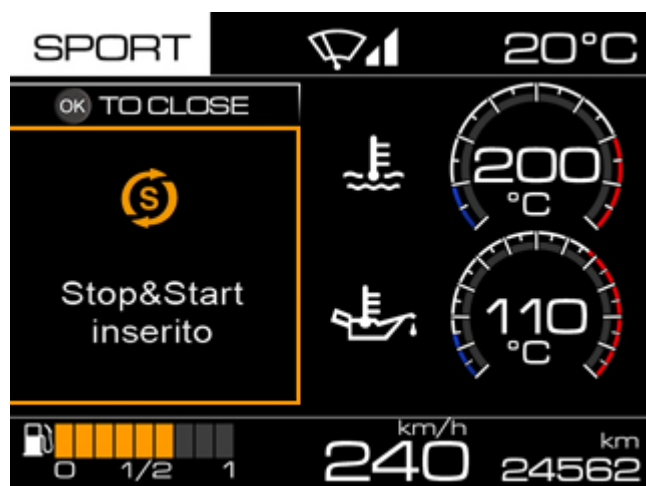


The driver may activate or deactivate the Stop&Start system at any time by pressing button **(A)** on the roof panel.

If the Stop&Start system is active, the LED on the button **(A)** is lit; if the system is off, the LED will also be off.

If the system is switched off by pressing the button **(A)** with ignition on and engine off (or if the engine has

been stopped automatically by the Stop&Start system), the engine will restart automatically.



If the system is deactivated, press the button to activate: the message "**Stop&Start ON**" is displayed on the TFT display for 5 seconds, together with the specific symbol.

When the system is active, the engine stops automatically if the vehicle is stationary with the brake pedal depressed, and restarts when the brake pedal is released.

The following conditions must be met to enable automatic engine cut-out while the vehicle is running:

- Stop&Start system activated from button on roof panel (LED on);
- driver seat belt buckled.



The TFT display notifies the driver when the Stop&Start system has stopped the engine by displaying the message "**Stop&Start attivo**", together with the specific symbol.

This message is displayed continuously for as long as the vehicle is in the stop state.

To cancel the message and reduce the symbol to icon form, press the MODE button ("ESCAPE" function).

For reasons of safety, to maintain comfort levels and to ensure that the vehicle and its individual systems function correctly, automatic engine cut-out is inhibited in the following cases:

- accelerator pedal depressed;
- when the system recognises a potentially hazardous situation (vehicle on a gradient, vehicle stationary with wheels steered - e.g. while vehicle is about to turn into a junction or a roundabout);
- when the system recognises that the vehicle is in a traffic queue or parking (by monitoring reverse gear state, time elapsed since last stop and vehicle speed);

- with maximum AC system output requested ("low", "max defrost" or "defrost rear screen");
- with very low or very high external temperatures;
- gearbox in "N";
- "Front LIFT" system moving;
- DCT gearbox Park Lock function released manually;
- in the event of a malfunction compromising the functionality of the system itself.

The system also constantly monitors a number of vehicle parameters (battery state of charge, engine coolant temperature, catalytic converter temperature, clutch oil temperature, brake servo vacuum level, climate comfort in passenger compartment) and will inhibit automatic engine cut-out if necessary to maintain safety, vehicle functionality and on-board climate comfort.

With the Stop&Start system active and the vehicle in stop state, performing any of the following actions will restart the engine:

- releasing the brake pedal;
- pulling the UP shift paddle;
- engaging reverse;
- pressing the accelerator pedal.

For reasons of safety, to maintain comfort while the vehicle is stationary and to ensure that the entire vehicle and its systems function correctly, the Stop&Start will automatically restart the engine in any of the following cases:

- ENGINE START button on steering wheel pressed;
- function deactivated by pressing button on roof panel;
- driver side seat belt unbuckled;
- driver side door opened;
- "Front LIFT" system activated;
- rear screen defrost requested or AC system set to "low" or "max defrost".

The system also constantly monitors a number of vehicle parameters (battery state of charge, engine coolant temperature, catalytic converter temperature, clutch oil temperature, brake servo vacuum level, climate comfort in passenger compartment, vehicle speed) and will automatically restart the engine if necessary to maintain safety, vehicle functionality and on-board climate comfort.

In certain cases, after the Stop&Start system has automatically stopped the engine, the engine may not restart automatically when requested by the driver: this means that the vehicle systems have permanently disabled automatic restart.



In this case, the engine must be restarted manually: the condition is indicated by the message **"Press ENGINE START button to restart"** on the TFT display, accompanied by an audible signal.

Automatic engine restart is permanently disabled in the following conditions:

- luggage compartment lid or engine compartment lid opened;
- failed automatic engine restart;
- detection of a fault which may compromise the functions of the Stop&Start system.

In the event of a malfunction, the Stop&Start system is disabled.

The driver is warned of the fault by the specific symbol, displayed on the TFT display for 20 seconds, accompanied by an audible warning signal and one of the following two messages, which correspond to two different alarm levels:



level 1 alarm: **"Stop&Start failure"**.

The message disappears at the end of the display cycle (20 seconds) or if the MODE button is pressed (with "ESCAPE" function), while the symbol remains, reduced to icon form.



level 2 alarm: **"Stop&Start failure. Go to dealer"**.

The message disappears at the end of the display cycle (20 seconds) or if the MODE button is pressed (with "ESCAPE" function), while the symbol remains, reduced to icon form.



In certain cases, depending on the severity of the fault, it may be necessary to press and hold the ENGINE START button for a few seconds before the engine restarts: the condition is indicated by the message **"Press and hold ENGINE START button to start"** on the TFT display, accompanied by an audible signal.



If the system is activated, press the button to deactivate: the message **"Stop&Start OFF"** is displayed on the TFT display for 5 seconds, together with the specific symbol.

Replacing the battery sensor

- Preparation in progress

Battery sensor calibration

When the battery sensor is powered for the first time, after battery replacement or after an interruption in the power supply, it runs a calibration cycle, during which it recognises the type of battery, its characteristics and its state of charge.

For the Stop&Start system to function correctly, the battery sensor calibration cycle must be completed correctly.

- Start the engine ( E5.08).
- Stop the engine ( E5.08).



DO NOT connect the vehicle to the battery conditioner.
DO NOT disconnect the battery.

- Leave the vehicle stationary with the engine off for at least **6 hours**.
- Drive the vehicle for at least **20 minutes**.

F3.01 Technical specifications

Direct injection

Overview

Direct injection is a fuel system in which fuel is injected via one or more precisely oriented jets directly into the combustion chamber. The injectors are located within the combustion chamber of each cylinder, so that fuel is injected directly into the individual combustion chamber.

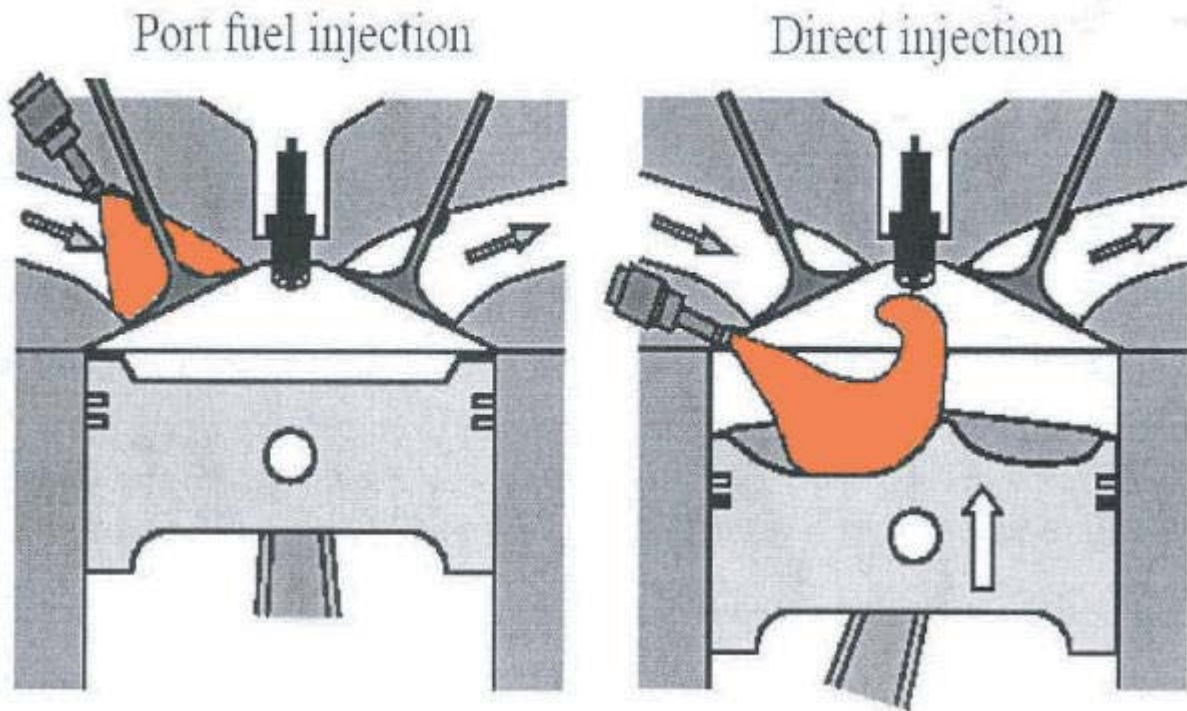
In conventional indirect injection systems, fuel is injected into the stream of aspirated air, before it enters the cylinder. Single point injection systems have a single injector - even for a multi-cylinder engine - located upstream of the point where the intake ducts branch out towards each cylinder. **Multi point** or **PFI (Port Fuel Injection)** systems, on the other hand, have multiple injectors - one per cylinder - located in the intake manifold, ahead of the intake valve. As a result, fuel is mixed differently - in PFI systems, mixing occurs in the intake duct, where part of the fuel evaporates, forming a fine mixture with the air, and part of the fuel does not evaporate, depositing instead on the inner wall of the duct creating a thin liquid layer (a phenomenon known as wall wetting), whereas in the case of direct injection, as only air flows through the ducts, mixing occurs directly within the combustion chamber.

Moreover, direct injection enables a **stratified charge**, resulting in a nonhomogeneous distribution of the fuel in the combustion chamber; in particular, this creates a zone with a stoichiometric or slightly rich mixture zone around the spark plug electrodes. This ensures combustion even with very lean mixtures: the **air/fuel ratios** - usually indicated with the symbol α - is in these cases extremely high, around **40:1**.

Stratification is controlled by a number of factors enabling the confinement of the stoichiometric zone, directing the spray and impeding excessive diffusion throughout the chamber:

- Combustion chamber geometry
- Conformation of the airflow field
- Injector geometry
- Injection type

Stratification allows control over the engine charge by metering the quantity of fuel injected alone - as occurs in diesel engines (quantity regulation) - eliminating the throttle valve and, as a consequence, reducing pumping losses. Furthermore, in low load conditions, the mixture core in which combustion propagates is surrounded by air alone. This insulates it from the surrounding environment, reducing thermal losses.



The following is a summary of the advantages and disadvantages of direct fuel injection.

- Advantages -

- Low fuel consumption and reduced emissions
- High compression ratios
- Improved engine flexibility and response
- High power from smaller displacement engines (if used in conjunction with a turbocharger)

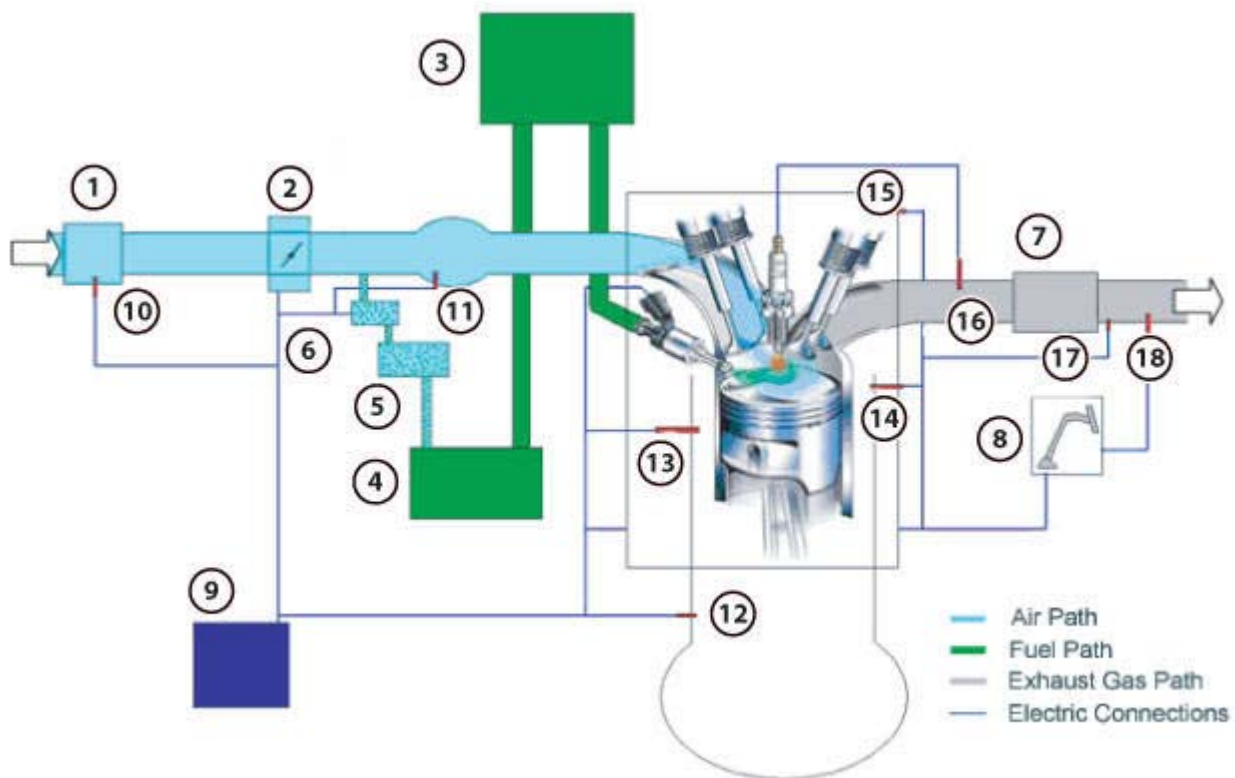
- Disadvantages -

- More complex production process
- Increased costs
- More difficult, more costly repairs

Functional layouts of the Ferrari direct injection system

The engine developed for the Ferrari California unequivocally confirms the validity of direct injection technology in high performance applications.

The implementation of direct injection has necessitated a number of significant changes to the engine and to the head in particular, with the adoption of high pressure pump, different injectors and, obviously, changes to the electronic engine management. The primary components of the direct injection system are shown in the following diagram.

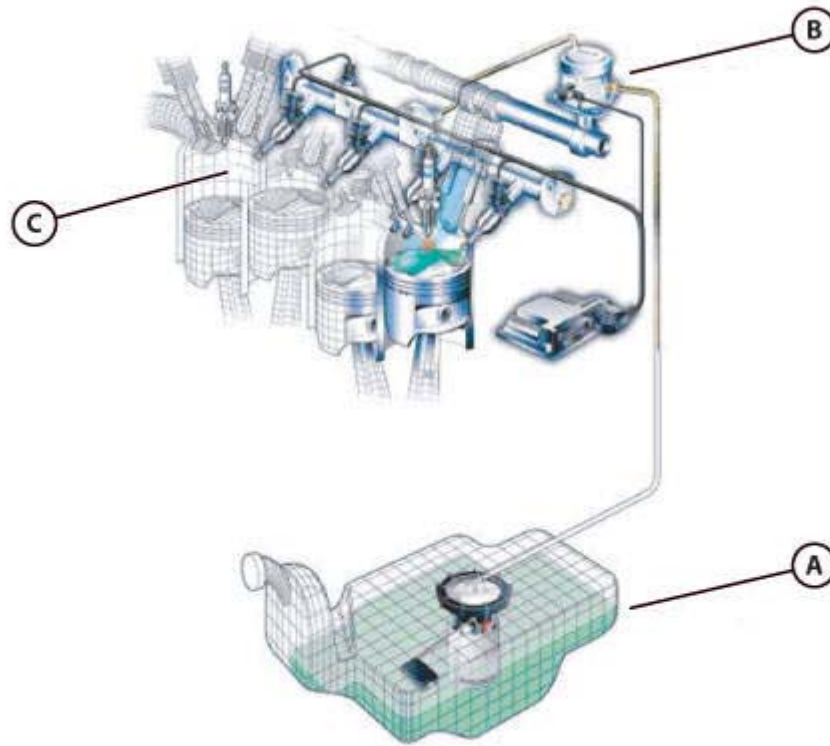


- 1 - Air flow meter
- 2 - Motorised throttle valve
- 3 - High-pressure pump
- 4 - Fuel tank
- 5 - Active carbon filter
- 6 - Bleed valve
- 7 - Trivalent catalytic converter
- 8 - Accelerator pedal
- 9 - Motronic ECU
- 10 - Air flow sensor
- 11 - Intake manifold sensor
- 12 - RPM sensor
- 13 - Knock sensor
- 14 - Temperature sensor
- 15 - Timing sensor
- 16 - Proportional oxygen sensor
- 17 - Exhaust gas temperature sensor
- 18 - Potentiometric oxygen sensor

The different subsystems forming the system can be seen in this diagram: intake, fuel supply, exhaust and electrical circuit. On the intake side, once past the air flow meter, the air flows through the throttle valve (unlike conventional systems, this is no longer wet by fuel). Depending on the instantaneous accelerator pedal angle and in relation to the engine mapping, the ECU sends the necessary signal to the injector to deliver the exact amount required. On the exhaust side, note the two oxygen sensors, one ahead of and one after the catalytic converter. The fuel system includes a high pressure pump separating the circuit into two parts: a high pressure section and a low pressure section.

The lubrication and cooling circuits are also of fundamental importance for the engine. The oil circuit features wet sump lubrication, which reduces maintenance costs and times compared with the previous dry sump configuration, and also reduces noise emissions; the oil pump is chain driven.

High and low pressure circuits



Fuel is injected into the combustion chamber at high pressure of up to 200 Bar. Before it is injected, the fuel must first pass through two circuits:

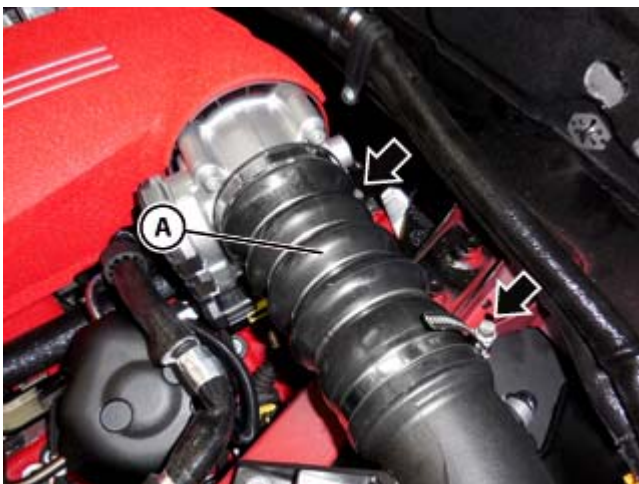
- a low pressure circuit, from the fuel tank to the high pressure pump (**A -> B**); fuel enters the pump at a pressure of **5-6 bar**;
- a high pressure circuit, from the pump to the injectors (**B -> C**); pressure varies from **50 to 200 Bar**.

F3.02 Ignition coils

Removing the ignition coils

- Disconnect the battery (🔌 F2.01).
- Remove the engine compartment cosmetic shields (🔌 E3.13).
- Remove the lateral cosmetic engine compartment shields.

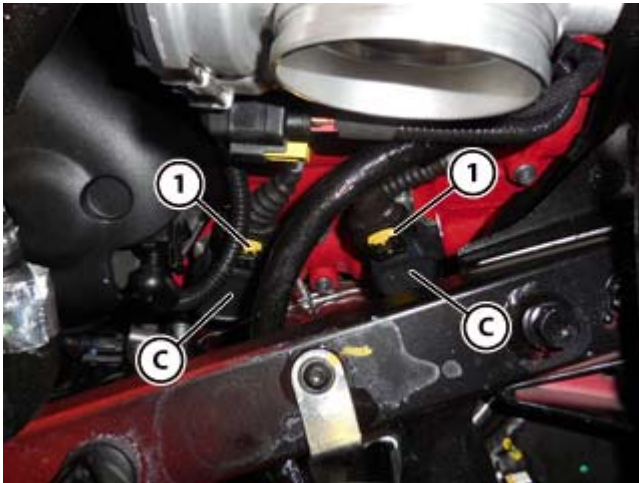
Right hand cylinder bank coils



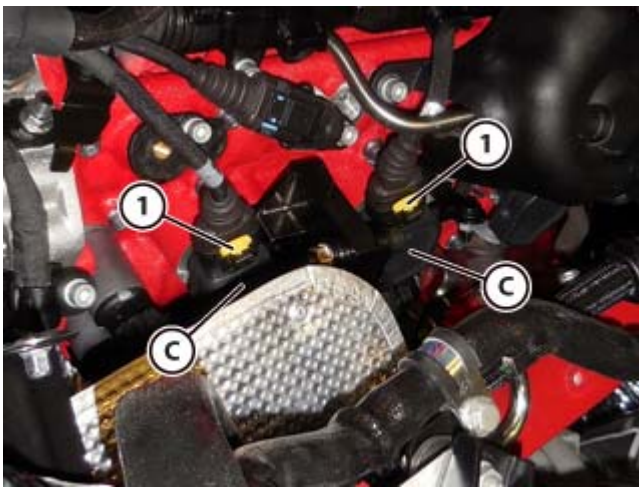
- Loosen the indicated screw collars.
- Detach and remove the hose connector **(A)**.



- Undo the screws indicated.
- Move the duct **(B)** aside.



- Disconnect the connectors **(1)**.
- Detach and remove the coils **(C)**.

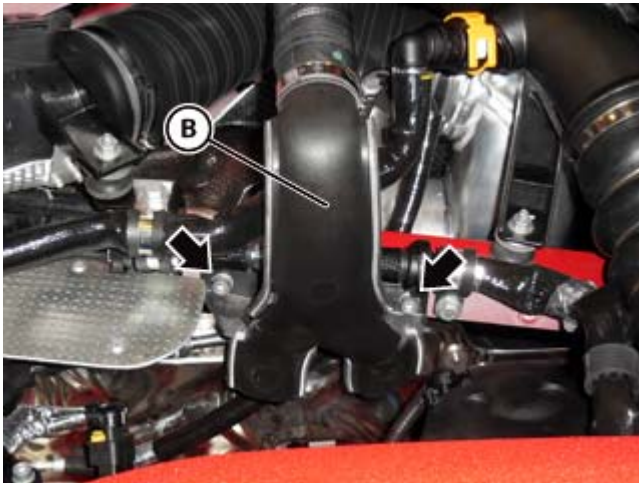


- Disconnect the connectors **(1)**.
- Detach and remove the coils **(C)**.

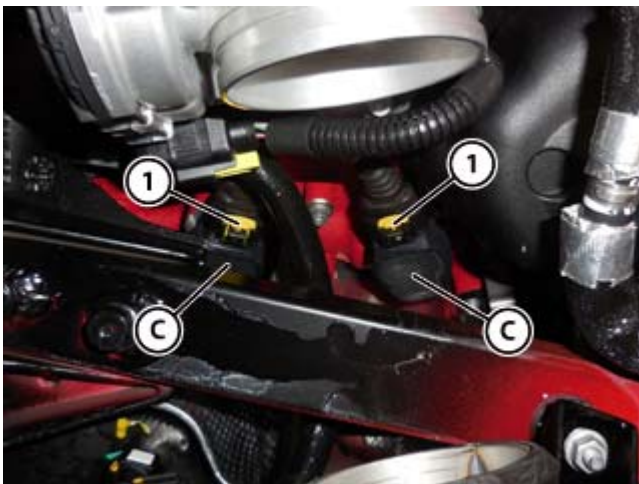
Left hand cylinder bank coils



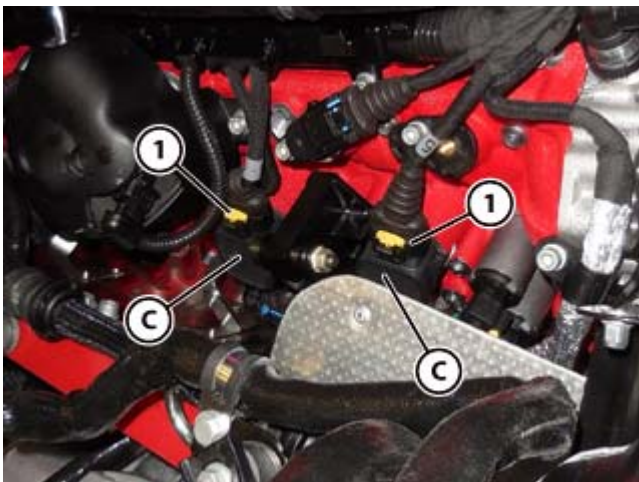
- Loosen the indicated screw collars.
- Detach and remove the hose connector **(A)**.



- Undo the screws indicated.
- Move the duct **(B)** aside.



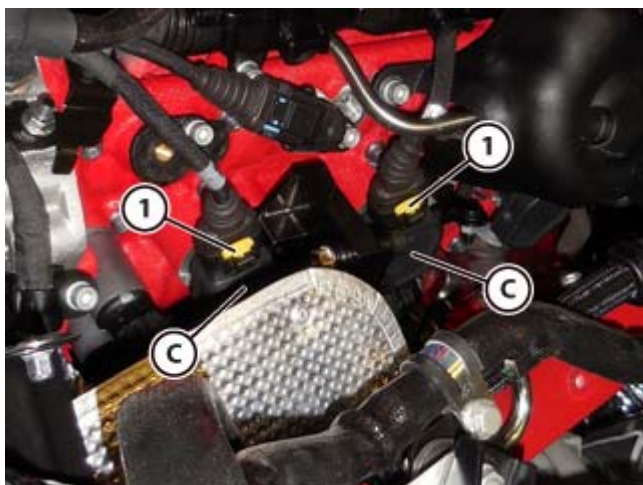
- Disconnect the connectors **(1)**.
- Detach and remove the coils **(C)**.



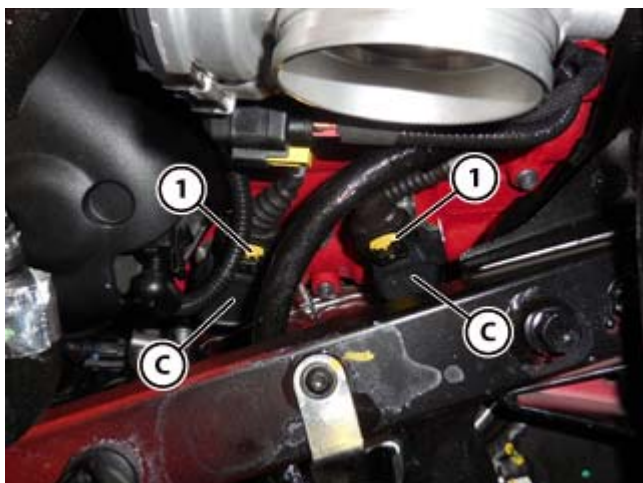
- Disconnect the connectors **(1)**.
- Detach and remove the coils **(C)**.

Refitting the ignition coils

Right hand cylinder bank coils



- Fit the coils (**C**) and fasten by pressing manually until they snap perceptibly into place.
- Connect the connectors (**1**).



- Fit the coils (**C**) and fasten by pressing manually until they snap perceptibly into place.
- Connect the connectors (**1**).

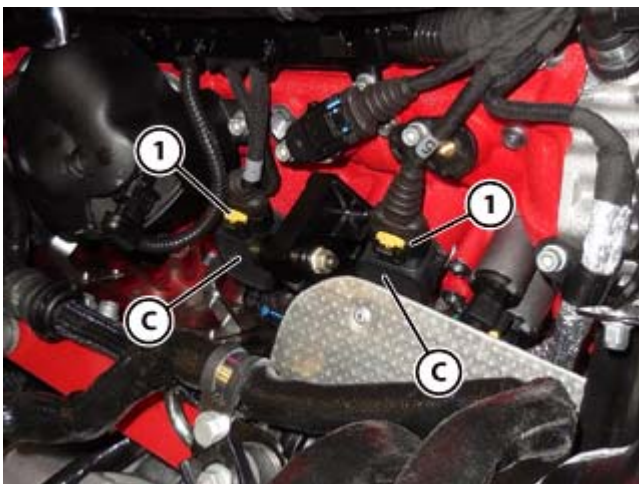


- Fit the duct (**B**).
- Tighten the screws indicated.



- Fit and fasten the hose connector **(A)**.
- Tighten the indicated screw collars.

Left hand cylinder bank coils



- Fit the coils **(C)** and fasten by pressing manually until they snap perceptibly into place.
- Connect the connectors **(1)**.



- Fit the coils **(C)** and fasten by pressing manually until they snap perceptibly into place.
- Connect the connectors **(1)**.



- Fit the duct **(B)**.
- Tighten the screws indicated.



- Fit and fasten the hose connector **(A)**.
- Tighten the indicated screw collars.

➤ Refit the engine compartment cosmetic shields (🔧 E3.13).
 ⓘ Refit the lateral cosmetic engine compartment shields.

➤ Connect the battery (🔧 F2.01).

F3.03 Timing sensors

Removing the timing sensors

- Preparation in progress

Refitting the timing sensors

- Preparation in progress

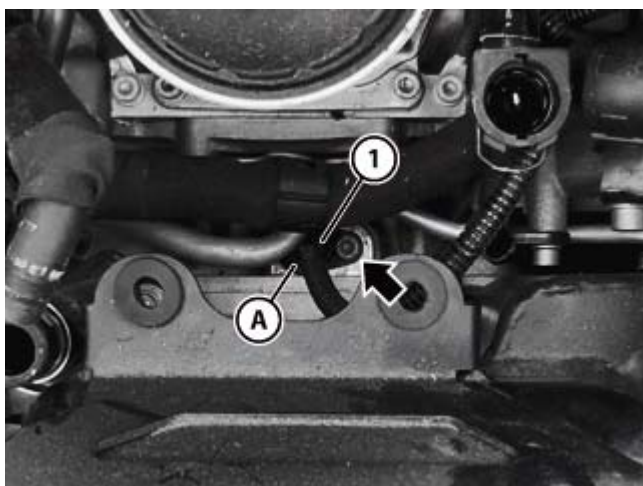
F3.04 RPM sensor

Replacing the RPM sensor



Tightening torque		Nm	Class
Fastening RPM sensor	Screw	8 Nm	B

- Disconnect the battery ( F2.01).
- Remove the engine cooling system tank ( B6.02).



- Disconnect the connector **(1)**.
- Undo the indicated screw.
- Remove the sensor **(A)** and replace.
- Fit the new sensor **(A)**.
- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the connector **(1)**.

- Refit the engine cooling system tank ( B6.02).
- Connect the battery ( F2.01).

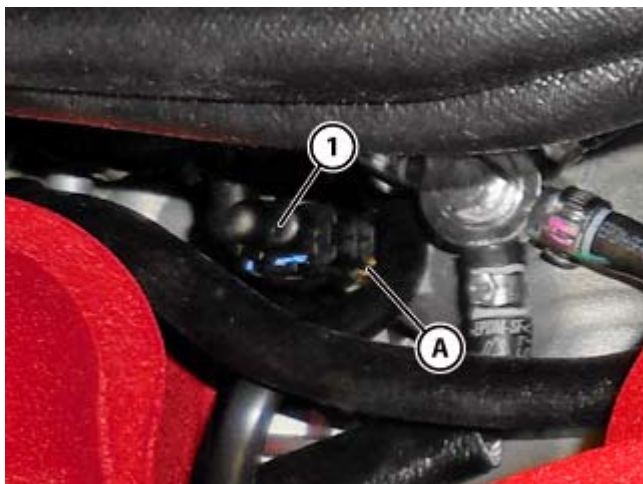
F3.05 Engine coolant temperature sensor

Replacing the engine coolant temperature sensor



Tightening torque		Nm	Class
Fastening engine coolant temperature sensor	Temperature sensor	20 Nm	B

➤ Disconnect the battery ( F2.01).



- Disconnect the connector **(1)**.
- Unscrew the sensor **(A)** and replace.
- Fit and tighten the new sensor **(A)**.



Tightening torque	Nm	Class
Temperature sensor	20 Nm	B

- Connect the connector **(1)**.

➤ Connect the battery ( F2.01).

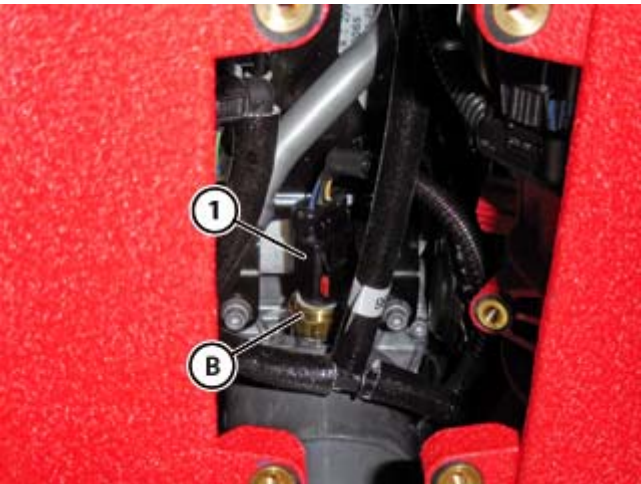
F3.06 Engine oil temperature and pressure sensors

Replacing the engine oil pressure sensor

			
Tightening torque		Nm	Class
Fastening oil pressure sensor	Pressure sensor	14 ⁺² ₋₂ Nm	0
Fastening intake manifold cosmetic grille	Screw	8 Nm	B



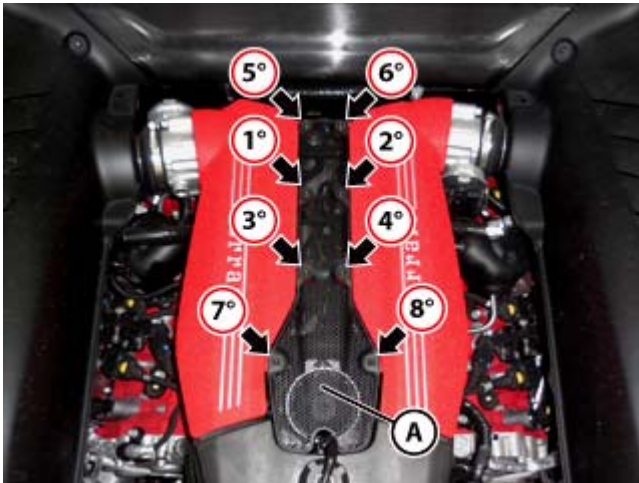
- Undo the screws indicated.
- Remove the cosmetic grille (A).



- Disconnect the connector (1).
- Unscrew the sensor (B) and replace.
- Fit and tighten the new sensor (B).

		
Tightening torque	Nm	Class
Pressure sensor	14 ⁺² ₋₂ Nm	0

- Connect the connector (1).



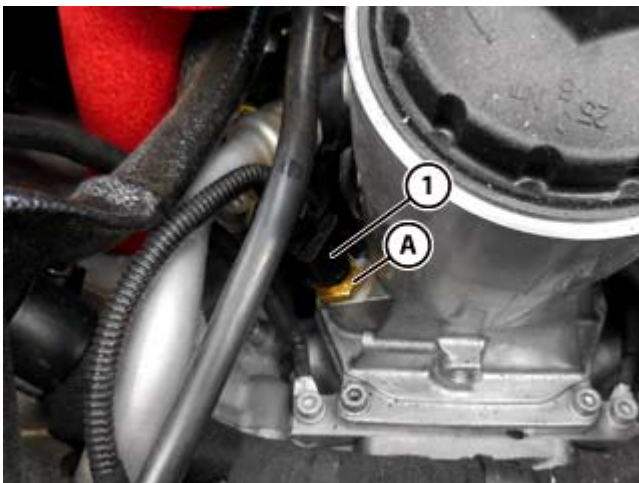
- Fit the cosmetic grille **(A)**.
- Tighten the indicated screws in the sequence given.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

Replacing the engine oil temperature sensor

			
Tightening torque		Nm	Class
Fastening oil pressure sensor	Pressure sensor	14^{+2}_{-2} Nm	0

- Disconnect the battery ( F2.01).
- Remove the engine cooling system tank ( B6.02).



- Disconnect the connector **(1)**.
- Unscrew the sensor **(A)** and replace.
- Fit and tighten the new sensor **(A)**.

		
Tightening torque	Nm	Class
Pressure sensor	14^{+2}_{-2} Nm	0

- Connect the connector **(1)**.

- Refit the engine cooling system tank ( B6.02).
- Connect the battery ( F2.01).

F3.07 Air flow meters

Removing the air flow meters

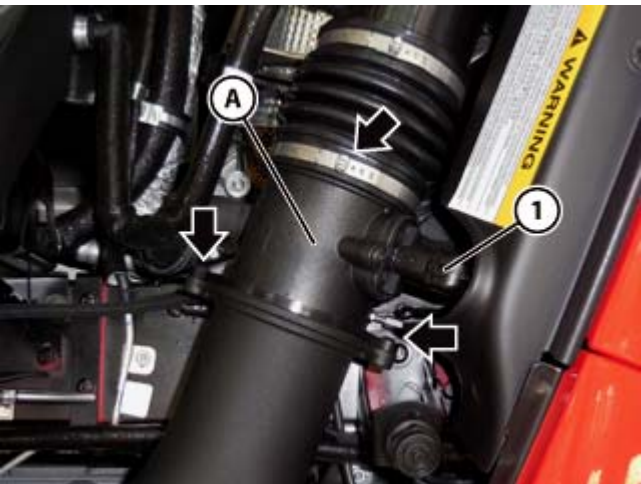
➤ Disconnect the battery (🔌 F2.01).

LH air flow meter



- Remove the indicated collar.
- Undo the screws indicated
- Disconnect the connector **(1)**.
- Disconnect and remove the air flow meter **(A)**.

RH air flow meter



- Remove the indicated collar.
- Undo the screws indicated
- Disconnect the connector **(1)**.
- Disconnect and remove the air flow meter **(A)**.

Refitting the air flow meters

			
Tightening torque		Nm	Class
Fastening the air flow meters	Screw	5 Nm	B

LH air flow meter

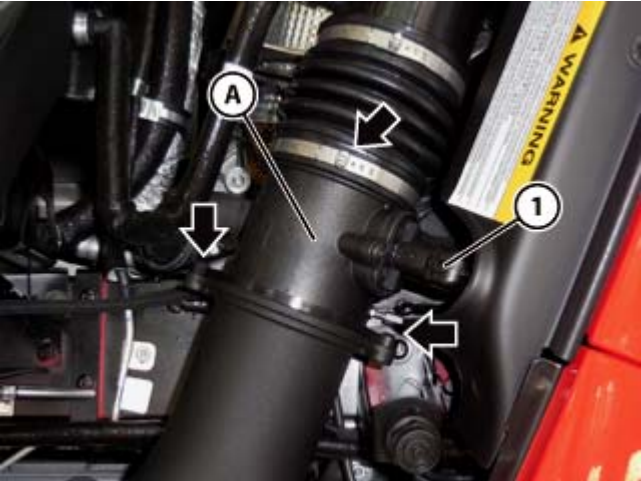


- Fit and connect the air flow meter **(A)**.
- Connect the connector **(1)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Fit and tighten a new collar as indicated.

RH air flow meter



- Fit and connect the air flow meter **(A)**.
- Connect the connector **(1)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

- Fit and tighten a new collar as indicated.

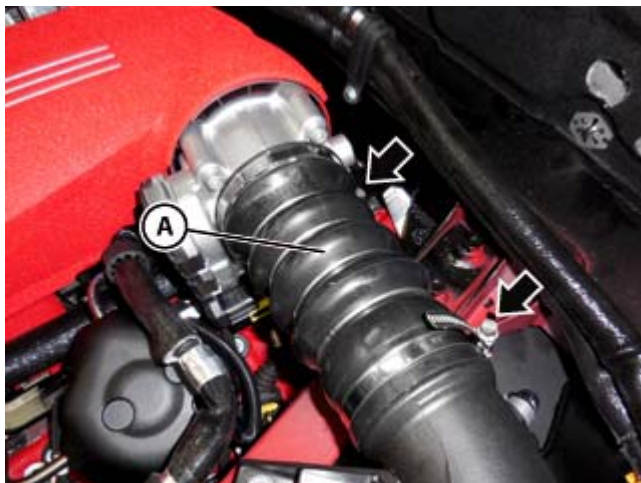
➤ Connect the battery ( F2.01).

F3.08 Motorised throttle bodies

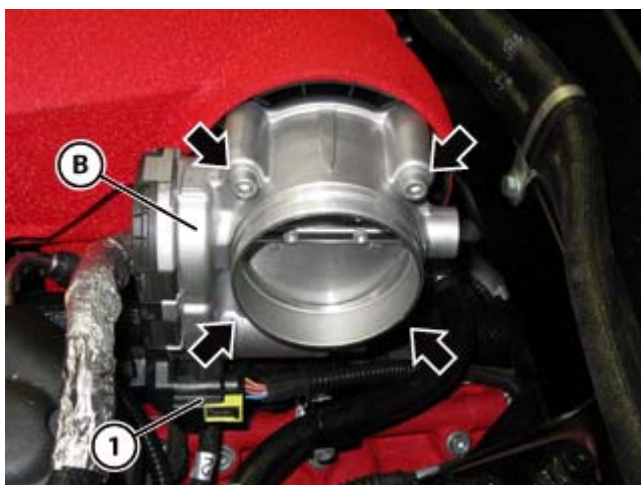
Removing the throttle bodies

- Disconnect the battery (🔌 F2.01).
- Remove the engine compartment cosmetic shields (🔧 E3.13).
- Remove the lateral cosmetic engine compartment shields.

RH throttle body



- Loosen the indicated screw collars.
- Disconnect and remove the hose union **(A)**.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the throttle body **(B)**.

LH throttle body



- Loosen the indicated screw collars.
- Disconnect and remove the hose union **(A)**.

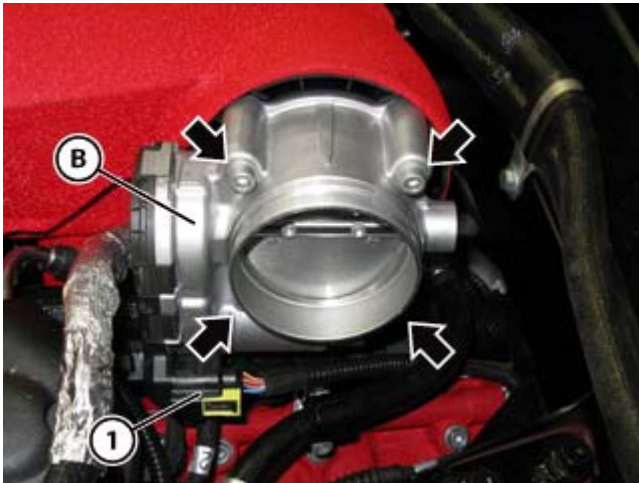


- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the throttle body **(B)**.

Refitting the throttle bodies

			
Tightening torque		Nm	Class
Fastening throttle bodies	Screw	10 Nm	B

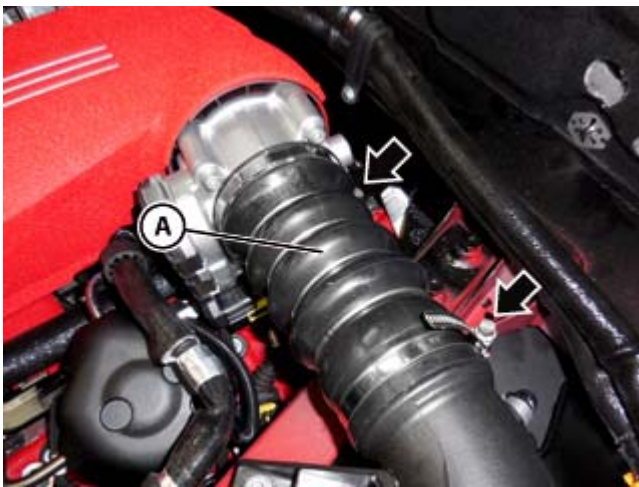
RH throttle body



- Fit and connect the throttle body **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the connector **(1)**.



- Fit and connect the hose union **(A)**.
- Tighten the indicated screw collars.

LH throttle body



- Fit and connect the throttle body **(B)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	10 Nm	B

- Connect the connector **(1)**.



- Fit and connect the hose union **(A)**.
- Tighten the indicated screw collars.

- Refit the engine compartment cosmetic shields (🔧 E3.13).
 - Refit the lateral cosmetic engine compartment shields.
- Connect the battery (🔧 F2.01).

F3.09 Accelerator control

Removing the accelerator pedal

- Preparation in progress

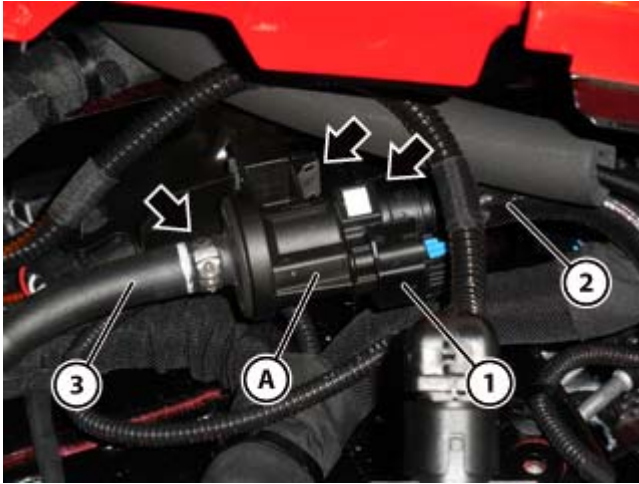
Refitting the accelerator pedal

- Preparation in progress

F3.10 Evaporative emissions control system solenoid valves

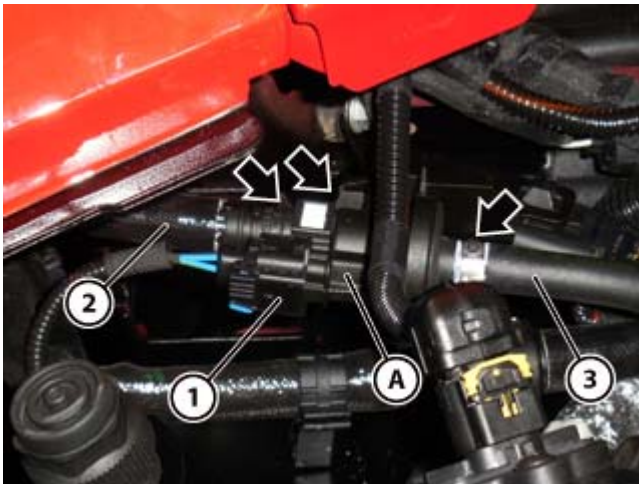
Replacing the evaporative emissions control system solenoid valves

- Disconnect the battery (🔌 F2.01).
- Remove the engine compartment cosmetic shields (🔌 E3.13).
 - Remove the lateral cosmetic engine compartment shields.



Right hand solenoid valve

- Disconnect the connector (1).
- Disconnect the pipe (2), releasing the indicated quick release coupling.
- Disconnect the pipe (3), removing the indicated collar.
- Detach and remove the indicated clip.
- Detach and remove the solenoid valve (A) from the respective mounting bracket.
- Replace the solenoid valve (A).
- Fit and fasten the solenoid valve (A) onto the respective mounting bracket.
- Fit and fasten the indicated clip.
- Connect the pipe (3) fitting and tightening a new collar as indicated.
- Connect the pipe (2), fastening the respective quick release coupling.
- Connect the connector (1).



Left hand solenoid valve

- Disconnect the connector (1).
- Disconnect the pipe (2), releasing the indicated quick release coupling.
- Disconnect the pipe (3), removing the indicated collar.
- Detach and remove the indicated clip.
- Detach and remove the solenoid valve (A) from the respective mounting bracket.
- Replace the solenoid valve (A).
- Fit and fasten the solenoid valve (A) onto the respective mounting bracket.
- Fit and fasten the indicated clip.
- Connect the pipe (3) fitting and tightening a new collar as indicated.
- Connect the pipe (2), fastening the respective quick release coupling.
- Connect the connector (1).

- Refit the engine compartment cosmetic shields (🔌 E3.13).
 - Refit the lateral cosmetic engine compartment shields.

- Connect the battery (🔌 F2.01).

F3.11 Secondary air system

Removing the secondary air pump

- Preparation in progress

Refitting the secondary air pump

- Preparation in progress

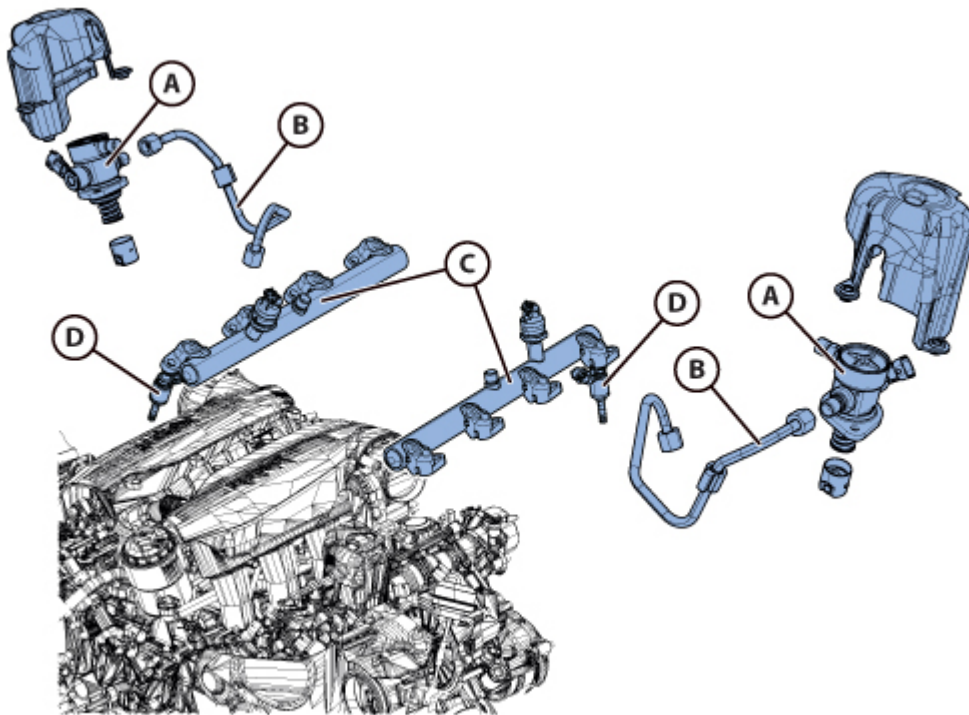
F3.12 Variable timing adjuster control solenoid valves

Replacing the variable timing adjuster control solenoid valves

- Preparation in progress

F3.13 GDI direct injection system

GDI injection system diagram



- A - High pressure pumps
- B - High pressure pipes
- C - Injector pipes
- D - Injectors

F4.01 Alarm system



If both the ignition keys provided with the vehicle are lost and the antitheft system of the vehicle is active, the Body Computer Node NBC must also be replaced as well as the key and lock set kit.

Ferrari CODE System

The vehicle is equipped with an electronic engine immobiliser system (Ferrari CODE) which is activated automatically when Key-OFF is activated

The keys contain an electronic device which transmits a coded signal to the Ferrari CODE ECU.

The Ferrari CODE ECU only permits engine start once it has recognised the signal.

Each time Key-OFF is activated, the protection system activates the engine immobiliser.

On engine start, pressing the ENGINE START/STOP button on the steering wheel:

- if the code is recognised, the CODE indicator light on the instrument panel goes out after the check cycle, while the EOBD indicator light extinguishes at the end of the ECU diagnostic cycle, only once the engine has effectively started: this means that the security system has recognised the key code and disabled the engine immobiliser;
- if the CODE indicator light remains lit, this means that the code has not been recognised: if this is the case, we recommend activating Key-OFF and then Key-ON and if the engine immobiliser is still not deactivated, try with the other key provided.

While driving with the engine running:

- the CODE indicator light illuminates when the system is running a self diagnosis cycle. The next time the vehicle is stopped, the system may be tested as follows: switch off the engine and activate Key-ON: The CODE indicator light should illuminate and extinguish again within one second. If the warning light stays on, repeat the procedure described above after activating Key-OFF for more than 30 seconds;
- the CODE indicator light flashes to indicate that the vehicle is not protected by the immobiliser system.

Electronic alarm

The electronic alarm performs the following functions:

- manages remote centralised door locking/unlocking;
- perimeter surveillance, detecting if any of the doors or lids are opened;
- volumetric surveillance, detecting intrusions into the passenger compartment;
- vehicle movement surveillance.



Press button **(A)** on the ignition key to arm the electronic alarm:

- the turn indicators flash once;
- the system emits an audible signal;
- the infoled on the dashboard starts flashing;
- the vehicle central locking system is activated, locking the doors.

After approximately 25 seconds, the system is armed.

The luggage compartment lid may be opened while the electronic alarm is armed. In this case, the volumetric sensors and anti-lift sensors are temporarily deactivated.

The sensors are reactivated when the luggage compartment lid is closed again.

The turn indicators and the infoled on the dashboard will flash nine times when the alarm is armed to indicate that one of the doors or lids is open or not closed correctly and that, as a result, the vehicle will not be protected by the perimeter surveillance function.

Should this occur, check all doors and lids and close any doors or lids left open. Disarming the alarm is not necessary. The turn indicators flash once to indicate that all doors and lids are now correctly closed and that the vehicle is protected by the perimeter surveillance function.

If the turn indicators and the red led on the dashboard flash nine times when the alarm is armed, but all doors and lids are correctly closed, this indicates that the self-diagnostic function has detected a system malfunction.



Press button **(B)** on the ignition key to disarm the electronic alarm:

- the turn indicators flash twice;
- the system emits a double audible signal;

- the infoLED on the dashboard extinguishes;
- the cabin lights and puddle lights switch on;
- the vehicle central locking system is deactivated, unlocking the doors.

The alarm system is now disarmed and you may now enter the vehicle and start the engine.

To access the vehicle if the remote control key battery is flat, insert the emergency key into the driver side door lock and turn to unlock the door; the alarm siren will sound.

Start the vehicle normally; the alarm siren deactivates.



Press **(C)** to disable the anti-lift function of the alarm system.

When the function is disabled, the indicator light on the button flashes for approximately 3 seconds and then extinguishes.

The CODE indicator light is shown on the display when starting the vehicle to indicate that there has been an attempted break-in.

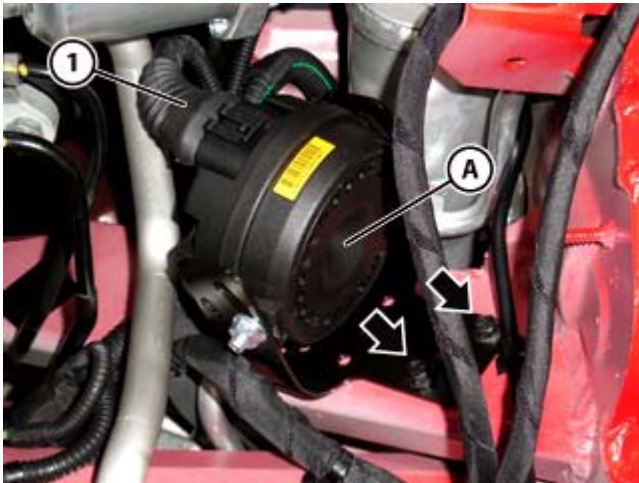
In this case, the system indicates the cause for the alarm as follows:

- LED switches off 2 times: anti-lift sensor alarm;
- LED switches off 3 times: door alarm;
- LED switches off 4 times: luggage compartment lid alarm;
- LED switches off 5 times: ignition key alarm.

When Key-ON is activated, the alarm system memory is reset.

Removing the antitheft system siren

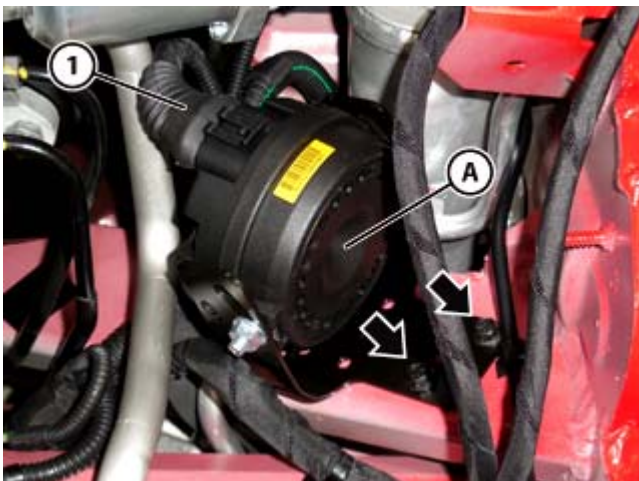
- Disconnect the battery (🔧 F2.01).
- Remove the luggage compartment trim panels (🔧 E4.06).
- Remove the luggage compartment tray.



- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the anti-theft system siren **(A)**.

Refitting the anti-theft system siren

			
Tightening torque		Nm	Class
Fastening anti-theft siren	Screw	5 Nm	B



- Fit the anti-theft system siren **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	5 Nm	B

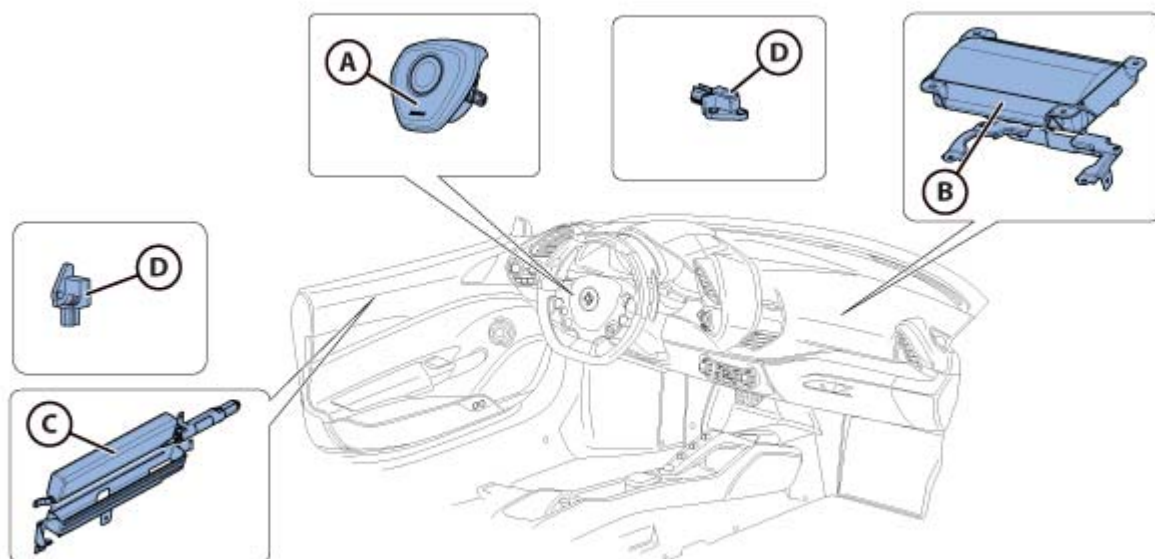
- Connect the connector **(1)**.
- Tilt the siren cone down by **30°** to allow water drainage.

- Refit the luggage compartment trim panels ( E4.06).
- Refit the luggage compartment tray.

- Connect the battery ( F2.01).

F4.02 Airbag

Airbag system layout



- A - Driver side airbag
- B - Passenger side airbag
- C - Side airbag
- D - Crash sensors

Removing the driver side airbag module



CAUTION

A damaged airbag module may cause severe or fatal injuries if activated.



After an accident causing airbag deployment, all the components of the system must be replaced (including wiring harnesses and connectors).
After an accident without airbag deployment, the components of the system (including wiring harnesses and connectors) must be checked and replaced if found to be bent, damaged or faulty. Individual system components (including wiring harnesses and connectors) found to be damaged or faulty must be replaced. NEVER attempt to repair a damaged or faulty component.
Airbag modules are subject to wear and ageing and must therefore be replaced at the intervals specified in the "Warranty Card", EVEN if the vehicle has NOT been involved in an accident. If the vehicle has been stolen or the subject of an attempted theft, the components of the airbag system must be checked.

➤ Disconnect the battery (🔌 F2.01).



- Prise out and remove the indicated plug.



- Undo the indicated screw.



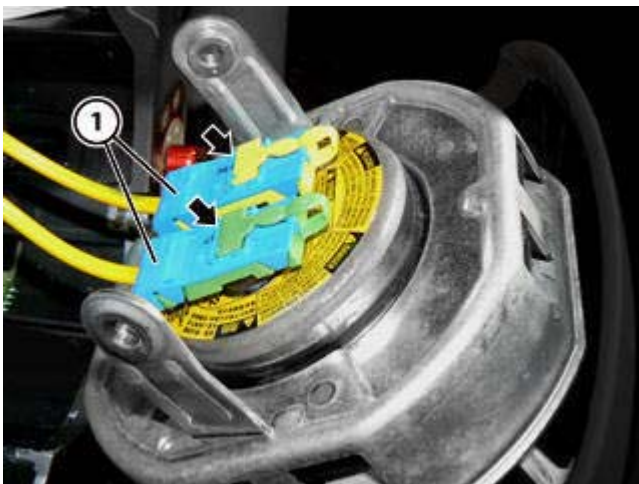
- Prise out and remove the indicated plug.



- Undo the indicated screw.



- Remove the driver side airbag module **(A)** from the steering wheel.



- Disconnect the connectors **(1)**, releasing the indicated safety retainers.

- Remove the driver side airbag module.

Refitting the driver side airbag module



Tightening torque

Fastening driver side airbag module

Screw

Nm

9.5 Nm

Class

A



CAUTION

A damaged airbag module may cause severe or fatal injuries if activated.

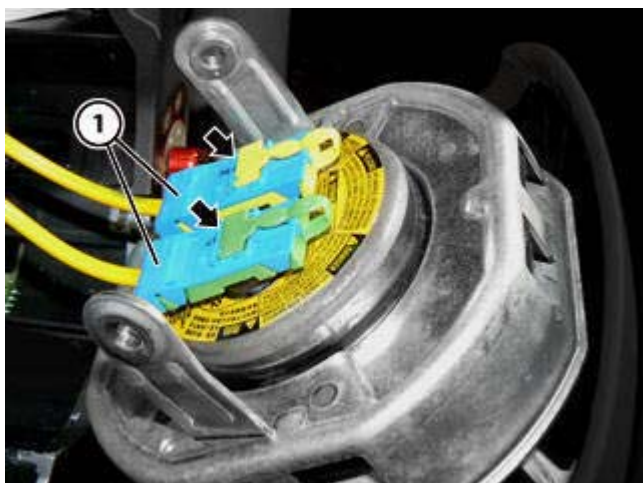


After an accident causing airbag deployment, all the components of the system must be replaced (including wiring harnesses and connectors).

After an accident without airbag deployment, the components of the system (including wiring harnesses and connectors) must be checked and replaced if found to be bent, damaged or faulty. Individual system components (including wiring harnesses and connectors) found to be damaged or faulty must be replaced. NEVER attempt to repair a damaged or faulty component.

Airbag modules are subject to wear and ageing and must therefore be replaced at the intervals specified in the "Warranty Card", EVEN if the vehicle has NOT been involved in an accident.

If the vehicle has been stolen or the subject of an attempted theft, the components of the airbag system must be checked.



- Connect the connectors (1), fastening the indicated safety retainers.



- Fit the driver side airbag module (A) on the steering wheel.



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	9.5 Nm	A



- Fit the indicated cap.



- Tighten the indicated screw.



Tightening torque	Nm	Class
Screw	9.5 Nm	A



- Fit the indicated cap.

- Connect the battery ( F2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
-  Perform the airbag ECU Cycle with the DEIS tester.

Replacing the passenger side airbag



Tightening torque		Nm	Class
Fastening the passenger side airbag	Nut	8 Nm	B
	Screw	8 Nm	B



CAUTION

A damaged airbag module may cause severe or fatal injuries if activated.

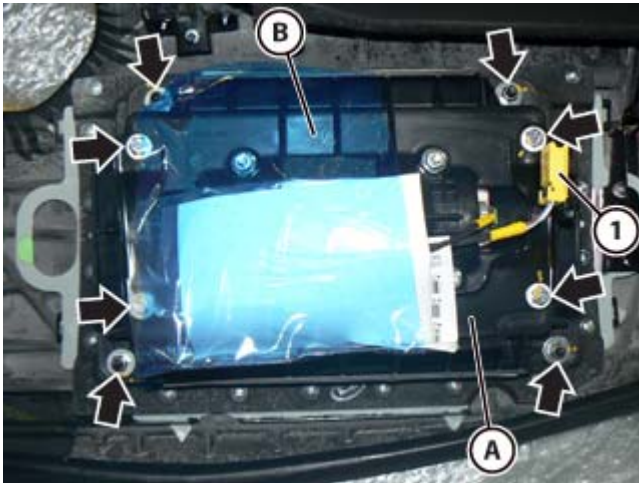


After an accident causing airbag deployment, all the components of the system must be replaced (including wiring harnesses and connectors).

After an accident without airbag deployment, the components of the system (including wiring harnesses and connectors) must be checked and replaced if found to be bent, damaged or faulty. Individual system components (including wiring harnesses and connectors) found to be damaged or faulty must be replaced. NEVER attempt to repair a damaged or faulty component.

Airbag modules are subject to wear and ageing and must therefore be replaced at the intervals specified in the "Warranty Card", EVEN if the vehicle has NOT been involved in an accident. If the vehicle has been stolen or the subject of an attempted theft, the components of the airbag system must be checked.

- Remove the dashboard trim panels ( E4.02).
-  Remove the passenger side airbag trim.



- Detach the connector (1) from the bracket (A).
- Undo the screws indicated.
- Remove the bracket (A).
- Undo the nuts indicated.
- Remove the passenger side airbag (B) and replace.
- Fit the new passenger side airbag (B).
- Tighten the nuts indicated.

Tightening torque	Nm	Class
Nut	8 Nm	B

- Fit the bracket (A).
- Tighten the screws indicated.

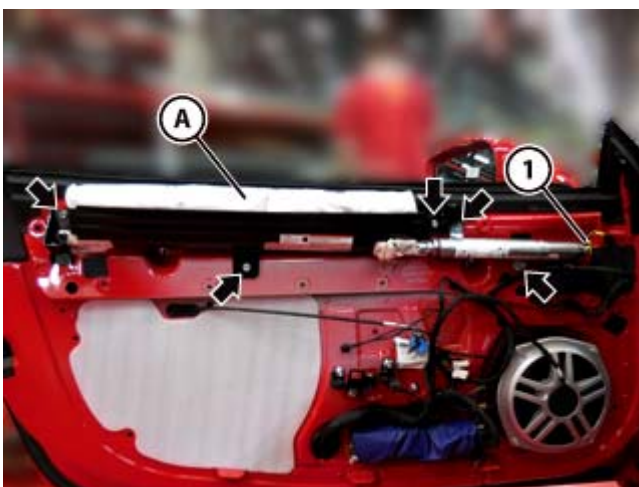
Tightening torque	Nm	Class
Screw	8 Nm	B

- Fasten the connector (1) to the bracket (A).

- Refit the dashboard trim panels (E4.02).
- Refit the passenger side airbag trim.
- Connect the DEIS diagnostic tester to the diagnostic socket (F2.08).
- Perform the airbag ECU cycle with the DEIS diagnostic tester.

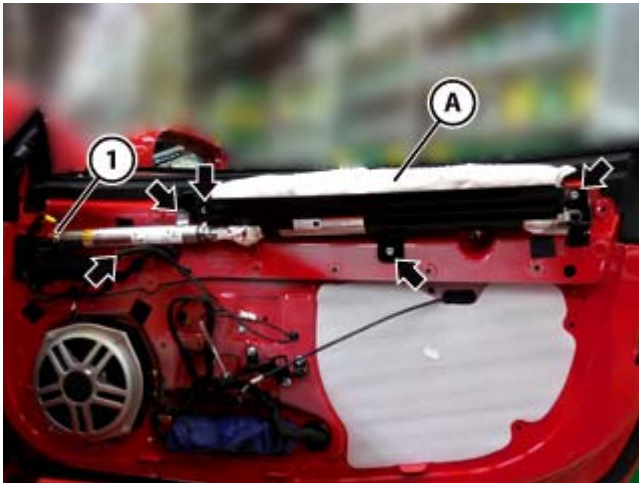
Removing the side airbag modules

- Disconnect the battery (F2.01).
- Remove the door trim (E3.08).



Left hand side airbag module

- Disconnect the connector (1).
- Undo the screws indicated.
- Remove the side airbag module (A).

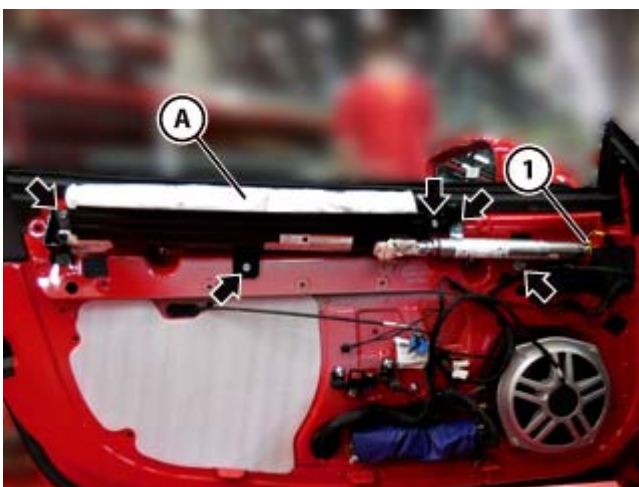


Right hand side airbag module

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the side airbag module **(A)**.

Refitting the side airbag modules

			
Tightening torque		Nm	Class
Fastening side airbag modules	Screw	9 Nm	B

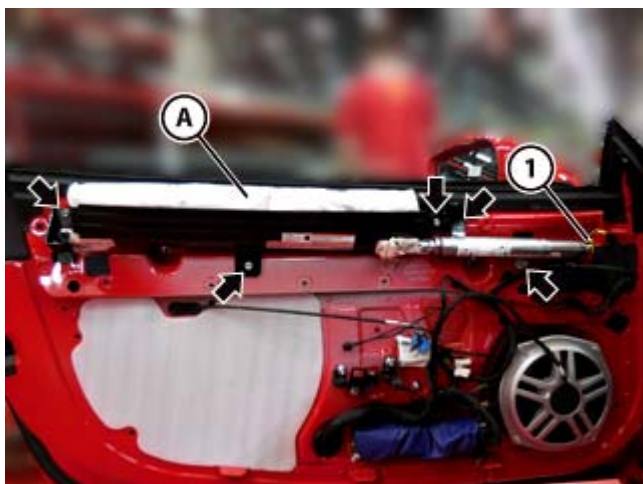


Left hand side airbag module

- Fit the side airbag module **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Connect the connector **(1)**.



Right hand side airbag module

- Fit the side airbag module (A).
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	9 Nm	B

- Connect the connector (1).

- Refit the door trim ( E3.08).
- Connect the battery ( F2.01).
- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).
- Perform the airbag ECU Cycle with the DEIS tester.

Replacing the crash sensors

		
Tightening torque	Nm	Class
Fastening the crash sensors	8 Nm	B

- Disconnect the battery ( F2.01).

Front crash sensors

- Remove the luggage compartment trim panels ( E4.06).
- Remove the lateral luggage compartment trim panels.

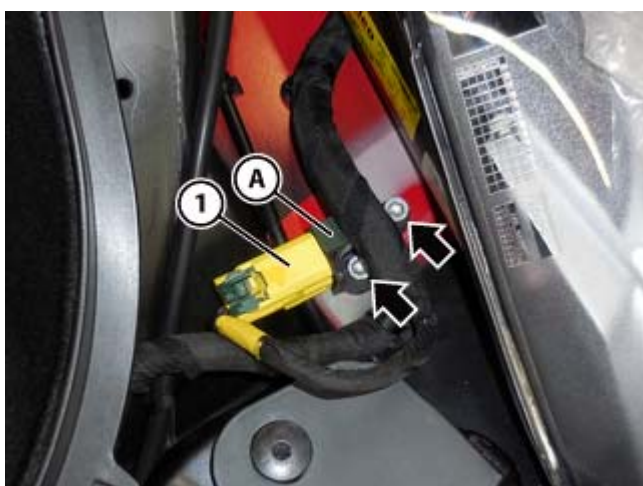


Right hand front crash sensor

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the crash sensor **(A)** and replace.
- Fit the new crash sensor **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the connector **(1)**.



Left hand front crash sensor

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the crash sensor **(A)** and replace.
- Fit the new crash sensor **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Connect the connector **(1)**.

- Refit the luggage compartment trim panels ( E4.06).

-  Refit the lateral luggage compartment trim panels.

- Connect the battery ( F2.01).

- Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).

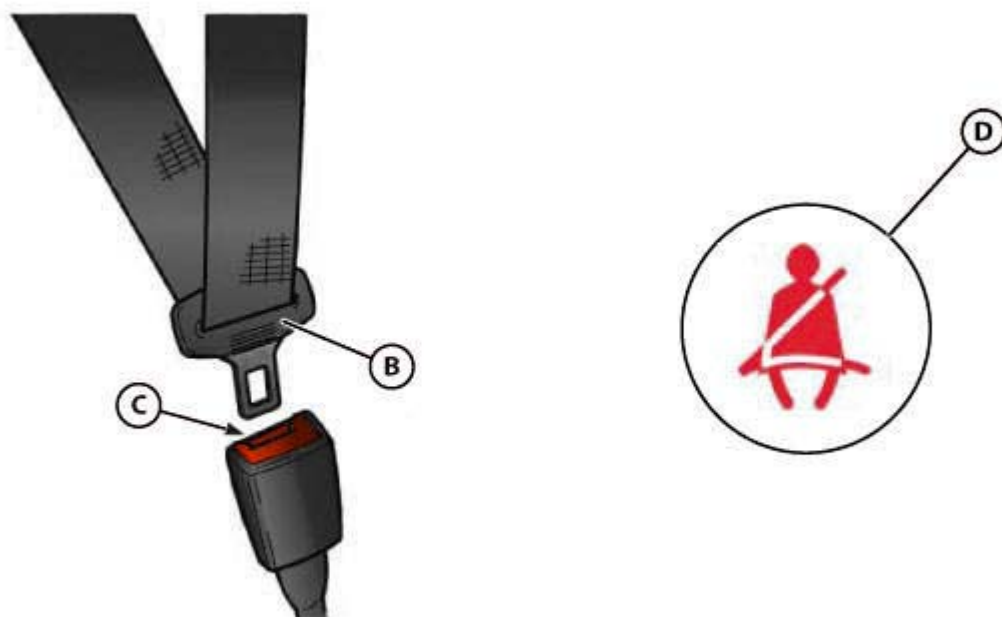
-  Perform the airbag cycle with the DEIS diagnostic tester.

F4.03 Seat belts

Seat belts

The vehicle is equipped with automatic three-point seat belts with inertia lock reel and pretensioner, installed next to the seats, on the outer side.

Seat belt fastening

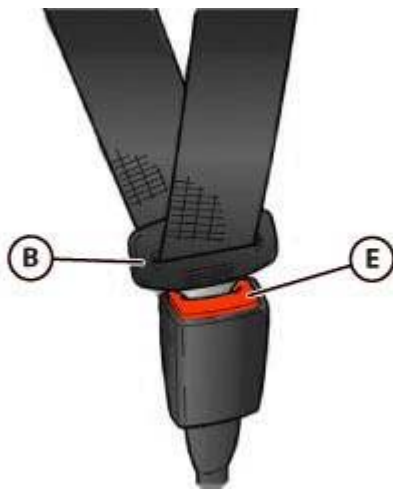


After adjusting the seat correctly, grip the clip **(B)**, pull the belt slowly and insert the tongue into the buckle **(C)**. If the belt locks while pulling, let it rewind a little and then pull it again without jerking abruptly. Ensure that the tongue clicks audibly into the buckle.

Position the seat belt correctly.

If the driver or passenger seat belts are not buckled, the warning lamp **D** lights when the ignition key is turned to **(II)**.

Releasing the seat belts



Press the release button **(E)**.
Accompany the buckle **(B)** back to its rest position.

Pretensioners

This device consists of a retractor with a pyrotechnic pretensioner. The pyrotechnic system is integrated in a single component with the retractor.

This device maximises the protective action of the seat belt.

The pretensioner is activated by the airbag control ECU in the event of a frontal collision (direction of impact between 11 a.m. and 1 p.m.) of excessive severity, or in the event of lateral collision of sufficient severity.

The seat belt is rewound by a few centimetres immediately before the restraining action begins, taking up any slack between the belt and the body of the occupant.



Effective activation of the pretensioner is indicated by the light on the instrument panel and by the tightening of the belt.

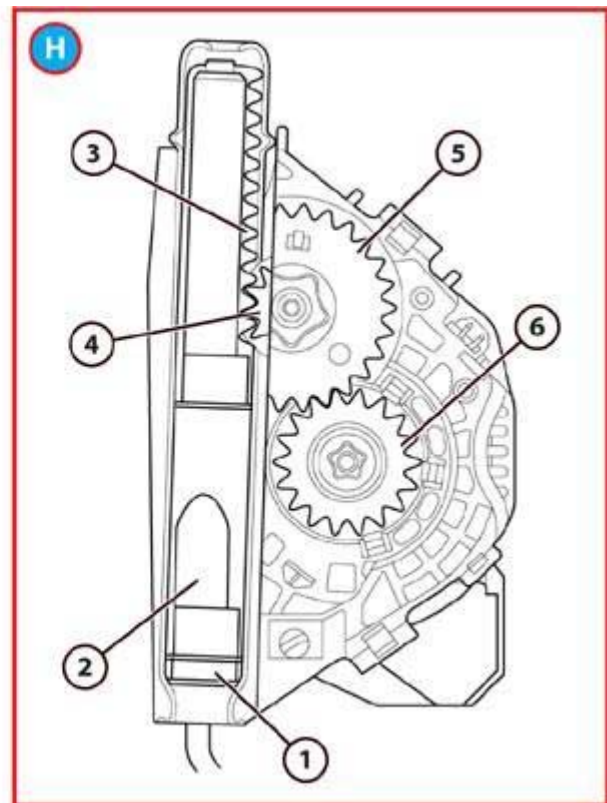
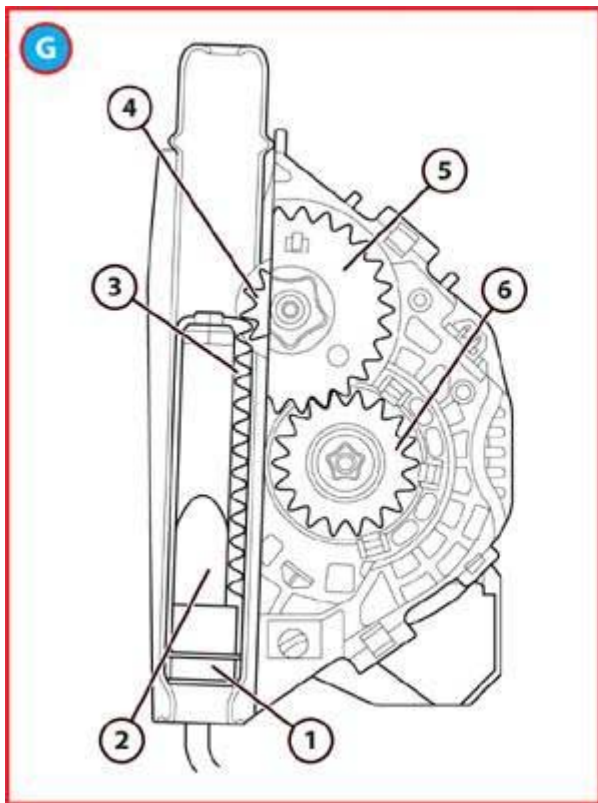
Pretensioner activation releases a small quantity of powder. This powder is harmless and is not an indication of fire.

Pretensioner activation depends only on the state of the seat belt and is not influenced by the presence of the occupant.

If the belt is not buckled, the pretensioner is not activated even if the seat is occupied.

The seat belt is equipped with a load limiter to reduce the restraint force exerted by the belt on the body of the occupant in the event of a collision. This device controls the force with which the seat belt is rewound during a collision.

Operation



Before activation, the device is in **(G)** state.

When the ECU detects a collision of a severity above the set threshold, it sends a signal to the pretensioner, firing the pyrotechnic charge **(1)** of the gas generator: the combustion of the propellant **(2)** releases high pressure gas, exerting an upward force on the rack piston **(3)**.

This motion is transmitted via pinions **(4)** and **(5)** to the toothed bushing **(6)** which rewinds the belt by a few centimetres (state **H**).

This takes up any slack between the belt and the body of the occupant immediately before the retention action begins.



Once activated, a pretensioner is no longer functional, cannot be repaired and must be replaced.

Seat belt and pretensioner care

- Replace the seat belt after a severe collision even if it does not appear damaged.
- Periodically check that the anchor screws are tightly fastened and that the belt itself is in good condition and winds and unwinds smoothly.
- The belt must be kept clean; dirt may compromise the effectiveness of the retractor.
- To clean the belt, hand wash with water and mild soap, rinse and allow to dry. Do not use strong detergents, bleach or harsh solvents that could weaken the fibres.
- Do not wet the retractors: water infiltration may compromise operation.
- The pretensioner requires no maintenance or lubrication. If the pretensioner has been immersed in water or mud, it must be replaced.
- The pretensioners must be replaced every **15 years**.
- Never dismantle or modify the belts, retractors and pretensioners.
- Particular repairs and maintenance work causing violent knocks, vibration or heating near the pretensioner may accidentally trigger the pretensioner; road vibration and shocks will not trigger the pretensioners.

Safety devices

- The pretensioners must be protected from exposure to temperatures of over **100 °C** for more than **6 hours** and from sparks and naked flames.
- The pretensioner may fire spontaneously at temperatures above **150 °C**.
- Pretensioners that have sustained knocks or falls must not be used and must be returned to the manufacturer, specifying the reason.
- Gas generators must be kept away from acids, water, grease or heavy metals to prevent the formation of toxic gases or explosive compounds.
- Do not store pretensioners together with inflammable and/or combustible materials.
- Never dismantle retention system components.
- Never carry pretensioners by the belt, as this may cause damage.
- Remove the pretensioners before carrying out repair jobs that may involve violent shocks (e.g. bodywork/chassis repairs) and/or high temperatures (e.g. painting with temperatures above **100 °C**).
- Fire pretensioners before scrapping.
- Avoid skin contact with the propellant or swallowing: wear protective gloves when handling fired pretensioners. In the event of contact with the propellant, wash with plenty of water and seek medical assistance.

Replacing seat belts

			
Tightening torque		Nm	Class
Fastening seat belts	Screw	40 Nm	B

- Disconnect the battery ( F2.01).
- Remove the seats ( E4.01).
- Remove the passenger compartment trim panels ( E4.04).
- Remove the lower lateral trim panels.



Right hand seat belt

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the seat belt **(A)** and replace it.
- Fit the new seat belt **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B

- Connect the connector **(1)**.



Left hand seat belt

- Disconnect the connector **(1)**.
- Undo the screws indicated.
- Remove the seat belt **(A)** and replace it.
- Fit the new seat belt **(A)**.
- Tighten the screws indicated.

		
Tightening torque	Nm	Class
Screw	40 Nm	B

- Connect the connector **(1)**.

➤ Refit the passenger compartment trim panels ( E4.04).

 Refit the lower lateral trim panels.

➤ Refit the seats ( E4.01).

➤ Connect the battery ( F2.01).

➤ Connect the DEIS diagnostic tester to the diagnostic socket ( F2.08).

 Perform the airbag cycle with the DEIS diagnostic tester.

F4.04 Inertia switch

Replacing the inertia switch

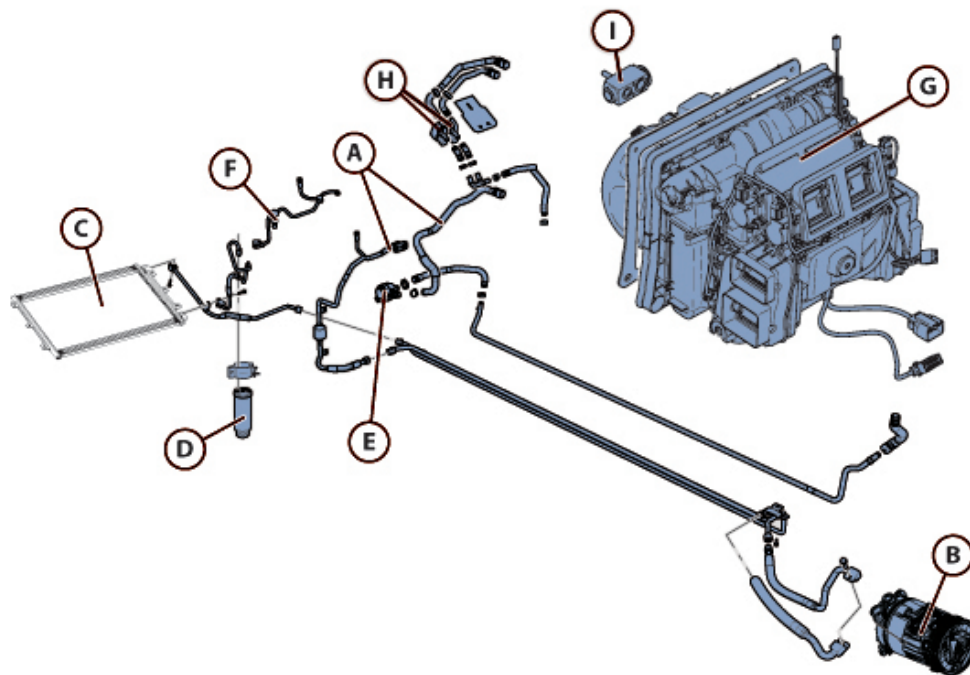
- Preparation in progress

F4.05 Park assistance

Replacing the parking camera

- Preparation in progress

F5.01 Air conditioning and heating system layout



- A - System charge/discharge unions
- B - Compressor
- C - Condenser
- D - Dehydrator filter
- E - Recirculation pump
- F - Pressure switch
- G - Heater / Evaporator
- H - TGK solenoid valve
- I - Expansion valve

F5.02 AC system controls

AC system controls



Automatic mode

Press the button **(A)** to enable (LED on) and disable (LED off) automatic mode for the air conditioning in the driver zone.

Press the button **(B)** to enable (LED on) and disable (LED off) automatic mode for the air conditioning in the passenger zone.

In automatic mode, the system automatically adjusts air flow, distribution and temperature to maintain the set temperature value.

In partial automatic mode, certain parameters may be adjusted manually while others are regulated automatically.

In manual mode, the user may adjust all parameters as desired.

Temperature setting

Turn the dial **(C)** clockwise to increase air temperature in the driver zone.

Turn the dial **(C)** anticlockwise to decrease air temperature in the driver zone.

Turn the dial **(D)** clockwise to increase air temperature in the passenger zone.

Turn the dial **(D)** anticlockwise to decrease air temperature in the passenger zone.

Air distribution mode selection

Turn the dial **(E)** clockwise or anticlockwise to select one from the six air distribution modes available for the driver zone.
Turn the dial **(F)** clockwise or anticlockwise to select from the six air distribution modes available for the passenger zone.

Fan speed

Turn the dial **(G)** clockwise to increase air flow.
Turn the dial **(G)** anticlockwise to reduce air flow and turn air flow off.

AC compressor on/off

Press the button **(H)** to switch the AC compressor on (LED on) and off (LED off).

Enable/disable single-zone operation

Press the button **(L)** to enable (LED on) and disable (LED off) single-zone operation.

Rear screen demist on/off

Press the button **(M)** to switch the rear screen demist/defrost function on (LED on) and off (LED off).

Windscreen demist on/off

Press the button **(N)** to switch the windscreen demist/defrost function on (LED on) and off (LED off).

Air recirculation on/off

Press the button **(P)** to enable (LED on) and disable (LED off) the air recirculation function.
With external temperatures above 32°C, the air recirculation function is always active, with 60 second pauses every 20 minutes to refresh the air.
When the windscreen washer function is active, the recirculation function is activated for 20 seconds to prevent the smell of detergent from entering the passenger compartment.
The recirculation function makes the air in the passenger compartment heat up or cool down more quickly.

Removing the AC system control panel

➤ Disconnect the battery ( F2.01).



 Take particular care not to damage the structure, the plastic fasteners and the leather trim.

- Detach and remove the control panel **(A)**.



- Disconnect the connector **(1)**.
- Remove the control panel **(A)**.

Refitting the AC system control panel



- Fit the control panel **(A)**.
- Connect the connector **(1)**.



Take particular care not to damage the structure, the plastic fasteners and the leather trim.

- Fit and press the control panel **(A)** into place.

➤ Connect the battery ( F2.01).

F5.03 AC system compressor

Removing the AC system compressor

- Preparation in progress

Refitting the AC system compressor

- Preparation in progress

F5.04 AC system condenser

Refitting the AC system compressor

- Preparation in progress

Refitting the AC system condenser

- Preparation in progress

F5.05 AC system pressure switch

Replacing the AC system pressure switch

- Remove the windscreen wiper unit (🔧 E3.09).
- Discharge the air conditioning system (🔧 F5.12).
- Disconnect the battery (🔧 F2.01).



- Disconnect the connector **(1)**.
- Undo the pressure switch **(A)** and replace.
- Fit and tighten a new pressure switch **(A)**.
- Connect the connector **(1)**.

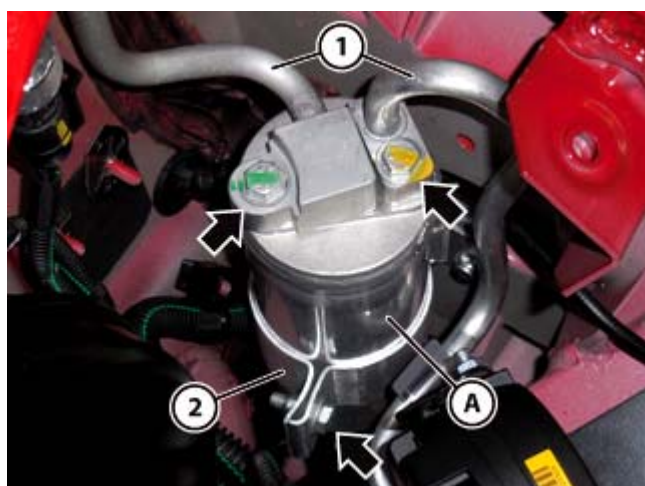
- Refit the windscreen wiper unit (🔧 E3.09).
- Connect the battery (🔧 F2.01).
- Charge the air conditioning system. (🔧 F5.12).

F5.06 AC system dehydrator filter

Replacing the AC system dehydrator filter

			
Tightening torque		Nm	Class
Fastening pipes - dehydrator filter	Screw	8 Nm	B

- Discharge the air conditioning system ( F5.12).
- Remove the windscreen wiper unit ( E3.09).



- Disconnect the pipes (1), undoing the respective screws indicated.
- Mark the position of the dehydrator filter (A) relative to the bracket (2).
- Open the bracket (2), undoing the indicated fastener screw.
- Remove and replace the dehydrator filter (A).
- Fit the new dehydrator filter (A) in the position marked previously
- Close the bracket (2), tightening the indicated fastener screw.
- Replace the gaskets on the pipes (1).
- Connect the pipes (1), tightening the respective screws indicated.

		
Tightening torque	Nm	Class
Screw	8 Nm	B

- Refit the windscreen wiper unit ( E3.09).
- Charge the air conditioning system. ( F5.12).

F5.07 AC system expansion valve

Replacing the AC system expansion valve

- Preparation in progress

F5.08 Complete AC unit

Removing the AC unit

- Preparation in progress

Refitting the AC unit

- Preparation in progress

F5.09 AC system TGK solenoid valves

Replacing the TGK proportional valves

- Preparation in progress

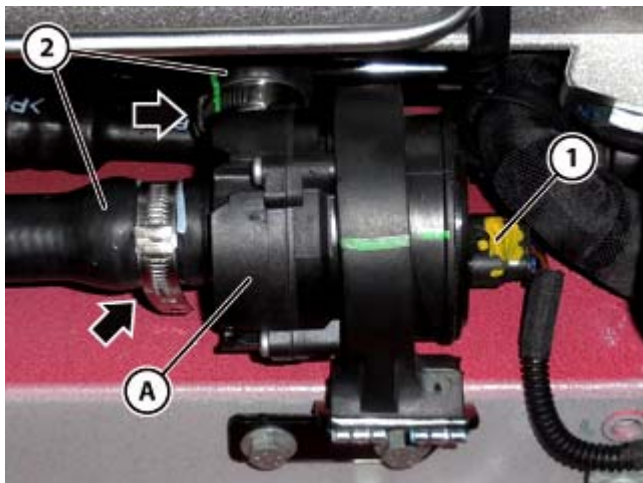
F5.10 AC system recirculation pump

Replacing the AC system recirculation pump



After loosening or removal, the Caillau Visa hose clamps must be replaced with Mikalor worm drive hose clamps, following the instructions given in Technical Information 2054 of December 2012.

- Drain the cooling system (🔧 B6.07).
- Remove the luggage compartment trim panels (🔧 E4.06).
- Remove the luggage compartment tray.



- Disconnect the connector **(1)**.
- Disconnect the pipes **(2)**, removing the indicated collars.
- Remove the recirculation pump **(A)** from the mounting bracket and replace.
- Fit the new recirculation pump **(A)** on the mounting bracket.
- Connect the pipes **(2)**, fitting and tightening new collars as indicated.
- Connect the connector **(1)**.

- Refit the luggage compartment trim panels (🔧 E4.06).
- Refit the luggage compartment tray.
- Fill and bleed the coolant system (🔧 A3.07).

F5.11 AC system sensors

Replacing the passenger compartment temperature sensor

- Preparation in progress

Replacing the sun radiation sensor

- Preparation in progress

F5.12 Discharging and charging the AC system

Discharging the air conditioning system

The air conditioning and heating system must be discharged with the special tool for recovering refrigerant gas.

If the function is available on the tool, measure the quantity of fluid recovered from the system to enable subsequent refilling with the correct amount.



- Lift the right hand windscreen wiper arm **(1)** into a vertical position.
 The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.
- Prise off the cover **(2)**, applying leverage in the position indicated.



- Remove the caps **(3)**.



CAUTION

Discharging refrigerant gas near open flame is extremely dangerous and may result in the emission of toxic gas (phosgene).

- Connect the **RED** union (**B**) to the high pressure pipe.
- Connect the **BLUE** union (**A**) to the low pressure pipe.
- Perform the **refrigerant gas recovery cycle**.
- Perform the **system discharge cycle**.
- To ensure correct system operation, the specified vacuum values must be attained during the vacuum cycle.

CAUTION

Do not use open flames to search for refrigerant leaks, as this may generate toxic gas (phosgene).

- If the vacuum value exceeds **33 mbar (25 mmHg)** within **5 minutes**, check the system for leaks.
- Disconnect the **RED** union (**B**).
- Disconnect the **BLUE** union (**A**).



Charging the air conditioning system

If some of the compressor oil has remained trapped in the machine after the discharging procedure, top up the system with the same quantity of the specified oil.



- Connect the **RED** union (**B**) to the high pressure pipe.
- Connect the **BLUE** union (**A**) to the low pressure pipe.



CAUTION

Do not use open flames to search for refrigerant leaks, as this may generate toxic gas (phosgene).

- After removing of any system component, perform the **system vacuum cycle** and check for leaks.
- Disconnect the **RED** union (**B**) from the high pressure pipe.
- Selecting the low pressure circuit only, perform the **system charge** cycle and wait for the cycle to complete.
- Start the engine.
- Activate the AC system by setting the minimum temperature and the maximum fan speed.
- Increase engine speed to 2000 rpm a few times.
- Check that the low pressure circuit manometer reading stabilises at around **2.5 bar**.
- Disconnect the **BLUE** union (**A**) from the low pressure pipe.
- Switch off the engine.
- Refit the caps (**3**).





The fastener teeth of the cover are fragile. Do not strain the cover when opening and closing.

- Fit the cover **(2)** onto the underwindscreen shield, inserting the rear tabs in the respective seats first and then the front tabs.