

12 31 020 Removing and installing/replacing alternator



TECHNICAL INFORMATION



- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

2 – Removing the acoustic cover



WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.



RISK OF DAMAGE

Damage to the acoustic cover.

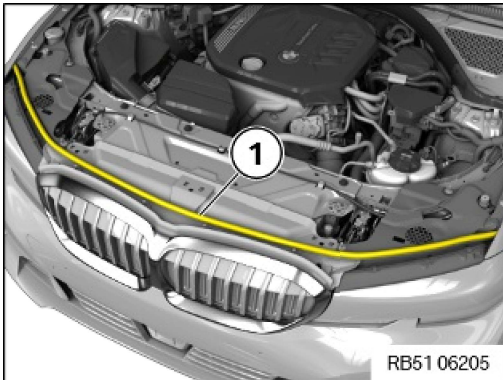
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures $>20^{\circ}\text{C}$.
- Use only distilled water as an auxiliary material during installation, no lubricants.



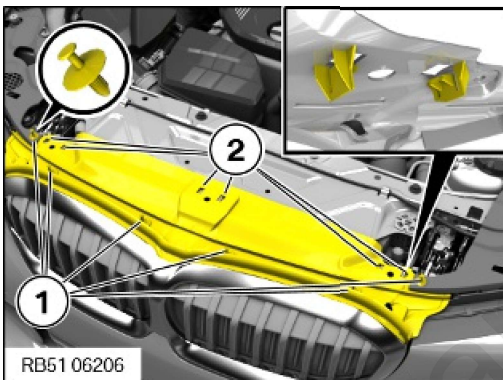
- Release the acoustic cover (1) towards the top from the rubber mounts (marks).

3 – Remove the seal for the bonnet in front



- Pull off front bonnet seal (1) upwards.

4 – Removing the centre engine compartment cover



- Detach all expanding rivets (1).
- Release the cover of the centre engine compartment with the latch mechanisms (2) .
- Feed the cover for the centre engine compartment out to the rear.

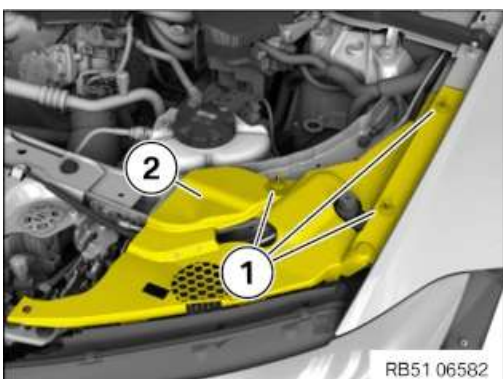
5 – Partially remove the top left and right cover in the engine compartment



NOTICE

Description is for left component only. Procedure on the right side is identical.

► Removing the cover in the engine compartment on top partially



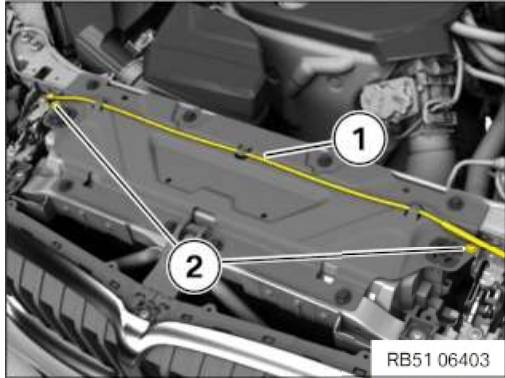
- Loosen the expanding rivet (1).
- Remove the cover in the engine compartment on top (2) partially.

6 – Removing the top cross connection

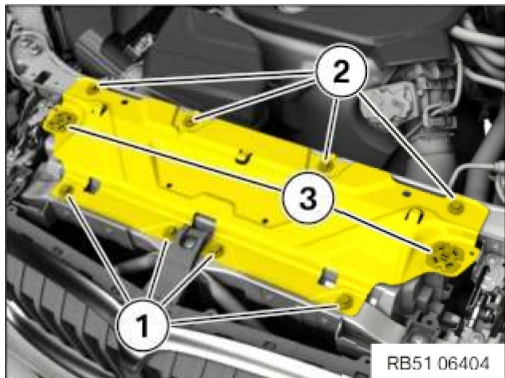
6 – Removing the top cross connection



- Release the housing for the coupling of the Bowden cables (1) from the body.

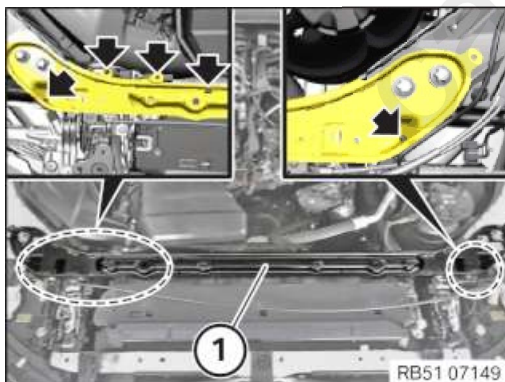


- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).

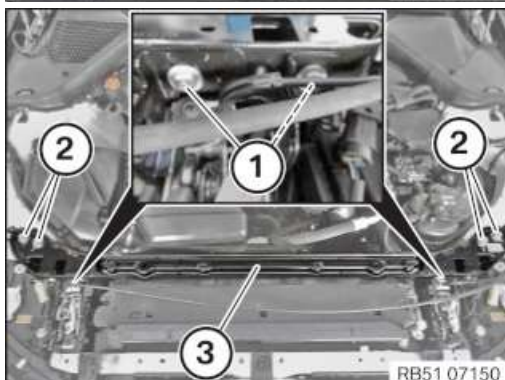


- Loosen screws (1) and (2).
- Remove the top cross connection with the holders(3) towards the top.

7 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the top rear cross connection (1).



- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

8 – Removing intake silencer housing

8 – Removing intake silencer housing



RISK OF DAMAGE

Damage to the clean air line. Damage to the air filter.

For changing the air filter insert, if the upper section of intake filter housing is only raised and not completely removed, the clean air line and the air filter insert may be damaged.

- Do not lift upper section of intake filter housing by force.
- Unfasten clamp.
- Remove upper section of intake filter housing completely.



- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Pull out and remove the intake silencer housing (3) from the rubber mounts towards the top.

9 – Removing clean air pipe



WARNING

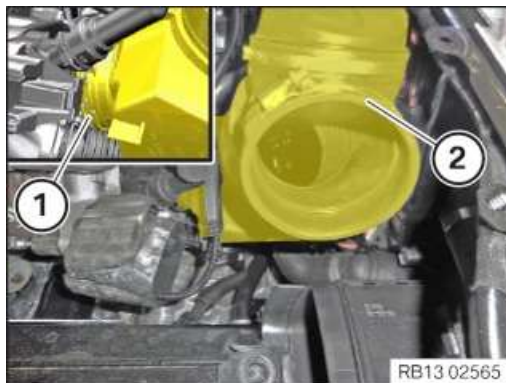
Hot surfaces.

Risk of burning!

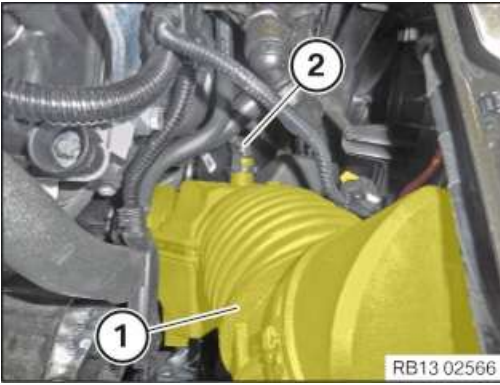
- Perform all work only on components that have cooled down.



- Loosen clamp (1).



- Unlock the clamp (1).
- Thread out clean air pipe (2) and set it aside.



- Position clean air pipe (1).
- Unlock and loosen engine ventilation line (2).
- Feed out clean air pipe and remove (1).

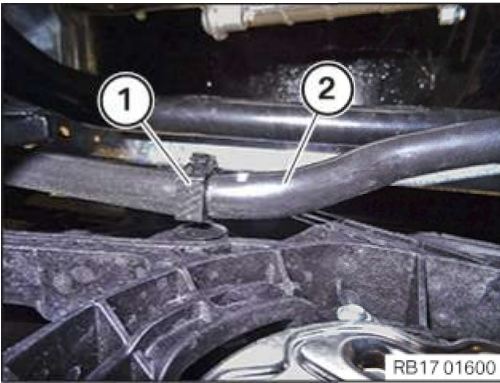
10 – Remove fan cowl.



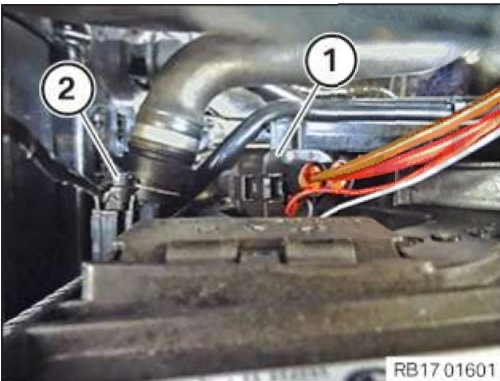
TECHNICAL INFORMATION



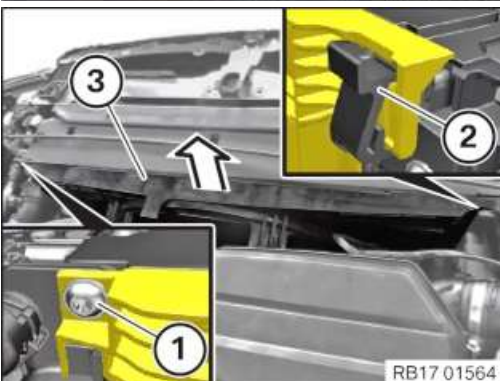
- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



- **If installed:** Release transmission oil line (2).
Unlock the holder (1).
Thread out transmission oil line (2) and set aside.



- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.



- Loosen screw (1).
- Unlock lock (2).
- Guide out and remove fan cowl (3) **carefully** in the direction of the arrow.

11 – Remove charge air line

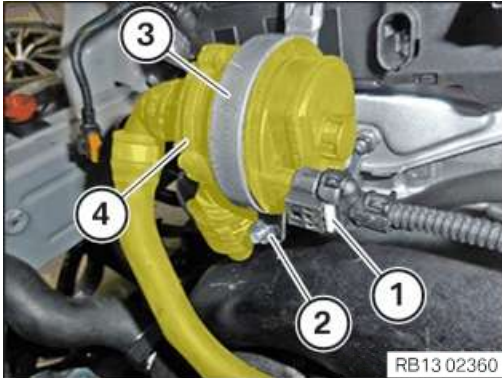


WARNING

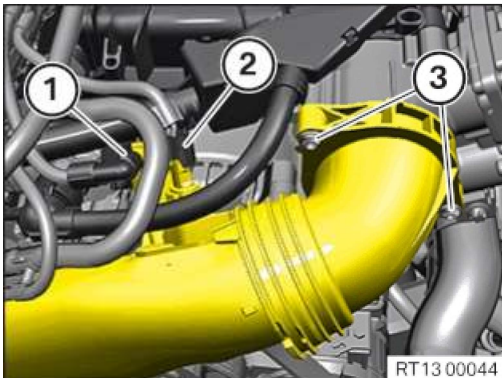
Hot surfaces.

Risk of burning!

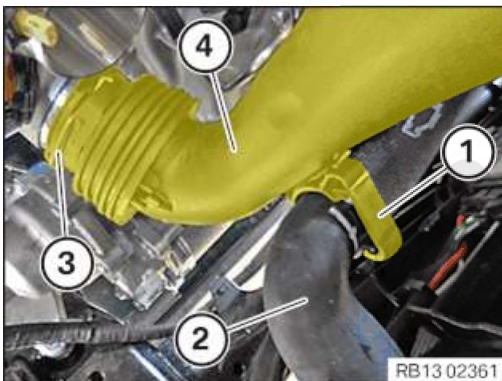
- Perform all work only on components that have cooled down.



- Unlock plug connection (1) and disconnect.
- Loosen nut (2).
- Guide the retaining bracket (3) out and remove.
- Guide out auxiliary coolant pump (4) and place it aside.



- Unlock plug connection (1) and disconnect.
- Unlock plug connection (2) and disconnect.
- Loosen screws (3).



- Unlock the clamp (1).
- Feed out the coolant hose (2) and set it aside.
- Unlock the clamp (3).
- Feed the charge air line (4) out upwards and remove it.

12 – Removing the throttle body



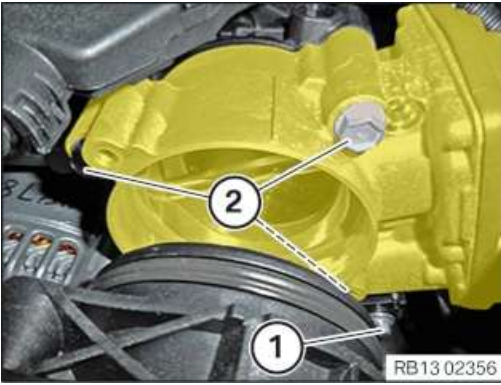
RISK OF DAMAGE



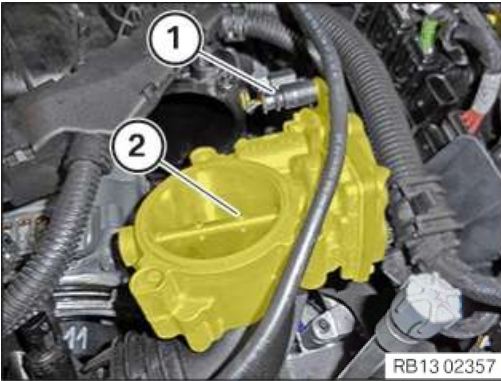
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.



- Loosen screw (1).
- Loosen screws (2).



- Thread the throttle body (2) a little bit out to the front.
- Unlock plug connection (1) and disconnect.
- Remove throttle body (2).

13 – Removing the drive belt for alternator



CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.



CAUTION

Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.



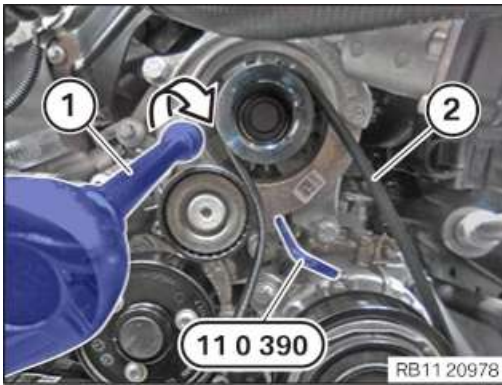
TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.



TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.



- Increase the preload on the belt tensioner in **the direction of the arrow** using standard tools (1).
- Secure the belt tensioner with the special tool [0 496 268 \(11 0 390\)](#).
- Guide out the drive belt for the alternator (2) and remove it.

MAIN WORK

14 – Removing the alternator



WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.



WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.



RISK OF DAMAGE



Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.

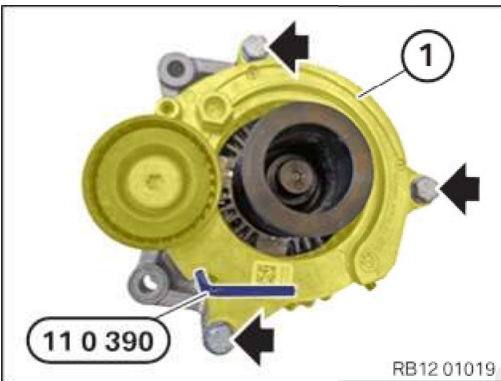


- Unfasten nut (1).
- Unlock and disconnect connector (2).

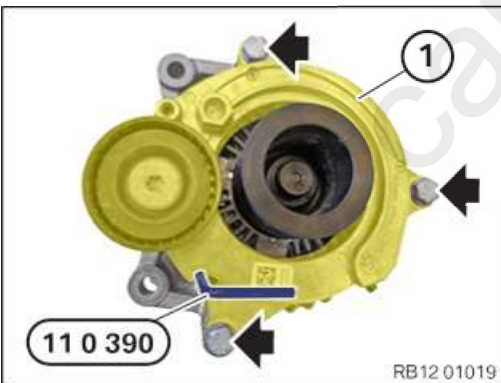


- Loosen screws (1).
- Guide out alternator (2) and remove.

15 – When replacing the alternator: Remount the tensioning device for the drive belt of the alternator



- Remove screws (arrows).
- Guide out the tensioning device for the drive belt of the alternator (1) and remove.
- Make sure that the special tool [0 496 268 \(11 0 390\)](#) is fitted correctly.



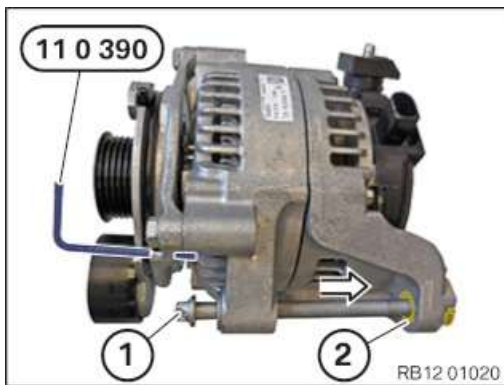
- Replace alternator.
- Parts:** Alternator
- Guide in and install the tensioning device for the drive belt of the alternator (1).
- Tighten screws (arrows).

Belt tensioner to alternator

M8X30		Tightening torque	28 Nm
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- Make sure that the special tool [0 496 268 \(11 0 390\)](#) is fitted correctly.

16 – Installing the alternator



- Slightly push back the threaded support sleeve (2) in the direction of the arrow to facilitate the installation of the alternator.
- Screw the screw (1) into the threaded support sleeve (2).
- Press back the threaded support sleeve (2) using the bolt (1).
- Once again unscrew the screw (1) from the threaded support sleeve (2).



- Insert and install the alternator (2).
- Tighten the screws (1).

Alternator to component carrier

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm



- Tighten nut (1).

Positive battery cable to the alternator

M8		Tightening torque	19 Nm
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- Connect connectors (2) and lock.
The connector (2) must engage audibly.

POSTPROCESSES

17 – Installing the drive belt for alternator

Overview of drive belt for alternator



1. Drive belt for alternator



TECHNICAL INFORMATION

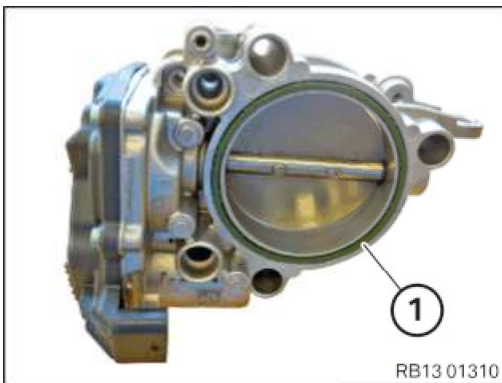
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

The drive belt must be replaced if contaminated with coolant- and oil residues.



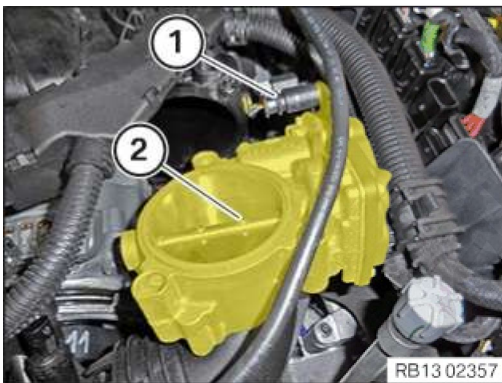
- Position the drive belt for alternator (2) on the ancillary components.
- Increase the preload on the belt tensioner in **the direction of the arrow** using standard tools (1).
- Feed the special tool [0 496 268 \(11 0 390\)](#) out of the belt tensioner and remove it.

18 – Installing the throttle body

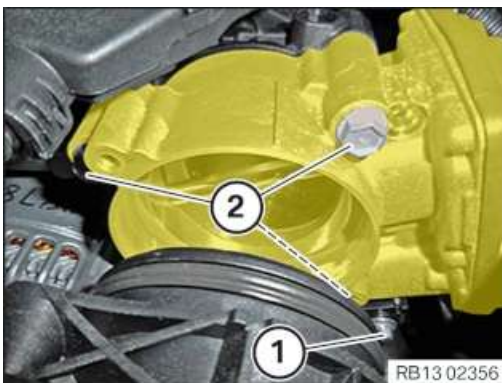


- Renew the sealing ring (1) with the special tool [0 496 714 \(00 9 030\)](#).

Parts: Sealing ring



- Position throttle body (2).
- Connect connectors (1) and lock.
The connector (1) must engage audibly.
- Install throttle body (2).



- Tighten down screws (2).

Throttle body to intake plenum

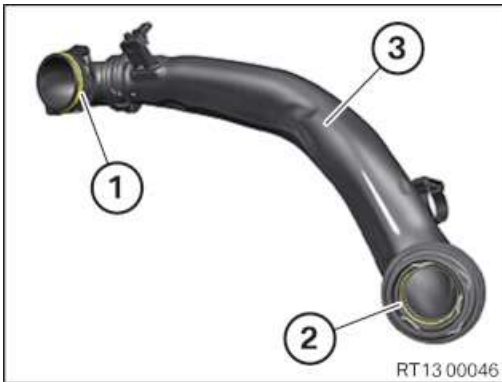
6X50		Tightening torque	7 Nm
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- Renew the screw (1).
- Parts:** Screw
- Tighten down screw (1).

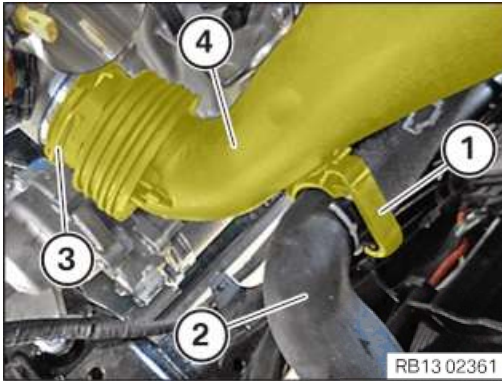
Bracket for coolant hose to throttle body

M6x16 screw	Renew screw.	Tightening torque	11,8 Nm
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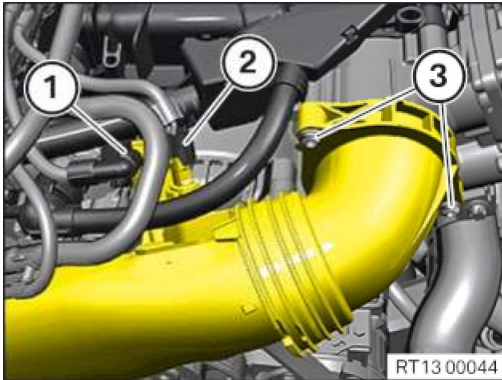
19 – Install charge air line



- Check the sealing ring (1) on the charge air line (3) for damage and renew it with the special tool [0 496 714 \(00 9 030\)](#), if necessary.
- Check the sealing ring (2) on the charge air line (3) for damage and renew it with the special tool [0 496 714 \(00 9 030\)](#), if necessary.



- Insert and install charge air line (4).
- Lock clamp (3).
The clamp (3) must engage audibly.
- Insert and install the coolant hose (2).
- Lock clamp (1).

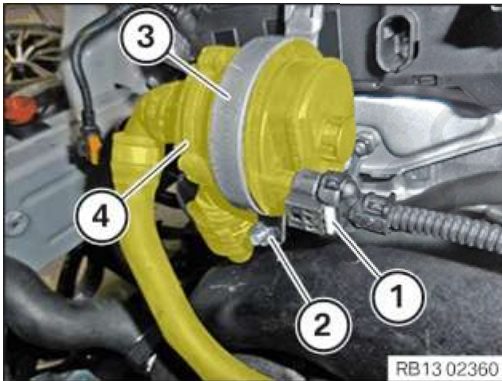


- Tighten the screws (3).

Charge air line to throttle valve

M6x30		Tightening torque	8 Nm
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- Connect connectors (2) and lock.
The connector (2) must engage audibly.
- Connect connectors (1) and lock.
The connector (1) must engage audibly.



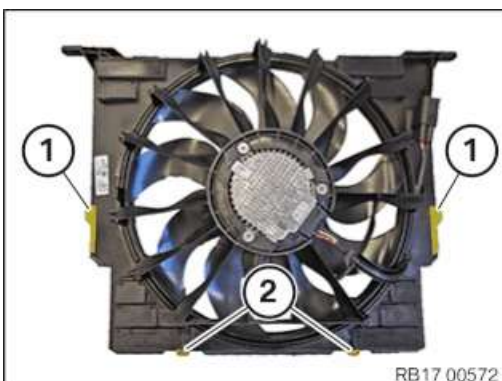
- Insert and position the additional coolant pump (4).
- Insert and position the retaining bracket (3).
- Tighten nut (2).

Electric coolant pump to holder

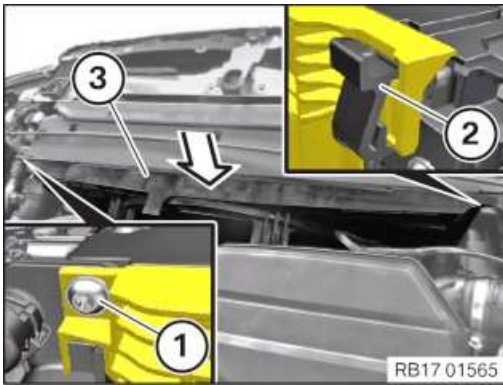
M6		Tightening torque	8 Nm
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- Connect connectors (1) and lock.
The connector (1) must engage audibly.

20 – Install fan cowl



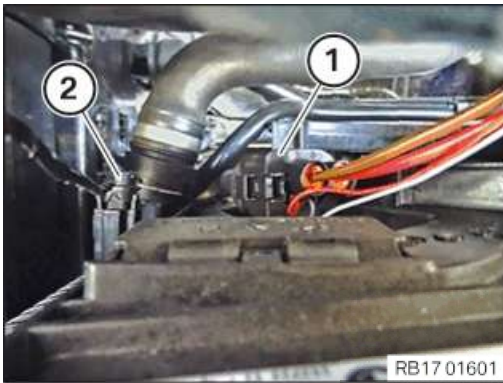
- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.



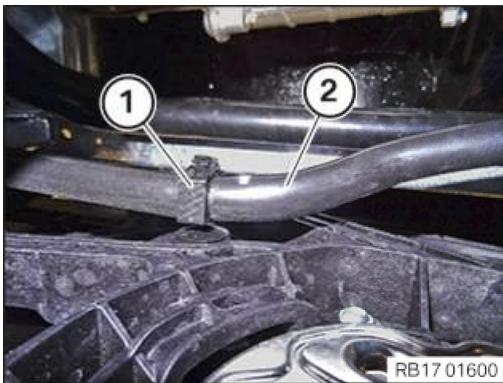
- Guide in and install fan cowl (3) **carefully** in the direction of the arrow.
- Ensure that the lock (2) engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

TS6x20		Tightening torque	6,5 Nm
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- Connect connectors (2) and lock.
The connector (2) must engage audibly.
- Connect connectors (1) and lock.
The connector (1) must engage audibly.



- **If installed:** Secure the transmission oil line (2).
Insert and install the transmission oil line (2).
Lock holder (1).

21 – Installing clean air pipe



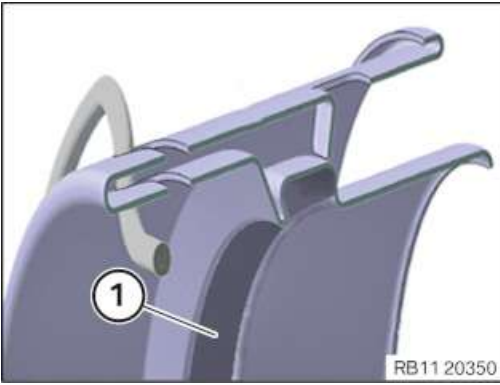
- Check the seal (1) for damage and renew if necessary.

► Replace damaged gasket

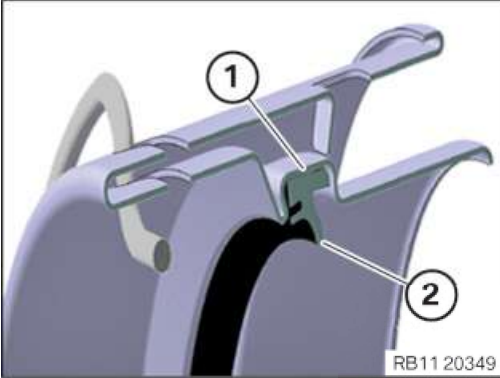


TECHNICAL INFORMATION

Do not use pointed or sharp-edged tools for the installation and/or removal.



- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.
The gasket groove (1) must be clean.



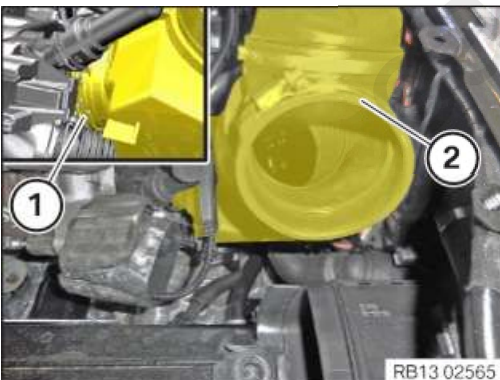
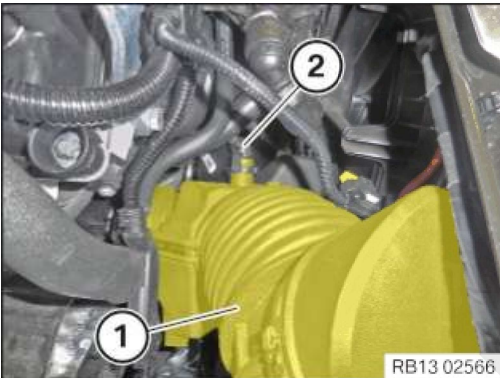
- Renew gasket.
Parts: Gasket
- Install seal dry without lubricant or mounting agent.



TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).
- Guide in and position clean air pipe (1).
- Connect engine ventilation line (2) and lock.
The engine ventilation line (2) must engage audibly.

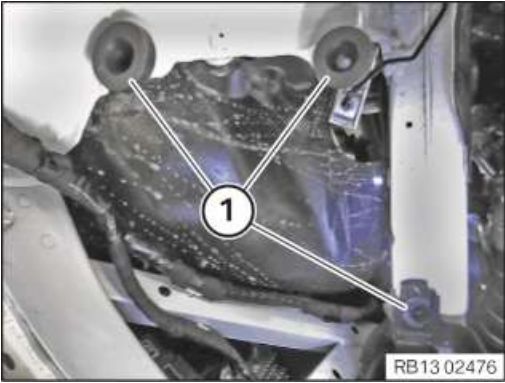


- Install the clean air pipe (2).
- Lock clamp (1).
The clamp (1) must engage audibly.

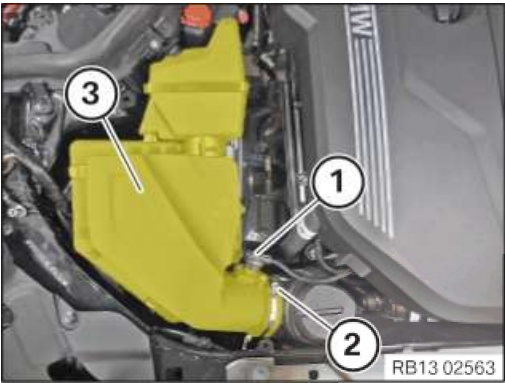


- Secure clamps (1).

22 – Installing intake silencer housing



- Check the rubber mount (1) for correct fit.



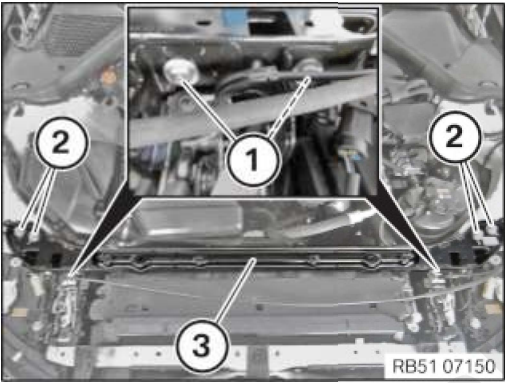
- Feed the intake filter housing (3) in and engage it in the rubber mounts.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm
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- Connect connectors (1) and lock.
The connector (1) must engage audibly.

23 – Install the rear top cross connection



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

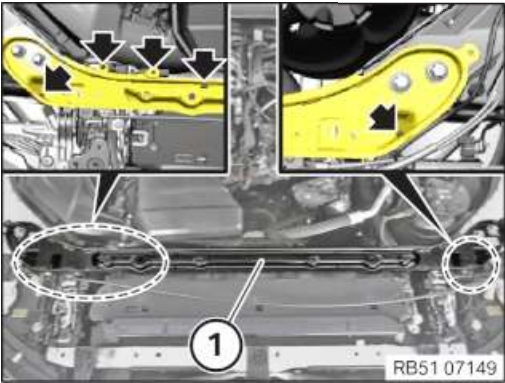
Top rear cross connection to bonnet catch support

Flat-head screw M6x20		Tightening torque	11,8 Nm
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- Renew screws (2).
- Parts:** Bolts
- Tighten the screws (2).

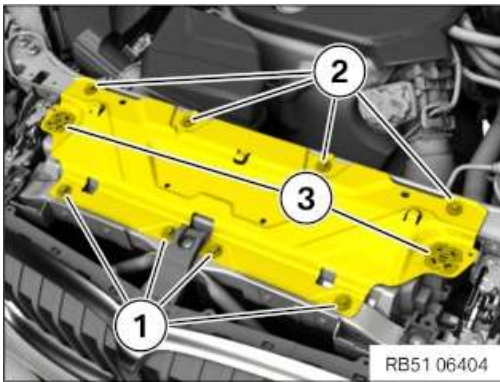
Rear top cross connection to wheel arch carrier support

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

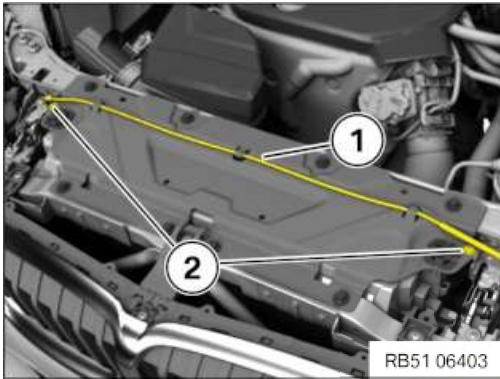
24 – Installing the top cross connection



- Set and position upper cross connection with holders (3) from above.
- Tighten down screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm
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- Tighten down screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm
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- Attach Bowden cable (1) on the upper cross connection.



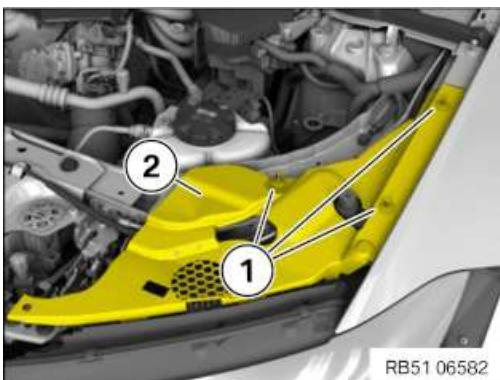
- Clip in the housing for the coupling of the Bowden cables (1).

25 – Install the cover in the engine compartment at top left and right partially



NOTICE

Description is for left component only. Procedure on the right side is identical.

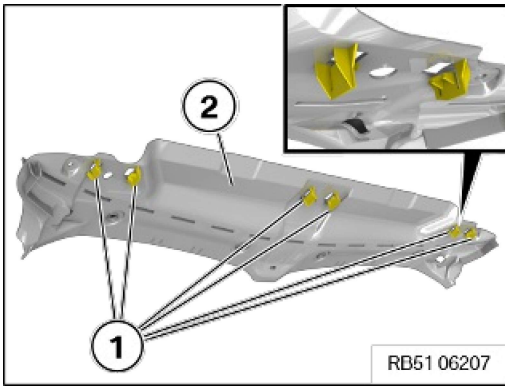


► Installing the cover in the engine compartment on top partially

- Install the cover in the engine compartment on top (2).
- Secure expanding rivet (1).

26 – Installing cover for engine compartment centre

Check



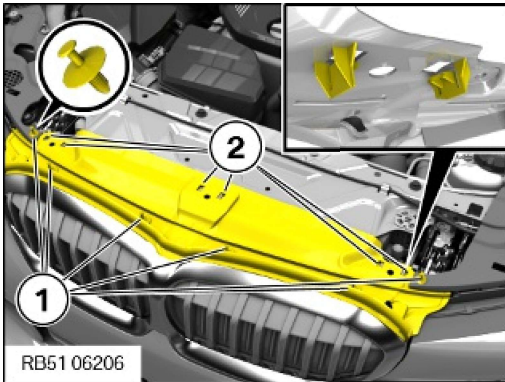
- Check latch mechanisms (1) of cover for engine compartment centre (2) for damage.

Result

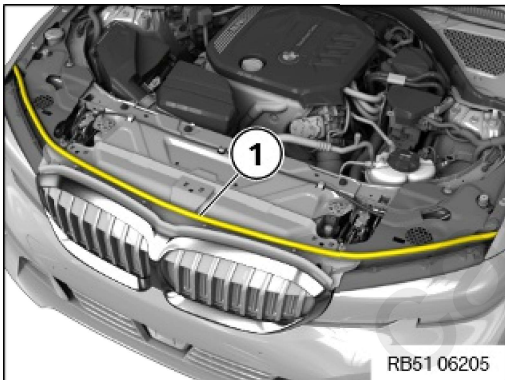
- » The latch mechanism (1) is damaged.

Measure

- Renew cover for engine compartment centre (2).
- Guide in the cover for the engine compartment centre from the rear and position it.
- Clip in the cover for the engine compartment centre with latch mechanisms (2).
- Mount all expanding rivets (1).



27 – Install the seal for the front bonnet



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

28 – Install acoustic cover

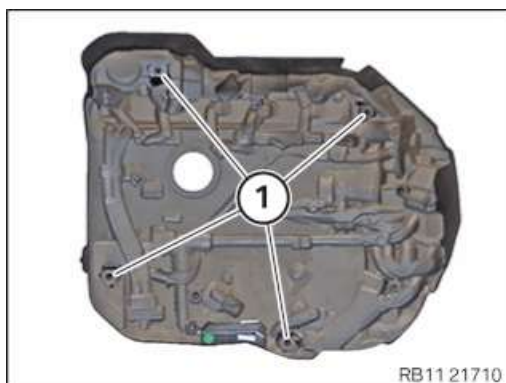


RISK OF DAMAGE

Damage to the acoustic cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Check the rubber mount (1) for correct fit in the acoustic cover.



- Install acoustic cover (1) and fix in the rubber mounts (marks).

29 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Belt tensioner to alternator

Used in step 15

M8X30		Tightening torque	28 Nm
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Alternator to component carrier

Used in step 16

M10x75		Tightening torque	38 Nm
M10x125		Tightening torque	38 Nm

Positive battery cable to the alternator

Used in step 16

M8		Tightening torque	19 Nm
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Throttle body to intake plenum

Used in step 18

6X50		Tightening torque	7 Nm
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Bracket for coolant hose to throttle body

Used in step 18

M6x16 screw	Renew screw.	Tightening torque	11,8 Nm
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Charge air line to throttle valve

Used in step 19

M6x30		Tightening torque	8 Nm
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Electric coolant pump to holder

Used in step 19

M6		Tightening torque	8 Nm
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Fan cowl with electric fan on radiator

Used in step 20

TS6x20		Tightening torque	6,5 Nm
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Clean air pipe to upper section of intake filter housing

Used in step 22

Clamp		Tightening torque	3 Nm
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Top rear cross connection to bonnet catch support

Used in step 23

Flat-head screw M6x20		Tightening torque	11,8 Nm
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Rear top cross connection to wheel arch carrier support

Used in step 23

M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Cross connection, top

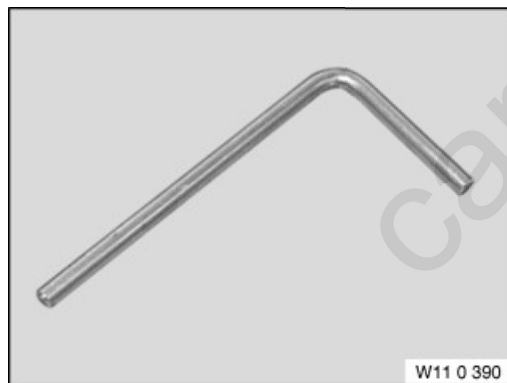
Used in step 24

M8x20		Tightening torque	28 Nm
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Cross connection, top

Used in step 24

M6x20		Tightening torque	11,8 Nm
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Overview of Special Tools**0 496 268 (11 0 390) Pin****Common**

Used in step 131517

Usage (roll pin) For securing new tensioning pulley (poly-V belt)

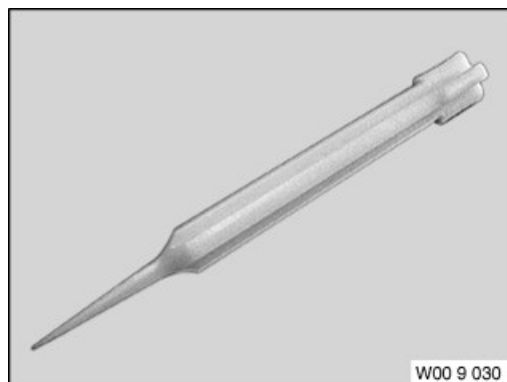
Included in the tool or work

Storage location B24

Replaced by

In connection with

SI-Number 01 15 07 (390)

0 496 714 (00 9 030) Wedge**Common**

Used in step 1819

Usage For dismantling O-rings, gaskets and trim panels. This special tool replaces special tool 00 9 316.

Included in the tool or work

Storage location A50

Replaced by

In connection with

SI-Number 01 20 09 (581)

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