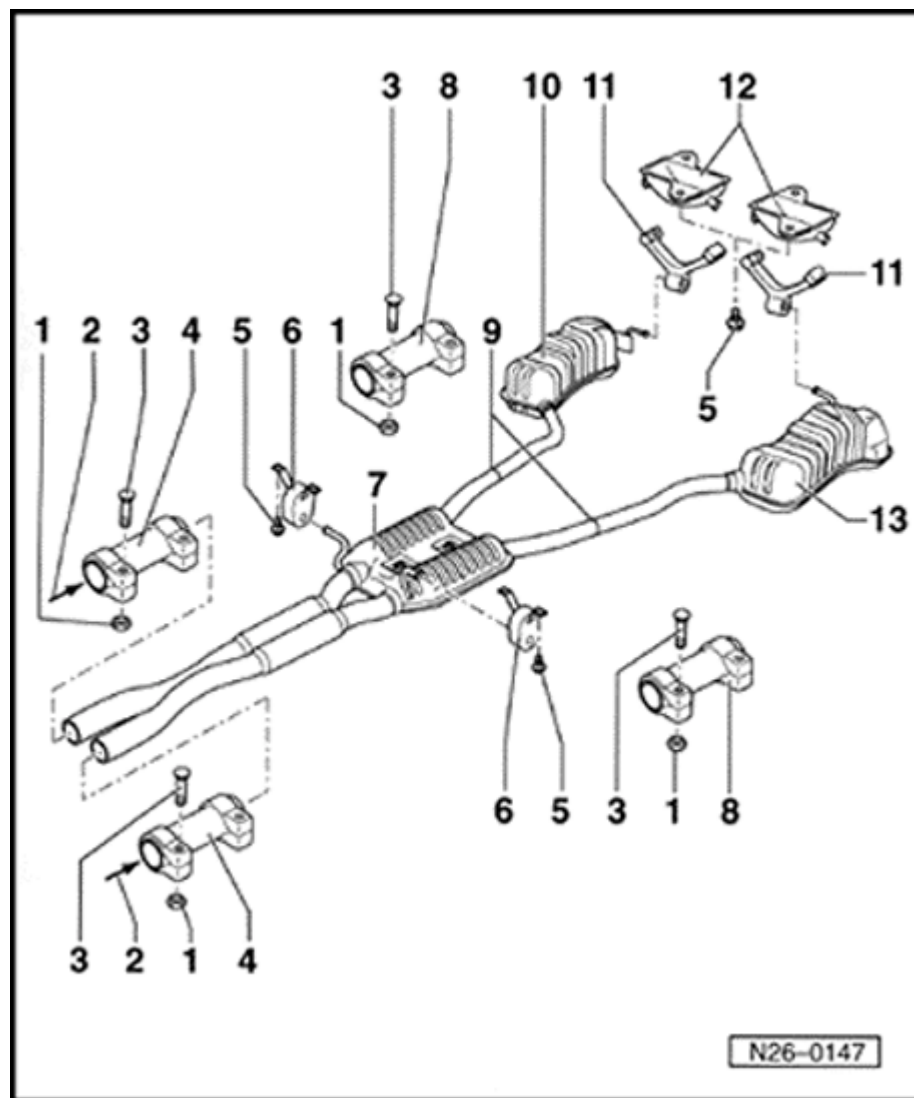


## Exhaust system components, removing and installing

### Notes:

- ◆ *Removing and installing exhaust manifold ⇒ [Page 26-17](#)*
- ◆ *After working on the exhaust system ensure that the system is not under stress, and that it has sufficient clearance from the bodywork. If necessary, loosen double and single clamps and align muffler and exhaust pipe so that sufficient clearance is maintained to the bodywork and the support rings are evenly loaded.*
- ◆ *Aligning exhaust system free of stress ⇒ [Page 26-11](#)*
- ◆ *Replace self-locking nuts.*



### Mufflers with mountings, removing and installing

1 - 40 Nm

2 - From catalytic converter

3 - Flat-head bolt

4 - Double clamp

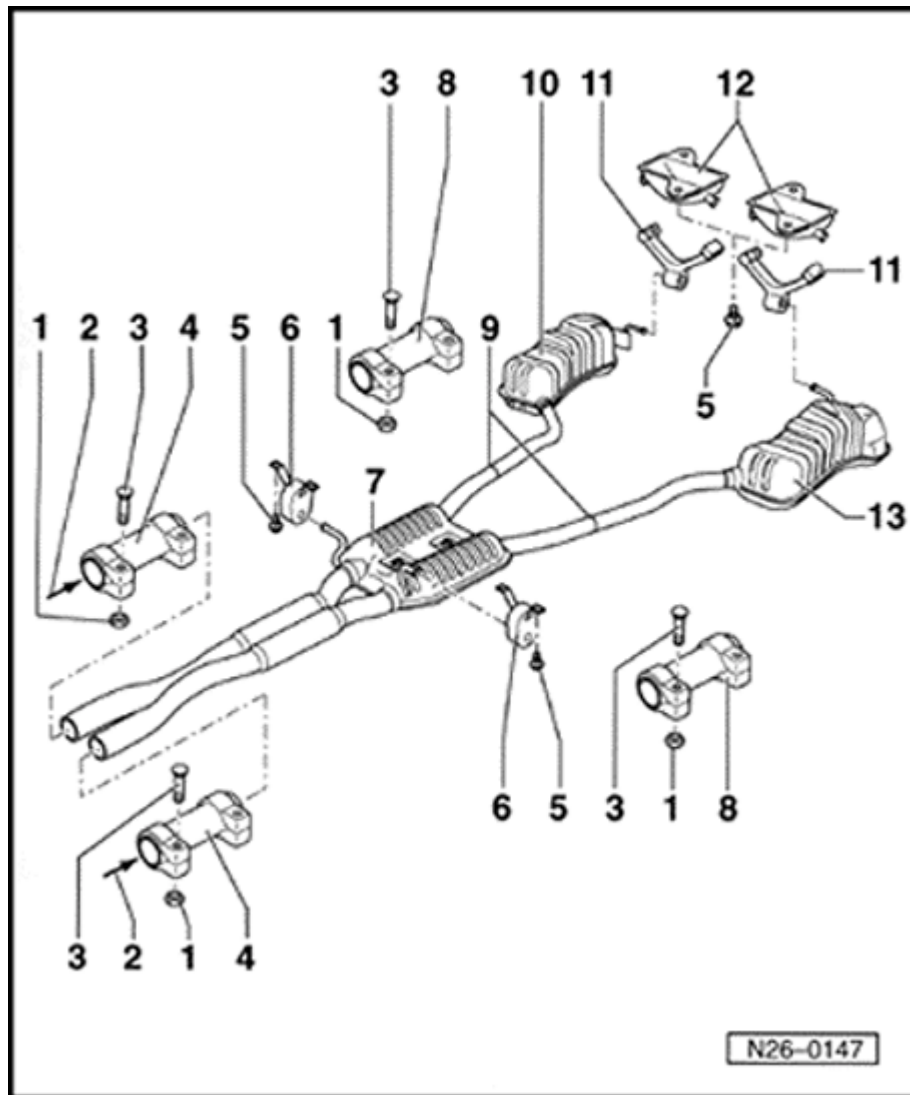
5 - 25 Nm

6 - Mounting

◆ With retaining ring

7 - Front muffler

8 - Double clamp (for repairs)



### 9 - Separating point

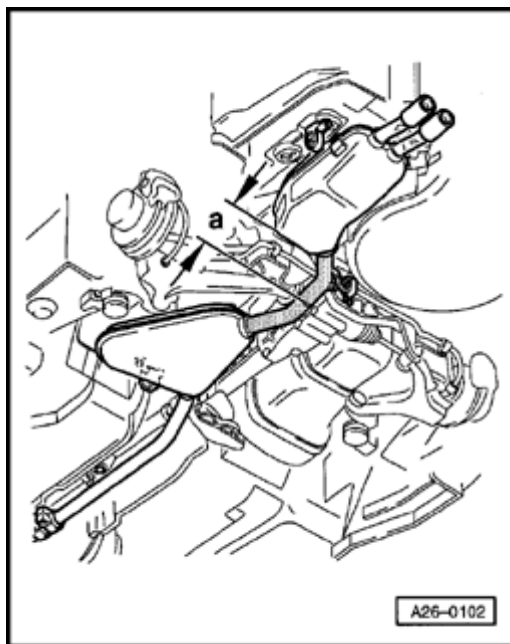
- ◆ Front and rear mufflers are installed as one component when vehicle is built. For repairs, front muffler and rear muffler can be replaced separately and connected with a double clamp.
- ◆ Cutting through connecting pipe ⇒ Fig. ⇒ [1](#)

### 10 - Rear muffler (right)

### 11 - Mounting

### 12 - Bracket

### 13 - Rear muffler (left)



**A** Fig. 1 Separating point between center muffler and rear muffler

**Note:**

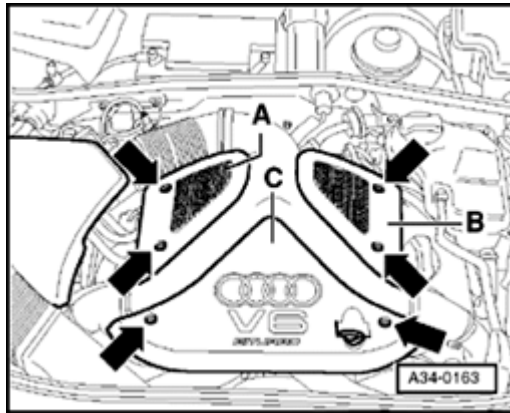
- ◆ A separating point has been provided for replacement of the center muffler or rear muffler in the event that repair work is necessary.
- ◆ A double clamp is used to attach the center and rear mufflers.
- Separate connecting pipe between center muffler and rear muffler where indicated by groove.

Dimension - a - approx. 160 - 170 mm.

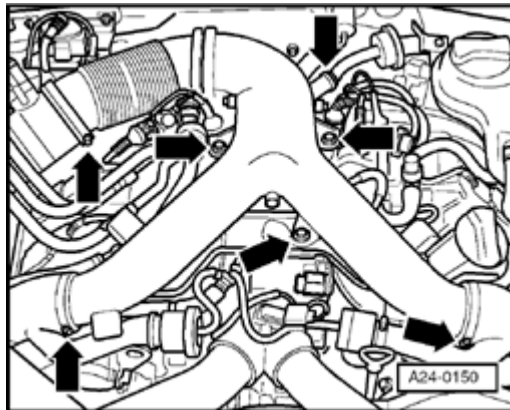
- Adjust exhaust system ⇒ [Page 26-11](#) .

## Catalytic converter, removing and installing

### Removing



- A** - Remove bolts -arrows- and take off engine cover panels -A ... C-.



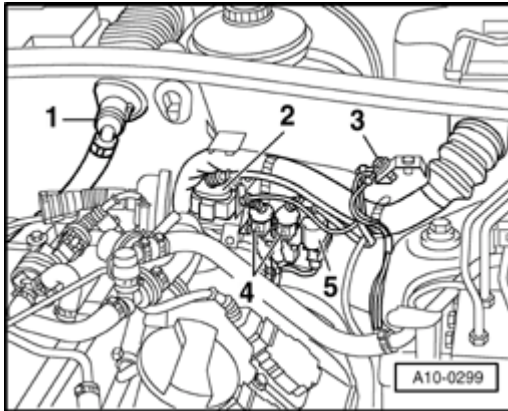
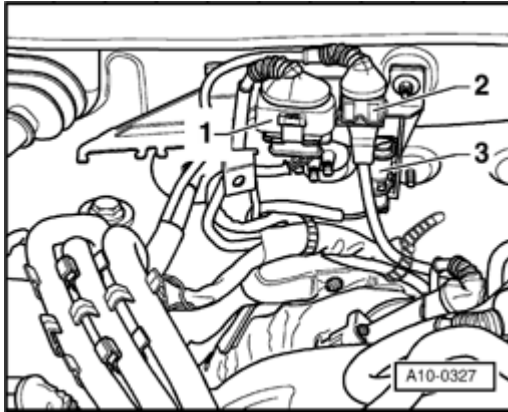
- A** - Remove air distributor component -arrows-.

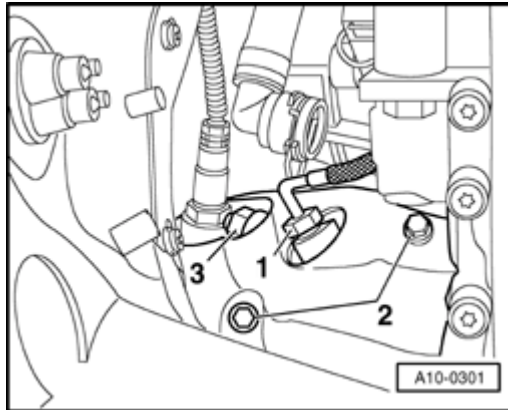
**Right-hand catalytic converter:**

- Disconnect connector -1- for oxygen sensor at bulkhead.

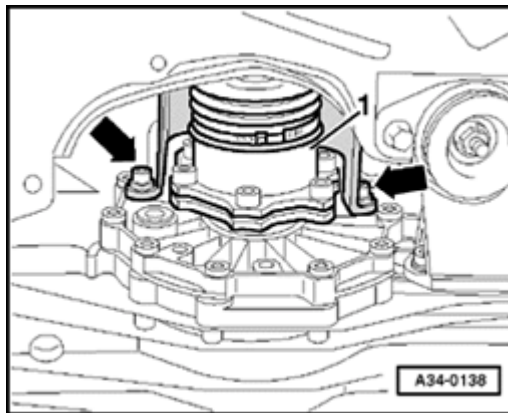
**Left-hand catalytic converter:**

- Disconnect connector -2- for oxygen sensor at bulkhead.

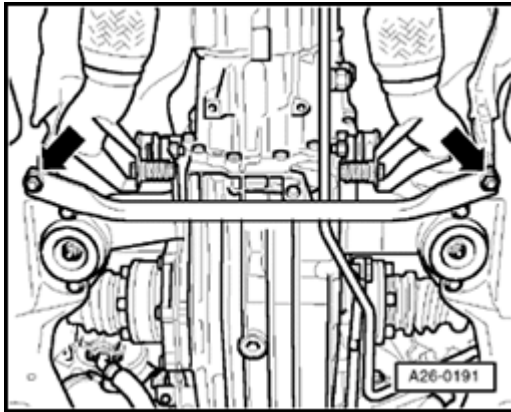


**A**

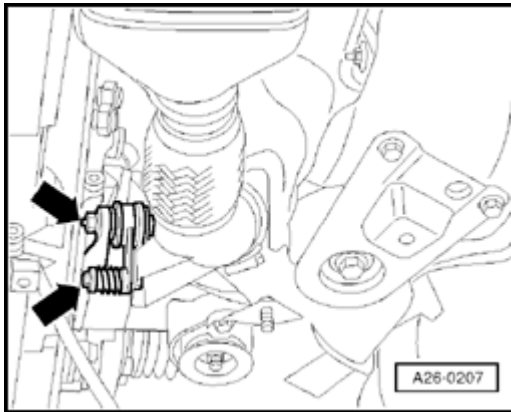
- Unbolt heat shield -2- on turbocharger.
- Remove upper bolt -3- securing front exhaust pipe to turbocharger.

**A**

- Unbolt guard plate -arrows- above drive shaft from transmission.
- Unbolt drive shaft -1- at transmission and tie up.

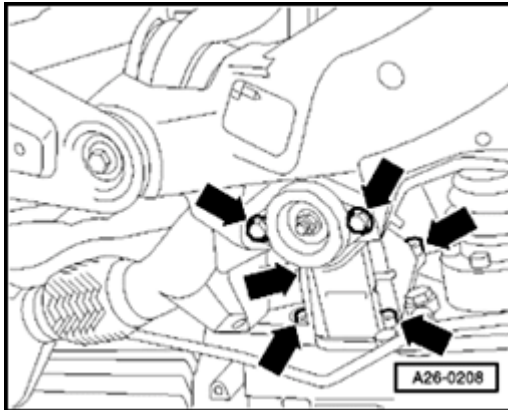


**A** - Remove cross strut -arrows-.



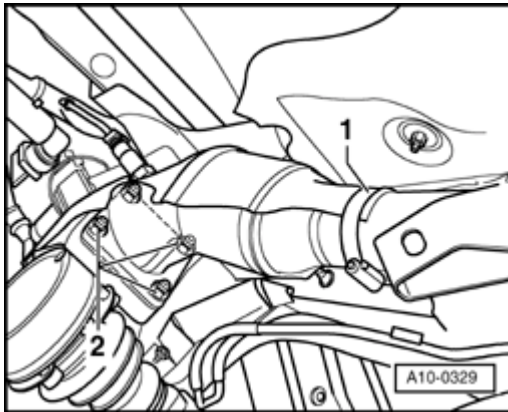
**A** - Remove retainers -arrows-.





A

- Remove transmission support -arrows-.
- Loosen exhaust system clamp and push clamp towards muffler.



A

- Loosen hose clamp -1- on turbocharger heat shield.
- Unbolt exhaust pipe -2- from turbocharger.

**Note:**

*Avoid excessive bending of the flexible pipe connection (de-coupling element) on the front exhaust pipe. The angle between the catalytic converter and the front exhaust pipe must not exceed 10°, otherwise the flexible connection will be damaged.*

### Installing

- Install in reverse order.

#### **Note:**

*The double clamp must be replaced after removeing the bolted connection.*

- Adjust exhaust system ⇒ [Page 26-11](#) .

## Exhaust system, aligning free of stress

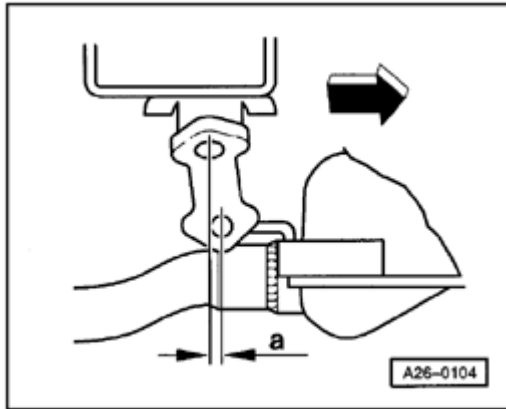
Align the exhaust system as follows to avoid stresses in the system and prevent the transmission of noise into the body:

### **Notes:**

- ◆ *Before assembling the exhaust system, the front exhaust pipes and the catalytic converters must be aligned accurately and secured.*
- ◆ *Loosen all bolted connections on the exhaust system (except exhaust manifold and flange mountings, catalytic converter/intermediate pipe).*
- ◆ *The exhaust system must be aligned when it is cold.*
- ◆ *Keep to the sequence described below.*
- ◆ *The dimensions in the illustrations are approximate.*

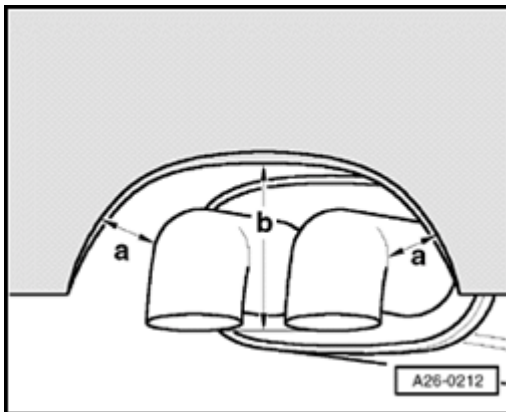
### Vehicles without clamp between center and rear muffler

- Loosen screws of front clamp between catalytic converter and center muffler.



A

- Push exhaust system far enough forward (arrow) so that pre-tension at retaining loop at rear right of rear muffler is -a- = 9 ... 11 mm.
- Tighten screws of front clamp between catalytic converter and main muffler evenly to 40 Nm, installation position ⇒ [Page 26-15](#) .
- Tailpipes, aligning



A

- Align tailpipes so that distance -a- (left side) is equal to distance -a- (right side).

Dimension -b- between bumper cutout and lower edge of tailpipes must also equal specification.

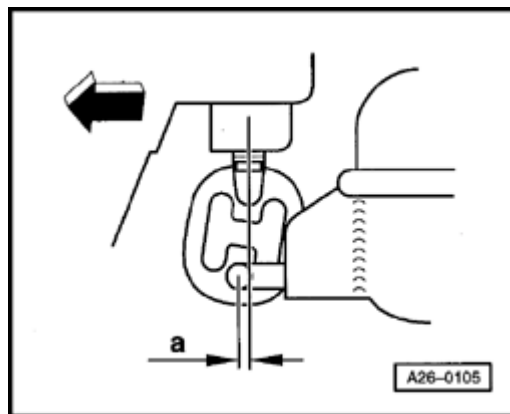
- ◆ Dimension b = 97 ... 103 mm

### Vehicles with clamp between front muffler and rear muffler

**Note:**

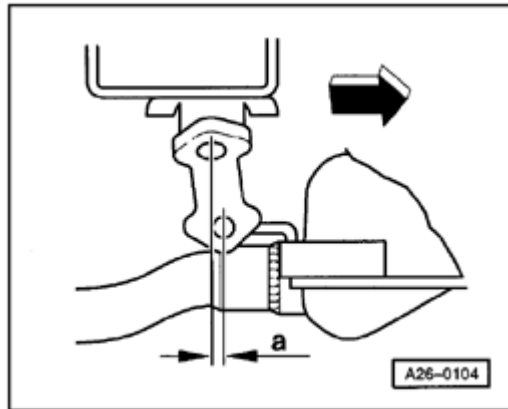
*It is only necessary to additionally align the front muffler on vehicles with clamp fitted between front muffler and rear muffler.*

- Loosen bolted connections on front clamps between catalytic converters and front muffler.



A

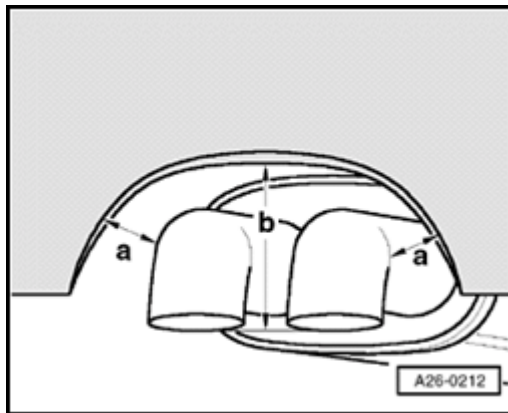
- Push exhaust system towards front of vehicle -arrow- so that rear left mounting on front muffler is pre-loaded by  $a = 7 - 9$  mm.
- Tighten bolts on front clamps between catalytic converters and front muffler evenly to 40 Nm; installation position  $\Rightarrow$  [Page 26-15](#) .



A

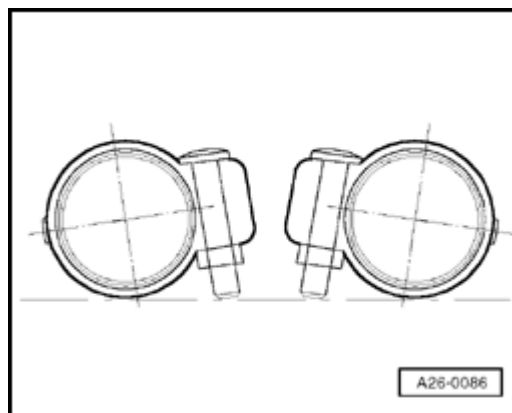
- Push rear muffler toward front of vehicle -arrow- so that rear right mounting on rear muffler is pre-loaded by  $a = 9 \dots 11 \text{ mm}$ .
- Tighten bolted connections on rear clamp between front muffler and rear muffler evenly to 40 Nm; installation position  $\Rightarrow$  [Page 26-15](#) .

Aligning tailpipes



A

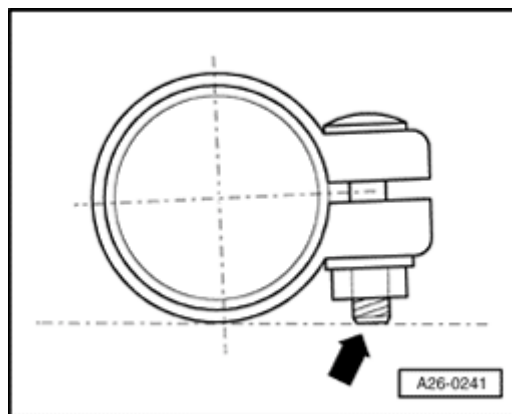
- Align tailpipes so that distance -a- is same on both sides.
- At same time, set distance -b- between bumper cut-out and bottom of tailpipes:
  - ◆ Distance  $b = 97 \dots 103 \text{ mm}$



### Installation position of double clamp at front

- ⚠ The ends of the bolts must not project below the bottom of the clamp.

### Installation position of double clamp at rear



- ⚠ The ends of the bolts must not project below the bottom of the clamp.

### **Exhaust system, checking for leaks**

- Start engine and run at idling speed.
  
- Plug tailpipe (e. g. with rag or stopper) and leave plugged until check is complete.
  
- Listen for noise at connection points (cylinder head/manifold, manifold/turbocharger, turbocharger/catalytic converter, etc.) to locate leaks.
  
- Correct any leaks that are found.



## Exhaust manifold, removing and installing

### Removing

- Remove engine ⇒ [Page 10-1](#) .
- Remove turbocharger ⇒ [Page 21-1](#)
- Unbolt exhaust manifold.

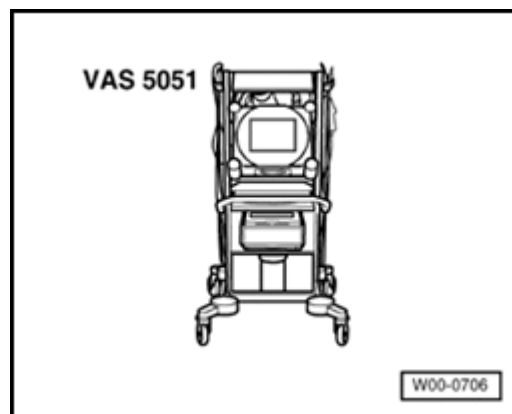
### Installing

#### **Notes:**

- ◆ *Replace self-locking nuts.*
- ◆ *Replace gaskets.*
- Install in reverse sequence.

**Tightening torques**

Bolted mountings	Tightening torques
Exhaust pipe between exhaust manifold and turbocharger	25 Nm
Exhaust pipe with catalytic converter to turbocharger	25 Nm
Exhaust manifold to cylinder head	25 Nm
Exhaust pipe to transmission	25 Nm
Catalytic converter to front muffler	25 Nm
Heat shield to turbocharger	10 Nm



## Exhaust gas temperature sensor, checking for function

### Special tools and equipment

- ◆ VAS 5051 with VAG 5051/1  
or
- ◆ VAG 1551 with VAG 1551/3A

### Test requirement:

- Coolant Temperature at least 80 ° C.

### **WARNING!**

- ◆ **During a road test in an airbag-equipped vehicle, test equipment must always be fastened to and operated from the rear seat by a second technician.**
- ◆ **When driving or riding in an airbag-equipped vehicle, NEVER hold the scan tool or other test equipment in your hands or lap while in motion. Objects between you and the airbag increase the risk of injury in an accident.**

### Test sequence

- Connect VAS 5051 tester or VAG 1551 scan tool and select control module for engine electronics using "address word" 01. Engine must run at idle for this.

⇒ [Repair Manual, 2.7 Liter V6 5V BiTurbo Fuel Injection & Ignition, Engine Code\(s\): APB, Repair Group 01](#)

Rapid data transfer      HELP  
Select Function XX



When indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" and press -Q- button to confirm input.

Read measuring value block      Q  
Input display group number XXX



When indicated on display

- Press buttons -1-, -1- and -2- to select "display group number 112" and press -Q- button to confirm input.

Read measuring value block 112      →  
1      2      3      4



Indicated on display (1...4 = display fields)

- Check exhaust gas temperature.

- Road test vehicle.

- ◆ Wide Open Throttle (WOT) at engine speeds between 5000...6500 RPM must be reached.

**Note:**

*Exhaust gas temperature must rise to above 980 °C so that regulation sets in. Values below 945 °C are displayed as 945 °C.*

	Display fields			
	1	2	3	4
<b>Display group 112: Exhaust temperature</b>				
<b>Display</b>	°C	%	°C	%
<b>Indicated</b>	Exhaust temperature, Bank 1	Enrichment factor, Sensor, Bank 1	Exhaust temperature, Bank 2	Enrichment factor, Sensor, Bank 2
<b>Specified value</b>	980 <sup>1)</sup>	90 ± 5 <sup>2)</sup>	980	90 ± 5
<b>Note:</b>	Regulation does not begin until temperatures above 980 °C	If the enrichment factor is above 30%, there is a malfunction	Regulation does not begin until temperatures above 945 °C	If the enrichment factor is above 30%, there is a malfunction

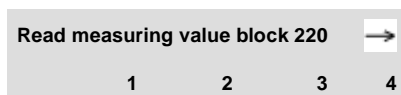
1) During oscillation stage, values around 1025 °C may be displayed briefly.

2) During oscillation stage, values of 25 % may be displayed briefly.

If values above 20 % are displayed constantly,  
then

- ◆ fuel pressure may be too low,
- ◆ mass air flow sensor signal may be too small.

- Select measuring value block 220.



Indicated on display (1...4 = display fields)

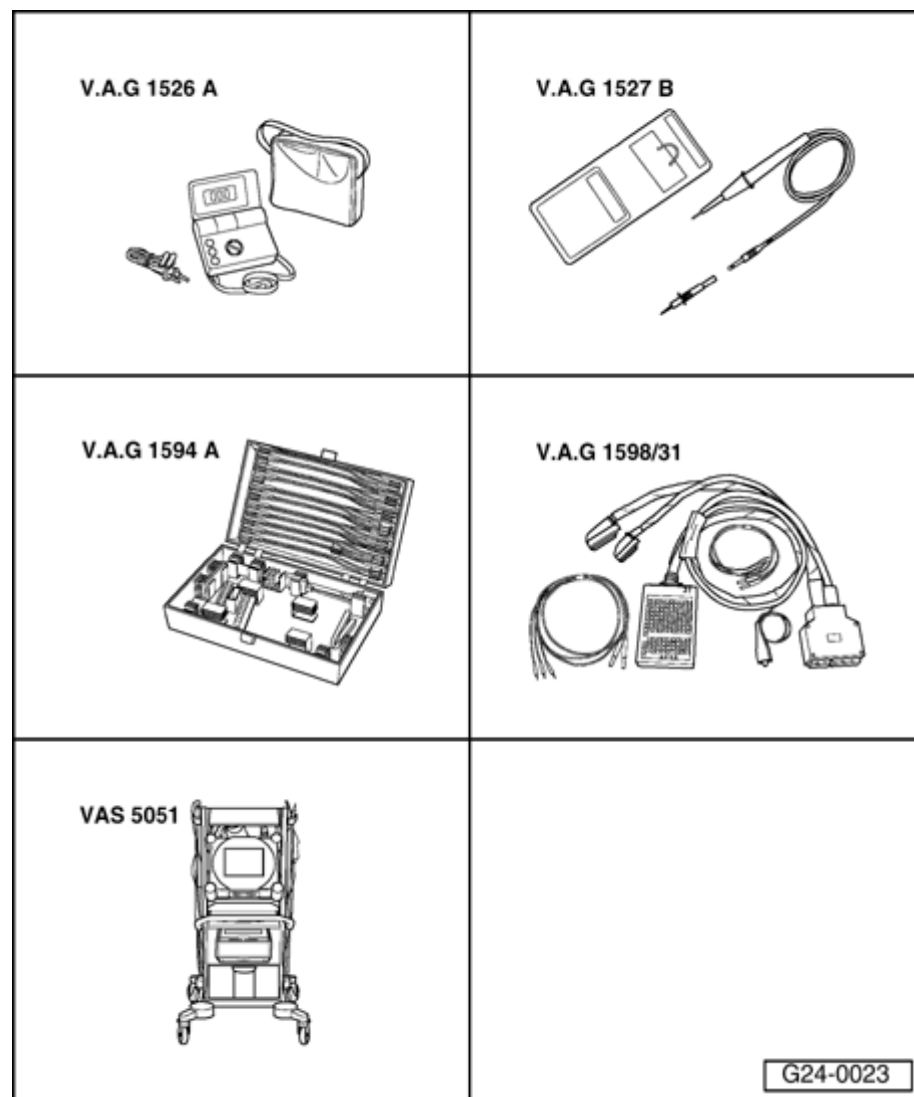
- Check exhaust temperature regulation.

	Display fields			
	1	2	3	4
<b>Display group 220: Exhaust gas temperature regulation</b>				
<b>Display</b>	1 RPM	%	%	Text
<b>Indicated</b>	Engine speed (RPM)	Load	Duty cycle, Sensor, Bank 1	Operating condition, Bank 1
<b>Specified value</b>	> 5000	> 100	42 ± 10	Regulation on
<b>Note:</b>	Increase engine speed and load enough that regulation jumps to "on"			

- Repeat test for bank 2 ⇒ measuring value block 221

If specified values are not obtained and there is a malfunction stored in the Diagnostic Trouble Code (DTC) memory:

- Check exhaust gas temperature sensor, ⇒ [Page 26-24](#) .



## Exhaust gas temperature sensor, checking

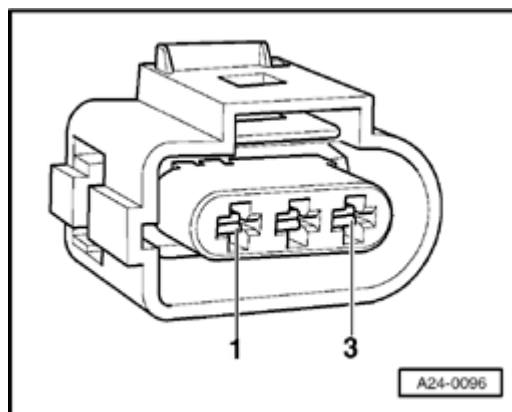
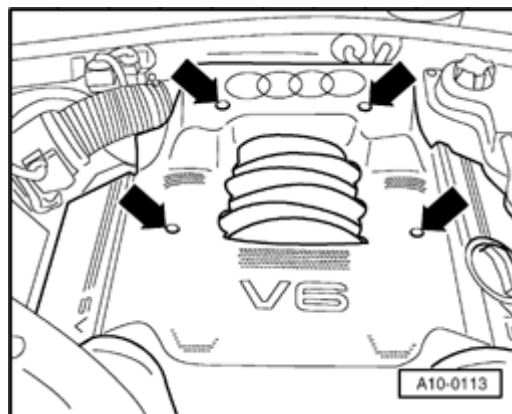
### Special tools and equipment

- ◆ VAG 1526A
- ◆ VAG 1527B
- ◆ VAG 1594A
- ◆ VAG 1598/31



### Checking voltage supply

- Switch ignition off.
- Remove engine cover (arrows).
- Disconnect connector at exhaust gas temperature sensor.



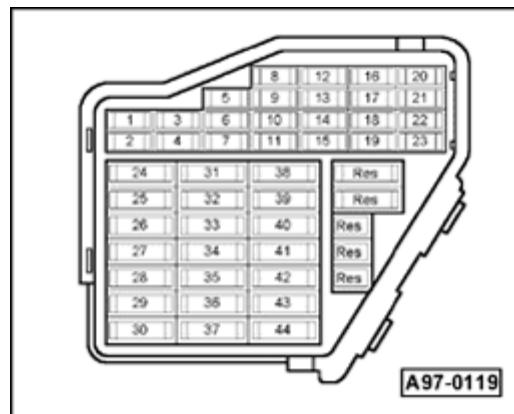
- Connect VAG 1527B voltage tester as follows:

Harness connector terminal	Measure to
3	Engine Ground (GND)

- Operate starter briefly.
  - ◆ LED must light.

If LED does not light:

- Perform following tests marked with dots:



A

- Check fuse -S234- (in fuse holder, position 34).
- Check wire connection from exhaust gas temperature sensor via fuse -S234- (in fuse holder, socket 34) to Fuel Pump (FP) relay for open circuit:

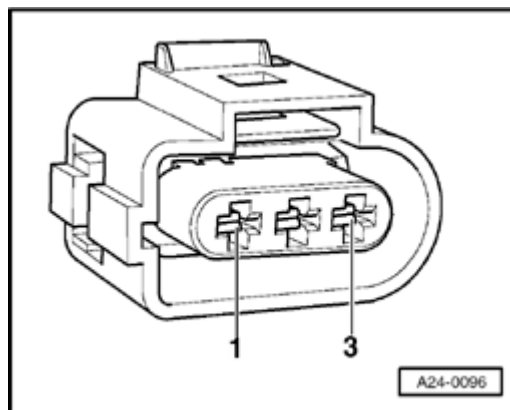
⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- Check Fuel Pump (FP) relay.

⇒ [Repair Manual, 2.7 Liter V6 5V BiTurbo Fuel Injection & Ignition, Engine Code\(s\): APB, Repair Group 24](#)

- Connect VAG 1598/31 test box at wiring harness to ECM. Do not connect ECM.

⇒ [Repair Manual, 2.7 Liter V6 5V BiTurbo Fuel Injection & Ignition, Engine Code\(s\): APB, Repair Group 24](#)



A

- Check following wire connections for open circuit and short circuit to Ground (GND) and B+:

Harness connector terminal	VAG 1598/31 test box Bushing
1 (Bank 1)	61
1 (Bank 2)	20
2	50

If wire connection is OK:

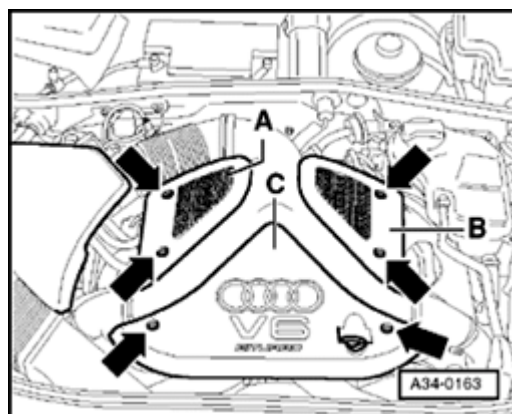
- Replace exhaust gas temperature sensor.

If the same malfunction occurs again after replacing the exhaust gas temperature sensor:

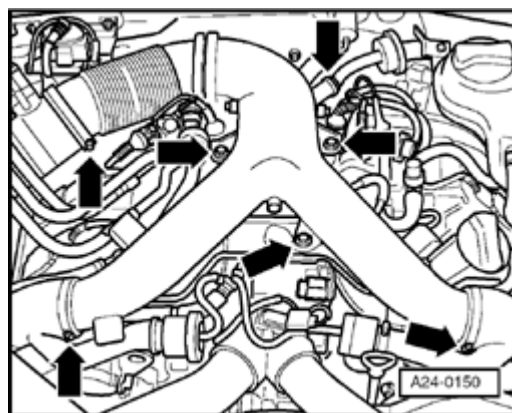
- Replace Engine Control Module (ECM).

⇒ [Repair Manual, 2.7 Liter V6 5V BiTurbo Fuel Injection & Ignition, Engine Code\(s\): APB, Repair Group 24](#)

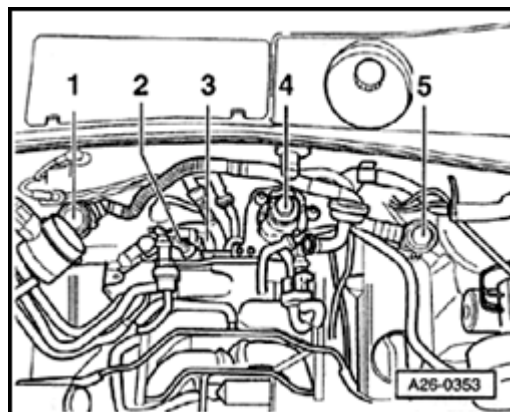
## Exhaust gas temperature sensor, removing and installing



- A**
- Remove bolts (arrows) and remove engine covers -A- and -B-.

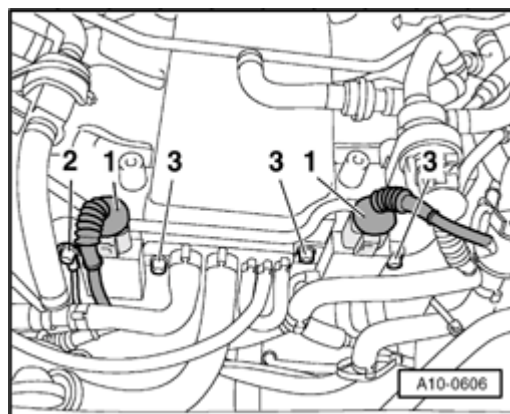


- A**
- Remove air distributor (arrows).



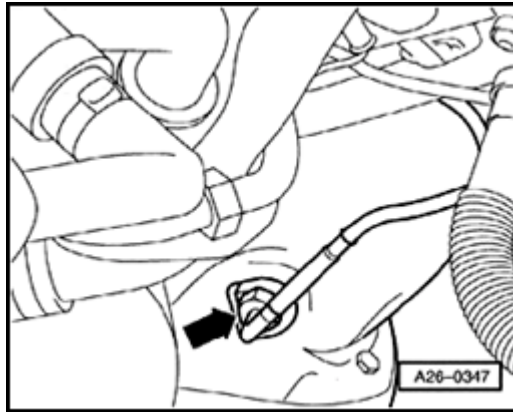
A

- Disconnect both connectors -2- from control modules for exhaust gas temperature.
- Remove control module from intake manifold and set wires aside.



A

- For vehicles with manual transmission, the control modules for exhaust gas temperature are at rear of intake manifold, on left and right.



A

- Remove exhaust gas temperature sensor from exhaust manifold.