



# Service

## Workshop Manual

Jetta 2005 ➤

Bora 2006 ➤

4-cylinder Injection engine (1.6 l engine, direct injection)

Engine ID

BLF

Edition 08.2005





## List of Workshop Manual Repair Groups

### Repair Group

- 00 - Technical data
- 10 - Removing and installing engine
- 13 - Crankshaft group
- 15 - Cylinder head, valve gear
- 17 - Lubrication
- 19 - Cooling system
- 20 - Fuel supply system
- 24 - Mixture preparation, Injection
- 26 - Exhaust system
- 28 - Ignition system



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

**All rights reserved.**  
No reproduction without prior agreement from publisher.



## Contents

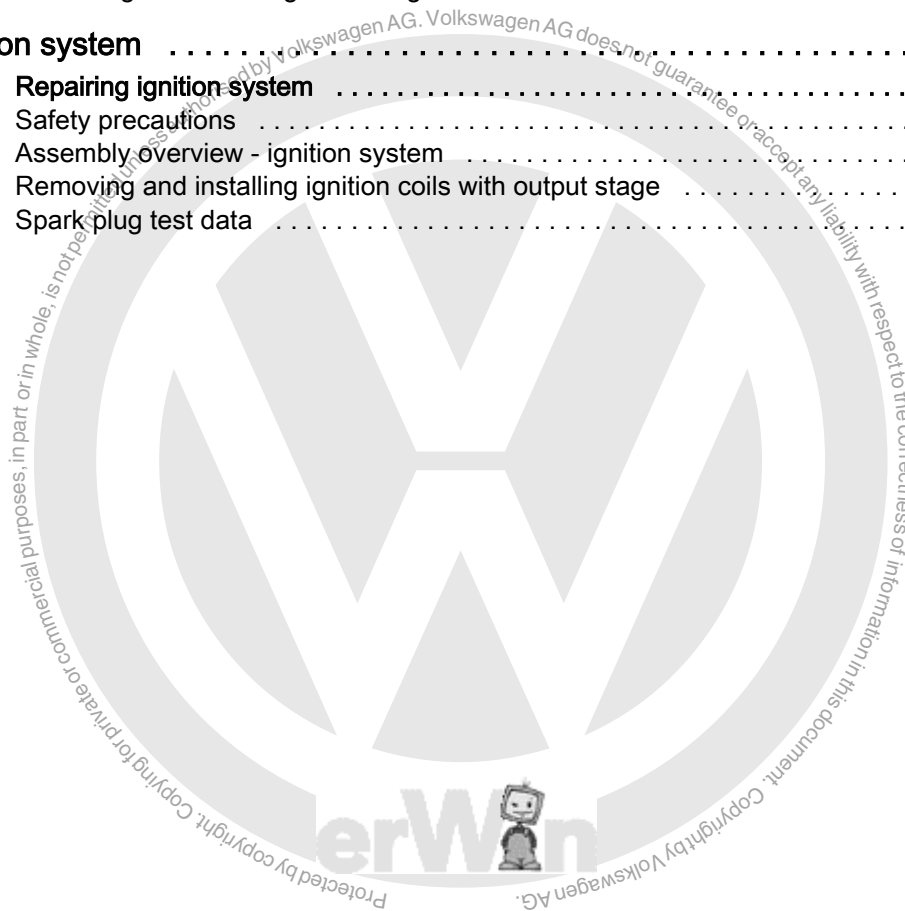
<b>00 - Technical data</b>	<b>1</b>
<b>1 Technical data</b>	<b>1</b>
1.1 Engine number	1
1.2 Engine data	2
<b>10 - Removing and installing engine</b>	<b>3</b>
<b>1 Removing and installing engine</b>	<b>3</b>
1.1 Removing engine	4
1.2 Securing engine to engine and gearbox support VAS 6095	14
1.3 Installing engine	16
1.4 Checking and adjusting assembly mounting	20
1.5 Assembly mountings	22
<b>13 - Crankshaft group</b>	<b>24</b>
<b>1 Dismantling and assembling engine</b>	<b>24</b>
1.1 Overview	25
1.2 Belt drive - Assembly overview	26
1.3 Chain drive - Assembly overview	27
1.4 Removing and installing poly V-belt	29
1.5 Removing and installing control housing	31
<b>2 Removing and installing sealing flange and flywheel</b>	<b>36</b>
2.1 Flywheel end - Assembly overview	36
2.2 Renewing crankshaft oil seal - belt pulley end	38
2.3 Tighten bolt for poly V-belt sprocket - crankshaft	40
2.4 Renewing crankshaft sealing flange -flywheel end-	43
2.5 Removing and installing flywheel	50
<b>3 Removing and installing crankshaft</b>	<b>52</b>
3.1 Crankshaft dimensions	52
<b>4 Dismantling and assembling pistons and conrods</b>	<b>53</b>
4.1 Pistons and conrods - Assembly overview	53
4.2 Check piston	54
4.3 Piston and cylinder dimensions	55
<b>15 - Cylinder head, valve gear</b>	<b>56</b>
<b>1 Cylinder head</b>	<b>56</b>
1.1 Cylinder head - Assembly overview	57
1.2 Removing and installing camshaft housing	59
1.3 Removing and installing cylinder head	63
1.4 Checking valve timing	67
1.5 Adjusting valve timing	69
1.6 Check compression pressures	74
<b>2 Repairing valve gear</b>	<b>76</b>
2.1 Valve gear - Assembly overview	76
2.2 Checking camshaft axial clearance	78
2.3 Reworking valve seats	79
2.4 Checking valve guides	80
2.5 Renewing valve stem seals	81
<b>17 - Lubrication</b>	<b>83</b>
<b>1 Removing and installing parts of lubrication system</b>	<b>83</b>
1.1 Engine oil	83
1.2 Parts of the lubrication system - Assembly overview	84



1.3	Oil cooler - Assembly overview	86
1.4	Removing and installing oil sump	87
1.5	Removing and installing oil pump	89
1.6	Removing and installing oil cooler	92
1.7	Checking oil pressure and oil pressure switch	94
<b>19</b>	<b>- Cooling system</b>	<b>96</b>
<b>1</b>	<b>Removing and installing parts of cooling system</b>	<b>96</b>
1.1	Parts of cooling system - body side - Assembly overview	97
1.2	Parts of cooling system engine side (thermostat side) - Assembly overview	98
1.3	Parts of cooling system engine side (coolant pump side) - Assembly overview	99
1.4	Coolant hose schematic diagram	99
1.5	Draining and filling coolant	102
1.6	Removing and installing radiator fan V7 and radiator fan 2 V177	105
1.7	Removing and installing radiator	106
1.8	Removing and installing coolant pump	108
1.9	Removing and installing thermostat	110
1.10	Check cooling system for leaks:	113
<b>20</b>	<b>- Fuel supply system</b>	<b>115</b>
<b>1</b>	<b>Removing and installing parts of fuel supply system</b>	<b>115</b>
1.1	Safety precautions when working on fuel supply system	115
1.2	Rules for cleanliness	115
1.3	Fuel tank - Assembly overview	116
1.4	Emptying fuel tank	118
1.5	Removing and installing fuel tank	120
1.6	Fuel filter - Assembly overview	123
1.7	Removing and installing fuel filter	123
<b>2</b>	<b>Repairing fuel supply</b>	<b>126</b>
2.1	Safety precautions when working on fuel supply system	126
2.2	Rules for cleanliness	127
2.3	Crash fuel shut-off	127
2.4	Removing and installing fuel delivery unit	127
2.5	Removing and installing fuel gauge sender G	129
2.6	Checking fuel pump	130
2.7	Removing and installing high-pressure pump	139
<b>3</b>	<b>Servicing electronic power control (EPC)</b>	<b>144</b>
3.1	Function of EPC system	144
3.2	Accelerator pedal module - Assembly overview	145
3.3	Removing and installing accelerator pedal module	145
<b>4</b>	<b>Activated charcoal filter system</b>	<b>147</b>
4.1	Functional check	147
4.2	Activated charcoal filter system - Assembly overview	148
4.3	Checking fuel tank breather	148
<b>24</b>	<b>- Mixture preparation, Injection</b>	<b>150</b>
<b>1</b>	<b>Repairing injection system</b>	<b>150</b>
1.1	General notes on injection	150
1.2	Safety precautions	151
1.3	Rules for cleanliness	152
1.4	Fitting locations overview	153
1.5	Technical data	160
1.6	Air cleaner/engine cover - Assembly overview	160
1.7	Removing and installing engine cover with air cleaner	161
1.8	Intake manifold - Assembly overview	162



1.9	Removing and installing intake manifold	164
1.10	Fuel rail with injectors - Assembly overview	167
1.11	Removing and installing fuel rail	168
1.12	Removing and installing injectors	170
1.13	Cleaning throttle valve module J338	173
<b>2</b>	<b>Checking components</b>	<b>175</b>
2.1	Check vacuum reservoir in intake manifold for leaks	175
2.2	Check function of intake manifold flap	176
2.3	Checking intake air preheating	176
<b>3</b>	<b>Engine control unit</b>	<b>178</b>
3.1	Reading and erasing engine control unit fault memory	178
3.2	Removing and installing engine control unit	179
<b>26</b>	<b>Exhaust system</b>	<b>183</b>
<b>1</b>	<b>Removing and installing parts of exhaust system</b>	<b>183</b>
1.1	Catalytic converters and attachments - Assembly overview	184
1.2	Silencer with mountings - Assembly overview	186
1.3	Removing and installing exhaust manifold	186
1.4	Removing and installing pre-catalytic converter with exhaust manifold	188
1.5	Connecting and disconnecting front and rear silencers	190
1.6	Aligning exhaust system free of stress	192
<b>2</b>	<b>Exhaust gas recirculation system</b>	<b>194</b>
2.1	Assembly overview - Exhaust gas recirculation system	194
2.2	Removing and installing exhaust gas recirculation valve N18	195
<b>28</b>	<b>Ignition system</b>	<b>197</b>
<b>1</b>	<b>Repairing ignition system</b>	<b>197</b>
1.1	Safety precautions	197
1.2	Assembly overview - ignition system	198
1.3	Removing and installing ignition coils with output stage	198
1.4	Spark plug test data	199





Jetta 2005 ➤ , Bora 2006 ➤

4-cylinder Injection engine (1.6 l engine, direct injection) - Edition 08.2005

---





## 00 – Technical data

### 1 Technical data

Engine number ⇒ [page 1](#)

Engine data ⇒ [page 2](#)

#### 1.1 Engine number

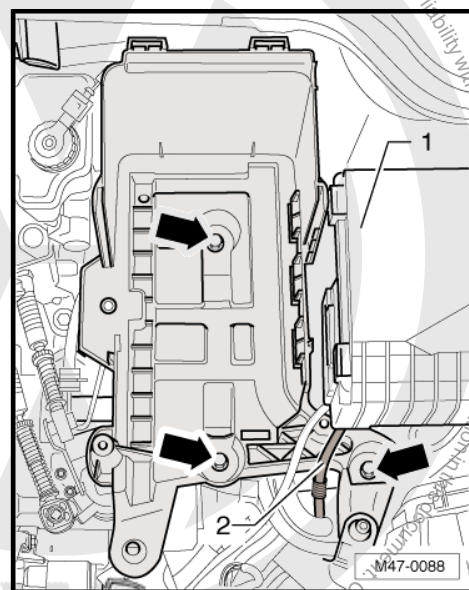
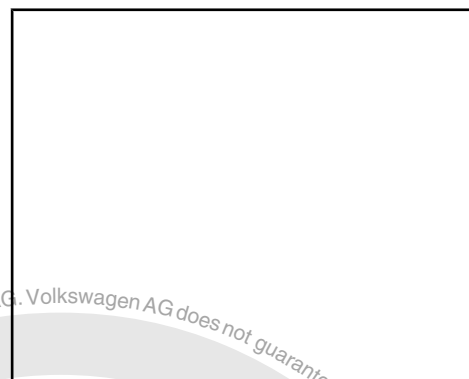
Engine code and engine number can be found on the sticker -arrow- on the control housing.

The engine code is also on the vehicle data plate and on the crankcase above the gearbox.

The engine number consists of up to nine characters (alphanumeric). The first part (maximum 3 characters) makes up the "engine code", and the second part (6 characters), the "serial number". If more than 999,999 engines with the same engine code are produced, the first of the six characters is replaced with a letter.

If there is no sticker and you need the "engine codes" and the "serial number", proceed as follows:

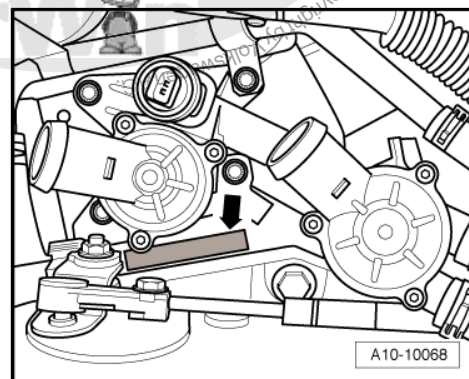
- Removing battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery; Vehicles with petrol engine .
- Open the cover -1- of the electronics box and remove the cable -2-.
- Remove bolts -arrows- and battery carrier.



- Read the engine code and the serial number on the left of the cylinder block -arrow-.

Install in reverse order of removal. During this step, observe the following:

- Install the battery and observe the respective measures after connecting the battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery; Models with petrol engine .





## 1.2 Engine data

Engine code	BLF		
Manufactured	08.05 ▶		
Emissions fulfil	EU 4 Standard		
Displacement	cm <sup>3</sup>	1598	
Output	kW at rpm	85/6000	
Torque	Nm at rpm	155/4000	
Bore	∅ mm	76,5	
Stroke	mm	86,9	
Compression ratio		12,0	
Valves per cylinder		4	
RON	min.	95 Unleaded	
Injection, ignition		Motronic MED 9.5.10	
Mixture formation		homogeneous	
Variable valve timing		yes	
Knock control		1 sensor	
Lambda regulation		2 probes	
Three-way catalytic converter		yes	
Exhaust gas recirculation		yes	
Secondary air system		no	
Electronic power control		yes	





## 10 – Removing and installing engine

### 1 Removing and installing engine

Removing engine ⇒ [page 4](#)

Fastening the engine to the assembly stand ⇒ [page 14](#)

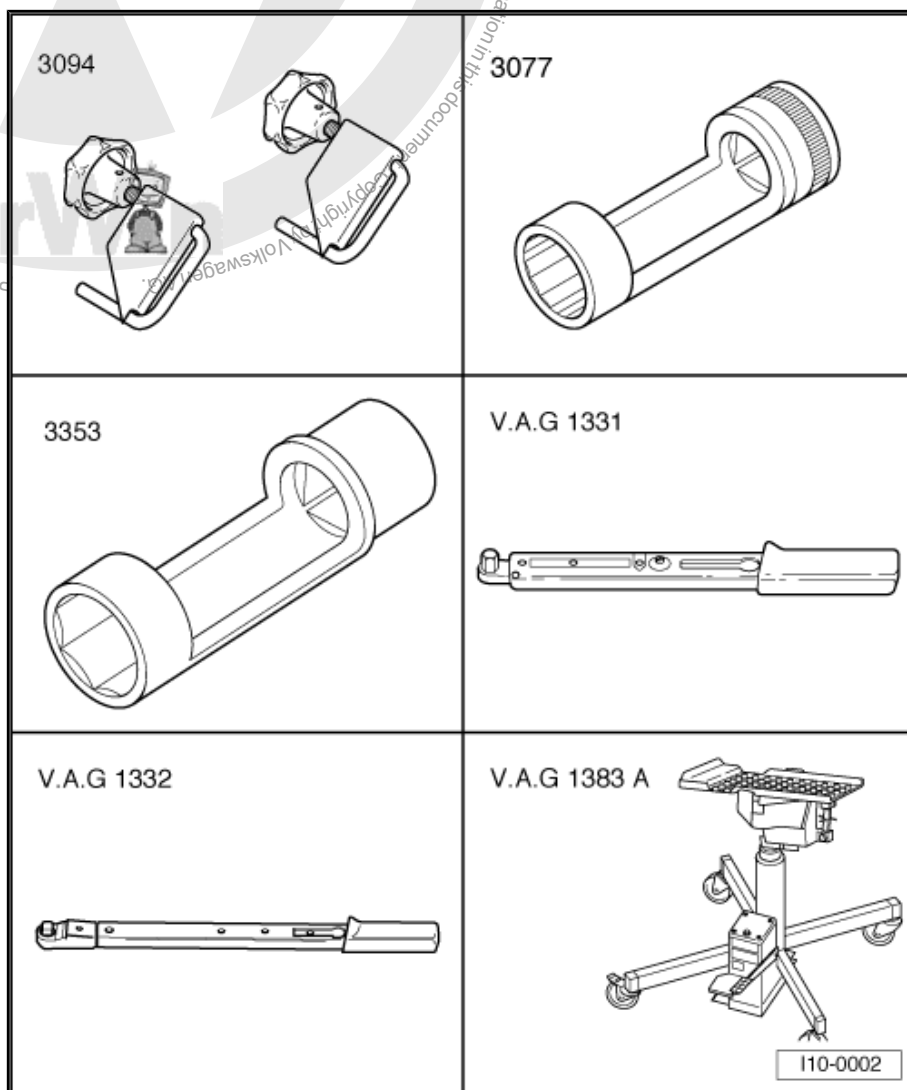
Installing engine ⇒ [page 16](#)

Checking and adjusting assembly mounting ⇒ [page 20](#)

Assembly mounting ⇒ [page 22](#)

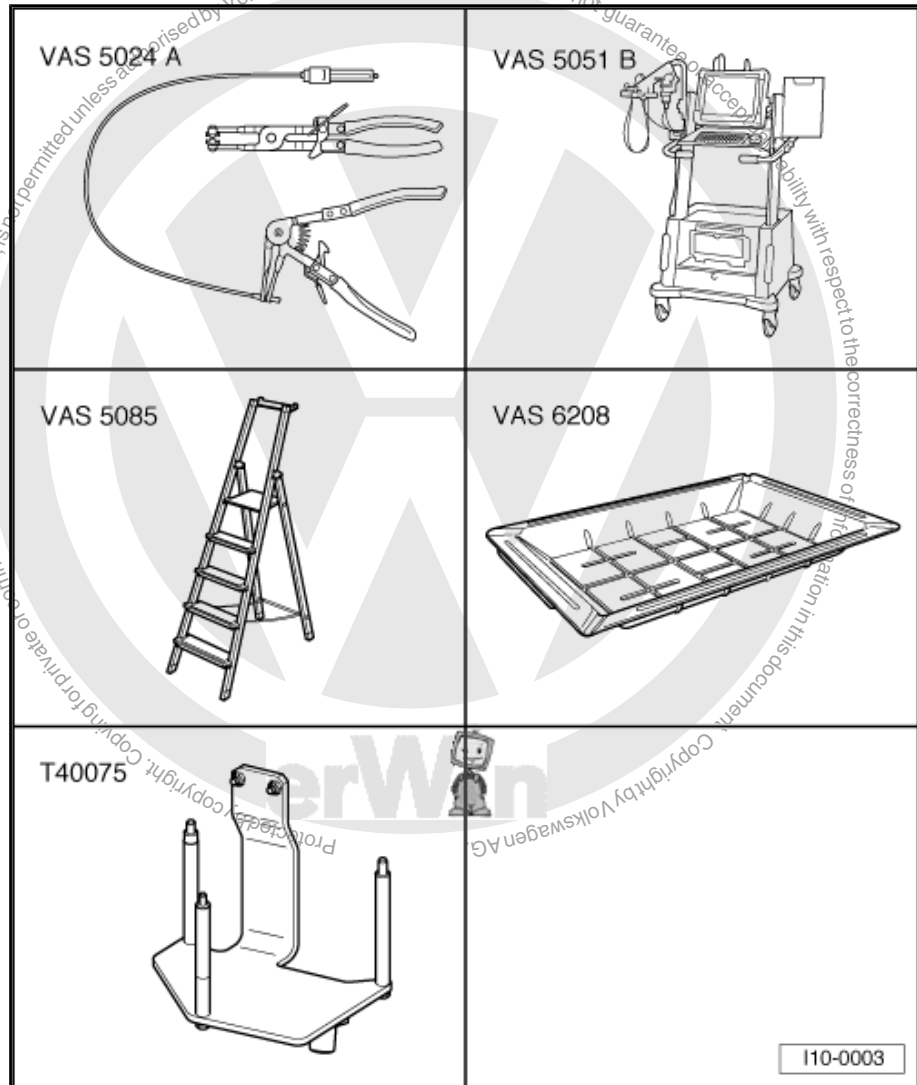
#### Special tools and workshop equipment required

- ◆ Hose clamp to Ø 25 mm -3094-
- ◆ Multi-point bit 19 mm -3077-
- ◆ Multi-point bit 18 mm -3353-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-





- ◆ Spring-type clip pliers -VAS 5024 A-
- ◆ Vehicle diagnosis, testing and information system - VAS 5051-
- ◆ or vehicle diagnosis and service information system -VAS 5052-
- ◆ Double ladder -VAS 5085-
- ◆ Drip tray -VAS 6208-
- ◆ Engine bracket -T40075-
- ◆ Engine bung set -VAS 6122-
- ◆ Grease -G 000 100-



## 1.1 Removing engine



### Note

- ◆ *In subsequent work sequences the battery earth strap must be disconnected. Therefore first check whether a coded radio is fitted. Obtain radio code first if necessary.*
- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *Observe rules for cleanliness ⇒ [page 115](#) .*
- ◆ *All cable ties which are opened or cut through when engine is removed must be replaced in the same position when engine is installed.*
- ◆ *Pull engine coolant hoses off with spring-type clip pliers -VAS 5024 A- .*

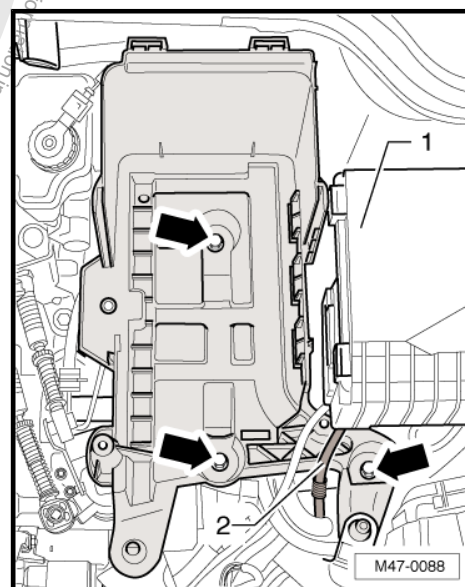


**Caution**

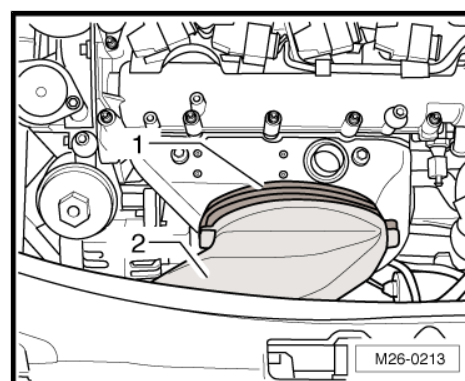
**When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:**

- ◆ **All wirings (e.g. for fuel, hydraulic system, activated charcoal canister system, coolant and refrigerant liquid, brake liquid, vacuum) and electrical wirings are to be installed in the original way.**
- ◆ **Ensure that there is sufficient clearance to all moving or hot components.**

- With ignition switched off disconnect battery earth strap → Electrical system; Rep. Gr. 27 ; Disconnecting and connecting the battery .
- Remove engine cover with air cleaner ⇒ [page 161](#) .
- Removing battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery; Vehicles with petrol engine .
- Open the cover -1- of the electronics box and remove the cable -2-.
- Remove bolts -arrows- and battery carrier.

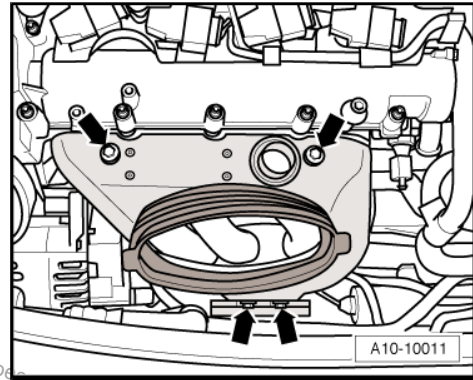


- Disconnect rubber bellows -1- from air duct -2-.
- Release both locking devices and take air duct -2- off.

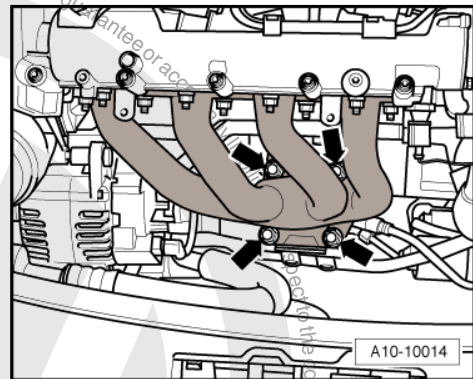




- Remove warm air collector plate -arrows-.

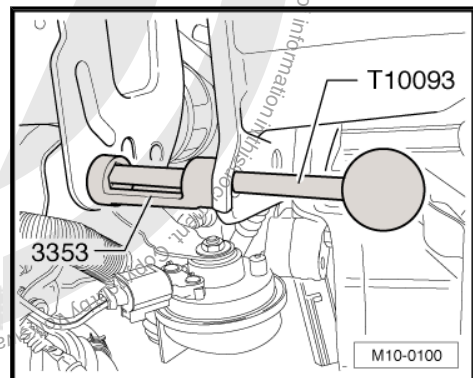


- Remove pre-catalytic converter with exhaust pipe from exhaust manifold -arrows-.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .
- Remove right and left front part of wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .
- Drain coolant ⇒ [page 102](#) .
- Bring lock carrier into service position ⇒ General body repairs, exterior; Rep. Gr. 50 ; Body front; Lock carrier service position .

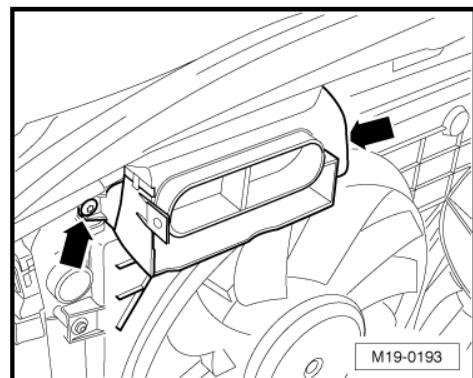


For subsequent work sequences the lock carrier must be supported on the longitudinal member.

- Support the lock carrier on one side using the multi-point bit 18 mm -3353- .
- Support the lock carrier on the other side using the multi-point bit 19 mm -3077- .



- Unscrew intake connecting piece on lock carrier -arrows-.



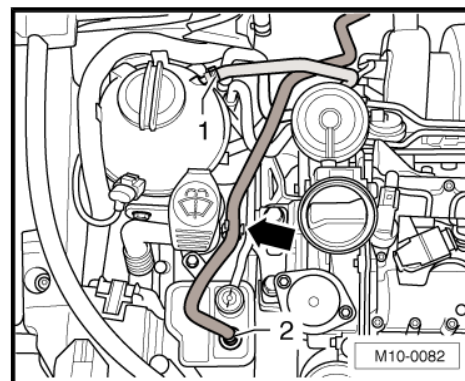


- Pull coolant hose -1- off expansion tank.
- Pull vacuum hose -2- off activated charcoal canister and windscreen washer system reservoir -arrow- and lay free.

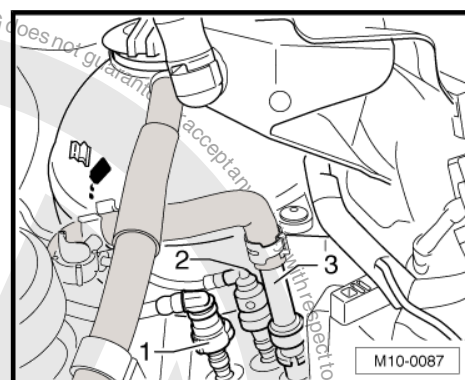


**WARNING**

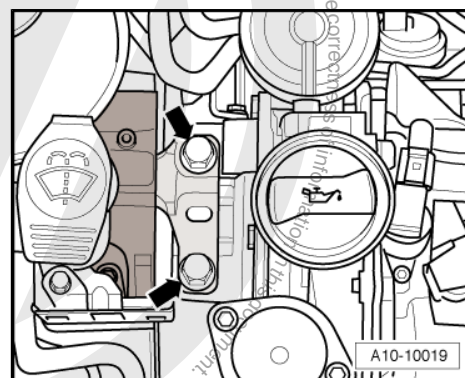
*The fuel line is under pressure! Wear protective glasses and clothing to avoid injuries and skin contact. Before loosening lines, wrap a cloth around the connection. Then release pressure by carefully removing the line.*



- Disconnect fuel supply line -3- (press locking ring inwards) and collect escaping fuel with a cloth.
- Disconnect breather line -1- (press locking ring inwards).
- Seal the lines so that the fuel system is not contaminated by dirt etc.

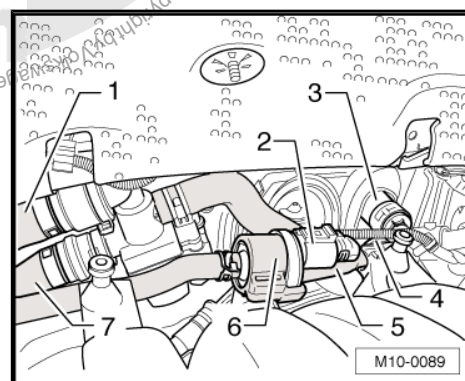


- Loosen bolts -arrows- of assembly mounting on engine just a bit (less than 1 turn).
- Remove upper coolant hose from radiator.



**Models without auxiliary heating**

- Remove coolant hoses -3- and -4- to heat exchanger on bulk head.
- Remove connector -2- and hose -5- from active charcoal filter system solenoid valve 1 -N80- -6-.
- Remove retainer along with active charcoal filter system solenoid valve 1 -N80- -6- from intake manifold.



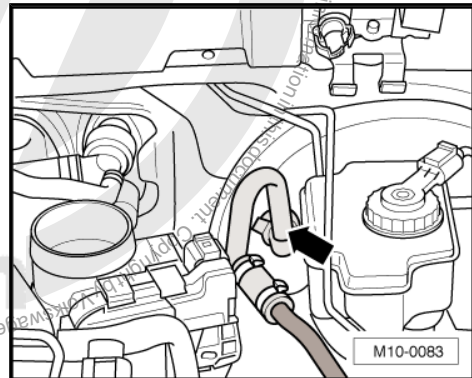
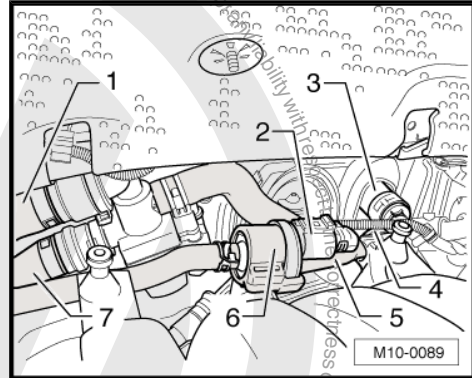
**Models with auxiliary heater**



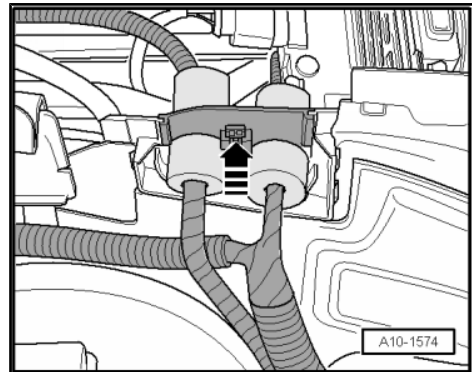
- Remove coolant hose -3- to heat exchanger on bulkhead.
- Remove connector -2- and hose -5- from active charcoal filter system solenoid valve 1 -N80- -6-.
- Remove retainer along with active charcoal filter system solenoid valve 1 -N80- -6- from intake manifold.
- Remove coolant hoses -1- and -7- on heater coolant shut-off valve -N279- .

**Continuation for all vehicles**

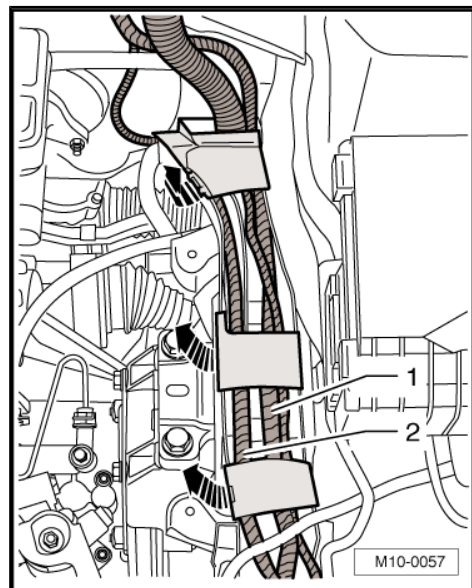
- Pull the vacuum hose -arrow- off brake servo.
- Release the front connector on the engine control unit and pull it off => [page 179](#) .



- Unlock duct for engine wiring harness -arrow- and pull off upwards.



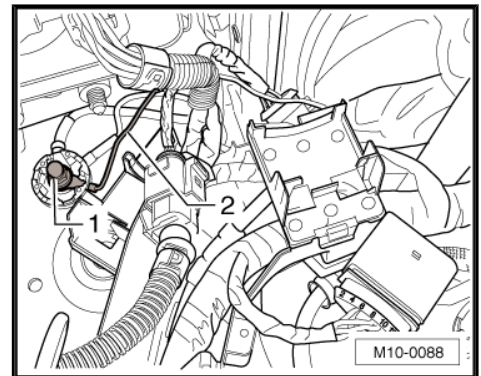
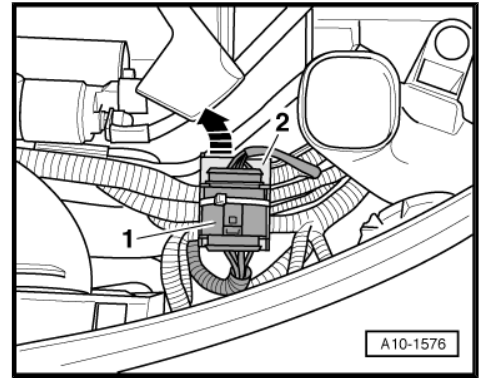
- Open wiring bracket -arrows-.
- Take engine wiring harness -1- to control unit out of the wiring guide.



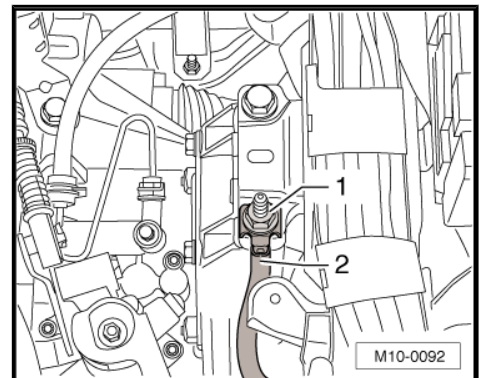


4-cylinder Injection engine (1.6 l engine, direct injection) - Edition 08.2005

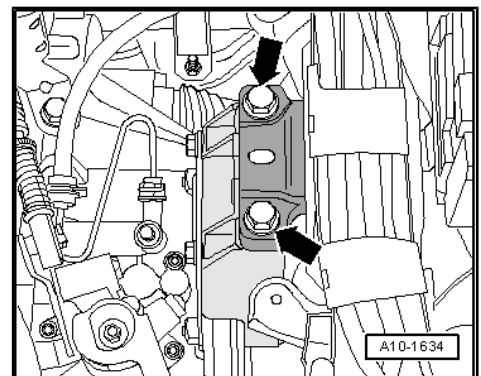
- Move electrical connector -1- free and disconnect.
- Release underneath bracket -2- of the wiring -arrow-
  
- Remove nut -1- and pull earth strap -2- off earth point.
- Take engine wiring harness to control unit off the wiring guide.
- Fit the cable with a cable tie to the engine.



- Remove nut -1- and the earth strap -2- from the assembly mounting.

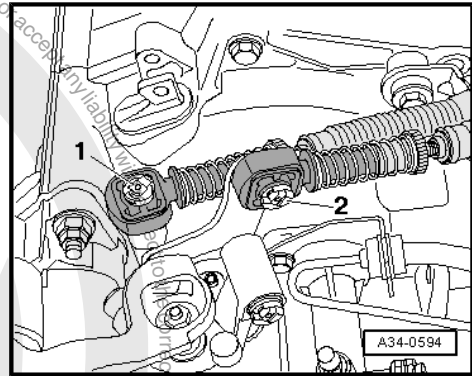


- Loosen bolts -arrows- of assembly mounting on gearbox just a bit (less than 1 turn).

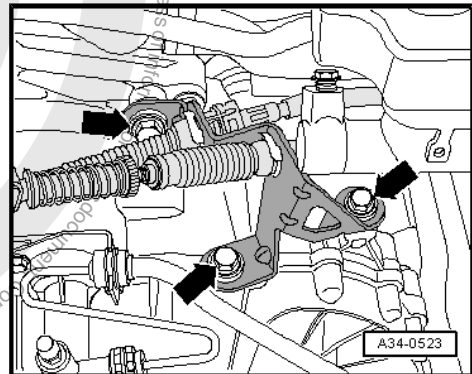




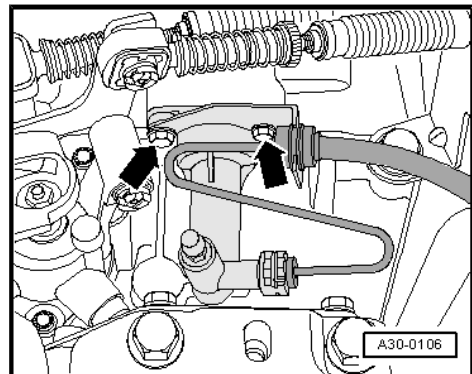
- Unclip securing clips -1- and -2- on both cables.
- Pull cable end-pieces off gearbox selector lever and relay lever.



- Remove cable support bracket from gearbox -arrows- and lay to side.



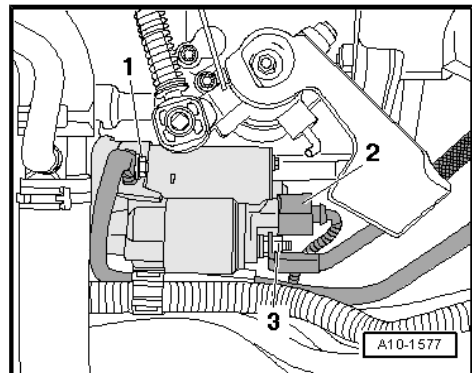
- Remove clutch slave cylinder -arrows- and lay to side, do not open pipes.



**Caution**

*Do not operate the clutch pedal anymore after removing the clutch slave cylinder.*

- Unscrew earth wire -1-.
- Remove electrical wirings -2- and -3- on starter and lay to side.

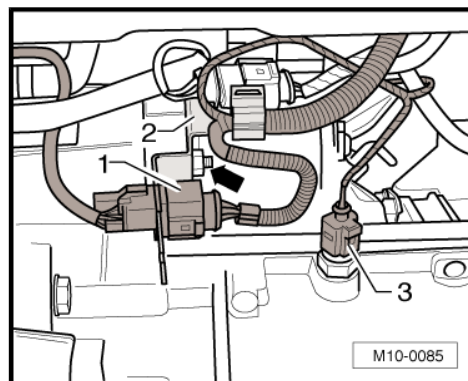






- Separate electrical connector -1- for Lambda probe -G39- .
- Disconnect electrical connector -3- for reversing light switch - F4- .
- Lay engine wiring harness on bracket -2- to side.
- Unscrew nut -arrow- and take retainer for electrical wiring off threaded stud.

**Models with an air conditioning system**

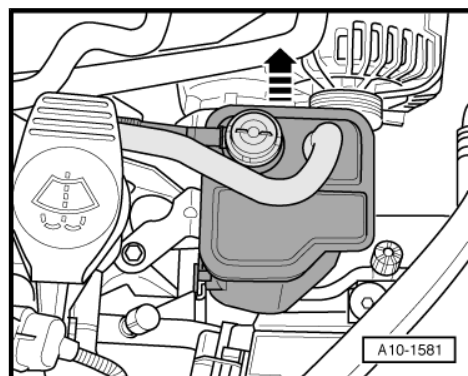


- Pull activated charcoal canister off the bracket upwards -arrow-.

**Note**

*To prevent damage to condenser also to the refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*

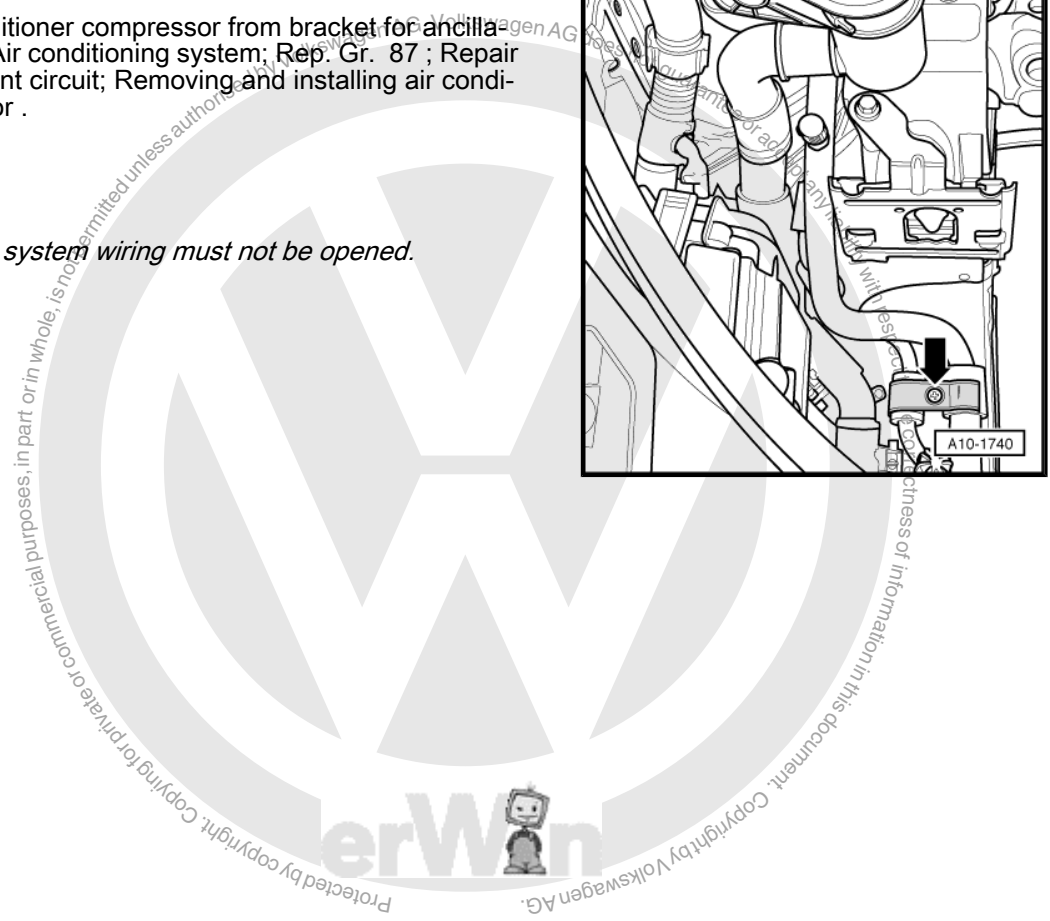
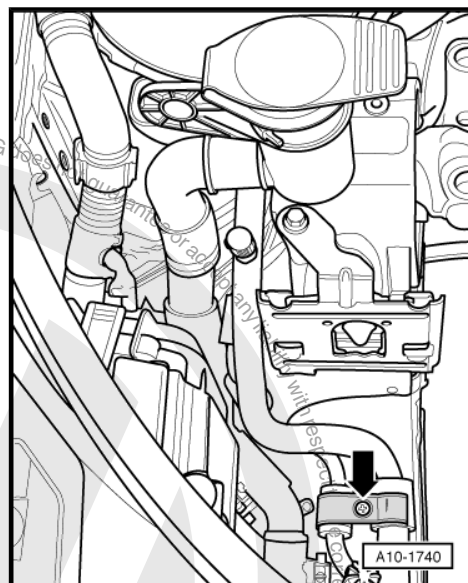
To facilitate removing and installing the engine without opening the refrigerant circuit:



- Remove bracket -arrow- for refrigerant lines on right longitudinal member.
- Remove ribbed belt => [page 29](#) .
- Remove air conditioner compressor from bracket for ancillaries => Heating, Air conditioning system; Rep. Gr. 87 ; Repair work on refrigerant circuit; Removing and installing air conditioner compressor .

**Note**

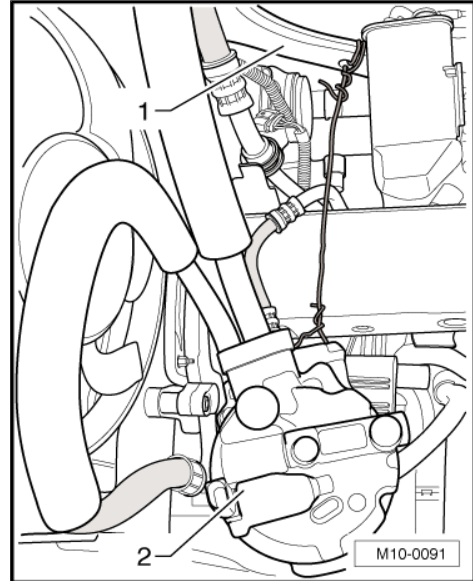
*The air conditioning system wiring must not be opened.*



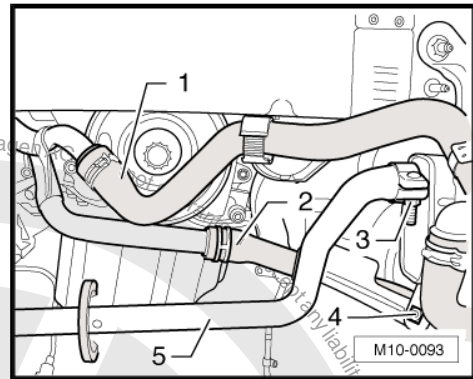


- Fit air conditioner compressor -2- to lock carrier -1-. To do this pull e.g. a wire through the right air conditioner compressor mounting.
- Observe that the wiring is not kinked.

**Models with auxiliary heater**

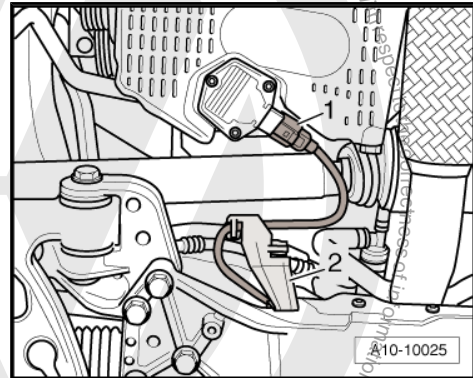


- Loosen nut -3-, remove bolt -4- and take exhaust pipe -5- off auxiliary heater.
- Place drip tray underneath.
- Release spring-type clips of coolant hoses -1- and -2- and pull coolant hoses off auxiliary heater.

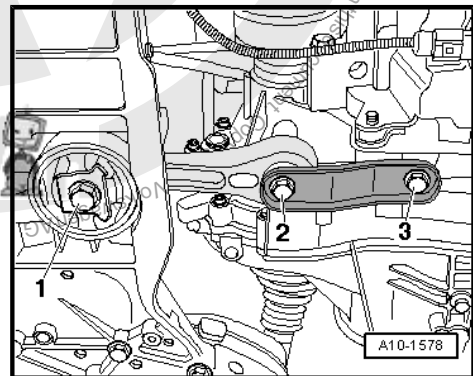


**Continuation for all vehicles**

- Remove alternator ➔ Electrical system; Rep. Gr. 27 ; Alternator; Alternator 1.6 l FSI engine
- Separate connector -1- at oil level and oil temperature sender -G266- .
- Unclip retainer -2- for the line to the oil level and oil temperature sender -G266- on subframe.



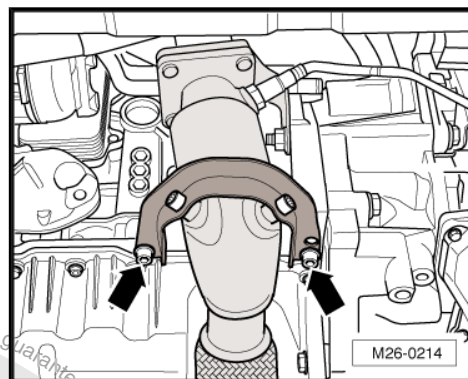
- Unscrew bolt -1- first.
- Unscrew bolts -2- and -3- and take pendulum support off.





- Remove bolts -arrows-.
- Remove right-hand drive shaft and left-hand drive shaft ⇒ Running gear, axles, steering; Rep. Gr. 40 ; Servicing drive shafts; Removing and installing drive shafts .

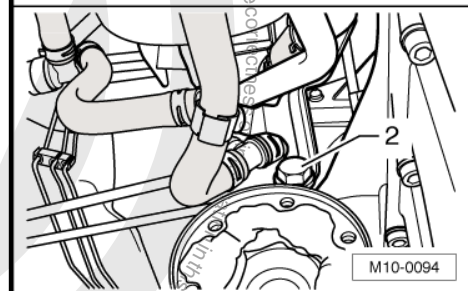
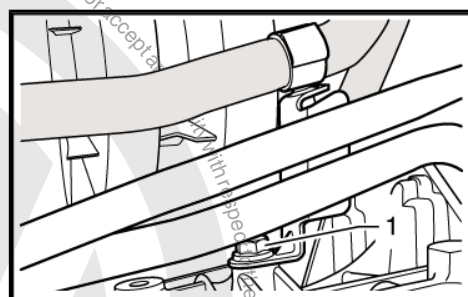
**Models with auxiliary heater**



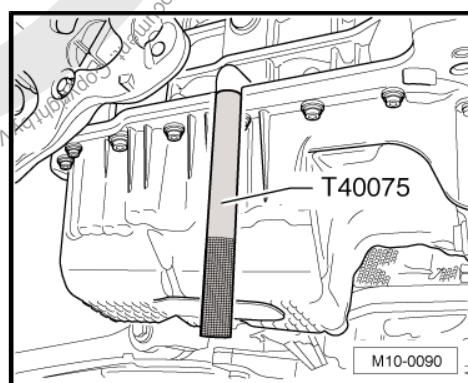
- Remove bolts -1- and -2- and pull coolant hoses off engine and gearbox. The coolant hoses remain connected.

**Continuation for all vehicles**

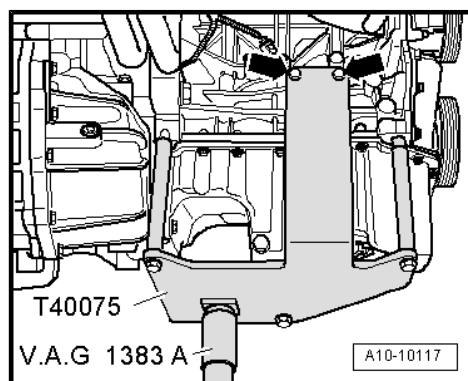
- Remove pre-catalytic converter along with exhaust pipe ⇒ [page 183](#) .
- Pull off/disconnect all other electrical connections and hoses as necessary from engine and lay to one side.
- Fit all electrical wirings and hoses on engine.



- Fit pin of engine bracket -T40075- to engine front first.



- Fit engine bracket -T40075- to the engine and gearbox jack - V.A.G 1383 A- .
- Fit engine bracket -T40075- to pin.
- Fit the engine bracket -T40075- to the rear side of the cylinder head -arrows- and tighten to 20 Nm.
- Lift engine/gearbox assembly lightly.



**Note**

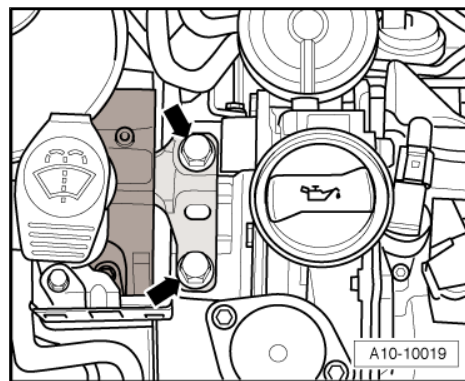
To remove securing bolts for assembly mounting use double ladder -VAS 5085- .



Jetta 2005 > , Bora 2006 >

4-cylinder Injection engine (1.6 l engine, direct injection) - Edition 08.2005

- Remove bolts -arrows- of assembly mounting from engine bracket.

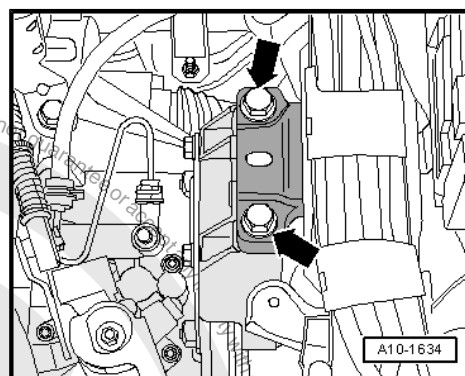


- Remove bolts -arrows- of assembly mounting from gearbox bracket.

## Note

- ◆ Check whether all hoses and wiring connections between engine, gearbox and body are disconnected.
- ◆ Engine with gearbox must be guided carefully when lowered to prevent damage.

- Pull engine/gearbox assembly forwards as far as possible and carefully lower.



## 1.2 Securing engine to engine and gearbox support -VAS 6095-

When working on the engine, the engine should be secured on the engine and gearbox support -VAS 6095- .