

# Volkswagen

# Jetta, Golf, GTI
















# Service Manual

**1999, 2000, 2001, 2002, 2003, 2004, 2005**

1.8L turbo, 1.9L TDI and PD diesel

2.0L gasoline, 2.8L VR6



Volkswagen	Audi	BMW
	Golf, GTI, Jetta 1999-2004, Jetta Wagon 2001-2004, R32	Subscription expires 2005 Feb 13
	Golf, GTI, Jetta 1993-1999, Cabrio 1995-2002	 <a href="#">Click here to purchase</a>
	Passat, Passat Wagon 1995-1997	 <a href="#">Click here to purchase</a>
	Passat, Passat Wagon 1998-2004	 <a href="#">Click here to purchase</a>
	New Beetle 1998-2004, New Beetle Convertible 2004	 <a href="#">Click here to purchase</a>
	Eurovan 1992-2004	 <a href="#">Click here to purchase</a>
	Touareg	 <a href="#">Click here to purchase</a>
	Phaeton	 <a href="#">Click here to purchase</a>

## Select a topic

- 00 - General, Technical data
- 10 - Engine - Assembly
- 13 - Engine - Crankshaft, Cylinder block
- 15 - Engine - Cylinder head, Valvetrain
- 17 - Engine - Lubrication
- 19 - Engine - Cooling system
- 20 - Fuel Supply
- 26 - Exhaust system, Emission controls

### Additional Information

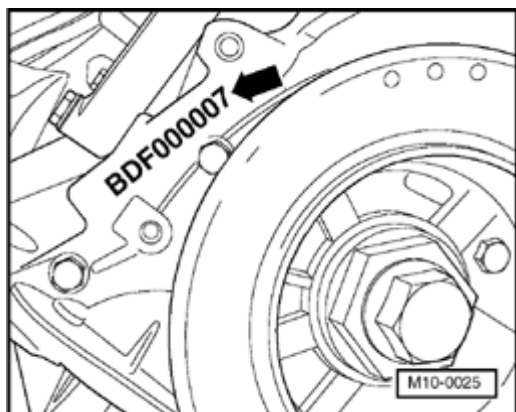
#### System Overviews

#### Other Topics

[24-Valve VR6 Variable Camshaft Timing Operation](#)

## Technical data

### Engine number



- ◀ The engine number (engine code and serial number) are located next to the vibration damper on the cylinder block.

The engine number consists of up to nine characters (alphanumeric). The first part (maximal 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.

Additionally there is a sticker on the intake manifold with the engine code and serial number.

The engine code is additionally included on the vehicle data plate.

## Engine data

<b>Engine code</b>		<b>BDF</b>
Manufactured		08.01 ➤
Cylinder application		VR <sup>1)</sup>
Cylinder angle		15.0 °
Capacity	ltr.	2.8
Output	kW at rpm	147/6200
Torque	Nm at rpm	265/3200
Bore	diameter mm	81.0
Stroke	mm	90.3
Compression ratio		10.75
RON	min.	98 unleaded <sup>2)</sup>
System designation		Motronic ME7.1.1

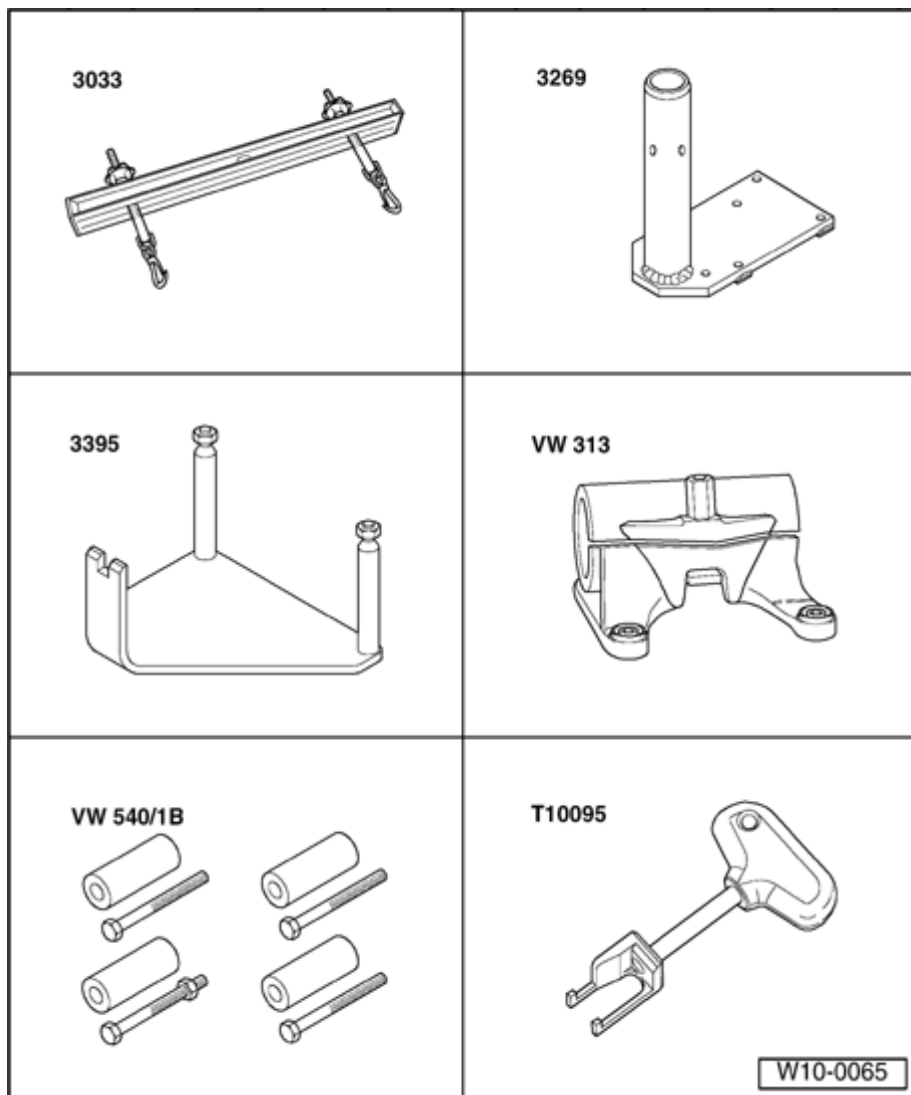
1) VR = V-arrangement in compact in-line design

2) 91 and 95 RON are also permitted, but with reduced output

<b>Engine code</b>	<b>BDF</b>
Exhaust emissions level	LEV <sup>1)</sup>
On Board Diagnostic (OBD)	OBD II
Knock regulation	2 knock sensors
Oxygen sensor control	2 sensors
Catalytic converter	yes
Exhaust gas recirculation	no
Charging	no
Secondary air system	yes
Electronic power control (EPC)	yes
Variable intake manifold	yes
Variable valve timing	yes <sup>2)</sup>

1) LEV = Low Emission Vehicles (exhaust emissions max. 0.075 g/mi HC).

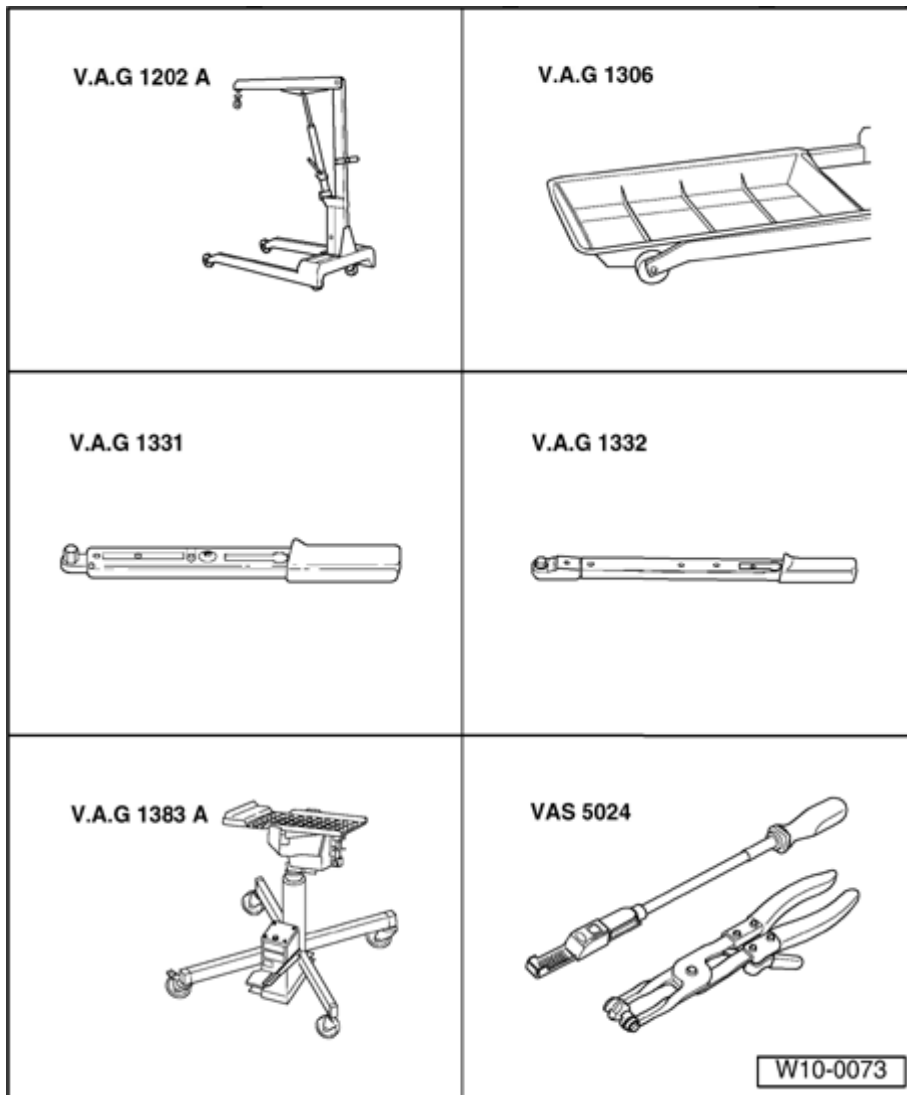
2) Two independently variable camshafts.



## Engine, removing and installing

### Special tools and equipment

- ◆ 3033 Lifting tackle
- ◆ 3269 Engine bracket
- ◆ 3395 Engine bracket
- ◆ VW 313 Support clamp
- ◆ VW 540/1 B Supplementary set
- ◆ T10095 Puller



- ◆ VAG 1202 A Workshop crane
- ◆ VAG 1306 Drip tray
- ◆ VAG 1331 Torque wrench (5...50 Nm)
- ◆ VAG 1332 Torque wrench (40...200 Nm)
- ◆ VAG 1383 A Engine/transmission jack
- ◆ VAS 5024 Assembly tool for spring-type clips
- ◆ VAS 5085 Step ladder
- ◆ G 000 100 Grease gun (models with manual transmission)
- ◆ Cable tie



## Notes on removing

The engine is removed downward together with the transmission.

### **CAUTION!**

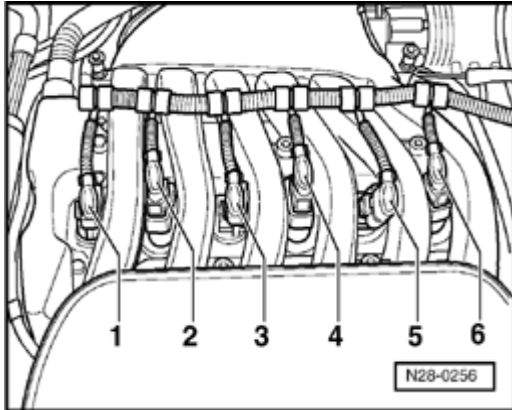
***When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:***

- ◆ ***Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.***
- ◆ ***Ensure sufficient clearance to all moving or hot components.***

All cable ties which are opened or cut open when removing engine, must be replaced in the same position when installing the engine.

## Work sequence

- Remove engine cover.
- First check whether a coded radio is installed. If so, obtain anti-theft coding.



- With ignition switched off disconnect battery Ground strap.

- Disconnect connectors from ignition coils

**Note:**

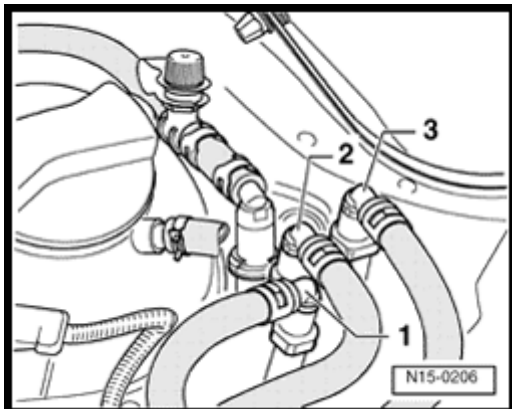
*Mark connector and component before disconnecting.*

- Remove ignition coils with final out stage cylinders 1...6 using puller T10095.

- Remove battery and battery retainer.

- Remove air cleaner with intake hose:

⇒ Repair Manual, 2.8 Liter VR6 4V Engine Mechanical, Engine Code(s): BDF, Repair (24



- Disconnect following hose connections and collect fluids that may leak out with a cloth

1 - vacuum hose to Throttle valve control m J338-,

2 - fuel return hose (with blue markings),

3 - fuel supply hose (with white markings).

**Note:**

*Press buttons on hose couplings to disconnect.*

**WARNING!**

**Fuel system is under pressure! Before opening the system place a cloth around the connection. Then release pressure by carefully loosening the connection.**

- Seal lines to avoid contamination of fuel system.
- Observe rules for cleanliness ⇒ [Page 20-14](#) .
- Remove center, left and right insulation trays:  
⇒ [Repair Manual, Body Exterior, Repair Group 50](#)
- Pull connectors off thermal switch and coolant fan.
- Remove front bumper:  
⇒ [Repair Manual, Body Exterior, Repair Group 63](#)
- Bring lock carrier into service position:  
⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Remove intake manifold ⇒ [Page 15-16](#) ,  
Removing and installing cylinder head cover.

**Note:**

*Seal the intake ports in the intake manifold or in the cylinder head with a clean cloth.*

- Remove ribbed belt ⇒ [Page 13-19](#) .
- Remove power steering pump on compact bracket and place to side; hoses remain connected:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48](#)

- Remove securing clamps for power steering pressure line.

**Vehicles with air conditioning**

- Observe additional information and removal work ⇒ [Page 10-22](#) .

**Models with a manual transmission**

- Disconnect selector mechanism from transmission:

⇒ [Repair Manual, 5 & 6 Spd. Manual Transmission 02M, Repair Group 34](#)

- Separate hydraulic line to slave cylinder for hydraulic clutch:

⇒ [Repair Manual, 5 & 6 Spd. Manual Transmission 02M, Repair Group 30](#)

### **Models with an automatic transmission**

- Remove gate selector lever cable from transmission:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 09A, Repair Group 37](#)

### **Continuation for all vehicles**

- Disconnect vacuum and breather hoses from engine.
- Separate connectors on following components:

#### **Note:**

*Mark connector and component before disconnecting.*

- ◆ Engine Coolant Temperature (ECT) sensor - G62- with Engine Coolant Temperature (ECT) sensor -G2-,
- ◆ After-run coolant pump -V51-,
- ◆ Valve -1- for camshaft adjustment -N205-,

- ◆ Camshaft adjustment valve 1 (exhaust) - N318-,
- ◆ Camshaft Position (CMP) sensor -G40-,
- ◆ Camshaft Position (CMP) sensor 2 -G163-  
,
- ◆ Injectors (-N30- to -N33-, -N83- and -N84-  
),
- ◆ Engine speed (RPM) sensor -G28-,
- ◆ Knock Sensor (KS) 1 -G61-,
- ◆ Knock Sensor (KS) 2 -G66-,

Installation locations:

⇒Repair Manual, 2.8 Liter VR6 4V Engine  
Mechanical, Engine Code(s): BDF, Repair Group  
24

- Disconnect all electric wires from transmission, alternator and starter and them move clear.
- Disconnect all other electrical connections from engine as necessary and place to one side.
- Drain coolant ⇒ [Page 19-15](#) .
- Disconnect coolant hoses quick release couplings from radiator.

- Pull all coolant hoses off to engine using assembly tool for spring-type clamps VAS 5024.

- Removing drive shafts:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)

- Remove pendulum support:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)

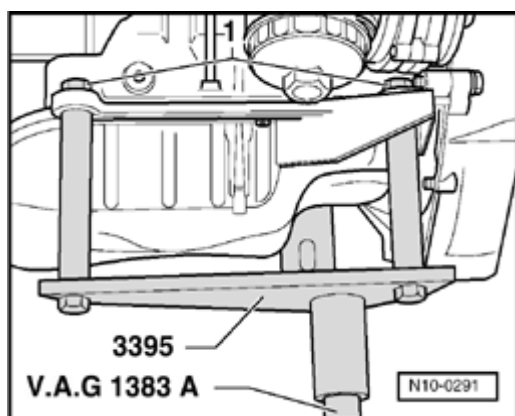
- Remove front exhaust pipe with catalytic converter ⇒ [Page 26-1](#) , Removing and installing parts of the exhaust system.

- Remove alternator and compact bracket:

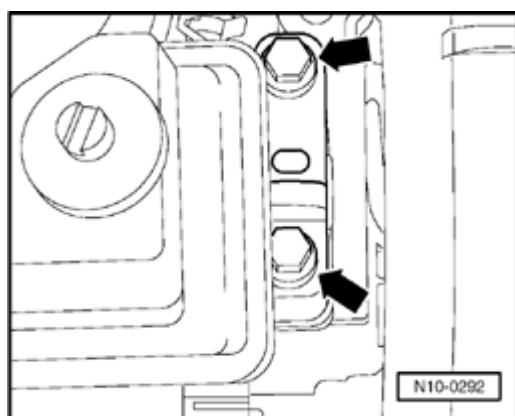
⇒ [Repair Manual, Electrical Equipment, Repair Group 27](#)

- Unscrew bracket for Secondary Air Injection (AIR) pump motor -V101- from oil pan and cylinder block ⇒ [Page 26-26](#) , item - 17 -.

- Install engine bracket 3395 onto engine/transmission jack VAG 1383 A.



- Install engine bracket 3395 to cylinder block and tighten securing nuts -1- to 40 Nm.
- Lift engine and transmission slightly using engine/transmission jack VAG 1383 A.

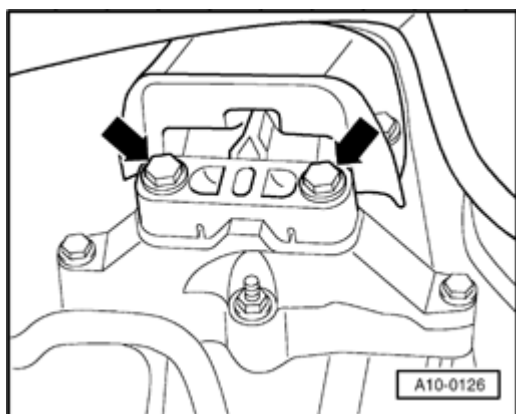


- Unbolt engine side of assembly mounting from engine bracket at top (arrows).

**Note:**

*Use ladder VAS 5085 to remove securing bolts.*





- Unbolt transmission side of assembly mounting from top of transmission carrier (arrows).

**Note:**

*Use ladder VAS 5085 to remove securing bolts.*

- Carefully lower engine with transmission.

**Note:**

*Engine with transmission must be guided carefully, when lowering, to prevent damage to bodywork.*

## Securing engine to assembly stand

### Note:

When working on the engine it should be secured to assembly stand VW 313 using bracket 3269 or VW 540 and supplementary set 540/1 B.

### Work sequence

- Remove transmission.

### Models with an automatic transmission

- Secure torque converter to prevent it falling after engine and transmission are separated.

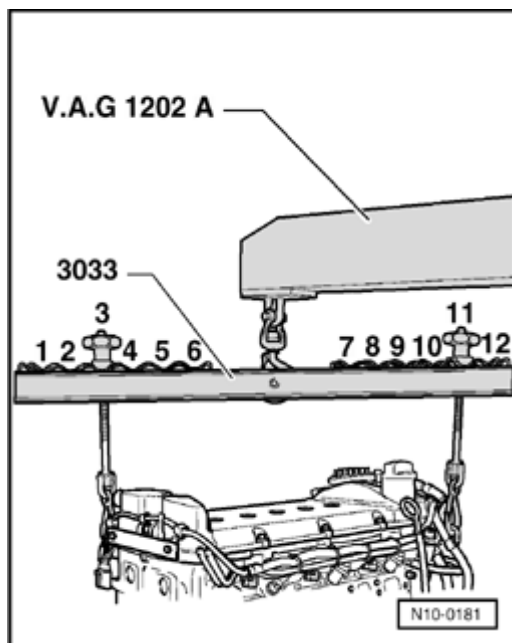
### Continuation for all vehicles

- Install engine bracket 3269 or VW 540 or supplementary set 540/1 B to cylinder block.
- Attach lifting device 3033 as follows and lift engine from engine/transmission jack using workshop crane VAG 1202.

Vibration damper end: Position 3

Flywheel end: Position 11

- Install engine in support clamp VW 313 using workshop crane VAG 1202 A.



## Notes on installation

Install in reverse sequence ; note the following points:

- Check whether dowel sleeves for centering engine/transmission are installed in cylinder block and install if necessary.

## Models with a manual transmission

- Check clutch and clutch operating mechanism and install:

⇒ [\*Repair Manual, 5 & 6 Spd. Manual Transmission 02M, Repair Group 30\*](#)

- Clean drive shaft splines and lightly grease with G 000 100.

## Models with an automatic transmission

- When securing torque converter to drive plate, only use nuts which are authorized for this purpose, ⇒ Parts catalog.

### Continuation for all vehicles

- When installing engine/transmission assembly, ensure sufficient clearance to engine and transmission mountings and radiator.

- Align engine and transmission mountings ⇒ [Page 10-18](#) .

#### **Note:**

*Torque settings for assembly mountings* ⇒ [Page 10-21](#) .

- Install compact bracket and alternator:

⇒ [Repair Manual, Electrical Equipment, Repair Group 27](#)

- Install front exhaust pipe with catalytic converter  
⇒ [Page 26-1](#) , Removing and installing parts of the exhaust system.

- Install pendulum support:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)

- Install drive shafts:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)