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# Technical Bulletin

**Subject: Starter Does Not Crank, Engine Does Not Start; Key Cannot be Removed from Ignition Switch**

**Group: 27**

**Number: 05-03**

**Model(s): Touareg with 4.2L V8 (Eng. Code AXQ, BHX)**

**2004 ▶ 2005 Up to VIN 5D023561**

**Date: Apr. 14, 2005**

**Supersedes T.B. Group 27 number 05-02 dated Mar. 31, 2005 due to changes in the Warranty table.**

## Condition

Consumer concern of electrical issues including No start, No crank, Load interventions and/or load intervention faults (electrical consumers not functioning) may be due to low battery voltage.

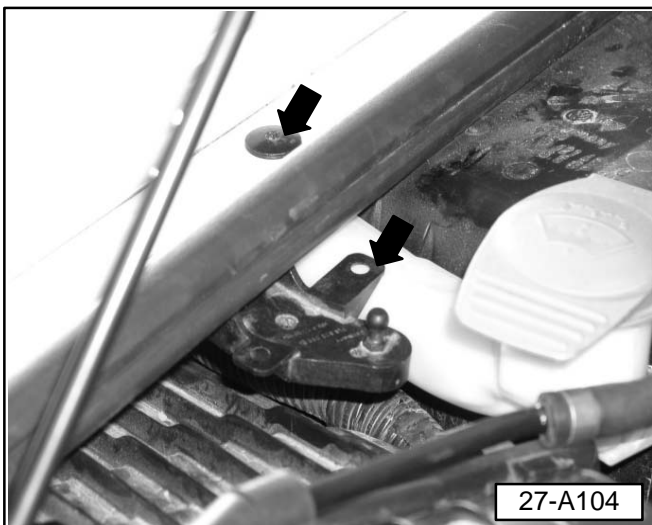
## Service

### Battery cables, measuring voltage:

Measure voltage of battery positive (B+) cable between generator and wire junction for terminal 30 (remote jumper positive terminal) as follows:

Measure voltage of ground (GND) cable between generator/engine and chassis as follows:

- Remove right front wheel.
- Remove right front wheel well liner.
- Remove engine compartment trim covers.
- ◀ - Remove right side engine compartment trim cover clip.
- Disconnect right Mass Air Flow (MAF) electrical connector.
- Reposition coolant hose away from air cleaner box.
- Remove air cleaner cover and filter. See Repair Manual.

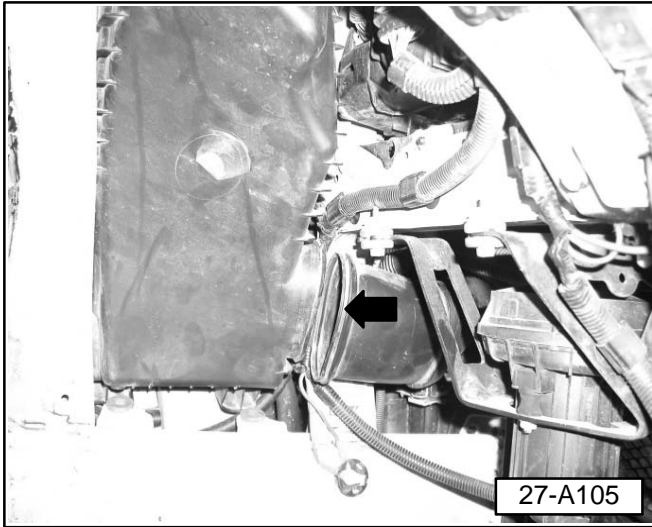




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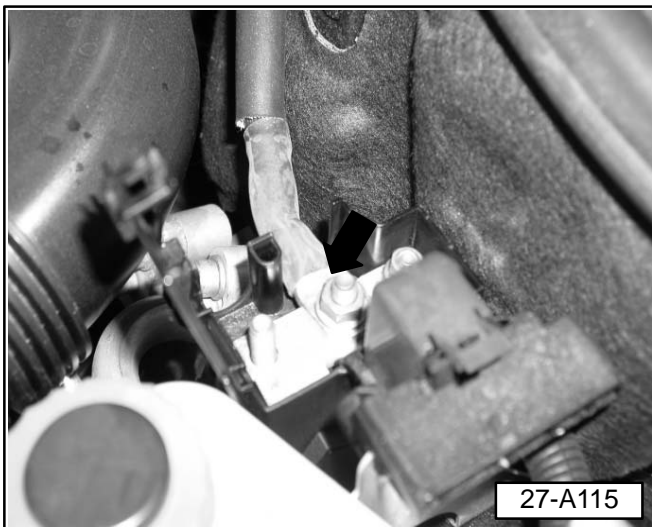
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- ◀ – From wheel well, disconnect air cleaner box from air intake pipe (in direction of arrow).
- Remove air cleaner box from vehicle.
- Remove protective cap covering battery positive (B+) cable attached to generator.

Using VAS 5051 or approved VW DVOM, measure voltage drop in battery positive (B+) cable between generator and remote jumper positive terminal as follows:



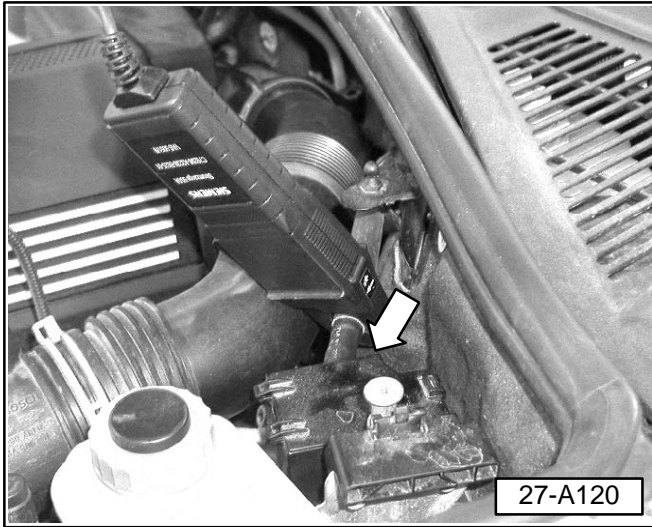
- Connect one lead to battery positive (B+) cable at rear of generator.
- ◀ – Connect second lead to terminal end of battery positive (B+) cable -arrow-.
- Temporarily connect right side MAF sensor.
- Start and idle engine for 5 minutes with all electrical consumers ON (radio at half volume, HVAC, rear defrost, heated seats, heated mirrors, interior lights, high beam headlights, parking lights, etc.)
- Allow engine to idle with these consumers ON for 5 minutes before taking any measurements.



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Using the VAS 5051 (500 Amp.) current probe, with engine idling:

- ◀ – Calibrate and then measure the current near the TV2 connector at the remote jumper location with current direction (arrow) as shown).
- Record the current value measured on the Repair Order as  $I_{GLXX}$  Amperes (XX = your current measurement).
- Measure the voltage drop between the B+ cable at the rear of the generator and the wire junction of the remote jumper positive terminal.
- Record the measured value on the Repair Order as  $V_{B+ XX}$  in Volts (XX = your voltage drop measurement).
- Now measure the voltage drop in chassis Ground (GND) cable (between the generator casing and chassis ground location).
- Connect one lead to the GND terminal at the chassis connection.
- Connect the second lead to the generator casing.
- Record the measured value on the Repair Order as  $V_{ECG XX}$  in Volts (XX = your voltage drop measurement).
- Based on the measured current ( $I_{GL}$ ) and the voltage drop readings  $V_{B+ XX}$  and  $V_{ECG XX}$ , use Table 1 (see page 5) to determine the maximum allowable voltage drop for both the B+ cable and the Engine/Chassis GND cable.



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*Always tighten terminal fasteners to correct torque as outline in the Repair Manual!*

If the measured voltage drop of the battery positive (B+) cable is outside the limits based on current measurement as stated in Table 1 (see page 5):

- Replace the positive (B+) cable between generator and remote jumper positive terminal (see page 6).

If the measured voltage drop of the Engine/Chassis Ground (GND) is outside the limits based on current measurement as stated in Table 1 (see page 5):

- Clean contamination at both sides of the cable connection using a brass wire brush.

If cable contamination cannot be cleaned:

- Replace the Engine/Chassis Ground (GND) cable.



**Tip:**

If the measured voltage drops are within allowable limits based on current measurement as stated in Table 1 (see page 5):

- DO NOT complete this bulletin, further diagnosis is required.



**Note:**

*All measured values taken during the diagnosis must be recorded on the repair order. Failure to document these values will result in a denied Warranty claim!*



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**Table 1: Current Measurement Range and Voltage Drop Limits**

Measured Current (Amps) In B+ Cable (Generator to Terminal End at Jump Location) Measured value as $I_{GL}$	Maximum Allowable Voltage Drop In B+ Cable (Generator to Terminal End at Jump Location) Measured value as $V_{B+}$	Maximum Allowable Voltage Drop Generator / Engine – Chassis Ground Measured value as $V_{ECG}$
40 - 49	0.08	0.08
50 - 59	0.1	0.1
60 - 69	0.12	0.12
70 - 79	0.14	0.14
80 - 89	0.16	0.16
90 - 99	0.18	0.18
100 -109	0.2	0.2
110 -119	0.22	0.22
120 -129	0.24	0.24
130 -139	0.26	0.26
140 -149	0.28	0.28
150 -159	0.3	0.3
160 -169	0.32	0.32
170 -179	0.34	0.34
180 -189	0.36	0.36
190 -199	0.38	0.38
200 -209	0.4	0.4



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- Replace Battery positive (B+) cable between generator and remote jumper positive terminal as follows:

**Battery positive (B+) cable between generator and remote jumper positive terminal, removing**

## WARNING

*When disconnecting battery cables, ALWAYS disconnect the battery Ground (GND) cable first.*

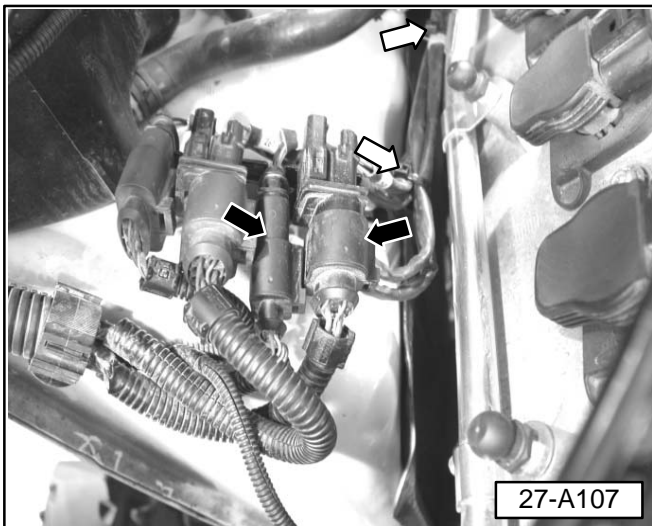
*Failure to do so in this order could result in personal injury!*



- Disconnect battery (see Repair Manual *Electrical Equipment Group 27 – Battery, Starter, Generator, Cruise control* “Battery, disconnecting and reconnecting”).

- Remove all engine trim covers.

- ◀ - Remove right and left air intake pipes -arrows-.



- ◀ - Disconnect oxygen sensor (black) connectors -black arrows-.

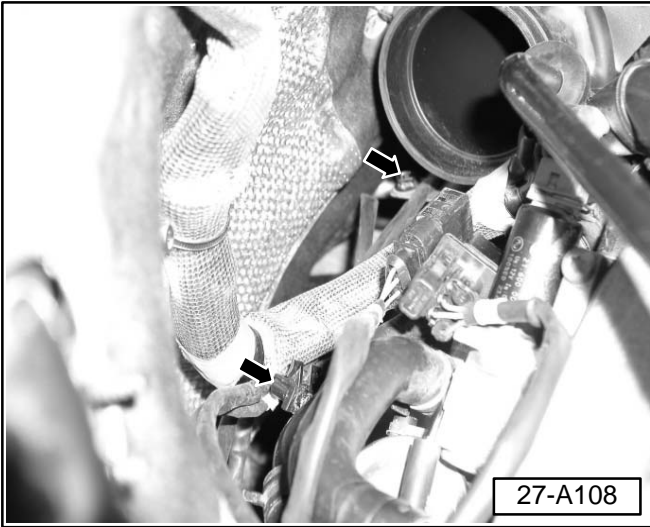
- Remove two cable ties retaining oxygen sensor wiring harness -white arrows-.



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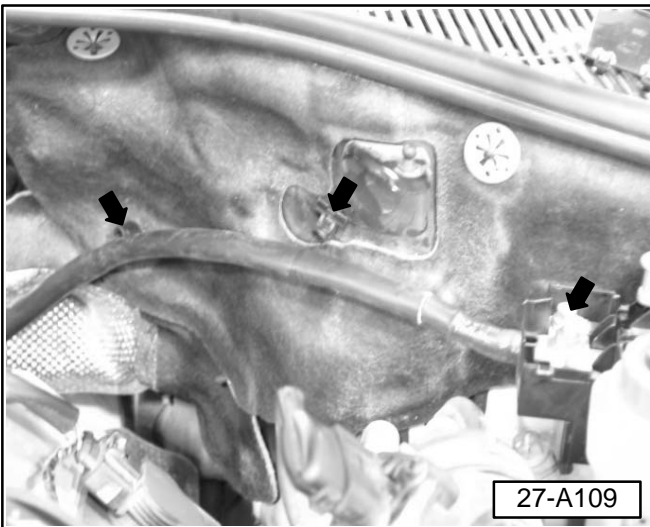
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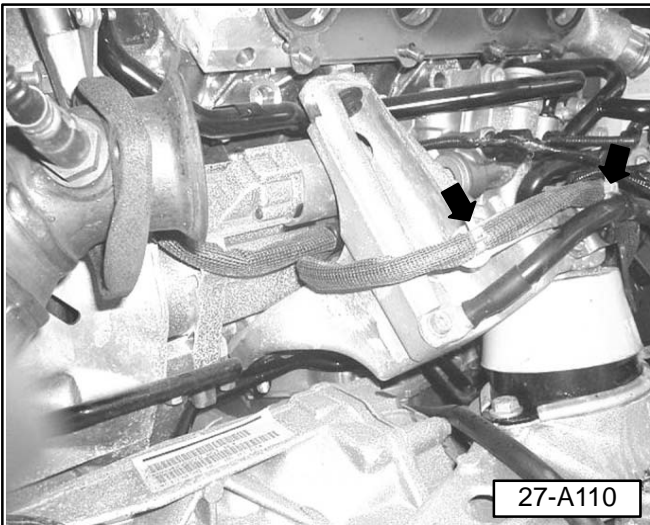
- ◀ – Remove two cable ties retaining oxygen sensor wiring harness to push pins shown -arrows-.
- Unclip oxygen sensor wiring harness from top of transmission.
- Position oxygen sensor wiring close to exhaust system.

### WARNING

***Make sure engine is cool. Contact with a hot engine can cause severe burns!***



- Remove two clips securing battery positive (B+) cable to bracket on rear of engine.
- ◀ – Unclip battery positive (B+) cable from clips on bulkhead and remove nut securing (B+) cable to remote jumper positive terminal -arrows-.



- ◀ – From wheel well, remove two clips -arrows- securing battery positive (B+) cable to bracket on right side of engine.

### Tip:

*Battery positive (B+) cable is routed around engine mount.*

### Tip:

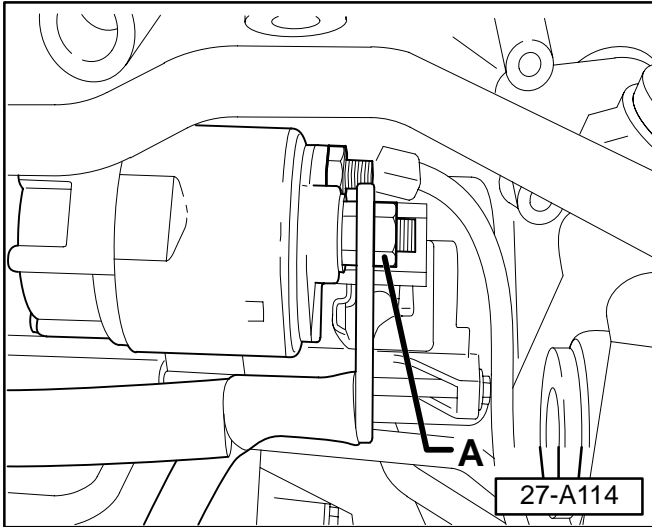
*Photo shows engine removed from vehicle for clarity.*



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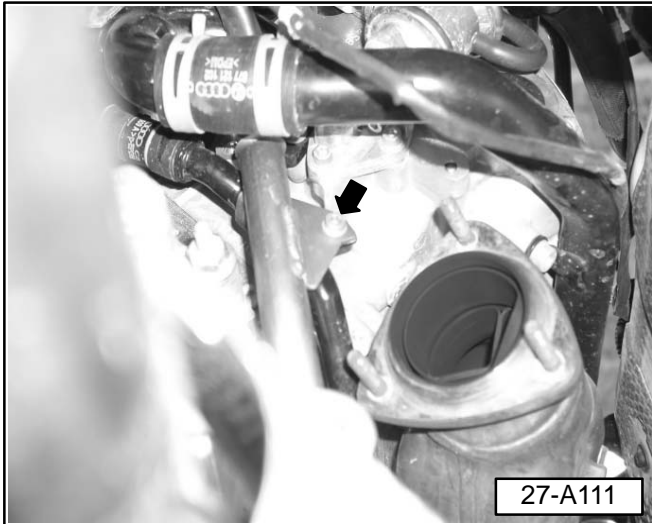
- Remove nut securing battery positive (B+) cable to generator.
- Remove cable from generator.

- ◀ - Remove nut securing battery positive (B+) cable to starter.

**i** Tip:

Use U-Joint extension and 13 mm socket to start removing cable nut at starter (two turns maximum).

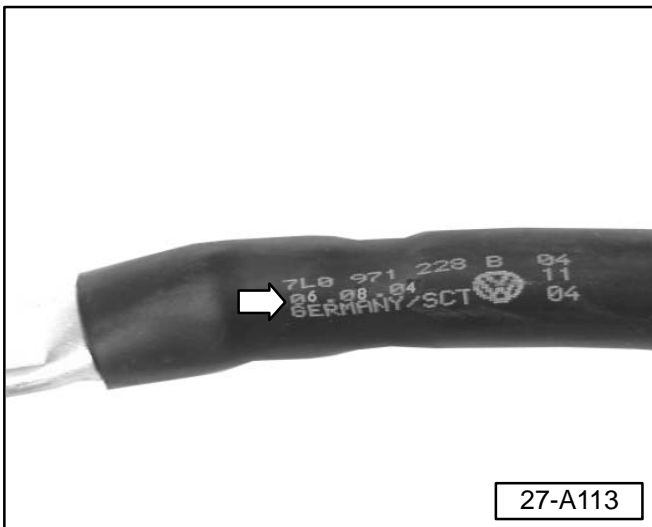
Use 13 mm swivel socket to remove nut from stud.



- Remove cable from starter.
- From underside of vehicle, remove rear sound insulation.
- Using suitable jack, support transmission.
- Remove transmission crossmember.
- Remove right side catalytic converter.

- ◀ - Remove bolt securing battery cable bracket to coolant pipe -arrow-.

- Temporarily reinstall transmission crossmember.



- Remove battery positive (B+) cable.
- Verify new battery positive (B+) cable is Part No. 7L0 971 228 B.

- ◀ - Verify production date of battery positive (B+) cable is on or after 06-08-04 (August 6, 2004). This date is shown on cable -arrow-.

**i** Tip:

Part numbers listed in this bulletin are for reference only. Always check with your Parts Dept. for the latest parts information.

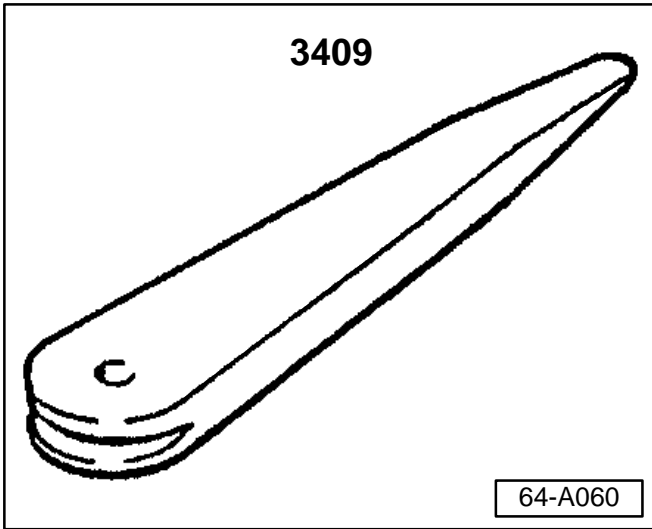




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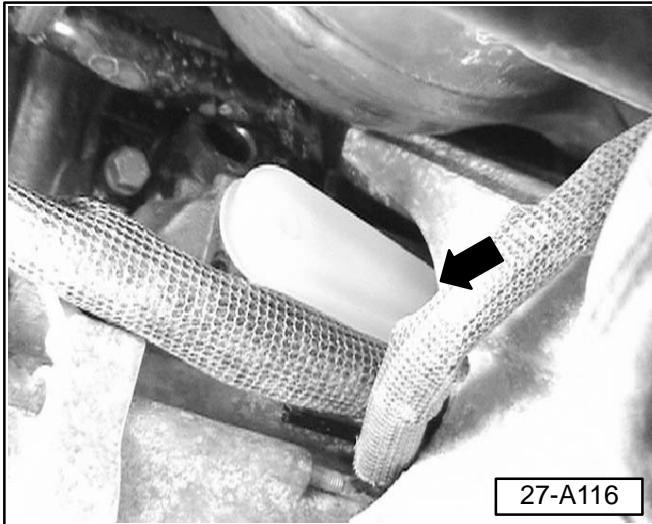
Battery positive (B+) cable between generator and remote jumper positive terminal, installing

- Route and connect battery positive (B+) cable to generator and starter.

**i** Tip:

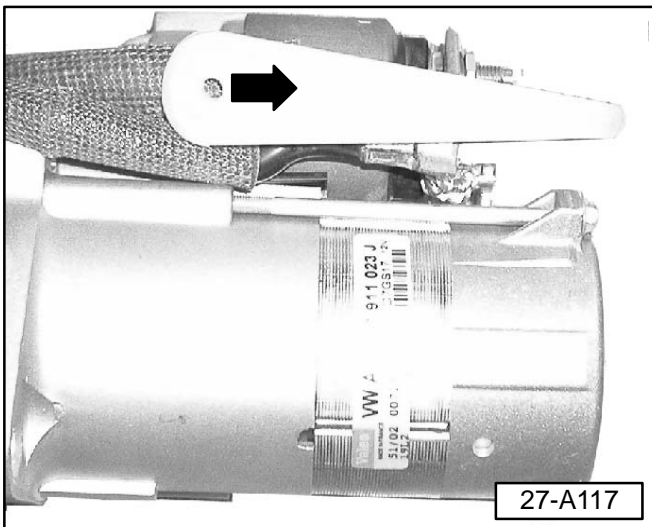
*The following steps should be performed prior to tightening B+ cable to starter.*

- ◀ - Using special tool 3409 (Trim removal wedge):



- ◀ From access above steering rack:

Insert Wedge Tool 3409 -arrow- between engine mount support and cable as shown.



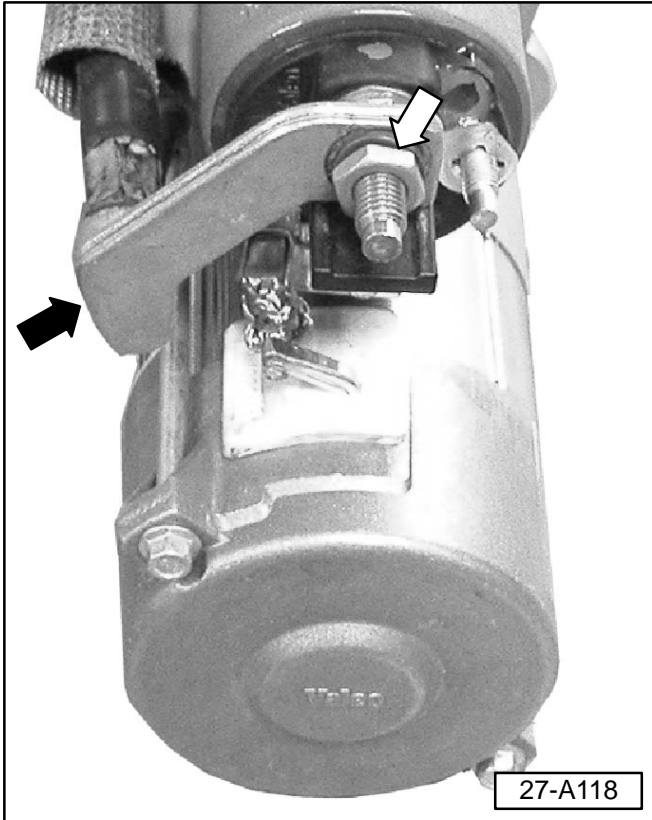
- ◆ Illustration shows starter removed for clarity.
- ◀ ◆ Trim tool is inserted in direction shown (arrow).



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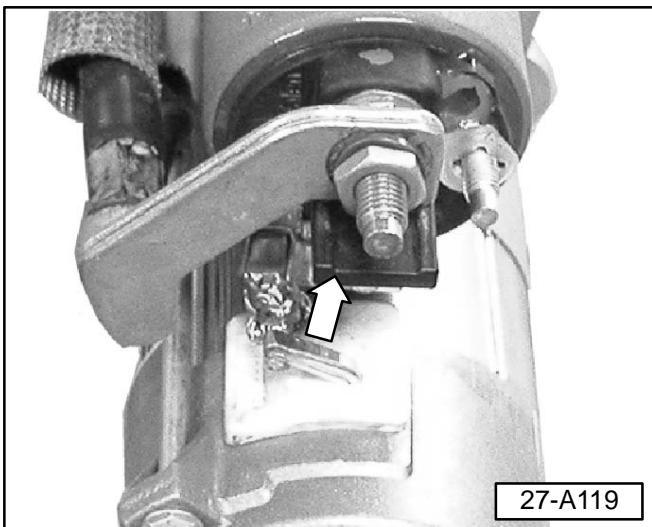


◀ If Wedge Tool 3409 has been inserted properly:

- ◆ You will be able to see the tip of Tool 3409 from Air Box Access.
- ◆ Wedge tool 3409 will effectively space and hold B+ cable (black arrow) in position away from engine mount while tightening nut (white arrow).
- ◆ Battery positive (B+) cable to starter torque = 15 Nm (white arrow).
- ◆ Battery positive (B+) cable to generator torque = 15 Nm.

With starter nut properly tightened:

- Remove trim tool.



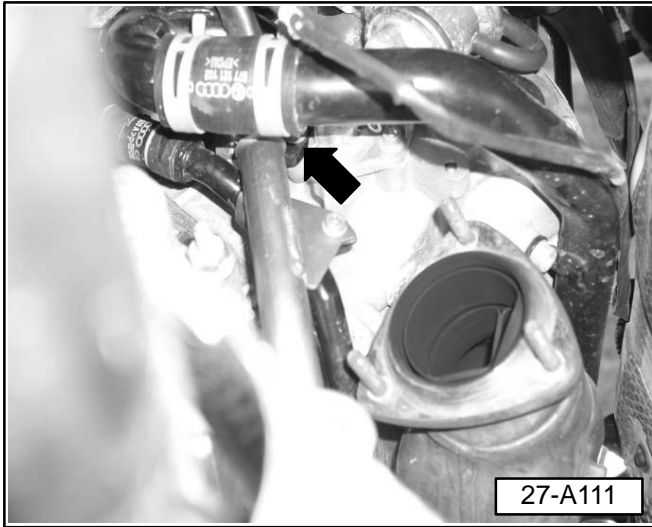
- ◀
- Ensure that cable is spaced away from engine mount support and that the terminal is lying flat on alignment block (arrow) of starter.
  - From wheel well, install two clips securing battery positive (B+) cable to bracket on right side of engine.



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### Tip:

◀ *Make sure battery positive (B+) cable is routed between coolant pipe and engine -arrow-.*

- Install bolt securing battery positive (B+) cable bracket to coolant pipe.
- ◆ Battery positive (B+) cable bracket torque = 12 Nm.
- Install two clips securing battery positive (B+) cable to bracket on rear of engine.
- Support transmission with suitable jack.
- Remove transmission crossmember.
- Install right side catalytic converter.
- Install transmission crossmember.
- Clip oxygen sensor wiring to top of transmission.
- Route oxygen sensor wiring and secure with cable ties.
- Install rear sound insulation.
- From top of engine compartment, attach battery positive (B+) cable to bracket on rear of engine.
- Attach battery positive (B+) cable to two clips on bulkhead.
- Install battery positive (B+) cable to remote jumper positive terminal.
- ◆ Battery positive (B+) cable torque = 15 Nm.
- Install right and left air intake pipes.
- Install air cleaner box, filter and cover.
- Install engine trim covers.
- Install right side engine compartment trim cover clip.
- Connect left and right MAF sensor electrical connectors.



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- Install engine compartment trim covers.
- Install right front wheel well liner.
- Install right front wheel.

### WARNING

***When connecting battery cables,  
ALWAYS connect the battery positive  
(B+) cable first then connect the battery  
Ground (GND) cable.***

***Failure to do so in this order could result  
in personal injury!***

- Connect battery (see Repair Manual *Electrical Equipment*, 27 – Battery, Starter, Generator, Cruise control “Battery, disconnecting and reconnecting”).
- Connect the VAS 5051/VAS5052 Diagnostic tool.
- Interrogate and erase and stored DTCs.
- Test battery and charging system using MCR340V tester.



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## Post procedure component reset / relearn

### Access Start Module

Before starting vehicle, Access Start Module must be reset:

- Turn ignition switch to left most position.
- Let ignition switch return to zero position (at rest when key is in ignition switch).
- Turn ignition switch to the right position to start the engine.

### Front windows “One touch feature”

With vehicle idling:

- Fully open both front windows.
- Fully close both front windows.

### Electronic front seat (if equipped) “Soft stop function”

With vehicle idling:

- Hold seat “forward/backward” switch in forward position until front seat moves fully forward and seat stops.
- Release switch.
- Hold seat “forward/backward” switch in forward position to ensure front seat is in fully forward position.
- Release switch.
- ◆ Forward soft stop position is learned.
- Hold seat “forward/backward” switch in backward position until front seat moves fully backward and seat stops.
- Release switch.
- Hold seat “forward/backward” switch in backward position to ensure front seat is in fully backward position.



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- Release switch.
- ◆ Backward soft stop position is learned.
- Repeat steps for other front seat.

### **Electronic steering column (if equipped)**

With vehicle idling:

- Operate steering column adjustment switch in each direction (up, down, forward and backward) until steering column stops in that direction.

### **Steering angle sensor & Air suspension**

- ◆ Steering angle sensor will temporarily lose calibration (light will illuminate) and must relearn its position.
- ◆ Air suspension will temporarily lose communication with the steering wheel angle sensor (light will illuminate).
- Drive vehicle forward with wheels in the straight ahead position for approx. 45 ft. (13.7 meters).



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<b>When procedure applies to vehicles within the New Vehicle Limited Warranty, use the following:</b>	
<b>Claim Type</b>	<b>W2</b>
<b>Part Identifier:</b>	<b>9745</b>
<b>Labor Operation: Diagnose Battery / Starter Harness and Engine Chassis Ground Harness</b>	<b>9745 0100 100 TU</b>
<b>Labor Operation: Remove and Install Battery / Starter Harness</b>	<b>9745 0102 300 TU</b>
<b>Labor Operation: Remove &amp; Install or Replace Ground (GND) cable</b>	<b>9787 19 00 70 TU</b>
<b>Diagnostic Time:</b>	<b>Included in SRT's above. No Other Diagnosis allowed</b>
<b>Claim Comment: Type "As per Technical Bulletin V270503" in comment section of Claim</b>	