Volkswagen Golf 5 2004-> VW Rabbit GTI 2006->

97 - 1

VAS 5051 / 5052

General information

On Board Diagnostic (OBD) program functions must be carried out using either the Vehicle Diagnostic, Testing and Information System VAS 5051 or Vehicle Diagnostic and Service System VAS 5052 .

Specific service, On Board Diagnostic (OBD) and component / function troubleshooting procedures are available via tester operating modes "Guided Fault Finding" or "Guided Functions" .

Additional information:

⇒ *Self Study Program - Course Number 811203 "VAS 5052 Design and Function"*

⇒ *VAS 5051 / VAS 5052 Operating instructions*

⇒ *VAS 5051 / VAS 5052 Operating mode "Administration" .*

- Connect Vehicle Diagnostic, Testing and Information System VAS 5051/5052 ⇒ 97-1, Vehicle Diagnostic, Testing and Information System VAS 5051 / 5052 , connecting .

Scan Tool (ST) and Test Equipment, Safety Precautions

Warning!

- ***Due to weight, size and need for manual operation of test instruments while vehicle is driven on public roads, instrument must be used only with a Driver operating the vehicle and an Instrument Operator operating the test equipment.***

- ***Do not use Instrument with Driver only. Always use two persons to conduct test.***

- ***Do not place Instrument on lap of Driver or front seat passenger because emergency stop may dislodge Instrument and cause airbag deployment with risk of injury to Instrument Operator.***

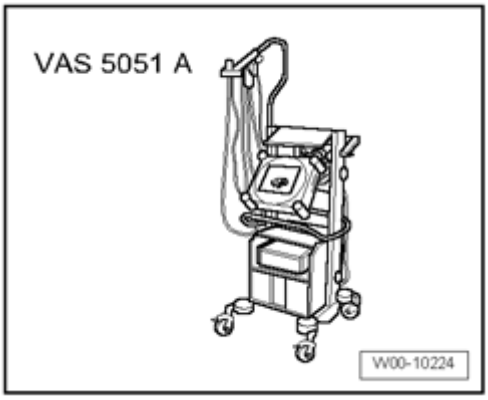
- ***Place Instrument in rear seating area and secure by available safety belt.***

- ***Instrument Operator must be seated in the other rear seating position, after sliding front passenger seat and moving the seat back as far forward as possible. Do not activate the seat back release lever.***

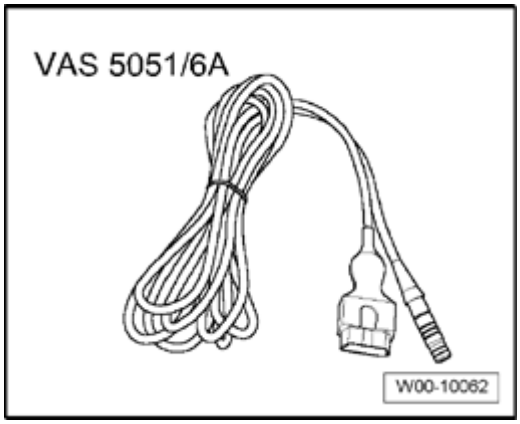
- ***Instrument Operator must wear safety belt.***

Vehicle Diagnostic, Testing and Information System VAS 5051 / 5052 , connecting

Special tools, testers and auxiliary items required



- Vehicle Diagnostic, Testing and Information System VAS 5051/5052 (VAS 5051 A version shown as example only)



- Diagnostic cable VAS 5051/6A (5 m)

- Diagnostic cable VAS 5051/5A (3 m)

Note:

- *Only the diagnostic cables listed above are to be used. Cables are equipped with CAN-wires that permit diagnosis of CAN-Bus systems.*

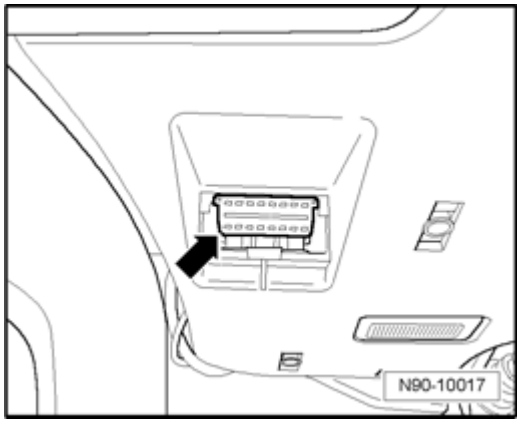
Connecting:

- Engage parking brake.

- For vehicles with automatic or DSG transmission, bring selector lever into position "P" or "N" .

- For vehicles with manual transmission, bring shift lever into neutral position.

- Switch off all electrical consumers.



- With ignition switched off, connect Vehicle Diagnostic, Testing and Information System VAS 5051/5052 with diagnostic cable VAS 5051/6A to Data Link Connector (DLC) located under left lower portion of instrument panel **- arrow -** .

- Switch ignition on.

- Select operating mode "Guided Fault Finding" , "Vehicle Self Diagnosis" or "Guided Functions"

The DTC memory of all control modules will be checked:

- Enter information as prompted. Where required, press ">" to confirm

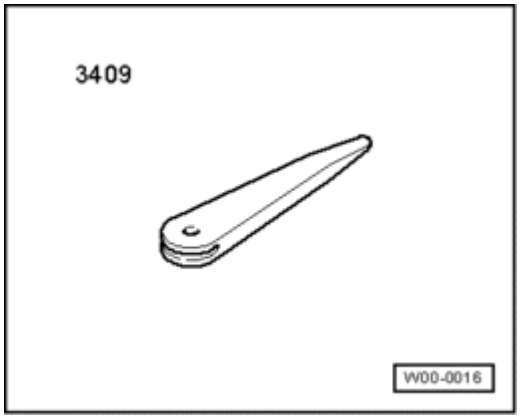
- Follow tester prompts

97 - 2

Fuse Panel

Fuse panel, removing and installing

Special tools, testers and auxiliary items required



- Trim removal wedge VAS 3409

Caution!

- ***When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in this Repair Manual ⇒ 27-4, Battery, disconnecting and connecting .***

- ***When removing switches, trim, covers or displays, prevent damage to visible areas of the interior by always applying appropriate tape to area surrounding the component, and the tools being used (screwdrivers, wedges etc.).***

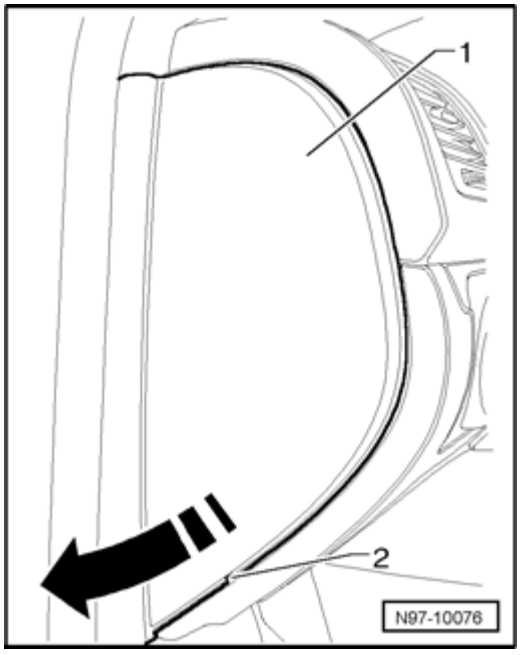
Removing:

- Disconnect battery ⇒ 27-4, Battery, disconnecting and connecting .

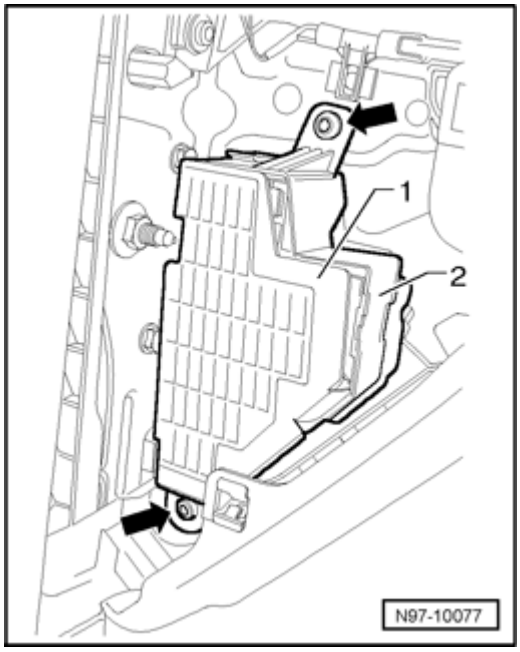
- Remove drivers storage compartment where applicable

⇒ *Repair Manual, Body Interior, Repair Group 68,*

.



- Remove left instrument panel side cover **- 1 -** by inserting trim removal wedge VAS 3409 or a screwdriver into recess **- 2 -** and pry off cover **- 1 -** in direction of **- arrow -** .



- Remove fuse assignment card **- 1 -** from fuse panel **- 2 -** .

- Remove screws **- arrows -** and guide fuse panel **- 1 -** outward as far as cable lengths permit.

Installing:

Install in reverse order of removal.

97 - 3

Relay Panels

Relay/fuse panel under left instrument panel, removing and installing

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications as well as instructions on performing OBD program and electrical system function checks as specified in this Repair Manual ⇒ 27-4, Battery, disconnecting and connecting .

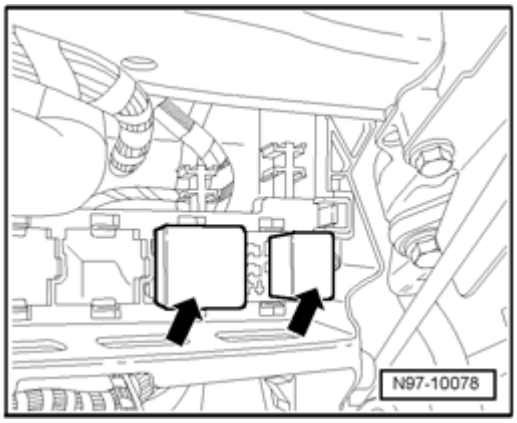
Removing:

- Disconnect battery ⇒ 27-4, Battery, disconnecting and connecting .

- Remove drivers compartment where applicable

⇒ *Repair Manual, Body Interior, Repair Group 68,*

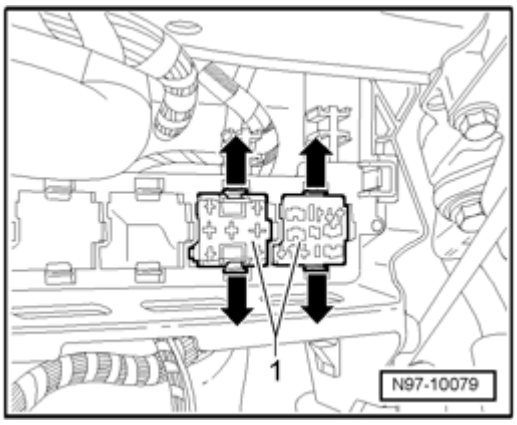
.



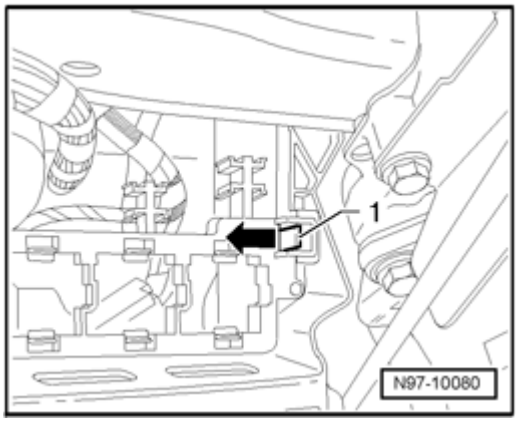
- Remove relays - **arrows** - from relay carrier.

Note:

- *The number of relays is dependent on vehicle equipment.*



- Release retaining tab in direction of **- arrow -** then press relay holders **- 1 -** out of relay panel.

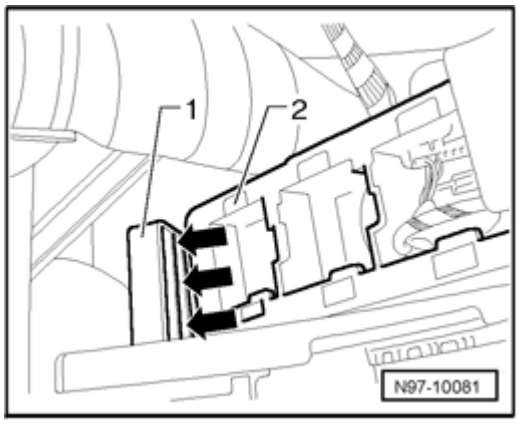


- Release retainer **- 1 -** for relay panel in direction of **- arrow -** and remove relay panel.

Installing:

Install in reverse order of removal, noting the following:

- First clip connector into relay carrier.



- Place relay carrier **- 2 -** into guide **- 1 -** and then engage relay carrier.

Relay panel integrated with Vehicle Electrical System

Control Module J519 , removing and installing

Note:

- *The relay panel integrated with Vehicle Electrical System Control Module J519 is permanently attached and cannot be serviced separately.*

- *If Vehicle Electrical System Control Module J519 is to be replaced, the work procedure to read out the coding stored in the module must always be performed ⇒ 97-5, Vehicle Electrical System Control Module J519 , coding .*

Removing:

Caution!

- ***Switch off all electrical consumers.***

- ***Switch ignition off and remove ignition key.***

- Remove drivers footwell cover

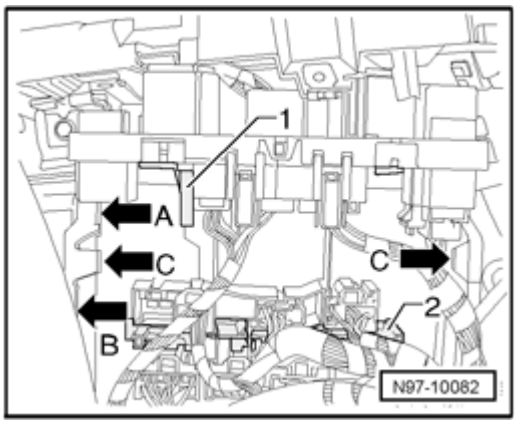
⇒ *Repair Manual, Body Interior, Repair Group 68,*

.

- Remove drivers storage compartment where applicable

⇒ *Repair Manual, Body Interior, Repair Group 68,*

.



- Disengage electrical connection lock **- 1 -** in direction of **-**

arrow A - .

- Disengage electrical connection lock **- 2 -** at Vehicle Electrical System Control Module J519 in direction of **- arrow B -** .

Note:

- *Harness connectors of Vehicle Electrical System Control Module J519 and of relay carrier at vehicle electrical system control module, at left instrument panel, can only be disconnected if lock is brought into position "OPEN" beforehand.*

- Disconnect all electrical connections to relay panel.

Note:

- *The number of electrical connections depends on vehicle equipment.*

- Unclip Vehicle Electrical System Control Module J519 with relay panel from latches **- arrows C -** .

- Pull Vehicle Electrical System Control Module J519 with relay panel downward and out of bracket in opposite direction of travel.

Installing:

Install in reverse order of removal, noting the following:

Note:

- *Electrical connection locks can only be brought into position " CLOSE" when all connections are connected "correctly" .*

97 - 4

Electronics Boxes (E-Boxes)

E-Box in engine compartment - left, removing and installing

Note:

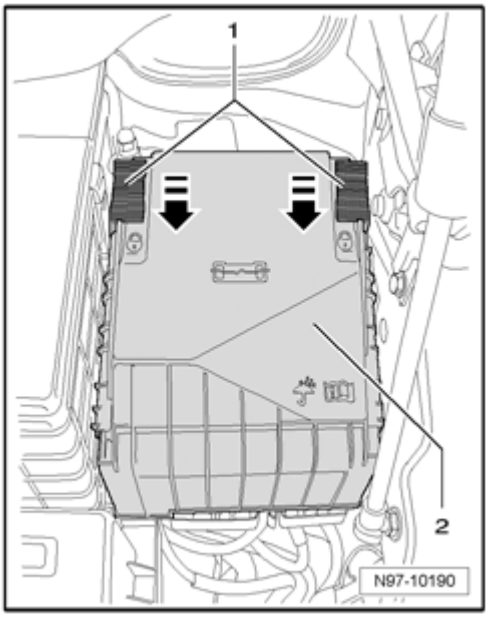
- *Depending on equipment, two different E-boxes are used: either "E-Box High" or "E-Box Low" . The following illustrations show "High" version. Removal and installation of "Low" version is the same.*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications as well as instructions on performing OBD program and electrical system function checks as specified in this Repair Manual ⇒ ***27-4, Battery, disconnecting and connecting*** ***.***

Removing:

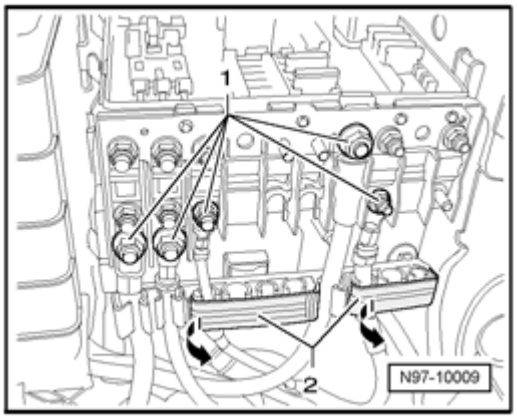
- Disconnect battery ⇒ 27-4, Battery, disconnecting and connecting .



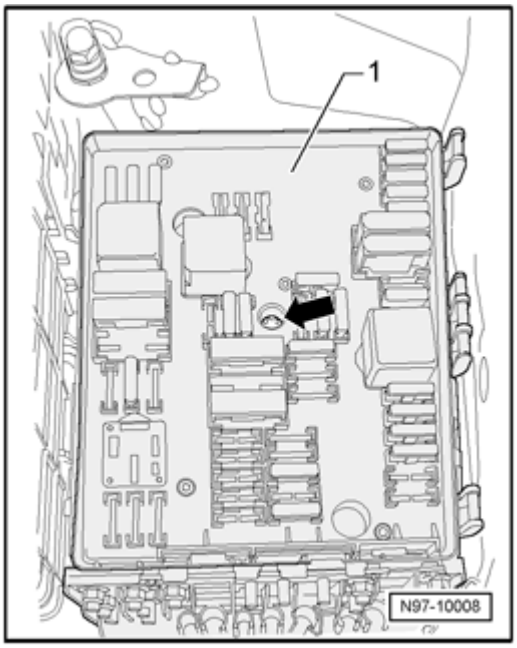
- Slide retainers **- 1 -** in direction of **- arrow -** and remove E-box cover **- 2 -** upward.

Note:

- *Mark location of cables connected to E-box.*



- Remove nuts **- 1 -** .
- Open **- arrows -** covers **- 2 -** for wire guides at E-box.
- Remove wires from connecting pins.
- Unclip wires from wire guides.



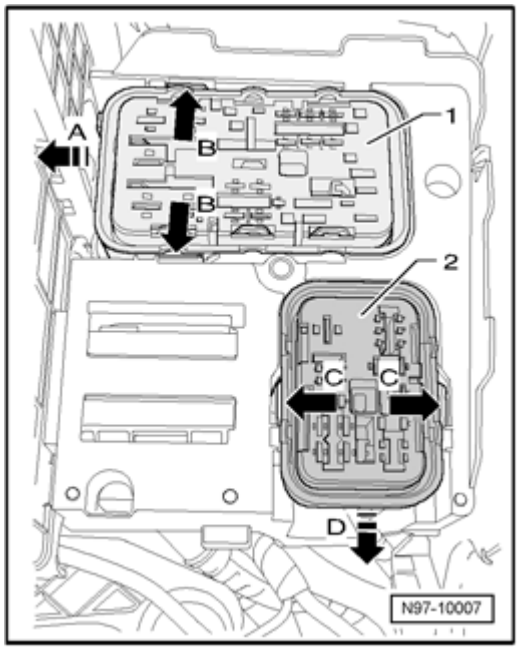
- Remove central screw **- arrow -** for E-box **- 1 -** .

Note:

- *Removing the central screw **- arrow -** presses off the E-box **- 1 -** upward from E-box bracket.*

- Remove E-box **- 1 -** upward from E-box bracket.

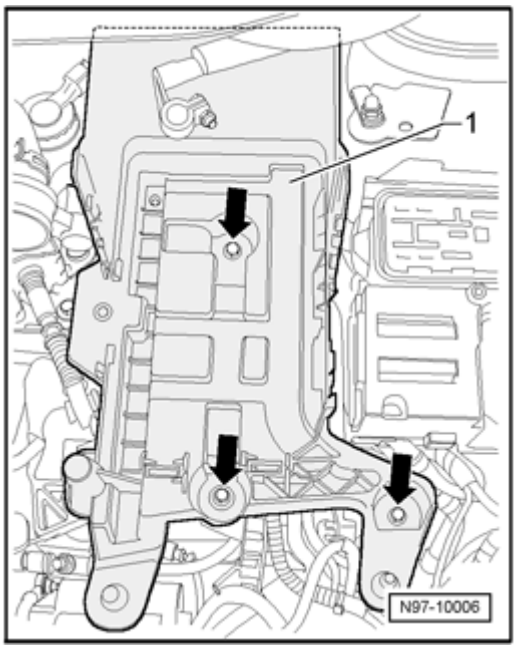
Note:



- *In order to remove flat terminal housing* ***- 1 -*** *, battery and battery console must be removed.*

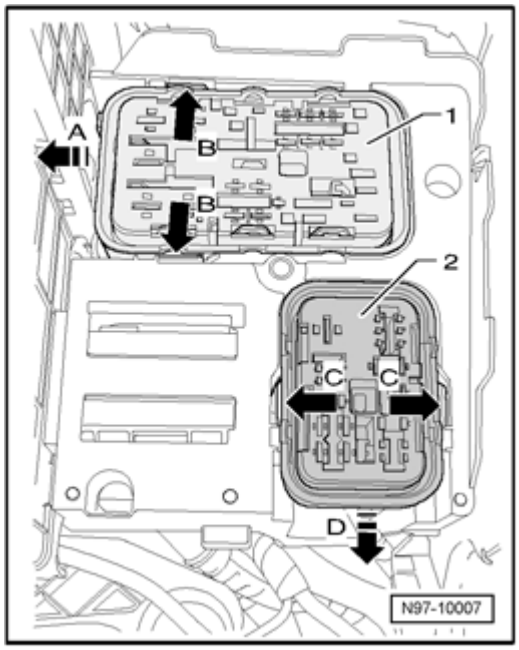
- If necessary, remove air filter housing.

- Remove battery ⇒ 27-5, Battery, removing and installing .



- Remove screws **- arrows -** for battery console **- 1 -** .

- Remove battery console **- 1 -** from vehicle.

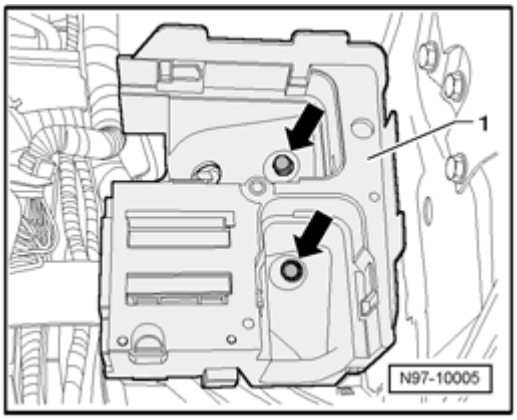


- Press straps on E-box bracket apart from each other **- arrows B -** and slide flat terminal housing **- 1 -** sideways **- arrow A -** from E-box bracket.

only vehicles with "High" E-box version:

- Press straps on E-box bracket apart from each other **- arrows C -** and slide flat terminal housing **- 2 -** toward front **- arrow D -** from E-box bracket.

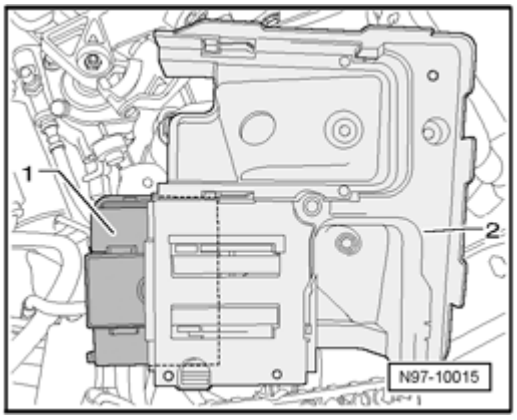
all vehicles:



- Remove nuts **- arrows -** of E-box bracket **- 1 -** .

Note:

- *Depending on vehicle equipment, an auxiliary relay panel may be installed.*



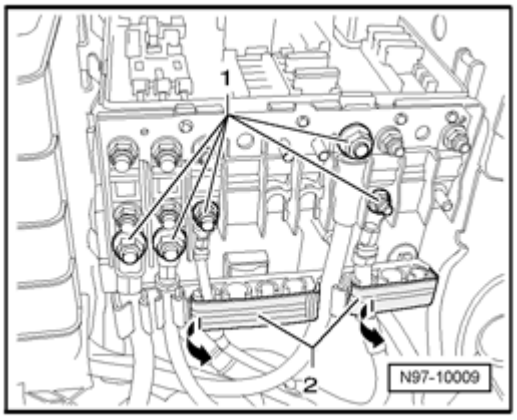
- Pull E-box bracket **- 1 -** upwards from studs as far as cable lengths permit.

- Unclip auxiliary relay carrier **- 1 -** sideways from E-box bracket **- 2 -** .

- Remove E-box bracket **- 2 -** from vehicle.

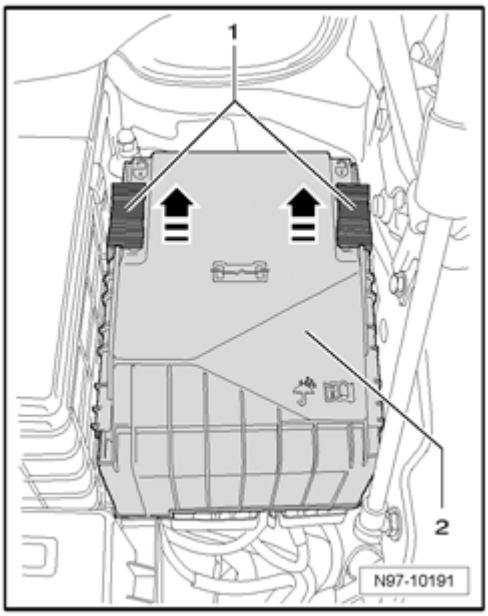
Installing:

Install in reverse order of removal, noting the following:



- Reconnect wires **- 1 -** to E-box in allocation marked during removal ⇒ *Electrical Wiring Diagrams, Troubleshooting and Component Locations binder* .

- Tighten all fasteners according to values in table ⇒ 97-6, E-Box in engine compartment, tightening torques .



- Place cover **- 2 -** onto E-box and slide retainers **- 1 -** in direction of **- arrow -** until engaged.

Note:

- *Always confirm E-Box cover **- 2 -** is correctly engaged.*

97 - 5

Control Modules

Vehicle Electrical System Control Module J519

Note:

- *The relay panel integrated with Vehicle Electrical System Control Module J519 is permanently attached and cannot be serviced separately.*

- *If Vehicle Electrical System Control Module J519 is to be replaced, the work procedure to read out the coding stored in the module must always be performed ⇒ 97-5, Vehicle Electrical System Control Module J519 , coding .*

General information:

Vehicle Electrical System Control Module J519 controls the function of the following components/systems:

- Electric load management
- Exterior light control
- Turn signal control
- Wipers, rear window
- Heated rear window
- Interior light control
- Shift-/selector gate illumination
- Terminal control
- Dimming, instrument illumination
- Fuel Pump (FP) supply

- Pre-energizing of generator
- Horn

The following functions can be adapted:

- Erase learned values and set standard adaptation values
- Adjust Coming Home Time (equipment dependent)
- Adjust Leaving Home Time (equipment dependent)
- Set rear window heater "on time"
- Switch footwell lights on and off
- Switch highway signaling on and off
- Set load management
- Set headlamp cleaning system "on time" ⇒ 97-5, Headlamp washer system, adaptation

Note:

- *Adaptations listed above are dependent on vehicle equipment level and market version.*
- *"Highway signaling" , "comfort-flashing" , or "tap signaling" means that turn signals are activated multiple times (1-5 times) when turn signal lever is tapped once (signal cycles).*
- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "VW 2006 GTI Introduction"*

⇒ *Wiring Diagrams and Component Locations*

On Board Diagnostic (OBD), functions:

Vehicle Electrical System Control Module J519 is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot Vehicle Electrical System Control Module J519 malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Vehicle Electrical System Control Module J519 , removing and installing

Note:

- *If Vehicle Electrical System Control Module J519 is to be replaced, the work procedure to read out the coding stored in the module must always be performed ⇒ 97-5, Vehicle Electrical System Control Module J519 , coding .*

Removing:

Remove relay panel integrated with Vehicle Electrical System Control Module J519 ⇒ 97-3, Relay panel integrated with Vehicle Electrical System Control Module J519 , removing and installing

Installing:

Install relay panel integrated with Vehicle Electrical System Control Module J519 ⇒ 97-3, Relay panel integrated with Vehicle Electrical System Control Module J519 , removing and installing

Vehicle Electrical System Control Module J519 , checking with Output Diagnostic Test Mode (DTM)

The function of many electrical components can be checked via output Diagnostic Test Mode (DTM) of Vehicle Electrical System Control Module J519 .

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27; 90-97)"

- Select "01 - Self-diagnosis"

- Select "Vehicle Electrical System Control Module"

- Select "Vehicle Electrical System Control Module functions"

- Select "J519 - output DTM, sequential (Repair Group 97)"

- Press ">" to confirm.

- Select "1 - Output Diagnostic Test Mode (DTM) for an individual component"

- Search and select appropriate light or switch component from menu, or

- Select "2 - Output Diagnostic Test Mode (DTM) for all actuators"

- Follow tester prompts

Vehicle Electrical System Control Module J519 , coding

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27; 90-97)"

- Select "01 - Self-diagnosis"

- Select "Vehicle Electrical System Control Module"

- Select "Vehicle Electrical System Control Module functions"

- Select "Coding"

- Press ">" to confirm.

- Follow tester prompts

Headlamp washer system, adaptation

The "active time" of headlamp washer system can be adjusted variably between 0 seconds and 12.75 seconds.

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27; 90-97)"

- Select "01 - Self-diagnosis"

- Select "Vehicle Electrical System Control Module"

- Select "Vehicle Electrical System Control Module functions"

- Select "Adapting headlamp washer system"

- Press ">" to confirm.

- Follow tester prompts

Data Bus On Board Diagnostic Interface J533

General information:

The Data Bus On Board Diagnostic Interface J533 "Gateway" is no longer integrated with the instrument cluster. It is now a separate control module.

"J533" performs the following functions:

- Performs data exchange between CAN-Bus systems "CAN-Bus powertrain" , "CAN-Bus comfort" and "CAN-Bus Infotainment"

- Transfers diagnostic data of CAN-Bus systems onto K-wire and vice-versa, allowing data from Vehicle Diagnosis, Testing and Information System VAS 5051/5052 to be utilized

Note:

- *If Data Bus On Board Diagnostic Interface J533 is to be removed, the work procedure to read out the coding stored in the module must always be performed* ⇒ *97-5, Data Bus On Board Diagnostic Interface J533 , replacing* .

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "VW 2006 GTI Introduction"*

⇒ *Wiring Diagrams and Component Locations*

On Board Diagnostic (OBD), functions:

Data Bus On Board Diagnostic Interface J533 is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot Data Bus On Board Diagnostic Interface J533 malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Data Bus On Board Diagnostic Interface J533 , replacing

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27;

90-97)"

- Select "01 - Self-diagnosis"
- Select "Diagnostic interface for databus"
- Select "Functions"
- Select "Diagnostic interface for databus, replacing"
- Press ">" to confirm.
- Follow tester prompts

Data Bus On Board Diagnostic Interface J533 , removing and installing

Note:

- *Before removing Data Bus On Board Diagnostic Interface J533 , the work procedure to read out the coding stored in the module must always be performed ⇒ 97-5, Data Bus On Board Diagnostic Interface J533 , replacing .*

Removing:

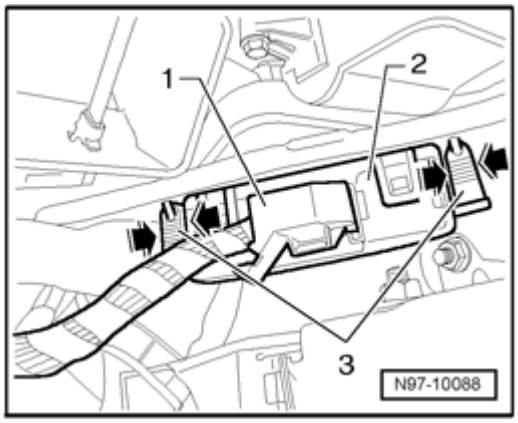
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

- Remove drivers footwell cover

⇒ *Repair Manual, Body Interior, Repair Group 68,*

.



- Disengage electrical connection lock **- 1 -** and disconnect from Data Bus On Board Diagnostic Interface J533 **- 2 -** .

- Press mounting pins **- 3 -** together **- arrows -** and from holes.

Installing:

Install in reverse order of removal.

Comfort System Central Control Module J393

General information:

Comfort System Central Control Module J393 performs the following functions:

- Sunroof control (issues enabling)
- Window regulator control (issues enabling)
- Central locking system control
- Anti-theft warning system control
- Radio receiver
- Rear lid closing
- Comfort operation

Some of the functions listed above can be adapted ⇒ 97-5, Comfort System Central Control Module J393 , adapting .

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "VW 2006 GTI Introduction"*

⇒ *Wiring Diagrams and Component Locations*

On Board Diagnostic (OBD), functions:

Comfort System Central Control Module J393 is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot Comfort System Central Control Module J393 malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Comfort System Central Control Module J393 , removing and installing

Removing:

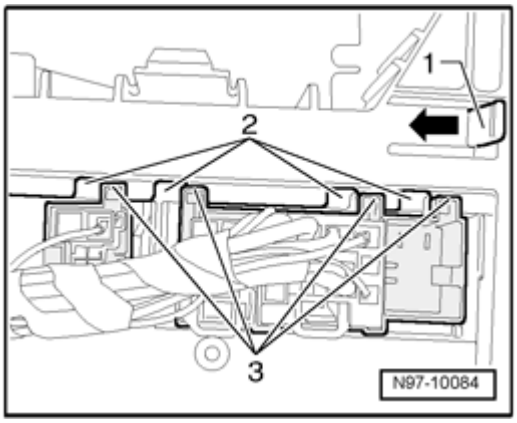
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

- Remove glove compartment

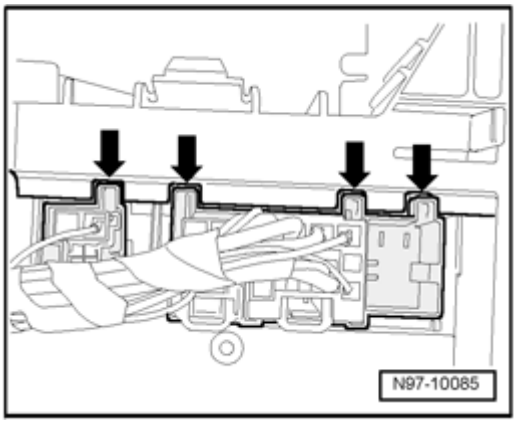
⇒ *Repair Manual, Body Interior, Repair Group 68, storage compartments, covers and panels; removing and installing glove compartment*

.



- Pull retaining tab **- 1 -** of bracket of Comfort System Central Control Module J393 in direction of **- arrow -** and slide Comfort System Central Control Module J393 until recesses **- 2 -** stand over recesses **- 3 -** .

Note:

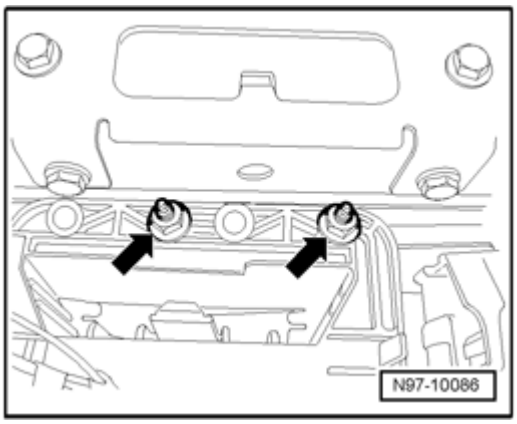


- *Electrical connections can only be disengaged and disconnected when recesses **- arrows -** are lined up.*

- Release and disconnect electrical connections from Comfort System Central Control Module J393 .

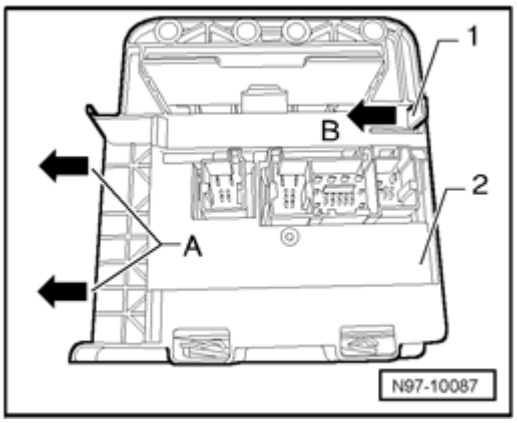
Note:

- *The number of electrical connections depends on vehicle equipment level and market version.*



- Remove nuts **- arrows -** .

- Remove bracket with Comfort System Central Control Module J393 .



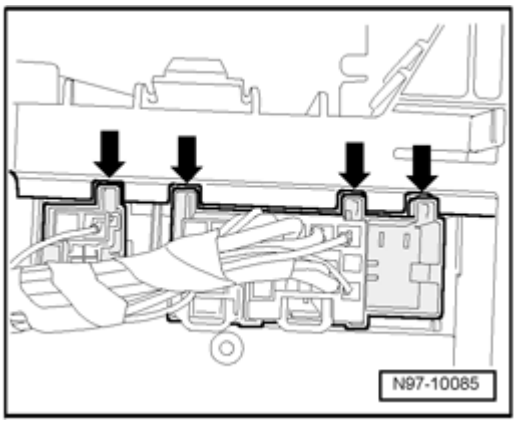
- Pull retaining tab **- 1 -** in direction of **- arrow B -** and slide module **- 2 -** from bracket in direction of **- arrow A -** .

Installing:

Install in reverse order of removal, noting the following:

Note:

- *After installing a new Comfort System Central Control Module, it must be coded ⇒ 97-5, Comfort System Central Control Module J393 , coding .*



- *Electrical connections can only be disengaged and disconnected when recesses **- arrows -** are lined up.*

Comfort System Central Control Module J393 , coding

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Repair work int/ext (Repair Group 01; from 55 to 77)"

- Select "01 - Self-diagnosis"

- Select "46 - Central module comfort system"

- Select "Functions"

- Select "Coding"

- Press ">" to confirm.

- Follow tester prompts

Comfort System Central Control Module J393 , adapting

The following functions can be adapted (depending on vehicle equipment):

- Activating and deactivating "single door opening"
- Activating and deactivating "automatic locking at >15 Km/h"
- Activating and deactivating "automatic unlocking when removing ignition key"
- Activating and deactivating "country setting for intelligent alarm horn"
- Activating and deactivating "battery monitoring (sounder)"
- Activating and deactivating "comfort operation via radio-frequency remote control"
- Activating and deactivating "anti-theft warning system - alarm delay when opening driver door"

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Repair work int/ext (Repair Group 01; from 55 to 77)"

- Select "01 - Self-diagnosis"

- Select "46 - Central module comfort system"

- Select "Functions"

- Select "Adaptation"

- Press ">" to confirm.

- Follow tester prompts

Comfort System Central Control Module J393 Anti-theft alarm system, checking alarm sources

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051/5052 ⇒ 97-1, VAS 5051 / 5052 .

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Use "Go to" button to select "Function / Component Selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Repair work int/ext (Repair Group 01; from 55 to 77)"

- Select "01 - Self-diagnosis"

- Select "46 - Central module comfort system"

- Select "Functions"

- Select "Comfort System Central Control Module J393, checking alarm sources of anti-theft alarm system"

- Press ">" to confirm.

- Follow tester prompts

Garage Door Opener Control Module J530

Garage Door Opener Control Module J530 , removing and installing

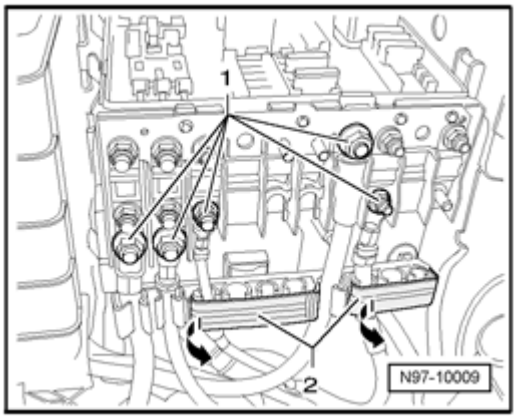
- Garage Door Opener Control Module J530 , removing and installing ⇒ 96-7, Garage Door Opener Control Head E284 , removing and installing

Checking Garage Door Opener Control Module J530

Information not available at time of publication

97 - 6

Wiring, tightening torques



E-Box in engine compartment, tightening torques

Fastener / location		Tightening torques
E-Box / nuts **- 1 -**	M5 (8 mm)	4 Nm
E-Box / nuts **- 1 -**	M6 (10 mm)	6 Nm
E-box central screw on bracket		9 Nm

97 - 7

Wiring Harness and Connectors, repairing

Safety measures

Caution!

Before beginning repairs on the electrical system:

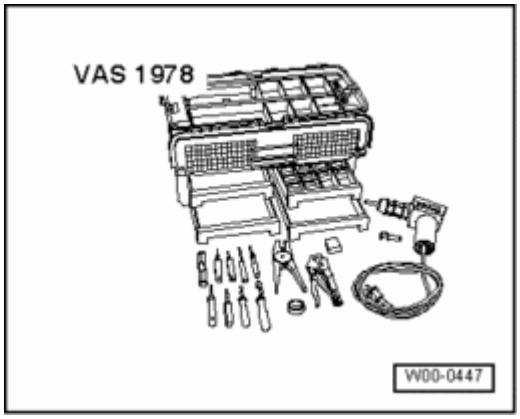
- ***Where applicable, obtain the anti-theft radio security code .***
- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***Disconnect negative (-) battery terminal.***
- ***When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in this Repair Manual ⇒ 27-4, Battery, disconnecting and connecting . Not adhering to proper disconnection sequence will result in the deactivation of Main Battery Switch -E74- and subsequent damage to electrical system components.***

Caution!

- ***Airbag and safety belt tensioner harness and connector repairs must only be performed using VAS 1978 Wiring Harness Repair Kit ⇒ VAS 1978 Instruction Manual .***
- ***Airbag and safety belt tensioner harness and connector repairs must only be performed using applicable wires, connectors and terminals ⇒ Parts Catalog .***

Wiring harness repair kit

Wiring Harness Repair Kit VAS1978



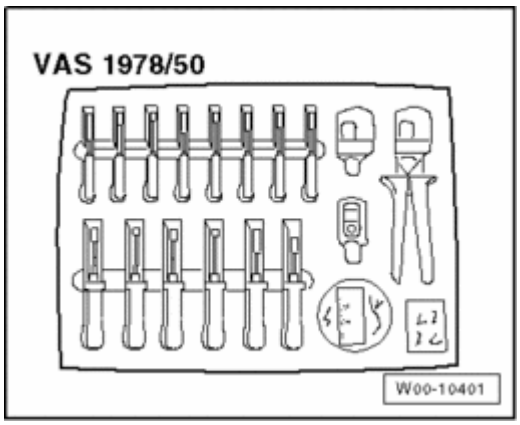
Wiring Harness Repair Kit VAS1978 makes optimal repair quality possible within vehicle electronics. Using the tools, repairs affecting harness connectors and breaks in wiring can be performed. For this purpose, complete repair wires with terminals already crimped on are used and can be connected to vehicle-specific wiring harness by the use of crimp connections. A pair of crimping pliers with three different crimp slots and a hot air gun for shrinking the crimp connections provide trouble-free electrical connection.

Note:

- *For additional information:*

⇒ *Users instructions of Wiring Harness Repair Kit VAS1978*

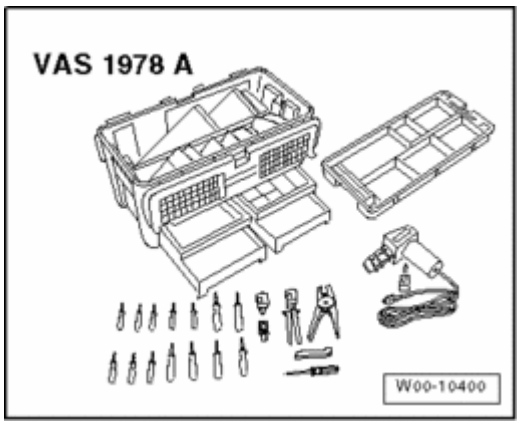
Upgrade kit VAS 1978/50 (where applicable)



Upgrade kit VAS 1978/50 is required to bring the "old" Wiring Harness Repair Kit VAS1978 up to the new standard of Wiring Harness Repair Set VAS1978A . The upgrade kit contains 4 assembly- and 10 release tools as well as new crimp pliers for crimp connections with exchangeable heads for 0.35 mm - 2.5 mm VAS 1978/1-1 , 4.0 mm - 6.0 mm VAS 1978/2A and changeable head for JPT VAS 1978/9-1 . Furthermore it contains new

stickers, a new set of user instructions, crimp connections for 0.35mm ^{2} -wire cross sections and a roll of black felt adhesive tape.

Wiring Harness Repair Set VAS1978A



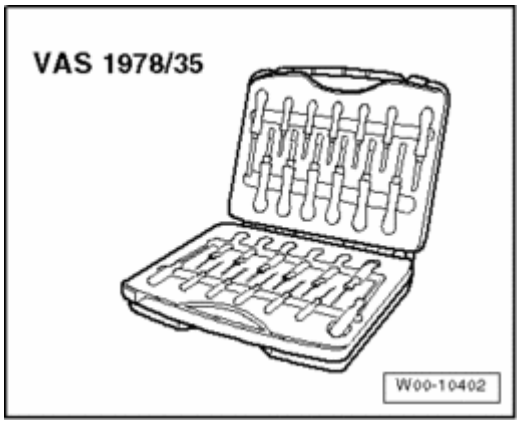
The new Wiring Harness Repair Set VAS1978A makes optimal repair quality possible within vehicle electronics. Using the new pliers, repairs affecting harness connectors and breaks in wiring can be performed. For this purpose, complete repair wires with terminals already crimped on are used and can be connected to vehicle-specific wiring harness by the use of the four different types of crimp connections. A pair of new crimping pliers with exchangeable heads and a hot air gun for shrinking the crimp connections provide trouble-free electrical connection.

Note:

- *For additional information:*

⇒ *Users instructions of Wiring Harness Repair Set VAS1978A*

Release Tool Set VAS1978/35



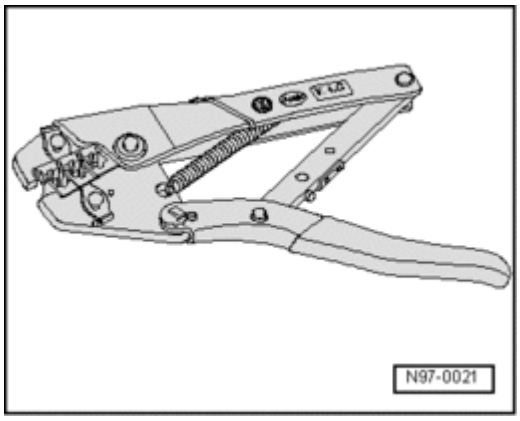
The Release Tool Set VAS1978/35 is used to release the

various primary and secondary locking mechanisms on VW-group vehicles. The set consists of 26 different tools which can be used to professionally release or assemble e.g. round connector systems, flat terminals with one or two locks as well as single wire seals.

The application of the correct release tools to the respective locks can be found in the table in ⇒ *users instructions for Release Tool Set VAS1978/35* .

Tool descriptions

Crimp pliers with insert



The Crimping Pliers Without Insert VAS1978/1 , with Insert For Crimping Pliers VAS1978/2 , is a component of Wiring Harness Repair Kit VAS1978 and is used to crimp the crimp connection during wiring harness repair.

Crimp connection color	Crimp slot color	Wire cross-section
yellow	yellow	0.35 mm^2
red	red	0.5 mm^2 - 1.0 mm^2
blue	blue	1.5 mm^2 - 2.5 mm^2
yellow	yellow	4.0 mm^2 - 6.0 mm^2

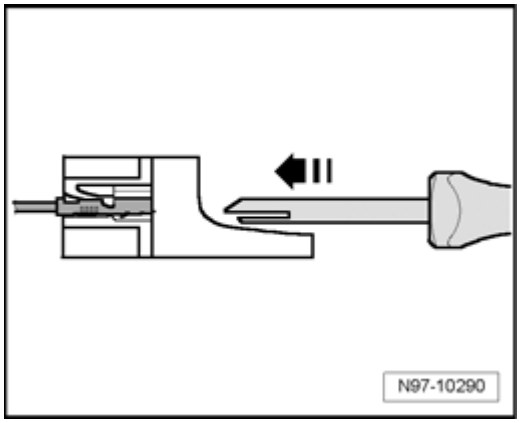
Note:

- *Crimping pliers (base tool) VAS 1978/1-2 in conjunction with exchangeable heads VAS 1978/1-1 or VAS 1978/2A can also be used to crimp the connections as an alternative ⇒ 97-7, Crimp pliers VAS 1978/1A (where applicable) .*

- *Always be sure to use the correct crimp slot for the crimp connection used.*

- *Do not crimp wire insulation.*

Release tools for terminals



Various release tools are used to remove the different terminals from terminal housings without damage.

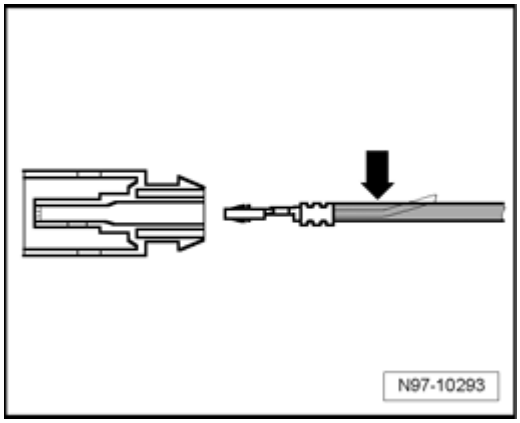
A selection of release tools are a component of Wiring Harness Repair Kit VAS1978 and of Wiring Harness Repair Set VAS1978A . Release Tool Set VAS1978/35 contains the entire set of release tools ⇒ 97-7, Release Tool Set VAS1978/35 .

Warning!

Some tools are supplied with a tool safety clip, which is slid over the tool points after using the tool, in order to protect other workers from injuries and tool points from damage.

Releasing and disassembling terminal housings ⇒ 97-7, Terminal housings, releasing and disassembling .

Assembly tools for single wire seals

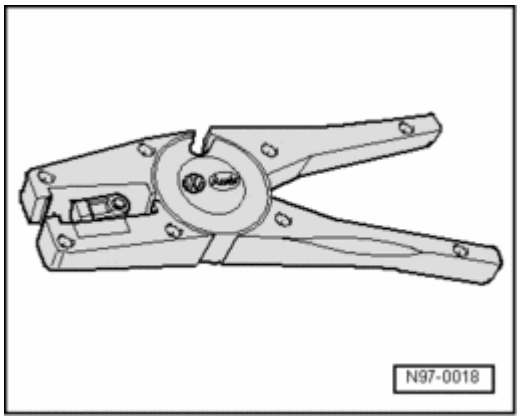


Assembly tools allow single wire seals to be slid into terminal housing up to stop without damage, this achieves a complete seal between single wire and terminal housing.

Four assembly tools for single wire seals are components of Wiring Harness Repair Kit VAS1978 and of Wiring Harness Repair Set VAS1978A .

Assembly of single wire seals ⇒ 97-7, Assembly of single wire seals .

Wire Stripper VAS1978/3



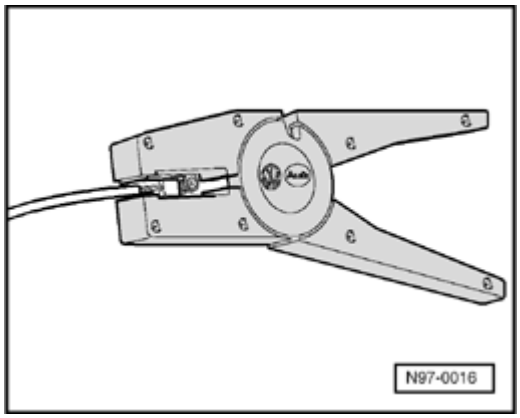
Wire Stripper VAS1978/3 is used for professional stripping and cutting of wires.

Wire Stripper VAS1978/3 is a component of Wiring Harness Repair Kit VAS1978 and of Wiring Harness Repair Set VAS1978A .

Wire stripper has an adjustable stop in its pliers-jaws which can be set to the desired length of wire insulation to be removed.

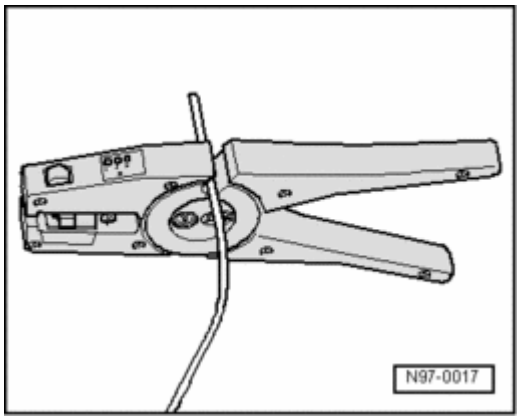
Stripping:

- Set the slideable stop in pliers-jaws to the desired length dimension to be stripped.

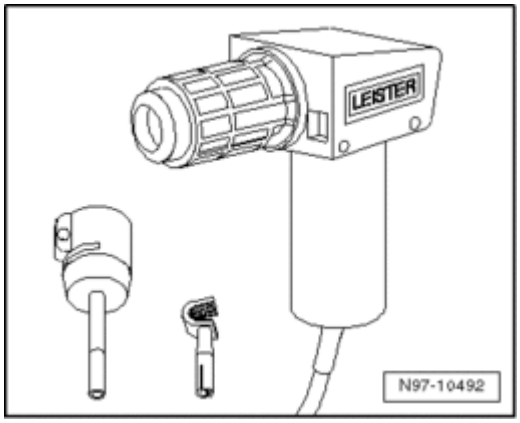


- Insert wire end from front up to stop into jaws of pliers and squeeze the pliers completely.

- Open pliers again and remove the stripped wire end.



- If necessary, cut wires using side-cutter function on the top of the wire stripper.



Hot Air Gun VAS1978/14

Caution!

When heat-shrinking crimp connections, do not damage any other wiring, plastic parts or insulating material with the hot air gun nozzle.

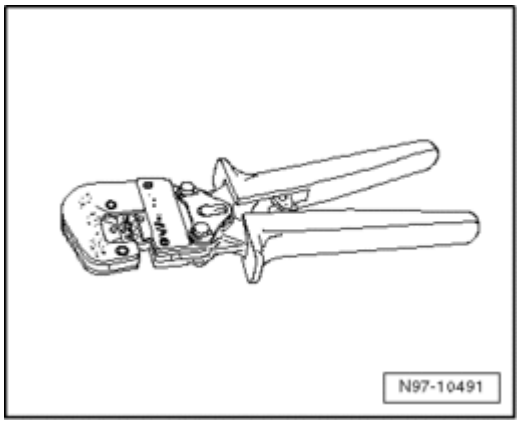
Always observe operating instructions of heat gun.

Hot Air Gun VAS1978/14 is used in conjunction with Shrink Tip For Hot Air Gun VAS 1978/15 to heat-shrink the crimp connections. After crimping, heat-shrink crimp connections using hot air gun to prevent moisture penetration.

Hot Air Gun VAS1978/14 is a component of Wiring Harness Repair Kit VAS1978 and of Wiring Harness Repair Set VAS1978A .

Heat-shrinking crimp connections using Hot Air Gun VAS1978/14 ⇒ 97-7, Wire break with single repair point , or ⇒ 97-7, Wire break with dual repair point .

Crimp pliers VAS 1978/1A (where applicable)



Crimp pliers VAS 1978/1A or crimp pliers (basic tool) VAS 1978/1-2 together with exchangeable head 0.35 - 2.5mm/2 VAS 1978/1-1 or exchangeable head 4.0 - 6.0mm/2 VAS 1978/2A from wiring harness repair kit is used to compress the crimp connections.

Compressing crimp connections using crimp pliers VAS 1978/1A ⇒ 97-7, Wire break with dual repair point .

The following exchangeable heads can be obtained for crimp pliers (basic tool) VAS 1978/1-2 :

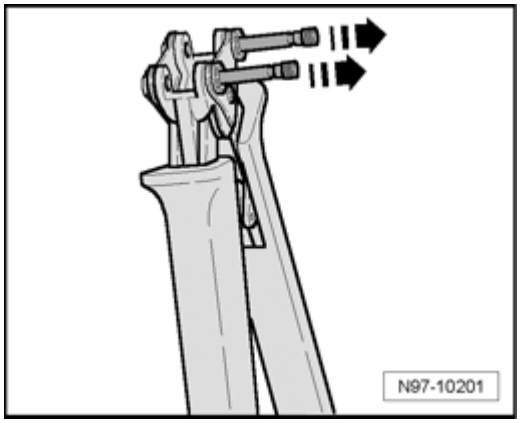
- Exchangeable head 0.35 mm ^{2} - 2.5 mm ^{2} VAS 1978/1-1
- Exchangeable head 4.0 mm ^{2} - 6.0 mm ^{2} VAS 1978/2A
- Exchangeable head for JPT-terminal VAS 1978/9-1

In conjunction with exchangeable head for JPT-terminal VAS 1978/9-1 , crimp pliers is used to crimp on terminals on to individual wires when repairing wiring cross-sections up to 0.35 mm ^{2} ⇒ 97-7, Repairing wires with a cross-section up to 0.35 mm 2 .

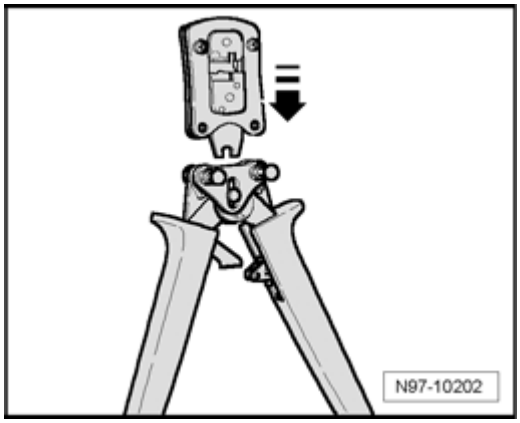
Use crimp pliers in conjunction with exchangeable head for JPT-terminal VAS 1978/9-1 to crimp terminals on to individual wires when repairing wiring cross-sections up to 0.35 mm ^{2} ⇒ 97-7, Repairing wires with a cross-section up to 0.35 mm 2 .

Changing exchangeable head:

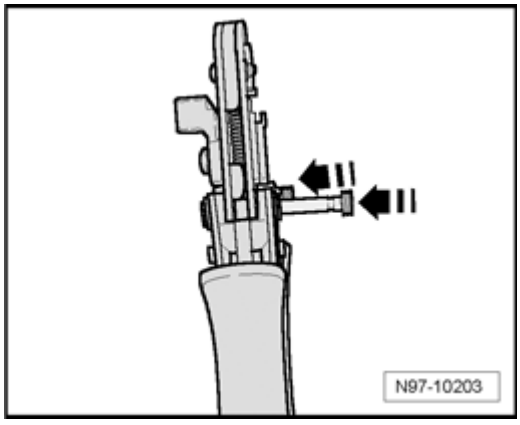
- Open crimp pliers completely.



- Disengage both locking pins **- arrows -** from crimp pliers basic tool.



- Insert the required exchangeable head in crimp pliers basic tool from above **- arrow -** .



- Lock exchangeable head into crimp pliers basic tool by pressing in the pins **- arrows -** .

Electrical system, general repair measures

Caution!

When disconnecting and connecting battery, the procedure must be followed as described in the Repair Manual ⇒ ***27-4, Battery, disconnecting and***

***connecting* .**

Always refer to and heed CAUTION! and WARNING! texts associated with repair and/or removal and installation information in the Repair Manual.

Only the yellow repair cables and insulation tape supplied with VAS 1978 are to be used for wiring/connector repairs. The use of yellow repair wires and yellow insulation tape identifies that a repair has taken place ⇒ VAS 1978 Instruction Manual .

Before beginning wiring and connector repairs, determine and rectify the cause of damage, Eg.: pinched between metal parts, malfunctioning electrical consumers, corrosion due to water ingress etc.

Avoid loosening or removing any individual ground connections (potential for corrosion).

When repairs are completed, always perform a functional check of the component or system. Where applicable, check and erase Diagnostic Trouble Codes (DTCs) and set basic settings where applicable according to Repair Manual and/or VAS 5051/5052.

Warning!

Some tools are supplied with a tool safety clip, which is slid over the tool points after using the tool, in order to protect other workers from injuries and tool points from damage.

- Observe the current information in the corresponding Repair Manual for all repairs.
- Observe country-specific laws.
- Before working on electrical system, disconnect battery Ground (GND) strap.
- By disconnecting battery Ground (GND) strap (current disruption), safe work on the electrical system is guaranteed. It is necessary to disconnect battery positive wire only when removing the battery.
- Further information, e.g. installing and removing individual components, can be found in the appropriate Repair Manual.

- For repairs to vehicle electrical system, soldering is not permitted.
- Only perform wiring harness and connector repairs to vehicle electrical system using Wiring Harness Repair Kit VAS1978 or Wiring Harness Repair Set VAS1978A .
- Wiring harness repairs may only be carried out using yellow wires.
- Wiring harness repairs may not be performed again in the wrapping of the vehicle-specific wiring harness and are to be marked with yellow adhesive tape.
- These yellow wires and every location on wiring harness wrapped in yellow insulating tape indicates a previous repair.
- Crimp connections must never be repaired. If necessary, lay a wire parallel to the faulty wire.
- After crimping, heat-shrink crimp connections using hot air gun to prevent moisture penetration.
- Always observe also the supplementary notes for repairing wiring harnesses on airbag- and seat belt tensioner systems, fiber optic cables, CAN-Bus wires, antenna wires and wire cross-sections up to 0.35 mm ^{2} ⇒ 97-7, Notes for wiring harness repairs .
- Perform a function test after every repair. If necessary, check DTC memory, erase and/or bring systems into basic setting.
- If possible, do not loosen Ground (GND) straps from body (danger of corrosion).

Wiring harnesses, repairing

Note:

- *Observe general notes for repairs on the vehicle*

electrical system ⇒ 97-7, Electrical system, general repair measures .

- *Not all the wire cross-sections installed in the vehicle are contained in the Wiring Harness Repair Kit VAS1978 or Wiring Harness Repair Set VAS1978A . If the wire cross-section required is not present, use the next greater cross-section.*

Caution!

- ***Note specific CAN-Bus wiring repair measures ⇒ 97-7, Repairing CAN-Bus wires .***
- ***Note specific primary and secondary terminal and connector repair measures ⇒ 97-7, Terminal housings, releasing and disassembling***
- ***Soldering is not permitted!***
- ***Do not repair welded connections in the wiring harness. Fabricate and connect an appropriate overlay harness instead.***
- ***Wiring harness and connector repairs must only be performed using VAS 1978 Wiring Harness Repair Kit ⇒ VAS 1978 Instruction Manual .***
- ***Only the yellow repair cables and insulation tape supplied with VAS 1978 are to be used for wiring/connector repairs. The use of yellow repair wires and yellow insulation tape identifies that a repair has taken place.***
- ***All shielded wiring (Eg.: knock sensors, antenna etc.) are Not to be repaired! Replace complete wiring harnesses as necessary.***

Notes for wiring harness repairs

Note:

- *Wiring harness and connector repairs to vehicle electrical system must only be performed using Wiring Harness Repair Kit VAS1978 or Wiring Harness Repair Set VAS1978A .*

- *For repairs to vehicle electrical system, soldering is not permitted.*
- *Wiring harness repairs may only be performed using yellow wires.*
- *Wiring harness repairs may not be performed again in the wrapping of the vehicle-specific wiring harness and are to be marked with yellow adhesive tape.*
- *These yellow wires and every location on wiring harness wrapped in yellow insulating tape indicates a previous repair.*
- *Crimp connections must never be repaired. If necessary, lay a wire parallel to the faulty wire.*
- *After crimping, heat-shrink crimp connections using hot air gun to prevent moisture penetration.*
- *Shielded wires must not be repaired. Replace completely if damaged.*
- *Heat-resistant wires have been installed in the vehicle at various locations, mainly in the engine compartment. Heat-resistant wires can be recognized by their somewhat duller and softer insulation. Only heat-resistant wires may be used to repair these wires.*
- *Always observe also the supplementary notes for repairing wiring harnesses on airbag- and seat belt tensioner systems, fiber optic cables, CAN-Bus wires, antenna wires and wires with cross-sections up to 0.35 mm ^{2} .*

Supplemental information for repairing airbag- and seat belt tensioner wires ⇒ 97-7, Repairing airbag- and seat belt tensioner wires

Supplemental information for repairing fiber optic cables ⇒ 97-7, Fiber-optic cables

Supplemental information for repairing CAN-Bus wires ⇒

97-7, Repairing CAN-Bus wires

Supplemental information for replacing antenna wires ⇒ 97-7, Replacing antenna wires

Supplemental information for repairing wires with a cross-section up to 0.35 mm ^{2} ⇒ 97-7, Repairing wires with a cross-section up to 0.35 mm 2

Repairing airbag- and seat belt tensioner wires

In addition to the general repairs on wiring harnesses, observe the following methods and instructions for repairs on airbag- and seat belt tensioner wires:

Warning!

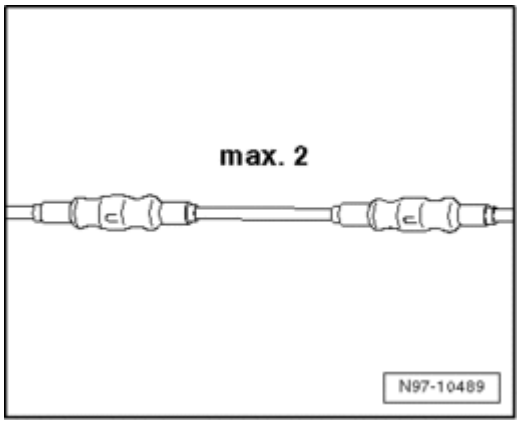
- ***Airbag and seat belt tensioner can fail.***
- ***Faulty repairs performed on airbag and seat belt tensioner system can lead to malfunction in passenger protection.***
- ***When performing repairs on airbag and seat belt tensioner wiring harness, use only terminals, connectors and wires designated for it ⇒ Parts Catalog (ETKA) .***

Note:

- *Only use Wiring Harness Repair Kit VAS1978 or Wiring Harness Repair Set VAS1978A to repair wires of airbag- and seat belt tensioner wiring harness.*
- *Pay attention to stickers designating high voltage components. When performing repairs, residual voltage must be discharged*

⇒ Repair Manual, Body Interior, Repair Group 69, Passenger protection

.

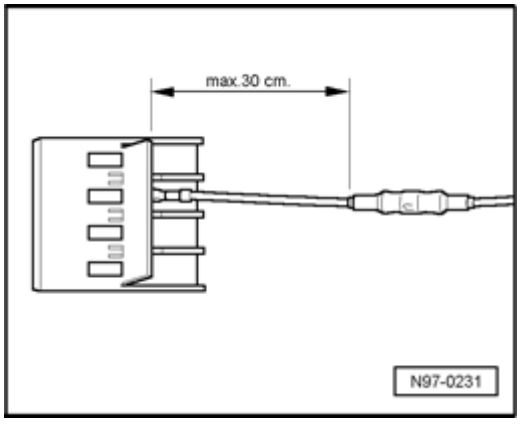


- *A maximum of two repair points may be performed when repairing wires of airbag- and seat belt tensioner system. Repair points increase the electrical resistance in the wire and may trigger malfunctions in the system On Board Diagnostic (OBD).*

- *When repairing wiring harness of airbag- and seat belt tensioner system, always heat-shrink crimp connections to prevent corrosion.*

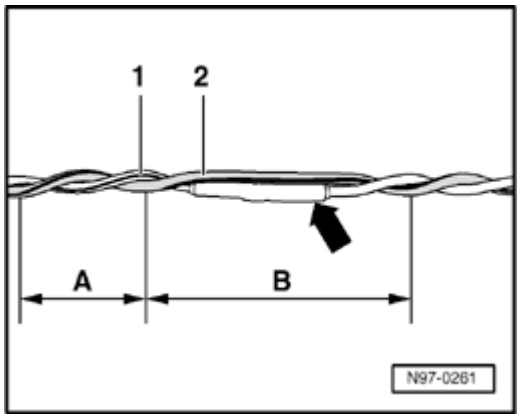
- *Wiring harness repairs may only be performed using yellow wires.*

- *Do not wrap the repair point again into the vehicle-specific wiring harness and mark the repair point quite visibly with yellow insulating tape.*



- *Repairs in the area of the airbag or seat belt tensioner should be performed a maximum of 30 cm from the next terminal housing. Together with the identification via yellow insulating tape, this procedure makes it possible to obtain a quick overview of previously performed repairs.*

- *Wires to the deploying units (airbags) have a wire-twisting with a length of lay of 20 mm ± 5 in series production. This length of lay is guaranteed via the norm part numbers for wire pairs in series production and must be observed strictly for the repair lengths of twisted wires.*



- *During repair work, wires to deploying units (airbags) must have the same length. When twisting together wires **- 1 -** and **- 2 -** , observe strictly the length of lay of A=20 mm ± 5.*

- *While doing this, no section of the wire, e.g. in area of welded connectors **- arrow -** , may be greater than B = 100 mm without twisting of the wires.*

Fiber-optic cables

Caution!

Fiber-optic cables on Volkswagen vehicles are not to be repaired. In the event of malfunction, the complete fiber-optic cable must be replaced. In this regard, observe the following measures:

- ***Fiber optic cables are not to be kinked or excessively bent (bending radius must not exceed 25mm).***

- ***Fiber-optic cable must not be routed over sharp edges.***

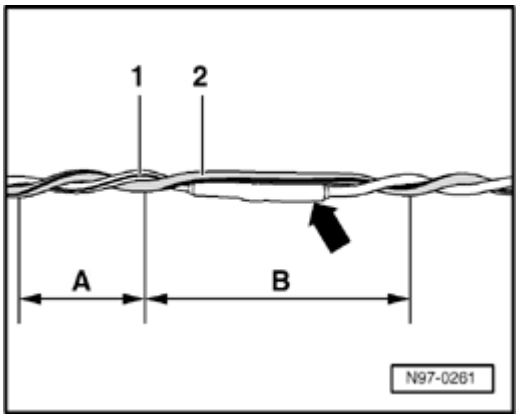
- ***End pieces (lenses) must be kept free from contaminants, fingerprints etc.***

- ***Fiber-optic cables must not be heated.***

- ***A pair of fiber-optic cables must not be twisted together, nor should a single fiber-optic cable be twisted together with a copper wire conductor.***

-

Repairing CAN-Bus wires



- Use an unshielded two-strand wire **- 1 -** and **- 2 -** with a cross-section of 0.35 mm ^{2} or 0.5 mm ^{2} as a CAN-Bus wire.

- Refer to the following table for color coding of CAN-Bus wires:

Powertrain CAN-Bus, High	orange/black
Convenience CAN-Bus, High	orange/green
Infotainment CAN-Bus, High	orange/violet
CAN-Bus, Low (all)	orange/brown

Caution!

- ***Perform wiring harness repairs only with yellow wires from VAS 1978 Wiring Harness Repair Kit. Mark repair locations with yellow tape.***

- ***Both bus wires must be the same length. When both wires - 1 - and - 2 - are twisted, length - A - = 20 mm must be maintained for the twist.***

- ***No part of the bus wiring in the vicinity of heat-***

shrink sleeves - arrow - , may be greater than - B - = 50 mm without the wires being twisted.

- Repairs on CAN-Bus wires can be performed with repair wire with matching cross section and also with twisted wires "green/yellow" or "white/yellow" from ⇒ *Replacement parts catalog (ETKA)* .

- Wrap repair points with yellow adhesive tape to signify a repair.

Replacing antenna wires

A new repair concept has been developed for repairing antenna wires. Instead of a complete antenna wire, connecting wires of different lengths and various adapter leads are now available as replacement parts.

General information:

- If a repair is necessary, antenna wires may not be repaired, but rather are to be replaced with genuine replacement parts, such as connecting wires and adapter leads.

- Replacement parts can be found in ⇒ *Parts Catalog (ETKA): Special catalog; electrical connections; original accessories; subgroup 35 as of illustration no. 035-20* .

- These genuine replacement parts are suitable for all antenna wires and wire cross sections, that require replacement.

- Connector housing for antenna wires can be obtained as a replacement part only in one color, but can be used for all antenna connector colors.

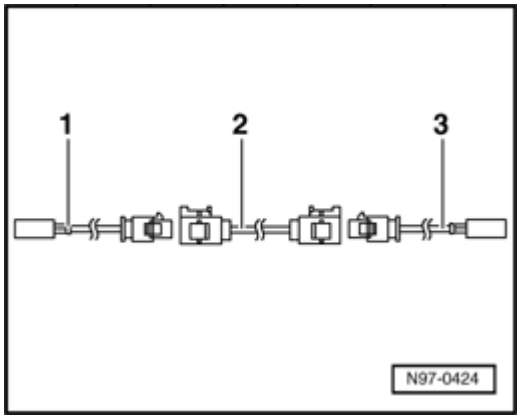
- The replacement of individual antenna connectors during repair work is not intended.

- The wires are appropriate for use on all VW models with equipped antenna wiring cross-sections.

- All adapter leads and connecting wires are suitable

for various transmission and reception signals.

- This repair concept can also be used for testing or as an aftermarket solution.



Assembly overview of antenna wire:

Example: Antenna wire from radio to antenna is faulty. For the repair, the following wires are required:

- Adapter lead, for connecting to radio. Length approx. 30 cm.
- Connecting wire, available in various lengths.
- Adapter lead, for connecting to antenna. Length approx. 30 cm.

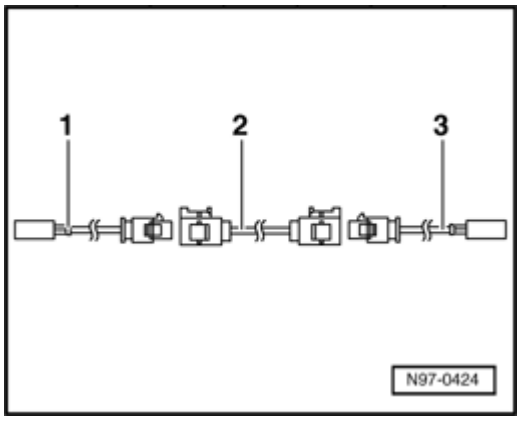
Installation of a new antenna wire:

Note:

- *Make sure that the total length of antenna wire can be divided into partial lengths through control modules for antenna selection, control modules for traffic monitoring or antenna amplifier. Replace only the respective faulty partial section.*

- Disconnect electrical connections of the faulty antenna wiring from their components.

- Determine the path of the faulty antenna wire in the vehicle and measure the total length of antenna wire to be replaced.



The entire length of the antenna wire consists of the length of the required adapter leads **- 1 -** and **- 3 -** as well as the connecting wire **- 2 -** .

- Subtract 60 cm from the total length calculation for an antenna wire to provide for the required length of connecting wire **- 2 -** to be installed.

- Obtain the required adapter leads **- 1 -** and **- 3 -** as well as the calculated length of connecting wire **- 2 -** as genuine replacement part according to Parts Catalog.

- Cut off harness connectors of faulty antenna wire.

The rest of the faulty antenna wire remains in vehicle.

- Connect adapter leads **- 1 -** and **- 3 -** to modules in vehicle.

- Route and secure connecting wire **- 2 -** parallel to the old antenna wire.

Note:

- *Antenna wires must not be kinked or excessively bent! Bending radius must never be below 50 mm.*

- Connect connecting wire with adapter leads.

- Perform a function test.

Repairing wires with a cross-section up to 0.35 mm ^{2}

When repairing wires with a cross-section up to 0.35 mm ^{2} , new terminals must always be crimped on using crimp pliers for JPT-terminals VAS 1978/9A , or crimp pliers (basic tool) VAS 1978/1-2 with mounted exchangeable head for JPT terminal VAS 1978/9-1 . Due to the low current strengths of these wires in the micro- to milli-range, terminals incorrectly crimped on lead to continuity resistances and cause malfunctions or failure of the

respective system. The most frequent applications of these terminals are:

- Oxygen sensor
- Speed (RPM) sensor
- Mass Air Flow (MAF) sensor

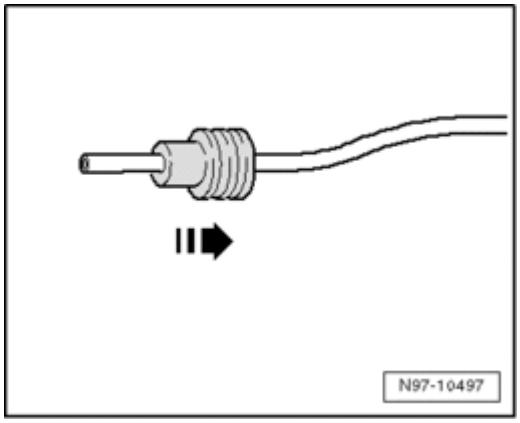
By using crimp pliers for JPT-terminals VAS 1978/9A or crimp pliers (basic tool) VAS 1978/1-2 with mounted exchangeable head for JPT terminal VAS 1978/9-1 , correct connection between crimp terminal, wire and single wire seal is guaranteed. The tool is to be used only for the purpose described.

Note:

- *Terminals in a normal and a gold-plated version are crimped on to repair wires. Always use the same version of repair terminal as that installed by the factory.*

Crimping a new terminal with single wire seal

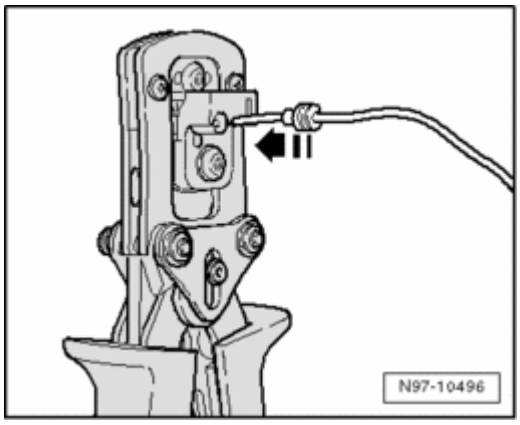
- Insert exchangeable head for JPT terminal VAS 1978/9-1 into crimp pliers (basic tool) VAS 1978/1-2 ⇒ 97-7, Crimp pliers VAS 1978/1A (where applicable) .



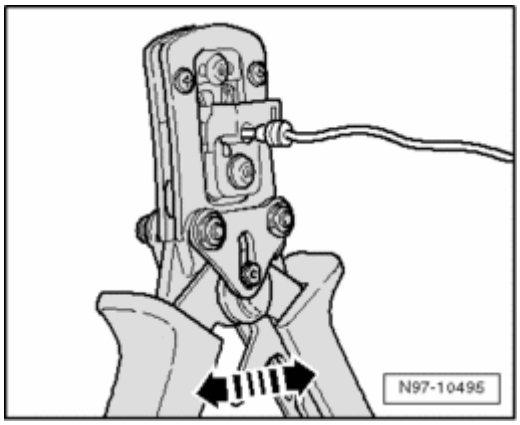
- Place the single wire seal on to the repair wire **- arrow -** .

Note:

- *When doing this, the smaller diameter of single wire seal must face direction of terminal to be crimped on.*

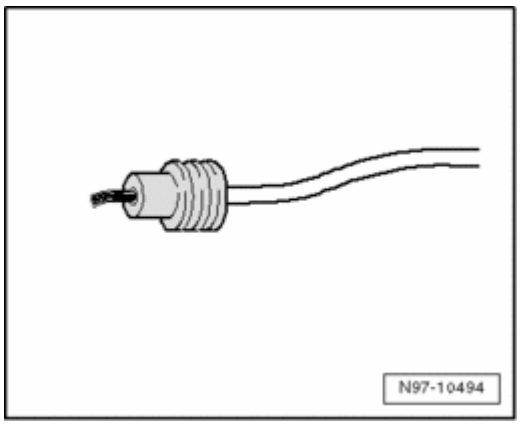


- Open crimp pliers and place the repair wire end into stripping slot of crimp pliers **- arrow -** .

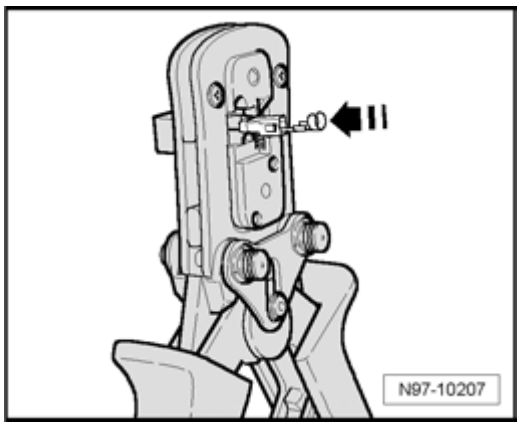


- Close crimp pliers completely **- arrows -** .

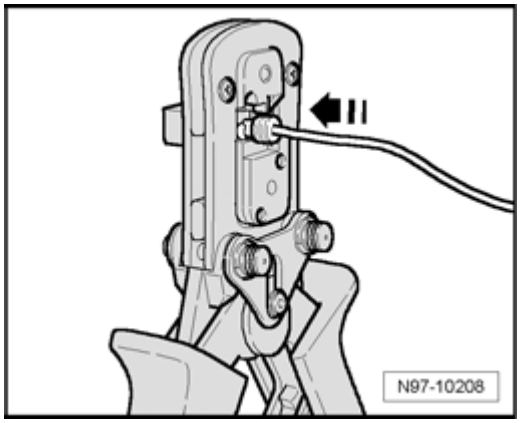
- Open crimp pliers again and remove the stripped wire end.



- Slide single wire seal in direction of stripped wire end until it rests flush with the wire insulation.



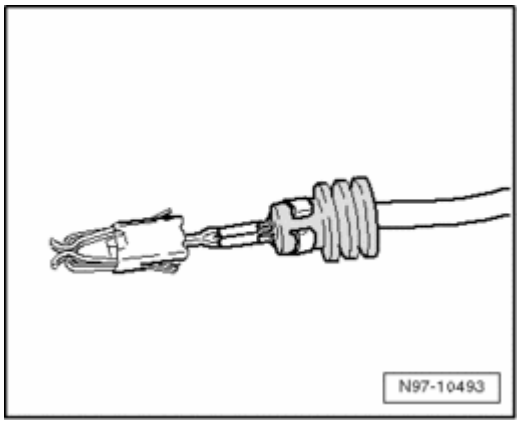
- Place new crimp terminal **- arrow -** into mount on crimp pliers.



- Insert the stripped wire end with positioned single wire seal into crimp terminal **- arrow -** until it makes terminal on "wire stop" .

- Crimp the terminal, wire and single wire seal by closing crimp pliers completely.

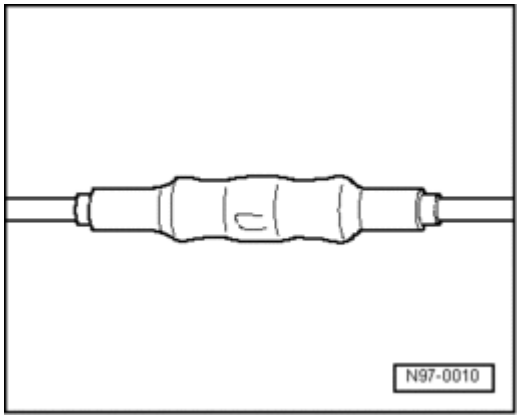
- Open crimp pliers again and remove the finished crimped-on terminal.



A correctly performed crimp is distinguished by a clean compression of wire and single wire seal in the terminal and has an impression on the rear side which identifies

that the crimp was performed by a professional using the correct tool.

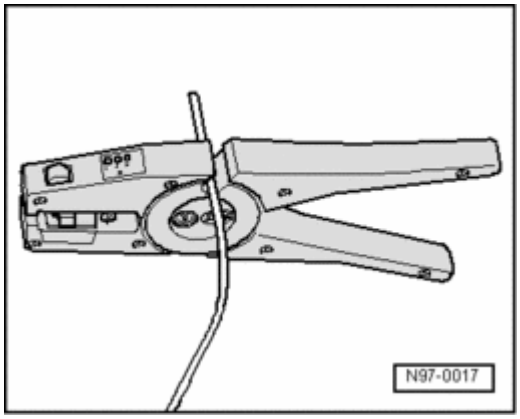
Wire break with single repair point



Repair point with single crimp connection

- Free up wire intended for repair (approx. 20 cm to both sides of repair point).

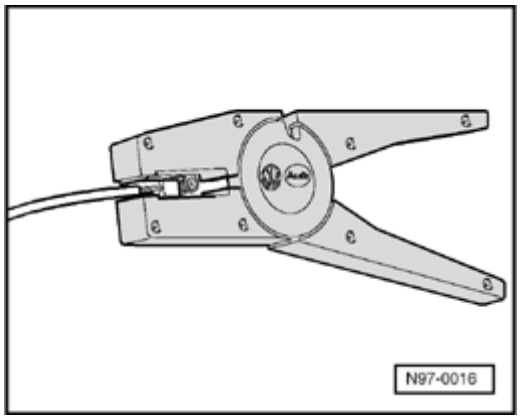
- If required, remove wiring harness wrapping using a folding knife.



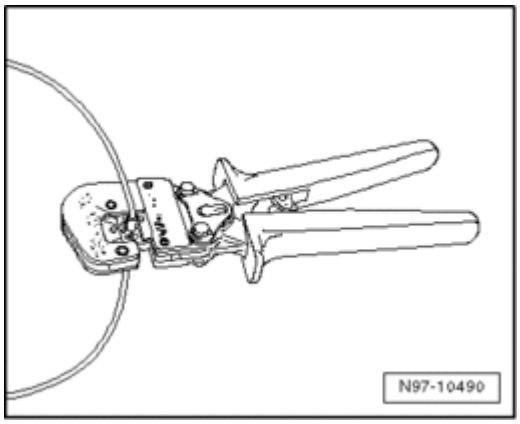
- Cut out the damaged wire section using Wire Stripper VAS1978/3 .

Note:

- *If, by cutting out the damaged wire section, both ends of the vehicle-specific single wire are too short for a repair using a single crimp connection, insert a repair wire section of matching length with two crimp connections ⇒ 97-7, Wire break with dual repair point .*



- Strip wire ends using 6 - 7 mm wire stripper.



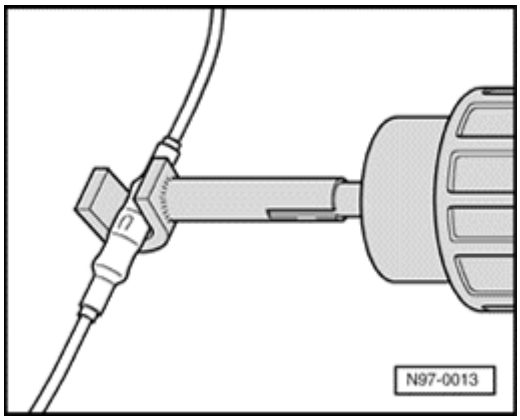
- Slide crimp connection on to both stripped wire ends of vehicle-specific single wire and crimp them using crimp pliers.

Note:

- *Always be sure to use the correct crimp slot for the crimp connection used ⇒ 97-7, Crimp pliers with insert .*
- *Do not crimp wire insulation.*

After crimping, heat-shrink crimp connections using hot air gun to prevent moisture penetration.

- Put Shrink Tip For Hot Air Gun VAS 1978/15 on to Hot Air Gun VAS1978/14 .



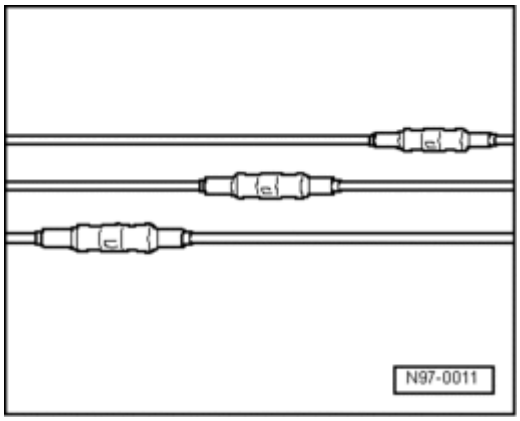
- Heat crimp connection using hot air gun lengthwise from center outward until it is sealed completely and adhesive comes out the ends.

Caution!

When heat-shrinking crimp connections, do not damage any other wiring, plastic parts or insulating material with the hot air gun nozzle.

Always observe operating instructions of heat gun.

Note:

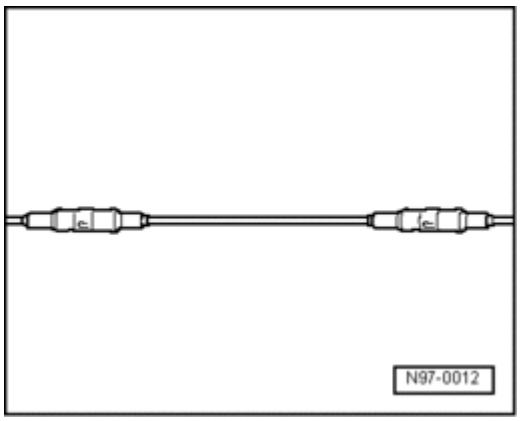


- *Make sure that crimp connections do not lie directly next to each other when several wires need to be repaired. Arrange crimp connections at a slight offset so that the circumference of the wiring harness does not become too large.*

- *In the event the repair point was taped previously, tape this point anew with yellow insulating tape after repairs.*

- *Secure the repaired wiring harness if necessary with a cable tie to prevent flapping noises while driving.*

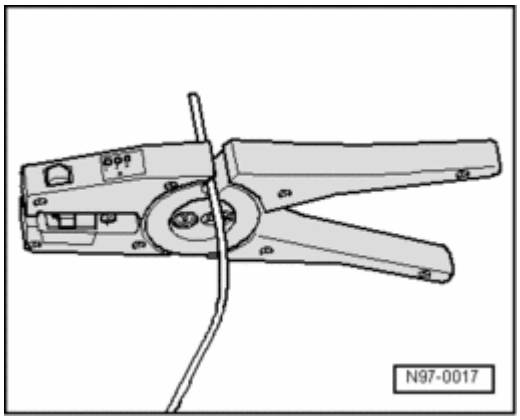
Wire break with dual repair point



Repair point with intermediate wire section

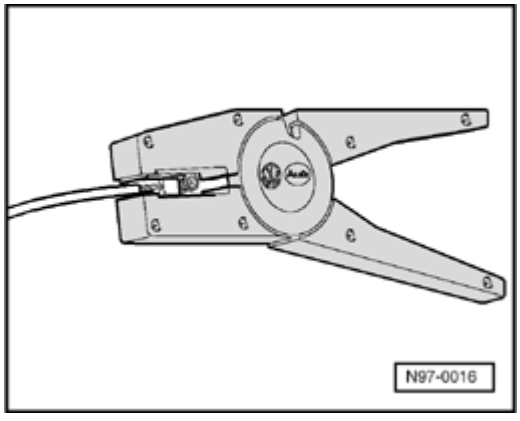
- Free up wire intended for repair at two points (approx. 20 cm to both sides of respective repair points).

- If required, remove wiring harness wrapping using a folding knife.



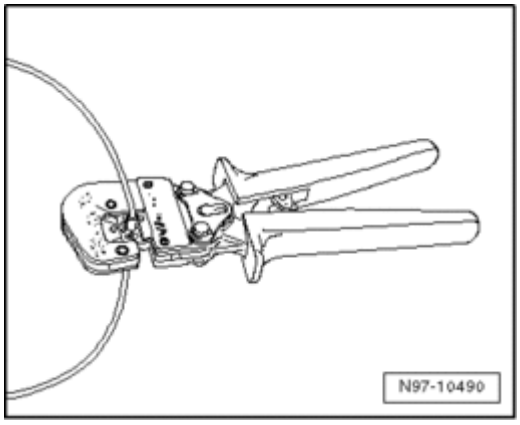
- Route yellow repair wire next to damaged wiring harness and cut repair wire to the required length using Wire Stripper VAS1978/3 .

- Cut damaged wire section from the vehicle-specific single wire.



- Strip wire ends using 6 - 7 mm wire stripper.

- Slide crimp connection on to vehicle-specific single wire at one side and on to repair wire at the other side.



- Crimp the crimp connection at both wire ends using crimp pliers.

- Repeat this procedure at the other repair wire end.

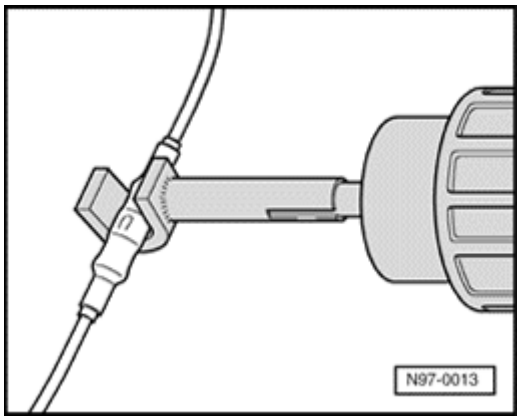
Note:

- *Always be sure to use the correct crimp slot for the crimp connection used ⇒ 97-7, Crimp pliers with insert .*

- *Do not crimp wire insulation.*

After crimping, heat-shrink crimp connections using hot air gun to prevent moisture penetration.

- Put Shrink Tip For Hot Air Gun VAS 1978/15 on to Hot Air Gun VAS1978/14 .



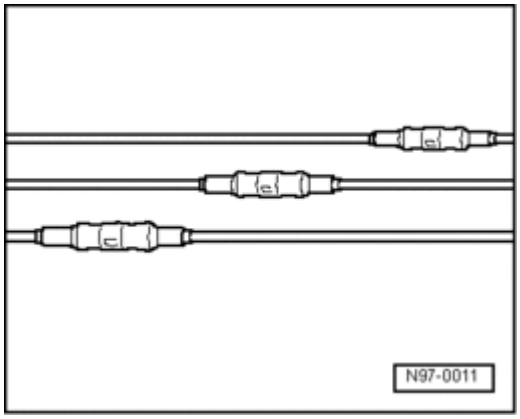
- Heat crimp connection using hot air gun lengthwise from center outward until it is sealed completely and adhesive comes out the ends.

Caution!

When heat-shrinking crimp connections, do not damage any other wiring, plastic parts or insulating material with the hot air gun nozzle.

Always observe operating instructions of heat gun.

Note:



- *Make sure that crimp connections do not lie directly next to each other when several wires need to be repaired. Arrange crimp connections at a slight offset so that the circumference of the wiring harness does not become too large.*

- *In the event the repair point was previous taped, this point must be taped anew with yellow insulating tape after repairs.*

- *Secure the repaired wiring harness if necessary with a cable tie to prevent flapping noises while driving.*

Terminal housing and harness connector repairs

Terminal housing and harness connector repairs, general information

Note:

- *Observe general notes for repairs on the vehicle electrical system ⇒ 97-7, Electrical system, general repair measures .*

- *Allocation of crimp terminals with correct fit to terminal housing is performed according to the part number stamped in on the terminal housing. Part numbers of terminal housing are listed in conjunction*

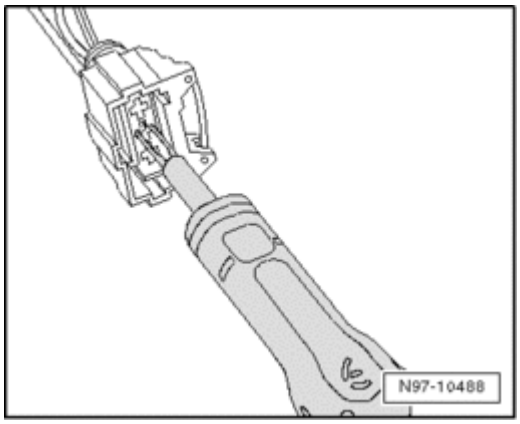
with the respective crimp terminals with correct fit in plate 198 (electrical connecting elements) in ⇒ Replacement parts catalog (ETKA) .

- *Damaged terminal housings must always be replaced.*

- *New terminal housings may be ordered via OTC Kassel.*

Repairing terminals in terminal housing

- First, open or release if necessary the secondary lock of the terminal housing ⇒ 97-7, Terminal housings, releasing and disassembling .



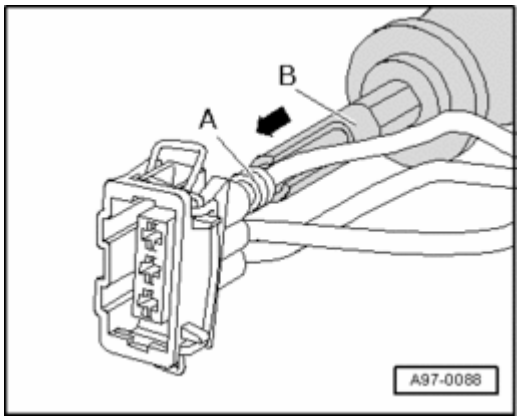
- Release terminal (primary lock) using the appropriate release tool ⇒ 97-7, Terminal housings, releasing and disassembling .

- Pull terminal at single wire out of terminal housing.

- Take yellow repair wire with correct terminal out of wiring harness repair kit .

- Free up repair point of vehicle-specific wiring harness (approx. 20 cm to both sides of repair point).

- If required, remove wiring harness wrapping using a folding knife.



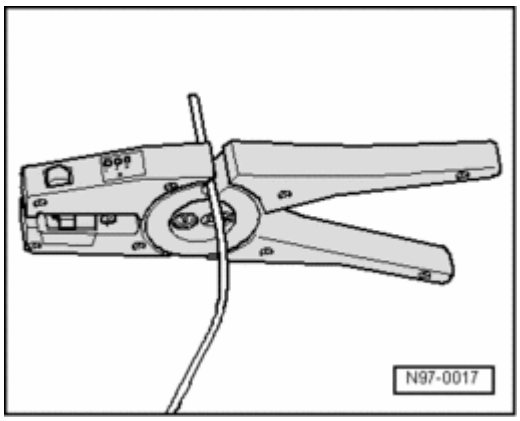
- Insert new terminal of repair wire into terminal housing until it engages.

- Slide a single wire seal on to the repair wire.

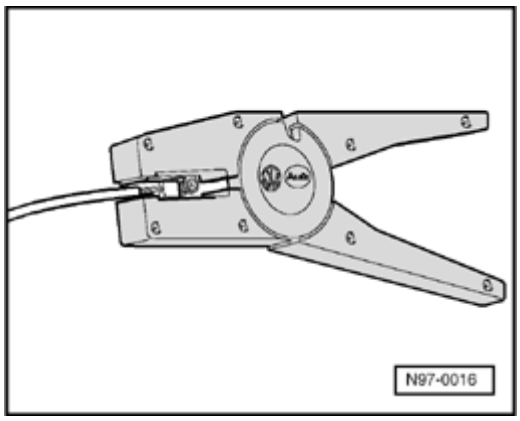
Note:

- *When doing this, small diameter of single seal must point toward terminal housing.*

- Slide single wire seal into terminal housing using the correct assembly tool ⇒ 97-7, Assembly of single wire seals .



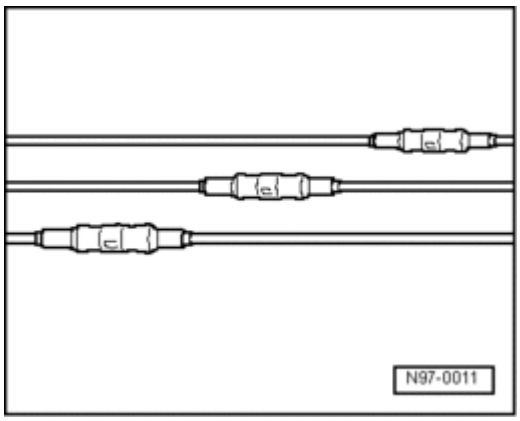
- Shorten repair wire and single wire of vehicle-specific wiring harness according to your needs using Wire Stripper VAS1978/3 .



- Strip ends of repair wire and of vehicle-specific single wire using 6 - 7 mm wire stripper.

- Crimp the stripped ends of repair wire and single wire of vehicle-specific wiring harness using crimp pliers and a crimp connection as described in chapter "Wire break with single repair point" ⇒ 97-7, Wire break with single repair point .

Note:



- *Make sure that crimp connections do not lie directly next to each other when several wires need to be repaired. Arrange crimp connections at a slight offset so that the circumference of the wiring harness does not become too large.*

- *In the event the repair point was taped previously, tape this point anew with yellow insulating tape after repairs.*

- *Secure the repaired wiring harness if necessary with a cable tie to prevent flapping noises while driving.*

Assembly of single wire seals

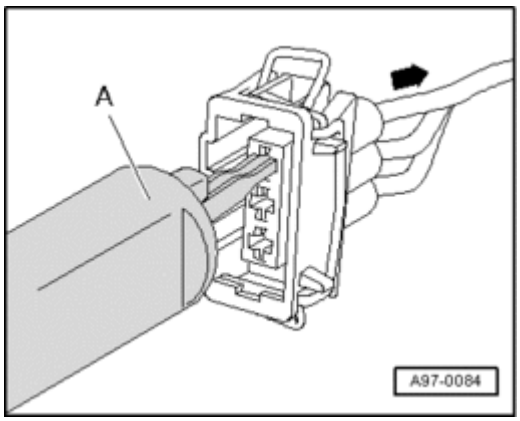
Note:

- *Single wire seals prevent the penetration of water and dirt into the terminal housing. They are installed e.g. in engine compartment and must be reinstalled after a repair.*

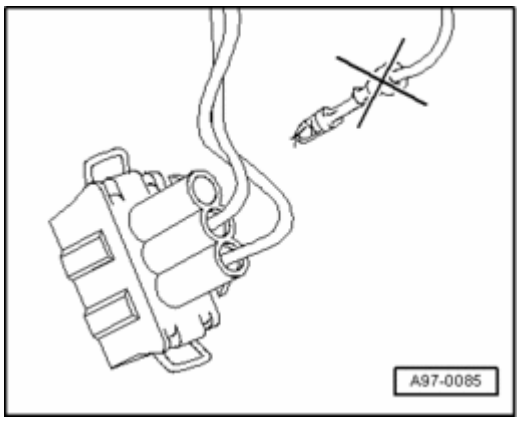
- *Single wire seal is crimped on at the factory together with terminal on the wire, this is not the case for repair wires. Slide single wire seal on to wire first before crimping the repair wire.*

- *Single wire seals must always fit together with wire cross-section of the repair wire used. Outer circumference of single wire seal is aligned according to chamber circumference of the terminal housing. Perform assembly using only the assembly tool with correct fit.*

Assembling single wire seal:

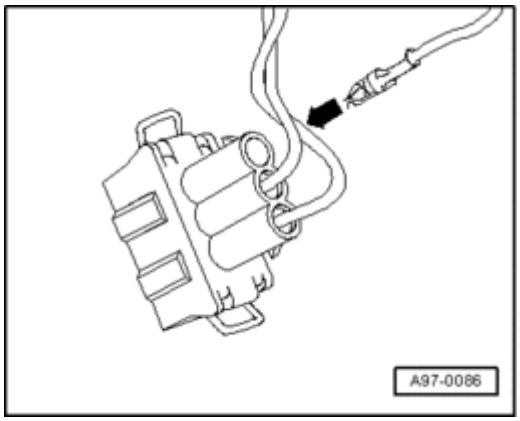


- Release terminal lock using assembly tool with correct fit **- A -** and then pull wire with single wire seal toward rear **- arrow -** out of terminal housing.

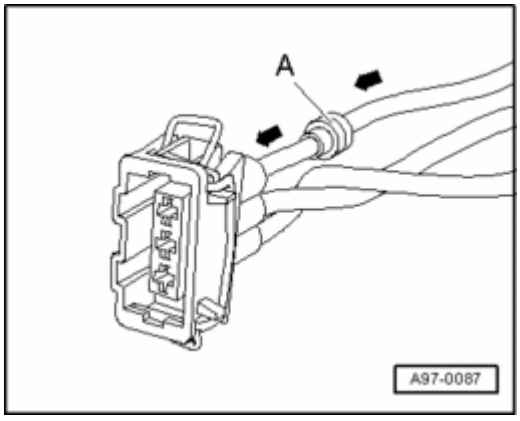


- Cut off the old terminal with single wire seal from the

vehicle-specific wiring harness.



- Slide repair wire with new terminal into corresponding chamber of terminal housing until it engages **- arrow -** .

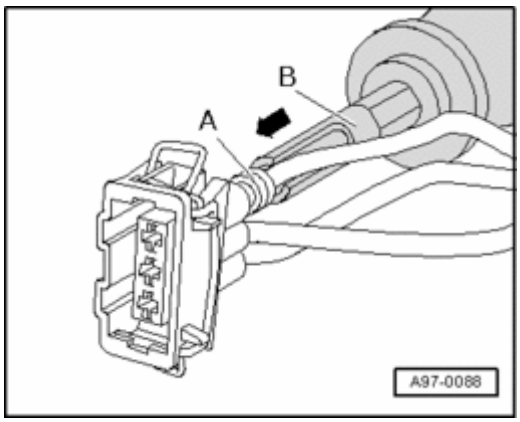


- Put single wire seal **- A -** on to free end of repair wire.

Note:

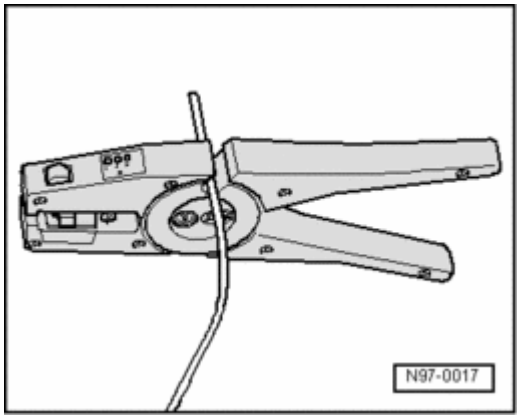
- *When doing this, small diameter of single wire seal must point toward terminal housing.*

- Slide single wire seal **- A -** on to repair wire up to the terminal housing.



- Slide single wire seal **- A -** into terminal housing until it

stops using the corresponding assembly tool **- B -** .

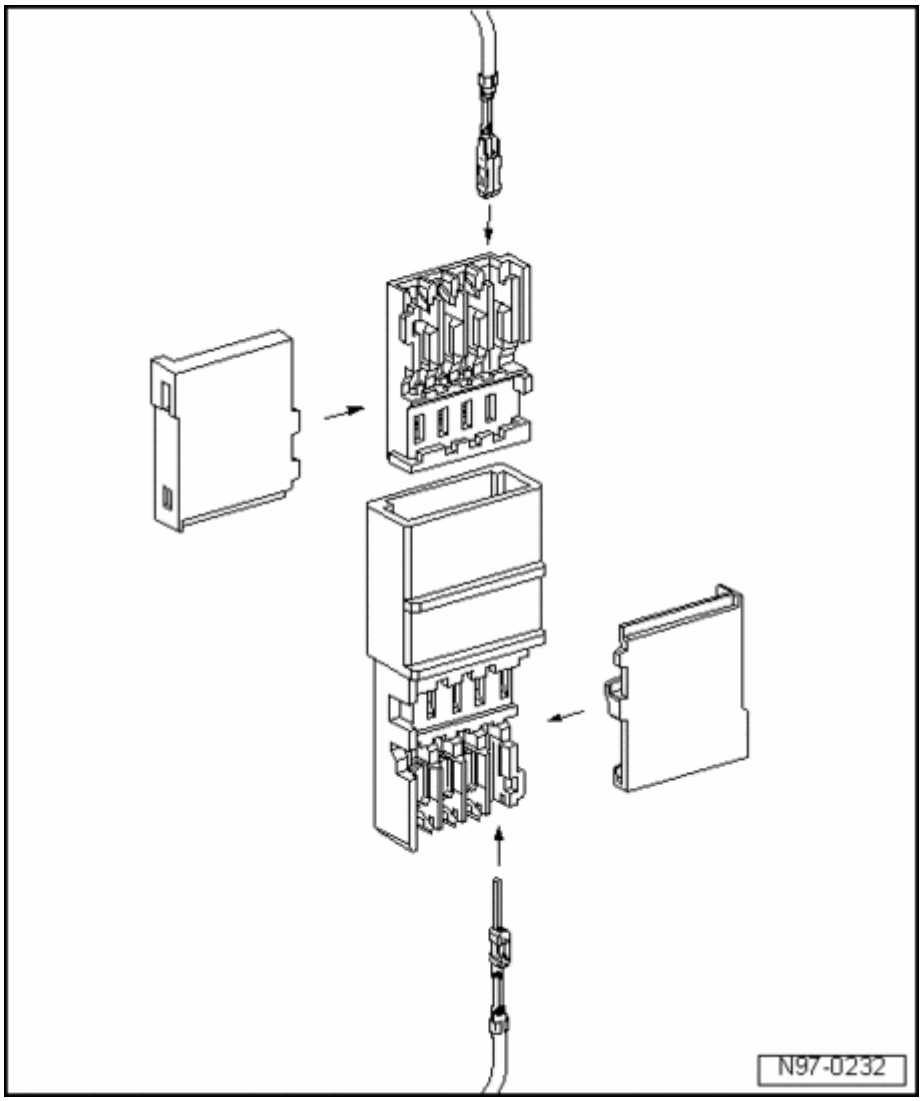


- Shorten repair wire and single wire of vehicle-specific wiring harness according to your needs using Wire Stripper VAS1978/3 .

- Crimp the stripped ends of repair wire and single wire of vehicle-specific wiring harness using crimp pliers and a crimp connection as described in chapter "Wire break with single repair point" ⇒ 97-7, Wire break with single repair point .

Repairing terminal housings with insulation displacement terminal

Note:



- *For technical reasons, terminal housings for insulation displacement application can be supplied only with insulation displacement terminals slid on.*

- *These terminals can be removed at every other terminal housing in the event they are not required.*

- *Repair wires that have already been equipped with corresponding terminals crimped on are available ⇒ replacement parts catalog (ETKA) .*

Terminal housings, releasing and disassembling

Notes on releasing and disassembling terminal housings

Note:

- *Observe general information for repairs on the vehicle electrical system ⇒ 97-7, Electrical system,*

general repair measures .

- *Always use the release tools intended for the releasing process. Under no circumstances may terminals be pulled forcefully out of terminal housings.*

- *Damaged terminal housings must always be replaced. New terminal housings may be ordered via OTC Kassel.*

- *Small screwdrivers may be used as an aid to release the secondary locks.*

- *Chamber/pin assignment is located partially stamped in on secondary lock or rear side of terminal housing.*

- *Detailed information on component locations of harness connectors ⇒ Electrical Wiring Diagrams, Troubleshooting and Component Locations binder .*

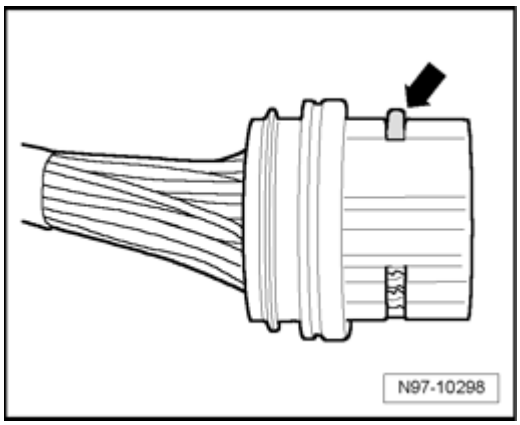
The application of the correct release tools to the respective locks can be found in the table in ⇒ *users instructions for Release Tool Set VAS1978/35* .

Secondary lock

The secondary lock is a housing securing mechanism (second locking mechanism) that secures all wires in a terminal housing. If a secondary lock is installed at a terminal housing, it must always be opened or removed using specified tool before releasing and pulling out individual crimp terminals.

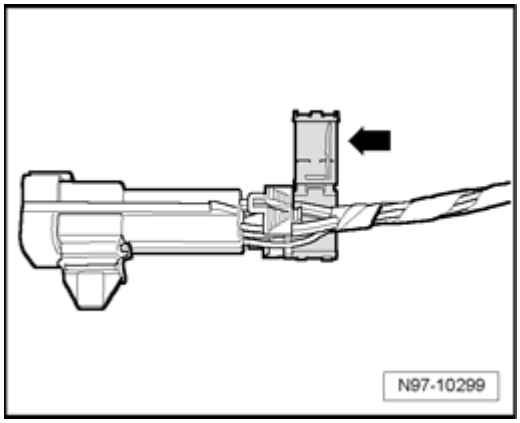
Secondary lock is distinguished by a different color from the rest of the terminal housing. It simplifies recognizing the secondary lock and clarifies its function.

The shapes of the terminal housings depicted here are only a selection which, as an example, should make clear the various functions of the secondary lock.



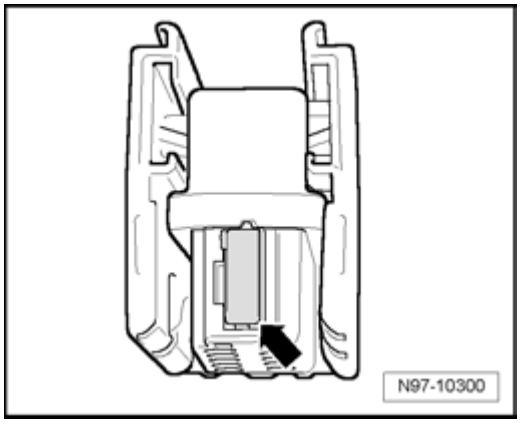
Example 1:

Housing securing mechanism is released by removing a "comb" **- arrow -** .



Example 2:

Housing securing mechanism is released by opening a "flap" **- arrow -** .



Example 3:

Housing securing mechanism can be released by disengaging a "slider" **- arrow -** .

Primary lock

The primary lock is the locking mechanism of one individual crimp terminal in terminal housing.

If necessary, release or remove housing securing mechanisms (secondary locks) using specified tool before releasing the terminals ⇒ 97-7, Secondary lock .

The shapes of the primary locks depicted in the following are only a selection which, as an example, should make clear the various functions of the primary lock.

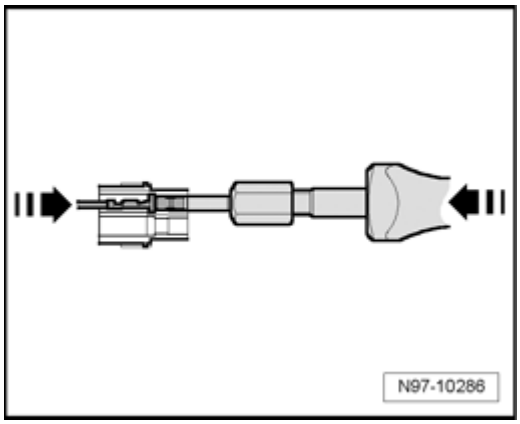
- Round connector systems ⇒ 97-7, Round connector systems
- Flat connector systems ⇒ 97-7, Flat connector systems
- Special connector systems ⇒ 97-7, Special connector systems

The application of the correct release tools to the respective locks can be found in the table in ⇒ *users instructions for Release Tool Set VAS1978/35* .

Round connector systems

Note:

- *If necessary, release or remove housing securing mechanisms (secondary locks) using specified tool before releasing the terminals ⇒ 97-7, Secondary lock .*



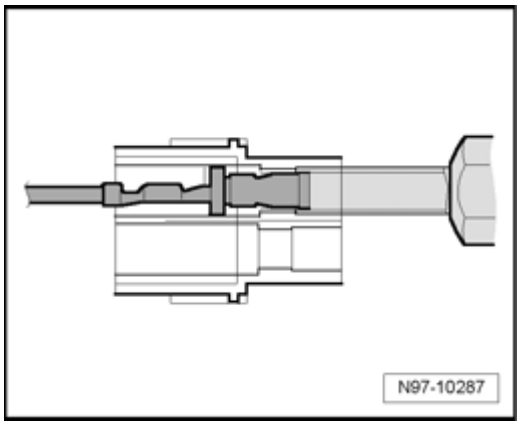
- Guide the release tool which fits the terminal housing into release channel on terminal housing.

- Grasp terminal at wire and push it gently into terminal housing **- arrow -** .

Note:

- *By pushing terminal in direction of terminal housing, retaining tabs of terminal are lifted off the housing shoulder and can be released using the release tool.*

- At the same time, push release tool in direction of terminal housing **- arrow -** and pull the released terminal out of terminal housing.

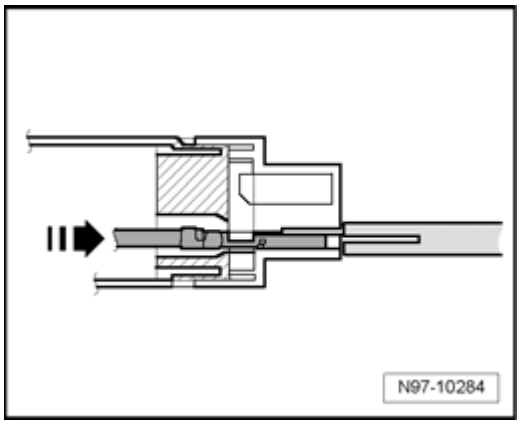


- After removing the terminal, release tool can be pulled out of terminal housing again.

Flat connector systems

Note:

- *If necessary, release or remove housing securing mechanisms (secondary locks) using specified tool before releasing the terminals* ⇒ *97-7, Secondary lock* .



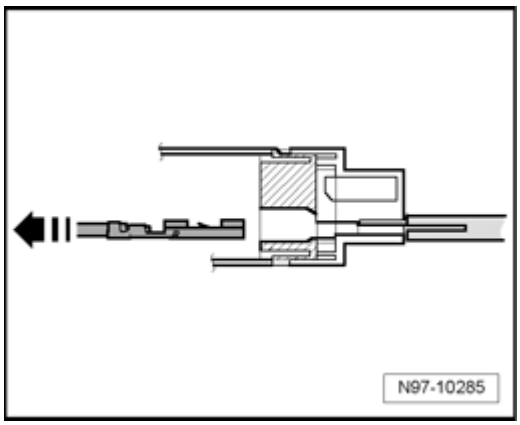
Flat connector system with one retaining tab:

- Guide the release tool which fits the terminal housing into release channel on terminal housing.

- Grasp terminal at wire and push it gently into terminal housing **- arrow -** .

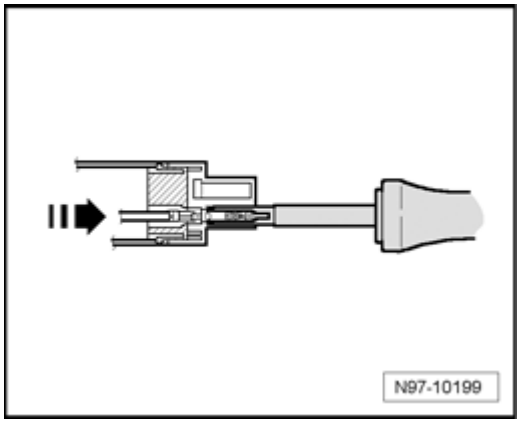
Note:

- *By pushing terminal in direction of terminal housing, retaining tab of terminal is lifted off the housing shoulder and can be released using the release tool.*



- At the same time, push release tool in direction of terminal housing and pull the released terminal out of terminal housing **- arrow -** .

- After removing the terminal, release tool can be pulled out of terminal housing again.



Flat connector system with two retaining tabs:

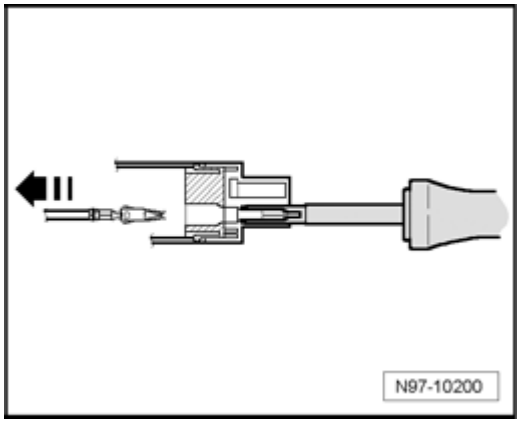
- Guide the release tool which fits the terminal housing into release channel on terminal housing.

- Grasp terminal at wire and push it gently into terminal housing until it stops **- arrow -** .

Note:

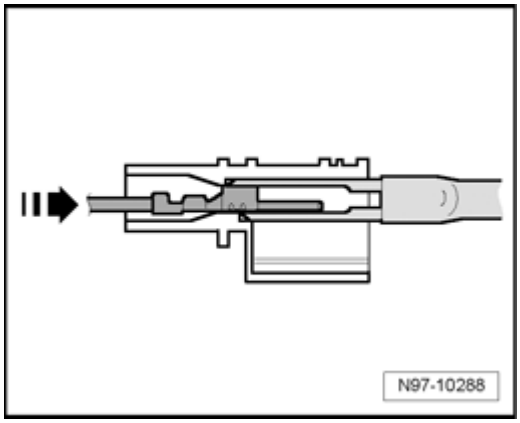
- *By pushing terminal in direction of terminal housing, retaining tabs of terminal are lifted off the housing*

shoulder and can be released using the release tool.



- At the same time, push release tool in direction of terminal housing and pull the released terminal out of terminal housing **- arrow -** .

- After removing the terminal, release tool can be pulled out of terminal housing again.



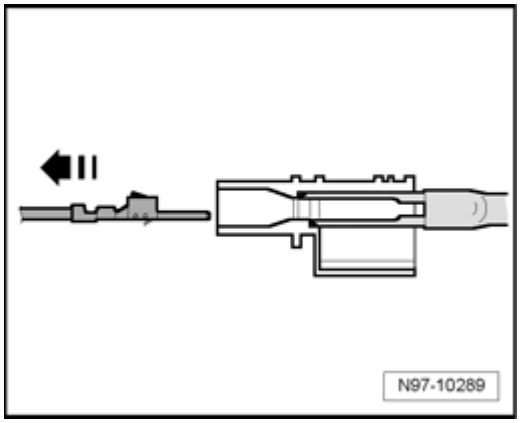
Asymmetrical:

- Guide the release tool which fits the terminal housing into release channel on terminal housing.

- Grasp terminal at wire and push it gently into terminal housing **- arrow -** .

Note:

- *By pushing terminal in direction of terminal housing, retaining tabs of terminal are lifted off the housing shoulder and can be released using the release tool.*



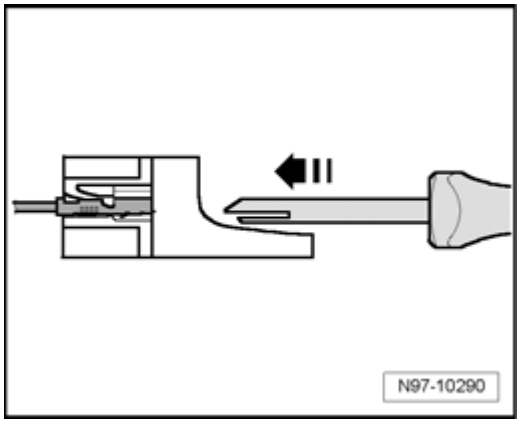
- At the same time, push release tool in direction of terminal housing and pull the released terminal out of terminal housing **- arrow -** .

- After removing the terminal, release tool can be pulled out of terminal housing again.

Special connector systems

Note:

- *If necessary, release or remove housing securing mechanisms (secondary locks) using specified tool before releasing the terminals ⇒ 97-7, Secondary lock .*



Faston terminals:

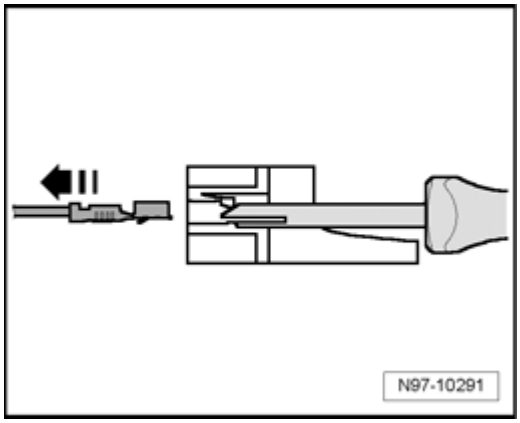
- Guide the release tool which fits the terminal housing into release channel on terminal housing **- arrow -** .

- Grasp terminal at wire and push it gently into terminal housing.

Note:

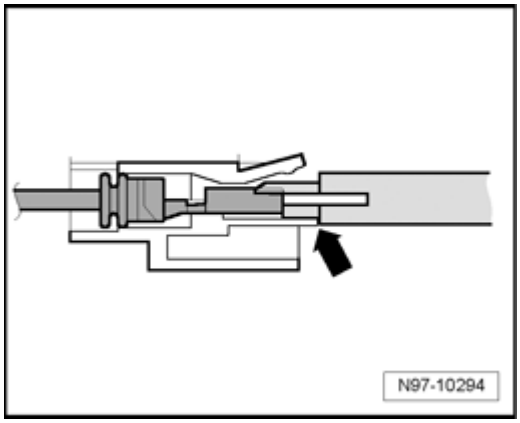
- *By pushing terminal in direction of terminal housing, retaining tabs of terminal are lifted off the housing*

shoulder and can be released using the release tool.



- At the same time, push release tool in direction of terminal housing and pull the released terminal out of terminal housing **- arrow -** .

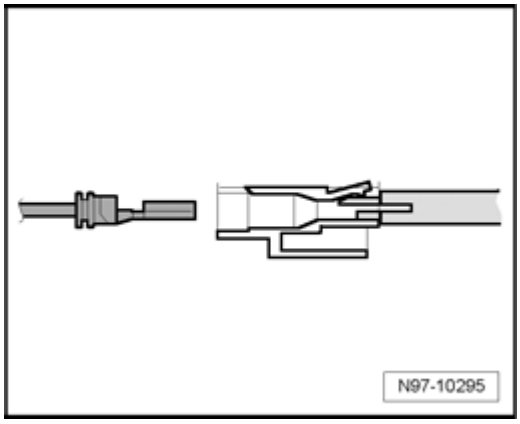
- After removing the terminal, release tool can be pulled out of terminal housing again.



GT 150/280 terminals:

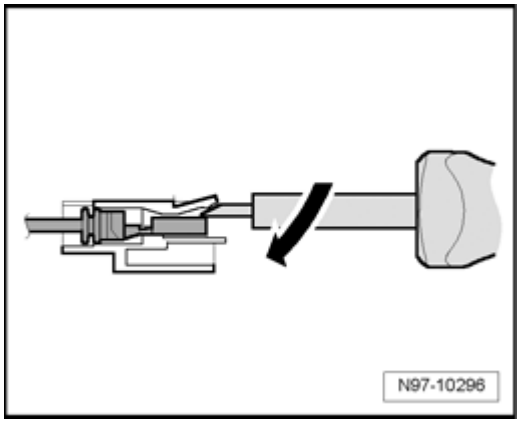
- Guide the release tool which fits the terminal housing under retaining tab into terminal housing.

- Push tool into terminal housing until it stops **- arrow -** .



Terminal is ejected from the terminal housing.

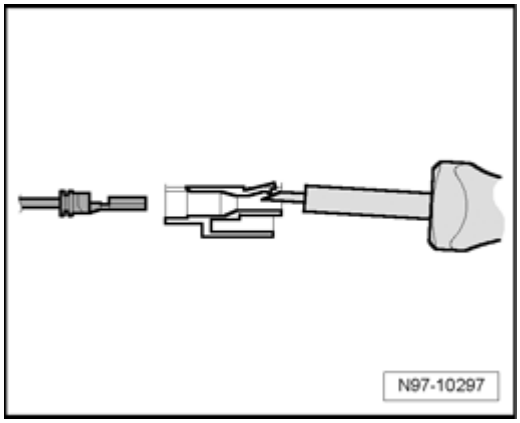
- After ejecting the terminal, release tool can be pulled out of terminal housing again.



Terminals without retaining tabs:

- Insert release tool under retaining tab of terminal housing.

- Push release tool through until it stops by gently lifting **- arrow -** .



Terminal is ejected from the terminal housing.