

90 - INSTRUMENTS

INSTRUMENT CLUSTER

Instrument cluster

NOTE:

- All control lamps in instrument cluster are equipped with LEDs. In case an indicator lamp is malfunctioning, the instrument cluster must be replaced.

Instrument cluster removing and installing

Special tools, testers and auxiliary items required

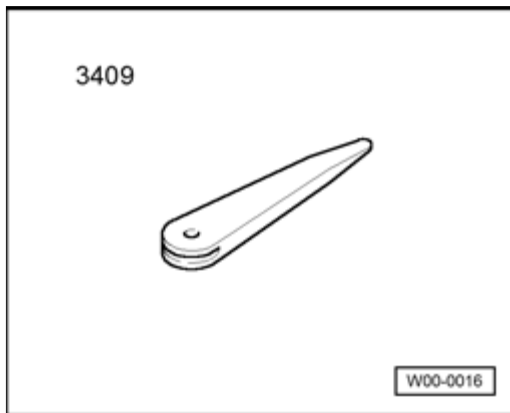


Fig. 120: Identifying Trim Removal Wedge 3409
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Trim removal wedge 3409

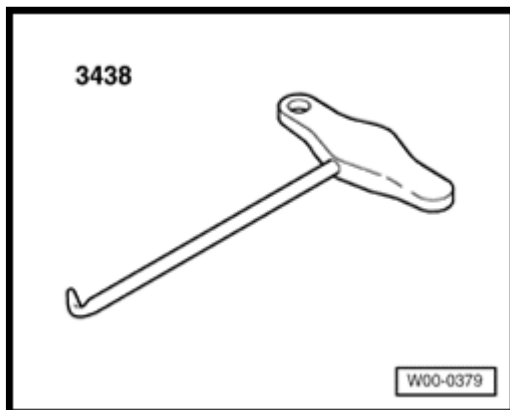


Fig. 121: Hook 3438
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 2x Hook 3438

Removing

NOTE:

- Do not disassemble instrument cluster.
- If the instrument cluster is replaced with Instrument Cluster Control Module J285 , select "Replace" function of J285 in "Guided Functions".
- Adjust steering wheel downward and to rear as far as possible, use entire adjustment range of steering column adjustment for this.
- Switch ignition off and remove ignition key.

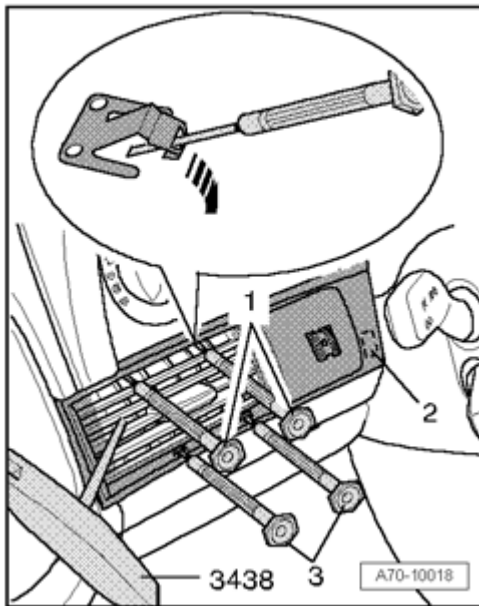


Fig. 122: Releasing Spring Pins Of Decorative Panel From Instrument Panel Using Trim Removal Wedge 3409

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully release spring pins - 2 - of decorative panel from instrument panel using trim removal wedge 3409.

NOTE:

- The instrument panel vent provides a hole on both sides to engage the hook 3438.
- Carefully remove the instrument panel at both sides from installation opening using the hook 3438.

If the instrument panel vent cannot be pulled out that way, proceed as follows:

- Position lamellae of instrument panel vent horizontally.
- Release all clips - **arrow** - by inserting clockmaker screwdrivers - 1 - and - 3 -.
- Remove instrument panel vent on both sides out of installation opening using hook 3438 , the clockmaker

screwdrivers must remain inserted when doing so.

- Disconnect electrical harness connectors at instrument panel vent and rotary knob for headlamp range control where present.

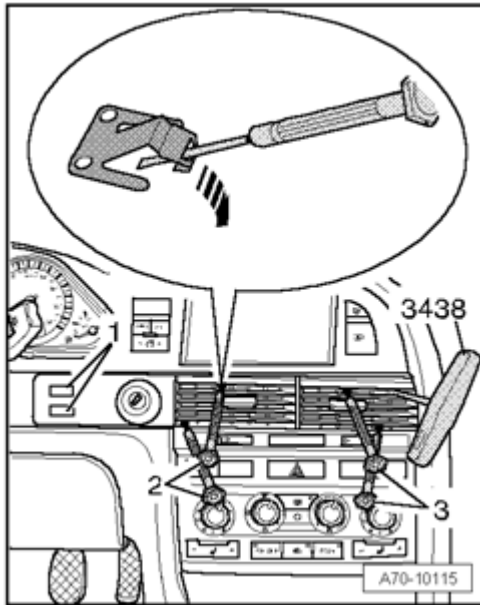


Fig. 123: Releasing Spring Pins Of Decorative Panel From Instrument Panel Using Trim Removal Wedge 3409

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully release spring pins - 1 - of decorative panel from instrument panel using trim removal wedge 3409.

NOTE:

- The instrument panel vent provides a hole on both sides to engage the hook 3438.
- Carefully remove the instrument panel at both sides from installation opening using the hook 3438.

If the instrument panel vent cannot be pulled out that way, proceed as follows:

- Position lamellae of instrument panel vent horizontally.
- Release all clips - **arrow** - by inserting clockmaker screwdrivers - 2 - and - 3 -.
- Remove instrument panel vent on both sides out of installation opening using hook 3438 , the clockmaker screwdrivers must remain inserted when doing so.
- Disconnect electrical harness connectors.

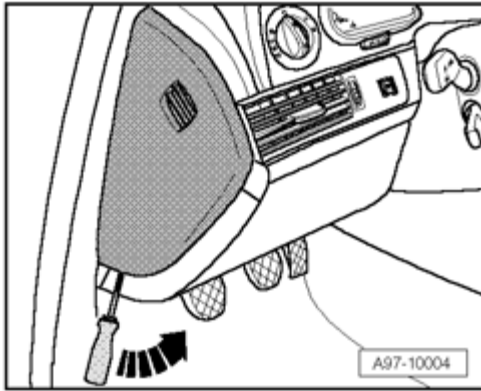


Fig. 124: Prying Off Left Cover From Instrument Panel Using A Screwdriver
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pry off left cover from instrument panel using a screwdriver - **arrow** -.

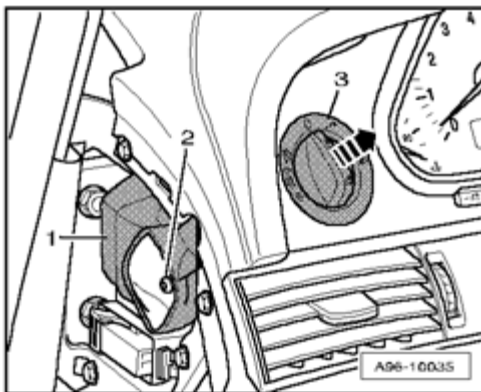


Fig. 125: Identifying Light Switch, Spreader Pin, And Instrument Cluster
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn light switch - **3** - to "0" position.
- Remove spreader pin - **2** - at air guide - **1** - and remove air guide.
- Reach through opening above instrument panel vent from the side and press light switch out of instrument cluster - **arrow** -.
- Disconnect electrical harness connector.

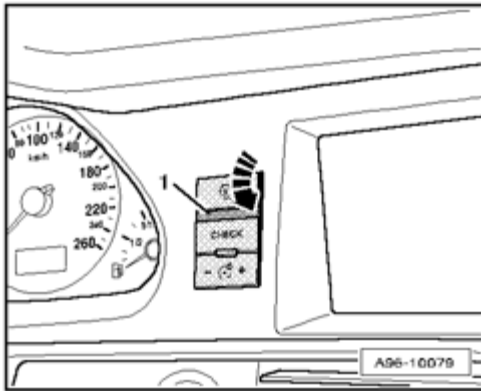


Fig. 126: Pressing Cover Strip At Button Unit For Instrument Cluster
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press cover strip - **1** - at button unit for instrument cluster in - **direction of arrow** -.
- Remove cover strip and pull off switch.

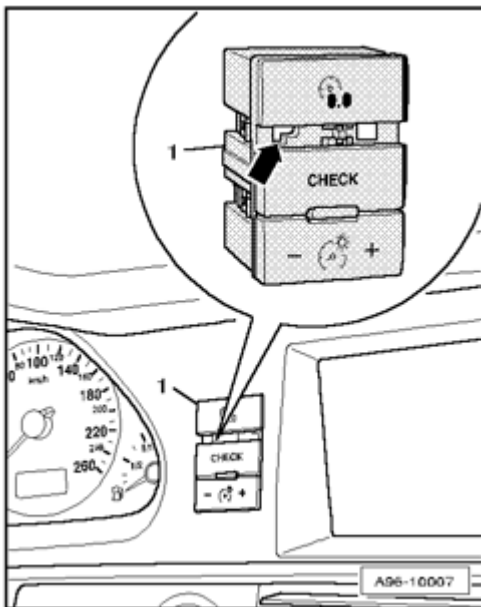


Fig. 127: Removing Buttons From Instrument Cluster Lining Using Hook 3438
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Attach hook 3438 in opening - **arrow** - at button unit.
- Carefully remove buttons - **1** - from instrument cluster lining.
- Disconnect electrical harness connector.

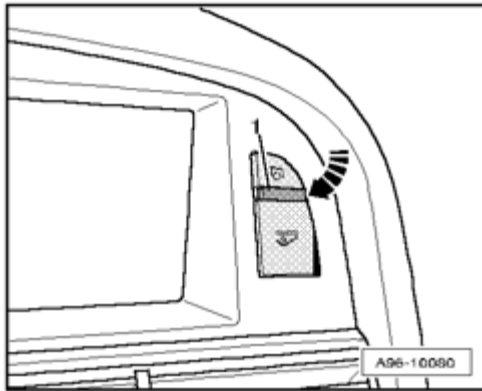


Fig. 128: Pressing Cover Strip At Button For Glove Compartment Release
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press cover strip - **1** - at button for glove compartment release in - **direction of arrow** -.
- Remove cover strip and pull off switch.

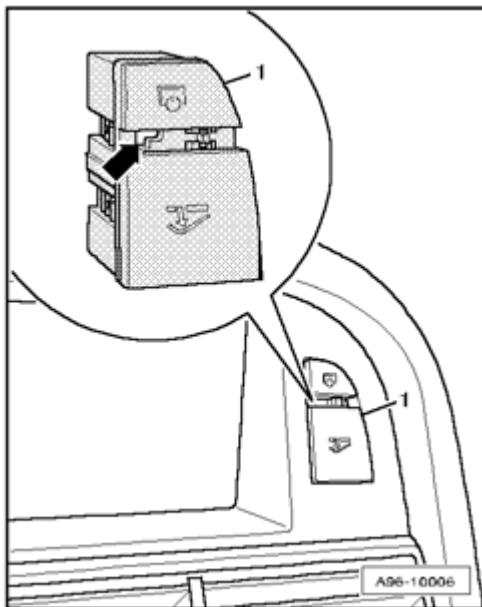


Fig. 129: Removing Buttons From Instrument Cluster Lining Using Hook 3438
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Attach hook 3438 in opening - **arrow** - at button unit.
- Carefully remove buttons - **1** - from instrument cluster lining.
- Disconnect electrical harness connector.

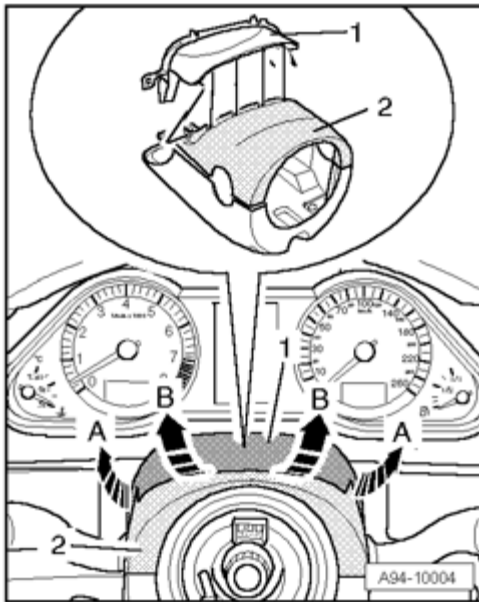


Fig. 130: Releasing Gap Cover At Upper Steering Column Trim Using A Small Screwdriver
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- For clarity, the work steps shown in the following illustrations are depicted with steering wheel removed.
- Release gap cover - 1 - at upper steering column trim - 2 - using a small screwdriver - arrows A and B -.

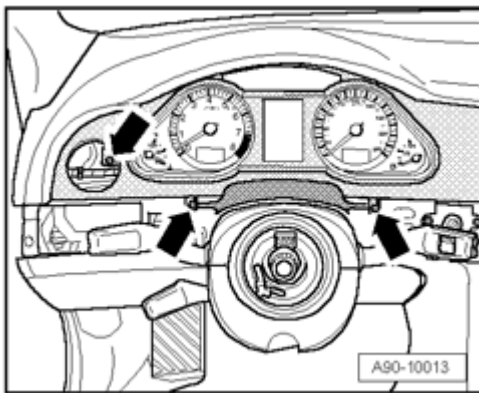


Fig. 131: Locating Bolts
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.

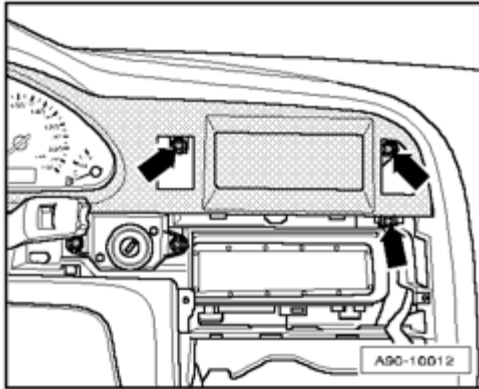


Fig. 132: Identifying Bolts For Instrument Cluster Lining
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Pull instrument cluster lining a bit out of instrument panel.

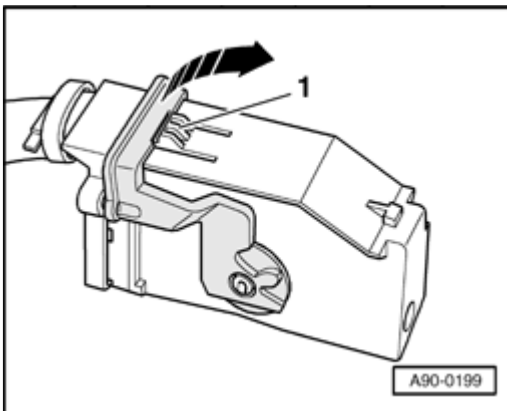


Fig. 133: Identifying Catch And Retainer
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector on instrument cluster, to do so, press catch - **1** - , rotate retainer in - **direction of arrow** - and disconnect connector.

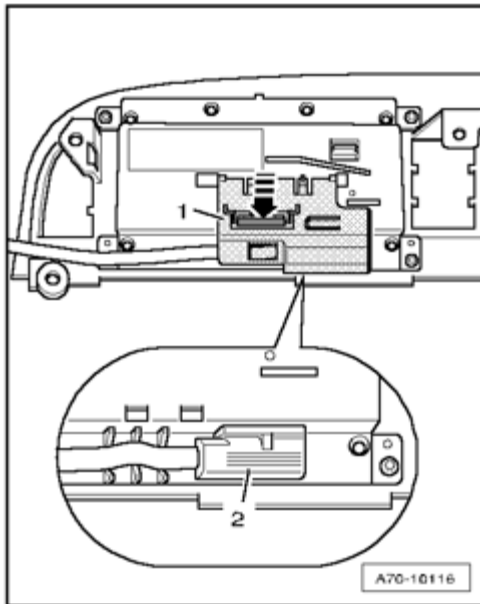


Fig. 134: Releasing Connector Lock On MMI Display And Swiveling Upward
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release connector lock - **1** - on MMI display - **arrow** - and swivel upward.
- Disconnect electrical harness connector - **2** - on MMI display.
- Remove instrument cluster lining with instrument cluster and MMI display between steering wheel and instrument panel.

Installing

Installation is performed in the reverse order of removal.

Tightening torque

Component	Nm
Instrument cluster lining to instrument panel	3.5

Instrument cluster multi-pin connector assignments

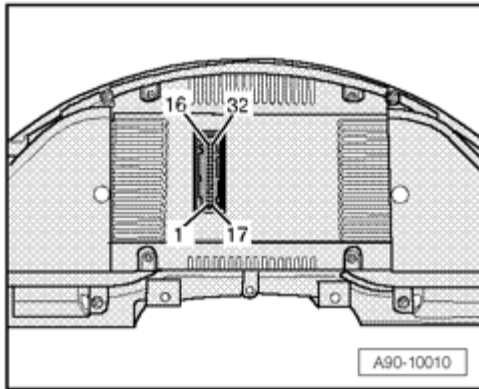


Fig. 135: Instrument Cluster Multi-Pin Connector Assignments
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Gray 32-pin multi-pin connector

1. Not assigned
2. Not assigned
3. CAN Bus Low (to Data Bus On Board Diagnostic Interface J533)
4. CAN Bus High (to Data Bus On Board Diagnostic Interface J533)
5. Terminal 31, sensor Ground (GND)
6. Sender for fuel gauge G
7. Fuel Level Sensor 2 G169
8. Button module
9. Outside temperature
10. Not assigned
11. Not assigned
12. Lack of coolant
13. Low washer fluid level
14. Terminal 31
15. Terminal 30
16. Terminal 58s
17. Terminal 58d
18. Oil pressure switch
19. Low brake fluid level
20. Check
21. Not assigned
22. EPB (electro-mechanical parking brake)
23. Radio controlled clock 5 V
24. Radio controlled clock signal

25. Oil level
26. Brake pad
27. External buzzer
28. Wake-up line (to Data Bus On Board Diagnostic Interface J533)
29. Terminal 31
30. Terminal 31
31. Terminal 30
32. Terminal 30

Fuel level sensors connector assignment

Preparation

- Disconnect 5-pin electrical harness connector at connector flange or fuel tank; procedure -->
 - **20 - FUEL SUPPLY SYSTEM** for 3.2 LITER V6 4V GENERIC SCAN TOOL, ENGINE CODE (S): BKH
 - **20 - FUEL SUPPLY** for 4.2 LITER V8 4V GENERIC SCAN TOOL, ENGINE CODE(S): BVJ
 - **20 FUEL SUPPLY** for 4.2 LITER V8 5V GENERIC SCAN TOOL, ENGINE CODE(S): BNK
 - **20 - FUEL SUPPLY** for 5.2 LITER 10-CYL. 4V GENERIC SCAN TOOL, ENGINE CODE(S): BXA

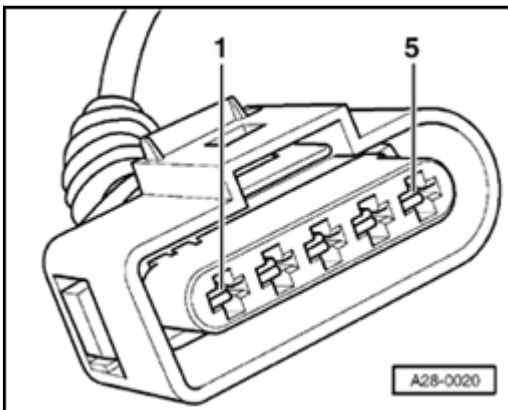


Fig. 136: Identifying Engine Control Module (ECM) 5-pin Connector Terminals 1 & 5
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Terminal assignment of the 5-pin harness connector at Fuel Level Sensor -G- G - vehicles with front wheel drive

1. B+ activation of electrical fuel pump
2. Wire connection from Fuel Level Sensor -G- G to instrument cluster (fuel gauge)
3. Ground (GND) for fuel level sensor (sensor ground)

4. Not assigned
5. Ground (GND) for electrical fuel pump

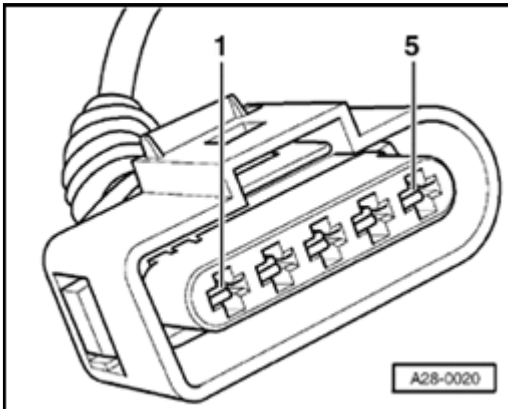


Fig. 137: Identifying Engine Control Module (ECM) 5-pin Connector Terminals 1 & 5
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Terminal assignment of the 5-pin harness connector at Fuel Level Sensor -G- G and Fuel Level Sensor 2 G169 - vehicles with all-wheel drive

1. B+ activation of electrical fuel pump
2. Wire connection from Fuel Level Sensor -G- G to instrument cluster (fuel gauge)
3. Ground (GND) for fuel level sensor (sensor ground)
4. Wire connection from Fuel Level Sensor 2 G169 to instrument cluster (fuel gauge)
5. Ground (GND) for electrical fuel pump

Engine Coolant Temperature (ECT) Sensor G62 Connector assignment

Special tools, testers and auxiliary items required

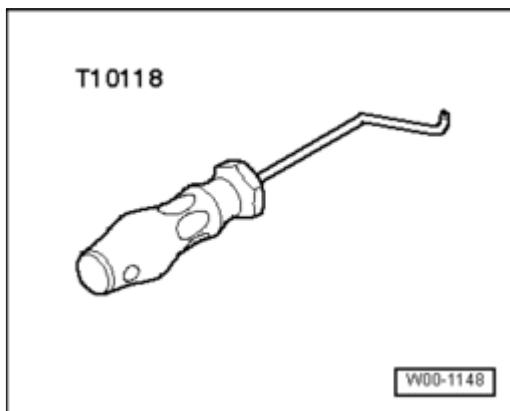


Fig. 138: Identifying Assembly Tool T10118
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assembly tool T10118

Preparation

- Disconnect electrical harness connector at Engine Coolant Temperature (ECT) Sensor G62 ; procedure:
 - Vehicles with 3.2l FSI engines.
 - Vehicles with 4.2l MPI engine.
 - Vehicles with 4.2l FSI engine.
 - Vehicles with 5.2l FSI engine.

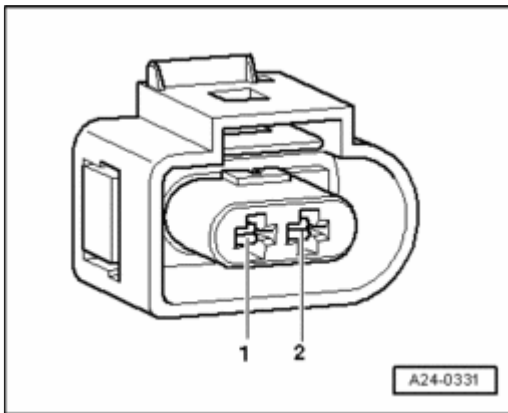


Fig. 139: Identifying 2-Pin Electrical Harness Connector & Terminals
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Terminal assignment of the 2-pin harness connector at Engine Coolant Temperature (ECT) Sensor G62

1. Sensor ground (GND)
2. Wire connection from Engine Coolant Temperature (ECT) Sensor G62 to engine control module

Electrical harness connector at Engine Coolant Temperature (ECT) Sensor G62 , disconnecting - vehicles with 3.2l FSI engines

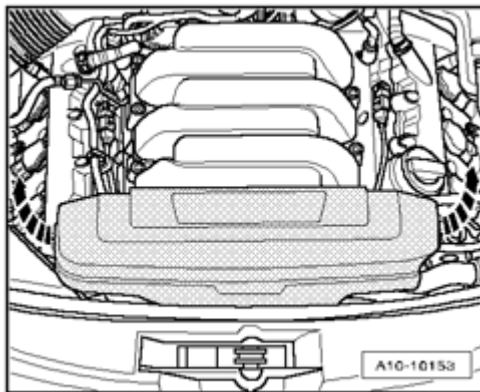


Fig. 140: Identifying Front Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Work procedure

- Remove engine cover at front - **arrows** -.

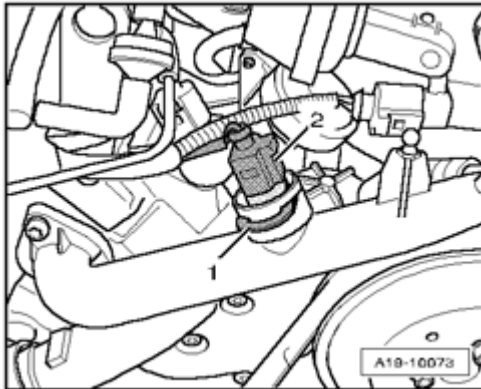


Fig. 141: Disconnecting Electrical Connector, Retaining Clip And Engine Coolant Temperature (ECT) Sensor G62

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector - **2** - at Engine Coolant Temperature (ECT) Sensor G62.

NOTE:

- **Disregard - 1 -.**

Installation is performed in the reverse order of removal.

Electrical harness connector at Engine Coolant Temperature (ECT) Sensor G62 , disconnecting - vehicles with 4.2l MPI engines

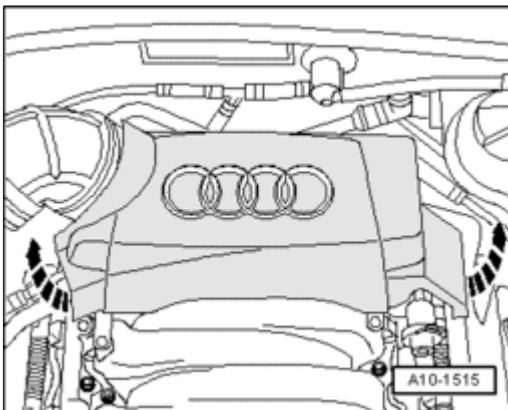


Fig. 142: Removing Rear Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Work procedure

- Remove rear engine cover - **arrows** -.

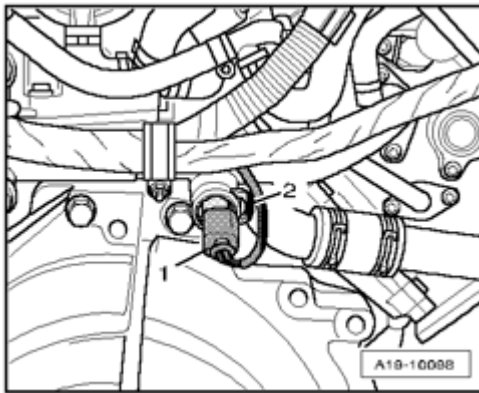


Fig. 143: Identifying Electrical Connection At Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector - **1** - at Engine Coolant Temperature (ECT) Sensor G62 using assembly tool T10118.

NOTE:

- For clarity, depicted without engine.
- Disregard - **2** -.

Installation is performed in the reverse order of removal.

Electrical harness connector at Engine Coolant Temperature (ECT) Sensor G62 , disconnecting - vehicles with 4.2l FSI engine



Fig. 144: Removing Rear Engine Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Work procedure

- Remove rear engine cover - **arrows** -.

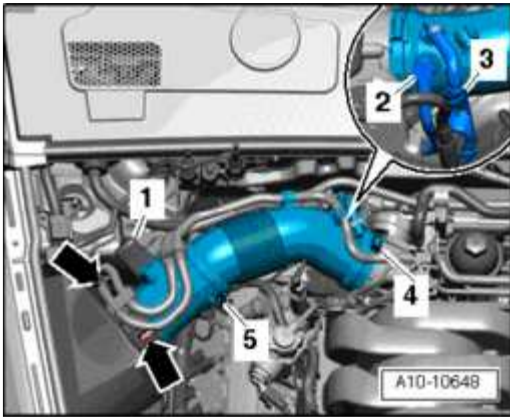


Fig. 145: Identifying Electrical Harness Connector, Clips, And Hose Clamp
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lay aside fuel line and line to EVAP canister at air guide pipe.
- Remove air guide hose from air filter housing, loosen hose clamp - **4 and 5** - to do so.
- Lay aside air guide hose with wires - **2 and 3** - connected.

NOTE:

- **Disregard - 1 and arrows -.**

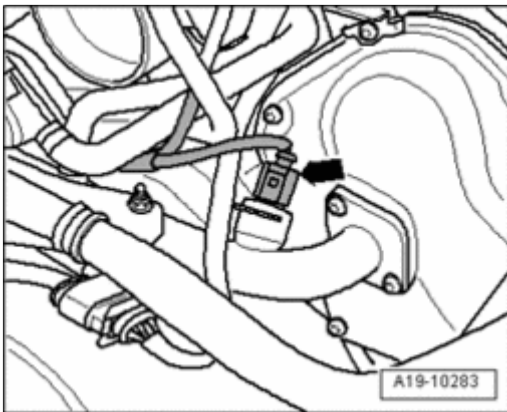


Fig. 146: Identifying Electrical Harness Connector At Engine Coolant Temperature (ECT) Sensor G62
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector - **arrow** - at Engine Coolant Temperature (ECT) Sensor G62.

NOTE:

- **For clarity, depicted without engine.**

Installation is performed in the reverse order of removal.

Electrical harness connector at Engine Coolant Temperature (ECT) Sensor G62 , disconnecting - vehicles with 5.2l FSI engine



Fig. 147: Removing Rear Engine Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Work procedure

- Remove engine cover at front - **1** - and at rear - **2** - - **arrows** -.

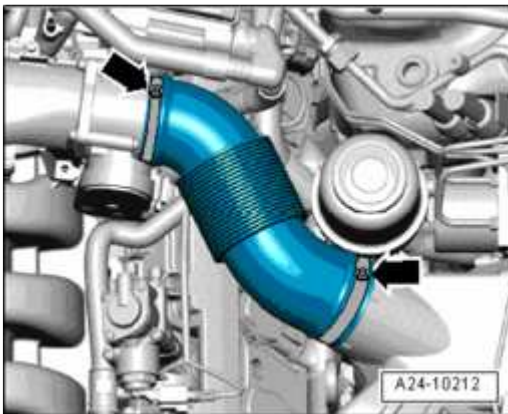


Fig. 148: Identifying Hose Clamps For Left Air Guide Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove left air guide hose - **arrows** -.

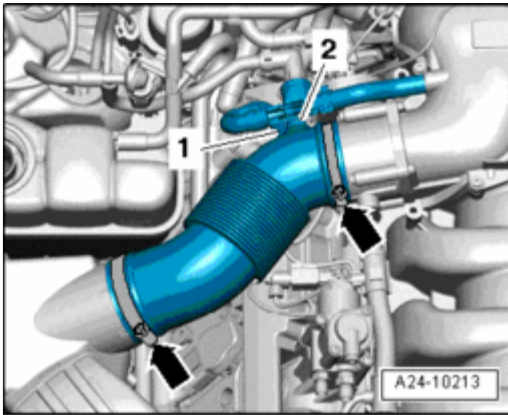


Fig. 149: Identifying Hose Clamps And Electrical Connector
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove right air guide hose - **arrows** -.

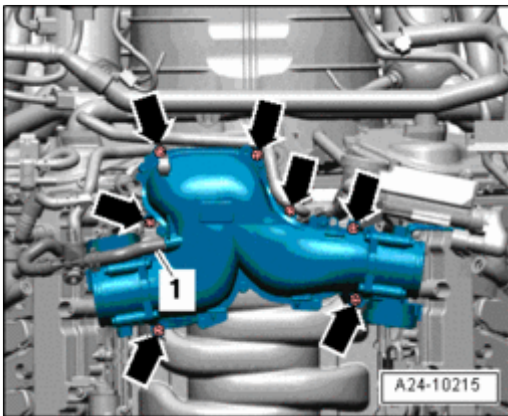


Fig. 150: Identifying Vacuum Hose And Bolts
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect vacuum hose - **1** - from intake manifold.
- Unscrew bolts - **arrows** - and remove air guide.

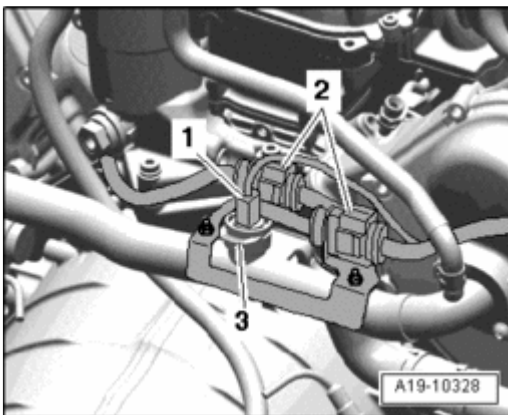


Fig. 151: Disconnecting Electrical Harness Connector At Engine Coolant Temperature (ECT) Sensor

G62

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector - **1** - at Engine Coolant Temperature (ECT) Sensor G62.

NOTE:

- **Disregard - 2 - and - 3 -.**

Installation is performed in the reverse order of removal.

Radio Frequency Controlled Clock Receiver J489 , removing and installing - Sedan

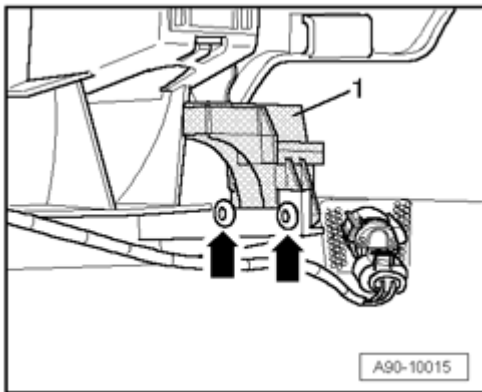


Fig. 152: Radio Frequency Controlled Clock Receiver J489 , Components - Sedan
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removing

- Remove rear bumper cover --> **63 - BUMPERS** .
- Remove bolts - **arrows** -.
- Remove Radio Frequency Controlled Clock Receiver J489 - **1** - from rear bumper cover.

Installing

Installation is performed in reverse order of removal, noting the following:

- Install rear bumper cover --> **63 - BUMPERS** .

Tightening torque

Component	Nm
Radio Frequency Controlled Clock Receiver J489 at bumper cover	2.5

Radio Frequency Controlled Clock Receiver J489 , removing and installing - Avant

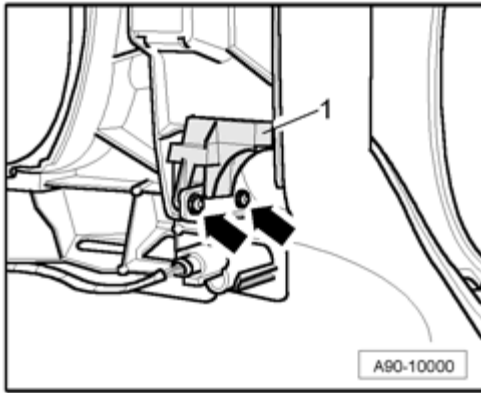


Fig. 153: Radio Frequency Controlled Clock Receiver J489 , Components - Avant
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removing

- Remove rear bumper cover --> **63 - BUMPERS** .
- Remove bolts - **arrows** - .
- Remove Radio Frequency Controlled Clock Receiver J489 - **1** - from rear bumper cover.

Installing

Installation is performed in reverse order of removal, noting the following:

- Install rear bumper cover --> **63 - BUMPERS** .

Tightening torque

Component	Nm
Radio Frequency Controlled Clock Receiver J489 at bumper cover	2.5

Garage Door Opener Control Module J530 , removing and installing

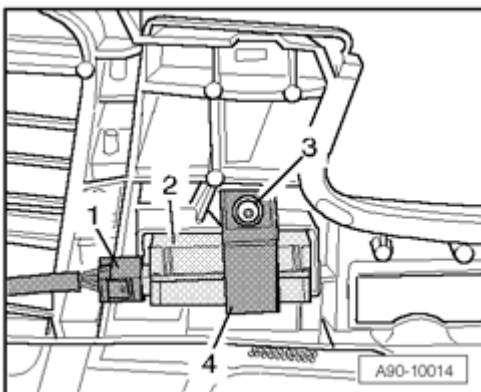


Fig. 154: Identifying Bolt, Harness Connector, And Garage Door Opener Control Module
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removing

- Remove front bumper cover --> **63 - BUMPERS** .
- Remove bolt - **3** - and remove retaining bracket - **4** - .
- Remove Garage Door Opener Control Module - **2** - out of bumper cover.
- Disconnect electrical harness connector - **1** - .

Installing

Installation is performed in reverse order of removal, noting the following:

- Install front bumper cover --> **63 - BUMPERS** .

Tightening torque

Component	Nm
Garage Door Opener Control Module J530 to bumper cover	2.5

Diagnostic interface for CAN-bus J533

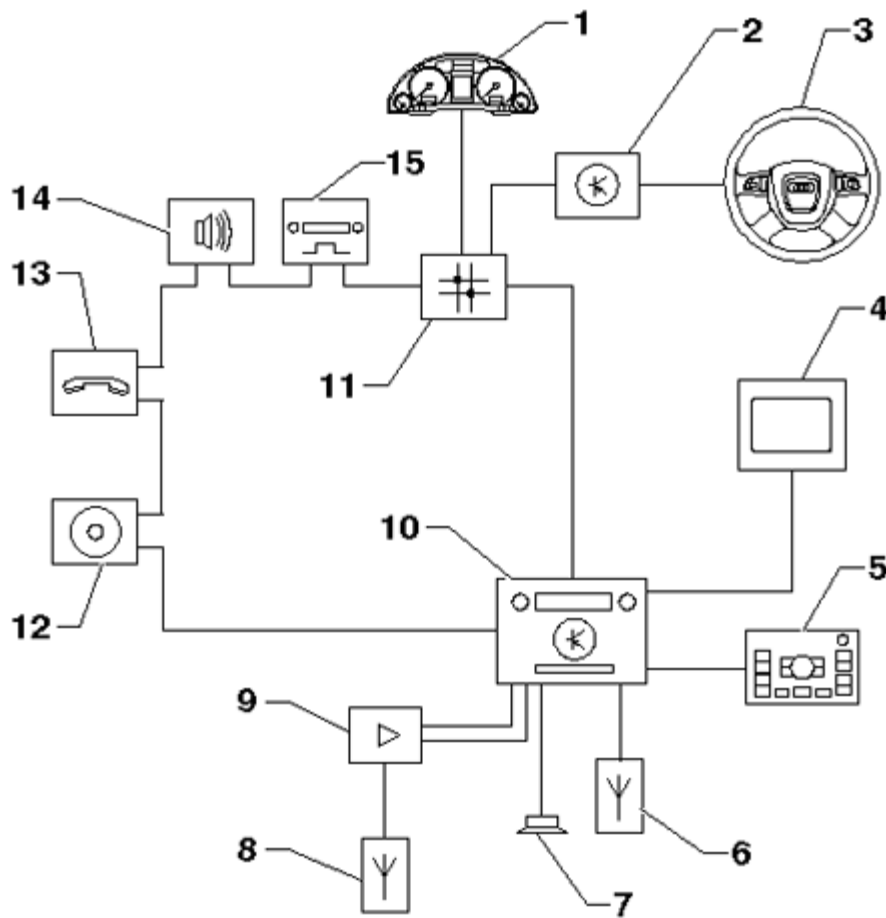
General description

Data Bus On Board Diagnostic Interface J533 interlinks the different CAN bus systems in the vehicle.

It transmits data from e.g. the engine control module (drivetrain CAN bus) to the instrument cluster (instrument cluster CAN bus).

Fault finding is performed via "Guided Fault Finding".

Data Bus On Board Diagnostic Interface J533 in connection with MMI Basic/MMI Basic Plus - component overview



A91-10073

Fig. 155: MMI Basic, Basic Plus Systems, Layout
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Control module with indicator unit in instrument panel insert J285

- In instrument cluster

2 - Steering Column Electronic Systems Control Module J527

- On steering column

3 - Multi-function steering wheel

4 - Front Information Display Control Head J685

- In instrument panel, center

5 - Multimedia Control Head E380

- In center console, center

6 - Navigation System Antenna R50

- With navigation system on MMI Basic Plus
- Behind rear center roof end trim

7 - Sound systems

8 - Rear window antennas

9 - Antenna amplifier R24

- Behind left roof end trim

10 - Front Information Display Control Head Control Module J523

- Behind glove compartment

11 - Diagnostic interface for CAN-bus J533

- Gateway
- Behind glove compartment

12 - Media player in position 2 R119

- In glove compartment

13 - Telephone Transceiver R36

- Beneath floor carpet in drivers footwell

14 - Digital Sound System Control Module J525

- With MMI Basic Plus
- In luggage compartment, left side, behind side trim

15 - Digital radio (DAB) R147

- In luggage compartment, left side, behind side trim

Data Bus On Board Diagnostic Interface J533 in connection with MMI - component overview

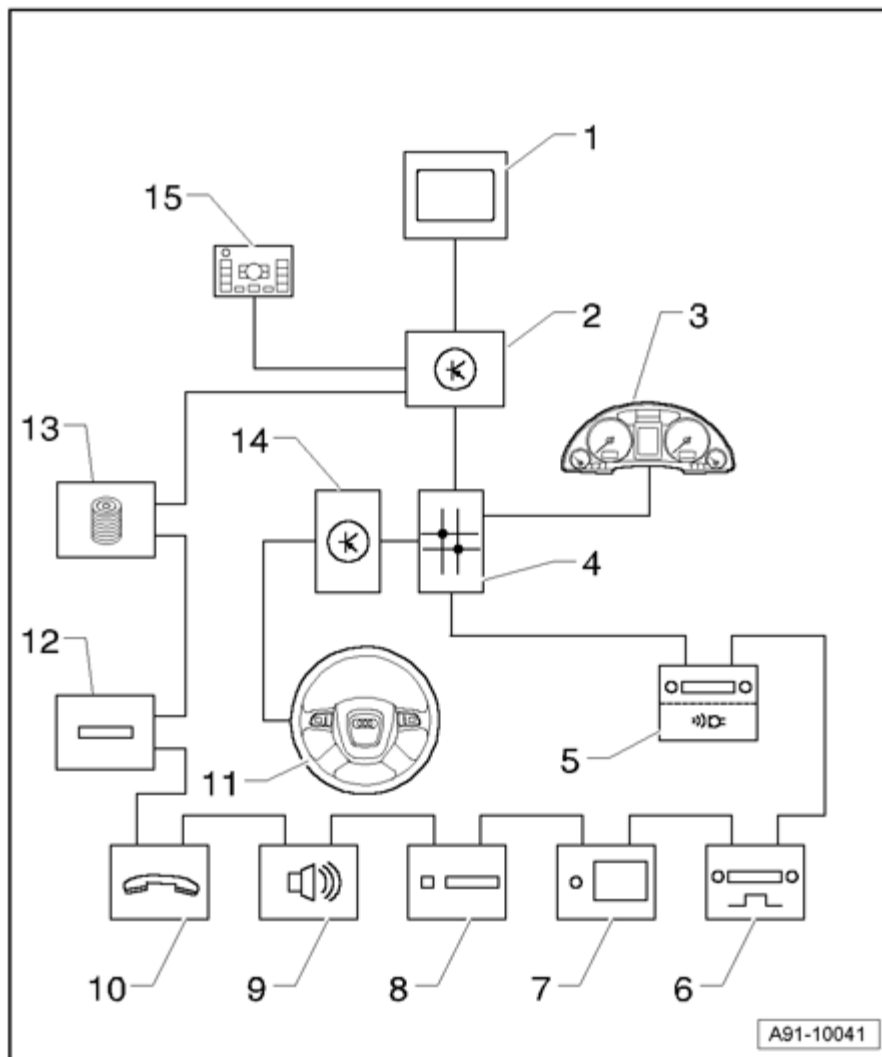


Fig. 156: MMI System, Layout

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Front Information Display Control Head J685

- In instrument panel, center

2 - Front Information Display Control Head Control Module J523

- Behind glove compartment

3 - Control module with indicator unit in instrument panel insert J285

- In instrument cluster

4 - Diagnostic interface for CAN-bus J533

- Gateway
- Behind glove compartment

5 - Radio R

- With Speech Input Control Module J507 , depending on equipment
- In luggage compartment, left side, behind side trim

6 - Digital radio (DAB) R147

- In luggage compartment, left side, behind side trim

7 - TV Tuner R78

- In luggage compartment, left side, behind side trim

8 - Navigation System with CD Drive Control Module J401

- In luggage compartment, left side, behind side trim

9 - Digital Sound System Control Module J525

- In luggage compartment, left side, behind side trim

10 - Telephone Transceiver R36

- Beneath floor carpet in drivers footwell

11 - Multi-function steering wheel

12 - Media player in position 1 R118

- In glove compartment

13 - Media player in position 2 R119

- In glove compartment

14 - Steering Column Electronic Systems Control Module J527

- On steering column

15 - Multimedia Control Head E380

- In center console, center

Data Bus On Board Diagnostic Interface J533 , removing and installing**Special tools, testers and auxiliary items required**

Fig. 157: Fiber Optic Plier Repair Set VAS 6223
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Protective Cap For Cable Connector VAS 6223/9 from Fiber Optic Plier Repair Set VAS 6223

Removing

- If control module is replaced, select "Guided Functions" of respective control module in.
- Switch ignition off and remove ignition key.
- Remove glove compartment --> **68 - INTERIOR EQUIPMENT** .

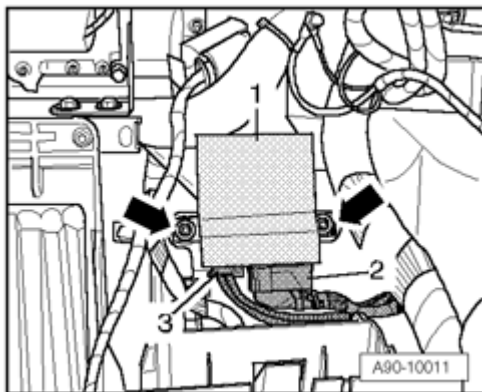


Fig. 158: Identifying Bolts, Data Bus On Board Diagnostic Interface J533, And Electrical Harness Connector

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove Data Bus On Board Diagnostic Interface J533 - **1** - .
- Disconnect electrical harness connector - **2** - .
- Disconnect harness connector - **3** - for fiber-optic cable.

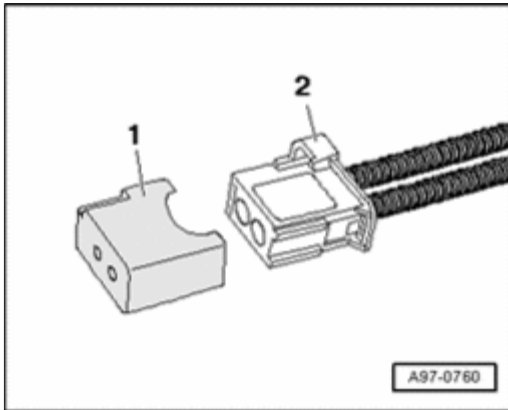


Fig. 159: Fiber-Optic Cable Harness Connector And Protective Cap For Cable Connector VAS 6223/9
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Seal open harness connector - 2 - for fiber-optic cable using Protective Cap For Cable Connector VAS 6223/9 - 1 -.

NOTE:

- The protective cap prevents soiling or mechanical damage on contact surface of fiber-optic cable, which would otherwise impair signal transmission.

Installing

Installation is performed in reverse order of removal, noting the following:

- Install glove compartment --> **68 - INTERIOR EQUIPMENT** .

Tightening torque

Component	Nm
Data Bus On Board Diagnostic Interface J533 to body	3

Harness connector on Data Bus On Board Diagnostic Interface J533

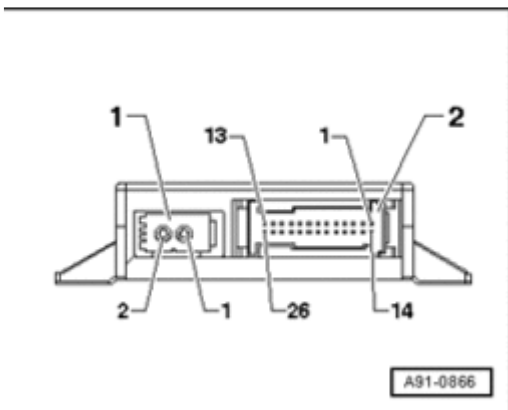


Fig. 160: Harness Connector On Data Bus On Board Diagnostic Interface J533
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Connection optical MOST bus (fiber-optic cable) - 1 -

1. Input
2. Output

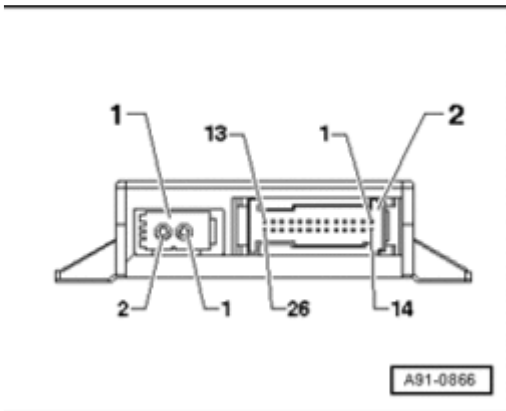


Fig. 161: Harness Connector On Data Bus On Board Diagnostic Interface J533
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

26-pin harness connector - 2 -

1. Battery + (terminal 30)
2. Battery + (terminal 30)
3. Instrument cluster wake up
4. Ring-break diagnostic wire
5. Not assigned
6. CAN bus High (Comfort)
7. Not assigned
8. CAN bus High (drivetrain)
9. CAN bus High (instrument cluster)
10. Not assigned
11. CAN bus High (diagnosis)
12. Not assigned
13. CAN Bus High (to Distance Regulation Control Module J428)
14. Ground (GND) (terminal 31)
15. Ground (GND) (terminal 31)
16. Terminal 15
17. Not assigned
18. Not assigned

- 19. CAN bus Low (Comfort)
- 20. Not assigned
- 21. CAN bus Low (drivetrain)
- 22. CAN bus Low (instrument cluster)
- 23. Not assigned
- 24. CAN bus Low (diagnosis)
- 25. Not assigned
- 26. CAN Bus Low (to Distance Regulation Control Module J428)