

# 90 INSTRUMENTS

## INSTRUMENT CLUSTER

### General information

The instrument cluster contains an electronic speedometer, tachometer, liquid crystal (LCD) displays for odometer, trip odometer, digital clock with date, as well as analog coolant temperature and fuel level gauges. Control and warning lamps are situated within the speedometer and tachometer faces. Automatic transmission models also contain an LCD gear indicator display.

A "Drivers Information System" LCD is located between the tachometer and speedometer. Displayed information includes an auto check system, outside air temperature, automatic transmission range, radio frequency and selectable trip computer functions.

The optional Navigation system display is also included in the Drivers Information System (where applicable).

### Instrument cluster, disposal

- NOTE:
- Instrument cluster LCD display contains mercury.
  - Faulty instrument clusters (not covered by new vehicle warranty) may need to be disposed of as hazardous waste. Always heed state/local regulations concerning disposal of hazardous waste.

### On Board Diagnostic (OBD), function

The instrument cluster is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability. If malfunctions occur in monitored sensors and components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot instrument cluster malfunctions and perform OBD program functions using VAS 5051/5052 tester in mode "Guided Fault Finding".

VAS 5051/5052 connected and in mode "Guided Fault Finding":

- Enter appropriate model, equipment and model year information and press ">" to confirm.

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

- Press "Go to" "Go to" button
- Select: "Function / Component Selection"
- Select: "Body (Repair 01; 27; 50 - 97)"
- Select: "Electrical Equipment (Repair 01; 90 - 97)"
- Select: "01 - On Board Diagnostic (OBD) capable systems"

- Select: "Instrument Cluster"
- Select appropriate option
- Follow tester prompts.

#### Message "dEF" in trip recorder display

If the instrument cluster control module detects a DTC in permanent memory, letters "dEF" will appear in the trip recorder display.

- If "dEF" is displayed, Replace instrument cluster --> **Instrument cluster, removing and installing.**

#### Instrument cluster, removing and installing

#### Special tools, testers and auxiliary items required

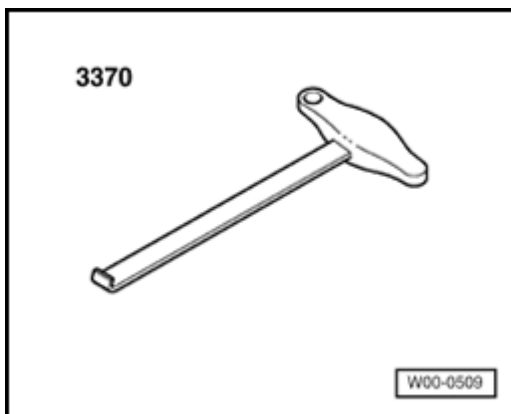


**Fig. 186: Identifying Special Hook 3370**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Hook 3370

#### Removing

##### NOTE:

- Do not disassemble instrument cluster.
- Instrument clusters contain no field serviceable components. Should malfunctions occur, replace complete instrument cluster.
- If instrument cluster is to be replaced, connect VAS 5051/5052 and initiate OBD program option "Instrument cluster, replacing" --> **On Board Diagnostic (OBD), function**

##### CAUTION:

- Switch off all electrical consumers.
- Switch ignition off and remove ignition key.
- Pull steering wheel with adjusting mechanism fully out and move it downward.

**NOTE:**

- For clarity, steering wheel is shown removed in the following illustrations.

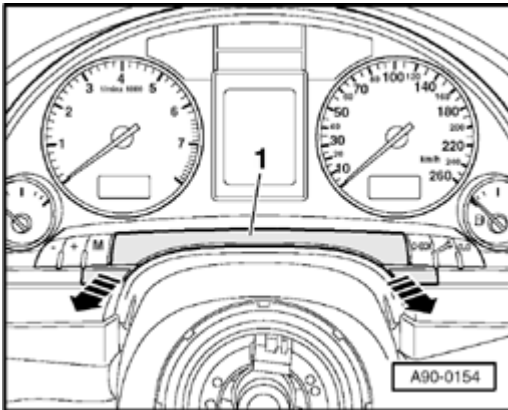


**Fig. 187: Pulling Off Bottom Cover Towards Rear**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off bottom cover - **1** - towards rear - **arrows** -.

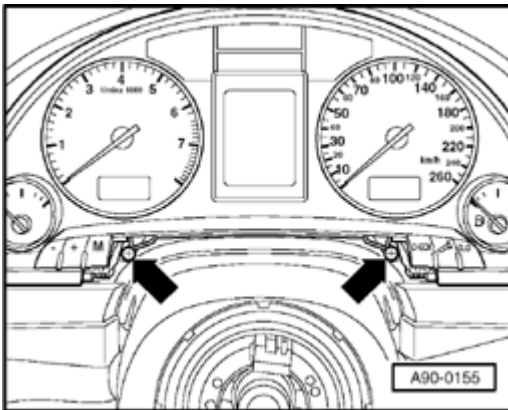


**Fig. 188: Locating Screws**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove screws - **arrows** -.

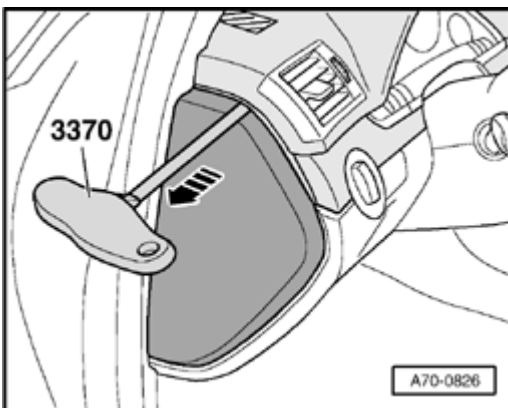


**Fig. 189: Pulling Off Left Instrument Panel Cover Using Special Hook 3370**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove left instrument panel side cover - **arrow** - using hook 3370.

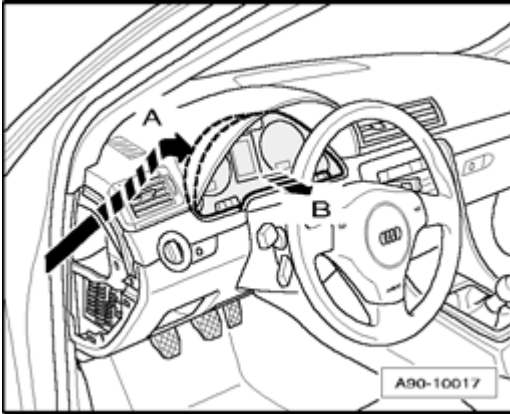


**Fig. 190: Reaching Through Opening Above Fuse Panel And Pushing Out Instrument Cluster**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Reach through opening - **arrow A** - above fuse panel and push out instrument cluster in direction of - **arrow B** -.

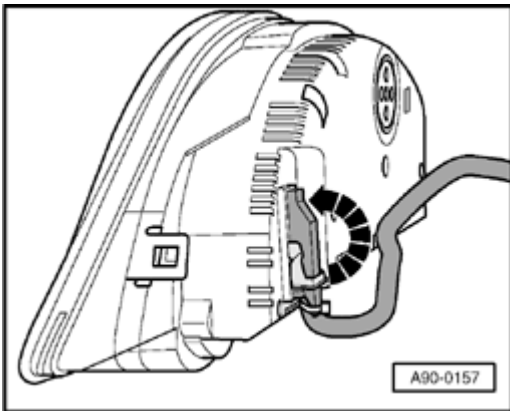


**Fig. 191: Identifying Securing Bracket Of Connectors**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage lock on electrical connectors - **arrow** - and disconnect.
- Remove instrument cluster from instrument panel opening.

**Installing**

Install in reverse order of removal, noting the following:

- After installation, perform functional test of instrument cluster.
- If instrument cluster is replaced, continue to follow VAS 5051/5052 tester prompts in conjunction with

### Instrument cluster, rear view

**NOTE:**

- Do not disassemble instrument cluster.
- Instrument clusters contain no field serviceable components. All indicator warning lamps are Light Emitting Diodes (LED).

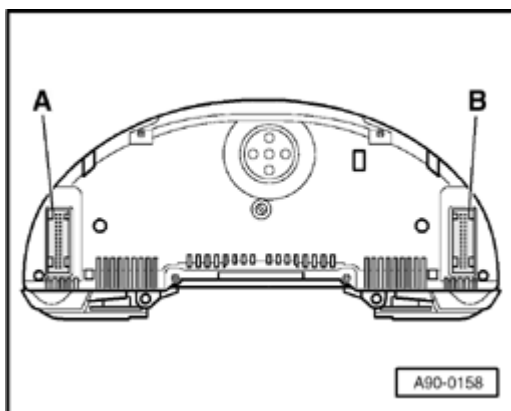


**Fig. 192: Instrument Cluster, Rear View**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Should malfunctions occur, replace complete instrument cluster.

A - 32-pin multi-pin connector, green

B - 32-pin multi-pin connector, blue

### Instrument cluster multi-pin connector assignments

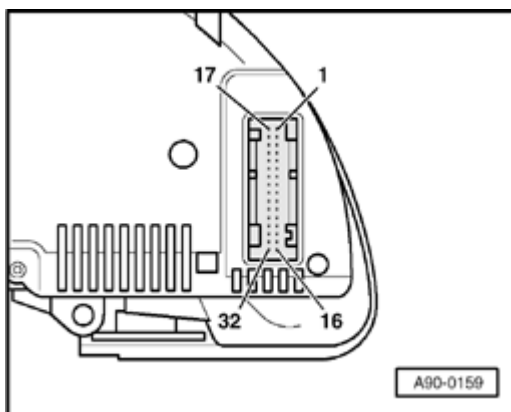


**Fig. 193: Identifying Multi-Pin Connector 32-Pin, Blue**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

32-pin multi-pin connector, blue

1. Washer fluid low
2. Coolant level low
3. Fuel gauge sensor
4. Coolant temperature
5. Push button circuit 2 Navigation system
6. Push button circuit 3 Navigation system
7. Push button circuit x Telematics
8. Menu switch
9. Vacant
10. Front hood switch
11. Fuel gauge sensor 2
12. Menu switch (Out A)
13. Vacant
14. Vacant
15. Vacant
16. FDR/TCS (= ESP)
17. Convenience CAN-Bus High
18. Convenience CAN-Bus Low
19. Infotainment CAN-Bus Low
20. Infotainment CAN-Bus High
21. Ambient temp. (input)
22. S contact
23. Oil level / oil temperature
24. Self-levelling suspension
25. Menu switch (enter)
26. Vacant
27. Vacant
28. Menu switch (Out B)
29. Vacant
30. Transponder 2
31. Transponder 1
32. Terminal 31 (sensor)

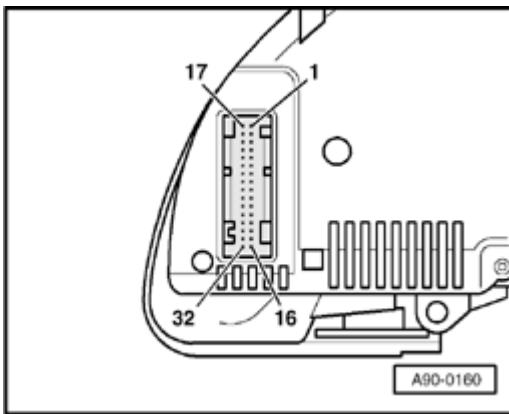


**Fig. 194: Identifying Green 32-Pin Multi-Pin Connector**  
**Courtesy of VOLKSWAGEN UNITED STATES, INC.**

### **32-pin multi-pin connector, green**

1. Terminal 58d
2. Terminal 30
3. Terminal 15
4. Vacant
5. Speedometer (input)
6. Speedometer (output 2)
7. Airbag (inverted)
8. Turn signal (right-side)
9. Brake fluid low
10. Turn signal (left-side)
11. Turn signal (trailer)
12. Powertrain CAN-Bus Low
13. Powertrain CAN-Bus High
14. Terminal 61 (generator charge warning)
15. Vacant
16. Oil pressure 2
17. Terminal 58s
18. Terminal 31 load
19. Terminal 31 load
20. Vacant
21. Speedometer (output 1)
22. ABS warning
23. K wire
24. CAN-Bus drive (display)

25. Tank flap switch
26. CAN-Bus diagnosis Low
27. CAN-Bus diagnosis (display)
28. CAN-Bus diagnosis High
29. HRC (headlamp range control)
30. Safety belt buckle
31. External buzzer
32. Brake pad wear

#### Fuel Level Sensor G - front-wheel drive, multi-pin connector assignments

##### CAUTION:

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

#### Preparations

Fuel level sensor is located under the floor covering in the luggage compartment.

- Remove luggage compartment floor lining.
- If necessary, fold right backrest of rear seat bench forwards.

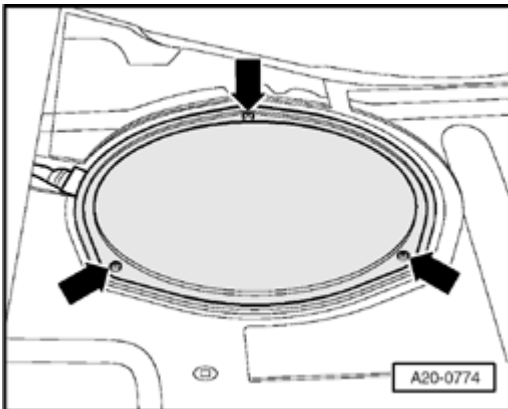


**Fig. 195: Unbolting Cover**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove screws - **arrows** - and remove access panel.

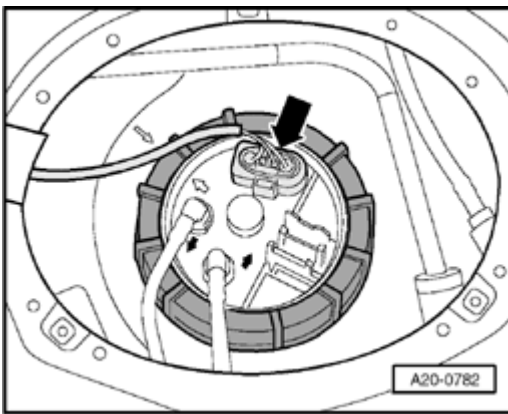


**Fig. 196: Identifying Electrical 4-pin Harness Connector**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully unlock and disconnect 4-pin connector - **arrow** -.

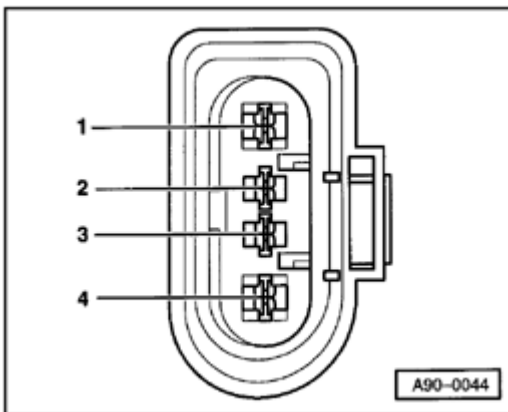


**Fig. 197: Identifying Terminal Assignment Of The 4-Pin Connector On Fuel Gauge Sender**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

#### Pin assignment for 4-pin connector at fuel level sensor

1. Fuel pump positive ( + )
2. Sensor to fuel gauge
3. Sensor Ground (GND) ( - )
4. Fuel pump Ground (GND) ( - )

Fuel Level Sensor G , Fuel Level Sensor 2 G169 - quattro, multi-pin connector assignments

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

#### Preparations

- Remove rear seat bench --> **72 - SEAT - FRAMES** .

## Fuel Level Sensor G

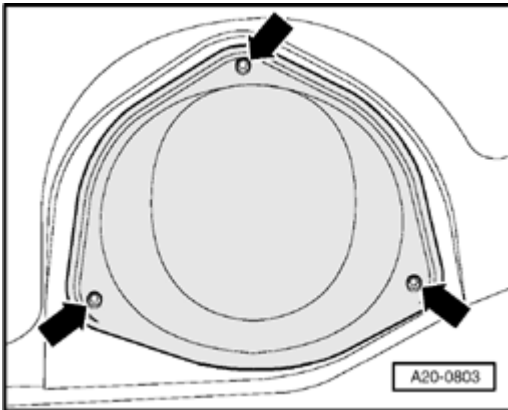


**Fig. 198: Removing Cover Bolts For Locking Flange**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove screws - **arrows** - and remove right access panel.

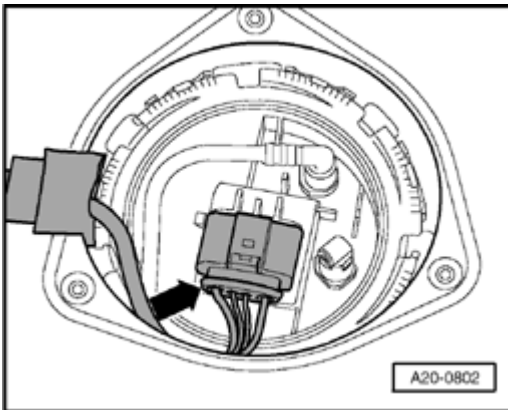


**Fig. 199: Identifying Electrical 4-pin Harness Connector**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully release and disconnect 4-pin connector - **arrow** - (right-side).

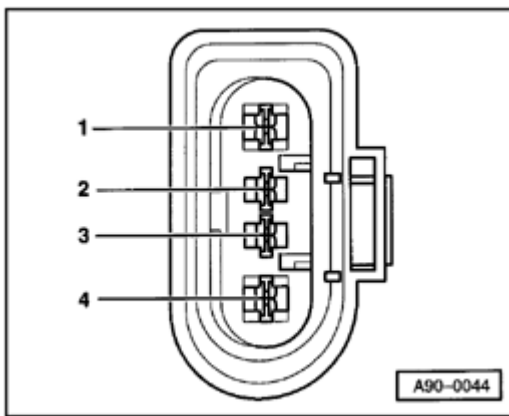


**Fig. 200: Identifying Terminal Assignment Of The 4-Pin Connector On Fuel Gauge Sender**  
**Courtesy of VOLKSWAGEN UNITED STATES, INC.**

**Assignment of 4-pin connector at fuel level sensor.**

1. Fuel pump positive ( + )
2. Sensor to fuel gauge
3. Sensor Ground (GND) ( - )
4. Fuel pump Ground (GND) ( - )

#### **Fuel Level Sensor 2 G169**

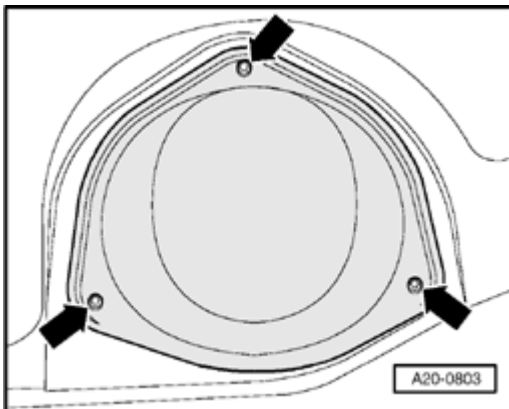


**Fig. 201: Removing Cover Bolts For Locking Flange**  
**Courtesy of VOLKSWAGEN UNITED STATES, INC.**

- Remove screws - **arrows** - and remove left access panel.

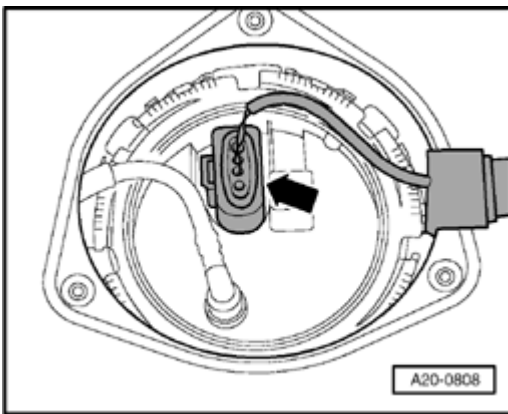


**Fig. 202: Disconnecting Electrical Harness Connector At Left Locking Flange**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully release and disconnect 4-pin connector - **arrow** - (left-side).

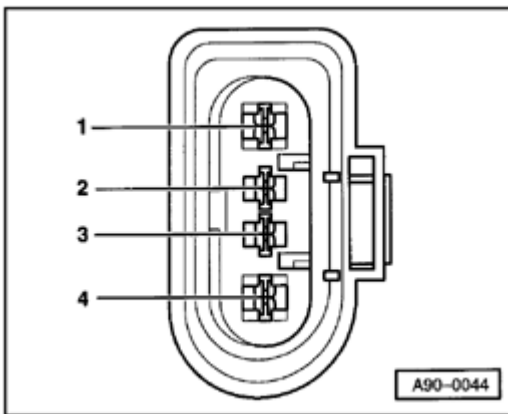


**Fig. 203: Identifying Terminal Assignment Of The 4-Pin Connector On Fuel Gauge Sender**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

#### Assignment of 4-pin connector at fuel level sensor 2

1. Vacant
2. Sensor to fuel gauge
3. Sensor Ground (GND) ( - )
4. Vacant

#### Engine Coolant Temperature (ECT) Gauge Sensor G2 - 1.8L 4-cylinder Turbo engine, multi-pin connector assignments

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

#### Preparations

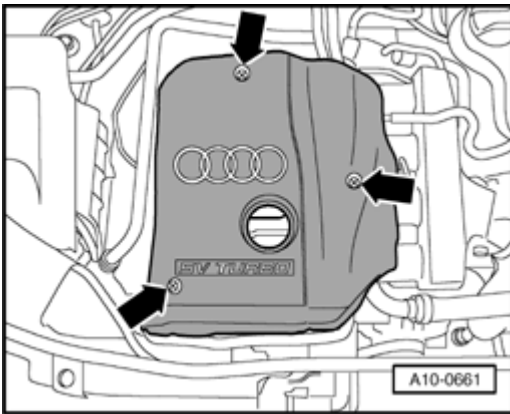


**Fig. 204: Removing Engine Cover**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release fasteners and remove engine cover - **arrows** -.

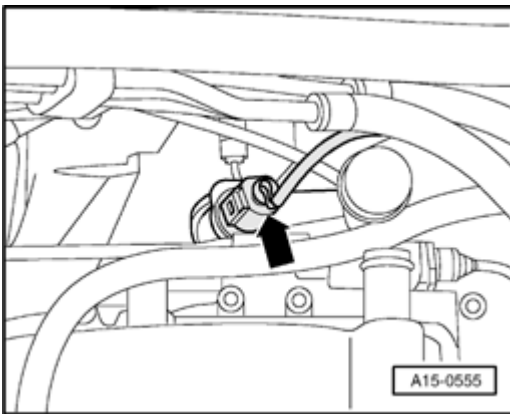


**Fig. 205: Disconnecting Connector At Coolant Temperature Sensor G2/G62**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection - **arrow** - at sensor.

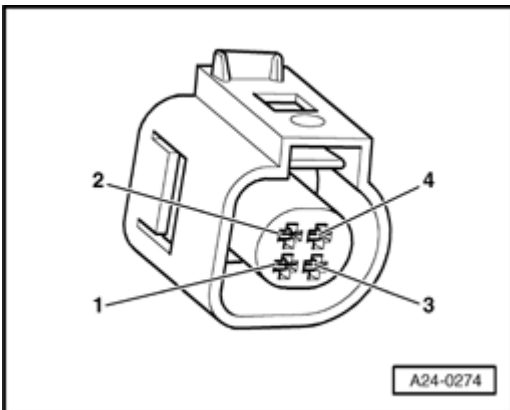


**Fig. 206: Coolant Temperature Sensor Terminals**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

## Pin assignment for 4-pin connector at Engine Coolant Temperature (ECT) Gauge Sensor G2 G2

1. Wiring from sensor to instrument cluster (temperature gauge)
2. Ground (GND) ( - )

Engine Coolant Temperature (ECT) Sensor G62 - 2.0L 4-cylinder Turbo FSI engine, multi-pin connector assignments

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

### Preparations

Location: on rear right of engine.

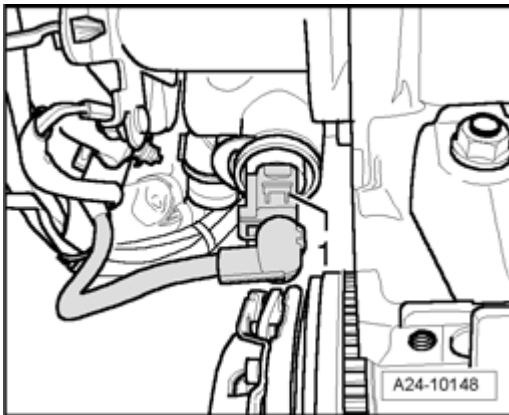


**Fig. 207: Disconnecting Electrical Harness Connector From Engine Coolant Temperature (ECT) Sensor G62**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection at sensor - 1 -.

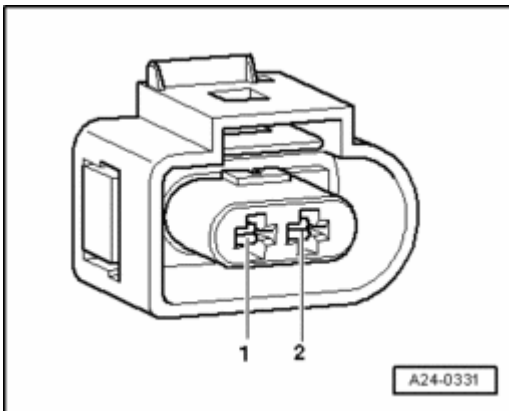


**Fig. 208: Identifying 2-Pin Electrical Harness Connector & Terminals**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

## Pin assignment for 2-pin connector on Engine Coolant Temperature (ECT) Sensor G62

1. Wiring from sensor to instrument cluster (temperature gauge)
2. Ground (GND) ( - )

Engine Coolant Temperature (ECT) Gauge Sensor G2 - 3.0L 6-cylinder engine, multi-pin connector assignments

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

### Preparations

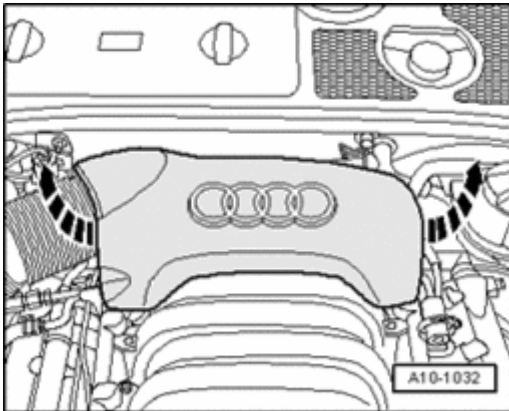


**Fig. 209: Removing Rear Engine Cover**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

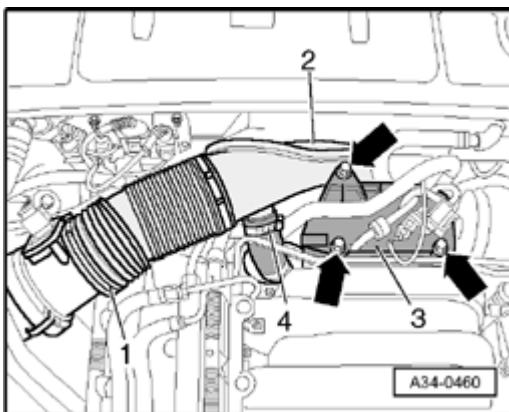


**Fig. 210: Identifying Holding Plate, Intake Air Hose, Hose & Air Duct**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts for solenoid valve retaining plate - **3** - - **arrows** -.
- Remove air intake hose - **1** - at Mass Air Flow (MAF) Sensor G70.

- Remove hose - 4 - at air duct - 2 -.

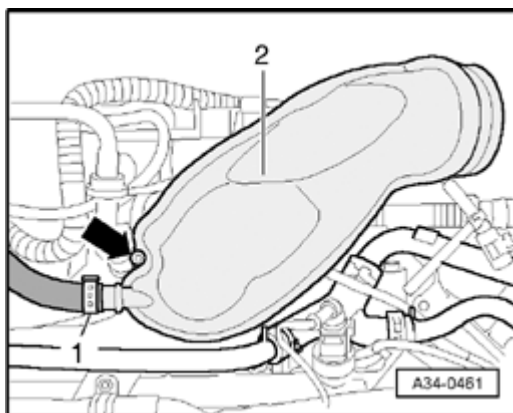


**Fig. 211: Removing Bolt And Disconnect Air Duct At Throttle Valve Control Module**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolt - **arrow** - and pull off air duct - 2 - at throttle valve control module J338.
- Where applicable, remove hose - 1 - at air duct.

**NOTE:**

- For illustration purposes the air duct is shown from the rear with the engine removed.

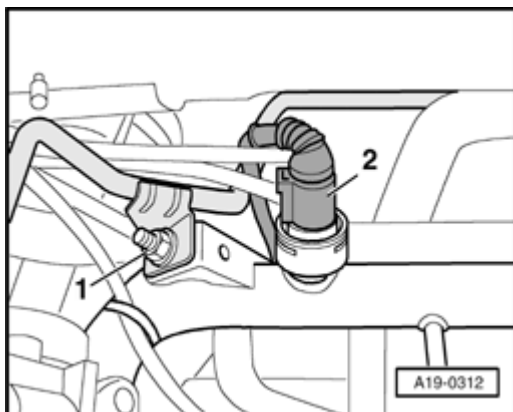


**Fig. 212: Disconnecting Electrical Harness Connector At Engine Coolant Temperature (ECT) Sensor - G2-/-G62-**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection - 2 - at sensor.

**NOTE:**

- Disregard - 1 -.

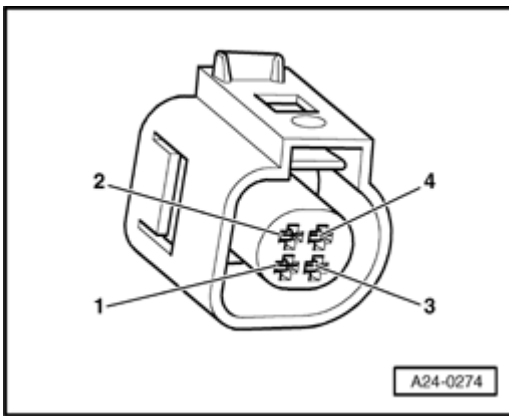


**Fig. 213: Coolant Temperature Sensor Terminals**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

### Pin assignment for 4-pin connector at Engine Coolant Temperature (ECT) Gauge Sensor G2

1. Wiring from sensor to instrument cluster (temperature gauge)
2. Ground (GND) ( - )

Engine Coolant Temperature (ECT) Sensor G62 - 3.2L 6-cylinder FSI engine, multi-pin connector assignments

#### CAUTION:

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

### Preparations

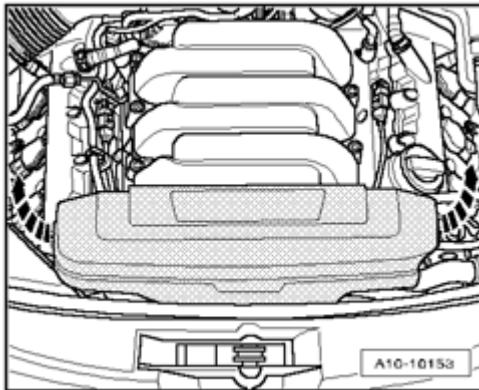


**Fig. 214: Identifying Front Engine Cover**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

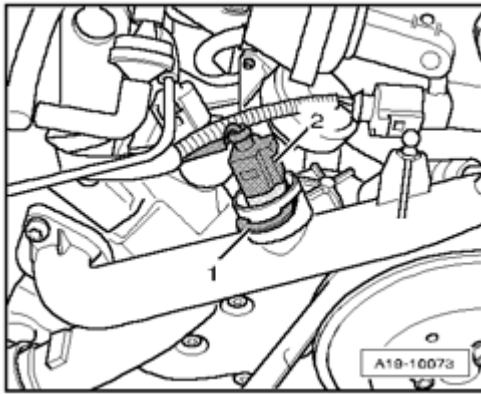


**Fig. 215: Disconnecting Electrical Connector, Retaining Clip And Engine Coolant Temperature (ECT) Sensor G62**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection at sensor - 2 -.

**NOTE:**

- Disregard - 1 -.

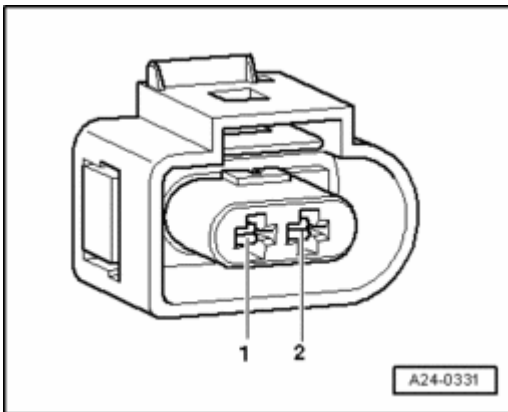


**Fig. 216: Identifying 2-Pin Electrical Harness Connector & Terminals**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

**Pin assignment for 2-pin connector on Engine Coolant Temperature (ECT) Sensor G62**

1. Ground (GND) ( - )
2. Wiring from sensor to instrument cluster (temperature gauge)

Engine Coolant Temperature (ECT) Sensor G62 - 4.2L 8-cylinder engine (Audi S4), multi-pin connector assignments

**CAUTION:**

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

**Preparations**

|  |             |         |  |
|--|-------------|---------|--|
|  |             |         |  |
|  | 12:17:05 AM | Page 18 |  |

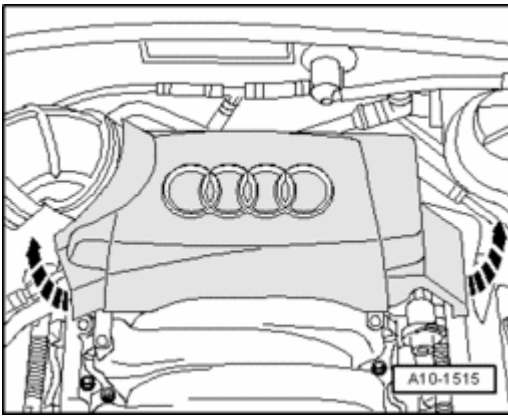


**Fig. 217: Removing/Installing Rear Engine Cover**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

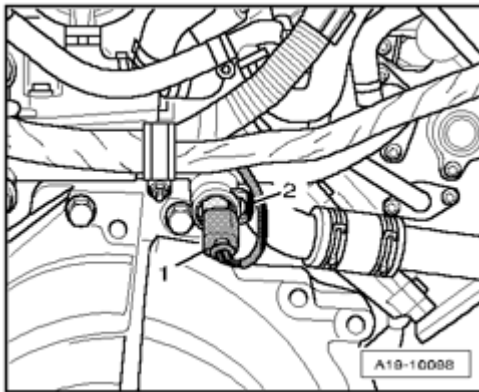


**Fig. 218: Identifying Electrical Connection At Sensor**  
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection - **1** - at sensor.

**NOTE:**                      • Illustration shows engine removed.

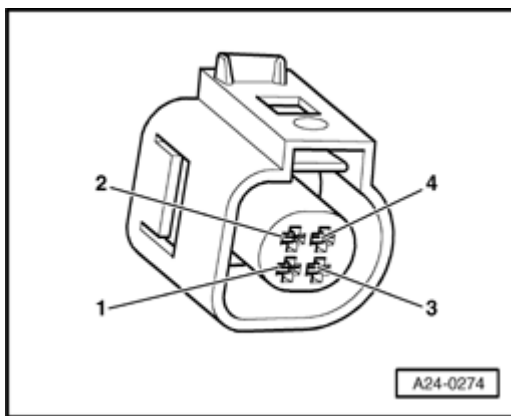


**Fig. 219: Coolant Temperature Sensor Terminals**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

**Pin assignment for 4-pin connector at Engine Coolant Temperature (ECT) Sensor G62 - through 05.05**

- 3 - Ground (GND) ( - )
- 4 - Wiring from sensor to instrument cluster (temperature gauge)

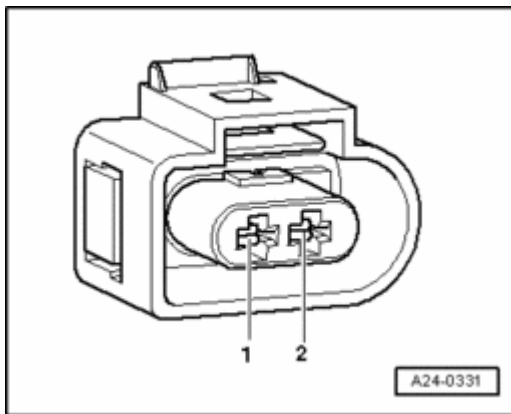


**Fig. 220: Identifying 2-Pin Electrical Harness Connector & Terminals**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

**Pin assignment for 2-pin connector at Engine Coolant Temperature (ECT) Sensor G62 - from 06.05**

- 1. Ground (GND) ( - )
- 2. Wiring from sensor to instrument cluster (temperature gauge)

**Engine Coolant Temperature (ECT) Sensor G62 - 4.2L 8-cylinder engine (Audi RS4), multi-pin connector assignments**

**CAUTION:**

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

**Preparations**

|  |             |         |  |
|--|-------------|---------|--|
|  |             |         |  |
|  | 12:17:05 AM | Page 20 |  |

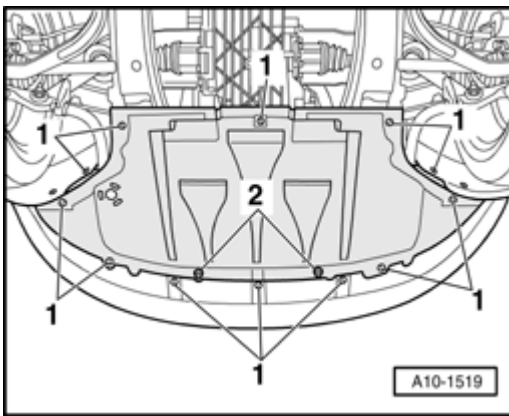


**Fig. 221: Removing Quick-Release Fasteners, Screws And Noise Insulation**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release fasteners - 1 - and - 2 - and remove front noise insulation.

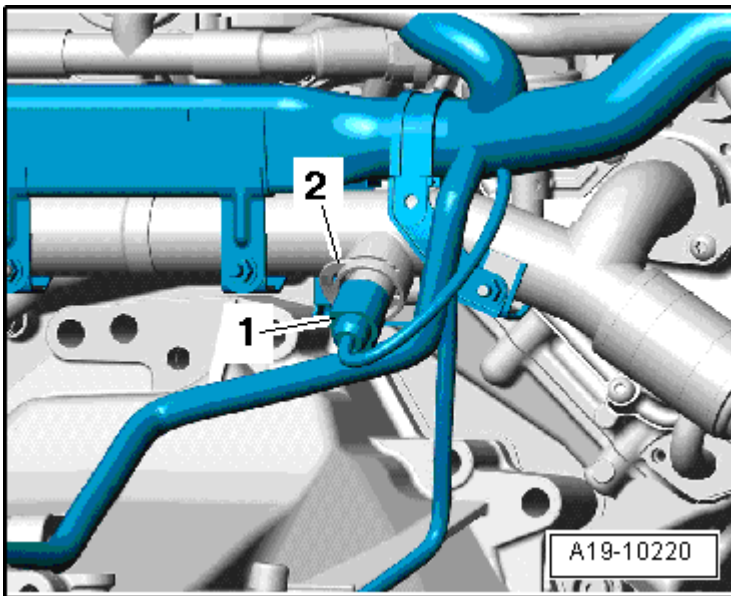


**Fig. 222: Disconnecting Electrical Connector On Engine Coolant Temperature (ECT) Sensor G62**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection - 1 - at sensor.

**NOTE:**

- Engine Coolant Temperature (ECT) Gauge Sensor G62 is accessible from lower right with engine installed.
- Engine shown removed for clarity.

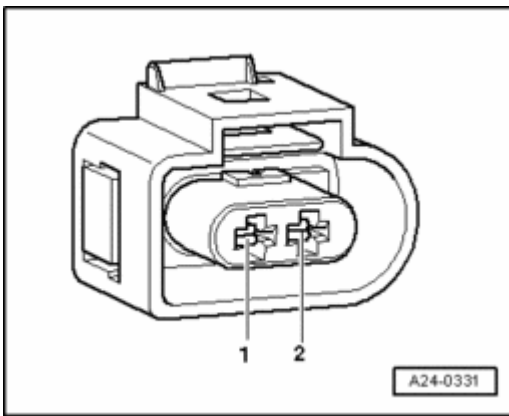


**Fig. 223: Identifying 2-Pin Electrical Harness Connector & Terminals**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

**Pin assignment for 2-pin connector at Engine Coolant Temperature (ECT) Gauge Sensor G62**

1. Wiring from sensor to instrument cluster (temperature gauge)
2. Ground (GND) ( - )

**Radio Frequency Controlled Clock Receiver J489 , removing and installing**

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

- NOTE:**
- J489 only where applicable.

**Removing**

- Remove rear bumper cover --> **63 BUMPER** .

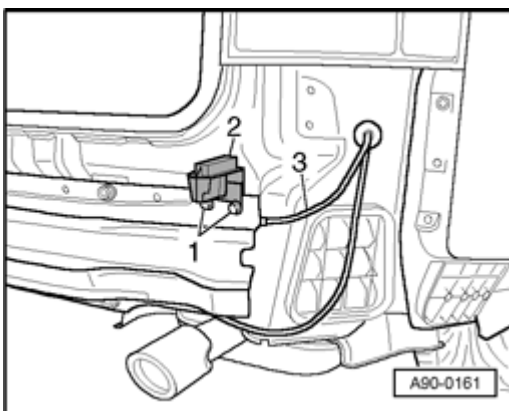


**Fig. 224: Identifying Electrical Connection, Receiver, And Bolts**  
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connection - **3** - at receiver - **2** -.
- Remove bolts - **1** - and remove receiver.

## Installing

Install in reverse order of removal, noting the following:

- Install rear bumper cover: --> **63 BUMPER** .