

ENGINE**3.0 Liter - Ignition/Glow Plug System - Engine Code(s): CCBA (Sedan)****28 IGNITION/GLOW PLUG SYSTEM****GENERAL INFORMATION****SAFETY PRECAUTIONS**

If testing equipment must be used during a road test, observe the following:

WARNING: Improperly secured testing and measuring equipment and distraction during a road test increase the risk of an accident.

The passenger airbag could pose a risk if it deploys in a collision.

- Operating testing equipment while driving causes it to shift position.
- There is an increased risk of injury due to unsecured testing equipment.
- Always secure testers on the rear seat with a strap and have a second person on the rear seat to operate them.

To prevent personal injury and damage to the injection and ignition system, observe the following:

- Individuals with a pacemaker must not stay in the danger area of the high voltage systems, for example ignition systems, xenon light.
- Turn off the ignition before disconnecting and connecting the wiring for the injection and ignition system. This includes tester cables as well.
- Do not touch or remove ignition wires when engine is running or turning at starter speed.
- Only clean engine with ignition switched off.
- If the engine is to be cranked at starting RPM without starting, disconnect the connectors from the ignition coils and fuel injectors.
- While testing it is possible that there may be some faults stored in the Engine Control Module (ECM). After completing all testing and repairs, check the Diagnostic Trouble Code (DTC) memory. If a fault has been stored:

CAUTION: Risk of destroying electronic components when disconnecting the battery.

- Observe measures for disconnecting the battery.

-- Disconnect the battery. Refer to Removal and Installation .

IGNITION SYSTEM

- The Engine Control Module (ECM) is equipped with On Board Diagnostics (OBD).
- For the electric components to work properly, a voltage of at least 11.5 Volts is required.
- While testing it is possible that there may be some faults stored in the ECM. After completing all testing and repairs, check the Diagnostic Trouble Code (DTC) memory. If a fault has been stored:
- If the engine only starts briefly and then turns off again after troubleshooting, repair or checking of the components, it may be that the immobilizer is blocking the ECM. DTC memory must then be checked and if necessary, the control module must be adapted.

DESCRIPTION AND OPERATION

IGNITION OVERVIEW

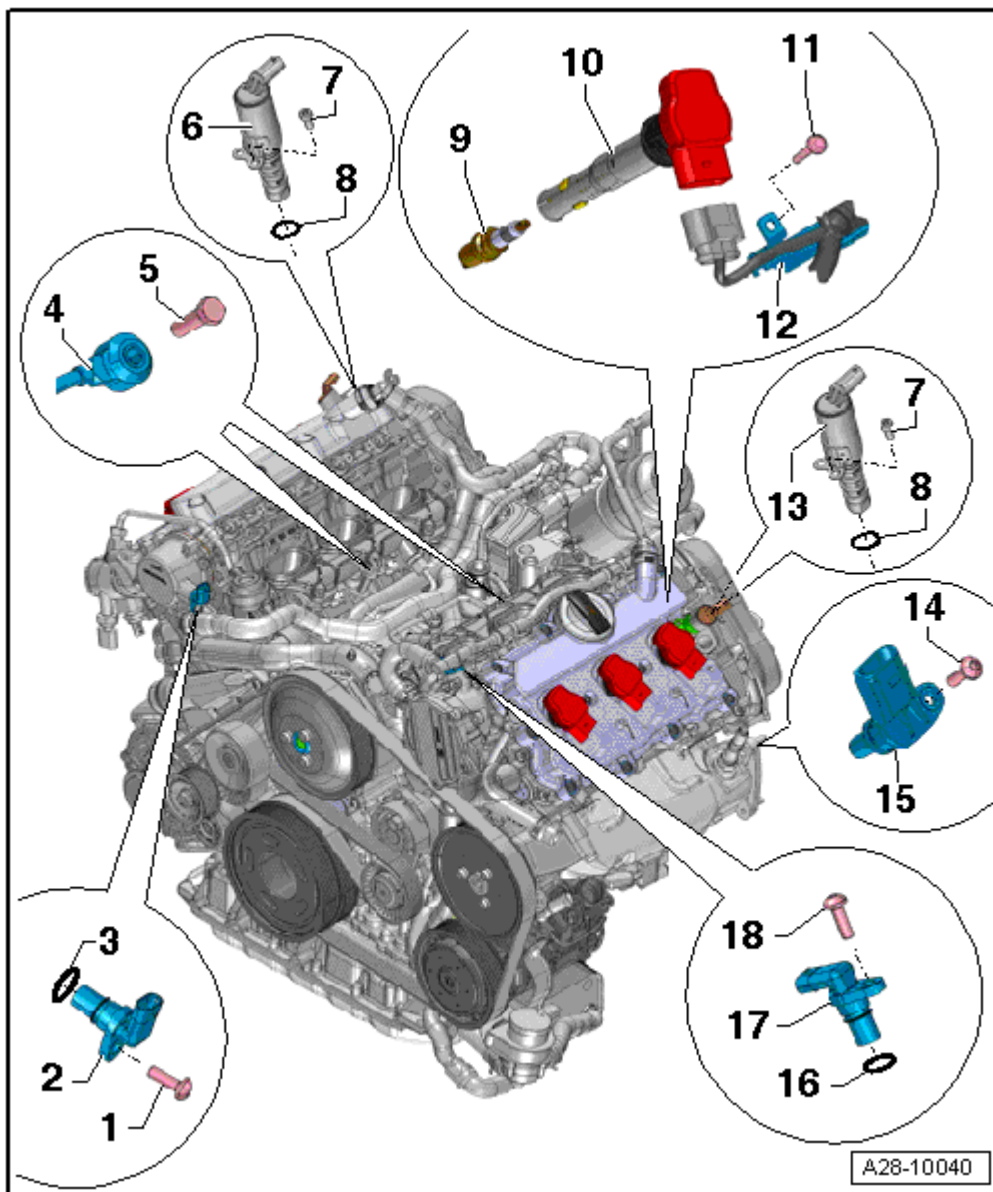


Fig. 1: Identifying Ignition Component Overview**Courtesy of AUDI OF AMERICA, LLC**

1. Bolt
 - 9 Nm
2. Camshaft Position (CMP) Sensor -G40-
 - Removing and installing, refer to **Camshaft Position Sensor -G40- / Camshaft Position Sensor 2 -G163-**
3. O-ring
 - Replace
4. Knock Sensor (KS)
 - KS 1 -G61- (cylinder bank 1), KS 2 -G66- (cylinder bank 2)
 - Removing and installing, refer to **Knock Sensor -G61- / Knock Sensor -G66-**
5. Bolt
 - 20 Nm
 - Tightening specification affects the functionality of the knock sensors
6. Camshaft Adjustment Valve 1 -N205-
7. Bolt
 - 5 Nm
8. O-ring
 - Replace
9. Spark Plug
 - Change interval.
 - Tightening specification.
10. Ignition Coil
 - Removing and installing, refer to **IGNITION COILS**
11. Bolt
 - 5 Nm
12. Wiring Harness
13. Camshaft Adjustment Valve 2 -N208-
14. Bolt
 - 9 Nm
15. Engine Speed (RPM) Sensor -G28-
 - Removing and installing, refer to **Engine Speed Sensor -G28-**
16. O-ring
 - Replace
17. Camshaft Position (CMP) Sensor 2 -G163-
 - Removing and installing. **Camshaft Position Sensor -G40- / Camshaft Position Sensor 2 -G163-**
18. Bolt

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- 9 Nm

SPECIFICATIONS**FASTENER TIGHTENING SPECIFICATIONS**

Components	Fastener Size	Nm
Camshaft Adjustment Valve	-	5
Camshaft Position Sensor	-	9
Engine Speed (RPM) Sensor	-	9
Knock Sensor	-	20
Wiring Harness	-	5

TEST DATA

3.0L TFSI Engine		
Engine idle speed		Cannot be adjusted, it is regulated by idle stabilization
Ignition timing		Not adjustable, regulated by the control module
Ignition/Glow Plug System		Single coil ignition system with 6 ignition coils (output stages integrated) that are connected directly to the spark plugs via the ignition cables.
Spark plugs	Names	=>
	Tightening specifications	
Ignition sequence		1-4-3-6-2-5

REMOVAL AND INSTALLATION

CAMSHAFT POSITION SENSOR -G40- / CAMSHAFT POSITION SENSOR 2 -G163-

Removing

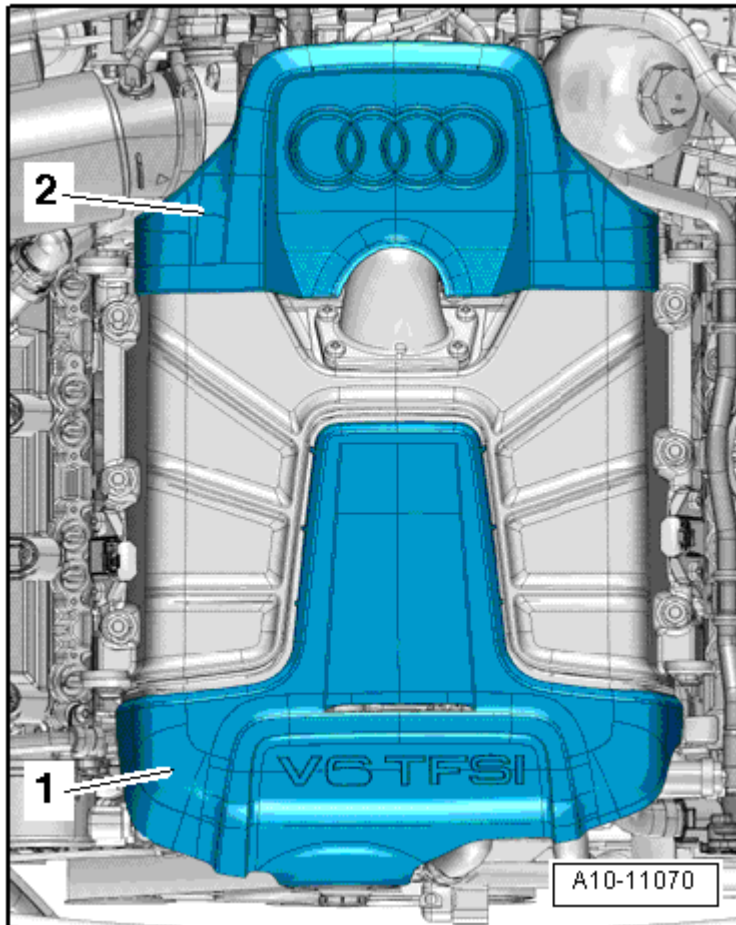


Fig. 2: Identifying Engine Cover -1- And -2-
Courtesy of AUDI OF AMERICA, LLC

- Remove the front engine cover -1- upward.
- Disconnect the connector -1-.

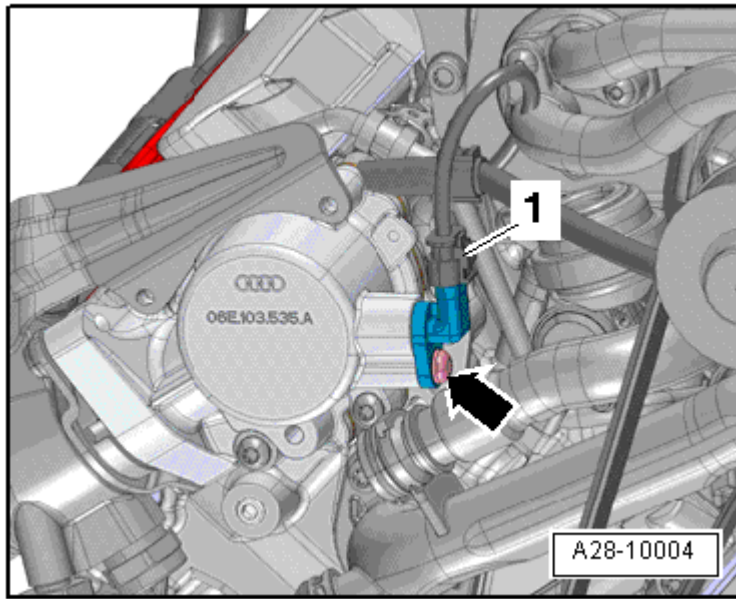


Fig. 3: Identifying Connector -1- And Bolt -Arrow-
Courtesy of AUDI OF AMERICA, LLC

- Remove the bolt -arrow- and remove the Camshaft Position (CMP) sensor (cylinder bank 1).
- Disconnect the connector -1-.

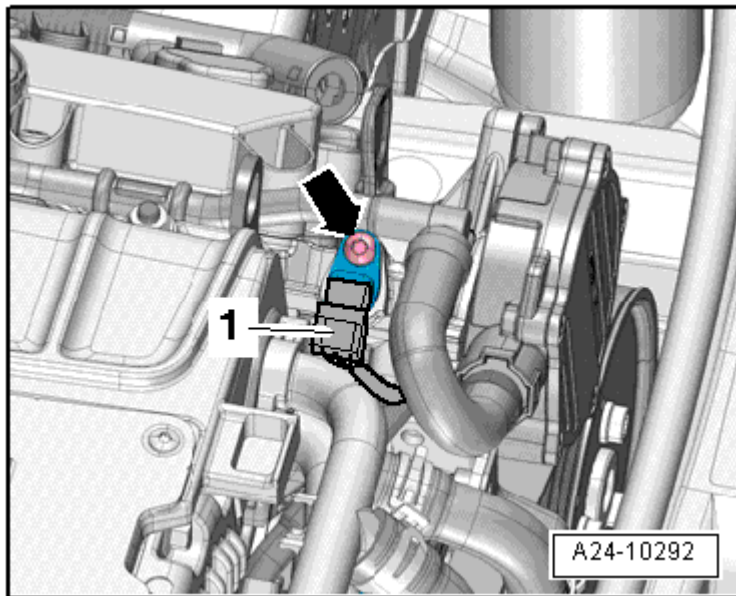


Fig. 4: Identifying Connector -1- From (CMP) Sensor
Courtesy of AUDI OF AMERICA, LLC

- Remove the bolt -arrow- and remove CMP sensor 2 (cylinder bank 2).

Installing

Install in reverse order, paying attention to the following:

-- Replace the O-rings.

- Tightening specifications: Ignition system assembly overview, refer to **IGNITION OVERVIEW**

ENGINE SPEED SENSOR -G28-

Removing

-- Remove the noise insulation, to do this, loosen the mounting parts -1, 2, 3-.

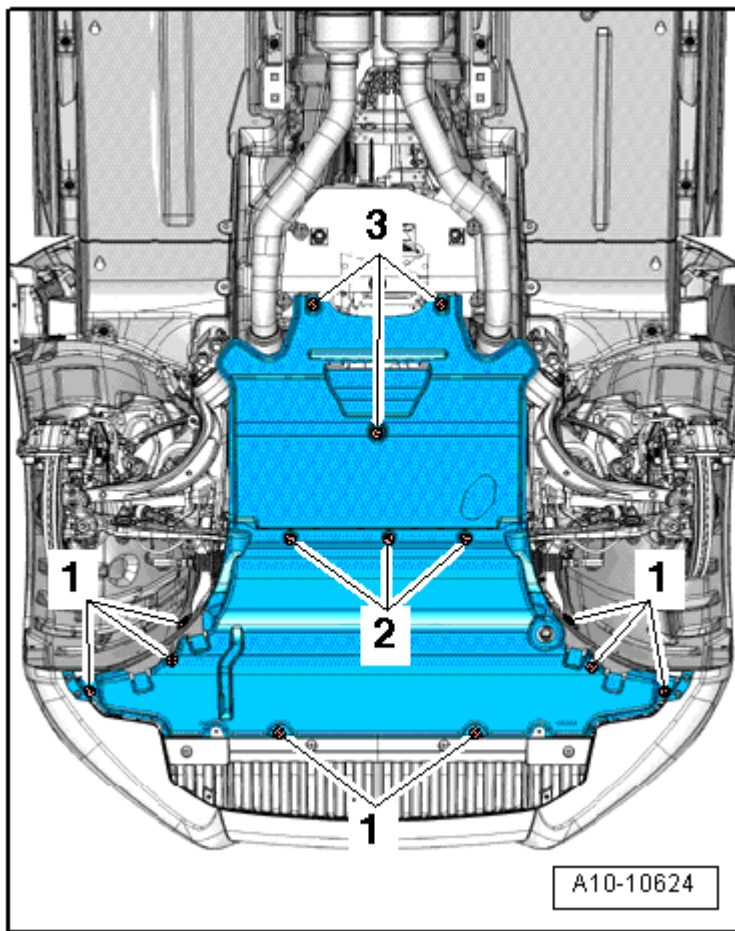


Fig. 5: Identifying Noise Insulation Components
Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the connector -2-.

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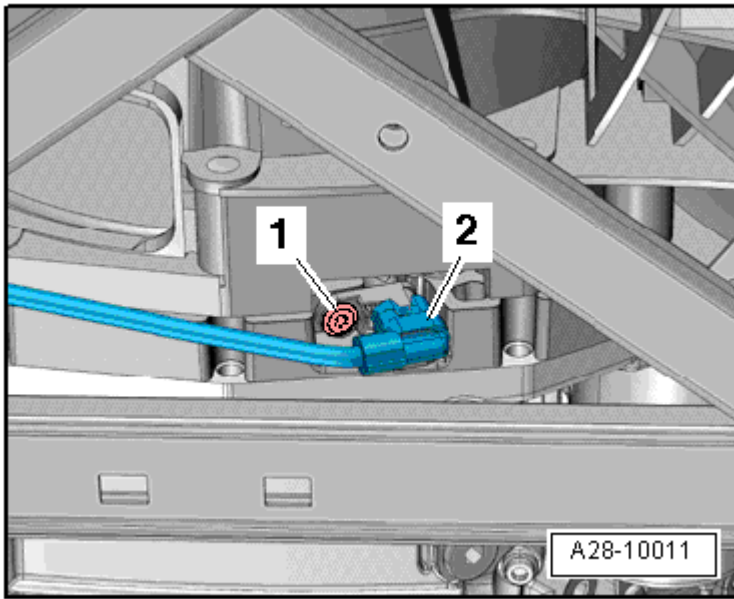


Fig. 6: Location Engine Speed (RPM) Sensor -G28-
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolt -1- and the RPM sensor.

Installing

Install in reverse order of removal.

- Tightening Specifications: Component location overview, refer to **COMPONENT LOCATION OVERVIEW**

IGNITION COILS

Special tools and workshop equipment required

- Ignition Coil Puller T40039

Removing

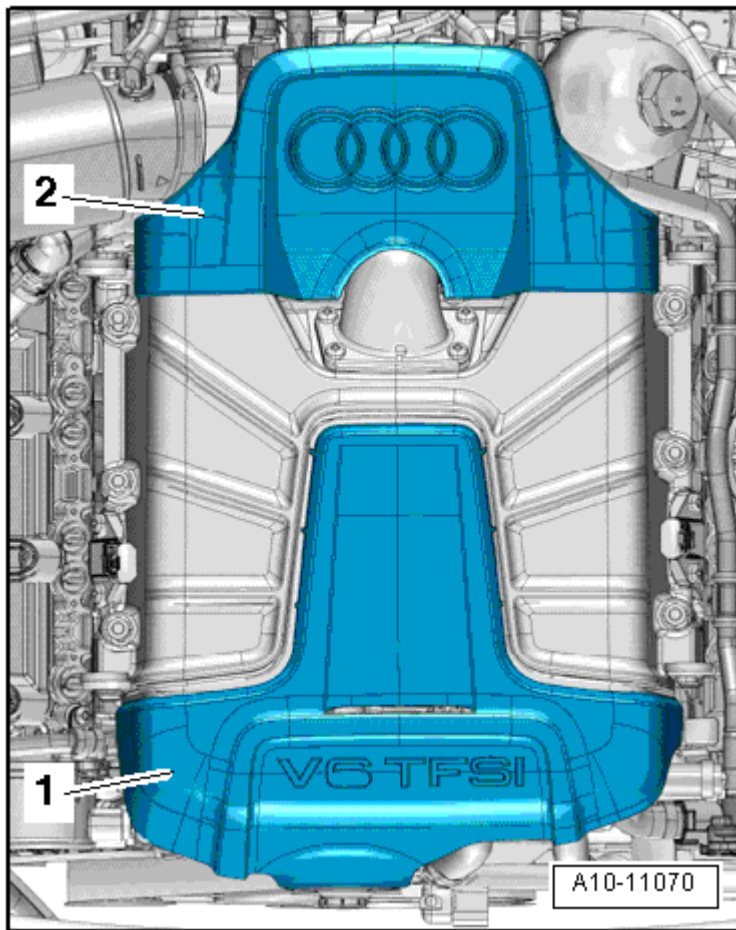


Fig. 7: Identifying Engine Cover -1- And -2-
Courtesy of AUDI OF AMERICA, LLC

-- Remove the engine covers -1 and 2- upward.

-- Free up the fuel line -4- and hose connection -1- from the Evaporative Emission (EVAP) canister on the air filter housing and on the air guide tube.

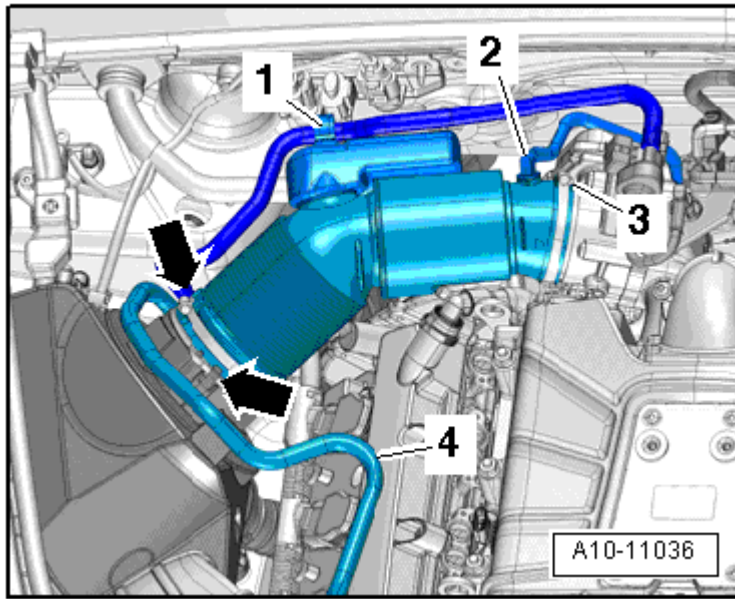


Fig. 8: Identifying Free Up Fuel Line
Courtesy of AUDI OF AMERICA, LLC

- Remove the vacuum hose -2- from the air guide hose connection.
- Remove the air guide pipe by loosening the hose clamp -3- and opening the clips -arrows-.
- Remove the air filter housing.
- Remove the bolts -arrows- and disconnect the connectors on the ignition coils.

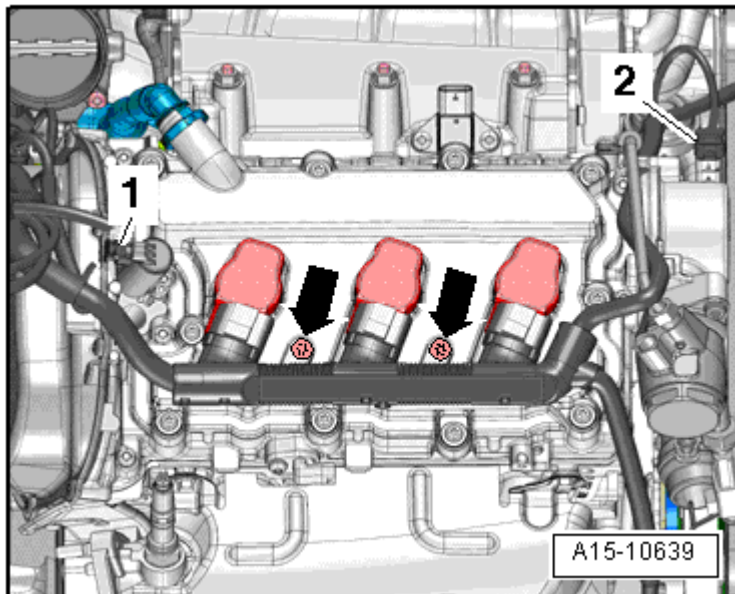


Fig. 9: Identifying Camshaft Position Sensor And Exhaust Camshaft Control Valve Cylinder Bank 1 (Right)

Courtesy of AUDI OF AMERICA, LLC

-- Lay the electrical wiring harness down slightly.

NOTE: Ignore -1 and 2-.

Cylinder Bank 2 (left)

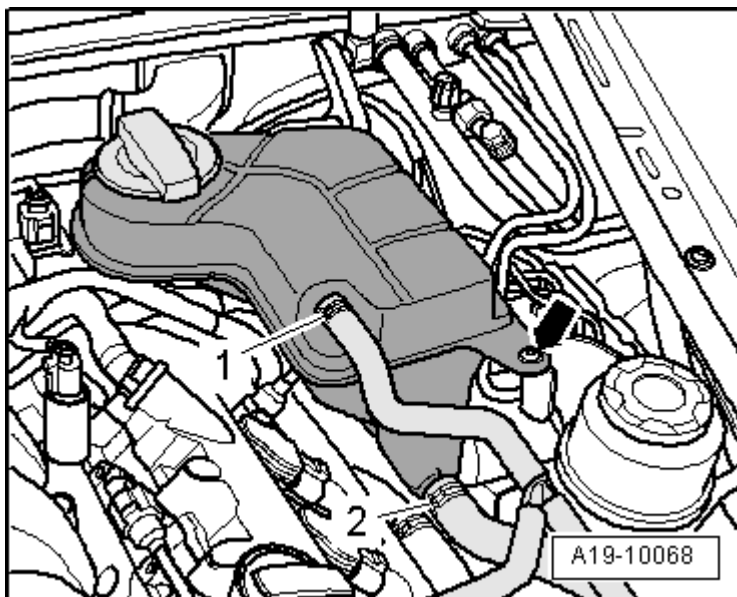


Fig. 10: Identifying Coolant Hoses At Coolant Expansion Tank

Courtesy of AUDI OF AMERICA, LLC

-- Remove bolt -arrow-.

-- Disconnect the electrical connector to the engine coolant level warning switch -F66- on the bottom of the coolant reservoir and lay the reservoir aside with the coolant hoses -1 and 2- attached.

-- Remove the bolts -arrows- and disconnect the connectors on the ignition coils.

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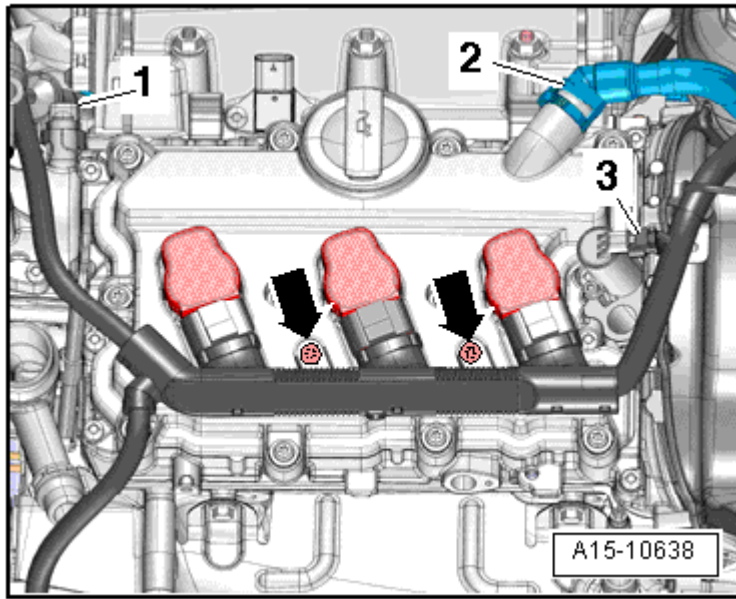


Fig. 11: Identifying Cmp Sensor And Exhaust Camshaft Control Valve Cylinder Bank 2 (Left)
Courtesy of AUDI OF AMERICA, LLC

-- Lay the electrical wiring harness down slightly.

NOTE: Ignore -1, 2 and 3-

Continued for Both Sides

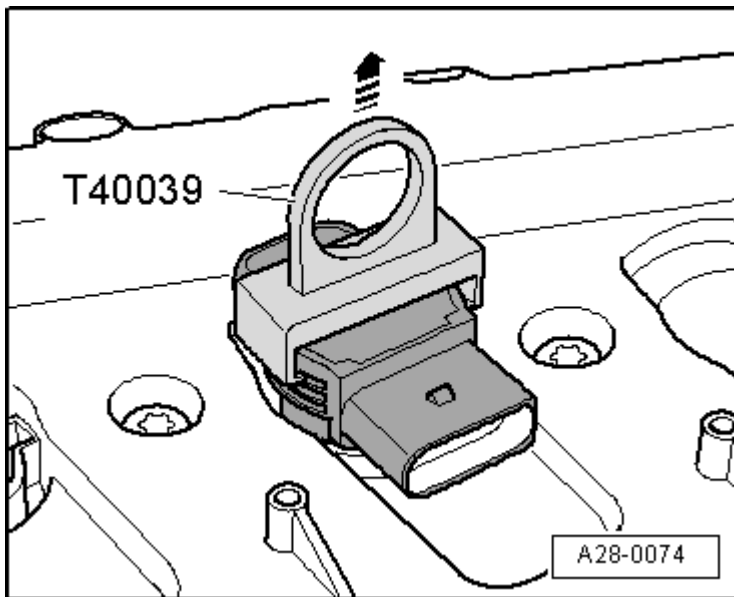


Fig. 12: Identifying Ignition Coil Puller T40039 To Remove Ignition Coils
Courtesy of AUDI OF AMERICA, LLC

-- Remove the ignition coils with the T40039.

Installing

- Tightening specifications, refer to **AIR FILTER OVERVIEW** and **IGNITION OVERVIEW**.

Install in reverse order of removal.

KNOCK SENSOR -G61- / KNOCK SENSOR -G66-

Removing

- Remove supercharger. Refer to **Removal and Installation** .
- Remove left and right lower intake manifold sections. Refer to **INTAKE MANIFOLD LOWER SECTION, WITH FUEL RAIL** .
- Pull the Knock Sensor (KS) 1 connector -1- out of the mount and disconnect it.

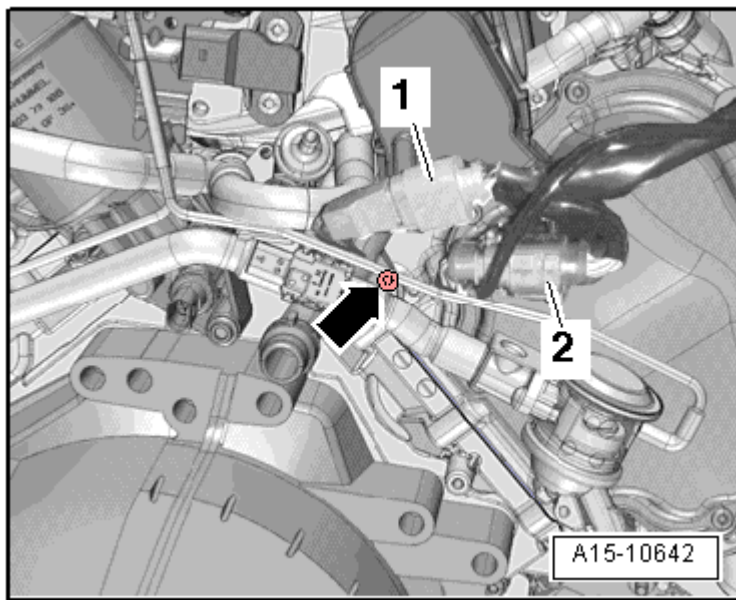


Fig. 13: Disconnecting Knock Sensor (KS) 1 -G61- Electrical Harness Connector -1-
Courtesy of AUDI OF AMERICA, LLC

NOTE: Ignore -2- and -arrow-.

- Pull the KS 2 connector -2- out of the left mount and disconnect it.

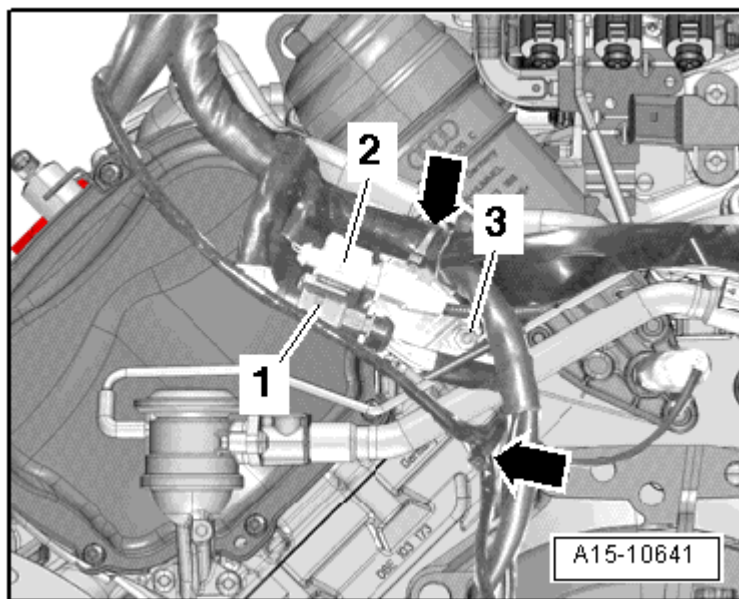


Fig. 14: Identifying Electrical Connectors On Left Rear Of Engine
Courtesy of AUDI OF AMERICA, LLC

NOTE: Ignore -1 and 3- and -arrow-.

-- Remove the bolts -1- for KS 1 and the bolt -2- for KS 2 and remove the sensors.



Fig. 15: Identifying Bolt -1- For KS 1 And Bolt -2- For KS 2
Courtesy of AUDI OF AMERICA, LLC

Installing

- Tightening specification, refer to **IGNITION OVERVIEW**.

Install in reverse order, paying attention to the following:

-- Install the left and right lower intake manifold sections. Refer to **INTAKE MANIFOLD LOWER SECTION, WITH FUEL RAIL** .

-- Install supercharger. Refer to **Removal and Installation** .

SPECIAL TOOLS

Special tools and workshop equipment required

- Ignition Coil Puller T40039

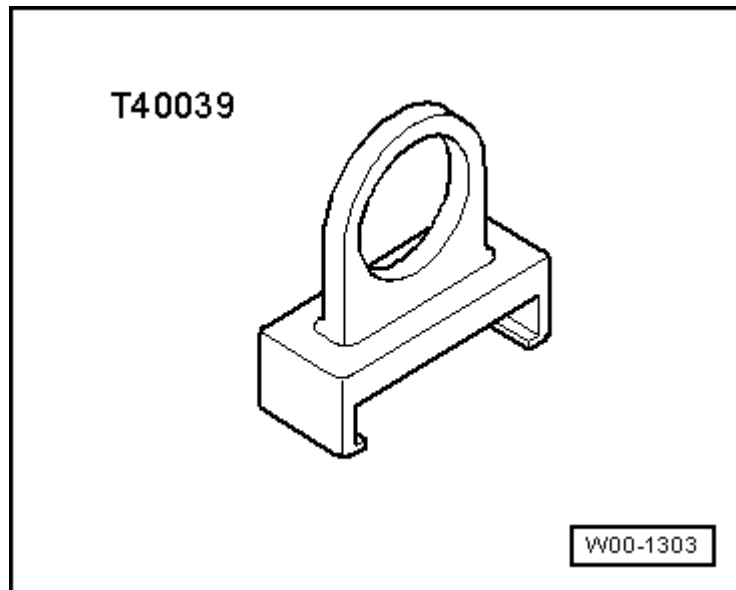


Fig. 16: Identifying Extractor T40039
Courtesy of AUDI OF AMERICA, LLC