Technical Service Bulletin

01 MIL on, DTC P049100 and P049200 are stored at the same time in the ECM

01 20 88 2033001/23 September 15, 2020. Supersedes Technical Service Bulletin Group 01 number 20-72 dated July 20, 2020 for reasons listed below.

Model(s)	Year	VIN Range	Vehicle-Specific Equipment
A6	2009 - 2016	All	3.2 FSI AVS and 3.0 TFSI
A7	2013 - 2016	All	3.2 FSI AVS and 3.0 TFSI
S4	2010 – 2012, 2014 - 2016	All	3.2 FSI AVS and 3.0 TFSI
A8, Q7	2011 - 2016	All	3.2 FSI AVS and 3.0 TFSI
A5, S5 Cabriolet, and Q5	2010 - 2016	All	3.2 FSI AVS and 3.0 TFSI

Condition

REVISION HISTORY		
Revision	**Date**	**Purpose**
23	-	Revised header (Added model) Revised *Warranty* (Added model) Revised *Required Parts and Tools* (Updated Coolant part number)
22	07/20/2020	Revised *Service* (Added alternate MVB) Revised *Warranty* (Updated Claim Type and Labor Operations)
21	05/06/2020	Revised *Warranty* (Updated Claim Types)

Customer states:

- MIL on.

Workshop findings:

- Mileage is greater than 15,000 miles.

Both of the following DTCs are stored in the engine control module (ECM), J623 (address word 0001):

- **DTC P049100** (Secondary Air System Insufficient Flow, Bank 1).
- **DTC P049200** (Secondary Air System Insufficient Flow, Bank 2).

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Technical Background

Under certain driving conditions, the secondary air ports in the cylinder head can accumulate carbon over time, causing a restriction.

Production Solution

Not applicable.

Service

Note:

Before performing this repair for the first time, it is mandatory that the technician complete Audi Academy Course #940134 and assessment #940134B. Otherwise, the warranty claim will be denied. The course and assessment can be found on the Audi Academy CRC site. Specific video sections are referenced in the instructions below.

Section 1A: Perform ODIS Testing – For all but A6 (C6) 3.2FSI and Q7 3.0T

1. Delete all DTCs. Bring the engine to operating temperature.
2. Go to *Control Modules >> 01 Engine Control Module >> Control module OBD >> Basic Settings >> Checking Secondary Air System.*
3. Select MVB: **MASS_SA_REL[0]** or **SAF_DIF[1]** and **MASS_SA_REL[1]** or **SAF_DIF[2].**
4. Perform test (Press brake and gas pedal at the same time, start test on ODIS tester).
5. While the *Basic Setting* test is running, check if the secondary air pump runs normally (no unusual noises). In addition, check for a leak in the secondary air hose routing between the pump and combi valves.
6. Immediately after the test is complete, read **MASS_SA_REL[0]** or **SAF_DIF[1]** and **MASS_SA_REL[1]** or **SAF_DIF[2].** Depending on the software level and engine code, the air mass flow will be displayed in one of two ways:
   - **For the old software version:**
     If the value is between 0.1 and 0.7, and there were no issues with the pump and hoses, the system needs to be cleaned. Follow the instructions below.
   - **For the new software version:**
     If the value is between 13 and 16, and there were no issues with the pump and hoses, the system needs to be cleaned. Follow the instructions below.

Section 1B: Perform ODIS Testing – For A6 (C6) 3.2FSI and Q7 3.0T only

1. Go to *Control Modules >> 01 Engine Control Module >> Control module OBD >> Basic Settings >> test 77.*
2. While performing test 77, check if the secondary air pump is running and make sure it does not make any abnormal or unusual noise:
   - If test 77 fails but the pump is running and does not make any abnormal/unusual noise, perform the cleaning process below.
   - If the pump is not running or if it makes an abnormal/unusual noise, **this TSB does not apply.**

Tip: Always use the latest version of this TSB.

Section 2: Prepare the Vehicle for Power Washing

1. Move the exhaust sliding bushings (that connect the catalytic converter and muffler) back, then lower the catalytic converter pipes (Figure 7).

   For Q7, unbolt muffler from the catalytic converter. Cover mufflers with a plastic bag to prevent water from entering.

   Cleaning water will drain out of the catalytic converter pipes during the cleaning process.

***Figure 7**. Lowered catalytic converter pipes.*

2. Remove all spark plugs and cover the engine harness plugs for the coils (for water protection).
3. Drain the coolant so that it can be reused.
4. Bring the front end of the car into service position (for Q5, A6, A8, S4, and S5 Cabriolet) to make room in the front of the engine. The Q7 has enough room for access to the front of the cylinder heads.

5. For 3.0T only: remove the coolant supply lines (intercooler of the supercharger) in the front of the engine (Figure 8).

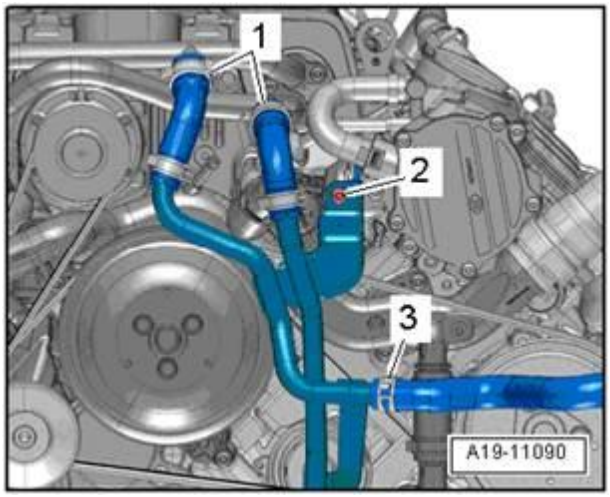

Figure 8. *Front coolant pipes to be removed for 3.0T.*

6. Remove the following components:

   - Coolant pipe (Figure 9, image 1).
   - Coolant flange (Figure 9, image 2).
   - Pulley and if needed bracket, of power steering pump (Figure 9, image 3).
   - Pulley of the water pump (Figure 9, image 4).
   - Coolant tube (Figure 9, image 5).
   - Dipstick tube (Figure 9, image 6).

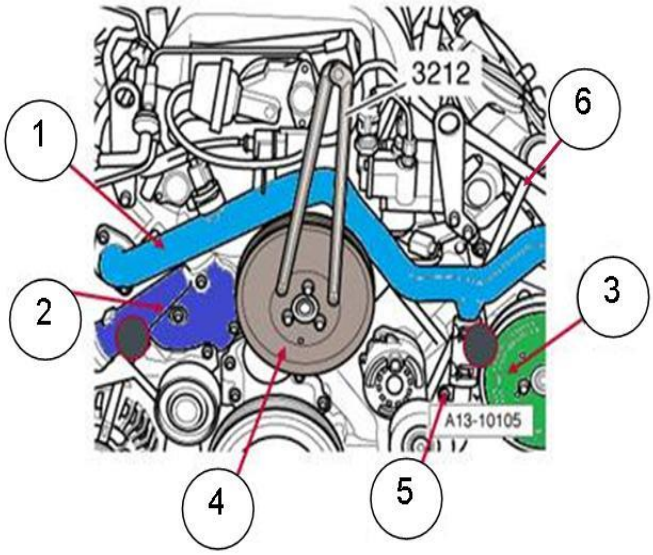

Figure 9. *Engine component removal.*

Note:

When removing the dipstick tube, turn it 180 degrees, and then reinstall it for water protection.

Note:

To loosen the coolant tube, remove 2 bolts (Figure 10, image A and C), open clip (Figure 10, image B), and pry bushing apart as shown in training video (Figure 10, image D). There is no need to loosen the AC compressor.

Cover opening of right coolant pipe to prevent coolant circuit contamination.

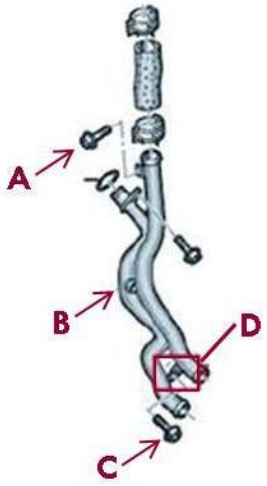

Figure 10. *Loosening the coolant tube.*

7. Remove the main port freeze plug by hitting the marked area with a small punch until it turns (Figure 11). Remove with pliers.

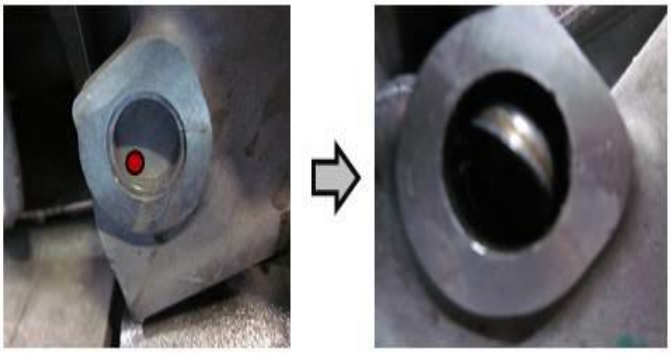

Figure 11. *Marked area on main port of freeze plug.*

Section 3: Prepare to Power Wash Tool Setup
Warning: • Read the pressure washer user manual and follow these safety instructions. • Always insert special cleaning hose into adaptor and engine *before* turning pressure washer on. • If switching special cleaning to a different port, turn pressure washer off and release residual pressure by pulling the trigger before removing the special cleaning hose from the engine. Wear safety glasses and gloves.

1. Become familiar with the special tool set VAS6825 (Figure 12):

- Special hose with scale for cleaning single ports (Figure 12, image 1).
- Special hose for cleaning the main ports (Figure 12, image 2).
- Hose adaptor for the special hose with scale (Figure 12, image 3).
- Engine adaptor for bank one (Figure 12, image 4a).
- Engine adaptor for bank two (Figure 12, image 4b).

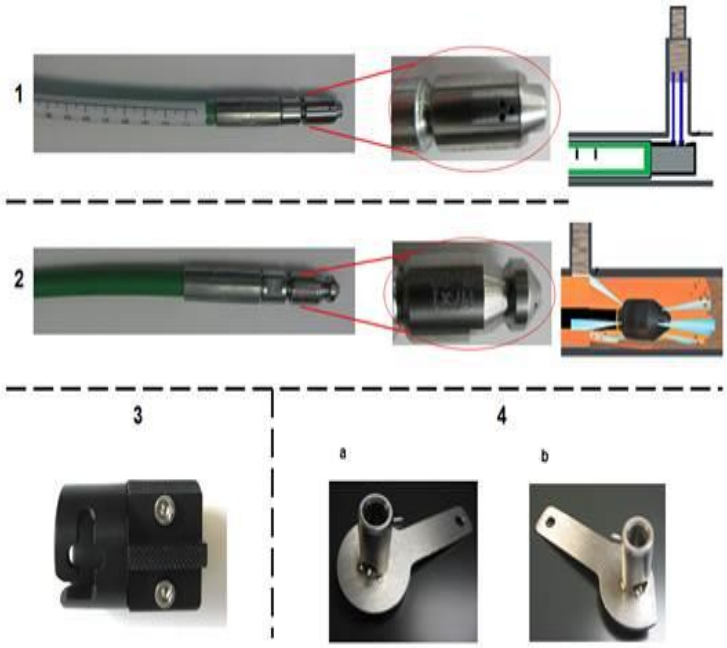

***Figure 12**. Special tool set VAS6825.*

2. To catch water, put a pan under the front of the engine and under the disconnected catalytic converter pipes.
3. Install engine adaptors on the appropriate banks (Figure 13 and Figure 14).

***Figure 13**. Engine adaptor on bank one.*

Figure 14. *Engine adaptor on bank two.*

4. To ensure proper pressure washer function, use a ¾-inch water supply hose (no longer than 60 feet) to supply pressure washer.

   The Audi-supplied pressure washer comes with a 22mm male-to-male adapter (to connect the special tool to trigger gun), a pressure gauge (to connect between pressure washer and high-pressure hose), and a 220V power adapter.

   Make sure that pressure is at least 1800 psi when using the special single port cleaning hose (the hose with the scale). Use the table below to compensate for low water pressure:

psi While Cleaning Single Ports	**Cleaning Time in Minutes**
Less than 1900	Pressure too low – check the water supply
1900	4
2000 or higher	3

Section 4: Power Wash the Ports

Cleaning Main Secondary Port:

1. Insert special main port cleaning hose (the hose without the scale) two inches into the engine adaptor.
2. Turn the pressure washer on.
3. Holding the cleaning hose tightly, pull the pressure washer trigger.
4. Gradually move the cleaning hose into the port, going back and forth until the combi valve is reached. All water comes out at adaptor #4.
5. Continue going back and forth through the whole port until only clean water drains out of the cylinder head.

6. Do the same with the other cylinder head.

Cleaning Single Ports:

1. Because every port has a different distance to the cylinder head, use the table below to position the hose adaptor for the special single port cleaning hose (the hose with the scale) correctly into the hose. The back side of the hose adaptor must align with the number on the scale of the cylinder to be cleaned (Figure 15). The longitudinal slot on the hose adaptor must align with the black line on the scale for correct rotational positioning (Figure 15).

Dimensions Port	1	2	3
Bank One	10.5	19.5	28.5
Bank Two	13.7	22.7	31.8

Figure 15: *Arrow indicating how the back side of the adaptor must align with the scale. The red dotted line indicating how the longitudinal slot must align with the black line on the scale.*

2. After adjusting the position of the hose adaptor, insert the special single port cleaning hose into the hose adaptor, and bring it back into locking position (Figure 16).

Figure 16*. Locking position/transverse longitudinal movement and of the hose adaptor*

3. While cleaning, make sure that the pressure washer is supplying pressure greater than 1800 psi.

4. Based on the washer's pressure, clean the port based on the table below. While cleaning, continuously move the hose adaptor within the longitudinal and transverse slots (Figure 16).

Psi While Cleaning Single Ports	Cleaning Time in Minutes
Less than 1900	Pressure too low – check the water supply
1900	4
2000 or more	3

Tip: After ten seconds of cleaning, all of the water should be draining out of the exhaust. If water is draining out of the engine adaptor, check the position of the hose adaptor on the hose.

5. Do the same for all remaining cylinders.

6. It is recommended that after cleaning, all single ports are checked with snap-on boroscope BK6000 (or similar, with 90-degree lens), to make sure all ports are clean (Figure 17).

***Figure 17**. Clean single port.*

7. When all carbon is removed, install a new main port plug using an 8mm socket with a short extension, paying special attention to install it squarely. The outer edge of the plug should be recessed ~0.5mm – 1mm behind the outer cylinder head edge.

8. Reinstall all components (except spark plugs) and fill the system with coolant according to ELSA.

9. Using a vacuum extractor, remove **all** water from **all** combustion chambers.

10. Make sure **all water is removed** from the combustion chambers by using the **self-start function twice while the spark plugs are still removed** (cover spark plug openings with a towel). Install spark plugs and coils.

Make sure water is completely drained out of the exhaust (make sure the exhaust is lowered enough).

Tip: There is no need to replace the engine oil; almost no water drains into the oil pan.

11. Allow the car to run at idle for 15 minutes to ensure that any remaining water in the exhaust system evaporates.

Section 5: After Power Washing

1. Delete all DTCs. Bring engine to operating temperature.
2. Go to *Control Modules >> 01 Engine Control Module >> Control module OBD >> Basic Settings >> Checking Secondary Air System.*
3. Select MVB: **MASS_SA_REL[0]** or **SAF_DIF[1]** and **MASS_SA_REL[1]** or **SAF_DIF[2].**
4. Perform test (Press brake and gas pedal at the same time, start test on ODIS tester).
5. Immediately after the test is complete, read **MASS_SA_REL[0]** or **SAF_DIF[1]** and **MASS_SA_REL[1]** or **SAF_DIF[2].**
   - **For the old software version:**
     If the value is between 0.9 and 1.0, the cleaning was successful.
   - **For the new software version:**
     If the value is between 0 and 5, the cleaning was successful.

Warranty

Claim Type:	• 1EB – Verify Vehicle Warranty Coverage. • If the vehicle is outside any warranty, this Technical Service Bulletin is informational only.		
Service Number:	2644		
Damage Code:	0010		
Labor Operations:	Coolant pipe remove + reinstall	1961 1906 **(Q5 CALB and CTUC, A6 CALA, and A5 CALA)** **Or** 1961 1941 **(A6 CCAA, A6/A7 CGXB, A6/A7 CTUA, S4, S5, S5 Cab CCBA & CGXC, A8 CTUB, and Q5 CTUD)**	See SRT with associated operations

		Or 1961 2039 **(Q7 CJWE, CJWC, CJWB, and CTWB)**	
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999 **(Q5 CALB, CTUC, CTUD, A6 CCAA & CALA, A6/A7 CGXB, A5 CALA, A8 CTUB, S4, S5, S5 Cab CCBA & CGXC, Q7 CJWE, CJWC, CJWB, and CTWB)** **Or** 2870 2099 **(A6/A7 CTUA)**	60 TU
	Loosen/fasten lock carrier **(Except Q7 CJWE, CJWC, CJWB, and CTWB)**	5038 0999 **(A6/A7 CGXB, Q5 CALB, CTUC, & CTUD, A6 CCAA & CALA, A5 CALA, S4, S5, S5 Cab CCBA, and A8 CTUB)** **Or** 5038 0999 (**A6/A7 CTUA)**	220 TU **Or** 290 TU
	Pressure wash	2644 1999 **(All)**	75 TU
	ACC Calibration **Note:** The following labor operations only apply if the vehicle is equipped with ACC. Only claim these labor operations if applicable and if necessary.	See Elsa	See SRT with associated operations
	Radar sensor adjust (if equipped)	9163 1550 **(Q5 CALB, CTUC, & CTUD, S4, S5, S5 Cab CCBA & CGXC, A6 CCAA & CALA, A5 CALA and Q7 CJWE, CJWC, CJWB, & CTWB)** **Or**	See SRT with associated operations

		9163 1650 **(A6/A7 CGXB, A6/A7 CTUA, and A8 CTUB)**	
	Preparation Driver Assist Calibration	9092 0051 **(All)**	See SRT with associated operations
	Vehicle front + rear measure	4495 0350 **(All)**	See SRT with associated operations
	Front wheel track adjust	4488 1550 **(All)**	See SRT with associated operations
	Rear wheel track adjust	4493 1550 **(All)**	See SRT with associated operations
	Front wheel camber adjust	4489 1550 **(Q5 CALB, CTUC, & CTUD, Q7 CJWE, CJWC, CJWB, & CTWB, A6/A7 CTUA, A6 CALA & CCAA, A5 CALA, A6/A7 CGXB, A8 CTUB, and S4/S5 CCBA & CGXC)**	See SRT with associated operations
	Rear wheel camber adjust	4494 1550 **(Q5 CALB, CTUC, & CTUD, A6 CALA & CCAA, A6/A7 CTUA, A5 CALA, A6/A7 CGXB, A8 CTUB, Q7 CJWE, CJWC, CJWB, & CTWB and S4/S5 CCBA & CGXC)**	See SRT with associated operations
	Camera f night vision sys adjusted (if equipped)	9080 1550 **Or** See Elsa	See SRT with associated operations
Diagnostic Time:	GFF – Checking and clearing fault codes included in existing labor operations	0150 0000	Time stated on the diagnostic

			protocol (Max 40 TU)
	Road test prior to the service procedure	0121 0002	10 TU
	Road test after the service procedure	0121 0004	10 TU
Claim Comment:	As per TSB #2033001/23		

All warranty claims submitted for payment must be in accordance with the *Audi Warranty Policies and Procedures Manual*. Claims are subject to review or audit by Audi Warranty.

Required Parts and Tools

Always check with your Parts Department and/or ETKA for the latest information and parts bulletins.		
Part Number	**Part Description**	**Quantity**
06E121119A or 06E121119E	O-ring cross pipe (3.2L and 3.0L respectively)	02
See ETKA	O-ring cross pipe (3.0L A8)	02
N 0119078	Freeze plug	02
06E121139E or 06E121139H	Seal coolant flange (3.2L and 3.0L respectively)	01
See ETKA	Seal coolant flange (3.0L A8)	01
GA137741GDSP	Coolant	0.5
06E121119C	O-ring cross pipe to therm (3.0L only)	01
See ETKA	Steering Power Fluid	See ELSA
See ETKA	Fasteners, Bolts, Nuts, and Screws as needed per the Repair Manual	See ETKA/ELSA

Tool Number	**Tool Description**
VAS6825	Tool set
VAS6825/1	Adaptor set
CAM20005MX or equivalent	Pressure washer

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Additional Information

All parts and service references provided in this TSB (2033001) are subject to change and/or removal.