Technical Service Bulletin

01 MIL on (P0491 and P0492 stored at same time)

01 17 13 2033001/12 May 9, 2017. Supersedes Technical Service Bulletin Group 01 number 17-03 dated February 23, 2017 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	All	3.2 FSI AVS and 3.0 TFSI
Q7	2011 - 2016	All	3.2 FSI AVS and 3.0 TFSI
A5, S5 cabriolet, Q5	2010 - 2016	All	3.2 FSI AVS and 3.0 TFSI

Condition

REVISION HISTORY		
Revision	**Date**	**Purpose**
12	-	Revised *Required Parts and Tools* (Updated descriptions)
11	02/23/2017	Revised *Warranty* (Updated table)
10	02/13/2017	Revised header data (Added engine code and model years)

Customer states the following:

- MIL on

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

- **DTC P0491** (Secondary Air System Insufficient Flow, Bank 1)
- **DTC P0492** (Secondary Air System Insufficient Flow, Bank 2)
- Mileage is greater than 15,000 miles

Technical Background

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

Technical Service Bulletin

Production Solution

Not applicable.

Service

Please note that 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.

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] and MASS_SA_REL[1].**
4. Perform test (Press brake and gas pedal at the same time, start test on ODIS tester).
5. While *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] and MASS_SA_REL[1].** Depending on the software level and engine code, the air mass flow will be displayed in one of two ways:
   - **For 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 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.

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 abnormal/unusual noise, **this TSB does not apply.**

Tip: Always use the latest version of this TSB.

Prepare 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 catalytic converter. Cover mufflers with 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 front end of the car into service position (for Q5, A6, S4, and S5 cabrio) 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 supercharger) in the front of the engine (Figure 8).

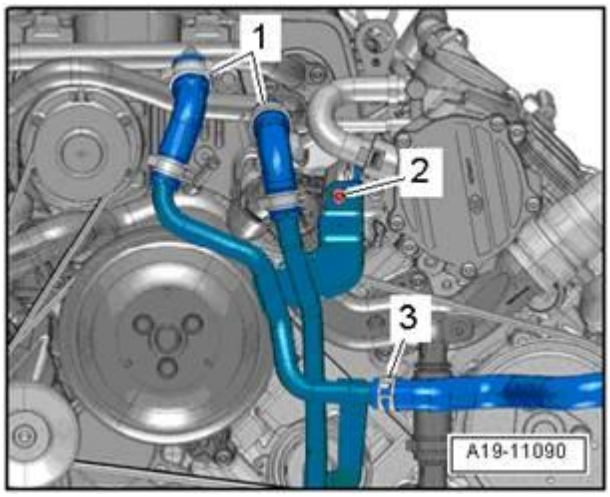

Figure 8. *Front coolant pipes to be removed for 3.0T.*

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 water pump (Figure 9, image 4).
- Coolant tube (Figure 9, image 5).
- Dipstick tube (Figure 9, image 6).

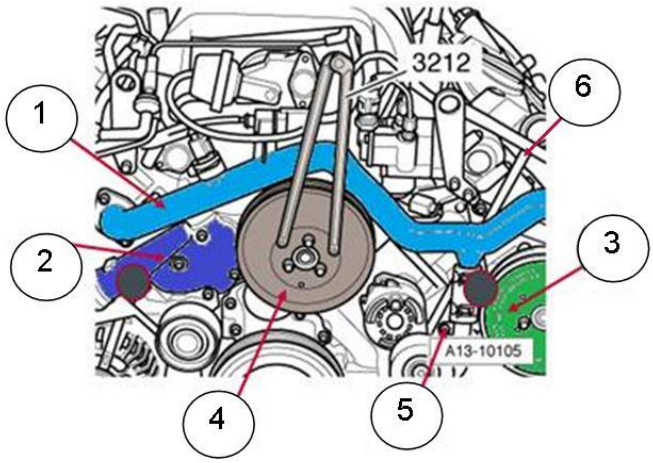

Figure 9. *Engine component removal.*

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.

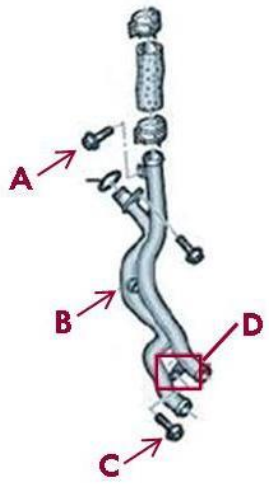

Figure 10. *Loosening the coolant tube.*

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

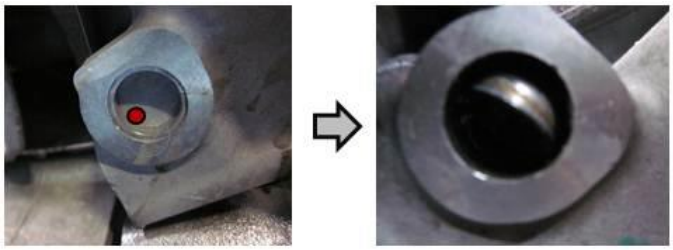

Figure 11. *Marked area on main port of freeze plug.*

Prepare to Power Wash:

Warning:

- Read 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).

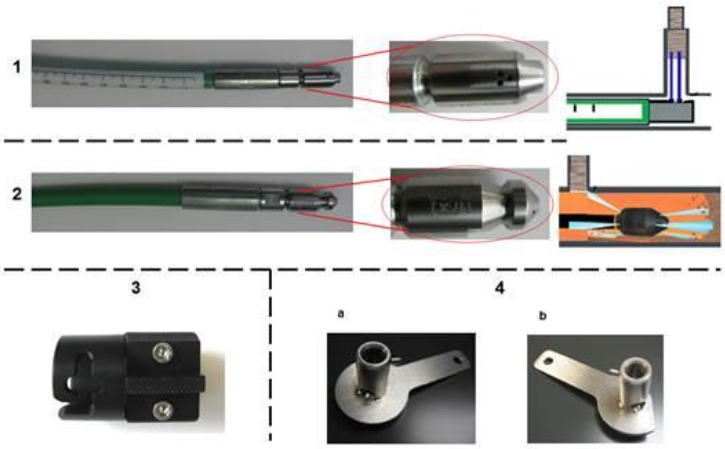

***Figure 12**. Special tool set VAS6825.*

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 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 water supply
1900	4
2000 or higher	3

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 the 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. 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 / transvers 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 transvers slots (Figure 16).

psi While Cleaning Single Ports	**Cleaning Time in Minutes**
Less than 1900	Pressure too low – check 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 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 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 in the exhaust system evaporates.

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] and MASS_SA_REL[1].**

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] and MASS_SA_REL[1].**

   - **For old software version:**
     If the value is between 0.9 and 1.0, the cleaning was successful.
   - **For new software version:**
     If the value is between 0 and 5, the cleaning was successful.

Technical Service Bulletin

Warranty

Claim Type:	1EB - Verify Vehicle Warranty Coverage.		
Service Number:	2644		
Damage Code:	0010		
Labor Operations:	**Q5 CALB, CTUC, CTUD engine (525)**		
	Coolant pipe remove + reinstall	1961 1906	250 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0900	160 TU
	Pressure wash	2644 1999	75 TU
	A6 CALA engine (555)		
	Coolant pipe remove + reinstall	1961 1906	220 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0900	220 TU
	Pressure wash	2644 1999	75 TU
	A5 CALA engine (525)		
	Coolant pipe remove + reinstall	1961 1906	250 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0900	160 TU

	Pressure wash	2644 1999	75 TU
	A6 CCAA engine (625)		
	Coolant pipe remove + reinstall	1961 1941	290 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0900	220 TU
	Pressure wash	2644 1999	75 TU
	A6/A7 CGXB engine (575)		
	Coolant pipe remove + reinstall	1961 1941	290 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0999	220 TU
	Pressure wash	2644 1999	75 TU
	A6/A7 CTUA engine (735)		
	Coolant pipe remove + reinstall	1961 1941	290 TU
	Spark plugs remove + reinstall (overlap reduced includes time for exhaust)	2870 2099	80 TU
	Loosen/fasten lock carrier	5038 0999	290 TU
	Pressure wash	2644 1999	75 TU
	S4, S5, S5 cab CCBA engine (565)		
	Coolant pipe remove + reinstall	1961 1941	290 TU

	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Loosen/fasten lock carrier	5038 0900	160 TU
	Pressure wash	2644 1999	75 TU
	Q7 CJWE, CJWC, CJWB, CTWB engines (335)		
	Coolant pipe remove + reinstall	1961 2039	220 TU
	Power steering pump remove + reinstall (overlap reduced includes time for exhaust and spark plugs)	4898 1999	60 TU
	Pressure wash	2644 1999	75 TU
Diagnostic Time:	GFF – Checking and clearing fault codes included in existing labor operations	0150 0000	Time stated on diagnostic protocol (Max 40 TU)
	Road test prior to service procedure	No allowance	0 TU
	Road test after service procedure	0121 0004	10 TU
	Technical diagnosis at dealer's discretion (Refer to Section 2.2.1.2 and Audi Warranty Online for DADP allowance details)		
Claim Comment:	As per TSB #2033001/12		

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

Part Number	Part Description	Quantity
06E121119A or 06E121119E	O-ring cross pipe (3.2L and 3.0L respectively)	2
N 0119078	Freeze plug	2
06E121139E or 06E121139H	Seal coolant flange (3.2L only)	1
G 013A8J1G	Coolant	0.5
06E121119C	O-ring cross pipe to therm. (3.0L only)	1

Tool Number	Tool Description	Quantity
VAS6825	Tool set	1
VAS6825/1	Adaptor set	1
Not applicable	Pressure washer	1

Additional Information

All parts and service references provided in this TSB (2033001) are subject to change and/or removal. Always check with your Parts Department and service manuals for the latest information.