Technical Service Bulletin

87 Air conditioning does not cool and / or compressor is noisy

87 15 71 2038023/7 October 14, 2015. Supersedes Technical Service Bulletin Group 87 number 15-68 dated August 21, 2015 for reasons listed below.

Model(s)	Year	VIN Range	Vehicle-Specific Equipment
A3, A3 Cabriolet	2015	000001 - 106816	Not Applicable

Condition

REVISION HISTORY		
Revision	**Date**	**Purpose**
7	-	Revised *Warranty* (Added N280 SRT and removed unnecessary SRTs) Revised *Required Parts and Tools* (Removed unnecessary parts and tools)
6	8/21/2015	Revised *Service* (Added more specific N280 debris description in steps 9 and 10)
5	7/29/2015	Revised *Warranty* (Added additional necessary SRTs)

- One or more of the following conditions are exhibited:
  - The air conditioning does not cool, or the cooling performance is very weak.
  - The air conditioning system cools, but the compressor is noisy. The noise is characterized as a grinding or groaning noise.
  - Either symptom may be intermittent.
- No DTCs are stored.

Technical Background

This condition is most likely caused by a faulty N280 valve (Figure 1). The internal components of the valve can be obstructed and incapable of full function. This loss of refrigerant regulation from N280 can cause noise from the A/C compressor and/or affect the HVAC cooling.

Figure 1. *N280 Refrigerant Regulating Valve.*

Production Solution

Denso A/C compressors are currently being installed in production (Figure 2 and Figure 3).

An improved N280 valve for the Sanden A/C compressor is now available as a replacement part (5Q0 260 839 A). Replacement of the entire A/C compressor is not necessary in most cases.

Figure 2. *Denso compressor identification tag.*

Figure 3. *Sanden compressor identification tag.*

Service

Confirm the cause:

Since either symptom may be intermittent, the diagnostic process can affect the reproducibility of the condition. Begin the diagnosis by isolating the cause before performing the basic checks:

1. Connect both the refrigerant service station (Figure 4) and the diagnostic tester to the vehicle.

Figure 4. *Robinair A/C Service Unit.*

2. **For cases of noise:**

   When diagnosing cases of noise, use chassis ears or a technician's stethoscope to make sure that the root cause of the noise is from the air conditioning compressor. The noise can change or may be absent depending on the setting on the HVAC control unit. In many cases, the noise is more pronounced with the system switched off.

   For cases of low or no cooling performance:

   Rule out a refrigerant circuit leak as the root cause. Evacuate the refrigerant circuit to determine the refrigerant volume. The refrigerant volume will likely be in specification. Should the refrigerant volume be too low, investigate a potential refrigerant leak in the circuit. It is not likely that the refrigerant level will be too high because if it is, a DTC will be stored. If no system leak is determined, recharge the circuit with the specified amount of refrigerant before proceeding.

Perform the test plan:

1. With the engine at idle, switch the climate control unit to full cold and full fan.
2. Using the diagnostic tester, go to Guided Functions.
3. Monitor the measuring value for the air conditioner compressor regulating valve N280 signal (Figure 5).

   The actual and specified values will be plausible and will show a normal regulating range of current for cooling request (0.400 A – 0.680 A).

   However, there will be equalized pressure readings on the high and low sides of the circuit (no pressure generation from the compressor).

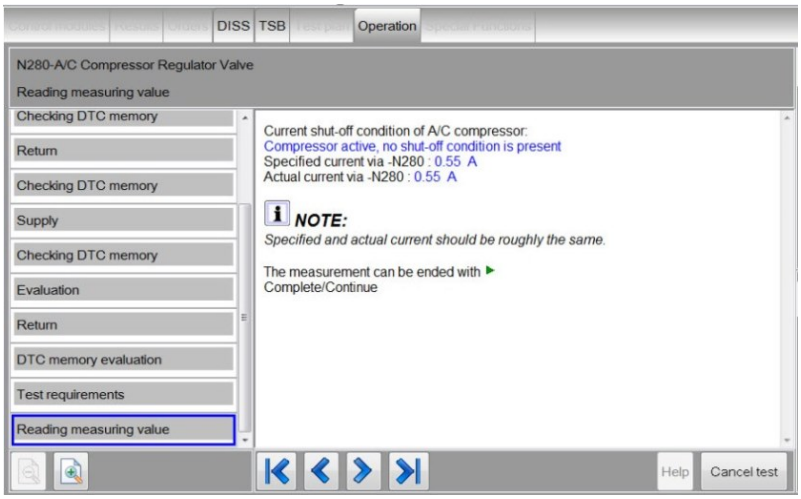

Figure 5. *Checking N280 signal value Measuring Value Block.*

4. Continuing in Guided Functions, select the test plan for “Check A/C Compressor” (Figure 6).

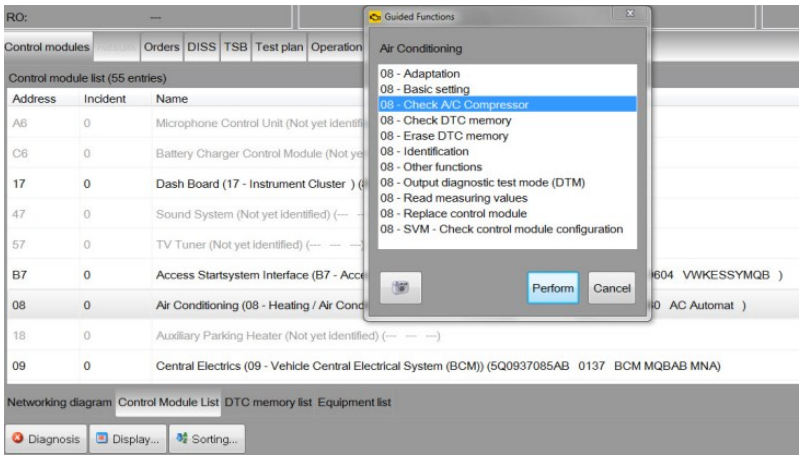

Figure 6. *Selecting test plan for “Check A/C Compressor”.*

5. Shut off the engine. Connect the breakout harness VAS 5256 (Figure 7) between the N280 valve and its connector.

Figure 7. *VAS 5256 breakout harness.*

6. Next, the signal wave form will be checked (Figure 8). The square wave signal should be between 75% and 100%.

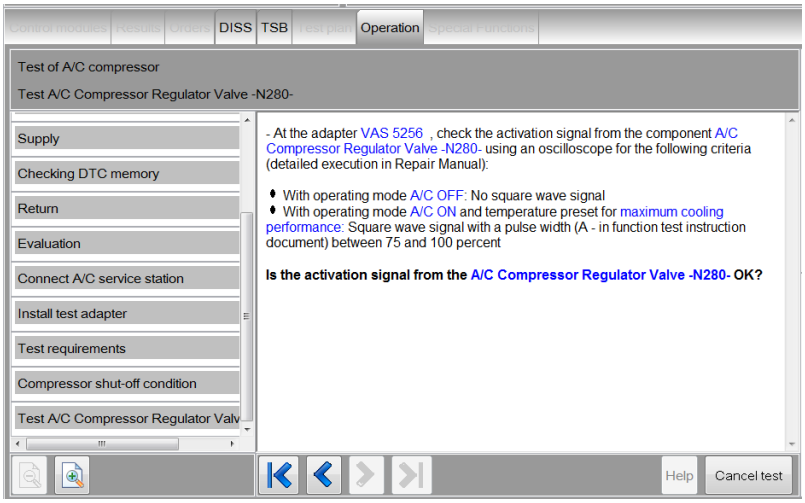

Figure 8. *Checking the N280 signal wave form.*

7. If the wave form signal is good, the mechanical integrity of the N280 valve will be inspected next (Figure 9).

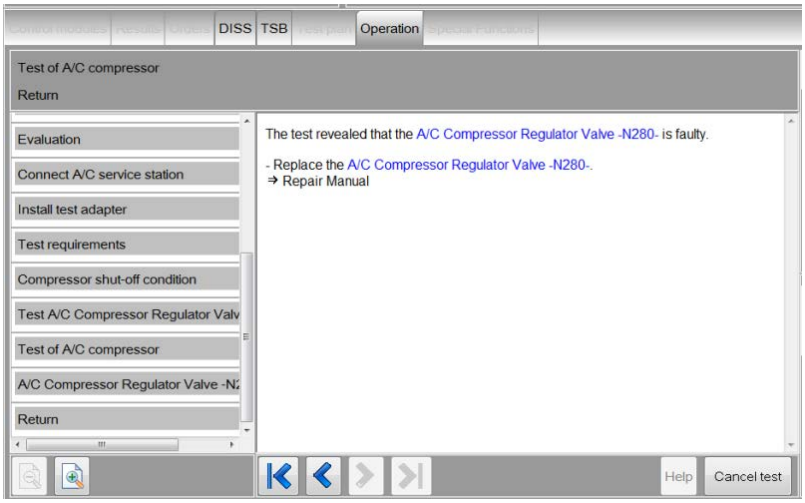

Figure 9. *Checking for N280 valve contamination.*

8. Recover the refrigerant from the system. Remove the N280 valve using the procedure in the Elsa Repair Manual.

⚠ **Warning:** With the refrigerant circuit charged the N280 valve is under pressure. Be certain that the refrigerant circuit is completely discharged before removing the N280 valve.

9. Assess the condition of the N280 valve bore and the valve filter screen (Figure 10). If severe contamination or corrosion is found in the valve bore there is a risk of damaging the replacement valve on installation. In these cases, the A/C compressor must be replaced. A slight amount of debris or corrosion does not present a risk and does not justify replacement of the A/C compressor.

Figure 10. *Corrosion in the N280 valve bore.*

10. Should severe contamination be found at the valve filter screen (Figure 11) and A/C compressor replacement becomes necessary, ensure that the refrigerant circuit is flushed in the course of repair. The presence of small random particles on the filter screen does not constitute 'severe' contamination and does not justify replacement of the A/C compressor.

Figure 11: *Severe contamination at the N280 valve filter screen.*

11. If little or no contamination is found, the test plan will direct to replace the N280 regulating valve (Figure 12). Replace the valve using the instructions in the Elsa Repair Manual.

Figure 12: *Test plan confirming that the N280 is faulty.*

In the rare case of a catastrophic air conditioning compressor failure, replace the air conditioning compressor:

1. As mentioned in the *Technical Background*, the originally-installed compressor on the MY 2015 A3 is manufactured by Sanden (Figure 13). The replacement compressor is manufactured by Denso (Figure 14).

   When replacing the original Sanden compressor with a Denso compressor, be aware that while the refrigerant volume is the same regardless of the compressor installed, the PAG oil type and volume is not. Sanden and Denso compressors have specific PAG oils that must be used.

Figure 13: *Sanden compressor identification tag.*

Figure 14: *Denso compressor identification tag.*

2. The original PAG oil that will be in the refrigerant circuit must be flushed out completely with the air conditioning service station with flushing equipment, as specified in the Elsa Repair Manual.
   - The flushing procedure can be found in the Elsa Repair Manual at: *Heating, Ventilation & Air Conditioning>>Refrigerant R134a Servicing>>87 Air Conditioning>>Refrigerant Circuit>>Refrigerant Circuit, Cleaning (Flushing), with Refrigerant R134a*. The procedure is also described in TSB 2018162.
   - The correct adapters for the 2015 A3 can be found in the Elsa Repair Manual at: *Heating, Ventilation & Air Conditioning>>Refrigerant R134a Servicing>>87 Air Conditioning>>Refrigerant Circuit>> Refrigerant Circuit, Cleaning (Flushing), with Refrigerant R134a>>Adapter for Assembling Flushing Circuit.*
3. The replacement compressor will come with the specified type of PAG oil for the compressor (Figure 15). The amount of PAG oil supplied with the replacement compressor may not be the exact amount required to replenish the refrigerant circuit. Drain and measure the PAG oil in the replacement compressor to determine the required amount. If the amount needs to be adjusted, do so using the correct type of PAG oil specified in ETKA. Refer to Elsa for the correct oil capacity for the compressor being installed.

Figure 15: *Compressor manufacturer specific PAG oils.*

Tip: Air conditioning compressors that are replaced due to the conditions described will be requested for submission and analysis. Any needlessly-replaced A/C compressor will be returned to the dealer and the warranty claim debited.
See TSB 2041717 before replacing the A/C compressor.

Warranty

Claim Type:	Use applicable claim type. If vehicle is outside any warranty, this Technical Service Bulletin is informational only.		
Service Number:	8737		
Damage Code:	0010		
	Refrigerant drain+fill	8703 1700	50 TU
	Noise dampening pan remove and reinstall	1082 1900	40 TU
	N280 refrigerant regulating valve remove and reinstall	8737 1950	20 TU
Diagnostic Time:	GFF	0150 0000	Time stated on diagnostic protocol (Max 100 TU)
	Road test prior to service procedure	0121 0002	10 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 #2038023/7		

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
VAS 5256	 Breakout Harness	1
ROB134APF	 Robinair A/C Service Unit	1
VAS 6337/1A		1

	Air Conditioning Flush Tool	
VAS 6338/3	 Refrigerant Circuit Adapter 3	1
VAS 6338/12	 Refrigerant Circuit Adapter 12	1
VAS 6338/38	 Refrigerant Circuit Adapter 38	1

5Q0260839A	 N280 Refrigerant Regulating Valve	1
G 052300A2	 Oil for refrigerant compressor - Denso	0.2
G 052154A2	 Oil for refrigerant compressor - Sanden	0.2

Additional Information

All parts and service references provided in this TSB (2038023) are subject to change and/or removal. Always check with your Parts Department and service manuals for the latest information.