Technical product information

Topic	Air spring fault finding guidelines
Market area	Bentley: worldwide (2WBE)
Brand	Bentley
Transaction No.	2053492/10
Level	EH
Status	Approval
Release date	

New customer code

Object of complaint	Complaint type	Position
running gear -> shock absorber/suspension control -> automatic shock absorber adjustment	functionality -> without function / defect	
running gear -> adaptive suspension, pitch and roll compensation	functionality	
running gear -> shock absorber/suspension control -> self-levelling suspension	functionality -> without function / defect	

Vehicle data

Mulsanne

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
3Y2*	2011	E		*	*	*
3Y2*	2012	E		*	*	*
3Y2*	2013	E		*	*	*
3Y2*	2014	E		*	*	*
3Y2*	2015	E		*	*	*
3Y2*	2016	E		*	*	*
3Y2*	2017	E		*	*	*
3Y2*	2018	E		*	*	*
3Y2*	2019	E		*	*	*
3Y2*	2020	E		*	*	*
3Y6*	2017	E		*	*	*
3Y6*	2018	E		*	*	*
3Y6*	2019	E		*	*	*
3Y6*	2020	E		*	*	*

Continental Series and Flying Spur

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
39*	2012	E		*	*	*
39*	2013	E		*	*	*
39*	2014	E		*	*	*
39*	2015	E		*	*	*
39*	2016	E		*	*	*
39*	2017	E		*	*	*
39*	2018	E		*	*	*
39*	2019	E		*	*	*
3W*	2004	E		*	*	*
3W*	2005	E		*	*	*
3W*	2006	E		*	*	*
3W*	2007	E		*	*	*
3W*	2008	E		*	*	*
3W*	2009	E		*	*	*
3W*	2010	E		*	*	*

3W*	2011	E		*	*	*
3W*	2012	E		*	*	*
3W*	2013	E		*	*	*
4W*	2014	E		*	*	*
4W*	2015	E		*	*	*
4W*	2016	E		*	*	*
4W*	2017	E		*	*	*
4W*	2018	E		*	*	*
4W*	2019	E		*	*	*

New Continental GT

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
3S3*	2018	E		*	*	*
3S3*	2019	E		*	*	*
3S3*	2020	E		*	*	*
3S3*	2021	E		*	*	*
3S3*	2022	E		*	*	*
3S3*	2023	E		*	*	*

Bentayga series

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
4V1*	2017	E		*	*	*
4V1*	2018	E		*	*	*
4V1*	2019	E		*	*	*
4V1*	2020	E		*	*	*
4V1*	2021	E		*	*	*
4V1*	2022	E		*	*	*
4V1*	2023	E		*	*	*
ZV1*	2023	E		*	*	*

New Continental GTC

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
3S4*	2019	E		*	*	*
3S4*	2020	E		*	*	*
3S4*	2021	E		*	*	*
3S4*	2022	E		*	*	*
3S4*	2023	E		*	*	*

New Flying Spur

Sales types

Type	MY	Brand	Designation	Engine code	Gearbox code	Final drive code
ZG2*	2020	E		*	*	*
ZG2*	2021	E		*	*	*
ZG2*	2022	E		*	*	*
ZG2*	2023	E		*	*	*

Documents

Document name
master.xml

Customer statement / workshop findings

The front and/or rear suspension appears to have dropped

Technical background

VERY IMPORTANT: Before proceeding with the instructions, the operative MUST be aware that all procedures within the repair manual MUST be strictly followed in particular when replacing air spring dampers and other air suspension components as the procedures differ depending on the vehicle model type

CAUTION

VERY IMPORTANT: Should the vehicle be specified with a High voltage system only be suitably qualified personnel should work on the vehicle

Bentley vehicles which are applicable to this TPI are fitted with air springs as part of the suspension system. Should air leak from the air spring dampers, this will cause the suspension to drop. However, the dropping of the suspension does not necessarily mean that the air spring is faulty.

The "Measure" section of this TPI describes how and where to check for air leaks on the front and rear air springs, the air supply unit, pipes, valve unit and air reservoirs. This includes potential air leak points on the air spring dampers and also the locations of an air leak that can be repaired without the need to replace an air spring damper.

These checks should be carried out in conjunction with the Elsapro procedure "Air suspension – To check" with the use of the special tool "Air suspension leak tester VAS 751 001" shown in Figure 1 as item (1). Refer to Elsapro, Repair Group 43, "Air suspension – To check".

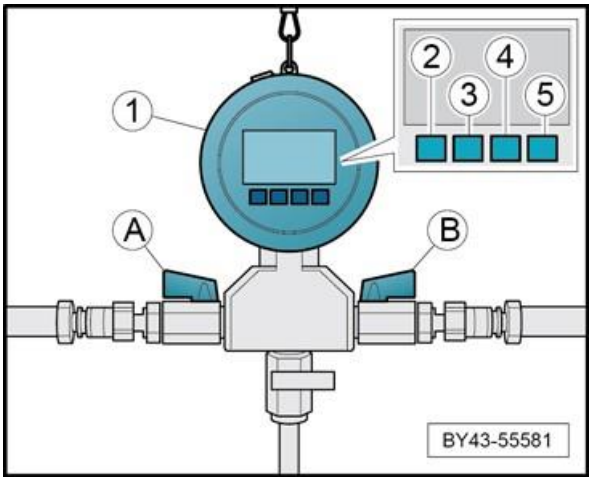


Figure 1

Please follow and complete the check list within the "Measure" section of this TPI to help in diagnosing the issue *(the check list does not need to be sent as an attachment should a DISS technical query be raised).*

Should a leak be found from an air spring damper, compressor, valve unit or reservoir, please raise a DISS technical query and include as much information as possible including photograph/s of the leak/s location. Once the DISS ticket has been submitted please await clarification before commencing with replacing any of the suspected faulty air spring dampers.

Mandatory reporting is applicable for all air spring related issues.

VERY IMPORTANT:

The examples shown below are taken from a Bentayga front air spring damper and are shown for photographic purposes only

NOTE: The operative MUST always refer to the applicable Rep.Gr within the repair manual as the procedures differ

depending on the vehicle model type

The operative MUST be aware that when disconnecting the air supply line from the air spring damper ONLY the brass nut connector (Figure 2 - Point A) should be used for disconnection/installation

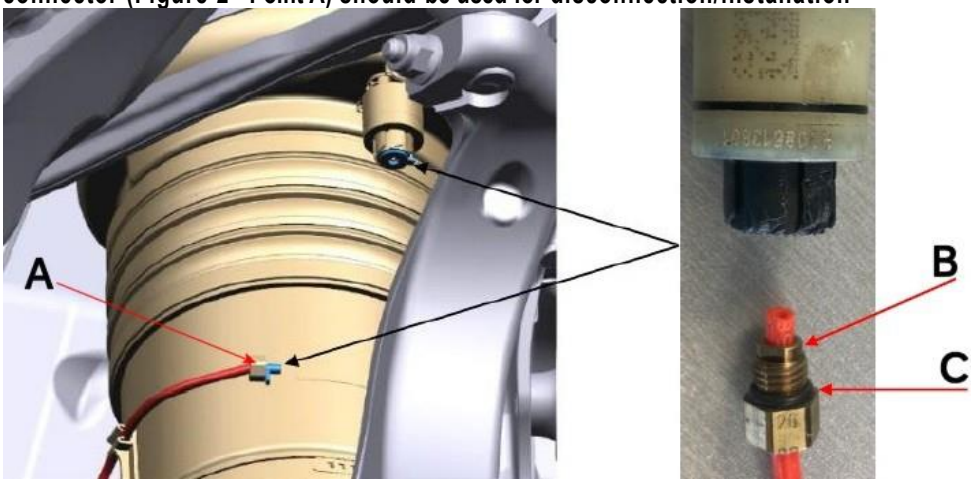


Figure 2

DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO DISCONNECT THE AIR SPRING DAMPER AIR SUPPLY LINE FROM ANY OTHER CONNECTION OTHER THAN AS SHOWN IN FIGURE 2 - Point A

Referring to Figure 2 - Points B and C the operative MUST be aware of the following:

- The operative MUST ensure the grip ring (B) is correctly installed and not damaged
- The operative MUST also ensure the O-ring (C) is correctly installed and not damaged

Figure 3 - Shows an example of a Bentayga front air spring damper minimum pressure valve, the valve was damaged during disconnection of the air supply line from the front air spring damper

Please note: In this scenario the front air spring was replaced, as damage was caused to the minimum pressure valve during the disconnection of the air supply line, please be aware that warranty payments will be cancelled should any damage be caused to the air spring assemblies due to the applicable procedures within the applicable Rep.Gr not being followed

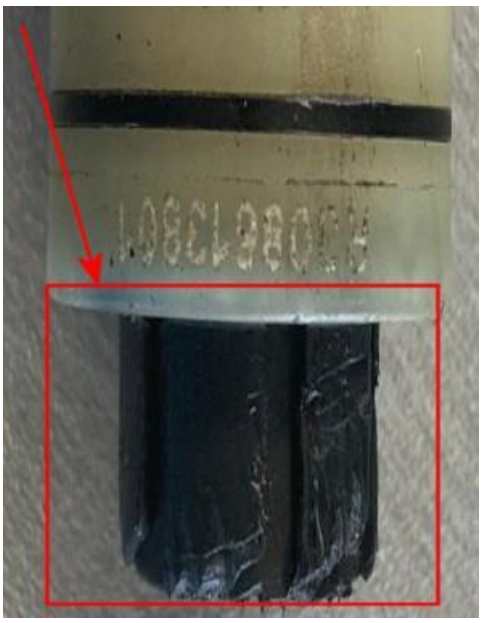


Figure 3

VERY IMPORTANT: When the air supply lines are disconnected the operative should ensure the pipes and connections are fitted with plastic caps/bungs to eliminate the risk of contamination within the air suspension system

Revision history

TPI 2053492/8

- Technical background section now amended to include care points relating to the disconnection of the air spring damper supply line

- Warranty accounting instructions amended

TPI 2053492/9

Section 3 within the Measure section (Air supply unit check points) has been updated requesting further checks/ and feedback in the event a leak or an issue is found on the air supply unit

TPI 205342/10

Section 3 within the Measure section (Air supply unit check points) has been updated requesting further checks/ and feedback regarding the correct fitment of the air pipes

CAUTION

The operative should be aware that all instructions regarding attaching photographs and videos to DISS queries is followed as advised within Section 3

Production change

Not applicable

Measure

Reference chart

Please use this generic "Reference Chart" (Figure 4) in conjunction with the customer description of the fault and the "Standard Ambient Conditions" of the DTC's if present, to focus on the relevant area (ie: if a DTC is pointing out to the accumulator and the event data from the DTC and the customer description explains that the issue appear while the vehicle was driving, then the potential source of the leak well might be in between reservoir, valve unit or compressor as these three components are active in these particular conditions).

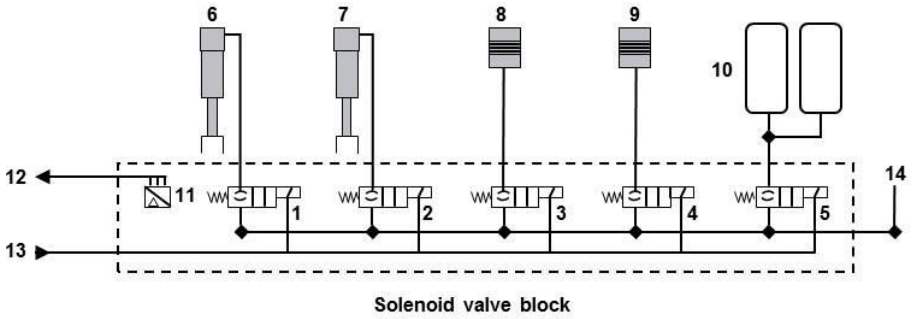


Figure 4

Component	Description
1 - 5	Solenoid valves
6 & 7	Front axle suspension struts
8 & 9	Rear axle suspension units
10	Pressure accumulator
11	Pressure sensor
12	Pressure reading
13	Electrical activation of solenoid valves
14	Compressor connection

Procedure

Position the vehicle on a flat and level surface and allow it to cool down.

- **Important**: Set the vehicle suspension into "Jack" mode.

Apply strips of masking tape (**1**) from the centre of each wheel to the highest part of the wheel arch as shown, making sure the masking tape is applied 'taut'

Using a tape measure (**2**), measure and take note of the ride heights (**A-A**) at all four corners of the vehicle. See Figure 5.

Figure 5

Leave the vehicle overnight and again measure the ride heights (**A-A**) at all four corners of the vehicle. Compare these values with those taken previously.

If there is **NO** difference in ride heights, and the strips of masking tape are still 'taut' then no air leak is present. Please explain to the customer the long term storage or changing climate conditions would cause a drop in ride height which is normal. As soon as the vehicle is started, the compressor will level the vehicle automatically. No further action is required.

If there **IS** a difference in ride heights, and the strips of masking tape (**1**) have 'sagged' (shown in Figure 6), then refer to the following leak finding procedures below.

Figure 6

It should be noted that if these checks involve a claim through warranty then photographic evidence of the vehicle sagging and air leak should be included.

Always select "Jack mode" before raising the vehicle and exhausting the air from the suspension system. Refer to Elsapro. Repair Group 43.

Section 1 - Front suspension air spring fault finding

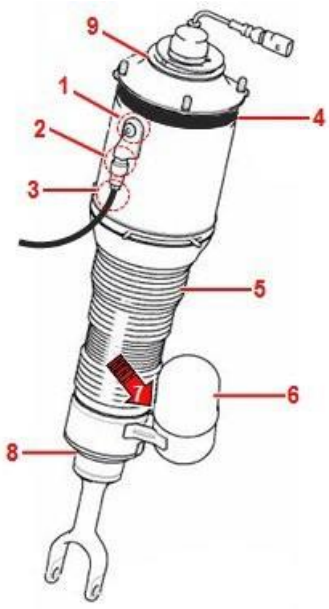
Before any other checks are made to the front air springs check to confirm the pipes are fully inserted and firmly connected within the brass fitting.

Air leakage may not be audible. A possible symptom of air leakage is excessive operation of the air supply unit. If no air leakage is apparent at the pipe unions and there is excessive operation of the air pump compressor, there may be a damaged air supply pipe to an air spring.

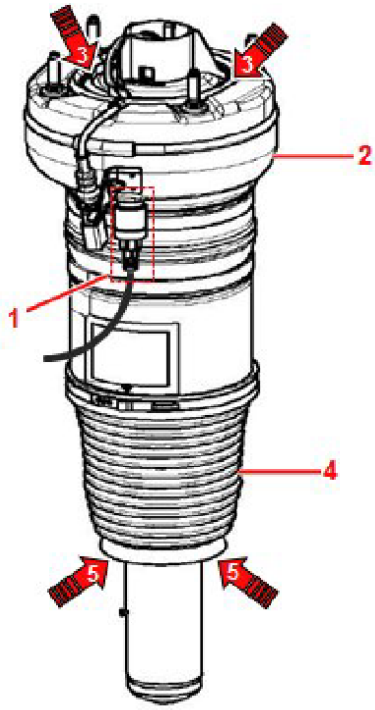
With the air suspension fully charged, use leak detector spray or a mild soap solution to check the connections for leaks as shown in the accompanying table.

Place an X in the appropriate column next to each check.

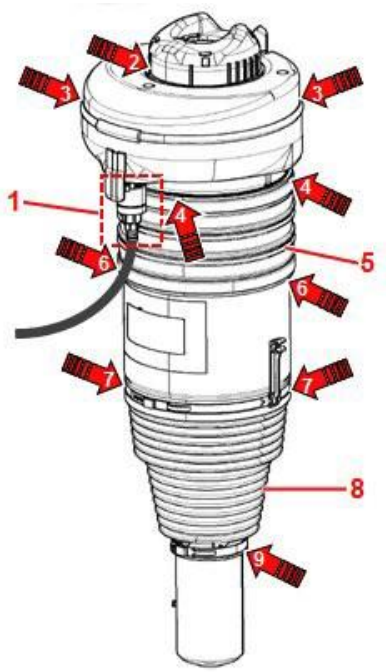
Front air spring check points - Continental series *(pre 2018)* and Flying Spur

Check	Yes	No	Comments
Brass fitting to air spring (**1**) Brass intermediate connection (**2**) Air feed pipe connection (**3**) Top of air spring (**4**) Air spring gaiter condition (**5**) Air canister and canister to air spring (**6 & 7**) Bottom of the air spring (**8**) Top of the air spring (**9**). Within engine compartment, pull dust seal back to inspect! 			

Front air spring check points – Mulsanne

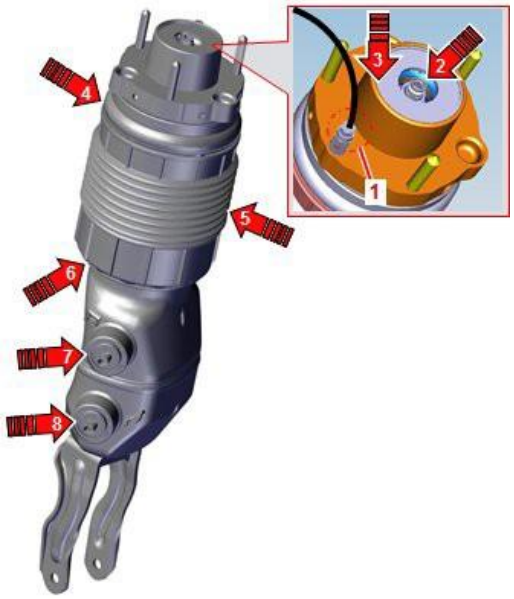
Check	Yes	No	Comments
Air connection to air spring (**1**) Upper air spring (**2**) Top of air spring (**3**) Air spring gaiter condition (**4**) Bottom of the air spring (**5**) 			

Front air spring check points – Bentayga

Check	Yes	No	Comments
Air connection to air spring (**1**) Top of air spring (**2 & 3**) Upper areas of air spring gaiter (**4 & 6**) Air spring upper gaiter condition (**5**) Lower areas of air spring gaiter (**7 & 9**) Air spring upper gaiter condition (**8**) 			

Front air spring check points – New Continental GT/C and New Flying Spur

Check	Yes	No	Comments
Air connection to air spring (**1**)			
Sealing area of top nut (**2**)			
Top crimp area (**3**)			

Top of air spring (**4**) Air spring gaiter condition (**5**) Lower areas of air spring gaiter (**6**) Switching valves, solenoids and welds (**7&8**) 			

Section 2 - Rear suspension air spring fault finding

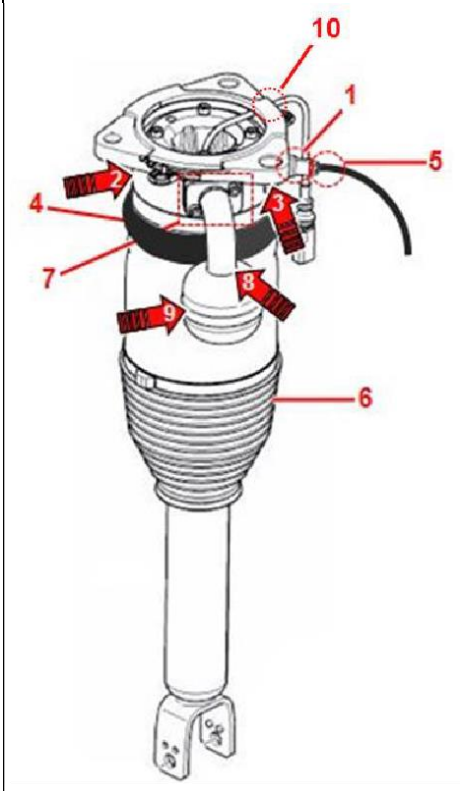
Before any other checks are made to the rear air springs check to confirm the pipes are fully inserted and firmly connected within the brass fitting.

Air leakage may not be audible. A possible symptom of air leakage is excessive operation of the air pump located above the rear diffuser. If no air leakage is apparent at the pipe unions and there is excessive operation of the air pump compressor, there may be a damaged air supply pipe to an air spring.

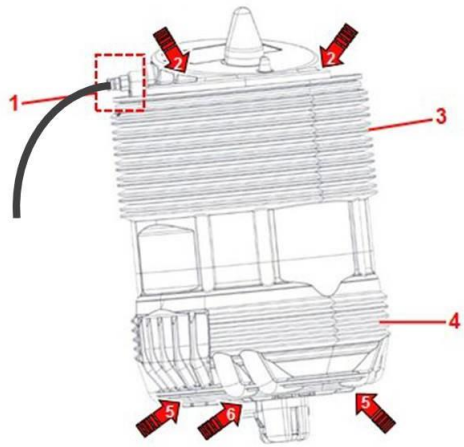
With the air suspension fully charged, use leak detector spray or a mild soap solution to check the connections for leaks as shown in the accompanying table.

Place an X in the appropriate column next to each check.

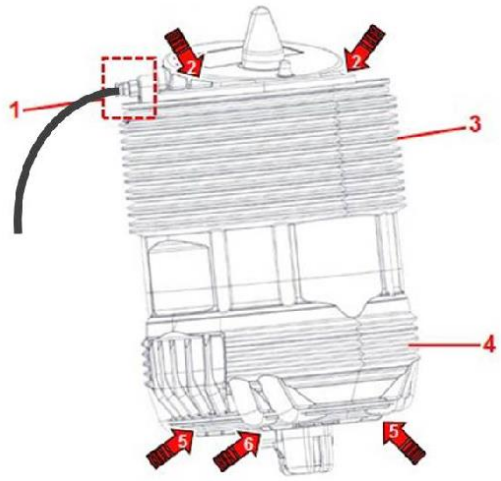
Rear air spring check points - Continental series (pre 2018) and Flying Spur

Check	Yes	No	Comments
Brass fitting to air spring (**1**) Top of air spring (**2 & 3**) Air spring bellows (**4**) Air feed pipe connection (**5**) Air spring gaiter condition (**6**) Air canister and canister to air spring (**7, 8 & 9**) Electrical cable route for air escaping (**10**) 			

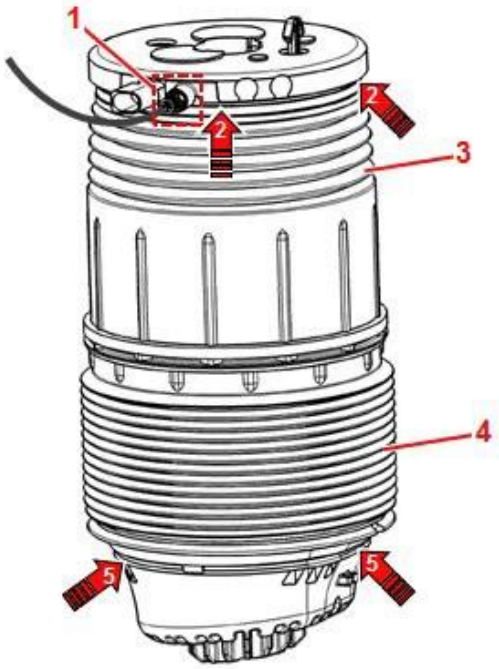
Rear air spring check points – Mulsanne

Check	Yes	No	Comments
Air feed pipe connection (**1**) Top of air spring (**2 & 3**) Upper air spring bellows (**4 & 5**) Lower air spring bellows (**6 & 7**) Air spring gaiter condition (**8 & 9**) 			

Rear air spring check points – Bentayga

Check	Yes	No	Comments
Air feed pipe connection (**1**) Top of air spring (**2**) Air spring gaiter condition (**3 & 4**) Lower areas of air spring (**5 & 6**) 			

Rear air spring check points – New Continental GT/C and New Flying Spur

Check	Yes	No	Comments
Air feed pipe connection (**1**) Top of air spring (**2**) Air spring gaiter condition (**3 & 4**) Lower area of air spring (**5**) 			

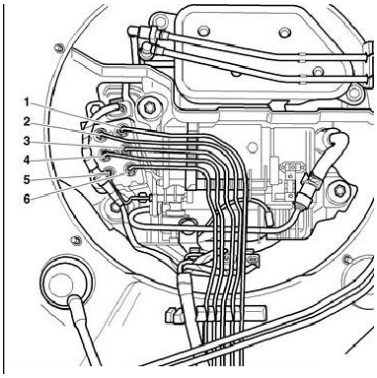
Section 3 - Air supply unit check points

Check for any air leaks on or around the air supply (compressor) unit.

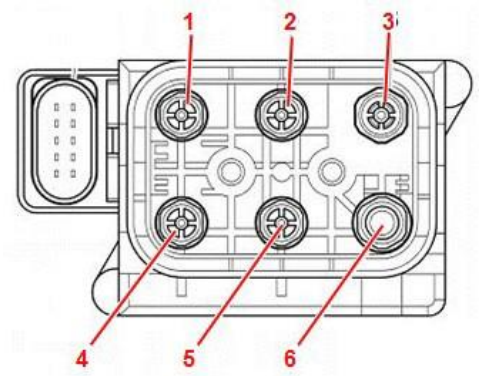
Place an X in the appropriate column next to each check.

Air supply check points - Continental series (pre 2018) and Flying Spur

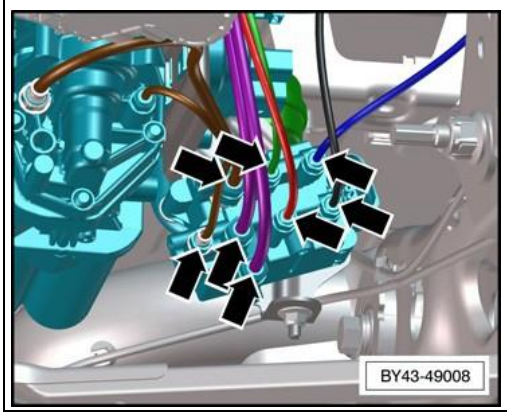
Check	Yes	No	Comments
Air pipe connections (**1 to 6**)			

 1 2 3 4 5 6			

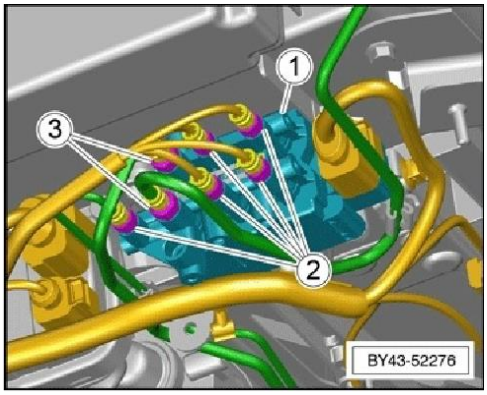
Air supply check points - Mulsanne

Check	Yes	No	Comments
Air pipe connections (**1 to 6**) 			

Air supply check points – Bentayga

Check	Yes	No	Comments
Air pipe connections (**arrows**) 			

Air supply check points – New Continental GT/C and New Flying Spur

Check	Yes	No	Comments
Air pipe connections (**2 & 3**) 			

NOTICE

In the event an air leak is evident at the air supply unit, the operative must conduct all remaining checks within this TPI, once complete the operative should provide all additional findings via a new or existing DISS query as per the examples below:

NOTE: The photos below are shown as examples and do not refer to a particular vehicle type

- Check if there any kinked, split or damaged air pipes HINT: The operative should also check to confirm that the heatshield is not contacting the air pipes as shown below

CAUTION

IMPORTANT REQUEST FOR NEW GT/C AND NEW FLYING SPUR VEHICLES: Before any of the air supply unit air lines are disconnected Photographic evidence showing all air lines fitted is required as shown below

HINT: The air lines must be connected with only one single 'paint marking' visible (Figure 7)

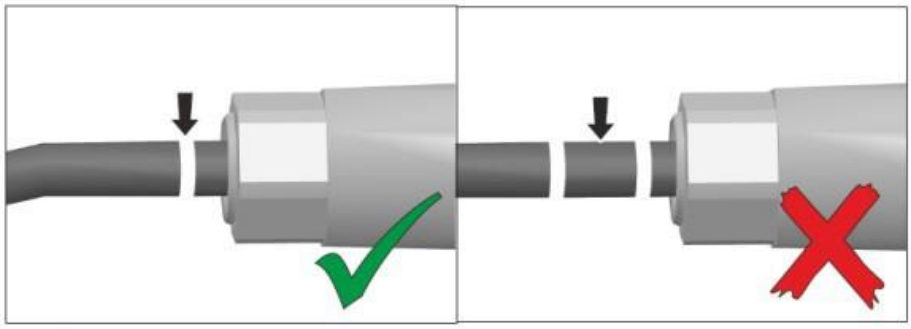
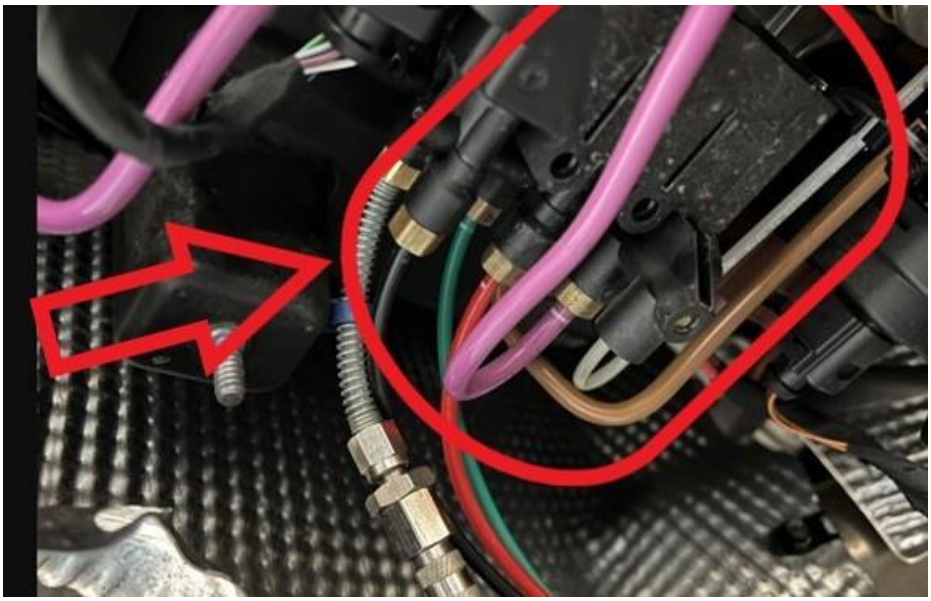


Figure 7

- Referring to Figure 8 - To assist in finding the leak, the operative must apply soapy water to the air supply unit in the area shown below, this is required to establish the source of the leak (air supply unit or air pipe connections)



- Figure 8

NOTICE

VERY IMPORTANT: In the event a leak is found at the air supply unit (Figure 9) a video and photographs of the leak is required to be attached to a new or existing DISS query

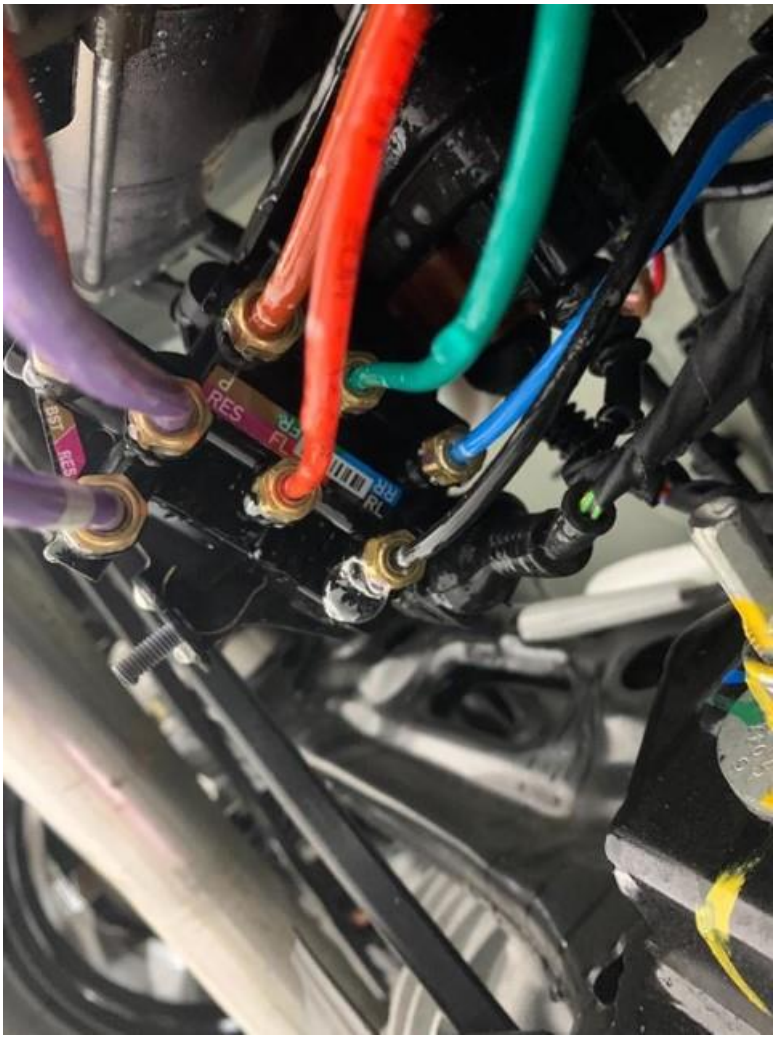


Figure 9

- Referring to Figure 10 - Ensure the air pipes are not kinked or damaged

CAUTION

A minimum radius of 30mm MUST be observed HINT: The pipes shown (CIRCLED) are bent and kinked and do not meet the minimum radius of 30mm

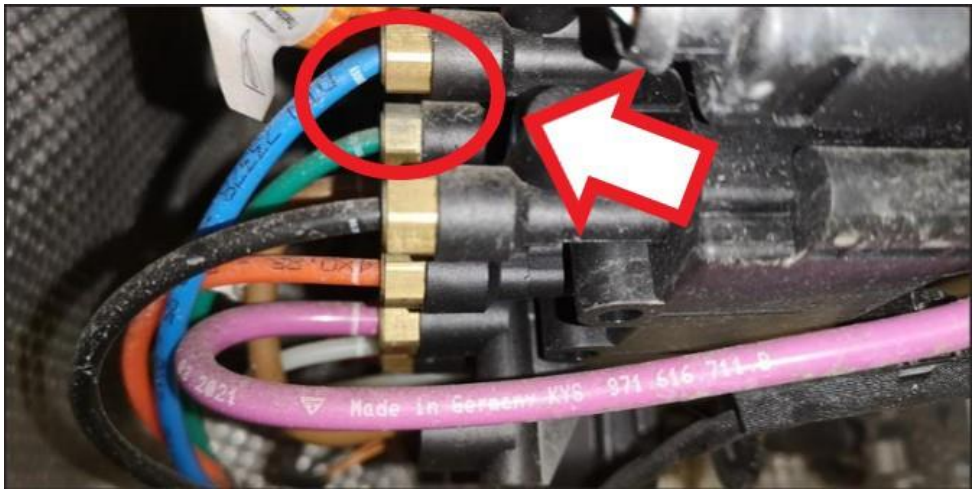


Figure 10

- Referring to Figure 11 - The pink air line routing IS NOT CORRECT

Hint: The pink air line is restricting the other air lines

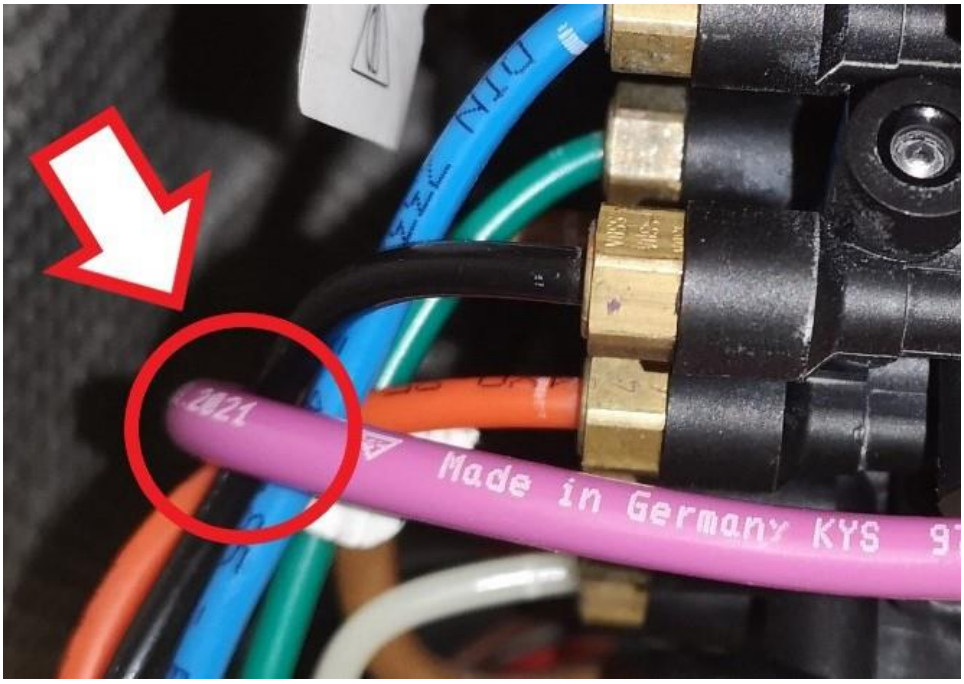


Figure 11

- Referring to Figures 12,13 and 14 attach clear photographs of the components shown

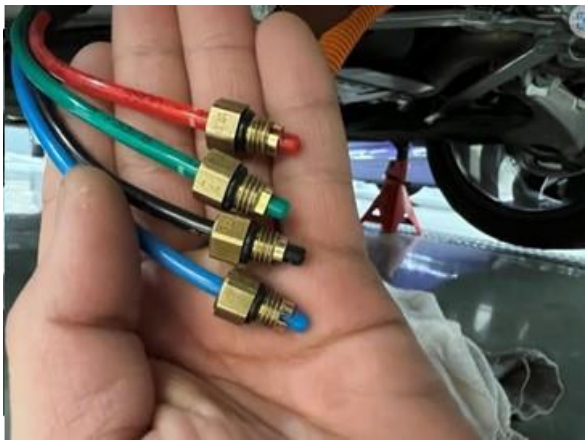


Figure 12

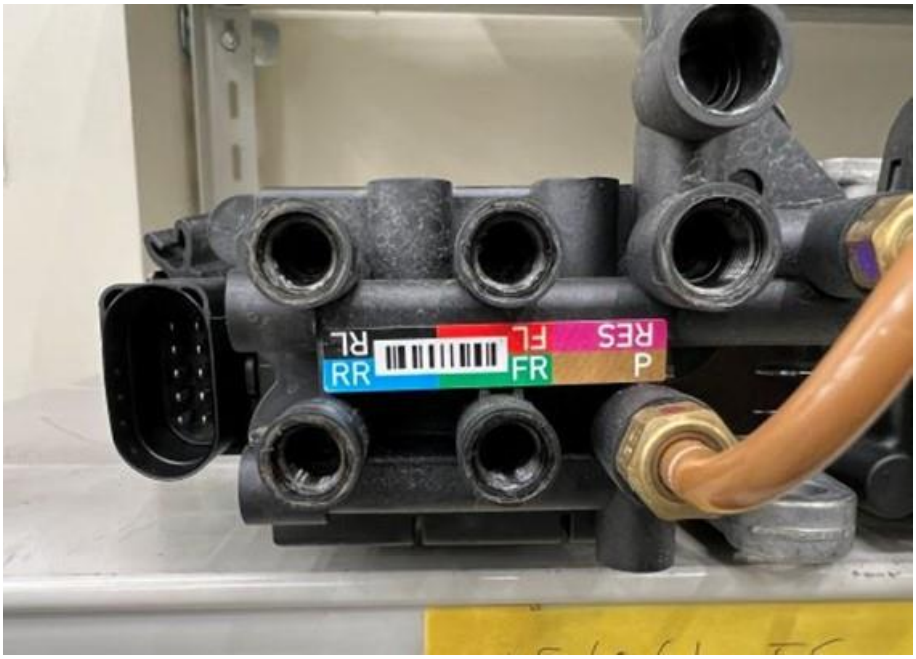


Figure 13

Figure 14

NOTICE

In the event an air leak or any other issues were found at any of the afore mentioned locations the operative should attach clear photos or video (if requested) to a new or existing DISS query

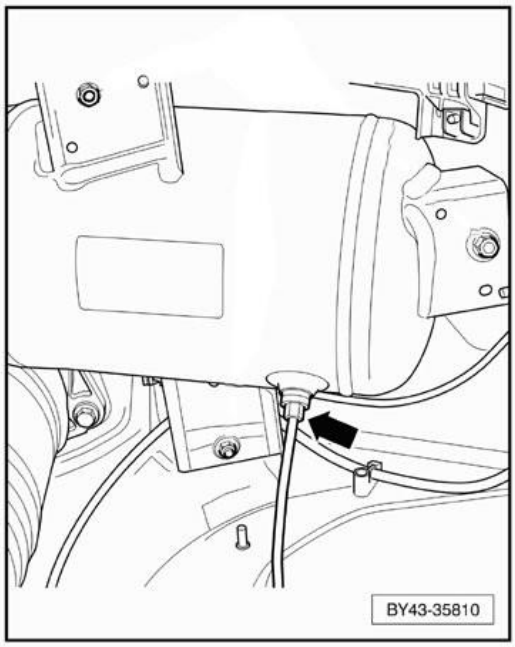
Hint: Warranty payments may not be processed should the required information not be provided

Section 4 - Air reservoir unit check points

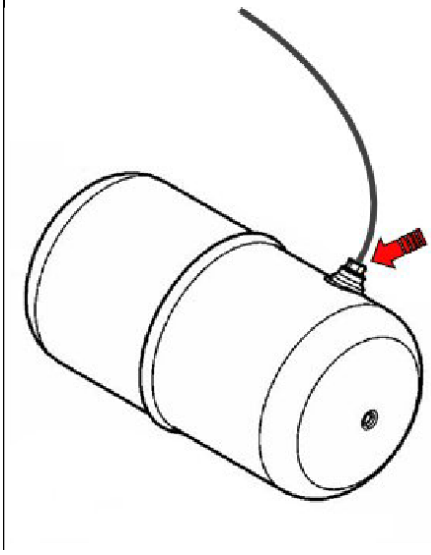
Check for any air leaks on or around the air reservoir.

Place an X in the appropriate column next to each check.

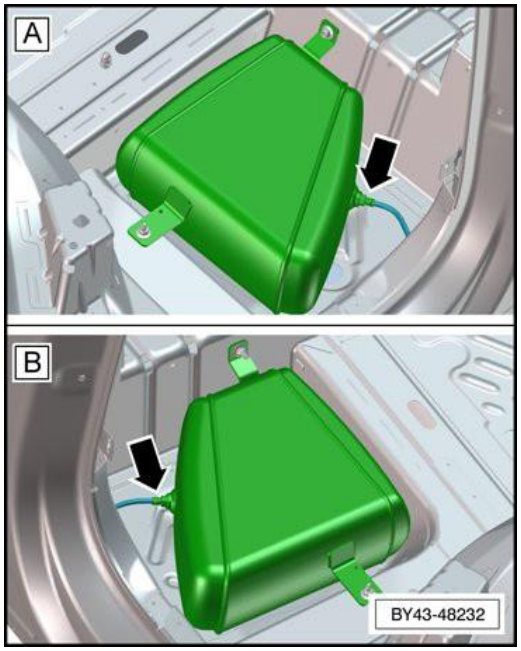
Air supply check points - Continental series (pre 2018) and Flying Spur

Check	Yes	No	Comments
Air pipe connection (**arrow**) Location - GT & Flying Spur: LH rear wheel arch Location – GTC: Behind backboard trim panel 			

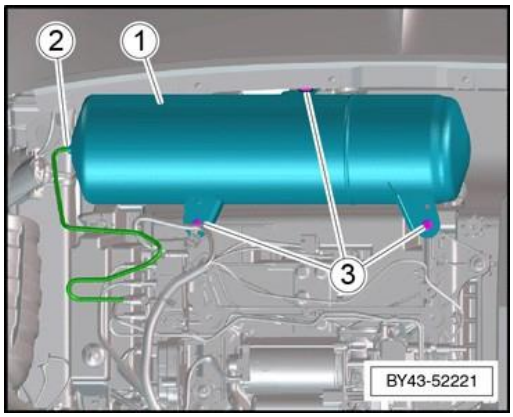
Air supply check points - Mulsanne

Check	Yes	No	Comments
Air pipe connection (**arrow**) Location – Boot floor 			

Air supply check points - Bentayga

Check	Yes	No	Comments
Air pipe connections on the twin tanks (**arrows**) Location – Rear footwells beneath carpets 			

Air supply check points – New Continental GT/C and New Flying Spur

Check	Yes	No	Comments
Air pipe connection (**2**) Location – Refer to the repair manual depending on model 			

Section 5 - Air pipe repairs

If no evident air leak has been detected in the previous sections, refer to Elsapro, Repair Group 43, “Air suspension – To check”.

The “Air suspension leak tester VAS 751 001” is used to check the air spring struts, solenoid valve block, accumulators, compressors, air reservoirs and air pipes for leaks.

In the event of an air leak from the air pipe/brass fittings on the supply unit the brass fittings and internal olive can be replaced individually.

To repair an air pipe, refer to Elsapro, “Air Supply Pipe - To Repair” - Repair Group 43.

Using a “Vehicle Tester”, recharge the air system. Refer to Elsapro, “To discharge and charge” - Repair Groups 40 and 42.

Warranty accounting instructions

Warranty type 110 or 910

Damage Service Number 43 25 - Air spring related claims

43 85 - Air supply line issues

Damage Code 00 50

Time to conduct the air suspension fault finding check

Labour Operation Code 44 96 01 00

Time 20 TU

Time to conduct the initial diagnosis

Labour Operation Code 44 96 03 00

Time 50 TU

Time to repair x1 air supply line

Labour Operation Code 44 96 41 00

Time 20 TU

Due to the numerous vehicle models which are covered within this TPI, please refer to the Elsa pro labour operations in the event that an air spring damper was replaced

It should be noted that if checks involve a claim through warranty then photographic evidence of the vehicle sagging and air leak should be included with the DISS technical query where possible.

Pictures should include the following:

- Tape (**1**) applied before and after, showing the tape sagging. See Figure 15
- All ride height measurements (**A-A**) before and after. See Figure 15
- Soap solution bubbling at the point of air leak (where possible).

Figure 15