Technical Service Bulletin

Topic	Mulsanne steering shimmy/vibration - 21 Inch wheels only (USA)
Market area	United States E05 Bentley USA and rest America (6E05)
Brand	Bentley
Transaction No.	2030349/3
Level	EH
Status	Released for publishing
Release date	May 20, 2019

New customer code

Object of complaint	Complaint type	Position
chassis -> steering	noises, vibrations	
chassis -> wheels, tires, tire pressure monitoring -> tires -> tire tread	appearance, surface -> bulge	> no instruction <
chassis -> steering, steering assist -> steer	noises, vibrations -> vibrating	
chassis -> steering, steering assist	functionality	
chassis -> wheels, tires, tire pressure monitoring	noises, vibrations	
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> installed incorrectly	

New workshop code

Object of complaint	Complaint type	Position
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> out of balance	left front
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> out of balance	left rear
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> out of balance	right rear
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> out of balance	right front
chassis -> wheel suspension, suspension, damping -> axle body bearing	component, automotive fluids -> incorrect	
chassis -> steering -> steering column brace	noises, vibrations -> noise	
chassis -> wheels, tires, tire pressure monitoring -> tires	component, automotive fluids -> installed incorrectly	> no instruction <

Vehicle data

Bentley 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		*	*	*

Documents

Document name
master.xml

Condition

This TPI is only applicable to Bentley Mulsanne fitted with 21 Inch wheels. This TPI is not applicable to vehicles fitted with Bentley 20 inch wheels, should 20 inch wheels be fitted please raise a DISS query.

Should a customer complain of steering wheel shimmy/vibration constantly above 80 kph/50 mph and the condition does not improve when driven please proceed with this TPI. Should the vehicle exhibit different symptoms other than described please raise a DISS ticket.

This TPI also applies to all vehicles which are built and registered for use in the countries listed below

EGYPT – INDIA – LEBANON – SYRIA - SOUTH AFRICA

Technical Background

We are aware that under certain conditions of shipment and storage, particularly involving large changes in ambient temperature, a condition can occur where the tread surface of the tyre forming the footprint on the road surface or container floor partly retains the relatively flat form when driven and does not immediately restore to a constant radius. Hence the name of flat spotting which is generally given to this condition.

Flat spotting should not be confused with out of balance, out of round or radial force variation. It is very important that the diagnosis and correction of these different conditions are not confused with each other. Attempting to correct flat spotting by rebalancing the assembly will not correct the problem and worse still, when the flat spots are removed the tyres will then be out of balance.

ATTENTION: During this TPI the Workshop Manual is quoted to help in carrying out various tasks, it is recommended that the procedures referenced are checked by the operative as the process within the Workshop manual may have changed since last viewed.

Production Solution

Improved Manufacturing, shipping and transportation procedures have been introduced.

Referring to Figure 1, from VIN SCBBA63Y9BC016115 the front suspension lower lever inner rear bushes with a higher damping frequency were fitted at the time of production.

Increased friction steering racks were fitted in production after VIN SCBBA63Y7CC016888

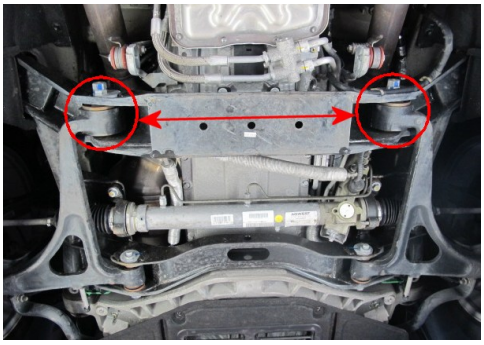

Figure 1

Service

Check the tyre specification and the date of manufacture code which is stamped on all four tyres, the correct specification tyre that should be fitted is as follows:

- Dunlop SP Sportmaxx GT 265/40/21 with the part number 3Y0 601 313H or higher

- To ensure correct specification the Bentley Mulsanne tyre has a 'B' stamped on the sidewall as shown in Figure 2

Figure 2

Referring to Figure 3, check the date of manufacture code, the code must be on or after 2011, this code translates as week 20 of the year 2011 hence 2011, Figure 3 shows 2811 which is week 28 year 2011.

Figure 3

<u>Should your tyres not meet any of the aforementioned criteria regarding brand, specification and date code</u> please bring the tyres up to the correct specification before proceeding with this TPI, Refer to Workshop manual Rep.Gr 44. Please also observe the key points detailed in point 3.

Should the tyres meet all criteria regarding tyre specification and date of manufacture please carry on with the TPI.

<u>IMPORTANT:</u> <u>Do not initially balance the wheel and tyre assemblies, before commencing ensure the initial checks below are carried out</u>

- Check the wheels and tyres for damage

- Check that Bentley approved 21 inch wheels are fitted and the tyres are to the correct specification

- Check the front and rear suspension for any damage and wear

- Check all steering components for damage and wear

1. Ensure the tyres are set at Normal pressure and adjust if required, drive the car until the flat spots come out or the flat spotting condition improves, then drive for approximately 10 minutes at the lowest speed possible to allow cooling

- Within a maximum of two minutes of returning from the road test raise the vehicle off the ground

2. Remove all four wheel assemblies Refer to Workshop Manual Rep.Gr 44

3. Using the Hunter GSP 9712 (VAS 6230) vibration control balancer (or similar) force match and balance all four assemblies, the assembly Radial Force Variation (RFV) should be no more than 85N after the force matching process has been conducted.

- To seat the tyre beads to the rim inflate to 3.5 Bar, once satisfied that the tyre beads are fully seated readjust to the correct measuring pressure of 3.0 Bar - Refer to Workshop Manual Rep.Gr 44 and also observe the following key points.

Does the vehicle have accessory valve caps fitted as shown in Figure 4? If Yes please ensure the force match and balance process is always conducted with accessory valve caps fitted

Figure 4

<u>IMPORTANT:</u> Apply a thin smear of silicon based grease for example Dow Corning high vacuum grease to the external threads of the valve stem prior to fitting the accessory valve cap. Grease should be applied any time the cap is removed and the grease is not evident

- For applicable Hunter machines, it is imperative that the adaptor cone with part number 158 F+ with a light Blue coloured face as shown in Figure 5.

- The cone must be fitted on the spindle as shown in Figure 6 ensuring the light Blue face of the cone is facing towards the end of the spindle

NOTE: Should the initial RFV reading be above 85 N this does not necessarily mean the assembly cannot be adjusted to within specified tolerance, please ensure that the force matching process is adhered to as instructed within the workshop manual Rep.Gr 44 – Tyres – Checking condition and replacement

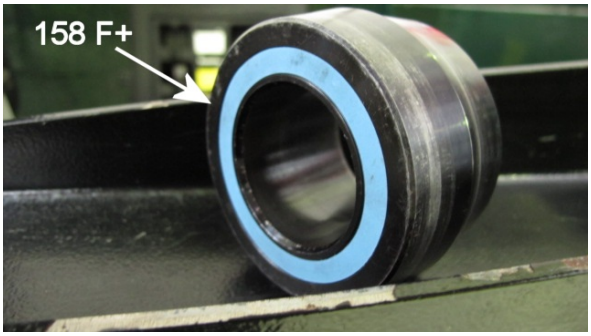

Figure 5

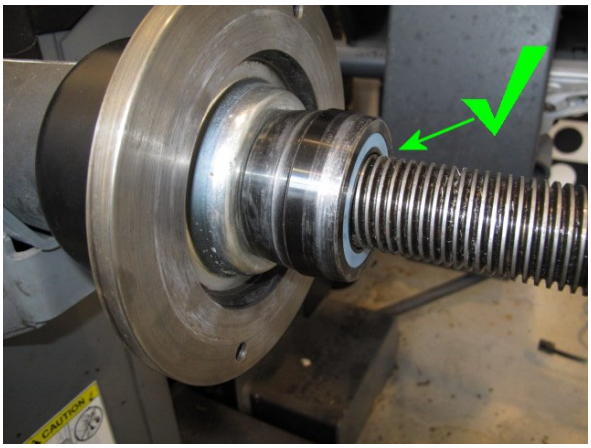

Figure 6

Important: When conducting the Mulsanne wheel and tyre force matching process or the tyres need replacing, a specific tyre fitting lubricant should be used. The lubricant is Rema Tip Top Anti Gliss Lube with the Bentley Part Number of RH 14530. On drying the Anti Gliss has adhesive properties that increases friction between the tyre and wheel rim to prevent slippage. Please Refer to Workshop Manual Rep.Gr 44 Tyres - Checking Condition and Replacement - Radial force variation - Best fit practice.

- Once the force matching process is complete, the assembly high spot is identified with a brown dash (Figure 7).

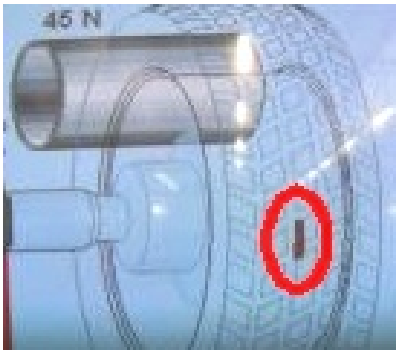

Figure 7

- Rotate the assembly on the spindle until the high point is at 12 o'clock and the Brown dash turns to Green (Figure 8).

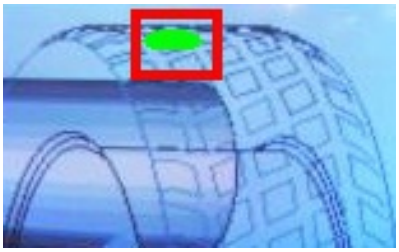

Figure 8

- Mark the RFV high point with a paint pen or similar (Figure 9) this will be required when refitting the wheels

Figure 9

IMPORTANT: All four tyres must be no more than 85N after force matching and balancing should this not be achievable replace the applicable tyres using Dunlop Sportmaxx GT 265/40/21 tyres with the part number 3Y0 601 313H or higher Refer to Workshop Manual Rep.Gr 44

4. Check the part number of the steering rack, if the part number on the existing steering rack is 'F' level suffix or lower replace the steering rack - Refer to workshop manual Rep.Gr 48

NOTE: The Link loom with the part number 3Y0 970 089 will require fitting along with the latest level steering rack up to VIN SCBBA63Y7CC016888 as detailed in the workshop manual Rep.Gr 48 – Steering rack – To Remove and Fit.

NOTE: When refitting the wheels Refer to Workshop manual Rep.Gr 44 Tyres – Checking Condition and Replacement – Radial force variation – Best fit practice

IMPORTANT: At this point a DISS query must be raised to authorise replacement bespoke front lower levers. If on receipt of the DISS query Bentley Engineering consider the fitting of bespoke parts beneficial then the DISS query will contain the correct new part numbers for the lower lever assemblies

5. If authorised above replace the right and left hand front suspension lower lever assembly's Refer to Workshop Manual Rep.Gr 40 Front suspension, drive shafts – Front Suspension Levers, Arms and Links – To Remove and Fit.

6. During new lower lever fitment incorporate the additional snubber parts into the assembly. These snubber parts are fitted to the rear bush (A figure 10) of both the left and right hand new lower levers. Snubber part number 3Y0407743, steel washer part number 3Y0407371A and steel washer part number 3Y0407742A should be assembled as detailed in figure 11. Arrow F points to front of vehicle. All other information relating to fitting the lower levers including torque tightening figures are unchanged and are therefore as detailed in the relevant section of the workshop manual.

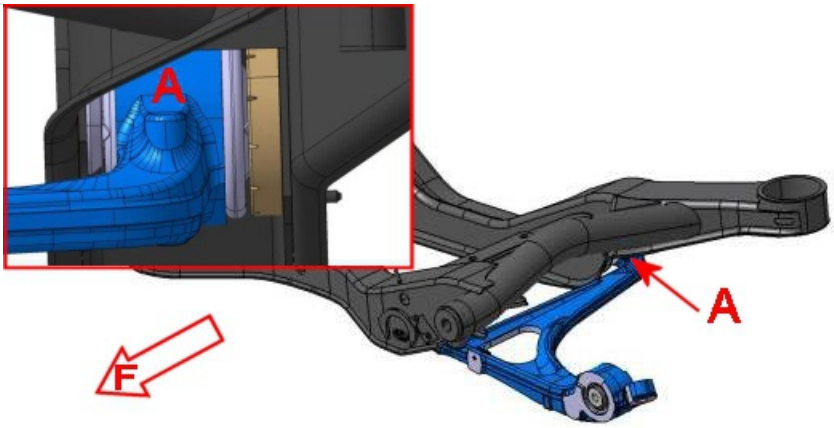

Figure 10

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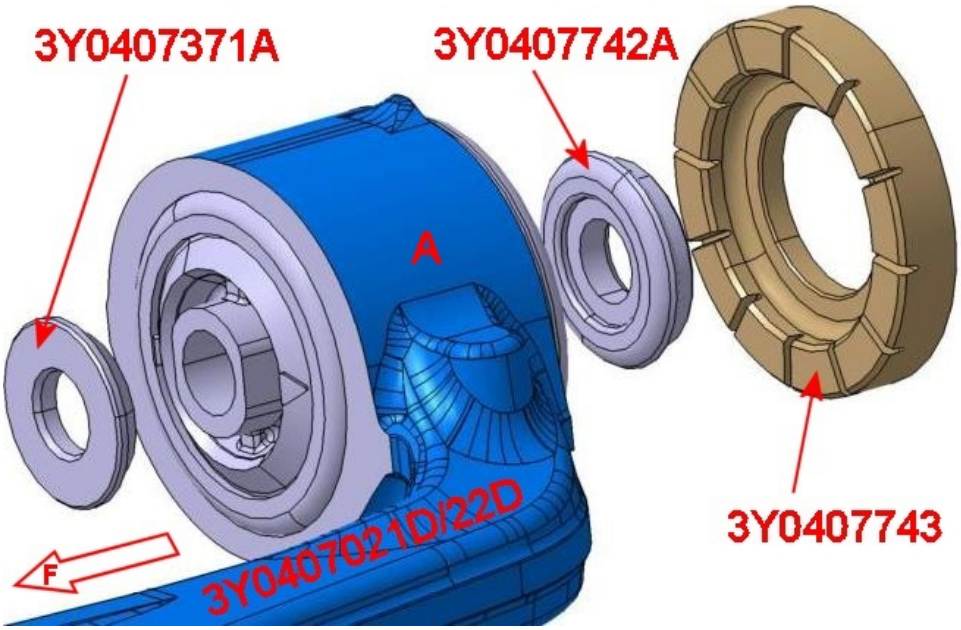

Figure 11

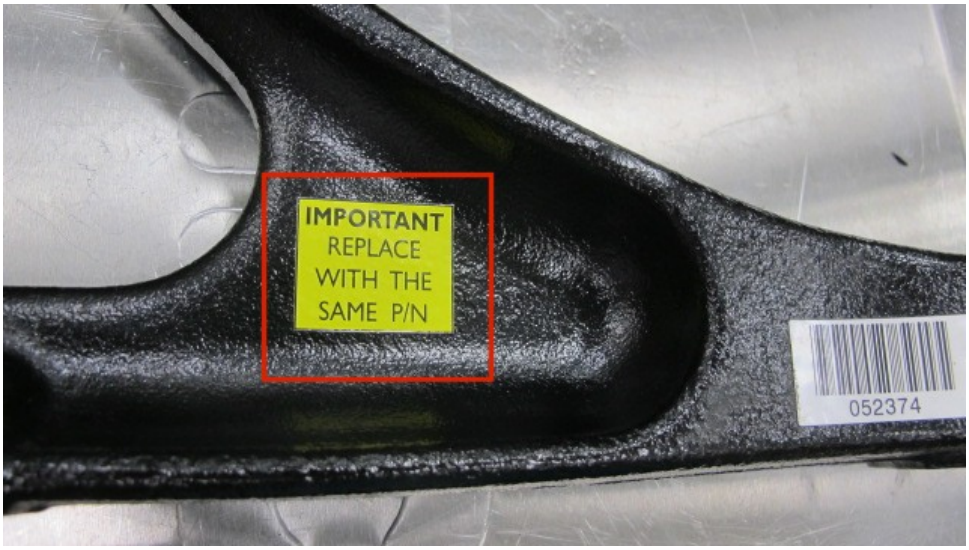

Figure 11a

Note: Any vehicle authorised to have this bespoke lower lever fitted will require a label RH15238 applying to the lower lever ensuring only these levers are fitted in the future see Figure 11a

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NOTE: When refitting the wheels Refer to Workshop manual Rep.Gr 44 Tyres – Checking Condition and Replacement – Radial force variation – Best fit practice

7. Place a Blue paint completion mark on the power steering reservoir bracket (Figure 12) to confirm the steering rack and the lower lever bushes (if pre VIN SCBBA63Y9BC016115) have been replaced.

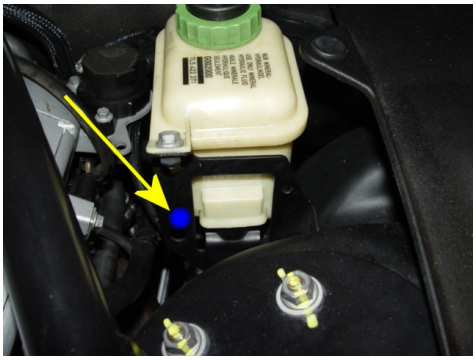

Figure 12

8. Drive the vehicle on the same route as previously covered and re-asses, should the condition still be evident please raise a DISS query and wait for further instruction from Product Support. Should the issue now be rectified please return the car to the customer.

Warranty

Please Note: Normal Warranty policies are applicable.

Time to carry out the initial flat spot recovery process including the force matching and balancing process.

Warranty type	910 or 110
Labour Operation Code	44 40 94 00
Damage Service Number	44 40
Damage Code	00 13
Time	Shop time

Time to replace the steering rack.

Warranty Type	910 or 110
Labour operation code	48 40 19 50
Damage Service Number	48 40
Damage Code	00 13
Time	90 Time Units

Time to replace both the right hand side and left hand side lower levers.

Warranty Type	910 or 110
Labour operation code	40 17 56 99

Damage Service Number 40 17

Damage Code 00 13

Time 170 TU Time Units

Time to check and set the vehicle geometry without ACC.

Warranty Type 910 or 110

Labour operation code 44 95 03 00

Damage Service Number 44 95

Damage Code 00 13

Time 80 Time units

Time to check and set the vehicle geometry with ACC.

Warranty Type 910 or 110

Labour operation code 44 95 03 10

Damage Service Number 44 95

Damage Code 00 13

Time 180 Time units

Time to replace 2 Tyres.

Warranty Type 910 or 110

Labour operation code 44 40 56 00 *

Damage Service Number 44 40

Damage Code 00 13

Time 50 Time units

* Enter twice to allow 100Time Units for the replacement of all 4 tyres

Road Test.

Warranty Type 910 or 110

Labour operation code 01 21 00 00

Damage Service Number 48 10

Damage Code 00 13

Time 50 Time Units

Required Parts and Tools

Description	Part Number	Quantity
Anti Gliss	RH 14530	1 x 500 Gram tin can be used for multiple applications

Description	Part Number
Dunlop SP Sportmaxx GT 265/40/21	3Y0 601 313H or higher always check for latest part number in ETKA

Should tyres be required, please ensure the new tyres are of the correct specification as detailed within the Workshop Manual Rep.Gr 44 – Tyres – Checking, Condition and Replacement

Parts required when replacing Steering rack and lower lever bushes

Description	Part Number	Quantity
Steering rack (Left hand drive)	3Y1 422 075N or higher always check for latest part number in ETKA	1
Steering rack (Right hand drive)	3Y2 422 075M or higher always check for latest part number in ETKA	1
Link loom (Up to VIN SCBBA63Y7CC016888)	3Y0 970 089	1
Sealing Washer (single use)	N013 849 5	2
Steering coupling bolt (single	N105 184 05	1

use)		
Hexagon Bolt (single use)	N105 029 02	4
Hexagon Bolt (single use)	N102 412 02	2
Self-locking Nut (single use)	N101 064 02	2
Track rod end Nut (single use)	WHT 000 785A	2
Upright ball joint nut	WHT 003 822	2
Collared bolt	N911 422 01	4
Bolt	N104 253 02	2
Nut	N102 861 10	2
Bolt	N106 999 01	2
Power steering fluid	JNV 862 564F	2 Litres
The following parts require authorisation prior to fitting		
Front lower lever LH	Detailed on DISS query	1
Front lower lever RH	Detailed on DISS query	1
Steel spacer rear bush	3Y0407371A	2
Steel spacer rear bush	3Y0407742A	2
Snubber	3Y0407743	2
Label	RH15238	2

Additional Information

The customer may notice an initial difference in the feel of the steering, however this is normal, the difference is due to the fitment of the latest level higher friction steering rack and lower lever bushes which have a higher damping frequency (Where applicable).

Bentley branded Tyre Cradles are now supplied as an approved Bentley accessory.

The tyre cradles have been designed and manufactured specifically for Bentley providing simple and effective tyre protection.

Tyre flat spotting can be caused by medium to long term storage or from parking after a long drive, especially where the tyre experiences large changes in temperature.

To prevent flat spotting, tyres need to be cooled in a controlled manner to enable the tyre to restore to a constant radius.

Made from a unique polymer that moulds to the shape of the tyre the new Bentley Tyre Cradles maintain the tyre shape whilst cooling and in storage.

The tyre cradles are easy to use, simply drive the car onto them in the desired parking area