Tech Tips

TT 44-13-01 **Date: June 21, 2014**

2011-2014 Touareg – Vibration or Steering Wheel Shimmy at Highway Speeds

Update to information: June 13, 2014.

The suspension characteristics of the Touareg make it more susceptible to variations in the rim and/or tire. For this reason a diagnostic balancer is necessary to balance, force match and/or select tire placement so that the vibration may be improved.

Note:

Vehicles in dealer inventory should be maintained per the recommended 30 days maintenance procedure to prevent any flat spots forming on tires.

Tip:

For vehicles in dealer inventory the tires should remain at the transportation pressure. Please reference the recommended 30-Day maintenance sheet on ServiceNet.

WARNING:

Tires should be lowered to normal operating pressure before sale or any test drive.

Radial force variation (RFV)

The radial force or wheel load is the force with which a tire is compressed (Figure 1) Tires have softer and stiffer areas along their circumference, which is illustrated using springs (Figure 1, A and B). Figure 1 shows the same tire at different points of rotation (A and B), as it rolls on level road with constant load (radial force).

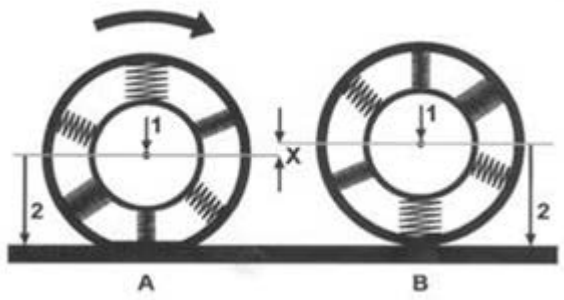

Figure 1. Wheel position (A), wheel position (B), wheel load (1), compressed amount (2), and rise and fall difference (x).

If this wheel rolls, with constant wheel load / radial force (Figure 1, arrow) the center of the wheel rises and falls on level road because of the different spring hardness of the tire by the amount x. The change by the amount x can be felt in the vehicle as vibration or shaking of the steering wheel. The change of the compression force of the tire is the RFV.

First Harmonic

The wheel force fluctuations during the turn of the wheel can be mathematically divided into individual harmonic vibrations. For an objective assessment of the tire stiffness the first harmonic (the basic vibration) is used. The first harmonic is the share of the radial force fluctuation which causes the strongest vibrations.

Service

1. Test drive vehicle to confirm vibration.

WARNING:

When attempting to duplicate the customer concern, DO NOT exceed the posted speed limit.

2. Label the position of the wheels on the vehicle.

3. Remove wheels.

Note:

Do not remove any wheel weights before attempting balance procedure.

Service Information

Below you will find the procedures for the 2 balancers (Hunter GSP9700 and John Beam RFV-2000) that Volkswagen recommends. Find your balancer and perform the procedure described.

	**Tip:** Flange plate with stud kit

HUNTER GSP9700 (VAS6230B3/4)

Note:

For most accurate measurements the vehicle should be driven right before measuring tires.

1. Install wheel on balancer using the flange plate with stud kit.

Tip:

Centering cones or collets should always be installed on the inside of the wheel. Make sure that they fit securely to wheel with no play.

	
Correct Fit	Incorrect Fit

Note:

Performing the centering check is critical to obtaining accurate measurements.

 Figure 1.1	2. Select Centering Check in the upper right. See figure 1.1.
 Figure 1.2	3. You can select one of the following to measure the centering of the wheel. - Use Runout Mode - Option seen in upper right in Figure 1.2 - Use Balance Mode - Shown in figure 1.2 4. Follow the prompts for measurement.
 Figure 1.3	5. After the machine is finished spinning, position the valve stem at the 12 o'clock position and press the foot pedal. As shown in figure 1.3.

Figure 1.4

6. You will now need to dismount the tire, rotate it, and then remount it. Screen will display as seen in figure 1.4.

Tip:

Rotate wheel 180 degrees without rotating arm of balancer.

Figure 1.5

7. Once the wheel is remounted follow steps 4 and 5 again.

- If the mounted wheel is centered on the balancer, the screen will display as seen in figure 1.5.

Figure 1.6

8. Make sure balancer is setup to measure Road Force, StraightTrak and to use SmartWeight. Figure 1.6.

Tip:

Enable Road Force and StraightTrak - Touch the roller till it shows Road Force with StraightTrak.

Figure 1.7

Tip: SmartWeight Enabled

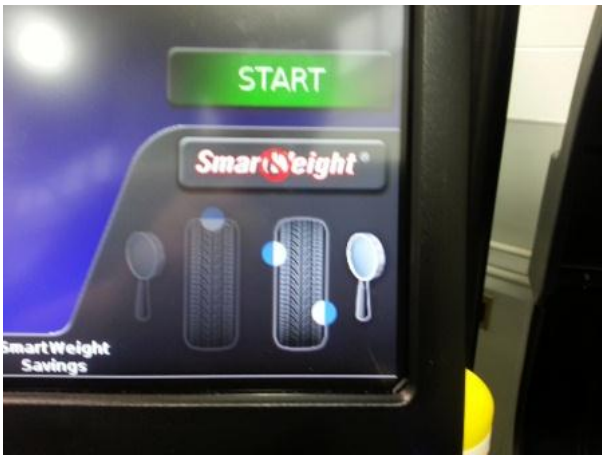

Figure 1.8

Tip: SmartWeight Disabled

9. Lower hood, set tire pressure and start the measurement.

10. Once the measurement is complete you must perform the following steps to optimize the tire and rim combination.

Figure 1.9

11. Does the balancer show the wheel needs to be balanced?

- Yes – Remove all current weights from wheel and move on to Road Force section. Figure 1.9.
- No – Move on Road Force section.

A. Road Force

Note:

Only perform this section if the Road Force is greater than 15 lbs.

Note:

If Road Force Matching is performed please E-mail a picture of the Road Force before and after measurements to VWGoA.Chassis@vw.com.

 Figure 1.10	12. Select Road Force, and then select Measure Rim Run out and follow prompts to measure run out. Figure 1.10.
 Figure 1.11	13. The Machine will give you two locations. As shown in figure 1.11. a. One on the Tire b. One on the Rim 8. Align the first mark to the top and mark as indicated. Repeat for the second mark.

14. Dismount tire and using a tire changer break down the tire and rotate it on the rim till the marks line up.

15. Reseat tire on the rim and reinstall the wheel on the balancer

16. Rerun measurements and proceed to Wheel Balancer section.

B. Wheel Balance

17. With SmartWeight enabled, install all recommended weights.

18. Once all recommended weights are installed, lower hood to run the check spin.

19. Add any additional recommended weights and move on to the StraightTrak.

C. StraightTrak

<table>
<tr>
<td> 

Figure 1.12</td>
<td>20. Open StraightTrak screen and verify tire is present.

21. If Tire is not present rerun the measurement of balance, Road Force and StraighTrak.</td>
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22. Once you verify tire is present in StraightTrak screen, move on to the next tire.

Note:

DO NOT move to Step 18 until all 4 tires have been through all of the previous steps.

 Figure 1.13	23. Select positioning the tire placement for least vibration and install wheels in the recommended pattern on the vehicle.

This concludes the Hunter GSP9700 step by step process for reducing tire vibration.

Note:

If the Vibration is not reduced to the satisfaction of the customer Please contact the Volkswagen Technical Helpline at 1-800-678-2389.

Note:

If Road Force Matching has been done, before and after measurements must be available upon request.

John Bean RFV-2000 (VAS 6311A)

Note:

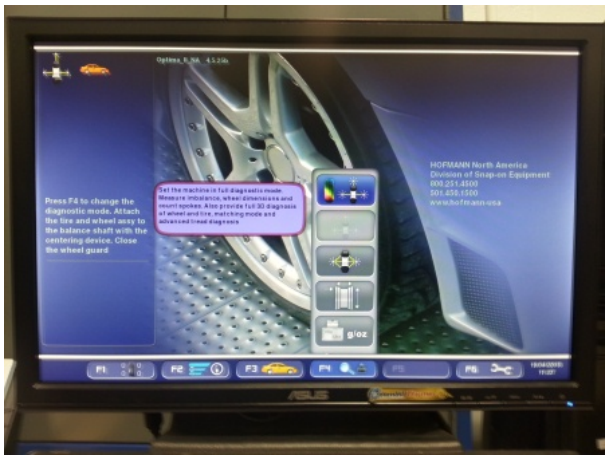
For most accurate measurements the vehicle should be driven right before measuring tires.

1. Install wheel on balancer using the flange plate with stud kit.

Tip:

Centering cones or collets should always be installed on the inside of the wheel. Make sure that they fit securely to wheel with no play.

	
Correct Fit	Incorrect Fit

 Figure 2.1	2. Make sure balancer is setup in 3D Diagnostics mode and that Opti-line is enabled. **Tip:** Enabling 3D Diagnostics – From the home screen press F3 and select 3D Diagnostics Figure 2.1
 Figure 2.2	**Tip:** Enabling Opti-line – From the home screen press F6 and select settings (Figure 2.2). Select Optima Settings, Select tire pull measurement and enable (Figure 2.3). Return to the Home Screen and press F1 to go into the balance screen, then F3 to go into the optima screen, then F5 to open the Opti-line menu and select Enable Opti-line (only option).

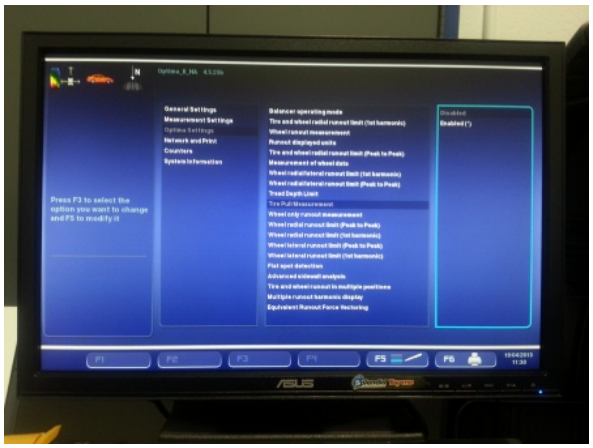


Figure 2.3

3. Lower hood and start the measurement.

4. Once the measurement is complete you must perform the following steps to optimize the tire and rim combination.

Figure 2.4

5. Does the balancer show the wheel needs to be balanced as shown in Figure 2.4?

- Yes – Remove all current weights from wheel and continue to step 6.
- No – Continue to step 6.

6. Go to the Optima screen by pressing F3.

7. Does the balancer state force matching will not improve the radial force?

- Yes – Proceed to Wheel Balance section.
- No – Proceed to the Radial Force section.

A. Radial Force

Note:

Do not perform this section if the balancer states that force matching will not improve the radial force.

Note:

If Radial Force Matching is performed please E-mail a picture of the Road Force before and after measurements to VWGoA.Chassis@vw.com.

 Figure 2.5	8. Measure tire pressure and set in machine. From the balance screen select F4 and select center option. Figure 2.5. **Tip:** Once you see tire pressure on the screen rotate the tire to change pressure. 9. Select Radial Force Matching from the balance screen under F4 at the top, as shown in Figure 2.5.
 Figure 2.6	10. Position the tire with the valve stem to the 12 o'clock position.

 Figure 2.7	11. Rotate the tire until the arrows on the screen are both green (the machine will lock the tire for a moment) Figure 2.7. 12. Mark the tire on the outer side wall at the 12 o'clock position, Figure 2.7.

13. Dismount tire and using a tire changer, break down the tire and rotate it on the rim till the mark lines up with the valve stem.

14. Reseat tire on the rim and reinstall the wheel on the balancer

15. Rerun measurements and proceed to Wheel Balancer section.

B. Wheel Balance

 Figure 2.8	16. With the setting to hide weights behind the spokes of the wheel (F5), install all recommended weights. Figure 2.8

17. Once all recommended weights are installed lower hood to run the check spin.

18. Add any additional recommended weights.

19. Proceed to the Opti-line section.

C. Opti-line

Figure 2.9

20. Open Opti-line screen.

Tip:

Opening Opti-line screen – From the balance screen press F3 (Figure 2.9) to open the Optima screen then F5 to bring up the Opti-line menu. Select open Opti-line screen. Figure 2.10 and 2.11.

Figure 2.10

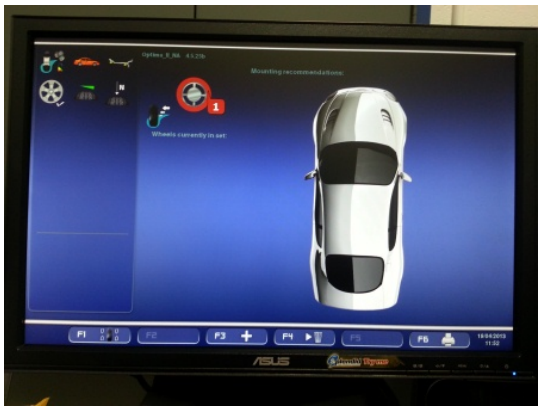


Figure 2.11

 Figure 2.12	21. Add the tire to set F3. Figure 2.12

22. Now this tire is complete.

Note:

DO NOT move to Step 23 until all 4 tires have been through all of the previous steps.

 Figure 2.13	23. Select positioning the tire placement for least vibration and install wheels in the recommended pattern on the vehicle by pressing F5 and select least vibration. Figure 2.13

This concludes the John Beam RFV-2000 step by step procedure for reducing tire vibration.

Note:

If the Vibration is not reduced to the satisfaction of the customer Please contact the Volkswagen Technical Helpline at 1-800-678-2389.

Note:

If Radial Force Matching has been done, before and after measurements must be available upon request.