



V8 XJ Series/XK

DATE 04/02  
Amended 04/03

204-17

SERVICE

# TECHNICAL BULLETIN

## Vibration/Shimmy – Tire Radial Force Variation – Optimizing Wheels And Tires

MODEL  
1997 MY-ON XK Range  
1998-2003 MY V8 XJ Series  
VIN  
001001-ON  
812256-F59525

Remove and destroy Bulletin 204-17, dated 4/02.  
Replace with this Bulletin.  
Revisions are marked with a bar and in **bold text**.

### Issue:

This technical bulletin can assist with resolving customer complaints of vibration/shimmy. Vibration/shimmy can be caused by Radial Force Variation (RFV) in the wheel/tire assemblies and the position of the affected wheels on the vehicle.

### Action:

**Note:** Access to a Hunter 9700/9712 wheel-balancing machine is required to perform the steps in this technical bulletin.

In case of a customer complaint of vibration/shimmy on vehicles, follow the optimization procedures below using a Hunter 9700/9712 balancing machine.

### TYPES OF OPTIMIZATION PROCEDURES

#### **Tire to Wheel Match Mounting**

Tire is positioned on the wheel so that the ‘low point’ of the tire is matched to the ‘high point’ of the wheel. This procedure is also referred to as ‘match mounting’.

The Hunter balancing machine performs this procedure.

#### **Tire/Wheel Assembly to Hub**

Tire/wheel assembly is mounted to the vehicle’s hub in a manner that allows the Radial Force ‘high point’ of the assembly to be neutralized by taking up the inherent clearance in the wheel to hub mating surface (Illustration 1). The Hunter balancing machine identifies high point of the wheel/tire assembly.



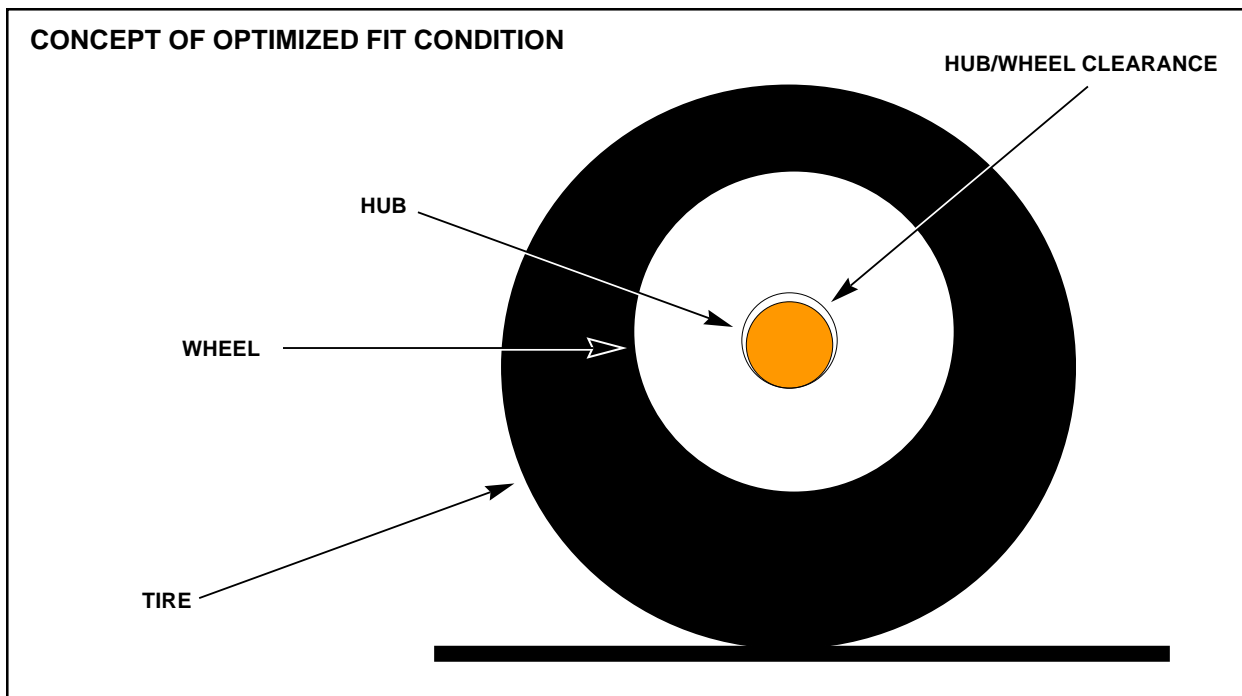
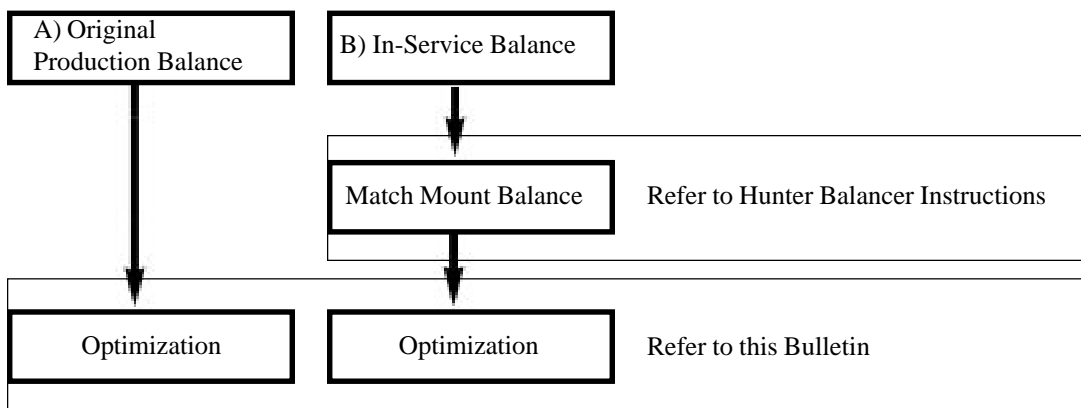


ILLUSTRATION 1



**Note:** Tires are **factory match-mounted** on the wheels by Jaguar Cars at point of initial assembly and balancing. It is important to retain this mounting on vehicles where it is known that the original factory balance is still intact.

WORKSHOP PROCEDURE

**Note:** Obtain the S96 Tire Optimization Form and first fill out the “original tire information” section.

1. Bring tires to proper cold air pressures and take the car on a 15-20 mile (highway) road test to ensure that all flat spots are removed and sufficient tire heating has taken place. **Tire heating is extremely vital to the process, it must not be overlooked.**

2. Ensure the vehicle is lifted off the ground as soon it returns, to minimize temporary flat spots.
3. **A) For vehicles with original factory balance intact** - while still warm, remove each wheel. Measure Radial Force variation, do not disturb factory wheel weights. Proceed to step 4.  
**B) For vehicles with non-factory balance or with a new tire being mounted** - while still warm, remove each wheel. Balance the wheel on the Hunter 9700/9712 and measure the Radial Force variation. Perform wheel to tire match mounting here if balancing machine indicates necessity.
4. Record the value of the Radial Force variation (lbs.) on the inside of each tire with crayon, and mark 'high point' spot (as indicated by Hunter 9700/9712) on the tire with a hash mark on the sidewall. It is recommended that a permanent paint mark be applied on the inside sidewall as well. This will eliminate the need to identify the "high" spot again if a future repair requires removing the wheel.  
The Tire Optimization Form (S 96) must be completed and attached to the hard copy of the repair order along with the Radial Force Variation print outs from the tire balancer.

<p><b>Note:</b> On vehicles with directional tires or different size front and rear tires, the wheel and tire assemblies can only be optimized at their original location on the vehicle. Proceed to step 6.</p>
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5. Reinstall wheels as follows:
  - lowest value of Radial Force variation on left front of vehicle,
  - second lowest value of Radial Force variation on right front of vehicle,
  - third lowest value of Radial Force variation on left rear of vehicle, and
  - greatest value of Radial Force variation on right rear of vehicle.However, do not fully tighten wheel nuts. Snug them in by hand to the point where there is no play or wobble between the road wheel and mounting surface.
6. Rotate each wheel so that the previously marked high point is at the bottom (6 o'clock position) and will contact the floor when the vehicle is lowered (for rear wheels, have transmission in neutral and have an assistant hold one wheel stationary while the other is rotated to bring the high point to the 6 o'clock position).
7. Lower the car partially to the floor, so that light to moderate load is placed on each of the wheels.
8. Torque the lug nuts of each wheel to 95 Nm (70 lb. ft.).
9. Road test the vehicle.

**MOUNTING EQUIPMENT FOR ALL WHEEL BALANCERS:**

For optimum results, Jaguar Cars requires that tire/wheel assemblies are mounted to the Hunter 9700/9712 using the rear cone and flange plate adaptor method (Illustration 2). The 5-lug flange plate adapter (part no. 175-264-1) can be ordered from Rotunda 1-800-ROTUNDA (768-8632). This flange plate must be used in conjunction with the proper rear mounting cone. This mounting method provides precise balance with the highest rate of repeatability.

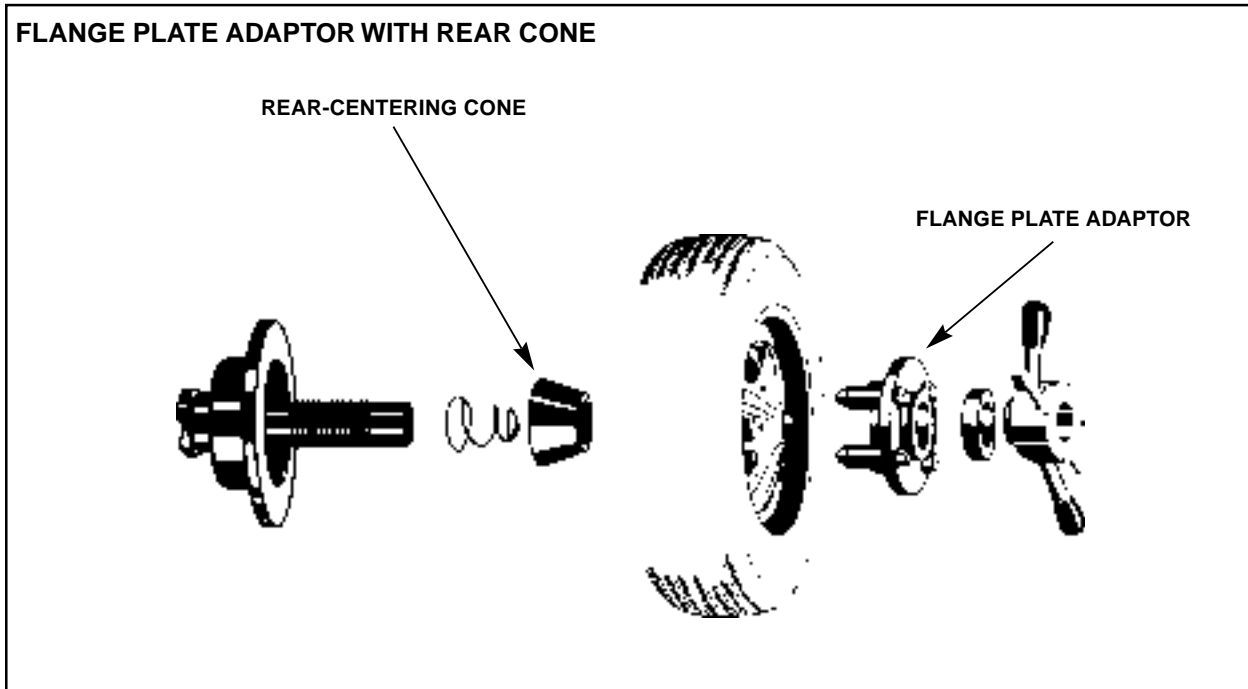


ILLUSTRATION 2

**TWO PIECE, CLIP-ON WHEEL WEIGHT INSTALLATION PROCEDURE**

For rim mounted wheel weights, use only Jaguar specification two piece clip-on wheel weights (Illustration 3). Jaguar Cars recommends the use of a compression tool to install wheel weights. This tool (**available through SPX-OTC**) prevents accidental damage to the rim and deformation of the wheel weight clips.

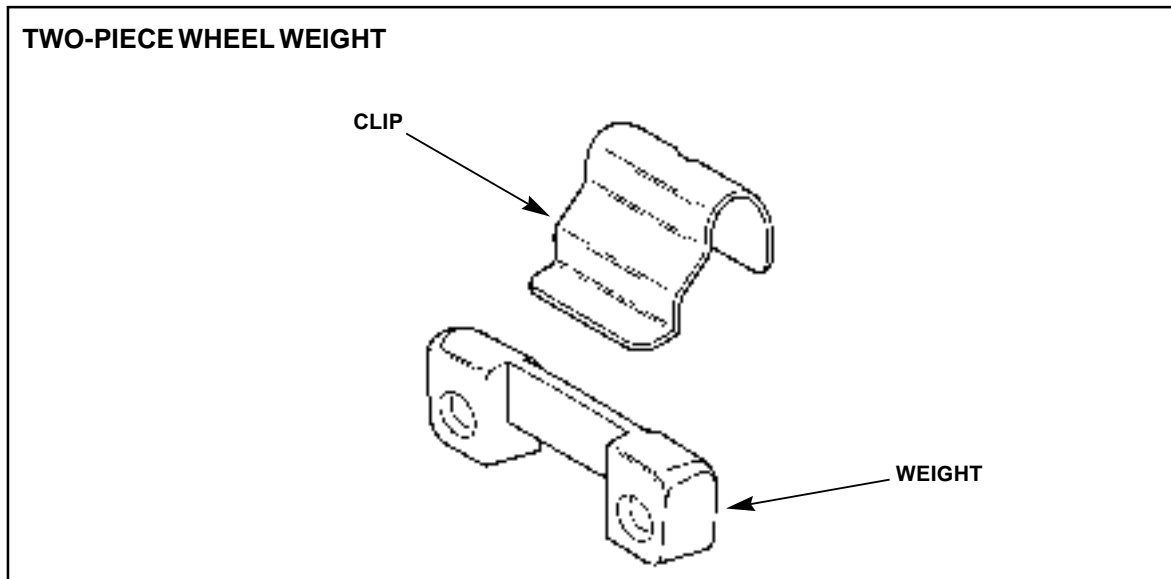


ILLUSTRATION 3

1. Compress the inflated tire at the bead, and the shoulder with compression tool HAW 900 (available through SPX-OTC) (Illustration 4).

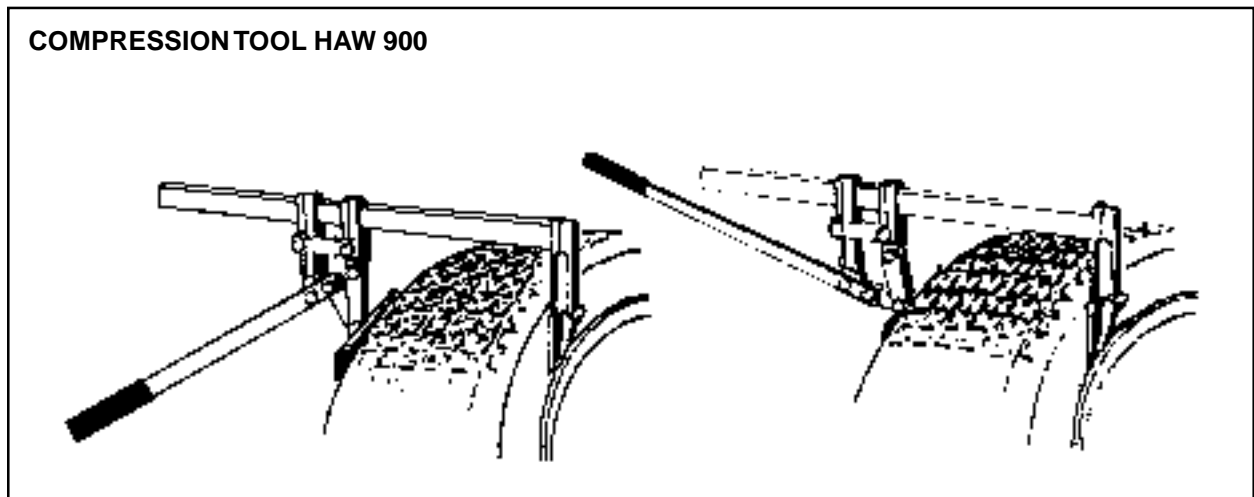


ILLUSTRATION 4

**Note:** Inner edge of compression tool must be placed close to rim.  
Outer swivel foot of compression tool must be placed onto shoulder of tire.

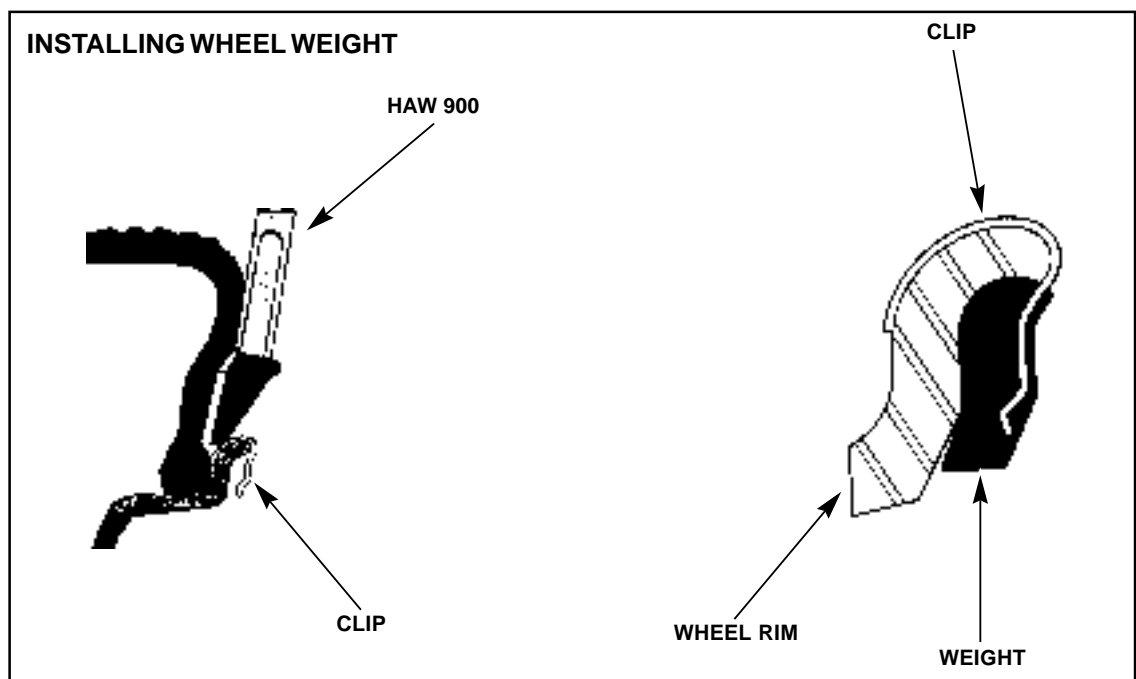


ILLUSTRATION 5

2. Insert the wheel weight clip between the tire bead and the road wheel as shown in Illustration 5. Release the compression tool.
3. Spread the wheel weight clip using the two piece clip tool HAW 900-1 (available through SPX-OTC). Slide the weight under the clip. Ensure that the weight is fully seated.
4. Recheck balance.

**SPX-OTC JAGUAR SPECIAL TOOLS FROM SPX OTC**

**Call 1-800-533-5338**

**Fax 1-800-578-7375**

**Parts Information:**

<b><u>DESCRIPTION</u></b>	<b><u>PART NUMBER</u></b>
5g Wheel weight	XR8 6353
10g Wheel weight	XR8 6354
15g Wheel weight	XR8 6355
20g Wheel weight	XR8 6356
25g Wheel weight	XR8 6357
30g Wheel weight	XR8 6358
35g Wheel weight	XR8 6359
40g Wheel weight	XR8 6360
45g Wheel weight	XR8 6361
50g Wheel weight	XR8 6362
55g Wheel weight	XR8 6363
60g Wheel weight	XR8 6364
Adhesive wheel weight - 60 g strip with removable 5 and 10 gram sections	XR8 9312

**Warranty Information:**

<b>Description</b>	<b>SRO</b>	<b>Time</b>	<b>Causal Part Number</b>	<b>Causal Part Description</b>
Wheel and tire optimization using Hunter 9700/9712 Balancer	74.91.09	1.8 hrs.	FRBAL RRBAL	Front balance Rear balance

**WARRANTY POLICY STATEMENT**

Jaguar Cars will pay for the replacement of a tire(s) for a steering vibration/shimmy complaint on a vehicle with less than 6 months, or 6,000 miles, whichever occurs first, provided the following conditions are met:

- The retailer has demonstrated consistent compliance in maintaining 60 PSI storage pressure on all new vehicles in inventory up to time of sale. Failure to demonstrate compliance with this requirement will exclude the retailer from eligibility for tire reimbursement under this policy.
- The diagnostic procedures outlined in this bulletin were followed using the required equipment, but the concern could not be resolved.
- A Tire Optimization Form, S96, must be completed and attached to the hard copy of the repair order along with the RFV print outs from the tire balancer.
- Replacement of the tire was authorized by your After Sales Market Manager prior to the work being completed. A signed W22 Authorization Request Form must be attached to the hard copy of the RO and stored in the vehicle file.
- The replacement tire(s) was purchased through Jaguar Tire Program.
- Displaced tires must be retained for inspection and scrapping by your After Sales Market Manager.