OPERATIONAL GUIDELINE: TESLA VEHICLE MANUFACTURER'S CLEARANCE SPECIFICATIONS OF MODEL 3 AND MODEL Y REAR KNUCKLE BALL JOINTS, THEIR MEASUREMENT, AND EVALUATION DURING PERIODIC INSPECTIONS

For the attention and action of Inspection Authorities,

Tesla uses ball joints in (not exclusively) the rear knuckle of its Model 3 and Model Y vehicles. These ball joints (Figure 1), especially the upper ball joint, may over time develop some axial and/or radial movement or 'play'. This play is acceptable if within the specifications as published in Tesla's service limits and as stated in this document. This needs to be carefully taken into account in inspection activities, particularly during periodic roadworthiness inspections.

With this operational guideline, Tesla informs specifically inspection authorities on manufacturer specifications. This guideline also aims to inform on how to assess the condition of the rear knuckle ball joints of these vehicles during periodic inspections, ensuring continued roadworthiness.

This guideline is intended to support inspection activities and should be applied in conjunction with existing applicable regulations. This guideline does not replace any applicable regulations.

Tesla defines, in its published technical materials and service instructions (see Service Limits[1]), the axial and radial operational clearance limits for all ball joints. These limits are based on the manufacturer's testing of safe wear limits, which have been validated to not cause any detrimental effect on the roadworthiness of the vehicle.

[1] Model 3 shown, also applicable to Model Y

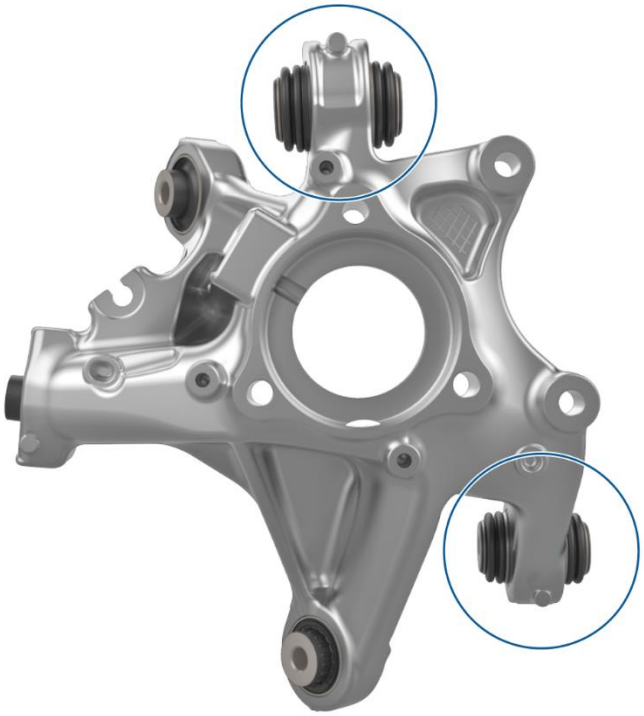

Figure 1

This guideline applies to the following Tesla-manufactured vehicles:

Model	Model Year	Total Axial and Radial Clearance in Rear Knuckle Ball Joints	Upper Position	Lower Position
Model 3	2017–2023	1.0 mm (0.039 in)	●	●
Model 3 (except Performance)	2024–	1.0 mm (0.039 in)		●
Model 3 Performance	2024–	1.0 mm (0.039 in)	●	●
Model Y	2020–2024	1.0 mm (0.039 in)	●	●
Model Y	2025–	1.0 mm (0.039 in)		●

Instructions for measuring clearances on the upper ball joint:

The Tesla Service Manual contains a specific procedure to measure clearance in the rear knuckle upper ball joint. See Service Manual Procedure Knuckle - Suspension - Rear (Inspect)[2].

Because of the geometry of the system, a small amount of play in the rear knuckle upper ball joint translates to more play at the circumference of the outer wheel. When inspecting vehicles, make sure to not mis-interpret acceptable amounts of play at the circumference of the outer wheel as indicating the play in the rear knuckle upper ball joint is exceeding the specification defined in the service manual.

The most significant movement is detected when the wheel is articulated by hand at the 1 and 7 o'clock position for the rear left wheel and the 5 and 11 o'clock position for the rear right wheel (Figure 2).

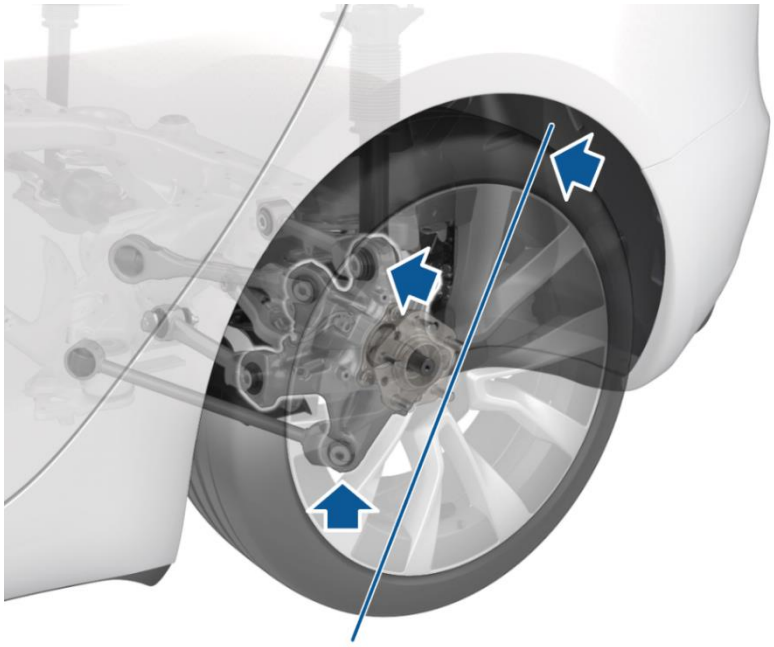

Figure 2

[2] Model 3 shown, also applicable to Model Y

Background:

Service limits for bushings and ball joints, as defined in Tesla's published technical materials and service instructions, have been subjected to thorough validation in terms of safety, drivability and possible detrimental effects. The published values have been found to not cause any concerns for the safety and roadworthiness of the vehicle.

Specifically the rear knuckle upper ball joint appears to be subject to rejection in Periodic Roadworthiness Inspections because of perceived play. However, measurements have proven that in a significant majority of cases the perceived play is well within acceptable clearance limits.

Tesla continues to review and share relevant manufacturer specifications to support consistent inspection practices across all models.

We respectfully request that inspection authorities adopt this guidance for assistance during periodic inspections, given the manufacturer specification. If further information is needed, our team remains available to support you at ServiceEngineering-Chassis@tesla.com.

Sincerely,

Brian Doorlag

Director of Chassis Design Engineering