

<b>Reference</b>	SSM73928
<b>Models</b>	Discovery / L462 Discovery Sport / L550 Range Rover / L405 Range Rover Evoque / L538 Range Rover Sport / L494 Range Rover Velar / L560
<b>Title</b>	Low Speed Manoeuvring Front Tyre Skip / Jump phenomenon
<b>Category</b>	Chassis
<b>Last modified</b>	09-Jul-2018 00:00:00
<b>Symptom</b>	306000 Tyres/Wheels
<b>Attachments</b>	Picture 1.pdf

**Content**                    **Issue:** Low Speed Manoeuvring Front Tyre Skipping Phenomenon

**Cause:** Acute Ackerman angles employed to enhance driving experience

**Action:**This SSM is a guide to explain the phenomenon of front tyre skipping while low speed manoeuvring with full lock applied to the steering causing a feeling of a slight jump, vibration or noise from the front tyres.

This is **NOT** an error state. It is a result of geometry focused for higher dynamic higher cornering speeds, manoeuvre, environment and tyre type.

#### Geometry

100% Ackermann Geometry principle means that front lock angles allow for the radius of travel of both wheels to be defined by a common point through the rear axle. However in reality this principle cannot be achieved due to inner wheel lock angle constraints. Typically, vehicles have Full Lock Ackermann levels between 55 and 65%. More sports orientated vehicles have lower levels of Ackermann specifically to improve tyre utilisation.

#### Manoeuvre

A benefit of low Ackermann can be found at higher cornering speeds when the tyres are generating slip angles. At very low speeds the tyres do not generate a slip angle which results in an aligning torque being applied to the tyres that is absorbed in the tyre. Tyre slip is

exaggerated at high lock angles.

#### Environment

Tyre slip is more perceptible when the friction level between road and tyre is lower, i.e. when there is ice and snow, or when the road surface is wet. Or Brick, car park painted surfaces or concrete containing pea shingle may exacerbate the concern.

#### Tyre Selection

Changing the tyres from summer to all season or winter tyres may result in an improvement but there is a trade off in economy, road noise and tyre life. A customer experiencing this phenomenon can choose to fit an alternative tyre at their own expense.

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More sports orientated vehicles have these lower levels of Ackermann specifically to improve tyre utilisation.

Technicians - Please rate this SSM and provide comments so that future communications can be improved.

1 = Poor – Basic information provided – The SSM does not help me resolve the customer concern.

3 = Average – Adequate information provided – The SSM partially helps me resolve the customer concern.

5 = Excellent – All required information provided to resolve the customer concern.