

## Suspension System - General Information -

### Coil Spring Suspension

Item	Specification
Front	Front: - Conventional coil spring with a twin tube damper and a high stress stabilizer bar
Rear	Rear: - Conventional coil spring with a twin tube damper and a high stress stabilizer bar

### Wheel Alignment Specification (All Markets) - Front

NOTE: All figures are with vehicle at 'Showroom' ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

Item		Left-hand		Right-hand		Total/Balance	
		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
Camber	Decimal degrees	-0.50°	± 0.75°	-0.50°	± 0.75°	0°	± 0.75°
	Degrees/minutes	-30'	± 45'	-30'	± 45'	0'	± 45'
		<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>
	Decimal degrees	-1.25°	0.25°	-1.25°	0.25°	-0.75°	0.75°
	Degrees/minutes	-1° 15'	15'	-1° 15'	15'	-45'	45'
		<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>
Castor	Decimal degrees	3.25°	± 0.75°	3.25°	± 0.75°	0°	± 0.75°
	Degrees/minutes	3° 15'	± 45'	3° 15'	± 45'	0'	± 45'
		<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>
	Decimal degrees	2.50°	4°	2.50°	4°	-0.75°	0.75°
	Degrees/minutes	2° 30'	4°	2° 30'	4°	-45'	45'
		<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>
Toe	Decimal degrees	0.10°	± 0.10°	0.10°	± 0.10°	0.20°	± 0.20°
	Degrees/minutes	6'	± 6'	6'	± 6'	12'	± 12'
		<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>
	Decimal degrees	0°	0.20°	0°	0.20°	0°	0.40°
	Degrees/minutes	0'	12'	0'	12'	0'	24'
		<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>

### Wheel Alignment Specification (All Markets) - Rear

NOTE: All figures are with vehicle at 'Showroom' ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

Item		Left-hand		Right-hand		Total/Balance		Thrust Angle	
		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
Camber	Decimal degrees	-1.95°	± 0.75°	-1.95°	± 0.75°				
	Degrees/minutes	-1° 57'	± 45'	-1° 57'	± 45'				
		<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>				
	Decimal degrees	-2.70°	-1.20°	-2.70°	-1.20°				
	Degrees/minutes	-2° 42'	-1° 12'	-2° 42'	-1° 12'				
		<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>
Toe	Decimal degrees	0.17°	± 0.14°	0.17°	± 0.14°	0.33°	± 0.20°	0°	± 0.14°
	Degrees/minutes	10'	± 8'	10'	± 8'	20'	± 12'	0'	± 8'
		<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>
	Decimal degrees	0.03°	0.31°	0.03°	0.31°	0.13°	0.53°	-0.14°	0.14°
	Degrees/minutes	2'	18'	2'	18'	8'	32'	-8'	8'
		<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>	<b>Nominal</b>	<b>Tolerance</b>

### Vehicle Ride Height

NOTE: All figures are with vehicle at 'Kerbside' (curbside) ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

NOTE: Ride height is measured vertically from wheel center to underside of wheel arch

Description	mm	inch
Front	490.7 ± 12	19.32 ± 0.47
Rear	504.6 ± 12	19.87 ± 0.47

# Suspension System - General Information - Suspension System

Diagnosis and Testing

## Principles of Operation

For a detailed description of the suspension system, refer to the relevant Description and Operation section in the workshop manual. REFER to:

- [Front Suspension](#) (204-01 Front Suspension, Description and Operation),
- [Rear Suspension](#) (204-02 Rear Suspension, Description and Operation),
- [Ride and Handling Optimization](#) (204-06 Ride and Handling Optimization, Description and Operation).

## Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage.

### Visual Inspection

Mechanical
<ul style="list-style-type: none"> <li>● Damaged tires</li> <li>● Wheel bearing(s)</li> <li>● Loose or damaged front or rear suspension components</li> <li>● Loose, damaged or missing suspension fastener(s)</li> <li>● Incorrect spring(s) installed</li> <li>● Damaged or sagging spring(s)</li> <li>● Damaged or leaking shock absorber(s)</li> <li>● Damaged or leaking strut(s)</li> <li>● Worn or damaged suspension bushing(s)</li> <li>● Loose, worn or damaged steering system components</li> <li>● Damaged axle components</li> </ul>

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

## Symptom Chart

Symptom	Possible Cause	Action
Crabbing	<ul style="list-style-type: none"> <li>● Incorrect rear thrust angle</li> <li>● Front or rear suspension components</li> <li>● Drive axle damaged</li> </ul>	CHECK the rear toe adjustment. REFER to: <a href="#">Specifications</a> (204-00 Suspension System - General Information, Specifications) / Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures). INSPECT the front and rear suspension systems. REPAIR or INSTALL new suspension components as necessary. INSTALL a new rear drive axle/differential as necessary
Drift/Pull	<ul style="list-style-type: none"> <li>● Unequal tire pressure</li> <li>● Incorrect wheel alignment</li> <li>● Tires</li> <li>● Unevenly loaded or overloaded vehicle</li> <li>● Damaged steering components</li> <li>● Brake drag</li> </ul>	CHECK and ADJUST the tire pressures. INSPECT the tire for excessive wear. REFER to: <a href="#">Specifications</a> (204-04 Wheels and Tires, Specifications). CHECK and ADJUST the wheel alignment. REFER to: Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures). CHECK and ADJUST the tire pressures. INSPECT the tire for excessive wear. REFER to: <a href="#">Specifications</a> (204-04 Wheels and Tires, Specifications). NOTIFY the customer of incorrect vehicle loading. CHECK the steering system. REFER to: <a href="#">Steering System</a> (211-00 Steering System - General Information, Diagnosis and Testing). CHECK the brakes. REFER to: <a href="#">Brake System</a> (206-00 Brake System - General Information, Diagnosis and Testing).
Front Bottoming or Riding Low	<ul style="list-style-type: none"> <li>● Coil springs</li> </ul>	CHECK the ride height. INSTALL new springs as necessary. REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).

Symptom	Possible Cause	Action
Incorrect Tire Wear	<ul style="list-style-type: none"> <li>● Incorrect tire pressure (rapid center rib or inner and outer edge wear)</li> <li>● Excessive front or rear toe (rapid inner or outer edge wear)</li> <li>● Excessive negative or positive camber (rapid inner or outer edge wear)</li> <li>● Tires out of balance (tires cupped or dished)</li> </ul>	<p>CHECK and ADJUST the tire pressure. INSPECT the tire for excessive wear. REFER to: <a href="#">Specifications</a> (204-04 Wheels and Tires, Specifications).</p> <p>CHECK and ADJUST the wheel alignment. REFER to: Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures).</p> <p>BALANCE the wheels/tires</p>
Rough ride	<ul style="list-style-type: none"> <li>● Spring failure</li> <li>● Damper failure</li> </ul>	<p>Check and install new spring(s) as necessary. REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p> <p>Check and install new damper(s) as necessary. REFER to: <a href="#">Front Shock Absorber</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p>
Shimmy or Wheel Tramp	<ul style="list-style-type: none"> <li>● Loose wheel nut(s)</li> <li>● Loose front suspension fasteners</li> <li>● Front wheel bearing(s)</li> <li>● Worn or damaged suspension component bushing</li> <li>● Wheel/tires</li> <li>● Loose, worn or damaged ball joint(s)</li> <li>● Loose, worn or damaged steering components</li> <li>● Front wheel alignment</li> <li>● Shock absorber(s)</li> <li>● Spring(s)</li> </ul>	<p>CHECK and TIGHTEN the wheel nuts to specification. REFER to: <a href="#">Specifications</a> (204-04 Wheels and Tires, Specifications).</p> <p>CHECK and TIGHTEN the suspension fasteners to specification. REFER to: <a href="#">Specifications</a> (204-01 Front Suspension, Specifications).</p> <p>CHECK the wheel bearings. REFER to: <a href="#">Front Wheel Bearing</a> (204-01 Front Suspension, Removal and Installation).</p> <p>CHECK and INSTALL new components as necessary. REFER to: <a href="#">Front Stabilizer Bar Bushing</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Stabilizer Bar Bushing</a> (204-02 Rear Suspension, Removal and Installation).</p> <p>CHECK the wheels/tires. BALANCE or INSTALL new wheel/tires as necessary. CHECK the Ball Joint(s). CHECK and INSTALL new steering components as necessary. CHECK and ADJUST the wheel alignment. REFER to: Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures).</p> <p>CHECK and INSTALL new shock absorber(s) as necessary. REFER to: <a href="#">Front Shock Absorber</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p> <p>CHECK and INSTALL new springs as necessary. REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p>
Poor self center action of the steering	<ul style="list-style-type: none"> <li>● Ball joints</li> <li>● Steering components</li> </ul>	<p>CHECK the Ball Joints. CHECK and INSTALL new steering components as necessary</p>
Steering wheel off-center	<ul style="list-style-type: none"> <li>● Unequal front or rear toe settings</li> <li>● Steering components</li> </ul>	<p>CHECK and ADJUST the wheel alignment. REFER to: Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures).</p> <p>CHECK and INSTALL new steering components as necessary</p>
Sway or roll	<ul style="list-style-type: none"> <li>● Overloaded, unevenly or incorrectly loaded vehicle</li> <li>● Loose wheel nut(s)</li> <li>● Coil spring(s)</li> <li>● Loose front stabilizer bar or rear stabilizer bar</li> <li>● Worn lower suspension arm stabilizer bar insulators</li> <li>● Shock absorber(s)</li> </ul>	<p>NOTIFY the customer of incorrect vehicle loading. CHECK and TIGHTEN the wheel nut(s) to specification. REFER to: <a href="#">Specifications</a> (204-04 Wheels and Tires, Specifications).</p> <p>CHECK and INSTALL new coil springs as necessary. REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) / <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p> <p>CHECK and TIGHTEN the stabilizer bar to specification. REFER to: <a href="#">Specifications</a> (204-01 Front Suspension, Specifications) / <a href="#">Specifications</a> (204-02 Rear Suspension, Specifications).</p> <p>INSTALL new lower suspension arm stabilizer bar as necessary. REFER to: <a href="#">Front Stabilizer Bar Link</a> (204-01 Front Suspension, Removal and Installation) /</p>

Symptom	Possible Cause	Action
		<p><a href="#">Rear Stabilizer Bar Link</a> (204-02 Rear Suspension, Removal and Installation).                      CHECK and INSTALL new shock absorber(s) as necessary.                      REFER to: <a href="#">Front Shock Absorber</a> (204-01 Front Suspension, Removal and Installation) /  <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p>
Vehicle Leans to One Side	<ul style="list-style-type: none"> <li>● Unevenly loaded or overloaded vehicle</li> <li>● Front or rear suspension components</li> <li>● Shock absorber(s)</li> <li>● Coil spring(s)</li> <li>● Incorrect ride height. Lateral tilt out of specification</li> </ul>	<p>NOTIFY the customer of incorrect vehicle loading. INSPECT the front and rear suspension systems. REPAIR or INSTALL new suspension components as necessary. CHECK and INSTALL new shock absorber(s) as necessary.                      REFER to: <a href="#">Front Shock Absorber</a> (204-01 Front Suspension, Removal and Installation) /  <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).                      CHECK and INSTALL new spring(s) as necessary.                      REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) /  <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).                      CHECK the ride height. INSTALL new spring(s) as necessary.                      REFER to: <a href="#">Spring</a> (204-01 Front Suspension, Removal and Installation) /  <a href="#">Rear Shock Absorber</a> (204-02 Rear Suspension, Removal and Installation).</p>
Vibration/Noise	<ul style="list-style-type: none"> <li>● Tires/wheels</li> <li>● Wheel bearings</li> <li>● Wheel hubs</li> <li>● Brake components</li> <li>● Suspension components</li> <li>● Steering components</li> </ul>	<p>CHECK and INSTALL new components as necessary</p>
Wander	<ul style="list-style-type: none"> <li>● Unevenly loaded or overloaded vehicle</li> <li>● Ball joint(s)</li> <li>● Front wheel bearing(s)</li> <li>● Loose, worn or damaged suspension components</li> <li>● Loose suspension fasteners</li> <li>● Steering components</li> <li>● Wheel alignment (excessive total front toe-out)</li> </ul>	<p>NOTIFY the customer of incorrect vehicle loading. CHECK the Ball Joint(s). CHECK the wheel bearings. CHECK and INSTALL new suspension components as necessary. CHECK and TIGHTEN the suspension fasteners to specification.                      REFER to: <a href="#">Specifications</a> (204-01 Front Suspension, Specifications) /  <a href="#">Specifications</a> (204-02 Rear Suspension, Specifications).                      CHECK and INSTALL new steering components as necessary. CHECK and ADJUST the wheel alignment.                      REFER to: Four-Wheel Alignment (204-00 Suspension System - General Information, General Procedures).</p>

## Suspension System - General Information - Four-Wheel Alignment

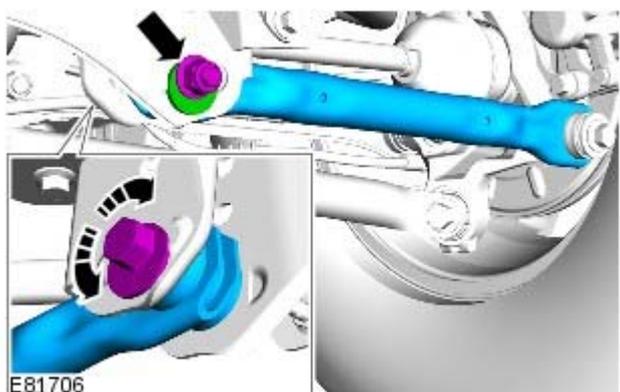
### General Procedures

1. Check the geometry specifications.

Refer to: [Specifications](#) (204-00 Suspension System - General Information, Specifications).

2. Check the tie rod ends, suspension joints, wheel bearings and wheels and tires for damage, wear and free play.
3. Check and adjust tire pressures.
4. Position the vehicle on a calibrated, level, vehicle lift.
5. Release the vehicle parking brake.
6. Using only four wheel alignment equipment approved by Land Rover, check and adjust the wheel alignment.

7.  **WARNING:** Make sure to support the vehicle with axle stands.  
Raise and support the vehicle.

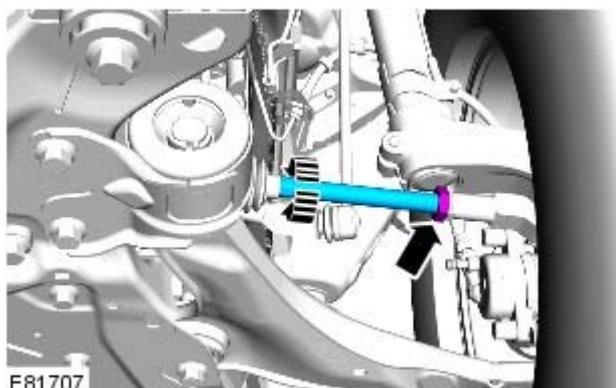


8. Adjust the rear toe.

*Torque:* 175 Nm

9. Repeat the rear toe measurement.

10. Align the steering to straight ahead.



11. Adjust the front toe.

*Torque:* 55 Nm

12. Check, and if necessary, repeat the wheel alignment procedure until the correct values are obtained.
  
13. Using the Land Rover approved diagnostic system, calibrate the steering angle sensor.