SIB 36 01 21 2021-04-07

CLUNKING SOUNDS AND VEHICLE JERKING AT SLOW SPEEDS WITH LARGE STEERING ANGLE

MODEL

F22 (2 Series Coupe)	F23 (2 Series Convertible)	F80 (M3 Sedan)	F82 (M4 Coupe)
F83 (M4 Convertible)	F85 (X5 M Sports Activity Vehicle)	F86 (X6 M Sports Activity Coupe)	F87 2016 to 2018: (M2 Coupe). 2019, 2020: (M2 Competition Coupe)
F90 (M5 Sedan)	F91 (M8 Convertible)	F92 (M8 Coupe)	F93 (M8 Gran Coupe)
F95 (X5 M Sports Activity Vehicle)	F96 (X6 M Sports Activity Coupe)	F97 (X3 M Sports Activity Vehicle)	F98 (X4 M Sports Activity Coupe)
G01 (X3 Sports Activity Vehicle)	G02 (X4 Sports Activity Coupe)	G05 (X5 Sports Activity Vehicle)	G06 (X6 Sports Activity Coupe)
G07 (X7 Sports Activity Vehicle)	G12 (7 Series Sedan)	G14 (8 Series Convertible)	G15 (8 Series Coupe)
G16 (8 Series Gran Coupe)	G22 (4 Series Coupe)	G23 (4 Series Convertible)	G29 (Z4 Roadster)
G30 (5 Series Sedan)			

All when equipped with Summer/High Performance (HP) tires.

SITUATION

At low outside temperatures (below 40 degrees F) and slow driving speeds (i.e. when parking, maneuvering) with a large steering angle, the front end can be slightly axially misaligned.

This can be felt (jerking)/ heard via an acoustic acknowledgement (clunk) as seen at the 11 second mark of the video.

See attached video V36 01 21.

CAUSE

Technical explanation:

The kinematics (the branch of mechanics that deals with pure motion, without reference to the masses or forces involved in it.) of the front axle geometry are deliberately designed to deviate from the so-called "Ackermann function".

Ackermann function - The inside wheel is steered to a greater angle than the outside wheel, allowing the inside wheel to steer a tighter radius. Without the Ackermann function, the inside tire would tend to “scrub” on the pavement because it’s being forced to travel in a larger radius.

This Ackermann function becomes evident in improved handling and a reduced vehicle turning radius. The patent for this design was issued in 1818 for horse-drawn carriages.

Summer tires, especially High Performance (HP) tires with further improved grip level, exhibit reduced profile elasticity at low temperatures due to their rubber compound and profile design.
This causes tension in the tire when driving slowly with very large steering angles. When rolling (particularly in case of an abrupt change in the coefficient of friction due to a change in road surface or differing road surface levels), the tension is released in individual or several successive jerking movements. See attached video V36 02 21.

This "jerking" is harmless and cannot be suppressed for design reasons. This is normal behavior in agile / sporty vehicles in these conditions.

Note:

- There is no vehicle damage involved
- This is of no consequence for vehicle safety
- This does not cause tension in the all-wheel drive drivetrain

INFORMATION

Diagnostic steps to confirm the jerking due to the “Ackermann function”.

1. Repeat the driving condition using warmed-up tires (i.e. by driving or parking in climate controlled garage/workshop).
2. Repeat the driving condition using a tire with a lower grip level (i.e. winter tires or all season tires).
3. If there is any indication of damage (i.e., “curb rash”), check the wheel alignment, make any corrections necessary and reassess.

Recommend to the customer the use of winter or all-season tires during the cold season if the diagnostic steps confirm the jerking/clunking due to the “Ackermann function”.

WARRANTY INFORMATION

This Service Information Bulletin serves to provide Technical Information to aid you in understanding the situation described above.

QUESTIONS REGARDING THIS BULLETIN

Technical inquiries	Submit feedback at the top of this bulletin
Warranty inquiries	Please contact the Warranty department by either using the Live Chat that’s available in the Warranty Documentation Portal or through IDS by selecting Coverage, Policy, Coding Questions and Mileage Corrections

Supporting Materials

Videos

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