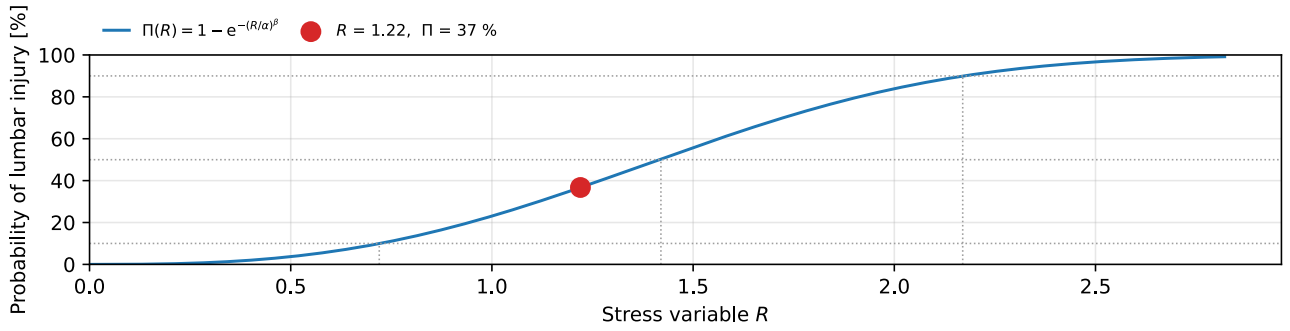
Whole-body multiple-shock health risk

Assessment of adverse health effects from whole-body vibration containing multiple shocks per ISO 2631-5:2018 (Clause 5 spinal response and Annex C risk model).

Client:	Example transport operator	Subject:	82 kg male operator (seated)
Workplace / vehicle:	Off-road vehicle, driver's seat	Date of assessment:	2026-07-20
Instrumentation:	Seat-pad accelerometer (ISO 8041-1), s/n 0117	Calibration:	Reference calibrator (ISO 8041-1) verified before/after the series within tolerance
Subject sex:	male	Age at start b [years]:	20
Exposure duration n [years]:	20	Exposure days per year N:	120
Counted response shocks:	5		

Dose and stress analysis

Quantity	Symbol	Value	Reference
Acceleration dose	D_z	55.97 m/s^2	Formula (3)
Daily acceleration dose	D_{zd}	55.97 m/s^2	Formula (4)
Daily compressive stress	S_d	1.62 MPa	Formula (C.1)
Cumulative stress variable	R	1.22	Formula (C.3)
Probability of lumbar injury	Π	37 %	Formula (C.5)



R = 1.22, Π = 37 % (moderate probability of an adverse health effect)

Annex C risk classification (Table C.2)

Risk band	Risk of lumbar injury	Stress variable R (Table C.2)	Classification
Low	< 10 %	R < 0.72	–
Moderate	10 % to 50 %	0.72 ≤ R < 1.42	● This assessment
High	50 % to 90 %	1.42 ≤ R < 2.17	–
Very high	≥ 90 %	R ≥ 2.17	–

Health-risk classification: stress variable R = 1.22 → moderate probability of an adverse health effect

ISO 2631-5:2018 defines no exposure limit; the stress variable R and the probability of lumbar injury P are the informative Annex C basis for assessing the potential of an adverse health effect. The risk bands follow the Table C.2 stress variables for 10 / 50 / 90 % risk of injury; the moderate band matches the Annex C worked example (a moderate adverse health effect, 10 % to 50 % risk of injury). The Clause 5 model is vertical-axis only (clause 4 of the 2018 edition neglects the horizontal contributions to spinal compression); assess horizontal whole-body exposure with the ISO 2631-1 metrics instead, and the Annex A / Annex E finite-element model is out of scope.

Laboratory: Phonometry reference example
Report no.: EXAMPLE-2631-5
Date: 2026-07-20
Notes: Reproduces the ISO 2631-5:2018 Annex C worked example.
Operator: phonometry Signature: _____

■ The results relate only to the tested specimen.