

SAE J2521 – simplified comparison 2006 v. 2013

	January 2006	April 2013	
Test schedules with expanded modules and lower standard fade temperatures	Disc brakes sequence – Standard (1-18) – 1430 brake applications – Cold (19-24) – 404 brake applications – Fade (25-31) – 487 brake applications	– Standard (1-18) – 1430 brake applications – Cold (19-24) – 460 brake applications – Fade (25-31) – 487 brake applications	
	Drum brakes sequence – Standard (1-18) – 1902 brake applications	– Standard (1-18) – 1908 brake applications – Cold (19-24) – 506 brake applications – Fade (25-31) – 363 brake applications	
	Maximum standard temperature during fade modules – FA-disc 550 °C – RA-disc 300 °C	– FA-disc 450 °C – RA-disc 250 °C – RA-drum 200 °C	
	Maximum optional temperature during fade modules – FA-disc 550 °C – RA-disc 300 °C	– FA-disc 550 °C – RA-disc 350 °C – RA-drum 300 °C	
Test setup and conditions with additional specifications to reduce test-to-test variability	Servo control – Ramp rate 250 ± 50 bar/s – Maximum pressure ≤ 160 bar – Pressure profiles 10 s (including initial/final ramps to/from pressure)	– Ramp rate ≥ 100 bar/s – Maximum pressure ≤ 160 bar – Deceleration control ± 0.5 m/s ² – Pressure control ± 1 bar – Pressure profiles 11 s (including initial/final ramp)	
	Cycle control and time stamps – IBT infrared sensor on rotor OD – μ when above 90% – μ by time	– IBT embedded TC on rotor – μ per time stamps t ₁ -t ₄ – μ by distance (deceleration) – μ by time (drags)	
	Test inertia – at Gross Vehicle Weight Rating (GVWR) or laden – 75/25% fixed split – Rolling radius per request	– At Gross Vehicle Weight Rating (GVWR) or laden – Per SAE J2789 below 0.65 g (default table or torque index methods) – Rolling radius based on revolutions per mile	
	Microphone and accelerometer – Microphone 10 cm out and 50 cm above flange center point – 500Hz-20 kHz with 25 Hz resolution – Peak-hold average with 50% overlap and Hanning windowing – Anti-aliasing and A-weighting	– Microphone 10 cm out and 50 cm above flange center point – 500Hz-20 kHz with 25 Hz resolution – Peak-hold average with 67% overlap and Hanning windowing – Anti-aliasing and A-weighting	
	Test fixture – Preferred suspension fixture – Preloaded using single compliant tension element	– L1 = knuckle – L2 = suspension – L3 = full axle – Same design, drive and fabrication – Pre-fill and conduct FRF (optional)	
	Cooling air – Temperature – 10 to 40 °C (air conditioning recommended) – Relative humidity 20-90 %RH – Background noise not to exceed 60 dB(A) > 900 Hz	– 25 °C/50 %RH – Round ductwork 200-300 mm – Background noise not to exceed 64 dB(A) > 900 Hz – Airflow measurement per ISO 3966 with nomogram for air speed, airflow and duct diameter	
	Comprehensive test parameters per EKB 3010	– Listing of test parameters for project, setup, measurements, dyno conditions, fixture, caliper, rotor, and brake pad	
Test report including VDA/EKB specifications noisy brake event harmonized with VDA 306	Frequency range – 0.9 – 17 kHz disc, full fixtures – 2 – 17 kHz disc, knuckle fixtures – 0.5 – 17 kHz drum fixtures	L1 = 2 – 16 kHz L2, L3 = 1.25 – 16 kHz (17 kHz optional upper limit)	
	Noisy brake event – Above 70 dB(A) – Within frequency range	– Above 70 dB(A) – Within frequency range – 6 dB(A) above average ± 75 Hz (or ± 1.25% of peak frequency) – At least 150 Hz separation (or ± 2.5% of peak frequency)	
	Graphs and tabular summaries – SPL v. frequency (noisy) – Temperature and frequency (noisy) v. application number – Relative noise occurrence v. section – Cumulative absolute occurrence vs. SPL – Absolute occurrence v. pressure, temperature, and speed – Friction and temperature by section	– SPL v. frequency (noisy) – Temperature and frequency (noisy) v. application number – Cumulative absolute occurrence vs. SPL, with noise index (AAA – F ranking) – Absolute occurrence v. pressure, temperature, and speed – Friction and temperature by section – Main and multiple peak (noisy) frequency v. SPL – Occurrence, peak SPL and duration per frequency class – Friction (noisy and non-noisy) and frequency v. stop number – Friction histograms – Tabular summary of noisy event count by frequency range and type of braking	