

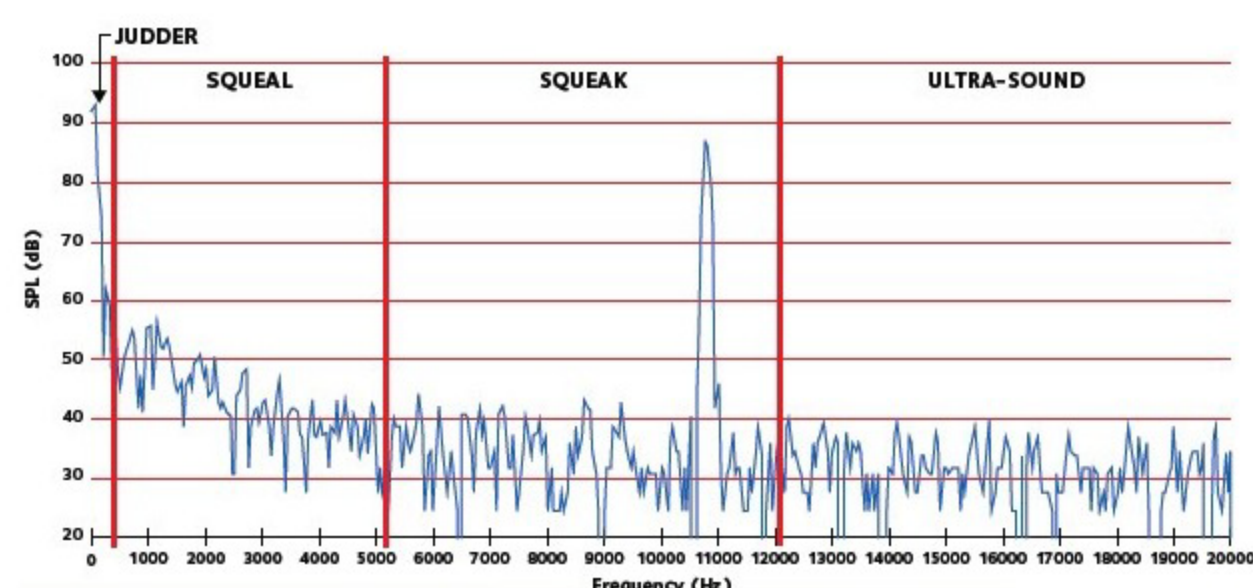
BRAKE NOISE - ISSUES AND SOLUTIONS

Brake noise is one of the major reasons for a driver to visit a repair shop. It can be a complex issue and is often difficult to solve.

WHAT IS BRAKE NOISE?

Brake noise typically originates from vibration of a part within the wheel end section of the vehicle – between the tire and the connection to the chassis. Noise is often blamed on the brake pad itself, but can come from any part, from the wheel bearing to the ball joint. Within the brake system, it's normal to have some vibration, but it is not usually intense enough to be audible.

A. TYPES OF NOISE EXPERIENCED BY DRIVERS



LOW FREQUENCY VIBRATIONS – JUDDER



DESCRIPTION:

A deep noise with frequency below 300hz.

CAUSE

- Poor tolerance (poor fitment on the hub or excessive disc thickness variation)
- Rotor damage

SOLUTION

Replace the rotor and clean and lubricate all surfaces of the brake assembly according to the vehicle manufacturer's instructions.

MEDIUM FREQUENCY VIBRATIONS – SQUEAL



DESCRIPTION

Noise with frequency in the range 300 - 5,000 Hz.

CAUSES

- Sticky movement on the caliper piston
- Rough finish of the working surface of the rotor
- Pad fitting errors
- Hardware and shims are not installed properly
- Disc thickness too low

SOLUTION

- Clean and lubricate components of the caliper
- Ensure rotor surface finish (once fitted on to the hub) will stay within a tolerance of 0.1 mm
- Clean the hub surface, machine rotor surface
- Replace rotor and make sure brake pads, shims and accessories are fitted properly
- Consider damping noise intensity with shims or brake pads with noise-reduction features

HIGH FREQUENCY VIBRATIONS – SQUEAK

DESCRIPTION

Noise with frequency higher than 5 kHz.

CAUSES

The most common reason for a squeak is a molecular vibration within the friction material during application to the brake rotor.

SOLUTION

Replace the brake pad set. Also check that the accessories (e.g. the caliper clips) are correct and properly fitted.

VERY HIGH FREQUENCY VIBRATIONS – ULTRASOUND

DESCRIPTION

Noise with frequency higher than 12 KHz, greater than the upper limit of human hearing.

B. FRICTION SURFACES GIVE VITAL CLUES

The appearance of the friction surfaces can give a good indication of the causes of noise problems. Jack up the vehicle, remove the pads and examine the friction surfaces to analyze potential problems. Below are five symptoms that relate to noise.

SYMPTOMS AND REMEDIES

TAPERED PADS



APPEARANCE: Uneven wear, tapered pads

CAUSE: Distorted caliper, caliper slides sticking, excessive caliper clearance

EFFECT: Premature pad wear, uneven braking pressure, noise

REMEDY: Replace pad set, maintain & service caliper

UNEVEN WEAR



APPEARANCE: Uneven wear on pad surface

CAUSE: Irregularly worn rotor (a wear lip will be visible on the disc)

EFFECT: Squeal & judder, premature pad wear

REMEDY: Replace rotors and pads

UNEVEN WEAR WITHIN AXLE



APPEARANCE: One or more brake pad within the axle set will be excessively worn

CAUSE: Caliper guide pins or piston sticking

EFFECT: The vehicle pulls to one side while braking, uneven & rapid pad wear, squeal & judder

REMEDY: Maintain all caliper slides & pistons, replace pads. Check rotors

DAMAGED BACK PLATE



APPEARANCE: Damaged back plate

CAUSE: Incorrect assembly, excessive force used during fitting

EFFECT: Braking inefficiency, irregular wear, noise & judder

REMEDY: Replace full brake pad set

PISTON DAMAGE



APPEARANCE: Anti-noise features (rubber-coat / shim) damaged by piston

CAUSE: Piston not retracting fully, heavy brake use

EFFECT: Overheating, noise

REMEDY: Replace brake pad set, maintain caliper