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eliminate the influence of alignment, all adjustments must be horizontally rectified. With the help of nuts and bolts, the complete installation is secured to the sturdy foundation structure. Figure 3.1 depicts the planned experimental set-up. The signals on the disc braking system are captured by an accelerometer, an impact hammer, and a microphone. Physical values such as displacement, velocity, and acceleration are converted into electrical numbers via these devices. Excitation and response signals from the hammer and accelerometer are acquired by a four-channel analyzer, and the measured signals are processed by a data acquisition system (Brüel&Kjær Type 3050-B-040). Directly measuring signals from sensors like accelerometers, impact hammers, and microphones is either too noisy or too risky. The signal conditioning circuit transforms a signal into one that can be fed into an ADC. Amplification, attenuation, filtering, and isolation may all be included in this circuit. A signal conditioning feature built into the DAQ device allows it to measure certain sensor types. Sensor sensitivity data is used to determine acceleration.

#### IV. EXPERIMENTAL RESULTS

Accelerometer Atriaxial CCLD piezoelectric accelerometer (Deltron type 2524-B) with a sensitivity of 9.507 mV/g and a frequency range of 0.2 Hz to 12.8 kHz was employed in the current tests. It uses the piezoelectric action of various materials to quantify dynamic changes in mechanical variables (such as acceleration, vibration, and mechanical shock). The seismic mass loads the piezoelectric element when a physical force is given to the accelerometer, according to Newton's second law of motion. The change in electrostatic force or voltage produced by the piezoelectric material can be seen as a result of the force applied to it. Piezoelectric accelerometers, like all converters, convert one kind of energy into another and output an electrical signal in response to a quantity, property, or circumstance. Taking a broad approach. A voltage exists between the two plates of this capacitor. One of these plates works as a diaphragm in a condenser microphone and is composed of a very light material. When sound waves strike the diaphragm, it vibrates, changing the capacitance by changing the distance between the two plates. The capacitance increases and a charge current is generated as the plates are closer together. The capacitance is lowered and a discharge current is generated when the plates are separated further. For this to work, voltage must be applied to the capacitor. The microphone receives this voltage from a battery.



Fig. 1. CLD for brake sequel.

Viscoelastic Material			RMP				
			300	600	900	1200	1500
1	Natural Rubber	Without CLD	75.31	76.33	76.63	79.68	80.2
		With CLD	64.22	65.15	65.89	66.29	66.76
		% Reduction	14.7258	14.64693	14.0154	16.80472	16.7581
2	Nitril Rubber	Without CLD	75.31	76.33	76.63	79.68	80.2
		With CLD	57.82	57.87	58.1	58.04	59.36
		% Reduction	23.22401	24.18446	24.18113	27.15863	25.98504
3	EPDM	Without CLD	75.31	76.33	76.63	79.68	80.2
		With CLD	61.73	61.82	62.46	62.96	63.72
		% Reduction	18.03	19.01	18.49	20.98	20.58

TABLE 1.0 Comparison of sound level of disc brake assembly without CLD and with CLD for different viscoelastic materials at 0.250 Hz

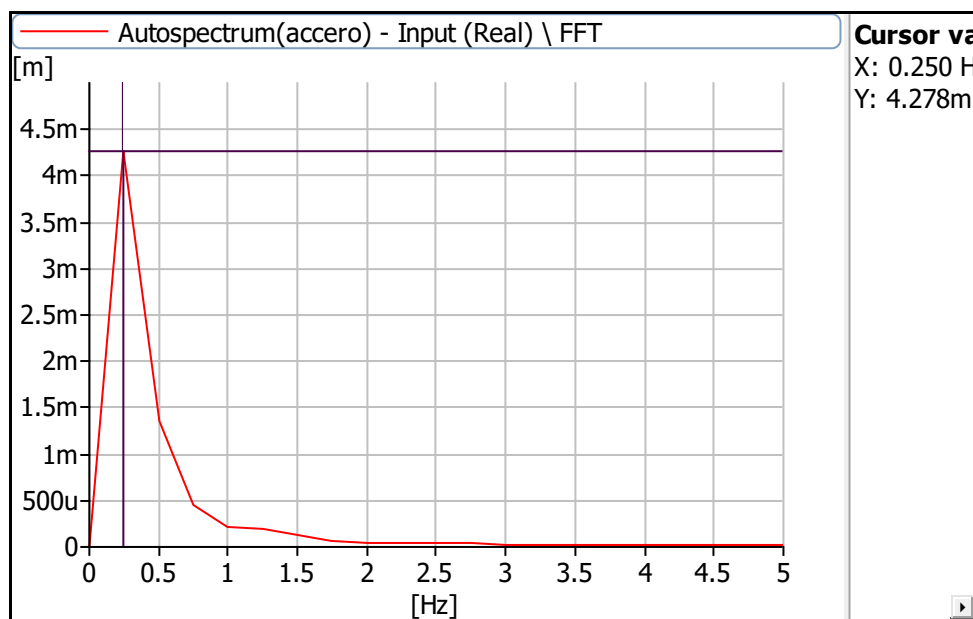


Fig. 2 Disc brake assemblyAutospectrum (300 rpm)

It is important to assess the vibration and sound level of the disc brake system without limited layer dampening in order to analyse brake scream. For the current case study, a 150 cc disc brake is used, and the vibration and sound levels of the disc brake are measured at various speeds. A DC motor is used to adjust the speed. The rectifier is a device that converts AC to DC voltage. With the help of a dimmerstat, the input DC voltage is varied, and the speed is measured with a tachometer. The accelerometer is mounted in a radial manner on the calliper, and a microphone is used to measure a sound level held at 1 metre from the mount. The braking system is being measured. Steel plates with thicknesses computed by determining the thickness of the several layers of the restricted layer damping are cut into brake pads for various viscoelastic materials. Each viscoelastic material is placed to the back of the friction plate and adhered to this limited plate of certain thickness with the help of adhesive material, and sound level of each damper is



analysed. Various viscoelastic materials are available on the market. Five alternative materials were chosen for convenience based on availability, cost, and thickness. Natural rubber, Nitrile rubber

#### V. CONCLUSION

Viscoelastic materials, confined layer materials, and constrained layer damping. It also offers restricted layer damping design. For varied viscoelastic materials and speeds, and sound levels of the disc brake assembly with limited layer damping were measured.

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