

Heavy Equipment Acoustical Treatment Guide

Operators of heavy equipment such as graders, bulldozers, earthmovers and cranes spend their entire workday in and around equipment. An environment that provides for reduced noise levels increases operator effectiveness and improves output. The major noise sources in heavy equipment are the engine, drive train, and power take-off systems. This sound radiates throughout the environment and affects operators, bystanders, nearby businesses, and individuals.

For over 20 years we have helped equipment manufacturers of all sorts solve their sound problems. Our professional staff is ready, willing, and able to help you solve your noise control challenges that are unique to your product. We'll get you the right products when you need them and provide the best value in the process.

The following information addresses common sources of heavy equipment noise problems and some common solutions. Remember these are generic problems and solutions and we recognize that each manufacturer may have unique issues and concerns. We welcome these challenges and are more than happy to help you find a solution that best fits your needs.

The second method of controlling the sound is to reduce the air borne noise.

Engine Compartment:

Most unwanted noise is generated by components in the Engine Compartment. This may be turbo whine, engine noise (Diesel and Gas), and/or hydraulic pumps. Unwanted noise manifest itself as either structure borne or air borne.

Structure borne noise is caused by vibrations from the different components and can be controlled using isolation or damping materials. The vibrations can cause structures such as wheel wells, firewalls, or sheet metal to resonate. Applying a damping material will change the resonance of the structures eliminating the vibrations.

The second method of controlling the sound is to reduce the air borne noise. This is handled using an absorber or absorber/barrier composite. Absorber materials absorb the sound waves. Absorber/barrier composites stop the transmission of sound.

Engine Compartment Acoustical Treatment Examples

Barrier Composite - VBFF-321-41-AR-XX

Absorber Material - AF-021-40-AR-XX

Damping Material – DM-X00

Cabs

Front or Rear Engine:

In the traditional cab design, most unwanted noise is generated by components in the engine compartment. This may be turbo whine, engine noise (diesel and gas), and hydraulic pumps. A barrier composite should be used along the firewall to keep the noise from entering the cab. A floormat material incorporating a sound barrier should be applied to the floor to block unwanted road noise. A floor underlayment can be used under carpet to achieve the same results. An acoustical headliner and /or body panels can be used to absorb sound within the cab.

Cab over Engine (Enclosed)

This design is treated very much like the traditional cab setup. The barrier composite emphasis should be on floormat and under cab treatments in order to optimize acoustic performance. A headliner material and/or body panels should also be used to absorb sound within the cab.

Cab over Engine (Open)

This design is the most difficult to handle. An effective engine compartment treatment is crucial with this design. Unwanted noise will most likely be caused by the noise flanking the cab and entering from above. The most effective means of treatment are to use an acoustical floor mat and headliner.

In all designs it is important to minimize through cab openings in order to minimize noise transmission paths.

Cab Acoustical Treatment Examples

Barrier Material - VBFF-321-11-AR-XX

Floormat Composite – VBF-351-01-DT-00

Headliner – AF-021-40-PC-XX

Control Levers

Barrier composites are placed around the base of the control levers to block sound leaks and prevent noise from reaching the cab.

Control Levers Acoustical Treatment Examples

Panels

Metal panels and bodywork can vibrate in sympathy with resonant frequencies from the engine, drive train or power take-off systems. These panels can be treated with vibration damping materials to disrupt this resonant frequency and significantly reduce secondary sound generation and structural vibration.

Control Levers Acoustical Treatment Examples

Damping Material – DM-X00

Custom noise control solutions for the heavy equipment industry

Technicon Industries will help you solve the noise control challenges that are unique to your heavy equipment.

We design and manufacture to order a complete line of sound absorbers, barriers, and vibration damping materials, used alone or in composite laminations.

You'll find our staff eager, responsive, and easy to do business with. We'll get what you need when and where you need it, at competitive prices.

We'd appreciate an opportunity to earn your business.

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