



ISOLATION OF
OFF-HIGHWAY VEHICLES

ABOUT AMC MECANOCAUCHO

Aplicaciones Mecánicas del Caucho (AMC) is a company that designs and produces anti vibration mounts as well as noise insulation composites for the industrial and building sectors.

Since 1969 we have been developing noise and vibration solutions for a wide range of applications. To meet the demands of each project, our products combine the properties of different isolating materials, such as rubber, metal, springs and Sylomer®.

Our dedicated engineering team are on hand to offer technical support with vibration calculations and product advice. On our website mecanocaucho.com you will find access to an extensive range of technical data for our products as well as calculation tools such as our Vibration Isolator Pro. This tool allows the input of your system specifications and provides a recommendation for the anti vibration mounts that meet the requirements of your project in terms of natural frequency or vibration isolation.

Our engineers travel throughout the world doing vibration measurements and providing engineering service to our customers. With a wide variety of customers served from across the world, we are ready to provide you with a customized solution for your noise and vibration problems.

We test our products in our own laboratory and we keep a large stock of products for a quick delivery.



Isolation of Off-Highway Vehicles

QUALITY



COMMITMENT TO QUALITY

Quality control in all production processes.
Official type approval and management's certificates



NATO NCAGE 0230 B.



Marine approval certificate
BRB-BSB-Marine DNV



ISO 9001:2015



ISO 14001:2015



Marine approval certificate
BRB-BSB-Marine Lloyd's



Marine approval certificate
BRB-BSB-Marine ABS



Marine approval certificate
BRB-BSB-Marine BV

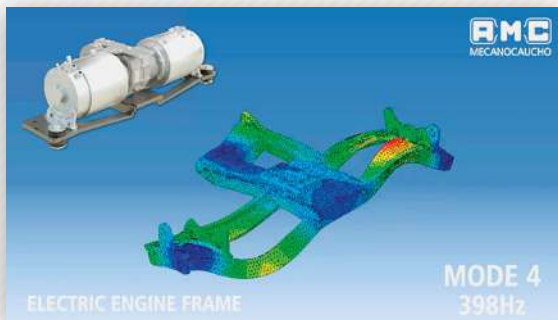
ENGINEERING AND MANUFACTURING

In house multi-axis dynamic testing machines



Isolation of Off-Highway Vehicles

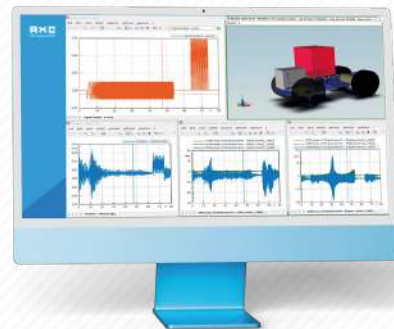
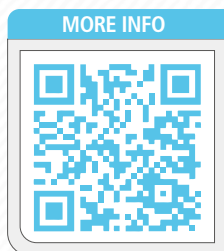
SOFTWARE AND NVH MEASUREMENT EQUIPMENT



STRUCTURAL ANALYSIS SOFTWARE

Our engineering team uses finite element analysis to analyze the structural stability of parts at different frequency modes.

This reduces the risk of resonance occurring in application.



6 DEGREES OF FREEDOM CALCULATION SOFTWARE

Customers have access to our proprietary six degrees of freedom calculation software.

There they can preform simulations of anti-vibration mount performance with their system.



NEW

NVH MEASUREMENT PRO KIT

The Pro kit provides an extensive range of noise and vibration data to be measured. This wireless unit allows simple data collection for off highway vehicle applications.

Sensors included are:

- 2x Triaxial accelerometers
- 2x laser displacement transducers
- 1x Tachometer
- 1x Microphone
- 1x Modal hammer



VIBRATION ISOLATOR PRO Bluetooth Accelerometer

The bluetooth accelerometer has been developed to work in conjunction with the AMC MECANOCAUCHO® free of cost app Vibration Isolator Pro for Android and iOS.



VIP-ACCELEROMETER RESERVATION

SCAN ME





Why should you use **AMC** mounts
in off-highway vehicles?

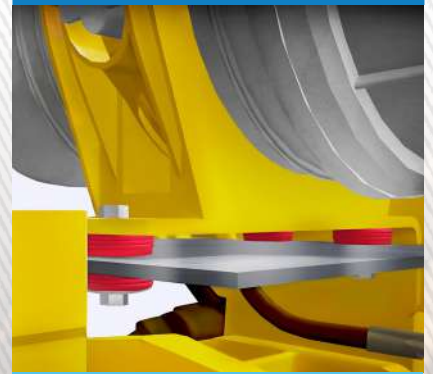
ENGINE & GEARBOX



SENSITIVE EQUIPMENT



INTAKE & EXHAUST



**Important areas of consideration
for off-highway vehicles**



HYDRAULICS



COOLING PACK



CABIN



Isolation of Off-Highway Vehicles

ENGINES

HYDRAULIC MOUNTS



CONE MOUNTS



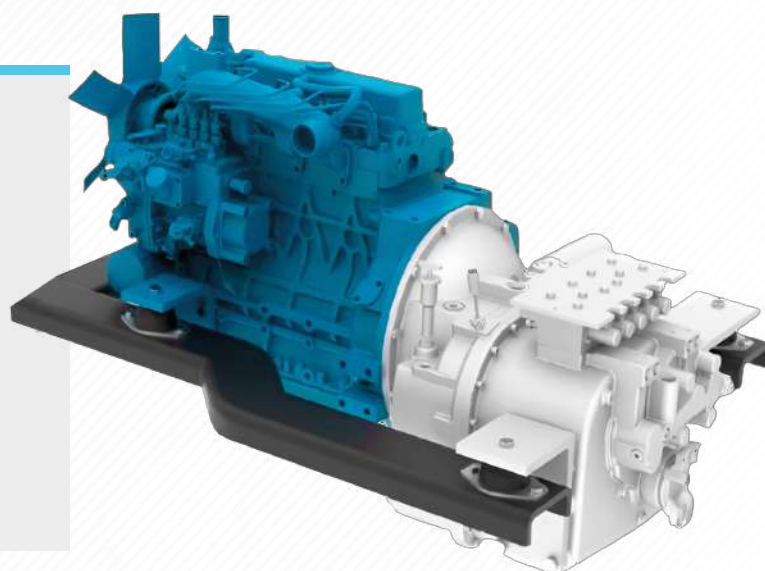
Technical considerations
for effective engine isolation



ENGINE ISOLATION

An internal combustion engine generates mechanical forces causing unwanted vibration, harmful resonances can occur if not properly analysed.

A correctly designed mounting system ensures these vibrations, along with dynamic shocks from vehicle movement are effectively controlled.



CB



MD



BRB



MARINE



BSB

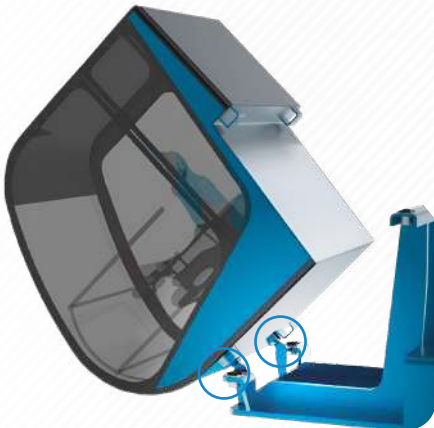


Range
of products



Isolation of Off-Highway Vehicles

CABINS



HYDRAULIC MOUNTS



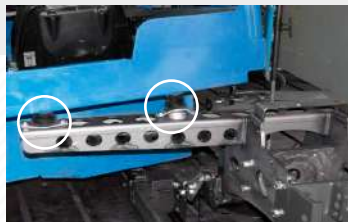
Technical considerations
for effective cabin isolation



CABIN ISOLATION

Important considerations:

- Static load due to the mass of the cab (including occupants)
- Dynamic loads due to terrain input
- Correct position of mounting points
- The available space envelope
- FOPS/ROPS requirements
- Environmental factors (temperature and contact with chemicals)
- Expected life cycle



CAB MOUNTS



CONE MOUNTS



TF



ECCENTRIC BUSHINGS



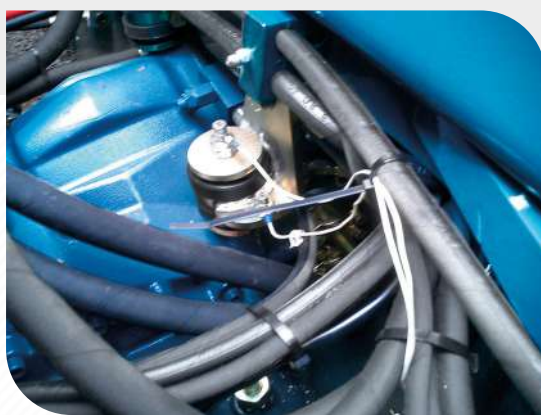
Isolation of Off-Highway Vehicles

GEARBOXES

GEARBOXES ISOLATION

Along with vibration isolation from the engine the gearbox mounts must effectively protect the installation from high torque reaction forces.

A gearbox can be considered a complex dynamic system with a high number of degrees of freedom (dof).



ELECTRIC MOTORS ISOLATION

An important consideration for electric motors is the high levels of torque they provide compared to an internal combustion engine. Coupled with the ability to apply this torque instantaneously can lead to very high forces at the mounting points.

To ensure good long term durability this should be analysed carefully.



CB



NP



SCHR



TF



ECCENTRIC BUSHINGS



Isolation of Off-Highway Vehicles

BATTERIES

HYDRAULIC



HYDRAULIC CONE



Technical considerations
for effective battery isolation



BATTERY PACK ISOLATION

Harsh vibrations can result in degradation of lithium batteries and lead to a reduced capacity with a shorter lifespan.

The shock forces produced due to dynamic vehicle movement should be analysed carefully, high forces from the vehicle should not be transferred to the battery itself as this can result in cracks occurring.

It is important to select a mount that has a long elastic course and high damping to remove energy.



Scanning electron microscope (SEM) images taken from a commercial 18650 battery cell, which has lost 45% of its capacity

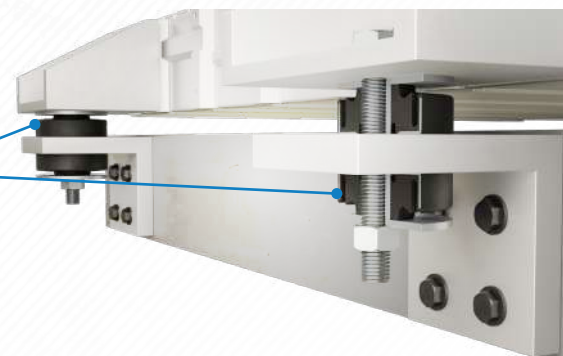
SCHR



TF

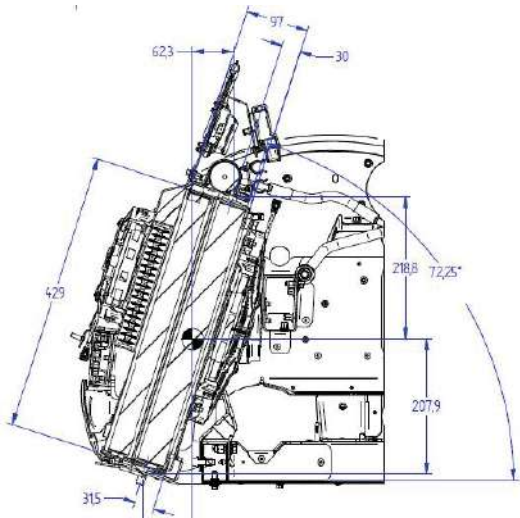


CB MOUNTS



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RADIATORS



TFS



BRB



CB



NP



RADIATORS ISOLATION

To ensure the radiator itself and the connecting pipework are not highly stressed, **vibration isolators** are **used to** account for **misalignment of brackets**, expansion/contraction due to heat and also to **reduce energy** from **vehicle shocks**.



BOBBINS



MD



SCBR



SCHR



SCH



Example measurement
radiator dynamic evaluation



Isolation of Off-Highway Vehicles

SENSITIVE EQUIPMENT



ACCELEROMETER

CB



FZ+SYLOMER



BOBBINS



SENSITIVE EQUIPMENT ISOLATION

On industrial vehicles there can be sensitive electronic components which have acceleration limits set by the component manufacturers. The correct shock and vibration isolation is crucial to prevent damage to sensitive elements, such as:

- ECUs
- Electronic control modules
- Motors
- Pumps
- Compressors



TFS



BRT



DRD



WIRE ROPE



Isolation of Off-Highway Vehicles

HYDRAULIC PIPEWORK



Technological review
of antivibration mounts



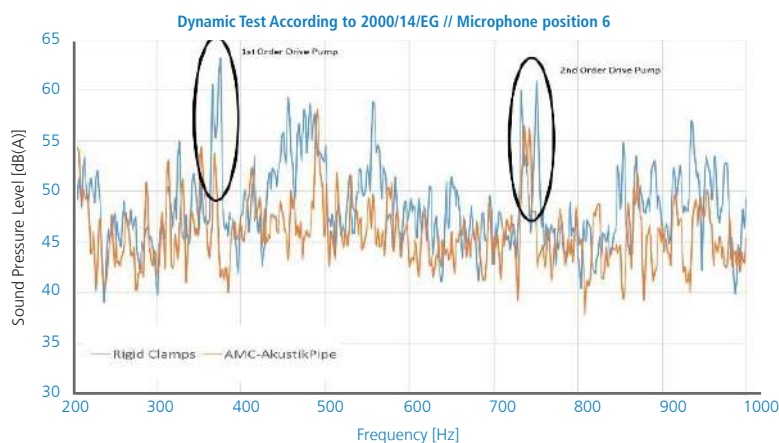
HYDRAULIC PIPEWORK ISOLATION

Hydraulic pumps can create high frequency vibrations which can be heard as a high pitch humming noise.

Rigid hoses connected to the pumps can be an important structural path for these vibrations to travel along. Elastically separating them from the vehicle chassis and cabin can help to reduce noise levels.



AKUSTIK PIPE



An example **noise measurement** showing the improvements that can be obtained using the **AMC Akustik pipe** compared to a traditional rigid plastic clamp.



ACOUSTIC ISOLATOR PRO

With the acoustic Isolator Pro app, you can perform sound measurements of machines and receive isolation recommendations and results.

DOWNLOAD THE APP!



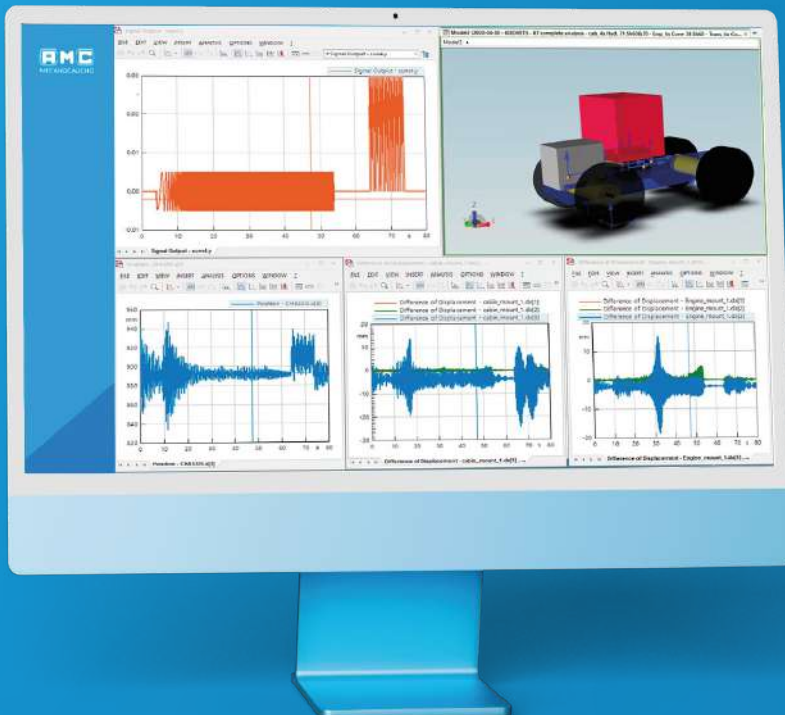
ACOUSTIC ISOLATOR PRO VIDEO



6 DEGREES OF FREEDOM

Calculation Software

Customers have access to our proprietary six degree of freedom calculation software. Multi body simulations can be performed to analyse shock and vibration, allowing the correct AMC solution to be determined.



MORE INFO





Our **expertise lies** in the **building** and **industrial acoustics field**, with a dedicated **technical department**. We have skilled engineers situated across various countries who are prepared to comprehend your specific situation and offer suitable solutions. Don't hesitate to **get in touch with our main office or explore our websites** and social media platforms.



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