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Q: What information should I to provide to Barry Controls so they can assist me with vibration or shock isolator selection?

A. In any engineering design or product application activity, technical information is key to coming up with an effective solution. When addressing vibration or shock issues, a complete system description, problem definition, and background help us to develop a successful solution which balances performance, cost, and timing.

Barry Controls' "**Isolator Application Questionnaire**", can be found in the Technical Reference section of our website, and is a tool to guide customers in providing the information that is necessary for us to start to evaluate an application and potential isolator solutions.

When filling out the questionnaire, the more detail provided the better for evaluating and recommending solutions. The following notes should help in this process.

Contact Information
So we know who we're talking to and how to get in contact.

General Description of the System
Describe the item to be isolated and where it is mounted. For example:

- Electronic module mounted on the chassis a military ground vehicle
- Camera system mounted on a helicopter
- Punch press mounted on a concrete floor in a factory
- Generator set mounted on a commercial marine vessel
- Sensitive equipment mounted in a shipping container

Pictures, sketches, drawings, CAD models, or other images of the system help to effectively communicate the primary elements and interfaces of the components to be isolated. They are also helpful for the process of identifying proposed isolation approaches.

In some cases we may already have history of successful isolator application on the type of equipment under consideration. Providing a thorough and complete description of the system/equipment can often expedite the isolator selection process by allowing us to compare to similar applications.

If the activity or inquiry is related to a specific project or program it can be helpful for us to know the project/program name or number. This helps us distinguish amongst multiple projects that we may be working on for the same customer or may have worked on previously. It also enables us to file related data, results, and correspondence Under a meaningful project/program identifier for future reference.

Physical Data

Physical data is best communicated via sketches, drawings, CAD models, or other presentation/report formats (e.g. PowerPoint) and should include as much of the following information as possible.

- Weight, CG Location, and overall dimensions of item to be isolated
- Number of mounting points and coordinates of mounting locations (ideally relative to the CG of the isolated item). Alternatively the static weight supported by each isolator can be provided.
- Mass-moments-of-inertia of isolated item. Required if system natural frequencies are to be calculated or dynamic analyses are to be run. Mass-moments-of-inertia can be estimated if weight, CG location, and overall dimensions of isolated mass are provided.
- Packaging envelope/constraints for isolators
- Sway space, clearance, and/or travel limit constraints in all pertinent directions

Dynamic Environment

Understanding of the dynamic environment that the system will experience in service and/or testing, is a critical piece of the isolator selection process.

- What kind of vibratory or shock inputs is the system exposed to? What are the primary sources of vibration or shock? Are there known disturbing frequencies or transient inputs related to operation of the system? Consider operating and non-operating conditions, transport/shipping, testing/qualification, etc.
- What are the isolation goals and how are they measured? Do natural frequency, transmissibility, and/or attenuation targets already exist for the system? Is the fragility of the system or isolated equipment known?
- Are there any frequencies or dynamic inputs that the system is particularly sensitive to?

Environmental Exposure

The environment to which the isolators will be exposed during their service life can have significant impacts on their performance and durability. It directly influences design choices of elastomer material and metal component finishes.

- What is the temperature range that the isolators will be exposed to? Consider operating, non-operating, and storage conditions. Consider duration of exposure to temperature extremes.
- Is there possibility of exposure to chemicals (especially oils, fuels, solvents), gases, radiation, etc.
- What is the duration or type of chemical exposure (splash/spray, soak/immersion)?
- Where are the isolators located? Will they be exposed to weather, sunlight (UV), salt spray?
- Are there any material requirements: e.g. Outgassing, Flammability, Smoke/Toxicity

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Commercial Data

Details related to the commercial aspects of the inquiry are important for making sure that the isolators considered are appropriate for:

- Quantity and Timing needs for isolators: prototypes, test units, production
- Estimated annual usage (EAU) in production: tooling capacity, isolator cost
- Engineering development needs: analysis, testing, qualification

Problem Statement

Frequently a Problem Statement can help in determining an appropriate solution.

- What is the key issue you are trying to solve or address?
- If there is a specific vibration issue that is occurring, describe it and indicate how is it assessed, measured, or quantified. What impact is it having on the end-product?
- Does the issue occur on all units, configurations, or assemblies? Does it occur in similar systems?
- Has any root cause investigation been done? Have other solutions or approaches already been considered or tried?

Isolation Precedent or History

In many applications there may already be precedent of isolator use which can serve as a good baseline for developing an improved system.

- Is this an existing system that uses isolators? Is it a modification, derivative, or extension of an existing system? Or is it an entirely new system, new design, or new concept altogether in regards to isolation?
- Is there any precedent for isolators on this type of system? If the system is already isolated, has been isolated in the past, or is similar to other systems that are isolated, it is beneficial for us to know as much about the isolators and isolation system as possible (part numbers, drawings, pictures, dimensions, specifications, test data, performance, durability, service life, etc.).

The "**Isolator Application Questionnaire**" form can be filled out and returned to Barry Controls to initiate the process of reviewing your system and making an isolation recommendation.

Completed forms can be submitted via the "Contact Us" link on our website: www.hutchinsonai.com, or can be emailed to applications@hutchinsonna.com.

For powertrain or engine mounting applications, see the Engine Mounting Analysis Form and Helpful Hints for Filling Out Barry Controls "Engine Mounting Analysis Form" also available on the Technical Reference page of our website.