An engine driven generator system is subjected to vibration generated by the reciprocating forces within the engine. A good design minimizes these imbalances, but they can never be totally eliminated. However, generator set manufacturers have been able to reduce residual vibration to acceptable levels for most applications by employing vibration-isolation mounting hardware and recommending proper foundation design.

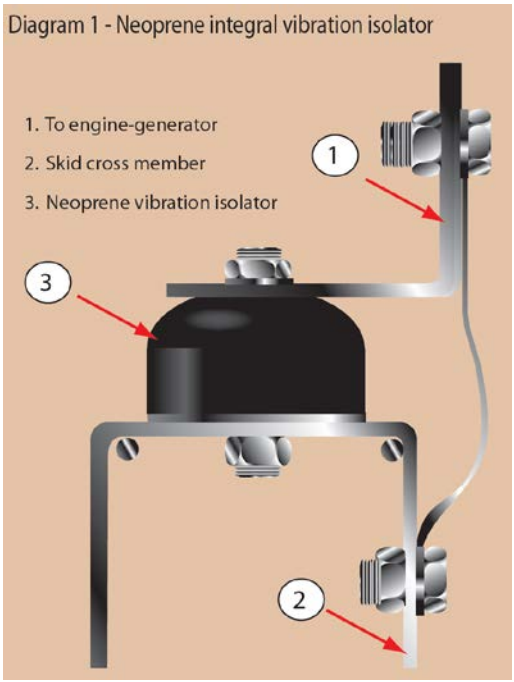
There are two major components to vibration isolation.

The first involves the isolation of the engine and generator from the remainder of the generator set assembly. The second component involves isolating the entire generator set from its mounting platform and the way in which this base connects to the building structure. Cost and the amount of vibration to be eliminated determine which of several devices a designer could use to reduce the transmission of vibrations to surrounding surfaces.

Generator set manufacturers routinely use elastomeric vibration isolators to isolate engines and alternators from the base frame. Additionally, elastomeric bushings are used to mount various electronic components and enclosures to the frame. These “non-spring” isolators reduce the transmission of vibration to other components by dissipating the mechanical energy in the elastomeric compound.

Neoprene or rubber isolators: - These are used between the set’s base and pad and also to isolate generator components, such as controls. Neoprene mounts are frequently integral mounts fitted by the manufacturer between the engine-generator assembly and the skid. They provide as much as 90 percent isolation efficiency, which is sufficient for most installations at or below grade level. (See Diagram 1.)

Diagram 1 - Neoprene integral vibration isolator



Because generator sets come in many sizes and configurations and every application has a unique installation location, there are several considerations that must be taken into account when determining the best method of mounting a generator set to its operating base or foundation.

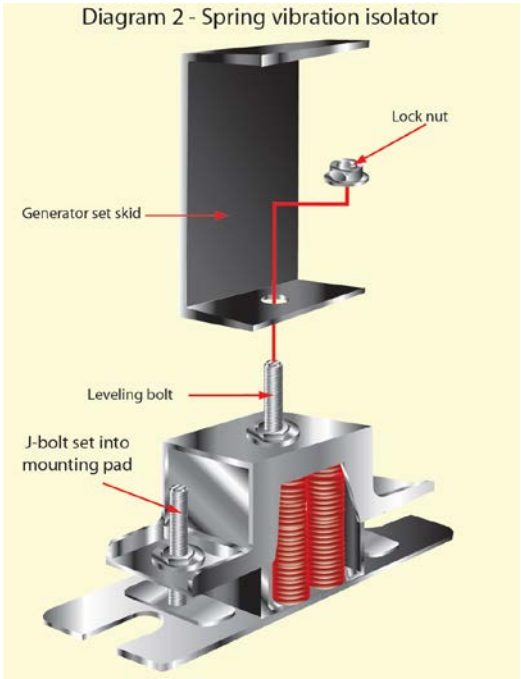
In some applications, a generator set can be installed away from occupied structures. These power systems are often simple, single-set standby systems that can be mounted on massive, dedicated concrete pads. In these applications, the generator set can be bolted directly to the concrete pad, generally with thin elastomeric pads between the mating surfaces. This popular type of mounting is not detrimental to either the concrete or the generator set, and any vibration transmitted into the ground will be absorbed by the mass of the concrete and the surrounding earth.

However, in many situations the generator set cannot be placed outside of a building or spatially isolated from sensitive equipment or occupants inside the building. In these situations, even if the generator set is mounted on a dedicated concrete pad, it may be necessary to further reduce ground vibration (dynamic loading) by placing the generator set on spring vibration isolators

Spring isolators - These isolators provide up to 98 percent vibration isolation and are suitable for all applications. They are required when the generator set is installed above grade. When choosing a spring type, be sure the model matches the weight of the generator, to avoid overly compressing the springs. The designer should consult local codes to determine if spring isolators are required. Spring types are mounted between the generator skid and the mounting surface. (See Diagrams 2)

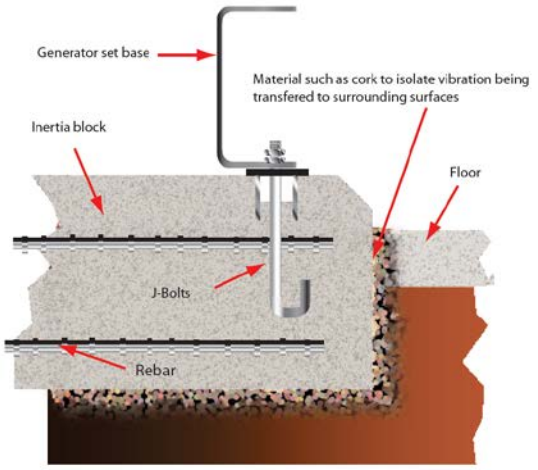
Spring type with sub-base tank - When spring isolators are mounted between the concrete pad and a sub-tank, special consideration must be given to the spring isolators' selection to compensate for the variable weight of the package that will occur because of the amount of fuel in the tank.

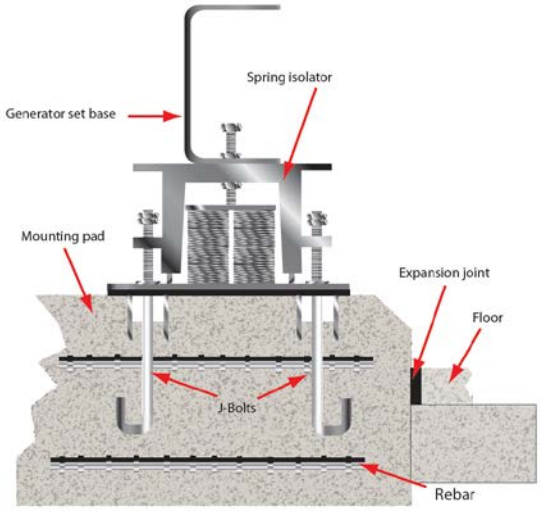
Diagram 2 - Spring vibration isolator

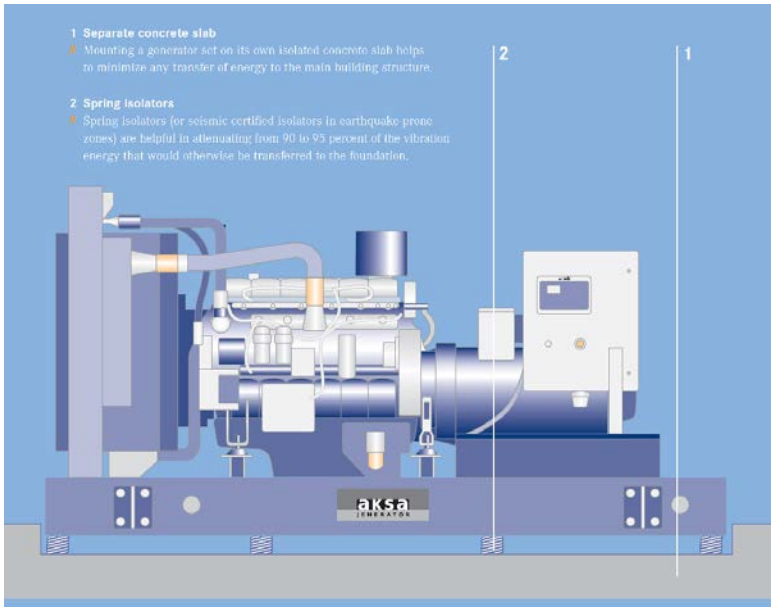


Regardless of whether the generator installation will be outside a building or inside, the generator set mounting surface or concrete pad should be engineered locally. If the unit is to be mounted within a commercial or public building, local building codes will probably require the design of the supporting system be approved by a licensed professional engineer. In other locations, concrete pads may not need to be approved by a licensed professional engineer but should be built according to local codes with regard to soil density, seismic risk and wind loading requirements.

The location of the generator set is a major factor in transmitting vibrations to its surroundings. **The unit should not be mounted directly to rock, concrete, metal, soil or other surfaces that transmit vibration over a considerable distance.** Because it is preferable to install the generator set on a concrete pad, the designer should specify installation of vibration isolators between the generator set and the mounting pad.







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