

Enidine by Design

Shock Isolator Double Acting Spring (SIDAS) to Protect Critical Shipboard Radar Equipment

Enidine Shock Isolation Application

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Product Overview

A major manufacturer of radar weapons consoles for Navy ships needed to protect sensitive electronic equipment from damage caused by the shock forces of a near miss-hit situation. Since the shock input levels in the application varied depending on the frequency of the deck on which the radar console was mounted, providing a solution was especially challenging. The fragility level of the equipment was 20 G's, with input accelerations ranging from 40-85 G's depending upon deck frequency.

The customer previously utilized highly pressurized liquid springs for shock attenuation. The liquid spring design is subject to constant high pressure (4,000 psi) necessary to achieve required preload forces, which drastically increases (15,000 psi) during dynamic operation.

These high pressure conditions propagate fluid leakage, which could leave critical defense systems unprotected, and do not provide adequate protection over the entire deck frequency range. A shock isolation product that could reliably attenuate shock over a range of four different deck frequencies was mandatory.



Product Solution

Enidine designed and developed the patented Shock Isolator Double Acting Spring (SIDAS) to satisfy the requirements of this application. The SIDAS design combines a preloaded mechanical spring to provide static preload forces with a low pressure hydraulic damper to provide dynamic damping forces. During normal shipboard operating conditions, the hydraulic damper of the SIDAS remains at atmospheric pressure while the preloaded mechanical spring provides static preload forces. During a shock event, the SIDAS experiences a pressurized condition (1500 psi) for a duration of less than 1 second. This low pressure situation ensures positive fluid sealing, thus providing long life shock attenuation over the range of all four deck frequencies.

Application Opportunity

The SIDAS design satisfied all of the customer's shock isolation requirements, extended the service life of its current shock isolation system, and assured critical defense system protection. In addition, it performed exceptionally well in extensive barge qualification testing per Mil-S-901D "Requirements for High Impact Shock Tests for Shipboard Machinery, Equipment and Systems". As a result, the liquid spring design was replaced by the Enidine SIDAS in this customer's radar console system.

Because of custom engineering capabilities and the use of proprietary computer modeling simulation programs, Enidine can develop solutions like the SIDAS to satisfy the stringent performance and environmental challenges of today's defense, commercial aviation and industrial applications.

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