SOFT-MOUNT CRANE RAIL SYSTEMS

Introduction

The ever growing demands by industry for increased automation and higher plant output rates resulted in the development of generation after generation of higher speed, heavier duty modern bridge cranes. While mechanical engineers concentrated their efforts on designing bigger and more efficient cranes, structural engineers maintained an equivalent pace in improving crane girder, support structure and foundation designs. Between these two fields of expertise lies the crane rail, which represents the hinge point of the installation. Traditional rail mounting methods have, in general, not kept pace with the ever increasing demands made on them.

The result can be that this relatively inexpensive area, in terms of initial outlay and design, can cause considerable operating expenses that manifest themselves in the short term by high wear rates in wheels, bearings, axles and rail breakage, with the associated down time, maintenance cost and high noise levels.

In the longer term, the impact and vibration transmitted to the girder structure and foundations can result in structural damage and possible girder failure due to excessive fatigue stressing.

Fatigue

The area of contact between a steel rail and the top flange of a crane girder can be as little as one percent of the projected area of the rail. Since both the rail and girder are stiff in compression, even heavy wheel loads will not substantially increase the contact area, and very large local stresses result. To compound this problem, these contact points are randomly distributed, leading to complex and indeterminate stress patterns in the supporting girder. Continuous movement and shock loads produced by the operations of the crane can and usually do result in fatigue and consequent damage to both the crane rail and the girder. The most common manifestation is cracking in the upper portion of the web.

Where rails are mounted on concrete, a similar rationale applies with resulting progressive disintegration of the concrete and loosening of the anchor bolts.

Crane Rail Mounting

Soft mounting crane rail systems have developed over 35 years in an effort to reduce the all too frequent problems associated with crane rail installations. Today's line of mounting pads and clips are sophisticated, proven and easy to install. They result in reduced mechanical wear, lower impact due to shock loading, less vibration and a quieter installation. These systems consist of steel reinforced, vulcanized, synthetic rubber pads and resilient clips designed specifically for the mounting of crane rails in light, medium or heavy duty applications.

Pads protect the installation by:

- Distributing and recentering the load
- Eliminating point contact
- Reducing impact, vibration and noise
- Absorbing relative motion between rail and girder
- Eliminating fretting of the top girder flange

Clips complement the pad by:

- Ensuring continuous and permanent contact between the rail, pad, and girder at all times
- Constraining the rail in the vertical and lateral planes while allowing controlled movement in the axial direction
- Allowing lateral adjustment during and after installation
- Performing consistently over many years without maintenance, loosening of the anchor bolts, or fatigue failure

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