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Investigation into Energy Regeneration of Hydraulic Elevators

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Abstract:

In the conventional valve controlled hydraulic elevator, when the cabin moves downwards, the entire potential energy of cabin is wasted and converted into fluid heat by throttling. Thus the energy consumption of a traditional hydraulic elevator is much higher with comparison to that of the traction elevator. To reduce the energy consumption and power installation requirements, energy-regenerative hydraulic elevators have been developed since 1997. Different methods of energy recovery were introduced for the new design of energy-regenerative system. Experimental studies were carried out to compare the energy consumption of different system designs of hydraulic elevator

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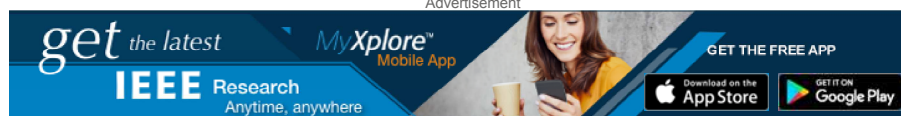
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I. Introduction

The hydraulic elevator, a typical mechatronic system with embedded controllers, is one of the most popular types of elevator in Europe and North America. However, from the environmental point of view especially energy-saving, the hydraulic elevator is facing the serious challenges for its large power installation and energy consumption compared with those of the normal traction elevator. Hence, the reduction of the power installation and energy consumption becomes the key focus of the industry.

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