

The Vertical Vibration Reduction Control System Mounted on the luxurious trains of JR East and JR West

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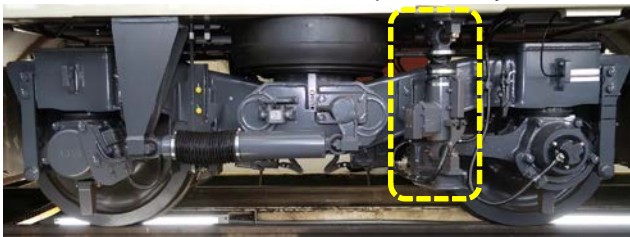
The “vibration reduction control system using variable vertical damper,” what we call vertical vibration reduction control system, jointly developed by Hitachi Automotive Systems, Ltd. and Railway Technical Research Institute (RTRI) has been mounted to the luxurious trains newly launched by JR East and JR West, “Train Suite Shiki-Shima”, and “Twilight Express Mizukaze.”



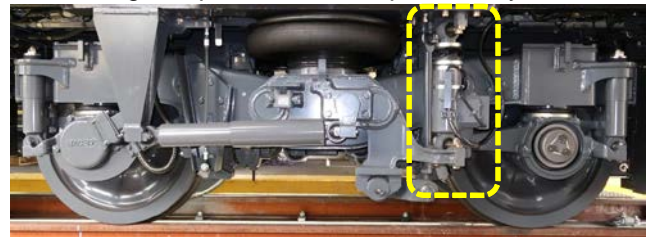
“Train Suite Shiki-Shima” provided by JR East



“Twilight Express Mizukaze” provided by JR West



Vertical vibration reduction control system of
“Train Suite Shiki-Shima”



Vertical vibration reduction control system of
“Twilight Express Mizukaze”

Fig Vertical vibration reduction control system mounted “Train Suite Shiki-Shima” and “Twilight Express Mizukaze”

The vertical vibration reduction control system was developed to reduce vertical vibration of running railway vehicles. This system has already been mounted on sightseeing express trains of JR Kyushu including “Ibusuki no Tamatebako” and “Yufuin no Mori” and has contributed to improving the ride comfort on these trains by reducing vertical vibration by up to 50%. “Seven Stars in Kyushu,” a luxurious train of JR Kyushu which started operation in 2013 has also been equipped with this system.

On May 1 and June 17 this year, luxurious trains of JR East and West, “Train Suite Shiki-Shima” and “Twilight Express Mizukaze” started commercial services. Following “Seven Stars in Kyushu,” this system has also been mounted on these two trains. Now all the luxurious trains in Japan have this system and their ride comfort is much higher than conventional passenger vehicles.

Overview of Vertical Vibration Reduction Control System

In this system, variable vertical dampers (vertical-direction hydraulic dampers capable of controlling damping force) and the secondary pneumatic suspensions are mounted on bogies in parallel. The dampers reduce vertical vibration by controlling the damping force so as to cancel vibration of carbody based according to acceleration measured by on-board (Fig. 1 and Fig. 2).

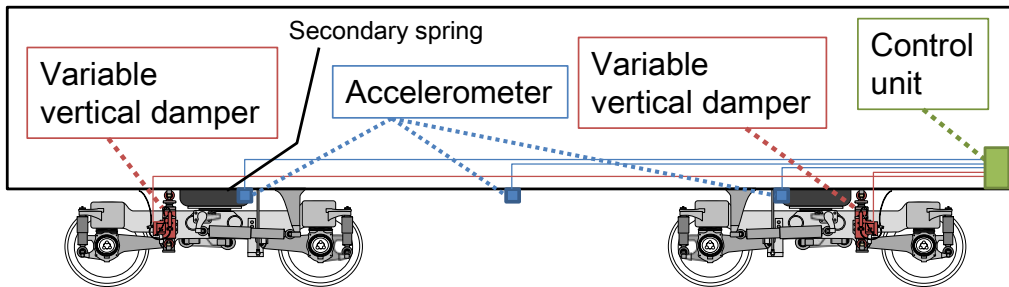


Fig.1 Structure of Vertical Vibration Reduction Control System

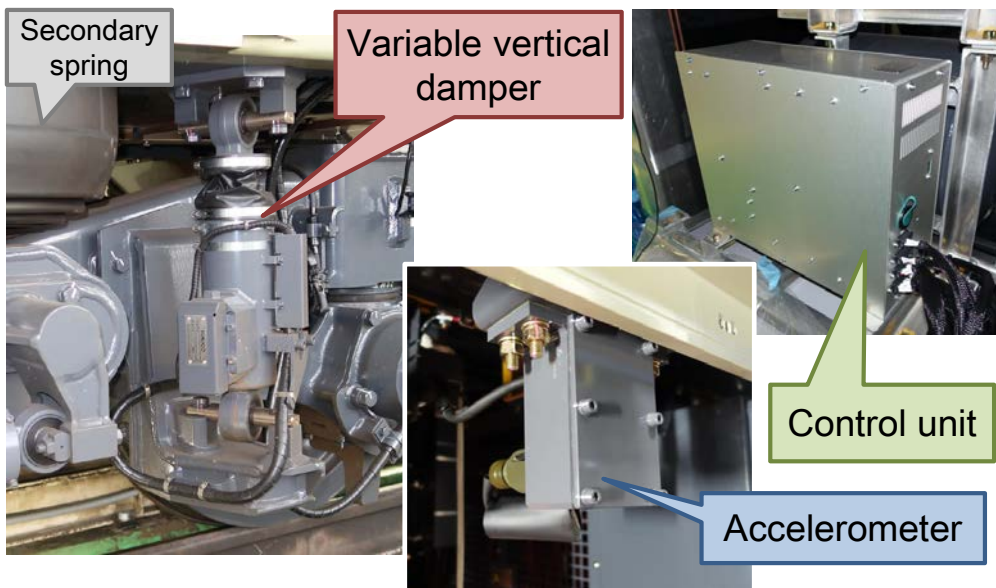


Fig.2 Variable vertical dampers mounted on vehicle, accelerometers and control unit