

For Immediate Release: August 3, 2023

PRESS RELEASE

IIT (ISM) Mechanical Engineering researchers develop improved hydraulic steering system for Load Haul Dump (LHD) vehicles used in mining operations; newly developed system besides being power efficient and cost effective is also in tune with the objective of Net Zero Emission.

At a time when there is renewed focus of energy conservation across the world in tune with the call for Net Zero emission by 2050, two faculty members of Mechanical Engineering Department of the institute have developed a hydraulic circuit system for Load Haul Dump (LHD) vehicles used in mining operations, that helps in ensuring energy conservation.

The newly developed system can also prove to be helpful during emergency situations like- pump failure to drive out the LHD vehicles to safer places.

The two researchers led by Prof Ajit Kumar, an Assistant Professor and Nirajan Kumar, Associate Professor have developed the new system in around two years as part of an institute funded project worth Rs 6 lakh, which began in 2019.

The system can be used commercially by mining equipment manufacturers, especially industries dealing with LHD vehicles manufacturing.

Notably, Load Haul Dump (LHD) vehicles are improvised front end loader developed for the toughest hard rock mining operation as they are extremely rugged, highly manoeuvrable and more productive.

Giving details, Prof Ajit Kumar, Principal Investigator of the project said, “In the traditional Hydraulic Circuit Arrangement of LHD vehicles, there is a separate hydraulic system for operation of Cable Reeling Drum (CRD) that requires an additional pump along with the couplers, thereby increasing the overall power requirement of the vehicles”

In the proposed design an integrated hydraulic circuit system for the LHD vehicles steering system and CRD Drive has been introduced to facilitate the simultaneous operations of vehicle’s steering system and CRD drive using a single power pack unit thus minimizing the overall power required for the vehicle.

Moreover, through there is no arrangement in the traditional LHD vehicles to steer during a state of emergency but in improvised design of LHD vehicles an accumulator is used in Hydraulic Steering Circuit that acts as a power assist unit (PAU) to account for the Vehicles Emergency operation, like during the state of pump failure.

Explaining the working of the accumulator, Prof Ajit Kumar said, “The accumulator flow can be utilized to steer the vehicle for a limited time and be brought to a safer location for trouble shooting”.

Divulging more details, Kumar said that the invention relates to an open circuit proportional directional valve controlled hydraulic power steering system coupled with a priority valve and an accumulator for Load Haul Dump (LHD) vehicles.



The invention for which patent application has already been filed is at present in laboratory stage and its field trail would be conducted soon.

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