

Heavy Vehicle Safety Chain of Responsibility Implications

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Abstract

Much has been discussed and enacted in regard chain of responsibility involving the loading, operation, scheduling, driver behaviour, driver fatigue and maintenance practices of heavy vehicles and road trauma. In comparison, hitherto, minimal attention has been devoted to chain of responsibility implications associated with heavy vehicle design, specification and detailing aspects and road trauma. This interaction is intensified due to the general adverse infrastructure standard (both sealed and unsealed), long haulage distances, the commonplace haulage of high centre of gravity loads and significant productivity pressure. Furthermore even greater attention must be devoted to correct specification and detailing should the vehicle be hauling combustible loads, stock grades, comprise a 'new generation' high productivity combination or be hauled by a short wheel base prime mover. In addition the alarming continual increase in road trauma generated by heavy rigid vehicles suggests chain of responsibility implications be applied to the widest extent possible.

One paramount componentry requiring careful specification, applicable to both rigid and articulated heavy vehicles, is the drive air suspension. In particular, the suspension must exhibit consistent, reliable behaviour, exhibit optimal traction and braking, optimal in service roll resistance and minimal frame rise and droop. In addition, the installed air suspension should generate minimal loading to the vehicle's chassis and drive line componentry and minimal vehicle vibrations and pitching. It is also desirable the drive suspension inflict minimal infrastructure damage. Fortunately simple relatively low cost, easily retrofitted modifications can be effected to convert existing adverse static load sharing suspensions to optimal dynamic inherently damped mean ride height single valve controlled air suspensions. An immediate advantage of the latter optimal air suspensions is that their damping characteristics are relatively invariant of the state of repair of the mechanical shock absorbers. The same strategically allays the findings of past RTA testing which revealed 60% of vehicle axles operate with mechanical shock absorbers out of specification.

To highlight the system advantages test results will be presented highlighting the traction and braking advantages exhibited by typical in service dynamic load sharing air suspensions on typical pavements both dry and wet.

Opportunity will also be taken to declare paramount vehicle operator feedback relating to the application of ABS, EBS, electronic stability control (ESC) and electronic roll protection (ERP) systems and software. Special note will be made to operator experience hauling on poor quality roads and for vehicles hauling high centre of gravity loads. This feedback unfortunately reveals these technologies are not the assumed convenient panacea for reducing heavy vehicle road trauma. In fact, the concoction of problems exhibited confirms the necessity to first correct the operational characteristics of standard air suspensions. So much so that the successful application and operation of the stated complex software based technology systems demands the drive suspension be upgraded to the state-of-the-art reliable analogue hardware based dynamic load sharing system.

Brief discussion will also be devoted to cabin thermal loading and other vehicle detail differences generated by operating essentially 'converted left hand' drive vehicles on local roads. Here it will be stressed the local heavy vehicle market is not sufficient in quantity to justify purpose supplied vehicle componentry for local RH drive operation. Purpose supplied componentry and engine component arrangements (in particular the exhaust manifold and exhaust duct routing (and

meticulous design, detailing and maintenance of same in combination with the cabin air conditioner) will yield paramount improvements to reducing (both thermal and vibration induced) driver fatigue. The significant reduction in driver fatigue will, in turn, reduce heavy vehicle road trauma.