

**Part one of a series of articles on brake adjustment**

By Daniel Judson

Unless root causes are understood, how will you make the simple corrections needed to reduce your exposure to the risks and liabilities associated with the trucking industry's most costly, most dangerous and most frequently cited defect?

Consider that since 1998, when the Commercial Vehicle Safety Alliance (CVSA) began conducting annual inspections, out-of-adjustment brakes have consistently topped the list as the number one safety defect, and that each year roughly one out of every eight vehicles inspected in the United States gets put out-of-service for non-compliant brake adjustment. The significance of these inspections is that because they are done randomly and in a variety of geographic locations, they provide a valuable "snapshot" of the entire truck population - - meaning that if every vehicle equipped with airbrakes was to be inspected today, we could expect that nearly one in every eight would be placed out-of-service for exceeding the 20 percent allowable safety threshold.

**Brake Adjustment Defects**

Why is it that today, more than a decade after the mandated use of automatic slack adjusters, improved braking technology, increased enforcement efforts and all the emphasis on highway safety, brake adjustment persists as the main defect; is estimated to be a contributing factor in at least 30 percent of all truck crash fatalities; and consistently has the highest rate of out-of-service violations?

If the answer seems to be elusive, it's because root causes are hidden in the last place you would suspect. And the reason they've escaped suspicion for so long is because they have been a subtle and almost integral part of the inspection and maintenance process - a process that has become flawed as the result of faulty assumptions and the ignorance that perpetuates them.

Therefore, rather than a general discussion of airbrake systems, our objective in this and subsequent articles will be to identify root causes by analyzing the process and detailing those aspects of the braking system pertinent to brake adjustment. This will necessarily lead us into examining the crucial role of drivers and technicians, and will include a review of airbrake basics, automatic slack adjusters and maintenance practices.

**The Role of Drivers and Technicians**

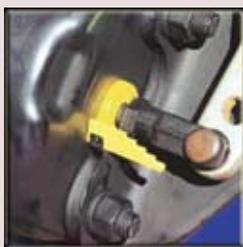
Whether you own or manage a fleet, it's important to recognize that the process you rely on to guard your assets ultimately relies on your "lines of defense", drivers and technicians; drivers to perform daily pre/post-trip inspections and technicians to perform periodically scheduled preventive maintenance inspections. The process therefore describes a continuous and on-going cycle of inspections that is dependent on the effectiveness of drivers and the proficiency of technicians.

In particular, as the primary 'line of defense', drivers are expected to inspect, identify and report defects, while technicians, the final 'line of defense', are expected to

inspect, identify and correct defects. As long as these basic requirements are being fulfilled, the process is effective. Conversely, when they are not being met, the process fails.

As fundamental as the understanding of this process and its requirements should be, when you attempt to find its practical application to the inspection and maintenance of brake adjustment, you will quickly discover that nowhere has the process been more routinely compromised or faulty assumptions more prevalent.

For example, with long intervals between scheduled PM inspections, it's obvious that for the process to be effective, it must rely on drivers to inspect, identify and report defects. But does it specify what kind of defects? Can the process distinguish between overt and covert defects? Does the process take into account that drivers performing pre-trip inspections are able to visually check every item except brake stroke? Does the process know that brake adjustments can only be checked by measuring the applied stroke of the pushrod - a stroke, it should be noted, that is physically limited and in which a mere fraction of an inch can be the difference between safe, effective braking and unsafe, ineffective braking?



**The Danger of Guesswork**

Ignoring these simple facts, the majority of fleets continue to operate under a long-held and faulty assumption that drivers are somehow able to determine the condition of brake adjustments by "feel" (pronounced: guesswork) when, as roadside inspections and every evidence to the contrary will testify, drivers are commonly unaware of dangerous and costly out-of-adjustment conditions.

The implications, of course, are great. Yet this is just an example of how one faulty assumption; that by simply not recognizing that there are two distinct classifications of defects and "lumping" all defects into one category has had far-reaching, costly and often disastrous results. So how do you strengthen your primary 'line of defense'?

The solution is simple; it is what the "Final Report" of The North American Brake Safety Conference recommends as "...the single most meaningful change that can be made to improve brake compliance" - the use of effective visual brake stroke indicators. By one simple change you can effectively reduce your costs, risks and liabilities while improving brake safety, maintenance and compliance.

In our next issue we will continue our examination of the process in which we will consider the role of technicians and will discuss automatic slack adjusters and maintenance practices.

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