Manually Adjusting Automatic Slack Adjusters is Dangerous Business

By Daniel Judson

Part Two of a series of articles on Brake Adjustment

Why is it that more than a decade after the mandated use of automatic slack adjusters, increased enforcement and all the emphasis on safety, brakes out-of-adjustment remains the Number One defect; is estimated to be a factor in at least 30 percent of all truck crash fatalities; and consistently has the highest rate of Out-Of-Service violations?

Although much has been written to address various aspects of airbrake safety, I believe the most critical aspect has been overlooked and remains largely neglected; the inspection and maintenance process.

In Part One of this series (*Transportation Quarterly, Jan. 2006*) we began to examine the crucial role of drivers and technicians and the "lines of defense" in the process. As a brief summary, we defined "the process" as that continuous cycle of safety and maintenance inspections fleets rely on to safeguard their people and assets. (This is based on the expectation that, between drivers performing daily vehicle inspections and technicians performing periodically scheduled PM inspections, any safety or maintenance defects would be identified and corrected.)

The problem is that while the process provides an effective safeguard against most defects, it has been ineffective against brake adjustment defects. But because this process is so widely used and trusted, many fleets would never suspect that their 'lines of defense' are the major contributors to the problem. Unaware of this, and operating under the assumption that the process is effective, fleets are always exposed to higher costs, risks and liabilities.

First Line of Defense

As noted in the first article, for the process to be effective, each 'line of defense' must fulfill three basic requirements. As the primary 'line of defense', drivers are required to inspect, identify and report defects, while technicians, the final 'line of defense', are required to inspect, identify and correct defects.

When we tried to find these requirements applied to the primary 'line of defense' in the first article, we saw that drivers performing daily vehicle inspections are able to visually inspect every item except brake stroke. And yet, despite evidence showing drivers to be unaware of existing brake defects, many fleets continue to operate under the faulty assumption that drivers are somehow able to determine the condition of brake adjustment by "feel". Unable to properly inspect, identify or report defects, the process is instantly compromised and the primary 'line of defense' turns out to be no defense at all.

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– Daniel Judson, Brake Sentry.

With the final 'line of defense' remaining, we need to ask if technicians are fulfilling the three basic requirements. Apart from some rare exceptions, the answer is no. Although many technicians are proficient with foundation brakes, few have a proper understanding of airbrake systems in general or the factors affecting the function of automatic brake adjusters in particular. And it's not just technicians. Widespread ignorance and confusion regarding the proper inspection and maintenance of automatic slack adjusters exists at every level in the industry and is perpetuated in the policies and procedures of many fleet maintenance operations that are using a system that's a carry-over from the days of manual slack adjusters.

NTSB Findings

A recent report of an accident investigation issued by the National Transportation Safety Board (NTSB) on February 7, 2006 brings to light the consequences of improper maintenance on automatic slack adjusters.

The report tells of an accident where a truck driver was unable to stop his truck on a steep downgrade. After hitting four passenger cars stopped at an intersection, the truck continued through the intersection, through a gas station parking lot and past a set of railroad tracks before coming to rest about three hundred feet beyond the intersection. Although the truck driver was not injured, the crash resulted in three pedestrian injuries and two fatalities, including the driver and an 11-year-old occupant of a passenger car.

Contributing to the accident was the misdiagnosis of the truck's underlying brake problems by mechanics involved with the truck's maintenance, a lack of accurate information about automatic slack adjusters, and inadequate warnings about the safety problems caused by manually adjusting them.

As a result of this investigation, NTSB warns that "…manually adjusting automatic slack adjusters is dangerous and should not be done, except during installation or in an emergency to move the vehicle to a repair facility, because manual adjustment of this brake component (1) fails to address the true reason why the brakes are not maintaining adjustment, giving the operator a false sense of security about the effectiveness of the brakes, which are likely to go out of adjustment again soon, and (2) causes abnormal wear to the internal adjusting mechanism for most automatic slack adjusters, which may lead to failure of this brake component."

If out-of-adjustment brake defects are undetected by drivers, they are uncorrected by technicians for the same reason. In both cases, the basic requirements are not

being fulfilled and everything is relying on assumptions. Instead of inspecting the 'applied stroke' of the pushrod to identify defects, the majority of technicians are performing manual adjustments to automatic slack adjusters. Instead of correcting, they are adjusting. By giving the appearance of maintenance correction, this practice actually conceals existing defects, returns defective units to service and effectively defeats the purpose of PM inspections.

In the end, the process can be likened to a football team with a strong defense, yet has one opponent that can always get past its defensive lines. And when you examine why, you discover that the front line is playing blindfolded and the secondaries are playing "two hand touch" in a game of tackle football.

Our next issue will get into more detail about airbrakes, automatic slack adjusters and the factors affecting their proper function.

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Blood Tests and Oil Analysis… What's The Difference?

By Brett Winberg and Jim Hutchek

In most cases the average human has their blood sampled at least once a year. Why do we sample our blood? A blood test is used to determine the amount of any given substance in the blood and to identify abnormally high or low levels that may affect normal body functions and the ability to maintain optimal health.

When we sample our blood we see things internally that are not noticed in everyday life, and this information is very useful to our doctors and health practitioners for the proper diagnosis of many conditions and/or diseases. A sample of blood will usually test for the following:

* Glucose Count
* Erythrocyte sedimentation rate
* HIV Testing
* Protein Electrophoresis
* Electrolytes
* Liver Enzymes

What does this have to do with this article? In comparison… the importance of testing your blood to the importance of testing the oil in your Over the Road Truck is paramount of the trucks reliability for longer component life and engine life. Engines, gear boxes, transmissions, pumps, etc; all have unique properties of which an oil sample, when properly analyzed, will give you, the knowledge you need to properly diagnose your trucks condition.

When discussing oil analysis with mechanics, truck drivers and equipment operators, we have observed a common misunderstanding about why we oil sample our equipment. The most common belief is that we are looking at the condition of the oil, but in reality we are more commonly looking at the condition of the component we are sampling. Also we are determining if a downtime failure is in the future as you are traveling across the states with a large load of produce that is on a deadline schedule.

Correct Oil Sampling

There is so much more value when doing the correct type of oil sample on your truck and components. For example, every time an engine or component runs, the oil picks up metal from moving parts and contaminants such as dirt, water, fuel, and antifreeze. The fluid sampling process checks the oil quality and detects metals and contaminants, revealing the source of current and potential engine problems, just like your blood sample would. With over twenty-five given tests performed on each sample, you can be assured that every engine or component properly tested receives a thorough checkup. Acting upon this information is really what makes the difference to reliability and component life.

What is Oil Analysis, is it a test for oil only?

Oil analysis involves sampling and analyzing oil for various properties and materials to monitor wear and contamination in an engine, transmission or hydraulic system. Sampling and analyzing on a regular basis establishes a baseline of normal wear and can help indicate when abnormal wear or contamination is occurring.

Oil analysis works like this; oil that has been inside any moving mechanical apparatus for a period of time reflects the exact condition of that assembly. Oil is in contact with engine or mechanical components as wear metallic trace particles enter the oil. These particles are so small they remain in suspension. Many products of the combustion process also will become trapped in the circulating oil. The oil becomes a working history of the machine.

Particles caused by normal wear and operation will mix with the oil. Any externally caused contamination also enters the oil. By identifying and measuring these impurities, you get an indication of the rate of wear and of any excessive contamination. An oil analysis also will suggest methods to reduce accelerated wear and contamination. The typical oil analysis tests for the presence of a number of different materials to determine sources of wear, find dirt and other contamination, and even check for the use of appropriate lubricants.

Oil analysis can detect:

Wear Metals – Pistons, Rings, Cylinders, Cams, Bearings, Bushings, Gears, and more.

Silicon – Time to check the PCV (Positive Crankcase Ventilation) Filter, Check air filter, and check for recent gasket changes.

Oxidation – Correlates to sludge and varnish formation

Coolant Leaks – Major cause of engine failure, found from the trace elements of Sodium, Potassium, and Silicon. Glycol and or water do not need to be present or at abnormal levels on your oil analysis report to indicate a coolant leak.