Single Wide Tires for Log Trucks

Jeff Wimer¹ and John Sessions²

Abstract

Single wide tires for log trucks offer potential savings in fuel through decreased rolling resistance and increased log volume per load through reduced tire and wheel weights. Their use is steadily increasing by on-highway fleets. We provide an overview of the opportunities and challenges for introducing single wide tires for logging.

Keywords: Log hauling, truck fuel economy, transportation cost efficiency

Introduction

On July, 20, 1964, Weyerhaeuser Company (Ekse, 1965) at their Longview (Washington) Tree Farm, tested single wide tires on off-highway logging trucks on gravel logging roads. The purpose was to test the hypothesis that wide tires (23 x 23.5) require less rock than dual tires (12 x 24), due to their lower dynamic loading on the road bed. The study concluded that for their conditions, use of wide tires would save 15-20 percent on rock depth. Interestingly, there was a side benefit of reported savings of about 10 percent in fuel consumption and there was a lower frequency of flat tires. But who cared? Diesel was about $.20 per gallon, tires were the largest cost center, followed by labor with fuel a distant fourth.

Fast forward 40 years. The tire manufacturers are back with a new and improved single wide tire design (Figure 1) that provides claims of up to a 10% reduction of fuel usage. With On-highway diesel periodically topping $4.00 per gallon, fuel is now the largest cost center labor is second, and tires are fourth. With some log trucks using $60,000 per year in fuel and hauling longer distances to deliver product is it time to revisit the application of single wide tires in log truck use?

Fuel Savings

Savings in fuel from reduced rolling resistance depends upon tread depth and the number of single wide tires on the truck. Claims of fuel savings vary from 6 – 10%. These claims come from widely different sources including EPA (Bachman et al., 2005), SAE supported literature (Fitch, 1994), and truck maintenance records from a local log-hauling cooperator who has been running wide tires for several years. With a truck hauling 80,000 miles per year, diesel at $4.00 per gallon and the truck currently...

¹ Department of Forest Engineering, Resources and Management. Oregon State University Corvallis, Oregon 9733. Jeff.wimer@oregonstate.edu
² Department of Forest Engineering, Resources and Management. Oregon State University Corvallis, Oregon 9733. john.sessions@oregonstate.edu
averaging 5 mpg, a 6% savings equates to a savings of $3840 per year. A 10% savings equals $6400 in savings. Low rolling resistance single wide tires are identified as an important contributor to the EPA SmartWay Technologies program (EPA 2012)

![Figure 1. Single wide tires on a log truck tractor.](image)

**Weight Reduction**

The reduction in truck tare weight is about 150 pounds per single wide tire and rim. Trucks with 8 single wide tires have a weight reduction of about 1200 lbs. Operators who are paid on a per ton or per mbf basis could see annual revenue increase of approximately 2 - 3%. With operations receiving $750 per day and operating 200 days per year this revenue increase equates to a $3000 - $4500 increase in revenue due to increased load.

**Tire Life and Maintenance**

The largest influence on tread life, other than the operator, is the percentage of unpaved road miles. One cooperator showed tire life for single wide tires in the range of 30,000 – 80,000 miles depending on percentage of paved miles. This is similar to tire life for conventional log truck tire applications. Sidewalls have not been an issue in the current single-wide tire design. Our cooperator reported no sidewall failures. All flat tires reported were because of face related injury. Flat tires for our cooperator occurred about once every 3 months of operation per truck. One major problem with single wide flats, where the tire goes completely flat, is that the truck is down until roadside assistance is available. With conventional tires a driver may be able “to limp” an empty truck to town for flat repair. This additional downtime could result in the loss of loads as well as the expense of a road call. Tire pressure monitors would be important to detect leaks to prevent roadside flats so that tire maintenance could take place at the shop rather than in the field.
Tire Performance

Drivers reported that the ride for single-wide tires was not significantly different that of a truck equipped with conventional tires. One exception was where the operation was on muddy roads. With the single-wide design there is no central cavity between the tires to help disperse the mud and the mud accumulates in front of the tire. This, in effect, causes the mud to dam up in front of the tire thereby reducing traction. Reducing tire pressure might increase traction, but tire load ratings would need to be approved by the tire manufacturer and traction data for wide tires at reduced pressures is not available. Wide tires can be reportedly recapped two to three times if the carcass is not damaged.

Retrofitting Existing Trucks

Retrofitting an existing truck with single wide tires does not require any changes to the axle hub assembly. The single-wide rims mount onto existing stud configurations. Several truck manufacturers have a single wide option when ordering new trucks. A single wide tire costs approximately the same as two conventional tires. The fleet price for a new truck and trailer with wide tires is reportedly slightly less than with conventional tires. Retrofitting an existing truck will require an investment in rims. There is some evidence that on-highway trucks with wide tires have a higher resale price that with conventional tires.

Putting It All Together

Are savings in fuel and reduced weight enough to justify the use of super singles in an unpaved road hauling application? Problems may arise in traction, when hauling in mud and snow or with flat tires and cap-ability of the tires. Early reports from cooperators, who run a large percentage of on-highway miles, show some promising results.

An option to running wide tires on the truck and tractor is to run wide tires on the trailer only. Trailer tires do not need the aggressive tread designs that traction tires require. Tread depth can be less, although tire life to retread will be shorter. At least one chip van manufacturer is equipping trailers with single wide tires for forest biomass recovery.

We have developed a prototype spreadsheet program to assist transport managers in comparing the cost efficiency of single wide to dual tires

References Cited


EPA, 2011.  
