LOGGING INDUSTRY RESEARCH ASSOCIATION

SUSPENSION OPTIONS FOR 6x4 LOGGING TRUCKS

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ABSTRACT

The new weights and dimensions legislation allows 6 x 4 trucks with tag axles that have completely load sharing suspension, to operate at 42 tonnes gross on highway.

Operators of 6 x 4 trucks and tag axles, where the suspension is not load sharing, are faced with the dilemma of removing the tag axle and increasing productivity or leaving the axle on the unit and reducing road user charges.

This report is an economic comparison of the three suspension options available to operators of 6 x 4 trucks. The report compares the economic performance of each of the following over five years :

- *A 6 x 4 truck and tag axle with compatible air bag suspension (42 tonnes GVW).*
- *A 6 x 4 truck and tag axle with non-compatible suspension (39 tonnes GVW)*
- *A 6 x 4 truck with no tag axle (42 tonnes GVW)*

The results show that where the suspension is not load sharing, the removal of the tag axle is the best option.

INTRODUCTION

The introduction of the new weights and dimensions legislation in 1989 has had a major effect on the efficiency of road transport in New Zealand.

Some of the more common log transport configurations such as Bailey Bridge trailers with either self-steering bogies or castoring axles have had their productivity cut by up to 6%. Other configurations, such as 8 x 4 or 6 x 4 trucks have had their productivity greatly enhanced and in most cases this increase has been achieved without any increase in tare weight or alteration to the equipment presently being used.

Log transport differs from other forms of road transport in that the equipment used must be economic in terms of payload when running on highway but must also be economic in terms of repair and maintenance costs when running off highway. The "in bush" part of the log transport cycle is where repair and maintenance costs are critical. Roading conditions are generally poor and chassis, suspension and driveline components are punished.

Prior to the introduction of the new weights and dimensions legislation, 6 x 4 trucks and 3 axle trailers were used extensively for

transporting both short and long logs. Some operators realised that the addition of a tag axle on a 6 x 4 truck meant an increase of approximately 800kg in tare weight and a subsequent reduction in payload, but resulted in an approximate 40% reduction in road tax. The maximum gross vehicle operating weight of a 6 x 4 truck was not affected through the addition of the tag axle and remained at 39 tonnes.

Since the introduction of the new weights and dimensions legislation, 6 x 4 trucks and 3 or 4 axle trailers can achieve 42 tonnes gross. However, 6 x 4 trucks with tag axles, where the suspension medium is not deemed to be completely load sharing, are limited to 39 tonnes.

ECONOMIC COMPARISON:

This report is an economic comparison over a five year period of the three options available to operators of 6 x 4 trucks:

1. A 6 x 4 truck and tag axle with compatible air bag suspension (42 tonnes GVW)
2. A 6 x 4 truck and tag axle with non-compatible suspension (39 tonnes GVW)
3. A 6 x 4 truck with no tag axle (42 tonnes GVW)

Certain factors were kept constant in comparing the cash flows (Table 1).

Table 1 - Constant Factors for Costing Calculations

Transport Rate	*(cents/tonne km)*	*14.5*
Own Investment	*($)*	*75,000*
Loan Term	*(years)*	*5*
Interest Rate	*(%)*	*16.5*
Driver's Wages	*($)*	*32,000*
Average Haul Distance	*(km)*	*95*
Productive Days per Annum	*(days)*	*223*
% of haul distance on highway	*(%)*	*80*
% of haul distance on seal	*(%)*	*85*
Total distance travelled annually	*(km)*	*130,455*

Table 2 : Input Data for Costing Calculations

		6x4 + tag Load sharing suspension	*6x4 + tag Non-load sharing suspension*	*6x4 No tag axle*
Purchase Price Truck	*($)*	*241,000*	*244,000*	*235,000*
Purchase Price Trailer	*($)*	*38,000*	*38,000*	*38,000*
Fuel Consumption	*(l/100 km)*	*57*	*53*	*55.5*
Road User Charges Truck	*($/km)*	*.24*	*.21*	*.37*
Road User Charges Trailer	*($/km)*	*.31*	*.27*	*.31*
Repairs and Maintenance	*($/km)*	*.19*	*.17*	*.21*
Tare Weight Truck	*(kg)*	*10,160*	*10,310*	*9,360*
Tare Weight Trailer	*(kg)*	*4,800*	*4,800*	*4,800*
Payload	*(kg)*	*28,090*	*25,840*	*28,890*