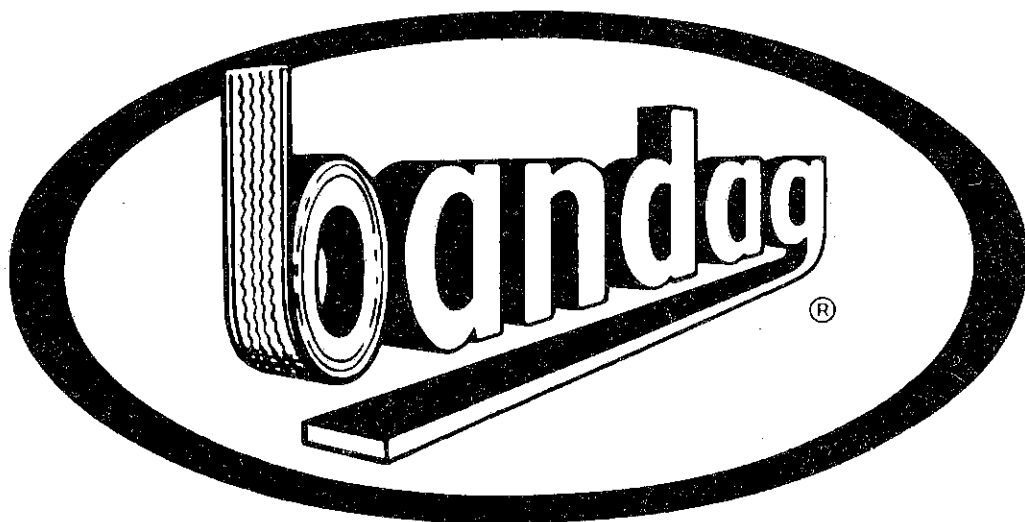


TYRE RETREADING



“World’s Most Trusted Retread”

" THE CHOICE IS YOURS "

BY: GARY G. KING, MANAGER, TRAINING AND DEVELOPMENT CENTRE,
BANDAG INDUSTRIES NEW ZEALAND LIMITED.

SYNOPSIS

This paper is primarily a review of the alternatives offered to the transport and contracting sector within the tyre industry in New Zealand.

The Economics Division of the Ministry of Transport shows that tyres are fourth on the list of running costs.

So it is vital that the selection of your first set of new tyres is the right one.

It is also just as important that you make the right decision when you come to retreading and repairing tyres - because no fleet operators in New Zealand can afford to continually replace with new tyres.

Make sure that you have the right tyre for the right job. It is therefore essential that the tread pattern is the correct one for your particular type of fleet operation.

If your tyre casing is not returning you a minimum of 2.25 treads per casing then you are not going to break even on your original investment.

You will be shown that there is a difference in retreading processes - both in the method and the cost.

But in the final analysis you will be told "The Choice is Yours".

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1. INTRODUCTION

In the modern truck tyre of today the major components are synthetic materials many of which are petroleum based.

The price of oil, the fluctuations of the New Zealand dollar and necessity of importing steel belted truck tyres means the cost of tyres is substantial. The viability of manufacturing steel belted radial truck tyres in New Zealand is cost prohibitive due to the initial plant cost and the small New Zealand market.

Truck operators in New Zealand have available many brands and types of tyres, both locally produced bias ply and imported steel radials.

The technical expertise of radial construction varies greatly around the world and consequently so does the quality. The quality of a tyre is going to reflect on the operator's annual running costs.

Cost conscious operators have already realised that the less expensive radials do not produce a casing capable of accepting multiple retreads and giving lowest cost per kilometre over the life of the casing. Because of these cost factors, it is not viable to run a fleet on new tyres.

Therefore it becomes necessary to select a retread and repair system that is going to give the operator the lowest cost per kilometre.

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Let us look at retreading and repair. Today's technology allows the operator to purchase a retread on a quality casing that will perform as well as a new tyre, dependent on the retread system selected. Good tyre management suggests that where practical if the new tyre application is for highway use then the tyre should be retreaded for highway use. If the new tyre application is for on/off the road use then the tyre should be retreaded for on/off the road use.

That's established the basics - the right quality tyre casing for the right job.

2. TYRE PERFORMANCE

What does the operator expect his new tyre to provide? He wants good tyre performance at the lowest cost per kilometre and driver acceptance.

What does the operator expect from his retread tyre? He expects good performance at the lowest cost per kilometre, driver acceptance in both handling and safety. He also expects as little downtime as possible.

In fact the only difference between the new tyre and the retread is the operator expects the casing to continue to perform over many retreads because this represents 80% of his original tyre investment.

Early methods of retreading were regarded as the poor relation to the purchase of a new tyre and different retread and repair

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methods resulted in varying quality and performance.

Even today, some retreading processes lack consistent quality in raw materials, methods and end product.

For instance too high vulcanising temperatures during retreading will affect casing life and further retreadability and repair.

3. ALTERNATIVES

So what are the alternatives? Does the transport operator ignore retreading altogether and stay with new tyres? No. This would be inefficient use of company capital.

Figures presented by the economics division of the Ministry of Transport (1), show that tyres ran in fourth place to road user charges, fuel, repairs and maintenance as the most expensive on-going annual costs.

Study these running costs which the fleet operator can expect to meet, based on the most recent figures from the Ministry of Transport:

3.1 Estimated Cost of Operating a Typical Diesel Artic Flat

Deck Truck in New Zealand:

Gross weight: 45000 KG

ITEM OF EXPENDITURE 40,000 KM

Running costs \$

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Fuel	10,225.80
Oil	162.52
Tyres and tubes	5,936.94
Repairs and Maintenance	10,063.00
Depreciation	9,198.23
Road User charges	<u>16,708.40</u>
TOTAL	52,294.88
	=====

Example:3.2 Operation of a 14 wheeler articulated vehicle:

Running on new tyres 40,000 KM = \$9562 (based on average new tyre price \$683)

Running on retreads 40,000 KM = \$3220 (based on \$230 per retread)

Savings to run this vehicle on retreads = \$6342

HOW MANY VEHICLES ARE IN YOUR FLEET?

The savings on any small or large vehicle fleet are obvious and much too high for the operator to ignore.

The key then to a successful and cost saving repair and retreading programme is to start with a good tyre that is capable, quality wise, of being retreaded, maintaining that tyre through its original tread life with the full intention of retreading it as many times as possible and selecting a tread pattern that suits the casing condition, and the truck's operating conditions.

It is important that the operator should be, if not already, regularly reviewing the cost of running his tyres.

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4. TECHNICAL

The benefits of a retreading programme have been explained. To ensure maximum benefits are obtained from that retread programme, it is important for the operator to have a basic understanding of what should happen to his tyre casing during the retread process.

Why? Because the extended life of the casing and the tread depends on the technology, equipment and materials and methods used by the retreader.

Procedures practised by Bandag worldwide are recognised as the most thorough and proven in the retreading industry.

The procedures are based around the total control over all equipment, products and materials and the bonding of a repair and precured tread to a properly prepared tyre casing at a low temperature.

There are three basic retreading methods available to the transport operator:

- a) Conventional hot cap which utilises high temperatures and pressure.
- b) Precured treads utilising high temperature.
- c) Precured treads utilising low temperature.

Whatever the system, the tyre casing will pass through the following stages of repair and retreading:

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- a) Inspection
- b) Casing preparation
- c) Building
- d) Curing

The title of this paper is "THE CHOICE IS YOURS."

In order to assist the operator in this choice study each stage briefly:

4.1 Inspection:

The objective is for the inspector to determine whether the casing will remain in safe condition giving ultimate performance during the life of the retread and/or repair.

The tread pattern must be complimentary to the current condition of the casing.

Inspection standards must be maintained to ensure performance and safety, because the speed, load and torque of vehicles has increased dramatically.

4.2 Casing Preparation:

Buffing:

The best textured surface for a high adhesion value should be to Rubber Manufacturers Association grade 3 (RMA 3) specifications.

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- a) To obtain the correct profile, the buff must have the ability to control the radius, inflate the tyre and set the beads at the running rim width of the vehicle to which the tyre will be fitted. Not all retreaders have or use this system of controlled radius buffing.
- b) The tyre casing must be shoulder trimmed to accept the correct tread width recommended by new tyre companies, eg. Yokohama, Bridgestone, Michelin, Goodyear.

These factors will give the truck operator maximum tread to casing bond, maximum footprint for traction, a well balanced tyre for driver comfort and low vehicle maintenance to give ultimate tyre performance.

4.3 Repair and Tyre Reinforcements:

The object of repairing tyres is to replace lost strength caused by damage to the body plies of the tyre casing, so that the original casing strength is maintained ensuring further retreading of the casing.

The construction of the steel radial tyres allows for substantial repairs to be made in both the tread and sidewall area compared to its bias ply counterpart.

All repair materials must be compatible with all other cements and rubber compounds used by the retreader and tyre manufacturer.

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4.4 Building:

There are two methods of building tyres:

- a) Form a platform of uncured rubber using camelback extrusion or the orbitread system.
- b) Replace with a preformed precured tread which has superior puncture resistant and wear qualities.

4.5 Curing:

The object of curing is to give maximum bond between tyre casing and replacement tread. The two methods are:

- a) Using rigid moulds requiring high temperature curing, which also distorts the tyre casings.
- b) Using flexible rubber envelopes which allow tyre casings to maintain shape and which are cured in a low temperature Autoclave.

Curing temperatures fall into two categories, high and low. The temperature is considered to be high when it exceeds 265 degrees F (130 C) which is considered to be the critical temperature at which adhesion or bond between rubber and cord body or steel in the tyre casing begin to deteriorate.

Normal running temperature (E. WAGNER(2))

A 10.00 x 20 tyre correctly loaded, correctly inflated with ambient temperature of 78 degrees F (25 C):

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Bias ply 175 F (79 C) to 195 F (91 C) approx.

Radial 155 F (68 C) to 175 F (79 C) "

Adhesion to cord/steel breakdown 265 degrees F (130 C).

This illustrates the importance of the low temperature curing system.

5. CONCLUSION

For the truck operator to reduce his tyre running costs, he must:

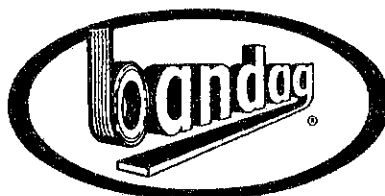
- a) Purchase a quality tyre.
- b) Purchase the right type of tyre for the right job.
- c) Ensure tyres are maintained regularly, especially inflation pressures.
- d) Only consider a retread and repair system that not only has complete control over all product and materials, but uses a system that will not subject the tyre casing to retread and repair procedures which will be detrimental to the life of the tyre casing.

Tyre costs are controllable :

THE CHOICE IS YOURS

Economics Division, Ministry of Transport, Truck Operating Costs, 1984.

WAGNER E, Retreading Journal, American Retreaders' Association.



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