LOGGING INDUSTRY RESEARCH ORGANISATION

P.O. Box 147,
ROTORUA,
New Zealand.
Telephone: 07-348-7168
Facsimile: 07-346-2886

TECHNICAL NOTE TN-18

THE M.A.N. 8X8 TRUCK

BACKGROUND

Off-road logging trucks and forwarders are often used for second stage hauling on roads or tracks not suitable for conventional on-highway trucks. The main reasons for using off-highway carriers are to reduce costs and site disturbance associated with forming roads of suitable standard for conventional on-highway trucks.

With the expansion of the forest resource into smaller privately-owned woodlots, which generally lack the quality of roading infrastructure seen in the more established logging areas, the need for all terrain logging trucks is likely to increase.

Figure 1 - The M.A.N. 8x8 truck

The M.A.N. truck (Figure 1) is owned by Whangarei cartage contractor Alan Campbell. Alan has owned the truck for two years, working regularly for Rayonier New Zealand Limited in two staging and road lining operations. The M.A.N. is ex-U.S. Army, a purpose-built off-road truck designed for tank recovery. Because of its eight wheel drive and fully lockable differentials, the truck is capable of negotiating untracked terrain and climbing grades of up to 1:3.

SPECIFICATIONS

The M.A.N. truck is powered by a 400 horse power V10 M.A.N. motor. Power is applied to all eight wheels through a ZF eight-speed transmission, with a ZF torque converter (with a 2:1 reduction). The transfer case is also ZF. The M.A.N. runs hub reduction differentials, which can all be cross locked.

The truck chassis is of rigid box section construction, on independent coil springs. Tyres are Michelin 16.00 R20 (XL)'s running at 50 p.s.i.. Braking on the two rear axles is full air, the front two axles have air over hydraulic brakes. Additional retardation is provided by the engine exhaust brake.

The truck is fitted with two bolsters with fixed side arms, and is capable of carting up to 9 m logs. If it is necessary to cart log lengths in excess of 9 m, the logs would have to be carted as long logs with the rear end of the logs supported on a logging jinker. The rear bolster on the truck would need to be mounted on a bolster bed and shifted forward in the same manner as highway convertible trucks. Where the logging system allows it, a two axle trailer can also be used to increase the short log

payloads. Unladen, the truck weighs 15 tonnes.

The M.A.N. is left hand drive, and not licensed for on-highway use. This requires that a transporter must be used when shifting between forest areas on public roads. On conventional haul roads, the truck is capable of a maximum speed of approximately 90 km/hr.

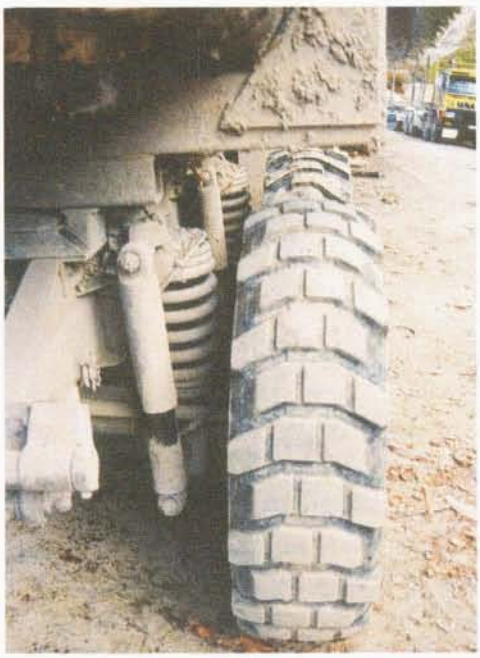

Figure 2 - Independent coil springs

Having a M.A.N./ZF drive-train, parts for the truck are easily sourced. Over the two years of operation, mechanical breakdowns have been minimal.

TWO STAGING OPERATION

The truck was observed for two days working at Moerewa Station, north of Whangarei. The truck was two staging logs from three ground-based crews, downhill to a transfer yard.

The average haul distance was 3.8 km (range 3.4 km to 4.3 km). The two staging road between the logging area and the transfer yard was an earth road, in places supported by corduroy. While providing a firm base when dry, the silty-clay soils can quickly become pugged and slippery when wet. The maximum grade of the two stage road was 1:4 over distances of up to 120 m. The skid sites were easily accessible under wet conditions, with the main factor controlling continuation of operation being the downhill haul when loaded.

At the skid sites, logs were loaded on the M.A.N. using A-Series Bell Ultralogger's and were unloaded at the transfer yard by a Clark 45C rubber-tyred loader, which also loaded the on-highway trucks.

Average cycle time for the M.A.N. was 53 minutes (n=26). The average unloaded uphill travel time was 11 minutes (average 21 km/hr), and the average loaded downhill time was 16 minutes (14 km/hr). Loading and unloading times were typically eight to 12 minutes each. Payloads ranged from approximately 11 tonnes for 3.7 m logs, to 17 tonnes for 7.1 m logs. For longer log payloads, the limiting factor appears to be load height, affecting vehicle stability. The manufacturer's gross weight allows for a 20 tonne payload.

The truck was easily capable of transporting 200 tonnes per working day (approximately 12 hours), although maximum daily tonnage was limited by the poor availability of the rubber-tyred loader at the transfer yard. Diesel usage for the operation was approximately 100 litres per day.

CONCLUSIONS

The M.A.N. has proved to be a versatile two staging vehicle because of its combined gradeability and power. Thus, this truck has the potential to reduce harvesting costs for many of our small forests and woodlots.

For further information, contact LIRO.

Shane McMahon and Neil Wylie,
Researchers

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