A Remarkable Two-tonner.

The S.D. Freighter, Specially Designed on Entirely Unconventional Lines to Meet Certain Phases of Town Transport

MOTOR
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SHELVOKE AND DREWRY Ltd.

Letchworth, Herts

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The S.D. Freighter can certainly claim to have originated an entirely new type of road vehicle. It takes its initials from its makers, Messrs. Shelvoke and Drewry Ltd., of Letchworth, who Christened it the "Freighter" on the grounds that the new type is to the 3 ton or 5 ton motor wagon what the freighter is to the liner. In its conditions and requirements road traffic varies so widely that development is pointing more and more towards specialised types, and, recognising this, the aim of the Freighter's originators has been the production of a vehicle easily handled in traffic by the most unskilled to the finest speed gradations, and lending itself in general to improved loading facilities.

The very original S.D. Freighter, though in appearance possessing much in common with the works truck, is designed for road work at speeds up to 14 m.p.h., and its careful springing and weight distribution afford exceptionally easy riding, even over 'pot holey' roads

On Unconventional Lines.

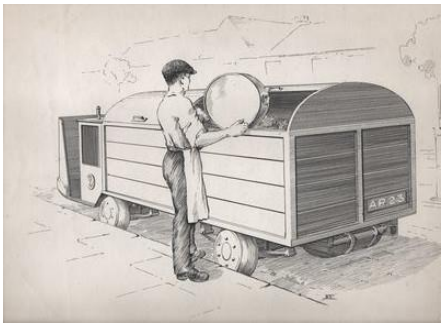
The result has been something which, though introducing no altogether new or untried mechanical principles, is entirely different from accepted practice. At first appearance the newcomer impresses one as very like a large electric works or yard truck, but in actuality it is driven not electrically, but by petrol, though it certainly possesses great possibilities for work in yards or on wharves, it is essentially a road vehicle, and as such promises to be remarkably efficient to judge by a short trial which we recently experienced in the vicinity of the maker's factory.

At the front, behind the dash, is a casing recessed towards the centre for the driver's seat (see drawing) At either side, projecting through the substantial aluminium top of the casing is a handle like that of the controller on an electric vehicle; that to the right controls the steering; that to the left the speed-changing , braking and engine control, while additional braking is afforded by a pedal operating in drums on the front wheels, for all four wheels are braked.

Inside the casing to the driver's right the four cylinder engine lies across the frame and drives to the three-speed gear box, which is inside the casing at the left side. As all the first stages of the transmission thus lie across the frame, the gear box also contains a bevel gear, by which its final shaft transmits power to the propeller that drives the back axle through worm transmission. Since the gear box is to the near side of the chassis, the crown wheel of the back axle is also to one side, this the crown wheel casing, being fairly close to one of the road wheels, affects clearance far less than if it was in mid axle.

The Record for Handiness.

No great propeller shaft length is necessary, as the wheelbase is only 6ft. 6in. (with a track of 4ft. 1in.) This makes for extreme handiness, but without entailing the usual concomitant disadvantage of extreme overhang. With a standard body 10ft. long, and affording a full 2 ton platform area, only 3ft. 1in. overhangs at the back. Indeed, for such loads as empty beer barrels a 14ft. body has been fitted.



These sketches of the S.D. Freighter in service give an idea of the advantages claimed for specialised traffic.

This is really achieved by placing the front wheels much further back than is usual. Thus at the forward end there is also an overhang of 3ft. 4in., and this extra-ordinary handliness of the vehicle is mainly attributable: we have seen it turn completely in a circle of 10ft. 6in. radius, much less than required for a taxicab. The way in which it will approach a kerb dead-on and the front of the vehicle will then sheer off seemingly almost at right angles, has to be seen to be believed. From the above it will be realised that the Freighter can be manoeuvred in very small areas – a valuable advantage in many classes of haulage work.

Small Parts and Reduced Weight.

Another factor in this handliness is no doubt the moderate weight combined with the moderate gearing of the vehicle.

Indeed compared with conventional practice, the new type offers an enormous reduction of tare – in other words unprofitable – weight, yet without any decrease in what may be called "sustainability." Though designed fully up to 2-ton loads, the Freighter itself only weighs 21 cwt. : out of 3 tons [*] laden weight 2 tons is useful load, and though it only has a 12 h.p. engine (adequate to the maximum speed of 14 m.p.h.) its transmission is amply strong enough for 30 horse or more.

A sketch of the Freighter on laundry service

But while the very moderate size of the power unit in itself tends to lightness, it has also been dictated by economic reasons. Gears allowing relatively high road speeds entail relatively high powers, but the idea in this case has been to proportion power and gearing to maintain a good average speed and keep the engine working. The result, it is claimed, is a vehicle that can average 15 m.p.g. and cost but two-thirds as much as an ordinary vehicle of similar capacity, both in working and purchase.

Again, take the frame. Thanks to the short wheelbase only some 2ft. 6in. or 2ft. 9in, of its length is unsupported between the front and back springs; consequently the bending stress of this vital part is far less than in an ordinary chassis, with the result that a less heavy section of channel can be used.

Moderate Engine Power for Commercial Speeds.

To go more into detail, the four cylinders of the compact little engine are comprised in a single casting with detachable head, cooled by pump circulation and gilled tube radiator. Designed specifically for heavy duty work like this, the engine is given a three-bearing crankshaft drilled to afford passage of oil at pressure to the bearings. A governor that cuts out at 1,250 r.p.m. is so sealed as to defy tampering on the road or without leaving evidence, and a Solex carburettor and a Conner magneto complete the engine equipment.

A Fool-proof Transmission.

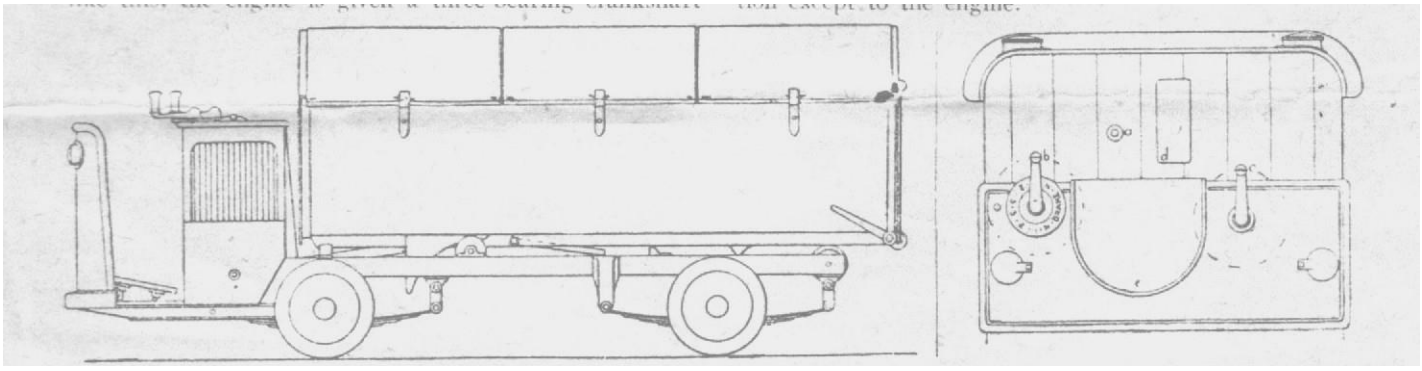
From the engine epicyclic gears can be driven by either of two clutches. The first transmits power through the first speed, the other through the second speed, the whole being locked together and driven solid and direct when both are engaged.

The shaft driven through these gears carries a bevel pinion in mesh with two bevels on the driven end of the propeller shaft, and these they drive through clutches.

As the one bevel gives forward movement it follows that the other gives reverse, and thus, when the vehicle is travelling, say, in a forward direction, by bringing the reverse clutch into action, a braking effect can be obtained to any required degree. With such a form of transmission all three speeds are available for reverse: for forward travelling, the change lever is moved anti-clockwise from neutral, for reverse clockwise, and change can be effected hap-hazard to any gear quite sweetly without any chance of damage. The arrangement certainly offers the most fool-proof gear change we have seen, and the engine control and gear change is connected up with it, the one lever covers a very wide, and, as far as we observed, very effective range of control.

Cutting Out Lubricant Replenishment.

Beyond the fact that flexible plate steel joints are introduced at both ends of the propeller shaft, transmission *per se* calls for no further details, but it should be noted that throughout all shafts run on ball bearings, which in view of the ample size of the shafts are themselves very ample. Moreover, as every bearing is in a self-lubricating housing well packed with grease, lubrication is vastly simplified. Indeed apart from the engine, the machine requires no lubrication between overhauls; all the semi-rotating bearings, like shackle pins, for instance, are well above their load, and fit in compressed fabric oil-less bushes, and the usual objection to this arrangement – that the pins are apt to rust up – is overcome by the use of rustless steel. The vehicle we tried had run between 3,000 and 4,000 miles without lubrication except to the engine.



Illustrating the short wheelbase, springing, low loading line and control arrangements.

A Low Tyre Cost.

The wheels, mounting 5in. solid rubber tyres, are only 20in. in diameter, and so already offer a very cheap running proposition which, with the increase of numbers on the roads, promises to be cheaper still. Moreover, by merely undoing six nuts a wheel can be changed in about 20 minutes, so that, as the makers on receipt of a wire will supply a fresh wheel newly tyred and give a credit for the old one, a practical tyre pressing serving service is afforded. These wheels are practically substantial pressed steel drums, inside which with a clearance of only 1/8 in. are separate brake drums that are not detached with the wheels – this is to prevent overheating of the tyres, the back wheel brakes being connected to the control lever, capable of being put full on even with a finger or thumb, the front separately to the foot brake. The steering pivots on which the front wheels turn are placed with their axes centrally over the tyre treads, for easy steering.

An important point is that all wheels carry the same weight, and thus none, even with a bit of overload, are subjected to a load of more than 17 cwt. Which is certainly very easy on a 5in. tyre, despite the small diameter, and should result in good tyre mileage. This weight disposition also enables the long underslung springs of the shackles to be interchangeable.

[**] The mechanism of the Freighter is much more accessible than with the ordinary bonnet arrangement. By opening a door on the off-side and removing the front plate, access is obtained to the engine. After undoing four nuts of the front plating it and the top can be removed in two minutes, leaving the engine available for withdrawing after breaking the necessary water joints and petrol pipe. The engine can, in fact, be drawn in a quarter of an hour, while from the other side the gearbox can be dismantled without removal in about 20 minutes or removed from the other side, together with the engine, in another 20. No greasing up, and very little oiling and cleaning are required to keep the machine in good running order, consequently the time occupied in garage should be very small as compared with other vehicles.

Throughout, a very high-grade of material and workmanship is used. Nickel-chrome steel is used throughout the transmission, while the parts we examined were made under most modern factory conditions to a real standard of perfectly fitting inter-changeability.

That the new type fills a want is already attested by the fact that Deptford Corporation, that has been searching for their ideal dust-cart, have already placed an order for two. And here it may be interpolated that a pump mechanism for the hydraulic gear can be engine driven off a shaft in the gearbox. Other municipalities, railway companies, and large stores seem much interested in the first batch of machines which are expected to make their appearance in about five weeks' time, while the very low loading platform – little more than 20in. from the ground – should also be found a real advantage for the transport of livestock, especially as a side exit is not complicated by any paddle-boxing for the back wheels.

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Notes:- Because this document is nearly a hundred years old it isn't surprising that some of the language used is no longer in common use. Two passages have been altered for clarification:-

[*] Original has "unladen."

[**] I was unable to make sense of this section starting as it does with:- "In this position the mechanism is much more accessible than ..." I have altered it to:- The mechanism of the Freighter is much more accessible than …"

This document re-typed from a scan of the original.

Brian Carpenter.
6th February 2020
The SD Enthusiasts' Club.