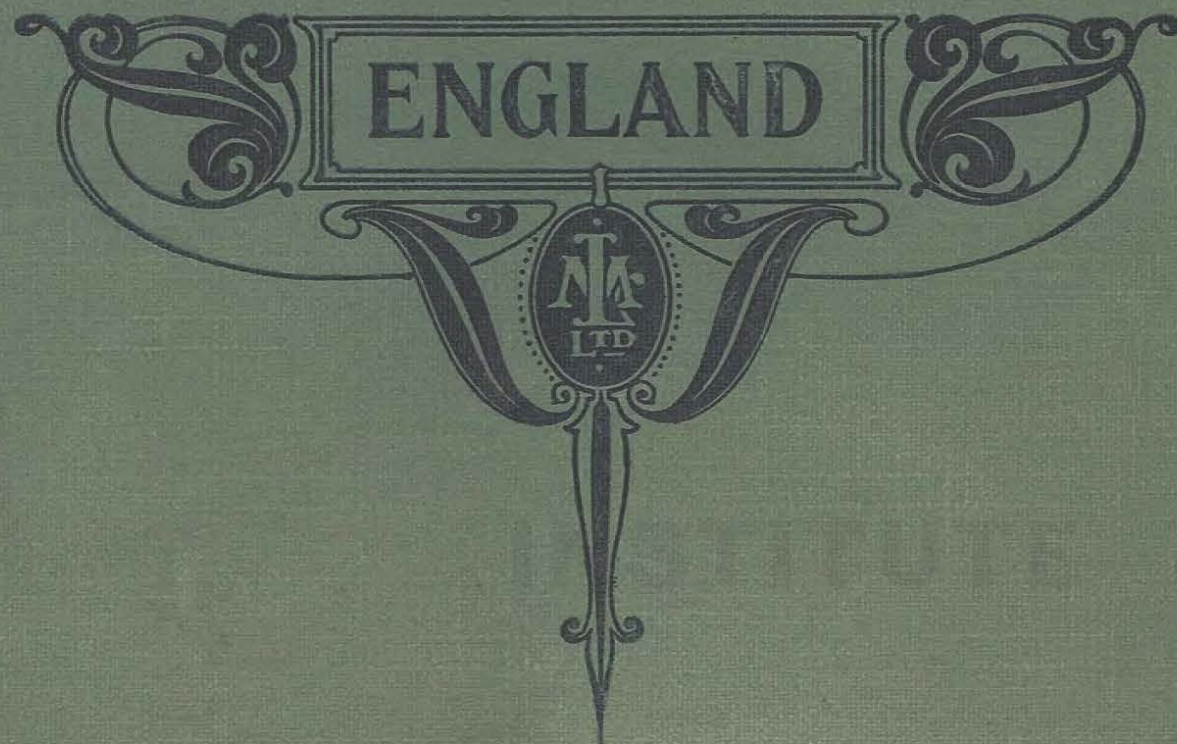


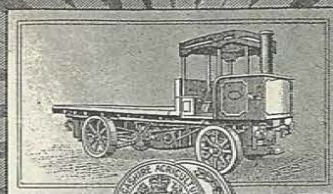
LEYLAND MOTORS LTD



LEYLAND MOTORS LTD



1895.



1908.

LABORE MULTO LABORATA

LEYLAND.

Two £100 Prizes.

ALL PREVIOUS ISSUES CANCELLED

CATALOGUE No. 11, 1908

Contractors to the Post Office, Admiralty, War Office, Crown Agents for the Colonies, and many of the largest Municipal Authorities

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Telephone : : No. 7, Leyland

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Telegrams : "MOTATURA, LONDON"

Telephone : No. 8963 Central, London

GENERAL

STEAM

PETROL

BODIES

TABLES

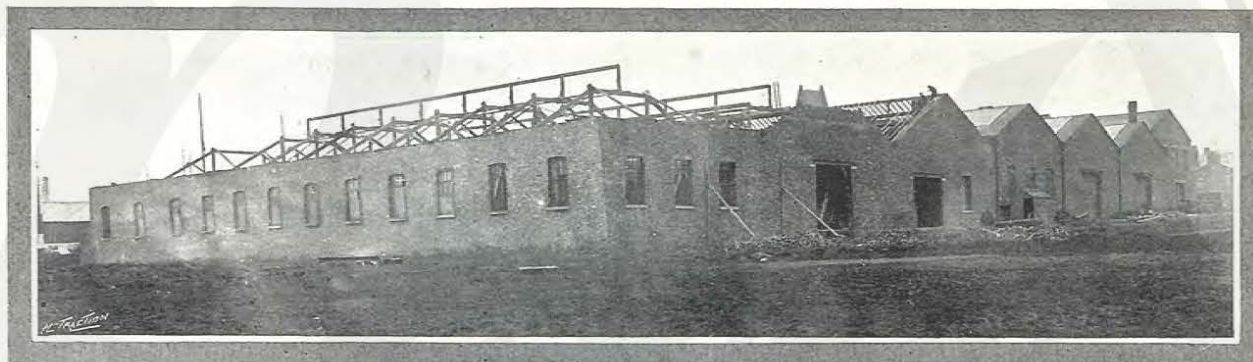
LEYLAND MOTORS, LIMITED

TO THE READER

This brochure is not a compilation of self-laudatory statements.

It is hoped that it will tell you everything you want to know about our business; but if there is any point about which you want further enlightenment we shall be pleased to assist you if you will make your wants known.

We tell you about our works, we point out the respective advantages of Steam and Petrol wagons, with the help of explanatory tables of working costs. A few letters follow bearing independent testimony to the efficiency of our machines, and the first half of the book is completed by a full description of our Steam wagons. In the second half a full description is given of all sizes of Petrol Vehicles, and a number of pages are devoted to illustrations and particulars of various types of body. The final section is devoted to tables and other general information valuable to the commercial motor user. All the prices and our terms are given on the two middle pages of the book.



General View of New Extension.

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LEYLAND MOTORS, LIMITED

Leyland is a large village, $5\frac{1}{2}$ miles south of Preston, on the Main Line of the London and North-western Railway, and on the Fleetwood line of the Lancashire and Yorkshire Railway. The main North road also passes close to the Works. We are therefore exceptionally situated as regards the quick dispatch of spare parts, and for obtaining low rates. Liverpool and Manchester are both about 30 miles distant. Wagons destined for the Continent can usually be shipped without packing, in which case they can be run alongside under their own steam.

The best way of getting to our works is by Express to Preston and by local train back to Leyland. When an appointment is made we can usually meet our friends with a car at Preston Station.

Despite their new name Leyland Motors, Ltd. is an old-established firm, and it is thirteen years since they began to turn their attention to the manufacture of steam wagons. As far back as 1899 they supplied a steam motor mail van to the Ceylon Government. Evolution has been gradually proceeding, and, as may be supposed, there is little in common between the first models and those which are now offered to the public. Scores of their steam wagons are doing satisfactory work at the present moment in all parts of this country and abroad, and they are also makers of petrol motor 'buses and other industrial vehicles, in which department they have met with considerable success.

To cope with the steady increase in business in all branches, Messrs. Leyland Motors, Ltd., have recently enlarged their works very considerably by the addition of a building measuring 200ft. by 135ft. The works are large and well appointed, and contain the following shop and stores: 1, Foundry; 2, machine shop; 3, fitting and erecting shop; 4, finished stores; 5, rough stores such as castings; 6, joiners' and bodybuilders' shop; 7, boiler makers', smiths', and tinsmiths' shop; 8, repair shop.

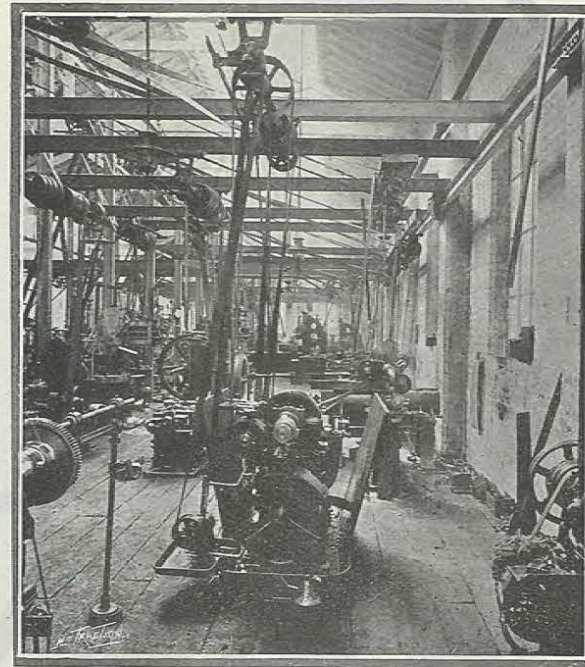
In addition to these there are commodious offices built and fitted up in a businesslike way.

The machinery is run by two suction-gas plants, and the works are lit up with gas (Keith's high-pressure system).

The company do not make all their own castings, only dealing with those of brass and aluminium.

Throughout its decidedly long career the Lancashire steam wagon has given excellent results in the hands of users, and we have no hesitation in recommending it to the serious consideration of those who are contemplating the purchase of a vehicle of this class, for be it remembered this make of motor wagon was among the earliest types in regular use in this country, and the makers can accordingly claim a longer experience than most.

In addition to the many firms now using Leyland steam vehicles, it is worth noting the popularity that this lorry has gained among corporation engineers for municipal work, and should any of our readers wish to see the results that are being practically universally obtained in all the larger cities throughout the country, we would refer them to a special article dealing with this matter published in *Motor Traction* of May 11th of last year, page 558.



A portion of the well-equipped machine shop of Leyland Motors, Ltd.

LEYLAND

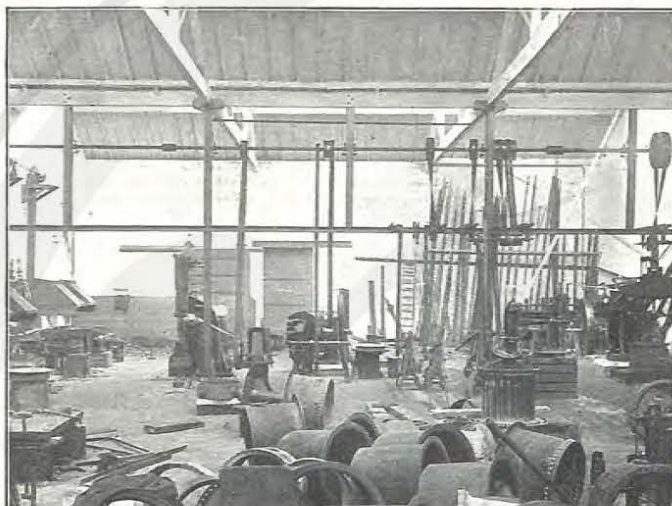
OUR WORKS

Reprint from
"Motor
Traction,"
Feb. 1, 1908

STREAM
PETROL
BODIES
TABLES

LEYLAND MOTORS, LIMITED

Some Successes



A portion of Boiler Shop.

"Chassis" Meaning of

Write for Advice

We ask you to look through this pamphlet and then write and tell us all about your cartage and railway arrangements. What class of goods you send and receive, what quantities, where they come from, where you send them to, &c.

Our technical experts and designing staff are at your disposal, to assist you to buy the best motor for your particular business.

Warning

Every endeavour has been made to insure the accuracy of the dimensions and prices given in this book. They cannot, however, be guaranteed, as the cost of materials fluctuates considerably, and improvements in design are constantly being made. We therefore ask buyers to write for a final quotation with specification attached, before placing their order.

SILVER MEDAL (Highest Award) for Self-moving Vehicles, by the Royal Agricultural Society of England, Manchester, 1897.

FIRST PRIZE £100 for Self-moving Vehicles, by the Royal Agricultural Society of England, Birmingham, 1898.

FIRST PRIZE £100 for Self-moving Vehicles, by the Liverpool Self-propelled Traffic Association, Incorporated, 1898.

GOLD MEDAL (Highest Award) Liverpool Trials, 1901.

SILVER MEDAL (Highest Award) Royal Lancashire Agricultural Society, Manchester (for "Composite" Road Wheels), 1903.

SILVER MEDAL (Highest and only Award for Steam Road Wagons) Royal Lancashire Agricultural Society, Southport (for Patent Steam Motor Tip Wagon), 1904.

This is a word of French origin, and signifies the whole frame and working parts of a motor vehicle. It covers everything but the bodywork and india-rubber tyres.



General View of Repairs Bay.

LEYLAND MOTORS, LIMITED

Prospective driver selected by purchaser may be sent to us for a fortnight for training, pending delivery of the vehicle; he must conform to our workshop regulations while with us, and this arrangement is to be clear of any expense to us beyond that involved in the necessary instruction.

**Tuition of
Drivers**

Instructions printed on stiff cards in bold type and varnished are sent out in the tool boxes of the wagons.



SOME RECENT ORDERS FOR FIVE TON WAGONS

SCORES OF REPEAT ORDERS.

WRITE FOR COPIES OF TESTIMONIALS.

We were one of the very first firms to build a modern road motor vehicle.

All the early successes were with steam, but we recognised from the beginning the advantages of the internal combustion engine, and have continuously experimented in this direction.

**Steam versus
Petrol**

It is incorrect to say that steam is better than petrol or that the reverse is true. For loads below 3 tons, petrol is most suitable. For loads between 3 and 5 tons, the advantage may be either way, but for heavy loads, above 5 tons, there is no doubt that steam is the more economical source of power at the present price of petrol and rubber.

We build both types and are always willing to give free advice to those in doubt.

LEYLAND MOTORS, LIMITED

ANNUAL APPROXIMATE WORKING COST OF 5-6 TON STEAM WAGON.

285 miles per week.

**Working Costs
Steam Wagon**
(Severe conditions from
Actual Practice.)

	£	s.	d.
Cost—Interest on £550 at 5 per cent. per annum	27	10	0
Depreciation, at 10 per cent. per annum	55	0	0
Fuel, 75 tons of coke at 12s. per ton	45	0	0
Driver, at 35s. per week	91	0	0
Loader (sometimes not necessary) 22s. per week	55	10	0
Repairs and Adjustments	50	0	0
Lubricants	14	0	0
Insurance and Sundries	17	0	0
	<u>£355</u>	<u>0</u>	<u>0</u>

Work done: 5 tons × 57 miles × 260 days.

Equals 74,100 ton miles per annum.

£355 ÷ 74,100 = say 1.25d. per ton mile.

In this case (which is taken from actual practice) the wagon is fully loaded in both directions. If loaded in one direction only the cost per ton mile will work out rather less than double, say 2d. per ton mile.

ANNUAL APPROXIMATE WORKING COSTS OF 5-6 TON STEAM WAGON.

150 miles per week.

**Working Costs
Steam Wagon**
(Average Conditions)

	£	s.	d.
Cost—Interest on £550 at 5 per cent. per annum	27	10	0
Depreciation at 10 per cent. per annum	55	0	0
Fuel, 50 tons of coke at 12s. per ton	30	0	0
Driver at 35s. per week	91	0	0
Loader (sometimes not necessary) at 20s.	50	0	0
Repairs and Adjustments	40	0	0
Lubricants	12	10	0
Insurance and Sundries	17	0	0
	<u>£323</u>	<u>0</u>	<u>0</u>

Work done: A, without Trailer, loaded in both directions.

6 tons × 30 miles × 260 days.

Equals 46,800 ton miles per annum.

£323 ÷ 46,800 = say 1.7 pence per ton mile.

B, with Trailer, loaded in one direction.

10 tons × 15 miles × 260 days.

Equals 39,000 ton miles per annum.

£323 ÷ 39,000 = say 2d. per ton mile.

C, with Trailer, loaded in both directions.

9 tons × 30 miles × 260 days.

Equals 70,200 ton miles per annum.

£323 ÷ 70,200 = 1.2d. per ton mile.

APPROXIMATE COST OF WORKING 5 TON PETROL LORRY ON RUBBER TYRES.

Conditions similar to steam wagon, but distance too great to be accomplished by a steam wagon in a day, viz., 40 miles out and 40 miles home, at a speed of 10 miles per hour.

Prime Cost, excluding tyres, £600.

**Working Costs
5 Ton Petrol.**

	£	s.	d.
Interest on ditto, at 5 per cent. per annum	30	0	0
Depreciation at 15 per cent. per annum	90	0	0
Repairs	40	0	0
Petrol—20,000 miles, at 5 miles per gallon, at 9d. per gallon	150	0	0
Tyres—£145 per set, a set lasting about 8 months	217	10	0
Driver—at 35/- per week, 50 weeks	87	10	0
Lubricants	10	0	0
Insurance	15	0	0
	<u>£640</u>	<u>0</u>	<u>0</u>

Work done: 40 miles with 5 tons by 250 days.

Equals 100,000 ton miles per year.

Equals 1.5d. per ton mile, or allowing for less wear and tear of tyres, &c., and less petrol consumption, about 2.5d. if loaded one way only.

LEYLAND MOTORS, LIMITED

ANNUAL APPROXIMATE WORKING COST OF 3-TON PETROL LORRY.

Prime Cost—with rubber tyres, £655; without rubber tyres, £550.

	£	s.	d.	
Interest on capital of £550, at 5 per cent. per annum ...	27	10	0	Working Costs 50—70 cwt. Petrol.
Depreciation at 15 per cent per annum ...	82	10	0	
Repairs ...	30	0	0	
Petrol—100 miles per day, 250 days per annum, at 7 miles per gallon, 9d. per gallon ...	134	0	0	
Tyres—£105 per set, a set lasting about 8 months at 12,000 miles per set ...	182	0	0	
Driver—35/- per week, 50 weeks ...	87	10	0	
Lubricants ...	8	10	0	
Insurance, &c. ...	15	0	0	
	£567	0	0	

Work done = 3 tons by 100 miles by 250 days = 75,000 ton miles per annum. Cost $£567 \div 75,000 =$ say, 1½d. per ton mile, loaded both ways; or, if loaded one way only, 3d.

ANNUAL APPROXIMATE WORKING COST OF 2-TON PETROL LORRY.

Prime cost, with Rubber Tyres ...	£510	0	0	Cost of Working 2-ton Petrol Lorry
Prime cost, without Rubber Tyres ...	£425	0	0	
	£	s.	d.	
Interest on £425 at 5 per cent. per annum ...	21	5	0	
Depreciation at 15 per cent. per annum ...	63	15	0	
Repairs ...	25	0	0	
Petrol: 100 miles per day, 250 days per annum, at 9d. per gallon, 10 miles per gallon ...	75	0	0	
Tyres: £75 per set (a set lasting about 8 months at 12,000 miles per set) ..	112	10	0	
Driver: 35/- per week, 50 weeks ...	87	10	0	
Lubricants ...	8	0	0	
Insurance, &c. ...	13	0	0	
	£406	0	0	

Work done = 100 miles with 2 tons $\times$ 250 days = 50,000 ton miles per year. Cost $£406 \div 50,000 =$ say 2d. per ton mile.

In this case the wagon is fully loaded in both directions. If loaded in one direction only the cost per ton mile will work out rather less than double, say 3½d. per ton mile.

LEYLAND MOTORS, LIMITED



JONATHAN PARTINGTON,
MIDDLETON JUNCTION,
MANCHESTER, May 13th, 1907.

Messrs. The Lancashire Steam Motor Co., Ltd., Leyland.

GENTLEMEN.—I have pleasure in handing you an order for a third Wagon at the same price as before, to be fitted with mechanical tipping gear, composite wheels, and sight-feed lubricator. I have pleasure in stating that the other two Wagons have and are continuing to give every satisfaction.—Yours truly,

JONATHAN PARTINGTON.



One of two similar wagons supplied to this Council.



One of three similar wagons shipped to Monte Video.
Two supplied in 1906, one in 1908.

STEAM
PETROL
BODIES
TABLES

LEYLAND MOTORS, LIMITED



THE BREWERY,
ST. HELENS, November 28th, 1907.

Some Testimonials

The Lancashire Steam Motor Co., Ltd., Leyland.

DEAR SIRs,—We beg to confirm our order given to your Mr. Spurrier in London by our Mr. Arthur Robinson for another Steam Wagon, similar pattern to the last you supplied us with, but without a Cab, and with all latest improvements.—Yours truly,

GREENALL, WHITLEY & CO., Ltd.
(Signed) ARTHUR ROBINSON.

Note.—This is the 4th Wagon of our make supplied to the above firm, and a fifth has just been ordered (September, 1908).

ELY BREWERY, LTD., ELY, NR. CARDIFF.

Our South Wales Agent, Mr. T. Scott King, writes us on November 20th, 1907, as follows :—

"I am asked by the Ely Brewery Co. to instruct you to put in hand a New Steam Wagon in all respects the same as those previously supplied, but to have $1\frac{1}{16}$ " holes drilled on the outer edge of the wheels between the trod plates. Mr. Jarvis, the Secretary, says if you will write them a letter confirming acceptance of order and stating that you guarantee to have the Wagon on rail on December 12th, certain, they will sign the contract notes and send on."

Note.—This is the 3rd Wagon of our make supplied to the above firm.

Motor Traction for Municipal Purposes

By T. W. E. HIGGENS, Assoc. M. Inst. C.E.

Extract from "Motor Traction," June 13, 1908.

Every municipal engineer likes to be up to date, but with the limited amount of money placed at his disposal for municipal purposes this is not usually possible in every department of the public service. Some authorities are to the fore in lighting, some in refuse destruction, some in housing, but very few in traction; and it is in traction that the greatest improvements have been made during the last eight or nine years. The brewer's dray with its sleek prize horses, the miller's bell-bedecked team, have both given place to the perhaps less attractive, but more serviceable, motor lorry; but municipal authorities, with few exceptions, have not kept pace with improvements in traction. It is true that some thirty or forty local authorities use motors—mostly only one or two—but what are they among so many?

Probably the first authority in the South of England to use motors for municipal purposes was Chiswick. With Thornycroft's works in the borough, it is not surprising that the Chiswick vehicles were made by that firm. Very shortly after the introduction into the South, the City of Liverpool purchased a motor van from the Lancashire Steam Motor Co. (now Leyland Motors, Ltd.), and in 1900 the Chelsea Borough bought three motor vans—one from Thornycroft's and two from the Leyland firm. It is worthy of note that the Thornycroft motor was not a new machine when bought, it having been built early in 1898, and having been used for various purposes before its purchase by Chelsea. It is still in use, doing very good work.

The Chelsea Borough authorities have largely increased the number of their motor vehicles, and in each case the machines have been built by Leyland Motors. Two more were purchased in 1903, one in 1905, and ten in 1906. Of these sixteen vehicles, ten have been supplied with interchangeable water tanks for street-watering purposes.

Type of Vehicles.—When a municipal authority desires to equip its borough with a service of motor vehicles, the question arises as to what is the best type for the public service. There is no one type which is best for all municipal purposes. In large towns special vans must be set apart for the removal of house refuse, while others must be used for collecting street and market sweepings, and others for the cartage of materials. For each of these

services a different type of body is required, in order to obtain the utmost efficiency out of the motor; but with first-rate machinery and a strong under-carriage a body can be fitted with adjustable sides, so as to make a good all-round vehicle, suitable for most of the requirements of a local authority. It is advisable in such a vehicle to have the under-carriage so arranged that the cartage body can be easily removed and a galvanised watering tank fixed in its place, and also to have the rear of the under-carriage provided with a hook for a trailer attachment to take a trailer or a rotary broom.

As regards the specification for serviceable vehicles for municipal work, the following has been found a suitable one for steam motor vans.

The motor vans to be four-wheeled vehicles, and to have detachable bodies, one for cartage purposes and the other for street watering. The cartage bodies to be provided with easily removable covers, and the vehicles are to be of sufficient capacity to carry six cubic yards of sand or other material, of a weight not exceeding five tons. The bodies to be constructed of well-seasoned ash framing, and hard wood bottoms. The portion of the bodies immediately behind the driver to have permanent ends 3ft. deep. Sheet steel lining plates are to be provided. The foundation for receiving the cartage bodies to be of steel channels 4½ in. by 2½ in. by ¾ in., well braced at the corners. The tailboards to be operated by means of a lever, and the van is to be capable of being tipped by one man over a baulk of timber 14 in. high, and held at any angle. The tipping gear to be of differential telescopic pattern. The engine change speed and the compensating gear to be self-contained in dustproof and oilproof casing. The engine to be 35 i.h.p. The average working speed on the level to be from five to six miles per hour. The compensating gear to be so designed that it can be locked in order that both wheels may become drivers, as occasion demands. The boilers to be fed by a ram pump and an injector. The safety working pressure is to be 200 lbs. per square inch. An automatic injector is to be used for auxiliary feed supply. The steering wheels to be 2ft. 10 in. in diameter, with 5 in. steel tyres, and the driving wheels, 3ft. in diameter, with 10 in. tyres, are to be driven with Hans Renold's improved roller pattern chains. The brakes to be capable of holding the vehicle on any gradient. The street watering tanks to be of ⅜ in. sheet steel with a capacity of 1,000 gallons, galvanised, and made thoroughly watertight, and to be fitted with two partitions to prevent the water washing backwards and forwards. The valves to the distributors to be capable of regulating the width and amount of the spray.

Garage.—Having decided upon the type of motor vehicle, the next thing is to decide upon the position of the garage and its internal arrangements. These must be carefully thought out, if the motors are to be worked on the most economical lines. In too many cases the municipal engineer must make shift with the existing depot, which is used for a variety of purposes, and fit it up as well as he can; but if he has a free hand, it is best to secure a site in a fairly central position, where if possible separate entrance and exit gates can be provided.

The ideal garage should protect the motors against frost in winter, as a sudden fall of temperature may seriously damage any tubes in which water has been allowed to remain. There should be sufficient space to manoeuvre the vehicles, so that any one of them can enter or leave the garage without interfering with the others; and every motor standing should have proper arrangements for removing the bodies and replacing or interchanging them. It is well to provide for each motor having its second body, when out of use, hung at the end of its standing ready for immediate use. Motor pits are not a necessity for most steam vehicles, but it is well to have one or two of the motor standings provided with them.

Working Arrangements.—It may be asked, What municipal services can best be performed by means of motor traction? The answer to this question must, of course, differ with the district, but as a general rule one may say all which can be performed with horses. In general cartage very great results can always be obtained. It usually happens in large towns that the works manager has to send small quantities of material to a number of places the first thing in the morning to enable the various gangs of masons, paviors, &c., to start their work. A motor well loaded up will serve five or six gangs and be back at the depot before a horse can get to two of the jobs. After a few days' experience with a motor wagon any municipal engineer will appreciate the advantages to be gained by its use.

In street watering the motor is invaluable. The water tank to be used may be of 800 or 1,000 gallons capacity, and should be provided with thoroughly efficient means of regulating the spread. In most large towns main roads are flooded with water during the night. The motor water van will do this most efficiently. It will work from midnight to five or six in the morning washing the roads, and then turn to watering the macadam streets in the ordinary way, and work the whole day through, sprinkling as many streets as would three horsed carts.

In street sweeping the motor has similar advantages if used with a rotary broom as a trailer. In some cases brooms have been fixed to the motor carriage itself, but this arrangement does not seem to give sufficient spring to the broom, and is apt to grind out the brooms at an alarming rate, and injure the macadam road. But if the ordinary rotary broom is fitted as a trailer, very excellent results are obtained. The motor can go out sweeping half the day, and during the remainder can go over the same route and be loaded up with the sweepings.

In the collection of house refuse, motor traction does not always show such good results. It all depends upon the position of the dust shoot. In some districts the refuse must be shot at a destructor or a wharf well inside the borough. If this is the case, the motor spends

LEYLAND MOTORS, LIMITED

a large proportion of its time standing still while the dustmen are loading it. That is not an economical way to use a motor. A motor is intended to *move*, and if well loaded it is paying well when on long journeys, but not when it is crawling from door to door. On the other hand, there are some districts where the refuse has to be carted to a shoot which is a long distance outside the borough. In such cases motors have proved economical, and have effected a very large saving. At Pontypridd, for instance, the introduction of motor cartage resulted in a saving of £20 per week, and at Blackburn there is a saving of 50 per cent.; but each case must be taken on its own merits, and no universal rule will apply.

A Working Day.—The ordinary working day in Chelsea begins at midnight, when the motor drivers who are told off for night duty come to the depot to light up their fires and see that their motors are in good condition. At 1 a.m., if the weather is suitable for washing the roads, the motors go out with the water tanks, followed soon after by the sweeping machines. They work backwards and forwards along the main roads until the sweepers come along at 5 a.m. and squeegee the pavements. About 6 a.m. one of the motors which has been sweeping returns to the depot, leaves the rotary broom, and goes out to the main roads to pick up the sweepings, and continues at this work until 8 p.m. When the other motors have finished washing, they proceed to their proper districts, where they will work all day with the other watering motors which have started from the depot at six o'clock, while another of the sweeping motors, which returns about 6 a.m., is sent out to help in the general cartage until 5-30 p.m. By this arrangement of double shifts, the motors are utilised for as long a time as possible, and made to work in the most profitable manner.

Savings Effected.—Up to the year 1899 the street watering in Chelsea was done by horsed vehicles. The watering bills for 1897 and 1898 were £3,178 and £3,094 respectively. The costs for 1905 and 1906, when motors were very largely used, were £2,056 and £2,114, which shows a very considerable saving. For street washing at night, two motors do the work formerly done by horsed water vans.

In emptying street gully pits, one motor working night and day has more than saved its own cost in two years. There are also other savings in cleansing, which are the result of using motors. In the removal of house refuse, however, owing to the shoot being less than two miles from the extreme end of the borough, the service is at present somewhat more costly than when carried out with horses.

Life of Motors.—When considering the question of motor traction the life of a motor is bound to enter into the calculations. The life of municipal plant is phenomenal. Public bodies, being surrounded by innumerable critics, are very slow to scrap expensive plant. If the life of motor vans approximates in any degree to that of steam rollers they will last a long time. A steam roller nearly twenty-five years old works away in excellent style. True it has had new wheels, new boiler, and various other new parts from time to time, but, like the human body, it does not lose its identity by renewing its organs. One of the Chelsea motors is nearly ten years old; two are about eight years old, and after alterations and renewals of parts will be maintained by the makers for another four years, and there seems no reason why, being given a sound framework to start with, the periodical renewal of parts might not enable a well-built motor to become a very Methuselah among machines. It is a question of policy. At the present time there does not seem to be any agreement as to the age at which a motor should be scrapped, and so long as the maintenance can be undertaken for £50 or £60 per annum per vehicle the question does not arise in an acute form.

Cost.—A thoroughly reliable motor van for municipal purposes can be purchased for about £550, and a watering body to be fitted to the under-carriage for alternate use can be supplied for about £40. The Chelsea Borough purchased their ten last vans for £535 each from Leyland Motors, Ltd. The cost of maintenance varies considerably, but with a fleet of motors all of one make the maintenance cost is considerably reduced. The Chelsea motors are each maintained for £40 per annum, which is a very moderate sum.

What is the cost of running a motor? The average cost of a motor used for municipal purposes is somewhat difficult to arrive at. The cost of the motors for fuel naturally varies according to the number of hours worked.

The average cost of the whole sixteen Chelsea motors for fuel alone works out at £49. 3s. 8d. per annum for each motor, or 18s. 11d. per week. And when it is borne in mind that four or five of the sixteen work double shifts this cannot be said to be excessive. But if only the motors used for the removal of house refuse are taken, the average for fuel only is £34. 12s. 2d., or 13s. 4d. per week for each vehicle. This difference is accounted for by the fact that the dust motors only work a day of ten hours, and are employed carrying very light loads compared with those carried by the other vehicles. If the cost of these three vehicles is taken to include fuel, oil, insurance of boiler (£1. 4s.), tools (£10), maintenance (£40), and depreciation (5 per cent. on £535), but without labour, the average cost is £2. 2s. per week.

When the average is taken for all the motors, including labour, maintenance, fuel, oil, etc., but without allowing for depreciation, the cost of each vehicle works out at slightly under £265 per annum.

Generally.—While it is recognised that each municipal borough must be guided by its own particular conditions, and that what will suit one town may be unsuitable for another, yet, when it is considered that motor traction can be adapted to so many different purposes, it is difficult to suppose that it can fail to prove a success in one or other department of the public service in most of our towns, and that in many cases it may not only prove economical, but may promote cleanliness in our streets, and ultimately tend to efficiency of administration.

LEYLAND MOTORS, LIMITED

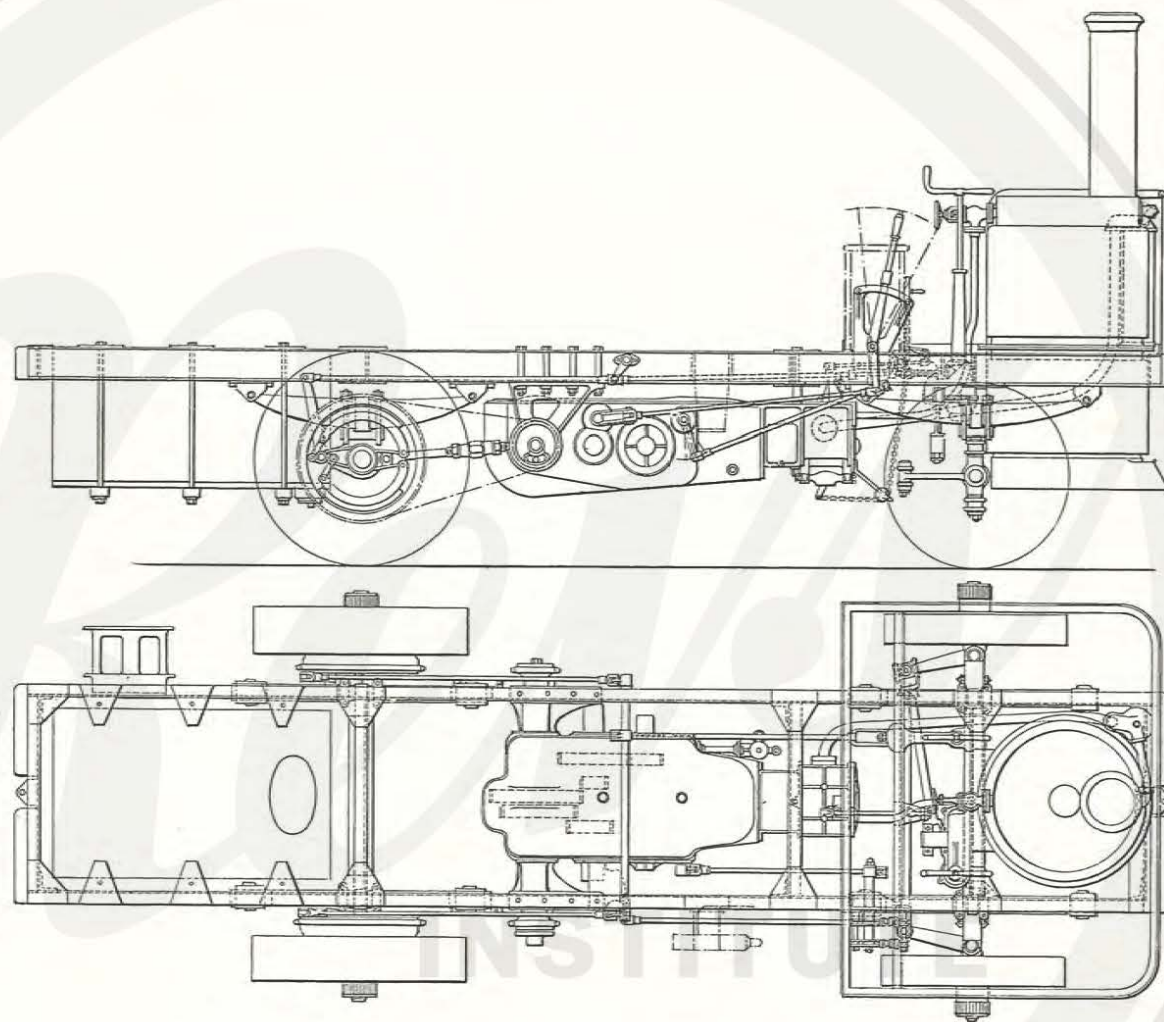


Group of 15 Municipal Wagons.
Two ordered 1900; One in 1903; Two in 1905; Ten in 1906.

Repeat Orders from Chelsea, Westminster Liverpool, Pontypridd, etc., etc., have been filled.

STEAM
PETROL
BODIES
TABLES

**General
Arrangement
of
Steam Wagon**



Class "H." Chassis for 13ft. 6in. Platform. Price, £535.

**Shipping
Specification
(Approximate)**

Packed in one large case. Length 20ft., width 8ft., height 6ft., cube 960 cu. ft., gross weight under 7 tons.

NOTES.—If a standard flat platform be included it will not increase the freight charges.

For chassis packed in parts see page 19.

General Description of Class "H" Steam Road Vehicle

The carrying capacity on good macadam or paved roads and on grades not exceeding 1 in 9 is 5-6 tons. Under favourable conditions a further load of 2 tons may be taken on a trailer.

Platforms 13ft. 6in., or 14ft. 6in. long by 6ft. 6in. wide. The length and width can be varied.

Length overall, 19ft. ; width overall, 7ft. 2in. ; height, 9ft. ; wheel base, 10ft. ; front wheels, 3ft. diam., 6in. wide ; back wheels, 3ft. 6in. diam., 10in. wide ; height from ground to top of frame (loaded), 3ft. 3in. ; length, back of driver's seat to back of frame, 13ft. 8in. ; tare, 4 tons 10 cwt. ; speeds, 3 and 6 miles per hour.

The hand wheel actuates a worm and worm wheel in an oil-tight steel case. The Ackermann principle is adopted, but the arms are practically non-existent, because the pivot is inside the hub and exactly central with the middle of the tread. The wagon is therefore handled with the minimum of exertion.

NOTE.—This improved steering gear is not shown on the steam wagon illustrated ; it is applied however to the petrol chassis, page 38.

Our class "H" engine is horizontal, double acting, compound, wholly contained in one casing with the two-speed gear and differential and supported from the frame by a three-point suspension. The B.H.P. is 35, and the speed 450 revs. The valves are flat, of Stone's bronze, driven by a radial, constant lead, valve gear.

The final drive is by means of two side chains. The differential gear is designed so that it can be locked, when both wheels become positive drivers. All the bearings except the crosshead and connecting rod are of improved bushed pattern, of sufficient diameter and length to dispense with all adjustment for a considerable period. The renewal is of the simplest possible description by means of standard bushes. Lubrication is effected by means of a splash which is arranged so as to ensure a thorough circulation through the whole of the bearings. The cylinders are lubricated by a positive mechanically-operated lubricator driven by the engine itself. Wherever possible steel stampings are used, and case-hardened and ground pins and jaws are employed throughout.

The Boiler is of our Fire-Tube Central Feed type (which we designed in 1900), built under the inspection of the National Boiler Insurance Co., the Manchester Steam Users' Association, or other approved Insurance Company for a safe working pressure of 200lbs. per square inch. The evil effects of bad and corrosive water can be guarded against by our copper sleeve composite tube.

The boiler is fed by a pump geared to the crank shaft of the engine, and capable of being used when the engine is running or standing ; and further by an auxiliary pump having a separate suction from the water tank.

The wheels, in ordinary circumstances, are of our "Composite" pattern (which we designed in 1901). The tyres are of weldless steel, hydraulically fitted.

Our improved internal brakes are fitted inside the chain rings and are protected from dust. They are capable of holding the vehicle on any reasonable gradient in either direction.

The wagon complies with the requirements of the L.G.B. New Regulations when carrying a load of over 5 tons.

Carrying Capacity

Platform

General Particulars

Steering Gear

Engine and Transmission

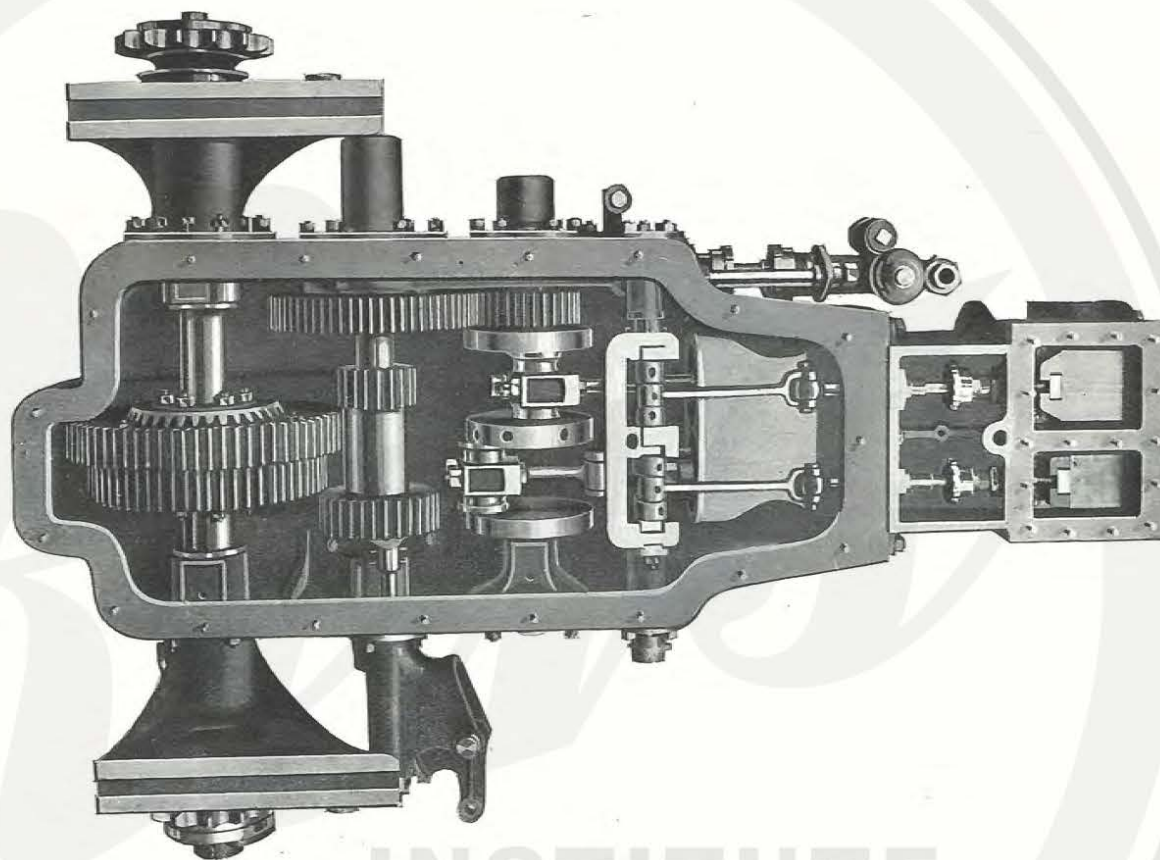
Boiler

Pumps

Wheels

Brakes

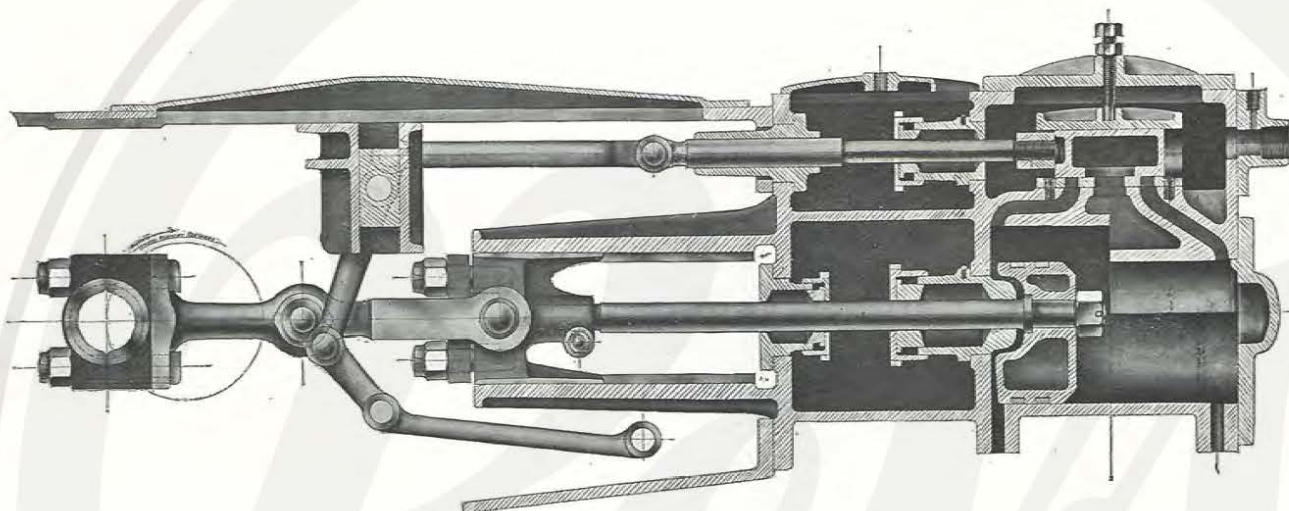
Legality

**Plan of
Engine**

General arrangement of Steam Engine, with Covers removed.

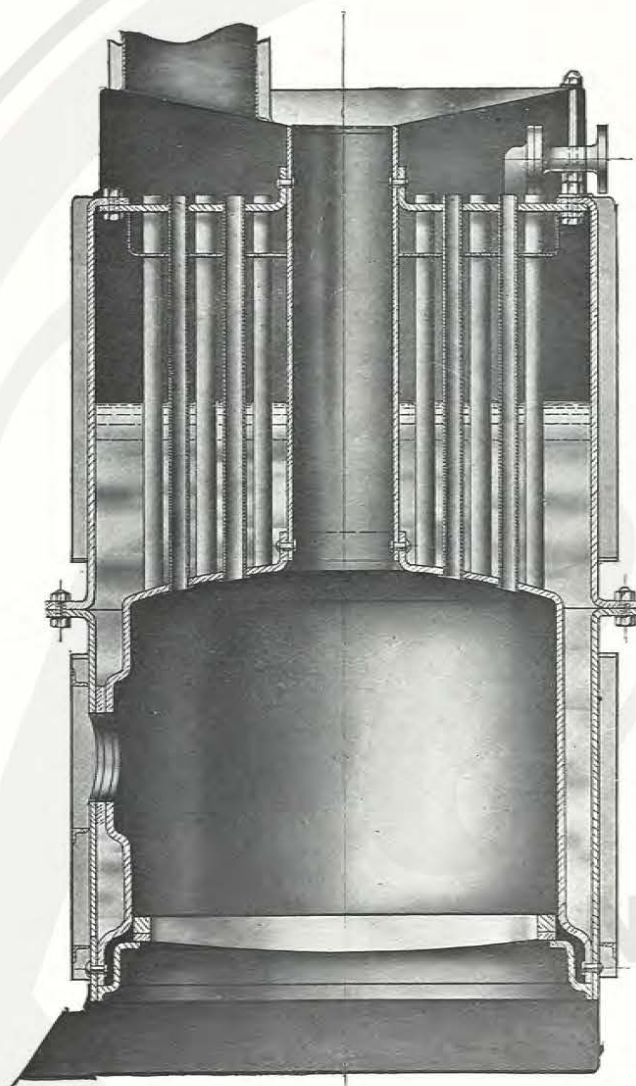
The Illustration indicates very clearly the great length of the bearings which take the side pull of the driving chains.

It also shows the short compact crank shaft with a minimum distance between supports, the great size of the big-end bearings, and the convenient position in which the road pump is fitted, alongside the cylinders. The sliding gear sleeve is mounted on two feathers machined from the solid shaft.

Elevation of
Engine

Sectional Elevation of Steam Engine Motion and Valve Gear

This illustration shows clearly the method of actuating the valves. The bottom portion of the cylinder section represents the low pressure barrel, the top portion the high pressure. In the same way the right hand portion of the steam chest is HP, and the left hand LP.

**Elevation of
Boiler**

(Elevation)

We brought out and patented the Central Feed Boiler in 1900. All our boilers are built under the supervision of the National Boiler and General Insurance Co., the Manchester Steam Users' Association, or other approved Insurance Company, for a working pressure of 200lbs.

If necessary, Composite tubes can be fitted when the water is corrosive.

Two sizes of boiler are built—2ft. 10 $\frac{1}{4}$ in. diam. ; 81 sq. ft. heating surface ; 3.2 sq. ft. grate area, for the 5 ton wagon ; and 3ft. 1 $\frac{1}{4}$ in. diam. ; 100 sq. ft. heating surface ; 4 sq. ft. grate area, for the 8 ton wagon.

NOTE.—The diameter is measured overall.



(Plan)

Standard Steam Wagon Boiler



Standard
5-6 ton
Steam Wagon

"H" Chassis, Price, £535. 14ft. 6in. Plain Platform, Price, £15.

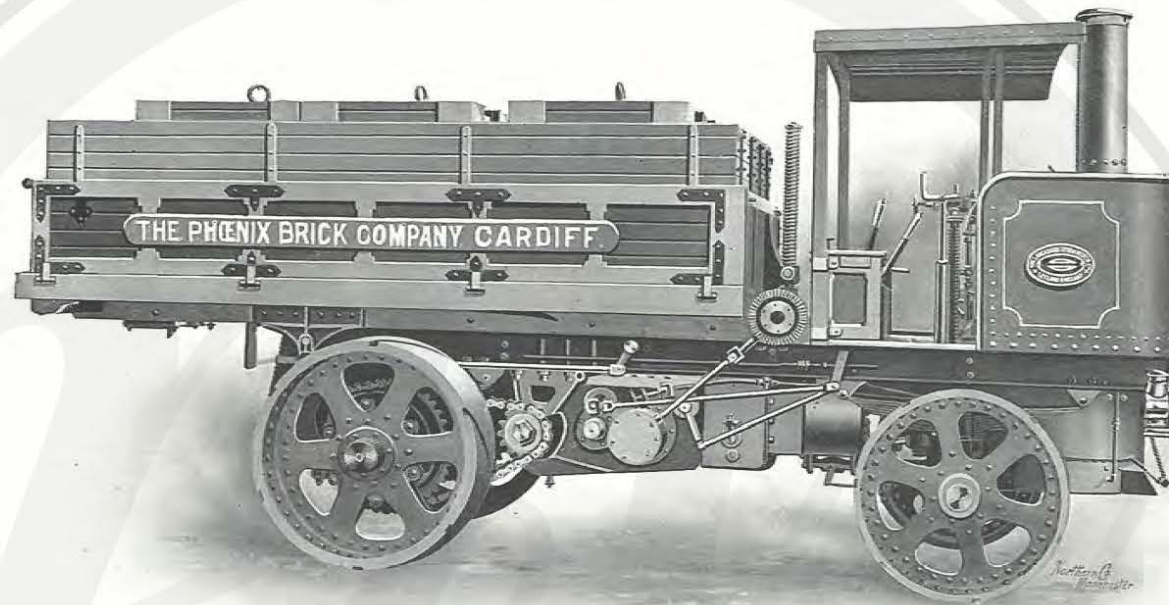
FOR CHASSIS PACKED IN PARTS.

	Actual Weight.	MEASUREMENTS.			Cubic Feet.	Shipping Weight.
		20ft. 0in.	by 3ft. 7in.	by 0ft. 7in.		
Frame	6 cwts....	20ft. 0in.	by 3ft. 7in.	by 0ft. 7in.	36 ...	18 cwts.
Boiler	18 ,, ...	4ft. 6in.	,, 3ft. 9in.	,, 3ft. 9in.	64 ...	32 ,,
Engine with one ton Axles, Springs, etc....	43 ,, ...	6ft. 8in.	,, 5ft. 2in.	,, 2ft. 6in.	87 ...	43½ ,,
Bunker, Seat, etc.	— ...	4ft. 0in.	,, 2ft. 10in.	,, 6ft. 7in.	75 ...	38 ,,
Angle Frame	— ...	6ft. 7in.	,, 6ft. 0in.	,, 0ft. 4in.	13 ...	6½ ,,
Front Wheels (unpacked)	8 ,, ...	3ft. 0in.	,, 3ft. 0in.	,, 2ft. 0in.	18 ...	9 ,,
Back Wheels	16 ,, ...	3ft. 6in.	,, 3ft. 6in.	,, 2ft. 6in.	32 ...	16 ,,

Shipping
Specification
(Approximate)

NOTE.—For Chassis packed in one case see page 14.

**General
Description
Class "H,"
Standard
Steam Tip
Wagon Chassis**



"H" Tip Chassis. Mechanical Tip Gear, Price, £562; Body, £57.

For particulars of Tip Bodies see page 41.

**General
Particulars of
Chassis**

The Engine and Boiler are the same as on the Long Platform Wagon, page 15.

The frame is, however, much shorter, and the auxiliary pump is replaced by a combination injector having separate suction from the feed tank.

Length overall, 15ft. 3in. ; Width overall, 7ft. 2in. ; Height 9ft. ; Wheel Base 9ft. 3in. ; Front Wheels 3ft. 0in. diam., 6in. wide ; Back Wheels, 3ft. 6in. diam., 10in. wide ; Height from ground to top of frame (loaded), 3ft. 3in. ; Length, back of driver's seat to hinge pin, 8ft. 8in. ; Tare, 4 tons 10 cwt. ; Speeds, 3 and 6 miles per hour.

**Approximate
Shipping
Specification**

Chassis packed in one large Case, 16ft. 3in. long, 8ft. wide, 6ft. high, 780 cu. ft., gross weight under 7 tons.

Complete Wagon in one Case, 18ft. long, 8ft. wide, 6ft. high, 875 cu. ft., weight under 8 tons.

If Chassis packed in parts the details given on page 19 apply, except that the frame would be

Weight.		Measurements.		Cube.		Shipping Weight.
5 cwt.	...	15ft. by 3ft. 7in. by 7in.	...	22 cu. ft.	...	11 cwt.

LEYLAND MOTORS, LIMITED



**Timber
Wagon**

Class "H" Chassis with Bolsters. £560. Trailer £58 10 0.

The Chassis is our standard "H." The distance between the back of the driver's seat and the end of the frame is 16ft. 9in. The distance between the same point and the centre of back axle is 10ft. Wheel base is 12ft. 2in. The cross bearers, four in number, are of oak heavily ironed, and a box is provided to carry the pins and other tackle.

Specification

Complete wagon in one case. 24ft. 6in. long, 8ft. wide, 6ft. high, 1,175 cu. ft. ; gross weight under 8 tons.

Approximate Shipping Specification

To meet the requirements of our Colonial friends we have designed a stronger wagon. This has a larger boiler than usual and an engine with two high-pressure cylinders. A pressed nickel steel frame is also fitted and of course stronger springs, etc. The wagon carries 8 tons.

Special Extra Large Wagon Class "F"

**Municipal
Steam Tip
Wagon**



This body is interchangeable with the water tank on opposite page.

Price, Chassis, Hand Tipping Gear, £540; Body, £55.

**General
Particulars**

For particulars of bodies see page 41.

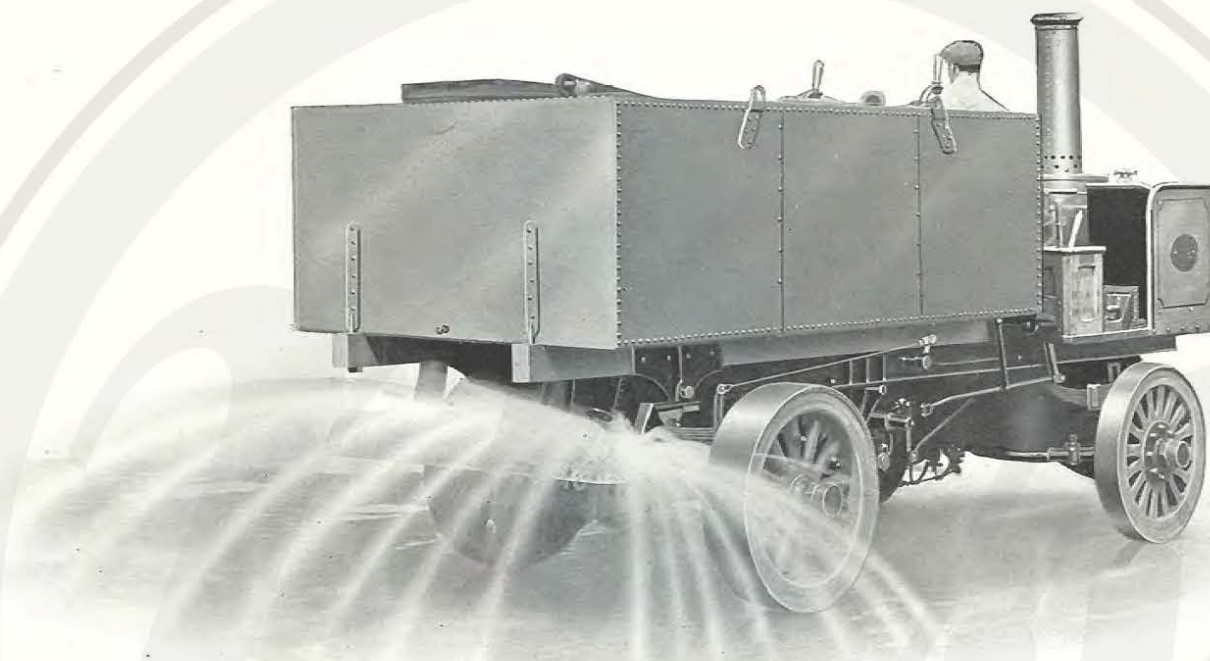
The above is a standard tip wagon, but built with a lighter frame and springs and with back road wheels 3ft. diam. by 8in. wide. It is geared to 7 miles per hour. The lighter construction is amply strong enough for a full 5 ton load on well paved city streets.

**Approximate
Shipping
Specification**

Chassis packed in one large case. 16ft. long, 8ft. wide, 6ft. high, 770 cu. ft.; gross weight under 7 tons.

Complete wagon in one case. 18ft. long, 8ft. wide, 8ft. high, 1,200 cu. ft.; weight under 7 tons.

If Chassis packed in parts the particulars on page 19 apply, except that the frame would measure 11 cwt.

**MUNICIPAL
STEAM
WATER CART**


This body is interchangeable with the tip box on opposite page.

Price of 1,000 gallon tank and box spreaders, £58.

800 gallons, £54.

These tanks are made of $\frac{3}{16}$ in. sheet steel, strengthened with 3 splash plates and galvanised on completion.

The box spreader is of the usual pattern, but divided into 4 compartments to regulate the flow. The valves for the purpose are in the middle of the seat and can be worked by either man.

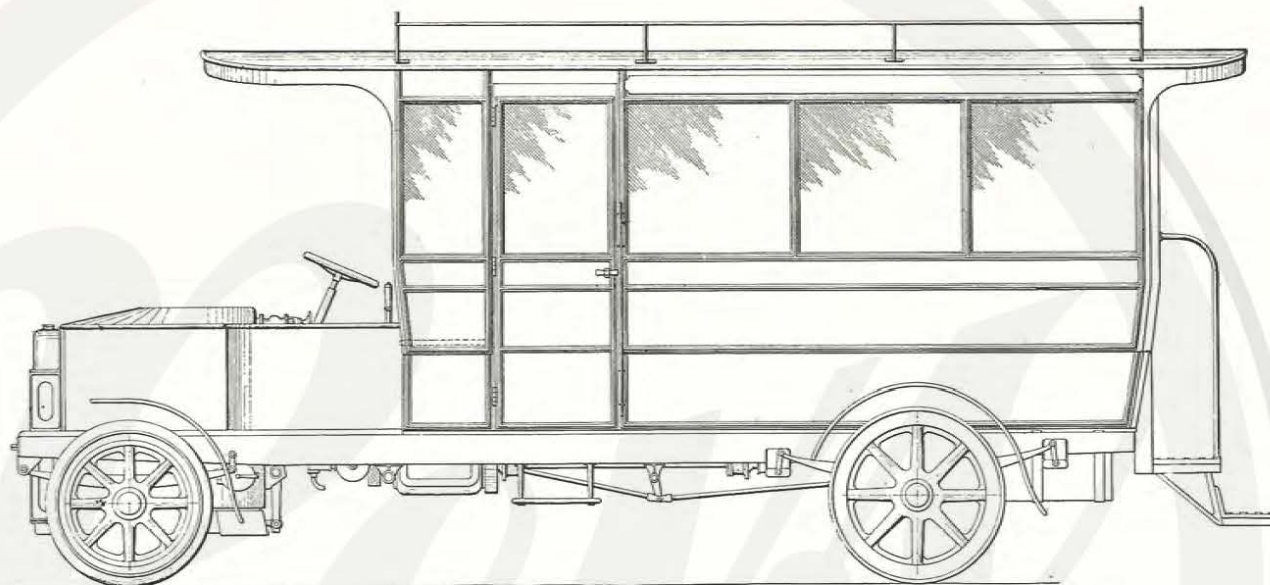
A rotary spreader for wide roads up to 40ft. can be fitted, driven from the engine, at an additional charge of £27 [CHREYAL]. Gully flushing valve and pipe, £10 [CIAVERA]. Pump or vacuum ejector for filling tank, £30 [CAMICALA].

800 gallon tank and spreader. 10ft. 6in. by 6ft. 6in. by 3ft. 6in., 240 cu. ft., lift under 2 tons [COLLIAEEN].

1,000 gallon tank „ 11ft. 6in. by 6ft. 6in. by 3ft. 6in., 280 cu. ft., lift under 2 tons [COLTAMER].

...23...

**General
Particulars**
**Approximate
Shipping
Specification**

**SPECIAL
LIGHT
STEAM
CHASSIS**

Class "K" Chassis, £550. Tyres for all wheels, £105. Body, £140.

Description

This is a steam chassis fitted with a vertical fire-tube boiler of our usual construction, but adapted for slow combustion. The engine has three single-acting cylinders placed vertically, and the drive is that of our standard "X2" Chassis described on page 36.

A condenser is fitted. The machine is intended to be driven by one man. The fuel is smokeless coal or coke. The machine has been got out for special service where the petrol engine is unsuitable.

**General
Particulars**

Length overall, 19ft. ; width, 7ft. 2in. ; height, 6ft. ; wheel base, 13ft. 4in.

Front wheels, 34in. diam. ; back, 40in. ; height from ground to top of frame (loaded), 2ft. 7in.

Length, back of driver's seat to back of frame, 11ft. Tare, 3 tons.

**Approximate
Shipping
Specification**

Chassis in one case. Length, 20ft. ; width, 5ft. ; height, 4ft. 6in. ; 450 cu. ft. ; lift under 5 tons. [COGNEBEM].

LEYLAND MOTORS, LIMITED

FURNITURE REMOVALS



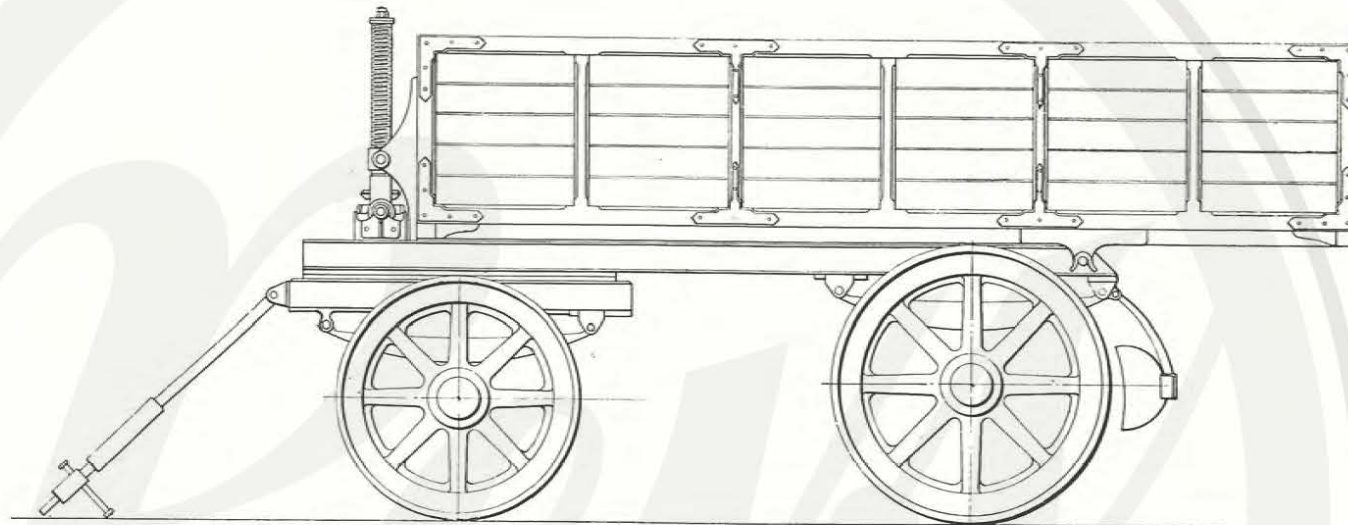
Class "H" Chassis with 14ft. 6in. platform. Carrying Lift Van and drawing Pantechon.
(For Lift-off Van Bodies see page 46.)



Mr. J. A. BRODIE, City Engineer, Liverpool, writes:—

I have in use 7 Motor vehicles which have been supplied by the Lancashire Steam Motor Co., Ltd. I estimate that a saving as compared with horses on the same cartage distance has been effected on this work of at least 10 to 15 per cent. over horse haulage.

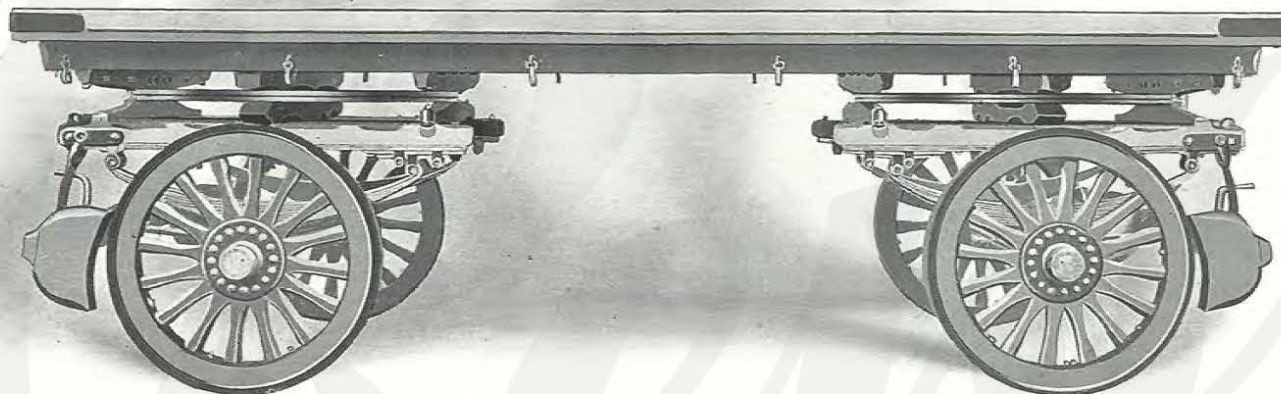
**END TIP
TRAILER**



Price complete, as illustrated, with Draw Bar, £73.

Specification

WHEELS.	Our composite pattern ; front 2ft. 10in. by 5in.; back 3ft. 3in. by 6in.
TYRES.	Weldless steel, hydraulically fitted.
AXLES.	Mild steel on oak beds.
BODY.	Heavily framed in well-seasoned oak.
SIDES.	Either battened, hinged and removable, or framed and fixed.
TIP GEAR.	The Trailer is built with or without Tipping Gear. When fitted, this is of the same pattern as is described in connection with our steam tip wagon.
DRAW BAR.	A strong triangular spring Draw Bar is fitted.



Ordinary Trailer. Single Lock, price £58, 10s. Double Lock, as shown, price £68, 10s.

Length, 12ft. 6in.	Width, 6ft. 6in.	Height to floor level, 3ft. 10in.		
BODY (inside).	Length, 10ft. 6in.	Width, 5ft. 6in.	Depth, 2ft. 0in.	Capacity, 4 cubic yards.
SHIPPING.	In one case, 12ft. 0in. by 8ft. 0in. by 3ft. 6in.		336 cu. ft.	Lift, under 3 tons.
	Hinged sides.	Code word [CAAKAL].		

**General
Particulars
Tip**

Length, 12ft. 6in.	Width, 6ft. 6in.	Height to floor level, 3ft. 10in.		
PLATFORM.	12ft. 6in. by 6ft. 6in. (outside measure).			
SHIPPING.	13ft. 6in. by 7ft. 6in. by 2ft. 6in.	250 cu. ft.	Lift, under 3 tons.	
	Single lock [ESCAARI].	Double lock [CABEBAR].		

**General
Particulars
Non-Tip**

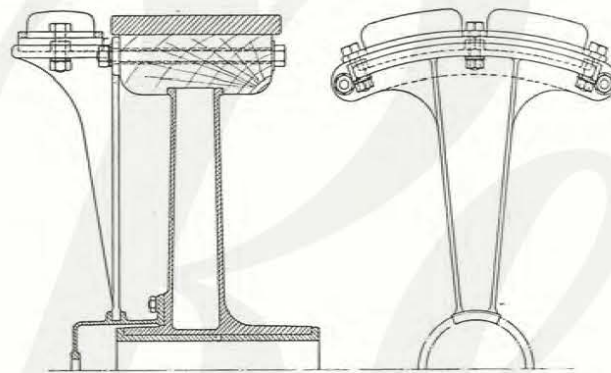
LEYLAND MOTORS, LIMITED

Patent Non-Skids

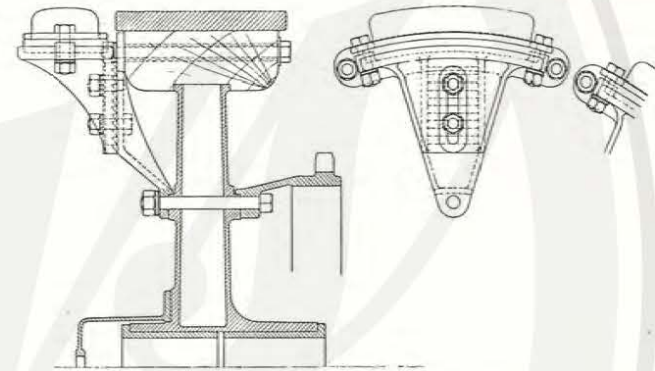
NON-SKIDS.—The Spurrier Patent Non-Skid (illustrated) is intended to enable a Motor Vehicle, fitted with smooth steel tyres on the driving wheels, to travel in a moderate fall of snow or on an ice-bound road. This is accomplished by a rubber block tyre made in sections and arranged to stand one-half inch proud of the permanent steel tyre. The rubber is compressed by the weight of the vehicle, and whilst carrying only a small percentage of the gross load, provides the additional adhesion required.

These non-skids can be fitted to one or both of the driving wheels, and can be made attachable or can be carried permanently in winter, with a screw appliance for bringing them into action. They are intended to be temporary tyres only, although permanent tyres on this principle in many cases are of great service.

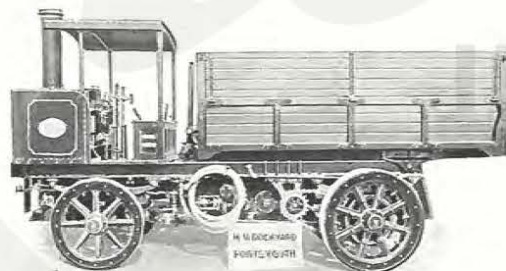
Prices and further particulars on application.



Detachable Non-Skid



Semi-permanent Arrangement with Adjustment



One of two Tip Wagons supplied to the Admiralty.



One of two Government wagons burning wood fuel, and in service on the East Coast of Africa.

LEYLAND MOTORS, LIMITED

CHASSIS PRICE LIST

PAGE		NO TYRES £	STEEL TYRES £	SOLID RUBBER TYRES £	*
14	Steam. Class "H" 13ft. 6in. or 14ft. 6in. Platform space ..	...	535	...	ALBERTINE
—	" " "H" 15ft. 6in. or 16ft. 6in. " " ..	...	542	...	APENINA
—	" " "H" Standard Tip, hand tip gear	...	550	...	ARTUSAB
20	" " " " " " mechanical tip gear	...	567	...	ASTRICUMB
22	" " "H" Municipal Tip Chassis	...	540	685	AUSMOGEN
—	" " "H" { Extra strong pressed frame and with springs, etc., for 8 ton load	...	555	...	ATURIAH
—	" " "F" { As above, but with new engine and larger boiler	...	565	...	ARNARODO
24	" " "K" 3 ton Chassis	550	...	655	AKUAB P
36	Petrol. " "W" 13ft. 6in. platform. 35 h.p. Load 5 tons	600	RUBBER FRONT, STEEL BACK WHEELS 665	745	BAAKOB
36	" " "X2" (straight) 13ft. 6in. platform. 35 h.p. Load 50-70 cwt.	550	...	655	BARCUDIN
36	" " "X2" (bus) 11ft. 6in. platform. 35 h.p. ...	600	...	705	BEJOBEB
47	" " "W" Municipal, Load 4 tons. Hand tipping	620	685	765	BESAMU
—	" " " " " " Mechanical tipping	645	710	790	BIEANAM
34	" " "TX" 11ft. 6in. platform. 30 h.p. Load 40-50 cwt.	500	...	585	BLOBOB
35	" " "T" 10ft. 6in. platform. 24 h.p. Load 30-40 cwt.	450	...	535	BOAED
—	" " "T" 10ft. 6in. platform. 18 h.p. Load 30-40 cwt.	425	...	510	BOVANTIA
—	Extra for 50 h.p. instead of 35 h.p. engine... ..	25	...	...	BRAHTIN
—	" " Dual ignition on 4-cylinder engine	20	...	...	BROAB

* The code words are for chassis with steel tyres. P These code words are for chassis without tyres. If rubber tyres required add [tyres].

LEYLAND MOTORS, LIMITED

STEAM WAGON PRICE LIST

PAGE	DESCRIPTION	CODE WORD	PRICE
19	Plain Platform, 16ft. 6in. long	DAKATOE	£560
19	„ „ 15ft. 6in. „	DARMDEIN	559
19	„ „ 14ft. 6in. „	DARNOGEB	551
19	„ „ 13ft. 6in. „	DECORBAK	550
—	Tip Wagon, Hand Tip Gear	DEDEBAM	595
20	„ „ Power Gear	DEHAKARA	612
22	„ „ Municipal	DEMABAU	585
—	Street Tank, 1,000 gallons	DEPOBAB	608
—	„ „ 800 „	DESDEBU	604
23	„ „ Lighter Pattern, 1,000 gallons	DIABONA	598
23	„ „ „ „ 800 „	DIABROBEN	594
22 & 23	Municipal Tip Wagon, and 1,000 gallon tank	DIACABIA	643
22 & 23	„ „ „ „ 800 „ „	DIAGACIAN	639
44	Box Van... ..	DIDABARN	635
25	Lift-off Van	DIENADY	610
21	Timber Wagon... ..	DIKATEN	560
—	Extra for Strengthening Standard Wagons to carry 8 tons	CHAPPELD	22
21	Extra for High-pressure Engine and Larger Boiler	CHAPUDAR	30
43	Sheet Van double the price of Plain Platform and Tar Sheet ... add	EDELHOGN	—

NOTE.—Steel Tyres only are included in all these prices.

LEYLAND MOTORS, LIMITED

PETROL VEHICLE PRICE LIST

Page	DESCRIPTION	CLASS T Page 35		CLASS T X Page 34		CLASS X ₂ 'BUS Page 37		CLASS X ₂ STRAIGHT Page 37		CLASS W ₅ TON Page 37	
		PRICE	CODE WORD	PRICE	CODE WORD	PRICE	CODE WORD	PRICE	CODE WORD	PRICE	CODE WORD
40	Plain Long Platform, 14ft. 6in.	...	...	...	...	£672	EASABAR	£672	EDGORAB	£762	EFFETIK
40	" " " 13ft. 6in.	...	...	£601	DIVOGO	671	EASTORA	671	EDOMOAR	761	EGAKOG
40	" " " 11ft. 6in.	£525	DILABAK	600	DIZIGAR	...	...	...	...	...	...
40	" " " 10ft. 6in.	523	DIMABUR	...	...	...	...	...	...	...	...
44	Box Van	...	DIOAKAN	665	DOGABAF	735	EBAGIN	745	EDRORU	845	EGERTIN
46	Lift-off Van	...	DISARBOB	650	DOLHAUR	720	EBATAB	725	EENBEG	820	EGETTAR
52	Tramway Tower Wagon	...	DISMABAN	670	DORMAKOR	740	EBRAKAN	740	EERAKAG	...	...
47	Tip Wagon, Hand Tip Gear...	570	DISPUBOG	645	DRYDEN	710	ECAGLEN	...	...	810	EHRAHN
47	" " Power Tip Gear	...	...	...	...	735	ECHASTER	...	...	835	EICAKAM
48	Double-decked Omnibus	...	...	...	...	845	ECLIANE	...	...	...	...
48	" " better finish	...	...	...	...	870	ECSTARYO	...	...	...	...
49	Single-decked Omnibus	...	...	705	DSOGAR	825	ECTAKAR	...	...	...	...
49	" " better finish	...	...	725	DUBABOK	845	ECTUAM	...	...	...	...
50	Char-a-banc, 32 Pass.	...	...	...	...	820	ECUNAK	...	...	...	...
50	" better finish	...	...	...	...	840	EDAGAN	...	...	...	...
51	" 32 Pass.	...	...	...	...	845	EDELEB	...	...	...	...
51	" better finish	...	...	...	...	870	EDENTENA	...	...	...	...
50	" 22 Pass.	...	...	675	DURGON	...	...	...	...	...	...
50	" better finish	...	...	690	DUTABAM	...	...	...	...	...	...
44	Combination Body	...	...	695	EABAM	815	EDEKUR	815	EFATARN	...	...
		(a)		(a)		(b)		(b)		(c)	

NOTES.—Solid rubber tyres, single for front, twin for back wheels, included in every case.

(a) Tyres at £85 a set included.

(b) " £105 "

(c) " £145 "

Extra for 24 instead of 18 h.p. 2-cylinder engine, £25.

" 50 " 35 h.p. 4 " " £25.

TERMS OF BUSINESS.

Payment

One-third cash with order, balance after testing in the presence of the purchaser or his representative in the neighbourhood of our works.

Prices

Our prices are always quoted as f.o.r. Leyland.

Trial Runs

We can generally arrange to give a week or a month's trial, purchase being conditional on a satisfactory result. The rates vary from 30/- to 80/- per day according to conditions.

Outfit

With complete vehicles we supply a horn, two side lamps, and one tail lamp, with necessary lamp brackets. With all Chassis and vehicles we supply certain special spanners.

Spare Parts

We keep in stock for immediate delivery a full series of all parts of our Chassis that are liable to wear or to be damaged by accident.

Guarantee

Every care is exercised that only the very best material and most careful workmanship are employed in the construction of our vehicles, and we are prepared to supply at our works, free of charge, any part which may prove faulty, through defects of workmanship or material, within three calendar months of delivery. In every case the defective part must be returned to us, carriage paid, for examination before we can accept liability. This guarantee does not apply to rubber tyres or electrical details not of our manufacture. We do not undertake any contingent liabilities.

Customer's Vehicles

Customer's vehicles are driven by our staff only at owner's risk and responsibility.

Packing

In cases where vehicles are ordered for export, it is advisable to pack in strong wooden cases, involving an additional charge of $4\frac{1}{2}\%$, including delivery f.o.b. English ports. Packing is not generally necessary when shipping to the Continent only.

Dismantling

The amount of dismantling desirable will depend upon the destination of the vehicle and the facilities for re-erection. In many cases it is sufficient to remove the body (when one is supplied), one large case containing the frame and the rest of the mechanism complete.

Painting

Estimates include ordinary painting and lining out, three coats, and colours to customer's requirements, and lettering within reason. Gilding and elaborate devices will be charged for as an extra.

LEYLAND MOTORS, LIMITED

SPECIFICATION—CHASSIS “TX” and “T”

The Class “T” Chassis has a pressed steel frame, made in several lengths ; it is suitable for a single decked 'Bus or Char-a-banc, seating 20 passengers, or, when goods are carried, loads from 30 to 50 cwt.

Any of these engines can be fitted :—

2 Cylinder, 18 h.p.	} Low Tension Magneto Ignition, power measured at 700 revs.
2 Cylinder, 24 h.p.	
4 Cylinder, 30 h.p.	

2 Cylinder Engine, 12-15 miles per hour.

4 Cylinder Engine, 15-18 miles per hour.

All these particulars are the same as on our Class “X2” Chassis, described on page 36, except that the foot pedal brake acts on the driven shaft of the change gear box.

The gear shafts run on ball bearings. 3 changes forward and reverse are provided with the 4-cylinder engine, 4 changes forward and reverse with the 2-cylinder engines. The gear box is substantially that described on page 36, as fitted to the “X2” Chassis.

There is a double jaw coupling between the engine and the gear box. The back axle provides a further reduction between the differential shaft and the road wheels, and is of the live type, combined with our Patent Spherical Thrust Block Drive, which relieves the springs of all torsional and driving strains, making them more flexible. The driving axles and propeller shaft are entirely encased and so arranged that no strain, other than the drive, comes upon them, the outer casings carrying all the weight. The power is transmitted from the propeller shaft to the axles by a hardened steel worm and phosphor-bronze wheel, carrying inside it the differential gear. The whole of this gearing runs on ball bearings in an oil bath, so that the wear and tear are reduced to a minimum.

	“T”	“TX”
Length overall	16ft. 3in.	19ft. 0in.
Width overall... ..	6ft. 6in.	6ft. 6in.
Height overall	5ft. 9in.	5ft. 9in.
Wheel Base	10ft. 9in.	13ft. 4in.
Diameter Wheels	32in. and 34in.	32in. and 40in.
Height from ground to top of frame (light)	2ft. 9in.	2ft. 11in.
Length, back of driver's seat to back of frame	10ft. 0in.	11ft. 0in.
Tare Weight	2 tons.	2 tons, 10 cwt.

...33...

Carrying Capacity

Engine Power

Speed

Body, Wheels, Brakes, Engine, Ignition

Change Gear Box

Transmission

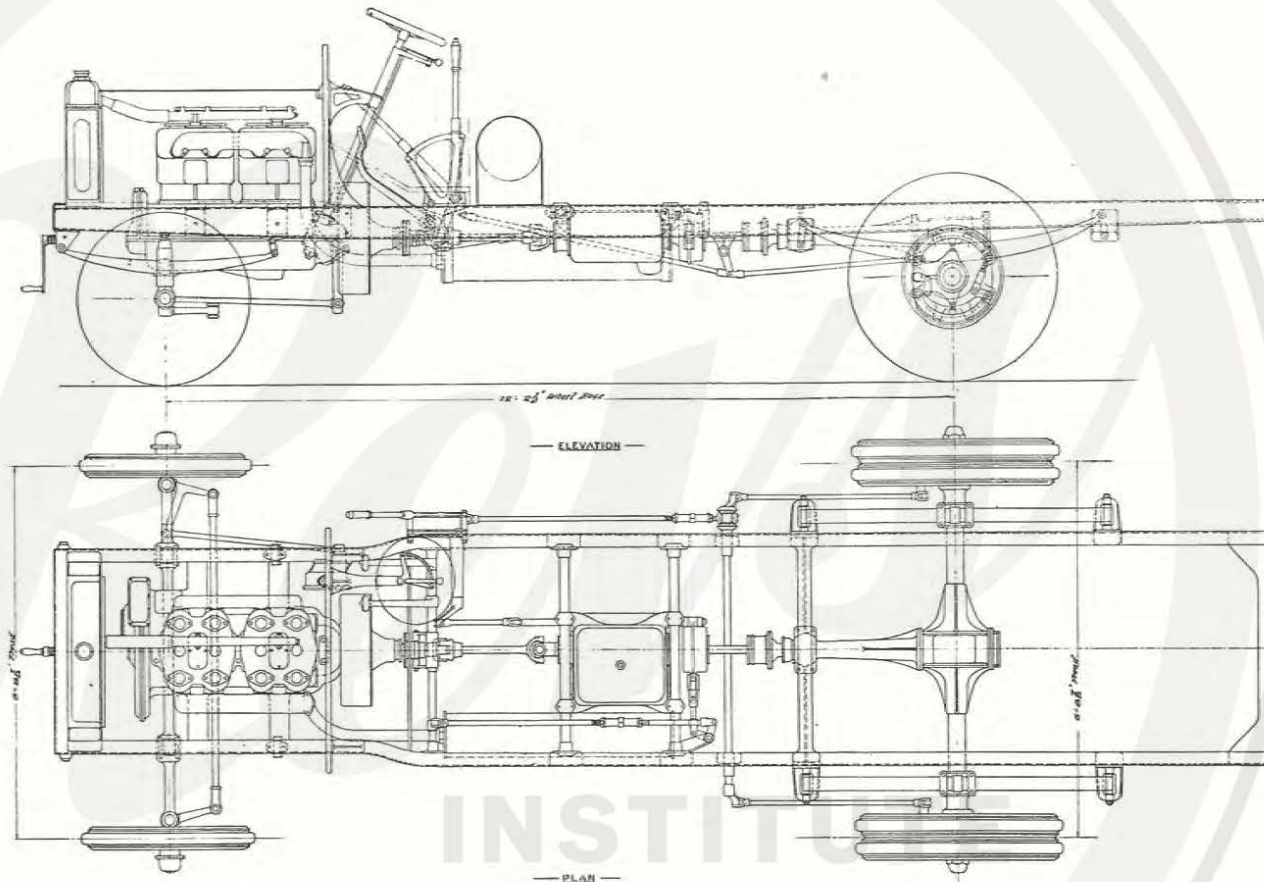
General Particulars

PETROL

RODIES

TABLES

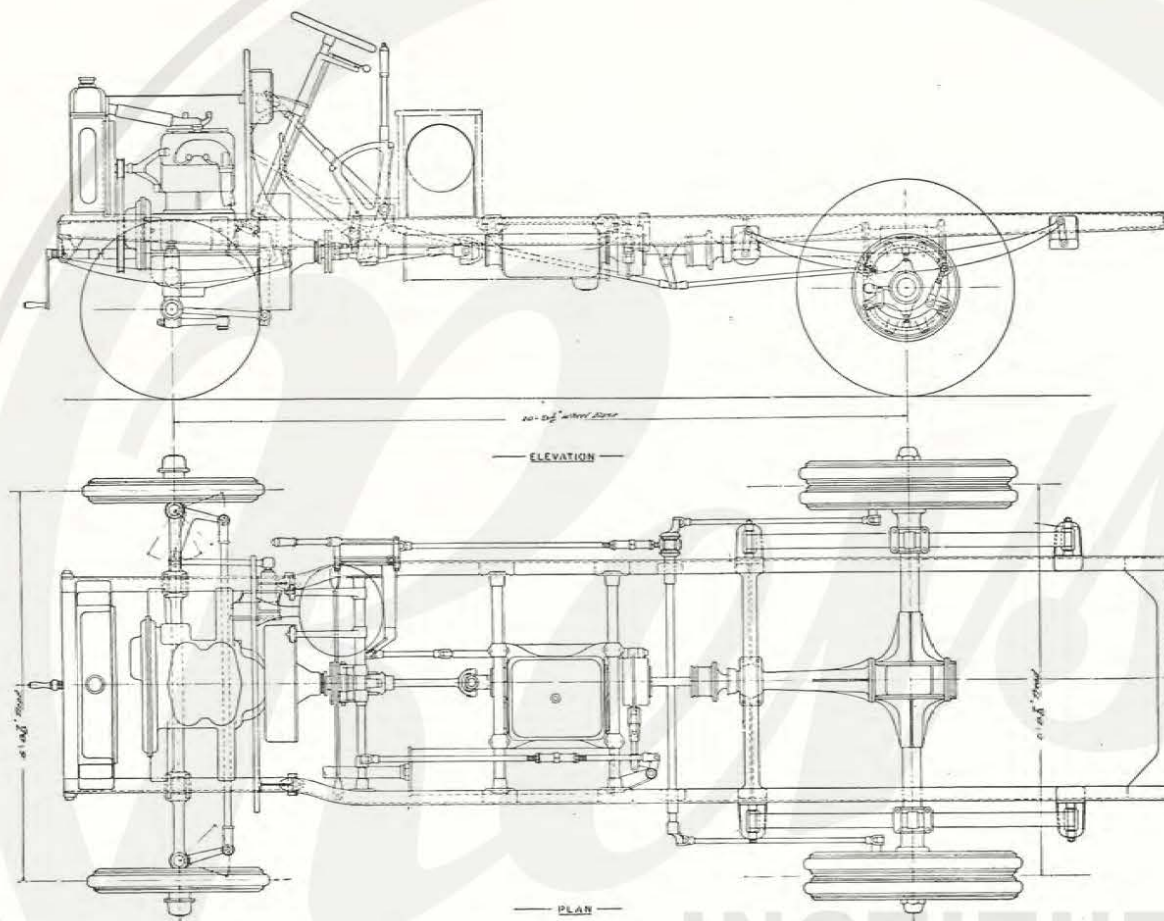
**General
Arrangement
Chassis Class
"T X"**



Chassis "T X," 4 cyl.; 30 h. p. load; 40-50 cwts.; Price £500.

**Approximate
Shipping
Specification**

Chassis "T X" in one case. 20ft. oin. long; 5ft. oin. wide; 3ft. 9in. high; 400 cu. ft.; lift, 3 tons.



**General
Arrangement
Chassis
Class "T"**

Chassis "T," 2 cyl.; 24 h.p.; Load 30-40 cwts.; Price £450.

" "T," 2 " ; 18 h.p.; " " ; " £425.

For specifications see page 33.

Length (overall) 16ft. 3in. ; Width (overall) 6ft. 6in. ; Height (overall) 5ft. 9in. ; Wheel Base, 10ft. 9in. ; Diameter Wheels, 32in. and 34in. ; Height from ground to top of frame (light) 2ft. 9in. ; Length, back of driver's seat to back of frame, 10ft. 0in. ; Tare weight, 2 tons.

Chassis "T" in one case. 17ft. 0in. long ; 5ft. 0in. wide ; 3ft. 9in. high ; 320 cu. ft. ; lift, 3 tons.

Specification

General Particulars

Approximate Shipping Specification

SPECIFICATION OF CLASS "X₂" AND "W" PETROL CHASSIS.

Carrying Capacity

This Chassis is fitted with a 35 h.p. four-cylinder Petrol Engine or with a 50 h.p. engine of exactly similar design. Both are suitable to carry a fully-loaded omnibus seating 34 passengers, or a char-a-banc for the same number, or when goods are carried by modification of springs and gearing loads of 3 to 5 tons.

Speed

With 'bus body or 3 tons of goods, 12 to 15 miles per hour. With 4 to 5 tons of goods, 8 to 10 miles per hour.

Body

Bodies of almost any design to suit purchasers' requirements can be built, and drawings will be supplied on receipt of particulars. For the guidance of buyers a few representative designs are submitted.

Frame

The frame is of pressed nickel steel. It is made in two strengths.

Wheels

The wheels are of our composite type, which has proved itself the only design which will withstand bad roads and rough usage; practically any make of tyre can be fitted, the price varying with that selected.

Brakes

Two sets of our improved internal expanding compensating brakes are fitted to each of the road wheels. The blocks acting on the larger drum are worked by a pedal. Those on the other drum by a hand lever.

Engine

The cylinder metal is particularly hard, and the arrangements for cooling, including our special radiator, are very efficient. The crank shaft and other important parts of the gearing are of vanadium and nickel steels. The valves are mechanically operated, and placed symmetrically on either side of the engine. Automatic lubrication is used.

Ignition

The ignition is of the Simms-Bosch low-tension type; our engines are however constructed in such a manner that high tension magneto and accumulator ignition can be conveniently fitted.

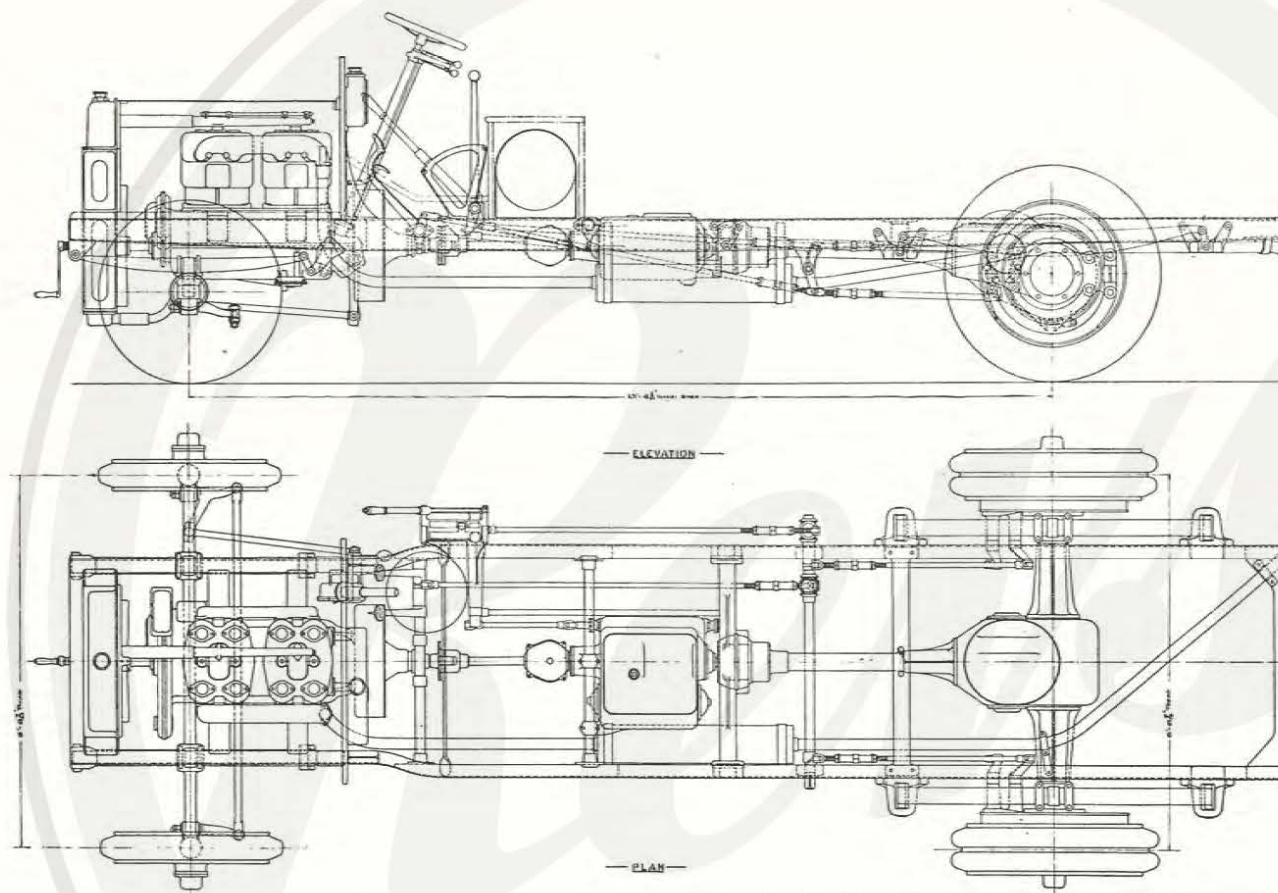
Change Gear Box

The gear shafts run on ball bearings. Four changes forward and reverse are provided. The hand lever is arranged on the "gate" principle. The gears are case-hardened by a special process and ground correct after hardening. The gear sleeves slide on 4 keys machined from the solid shaft.

Transmission

There is a double jaw coupling between the engine and gear box. The back axle provides a further reduction between the differential shaft and the road wheels, and is of the live type combined with our patent spherical thrust block drive, which relieves the springs of all torsional and driving strains, making them more flexible. The driving axles and propeller shaft are entirely encased, and so arranged that no strain, other than the drive, comes upon them, the outer casings carrying all the weight. The power is transmitted from the propeller shaft to the differential by a bevel drive, and from the latter to each of the axle ends by a single reduction spur gear. The whole of this gearing is of special oil-tempered steel, and runs on ball bearings in an oil bath, so that the wear and tear are reduced to a minimum.

**GENERAL
ARRANGEMENT
CLASS "X2" and
"W" PETROL
CHASSIS**



Price, "X2" 'Bus Chassis, as illustrated, £600 without, £705 with tyres.

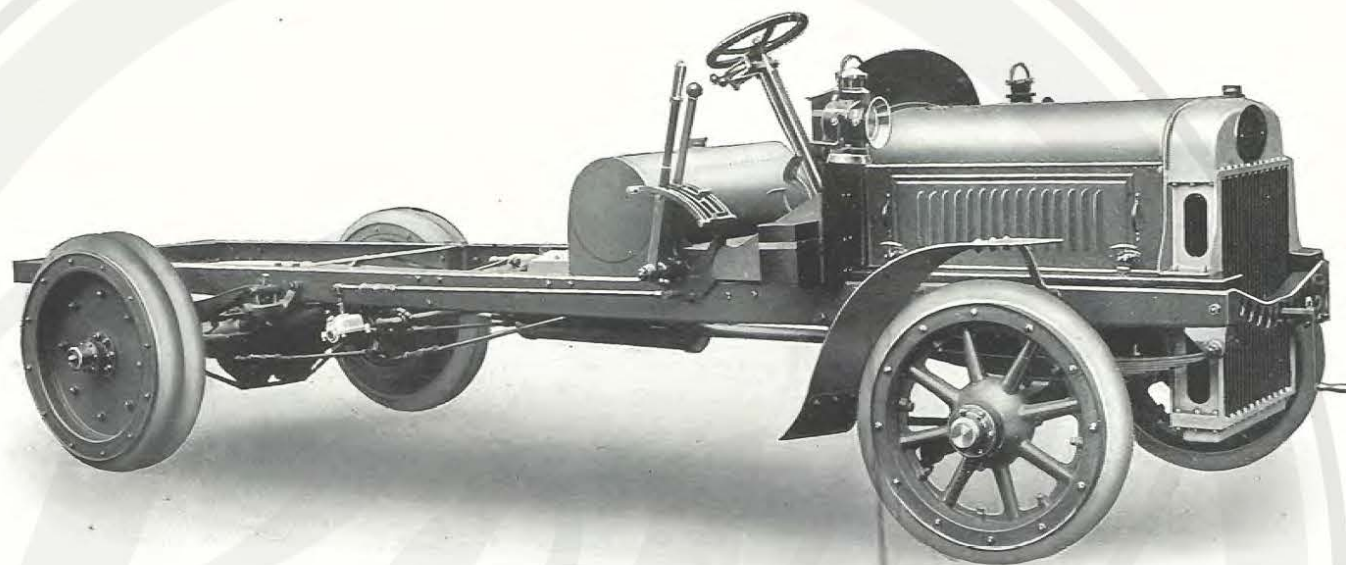
" "X2" Straight, 50-70 cwts. load, £550 " £655 " "

" "W" 5 ton load £600 " £745 " "

The Engine is of 35 h.p. Extra for Engine of 50 h.p. £25

" " Dual Ignition ... £20

**SIDE VIEW.
"X2" and "W"
PETROL
CHASSIS**



For prices see page 29.

**General
Dimensions
Class "W,"
5 tons**

Length overall, 21ft. 8in. Width overall, 6ft. 7in. Height, 5ft. 9in. Wheel base, 13ft. 4in. Front wheels, 34in. diam. Back wheels, 40in. diam. Height from ground to top of frame (light), 3ft. 3in. Length, back of drivers' seat to back of frame, 13ft. 6in. Tare, 3 tons 5 cwt.

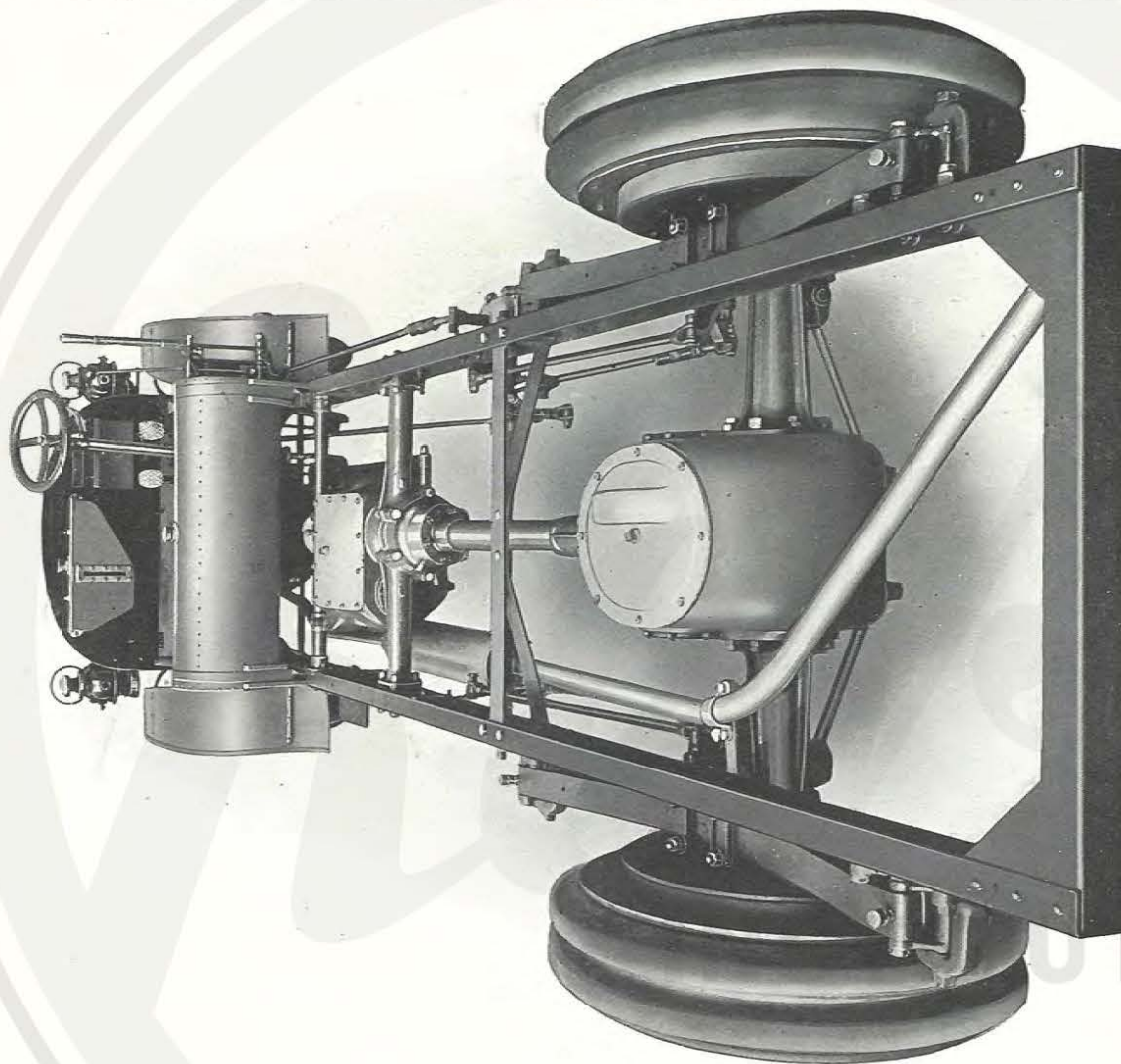
**General
Particulars
Class "X2"
Straight
50-70 cwt.**

Same as Class "W," except that tare is 3 tons.

**Shipping
Specification
"X2" and "W"**

Chassis packed in one case. 22ft. 6in. by 5ft. 0in. by 3ft. 9in. 420 cu. ft.

Lift, under 5 tons.

**PETROL
CHASSIS****Class "X2"
and "W."
End View**

This illustration shows very clearly our gear-driven back axle, the double expanding brakes on the driving wheels, the patent flexible spherical thrust block drive, and the clean appearance of the Chassis as a whole.

Length overall, 19ft. Width, 7ft. Wheel base, 13ft. 4in. Front Wheels, 34in. diameter. Back wheels, 40in. Height from ground to top of frame (light), 2ft. 10in. Length, back of driver's seat to back of frame, 11ft. Tare, 2 tons 18 cwt.

Chassis packed in one case. Length, 20ft. by 5ft. by 3ft. 9in. 400 cub. ft. Lift, under 4 tons.

**General
Particulars
Chassis
Class "X2" (Bus)****Approximate
Shipping
Specification**

**Plain
Platform**



"TX" Chassis, £500. Tyres, £85. Body, 11ft. by 6ft., £15.

**Approximate
Shipping
Specification
Class "X2" and
"W" Chassis**

Chassis packed in 5 cases, all under 2 tons gross.

Description.	Measurement.			Cubic Feet.	Shipping Weight. cwts.
	ft. in.	ft. in.	ft. in.		
Case No. 1—Frame	21	6 by 3	9 by 0 10	67	33½
Case No. 2—Engine, Radiator, and Dashboard	5	3 ,, 3	3 ,, 4 0	70	35
Case No. 3—2 Front Wheels	3	0 ,, 3	0 ,, 1 8	15	7½
Case No. 4—2 Back Road Wheels	3	6 ,, 3	6 ,, 2 0	25	13½
Case No. 5—Front and Rear Axles, Gear Box, Steering Gear, Petrol Tank, Silencer, Coupling and Carden Shaft, Springs, &c.	9	0 ,, 6	0 ,, 3 0	160	80

LEYLAND MOTORS, LIMITED

PLAIN PLATFORMS.

Plain Platforms

SIZE.	"H" Steam.				Petrol. Class "W."	Class "X2." Straight.	Class "X2." Bus.	Class "T X."	Class "T."
Capacity	104 sq.ft.	97.5 sq.ft.	84 sq.ft.	78 sq.ft.	78 sq.ft.	78 sq.ft.	60 sq.ft.	60 sq.ft.	50 sq.ft.
Length	16ft. 6in.	15ft. 6in.	14ft. 6in.	13ft. 6in.	13ft. 6in.	13ft. 6in.	11ft. 0in.	11ft. 0in.	10ft. 0in.
Width	7ft. 0in.	7ft. 0in.	6ft. 6in.	6ft. 6in.	6ft. 6in.	6ft. 6in.	6ft. 0in.	6ft. 0in.	5ft. 9in.
Price	£18	£17	£16	£15	£16	£16	£15	£15	£13
For Class "F," 8 tons ...	£20	£19	£18	£17	...	...	...	...	...
Extra for tar sheet and hood	£10	£9	£8	£8	£10	£10	£10	£10	£9
Packed for shipment, cube	160 cu.ft.	150 cu.ft.	125 cu.ft.	115 cu.ft.	165 cu.ft.	165 cu.ft.	140 cu.ft.	140 cu.ft.	100 cu.ft.
Maximum lift	2 tons	2 tons	1 ton	1 ton	1 ton	1 ton	1 ton	1 ton	1 ton
Code Words	DABABA	DABLEB	DALABY	DEABAR	DEBOBIN	DECAMAB	DIPOBY	...	...

All above dimensions of bodies are measured outside combings. For Tar Sheet and Hood quote Code Word [DECLEGEGB].

Tip bodies are strongly framed in ash, so as to support the full load when balanced on a single pair of hinges. The floor is sheet steel lined, and all the corners and combings are heavily ironed. The back door is hinged at the top, and held in position by a bolt worked by a lever underneath the body.

Tip Wagon Bodies.

Body for 5 Ton Steam Wagon, length 11ft., width 5ft. 9in., height 3ft., capacity 6½ cube yards.

Price £45. Code Word : DABARIKAM.

Body for 5 Ton Petrol Wagon, length 12ft., width 6ft., height 2ft. 6in., capacity 6½ cube yards.

Price £45. Code Word : DABIGIUM.

Body for 3 Ton Petrol Wagon, length 10ft., width 5ft. 6in., height 2ft., capacity 4 cube yards.

Price £35. Code Word : DACABAR.

NOTE.—All above dimensions are clear inside.

Extra for blinds or covers, £10. Code Word : DACHOBAN.

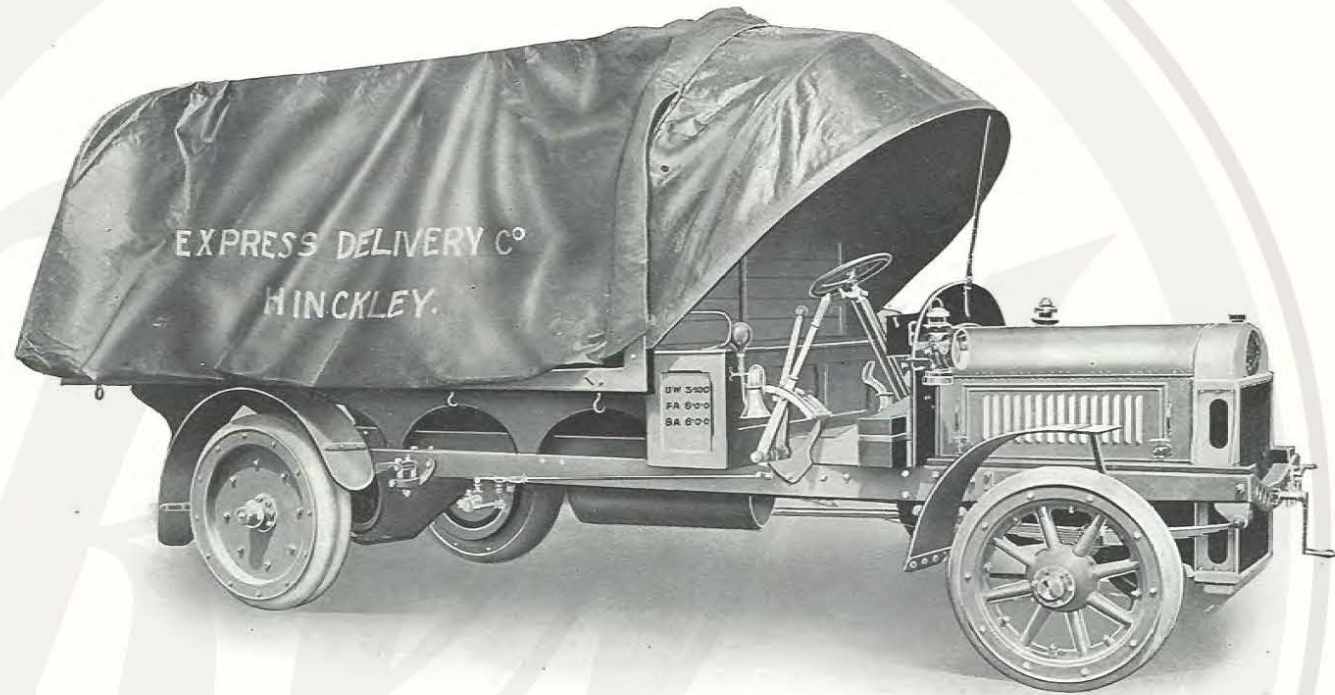
Extra for framed removable sides, £12. Code Word : DACHUAR.

For shipping purposes the body with fixed sides measures ... 5 ton size, 475 cubic feet ; 3 ton size, 300 cubic feet.

" " hinged sides " " " 300 " " 235 "

NOTE.—The case containing a body with fixed sides will also take the seat, bunkers, angle frame, and front wheels of the chassis without extra freight charge. See also page 20.

**PLAIN
PLATFORM
(with Sheet
and Hood)**



"X2" (Straight) Chassis. Price, £550. Tyres, £105. Body, 13ft. 6in. by 6ft. 6in., £26.
(Including extra Sheet and Hood.)

Description

This represents an ordinary lorry platform with the addition of angle steel hoops at either end, a longitudinal rail, tar-sheet, and hood over driver.

Code word for this extra [DECLEGE].



**SHEET
VAN BODY**

Class "X2" (Bus) Chassis, £600. Tyres, £105. Sheet Van, capacity 330 cu. ft., £30.

These bodies are of hard wood, of the same outside dimensions as the lorry platforms. The bent wood bows can be permanent or removable. The canvas is painted and lettered to requirements.

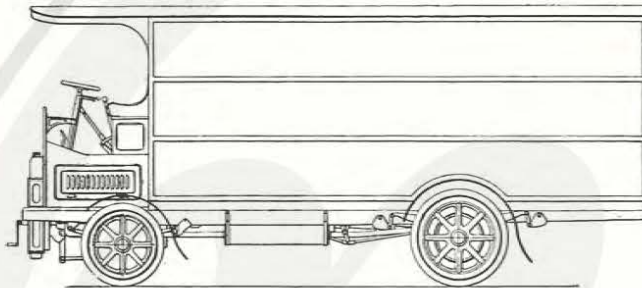
The prices are just double those quoted on page 41 for plain platforms with tar-sheet and hood.

For this Body add code word [EDELHOGN], to those on page 41.

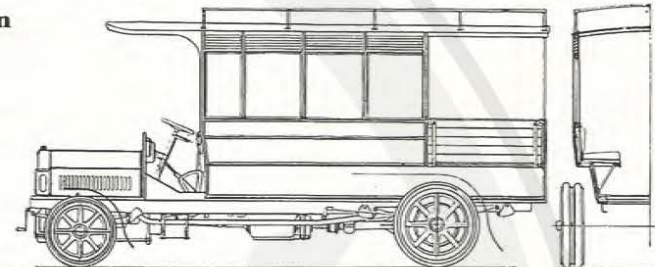
**Specification
and Prices**

LEYLAND MOTORS, LIMITED

**Box Van
Body**



**Combination
Body**



Price of Body £110.

BOX VAN BODIES.

SIZE.	5 ton Steam "H" or Petrol "W."	X ₂ Petrol Straight.	X ₂ Bus.	Class "T X" 4 Cyl.	Class "T" 2 Cyl.
Capacity	470 cu. ft.	470 cu. ft.	345 cu. ft.	345 cu. ft.	250 cu. ft.
Length	13ft. 0in.	13ft. 0in.	10ft. 6in.	10ft. 6in.	9ft. 6in.
Width	6ft. 0in.	6ft. 0in.	6ft. 0in.	6ft. 0in.	5ft. 3in.
Height	6ft. 0in.	5ft. 6in.	5ft. 6in.	5ft. 6in.	5ft. 0in.
Price	£100	£90	£80	£80	£60
<i>NOTE.—Dimensions are clear inside.</i>					
Packed cube in feet	895 cu. ft.	895 cu. ft.	710 cu. ft.	710 cu. ft.	550 cu. ft.
Lift under	3 tons	3 tons	3 tons	3 tons	2 tons
Code Words	CAAKAL	CABEBOR	CABORKIS	CACADON	CACHILES

The Combination Body is designed for use with Chassis "X₂" or Class "T," 4 cyl.

In front it is a single-decked bus, with a front entrance. It seats 10 passengers.

The luggage compartment is 4ft. 6in. long.

Packed, this body measures 700 cu. ft. Lift, under 2 tons.

Code word: CHRETADAN.



Box Van Body

Class "T X" Chassis, £500. Tyres, £85. Body, 345 cu. ft. capacity, £80.

These bodies are framed in ash. They are heavily ironed, have a hard wood floor, bay wood panels, and are finished in the best possible style.

For prices and shipping specifications see opposite page.

**Specification
and Prices**



**LIFT-OFF
VAN BODIES**

"X2" Chassis (straight) with lift-off Van body.

Particulars

Bodies such as the above are in general use amongst furniture removers. They are useful to take the place of the Box Van abroad, as they can be shipped in sections.

SIZE	Steam "H" Petrol "W"	"X2" Petrol Straight	"X2" Bus	Class "TX" 4-cyl.	Class "T" 2-cyl.
Capacity ...	470 cu. ft.	470 cu. ft.	350 cu. ft.	350 cu. ft.	250 cu. ft.
Length ...	13ft. oin.	13ft. oin.	10ft. 6in.	10ft. 6in.	9ft. 6in.
Width ...	6ft. oin.	6ft. oin.	6ft. oin.	6ft. oin.	5ft. 3in.
Height ...	6ft. oin.	6ft. oin.	5ft. 6in.	5ft. 6in.	5ft. oin.
Price ...	£75	£70	£65	£65	£50
Packed ...	410 cu. ft.	410 cu. ft.	395 cu. ft.	395 cu. ft.	305 cu. ft.
Lift, under ...	3 tons	3 tons	3 tons	3 tons	2 tons
Code Words ...	CICABIAN	CIRABALO	CIVODEN	CAHARTAR	CALYMONA

**Shipping Specifi-
cation for Body
packed in
sections**

LEYLAND MOTORS, LIMITED

To shorten the wheel base, the driver is above the engine. The engine, gear, etc., are our standard "X2." The frame and axles are suited to a 4-ton load. For particulars of bodies and street water tanks see pages 41 and 23.

14ft. long ; 6ft. 6in. wide ; 7ft. high ; 2 tons 15 cwts. tare.

With body :—

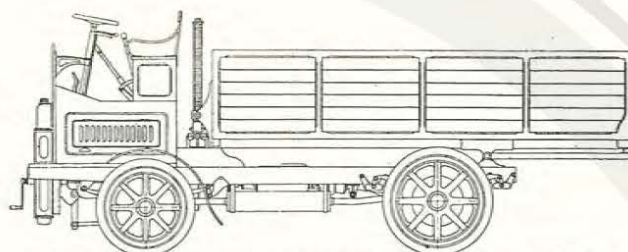
17ft. 6in. long ; 6ft. 6in. wide ; 7ft. high ; 3 tons 12 cwts. tare.

Wheel base 8ft. 6in. ; front wheels 34in. ; back wheels 40in.

Length, back of driver's seat to hinge pin, 9ft.

Chassis only in one case, 15ft. long by 7ft. 6in. by 6ft.

675 cu. ft. Lift, 4 tons.



Price : Chassis, £620. Tyres, £145. Body, £45.
Load 4 tons.

Extra for Mechanical Tipping Gear, £25

**SPECIAL TIP
"X2" and "W"
CHASSIS.**

**Chassis
Dimensions**

Shipping

**LEYLAND
'BUSES IN
LONDON**

*Short extract from MOTOR TRACTION,
September 5th, 1908.*

Some Account of the Upkeep and Maintenance
of the Fleet of the London Central Omnibus
Co. An Average of 98 per Cent. on the Road.

The vehicles owned by the London Central Omnibus Company have long been well-known to Londoners as extremely reliable and comfortable. It is a most unusual thing to see one of these 'buses laid up on the road, and, for this reason alone, some description of the method of maintenance adopted cannot fail to be of interest.

The normal working fleet is fourteen, one being kept as a stand-by, and one being assumed to be in course of overhaul. With the fourteen omnibuses kept in regular work, the actual mileage covered has averaged out at about 98% of the pre-arranged distances, and as high a percentage as 99.7 has been maintained for a period of three consecutive weeks. At the time of our visit one of the 'buses was in for its annual overhaul, which is a process that, considering the limited facilities, must take some little time. It does not, however, usually mean many renewals, and this is instanced by the fact that up to the present not a single change-speed or differential gear wheel has been replaced, though some must have run 60,000 miles—in fact, the Leyland Company have never yet had to replace gears in any of their industrial vehicles of the "X" type. So far as the omnibus company is concerned, cylinders and piston rings have caused equally little trouble, not a single cylinder having been rebored or a piston ring renewed.

**Results on the
Road**



1 supplied 1905 ; 4 in 1906 ; 1 in 1907 ; 10 in 1908.

LEYLAND MOTORS, LIMITED

**DOUBLE
DECK
OMNIBUS
BODY**



London Pattern Omnibus, "X2" Chassis, £600. Body, £140 [Caesquar]; £165 [Cludabar]. Tyres, £105.

Specification

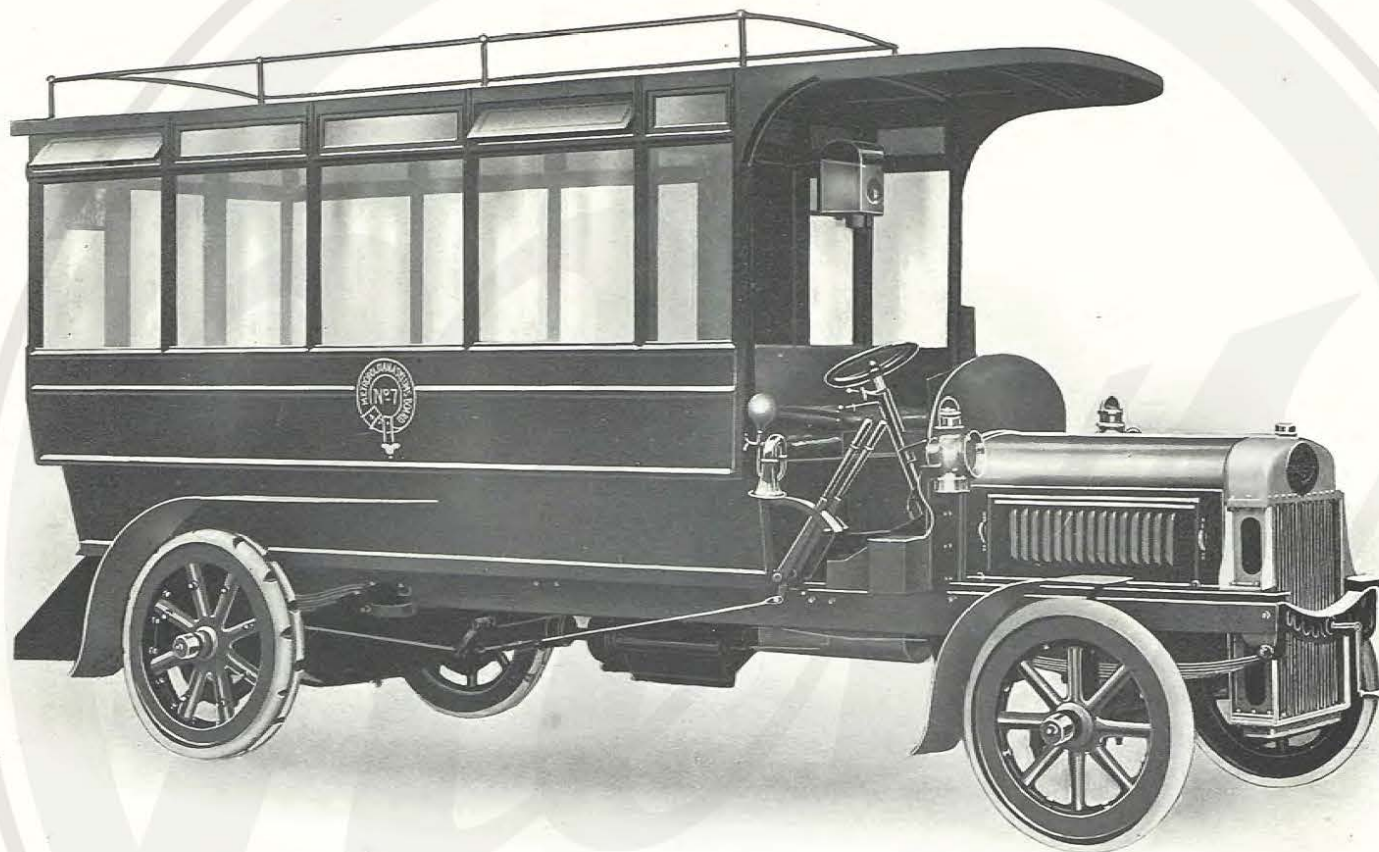
Built throughout of hard woods. Seating 16 inside, 18 on top, 2 by driver.

Seating : lengthwise inside, fitted with spring cushions covered in pegamoid.

„ garden type on top, grooved to keep dry in wet weather.

Finish : best paint and varnish outside, polished veneer inside.

Lettering included. Lighting extra. Built to comply with Metropolitan Police Regulations.



**SINGLE DECK
OMNIBUS**

INSTITUTE

Chassis "TX," Price £500. Tyres, £85. Body, £120 [Cagadel]; £140 [Clonarín].

Generally similar to the Double Decker. Seating 16 inside, 2 beside driver.

Body in one case ... 16ft. 6in. by 6ft. 6in. by 7ft. 6in. 805 cu. ft. Lift, under 3 tons.

...49...

**Shipping
Specification,
Single or
Double Decker**

CHAR-A-BANC
(Level Floor)



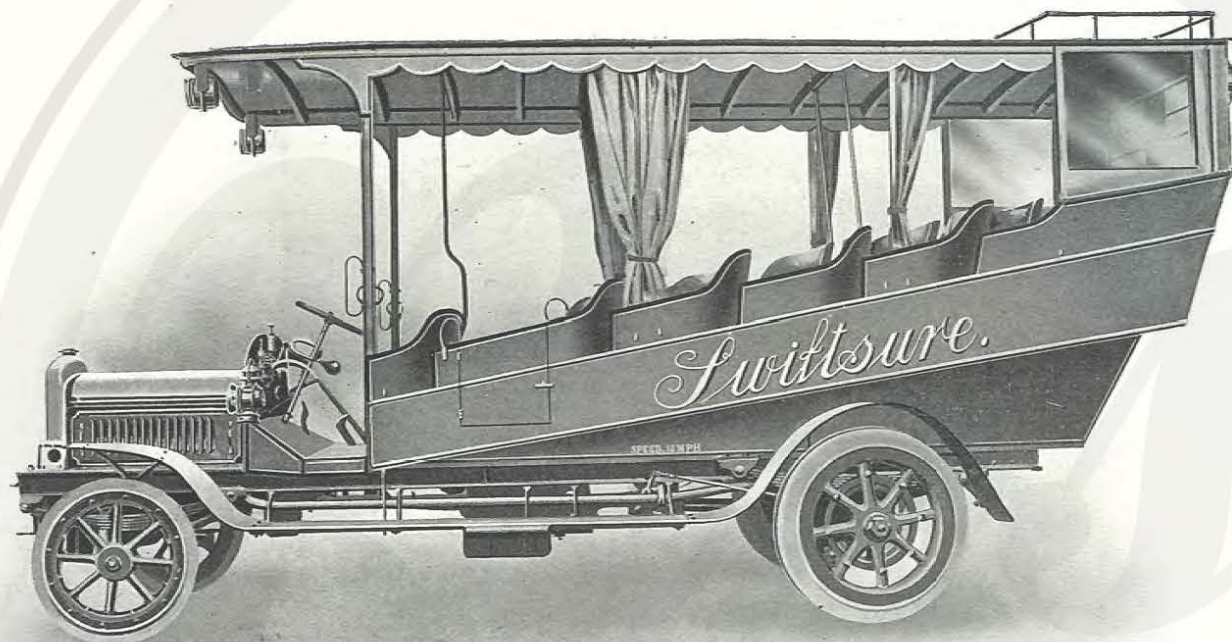
Seating Capacity, 32 Passengers. Body, £115 [Cnadam], and £135 [Civoden].

Extra for strong roof to carry Luggage, £15 [Cobadar].

(A similar body for 22 Passengers is made, price from £90 [Combebar], and £105 [Condsale].)

**Approximate
Shipping
Specification**

Body in one case										Large size.		Small size.	
Length	...	...	...	...	...	...	...	...	...	16ft. 6in.	...	14ft. 6in.	...
Width	...	...	...	...	...	...	...	...	...	8ft. 0in.	...	8ft. 0in.	...
Height	...	...	...	...	...	...	...	...	...	5ft. 6in.	...	5ft. 6in.	...
Cube	...	...	...	...	...	...	...	...	...	725 cu. ft.	...	645 cu. ft.	...
Maximum Lift	...	...	...	...	...	...	...	...	...	3 tons	...	3 tons	...



CHAR-A-BANC
(Sloping Floor)

Seating Capacity, 32 Passengers. Body, £140, [Cerdary]; and £165, [Celogian].

A more elaborate design than the preceding one, with bucket seats, two seats each side of gangway and a let-down one in middle. The enclosed back keeps out the dust and strengthens the roof to carry luggage. A box is also provided under the sloping floor.

Specification

**Approximate
Shipping
Specification**

Body packed in one case. Length, 17ft. 6in. Width, 8ft. 3in. Height, 8ft. 3in. 1,150 cu. ft. 3-ton lift.

**PETROL
TOWER
WAGON****Shipping
Particulars**

The Chassis adopted can be either "X2," "TX," or "T," according to the weight of stores and the speed considered desirable. We recommend the middle size. Price, with Tyres, £585.

The frame is all of hard and well-seasoned woods. The tower is extended by a screw. Height from ground, extended, 20ft. Closed, 12ft. 6in. Distance from centre of column to outside edge of platform, 6ft. 6in.

Tower, 13ft. by 5ft. by 4ft. 6in. 295 cu. ft. Lift, 1 ton. Code word [CREBANY].

Chassis with body, 20ft. by 5ft. by 4ft. 400 cu. ft. Lift, 4 tons.

Price of
Tower
and
Bodywork,
£85.

LEYLAND MOTORS, LIMITED

Mechanical Data

HEAT VALUE OF FUELS.

1lb. of Wood ...	... contains 6,000 heat units.	1lb. of Bituminous Coal contains 15,400 heat units.
„ Carbon ...	... „ 14,500 „ „	„ Coke ... „ „ 13,400 „ „
„ Anthracite ...	... „ 15,250 „ „	„ Petroleum ... „ „ 20,000 „ „

EVAPORATIVE POWER.

1lb. of Anthracite will evaporate 15.29 lbs. water	} from and at 212° Fah.
„ Bituminous Coal „ 15.99 „	
„ Coke ... „ 14.02 „	

HORSE-POWER OF STEAM ENGINE.

33,000 ft.-lbs. equal to 1 horse-power.

In a single-acting steam engine—

$$1 \text{ horse-power} = \frac{P L A N}{33,000}$$

Where P = the mean effective pressure per sq. inch in the

„ L = the length of stroke in feet. [cylinder.

„ A = the area of the piston in inches.

„ N = the number of revolutions.

Note.—In a double-acting engine this result must be doubled.

If there is more than one cylinder multiply also by the number of cylinders.

Horse-power to Forces-de-cheval multiply by 1.01.

TEMPERATURE CONVERSION.

Fahrenheit to Centigrade, $C^{\circ} = \frac{5}{9} (F^{\circ} - 32^{\circ})$

Centigrade to Fahrenheit, $F^{\circ} = \frac{9}{5} C^{\circ} + 32^{\circ}$

PRESSURE CONVERSION.

1lb. per sq. inch. = 69.34 grams. per sq. centimetre.

AUTOMOBILE CLUB RATING.

The nominal rating of petrol engines adopted by the Royal Automobile Club is—Horse Power equals $\frac{D^2 N}{2.5}$

Where D is the diameter of the piston in inches N is the number of cylinders.

PETROL CONSUMPTION EQUIVALENTS.

1 mile per gallon = .3541 kilometre per litre.

1 kilometre per litre = 2.825 miles per gallon.

For general rough work, a kilometre a litre is about three miles a gallon.

LOADING CAPACITY.

500 bricks = load = $1\frac{1}{2}$ tons.

1,000 bricks, stacked = 50 cu. ft.

1 ton of water = 36 cu. ft.

1 cu. ft. of coal weighs 55lbs.

1 cu. ft. of coke weighs 30lbs.

LEYLAND MOTORS, LIMITED

CONVERSION OF WEIGHTS.

Useful Data

To convert kilogrammes to lbs. multiply by	2.205	To convert lbs. to grammes. multiply by	435.6
„ lbs. to kilogrammes „	.4536	„ grammes to lbs. „	.0022
„ kilogrammes to tons „	.00098	„ cwts. to kilogrammes „	50.8
„ tons to kilogrammes „	1016	„ tons to kilogrammes „	1016
„ lbs. to litres „	.4536	„ tonnes (metric) to tons „	.984
„ lbs. to cubic feet „	.016	„ tonnes (metric) to kilos „	1000
„ lbs. to gallons „	.100		

LINEAL CONVERSIONS.

To convert Inches to Centimetres multiply by	2.54	To convert Miles to Kilometres	} See table, page 56.
„ Centimetres to Inches „ „	.394	„ Kilometres to Miles	
„ Feet to Metres	} See table on page 57.	„ Yards to Metres multiply by	.914
„ Metres to Feet		„ Metres to Yards „ „	1.094

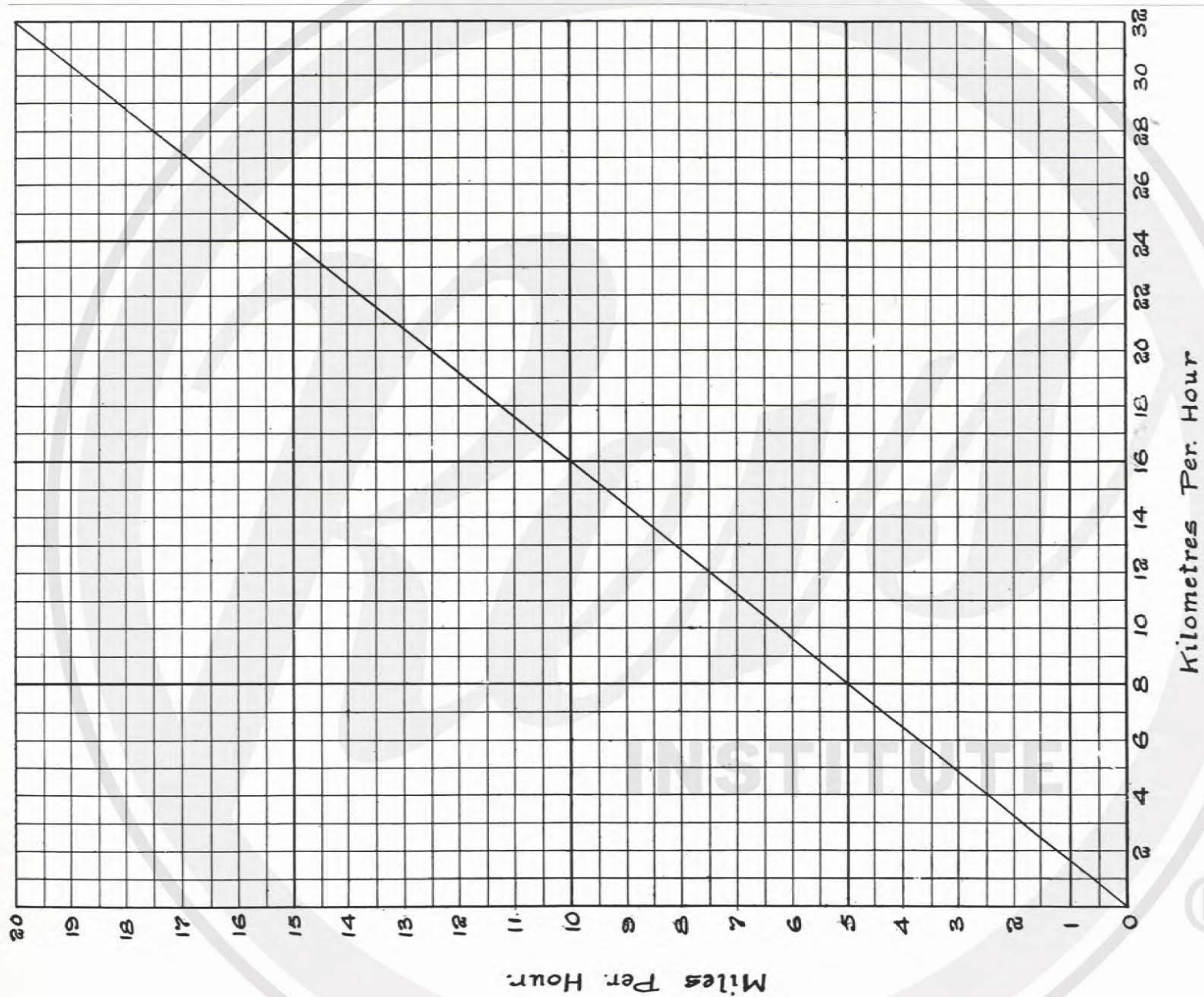
TO CONVERT CAPACITY.

Cubic Inches to Cubic Centimetres multiply by	16.39	Cubic Inches Water to Litres	multiply by	.016
„ Centimetres to Cubic Inches „ „	.061	Litres Water to Cubic Inches	„ „	61.03
„ Feet to Cubic Metres „ „	.028	Gallons to Litres	„ „	4.536
„ Metres to Cubic Feet „ „	35.32	Litres to Gallons	„ „	.2205
„ Yards to Cubic Metres „ „	.764	Litres Water to lbs.	„ „	2.205
„ Metres to Cubic Yards „ „	1.308	Cubic Feet Water to lbs.	„ „	62.42
„ Feet to Gallons „ „	6.242	Gallons Water to lbs.	„ „	10
Gallons to Cubic Feet „ „	.160	Gallons English to Gallons U.S.A.	„ „	1.2

SQUARE MEASURE.

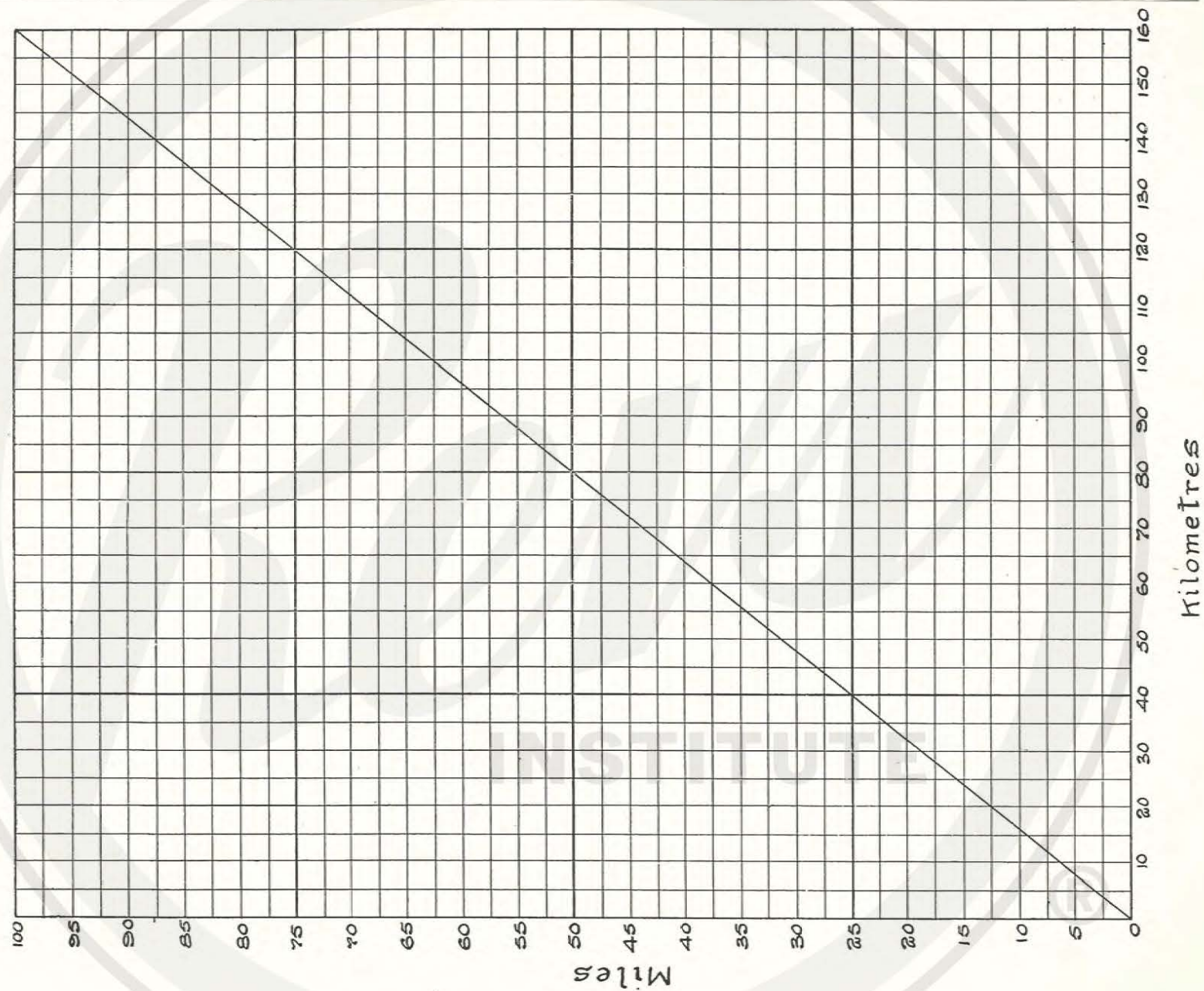
To convert square feet to square metres multiply by	.0929	To convert sq. centimetres to sq. inches multiply by	.155
„ „ metres to square feet „	10.76	„ „ yards to square metres „	.836
„ „ inches to square centimetres „	6.452	„ „ metres to square yards „	1.196

LEYLAND MOTORS, LIMITED

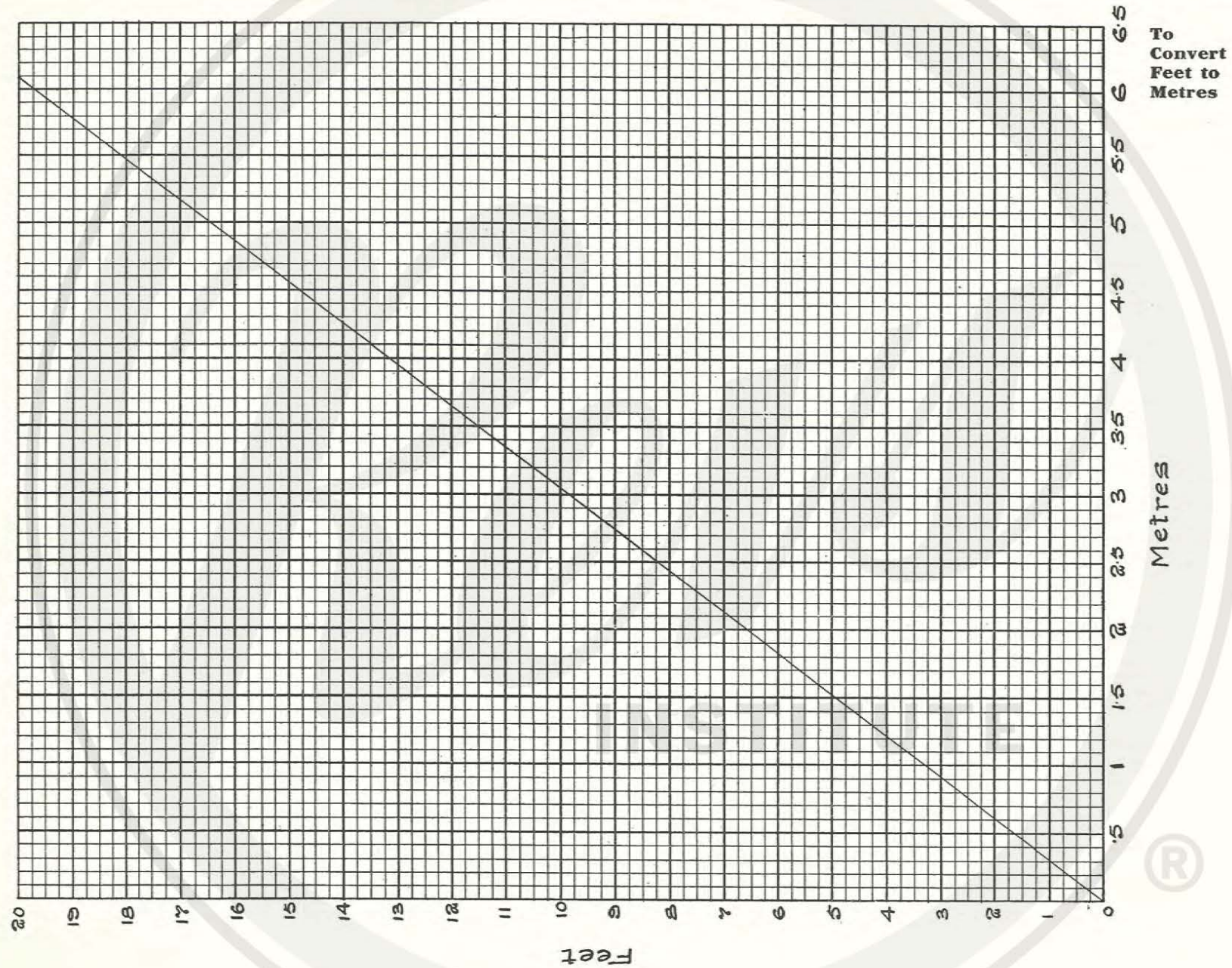


LEYLAND MOTORS, LIMITED

To
Convert
Miles to
Kilo-
metres



LEYLAND MOTORS, LIMITED



LEYLAND MOTORS, LIMITED

HEAVY MOTOR CAR ORDER, 1904.

(ABRIDGED.)

Light Locomotive or Heavy Motor Car

The expression "Light Locomotive or Heavy Motor Car" means a mechanically-propelled road vehicle, weighing, unladen, over 2 tons and under 5 tons.

Trailer

The expression "Trailer" means a vehicle drawn by a light locomotive or a heavy motor car.

Registration

Every heavy motor car must be registered with the Council of a County or the Council of a County Borough.

The owner must be prepared to give particulars as to :—

- (A) The unladen weight = U.W. tons.
- (B) The axle weight of each axle = A.W. tons.
- (C) The diameter and width of each wheel.

Fees

The registration fee for a heavy motor car, used for trade purposes only, is £1, and does not require renewing annually.

Identification Marks

The registered number must be placed in a conspicuous position in front and at the back of the car and on the back of the trailer when such is being drawn by a car or tractor.

A trailer does not require registering.

Licenses

No license is required for a heavy motor car which is used exclusively for carrying goods.

Driver

A driver must take out a license, which costs 5s., and must be renewed annually. If he resides in a County Borough he must apply to the chief constable; otherwise to the County Council Offices.

Weight Unladen

Weight unladen does not include water in the boiler or tanks, oil in the oil bath, fuel, or any detachable sides or other accessories not essential to the working of the machine.

Total Weight of Car and Trailer

The combined unladen weight of the motor vehicle must not exceed 5 tons, and of a motor and trailer 6½ tons.

Axle Weight

Axle weight means the aggregate weight transmitted to the road by the several wheels attached to any one axle of the motor car or trailer when such car or trailer is loaded.

The axle weight of car and load must not exceed 12 tons, and the weight transmitted to the road by any axle must not exceed 8 tons.

Tyres

The tyre of each wheel of a heavy motor car shall be smooth, and where the tyre touches the road it must be flat, excepting that the edges of the tyres may be rounded or bevelled on each edge to the extent of half an inch.

The tyres may, however, be constructed of separate plates, the space between each plate must be parallel, and such space must not measure more than one eighth of the width of the tyre, when the measurement is taken across the face of the tyre, in a line with the axle.

Width of Tyres and Diameter of Wheels

The width of a tyre of a heavy motor car must not be less than 5in. and, in the case of a trailer, not less than 3in. (if the trailer weighs, unladen, more than a ton).

NOTE.—If a purchaser proposes to use a trailer not specially designed for motor work, he should consult us as to the width of tyres, etc.

The width of tyres varies according to the diameter of wheel and axle weight.

Speed

The speed of a heavy motor car must not exceed 5 miles per hour if it weighs, unladen, over 3 tons, or the registered weight of any axle exceeds 6 tons, or if used to draw a trailer.

With pneumatic tyres or tyres of soft material, and if the axle weight does not exceed 6 tons, 12 miles per hour is allowed; if over 6 tons axle weight, the speed may be 8 miles per hour if the tyres are of soft or elastic material.

Trailers

Trailers must have painted on the right or off side in letters and figures not less than one inch in height, the weight of trailer unladen = U.W. tons, and the axle weight of each axle = A.W. tons, if the trailer weighs unladen more than one ton.

A trailer must be hung upon suitable springs. The axle weight of any trailer must not exceed 4 tons.

Brakes

A heavy motor car shall have two independent brakes; the reversing gear is, as a rule, taken as one of the brakes.

Width of Motor or Trailer

No heavy motor car or trailer shall exceed 7ft. 6in. width over all.

LEYLAND MOTORS, LIMITED

GOOD RESULTS ON A STEAM WAGON TEST.—Being the Second of our Reports on Road Tests under Service Conditions.

General Particulars.—Two Leyland steam wagons owned by Messrs. John Stanning and Son, Ltd., bleachers and dyers, Leyland, were under observation by the writer on July 21st, every facility being given for obtaining accurate data as to fuel consumption and for observing the behaviour of the wagons on a long journey typical of the work done daily by these wagons.

The vehicles were numbered 1 and 2, and were similar in every respect as regards construction. No. 1, of which most data were taken, has been in service some few months longer than No. 2, and on the day of the test carried a somewhat heavier load.

The total mileage for the day was fifty-seven, the route lying between Messrs. Stannings' works at Leyland and their distributing depôt at Salford, this being the ordinary journey made five times per week by each wagon.

The time of starting is very early, viz., 4 a.m., and the fires are lit about 3-15 a.m., the intervening time being taken to raise steam and prepare for a good day's run. The fuel was weighed the night before, and after filling the water tanks to overflow, weighing the loaded waggons, and taking other necessary observations, a start was made.

Burnley coke, of excellent quality, costing 15s. per ton, was used on both wagons, as this is their ordinary fuel. A remarkably small amount of clinker was formed, and this was only removed from the furnace once, i.e., just after getting clear of Salford on the return journey, or after running about thirty-three miles. Coke being bulkier than coal, weight for weight, necessitates more frequent stoking, but on a vehicle like the Leyland, where the driver has control of the steering as well as the engine, the use of coke fuel reduces running expenses, and gives a better division of work than on coal-fired vehicles, where one man has control of the steering and the other comparatively little to do.

Loads and Fuel Consumption.—The useful load carried on wagon No. 1 on the outward journey was 4 tons 12 cwt. 3 qrs. 18lbs., the fuel used on the outward journey, neglecting the amount (56 lbs.) to raise steam, being 3 cwt. 2 qrs. 6 lbs. On the return journey the useful load carried was 5 tons 8 cwt. 2 qrs., the fuel used amounting to 3 cwt. 2 qrs. The fuel per ton mile of useful load for the outward journey works out at 3 lbs., and for the return journey 2·53 lbs. It will be noticed that the total weight of fuel used is almost exactly the same for both outward and return journeys, while the fuel per ton mile for the return journey (on which the heavier load was carried) is considerably less, thus showing the economy of carrying a full load. This point is well illustrated by the following figures:—

	Load in tons.	Fuel per ton mile.
Wagon No. 2, same load out and home	3·46	3·5
Wagon No. 1, outward load	4·64	3·0
Wagon No. 1, return load	5·42	2·53

The useful load carried by wagon No. 2 on the outward journey was 3 tons 11 cwt. 19 lbs., and on the return journey 3 tons 7 cwt. 2 qrs. These loads are sufficiently similar to strike an average load for the double journey of 3 tons 9 cwt. 1 qr. 10 lbs. The fuel consumption for the double journey was 700 lbs. Thus the fuel per ton mile of useful load for wagon No. 2 is 3·5 lbs. Satisfactory as these figures appear, however, they could doubtless have been very greatly improved had it been possible to haul a trailer, or even to run with a full load.

Water Evaporation, Oil Consumption, &c.—As nearly as could be determined, the water evaporated on the outward journey of 28½ miles by wagon No. 1 was 1,860 lbs., or about 186 gallons; on the return journey the amount was 180 gallons. It is not possible to determine to a fine degree of accuracy the amount of water used by a steam wagon, but the above amounts were arrived at after very careful measurement, and are extremely near the mark. The average temperature of the feed water was 73° Fahr., this comparatively high temperature being due to steam heating from the lifter and the comparatively warm water taken from the roadside *en route*. The steam pressure for both journeys averaged 205 lbs. per square inch. The weight of water actually evaporated per pound of coke works out at 4·67 lbs., or 5·6 lbs. from and at 212° Fahr.; these figures were practically the same for the return journey, again showing in this direction also the advantages of a full load.

The water evaporated by boiler No. 2 was not determined; both wagons, however, filled up at the same places, and the results would not be very dissimilar.

Three quarts of lubricating oil are used by each wagon for the double journey—a quantity which ensures a copious supply to every part of the vehicle.

The Driving. Wagon No. 1 accomplished the journey on top gear, although gradients of 1 in 10 of considerable length were encountered. The regularity of running was remarkable, and from start to finish the wagons were only separated from each other by a few yards.

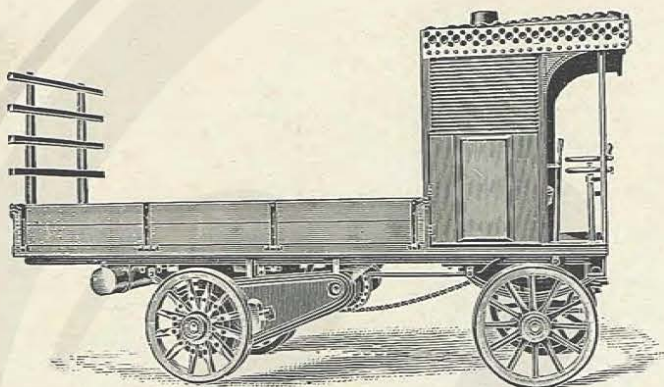
Both wagons were exceedingly well handled, and easily maintained the legal limit of speed throughout. After the trial, the writer was, by the courtesy of the firm, permitted to inspect the load book for these wagons at Messrs. Stanning's offices, which showed that during the month of June wagon No. 1 made nineteen journeys (Leyland to Salford and back), the total load carried being 163 tons 9 cwt., or an average load outward and return of 4 tons 7 cwt. Wagon No. 2 made the same number of journeys, total load carried 161 tons, or an average outward and return load of 4 tons 5 cwt. Messrs. Stanning have consequently just placed a third order for a similar steam wagon with Messrs. Leyland Motors, Ltd.—*MOTOR TRACTION, August 1st, 1908.*



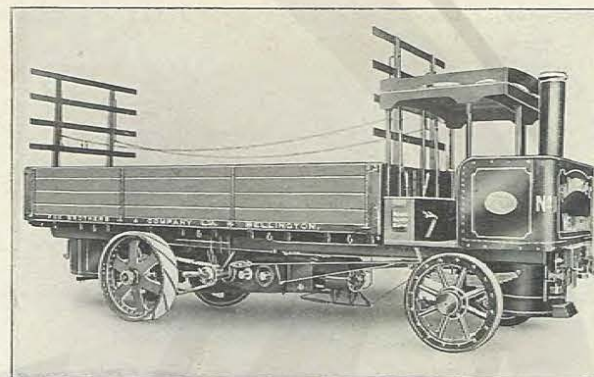
No. 1 Leyland Steam Wagon belonging to Messrs. John Stanning & Son, Ltd. One of the two steamers tested under service conditions by our representative on July 21st last.

LEYLAND MOTORS, LIMITED

MESSRS. FOX BROS., WELLINGTON, FIRST AND LATEST WAGONS.



Supplied in 1897.

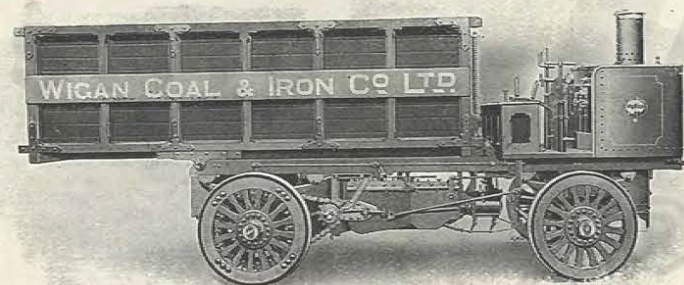


The fourth Wagon, supplied 1908.

Mr. S. H. SPARKES, Manager for Fox Bros., writes in "Commercial Motor," of Sept. 3, 1908: "The Leyland lorries also serve our weaving shed at Cullompton, 12½ miles from here, on the road to Exeter, where we have 90 broad looms running, and another shed at Wiveliscombe (7 miles) on the Minehead road, with 60 looms there. I consider it would have been practically impossible to have worked the Cullompton business in a satisfactory way, either by horse haulage or by rail. We often carry 5½ tons on the lorry platform, and two tons on the trailer; we work economically, and are quite satisfied."



A Gunpowder Van.



An early Tip Wagon, still in service.

LEYLAND MOTORS, LTD.



ON SERVICE
BETWEEN
LONDON and
SOUTHAMPTON.

FIRST BATCH Ordered JULY, 1908.
SECOND BATCH " DEC. 1908.



