





THE ROLLER WITH FOUR SPEEDS AND

Ruston Crude-Oil Road Rollers-made by one of the earliest builders of Steam Road Rollers and the pioneers in the heavy Oil Engine Industryhave for many years enjoyed an enviable reputation.

Previous to the introduction of the Ruston Light Crude-Oil Roller the advantages of this type of machine were enjoyed only by users of Ruston Rollers of heavier weight. Now, the Ruston  $2-2\frac{1}{2}$  ton Roller meets the needs of all who would combine great utility and reliability with extremely low fuel cost.

The Roller starts by hand from cold as easily as a motor car, but low consumption of cheap fuel means greatly reduced running costs while the absence of electrical ignition apparatus, freedom from fire risk and pilferage, which cannot be ignored in the case of a petrol engine, are points commanding the attention of road roller users.

Embodying modern road roller practice and all the latest features in airless injection oil engine design, the Ruston Light Crude-Oil Roller marks a distinct advance and considerably extends the field in which power rolling is a definite economy.



This Ruston Crude-Oil Roller seen on tarmacadam work on embankment alongside the River Thames is employed by the Barnes U.D. Council. Surveyors find the Ruston Roller ideal for sports grounds or macadam work.

RUSTON &

THE RUSTON INSTANTANEOUS REVERSE

### Working with a $2\frac{1}{2}$ ton roller at a fuel cost of less than a penny per hour, the Ruston Roller makes a big appeal to all who look for economy.

In the construction of the Roller high-grade materials, first-class workmanship, effective lubrication and, wherever possible, the enclosure of working parts, make for reliability and long life.

Change speed and reverse gears, together with clutches and all operating mechanism, are enclosed in the gear box so that all pins and joints work in an oil mist and, being protected from dust and moisture, require no independent lubrication.

Designed by manufacturers who are themselves Oil Engine specialists, the Ruston Roller is equipped with an engine of the most suitable power—an important fact which will be appreciated by engineers who know the loss of efficiency resulting from the use of an engine of excessive size.

The Ruston Roller has an engine which provides ample power when running at normal or "economical" load, and a properly proportioned gear box giving a wide range of speeds suitable for various gradients and all classes of work.



Offices of the Lindsey County Council. On tar-macadam work the Ruston Crude-Oil Roller proves highly efficient and economical. Water ballast gives ample weight for bedding down foundation.

HORNSBY LTD ENGLAND



A PROVED COMBINATION OF STRENGTH

#### SPEED and POWER

Travelling speed is an important consideration to Contractors or Surveyors using small Road Rollers on outlying jobs.

Here is an actual performance with a Ruston  $2\frac{1}{2}$  ton Roller. On completing the footpath job illustrated in bottom corner, the Roller proceeded for further macadam work as illustrated alongside.

Here are figures worthy of note :--

Distance job to job, 1.8 miles.

Travelling time, 29 minutes.

(Includes climbing hill illustrated.)

Length of hill, <sup>3</sup>/<sub>4</sub> mile. Maximum gradient, I in 10.

A four-speed gear box gives a travelling speed of 4 m.p.h. and a bottom speed of two-thirds m.p.h. at normal engine revolution, with two intermediate speeds carefully selected. These four speeds all operate in either direction while the **Ruston** double clutch gives an instantaneous reverse without disengagement of any gears.

MOBILITY - ECONOMY - ADAPTABILITY

"we find it to be extremely handy and economical. Apart from the remarkably low running costs, it appeals by reason of the quick reverse arrangement."

Wide driving wheels and generous overlap are prominent features, while the fact that the driving wheels have steel rims assures the maximum possible adhesion and minimum wear.

The Roller being of the three-wheel type, there is no projection beyond the wheels on either side and rolling is possible close up to a wall on either hand. By substituting extra wide hind wheels for the standard width wheels the Ruston Light Roller becomes the ideal machine for rolling Aerodromes, Cricket Grounds, Golf Courses, and other grass land. The standard rolling width can be increased up to 6 feet so that a large area can be rolled in a very short time and at surprisingly small expense.

Rolling at 4 m.p.h. the Ruston Roller will cover 2 acres in an hour with a fuel consumption of about 2 pints of Diesel fuel oil—a fuel cost (at current prices in England) of less than  $\frac{3}{4}$ d. per acre.

> "knits the turf beautifully, which enables it to stand the winter wear and tear quite well."



THE ROLLER FOR LOWEST RUNNING COSTS



### Medium speed airless injection "Diesel" engine, starting instantly from cold without use of electric ignition, lamp, or cartridge.

This engine runs on "Diesel" fuel, is extremely economical and simple in operation. A detailed description of the power unit will be found overleaf.

### Two powerful independent brakes; one hand and one foot.

Both brakes have linings of bonded asbestos fabric. The hand brake is controlled by a screw, and both brakes have full control even if the change-speed gear is in neutral position.

In addition to these brakes, the reversing clutches provide another effective safeguard, as the gear may be reversed with impunity even when descending steep hills.

The compression of the engine also gives such a great retarding effect that with a low gear engaged even steep hills can be descended without applying the brakes, the governor cutting off the fuel supply entirely. In this way hills several miles in length can be traversed without any wear or heating of the brakes, which need only be applied in order to bring the Roller to a standstill.

All gears made from forged steel,

with machine-cut teeth, and hardened.

All change-speed and reversing gears run in oil, with shafts carried in ball or roller bearings.-

All-steel wheels, giving maximum possible grip on the road and minimum wear on the rims.

Axle carried directly in gear box.

No bolted parts to get out of alinement.

#### Quick reverse by double disc-type clutches,

no gears having to be disengaged.

The whole of the clutch-operating mechanism is enclosed in the gear box, and consequently receives ample lubrication and is protected from dust. The clutches are controlled by one hand lever, which is simply moved forward or backward according to the direction of travel.



BUILT BY OIL-ENGINE SPECIALISTS

**Transmission.** Power is transmitted from the engine to the gears through a flexible coupling and double clutches. The reversing clutches and change-speed gears are totally enclosed in the gear box, the gears being of hardened steel and the shafts running in ball and roller bearings.



**Frame.** The frame is constructed of rolled steel sections and plates; designed to give great strength and rigidity without rendering the engine and other parts inaccessible.

THE ROLLER WITH FOUR SPEEDS AND

#### ENGINE

**The Engine.** The Roller is driven by a Lister\* single-cylinder vertical Diesel engine of the medium speed, airless injection cold starting type, running on the four-cycle principle.

It is started by hand and runs efficiently on a wide range of fuels, including paraffin, gas oil, solar oil, and Diesel light fuel oil.

The following is an abridged specification :--

Crankcase. Of stiff and uniform section cast iron.

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**Cylinder.** The cylinder and liner are cast together of close-grained hard-wearing cast iron.

**Piston.** Of cast iron with three pressure and one oil-scraping piston rings.

RUSTON



**Cylinder Head.** Fitted with overhead valves which are operated by push rods, both ends of which work in oil. The cylinder head carries the "Lister Patent Combustion Chamber."

Camshaft. Of case hardened mild steel ground all over, with

cams set in correct positions by means of taper pins.

**Crankshaft.** Of 30/35 tons tensile acid steel, ground all over.

**Connecting Rod.** Of a high-grade carbon steel drop forging, fitted with die-cast white metal big-end and phosphor bronze small-end bearings.

**Governor.** Variable quantity type operating on the by-pass system. The stroke of the pump is constant, and the amount of fuel oil delivered at a given load is fixed by the governor.

Lubrication. Pump feed to main bearings and by splash to big-end and small-end bearings.

Silencing. An efficient silencer is fitted and the exhaust carried clear above the awning.

\* Manufactured by R. A. Lister & Co. Ltd., Dursley, who are associated with Ruston & Hornsby Ltd. in the production of Modern Oil Engines.

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Making pathways adjoining well - known Racecourse. When equipped with wide wheels—as illustrated elsewhere—the Ruston is an ideal roller for racecourses, aerodromes and ! other grass land.

RUSTON &

LINCOLN



THE RUSTON INSTANTANEOUS REVERSE

An outstanding feature in the design of the engine fitted to this Roller is the compression ratio changeover valve,

designed to give immediate start by hand from dead cold, without any pre-heating or external ignition device whatsoever. The photograph reproduced above

illustrates how the Combustion Chamber is divided into two portions in such a manner that by means of the hand-operated valve shown, one part may be isolated from the main Combustion Chamber, thus increasing the

temperature generated by compression to a point well in excess of that required to ignite the fuel oil.

This "Lister" patented device renders hand starting easy even under the most severe atmospheric conditions—easier in fact than on any other make of Diesel engine of equal power.

To start the Engine the hand wheel is screwed in, raising the compression pressure from the normal to the starting pressure. The exhaust valve lifter, having been put to the "in" position, the Engine is swung a few revolutions by hand and the exhaust lifter released, when the Engine immediately fires. Directly the Engine gains speed the hand wheel is screwed out, thereby reducing the pressure to normal.

Cooling is effected by means of water passing through a fan-cooled radiator.

New Housing Estate at Yeadon, Yorks, where the Contractors, Mitchell Yeadon & Sons, have used a Ruston Roller for new road and footpath work with highly satisfactory results.

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A PROVED COMBINATION OF STRENGTH

Speeds. Four speeds are provided for travelling in either direction, these being, at full engine speed, respectively 4, 2, 11, and 2 miles (6.4, 3.2, 2.1 and 1 km.) per hour. The engine speed can be varied considerably and any intermediate speed obtained.

Steering. The movements of the steering fork are controlled by a hand wheel placed at a convenient angle in front and towards the right-hand side of the driver. The steering is operated through hardened steel worm gear, and the vertical stem of the fork is hardened and turns



in an accurately machined bearing in the forecarriage. The weight is carried on hardened steel thrust surfaces, which function in an oil bath.

The steering fork itself is of cast steel, and is pivoted to a steel frame which surrounds the front wheels and is capable of rocking in the fork to allow the wheels to follow the contour of the road.

Forecarriage. The forecarriage is of cast steel and is securely bolted to the side plates of the frame.

Rollers. These are built entirely of steel, and the nave, discs, and rim are electrically welded together to form one solid unit.

Interchangeable wheels of varying weights and widths can be supplied for special purposes, such as grass rolling.

The heavy type wheels are arranged for water ballast, but the light type, or "grass," rollers are not.



Report of a Municipal Engineer and Surveyor after using the Ruston Mark "A" Crude-Oil Roller

I am able to report that this roller worked perfectly the whole time and on all the classes of work upon which it was engaged. I consider it an ideal roller for rolling sports fields and the like and termscadam footpaths and channels. During nights and weekends the Roller was housed under a roof with open sides, and no difficulty was experienced in starting up the next morning. The Roller is easy of manipulation and in moving from one job to amother in top gear it travels at approximately 5 miles per hour. The Fuel Costs were carefully checked and worked out at 3.43 pence per 8-hour day, with fuel at 4gd.per gallon. Lubricating Consumption was correspondingly low.

Lincoln

**Ruston & Hornsby Limited** 

England

MOBILITY - ECONOMY - ADAPTABILITY

Scrapers. Efficient adjustable scrapers are fitted to both front and hind rollers.

Awning. An awning is provided for the protection of the driver.

**Bonnet.** A car-type bonnet is fitted to protect the engine and is provided with ventilating louvres.

Seat. A padded seat is supplied.

**Painting and Outfit.** The whole is painted, lined, and varnished in the best style. All necessary tools, tool box, instruction book, and equipment are supplied.

The following parts are extra unless expressly mentioned as included :-

Lamps. Two head and one tail lamps.

Water Sprayer. Tank with pipes and valves for spraying front and hind wheels. Awning Curtains. Side curtains only, or side and end curtains as desired.

While every care is taken in the preparation of this circular, the illustrations, etc., must not be taken as binding until confirmed by us, alterations being necessary from time to time. Covered by standard Ruston guarantee. Any variation from our standard specification may involve increases in price and delay in delivery.



"RUSTON" MEANS MORE THAN



Oil Engine Specialists since 1892 Builders of Road Rollers over 40 years







### CRUDE-OIL ROLLER

### **General Dimensions**

Weight in worl	king order,		including		
water ballast,	appro	x.			21 tons 2500 k.g.
Weight of water b	ballast				7½ cwt. 375 k.g.
Weight of fuel and	d coolir	ng wate	er, app	rox.	1 cwt. 50 k.g.
Width rolled					4′ 1″ 1250 m/m
Front Rollers		Diam. 690 m/	2′ 3″ m	W	idth 2′4″ 710 m/m
Hind Rollers		Diam. 840 m/	2′9″ m	۷	Vidth 14" 360 m/m
Engine B.H.P.					5
Engine revs. per n	nin. ma	ximum			600
Fuel tank capacity					4 galls. 18 lit.
Fuel consumption	, avera	age per	work	king	
day of 8 hour	s				1 <sup>1</sup> / <sub>2</sub> galls. 7 lit.
Travelling speeds	at 600	r.p.m. 4	4, 2, 1	, and I, and	<pre></pre>

NOTE.—This Roller can also be supplied, if desired, with non-ballasted wheels of the same sizes, giving a working order weight of approx. 2 tons, or with special wheels for grass rolling, giving a working order weight of approx.  $2\frac{1}{4}$  tons and a rolling width of 6 feet.

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