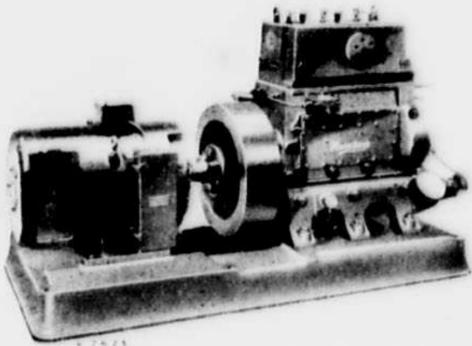
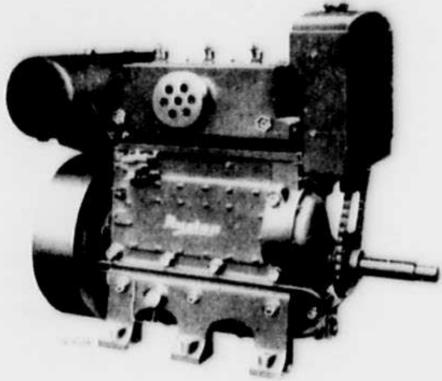


Publication 7828 (Reprint)

# Ruston VERTICAL OIL ENGINE Mark 3VSO



**B.H.P.**  
constant and maximum

**22½/25**

20/22

18/20

**SPEED**  
r.p.m.

**1000**

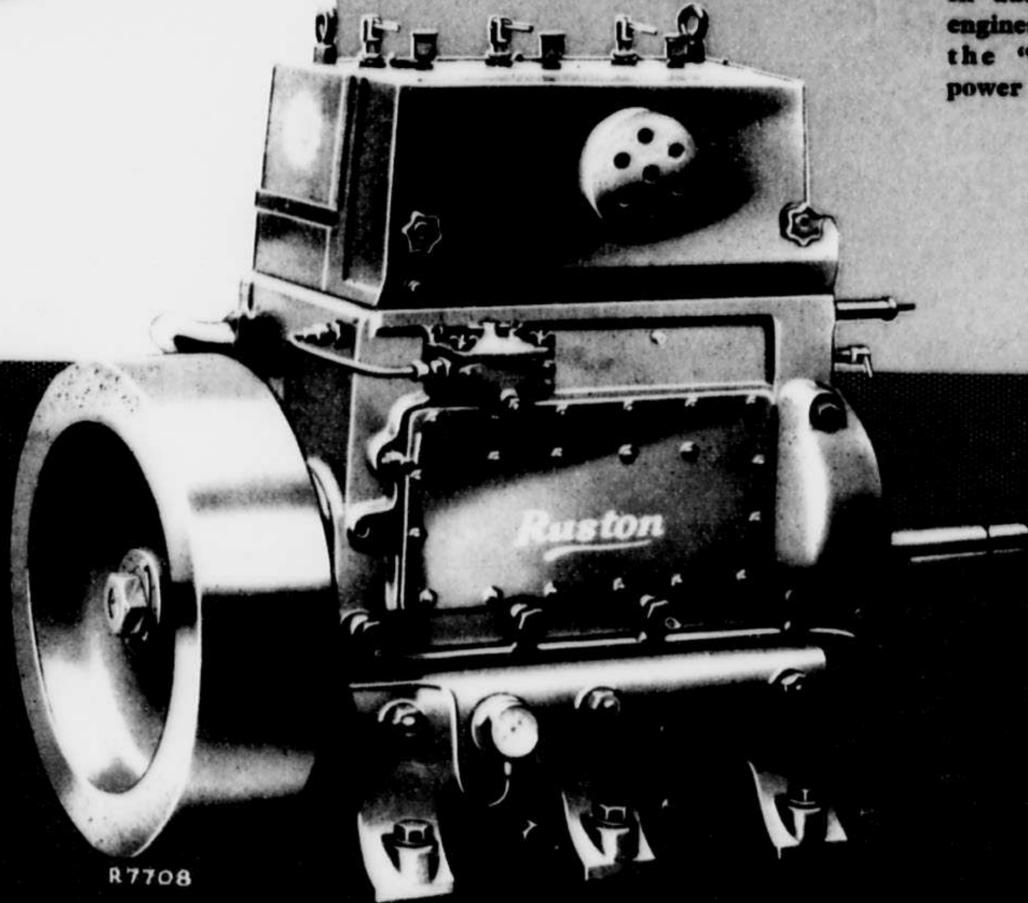
900

800

**POWER RATINGS** are of importance when comparing engines of competing makes.

The "constant" B.H.P. of Ruston engines is in accordance with the B.S.I. 12-hour rating, and the engines will maintain this power for twelve hours at temperatures up to 95° F.

In addition, Ruston engines will carry the "maximum" power for one hour.



R7708

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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**MARK 3VSO**

**SPECIFICATION**

Three cylinders .. .. . 22½/25 B.H.P. at 1000 r.p.m.  
 20/22 " " " 900 " "  
 18/20 " " " 800 " "

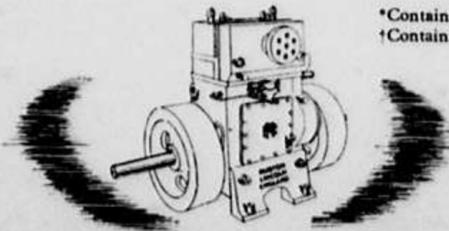
Allowance in power margin 3% reduction for every 1000 ft. over 330 ft. above sea level.  
 When temperature of the air supply rises above 95° F. a reduction of 1% must be made in the working load for each rise of 5° F.

Flywheel diam. and width .. .. . 1' 10½" x 6"  
 568 m/m x 152 m/m  
 Pulley diam. and width .. .. . 14" x 9"  
 356 m/m x 229 m/m  
 No. and diam. of foundation bolts .. .. . Six—¾" 19 m/m  
 Fuel tank capacity (tank-cooled model) .. .. . 10 galls. 45½ litres  
 Fuel tank capacity (radiator-cooled model) .. .. . 8 galls. 36 litres  
 Water tank capacity (temperate climates) .. .. . 350 galls. 1575 litres  
 Water tank dimensions .. .. . 3' 0" diam. x 8' 0" high  
 914 m/m x 2438 m/m  
 Water tank capacity (tropical climates) .. .. . 400 galls. 1800 litres  
 Water tank dimensions .. .. . 3' 3" diam. x 8' 0" high  
 991 m/m x 2438 m/m  
 Radiator capacity .. .. . 2.2 galls. 10 litres  
 Guaranteed fuel consumption per B.H.P. hour—full load .409 pint 188 grams  
 Guaranteed fuel consumption per B.H.P. hour—¾ load .418 pint 193 grams  
 Guaranteed fuel consumption per B.H.P. hour—½ load .454 pint 210 grams  
 The fuel used should be a distillate or diesel oil not exceeding .88 specific gravity and complying with B.S.S. (1937) Table No. 1  
 Lubricating oil consumption per engine hour .. .. . .081 pint .046 litre

**APPROX. SHIPPING MEASUREMENTS**

ENGINE MARK	PACKAGE	SIZE OF CASE	GROSS WEIGHT cwt. qr. lb.	NET WEIGHT cwt. qr. lb.	SHIPS ROOM cu. ft.
3VSO Tank Cooled Engine	1 Case	4' 3" x 2' 3" x 3' 8"	16 0 0 815	13 3 0 700	35 .99
	*1 Crate	8' 4" x 3' 4" x 3' 4"	2 3 0 140	1 3 0 89	93 2.65
	†1 Crate	8' 4" x 3' 7" x 3' 7"	2 3 21 150	1 3 14 95	108 3.06
3VSO Radiator Cooled	1 Case	4' 3" x 2' 3" x 4' 0"	16 2 0 838	14 0 0 712	38½ 1.08
	1 Case	2' 6" x 1' 4" x 1' 10"	3 14 45	1 14 19	6 .172

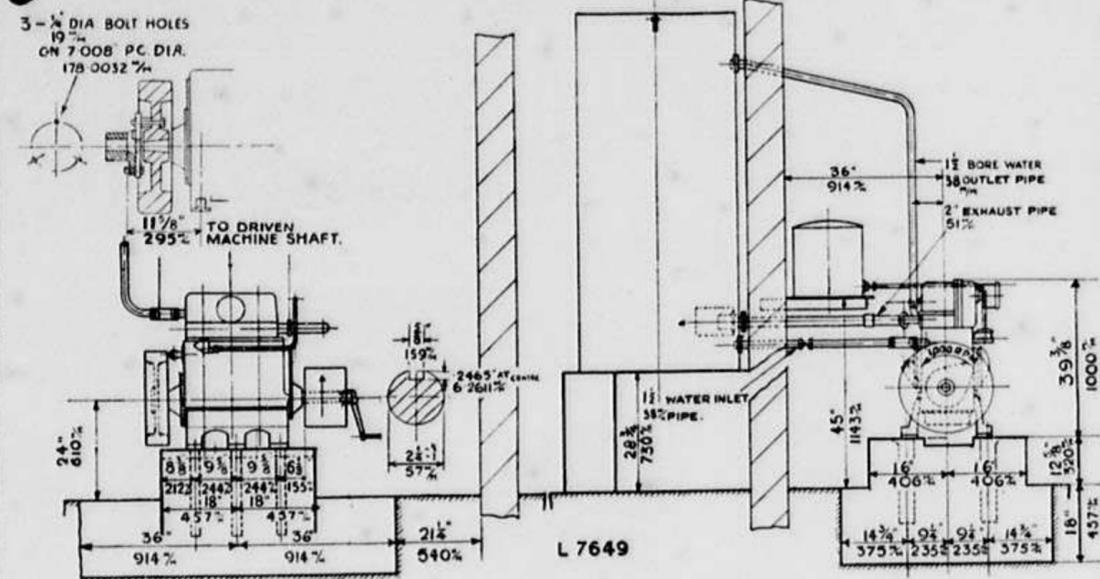
\*Containing Water Tank—Normal climate only  
 †Containing Water Tank—Tropical climate only



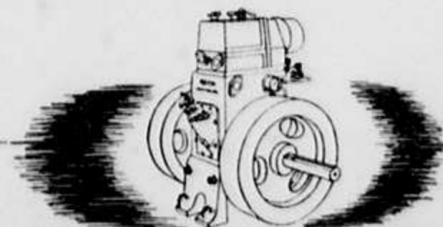
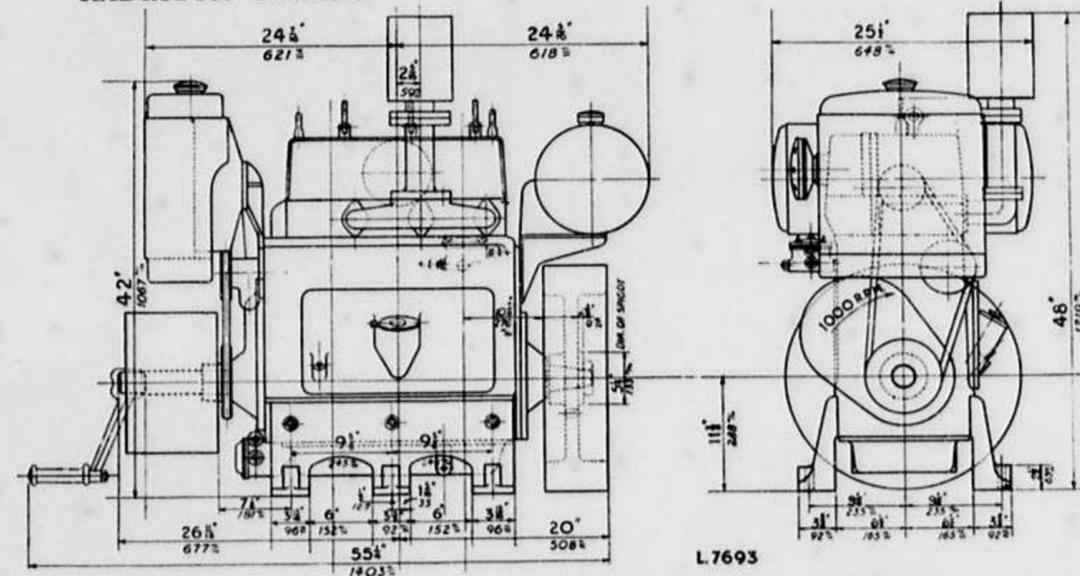
Makers of Successful Oil Engines since 1892

**MARK 3VSO**

**TANK COOLED DIMENSIONS**



**RADIATOR COOLED DIMENSIONS**



The Largest Makers of Oil Engines in the British Commonwealth

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

PUBLIC ARCHIVES ARCHIVES PUBLIQUES  
 CANADA

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## MARK 3VSO

### DESCRIPTION

**BEDPLATE AND HOUSING.** Cast iron. Cast in one piece.

**CYLINDER HEAD.** Cast iron. Separate water-jacketed casting, carrying valves, valve operating levers and atomiser. Combustion chamber designed to promote turbulence, to give complete combustion of fuel and instant starting from cold.

**VALVES.** Heat resisting steel. Overhead type, actuated by push rods. Inlet valve shrouded to produce turbulence. Exhaust valve guide of patented design.

**CYLINDER LINERS.** Close grained centrifugally cast iron. Wet type. Renewable. Specially hardened to ensure long life.

**CRANKSHAFT BEARINGS.** Steel bushes, lined with anti-friction metal. Easily renewable.

**CRANKSHAFT.** Steel forging. Accurately balanced. Drilled for lubrication of connecting rod large end bearings. Extended to take driving pulley.

**CONNECTING ROD.** Steel stamping. H. section. Large end bearings: Steel stampings lined with anti-friction metal. Small end bearings: Chilled phosphor-bronze bush.

**PISTON.** Special grade cast iron. Three pressure rings, one scraper ring.

**GUDGEON PIN.** Steel, hardened and ground. Fully floating type.

**CAMSHAFT.** Steel shaft: machined from the solid. Valve cams are hardened and ground.

**GEARS.** Machine-cut teeth. The gears run in oil.

**FUEL PUMP AND ATOMISER.** Plunger release type. Totally enclosed but accessible.

**FUEL FILTER.** Fitted to the suction and delivery sides of the fuel pump. The filter has an easily removable element.

**GOVERNOR.** Centrifugal, variable quantity type.

**LUBRICATION.** Forced feed, by gear type pump. Pump fitted with adjustable relief valve.

**COOLING.** Water cooling by tank or radiator as required.

**TOOLS AND EQUIPMENT.** Set of tools and equipment for maintenance is supplied.

**EXHAUST AND AIR SILENCERS.** Efficient exhaust silencer and a combined air filter and silencer are supplied.

**DIRECTION OF ROTATION.** Clockwise, looking at the camshaft gear drive end.

*N.B.—While every care is taken in the preparation of this Catalogue, which cancels all previous editions, the illustrations, specifications, weights and dimensions must not be taken as binding until confirmed by us, alterations being found necessary from time to time. Any variation from our standard specification may involve increase in price and delay in delivery.*

*GUARANTEE. In lieu of any warranty implied by law, we guarantee that the materials employed in*

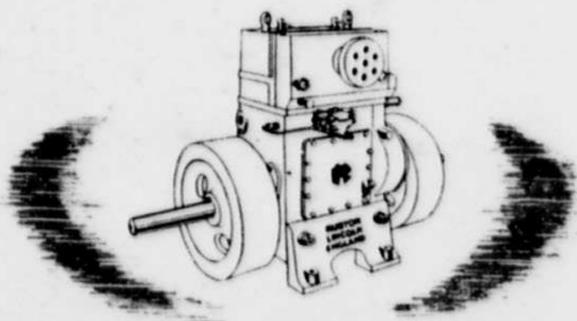
*the manufacture of our Machinery shall be of the best qualities of their respective kinds; and we undertake within twelve months from delivery, should any parts be broken or suffer from undue wear, to supply such new part or parts free of charge to the destination named in the Tender, provided it can be shown that that breakage or undue wear is the result of defective material or workmanship, and has not been caused by carelessness or improper treatment, or by inadequate lubrication.*

## RUSTON & HORNSBY L<sup>TD</sup> LINCOLN

Telegrams: RUSTON, LINCOLN

ENGLAND

Telephone: LINCOLN 580



EL688R

Printed in England

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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Publication 7829 (Reprint)

# Ruston VERTICAL OIL ENGINE

## Mark 4 VSO

B.H.P.  
constant and maximum

SPEED  
r.p.m.

**30/33**

**1000**

27/29<sup>3</sup>/<sub>4</sub>

900

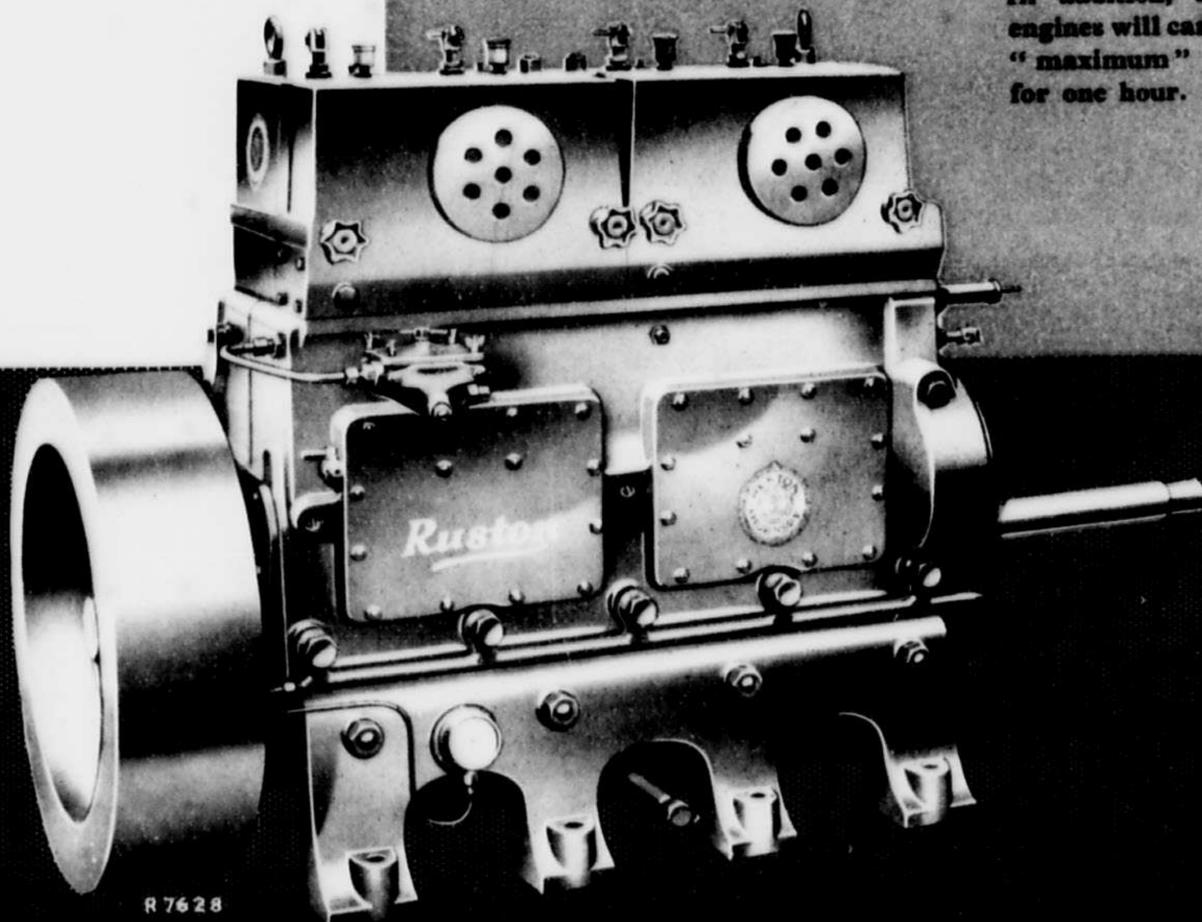
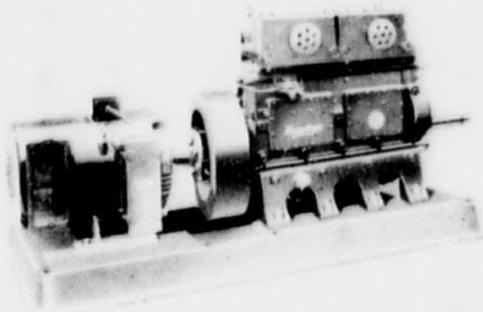
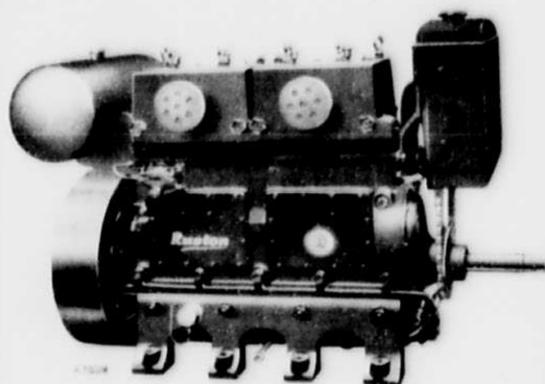
24/26<sup>1</sup>/<sub>2</sub>

800

**POWER RATINGS** are of importance when comparing engines of competing makes.

The "constant" B.H.P. of Ruston engines is in accordance with the B.S.I. 12-hour rating, and the engines will maintain this power for twelve hours at temperatures up to 95° F.

In addition, Ruston engines will carry the "maximum" power for one hour.



R 7628

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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**MARK 4VSO**

**SPECIFICATION**

Four cylinders . . . . . 30/33 B.H.P. at 1000 r.p.m.  
 27/29½ " " " 900 " "  
 24/26½ " " " 800 " "

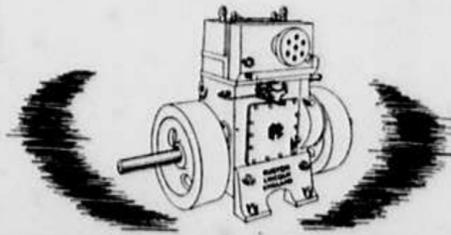
Allowance in power margin 3% reduction for every 1000 ft. over 330 ft. above sea level.  
 When temperature of the air supply rises above 95° F. a reduction of 1% must be made in the working load for each rise of 5° F.

Flywheel diam. and width . . . . . 1' 10¾" x 6"  
 568 m/m x 152 m/m  
 Pulley diam. and width . . . . . 14" x 9"  
 356 m/m x 229 m/m  
 No. and diam. of foundation bolts . . . . . Eight—¾" 19 m/m  
 Fuel tank capacity (tank-cooled model) . . . . . 10 galls. 45½ litres  
 Fuel tank capacity (radiator-cooled model) . . . . . 8 galls. 36 litres  
 Water tank capacity (temperate climates) . . . . . 350 galls. 1575 litres  
 Water tank dimensions . . . . . 3' 0" diam. x 8' 0" high  
 914 m/m x 2438 m/m  
 Water tank capacity (tropical climates) . . . . . 533 galls. 2398 litres  
 Water tank dimensions . . . . . 3' 9" diam. x 8' 0" high  
 1143 m/m x 2438 m/m  
 Radiator capacity . . . . . 2.2 galls. 10 litres  
 Guaranteed fuel consumption per B.H.P. hour—full load .409 pint 188 grams  
 Guaranteed fuel consumption per B.H.P. hour—¾ load .418 pint 193 grams  
 Guaranteed fuel consumption per B.H.P. hour—½ load .454 pint 210 grams  
 The fuel used should be a distillate or diesel oil not exceeding .88 specific gravity and complying with B.S.S. (1937) Table No. 1  
 Lubricating oil consumption per engine hour . . . . . .108 pint .06 litre

**APPROX. SHIPPING MEASUREMENTS**

ENGINE MARK	PACKAGE	SIZE OF CASE	GROSS WEIGHT cwt. qr. lb. Kilos	NET WEIGHT cwt. qr. lb. Kilos	SHIPS ROOM cu. ft. cu. m.
4VSO Tank Cooled Engine	1 Case	5' 0" x 2' 3" x 3' 8"	19 1 0 980	15 3 0 800	44 1'16
	*1 Crate	8' 4" x 3' 4" x 3' 4"	2 3 0 140	1 3 0 89	93 2'65
	†1 Crate	8' 4" x 4' 1" x 4' 1"	3 3 0 191	2 0 10 106	139 3'04
4VSO Radiator Cooled	1 Case	5' 0" x 2' 3" x 4' 0"	19 3 0 1005	16 3 0 850	45 1'27
	1 Case	2' 6" x 1' 4" x 1' 10"	3 14 45	1 14 19 6	.172

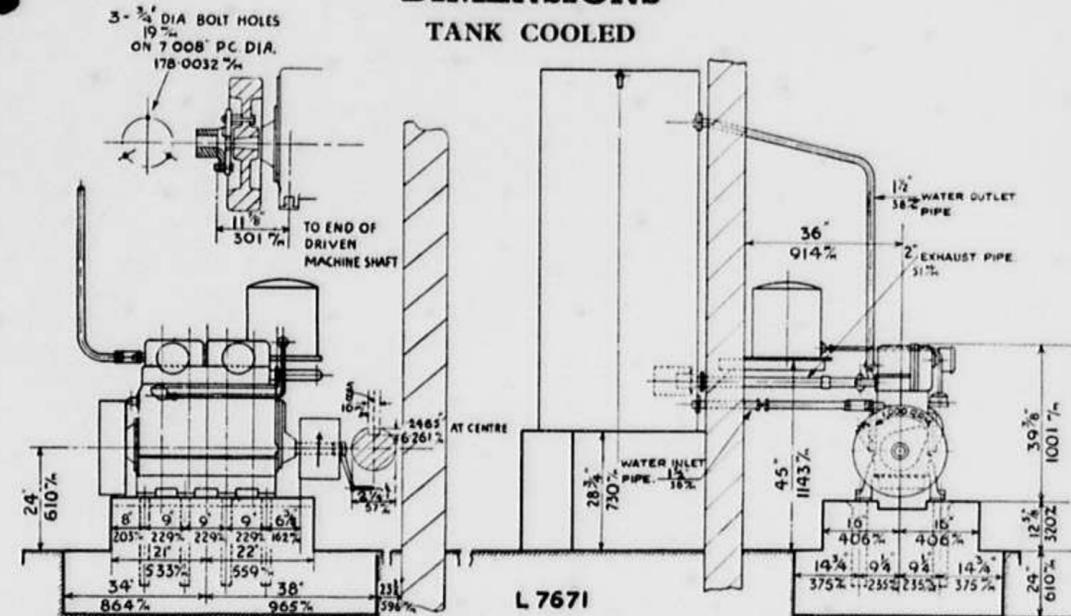
\*Containing Water Tank—Normal climate only  
 †Containing Water Tank—Tropical climate only



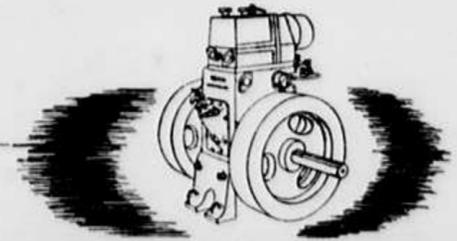
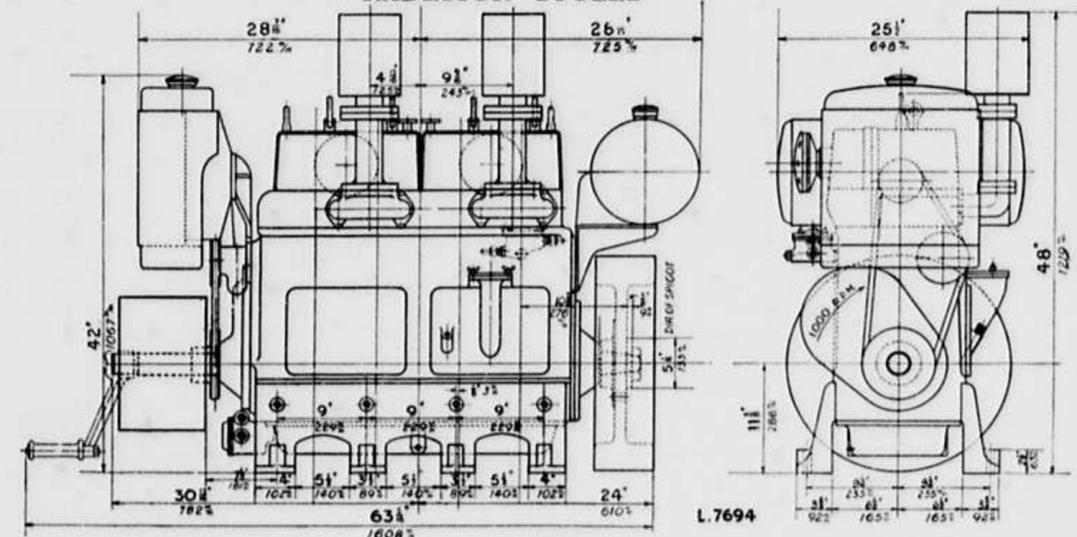
Makers of Successful Oil Engines since 1892

**MARK 4VSO**

**DIMENSIONS  
 TANK COOLED**



**RADIATOR COOLED**



The Largest Makers of Oil Engines in the British Commonwealth

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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## MARK 4VSO

### DESCRIPTION

**BEDPLATE AND HOUSING.** Cast iron. Cast in one piece.

**CYLINDER HEAD.** Cast iron. Separate water-jacketed casting, carrying valves, valve operating levers and atomiser. Combustion chamber designed to promote turbulence, to give complete combustion of fuel and instant starting from cold.

**VALVES.** Heat resisting steel. Overhead type, actuated by push rods. Inlet valve shrouded to produce turbulence. Exhaust valve guide of patented design.

**CYLINDER LINERS.** Close grained centrifugally cast iron. Wet type. Renewable. Specially hardened to ensure long life.

**CRANKSHAFT BEARINGS.** Steel bushes, lined with anti-friction metal. Easily renewable.

**CRANKSHAFT.** Steel forging. Accurately balanced. Drilled for lubrication of connecting rod large end bearings. Extended to take driving pulley.

**CONNECTING ROD.** Steel stamping. H. section. Large end bearings: Steel stampings lined with anti-friction metal. Small end bearings: Chilled phosphor-bronze bush.

**PISTON.** Special grade cast iron. Three pressure rings, one scraper ring.

**GUDGEON PIN.** Steel, hardened and ground. Fully floating type.

**CAMSHAFT.** Steel shaft: machined from the solid. Valve cams are hardened and ground.

**GEARS.** Machine-cut teeth. The gears run in oil.

**FUEL PUMP AND ATOMISER.** Plunger release type. Totally enclosed but accessible.

**FUEL FILTER.** Fitted to the suction and delivery sides of the fuel pump. The filter has an easily removable element.

**GOVERNOR.** Centrifugal, variable quantity type.

**LUBRICATION.** Forced feed, by gear type pump. Pump fitted with adjustable relief valve.

**COOLING.** Water cooling by tank or radiator as required.

**TOOLS AND EQUIPMENT.** Set of tools and equipment for maintenance is supplied.

**EXHAUST AND AIR SILENCERS.** Efficient exhaust silencer and a combined air filter and silencer are supplied.

**DIRECTION OF ROTATION.** Clockwise, looking at the camshaft gear drive end.

*N.B.—While every care is taken in the preparation of this Catalogue, which cancels all previous editions, the illustrations, specifications, weights and dimensions must not be taken as binding until confirmed by us, alterations being found necessary from time to time. Any variation from our standard specification may involve increase in price and delay in delivery.*

*GUARANTEE. In lieu of any warranty implied by law, we guarantee that the materials employed in*

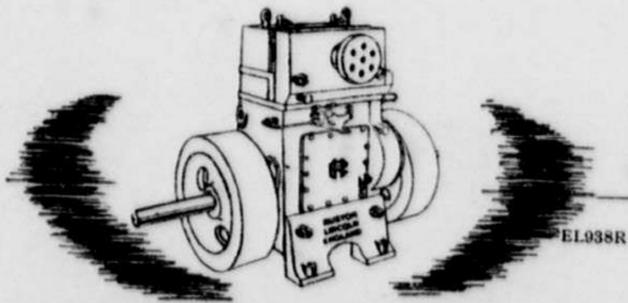
*the manufacture of our Machinery shall be of the best qualities of their respective kinds; and we undertake within twelve months from delivery, should any parts be broken or suffer from undue wear, to supply such new part or parts free of charge to the destination named in the Tender, provided it can be shown that that breakage or undue wear is the result of defective material or workmanship, and has not been caused by carelessness or improper treatment, or by inadequate lubrication.*

## RUSTON & HORNSBY L<sup>TD</sup> LINCOLN

ENGLAND

Telegrams: RUSTON LINCOLN

Telephone: LINCOLN 580



Printed in England

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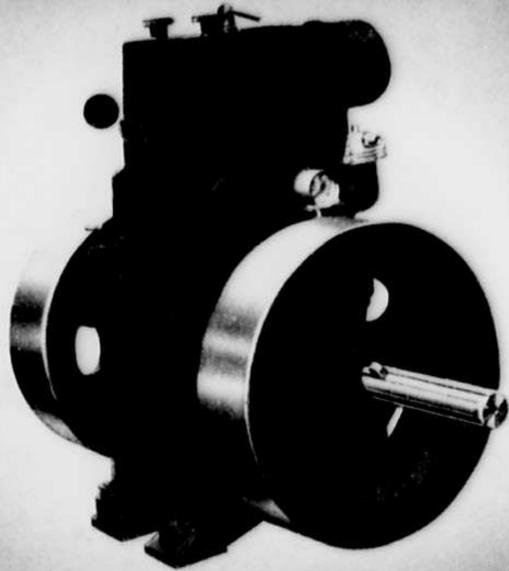
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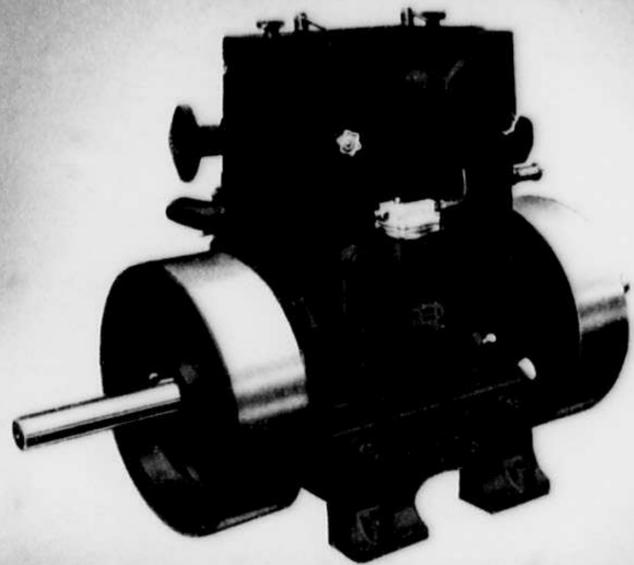
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POOR-COPY

Publication 7307



# SMALL VERTICAL OIL ENGINES



TYPE VTO & VSO  
5BHP. & 7½ BHP. PER  
CYLINDER

# RUSTON

RUSTON & HORNSBY LIMITED  
LONDON ENGLAND

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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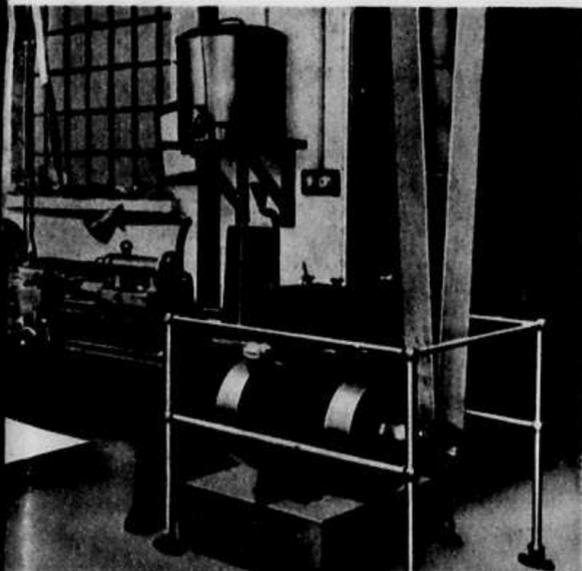
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**R**USTON small vertical oil engines are the outcome of long experience and research. They are 4-stroke compression ignition engines running on the lighter grades of Diesel oils such as those commonly used in "Diesel-engined" road vehicles.

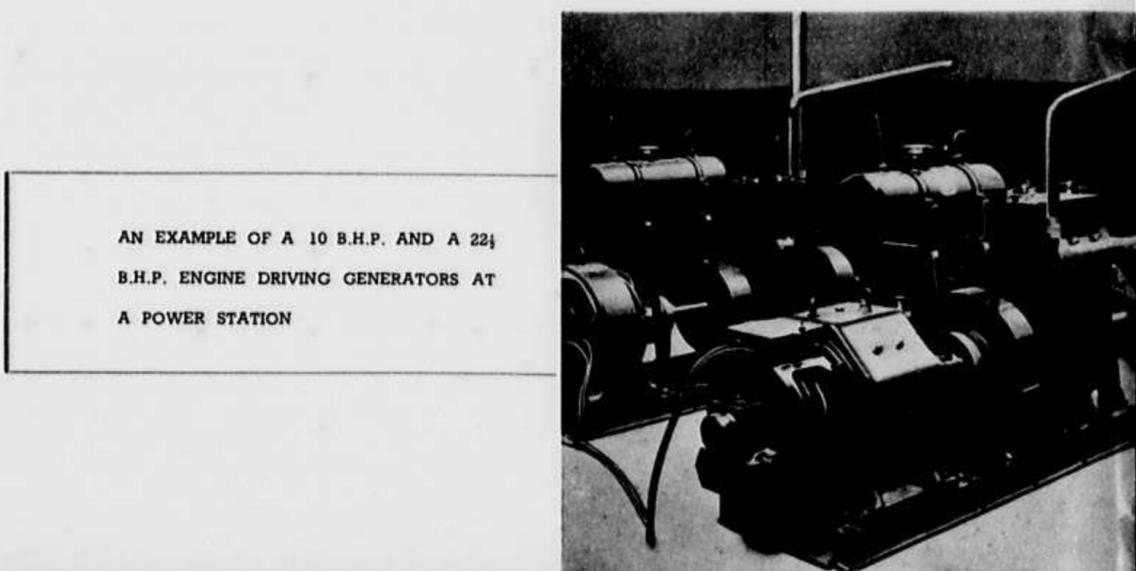
The fuel is to-day easily obtainable almost everywhere, and since it is non-volatile it is free from spontaneous fire risk, and is not subject to considerable loss through evaporation when stored in comparatively large quantities.

Steady vibrationless running is a feature of these small engines. The exhaust can be effectively silenced, and when the engine is enclosed in a well-built

outhouse very little sound can be heard outside. These engines are simple to run and maintain. They start by hand from cold and can be looked after by a chauffeur, gardener, tractor driver, or any intelligent man or youth. Simplicity has been obtained by skilful design and not in any case at the expense of performance. The sectional drawing on the centre page of this leaflet reveals the whole design of the engine and illustrates the robust construction of all parts. Uses for which they are ideal include; the lighting of country houses; providing power for small workshops, dairies, farm buildings, etc.; driving concrete mixers, elevators and conveyors, and other equipment requiring a built-in power unit, and a multitude of other purposes for which a limited supply of power is needed.



A 7 1/2 B.H.P. ENGINE DRIVING THE LINE  
SHAFTING OF A SMALL MACHINE SHOP



AN EXAMPLE OF A 10 B.H.P. AND A 22 1/2  
B.H.P. ENGINE DRIVING GENERATORS AT  
A POWER STATION

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

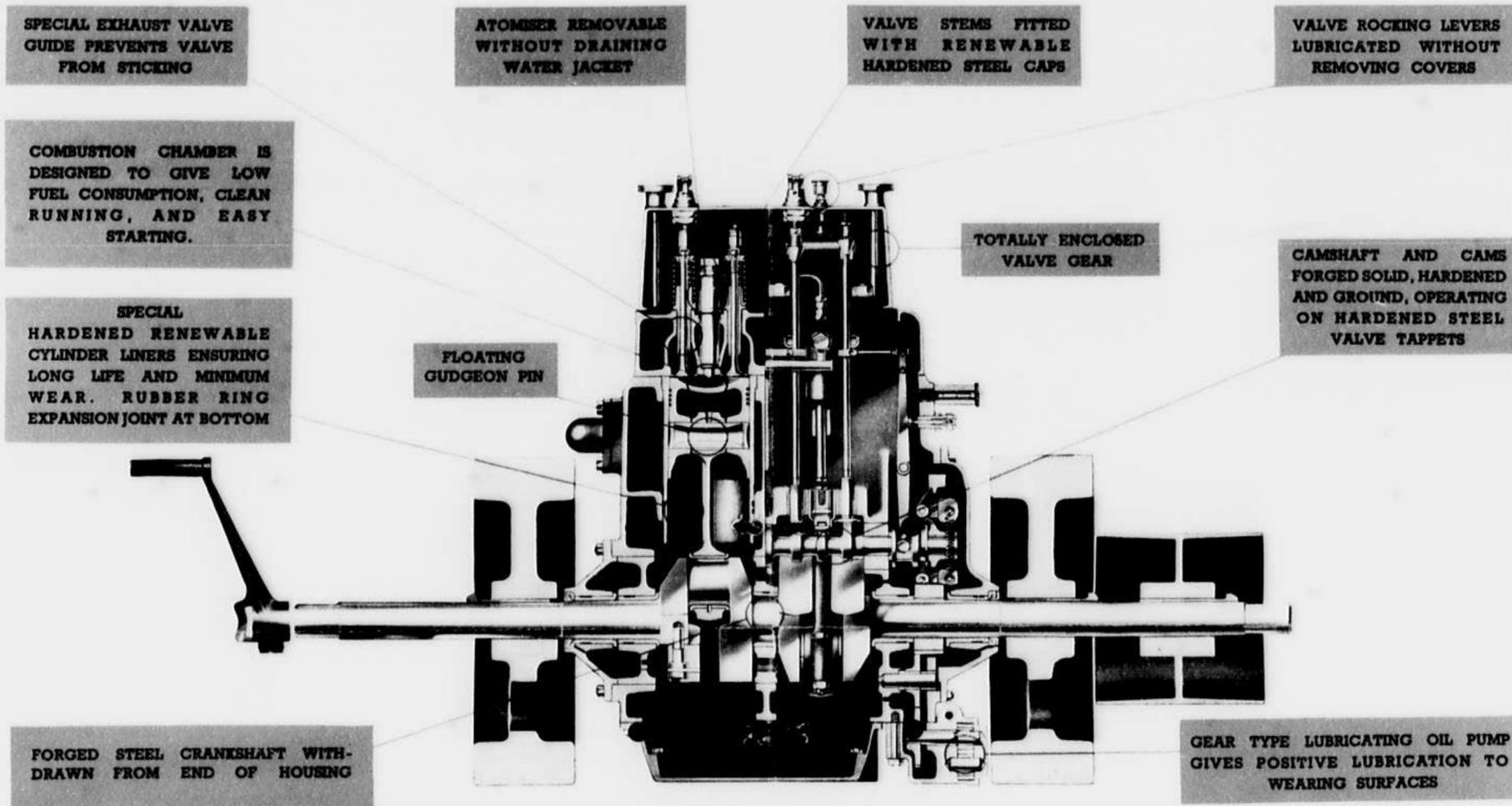
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# Why THE RUSTON IS SUPREME!



## *Easy Starting*

The ease with which engines in this series can be started is one of their outstanding features. The engine is turned by hand with the compression fully released. When sufficient speed has been attained (usually after 3 turns) full compression is put on and the fuel pump is brought into action. The engine fires instantly.

## *Simplicity*

The illustration shown above illustrates the simple nature of the engine and its robust construction. Note for example the straightforward design of the cylinder head also the simplicity of the governor and speeder gear by which the speed of the engine can be varied while running.

## *Long Life*

Factors which contribute to the lasting qualities of these engines are—

- (1) Smooth running due to sound design.
- (2) Freedom from delicate parts.
- (3) First-class materials and workmanship.
- (4) Rigid inspection during manufacture, including our own laboratory test on materials used.

## *Cheap Running*

The design of the combustion chamber ensures economical combustion of the fuel. This in turn means low fuel consumption, a clean engine and a clean exhaust. Thus fuel costs and maintenance costs will both be low. The cost for fuel and lubricating oil works out at approximately 1d. to 1½d. per B.H.P. hour.

# RUSTON & HORNSBY LIMITED

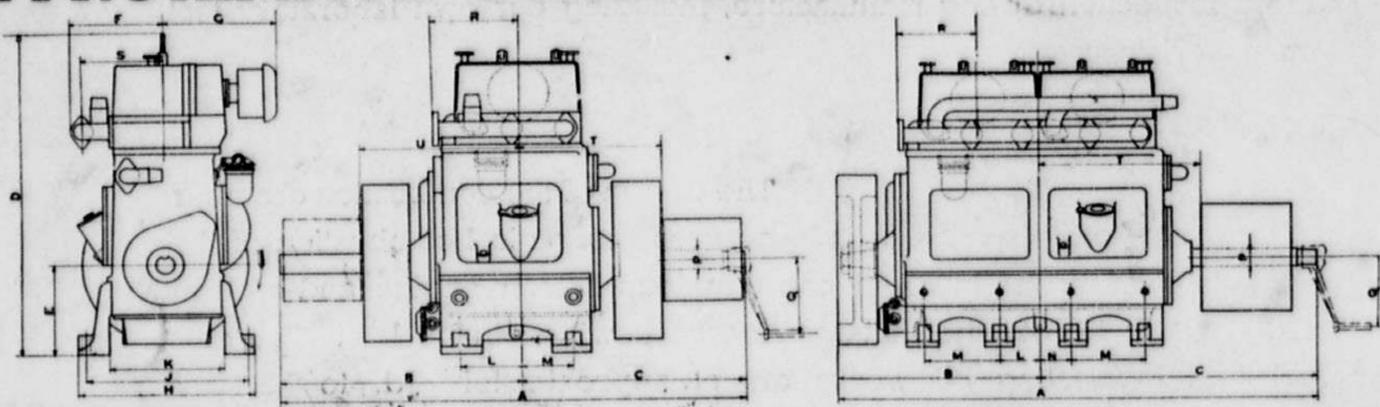
L I N C O L N      I N      G L A N D

BRITAIN'S LARGEST MANUFACTURERS OF OIL ENGINES

# TABLE OF SIZES

Mark	B.H.P.	No. of Cyls.	Revs.	Diameter of Flywheel	Pulley Dia. Width	Approximate Weight				Width of Keyway for Pulley	Dia. and No. of Foundation Bolts	Bore of Exhaust Pipe	Bore of Water Inlet and Outlet Pipe Rubber Hose	Number and Size Water Tanks	
						Unpacked Cwts.	Kgs.	Packed Cwts.	Kgs.					Dis.	Height
1VTO	5	1	1000	2-1' 6"	8" x 7 1/2"	7	357	9 1/2	484	1 1/2"	4-3/8"	1 1/2"	1 1/2"	1	1' 9" x 5' 0"
2VTO	10	2	1000	2-1' 6"	8" x 7 1/2"	8 1/2	446	11 1/2	573	1 1/2"	4-3/8"	1 1/2"	1 1/2"	1	2' 6" x 5' 0"
1VSO	7 1/2	1	1000	2-1' 7"	10" x 9"	10	510	12 1/2	650	1 1/2"	4-3/8"	2"	1 1/2"	1	2' 0" x 5' 6"
2VSO	15	2	1000	2-1' 7"	10" x 9"	12	612	14 1/2	752	1 1/2"	4-3/8"	2"	1 1/2"	1	2' 9" x 6' 0"
3VSO	22 1/2	3	1000	1' 10"	14" x 9"	12 1/2	624	15	765	1 1/2"	6-3/8"	2"	1 1/2"	1	3' 3" x 6' 0"
4VSO	30	4	1000	1' 10"	14" x 11"	14 1/2	726	17	867	1 1/2"	8-3/8"	2"	1 1/2"	1	3' 10" x 6' 0"

## APPROXIMATE DIMENSIONS



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
1VTO	3' 5 1/2"	1' 10 1/2"	1' 7 1/2"	2' 10 1/2"	40"	8 1/2"	12"	17 1/2"	16 1/2"	11 1/2"	4 1/2"	2 1/2"	—	2"	9"	—	—	11 1/2"	13 1/2"
	1063m/m	565m/m	498m/m	870m/m	254m/m	216m/m	309m/m	451m/m	413m/m	286m/m	105m/m	66m/m	—	51m/m	229m/m	—	—	292m/m	343m/m
2VTO	4' 2 1/2"	2' 2 1/2"	1' 11 1/2"	2' 10 1/2"	10"	9 1/2"	12"	17 1/2"	16 1/2"	11 1/2"	6 1/2"	4 1/2"	—	2"	9"	7 1/2"	7 1/2"	14 1/2"	16 1/2"
	1273m/m	664m/m	607m/m	883m/m	254m/m	235m/m	309m/m	451m/m	413m/m	286m/m	159m/m	121m/m	—	51m/m	229m/m	186m/m	200m/m	362m/m	413m/m
1VSO	3' 11"	2' 0 1/2"	1' 10 1/2"	3' 2 1/2"	10 1/2"	11 1/2"	13"	19 1/2"	18"	13"	4 7/8"	3 7/8"	—	2 1/2"	9"	—	—	13 1/2"	15 1/2"
	1194m/m	622m/m	571m/m	987m/m	276m/m	292m/m	330m/m	502m/m	457m/m	330m/m	106m/m	80m/m	—	57m/m	229m/m	—	—	336m/m	387m/m
2VSO	4' 7 1/2"	2' 4 1/2"	2' 2 1/2"	3' 2 1/2"	10 1/2"	11 1/2"	13"	19 1/2"	18"	13"	7"	6"	—	2 1/2"	9"	8 1/2"	9 1/2"	16 1/2"	18 1/2"
	1406m/m	726m/m	679m/m	987m/m	276m/m	292m/m	330m/m	502m/m	457m/m	330m/m	178m/m	152m/m	—	57m/m	229m/m	211m/m	241m/m	415m/m	466m/m
3VSO	4' 11"	1' 8 1/2"	2' 5 1/2"	3' 3 1/2"	11 1/2"	11 1/2"	13"	20 1/2"	18 1/2"	13"	9 1/2"	9 1/2"	1"	2 1/2"	9"	11 1/2"	9 1/2"	15 1/2"	—
	1264m/m	523m/m	740m/m	1000m/m	593m/m	292m/m	330m/m	514m/m	470m/m	330m/m	232m/m	232m/m	12m/m	57m/m	229m/m	292m/m	241m/m	400m/m	—
4VSO	4' 11"	2' 1 1/2"	2' 10 1/2"	3' 3 1/2"	11 1/2"	11 1/2"	13"	20 1/2"	18 1/2"	13"	5"	9"	4"	2 1/2"	9"	16 1/2"	9 1/2"	20"	—
	1499m/m	641m/m	870m/m	1000m/m	593m/m	292m/m	330m/m	514m/m	470m/m	330m/m	127m/m	229m/m	102m/m	57m/m	229m/m	409m/m	241m/m	508m/m	—

**The A. R. Williams Machinery Co. of Vancouver, Ltd.,**  
**495 Railway Street - VANCOUVER, B.C.**

A.M.11361.

Printed in England.

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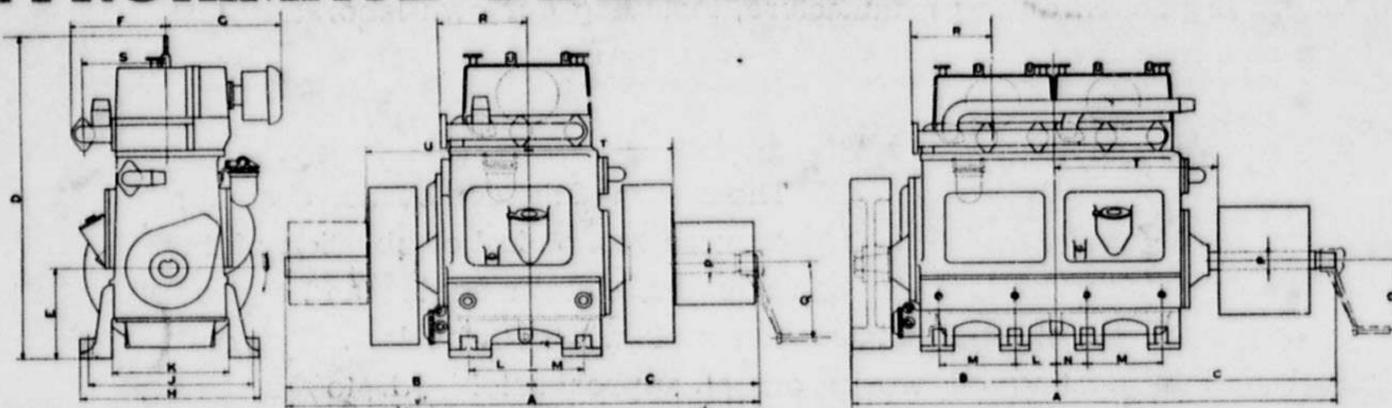
CANADA

POOR COPY

# TABLE OF SIZES

Mark	B.H.P.	No. of Cy's.	Revs.	Diameter of Flywheel	Pulley Dia. Width	Approximate Weight			Width of Keyway for Pulley	Dia. and No. of Foundation Bolts	Bore of Exhaust Pipe	Bore of Water Inlet and Outlet Pipe Rubber Hose	Number and Size Water Tanks		
						Unpacked Cwts.	Kgs.	Packed Cwts.					Kgs.	Dis.	Height
1VTO	5	1	1000	2-1' 6"	8" x 7 1/2"	7	357	9 1/2	484	1/2"	4-3/8"	1 1/2"	1 1/2"	1	1' 9" x 5' 0"
2VTO	10	2	1000	2-1' 6"	8" x 7 1/2"	8 1/2	446	11 1/2	573	1/2"	4-3/8"	1 1/2"	1 1/2"	1	2' 6" x 5' 0"
1VSO	7 1/2	1	1000	2-1' 7"	10" x 9"	10	510	12 1/2	650	3/8"	4-3/4"	2"	1 1/2"	1	2' 0" x 5' 6"
2VSO	15	2	1000	2-1' 7"	10" x 9"	12	612	14 1/2	752	3/8"	4-3/4"	2"	1 1/2"	1	2' 9" x 6' 0"
3VSO	22 1/2	3	1000	1' 10"	14" x 9"	12 1/2	624	15	765	3/8"	6-3/4"	2"	1 1/2"	1	3' 3" x 6' 0"
4VSO	30	4	1000	1' 10"	14" x 11"	14 1/2	726	17	867	3/8"	8-3/4"	2"	1 1/2"	1	3' 10" x 6' 0"

## APPROXIMATE DIMENSIONS



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
1VTO	3' 5 1/2"	1' 10 1/4"	1' 7 7/8"	2' 10 1/4"	10"	8 1/2"	12"	17 1/2"	16 1/2"	11 1/2"	4 1/2"	2 1/2"	—	2"	9"	—	—	11 1/2"	13 1/2"
2VTO	4' 2 1/4"	2' 2 3/8"	1' 11 1/4"	2' 10 1/4"	10"	9 1/2"	12"	17 1/2"	16 1/2"	11 1/2"	6 1/2"	4 1/2"	—	2"	9"	7 3/8"	7 1/4"	14 1/2"	16 1/2"
1VSO	3' 11"	2' 0 1/4"	1' 10 1/4"	3' 2 1/4"	10 1/2"	11 1/2"	13"	19 1/2"	18"	13"	4 3/8"	3 3/8"	—	2 1/2"	9"	—	—	13 1/2"	15 1/2"
2VSO	4' 7 1/2"	2' 4 1/8"	2' 2 1/4"	3' 2 1/4"	10 1/2"	11 1/2"	13"	19 1/2"	18"	13"	7"	6"	—	2 1/2"	9"	8 3/8"	9 1/4"	16 1/2"	18 1/2"
3VSO	4' 1 1/2"	1' 8 1/8"	2' 5 1/4"	3' 3 1/4"	11 1/4"	11 1/2"	13"	20 1/2"	18 1/2"	13"	9 1/2"	9 1/4"	1 1/2"	2 1/2"	9"	11 1/2"	9 1/2"	15 1/2"	—
4VSO	4' 11"	2' 1 1/4"	2' 10 1/4"	3' 3 1/4"	11 1/4"	11 1/2"	13"	20 1/2"	18 1/2"	13"	5"	9"	4"	2 1/2"	9"	16 1/2"	9 1/2"	20"	—

The A. R. Williams Machinery Co. of Vancouver, Ltd.,  
495 Railway Street - VANCOUVER, B.C.

A.M.11361.

Printed in England.

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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# RUSTON

## Small Vertical Oil Engines

3 b.h.p., 5 b.h.p. and 7½ b.h.p. per cyl. Class VWO, VTO & VSO

(Cold Starting, using Light Diesel Fuel)

### EASY HAND STARTING

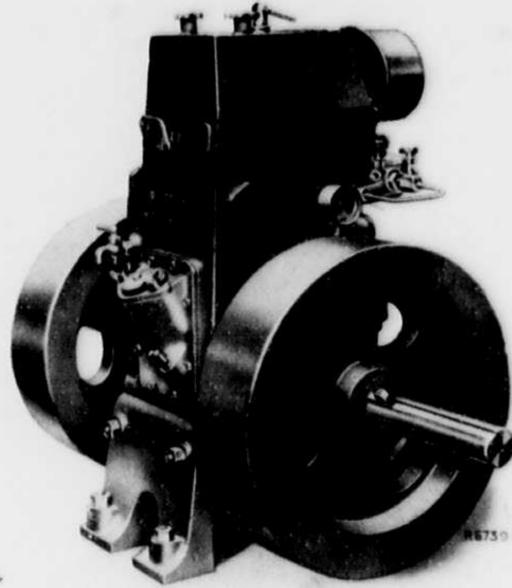
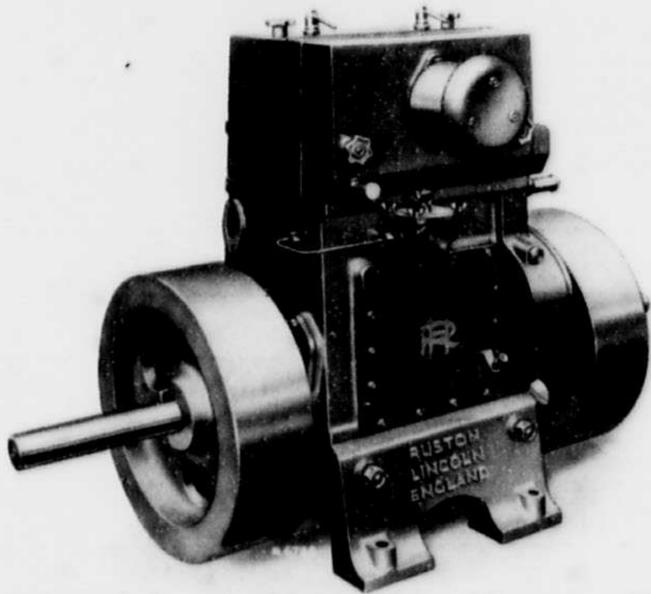
The ease with which engines in this series can be started is one of their outstanding features. The engine is turned by hand with the compression fully released. Practically no physical strength is required. When sufficient speed has been attained (usually after three turns) the fuel pump is brought into action and full compression is put on. The engine fires instantly.

### LOW FUEL CONSUMPTION

The simple, straightforward but well thought out design of the combustion chamber gives highly efficient combustion, which is reflected in the very economical running of these engines, which run effectively on distillate fuels having a specific gravity not greater than 0.88 and a viscosity not greater than 50 seconds at 100° F. (Redwood No. 1).

### CLEAN RUNNING

Because of the efficient combustion the engine is very clean internally, and will run for long periods without de-carbonizing or cleaning.



### PISTON RINGS

The design and running performance of these engines ensures clean running, gives free working piston rings and prevents the sticking of rings so common in many high speed engines.

### LONG LIFE

The factors which contribute to the lasting qualities of these engines are:—

- (1) Smooth running due to sound design.
- (2) Simplicity and freedom from delicate points.
- (3) First-class materials and workmanship.

### ACCESSIBILITY

All parts are readily accessible for inspection and, if necessary, adjustment. The cylinder head covers are easily removable giving full access to valve gear and fuel system.

Large doors are provided in the engine housing.



Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

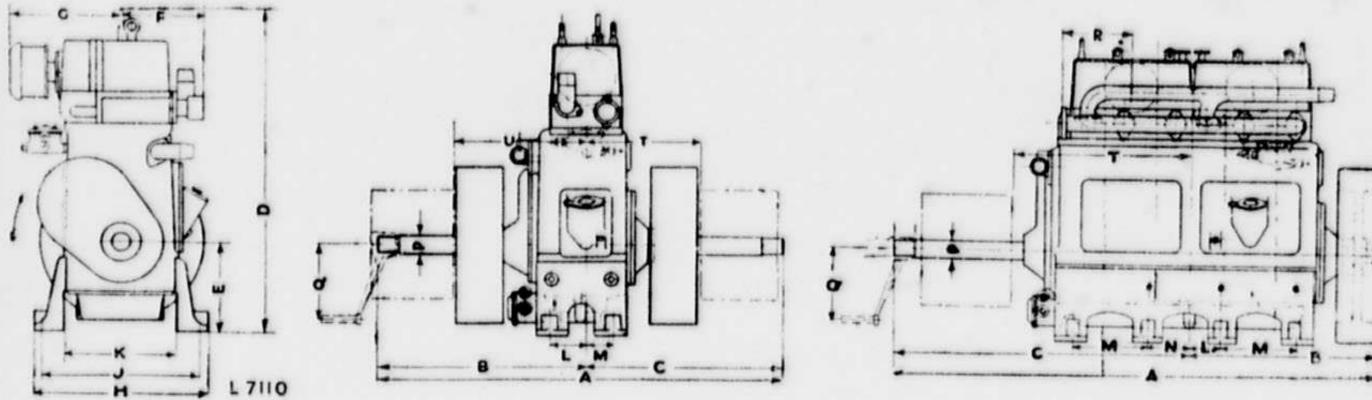
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CANADA

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## APPROXIMATE DIMENSIONS



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
1VVO	3' 0 1/2" 936m m	1' 9 1/2" 502m m	1' 7 1/2" 435m m	2' 9 1/2" 857m m	10" 254m m	—	12" 305m m	17 1/2" 451m m	16 1/2" 413m m	11 1/2" 286m m	4 1/2" 108m m	2 1/2" 63m m	—	2" 51m m	9" 229m m	—	—	10" 254m m	12" 305m m
1VTO	3' 5 1/2" 1063m m	1' 10 1/2" 565m m	1' 7 1/2" 498m m	2' 10 1/2" 870m m	10" 254m m	8 1/2" 206m m	12" 305m m	17 1/2" 451m m	16 1/2" 413m m	11 1/2" 286m m	4 1/2" 105m m	2 1/2" 66m m	—	2" 51m m	9" 229m m	—	—	11 1/2" 292m m	13 1/2" 343m m
2VTO	4' 2 1/2" 1273m m	2' 2 3/8" 664m m	1' 11 3/8" 607m m	2' 10 1/2" 870m m	10" 254m m	9 1/2" 235m m	12" 305m m	17 1/2" 451m m	16 1/2" 413m m	11 1/2" 286m m	6 1/2" 159m m	4 1/2" 121m m	—	2" 51m m	9" 229m m	7 3/8" 180m m	8 1/2" 210m m	14 1/2" 362m m	16 1/2" 413m m
1VSO	3' 11" 1194m m	2' 0 1/2" 622m m	1' 10 1/2" 571m m	3' 2 1/2" 987m m	10 1/2" 276m m	9 1/2" 238m m	13" 330m m	19 1/2" 502m m	18" 457m m	13" 330m m	4 3/8" 106m m	3 3/8" 80m m	—	2 1/2" 57m m	9" 229m m	—	—	13 1/2" 336m m	15 1/2" 387m m
2VSO	4' 7 1/2" 1406m m	2' 4 1/2" 726m m	2' 2 1/2" 679m m	3' 2 1/2" 987m m	10 1/2" 276m m	11 1/2" 292m m	13" 330m m	19 1/2" 502m m	18" 457m m	13" 330m m	7 3/8" 183m m	6 3/8" 157m m	—	2 1/2" 57m m	9" 229m m	8 3/8" 211m m	9 1/2" 241m m	16 1/2" 415m m	18 1/2" 466m m
3VSO	4' 1 1/2" 1266m m	1' 6 3/8" 481m m	2' 6 1/2" 785m m	3' 3 1/2" 1000m m	11 1/2" 593m m	11 1/2" 292m m	13" 330m m	20 1/2" 514m m	18 1/2" 470m m	13" 330m m	9 1/2" 232m m	9 1/2" 245m m	4" 122m m	2 1/2" 57m m	9" 229m m	11 1/2" 292m m	9 1/2" 241m m	18" 457m m	—
4VSO	4' 11" 1499m m	1' 11" 584m m	3' 0" 915m m	3' 3 1/2" 1000m m	11 1/2" 593m m	11 1/2" 292m m	13" 330m m	20 1/2" 514m m	18 1/2" 470m m	13" 330m m	5" 125m m	9" 229m m	4" 102m m	2 1/2" 57m m	9" 229m m	8 1/2" 213m m	9 1/2" 241m m	22" 559m m	—

## RUSTON & HORNSBY LTD., LINCOLN

**THE A. R. WILLIAMS MACHINERY COMPANY, of VANCOUVER, Limited.**  
**495 Railway Street - VANCOUVER, B.C.**

BL337D

Printed in England

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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# SPECIFICATION

<b>V.W.O.</b> 1000 r.p.m.	<b>V.T.O.</b> 1000 r.p.m.	<b>Normal Speed</b> <b>B.H.P. per cylinder</b> <b>No. of cylinders</b>	<b>V.S.O.</b> 1000 r.p.m.
3 1	5 1 and 2		7½ 1, 2, 3, 4

### BEDPLATE AND HOUSING

Material : Cast Iron.  
Cast in one piece.

### CYLINDER HEAD

Material : Cast Iron.  
Separate casting amply water-jacketed, carrying valves, valve operating levers and atomiser.

### VALVE

Material : Heat resisting steel.  
Overhead type, actuated by push rods.  
Inlet valve shrouded to produce turbulence.  
Exhaust valve guide of patent design.

### CYLINDER LINERS

Material : Close grained cast iron.  
Wet type. Renewable.

### CRANKSHAFT BEARINGS

Steel Bushes, lined with Anti-Friction Metal.  
Easily renewable.

### CRANKSHAFT

Steel Forging. Accurately balanced.  
Drilled for lubrication of large end bearings.  
Extended to take driving pulley.

### CONNECTING ROD

Steel stamping. H. Section.  
Large end bearings.  
Steel stampings lined with anti-friction metal.  
Small end bearings. Chilled phosphor bronze bush.

### PISTON

Material : Special grade cast iron.  
No. of Rings. 3 pressure, 1 scraper.

### GUDGEON PIN

Material : Steel, hardened and ground.  
Fully floating type.

### CAMSHAFT

Steel Shaft : machined from the solid.  
Valve cams are hardened and ground.

### GEARS

Machine cut teeth. running in oil.

### FUEL PUMP AND ATOMISER

Type : Plunger Release.  
Totally enclosed but accessible.  
Fuel filter has easily removable element.

### GOVERNOR

Centrifugal, variable quantity type.

### LUBRICATION

Forced Feed, by gear type pump.

## TABLE OF SIZES

Mark	B.H.P.	No. of Cyls.	Revs.	Diameter of Flywheel	Pulley Dia. Width	Approximate Weight				Width of Keyway for Pulley	Diameter and No. of Foundation Bolts	Bore of Exhaust Pipe	Bore of Water Inlet and Outlet Pipe, Rubber Hose	Size and Capacity of Water Circulating Tanks			
						Unpacked		Packed						Normal Climate		Hot Climate	
						Cwts.	Kgs.	Cwts.	Kgs.					Size	Galls.	Size	Galls.
1VWO	3	1	1000	2-1'7½"	7" x 5"	6	306	8½	433	1½"	4-½"	11"	11"	1'6" x 3'6"	38	1'9" x 4'0"	60
1VTO	5	1	1000	2-1'7½"	10" x 6"	7½	382	10	510	1½"	4-½"	11"	11"	1'6" x 3'6"	38	1'9" x 4'0"	60
2VTO	10	2	1000	2-1'7½"	10" x 6"	9¼	472	11¼	599	1½"	4-½"	11"	11"	2'0" x 5'0"	98	2'3" x 5'0"	124
1VSO	7½	1	1000	2-1'9¼"	10" x 6"	10½	535	13¼	675	1½"	4-½"	2"	11"	1'9" x 4'0"	60	2'0" x 5'0"	98
2VSO	15	2	1000	2-1'9¼"	10" x 9"	12½	637	15¼	777	1½"	4-½"	2"	11"	2'3" x 5'0"	134	2'6" x 6'0"	183
3VSO	22½	3	1000	1-1'10¾"	14" x 9"	12¼	650	15½	790	1½"	4-½"	2"	11"	2'6" x 6'0"	183	2'3" x 5'0"	276
4VSO	30	4	1000	1-1'10¾"	14" x 9"	14¼	905	17½	892	1½"	4-½"	2"	11"	2'9" x 6'0"	222	2'6" x 6'0"	405

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# SPECIFICATION

<b>V.W.O.</b> 1000 r.p.m. 3 1	<b>V.T.O.</b> 1000 r.p.m. 5 1 and 2	<b>Normal Speed</b> <b>B.H.P. per cylinder</b> <b>No. of cylinders</b>	<b>V.S.O.</b> 1000 r.p.m. 7½ 1, 2, 3, 4
--	--	--	--

### BEDPLATE AND HOUSING

Material : Cast Iron.  
 Cast in one piece.

### CYLINDER HEAD

Material : Cast Iron.  
 Separate casting amply water-jacketed, carrying valves, valve operating levers and atomiser.

### VALVE

Material : Heat resisting steel.  
 Overhead type, actuated by push rods.  
 Inlet valve shrouded to produce turbulence.  
 Exhaust valve guide of patent design.

### CYLINDER LINERS

Material : Close grained cast iron.  
 Wet type. Renewable.

### CRANKSHAFT BEARINGS

Steel Bushes, lined with Anti-Friction Metal.  
 Easily renewable.

### CRANKSHAFT

Steel Forging. Accurately balanced.  
 Drilled for lubrication of large end bearings.  
 Extended to take driving pulley.

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Type : Plunger Release.  
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						Unpacked		Packed						Normal Climate		Hot Climate	
						Cwts.	Kgs.	Cwts.	Kgs.					Size	Galls.	Size	Galls.
1VWO	3	1	1000	2-1'7½"	7" x 5"	6	306	8½	433	½"	4-½"	1½"	1½"	1'6" x 3'6"	38	1'9" x 4'0"	60
1VTO	5	1	1000	2-1'7½"	10" x 6"	7½	382	10	510	½"	4-½"	1½"	1½"	1'6" x 3'6"	38	1'9" x 4'0"	60
2VTO	10	2	1000	2-1'7½"	10" x 6"	9¼	472	11¼	599	½"	4-½"	1½"	1½"	2'0" x 5'0"	98	2'3" x 5'0"	124
1VSO	7½	1	1000	2-1'9¼"	10" x 6"	10½	535	13¼	675	½"	4-½"	2"	1½"	1'9" x 4'0"	60	2'0" x 5'0"	98
2VSO	15	2	1000	2-1'9¼"	10" x 9"	12½	637	15¼	777	½"	4-½"	2"	1½"	2'3" x 5'0"	134	2'6" x 6'0"	183
3VSO	22½	3	1000	1-1'10¾"	14" x 9"	12¾	650	15½	790	½"	4-½"	2"	1½"	2'6" x 6'0"	183	2'3" x 5'0"	276
4VSO	30	4	1000	1-1'10¾"	14" x 9"	14¾	905	17½	892	½"	4-½"	2"	1½"	2'9" x 6'0"	222	2'6" x 6'0"	405

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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# IMPORTANT FEATURES

Special Exhaust Valve Guide prevents valve from sticking.

Atomiser removable without draining water jacket.

Valve rocking levers lubricated without removing covers.

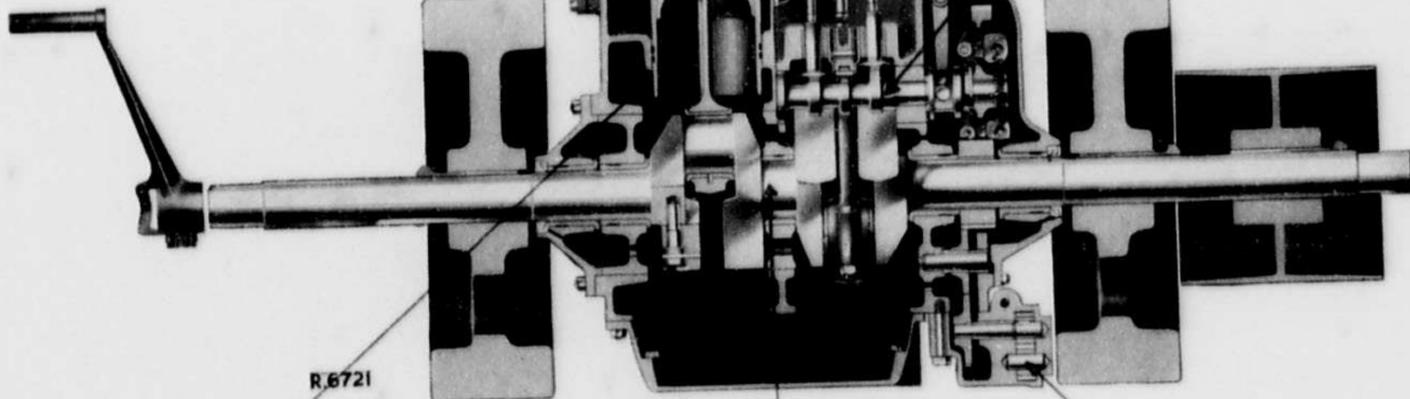
Combustion Chamber is designed to promote turbulence and to give complete combustion of fuel and instant starting from cold.

Valve stems fitted with renewable hardened steel caps.

Totally enclosed Valve Gear.

Camshaft and cams forged solid hardened and ground, operating on hardened steel valve tappets.

Floating Gudgeon Pin.



Special hardened renewable cylinder liners ensuring long life and minimum wear. Rubber ring expansion joint at bottom.

Forged steel crankshaft withdrawn from end of housing.

Gear type lubricating oil pump gives positive lubrication.

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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TELEPHONE: TRINITY 2125

# HOFFARS LIMITED

MARINE AND STATIONARY DIESEL ENGINES  
DIESEL LIGHTING PLANTS

**B.C. Distributors:**  
HALL-SCOTT GAS & DIESEL ENGINES  
COOPER - BESSEMER DIESELS  
LISTER DIESEL ENGINES  
GRAY MARINE ENGINES  
JOHNSON OUTBOARDS  
PARAGON REVERSE GEARS  
HYDE PROPELLERS



DISTRIBUTORS OF  
CANADIAN BYRON JACKSON  
CENTRIFUGAL PUMPS TURBINE  
CUMMINS DIESELS

1790 GEORGIA STREET, WEST  
**VANCOUVER, B.C.**

September 19, 1939.

Indian Affairs Branch,  
Department of Mines & Resources,  
P.O. Box 70,  
Vancouver, B.C.

Gentlemen:

As requested in your letter of September 18,  
we are quoting you herewith on one 6 H.P. and one 12 H.P.  
Lister Diesel Engine as follows:

One 6 H.P. Single Cylinder Lister Full Diesel Engine,  
4 cycle, solid injection, 650 R.P.M., to Direct Connect  
to your present generator -----\$380.00

One 2 cylinder, 12 H.P. Lister Full Diesel, 4 cycle,  
solid injection engine, 650 R.P.M. to Direct Connect  
to your generator -----\$590.00

INSTALLATION: This includes crating, cartage, freight  
to Alert Bay, as well as the services of an installation  
man to make the necessary change-over at Alert Bay.  
Installation price two engines -----\$140.00

These engines would be to the specifications as attached  
herewith, and as we have previously made a survey of these  
plants at Alert Bay, we know that no great difficulty should  
be experienced in making the change-over, as the size and  
R.P.M. of the Diesel Plants is very similar to the present  
engines.

Delivery could be made from stock on hand in  
Vancouver.

Yours very truly,

HOFFARS LIMITED.

Per: *D. Johnson*



Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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TELEPHONE TRINITY 2125

# HOFFARS LIMITED

MARINE AND STATIONARY DIESEL ENGINES  
DIESEL LIGHTING PLANTS

**B.C. Distributors:**  
HALL-SCOTT GAS & DIESEL ENGINES  
COOPER - BESSEMER DIESELS  
LISTER DIESEL ENGINES  
GRAY MARINE ENGINES  
JOHNSON OUTBOARDS  
PARAGON REVERSE GEARS  
HYDE PROPELLERS



DISTRIBUTORS OF  
CANADIAN BYRON JACKSON  
CENTRIFUGAL PUMPS TURBINE  
GUMMINS DIESELS

1790 GEORGIA STREET, WEST  
**VANCOUVER, B.C.**

September 19, 1939.

Indian Affairs Branch,  
Department of Mines & Resources,  
P.O. Box 70,  
Vancouver, B.C.

Gentlemen:

As requested in your letter of September 18,  
we are quoting you herewith on one 16 H.P. and one 12 H.P.  
Lister Diesel Engine as follows:

One 6 H.P. Single Cylinder Lister Full Diesel Engine,  
4 cycle, solid injection, 650 R.P.M., to Direct Connect  
to your present generator -----\$ 380.00

One 2 cylinder, 12 H.P. Lister Full Diesel, 4 cycle,  
solid injection engine, 650 R.P.M. to Direct Connect  
to your generator -----\$ 590.00

INSTALLATION: This includes crating, cartage, freight  
to Alert Bay, as well as the services of an installation  
man to make the necessary change-over at Alert Bay.  
Installation price two engine -----\$ 140.00

These engines would be to the specifications as attached  
herewith, and as we have previously made a survey of these  
plants at Alert Bay, we know that no great difficulty should  
be experienced in making the change-over, as the size and  
R.P.M. of the Diesel Plants is very similar to the present  
engines.

Delivery could be made from stock on hand in  
Vancouver.

Yours very truly,  
HOFFARS LIMITED.



Per: *D. Johnson*

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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MARK

# 5-1 DIESEL ENGINES

SINGLE CYLINDER—OVERHEAD VALVES

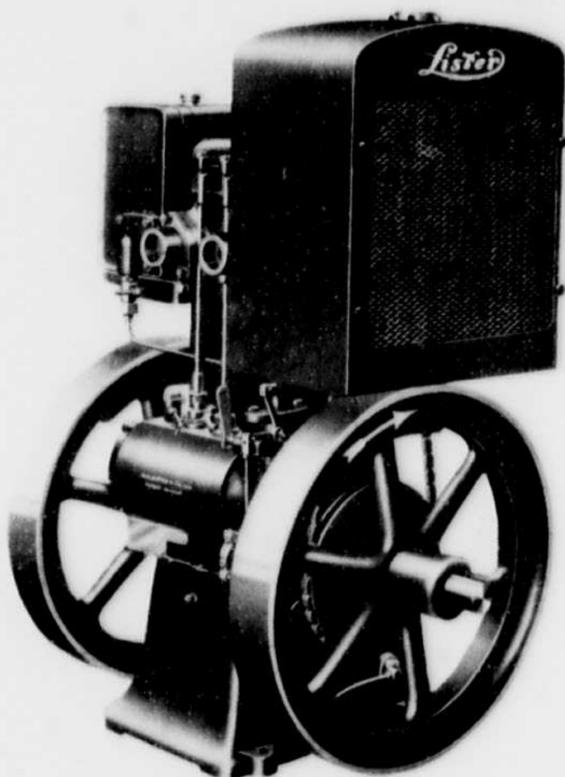
6 H.P. AT 650 R.P.M.

If the Engine is used at a speed lower than standard, the power is reduced accordingly, and the Engine will develop :—

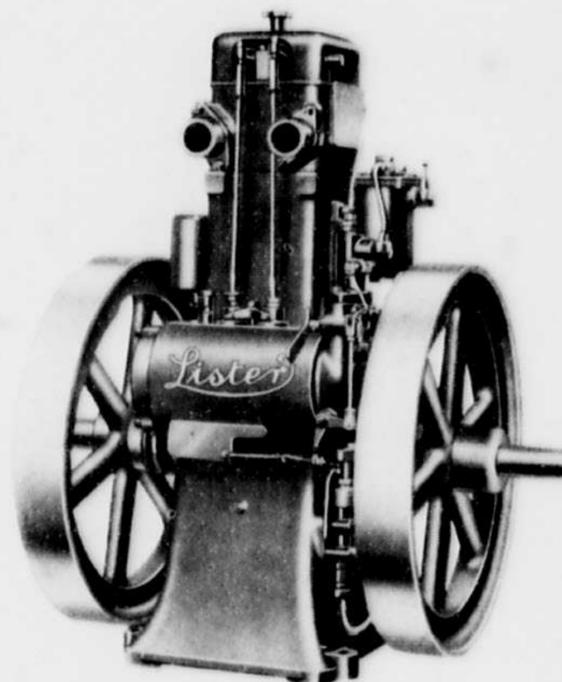
5 H.P. AT 600 R.P.M.

4 H.P. AT 500 R.P.M.

Sole Importers for British Columbia  
**HOFFARS LIMITED**  
 1708 Broadway Street, Vancouver, B.C., Canada



RADIATOR COOLED MODEL.



TANK COOLED MODEL.  
(Less Tank)

Illustrations are representative only; details are subject to modification.

### SPECIFICATION

BORE x STROKE	...	...	...	4 1/2" x 5 1/2"	114.3 x 140 m/m.
FLYWHEEL dia. x face	...	...	...	24" x 3 1/2"	610 x 89 m/m.
PULLEY dia. x face	...	...	...	4" x 7" & 5" x 7"	101 x 177 & 127 x 177 m/m.
" " " "	...	...	...	6" x 7" & 7" x 7"	152 x 177 & 177 x 177 m/m.
" " " "	...	...	...	8" x 7" & 9" x 7"	203 x 177 & 228 x 177 m/m.
" " " "	...	...	...	10" x 7" & 12" x 7"	254 x 177 & 304 x 177 m/m.
" " " "	...	...	...	13" x 7" & 14" x 7"	330 x 177 & 355 x 177 m/m.
" " " "	...	...	...	16" x 7" & 18" x 7"	406 x 177 & 457 x 177 m/m.
FUEL TANK CAPACITY (Tank Cooled Model)	...	...	...	4 gallons	18 litres
" " " (Radiator " " )	...	...	...	2 1/2 "	11.3 "
WATER " " " Temperate	...	...	...	50 "	227 "
" " " " Climate	...	...	...	23" x 33 1/2"	584 x 850 m/m.
WATER TANK CAPACITY } Tropical	...	...	...	70 gallons	318 litres
" " " " Climate	...	...	...	23" x 47"	584 x 1190 m/m.
RADIATOR CAPACITY (Temperate Climate)	...	...	...	3 gallons 1 pint	14.2 litres
" " " (Tropical " " )	...	...	...	3 1/2 "	15.8 "

SHEET 5-1 338 E C

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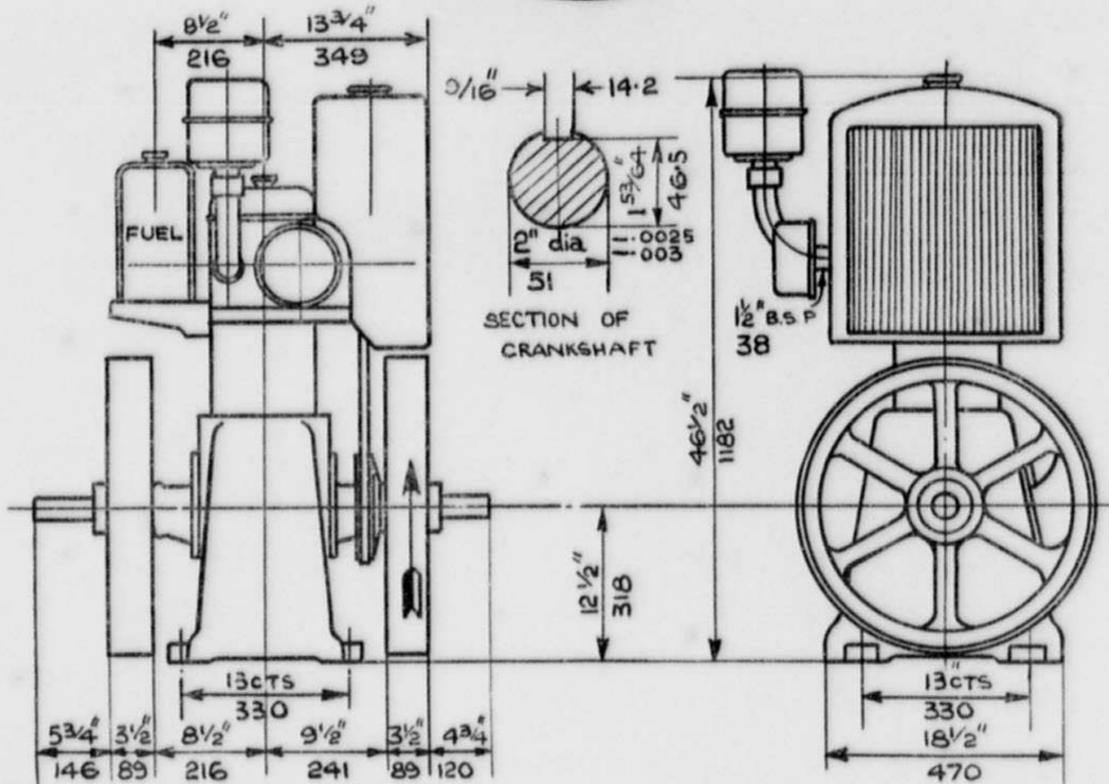
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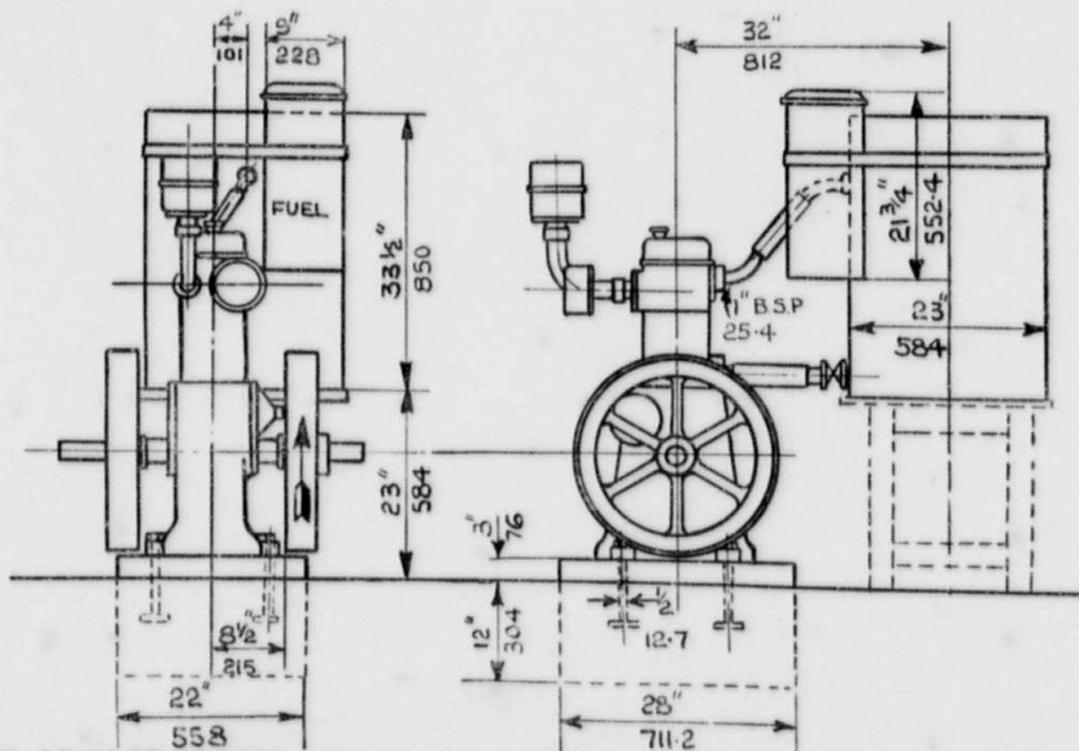
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# Lister



**RADIATOR COOLED MODEL**, Scale  $\frac{3}{4}$ " = 1' 0". Dimensions in inches and approx. m.m's.



**TANK COOLED MODEL**—Scale  $\frac{1}{2}$ " = 1' 0" For other dimensions see Radiator Cooled Model.

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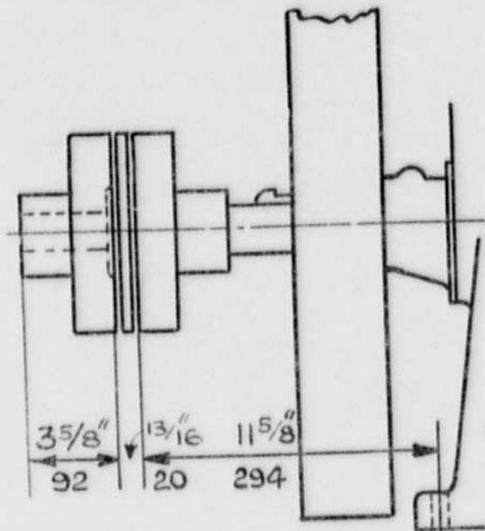
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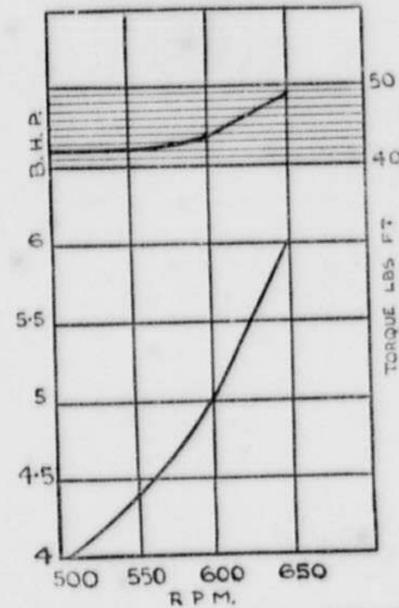
## POWER TAKE-OFF

Alternative to Pulley



Keyway and Bore dimensions to suit customer's requirements.

## POWER CURVE



CONTINUOUS 8 HO'JR RATING B.H.P.

GUARANTEED FUEL CONSUMPTION per B.H.P. per hour.				
Full load		$\frac{3}{4}$ load		$\frac{1}{2}$ load
.5 pints	.284 litres	.53 pints	.3 litres	.61 pints .347 litres
LUBRICATING OIL Consumption per B.H.P. per hour on full load .005 pints .002 litres.				
4 h.p. 50 hours per pint. 5 h.p. 40 hours per pint. 6 h.p. 33 hrs. per pint.				

Fuel and Oil Consumptions are conservative; in actual practice an improvement upon the published figures is invariably shown. Our Guarantee is conditional on the use of a distillate Fuel Oil, and we do not recommend the use of Residual Oils, or a mixture of Distillate and Residual Fuel oils.

### IMPORTANT FACTORS WHICH SHOULD BE TAKEN INTO CONSIDERATION IN SELECTING AN ENGINE.

- HORSE POWER AND GOVERNOR SPEED** at which Engine is to be operated. Variable Speed Control Fitting can be supplied as an extra.
- ROTATION**—Engines will be supplied with Rotation Clockwise looking on Flywheel with Fuel Pump on left hand side.
- COOLING**—State whether the Engine is required for Temperate or Tropical Climate and whether Tank or Radiator cooling system is required. State whether load is continuous or intermittent.
- AIR CLEANERS**—Engines to be operated under Dusty or Gritty conditions should always be fitted with efficient Air Cleaning equipment. A Lister Air Cleaner is suitable for average dirty conditions, or an Air Cleaner of the Vortex type for more severe conditions where abrasive dust is present.
- GENERAL CONDITIONS**—The following allowances should be made when estimating nett H.P. required.
- ALTITUDE**—A reduction of 4% per 1,000 ft. above 330 ft. above sea level.
- TEMPERATURE**—A reduction of 1% for every 5° F over 65° F.
- INSTALLATION**—Particulars of Engine mounting and type of Drive should be stated wherever possible. When a special Exhaust pipe layout is to be used please consult us and give us as much information as possible.

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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## DESCRIPTION OF ENGINE

**THE ENGINE** is provided with a specially designed Combustion Head incorporating the "Lister Patent Combustion Chamber," which ensures a positive start from cold by hand without need of Cartridge, Heating Lamp or Electric Ignition. A variable compression ratio initially ensures easy starting and subsequent running at low maximum pressures.

**THE CYLINDER BORE** is treated with the **LISTARD** process of chrome hardening (Van der Horst Patents) which has been proved to give the greatest wear resisting surface yet known, whether the wear may be due to heat, chemical action or abrasion from the piston rings; thus giving a greatly lengthened life throughout which the engine retains its ease of starting, fuel and lubricating oil consumption, and develops rated power.

**THE PISTON AND RINGS** are of high grade material, and finished to an accuracy equal to that employed in the finest motor car engine. Long life and full compression are thus assured.

**THE CRANKCASE** is totally enclosed and dust proof, making the engine especially suitable for work in dusty and gritty surroundings.

**THE CRANKSHAFT** is made from high grade steel, accurately machined and finished by grinding to an accuracy of half of one thousandth of an inch. It is extended beyond the Flywheel on both sides allowing the pulley or coupling to be fitted on either side or if necessary a pulley on each side.

**THE CAM, CAMSHAFT AND ROCKERS** are of high grade steel, accurately machined. The working surfaces are hardened and finished by grinding.

**THE CONNECTING ROD** is a Steel forging with renewable bearing at both ends. The small end Bush is of Phosphor Bronze and the large end bearing is of Steel Shells lined with white metal.

**THE BEARINGS** for Crankshaft are of ample size to provide maximum durability.

**THE VALVES** are of the finest alloy heat-resisting steel, and the valve seatings are efficiently water cooled to ensure long life.

**FUEL PUMP & FUEL INJECTOR.** C.A.V. Bosch Fuel Pump and suitable Fuel injector are fitted.

**GOVERNOR** is of the centrifugal type and operates on the fuel injection pump, varying the quantity of fuel injected in accordance with the load.

**LUBRICATION** is automatic. Main bearings are fed by positive plunger pump. Splash and Oil mist from Big End lubricates all other parts.

**GENERAL EQUIPMENT.** Tank or radiator to suit requirements, Exhaust Silencer, Air Silencer, Fuel Tank and piping, Starting Handle, Set of Tools, and Fuel Funnel with Strainer where necessary. Tank Cooled Engines ordered without Water Cooling Tanks are supplied with water connections unless contrary instructions are given. Where Radiator cooling is supplied an allowance of  $\frac{1}{2}$  h.p. should be made for fan.

### APPROXIMATE SHIPPING SPECIFICATION

TYPE OF ENGINE	Nett Wgt.		Gross Wgt.		Volume		Code Word
	lbs.	kgs.	lbs.	kgs.	cu. ft.	cu. m.	
4 h.p. Tank Cooled Model, (less Tank)	760	345	980	445	31.8	0.89	YNYRA
5 h.p. " " " " ( " " )	760	345	980	445	31.8	0.89	YMNZY
6 h.p. " " " " ( " " )	760	345	980	445	31.8	0.89	YNRUR
4 h.p. Radiator " " "	833	377	1008	457	38	1.06	YNYSZ
5 h.p. " " " " "	833	377	1008	457	38	1.06	YNRHO
6 h.p. " " " " "	833	377	1008	457	38	1.06	YNRYT
50 gall. Water Tank (Temperate climate)	28	13	56	25	23	.36	---
70 " " " (Tropical " " )	38	17	70	32	17.8	.50	---

Add Code Word ZANGY for Tropical Radiator  
 " " " YNYUT " Temperate Tank  
 " " " YNYVP " Tropical " "  
 " " " YNYWM " Pulley not required

NOTE: The Code Words above are for Engines fitted with normal size pulleys, for other sizes see separate page.

### R. A. LISTER & CO. LTD. DURSLEY, ENGLAND.

Telegraphic and Cable Address: Machinery, Dursley

*Largest manufacturers of small Diesel Engines in the World*

Printed in England by  
R. A. Lister & Co. Ltd.  
Dursley, Gloucestershire

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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# Lister

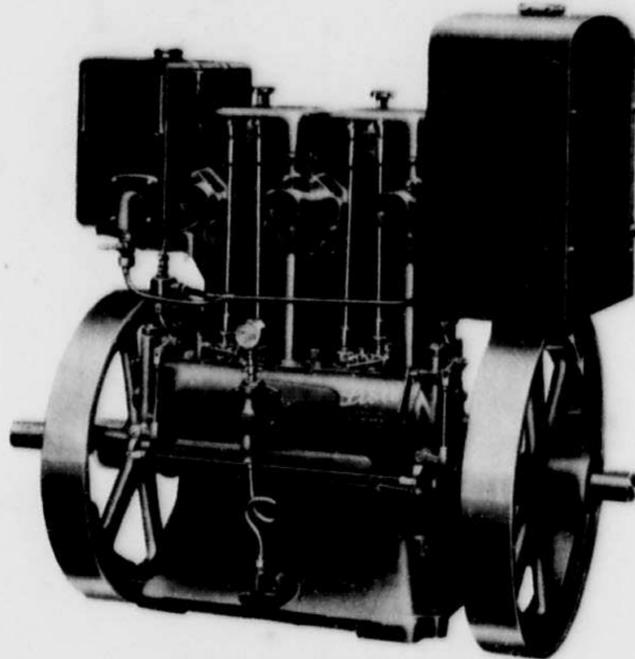
Distributors for British Columbia  
**HOFFARS LIMITED**  
 1790 Georgia Street West,  
 VANCOUVER, B. C.

**MARK**  
**10-2 DIESEL ENGINES**  
**TWIN CYLINDER — OVERHEAD VALVES**

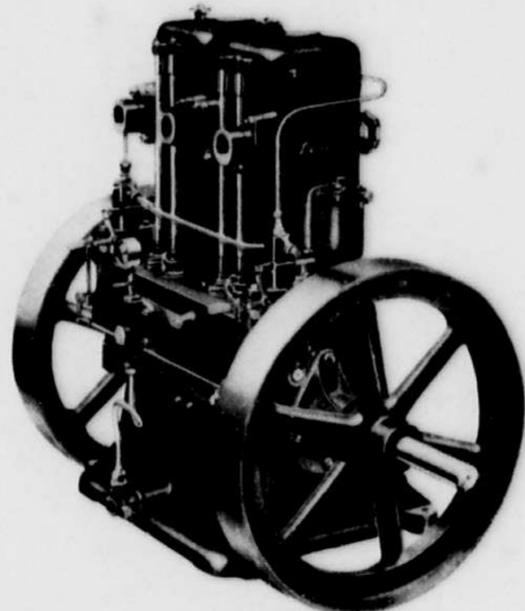
**12 H.P. AT 650 R.P.M.**

If the Engine is used at a speed lower than standard, the power is reduced accordingly, and the Engine will develop :—

10 H.P. AT 600 R.P.M.  
 8 H.P. AT 500 R.P.M.



RADIATOR COOLED MODEL



TANK COOLED MODEL  
(Less Tank)

Illustrations are representative only ; details are subject to modification.

**SPECIFICATION**

BORE x STROKE	...	...	...	4½" x 5½"	114.3 x 140 m/m.
FLYWHEELS dia. x face	...	...	...	24" x 3½"	610 x 89 m/m.
PULLEYS dia. x face	...	...	...	10" x 9" & 12" x 9"	254 x 228 & 304 x 228 m/m.
" " " " " " " "	...	...	...	14" x 9" & 16" x 9"	355 x 228 & 406 x 228 m/m.
" " " " " " " "	...	...	...	18" x 9" & 20" x 9"	457 x 228 & 508 x 228 m/m.
" " " " " " " "	...	...	...	10" x 12" & 12" x 12"	254 x 304 & 304 x 304 m/m.
FUEL TANK CAPACITY (Tank Cooled Model)	...	...	...	7 gallons	32 litres
" " " (Radiator " " )	...	...	...	4¾"	21 "
WATER " " " " " " " "	...	...	...	120 "	545 "
" " " " " " " "	...	...	...	30" x 48"	762 x 1220 m/m.
WATER TANK CAPACITY } Tropical	...	...	...	170 gallons	772 litres
" " " " " " " "	...	...	...	30" x 66"	762 x 1675 m/m.
RADIATOR CAPACITY } Temperate Climate	...	...	...	4¼ gallons	19.2 m/m.
" " " " " " " "	...	...	...	4¾ "	21.5 m/m.

SHEET 10-2 138 E.C.

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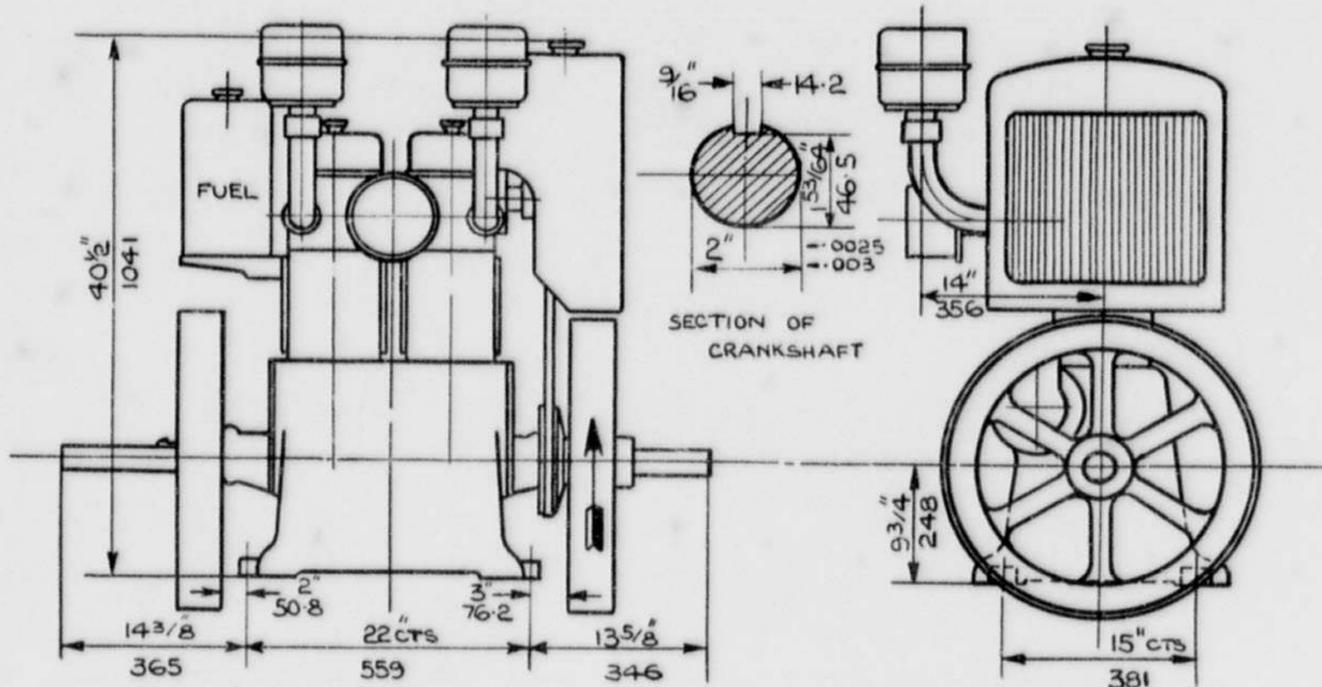
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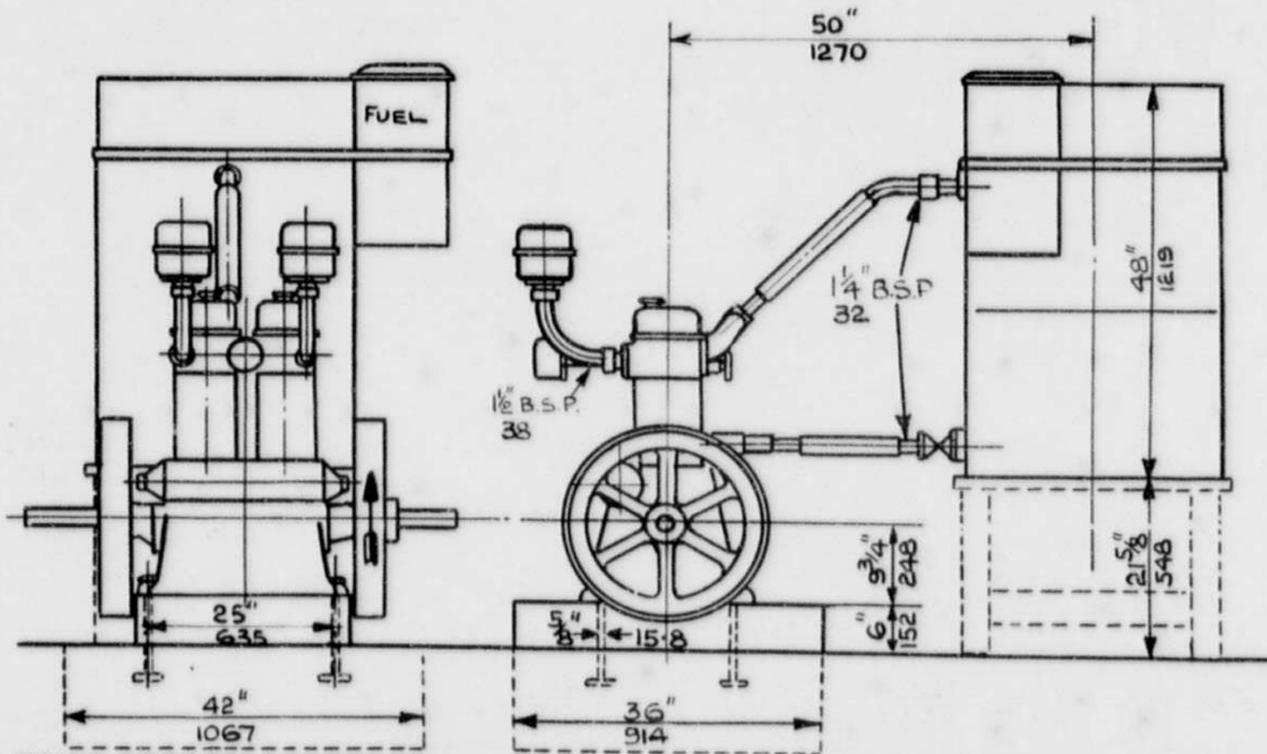
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# Lister



**RADIATOR COOLED MODEL** Scale  $\frac{3}{4}$ " = 1' 0". Dimensions in inches and approx. m/m's.



**TANK COOLED MODEL** Scale  $\frac{1}{2}$ " = 1' 0". For other dimensions see Radiator Cooled Model.

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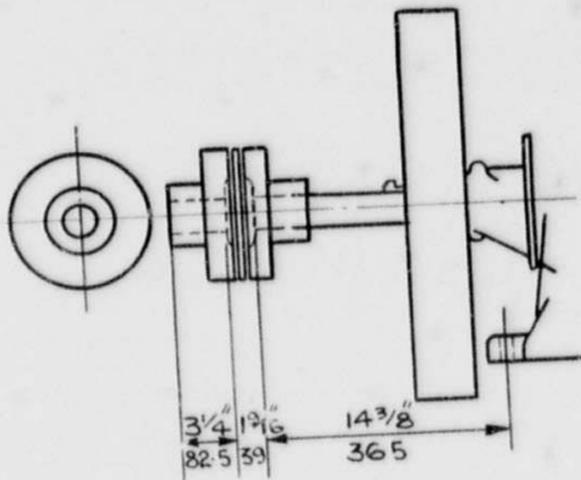
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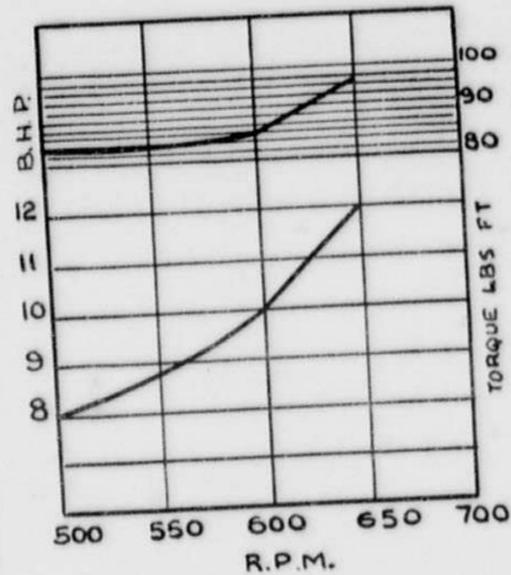


**POWER TAKE-OFF**  
Alternative to Pulley



Keyway and Bore dimensions to suit customer's requirements.

**POWER CURVE**



CONTINUOUS 8 HOUR RATING B.H.P.

GUARANTEED FUEL CONSUMPTION per B.H.P. per hour.				
Full load		$\frac{3}{4}$ load		$\frac{1}{2}$ load
.5 pints	.284 litres	.53 pints	.3 litres	.61 pints .347 litres
LUBRICATING OIL Consumption per B.H.P. per hour on full load .005 pints .002 litres.				
8 h.p. 25 hours per pint, 10 h.p. 20 hours per pint, 12 h.p. 16 1/2 hours per pint.				

Fuel and Oil Consumptions are conservative; in actual practice an improvement upon the published figures is invariably shown. Our Guarantee is conditional on the use of a distillate Fuel Oil, and we do not recommend the use of Residual Oils, or a mixture of Distillate and Residual Fuel oils.

**IMPORTANT FACTORS WHICH SHOULD BE TAKEN INTO CONSIDERATION IN SELECTING AN ENGINE.**

**HORSE POWER AND GOVERNOR SPEED** at which Engine is to be operated. Variable Speed Control Fitting can be supplied as an extra.

**ROTATION**—Engines will be supplied with Rotation Clockwise looking on Flywheel with Fuel Pump on left hand side.

**COOLING**—State whether the Engine is required for Temperate or Tropical Climate and whether Tank or Radiator cooling system is required. State whether load is continuous or intermittent.

**AIR CLEANERS**—Engines to be operated under Dusty or Gritty conditions should always be fitted with efficient Air Cleaning equipment. A Lister Air Cleaner is suitable for average dirty conditions, or an Air Cleaner of the Vortex type for more severe conditions and where abrasive dust is present. Please state requirements when ordering.

**GENERAL CONDITIONS**—The following allowances should be made when estimating nett H.P. required.

**ALTITUDE**—A reduction of 4% per 1,000 ft. above 330 ft. above sea level.

**TEMPERATURE**—A reduction of 1% for every 5° F over 65° F.

**INSTALLATION**—Particulars of Engine mounting and type of Drive should be stated wherever possible. When a special Exhaust pipe layout is to be used please consult us and give us as much information as possible.

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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**THE A.R. WILLIAMS MACHINERY COMPANY,  
OF VANCOUVER, LIMITED**  
Machinery and Supplies.

PHONE HIGH 40 495 RAILWAY STREET  
VANCOUVER, B.C.

CABLE ADDRESS "MACHINO"

Your Reference 15/6/1484

September 19th, 1939

The Indian Affairs Branch,  
Department of Mines & Resources,  
P. O. Box #70,  
Vancouver, B. C.

Our Reference No. 446

Attention: Mr. D. M. McKay  
Indian Commissioner for B. C.

ALL STATEMENTS OR AGREEMENTS ARE CONTINGENT ON STRIKES, ACCIDENTS, FIRES OR ANY OTHER CAUSES BEYOND OUR CONTROL. ALL ORDERS ARE SUBJECT TO APPROVAL BY THE HEAD OFFICE OF THIS COMPANY AT TORONTO, ONTARIO. QUOTATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Dear Sirs:

We have received your valued enquiry of the 18th of September, and have examined the Base Plan at your Office for these proposed Engines.

We do not find it economical to offer an Engine running at 600 R.P.M., for direct connection to your existing Generators, but we would suggest that these Generators be driven through the medium of Vee Belts and Sheaves, by Engines turning up at 900 R.P.M. This would mean that the Generators would have to be turned round, but we do not find anything very difficult in connection with this. Your existing Concrete Block is of ample dimensions to install our Engines as suggested.

We have pleasure in offering for your approval:-

- 1- Only Mark 1-VSO, RUSTON, Single Cylinder, 4 Cycle, Vertical, Full Diesel Engine, capable of developing 6-3/4 Horsepower continuously when running at a Speed of 900 R.P.M., and a maximum Horsepower of 7-1/2 Horsepower for one hour. Generally described and in accordance with the attached Publication #7826.

With the above Engine will be supplied:-

- 1- Vee Belt Drive consisting of:-

- 1- 3-Groove Sheave 10.6" Pitch Diameter
  - 1- 3-Groove Sheave 16" Pitch Diameter
- Together with three C-105 Vee Belts.

-ALSO-



Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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The Indian Affairs Branch:

September 19th, 1939

- 1- Only Mark 2-VSO, RUSTON, 4 Cycle, 2 Cylinder, Vertical, Full Diesel Engine, capable of developing 13-1/2 Horsepower continuously, when running at a Speed of 900 R.P.M., with a maximum Horsepower of 16-1/2 for one hour. Generally as described and in accordance with attached Publication #7827.

With the above Engine will be supplied:-

- 1- Only Vee Belt Drive, consisting of:-
  - 1- 2-Groove Sheave 10.6" Pitch Diameter
  - 1- 2-Groove Sheave 16" Pitch Diameter
  - 2- C-105 Vee Belts

This quotation includes the services of an Erection Engineer, to install completely, the above Engines at Alert Bay.

PRICE: Complete installation, F.O.B. Alert Bay, B.C. .. \$1444.00  
(Fourteen Hundred and Forty-four Dollars).

We trust the above quotation meets with your approval, and that we will be successful in receiving your valued Order.

We are,

Yours truly,

THE A. R. WILLIAMS MACHINERY COMPANY  
OF VANCOUVER LIMITED.

Per *A. Newland*  
Sales Department.

NOTE:

All quotations are made subject to fluctuations that may arise in Sales Tax, Duties and Exchange and will be adjusted at time of shipment. Deliveries quoted are subject to delays beyond our control. The above Engines are in stock and are offered subject to prior sale.

AN:KM  
ENCLS.

Indian Affairs. (RG 10, Volume 6428, file 875-5, part 7)

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**THE A. R. WILLIAMS MACHINERY COMPANY,  
OF VANCOUVER, LIMITED**  
Machinery and Supplies.

PHONE HIGH 40 495 RAILWAY STREET  
VANCOUVER, B. C.

CABLE ADDRESS "MACHINO"

Your Reference 15/6/148A

October 5th, 1939.

The Indian Affairs Branch,  
Department of Mines & Resources,  
P. O. Box #70,  
Vancouver, B. C.

Attention: Mr. D. M. McKay  
Indian Commissioner for B. C.

ALL STATEMENTS OR AGREEMENTS ARE CONTINGENT ON STRIKES, ACCIDENTS, FIRES OR ANY OTHER CAUSES BEYOND OUR CONTROL. ALL ORDERS ARE SUBJECT TO APPROVAL BY THE HEAD OFFICE OF THIS COMPANY. QUOTATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Dear Sirs:

Pursuant to our discussion at your Office this morning, relative to our Tender covering two Diesel Engines, dated September 19th:-

We have gone thoroughly into the question of an allowance to be made on the existing 6 Horsepower and 12 Horsepower Engines and we feel, that owing to the conditions existing at the present time, and the increased difficulty of selling used Equipment of this nature, also the fact that we would have to bring these Engines from Alert Bay; that it would not be possible for us to offer more than Two Hundred and Fifty Dollars (\$250.00), for the two Engines, as a trade in allowance on the Equipment quoted you in the above mentioned Tender.

We point out to you that it may be advantageous to dispose of these Engines, in or around Alert Bay, thus saving the Freight on them.

Trusting this will be satisfactory and that we will be favoured with your valued Order,

We are,

Yours truly,

THE A. R. WILLIAMS MACHINERY COMPANY  
OF VANCOUVER LIMITED.

Per

*A. Hewland*

Sales Department



AN:KM

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