GARDNER

Engine Forum

Spring 2026

No. 49 **www.gardnerengineforum.co.uk**

Electronic Newsletter

Copies of each newsletter can be emailed to members who wish to receive it by this method, either with or without a paper copy as well. Any email address used for this purpose will not be made available to any third party. If you would like to receive your newsletter this way please email the editor at gardnerengineforum@blueyonder.co.uk with your request and preferred email address.

The file will be in PDF format (usually around 2 Mb) so is universally readable

Gardner Engine Forum Philosophy

The aims of the Forum are to promote and foster interest in all Gardner engines"

Forum Officers

Chairman:
John Naylor. Thatched Folly.
Lindow End, Mobberley.
Knutsford. WA16 7BA
Tele 01565 872222

Secretary. Linda Kemp
See below for contact details

Treasurer.& Membership Secretary
Judith Gray 29 Verity Walk
Wordsley Stourbridge West Midlands DY8 4XS
Tele 01384 827745

Editor-Vice Chairman. Steven Gray
29 Verity Walk,
Wordsley, Stourbridge, West Midlands. DY8 4XS
Tele 01384 827745

Andrew & Linda Kemp.
Korna Cottage,
Works Lane,
Barnstone,
Notts.
NG13 9JJ
Tele 01949 860867

Website;- Steven Gray & Peter Bull

Contact email address
gardnerengineforum@blueyonder.co,uk

Contents **Page**

Chairman's Notes	2
The future and A.G.M	3
The B B Engine	4
The Motor Yacht "Virginia"	8
Garrett Diesel Tractors	14
For Sale	25

Advertising Rates:
Free for Members Personnel Ads, Museums, and individuals providing services in support of Gardner Engines

Cover Photo
Garrett Tractor
at the Casterton Vintage
Working Event.

Kindly supplied by
Eyes of a Penguin
Photography

Chairmans Notes

Welcome to the Spring newsletter. Looking back to the opening of the Autumn newsletter, I see that I hoped you enjoyed the dry Summer!!!
Today as I scribe it is 14th February! I have just read in my paper that the weather will be dry, bright and sunny! I am well aware that some of you will have suffered with all the rain, my sympathies go out to you.

The business Norris and Henty Ltd may not mean anything to some of you, I quote from Graham Edges book L Gardner & Sons Ltd. In the year 1891 Gardener selected the London based Norris & Henty to promote their goods. Norris & Henty would be best described as "general factotums" having contacts and wherewithal to sell almost anything anywhere. As Gardeners expanded it was fortunate that they had the offices of Norris & Henty to look after marketing.

In 1906 Gardeners bought Norris & Henty, the agency was renamed Norris, Henty & Gardners Ltd, but it was a separate company. New offices for the company were acquired at 115 Queen Victoria Street in the City of London. This was known as Gardner House.
The technical information on the "Belfast Barker" engine (page 4) marketed by Norris, Henty & Gardner Ltd, I hope will be of interest. Geoff Challinor of the Anson Engine Museum was recently given it by a visitor, have any of our members seen or got one?
The AGM in May will soon be with us, as you will see from the next page it is more important than normal as our Editor has indicated that he is relinquishing the position after the next newsletter.
Without new people to take on newsletter production and rally organiser then there is no future for the Forum. So if you feel able to take on either of the roles or simply have an opinion on what should happen next please contact me or any other committee member prior to the meeting.
I would like to welcome new members:- Glyn Jones and Allan Gillham.
I Look forward to meeting you at the AGM.
John

Usually Graces Guide provides further information about manufacturing companies, on this occasion it only has the reference:- 1915/17 Blueprints for engines from 2 to 16 hp. In the A-Z of British Stationary Engines by Patrick Knight. Published 1996.

I did manage to find the accompanying photograph
@ https://www.reddit.com/r/MachinePorn/comments/1hhrw59/cl_barker_2_cycle_marine_engine_built_around_1910/#lightbox

The Future and the Annual General Meeting

The Forum was formed in the first few months of 2001 so is now 25 years old. Over the years the Annual General Meetings have been held at different locations around the country so that members from different areas had the opportunity to attend and comment on the direction that we should head. As with many organisations, attendance at A.G.M's is often low relative to the number of members. Maybe the fear of being coerced into being a committee member!. The last new members joined the committee in 2012 and 2022

Our last AGM at the Commercial Vehicle Museum in Leyland was only attended by eight members plus the committee. So this time we are returning to the Anson Engine Museum, where we hope that more members will be able to attend.

Changes to the opening days at the museum has meant that we will be holding the meeting on a Friday as detailed below. We realise that this may exclude people who are still in full time employment, but this was the only date that all committee members could attend and when the museum is able to host us.

In the Autumn 2024 edition of the newsletter, I gave notice that this would be the last rally that I would be organising and asked if there was anyone who would be willing to take on organising one in 2027. Despite the Chairman asking again in his last notes, no one has come forward.

In addition to retiring from rally organisation, after 18 years and 35 editions, I will be retiring my keyboard, after compiling the Autumn edition of the newsletter. So there will be vacant positions on the committee, which require filling. If the forum is going to continue, then new volunteers are needed to carry it on. So this AGM is important in determining what happens next. If there are no volunteers, then the Forum will be wound up.

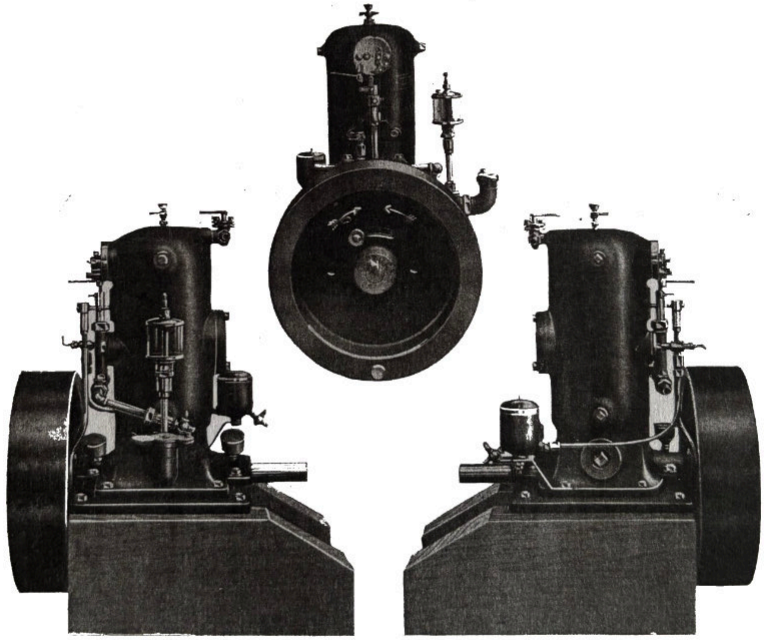
The 2026 Annual General Meeting

Will take place at
The Anson Engine Museum on
Friday 8th May at 2pm.
Entry cost will be covered by the forum.
The Museum opens at 10 am.
Items for the Agenda to be sent to the Secretary
by the 25th April.
By post to the address inside the cover of the newsletter
or by email to gardnerengineforum@blueyonder.co.uk

The

"B.B." MARINE ENGINE

A SMALL POWER TWO STROKE MARINE OIL ENGINE SUITABLE FOR OPEN LAUNCHES, SMALL FISHING BOATS, AND AUXILIARY POWER FOR YACHTS.



THE "B.B." ENGINE was introduced by us to meet the demand for a cheap, reliable Marine Engine. It is not a product of our own Works, as they are exclusively occupied manufacturing the well-known GARDNER ENGINES, but owing to the pressure of orders for our larger sizes, we have been reluctantly compelled to neglect the smaller Gardner Sets below $8\frac{1}{2}$ h.p. for Marine Work.

THE "B.B." MARINE ENGINE.

THE "B. B." ENGINE is no new or untried article, we have handled it for about ten years and some hundreds have been fitted in boats. These have given long service and satisfaction to their owners.

Before adopting this engine, we made a careful study of the types available and selected it as the one most suited to the exacting requirements of the trade for which we required it. We quite realise that for certain purposes, our Gardner Engines are too refined and expensive, they are a production of the highest class with superb workmanship, both internal and external, and have merited the reputation they now hold. The "B. B." Engine, on the other hand, is a thoroughly sound engineering job throughout, and is built with ordinary commercial finish, quite suited to the performance of its duties. In addition to the engines, we supply complete Marine Outfits, which include everything necessary to instal the engine in a hull. This material is all made in this country to designs prepared by us and follows the best marine practice.

ADVANTAGES. Low initial and running costs, extreme simplicity, trifling amount of space occupied, very low propeller speed, and spray proof ignition gear, which is not affected by water splashing on the sparking parts, are among the claims made for this type, and we are prepared to demonstrate any of these.

FUEL. Any class of Paraffin can be employed and the engine is arranged with Petrol starting fittings, only a few teaspoonsful of the latter fuel being required for starting up. There is no exhaust heated vapouriser or similar hot device; the fuel is dealt with by an automatic injector operated without working parts by the engine. Cold air only passes through the crank-case, thus keeping the bearings and lubricating oil cool and there is no hot oil vapour emitted from the base or other part. A float chamber controls the level of the fuel and prevents wastage.

IGNITION. Low Tension Coil Ignition is the only form that will stand the service "B. B." Engines are put to. High Tension Magnetos are impossible where contact with salt water is to be faced, and even low tension magnetos are not practicable, therefore we have adopted a simple primary coil, built into a protective casing and embedded in material unaffected by water. The necessary current to operate the coil is derived from dry cells built into a box in a waterproof manner, or accumulators can be employed if suitable re-charging facilities are available. The sparking mechanism is of uncommon design, and can be dismantled for cleaning in an instant. The working parts are of case-hardened steel and are therefore not liable to rust.

Undoubtedly the ignition gear is one of the strongest features of this engine and the intensity of the spark is enormous. It resembles the flame of an arc lamp and will spark whilst water is being poured on the points, yet no electric shock can be felt from it.

WATER CIRCULATION. A Plunger Pump driven from an eccentric provides a positive supply of water. The discharge is regulated by a valve of special form so that it may be turned into the exhaust system, directly overboard, or a combination of either. This feature is copied from Gardner practice and obviates the objection to exhaust injection.

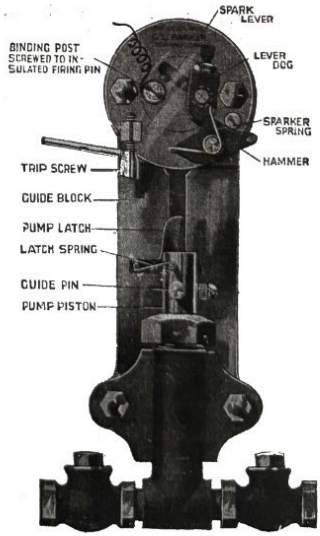
LUBRICATION. The main bearings are fed with grease from large cups, and this is an ideal method because, as previously explained, the crank-case and bearings are always perfectly cold. A sight feed lubricator feeds the connecting rod bearings and piston.

REVERSING. Whilst the engine cannot quite be described as directly reversible, yet a reversing device is embodied in its construction which meets the usual requirements of the user. It is true the engine has to be stopped and then started by hand in the opposite direction, but the re-starting operation is so quick and certain owing to the reversing device, that with very little practice it can be carried out as expeditiously as operating a separate reverse gear. We do not advocate this semi-direct reversing for boats used in crowded waterways or services where instantaneous operation is essential, but for beaching boats, ordinary fishing boats, or yacht auxiliaries, it is perfectly satisfactory, and not only is initial cost reduced, but less space is occupied and unnecessary working parts are dispensed with. How often does a sailing yacht with auxiliary power require to go astern quickly? Therefore, what is the use of fitting an expensive reverse when the "B. B." device will do absolutely all you want? When specified we can fit either a separate reverse gear, reversing propeller, or Roper Speed Controlling and Reversing Propeller. This latter is a sound proposition; it is British made and suits the peculiar requirements of line fishing admirably.

STERN GEAR. The stern tube is of gunmetal with double bearings and packing glands at both ends which allows the bearings to be properly lubricated with grease. Six feet of Manganese bronze tail shaft with gunmetal propeller fitted on a taper are provided.

OUTFIT. A complete outfit, including galvanised tray for the flywheel, Paraffin and Petrol Tanks, and all pipes, valves, strainers, and fittings necessary to carry out the installation in an ordinary hull are included.

SPARES & TOOLS. A few suitable spare parts are sent out with each engine, including a complete sparker block and a set of tools necessary for working the engine. We carry a large stock of spare parts and practically anything can be sent immediately.



THE "B. B." MARINE ENGINE.

GUARANTEE. The engines are covered by exactly the same guarantees as our Gardner production, and this extends for a period of twelve months.

PARTICULARS.

Size.	Cylinder.		Flywheel Diameter.	Weight.	Height from Centre of Shaft.	Size of Base.	Revolutions per Minute.	Diameter of Propeller.	Length of Shaft.
	Bore.	Stroke.				Width. Length.		2 Blade. 3 Blade.	
	inches.	inches.	inches.		inches.	inches.		inches.	
2 B.H.P.	$3\frac{5}{16}$	$3\frac{1}{2}$	10	100 lbs.	$12\frac{1}{2}$	10 × $8\frac{1}{2}$	600	12 or 10	4 ft.
4 „	$4\frac{1}{8}$	$4\frac{1}{4}$	12	170 „	14	12 × 10	500	16 or 14	5 „
6 „	$4\frac{9}{16}$	5	15	220 „	$17\frac{1}{2}$	$13\frac{1}{2}$ × 11	450	18 or 15	5 „
8 „	$5\frac{1}{2}$	$6\frac{1}{2}$	18	410 „	23	17 × 14	450	20 or 18	6 „

NORRIS, HENTY & GARDNERS LTD.

HEAD OFFICE:

Gardner House, 115, Queen Victoria St. LONDON, E.C. 4.

Telegrams: "Nornodeste," Cent. London. Telephone: City 9493 & 9494.

BRANCH OFFICES:

NEWCASTLE-ON-TYNE:

MILBURN HOUSE (Floor A).

Telegrams: "Propulsion," Newcastle-on-Tyne.
Telephone: Central 3685.

LIVERPOOL:

701—802, TOWER BUILDING.

Telegrams: "Cachalot," Liverpool.
Telephone: Central 5079.

BELFAST:

66, SCOTTISH TEMPERANCE BUILDINGS,

Telegrams: "Construct," Belfast.
Telephone: 2927

GLASGOW:

124, ST. VINCENT STREET.

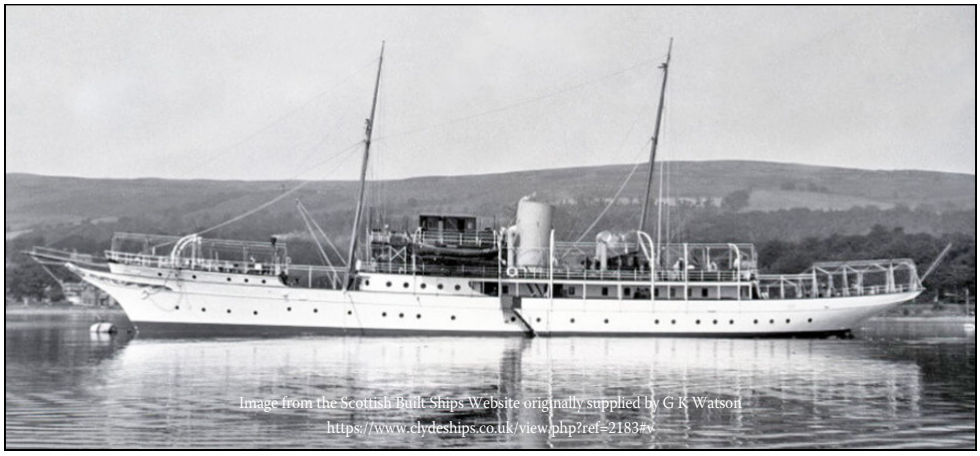
Telegrams: "Lowcock," Glasgow.
Telephone: Central 1200.

MOTOR YACHT " VIRGINIA'

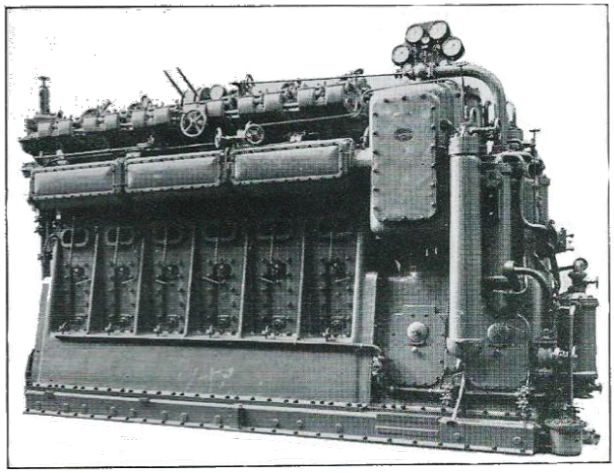
The twin screw motor yacht *Virginia* has recently completed intensive trials on the Clyde, these trials being particularly exhaustive for a yacht. A series of progressive speed trials were carried out, the top speed obtained during these trials being considerable above the contract guaranteed speed. A twenty four hour continuous trial at the cruising speed of 12.5 knots was also carried out during which the consumption of fuel oil and lubricating oil was carefully measured with all auxiliaries running including pumps, refrigerating plant, generating plant, water heating boilers, steering gear, etc. Finally a continuous long distance run was carried out at 13.8 knots, although the contract only required 13.5 knots. Manoeuvring and anchor trials were carried out. The absence of vibration during trials was a good feature of the yacht. A long pencil could be balanced on end in the owners rooms, in the dining rooms and on the pinnacle right aft.

Leading Particulars

The Virginia has been built for Major Stephen I Courtauld by Wm. Beardmore & Co. Ltd., Dalmuir, from designs by G. L. Watson & Co., Glasgow, who have also supervised the construction of the hull and machinery. The dimensions are :- Length overall, 209 foot,: breadth, moulded 29 ft 6 ins.: Depth, moulded 17ft 6ins,; tonnage. Thames measurement 712 tonnes. She has not been designed for high speed, but to give comfort and seaworthiness, with a reasonable sea cruising speed of 12.5. The yacht has a large reserve of power was revealed by the trial results, for she attained a speed of 14 knots with a dirty bottom. *The Virginia* has a clipper bow and a long overhanging Watson stern. She has also a

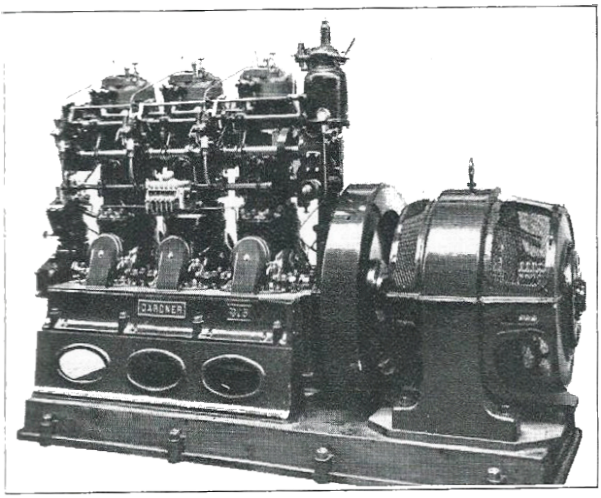


topgallant forecastle and a bridge, combined with a shade deck, on which are the upper houses with a navigation bridge above. Deck machinery and steering gear is electrically driven, windless, steering gear and boat winches having been supplied by Tomas Reed & Sons. Paisley.

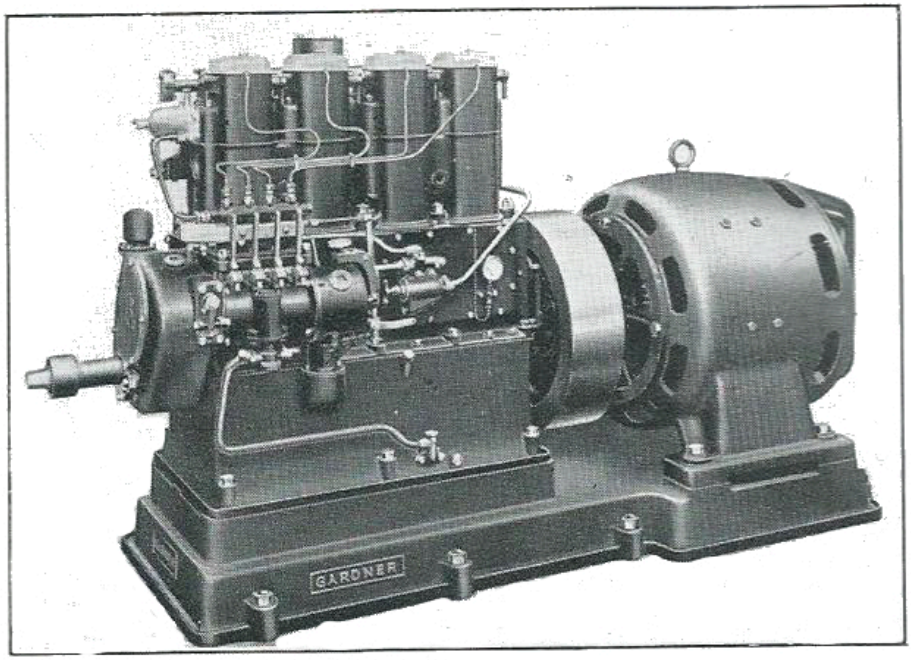


Sulzer Air Injection Main Engine of 620 B.H.P. at 200 r.p.m.

The owner has planned spacious, comfortable rooms, limited in number, rather than having as many as possible. The furnishings and decoration is most tasteful, and in every way the vessel is a fine example of yacht architecture. There are large storerooms and refrigerating chambers for the owner and crew. Furthermore, the comforts of the officers and crew have been well considered. Ample space has been provided for the Sulzer diesel machinery, which has been installed by the builders. The two main engines have been built by Sulzer Bros., Winterthur, each engine having six cylinders, 340 mm bore by 540mm stroke. They developed together a normal power of 1000 B.H.P. at 175/180 r.p.m., While 620 B.H.P. can be delivered to each shaft at 200 r.p.m. These engines are of standard Sulzer design, with air injection and attached scavenge pump. The two main generating sets are by Norris. Henty and Gardners Ltd. & Metropolitan - Vickers Electrical Co. Ltd., Each engine also driving a compressor for supplying manoeuvring air to the main engines. There is also an auxiliary generating set by the same makers, the engine



One of Two Gardner Two-stroke Cycle Diesel-Generator Sets, each of 36 kW., for the "Virginia."



Gardner 38-B.H.P. High-Speed Auxiliary Diesel Engine Generator Set for the "Virginia."

in this case being the Manchester's firm high speed diesel type. Both sets are illustrated with this article. The pumps in the engine room are by Mumford and by G. & J. Weir Ltd., All being electric motor driven. The refrigerating machinery, by the Liverpool Refrigeration Co., Is also electric motor driven. An evaporator and a distiller are installed in the engine room

There are two Clarkson waste heat thimble tube boilers for the water, fresh and salt. These are used as second silencers for the exhausts, but when required can be oil fired, as, for instance, when the vessel is in port. The electric lighting installation has been executed by Telford. Grier & Mackay. Large fuel bunkers are provided, so that the yacht can cross the Atlantic and back, at 12.5 knots speed, without refuelling. There are also large fresh water storage tanks, so that the vessel has a big cruising radius.

Since going into service, the Virginia has given her owner satisfaction in not only the manner of speed, seaworthiness and freedom from vibration but also in the respect of economy of fuel.

The following information was provided by Geoff Challinor , credit must go to Geoff for finding the test sheets applicable to these engines; all without the benefit of having the actual engine numbers beforehand. The only helpful clue being, that the article was published within the first year of L2 production.

GARDNER ENGINES FOR MOTOR YACHT VIRGINIA:
3J5 Engine No: 28351. Duration of test, January 20th 1930 to 25th 1930.
3J5 Engine No: 28352. Duration of test, January 17th 1930 1930.
Final record of spare parts supplied: April 1954.

4L2 Engine No: 28529. Duration of test, May 5th 1930 to 1930.
Final record of spare parts supplied: 5th March 1964.
I think you will agree, Virginia was a fine looking vessel.

Lady Virginia Courtauld

Many thanks to member David French for submitting this article for our interest.The following is from the Scottish Built Website
https://www.clydeships.co.uk/view.php?ref=2183#v

Name Official number Flag IMO
VIRGINIA 161917 GBR
Year built1930. Date launched 15/03/1930. Date completed 06/1930.

Vessel type Yacht. Vessel description Steel Motor Vessel 2 Masts Schooner.

Builder Wm. Beardmore & Co. Ltd., Dalmuir: Yard Naval Constr Wk: Yard no 660
Tonnage 676 grt/ 331 grt / 712 tm. Length 188.6 ft. Breadth 29.6 ft. Depth 17.5 ft. Engine builder Sulzer Brothers Ltd., Winterthur

Engine detail
Twin M6cyl diesel 2SA (13⅜x21¼") 2-screw.
Sulzer 30DB (made 1943).
12/1948 re-fitted.
1966 re-engined.
First owner Major Stephen L. Courtauld London.
First port of register Glasgow Registration date, 02/06/1930.

Other names
1958 LIBERIAN
Subsequent owner and registration history
1948 William Berry (1st Viscount Camrose).
1954 Executors of Viscount Camrose.
10/1957 Government of Liberia.
1971 ??, Sierra Leone
Vessel history
9/1939 requisitioned by the Admiralty for anti-submarine patrol.
1942 transferred to examination service.
1945 returned to owner.
10/1957 purchased by President William Tubman for use as a presidential yacht.
7/1958 delivered after refit.
by1963 692grt 342nrt 742tm, 209.5 x 29.6 x 13.9ft; in presidential service until late 1960s.
1971 sold by President William R Tolbert Jr in "clean up" campaign.
1971 operated as a casino in Sierra Leone until heavily damaged by fire.
2020 wreck reported still in existence, and could be rebuilt.

HMS VIRGINIA. War time configuration. Image courtesy of : Imperial War Museum (Ad№.8941)

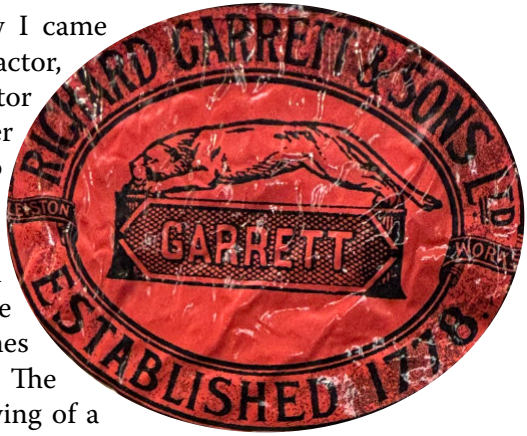
A FINE BUILDER'S MIRROR-BACK MODEL OF THE TWIN-SCREW MOTOR YACHT VIRGINIA, DESIGNED BY G.L. WATSON & CO. AND BUILT BY WM BEARDMORE & CO. LTD, 1930

with cutaway masts, carved gold-painted figurehead in the form of a seahorse, metal anchors with 'D' chains and anchor davits with rigging, deck rails, deck lights, companionways, anchor winch, bell, bollards, fairleads, deck lockers, superstructure with wood-capped deck rails, wheelhouse with binnacle and telegraphs over, starboard lamp, two rowing boats with oars and one motor launch in davits, stayed yellow- painted funnel, engine room lights, aft binnacle and helm, capstan and other details. The hull with lacquered decks, hawse pipes, boarding companionway, portholes, hinged bulwark ports, bilge keel, rudder and four-blade propeller is finished in white, green and red and with silver-plated fittings throughout is mounted on a mirror within mahogany-bound glazed case with builder's ivorine plaque (mirror replaced). Overall measurements -- 18¾ x 63½in. (48 x 161cm.)

This model of the Virginia sold for £18.800 at a Christies auction in 2002

Images and text from Christies web site
https://www.christies.com/en/lot/lot-3933953

Garrett Diesel Tractors



At the 2025 Newark Tractor Show I came across a 4L2 powered Garrett Tractor, thinking that this was another tractor that had seen a conversion to Gardner power I was somewhat surprised to find that Garrett had fitted agricultural tractors with Gardner Engines as original equipment. Non of the published books that I have read have any mention of engines supplied for agricultural tractor use. The centenary book has an outline drawing of a tracked trenching machine and the L Gardner and Sons Ltd, Legendary Engineering Excellence book by Graham Edge does show a tracked trenching machine powered by a 5LW built by Allens of Oxford (page 102), but no further description.

Garrett Engineering was formed in 1778 and was a company associated with Steam powered equipment for many uses, they produced, Portable Steam Engine, Traction Engines, Steam Rollers, Steam Tractors, Steam Wagons, Electric Vehicles, Trolley Busses, and of course Diesel Engined Tractors.

Garrett began to look at whether there was a market for electric vehicles in 1912, and having decided that they were ideally suited for certain types of work, produced their first vehicle in 1913. This was a 3.5-ton battery-powered vehicle, intended for local deliveries.The advert along side is dated 1920. So Richard Garrett Engineering was a forward looking company.

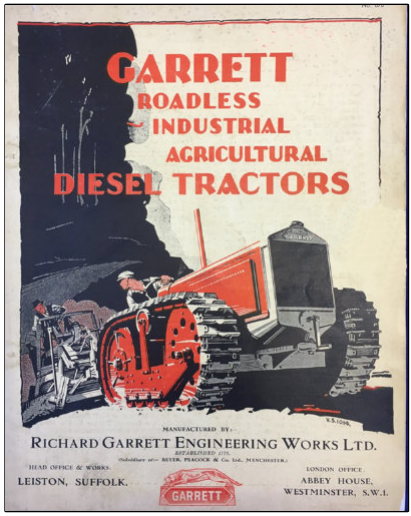
Wikipedia, Richard Garrett

In 1919 the Agricultural & General Engineering Ltd (AGE) was formed on the initiative of Thomas Aveling and Frank Garrett, conceived as a holding company, that would draw together the leading British manufacturers of Agricultural machinery, with the intention of helping those that had incurred heavy losses in Russia through the Soviet Governments repudiation of that country's foreign debts and also enabling a sales drive to be mounted abroad and also enabling a sales drive notably abroad notably in Australasia and South America.

AGE had a bad start in that a number of major concerns either refused to join or for reasons of internal politics were not invited to join. ACE consisted of

Aveling Porter Ltd.	Richard Garrett & Sons.	James Frederick Howard Ltd
E.H Benthall & Co Ltd	Blackstone & Co ltd	Barford Perkins
Clark Crank & Forge Co Ltd	L.R.Knapp & Co Ltd	E.R & F Turner Ltd
Bull Motors Ltd	Charles Burrell & Sons Ltd	Burrell Hiring Co Ltd
Davy Paxman & Co Ltd	Peter Brotherhood (70% share)	

Whilst still within the AGE group Garrett's were authorised to build 3 off



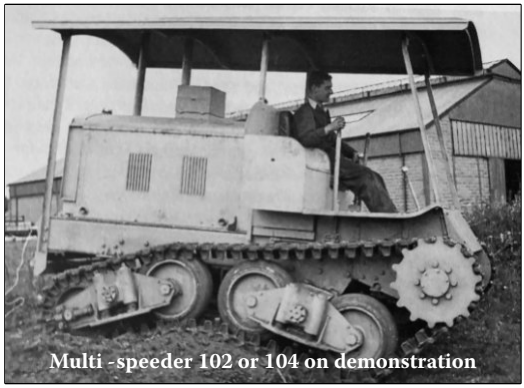
wheeled tractors carrying works numbers, 35231,35232 and 35233. By early 1930 a further two were built, of the original build 35233 was sent to Brotherhoods and 35232 was sent to Aveling & Porter, the other two 35413 & 4 had Blackstone engines fitted at Garrett works.

In total twelve tractors were built with either Blackstone or Brotherhood power units. One was converted to a roadless version, despite a successful trial of 35414, completing 977 hrs of continuous ploughing without stopping the engine and good reviews in a report on the World Tractor Trials, there was little in the way of interest.

The Blackstone powered tractors were priced at £500 and the Aveling & Porter powered at £550, whereas its direct competitor the International 15/50 was £320.

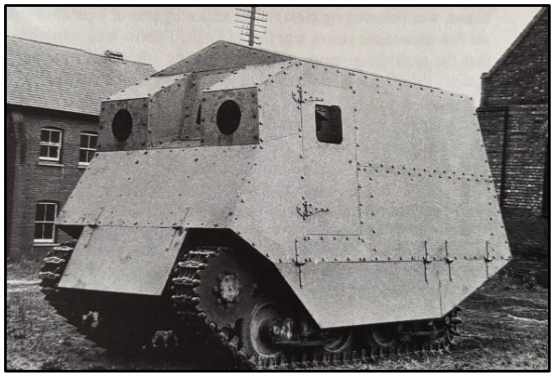
All of this occurred under the ACE management structure, where the individual companies manufactured the various elements as per their areas of expertise. For many reasons the partnership foundered and 1932 the individual companies were sold by the receiver for the best price, some were sold back to the former families others to to into fresh ownership, Garretts was sold to Beyer Peacock & Co, the Manchester based locomotive builders.

The new owners appointed Charles St Vincent Smith as development engineer, he had worked with Vickers on the design of tracked military vehicles, one of his first experimental projects was a multi-speed tractor with a front driving position which used a Gardner 4L2 engine. The date at which this was commissioned cannot be accurately determined as it appears that it was built largely from pencil sketches, with actual detailed drawing coming later. This tractor (101) was originally fitted with a National engine which suffered overheating issues, it was replaced with the 4L2, (engine no 30163) this tractor was allocated the number 101. During initial trials the engine suffered damage to the bores caused by sand being drawn in through the air intake, as another


Multi -speeder 102 or 104 on demonstration

4L2 (engine number 30455) was in stock it was fitted whilst the original was repaired.

In the second half of 1933 an order for two tractors was fulfilled 102 to Buenos Aires Western Railway the 103 to Buenos Aires Southern Railway. There can be no doubt that the tractors were very original in layout and also trendsetters in using the Gardner 4L2. The forward driving position, giving the driver a much enhanced view of the terrain ahead, was believed by most senior figures at the works to confer great advantage, a view not held by all which later events was to prove correct. For agricultural work the forward steering position was a disadvantage when the driver needed to watch the implement on tow behind the tractor. Tractor 104 was completed using engine number 30164, with its first test in August 1933.



During the later part of 1933 a demountable light armoured body with rifle slots was designed into which nine men could be carried. The tractor was tested and reviewed by the war office, subsequently the war office replied to say that they had no use for the vehicle. Further communication between Garretts and the war office solicited a response.

I am directed to refer to you letter No CMP/CEL 22nd December 133, and to say that it is not usual to furnish manufacturers with a report on performance of their machines etc subjected to tests by the War Office

The Director of Mechanisation has however, agreed that you may be furnished with the following notes so long as they are not used for publicity purposes, in anyway, and are to be strictly confidential.

I am to say thet your Tractor was tested at the Mechanical Warfare Experimental Establishments in December last towing a 60 Pounder gun

It was found that the Tractor was to light for use with medium Artillery, and without spuds ,failed on slopes of 1 in 5 owing to Track slip .

The Tractor however had several attractive features, notably the Gardner I.C. engine, and a simple and robust suspension.

The engine was remarkably easy to start,and had ample power.

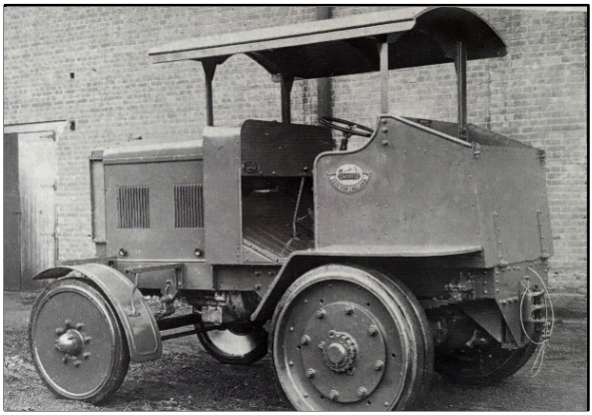
All failures were due to Track Slip, and the heavy load towed (60-pdr.gun)

I am to add that, as stated in this office letter under above number dated 20th December 1933 an immediate use for your tractor cannot,at present be visualised, but the report is being circulated to other departments at the War Office, as requested by you.

Should any requests for information about Tractors be sent to this office from the Colonial Governments your products will not be forgotten .

I am. Gentlemen. Your Obedient Servant. R.G. Awdrey. Director of Mechanisation.

Although it had been the intention to build six tractors, by 1942 only five had been completed, presumably the war effort had some bearing on this. Of the five only 102 & 103 had been sold both going to Argentina, sales were overseen by W.Cyril Williams who was based at the London head office, he had good contacts with overseas railway representatives.



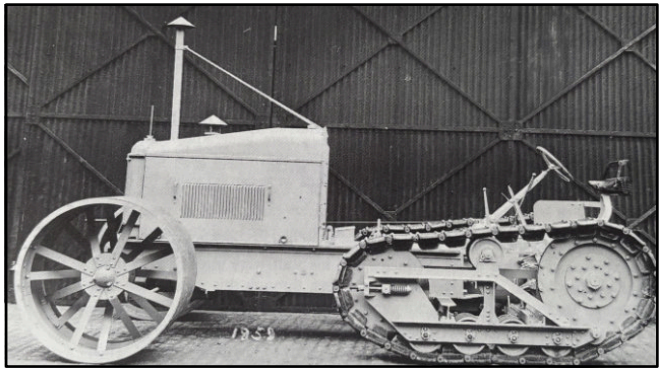
One of the trio of tractors supplied to Rhodesia, probably No 108

The weight of the tractor was transmitted to the tracks by twin four wheeled bogies with rubber tyres, which in temperate climates, improved the riding qualities and lessened noise, but would not have been suitable for tropical or sub tropical use. The track was tensioned by heavy spring loading of the rear bogie axle.Two gearboxes were provided.The first contained three forward speeds and reverse,and the standard design was arranged with speeds from 1 to 12 mph, but as we have seen a modification was designed and fitted to 104 by which the top speed was raised to 14 mph at normal revs or 20 mph if really hammered, It is likely that this was intended as the basis for the personnel carrier. Despite good reviews from the trade press the response from the public was disappointing. Sales were probably not helped by the 1934 selling price of £902. A number of enquiry's were received but all lost on price.

By late 1933 there was an order for three oil engined industrial tractors, designed to work at an altitude of 5000 ft. The engine selected was a 3LW equipped with special pistons to alter the compression ratio to suit the high altitude that it was going to work at. Other propriety equipment was a Meadows four speed gearbox, and a Borg and Beck single plate clutch. Braking was by shoes on the rear wheels, with separate shoes for the foot and hand brakes.

In 1935 one example was made and sent out to John Chambers and Son Ltd in Auckland, New Zealand. During the same period twenty one quotations were sent out with prices for fitting a Meadows Petrol engine as an alternative, and the fitting of pneumatic tyres all round. no orders were forthcoming. Although there were no further orders for this design of tractor, it seems very likely that an enquiry was received for tractors to be used in peat extraction from a company named Peco Ltd. This most likely came because of Cyril Williams London contacts. Two tractors were built from the spares for tractors original work numbers 35485 & 35486, they were fitted with the 4L2's 39163 & 30164

which had originally been used in multi-speed tractors 101 & 104. They were dispatched in 1934 to Dumfries Peco Ltd to extract peat from Lochar Moss Dumfriesshire. It is presumed that they were satisfactory as Peco turned to Garretts for specialised tractors to a peat project in Ireland.



The first of the half tracks. No 112 with Gardner 4L2
Photo By J.S.Wadell

Peat Tractors

The Peco system of peat extraction discarded with the traditional system method of cutting the peat into sods to be stacked an dried. Instead machines were devised for stripping off the surface vegetation and rubbish; milling out the the exposed peat in granular form. At first the cutting of drainage ditches was done by hand, a slow and expensive process, but subsequently this was done by a vertical disc milling cutter mounted on a heavy half track tractor.

Babcock & Wilcox Ltd were the main contractors for the plant that processed the peat before it being pressed into briquettes. It is believed that Peco were used as consultants for enquires of equipment to extract the peat. Orders were place by Babcock & Wilcox directly to Garretts for the supply of the tractors. The initial enquiry in 1934 was for three heavy tractors on half tracks, four on wheels , three harvester chassis-virtually special half tracked tractors without engines that were to be supplied by others. The general arrangement drawings and specification were supplied by Peco. The three heavy half track tractors, 110,111,112 were fitted with 4L2's.

The three harvesters , 113,114,115, were ordered as chassis only and fitted with Crossley engines.

The four wheeled tractors 120-123 were powered by 4L2's although looking fairly orthodox when viewed from the side they looked a little bizarre when viewed from any other angle due to the wide front wheels.

The four light half tracks 116-119 were originally fitted with 4LW's but were changed to Dorman 4RB engines as these were already in use, and found to be reliable, they were however, heavier, less fuel efficient, used more oil and dirtier exhausts.

Delivery of the tractors was spread over the first five months of 1935. The ground conditions on the Irish peat bogs were much softer and the tractors

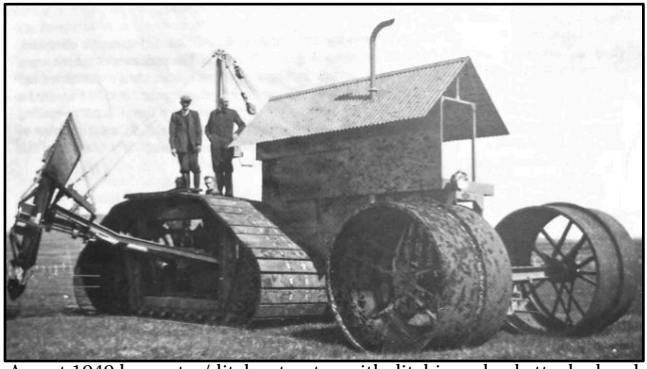
were often getting bogged down and required towing out, they also suffered steering and clutch failures, the steering failures were addressed by upgrading the material used for the components, despite the Borg & Beck 14R clutches being able to deliver the full torque delivery from the engines, they didn't survive the type of duty cycle that was required on site. They were replaced by the heavier duty 14R2 version.

The issue of bogging down was addressed by bolting 4ft long hardwood swamp shoes to the 10.5" wide tracks, inevitably as this created a lever effect on the track rollers suffered uneven wear on the track rollers. This lead to machines having wider axles fitting so that the load was centred on the tracks. These changes were incorporated in the remaining tractors. No further orders were received and the last of the Crossley engined harvesters was delivered in April 1937.

Unfortunately the Peat Fuel Company was not prosperous nor did its output reach its projected outputs, the convoluted political situation in Ireland further complicated matters and the company closed the Lullymoor operation in 1939 and went into liquidation. The outbreak of WW2 curtailed the supply of coal from Britain this left Ireland reliant on its own resources for fuel. In 1940 the Peat Development Board (subsequently renamed *"Bord na Mona"*) was set up to take over the Lullymoor operation and expand its output. It wasn't until 1949 that further orders for peat tractors was received. These orders fulfilled a large part of the output for the next eleven years. During the eleven year period they produced 92 harvester/ditcher tractors, which were powered by 6LW's . 179 half track tractors with ancillary equipment that went with them. Of the Light Half Tracks 106 were fitted with 6LW's the remaining 73 had 4LW's.

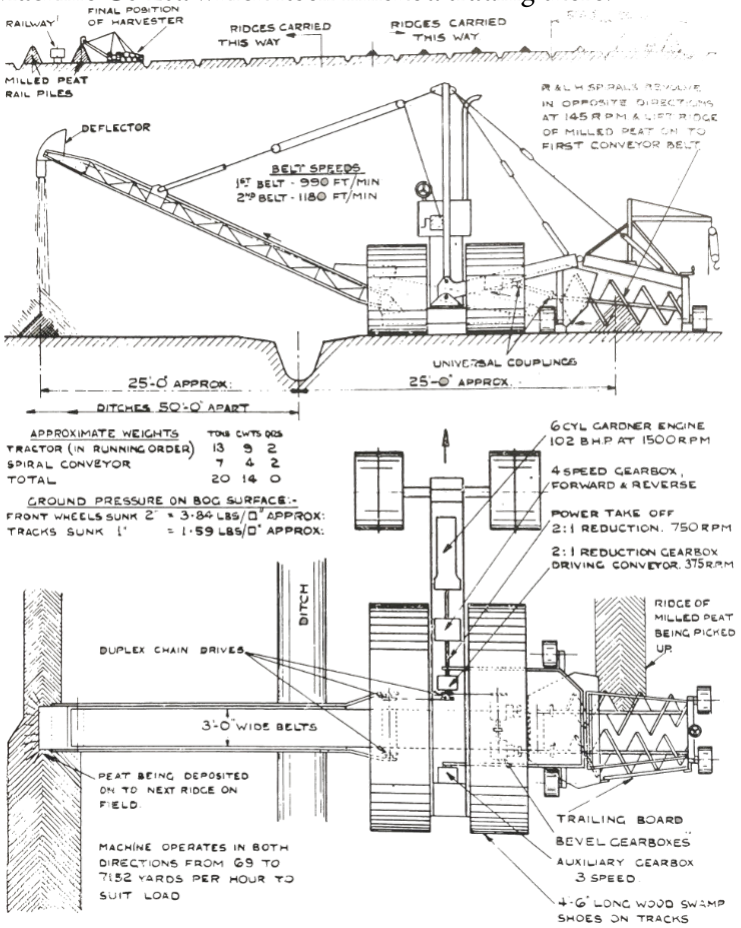
In addition to the Bord na Mona orders a further harvester/ditcher and three half tracks all with 6LW's were supplied to the North Scotland Hydro-Electric Board.

Initially all the work was carried out a the Garrett works in Leiston, but in 1951 Beyer Peacock & Co Ltd acquired Dennings of Chard, Somerset who were made a subsidiary of Garretts. During the third year of the 1949 contact some works were carried out at Chard. In 1952 BM



A post 1949 harvester/ditcher tractor with ditching wheel attached and the full glory of the cab visible

entered into a three year contract for the Light Half tracks previously mentioned, the order was worth £720,000 a sizeable sum at the time.
There was pressure from within BM to use companies within Ireland and as such BM wouldn't enter into a further contract's with Garretts's for the supply of further equipment. This lead to machines being built at the Irish company Thomas Thompson & Son of Carlow with the gearboxes being supplied from the Leiston works. 72 tractors were built at Thomas Thompson from either the 1952 or subsequent orders.
Although the supply of new tractors to BM ceased in 1960 Garretts continued to supply spare parts for over a decade, this provided some income to the Leiston works. Richard Garrett Engineering was wound up in 1979, the drawing office and its contents together with most of the works was taken over by S & S Machine Co Ltd which itself finished trading there.



The peat gathered in windrowes was then aggreated across the bog, as shown in the diagram using the spiral conveyor mounted on a harvester/ditcher

Brief Specifications of Peat Tractors (1957) Light Type Half-track Tractor

The Light Type Half-track Tractor is designed specially for operation on peat bogs and is complete with centrally pivoted front axle with 4' 0" diameter wheels, Ackermann cum worm and worm wheel steering gear, special type Gardner radiator, and Hermetic flexible disc couplings between engine and gearbox. It has:

Change speed gearbox having three speeds forward and one reverse, and provided with power take-off gear and

Hermetic flexible disc coupling and transmission shaft with outboard bearing toward rear of chassis. Hand operated transmission parking brake.

Hardy Spicer mechanical universal joints and transmission shaft for main drive to rear axle; differential worm and worm wheel drive to rear axle and track sprockets.

Track frames fitted with specially surfaced cast steel track rollers, running on manganese steel track shoes. Chassis frame arranged to receive Gardner 6LW Diesel engine or 4LW, depending upon its intended use]. Battery compartment complete with 12 volt alkaline batteries, and all wiring enclosed in conduits.

Steering, clutch, gearbox and power take-off, accelerator, stopping and parking brake controls, grouped around an adjustable pan type driver's seat.

Instrument panel provided with control switches, ammeter, panel light and engine oil gauge. Case for driver's log book. Engine speed tachometer, or hours run counter.

50 gallon capacity fuel tank. Engine exhaust and air filter systems.

Drawbar at front and rear. Head lamp and rear lamp provided, and one set of tools and equipment.

All transmission shafts mounted on ball or roller bearings.

Engine air filter and oil gauge, dynamo, electric started motor, fuel filters, Borg & Beck flywheel clutch, engine tools and equipment, together with a complete set of swamp shoes.

The tractor is supplied without cab or awning.

All equipment painted with three coats of paint, finishing with daffodil yellow enamel.

Harvester/Ditcher Tractor

The Peat Harvester/Ditcher Tractor is designed specially for operation on peat bogs and is complete with centrally pivoted front axle with 6' 0" diameter wheels, worm wheel-cum-drum and wire rope steering gear, special type Gardner radiator. Hermetic flexible disc coupling transmission shaft between engine and gearbox, and Layrub coupling drive shaft for power take-off. It has:

Main change speed gearbox having four speeds in both forward and reverse and provided with power take-off shaft, Hardy Spicer mechanical universal joints and transmission shaft for main drive to auxiliary gearbox, auxiliary gearbox having three speeds, with differential worm and worm wheel and spur gear drive to rear axle and track sprockets. Track frames fitted with specially surfaced cast steel track rollers running on manganese steel track shoes.

Chassis frame arranged to receive Gardner 6LW diesel engine with enclosed type Borg & Beck 16" clutch, and drilled to receive ditching wheel and harvesting spiral conveyor attachments.

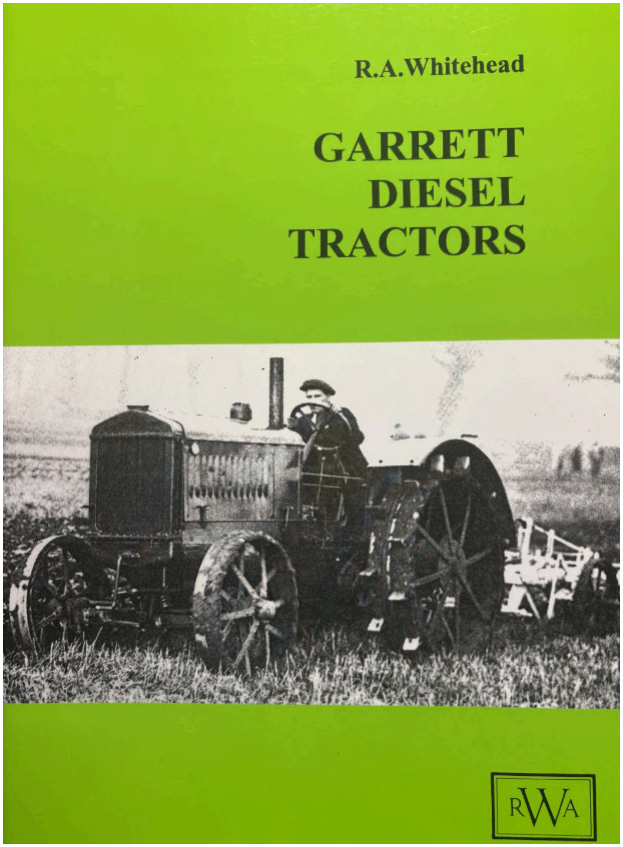
Battery compartment complete with 12 volt alkaline batteries and all wiring enclosed in conduits.
Steering, clutch, main gearbox, power take-off, accelerator, stopping and hand parking brake controls, grouped around an adjustable plank type driver's seat.
Instrument panel provided with control switches, engine and gearbox oil gauges, ammeter, and panel light. Driver's log book case. Engine speed tachometer, or hours run counter.
50 gallon capacity fuel tank. Engine exhaust and air filter systems.
On units intended for ditching work, removable enclosed type call for driver, having sliding door at near side, and provided with interior lighting.
Drawbar at front and rear. Front and rear headlamps, together with one set of tools and equipment.
Engine air filter, oil gauge, dynamo, electric starter motor, fuel filters, Borg & Beck flywheel clutch, engine tools and equipment, together with a complete set of swamp shoes.
All transmission shafts mounted on ball or roller bearings.
All equipment painted with three coats of paint, finishing with daffodil yellow enamel.

Appendix F
Makers data and dimensions of Multi-speed crawler tractor with Gardner 4L2
Engine Horse Power at 1 000 / 1 300 R.P.M. 38 / 50 B.H.P.
Drawbar Horse Power 35 B.H.P.
Tractor Speeds at 1 300 R.P.M.:

	Low Gear	High Gear
1st Speed	2 M.P.H.	6 M.P.H.
2nd Speed	3 M.P.H.	9 M.P.H.
3rd Speed	4 M.P.H.	12M.P.H.
Reverse	2.5 M.P.H.	7.5 M.P.H.

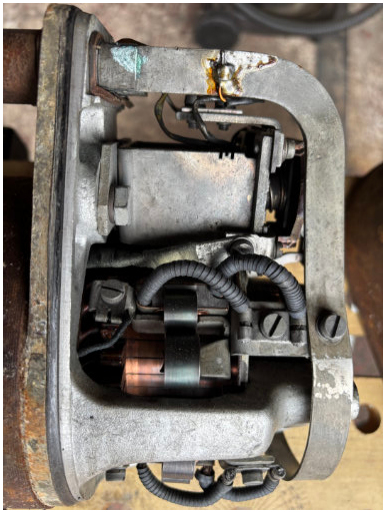
Maximum Drawbar Pull 8000 lbs.
Continuous Drawbar Pull 7500 lbs.
Fuel Consumption per hour at 42 B.H.P. 16.8 lbs
Capacity of Fuel Tank 25 gallons
Capacity of Radiator 9 gallons
Overall Length 12 ft.
Overall Width 7 ft.
Overall Height (top of Awning) 8 ft.
Weight 5½ tons

In total 290 Gardner engines were used by Richard Garrett Engineering in their tractors.
14 off 4L2's,- 4 off 3LW's - 70 off 4LW's,-202 off 6LW's



The information contained in this article is based on the above publication, highlighting the development of the various tractors and the use of Gardner Engines, all of the photographs and drawings are from either the same publication or Wikipedia.
Garretts were a company with a diverse portfolio and there are other books available covering there other products.
There is far more information in the above publication than can be usefully summarised and fitted into our publication. It is still readily available from https://classictractors.co.uk/product/garrett-diesel-tractors/ for £7.00
ISBN 0-9508298-3-8
Part of the original works at Leiston is now a museum which houses a collection of the artefacts and equipment relating to Garretts plus other agricultural items.
https://www.longshopmuseum.co.uk.

For Sale



Starter Motor for L2
This was a spare starter for a 4L2 which is now surplus to requirements, it is a 12 Volt 6" Dia Bosch Starter with a 13 tooth pinion, it has seen very little use as can be seen in the photograph of the brush gear and commutator.

Price £150
Call Steven on 07802 494492 if interested.

For opening times check the website

The Museum holds many records of Gardner and other makes of engine and also offers a dating service. Go to http://www.enginemuseum.org/news.html to find the downloadable enquiry form

Special events occur throughout the year normally at Bank Holidays See the Museum Website www.enginemuseum.org for up to date information

Anson Road,Poynton,Cheshire,SK12 1TD

Tel: 01625 874 426 Email: enquiry@enginemuseum.org

GARDNER PARTS

Centurion Court
Centurion Way
Leyland
Lancashire
PR25 3UQ

Tele 01772 642460
Fax 01772 621333

WALSH'S ENGINEERING LTD

COMMERCIAL DIESEL ENGINE SPECIALISTS

GARDNER

Barton Moss Road
Eccles
Manchester
MR30 7RL

Parts & Services

Tele:- 0161 787 7017 Fax:- 0161 787 7038

E Mail:- walshs@gardnerdiesel.co.uk www.gardnerdiesel.co.uk

Disclaimer please see note 2 on page 1